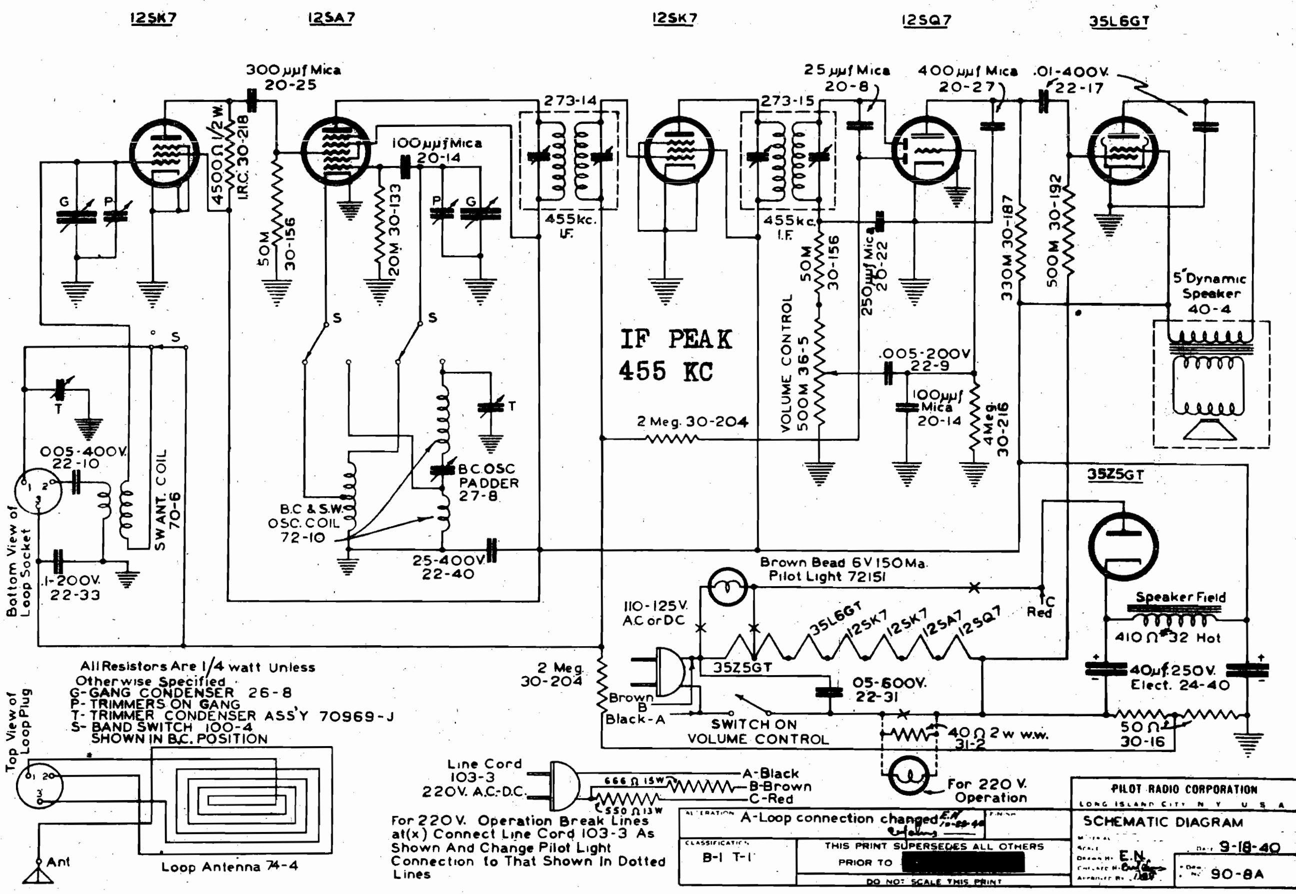
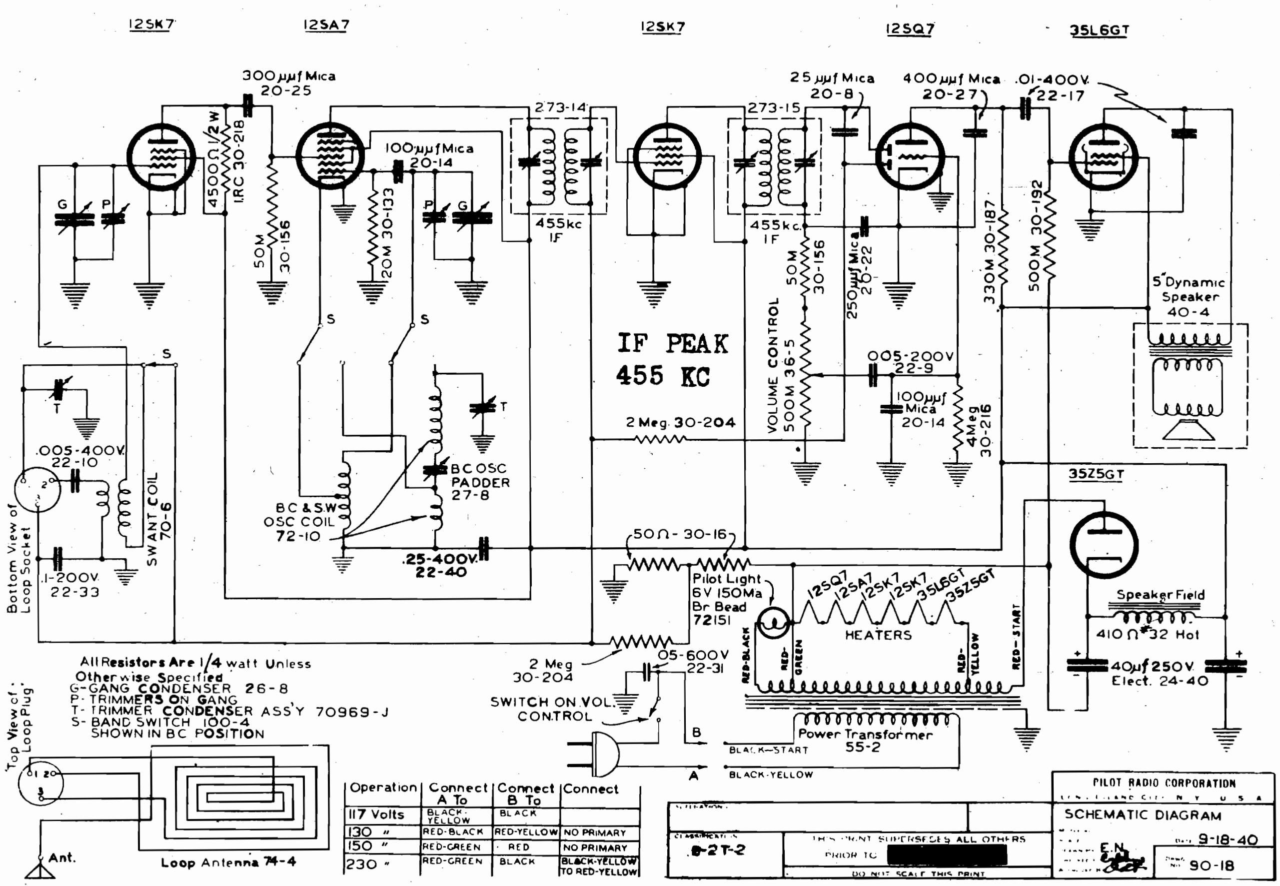
PILOT RADIO CORP.

MODELS B-1, T-1
MODELS B-2, T-2

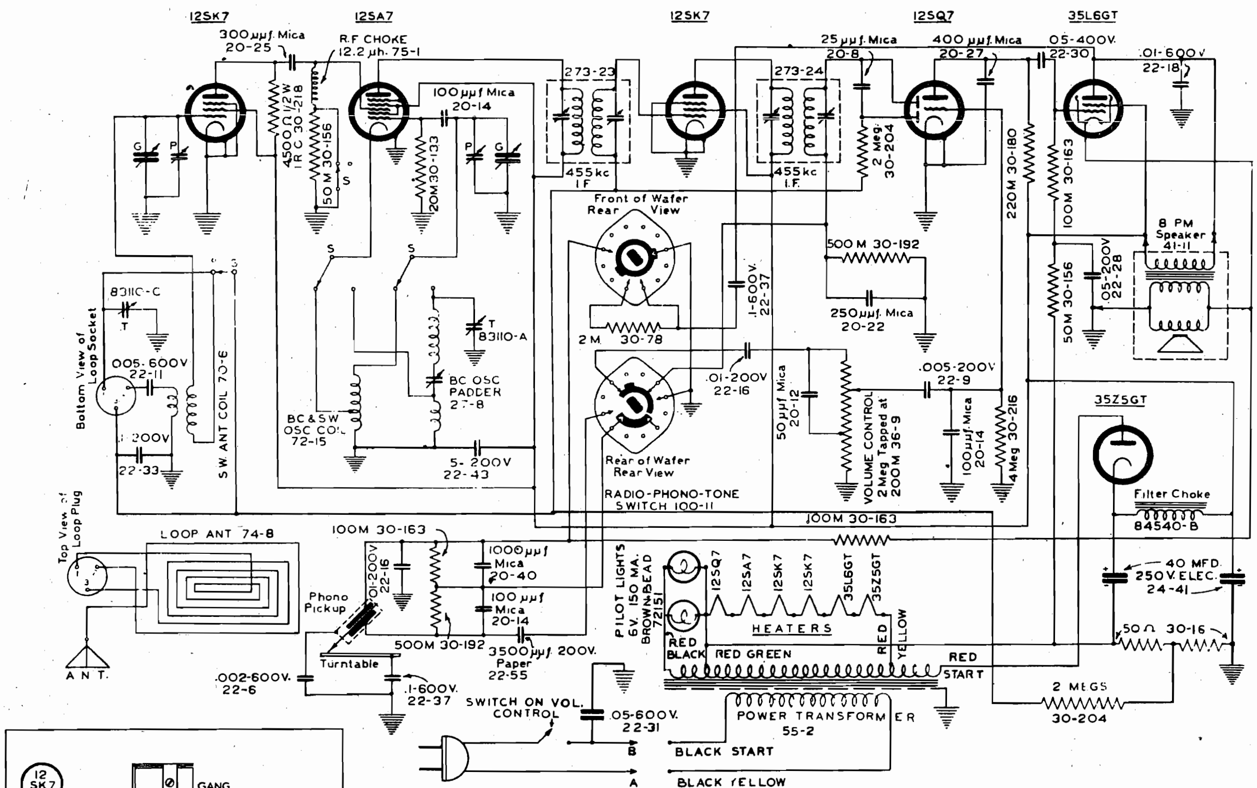


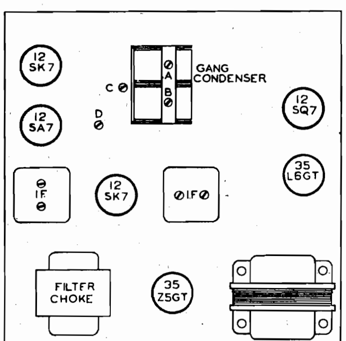


Operation	Connect A To	Connect B To	Connect
117 Volts	BLACK-YELLOW	BLACK	
130 "	RED-BLACK	RED-YELLOW	NO PRIMARY
150 "	RED-GREEN	RED	NO PRIMARY
230 "	RED-GREEN	BLACK	BLACK-YELLOW TO RED-YELLOW

MODEL TP-32

PILOT RADIO CORP.





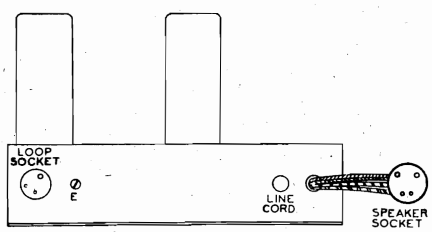
TOP VIEW OF CHASSIS

IF PEAK 455 KC

ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED
G- GANG CONDENSER 26-9
P- TRIMMERS ON GANG
T- TRIMMER CONDENSERS
S- BAND SWITCH 100-10 SHOWN IN S.W. POSITION
RADIO-PHONO-TONE SWITCH SHOWN IN EXTREME COUNTERCLOCKWISE POSITION (No. 1)
No. 1—RADIO VOICE
No. 2— " TREBLE
No. 3— " BASS
No. 4—PHONO VOICE
No. 5— " TREBLE
No. 6— " BASS

OPERATION	CONNECT A To	CONNECT B To	CONNECT
117 VOLTS	BLACK-YELLOW	BLACK	
130 "	RED-BLACK	RED-YELLOW	NO PRIMARY
150 "	RED-GREEN	RED	NO PRIMARY
230 "	RED-GREEN	BLACK	BLACK-YELLOW TO RED-YELLOW

PILOT RADIO CORP.
Long Island City, N.Y., U.S.A.
Schematic Diagram Model TP-32
Drawn by C.W. Date 12-2-40
Checked by
Approved by
Drwg. No. 90-24.



REAR VIEW OF CHASSIS

PHONOGRAPH OPERATION

The motor is controlled by the automatic stop lever which is at the rear right side of the turntable. Volume for both, "Phono" and "Radio" is regulated by the same control on the front of the receiver.

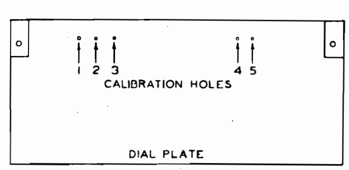
The tone control and phono radio switch must be in either of the three clockwise positions for phonograph operation.

The screws for adjusting both the R.F. and I.F. amplifiers of this receiver, together with the frequencies at which they should be adjusted, are all pictured on the above diagram. When aligning the I.F. amplifier, the generator must be connected to the grid of the 12SK7 R.F. tube through a .1 mfd condenser. When aligning the receiver, first align the shortwave band connecting the generator to the antenna post with a 400 ohm resistor. Then align the broadcast band using a .0002 mfd. condenser.

When aligning the loop, the receiver should be in the cabinet with the back in place. The adjusting condenser can be reached through the slot in the lower left hand side of the back.

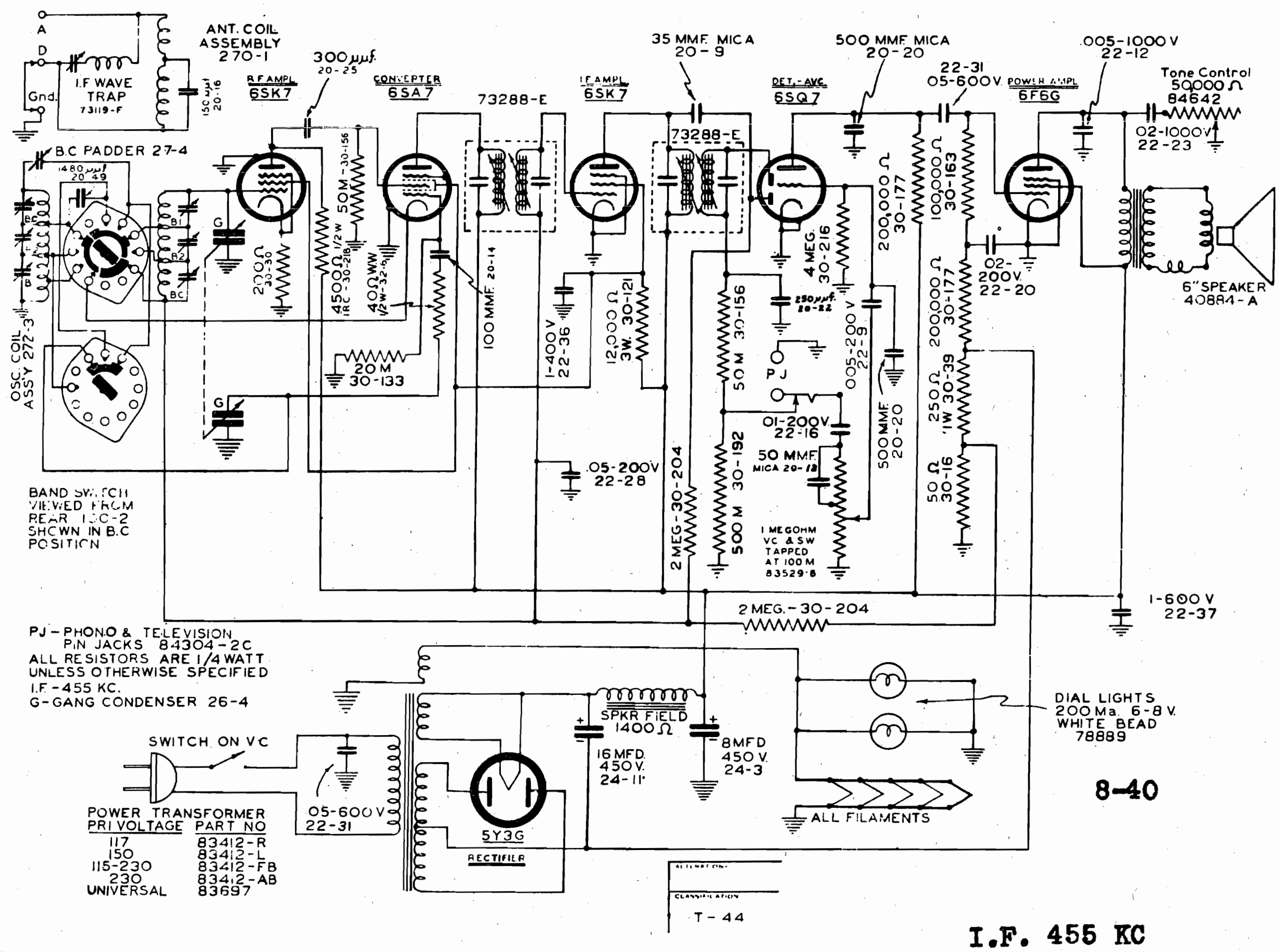
TRIMMERS
I.F. ADJUSTED AT 455 KC
A - ANTENNA S.W. 21.0 MC.
B - OSCILLATOR S.W. 24.0 MC.
C - OSCILLATOR B.C. 1400 KC
D - OSCILLATOR PADDER 600 KC
E - LOOP ANTENNA 1400 KC

DIAL PLATE CALIBRATION HOLES
1 - START 535 KC.
2 - ------ 6.0 MC.
3 - ------ 600 KC
4 - ------ 1400 KC
5 - ------ 21.0 MC



PILOT RADIO CORP.

MODEL T-44

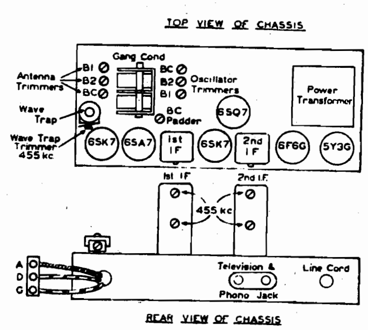


8-40

I.F. 455 KC

TUNING RANGE

Broadcast Band 535 to 1720 kc.; or 561 to 174.0 meters
Band II 1.98 to 7.05 mc. or 152 to 42.5 meters
Band I 6.95 to 24.75 mc. or 43.2 to 12.1 meters



SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.

OSC. TRIMMERS
BC- 1720 KC
B1- 24 MC
B2- 6 MC

ANT. TRIMMERS
BC- 1400 KC
B1- 18 MC
B2- 6 MC

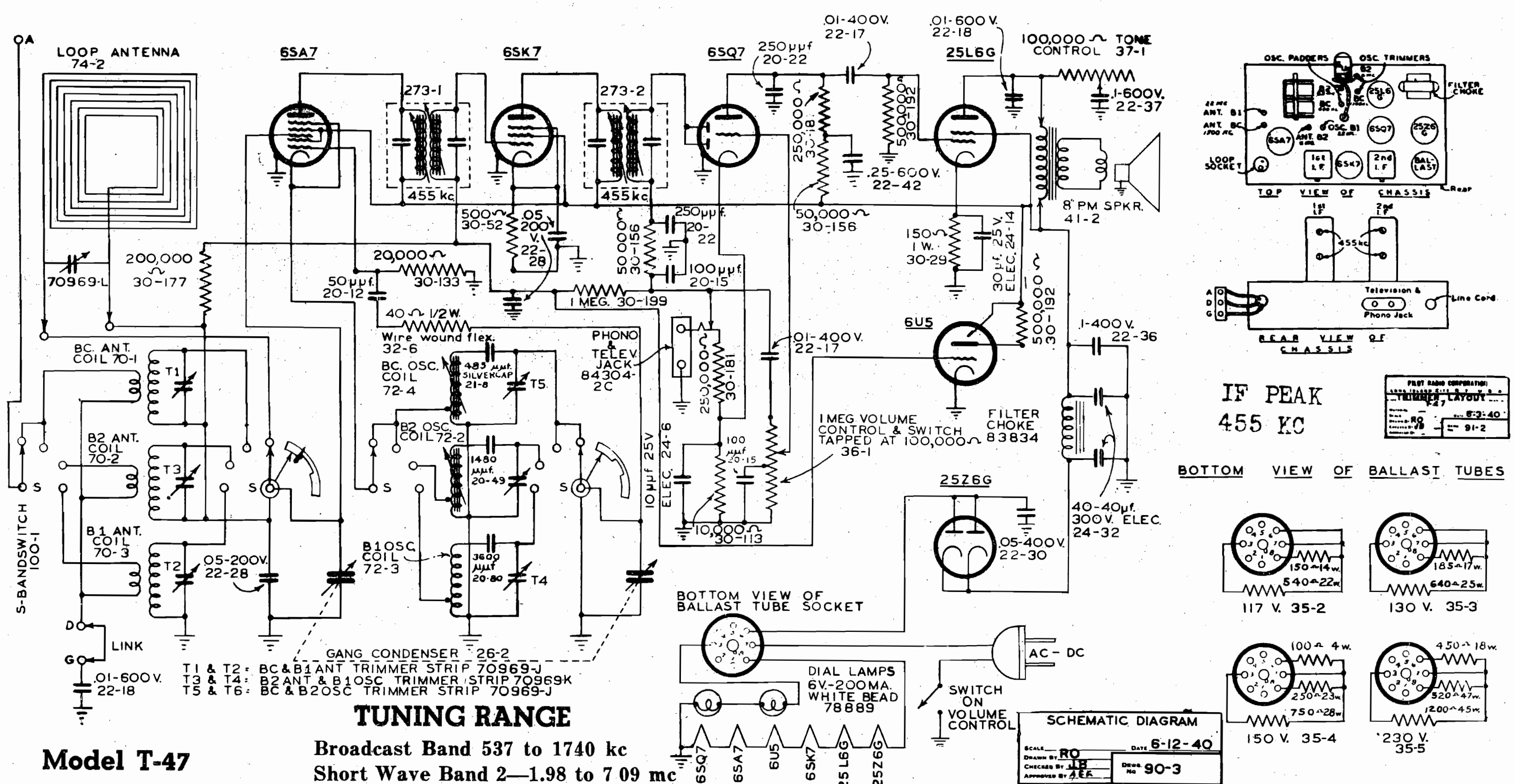
BC Padder- 600 KC

PHONOGRAPH AND TELEVISION JACKS

On the rear of the chassis is a set of "Pin" jacks. They are intended to be employed for connection with an electrical phonograph, or with the sound outlet of a television receiver.

MODEL T-47

PILOT RADIO CORP.



Model T-47

A.C.-D.C. Receiver

TUNING RANGE

Broadcast Band 537 to 1740 kc
Short Wave Band 2—1.98 to 7 09 mc
Short Wave Band 1—7.2 to 24.5 mc

ANTENNA

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".

POWER SUPPLY

This receiver is equipped with an interchangeable plug-in Resistor. To be sure of using the correct Resistor for the voltage of your particular house current, see the label attached to the back of the cabinet. This Resistor may be changed as easily as a radio tube.

When operating on direct current, if the receiver does not work about one minute after being turned on, reverse the plug in the light socket.

PHONOGRAPH AND TELEVISION JACKS

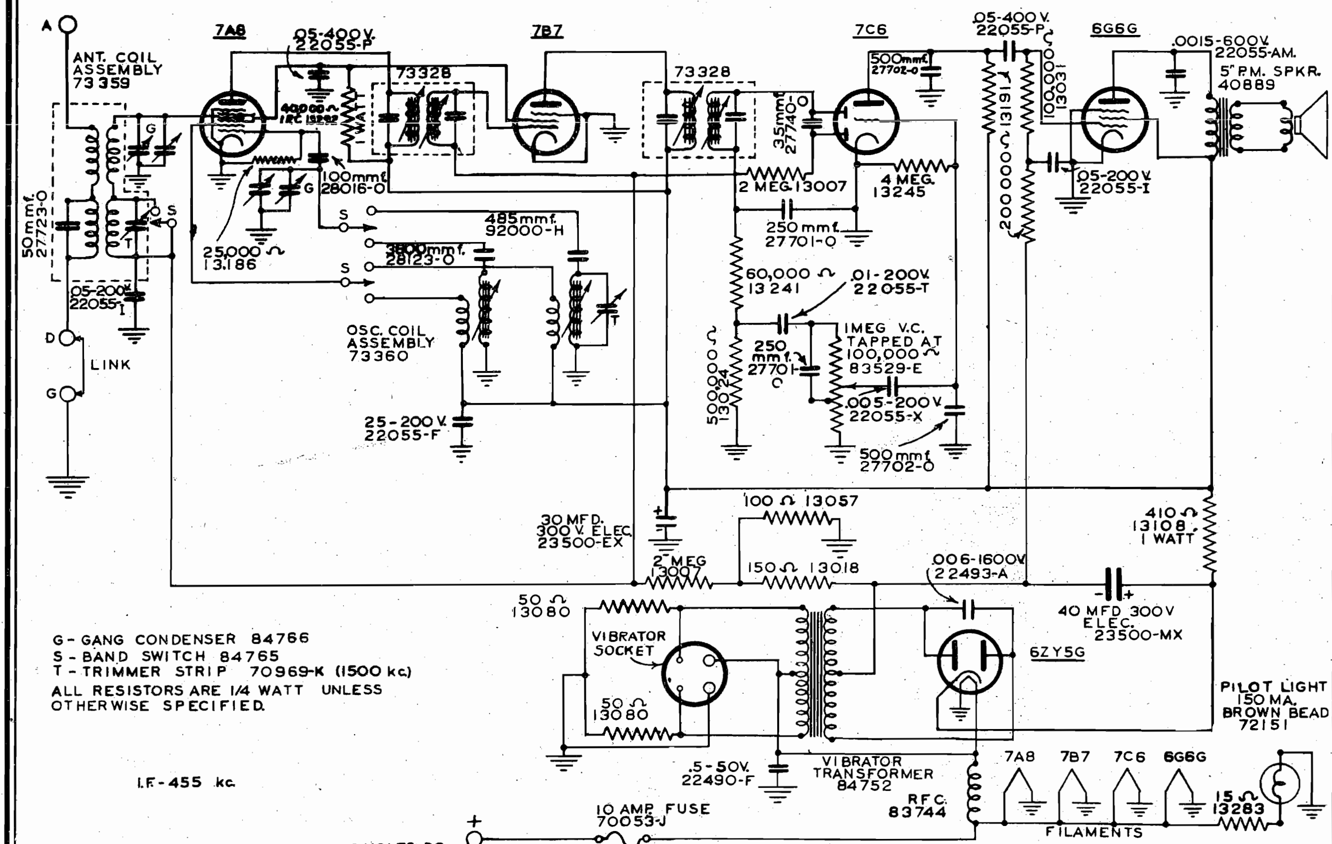
On the rear of the chassis is a set of "Pin" jacks. They are intended to be employed for connection with an electrical phonograph, or with the sound outlet of a television receiver.

SERVICE NOTES

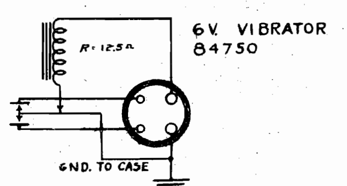
The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .002 mfd condenser, and on the two short wave bands use a 400 ohm carbon resistor.

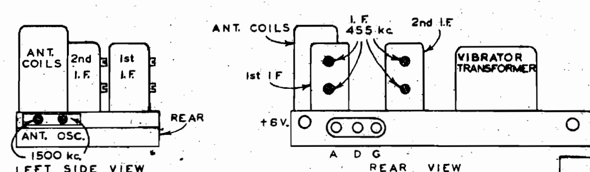
PILOT RADIO CORP.



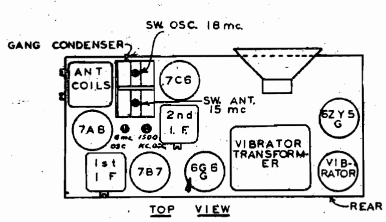
PILOT RADIO CORPORATION LONG ISLAND CITY N.Y. U.S.A.	
ALTERATIONS	FINISH
SCHEMATIC DIAGRAM T-Y-91	DATE 4-2-40
CLASSIFICATION: 91 SERIES	THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
DO NOT SCALE THIS PRINT	DRAWN BY R.O. DWG No. 25259



This Pilot Superheterodyne Receiver has 5 tubes and operates on a 6 volt power supply at 2.2 amperes.



PILOT RADIO CORPORATION LONG ISLAND CITY N.Y. U.S.A.
TRIMMER LAYOUT T-Y-91
DATE 4-2-40
DWG. No. 25260



Model 91
6 Volt D.C. Receiver

TUNING RANGE

Broadcast Band 535 to 1720 kc.
Short Wave. Band 5.6 to 19.8 kc.

SERVICE NOTES

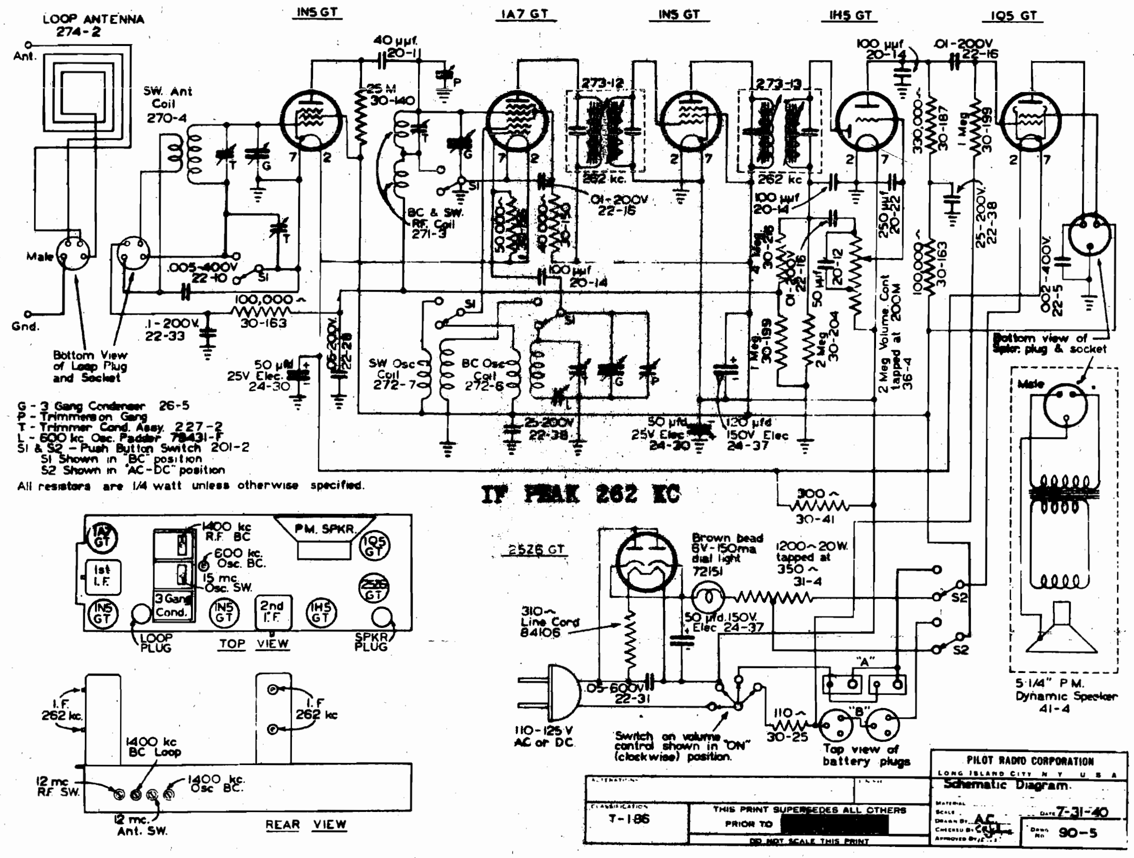
When aligning the I. F. amplifier, the generator must be connected to the grid of the 7A8 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.

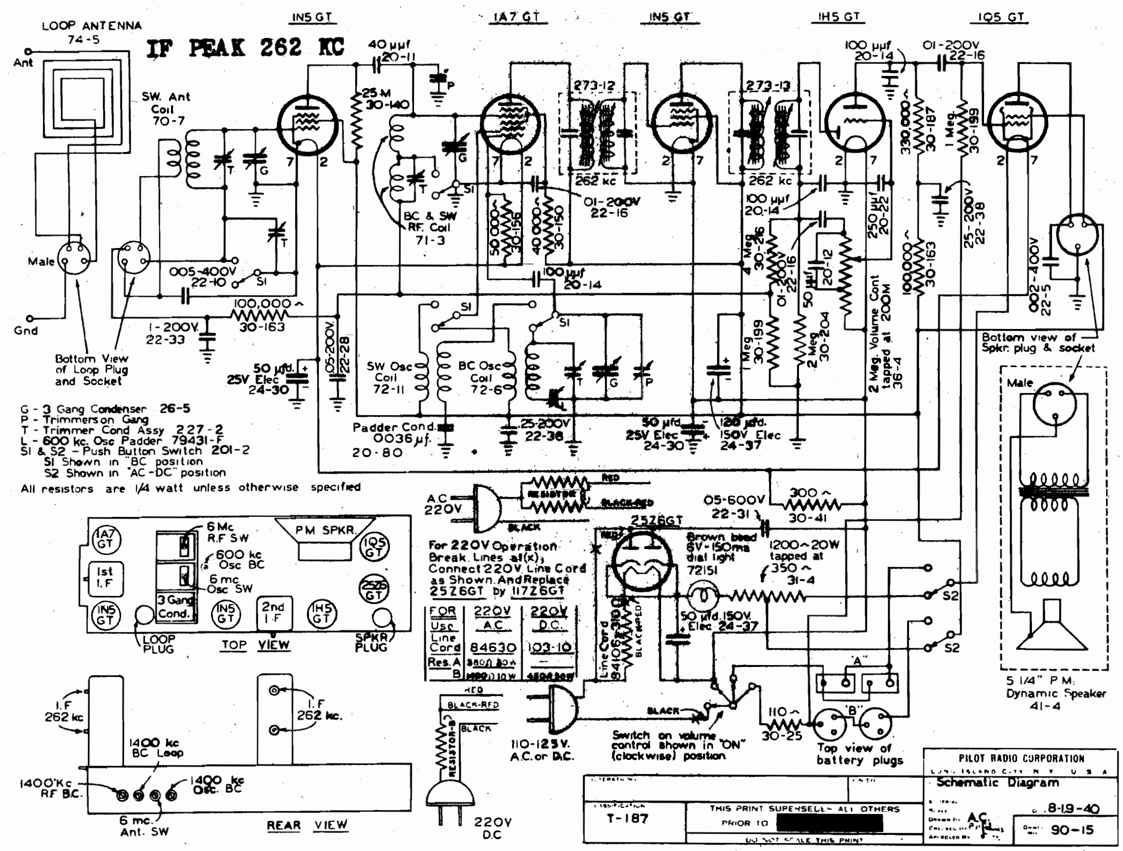
ANTENNA

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G"

MODEL T-186
MODEL T-187

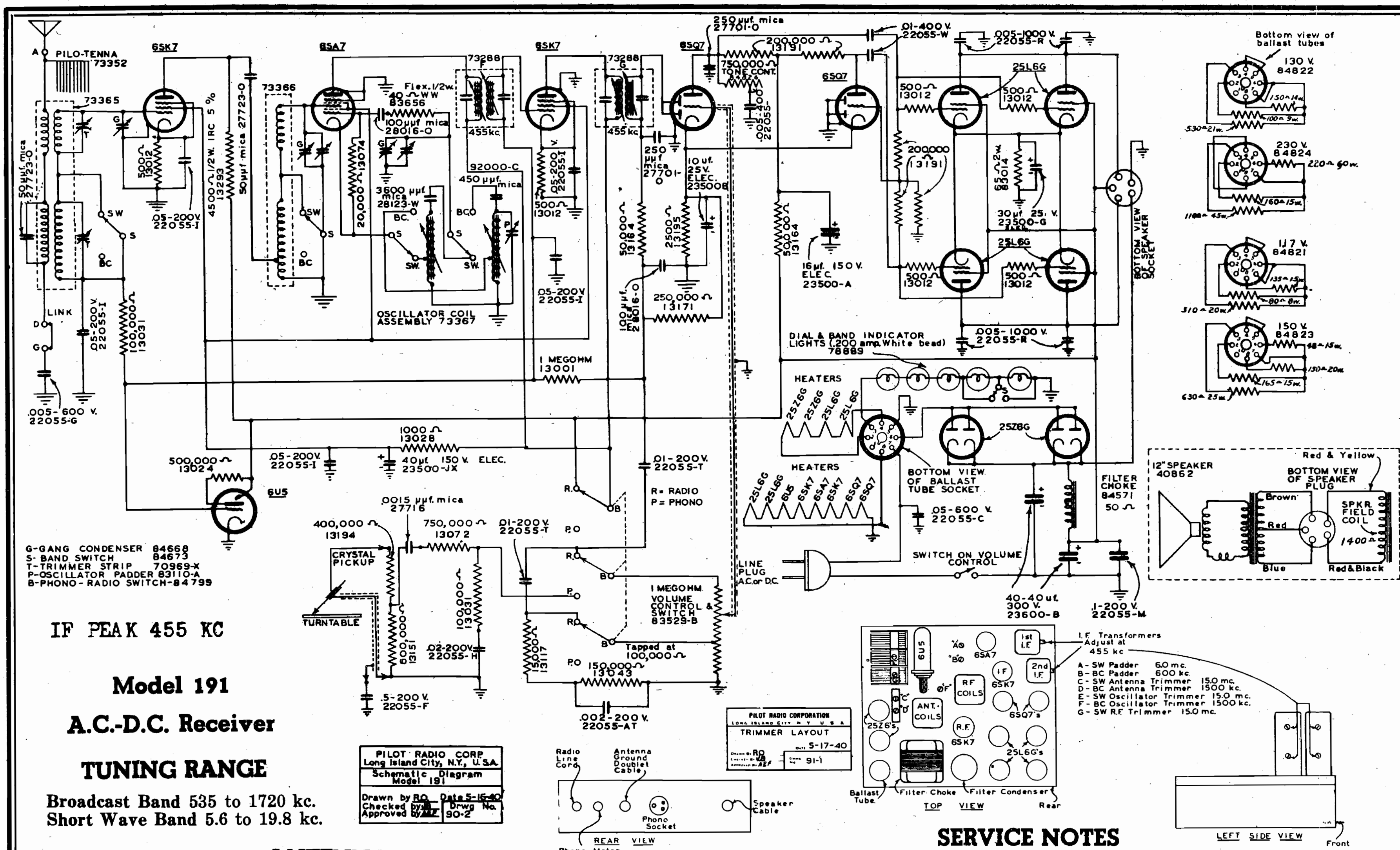
PILOT RADIO CORP.





MODEL 191

PILOT RADIO CORP.



IF PEAK 455 KC

Model 191

A.C.-D.C. Receiver

TUNING RANGE

Broadcast Band 535 to 1720 kc.
Short Wave Band 5.6 to 19.8 kc.

ANTENNA

When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G".

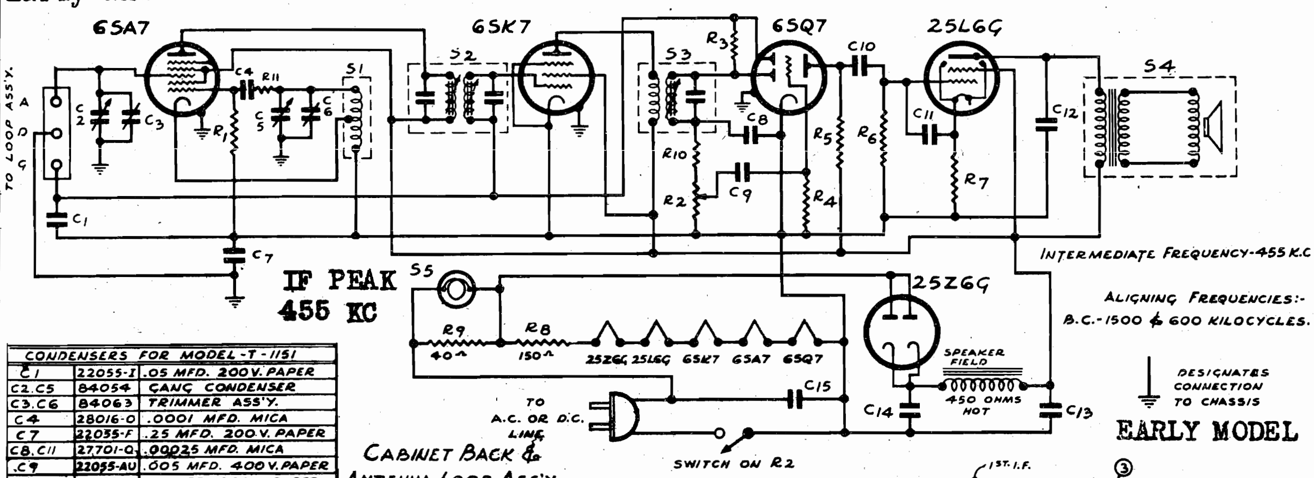
SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I. F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .0002 mfd condenser, and on the short wave band use a 400 ohm carbon resistor.

MODEL T-1151
Early and Late

PILOT RADIO CORP.



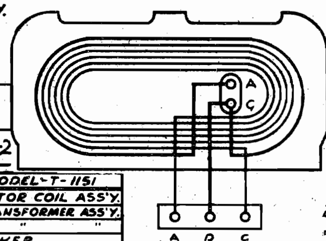
IF PEAK 455 KC

EARLY MODEL

CONDENSERS FOR MODEL-T-1151		
C1	22055-I	.05 MFD. 200V. PAPER
C2.C5	84054	GANG CONDENSER
C3.C6	84063	TRIMMER ASS'Y.
C4	28016-0	.0001 MFD. MICA
C7	22055-F	.25 MFD. 200V. PAPER
C8.C11	27701-Q	.00025 MFD. MICA
C9	22055-AU	.005 MFD. 400V. PAPER
C10.C12	22055-W	.01 MFD. 400 V. PAPER
C13.C14	23500-J	40MFDS. 150V. MIDGET ELECT
C15	22055-U	.01 MFD. 1000V. PAPER

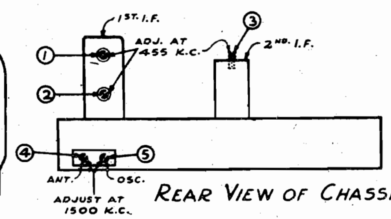
RESISTORS FOR MODEL-T-1151		
R1	13074	20,000 OHMS 1/4 WATT
R2	79429-B	500,000 OHMS VOLUME CONTROL & SWITCH
R3	13007	2 MEGOHMS 1/4 WATT
R4	13245	4 MEGOHMS 1/4 WATT
R5	13224	330,000 OHMS 1/4 WATT
R6	13028	500,000 OHMS 1/4 WATT
R7	13018	150 OHMS 1/4 WATT
R8, R9	84049	WIRE WOUND RESISTOR 190 OHMS TAPPED @ 40Ω
R10	13225	47,000 OHMS 1/4 WATT
R11	13220	470 OHMS 1/4 WATT

CABINET BACK & ANTENNA LOOP ASS'Y.

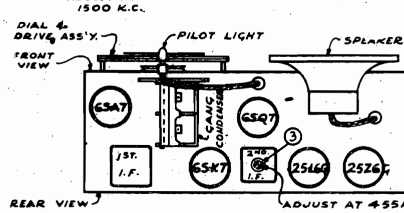


SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-T-1151
MATERIAL
SCALE
DATE 3-24-39
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DWG NO 25220-2

MISCELLANEOUS FOR MODEL-T-1151		
S1	73265	OSCILLATOR COIL ASS'Y.
S2	73192-D	1ST I.F. TRANSFORMER ASS'Y.
S3	73267	2ND I.F. " "
S4	40869	5" SPEAKER
S5	72151	PILOT LIGHT



REAR VIEW OF CHASSIS



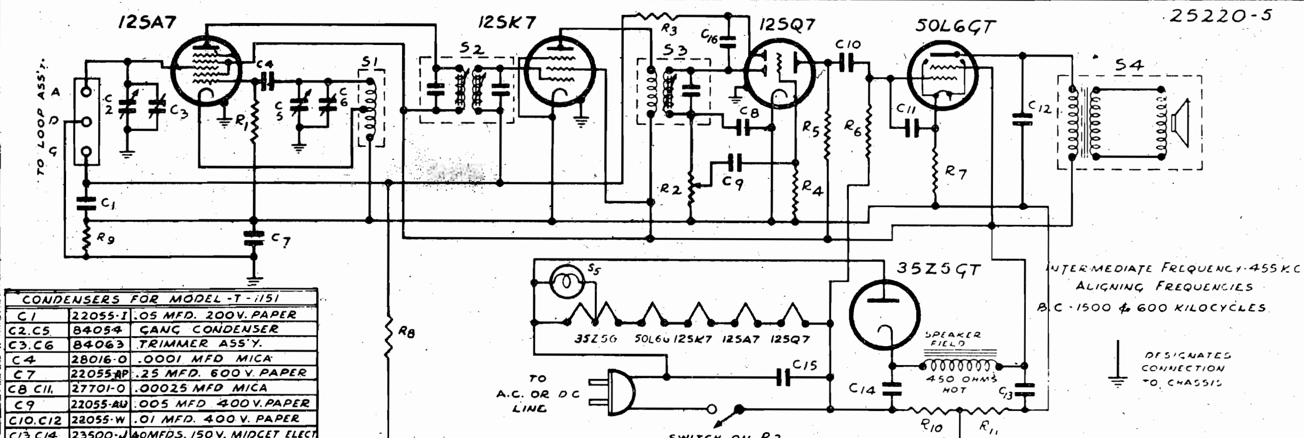
TOP VIEW OF CHASSIS

The screws for adjusting both the R.F. and I.F. amplifiers of this receiver, together with the frequencies at which they should be adjusted, are all pictured on the wiring diagram. WHEN ALIGNING THIS RECEIVER, IT MUST BE IN THE CABINET WITH THE LOOP ANTENNA CONNECTED AND THE BACK OF THE CABINET SCREWED ON. The adjusting condensers are reached through the hole in the lower left hand corner of the back, looking at the back. The I.F. amplifier can be aligned with the chassis out of the cabinet, but with the loop antenna connected.

ALTERATIONS (2) REVISED TUBES-C13,C14 WAS 16MFD. 19V. R8,R9 WAS 190Ω TAP 40Ω - ADDED R-10-R11. 8R.-8-10-39 | FINISH

CLASSIFICATION MODEL T-1151 | THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted] | DO NOT SCALE THIS PRINT

25220-5

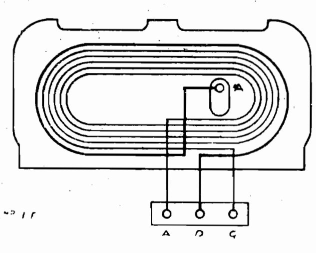


LATE MODEL

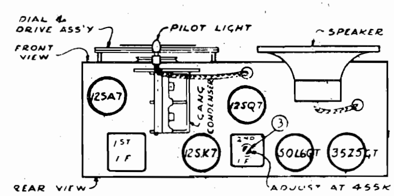
CONDENSERS FOR MODEL-T-1151		
C1	22055-I	.05 MFD. 200V. PAPER
C2.C5	84054	GANG CONDENSER
C3.C6	84063	TRIMMER ASS'Y.
C4	28016-0	.0001 MFD MICA
C7	22055-AP	.25 MFD. 600 V. PAPER
C8 C11	27701-0	.00025 MFD MICA
C9	22055-AU	.005 MFD 400 V. PAPER
C10.C12	22055-W	.01 MFD. 400 V. PAPER
C13.C14	23500-J	40MFDS. 150V. MIDGET ELECT
C15	22055-U	.01 MFD. 1000V PAPER
C16	27736-0	25 MMFD MICA.

IF PEAK 455 KC

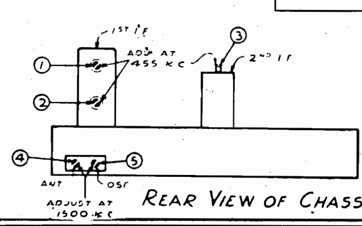
CABINET BACK & ANTENNA LOOP ASS'Y



RESISTORS FOR MODEL-T-1151		
R1	13074	20,000 OHMS 1/4 WATT
R2	79429-B	500 000 OHMS VOLUME CONTROL & SWITCH
R3, R8	13007	2 MEGOHMS 1/4 WATT
R4	13245	4 MEGOHMS 1/4 WATT
R5	13224	330 000 OHMS 1/4 WATT
R6	13028	500 000 OHMS 1/4 WATT
R7	13018	150 OHMS 1/4 WATT
R10	13284	65 OHMS 1/2 WATT
R11	13283	15 OHMS 1/4 WATT
R12	13043	150,000 OHMS 1/4 WATT



TOP VIEW OF CHASSIS



REAR VIEW OF CHASSIS

MISCELLANEOUS FOR MODEL-T-1151		
S1	73265	OSCILLATOR COIL ASS'Y
S2	73192-D	1ST I F TRANSFORMER ASS'Y
S3	73267	2ND I F
S4	40869	5 SPEAKER
S5	72151	PILOT LIGHT BROWN BEAD, 6V. 150 MA

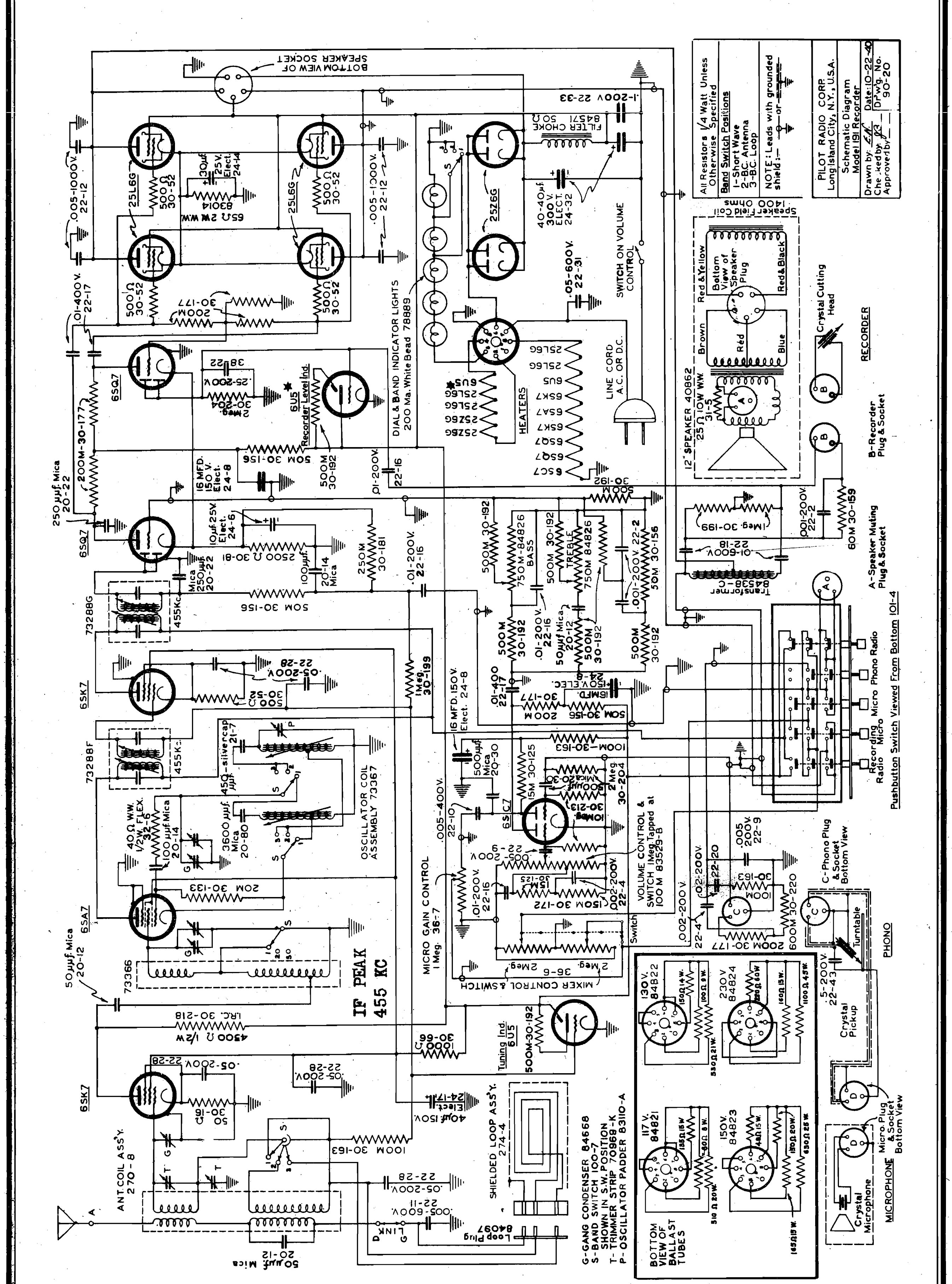
ALTERATIONS (2) REVISED TUBES-C13 C14 WAS 16MFD. 19V. R8,R9 WAS 90Ω TAP 40Ω - ADDED R-10-R11 8R.-8-10-39 | FINISH

CLASSIFICATION MODEL T-1151 | THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted] | DO NOT SCALE THIS PRINT

SCHEMATIC CIRCUIT DIAGRAM FOR MODEL-T-1151
MATERIAL
SCALE
DATE 3-24-39
DRAWN BY B.R.
CHECKED BY
APPROVED BY
DWG NO 25220-5

MODEL D-194

PILOT RADIO CORP.



PILOT RADIO CORP.

This Pilot Superheterodyne Receiver has 12 tubes and a Cathode Ray Tuning Beacon, and operates on an Alternating power supply.

TUNING RANGE

Broadcast Band 535 to 1720 kc.; or 561 to 174 meters
Short Wave Band 5.6 to 19.8 kc.; or 53.6 to 15.2 meters

This radio-phono unit with a combined recorder permits the owner to do the following things:-

1. Operate the receiver for Bc & Sw reception.
2. Play commercial recordings.
3. Record radio programs.
4. Record his voice separately or in conjunction with a radio program.
5. Play these records back
6. Do his own broadcasting by means of the microphone.

OPERATION

For the accomplishment of any of the above six functions, the following operations apply:-

1. To OPERATE RADIO- After the "on-off" power switch has been turned on, simply press down the button marked RADIO. Any of the upper knobs may be used in conjunction with the radio to increase volume, to tune in stations and to obtain the tone you desire.

2. To OPERATE PHONOGRAPH- Simply press down the button marked PHONO and use the upper knobs to adjust volume, bass or treble.

3. To RECORD RADIO PROGRAMS- First tune the radio program to its proper setting. Have the bass control in a middle position. The treble control can be operated to suit the individual taste. When the program is clearly heard, then press the button marked RADIO RECORDING. As soon as this is done, the speaker is muted although the radio program can still be heard.
Be sure the phonograph unit is set on MANUAL. When the button marked RADIO RECORDING is pressed in, the volume control should be turned up until the recorder level indicator on the phonograph panel is nearly closed. Then raise the cutting head and place it on the blank record disc. During the course of recording, the recording level indicator will waver according to the level of the program.

4. To RECORD VOICE-
   (A) Separate Voice Recording- To record a voice, press button marked MICRO RECORDING. Be sure the mixer control is set at the off position and proceed as in paragraph #3.
   (B) Voice Recording In Conjunction With A Radio Program- Set radio program as instructed in paragraph #3. Advance mixer to the right and speak or sing into the microphone. Adjust the mixer to proper proportion so either voice or radio program will sound loudest, as the case may be. By means of this process, you may, during the course of a radio program recording either (1) completely eliminate the program and insert your voice, (2) bring your voice into the foreground with the program in the background or (3) bring the program into the foreground with your voice in the background.

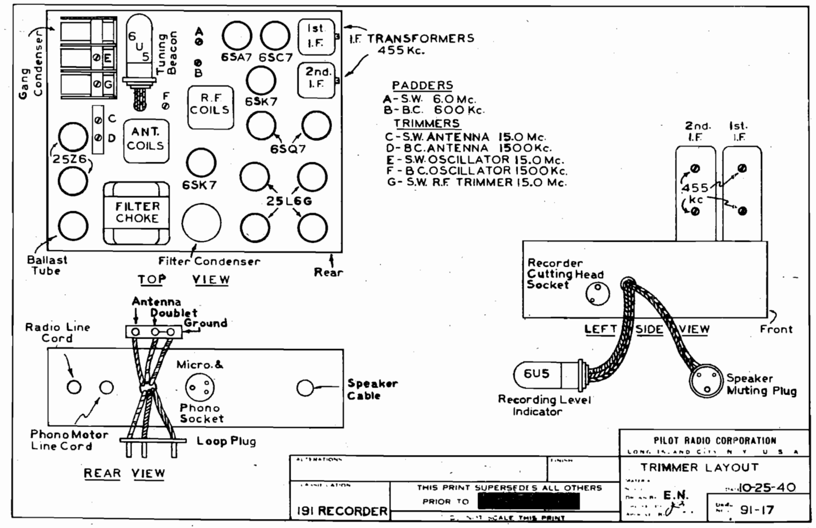
5. To PLAY BACK RECORDING- Proceed as in paragraph #2

6. To OPERATE MICROPHONE WITHOUT RECORDING- Press button marked MICRO in and speak into microphone. Adjust the microphone gain control to the desired level. It is advisable to turn the treble control to the extreme counter-clockwise position in order to cut down acoustic feedback.

SERVICE NOTES

The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

When aligning the I.F. amplifier, the generator must be connected to the grid of the 6SA7 tube through a .1 mfd condenser. When aligning the receiver on the Broadcast Band, connect the generator to the Antenna wire through a .002 mfd condenser, and on the two short wave bands use a 400 ohm carbon resistor.



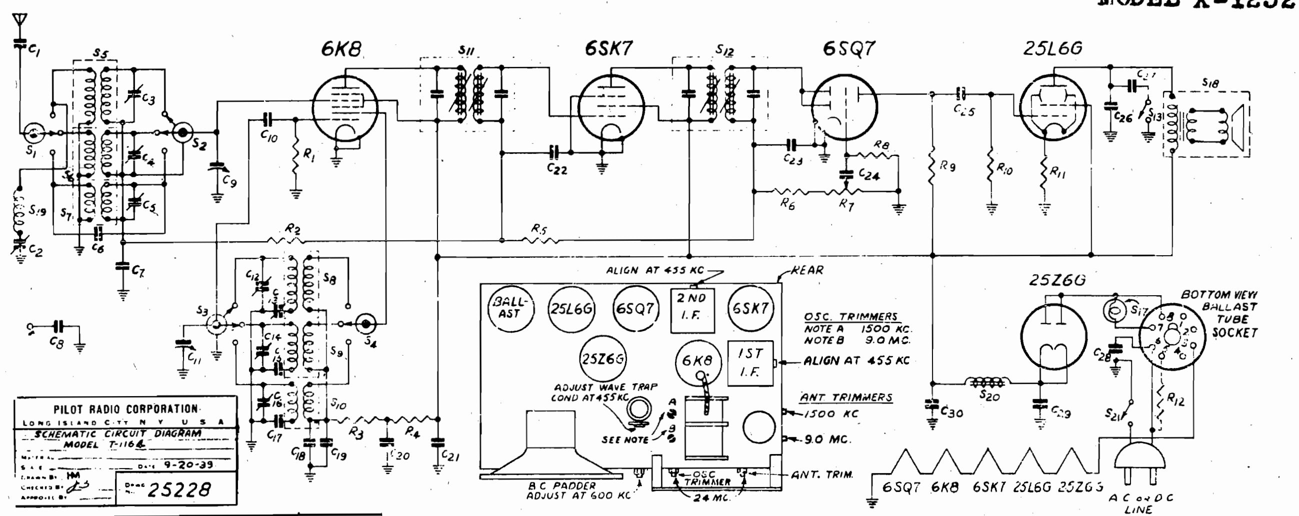
ANTENNA

This receiver contains the latest type of self-contained shielded loop aerial and will give excellent results even in distant localities where the signal from the broadcasting stations are faint. However, it may be necessary to turn the loop antenna located in the rear of the cabinet toward the direction of the incoming signal (since most broadcasting stations use the directional antennas), for the best reception from that particular station. For short wave or distant broadcast band reception, the use of an external antenna is required.

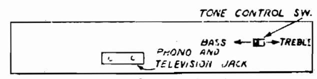
When using a doublet antenna, connect one lead-in wire to terminal "A" at the rear of the chassis, and the other lead-in wire to terminal "D". Remove the connecting link from terminals "D" and "G" and connect terminal "G" to a ground such as a cold water pipe or radiator. If an ordinary single wire antenna is used, connect the lead-in wire to Terminal "A" on the rear of the chassis. Leave the link between "D" and "G" terminals and connect a ground wire under terminal "G". A doublet antenna kit complete with all accessories, can be purchased from your dealer. Ask to see the "Pilot Antenna Kit".

PILOT RADIO CORP.

MODEL T-1164
MODEL X-1252

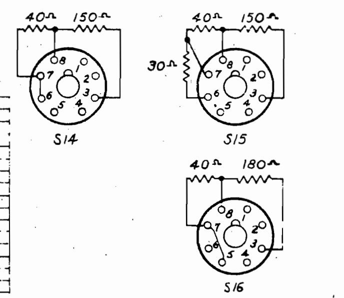


T-1164	THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]
	DO NOT SCALE THIS PRINT



REAR VIEW of CHASSIS

IF PEAK 455 KC

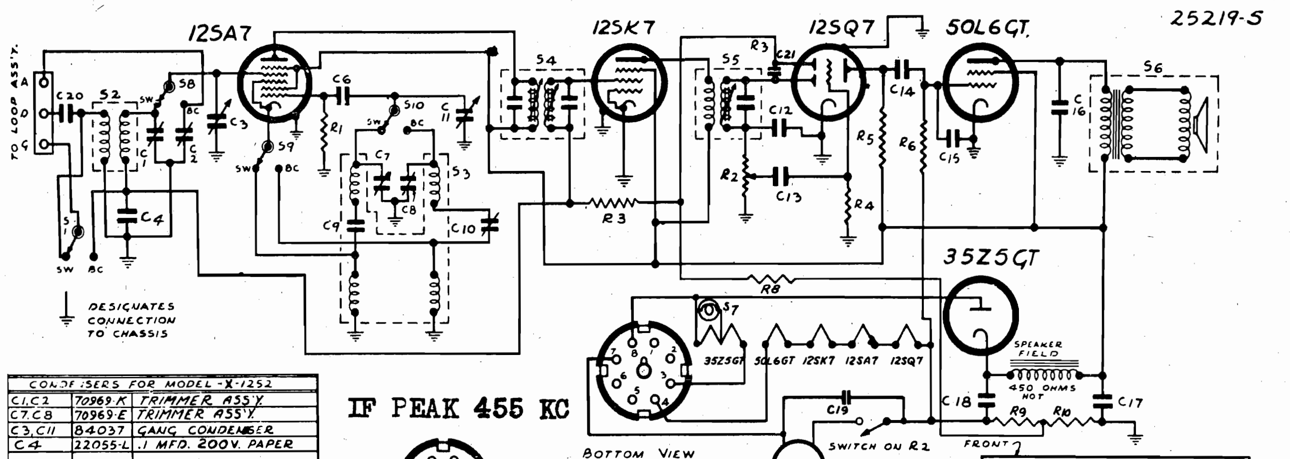


CONDENSERS FOR MODEL T-1164		
C1	22055-AR	.003 MFD 1000 V PAPER
C2	79455	25-125 MMFD WAVE TRAP TR.
C8	22055-R	.005 MFD 1000 V. PAPER
C5, C16	8311C	TRIMMERS
C12, C14	70969-E	TRIMMER ASSY
C3, C4	70969-E	TRIMMER ASSY
C13	79431-B	PADDER COND 300-500 MMFD
C15	27704-W	.002 MFD MICA
C17	27734-W	.006 MFD MICA
C18	22055-P	.05 MFD. 400 V PAPER
C21	22055-L	.1 MFD 400 V PAPER
C19, C20	85035	4-4 MFD 200 V. ELEC
C9, C11	79664	2 GANG COND
C10	27723-0	50 MMFD MICA
C7, C22	22055-I	.05 MFD 200 V PAPER
C23	27701-0	.00025 MFD MICA
C24, C25	22055-W	.01 MFD 400 V PAPER
C26	22055-AC	.02 MFD 600 V. PAPER
C27	22055-V	.03 MFD 1000 V PAPER
C28	22055-P	.05 MFD 400 V PAPER
C29, C30	78689	30-30 MFD 250 V ELEC.
C6	27737-0	.00001 MFD MICA

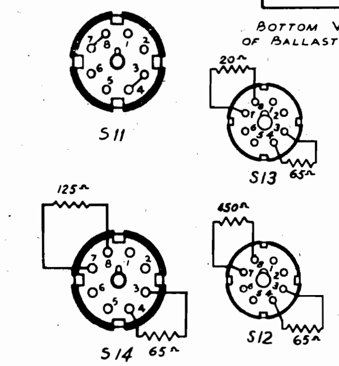
RESISTORS FOR MODEL T-1164		
R1, R6	13164	50,000 OHMS 1/4 WATT
R2	13031	100,000 OHMS, 1/4 WATT
R3, R4	13028	1,000 OHMS, 1/4 WATT
R5	13007	2 MEGOHMS. 1/4 WATT
R7	83523-E	1 MEGOHM VOL. CONT.
R8	13245	4 MEGOHMS 1/4 WATT
R9	13171	250,000 OHMS. 1/4 WATT
R10	13024	500,000 OHMS, 1/4 WATT
R11	13055	150 OHMS, 1/2 WATT
R12	84369	240 OHMS LINE CORD FOR 220-240 VOLTS

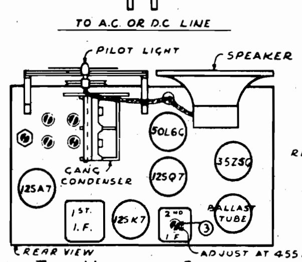
MISCELLANEOUS FOR MODEL T-1164		
S5, S7	73175	ANTENNA COIL ASSY BC - B1
S4	73154	ANTENNA COIL ASS'Y B2
S8 S10	73176	OSC COIL ASS'Y BC - B1
S9	73156-B	OSC COIL ASS'Y B2
S11	73288-B	1ST I.F. TRANS ASS'Y
S12	73289-B	2ND I.F. TRANS ASS'Y
S13	72049	TONE CONTROL SWITCH
S14	81985	BALLAST TUBE 110/125 V.
S15	84147	BALLAST TUBE 130 V.
S16	84364-2	BALLAST TUBE 230 V.
S17	71282	PILOT LIGHT, BLUE BEAD
S20, S18	40879	6 AC DC SPKR, 450Ω FIELD
S19	73119	WAVE TRAP COIL ASS'Y
S1, S2, S3	83104	BAND SWITCH
S21	INCLUDED ON VOLUME CONTROL	

25219-5

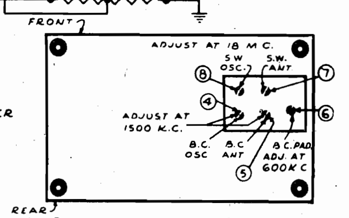


IF PEAK 455 KC

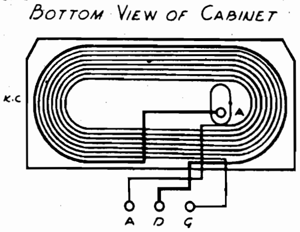




Top View of Chassis



Bottom View of Cabinet



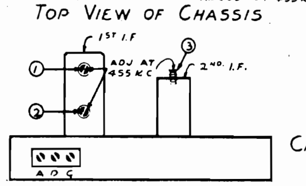
Cabinet Back & Antenna Loop Ass'y.

CONDENSERS FOR MODEL - X-1252		
C1, C2	70969-K	TRIMMER ASS'Y.
C7, C8	70969-E	TRIMMER ASS'Y.
C3, C11	84037	GANG CONDENSER
C4	22055-L	.1 MFD. 200V. PAPER
C6	28016-0	.0001 MFD. MICA
C9	27794-W	5000 MMFD. MICA
C10	19431-B	385 MMFD. PADDER
C12	27701-0	.00025 MFD. MICA
C13	22055-AU	.005 MFD. 400V PAPER
C14	22055-W	.01 MFD. 400 V. PAPER
C17, C18	23500-E	30 MFD. 300V. MIDGET ELEC
C19	22055-AC	.02 MFD. 600V. PAPER
C20	22055-W	.01 MFD. 400V. PAPER
C16	22055-A	.01 MFD. 600 V. PAPER
C21	27736-0	25 MMFD. MICA
C15	28122-0	.0004 MICA

MISCELLANEOUS FOR MODEL - X-1252		
S1	84060	BAND SWITCH
S2	73263	S.W. ANTENNA COIL ASS'Y.
S3	73262	B.C & S.W. OSCILLATOR COIL ASS'Y.
S4	73192-D	1ST I.F TRANSFORMER ASS'Y.
S5	73267	2ND I.F. " "
S6	40869	5" SPEAKER
S7	72151	PILOT LIGHT, BROWN BEAD
S8, S9, S10	84060	BAND SWITCH
S11	84428	BALLAST TUBE 110/125 V.
S12	84431	BALLAST TUBE 230 V.
S13	84429	BALLAST TUBE 130 V.
S14	84430	BALLAST TUBE 150 V

INTERMEDIATE FREQUENCY:- 455 K.C.
ALIGNING FREQUENCIES:
B.C. - 1500 & 600 KILOCYCLES.
S.W. - {ALIGN AT 18 MEGACYCLES. CHECK AT 6

RESISTORS FOR MODEL - X-1252		
R1	13074	20.000 OHMS 1/4 WATT
R2	79429-B	500.000 OHMS VOL. CONT. & SW
R3, R8	13007	2 MEGOHMS 1/4 WATT
R5	13147	300.000 OHMS 1/4 WATT
R6	13024	500.000 OHMS 1/4 WATT
R7	13018	150 OHMS 1/4 WATT
R9	13284	65 OHMS, 1/2 WATT
R10	13283	15 OHMS, 1/4 WATT
R4	13245	4 MEGOHMS, 1/4 WATT



REAR VIEW OF CHASSIS

5. REVISED FOR 150 MIL. TUBES 3/27/39

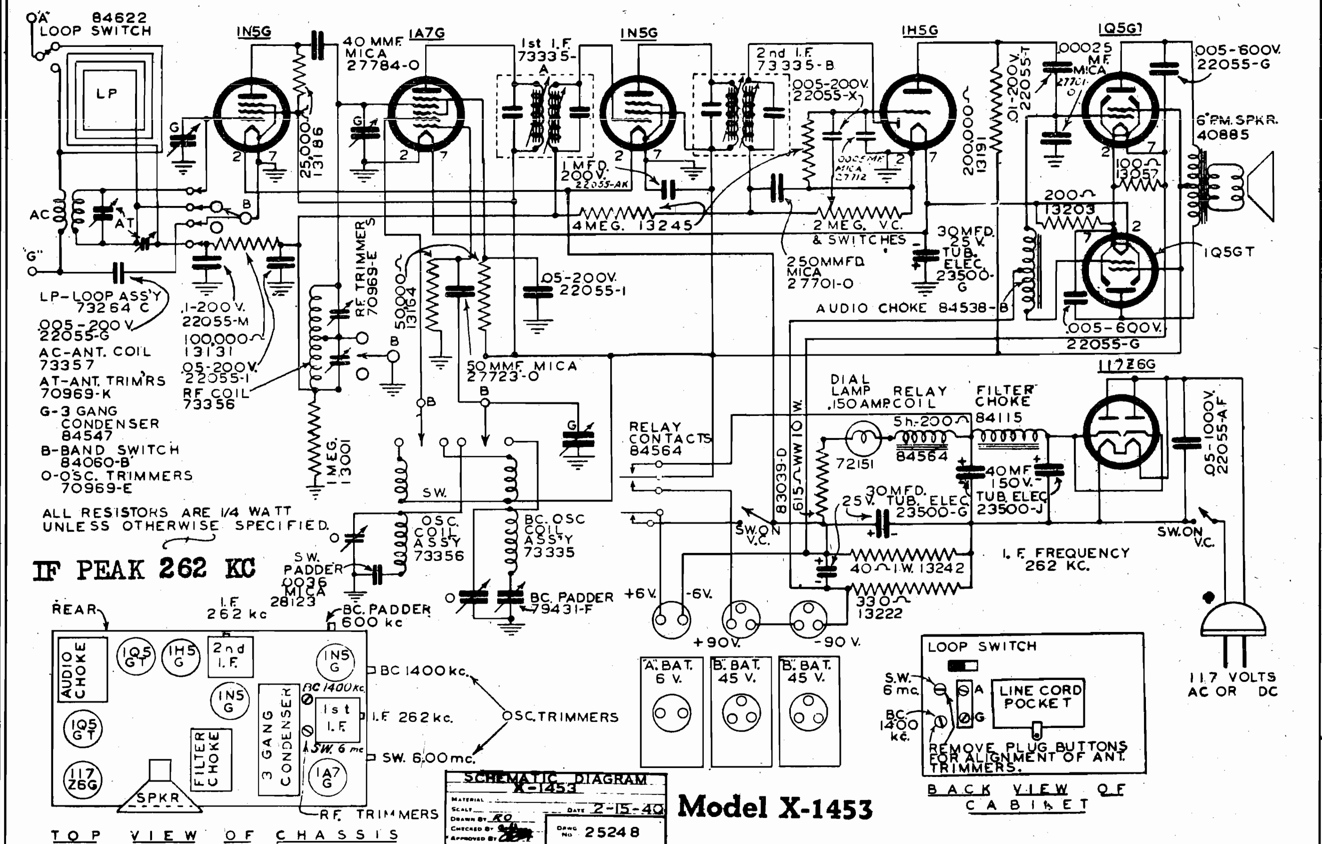
MODEL X-1252

(2) C19 WAS .01 MFD 400V PAPER. CO 2877-BR 3-10-39 & ADDED S12 BALLAST TUBE.
(3) REVISED 3-16-39 E F CO. 2527 2526, 2524

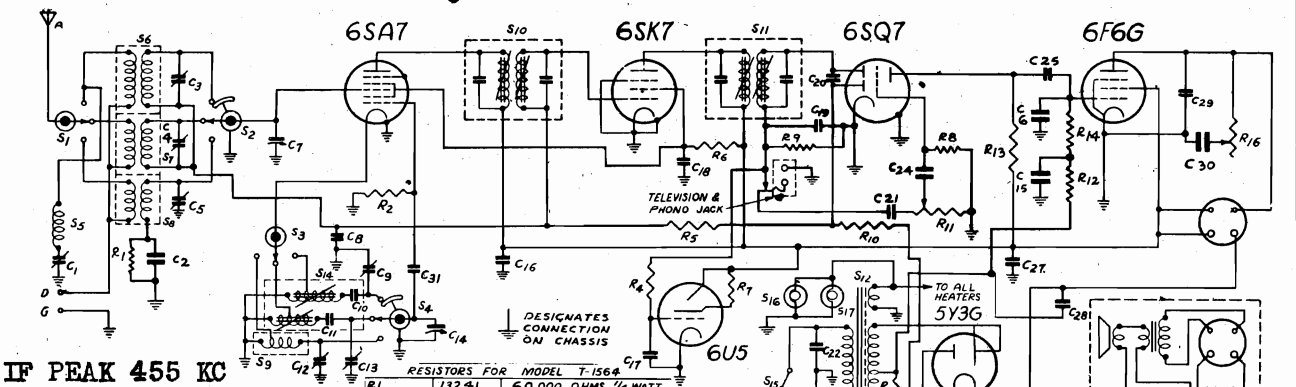
PILOT RADIO CORPORATION
LONG ISLAND CITY N Y U S A
SCHEMATIC CIRCUIT DIAGRAM FOR MODEL - X-1252
2-20-39
B.R.
25219-5

MODELS X-1452, X-1453
MODEL T-1564

PILOT RADIO CORP.



Model X-1452 is same as X-1453 except: AC ant. Coil is Part No.73346; Osc. coil and BC Osc. coil is one unit, part No. 73338. (S.W. Padder No.28123 is omitted) SW Osc. and Ant. trimmer adjustment is 12 MC.



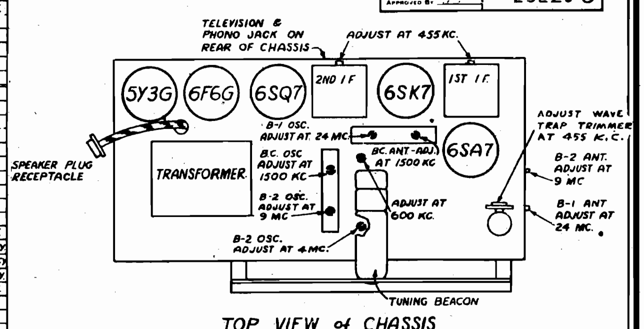
CONDENSERS FOR MODEL T-1564		
C1	79455	WAVE TRAP TRIM
C2	28120-W	.005 MFD. MICA ±5%
C19	27786-O	150 MMF. MICA
C7, C14	84125	GANG COND
C3, C12	70969-J	TRIMMER ASS'Y
C4, C5	70969-E	TRIMMER ASS'Y
C9, C13	70969-E	TRIMMER ASS'Y
C8	22055-I	.05 MFD 200 V.
C16	22055-AB	.1 MFD 600 V.
C17, C21	22055-T	.01 MFD 200 V.
C20	27740-O	35 MMF. MICA
C24 C15	22055-X	.005 MFD 200 V.
C25	22055-AC	.02 MFD 600 V.
C18	22055-P	.05 MFD. 400 VOLTS
C29	22055-G	.005 MFD. 600 V.
C30	22055-AJ	.03 MFD 600 V
C27	23500-D	8 MFD 450 V. ELEC.
C28	23500-C	16 MFD 450 V. ELEC.
C22, C23	22055-U	.01 MFD 1000 V
C31	28016-O	.0001 MFD MICA
C11	28103-W	2100 MMF. MICA ±2%
C10	92000-C	450 MMF. MICA ±5%
C6	27702-O	.0005 MFD. MICA

RESISTORS FOR MODEL T-1564		
R1	13241	60,000 OHMS, 1/4 WATT
R2.	13074	20,000 OHMS, 1/4 WATT
R4	13007	2 MEGOHMS 1/4 WATT
R7	13001	1 MEGOHM, 1/4 WATT
R5, R10	13007	2 MEGOHMS, 1/4 WATT
R6	13287	18,000 OHMS, 3 WATT
R11	83529-D	1 MEGOHM VOL. CONTROL
R13	13191	200,000 OHMS, 1/4 WATT
R17	13059	250 OHMS, 1 WATT
R16	83447-D	100,000 OHMS, TONE CONT.
R3	13189	30 OHMS, 1/4 WATT
R9	13205	650,000 OHMS, 1/4 WATT
R8	13245	4 MEGOHMS 1/4 WATT
R12	13171	250,000 OHMS 1/4 WATT
R14	13031	100,000 OHMS 1/4 WATT

MISCELLANEOUS FOR MODEL T-1564		
S1 TO S4	84246	BAND SWITCH
S5	73119	WAVE TRAP COIL
S6	73306	B.C. ANT. COIL ASS'Y
S7	73307	ANT. COIL ASS'Y B-2
S8	73308	ANT. COIL ASS'Y B-1
S14	73309	OSC COIL ASS'Y, B.C., B-2
S9	73310	OSC. COIL ASS'Y, B-1
S10	73288-B	1ST. I.F. TRANS. ASS'Y
S11	73288-B	2ND I.F. TRANS. ASS'Y
S12	83412-R	PWR TRANS., 117 V. 50-60 CY.
S12	83412-AB	PWR TRANS., 230 V. 50-60 CY.
S12	83412-FB	PWR TRANS., 115-230 V. 50-60 CY.
S12	83412-L	PWR TRANS. 150 V. 50-60 CY.
S12	83697	PWR TRANS. UNIV. 50-60 CY.
S13	40850	8" SPEAKER, 1200 Ω FIELD
S15	83529-D	SWITCH ON VOL. CONTROL
S16 - S17	71282	PILOT LIGHTS BLUE BEAD

SCHEMATIC WIRING DIAGRAM MODEL T-1564
DATE 9-26-39
DWG. NO. 25229-3

ALTERATIONS
② DOUBLET ANTENNA CONNECTION ADDED - HM - 10-12-39
③ REVISED. B.R. - 10-16-39. SAS.
FINISH
CLASSIFICATION T-1564
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [redacted]



RCA MFG. CO., INC.

MODEL PRP-1
MODEL PRP-2

The Publishers Service Record Players, Models PRP-1 and PRP-2, consist of a motor-turntable mechanism and a crystal pickup unit, with a volume control and motor switch. These players are adaptable to the audio amplifier system of practically any type radio receiver for the reproduction of records.

The two models are electrically and mechanically similar; they differ in that Model PRP-1 has a molded plastic cabinet, whereas Model PRP-2 has a veneer wood cabinet.

ELECTRICAL SPECIFICATIONS

Motor

Type of Motor........ Synchronous (Manual Starting)

Turntable Speed...................... 78.26 r.p.m.

Crystal Pickup

Impedance............. 100,000 ohms at 1,000 cycles

Average Output Voltage............ 1½ Volts across 250,000 ohm load at 1,000 cps

GENERAL DESCRIPTION

These instruments employ a crystal pickup unit which depends upon torsional vibration to produce the necessary output voltage. The crystal unit is contained in a metal case securely sealed against extremes of climate. An offset mounting for the pickup head gives an ideal tracking angle between the needle and record grooves.

The motor is a manual starting, synchronous type, designed to operate with good regularity of speed at the standard 78.26 r.p.m. Mechanically, the motor consists of a laminated rotor affixed to the turntable having a certain number of salient poles and a stator with a corresponding number of poles. Two field coils installed on the stator furnish the energizing magnetic flux. The rotor, stator and their bearing assembly are mechanically isolated from the turntable, motor mounting, and cabinet by adequate flexible couplings and supports.

PHONOGRAPH AND MOTOR SERVICE DATA

The synchronous motor used in this instrument is designed to be simple and foolproof. Among its many features are constancy of speed, low power consumption, single moving part, ease of starting, rubber damper, ease of repair and long life. The parts that may require attention are plainly shown in the figures. The motor is started by turning "on" the power switch and giving the turntable a clockwise spin with the hand. Smooth starting and running will be insured by keeping the bearings well oiled and cleaned.

The rotor and turntable assembly rests on the ball bearing at the bottom of the vertical bearing, and may be removed by lifting out. Do not turn player upside down without holding turntable.

For rotor adjustment use three 16-mil shims for motors mounted in a solid base or for motors of the "T" hanger type use three 13-mil shims, spaced equally around the gap between rotor and stator. When the rotor is suitably adjusted securely tighten the three screws which hold the rotor to the turntable. The centering operation is very similar to that done with a dynamic speaker.

If the top of rotor lamination assembly is not flush with the top of stator laminations, additional steel washers should be inserted beneath the stator until the two are aligned.

A small amount of hum when starting, decreasing to a negligible amount while running, is normal. If excessive vibration occurs either at starting or running it may be due to one of the following.

1. Insufficient lubrication, or any failure that will cause binding of bearings.
2. Leather washer not oiled. Check to be sure that leather and steel washers are arranged in proper sequence, as indicated in the drawing.
3. Motor not properly fastened in the cabinet. Check for loose mounting bolts.
4. Burrs on poles of rotor and stator.
5. Loose laminations of stator.
6. Slight eccentricity of rotor or spindle.
7. Improper horizontal alignment of rotor and stator. Correct horizontal alignment is as shown in the figure. The position of the stator is raised or lowered by adding or removing washers below the leather washer.

The damper spring must fit without binding or chattering, in the slot in the stator. The stator must be free to deflect and be flexible in either direction between the limits of the damper spring. Any binding in the washers or stator bearing which prevents the movement of the stator may cause speed variations in the motor. The damper spring must exert equal force in restoring the stator to its mid-position when the stator is deflected manually in either direction.

The following lead dress is important:

1. The power cord, stator leads and pickup cable should be dressed away from and not under the motor frame. Hum may be accentuated or rattles occur if this is not followed.
2. A periodic click will be heard when the power cord or stator lead rubs against the rotor. The leads should be dressed into the cabinet away from the rotor.

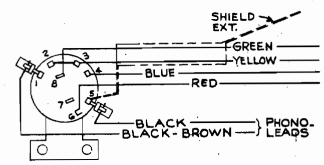
On high line voltages these players have considerable reserve torque. Any hum accentuated by such a condition may be further reduced at the expense of this reserve by inserting a 300 to 500 ohm 10 watt resistor in series with the line and motor winding.

The turntable is secured to the rotor drive table by means of a retaining ring and washer. In order for the turntable to be free of wobble, the rubber cushions between the drive table and the turntable must be secure in their positions. Slight wobble of the turntable can be eliminated by placing shims on the turntable side of these cushions, using that cushion where the table runs low.

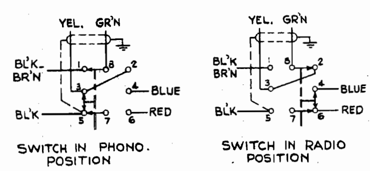
CONNECTING RECORD PLAYER TO RADIO RECEIVER

In connecting this player to a radio receiver care should be exercised to connect it at a point where there is sufficient gain between it and the speaker to yield normal output. Usually two or more stages of audio amplification are required. The radio part must be thoroughly disconnected or killed when playing records, else the radio signals will be heard with the record's music.

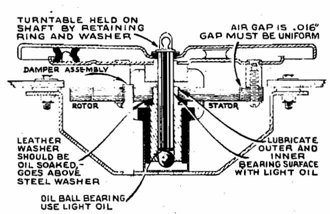
DO NOT CONNECT THE RECORD PLAYER INTO A PLATE OR CATHODE CIRCUIT. It must always be connected into a high impedance circuit (100,000 ohms or more). If the player is to be used in connection with an AC-DC receiver it is necessary to insert a capacitor (0.1 mfd.—400 volts) in series with the ground chassis connection.



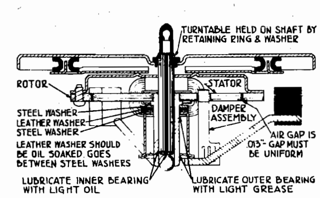
Radio-Phono Switch supplied with Record Player



Diagrams showing Switch in Radio and Phono positions



Motor using Solid Base with Bolts for Mounting



Motor using "T" Shaped Rubber Hanger Mounting

Stock No.	DESCRIPTION
	MOTOR ASSEMBLIES PRP-1 AND PRP-2 (60 cycles—110 volts)
32654	Ball—Steel ball
31045	Base—Motor support, damper and bearing cup assembly
31046	Bearing—Bearing assembly
32472	Cap—PRP-1 rubber spindle cap
31041	Cap—PRP-2 rubber spindle cap
31917	Coil—Motor field coil
31047	Cushion—Rubber cushion for bearing
33654	Frame—Rotor frame
33641	Lamination—Rotor lamination
34878	Lamination—Stator lamination
32469	Motor—110 volt, 60 cycle, complete with mounting for PRP-1
9841	Motor—110 volt, 60 cycle, complete with mounting for PRP-2
31040	Mounting—Turntable top rubber mountings sufficient for one turntable—PRP-1
32471	Mounting—Turntable top rubber mountings sufficient for one turntable—PRP-2
	MOTOR ASSEMBLIES PRP-1 and PRP-2 (60 cycles—110 volts)
33041	Ring—Retaining ring and metal washer to mount turntable plate
31042	Stator—Stator assembly comprising coils and laminations for 60 cycle operation
32473	Turntable—PRP-1 finished turntable top plate only—less rubber mountings
31039	Turntable—PRP-2 finished turntable top plate only—less rubber mountings
4083	Washer—Leather washer
14231	Washer—Metal spacing washer
33642	Wedge—Coil wedge
	MOTOR ASSEMBLIES (Motor mounted by "T" shaped rubber hanger) (110 volts—60 cycles)
	Note.—For additional motor parts see 60 cycle motor assemblies at top of list.
35724	Cap—Rubber spindle cap for PRP-1
33345	Cap—Rubber spindle cap for PRP-2
33346	Coil—Motor field coil
33350	Frame—Motor support frame and bearing cup
35746	Frame—Rotor frame, laminations and spindle shaft assembled
34480	Hanger—Rubber mounting hanger
35745	Lamination—Stator lamination and bearing —less field coils
33348	Washer—Leather and metal washer for stator bearing
34863	Wedge—Wooden wedge
	MOTOR ASSEMBLIES (110 volts—50 cycles)
	Note.—For additional motor parts see 60 cycle motor assemblies at top of list.
31918	Coil—Motor field coils
33941	Frame—Rotor frame complete with spindle and rotor laminations
33658	Laminations—Rotor laminations
33354	Laminations—Stator laminations

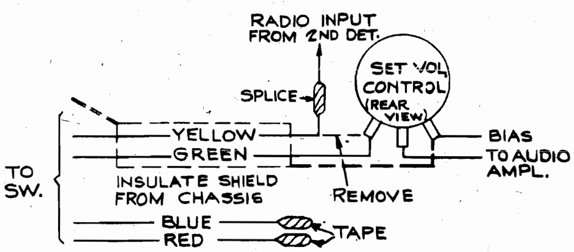
Stock No.	DESCRIPTION
	For motors mounted in "T" shaped rubber hanger
34810	Mounting—1 set mounting hardware
33345	Cap—Rubber spindle cap for PRP-1
33353	Cap—Rubber spindle cap for PRP-2
	PICKUP AND ARM ASSEMBLIES
32624	Pickup Arm—less crystal, PRP-1
32474	Pickup Arm—less crystal, PRP-2
31050	Crystal—Pickup crystal and needle screw
31745	Ring—Retaining ring for pickup arm base
12539	Screw—Pickup needle screw
	PICKUPS USING CRYSTALS HAVING VISCALOID DAMPING
33587	Arm—Pickup arm shell only PRP-1
33588	Arm—Pickup arm shell only PRP-2
35720	Pickup pivot arm for PRP-1
35722	Pickup pivot arm for PRP-2
35721	Base—Pickup arm base for PRP-1
35723	Base—Pickup arm base for PRP-2
33217	Crystal—Pickup crystal cartridge
32500	Mounting—Rubber spacer, flat washer and snap ring for mounting pickup arm base
34311	Ring—Retaining ring for pivot arm and base
31160	Screw—Needle screw
	MISCELLANEOUS ASSEMBLIES
31052	Control—Volume control and power switch
14086	Cord—Power cord with male plug
33680	Cup—Needle cup for PRP-2
35717	Decalcomania—"Symphonic De Luxe"
31051	Foot—Rubber foot for cabinet PRP-1
33006	Foot—Rubber mounting foot for cabinet PRP-2
34850	Hinge—Cabinet lid hinge PRP-2
4323	Knob—Volume control knob for PRP-1
3961	Knob—Volume control knob for PRP-2
31053	Mounting—Motor mounting screw assembly complete
35716	Mounting—Pickup arm mounting ring and rubber cushion
31054	Mounting—Pickup arm mounting nuts, washers, and rubber spacer
31048	Plug—Male plug for output cable
32610	Rest—Rubber pickup arm rest for PRP-2
32627	Support—Lid support

Models PRP-1 (Regular) and PRP-2 (DeLuxe)

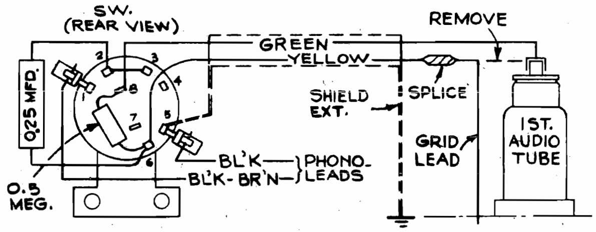
MODEL PRP-1
MODEL PRP-2

RCA MFG. CO., INC.

TYPICAL CONNECTION DIAGRAMS

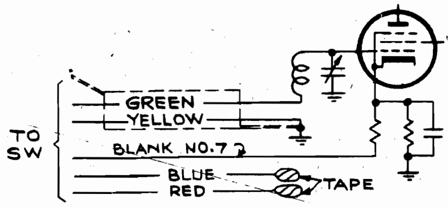


Radio Receivers where Receiver Volume Control is in Audio Input Circuit

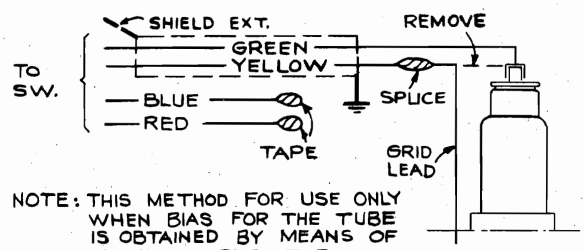


NOTE: REMOVE BLUE AND RED LEADS. CONNECT YELLOW LEAD TO TERMINAL NO. 6. ADD 0.5 MEG. RESISTOR AND 0.25 MFD. CAPACITOR AS SHOWN.

Radio Receivers where First Audio Tube is of the Grid Cap Type, and Fixed Bias for Tube is Obtained Through Grid Lead

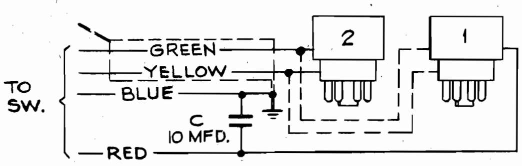


Radio Receivers using Biased-Type Detector



NOTE: THIS METHOD FOR USE ONLY WHEN BIAS FOR THE TUBE IS OBTAINED BY MEANS OF CATHODE RESISTOR.

Radio Receivers whose First Audio Amplifier Tube is of the Grid Cap Type



NOTE: WHEN NO. 1 IS USED AND TUBE IS OF "G" TYPE CARE MUST BE TAKEN TO SEE THAT SHIELD TERMINAL NO. 1 IS GROUNDED ON TUBE SOCKET.
WHEN NO. 2 IS USED TAPE RED LEAD, AND OMIT CAPACITOR.

No. 1—Adaptor opens grid circuit and inserts a 2,700 ohm resistor in cathode of 6C5 or 6J5 tubes for bias on phono reproduction. Applies when bias is obtained through grid return.

No. 2—Adaptor opens grid circuit of 6C5 or 6J5 tube. Applies when bias is obtained through cathode resistor.

Radio Receivers using 6C5 or 6J5, 6C5G or 6J5G, Tube for First Audio Amplifier

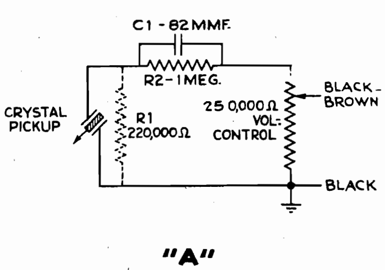
TONE COMPENSATION

Because of the widely varying frequency characteristics of various types of audio amplifiers with which these players may be used, it is desirable in some cases to make refinements in the pickup circuit to compensate for the characteristics of the amplifier.

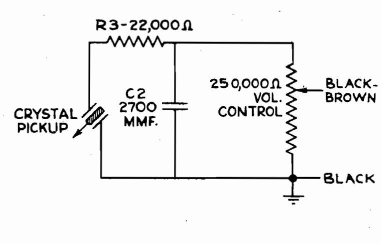
In "A" R1 controls the low frequency response; higher values of R1 give increased lows. For maximum low frequency response, remove R1. R2 controls pickup output, smaller values of R2 giving increased output. C1 controls high frequency response; to increase highs increase C1.

Where a decrease in high frequency response may be desired (for example, as an aid in reducing "needle scratch" on worn records), the circuit in "B" is applicable. In this circuit, C2 acts as loading on the pickup and is also a controlling factor on the high frequency response Smaller values of C2 give more pickup output and also more highs. R3 gives a sharper high frequency reduction; increasing R3 decreases highs.

The suggested values shown in "A" and "B" should serve as a basis from which slight alterations may be made to suit individual cases.



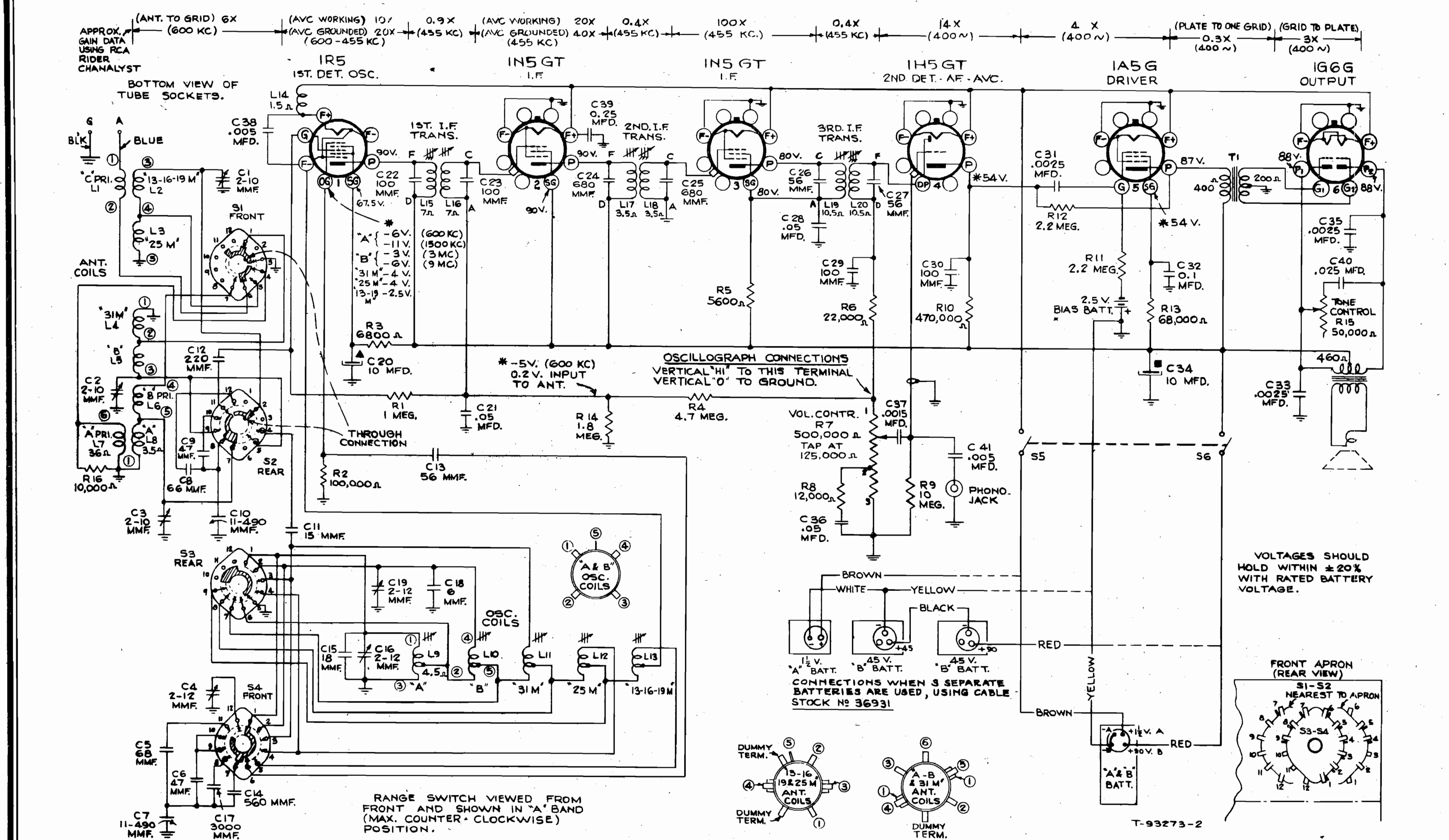
"A"



"B"

RCA MFG. CO., INC.

MODEL QB2
Ch. RC-529



Batteries Required
1—1.5 volt "A" Battery; 2—45 volt "B" Batteries

Current Consumption
"A" 0.35 amperes
"B" 12.6 milliamperes

On some models R5 is 4,700 ohms.

Frequency Ranges

Standard Broadcast ("A" Band)	540-1,720 kc (555-174 m)
Medium Wave ("B" Band)	3.0-9.5 mc (100-31.5 m)
Short Wave	9.5-11.7 mc (31.5-25.6 m)
Short Wave	11.7-15.1 mc (25.6-19.9 m)
Short Wave	15.1-22.5 mc (19.9-13.3 m)

Intermediate Frequency 455 kc

Power Output

Undistorted	0.55 watts
Maximum	0.65 watts

Loudspeaker (RL-92-2)

Type	6 inch permanent-magnet dynamic
Voice Coil Impedance	3.4 ohms at 400 cycles

FOR OTHER DATA SEE INDEX

A. C. Power Supply Rating
Using CV-112, A.C. power supply unit
Supply Voltages 105-125 or 210-250 volts; 50-60 cycles
Power consumption at nominal supply voltages 15 watts
"B" current drain....... 13.5 milliamperes at 90 volts dc output
"A" current drain............0.35 amperes at 1.4 volts dc output

MODEL QB2, Ch. RC-529
MODEL CV-112

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

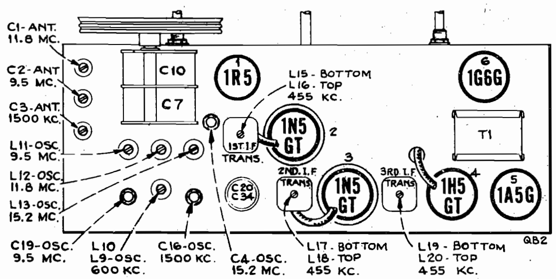
Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Tube and Trimmer Locations

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of the test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

For additional information, refer to booklet "RCA Victor Receiver Alignment."

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	1N5GT—2nd I-F grid cap, in series with .01 mfd.	455 kc	A	Quiet point near 180°	L20, L19 3rd I-F transformer
2	1N5GT—1st I-F grid cap, in series with .01 mfd.				L18, L17 2nd I-F transformer
3	1R5—1st Det. grid, in series with .01 mfd.				L16, L15 1st I-F transformer
4	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L12 (osc.) C1 (ant.)
5		15.2 mc		17°	C4 (osc.)*
6		Repeat steps 4 and 5.			
7		15.2 mc	19-13M	156°	L13 (osc.)**
8		9.5 mc	31M	156°	L11 (osc.)** C2 (ant.)
9		9.5 mc	B	11.5°	C19 (osc.)***
10	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C16 (osc.) C3 (ant.)
11		600 kc		150°	L9 (osc.) (Rock gang)
12		Repeat steps 9 and 10.			

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

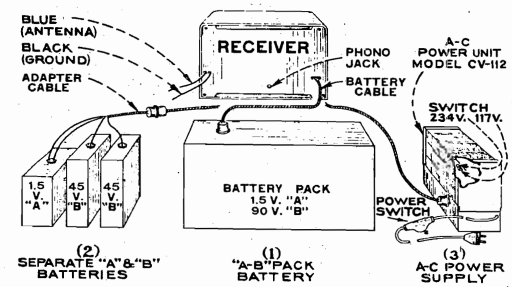
** Peak at minimum position of plunger if two peaks can be obtained.

*** Peak at minimum capacity of two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.

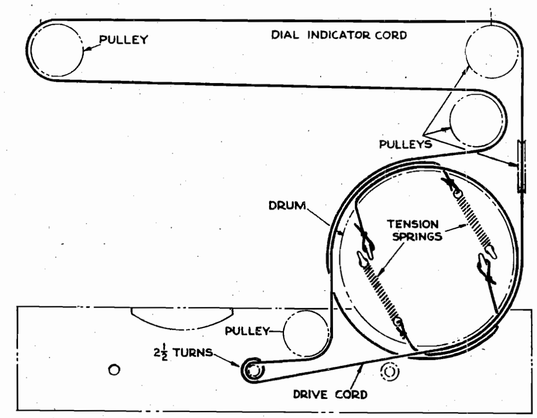
RCA Tube Complement
(1) RCA-1R5 .... 1st Det.,—Osc.
(2) RCA-1N5-GT .... 1st I-F Amplifier
(3) RCA-1N5-GT .... 2nd I-F Amplifier
(4) RCA-1H5-GT .... 2nd Det., A-F, and A.V.C.
(5) RCA-1A5-G .... Audio Driver Amplifier
(6) RCA-1G6-G .... Power Output

Chassis No. RC-529



A-C Power Supply

Model CV-112 is a separate power supply unit. It is used to provide operating voltages for Model QB2 from an a-c supply source.

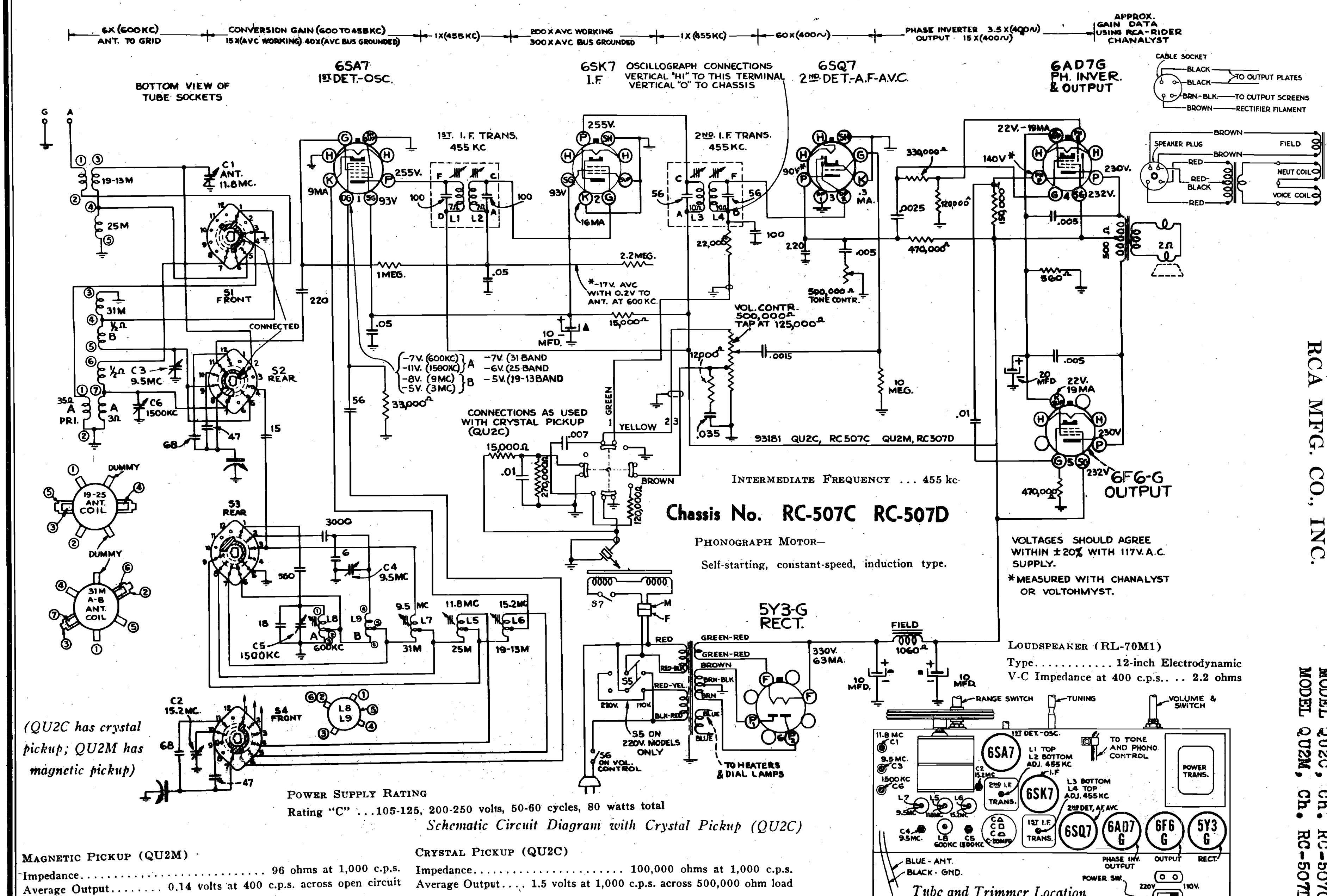


Precautionary Lead Dress:

1. All leads between antenna coil and switch must be as short as possible and kept away from the oscillator coil leads and switches.
2. Tap on 19-13 meter oscillator coil to pin No. 6 on oscillator tube socket must be dressed as far away from the air trimmer as possible.
3. All oscillator coil leads must be kept apart from each other, as well as other leads and parts.
4. Oscillator grid coupling condenser must bear against parts on S3, and be kept away from the shield between S2 and S3.
5. Check for correct bias cell polarity. Do not shunt with voltmeter.
6. The speaker leads must be kept from the volume control and associated parts and leads.
7. The two paper condensers on the sides of the 2nd I-F transformers must be held close to chassis to reduce interstage coupling.

RCA MFG. CO., INC.

MODEL QU2C, Ch. RC-507C
MODEL QU2M, Ch. RC-507D



VOLTAGES SHOULD AGREE WITHIN ±20% WITH 117V. A.C. SUPPLY.

*MEASURED WITH CHANALYST OR VOLTOHMYST.

Intermediate Frequency ... 455 kc

Chassis No. RC-507C RC-507D

Phonograph Motor—
Self-starting, constant-speed, induction type.

Loudspeaker (RL-70M1)
Type .... 12-inch Electrodynamic
V-C Impedance at 400 c.p.s. .. 2.2 ohms

(QU2C has crystal pickup; QU2M has magnetic pickup)

Power Supply Rating
Rating "C" ...105-125, 200-250 volts, 50-60 cycles, 80 watts total

Schematic Circuit Diagram with Crystal Pickup (QU2C)

Magnetic Pickup (QU2M)
Impedance .... 96 ohms at 1,000 c.p.s.
Average Output .... 0.14 volts at 400 c.p.s. across open circuit

Crystal Pickup (QU2C)
Impedance .... 100,000 ohms at 1,000 c.p.s.
Average Output .... 1.5 volts at 1,000 c.p.s. across 500,000 ohm load

MODEL QU2C, Ch. RC-507C
MODEL QU2M, Ch. RC-507D

RCA MFG. CO., INC.

Alignment

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	6SA7 1st Det. grid in series with .01 mfd.				L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L5 (osc.) C1 (ant.)
4		15.2 mc		17°	C2 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13M	156°	L6 (osc.)**
7		9.5 mc	31M	156°	L7 (osc.)** C3 (ant.)
8		9.5 mc	B	11.5°	C4 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C5 (osc.) C6 (ant.)
10		600 kc		150°	L8 (osc.) (Rock gang)
11		Repeat steps 9 and 10			

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

**Peak at minimum position of plunger if two peaks can be obtained.

***Peak at minimum capacity if two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

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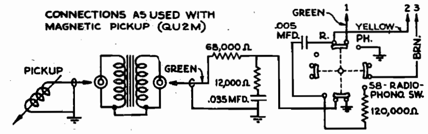
In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

The QU2M is equipped with a magnetic pickup, and the QU2C with a crystal pickup. The output of the crystal pickup is fed into the audio end of the receiver through a switch and compensating circuit. On instruments using a magnetic pickup, a transformer and compensating circuit are used between the pickup and the audio input (see schematic diagram). The transformer has two jacks, the larger one (primary) for input from the pickup and the smaller one (secondary) for output to the compensating circuit. The components of the compensating circuit are mounted externally to the chassis on a terminal board in the cabinet.



Schematic Showing Magnetic Pickup Connections (QU2M)

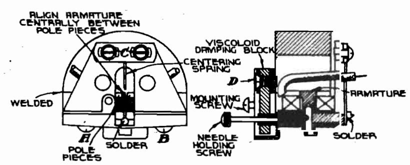
Crystal Pickup:

The crystal pickup is sealed in a metal case; if failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Magnetic Pickup:

The magnetic pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the pickup are as follows:

Centering Armature.—Refer to the figure showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm for re-adjustment. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.



Magnetic Pickup Detail

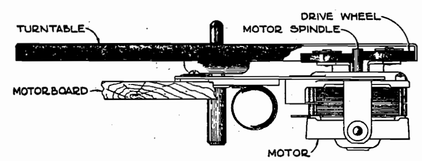
Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing.—Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves to reduce undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

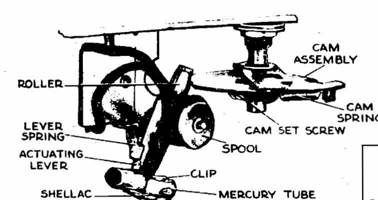
The phonograph motor has its bearing filled with oil and sealed at the factory and hence should not require lubrication in the field. However the two rubber tired idler pulleys should have their bearings lubricated occasionally with S.A.E. 10 oil. Care should be taken not to get any oil, grease, or other foreign matter on the rubber tires. These tires and the motor spindle should be cleaned occasionally with quick drying naphtha.

The turntable spindle bearing should also be lubricated occasionally with S.A.E. 10 oil.



Motor Detail

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1⅞ inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

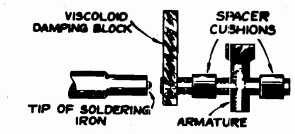


MERCURY SWITCH MECHANISM
(VIEWED FROM FRONT
SHOWN WITH PICKUP IN REST POSITION)

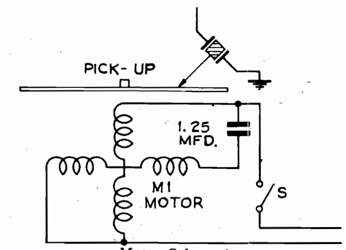
Precautionary Lead Dress.—

1. All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches.
2. All oscillator coil leads must be kept apart from each other and other leads and parts.
3. Blue plate lead of 2nd I-F should be dressed under other leads and against chassis.

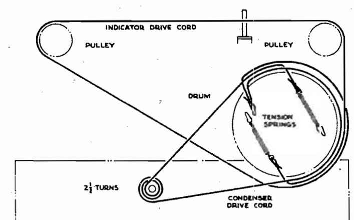
Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.



Attaching Damping Block



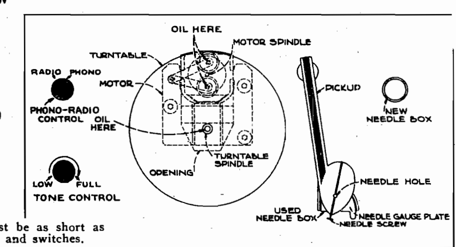
Motor Schematic



Dial-Indicator and Drive Mechanism

Frequency Ranges

Standard Broadcast ("A" band)	..540-1,720 kc (556-174 m)
Medium Wave ("B" band)....	....3.0-9.5 mc (100-31.6 m)
"31" Meter Spread Band	..9.5-11,7 mc (31.6-25.6 m)
"25" Meter Spread Band......	.11.7-15.1 mc (25.6-19.9 m)
"19-13" Meter Spread Band....	.15.1-22.5 mc (19.9-13.3 m)



Motorboard and Controls

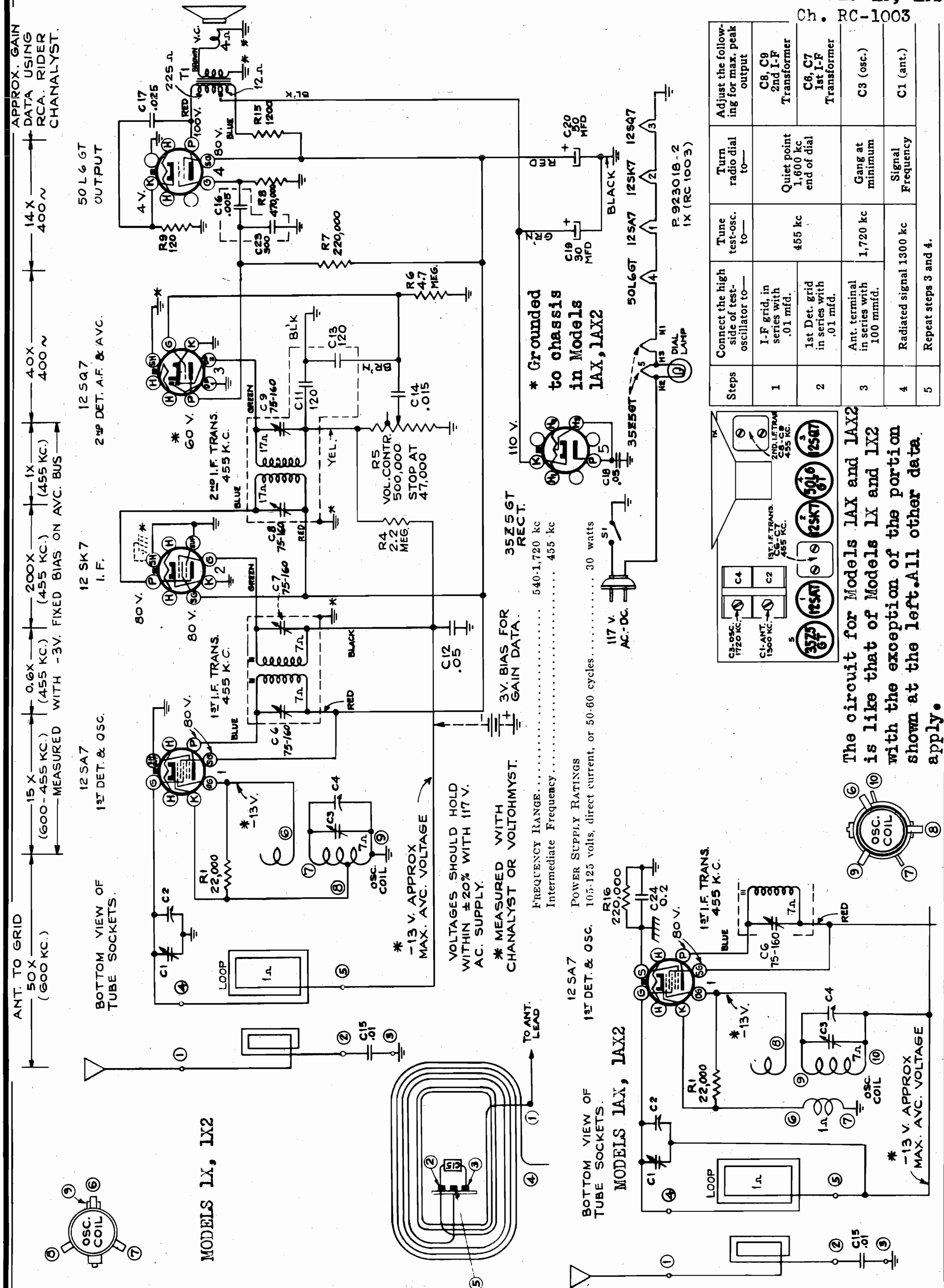
Power Output

Undistorted............ 3 watts
Maximum............ 3.5 watts

QU2C—**QU2M**

RCA MFG. CO., INC.

MODELS 1AX, 1AX2
Ch. RC1003A
MODELS 1X, 1X2
Ch. RC-1003



Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1,600 kc end of dial	C8, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C6, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1,720 kc	Gang at minimum	C3 (osc.)
4	Radiated signal 1300 kc		Signal Frequency	C1 (ant.)
5	Repeat steps 3 and 4.			

FREQUENCY RANGE .... 540-1,720 kc
Intermediate Frequency .... 455 kc

POWER SUPPLY RATINGS
105-125 volts, direct current, or 50-60 cycles .... 30 watts

* Grounded to chassis in Models 1AX, 1AX2

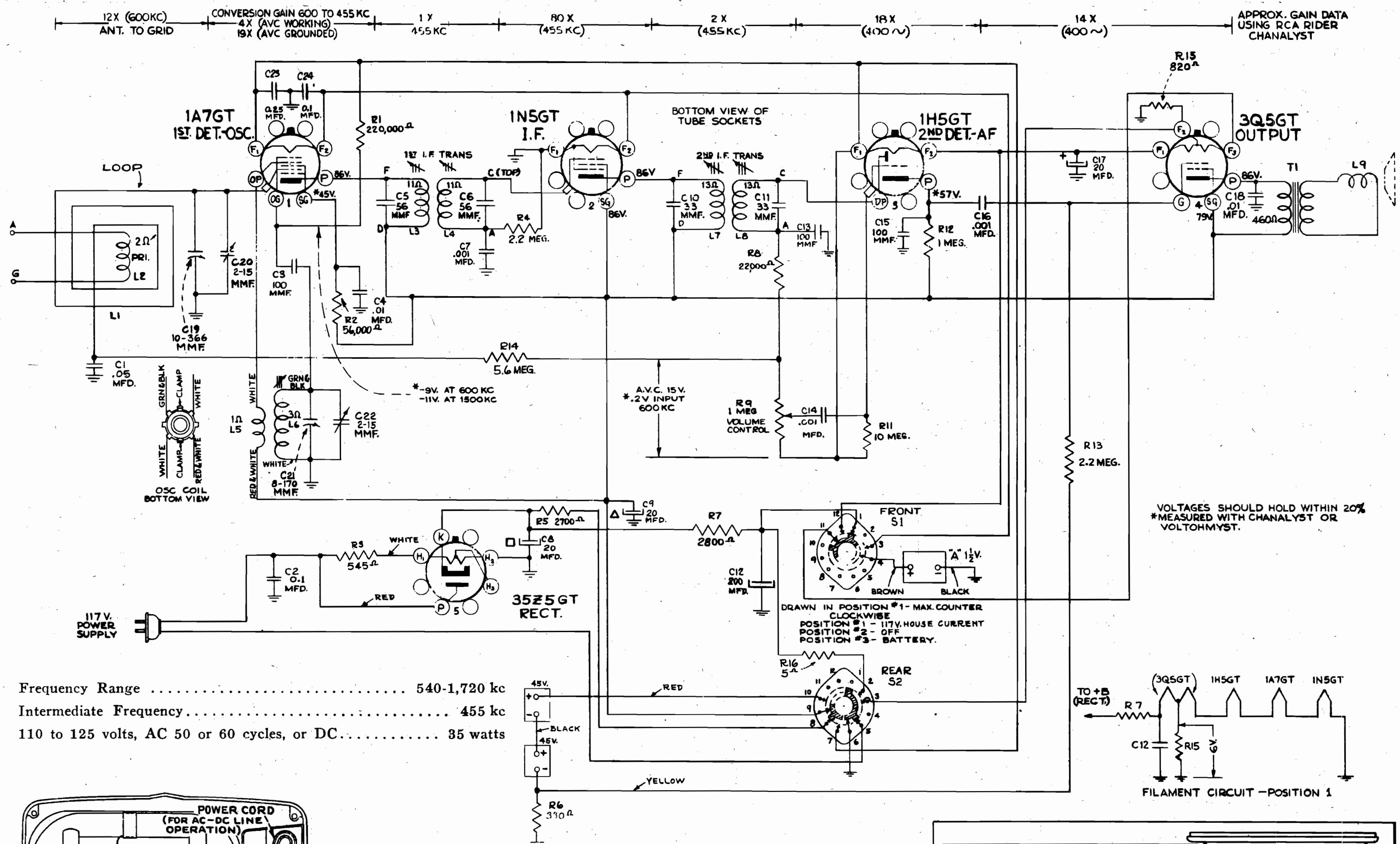
The circuit for Models 1AX and 1AX2 is like that of Models 1X and 1X2 with the exception of the portion shown at the left. All other data apply.

MODELS 1X, 1X2

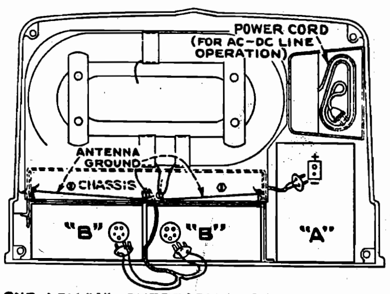
MODELS 1AX, 1AX2

MODEL Radiola P5

RCA MFG. CO., INC.



Frequency Range .... 540-1,720 kc
Intermediate Frequency .... 455 kc
110 to 125 volts, AC 50 or 60 cycles, or DC............ 35 watts



ONE 1.5V. "A"—EVEREADY No.743 OR EQUAL.
TWO 45V. "B"—EVEREADY No.482 OR EQUAL.

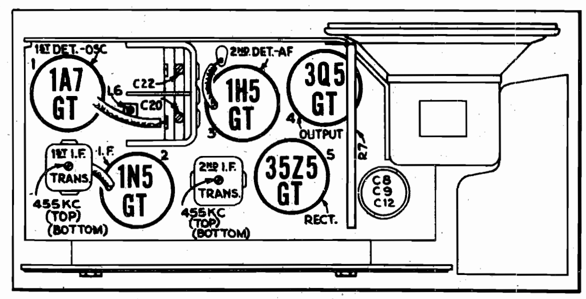
Batteries Required

"A" one 1.5 volt dry plug-in type "A," (Eveready No. 743 or equivalent)

"B" two 45 volt dry plug-in type "B," (Eveready No. 482 or equivalent)

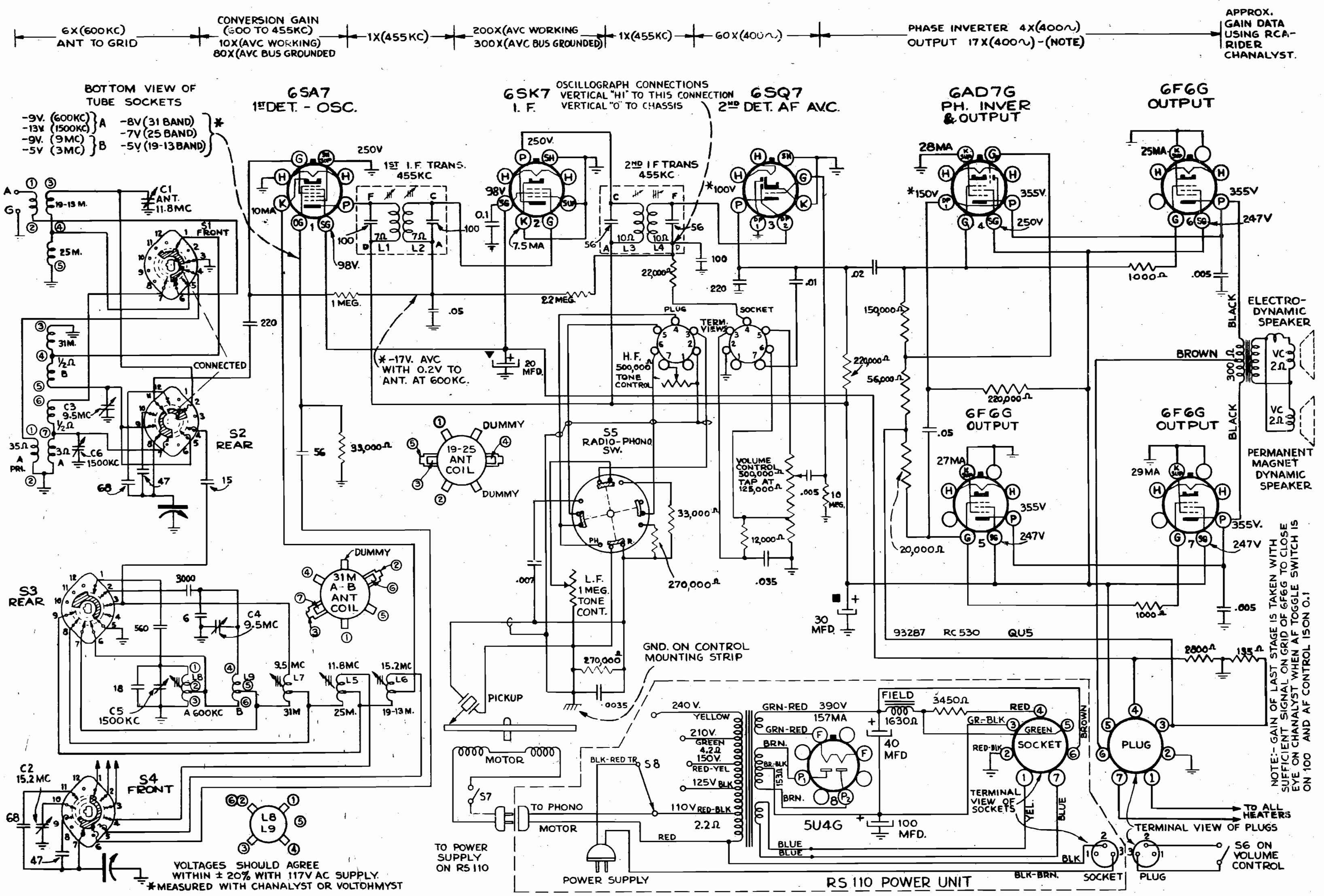
Current Consumption

"A" 0.25 amperes, "B" 11.5 milliamperes........ Battery Operation
Total Rect. "B" (117 volt, 60 cycle).................... 56 mils.



MODEL QU5
Ch. RC-530

RCA MFG. CO., INC.



Frequency Ranges

Standard Broadcast ("A" Band) .. 540-1,720 kc (556-174 m)
Medium Wave ("B" Band) ...... 3.0-9.5 mc (100-31.6 m)
"31" Meter Spread Band .... 9.5-11.7 mc (31.6-25.6 m)
"25" Meter Spread Band .... 11.7-15.1 mc (25.6-19.9 m)
"19-13" Meter Spread Band .... 15.1-22.5 mc (19.9-13.3 m)

Intermediate Frequency .... 455 kc

Power Supply Rating

105-125, 200-250 volts, 50-60 cycles, 160 watts

Loudspeakers

Model RL-70M-4 .... Electrodynamic 12 inch
Model RL-71A-4 ...... Permanent Magnet Dynamic 12 inch
Voice Coil Impedance (both) at 400 c.p.s. 2.2 ohms

Pilot Lamps { Mazda No. 55, 6.5 volts 0.4 amp. / Mazda No. 51, 7.5 volts 0.2 amp.

Power Output Rating

Undistorted .... 20 watts
Maximum .... 24 watts

FOR OTHER DATA SEE INDEX

MODEL QU5
Ch. RC-530

RCA MFG. CO., INC.

Alignment Procedure

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

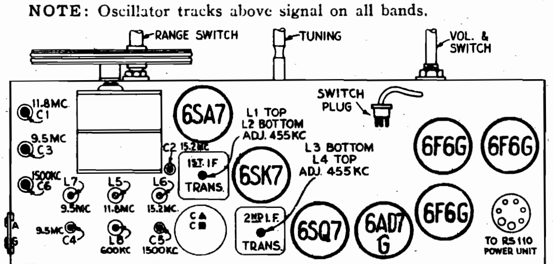
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

**Peak at minimum position of plunger if two peaks can be obtained.

***Peak at minimum capacity if two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.

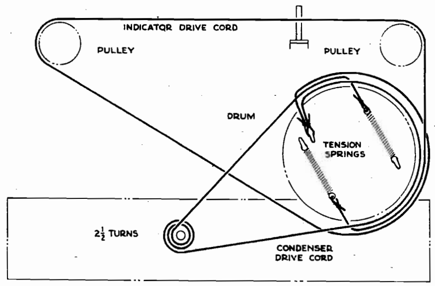


Tube and Trimmer Locations

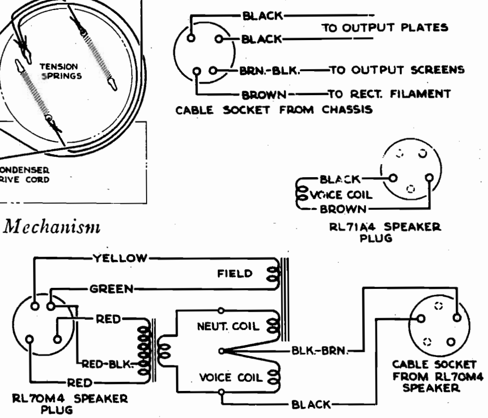
Synchronizing Speakers.—In order to get correct tone quality from the dual-speakers used in this model, it is essential that the two speakers be so connected that the diaphragms of both work in unison or synchronism. If the terminals of one speaker are reversed the tone of the set will be flat.

To test for proper connections, turn on receiver with volume down and connect the terminals of a 1½-volt dry cell across the voice coil-terminals of either one of the speakers. If the diaphragms move in or out together at the instant of contact, the speaker connections are O.K. If one moves out and the other moves in, they are bucking, and the voice coil leads of one of the speakers should be reversed.

The movement of the diaphragms may be observed visually or by placing the finger-tips on each cone to feel the movement.



Dial-Indicator and Drive Mechanism

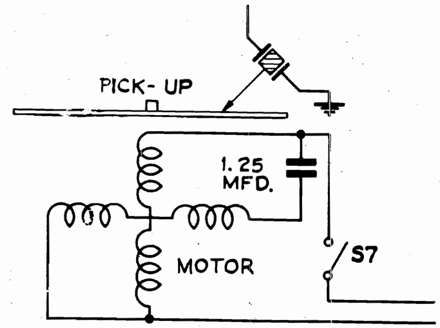


Connections and Colors of Loudspeaker and Cable

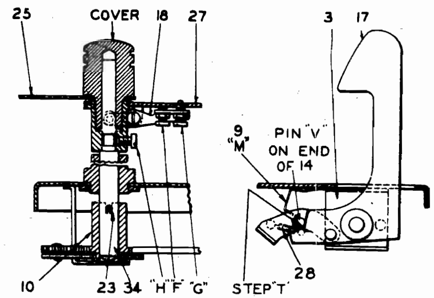
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	6SA7 1st Det. grid in series with .01 mfd.				L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L5 (osc.) C1 (ant.)
4		15.2 mc		17°	C2 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13M	156°	L6 (osc.)**
7		9.5 mc	31M	156°	L7 (osc.)** C3 (ant.)
8		9.5 mc	B	11.5°	C4 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C5 (osc.) C6 (ant.)
10		600 kc		150°	L8 (osc.) (Rock gang)
11		Repeat steps 9 and 10			

Precautionary Lead Dress.—

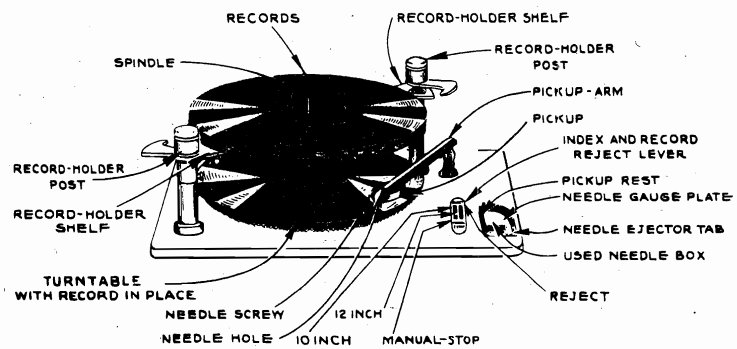
1. All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches.
2. All oscillator coil leads must be kept apart from each other and other leads and parts.
3. Blue plate lead of 2nd I-F should be dressed under other leads and against chassis.



Motor Schematic



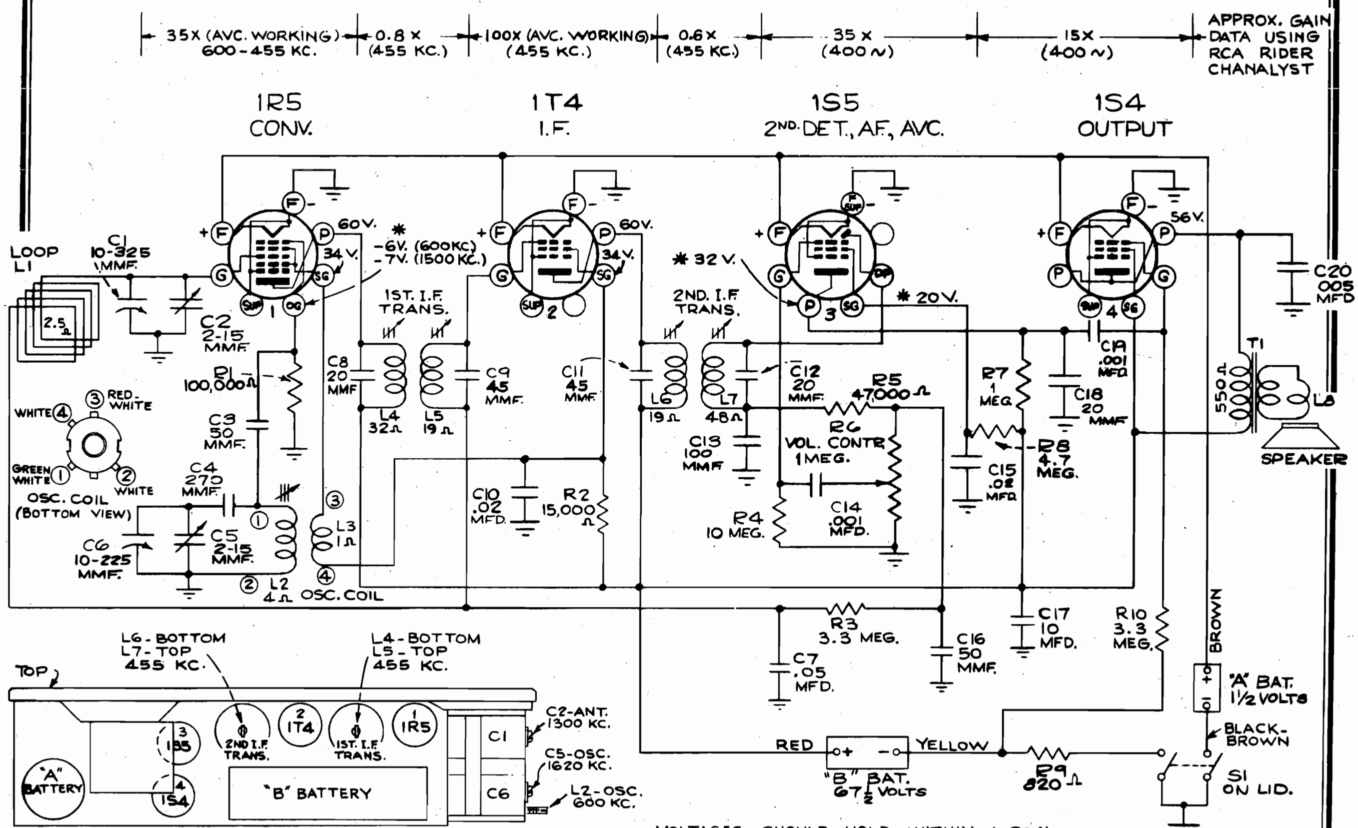
Details of Record Shelf Posts, and Locating Lever Assemblies



Top View of Automatic Record Changer

RCA MFG. CO., INC.

MODEL BP-10
"Personal"



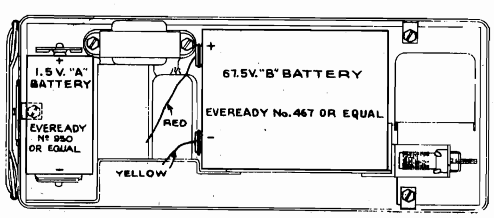
VOLTAGES SHOULD HOLD WITHIN ±20% WITH RATED BATTERY VOLTAGE.
* MEASURED WITH CHANALYST OR VOLTOHMYST.

P-84998

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (ant.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L7, L6, L5, L4 (2nd and 1st I-F transformers)
2	Radiated signal 1,620 kc	1,620 kc	Full clockwise (out of mesh)	C5 (oscillator)
3	Radiated signal 1,300 kc	1,300 kc	1,300 kc	C2 (antenna)
4	Radiated signal 600 kc	600 kc	600 kc	L2 (osc.)
5	Repeat steps 2, 3 and 4.			

Electrical and Mechanical Specifications

Frequency Range .... 540-1,600 kc

Intermediate Frequency .... 455 kc

RCA Tube Complement

(1) RCA-1R5 .... 1st Det.—Osc.
(2) RCA-1T4 .... I-F Amplifier
(3) RCA-1S5 .... 2nd Det., A-F, and A.V.C.
(4) RCA-1S4 .... Power Output

Power Supply

Type Battery	Current Consumption	Approximate Life (Intermittent Duty)
"A"—1.5 volt Eveready No. 950	0.25 amperes	3-5 hours
"B"—67.5 volts Eveready No. 467	8.5 milliamperes	25-40 hours

Power Output

Undistorted .... 0.05 watts
Maximum .... 0.12 watts

Loudspeaker

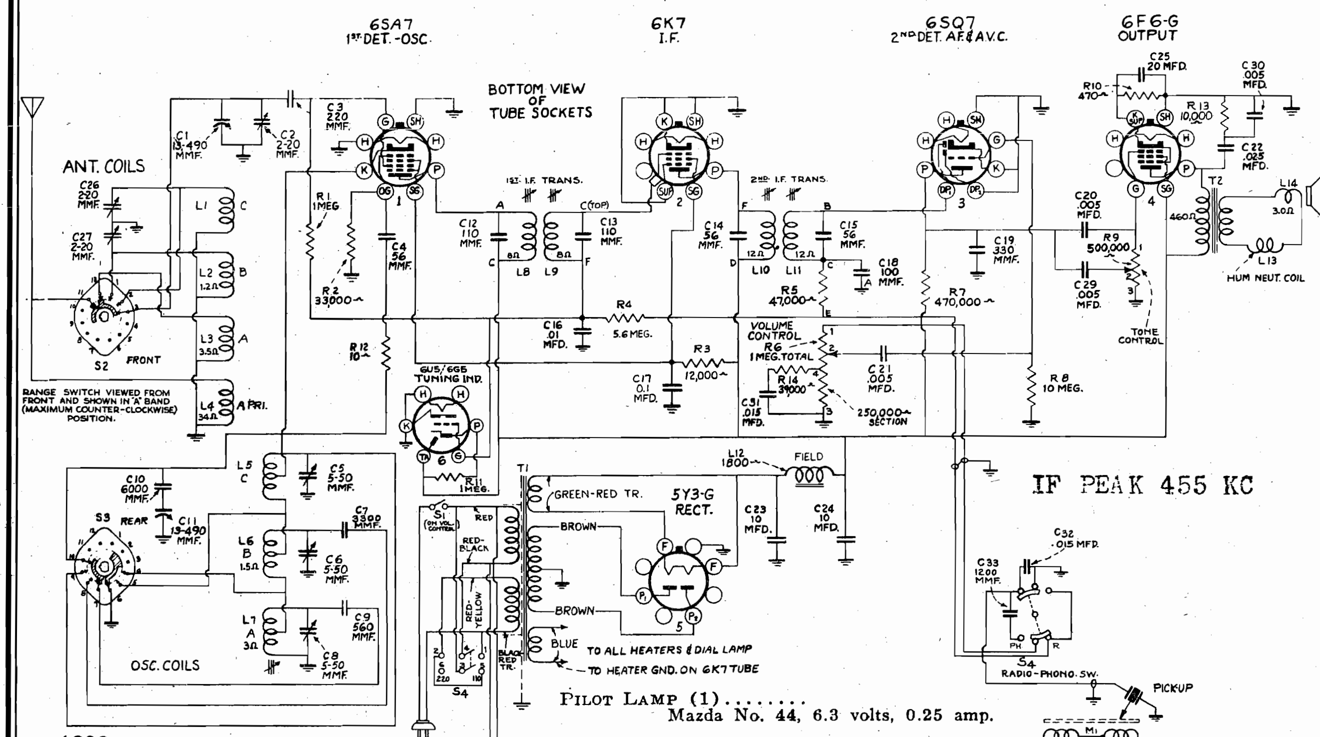
Type .... 3-inch permanent-magnet dynamic
V.C. Impedance .... 3 ohms at 400 cycles

	Height	Width	Depth
Cabinet Dimensions (inches)	3	8⅞	3⅝

Weight .... 3¾ lbs. (net) 4¾ lbs. (shipping)
Tuning Drive Ratio .... 1 to 1

MODEL 6QU
Ch. RC-414

RCA MFG. CO., INC.



PILOT LAMP (1)........ Mazda No. 44, 6.3 volts, 0.25 amp.

— 1939 — First Edition

Power Supply Ratings

Rating A5.. 105-125 volts, 60 cycles, 100 watts
Rating A6.. 105-125 volts, 50 cycles, 100 watts
Rating C6........... 105-125; 200-250 volts, 60 cycles, 100 watts
Rating C5........... 105-125; 200-250 volts, 50 cycles, 100 watts

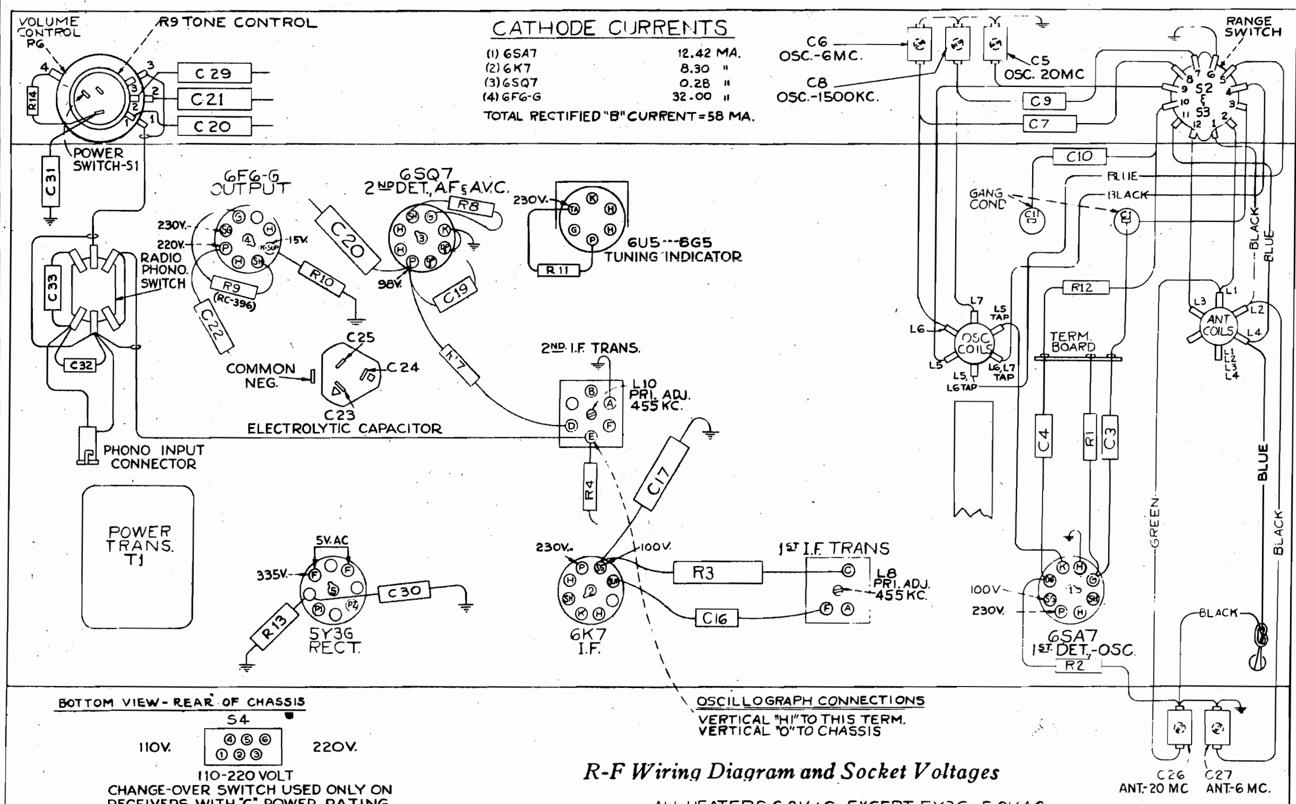
Intermediate Frequency 455 kc

Power Output Rating
Undistorted.............. 1.5 watts
Maximum.............. 3.3 watts

Loudspeaker (RL-79-2)
Type.......... 6-inch electrodynamic
V.C. Impedance. 3.4 ohms at 400 cycles

Crystal Pickup
Impedance...... 100,000 ohms at 1,000 cycles
Average Output.. 1½ volts at 1,000 cycles with 250,000 ohms load

Phonograph Mechanism
Type...... Manual; 10-inch or 12-inch records
Motor... Self-starting, constant speed induction



R-F Wiring Diagram and Socket Voltages

ALL HEATERS 6.3V.AC., EXCEPT 5Y3G, 5.0V.AC.

RC 414 6QU SN-941

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within ± 20% with 117-volt a-c supply.

***NOTE:** Values with star (*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

MODEL 6QU
Ch. RC-414

RCA MFG. CO., INC.

General Description

Model 6QU is a three-band, table-type, superheterodyne Victrola housed in a wood cabinet. The phonograph mechanism is of the manual type, and will play either 10-inch or 12-inch records.

Victrolas having "C5" or "C6" power rating may be made to operate on either 110 or 220 volts, conversion from one voltage to the other being made by means of a switch at the back of the chassis.

Features of design include: New type, single-ended tubes (6SA7 and 6SQ7); magnetite-core I-F transformers; magnetite-core oscillator coil on "A" band; automatic volume control; straight-line, edge-lighted dial; continuously variable tone control; supply-voltage change-over switch (on "C5" and "C6" rating Victrolas).

Miscellaneous Service Data

Phonograph Mechanism:

The phonograph motor is a self-starting, constant-speed induction type. It should be lubricated every six months by applying a few drops of light machine oil to the spindle bearing and oil hole.

The motor spindle is tapered, and a conical rubber piece fits snugly on the spindle. The hole in the turntable bushing is tapered to fit the rubber. This provides an excellent self-centering floating mounting.

A metal washer is placed on the spindle under the rubber piece. The washer has ears on the under side which fit over a pin that projects through the spindle.

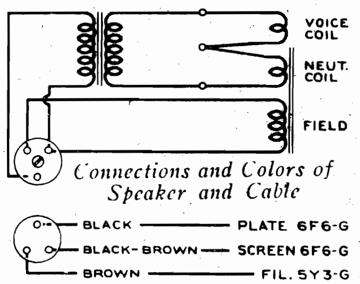
The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1⅜ inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

Crystal Pickup:

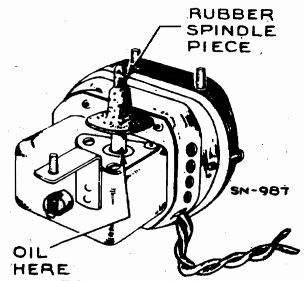
The crystal pickup is sealed in a metal case; if failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Precautionary Lead Dress:

1. Lead from 2nd I-F transformer to volume control should be kept close to the chassis and dressed against front apron.
2. C-10 should be dressed away from the antenna section of the variable condenser (C-1).



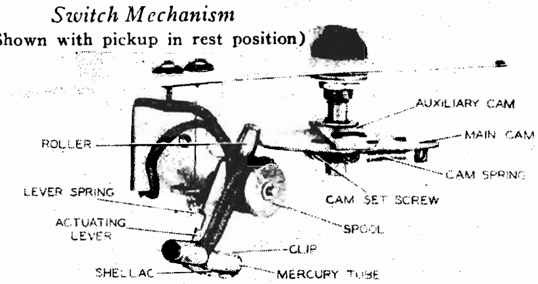
Connections and Colors of Speaker and Cable



Phonograph Motor

Switch Mechanism

(Shown with pickup in rest position)



Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

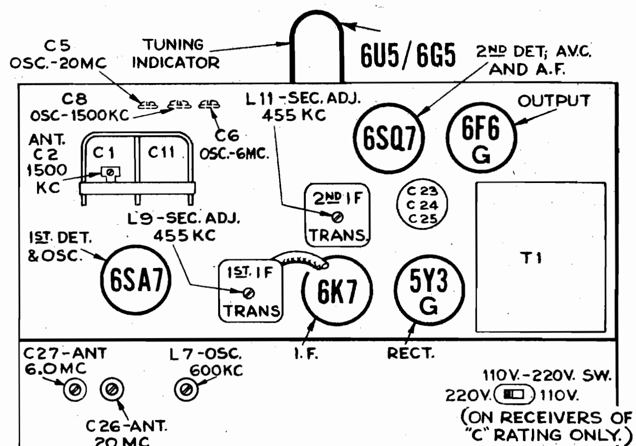
As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

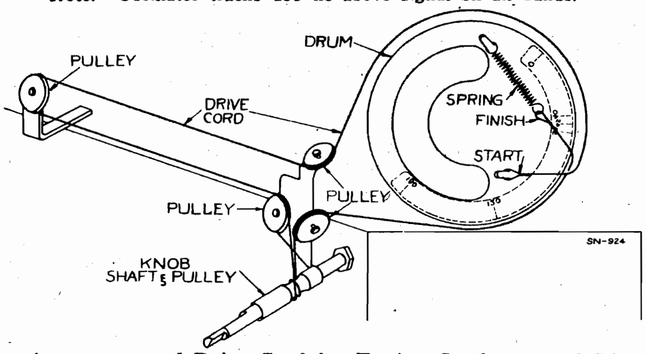
Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L10 and L11 (2nd I.F. trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd. **	455 kc		L8 and L9 (1st I.F. trans.)
3	Antenna lead in series with 200 mmfd.	600 kc	600 kc (33°) "A" Band	L7†
4		1,500 kc	1,500 kc (152.4°) "A" Band	C2 (ant.) C8 (osc.)
5	Repeat steps 3 and 4			
6	Antenna lead in series with 400 ohms	20 mc	20 mc (155.4°) "C" Band	C5 (osc.) * C26 (ant.)
7		6 mc	6 mc (149°) "B" Band	C6 (osc.) * C27 (ant.)
8	Antenna lead in series with 200 mmf.	1,500 kc	1,500 kc (152.4°) "A" Band	C8 (osc.)

* Use minimum capacity peak if two peaks can be obtained.
† Rock gang condenser slightly while adjusting L7.
** Make test-oscillator connection to lug on tuning condenser stator (oscillator section) in series with .01 mfd. condenser.
Note.—Oscillator tracks 455 kc above signal on all bands.



Tube and Trimmer Locations

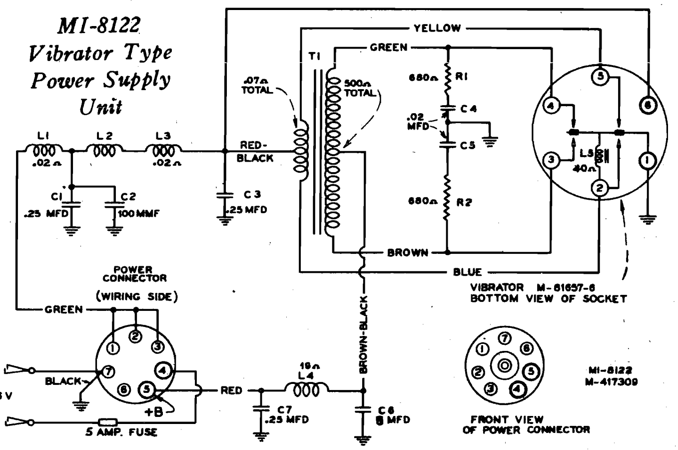


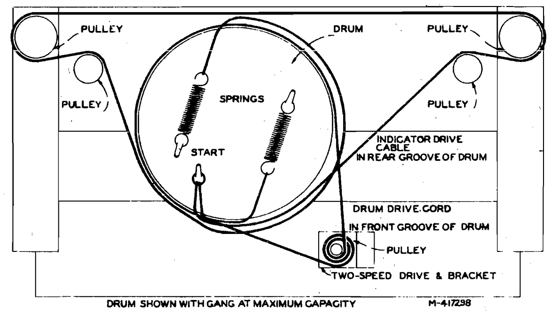
Arrangement of Drive Cord for Tuning Condenser and Dial Indicator. Drum Shown with Gang at Maximum Capacity

MODELS 7QB, 7QBK
Ch. RC-496

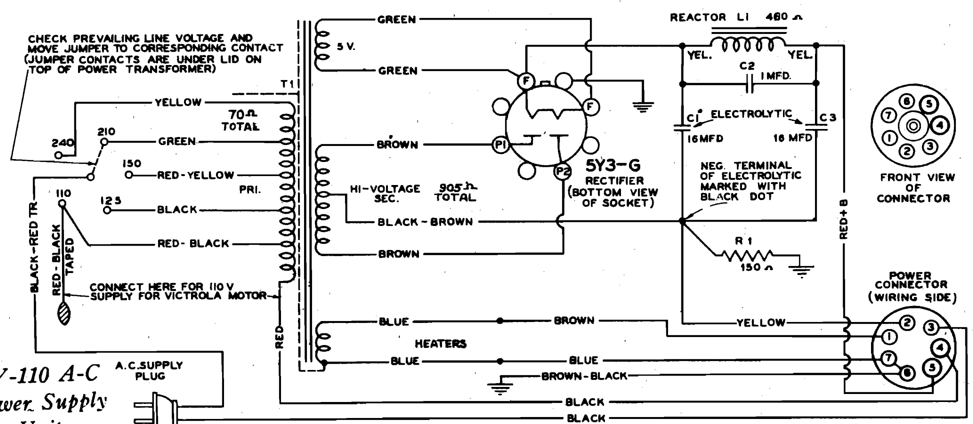
RCA MFG. CO., INC.

MI-8122 Vibrator Type Power Supply Unit

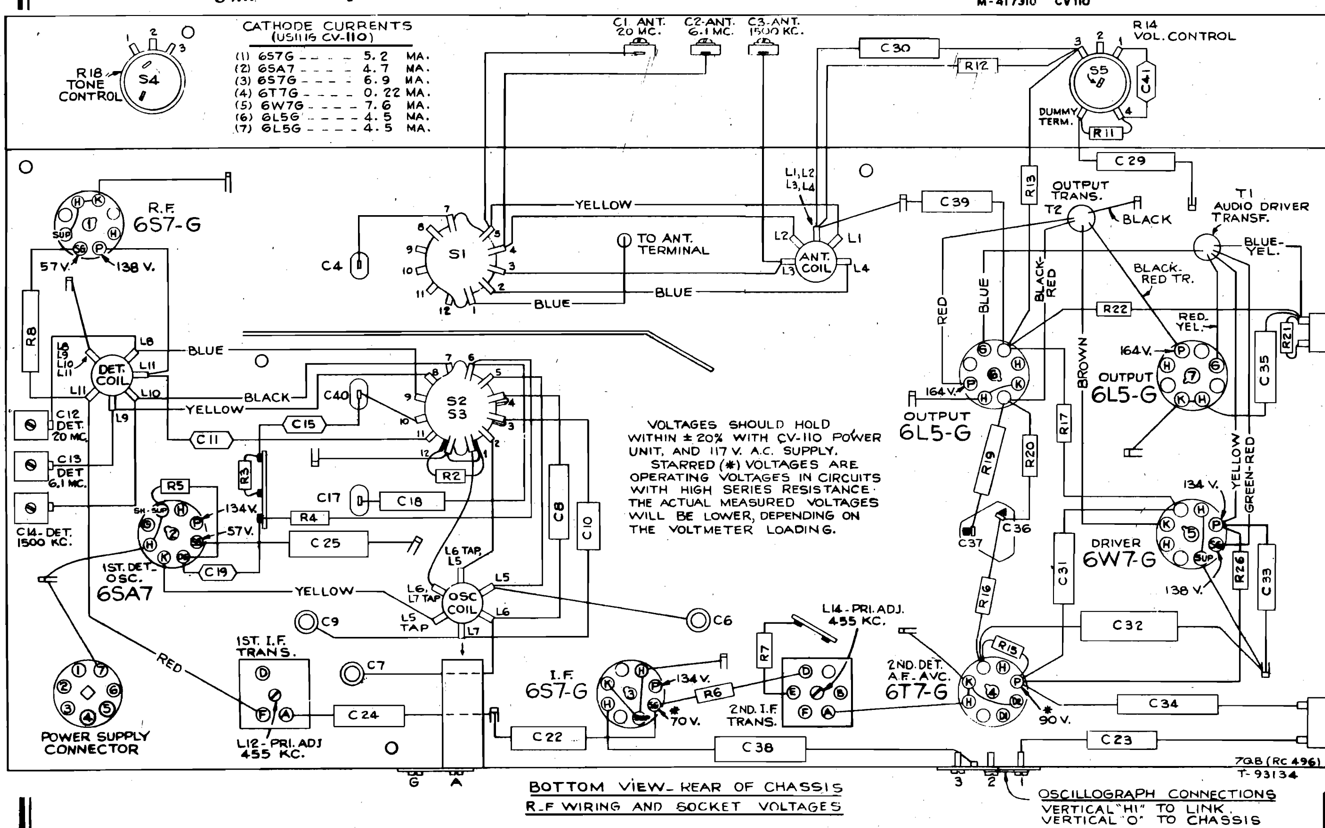




Above—Arrangement of Drive Cords for Tuning Condenser and Dial Indicator



CV-110 A-C Power Supply Unit

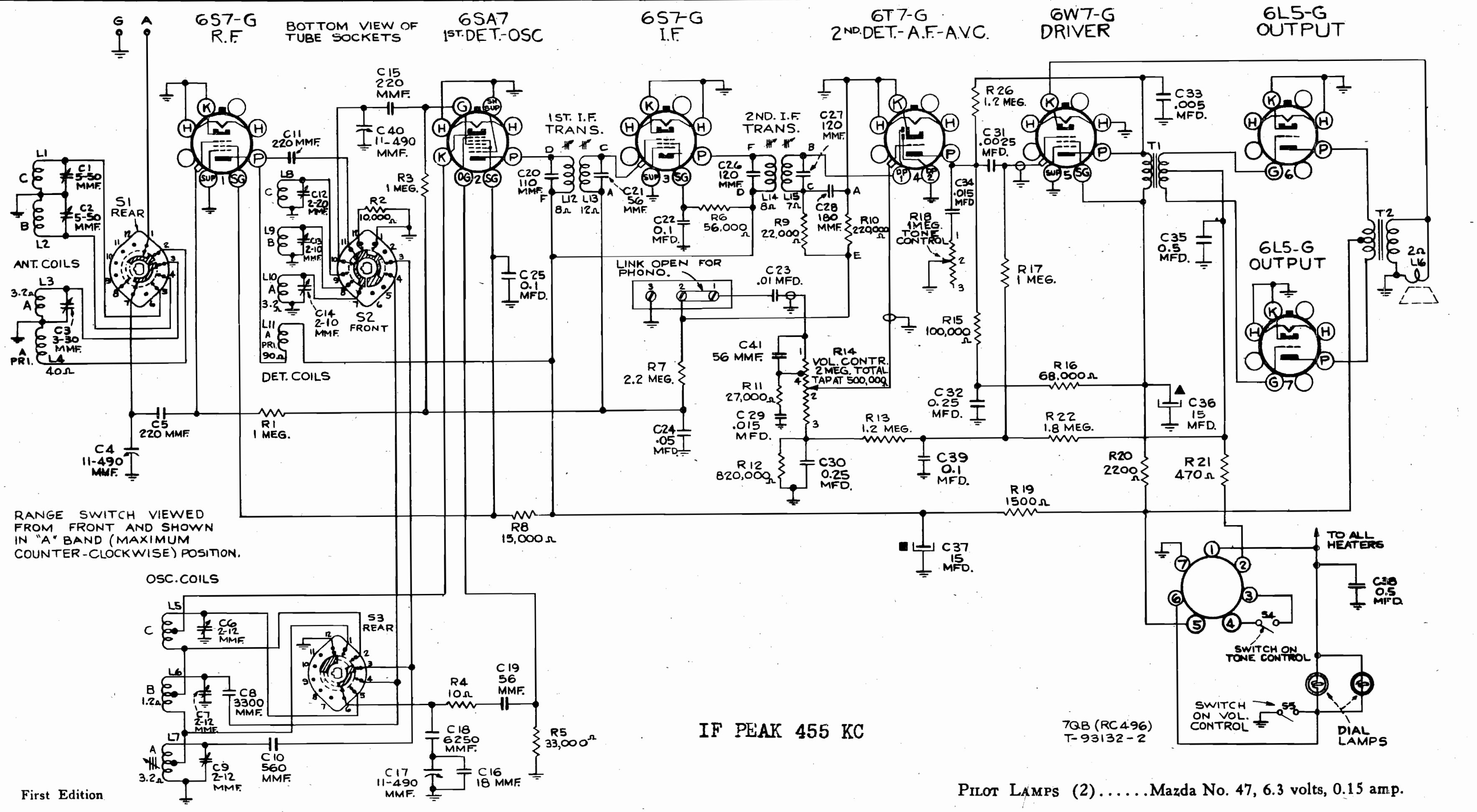


BOTTOM VIEW - REAR OF CHASSIS
R.F. WIRING AND SOCKET VOLTAGES

OSCILLOGRAPH CONNECTIONS
VERTICAL "HI" TO LINK.
VERTICAL "O" TO CHASSIS

MODELS 7QB, 7QBK
Ch. RC-496

RCA MFG. CO., INC.



First Edition

—1939—

Precautionary Lead Dress.—

1. Dress the blue lead from the antenna lug to the No. 1 terminal on the range switch (S-1) close to the chassis and away from the gang for its entire length across the top of the chassis base.

2. Dress the yellow lead from the detector coil to No. 8 terminal on the range switch (S-2), directly away from the detector coil towards the rear apron.

3. Keep the blue lead from the detector coil to No. 9 terminal on the range switch (S-2), isolated from the other leads and parts.

4. Loop the bus wire from oscillator coil to No. 5 terminal on the range switch (S-3), directly away from these terminals and other parts as far as possible, bending the loop towards the center of the chassis.

5. Dress the 3,300 mmfd. capacitor (C8) from the oscillator coil to No. 4 terminal on the range switch (S-3), directly toward the center of the chassis, being sure to clear the bus wire loop mentioned above (4).

6. Pull in the slack on the long yellow wire which runs from the terminal board in the rear corner to the tone control, at the tone control end, making the portion of the lead lying outside the front apron taut, and close to the apron.

PILOT LAMPS (2)......Mazda No. 47, 6.3 volts, 0.15 amp.

POWER SUPPLY RATING

D-C Rating (with vibrator-type power supply unit MI-8122)—6.3 volts, 3.2 amps.

A-C Rating (with CV-110 A-C power supply unit)—105-117, 117-130, 140-160, 200-225, 225-250 volts, 25-60 cycles.

POWER OUTPUT RATING

Maximum .... 2.6 watts
Undistorted .... 2.0 watts

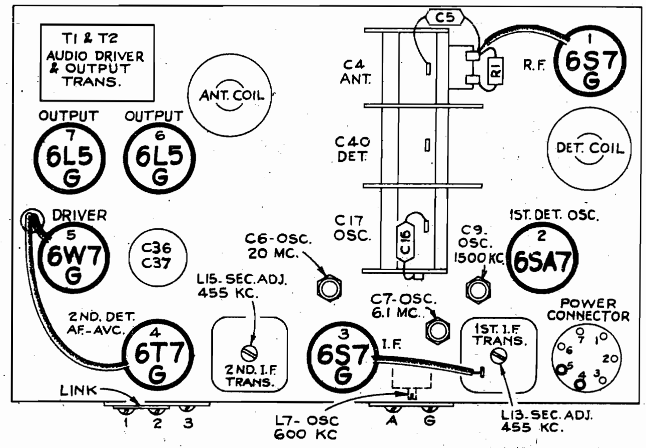
LOUDSPEAKERS (Permanent-Magnet Dynamics)

7QB (RL-90-2) 8-inch
7QBK (RL-71-5) 12-inch
Voice-coil impedance at 400 cycles . 2.4 ohms

MODELS 7QB, 7QBK
Ch. RC-496

RCA MFG. CO., INC.

Alignment Procedure



Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

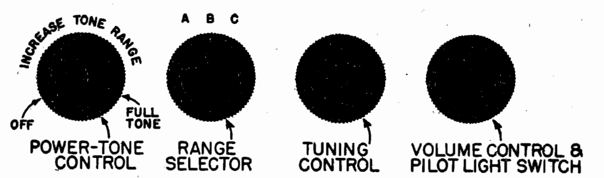
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The surface of the drum must be flush with the end of the gang-condenser shaft. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the left-hand end mark on the dial scales and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



The pilot lights are illuminated by pressing in the volume-control knob. (The pilot lights are not controlled by this action when the receiver is operated with the CV-110 a-c power supply unit.)

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6S7-G I-F grid cap in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L14 and L15 (2nd I-F trans.)
2	6SA7 1st det. grid cap in series with .01 mfd.			L12 and L13 (1st I-F trans.)
3	Antenna terminal in series with 300 ohms	20 mc	20 mc (22°) "C" band	C6 (osc.)* C12 (det.) (Rock C1 (ant.) Gang)
4		6.1 mc	6.1 mc (27.9°) "B" band	C7 (osc.)** C13 (det.) C2 (ant.)
5	Antenna terminal in series with 200 mmfd.	600 kc	600 kc (143.5°) "A" band	L7 (osc.) Rock Gang
6		1,500 kc	1,500 kc (27.8°) "A" band	C9 (osc.) C14 (det.) C3 (ant.)
7	Repeat steps 5 and 6			

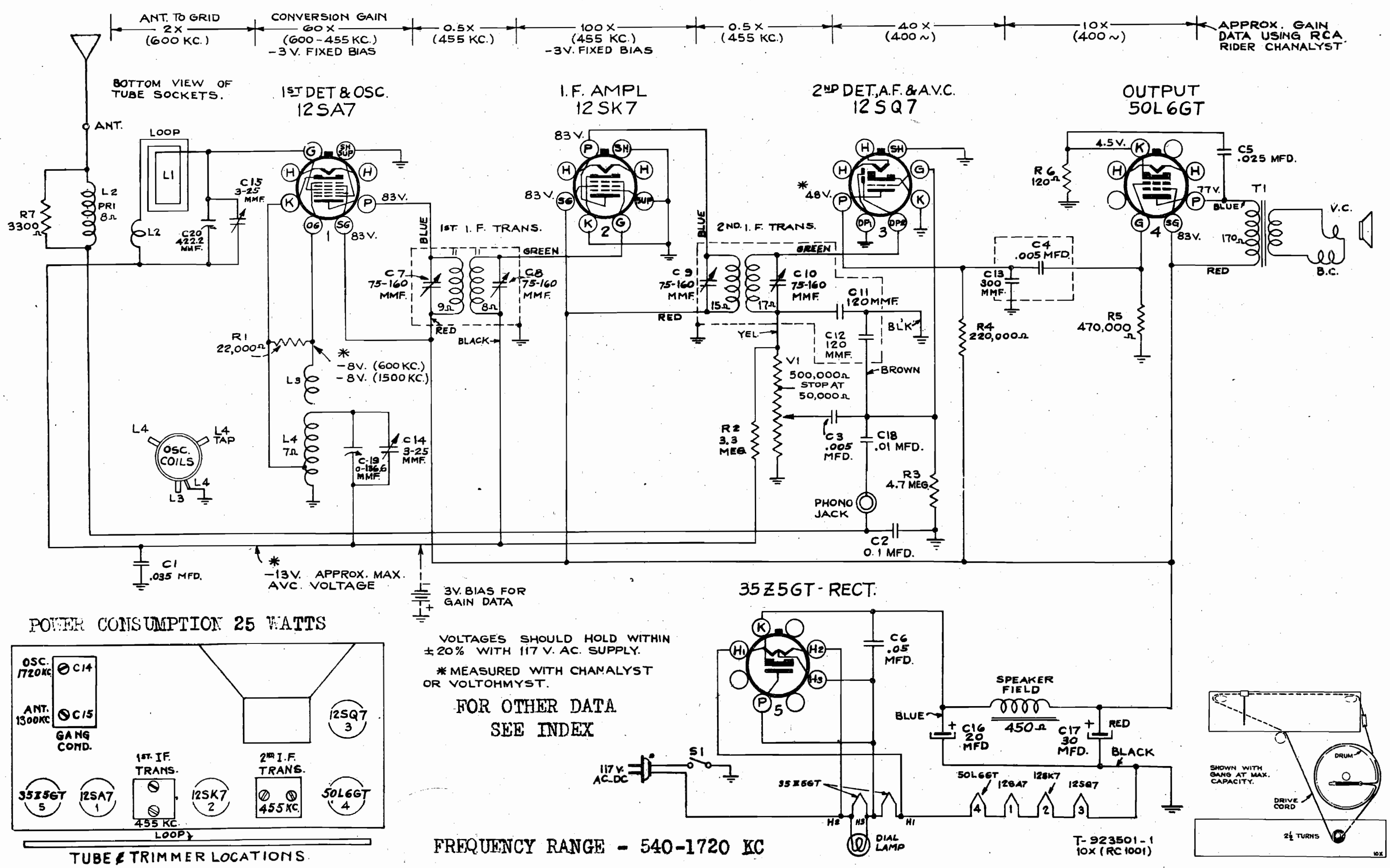
* Use **minimum** capacity peak (plunger out) if two can be obtained. Check to determine that C6 has been adjusted to the correct peak by turning radio to approximately 19.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C7 has been adjusted to the correct peak by turning radio to approximately 5.19 mc where a weaker signal should be heard.

Note: Oscillator tracks **above** signal on all bands.

RCA MFG. CO., INC.

MODEL 10X
Ch. RC-1001



Precautionary Lead Dress.—

1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT filament wires should be dressed to rear of chassis and away from the second I-F transformer leads.
5. Dress brown lead from second I-F transformer to 12SQ7 away from power cable.
6. Dress wire to No. 1 grid of the 12SA7 away from pilot lamp leads.
7. Dress wire from loop to variable condenser away from chassis.
8. Dress all capacitors, leads, etc. which come close to oscillator coil rigidly and as far as possible from it.

MODELS 10X, 11X-1, 45X-18, 16X-4

RCA MFG. CO., INC.

Alignment Procedure

MODELS 10X, 11X-1

Output Meter Alignment.—If this method is used connect the meter across the voice coil, and turn the receiver volume control to maximum.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor. When the electronic voltmeter is used as an alignment indicator the output of the test oscillator should be adjusted to produce several volts of AVC. With the output meter alignment method the oscillator output should be kept as low as possible.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. of ant. trans. in series with 200 mmfd.	1,720 kc	1,720 kc	C14 (osc.)
4	Radiated Signal 1,300 kc		Resonance on Signal	C15 (ant.)
5	Repeat steps 3 and 4.			

Replacement Parts

MODELS 10X, 11X-1

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES Model 10X (RC-1001)	
33584	Capacitor—.005 mfd.	.25
37359	Capacitor—1 section of .005 mfd., and 1 section of 300 mmfd.	.25
14393	Capacitor—.01 mfd.	.30
30938	Capacitor—.025 mfd.	.20
5196	Capacitor—.035 mfd.	.20
32787	Capacitor—.05 mfd.	.20
4839	Capacitor—0.1 mfd.	.30
34505	Capacitor—0.2 mfd.	.30
35348	Capacitor—Electrolytic comprising 1 section of 30 mfd., and 1 section of 20 mfd.	.95
37356	Coil—Loop primary coil (Antenna)	.35
36234	Coil—Oscillator coil	.60
37353	Condenser—Tuning condenser	2.75
36584	Control—Volume control and power switch	1.50
32634	Cord—Drive cord (approx. 32-in. overall length)	.10
37068	Indicator—Station selector indicator	.20
37351	Plate—Dial back plate complete with pulleys—less dial	.60
36230	Pulley—Drive cord pulley	.04
37355	Receptacle—Receptacle and terminal board	.20
12312	Resistor—3,300 ohms, ¼ watt	.20
13998	Resistor—22,000 ohms, ¼ watt	.20
12264	Resistor—220,000 ohms, ¼ watt	.20
30648	Resistor—470,000 ohms, ¼ watt	.20
12928	Resistor—3.3 meg., ¼ watt	.20
30271	Resistor—4.7 meg., ¼ watt	.20
37352	Shaft—Tuning shaft	.15
34449	Socket—Dial lamp socket	.30
31251	Socket—Tube socket (wafer type)	.25
37605	Socket—Tube socket (moulded type)	.25
37357	Spacer—Wood spacer for antenna loop	.10
31418	Spring—Drive cord spring	.05
37350	Transformer—Audio transformer (output)	1.35
36232	Transformer—First I.F. transformer	1.50
36233	Transformer—Second I.F. transformer	1.50
33726	Washer—"C" washer for tuning shaft	.02
37358	Winding—Antenna loop winding only	.55
	SPEAKER ASSEMBLIES (RL-86A1)	
32907	Cap—Dust cap	.02
35570	Cone—Cone complete with voice coil	1.20
37332	Speaker—5-inch dynamic speaker complete with cone and voice coil	3.25
	MISCELLANEOUS ASSEMBLIES	
37360	Back—Cabinet back	.25
35681	Base—Roto base complete	.35
37362	Clamp—Dial clamp (1 set)	.20
37363	Dial—Dial scale	.75
37831	Fastener—Push-on fastener for back	.10
37361	Knob—Volume control or tuning knob	.20
11765	Lamp—Dial lamp	.15
30900	Spring—Retaining spring for knobs	.05

Alignment Procedure

MODEL 45X-18

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is horizontal.

Push Button Adjustment.—The push-buttons should be adjusted for five favorite stations after the receiver is operating, and has had a brief warm-up period. Any standard broadcasting stations may be chosen, it being preferable to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Push in each button and loosen the push-button screws in back of the station marker recesses.
2. Accurately tune-in the first station manually.
3. With the station accurately tuned, press in the first push-button and tighten the screw.
4. Place station marker tab in the recess.
5. Adjust four remaining push buttons in a similar manner.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to	Adjust the following for max. peak output
1	12SK7 I-F grid, in series with .01 mfd.	455 kc	Quiet point 1600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 1st Det. grid in series with .01 mfd.			C8, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1600 kc	1600 kc	C3 (osc.)
4	Radiated signal	1300 kc	Signal frequency	C1 (ant.)
5	Repeat steps 3 and 4.			

MODEL 16X-4

Push Button Adjustment:

1. Make a list of the six desired stations, arranged in order from low to high frequencies, and manually tune-in the first station on this list.
2. Push in station button No. 1 (extreme left) and adjust No. 1 oscillator core to receive the station.
3. Adjust antenna trimmer for maximum output. Clockwise core and trimmer adjustment tunes circuits to lower frequencies.
4. Adjust for each of the four remaining stations in a similar manner.
5. Make a final careful re-adjustment of oscillator cores and antenna trimmers.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio to—	Adjust the following for maximum peak output
1	12SK7 I-F grid, in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C23, C22 2nd I-F transformer
2	12SA7 1st det. grid, in series with 0.1 mfd.			C21, C20 1st I-F transformer
3	12SK7 R-F grid, in series with 0.1 mfd.	1,720 kc	1,720 kc	C18 (osc.)
4	Radiated signal 1,300 kc		Resonance on signal	C16 (ant.)
5	Repeat steps 3 and 4			

RCA MFG. CO., INC.

MODEL 7Q4, Ch. RC-478A
MODEL 7QK4, Ch. RC-478B
MODEL 7Q4X, Ch. RC-502

Models 7Q4 and 7QK4 are similar to Model 6Q4 except for the addition of a tuning indicator (RCA-6U5/6G5). The 7QK4 chassis uses an RCA-6F6 output tube, whereas the 7Q4 uses an RCA-6F6-G output tube.

The dial scale of Models 7Q4 and 7QK4, together with a table giving alignment frequencies and calibration degrees, is show below. For additional alignment data, schematic diagram, etc., refer to the service note on Model 6Q4.

Tube Complement

(1) RCA-6SK7........................ R-F Amplifier
(2) RCA-6SA7.................. 1st Detector-Oscillator
(3) RCA-6SK7......................... I-F Amplifier
(4) RCA-6SQ7.. 2nd Detector, A.V.C., and A-F Amplifier
(5) RCA-6F6-G (7Q4) / RCA-6F6 (7QK4) .... Output
(6) RCA-5Y3-G.............................. Rectifier
(7) RCA-6U5/6G5.................... Tuning Indicator

Loudspeakers

7Q4 (RL-63K-2) .... 8-inch electrodynamic
7QK4 (RL-70J-4) .... 12-inch electrodynamic
V. C. Impedance.................. 2.2 ohms at 400 cycles

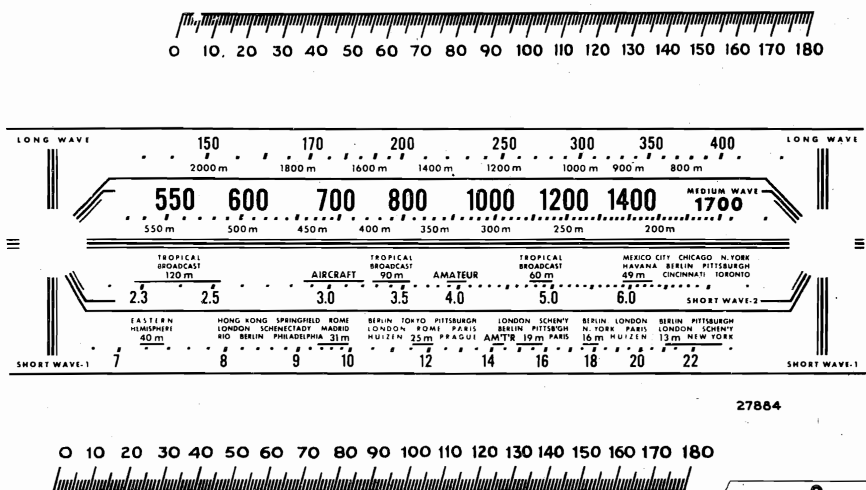
Cabinet Dimensions

7Q4............ 15⁹⁄₁₆-inches x 20⅝-inches x 9⅞-inches
7QK4.............. 38-inches x 26-inches x 11¾-inches

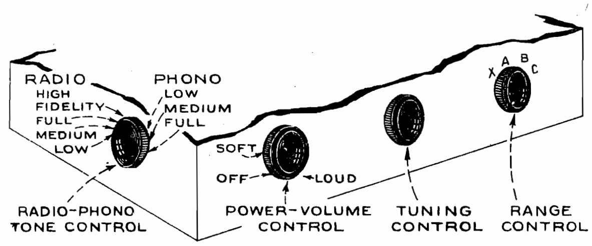
Calibration Scale

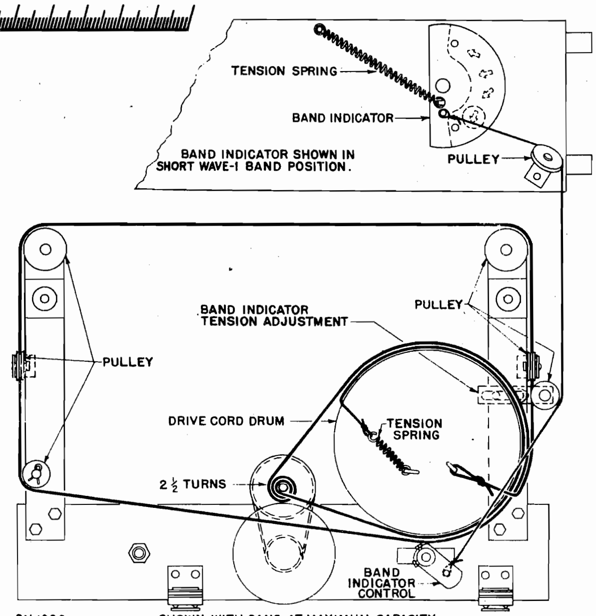
Frequency	Calibration Degrees
175 kc	52.8
360 kc	148.5
600 kc	32.0
1,500 kc	152.0
6.0 mc	150.0
20.0 mc	157.0

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale.



At Right—Dial Drive Mechanism and Band Indicator
Below—Controls





Dial Drive and Controls

for Models 7Q4, 7QK4 and 7Q4X

—1939—

First Edition

MODEL 11X-1
Ch. RC-1001-A

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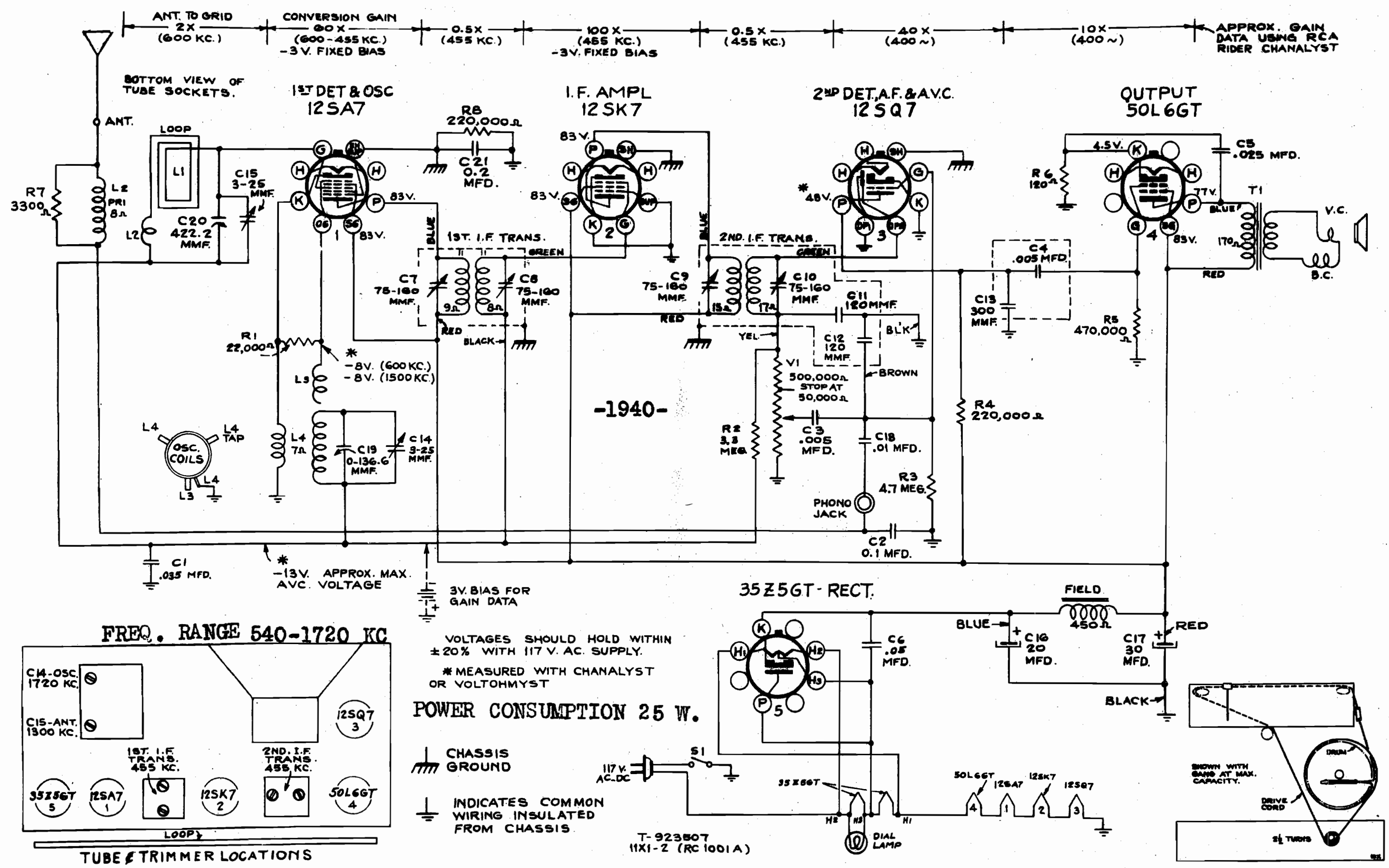


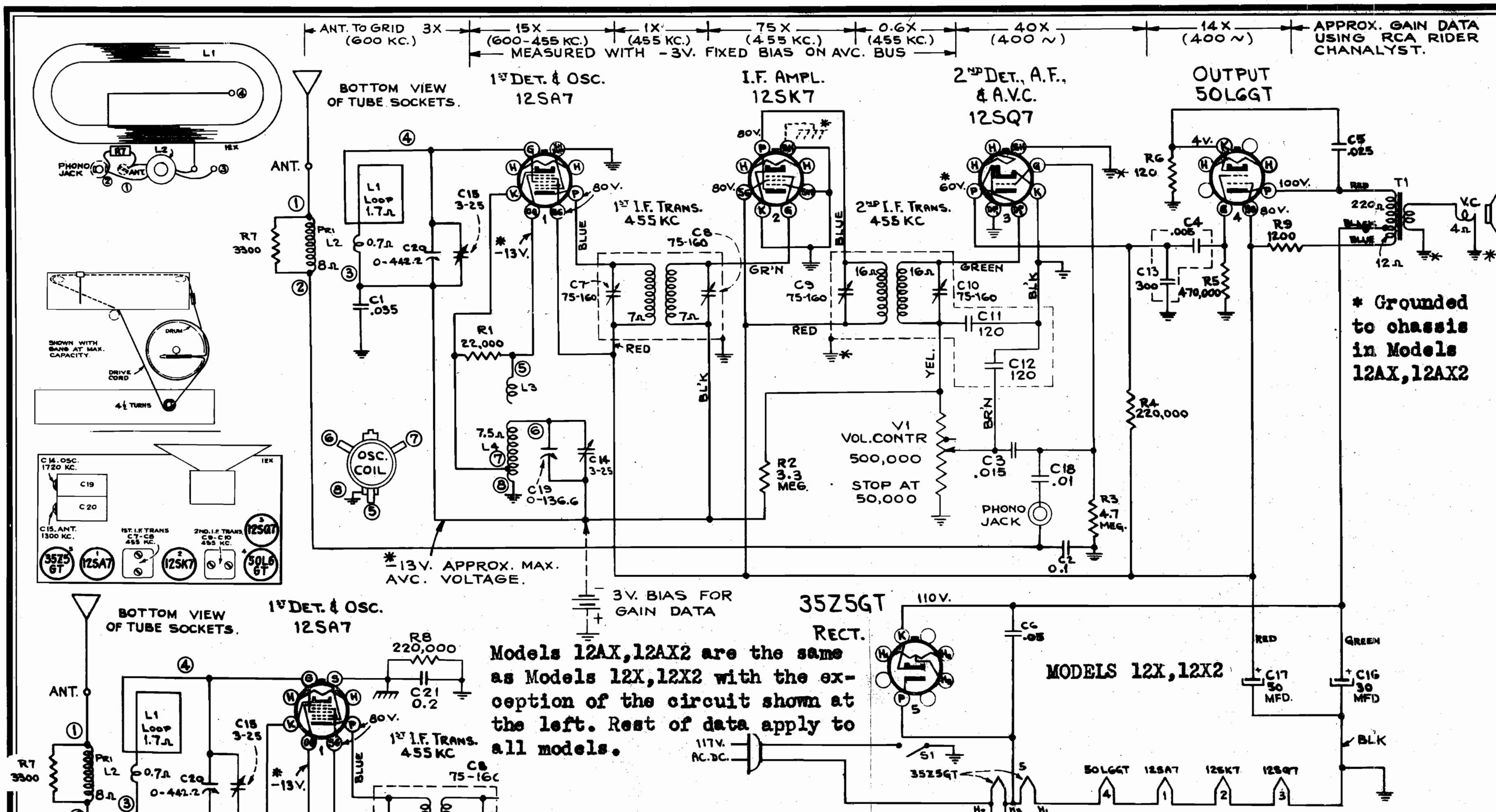
FOR OTHER DATA SEE INDEX

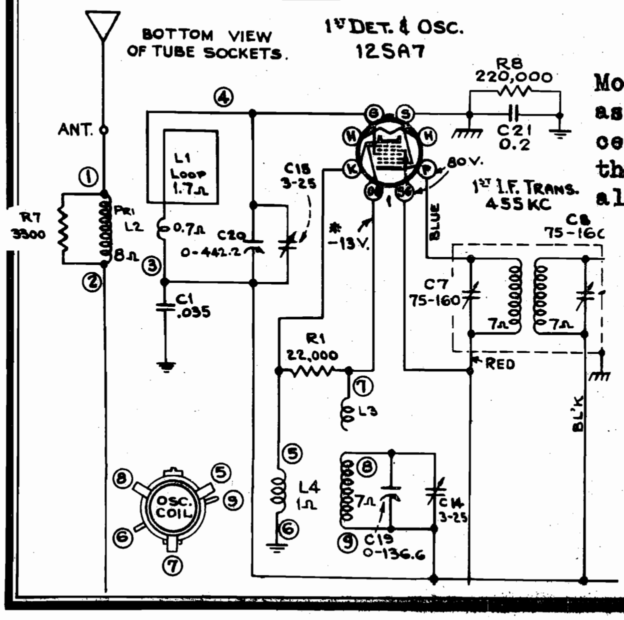
Precautionary Lead Dress.—

1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT filament wires should be dressed to rear of chassis and away from the second I-F transformer leads.
5. Dress brown lead from second I-F transformer to 12SQ7 away from power cable.
6. Dress wire to No. 1 grid of the 12SA7 away from pilot lamp leads.
7. Dress wire from loop to variable condenser away from chassis.
8. Dress all capacitors, leads, etc. which come close to oscillator coil rigidly and as far as possible from it.

RCA MFG. CO., INC.

MODELS 12X, 12X2
Ch. RC-1001B
MODELS 12AX, 12AX2
Ch. RC-1001C





Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet point 1600 kc end of dial	C10, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.			C8, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	1,720 kc	Gang at minimum	C14 (osc.)
4	Radiated signal 1300 kc		Signal frequency	C15 (ant.)
5	Repeat steps 3 and 4.			

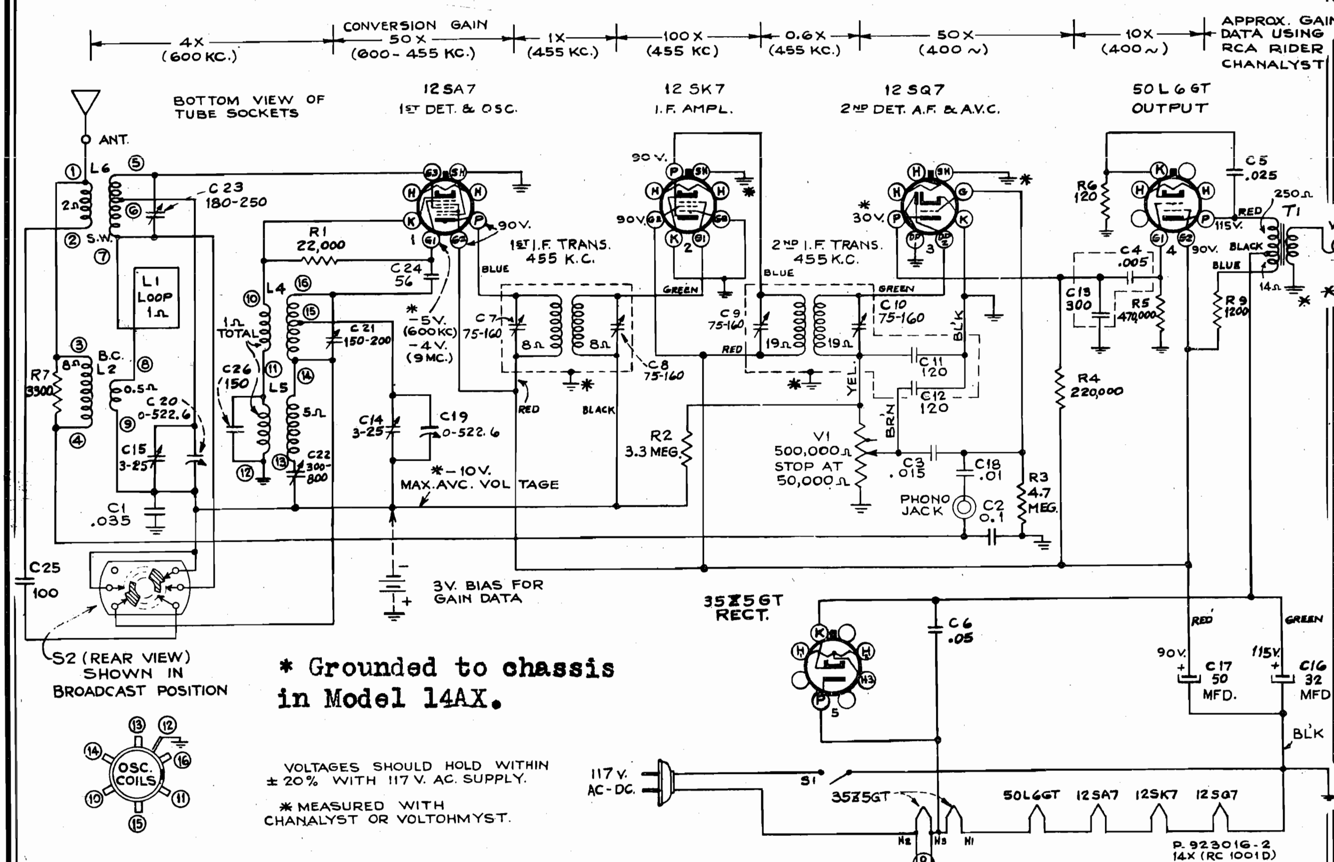
Record Player.—A jack is provided on the rear of the set for attaching a Record Player. The cable from the Record Player should be terminated in a Stock No. 31048 plug to fit the jack.

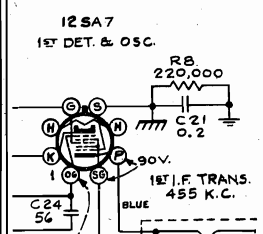
For phono operation, tune the receiver to a quiet point on the dial, turn the radio volume control to minimum, and use the control on the Record Player to regulate volume.

For radio operation, always remove the record-player plug from the jack.

MODEL 14X, Ch. RC1001D
MODEL 14AX, Ch. RC1001E

RCA MFG. CO., INC.





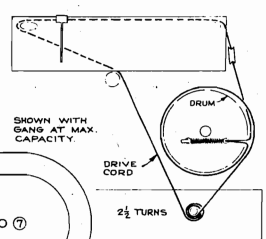
Model 14AX is the same as Model 14X with the exception of the circuit shown above.

Power Output

Undistorted .... .9 watts
Maximum .... 1.3 watts

Loudspeaker (92161-1)

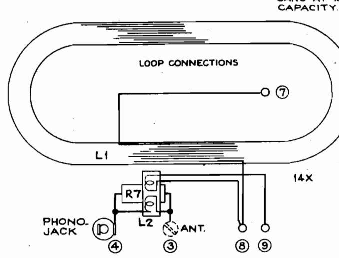
Type .... 5-inch permanent-magnet dynamic
V.C. Impedance .... 3.3 ohms at 400 cycles

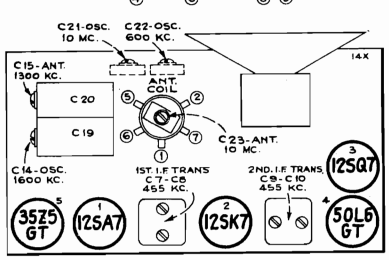


Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
3	Antenna term. in series with 47 mmf.	10 mc*	10 mc	C21 (osc.)** C23 (ant.)
4	Antenna term. in series with 200 mmfd.	1,600 kc	1,600 kc	C14 (osc.)
5	Radiation Loop	1,300 kc	Resonance on Signal	C15 (ant.)
6	Radiation Loop	600 kc	600 kc	C22 Osc. Rock in

* It is recommended that this step be repeated using a received station of known frequency.

** Use minimum capacity if two peaks can be obtained.





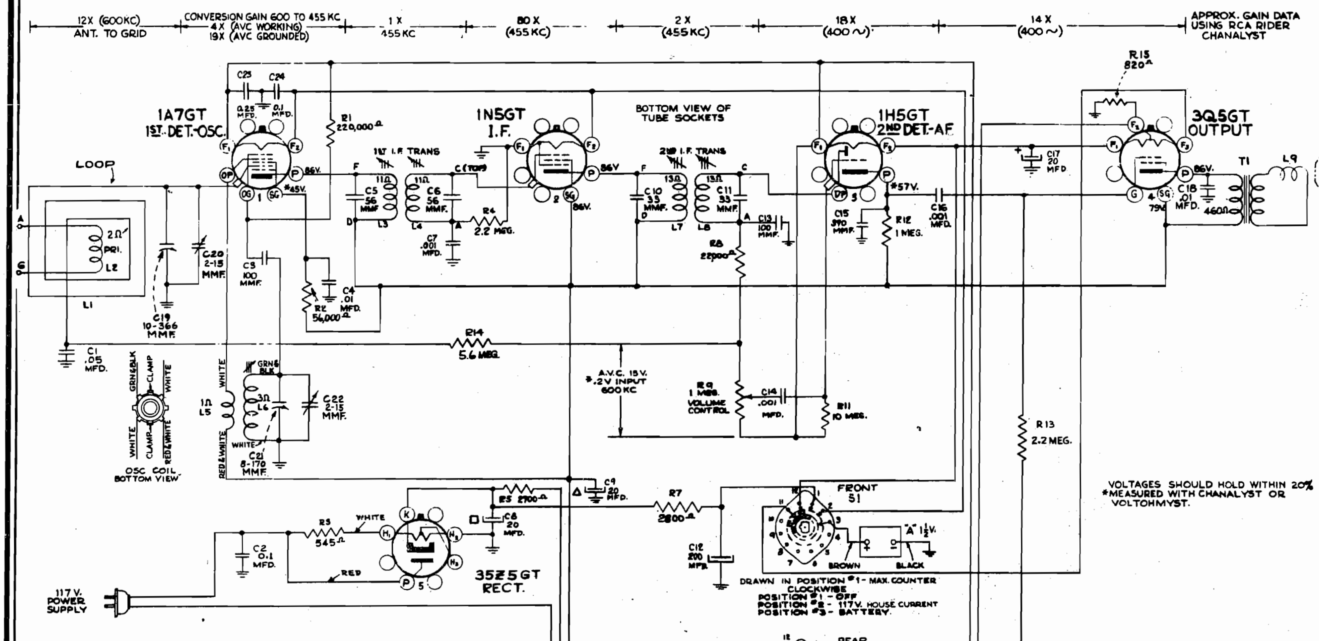
Precautionary Lead Dress.—

1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT filament wires should be dressed to rear of chassis and away from the second I-F transformer leads.
5. Dress brown lead from second I-F transformer to 12SQ7 away from power cable.
6. Dress wire to No. 1 grid of the 12SA7 away from pilot lamp leads.
7. Dress wire from loop to variable condenser away from chassis.
8. Dress all capacitors, leads, etc. which come close to oscillator coil rigidly and as far as possible from it.

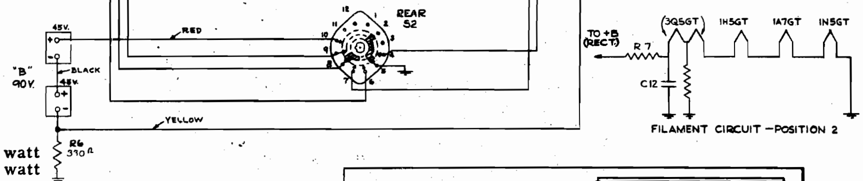
MODELS 15BP3, 15BP5
Ch. RC-527A

RCA MFG. CO., INC.

MODELS 15BP1, 15BP2,
15BP4, 15BP6, Ch. RC-527



Frequency Range............ 540-1,720 kc
Intermediate Frequency............ 455 kc



Line Current Supply
110 to 125 volts, AC 50 or 60 cycles, or DC

Power Output
Undistorted........................ .15 watt
Maximum........................ .25 watt

Batteries Required
"A" one 1.5 volt dry plug-in type "A," (Eveready No. 743 or equivalent)
"B" two 45 volt dry plug-in type "B," (Eveready No. 482 or equivalent)

Current Consumption
"A" 0.25 amperes
"B" 11.5 milliamperes } .... Battery Operation

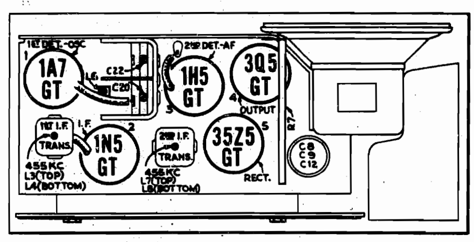
Loudspeaker
Type........................ 5-inch permanent-magnet dynamic
Voice-coil Impedance.................. 3.4 ohms at 400 cycles
Identification Number........................ RL-85-A1

Alignment Procedure

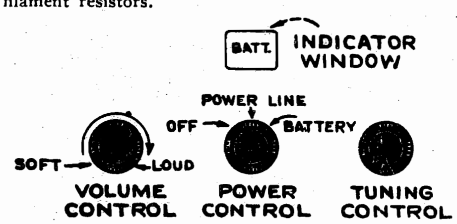
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

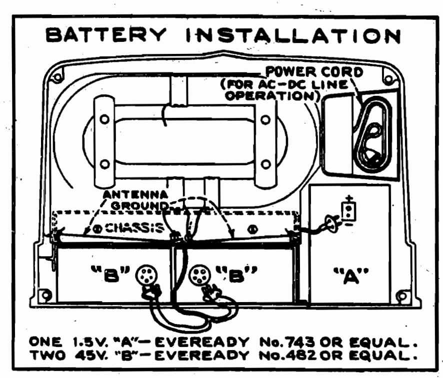
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1N5GT I-F grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L8, L7 (2nd transformer)
2	1A7GT 1st-Det. grid cap, in series with .01 mfd.			L4, L3 (1st I-F transformer)
3	radiated signal 1,720 kc		signal frequency	C22 (Osc. Trimmer)
4	radiated signal 1,400 kc			C20 (Ant. Trimmer)
5	radiated signal near 600 kc			L6 (Rock in)
6	Repeat steps 3, 4 and 5 until aligned.			



Precautionary Lead Dress.—
1. Lead from I-F tube grid and from the loop to variable capacitor should not be disturbed after receiver has been aligned.
2. Grid lead to the 1N5-GT tube should be kept away from leads to filament resistors.



Model	Type Cabinet
Chassis	RC-527
15BP-1	Plastic
15BP-2	Brown Fabric
15BP-4	Brown Leatherette
15BP-6	Wood
Chassis	RC-527A
15BP-3	Gray Fabric
15BP-5	Blue Leatherette

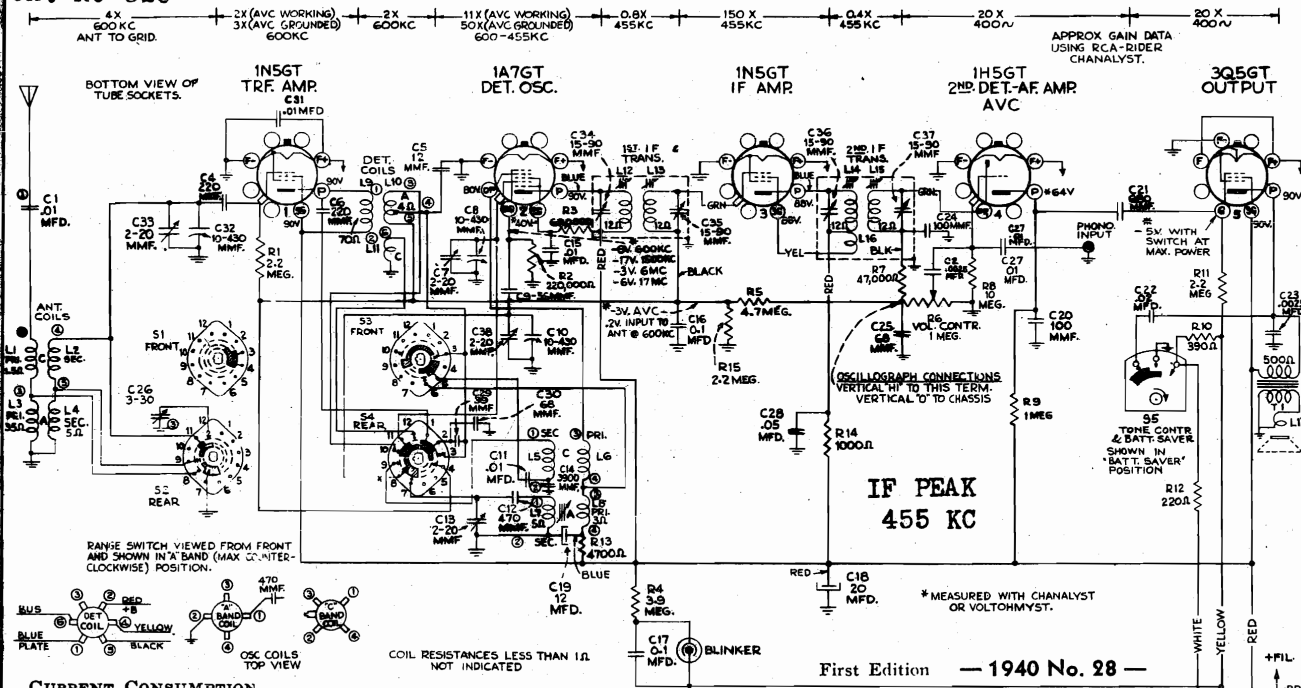


—1940 No. 26—

First Edition

MODEL 15BT
Ch. RC-526

RCA MFG. CO., INC.



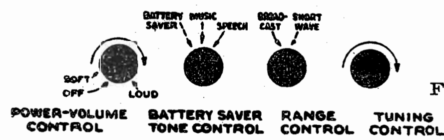
First Edition — 1940 No. 28 —

Current Consumption
"A", 0.3 ampere—"B", 13 milliamperes
(In "Battery Saver" position, the "B" drain is reduced approximately 40%)

Batteries Required
"A"—"B" Pack (1.5 volt "A," 90 volt "B.")

Power Output
Undistorted .... 0.14 watts
Maximum .... 0.25 watts

Loudspeaker
Type .... 5-inch permanent-magnet dynamic
Voice Coil Impedance .... 3.4 ohms at 400 cycles
Indentification Number RL-93-1



Frequency Range
535-1,712 kc
5.9-18.3 mc

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagrams.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

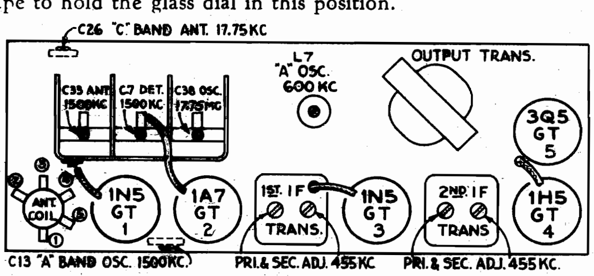
Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

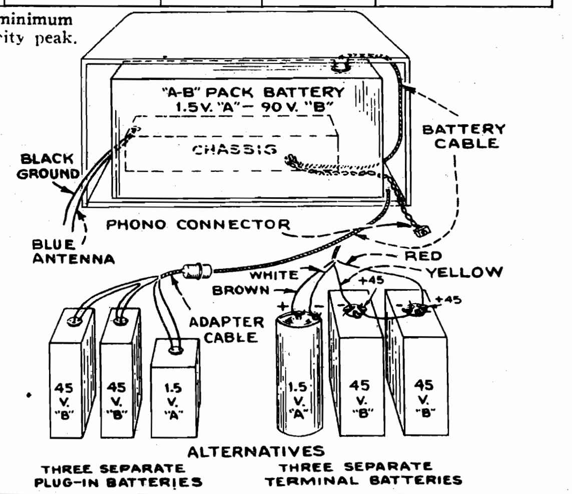
Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment.

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5GT I-F grid cap in series with 0.1 mfd.	455 kc	"A" band Quiet point between 550-750 kc	C37, C36 2nd I-F transformer
No. 2	1A7GT 1st-Det. grid cap, in series with 0.1 mfd.	455 kc	"A" band Quiet point between 550-750 kc	C35, C34 1st I-F transformer
No. 3	Antenna lead, in series with 200 mmfd.	17.75 mc	"C" band 17.75 mc	C38* Osc. trimmer
No. 4	Antenna lead, in series with 200 mmfd.	1,500 kc	"A" band 1,500 kc	C13, C7, C33 Osc. R.F. Ant. Trimmers
No. 5	Antenna lead, in series with 200 mmfd.	600 kc	"A" band 600 kc	L7 osc. (Rock in)
No. 6	Antenna lead, in series with 200 mmfd.	Repeat steps 4 and 5		
No. 7	Antenna lead, in series with 200 mmfd.	17.75 mc	"C" band 17.75 mc	C26 Ant. trimmer

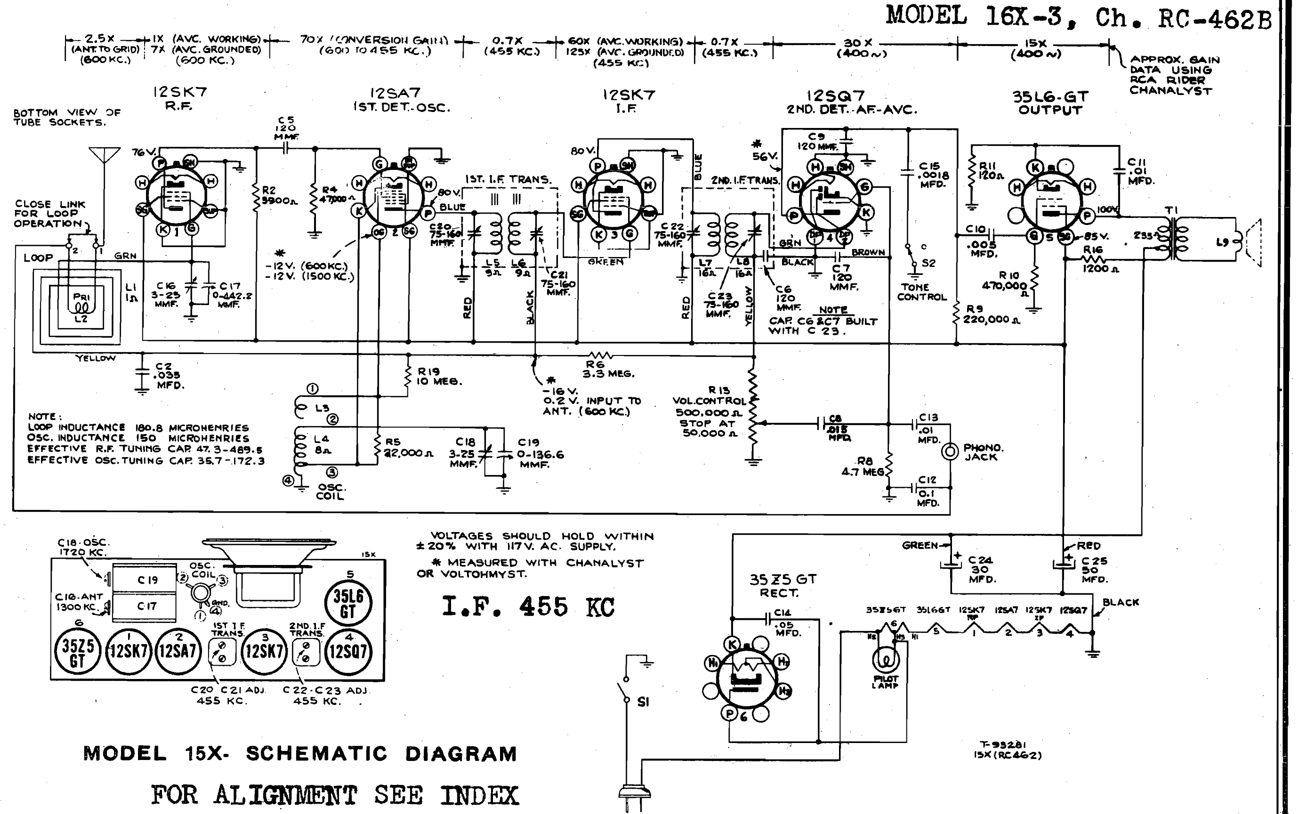
* Use minimum capacity peak.





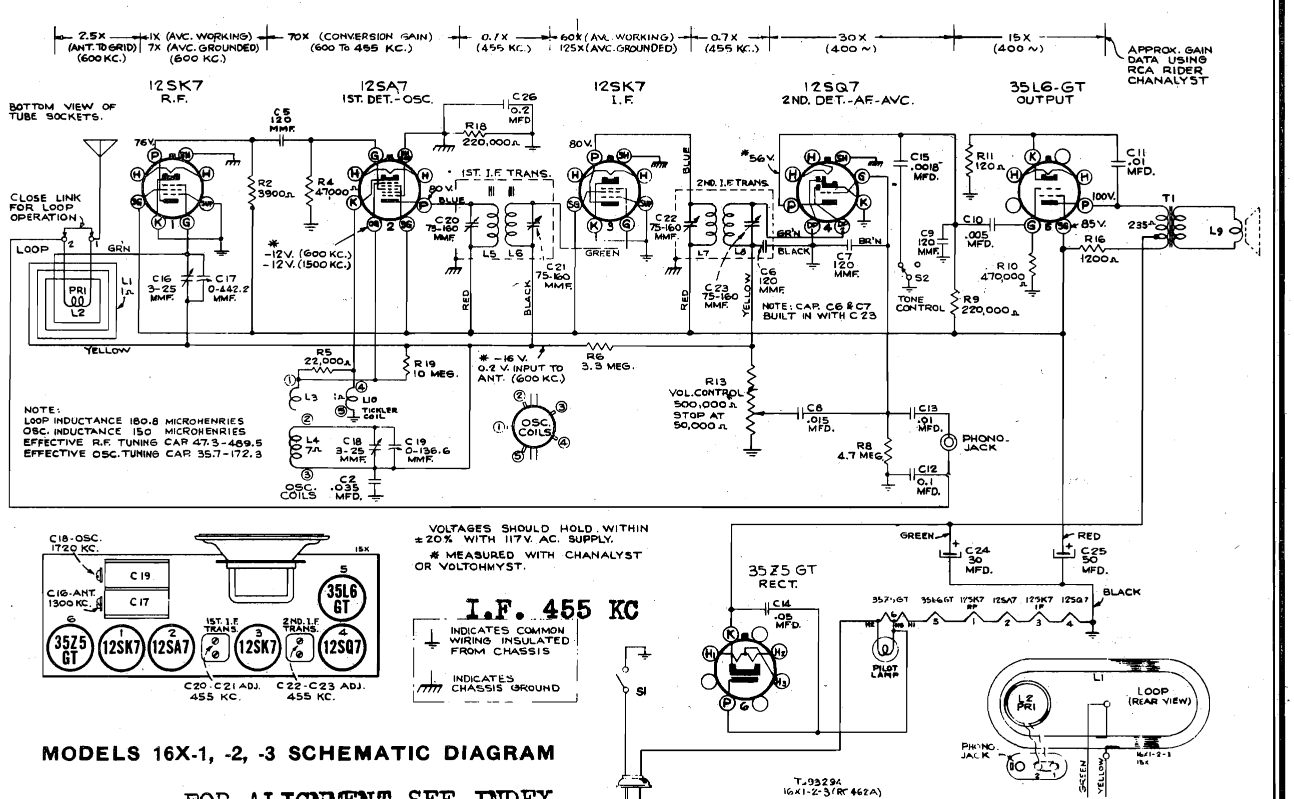
RCA MFG. CO., INC.

MODEL 15X, Ch. RC-462
MODELS 16X-1, 16X-2 Ch. RC-462A
MODEL 16X-3, Ch. RC-462B



MODEL 15X- SCHEMATIC DIAGRAM

FOR ALIGNMENT SEE INDEX



MODELS 16X-1, -2, -3 SCHEMATIC DIAGRAM

FOR ALIGNMENT SEE INDEX

Frequency Range .... 535-1,720 kc

Power Output
Undistorted .... 0.9 watts
Maximum .... 1.4 watts

Loudspeaker (RL-81A-5)
Type .... 5-inch permanent-magnet dynamic
V.C. Impedance .... 4 ohms at 400 cycles

Power Supply Rating
105-125 volts, AC, 50 or 60 cycles, or DC .... 30 watts

MODELS 15X, 16X-1, 16X-2, 16X-3
MODELS 16X-11, 16X-13, 16X-14
MODELS 500, 501

RCA MFG. CO., INC.

MODEL BP-10

Alignment Procedure

Output Meter Alignment. — If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For all alignment operations, keep the output as low as possible to avoid a-v-c action.

MODELS 500, 501

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with .001 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C17, C18 (2nd I-F Trans.)
2	12SA7 grid in series with .001 mfd.			C15, C16 (1st I-F Trans.)
3	Antenna term. of ant. trans. in series with 100 mmfd.	1,720 kc	Full clockwise (out of mesh)	C14 (oscillator)
4		1,500 kc	Resonance on 1,500 kc signal	C12 (antenna)

MODELS 15X, 16X-1, 16X-2, 16X-3

Precautionary Lead Dress:

1. .01 mfd. capacitor from output plate to cathode to be dressed as far as possible away from .015 mfd. 1st audio grid condenser and volume control terminals to eliminate audio howl.
2. Filament lead to pin No. 7 on 35L6-GT socket to be dressed away from 1st audio grid.
3. Dress B+ lead on 12SK7 I.F. socket across bottom of socket between grid and plate contacts to aid reduction of grid plate capacitance.
4. Dress excess lead lengths of I.F. transformer, grid and plate leads into cans to aid shielding.
5. Dress filament leads of 35L6-GT around 12SQ7 socket and into chassis corner to reduce hum.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio to—	Adjust the following for maximum peak output
1	12SK7 I-F grid, in series with 0.1 mfd.	455 kc	Quiet Point at 1,700 kc end of dial	C23, C22 2nd I-F transformer
2	12SA7 1st det. grid, in series with 0.1 mfd.			C21, C20 1st I-F transformer
3	12SK7 R-F grid, in series with 0.1 mfd.	1,720 kc	1,720 kc	C18 (osc.)
4	Radiated signal 1,300 kc		Signal frequency	C16 (ant.)
5	Repeat steps 3 and 4			

Alignment Procedure

MODELS 16X-11, 16X-13, 16X-14

Steps	Connect the high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with 0.1 mfd.	455 kc	"A" Band Quiet Point 1,600 kc end of dial	C23, C22 2nd I-F Transformer
2	12SA7 1st Det. grid in series with 0.1 mfd.			C21, C20 1st I-F Transformer
3	Ant. terminal in series with 47 mmfd.	19 mc	"C" Band 19 mc	C18 (osc.)
4	Radiated Signal 18 mc		"C" Band Resonance on Signal	C31 (ant.)
5	Radiated Signal 6.1 mc		Resonance on Signal	Inductance of L12*
6	Ant. terminal in series with 200 mmfd.	1,720 kc	"A" Band 1,720 kc	C35 (osc.)
7	Radiated signal 1,400 kc		"A" Band Resonance on Signal	C33 (ant.)
8	Ant. terminal in series with 200 mmfd.	590 kc	"A" Band 590 kc	C36 (osc.)
9	Repeat steps 6, 7 and 8			

* Adjust by dressing proximity of AVC lead to coil.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

Replacement Parts MODEL BP-10

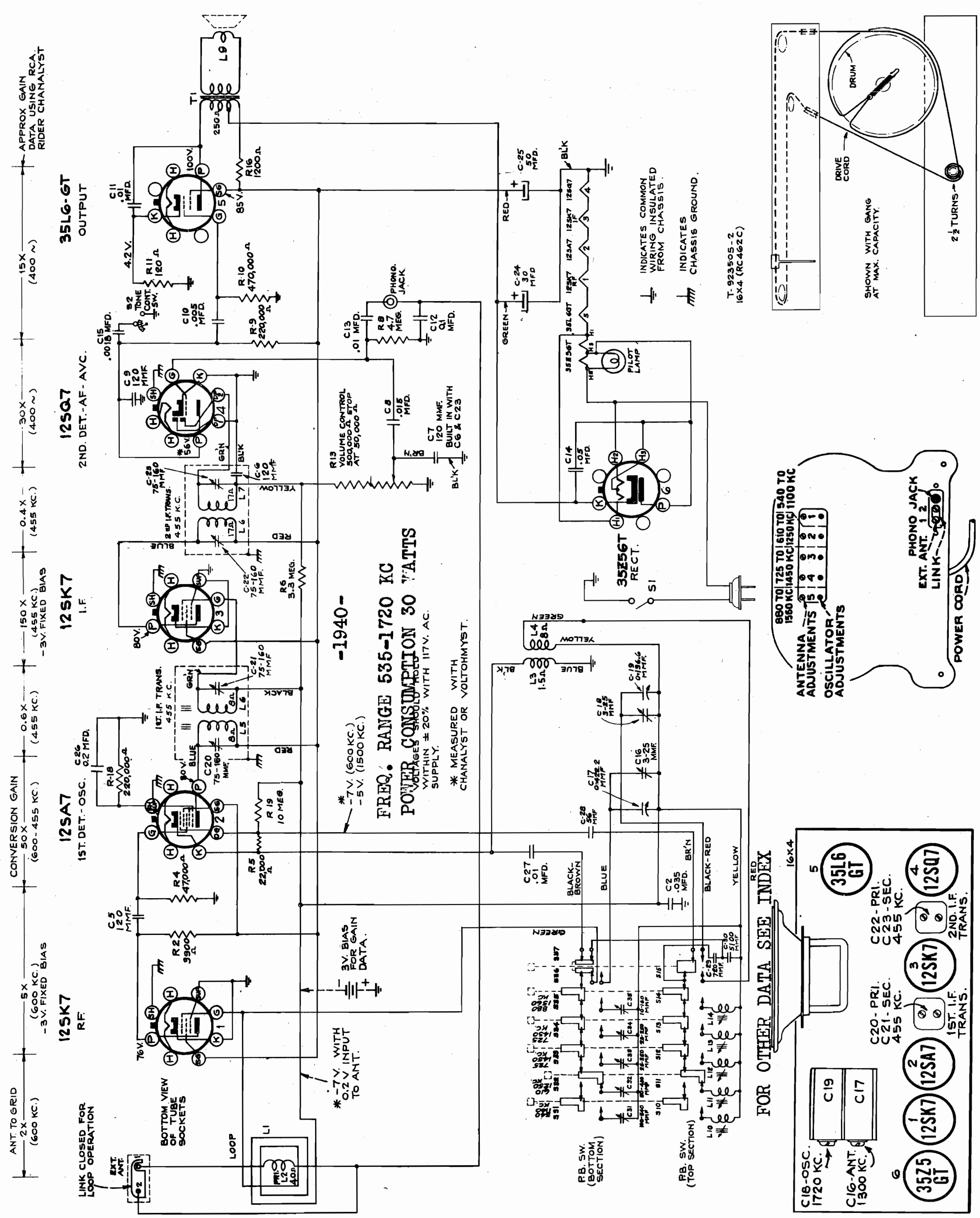
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	CHASSIS ASSEMBLIES (RC-544)	
36717	Capacitor—20 mmfd	.40
36715	Capacitor—50 mmfd	.40
36716	Capacitor—100 mmfd	.40
12488	Capacitor—270 mmfd	.35
36163	Capacitor—.001 mfd	.25
33584	Capacitor—.005 mfd	.25
36248	Capacitor—.02 mfd	.20
32787	Capacitor—.05 mfd	.20
36718	Capacitor—Electrolytic, 10 mfd., 60 volts	.40
36497	Coil—Oscillator coil	.70
36496	Condenser—Variable tuning condenser	2.75
36495	Control—Volume control	1.00
36606	Core—Adjustable core and stud for oscillator coil	.15
36503	Holder—Battery holder complete	.40
36501	Knob—Tuning knob	.75
36502	Knob—Volume control knob	.60
30158	Resistor—820 ohms, ½ watt	.20
36714	Resistor—15,000 ohms, ½ watt	.20
30787	Resistor—47,000 ohms, ½ watt	.20
3252	Resistor—100,000 ohms, ½ watt	.20
30652	Resistor—1 megohm, ½ watt	.20
31417	Resistor—3.3 megohm, ½ watt	.20
30931	Resistor—4.7 megohm, ½ watt	.20
30992	Resistor—10 megohm, ½ watt	.20
31085	Screw—No. 8-32 x ⅛ set screw for knobs	.15
36500	Socket—Tube socket	.15
36069	Socket—1T4 tube socket	.20
36498	Transformer—First I.F. transformer	1.90
36499	Transformer—Second I.F. transformer	1.90
	SPEAKER ASSEMBLIES (84991-501)	
36504	Speaker—3-inch P. M. speaker, complete with cone and voice coil, less output transformer	2.50
36505	Transformer—Output transformer	.75
	MISCELLANEOUS ASSEMBLIES	
36510	Antenna—Antenna loop and cover	1.75
36507	Bottom—Receiver case bottom cover	1.50
36508	Center—Receiver case center strip	2.50
36509	Handle—Carrying handle and bracket	.45
36696	Initials—100 initials to each set comprising 25 groups of the average initials and one tube of cement	2.00
36511	Lid—Receiver case top cover and panel	5.50
36695	Strap—Shoulder strap	.60
36506	Switch—Power switch	.40

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

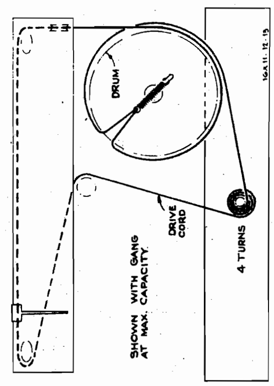
MODEL 16X-4
Ch. RC-462-C

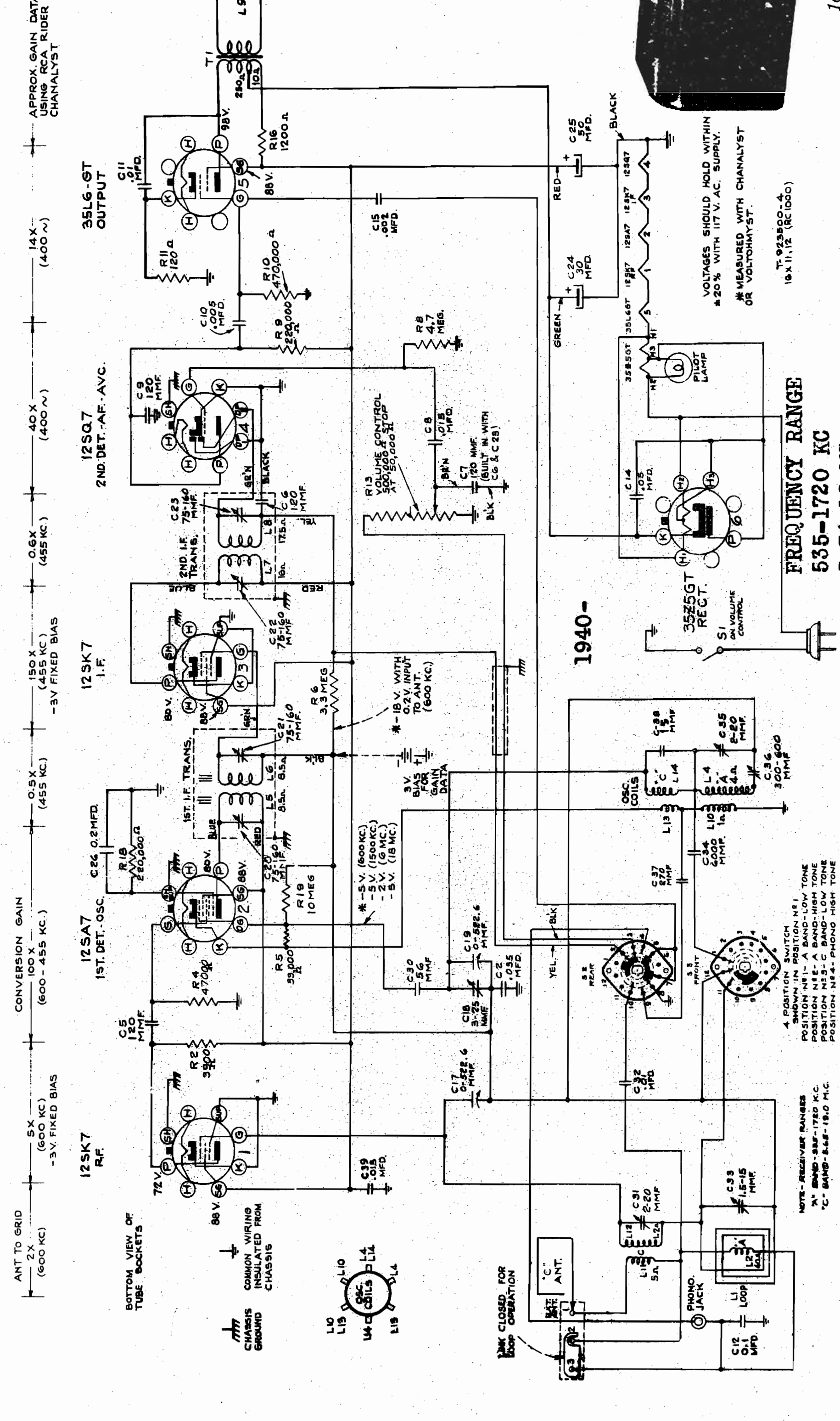


MODEL 16X-11, Ch. RC-1000

MODEL 16X-13,
Ch. RC-1000A

RCA MFG. CO., INC.





1940-

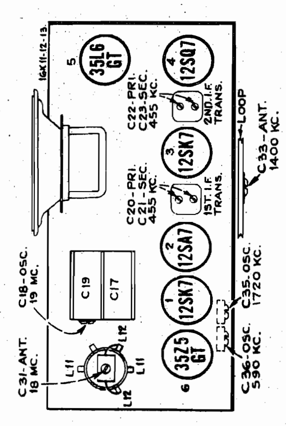
FREQUENCY RANGE
535-1720 KC
5.74-19 MC

POWER CONSUMPTION 30 WATTS

FOR OTHER DATA SEE INDEX

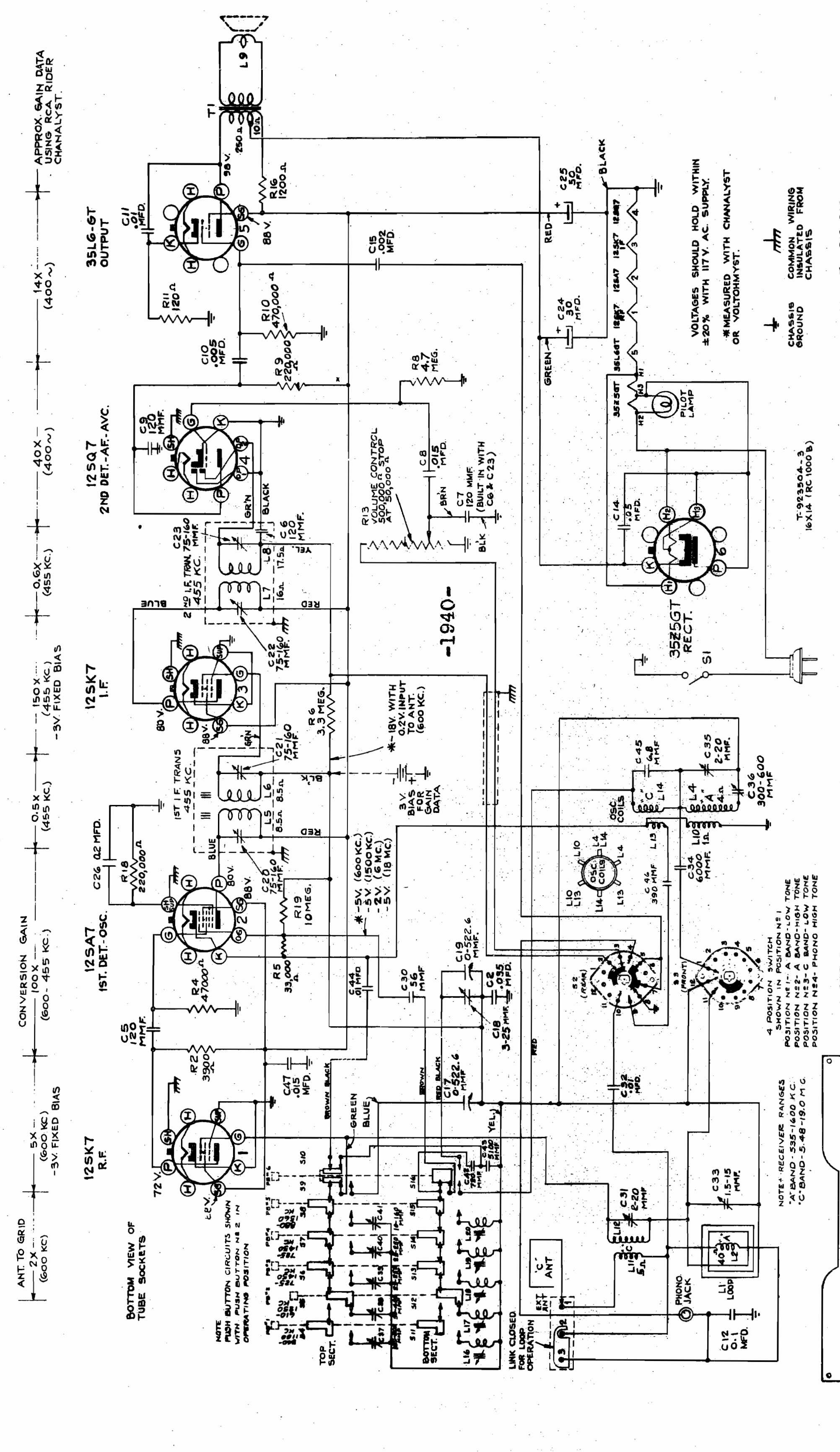
Precautionary Lead Dress.—

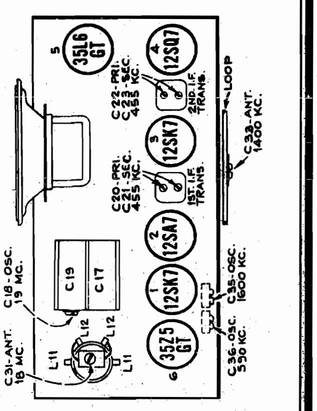
1. Dress all capacitors, leads, etc., coming close to osc. coil rigidly and as far as possible from it.
2. Dress blue lead from loop trimmer against loop and around outside of 35Z5 tube.
3. Dress leads of 120 mmfd. capacitor from terminal board to grid of 12SA7 as short and direct as possible.
4. Dress leads of peaking coil from plate of 12SK7 RF tube to terminal board as short and direct as possible.
5. Dress blue lead from SW ant. coil through same hole in base through which green lead from stator of rear section of the variable condenser passes.



MODEL 16X-14
Ch. RC-1000B

RCA MFG. CO., INC.





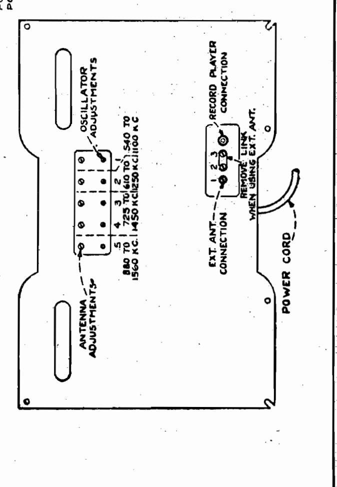
FOR OTHER DATA

SEE INDEX

POWER CONSUMPTION 30 WATTS

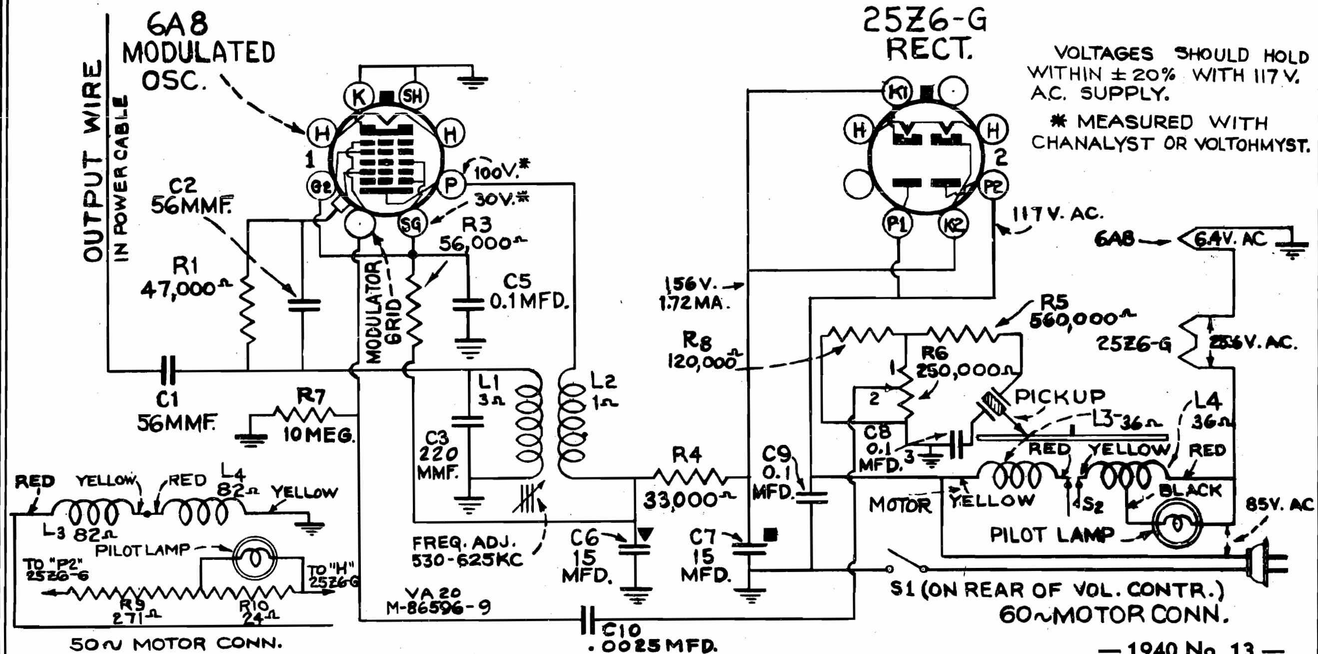
Push Button Adjustment.—

1. Make a list of the six desired stations, arranged in order from low to high frequencies, and manually tune-in the first station on this list.
2. Push in station button No. 1 (extreme left) and adjust No. 1 oscillator core to receive the station.
3. Adjust antenna trimmer for maximum output. Clockwise core and trimmer adjustment tunes circuits to lower frequencies.
4. Adjust for each of the four remaining stations in a similar manner.
5. Make a final careful re-adjustment of oscillator cores and antenna trimmers.



MODEL VA21

RCA MFG. CO., INC.



— 1940 No. 13 —

First Edition

Electrical and Mechanical Specifications

Frequency Range .... 530-625 kc

Tube Complement

(1) RCA-6A8 .... Modulator-Oscillator
(2) RCA-25Z6-G .... Half-Wave Rectifier
Dial Lamp .... Mazda 47, 6-8 volts, .15 amp.

Power Supply Ratings

A-6 .... 105-125 volts, 60 cycles, 50 watts
A-5 .... 105-125 volts, 50 cycles, 50 watts

Motor

Type .... Synchronous (Manual Starting)
Turntable Speed .... 78 r.p.m.

Pickup

Type .... Crystal
Pickup Impedance .... 100,000 ohms at 1000 cycles
Average Output Voltage .... 1½ volts at 1000 cycles with 250,000 ohm load.

Cabinet Dimensions

Height .... 3⅞ inches
Width .... 12½ inches
Depth .... 8¼ inches
Over-All Height .... 5 inches
Turntable Diameter .... 7 inches
Weight 7¼ lbs. (net), 9¼ lbs. (shipping)

Set-Up Procedure

1. Insert plug in power supply outlet, and turn the power-switch—volume control knob on top of VA-21 to full clockwise position. Start a record on the VA-21. The motor is a synchronous manual-starting type, and requires a clockwise spin to start.

2. Tune the radio receiving set to a quiet point between 530-625 kc.

3. Tune the oscillator in the VA-21 to this frequency by adjusting the button on the rear of the VA-21 cabinet to obtain peak output on the receiver. Clockwise rotation decreases the frequency; counter-clockwise rotation increases the frequency.

4. Adjust the radio volume control for the highest volume that is likely to be required, and then use the VA-21 volume control for further adjustment.

5. In noisy locations, it may be desirable to leave the VA-21 volume control turned full clockwise, and regulate the radio volume control for the desired level.

6. If there is insufficient volume, or excessive noise, the remedy is to couple the VA-21 to the radio receiver, by running a piece of insulated wire between the two units: Wrap one end (three or four turns) around the antenna lead-in on the radio, and wrap the other end (three or four turns) around the short wire that projects from the plug on the power cord of the VA-21. With an RCA Master Antenna, wrap the wire around the counter-poise lead where it attaches to the receiver (terminal A3) or to the coupling unit (terminal B). With a loop receiver, place the end of the wire close to the loop.

7. If the radio receiver has push-button tuning, one of the buttons may be set up to tune in the VA-21 oscillator frequency. This button should be marked "Record Player."

Precautionary Lead Dress

1. The power supply cord must be dressed between chassis and top of cabinet, away from grid of 6A8, and entirely away from 25Z6-G.

2. All leads to oscillator coil must be as short as possible.

3. All motor leads must be dressed away from rotor.

4. Pickup leads must be dressed away from the top grid of 6A8, and kept away from the 25Z6-G.

Motor Data

Smooth starting and running will be insured by keeping the bearings well cleaned and oiled.

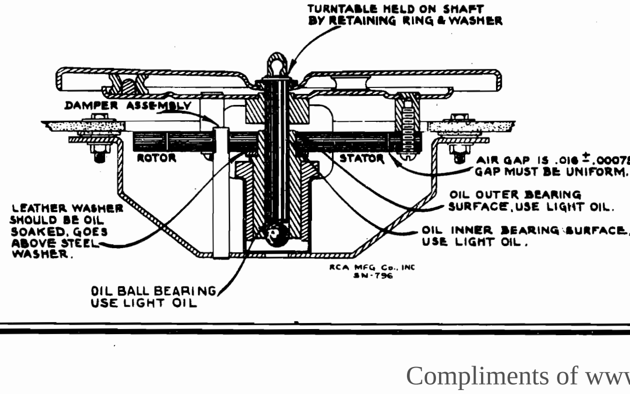
Hum and Vibration.—A small amount of hum when starting, decreasing to a negligible amount when running, is normal. If excessive vibration occurs it may be due to:

1. Insufficient lubrication, or any failure that will cause binding.
2. Leather washer not oiled. (Check to make certain that the leather washer is above the steel washer.)
3. Motor not properly supported from motor board.
4. Burrs on poles of rotor or stator. Remove with fine emery cloth.

The damper spring must fit without binding or chattering in the slot in the stator. The stator must be free to deflect in either direction between the limits of the damper spring. The damper spring must exert approximately equal force in restoring the stator to its mid-position when the stator is deflected manually in each direction.

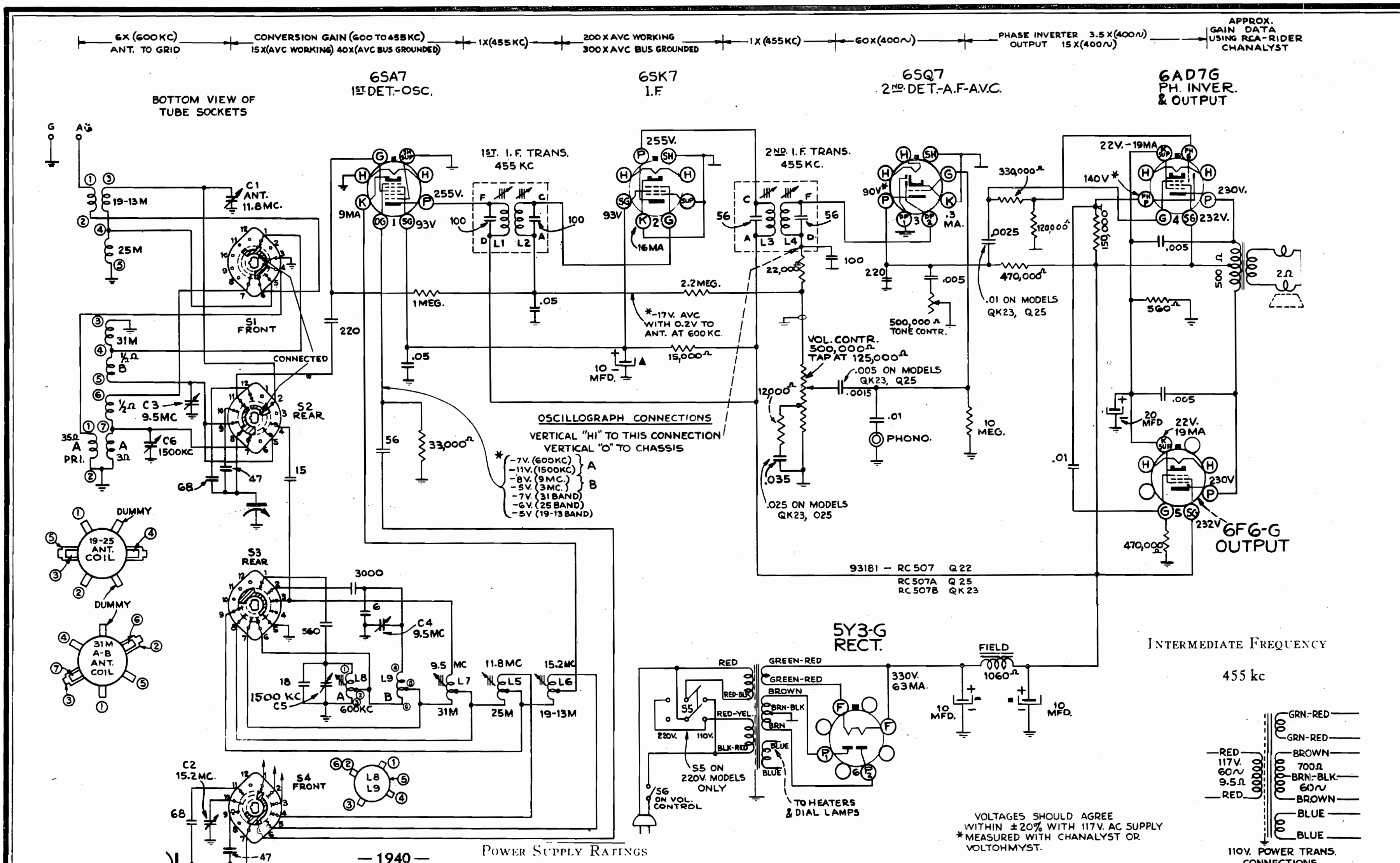
Removing Rotor.—The rotor and turntable assembly simply rests on the ball bearing at bottom of vertical bearing. Remove by lifting upward.

Rotor Adjustment.—Remove motor from cabinet. Loosen the three screws that hold the rotor to the turntable, insert three 16-mil shims at equal distances around the gap between the rotor and stator, and then carefully tighten the three screws. The top of rotor must be flush with top of stator; add additional steel washers beneath the stator if necessary.



RCA MFG. CO., INC.

MODEL Q22, Ch. RC-507
MODEL QK23, Ch. RC-507B
MODEL Q25, Ch. RC-507A



INTERMEDIATE FREQUENCY

455 kc

— 1940 —

First Edition

FREQUENCY RANGES

Standard Broadcast ("A" Band)	540-1,720 kc (556-174 m)
Medium Wave ("B" Band)	3.0-9.5 mc (100-31.6 m)
"31" Meter Spread Band	9.5-11.7 mc (31.6-25.6 m)
"25" Meter Spread Band	11.7-15.1 mc (25.6-19.9 m)
"19-13" Meter Spread Band	15.1-22.5 mc (19.9-13.3 m)

POWER OUTPUT RATING

Undistorted	3 watts
Maximum	3.5 watts

POWER SUPPLY RATINGS

Symbol	Voltages	Frequency (cycles)	Watts
Rating A	105-125	50-60	65
Rating B	105-125	25-60	65
Rating C	105-125, 200-250	50-60	65

LOUDSPEAKER

	Q22	QK23	Q25
Model	RL-79A6	RL-70J3	RL-63K5
Type (Electrodynamic)	6-inch	12-inch	8-inch
V.C. Impedance at 400 c.p.s.	2.2 ohms	2.2 ohms	2.2 ohms

Precautionary Lead Dress.—

1. All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches.
2. All oscillator coil leads must be kept apart from each other and other leads and parts.
3. Blue plate lead of 2nd I-F should be dressed under other leads and against chassis.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

MODEL Q22, Ch. RC-507
MODEL QK23, Ch. RC-507B
MODEL Q25, Ch. RC-507A

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

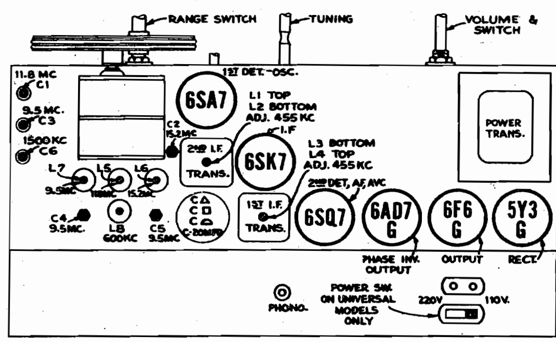
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	12C8 I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	12SA7 1st Det. grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L5 (osc.) C1 (ant.)
4	Ant. lead in series with 300 ohms	15.2 mc	25M	17°	C2 (osc.)*
5	Ant. lead in series with 300 ohms	Repeat steps 3 and 4			
6	Ant. lead in series with 300 ohms	15.2 mc	19-13M	156°	L6 (osc.)**
7	Ant. lead in series with 300 ohms	9.5 mc	31M	156°	L7 (osc.)** C3 (ant.)
8	Ant. lead in series with 300 ohms	9.5 mc	B	11.5°	C4 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C5 (osc.) C6 (ant.)
10	Ant. lead in series with 200 mmf.	600 kc	A	150°	L8 (osc.) (Rock gang)
11	Ant. lead in series with 200 mmf.	Repeat steps 9 and 10			

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

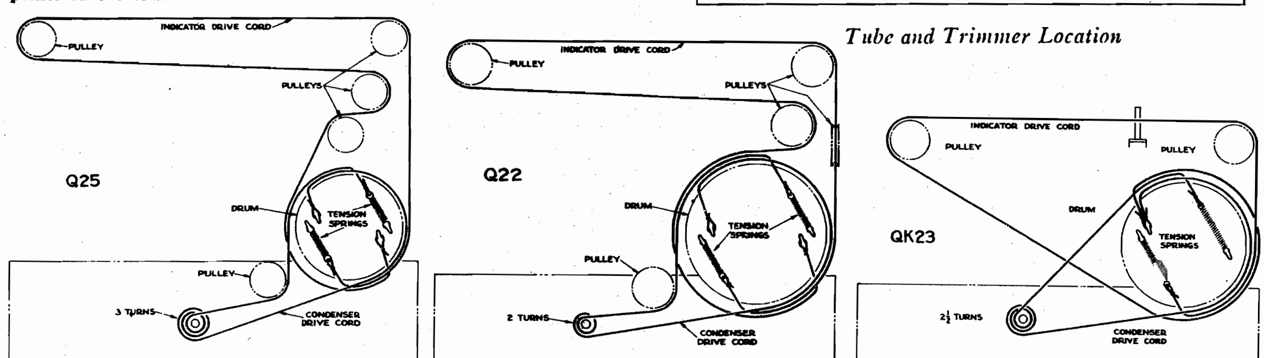
**Peak at minimum position of plunger if two peaks can be obtained.

***Peak at minimum capacity if two peaks can be obtained.

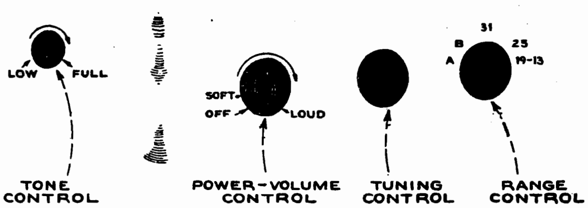
NOTE: Oscillator tracks above signal on all bands.



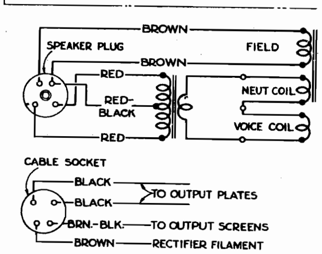
Tube and Trimmer Location



Dial-Indicator and Drive Mechanism



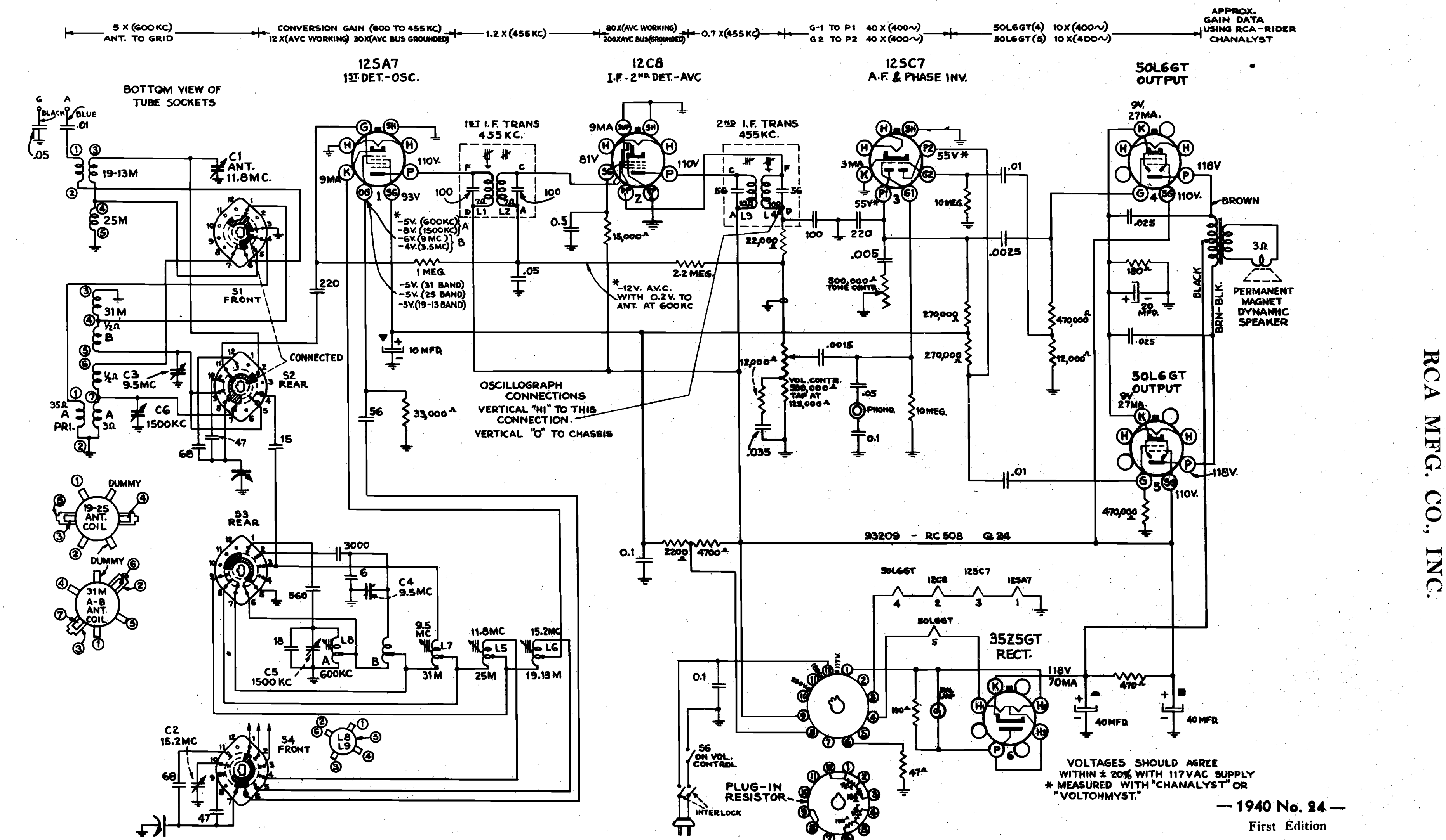
Location of Controls



Connections and Colors of Loudspeaker and Cable

RCA MFG. CO., INC.

MODEL Q24
Ch. RC-508



—1940 No. 24—
First Edition

Frequency Ranges

Standard Broadcast ("A" Band)	540-1,720 kc (556-174 m)
Medium Wave ("B" Band)	3.0-9.5 mc (100-31.6 m)
31 Meter Spread Band	9.5-11.7 mc (31.6-25.6 m)
25 Meter Spread Band	11.7-15.1 mc (25.6-19.9 m)
19-13 Meter Spread Band	15.1-22.5 mc (19.9-13.3 m)

Intermediate Frequency .... 455 kc

Power Supply Ratings

105-125 volts A-C 40-100 cycles or D-C	50 watts
160-180 volts A-C 40-100 cycles or D-C	55 watts
210-250 volts A-C 40-100 cycles or D-C	65 watts

Loudspeaker (RL-92-1)

Type	6-inch permanent magnet dynamic
V. C. Impedance at 400 cycles	3.4 ohms

Power Output

Undistorted	3 watts
Maximum	3.5 watts

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Victrola Attachment.—A jack is provided on the rear of chassis for connection to a Victrola Attachment. The cable from the attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Precautionary Lead Dress.—

1. All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches.
2. All oscillator coil leads must be kept apart from each other and other leads and parts.
3. Blue plate lead of 2nd I-F should be dressed under other leads and against chassis.
4. Filament lead of 50L6GT should be dressed against chassis and away from 12SC7 socket.

MODEL Q24
Ch. RC-508

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

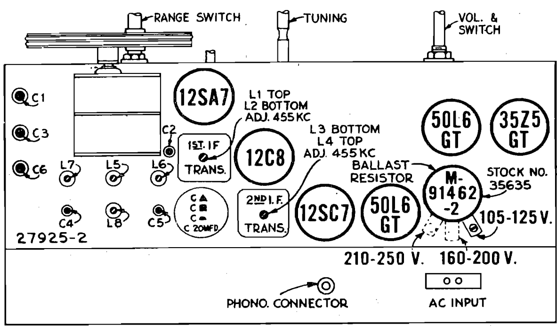
Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment. — After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



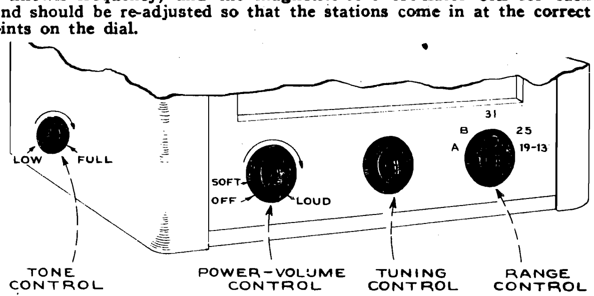
Tube and Trimmer Location

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.



Controls

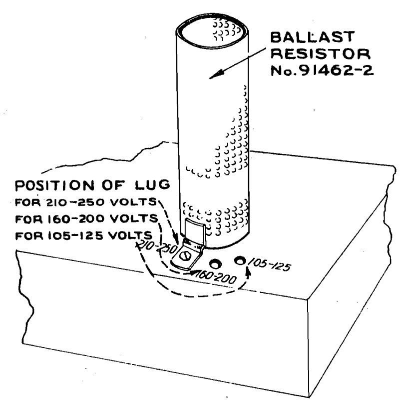
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	12C8 I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	12SA7 1st Det. grid in series with .01 mfd.				L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L5 (osc.) C1 (ant.)
4		15.2 mc		17°	C2 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13M	156°	L6 (osc.)**
7		9.5 mc	31M	156°	L7 (osc.)** C3 (ant.)
8		9.5 mc	B	11.5°	C4 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C5 (osc.) C6 (ant.)
10		600 kc		150°	L8 (osc.) (Rock gang)
11		Repeat steps 9 and 10			

* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

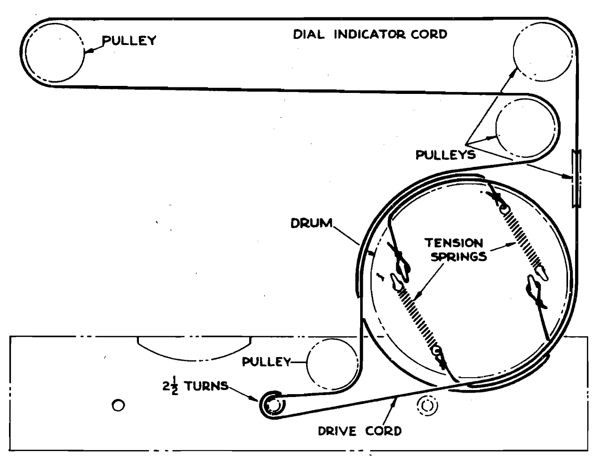
**Peak at minimum position of plunger if two peaks can be obtained.

***Peak at minimum capacity if two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.



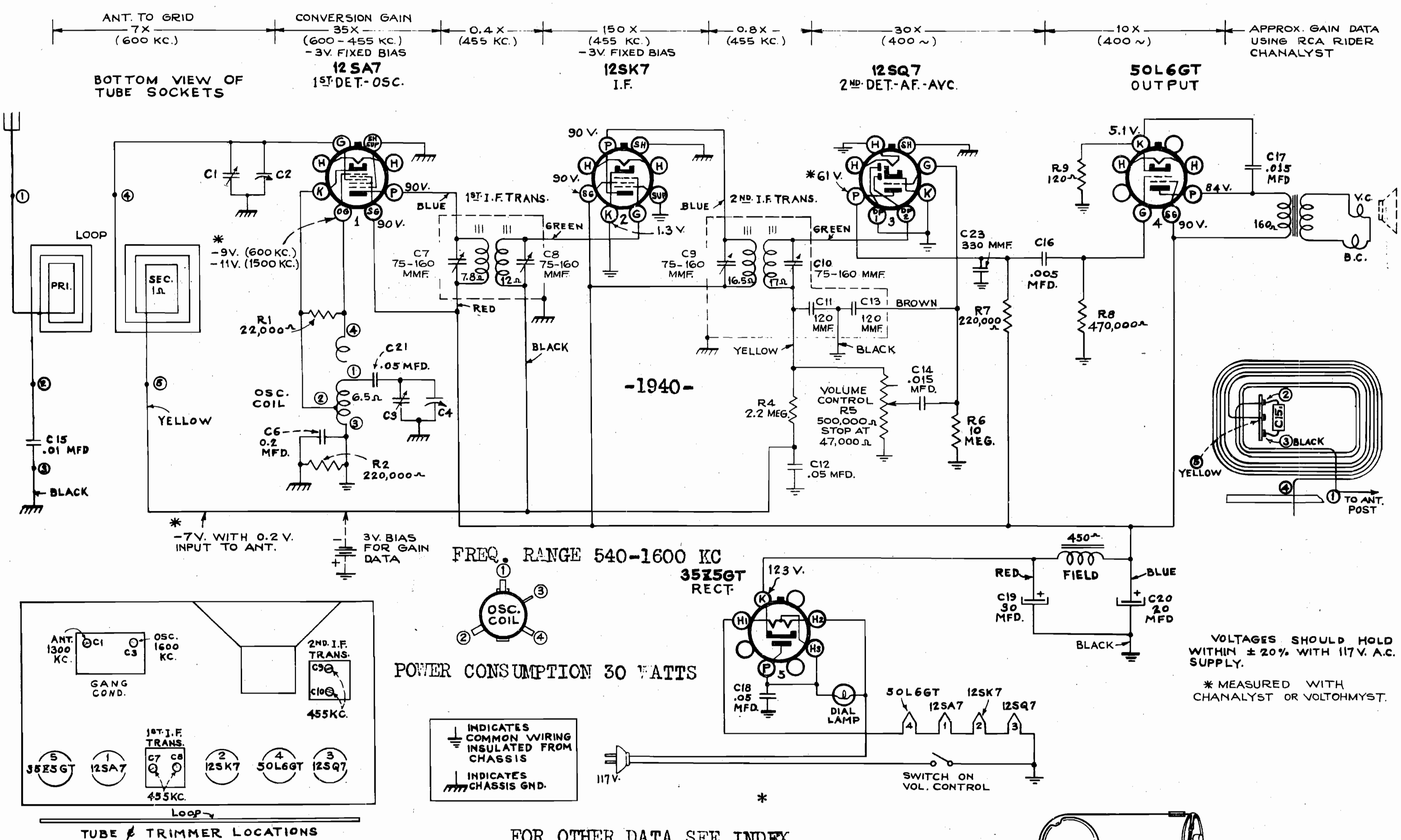
Ballast Resistor



Dial-Indicator and Drive Mechanism

RCA MFG. CO., INC.

MODEL 45X18
Ch. RC-541-C



FOR OTHER DATA SEE INDEX

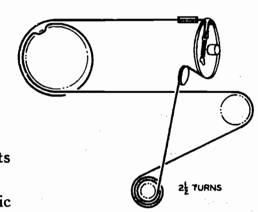
Precautionary Lead Dress:

1. Dress 1st I-F plate and grid leads against chassis and away from each other.
2. Dress plate lead from 12SK7 close to chassis.
3. Dress leads from terminal board on loop support away from loop.

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Power Output (125 volts, 60 cycle supply)
Undistorted......0.8 watts Maximum......1.2 watts

Loudspeaker.......................... 5 inch electrodynamic

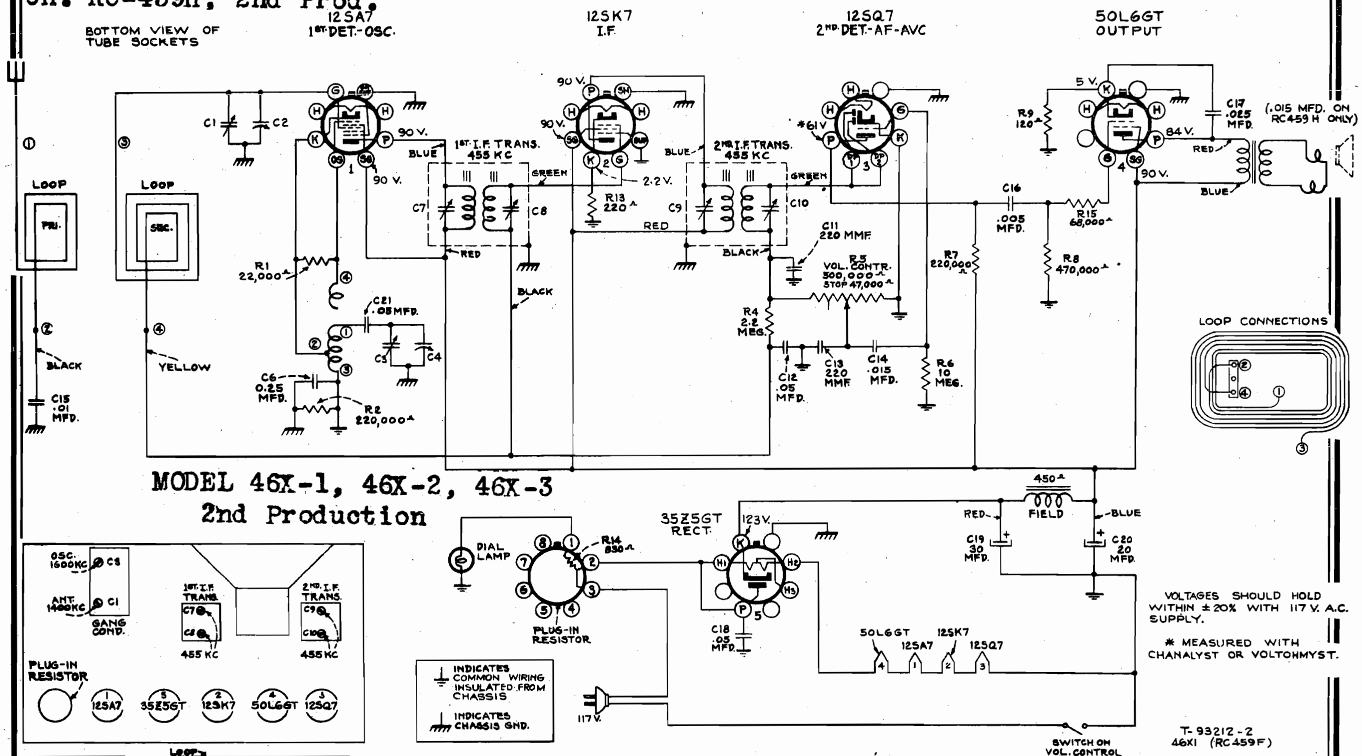


Drive Cord Detail

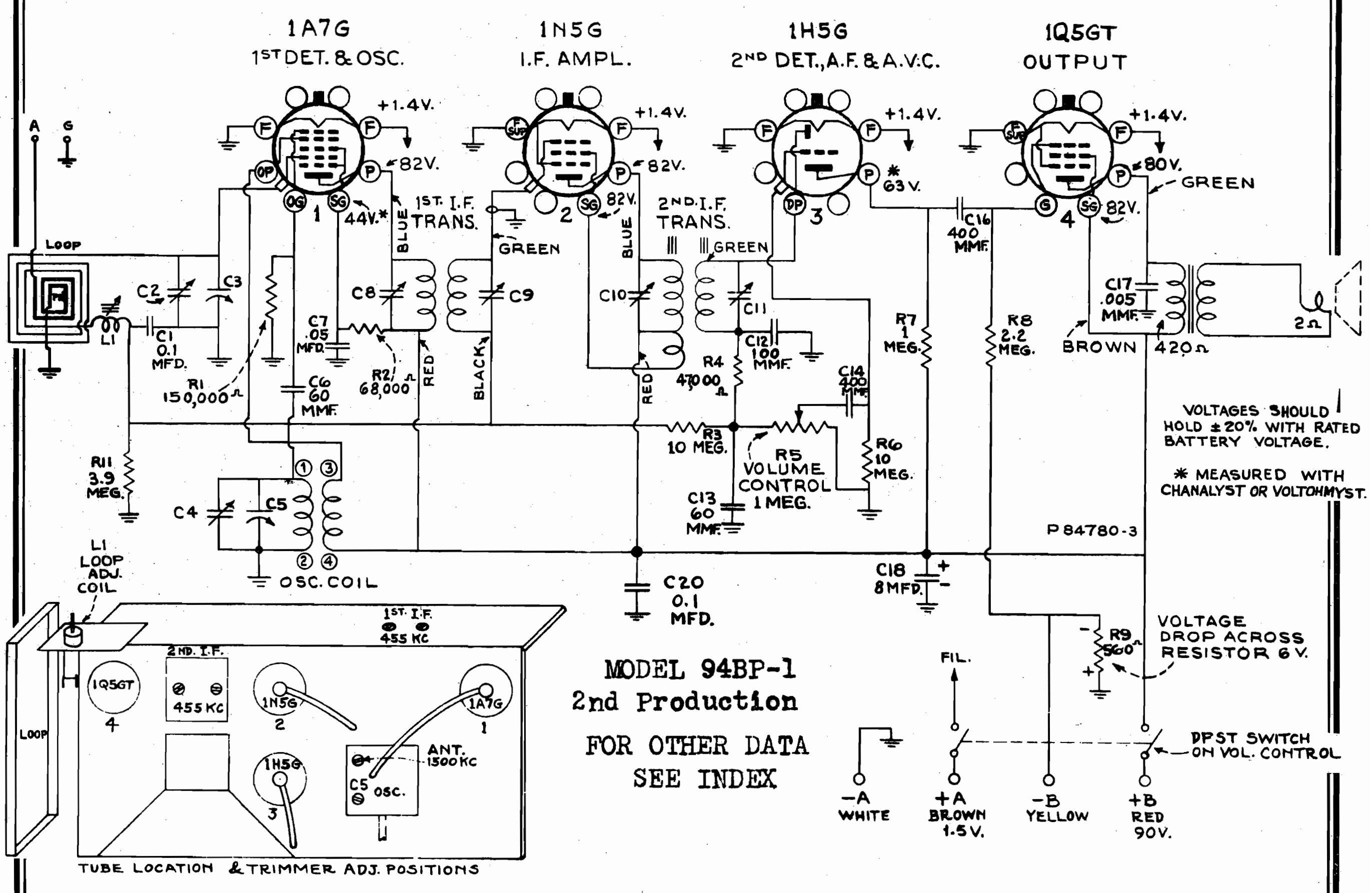
MODELS 46X-1, 46X-2
Ch. RC-459F, 2nd Prod.
MODEL 46X-3
Ch. RC-459H, 2nd Prod.

RCA MFG. CO., INC.

MODEL 94BP-1
Ch. RC-407B, 2nd Prod.



FOR OTHER DATA SEE INDEX

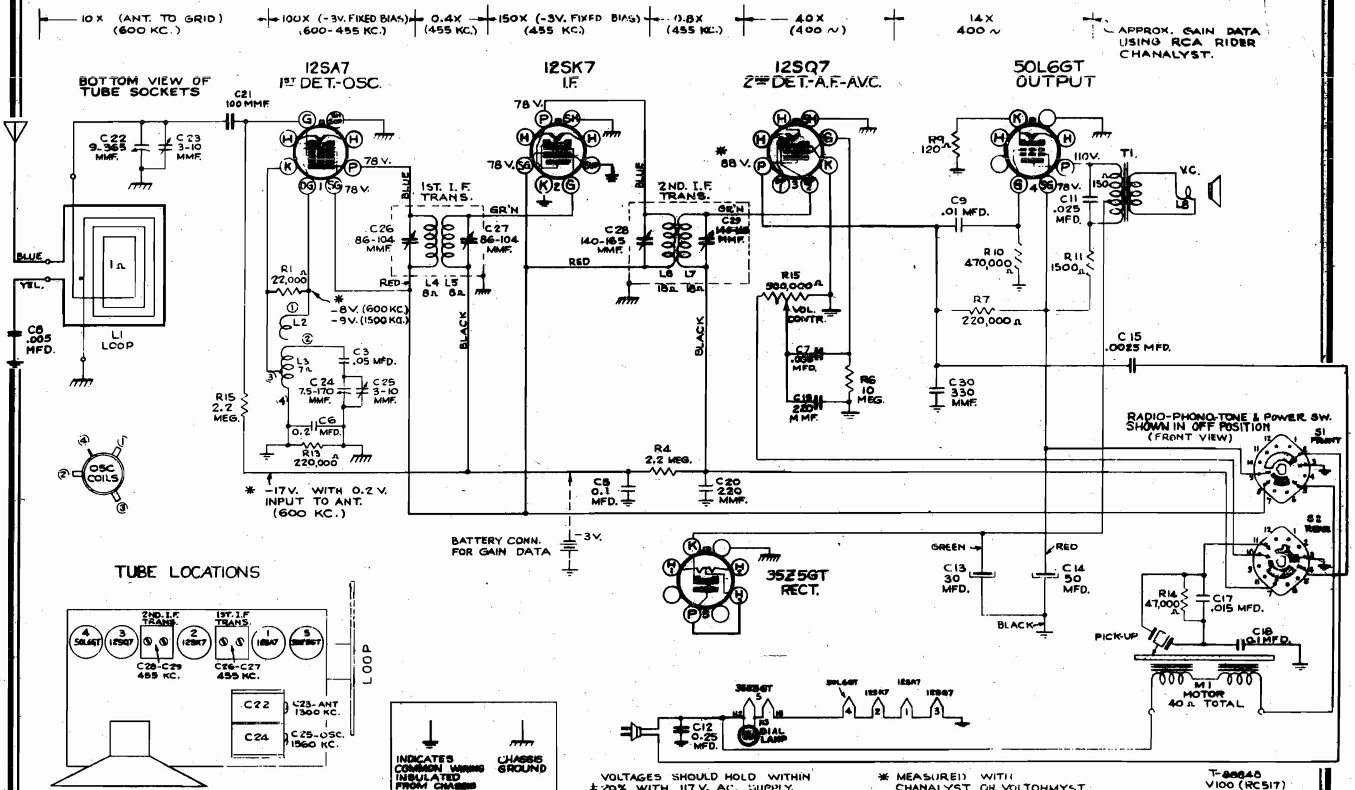


MODEL 94BP-1
2nd Production

FOR OTHER DATA SEE INDEX

RCA MFG. CO., INC.

MODEL V-100
Ch. RC-517

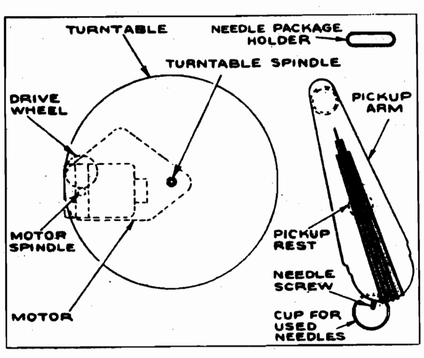


Alignment Procedure

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd. capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with 0.1 mfd.	455 kc	Quiet Point 1,500 kc end of dial	C29, C28 2nd I-F transformer
2	12SA7—1st. det. grid in series with 0.1 mfd.			C27, C26 1st I-F transformer
3	radiated signal 1,560 kc		signal frequency	C25 (osc.)
4	radiated signal 1,300 kc			C23 (ant.)
5	Repeat steps 3 and 4.			



Electrical and Mechanical Specifications

Frequency Range .... 540-1,650 kc

Intermediate Frequency .... 455 kc

Tube Complement
(1) RCA-12SA7 .... 1st Det.—Osc.
(2) RCA-12SK7 .... I-F Amplifier
(3) RCA-12SQ7 .... 2nd Det., A.V.C., and A-F Amplifier
(4) RCA-50L6-GT .... Power Output
(5) RCA-35Z5-GT .... Rectifier

Power Output
Undistorted .... 0.9 watts
Maximum .... 1.2 watts

Pilot Lamp .... 1—Mazda No. 51, 6-8 volts, 0.2 amps.

Power Supply Rating
105-125 volts, 50 cycles .... 55 watts
105-125 volts, 60 cycles .... 55 watts

Loudspeaker (RL-81A-4)
Type .... 5-inch permanent-magnet dynamic
V.C. Impedance .... 4 ohms at 400 cycles

	Height	Width	Depth
Cabinet Dimensions (inches)	10 15/16	16 9/16	13 11/32

Weight (net) .... 19 lbs.
Shipping .... 23 lbs.
Tuning Drive Ratio 9:1

Phonograph Motor Service Data:—

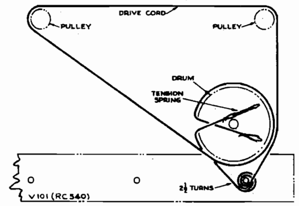
The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

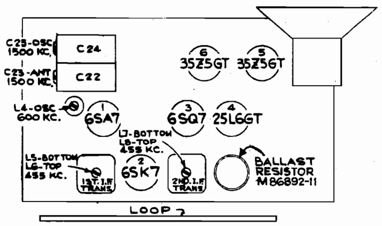
The motor should be lubricated once or twice a year by placing a few drops of S. A. E. 20 (or equivalent) on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S. A. E. 10 oil. **Caution—The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.**

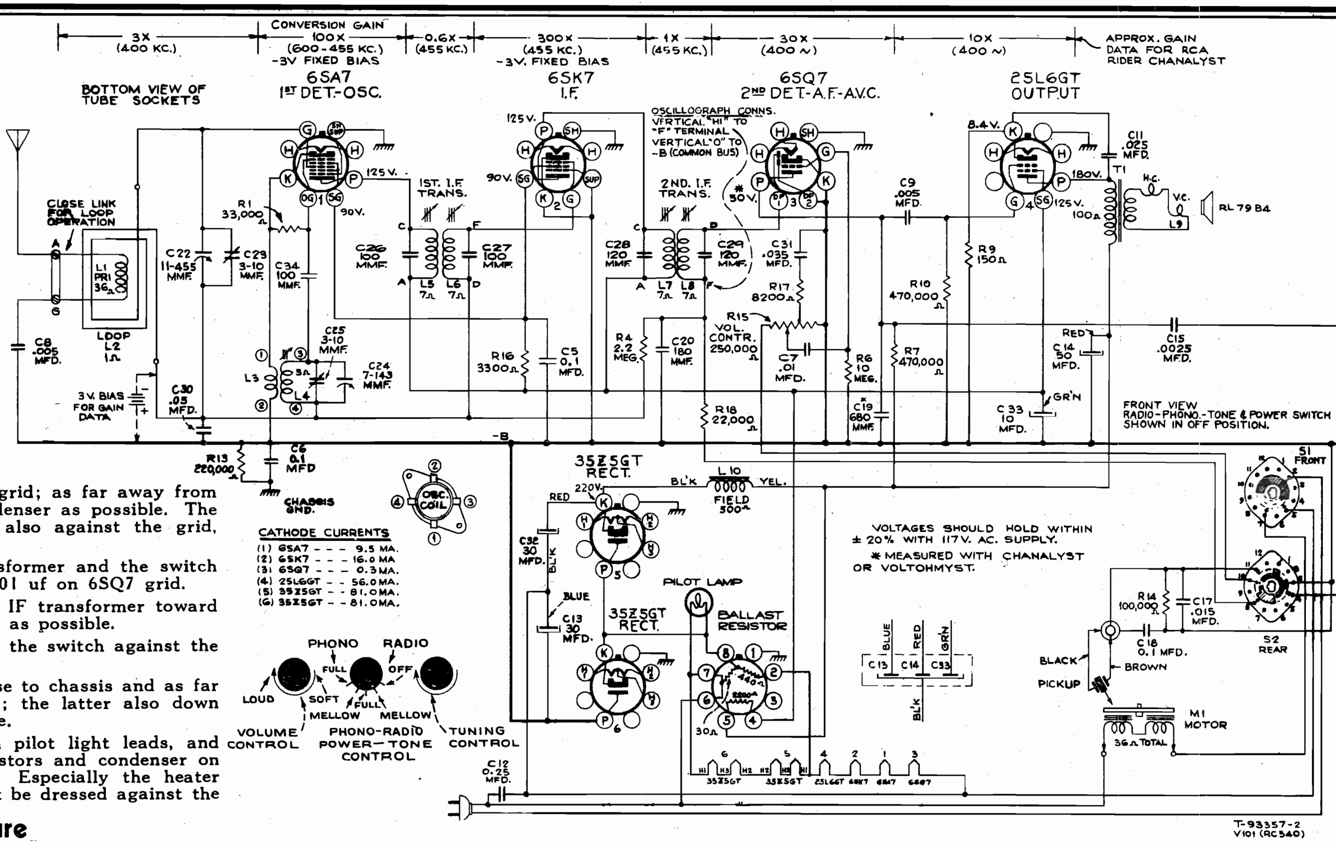
Power Supply.—Although this model employs an ac-dc chassis, it is not suitable for use on d.c., as this would damage the motor.

MODEL V-101
Ch. RC-540

RCA MFG. CO., INC.







Precautionary Lead Dress.—

1. Dress the 10 meg. and .01 uf on the 6SQ7 grid; as far away from heater and power leads and the .25 uf condenser as possible. The 10 meg. must be very short and dressed also against the grid, away from the 2nd IF transformer.
2. Dress the yellow lead between 2nd IF transformer and the switch as far away as possible from 10 meg. and .01 uf on 6SQ7 grid.
3. Dress the bus between 6SK7 plate and 2nd IF transformer toward front apron and as far away from the 6SQ7 as possible.
4. Dress the red lead between the rectifier and the switch against the corner of the chassis and front apron.
5. Dress the green 6SA7 control grid lead; close to chassis and as far away from the blue plate lead as possible; the latter also down against the chassis and as short as possible.
6. The brown heater leads, black, and brown pilot light leads, and all power and output leads must clear resistors and condenser on the 2nd IF transformer by at least ¾-in. Especially the heater lead between 25L6GT and 6SK7, which must be dressed against the rear apron.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

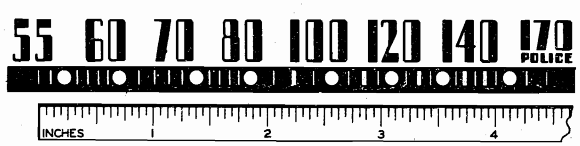
Test-Oscillator.—Connect the low side of the test-oscillator to the Ground Terminal "G," and keep the output as low as possible.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

2. Place a flat 6-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at the bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

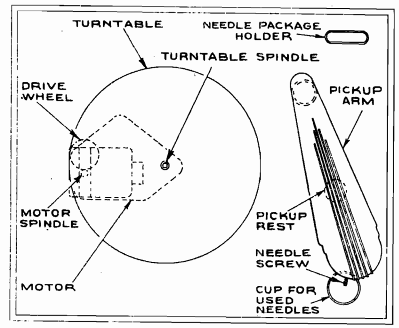


Phonograph Motor Service Data.—

The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S. A. E. 20 oil (or equivalent) on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S. A. E. 10 oil. **Caution—The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.**

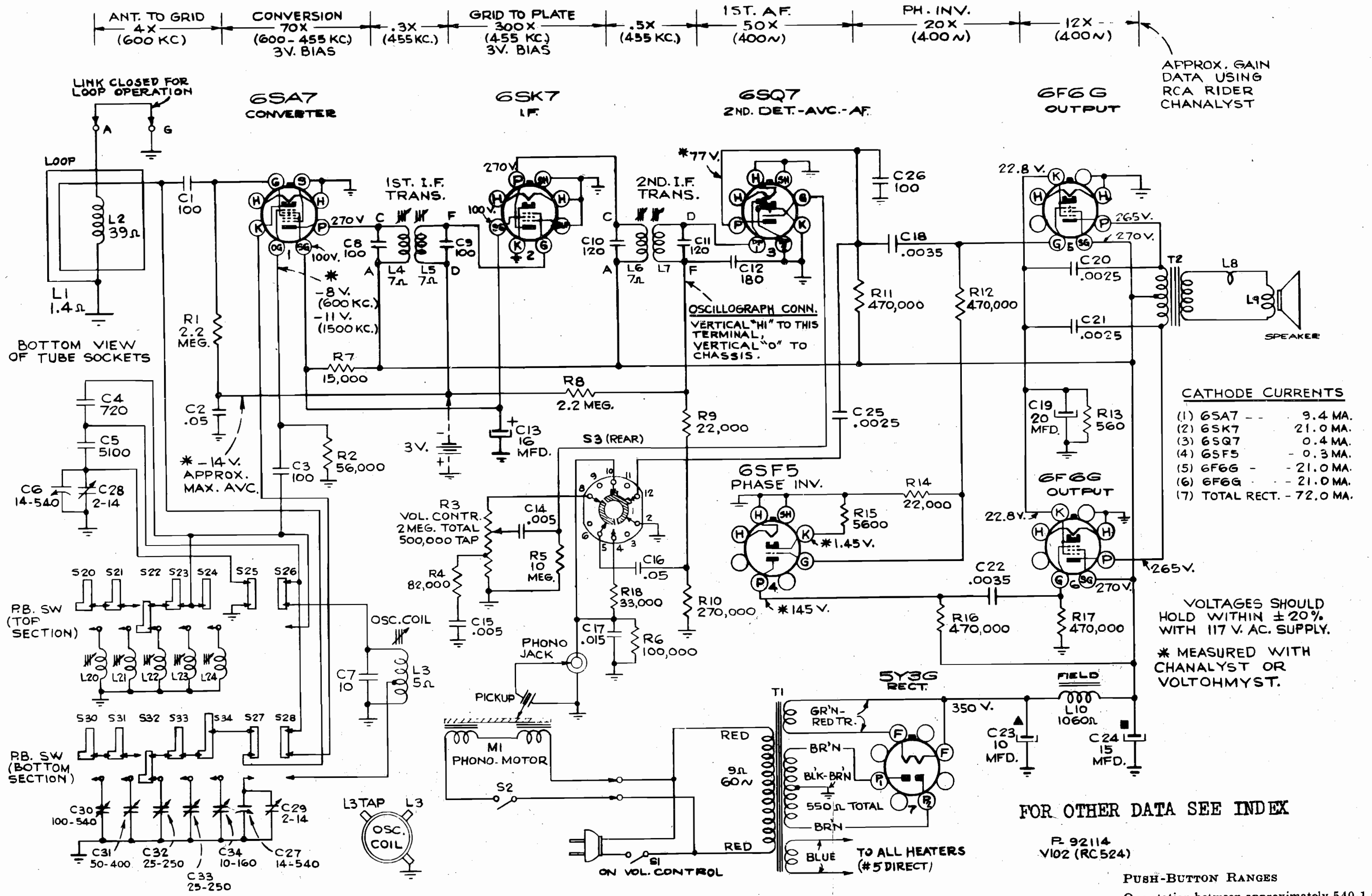
Steps	Connect High Side of Test Oscillator to—	Tune Test Osc. to—	Turn Radio Dial to—	Adjust for max. output—
1	6SK7 Grid Thru 200 mmf.	455 kc	Quiet Point between 550-750 kc	L7, L8 2nd I-F Trans.
2	6SA7 Grid Thru 200 mmf.	455 kc		L5, L6 1st I-F Trans.
3	Radiation Loop	1,500 kc	1,500 kc (See Scale)	C25 osc. C23 ant.
4	Radiation Loop	600 kc	600 kc (See Scale)	L4 osc. Rock In



IMPORTANT.—DO NOT PLUG CHASSIS INTO A DC POWER SUPPLY.

RCA MFG. CO., INC.

MODEL V-102
Ch. RC-524



FOR OTHER DATA SEE INDEX

P. 92114
V102 (RC524)

Push-Button Ranges

One station between approximately 540-1,030 kc
One station between approximately 610-1,250 kc
Two stations between approximately 740-1,430 kc
One station between approximately 880-1,550 kc

The R-F and I-F gain measurements were made with a 3-volt bias battery connected from the A.V.C. bus to chassis, as shown in dotted lines.

Frequency Range

Broadcast "A" .... 540-1,700 kc

Intermediate Frequency .... 455 kc

Power Output Rating

Undistorted .... 4.5 watts
Maximum .... 5.5 watts

Loudspeaker (RL-79-A1)

Type .... 6-inch Electrodynamic
V.C. Impedance .... 3.4 ohms at 400 cycles

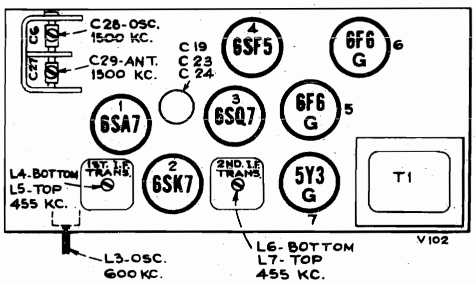
Power Supply Ratings

105-125 volts, 60 cycles .... 110 watts
105-125 volts, 25 cycles .... 110 watts

MODEL V-102
Ch. RC-524

RCA MFG. CO., INC.

Alignment Procedure



Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

4. After completion of alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

Using Calibration Scale.—

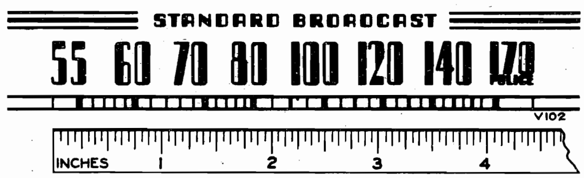
1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

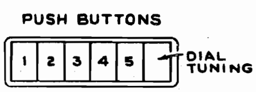
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

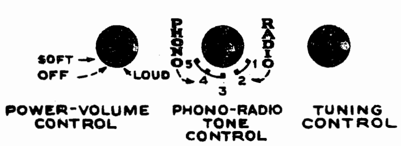
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at bottom.

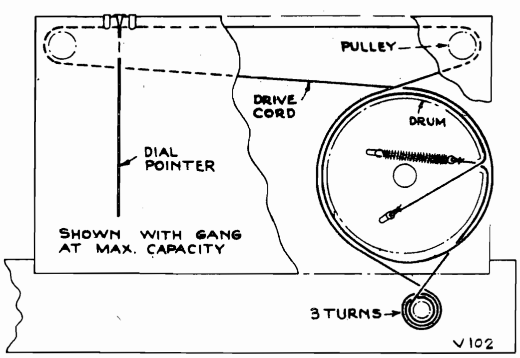
Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid, in series with .01 mfd.	455 kc	Quiet Point at H-F end of dial	L6 and L7 (2nd I.F. Trans.)
2	1st det. grid, in series with .01 mfd.			L4 and L5 (1st I.F. Trans.)
3	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C28 (osc.) C29 (ant.)
4		600 kc	600 kc "A" band	L3 (osc.) Rock in
5	Repeat steps 3 and 4.			









Phonograph Motor Service Data:—

The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S. A. E. 20 (or equivalent) on the turntable spindle and saturating the oil retaining felt pads on the motor shaft with S. A. E. 10 oil. **Caution—The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.**

Precautionary Lead Dress.—

1. Dress power leads to AC switch away from terminals of volume control.
2. Dress heater leads to 6SQ7 away from 10 megohm leak.
3. Dress C-14 and C-16 away from all heater and power supply leads.
4. Green lead to loop away from I.F. can.
5. Green lead from C-1 to button assembly away from oscillator.
6. Green phono lead up from chassis and away from C-13.

The Phono-Radio Tone Control.—

The five positions of the knob are:

1. Fully counterclockwise—radio mellow tone with emphasis on lows and reduction of static and high pitched interference.

2. Radio full tone with all sound effects.

3. Phonograph—mellow tone—with reduction of high pitched surface noise and emphasis on lows.

4. Phonograph—full tone—all sound effects from the record.

5. Phonograph—high tone—with reduction of bass resonance and low tones.

MODEL 94BP-1, Ch. RC-407B
2nd Production
MODEL V-102, Ch. RC-524

. RCA MFG. CO., INC.

MODELS 46X-1, 46X-2, 46X-3
Ch. RC-459F, RC-459H
2nd Production

Alignment Procedure MODELS 46X-1,46X-2,46X-3 CHASSIS RC-459F,RC-459H 2nd Production

Output Meter Alignment. — Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator. — For I-F alignment, connect the low side of the test-oscillator to the receiver chassis through a .01 mfd. capacitor, and keep the output as low as possible.

Pre-Setting Dial.—With gang condenser in full mesh, the pointer should be adjusted so that it is vertical.

Antenna. — The set is equipped with a built-in loop antenna. If an outdoor antenna is used, it may be connected to the "ANT" terminal on rear of cabinet. It should not be longer than 100 feet, including lead-in. If it is longer, connect a 100 to 200 mmf. capacitor in series with the lead-in.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 I-F grid in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C9 and C10 (2nd I-F trans.)
2	Tuning condenser stator (osc.) in series with .01 mfd.			C7 and C8 (1st I-F trans.)
3	Radiation loop consisting of two turns of wire 18 inches in diameter	1,600 kc	Full Clockwise (out of mesh)	C3 (oscillator)
4		1,400 kc	Resonance on 1,400 kc signal	C1 (antenna)

MODEL 94BP-1 series Chassis RC-407B 2nd Production

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action. Connect low-side of oscillator to the receiver chassis.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Loop-Adjusting Coil.—The second production of 94BP-1 series incorporates a loop inductance adjustment coil (L1) which is adjusted at 600 kc. For best performance, it is recommended that the alignment procedure be followed exactly as given. This will ensure maximum sensitivity over the entire broadcast band.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1A7G 1st-Det. grid cap, in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C11, C10, C9, C8 (1st and 2nd I-F transformers)
2	Antenna terminal, in series with 15 mmfd.	1,650 kc	Full clockwise (out of mesh)	C4 (oscillator)
3		Set antenna trimmer C2 approximately ½ turn from maximum capacity		
4		600 kc	600 kc signal	L1 (ant.)
5		1,500 kc	1,500 kc	C2 (ant.)
6	Repeat steps 4 and 5			

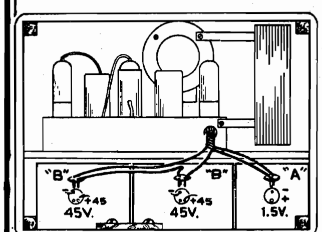


Figure 1.

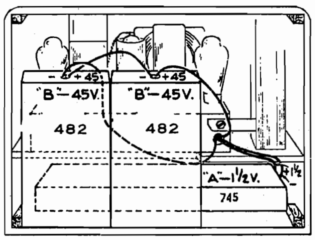


Figure 2.

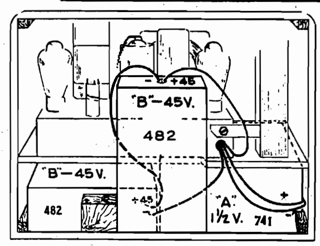
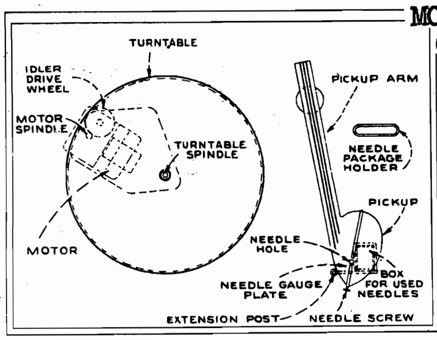


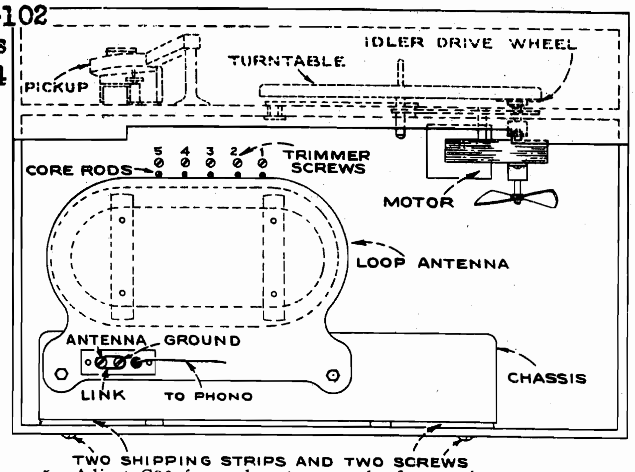
Figure 3.

For your convenience a wide variety of battery complements may be used with this receiver, and Figures 1, 2, and 3 illustrate three different sets of batteries installed in place. The following table gives type numbers of Eveready batteries but any equivalent battery of standard make may be used.

Figure	"A" battery 1½ v.	"B" battery 45 v. ea
1	No. 742	No. 762
2	No. 745	No. 482 or No. 727
3	No. 741, No. 742 or No. 743	No. 482 or No. 727

MODEL V-102 Chassis RC-524





Push Button Adjustments

The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning button and manually tune in the first station on the list.
3. Press in the left-hand button.
4. Adjust L20 to receive the first station. To secure the best adjustment, rotate the set for least pickup, and adjust L20 for peak output.
5. Adjust C30 for peak output on the first station.
6. Proceed in the same manner to adjust for the remaining four stations.

On the 880 to 1,550 kc push-button, the higher frequency stations may be received with L24 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

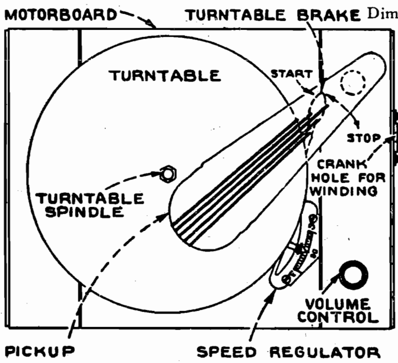
MODEL R-103-S

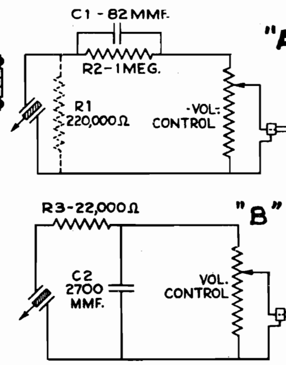
RCA MFG. CO., INC.

Specifications

Motor...... Spring-wound, Governor Type
Speed............ 78 r.p.m. (adjustable)
Record sizes.......... 10-inch and 12-inch

CRYSTAL PICKUP
Impedance... 100,000 ohms at 1,000 cycles
Average Output Voltage....... 1⅓ Volts at 1,000 cycles across 250,000 ohms load
Dimensions........ 6-in high, 12½-in. wide, 10-in. deep





SERVICE DATA

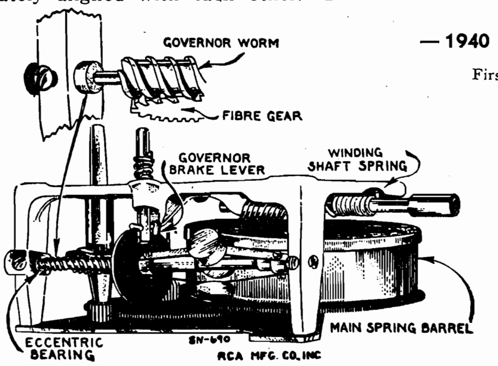
Motor.—The drive motor is of simple design and substantial construction. It should require little or no service if properly maintained. Attention to lubrication of the moving parts and occasional cleaning of the mechanism will go far to prevent faulty operation. Should it become necessary to repair the motor, the following procedure should be applied: **CAUTION.—Allow the motor mechanism to run down completely before attempting adjustment, repairs, or replacements.**

Removing Motor from Cabinet.—Remove the winding key. To dismount the motor, unscrew the spindle cap and remove turntable, slightly tapping the spindle while exerting an upward lift on the turntable. Loosen the screw holding the speed-regulating lever and remove the latter. The three screws holding motor to motor board should then be loosened to permit removal of motor assembly.

Replacing Main Spring Barrel. — In case of main spring failure, the entire spring barrel and gear should be replaced. Remove the spring-barrel spindle screw by **unscrewing to right.** Remove the C washer and two pillar screws holding bottom plate. Remove bottom plate, intermediate spindle shaft, and spring barrel. Reassemble parts in reverse sequence.

Winding Shaft Spring.—This spring functions as a friction ratchet. It may be removed as follows: remove pin holding winding worm on shaft; remove winding shaft; then remove screw holding spring. Replace in reverse sequence.

Governor Adjustments.—The mesh of the worm and fiber gears is adjusted by rotation of the eccentric spindle bearings. The adjustments should be made so that the worm meshes properly with the fiber gear and rotates freely without binding. The bearings should be accurately aligned with each other. The minimum of



spindle end-play which permits smooth operation should be used.

Speed Regulator Lever.—After assembly, adjust the speed regulator until the turntable rotates at 78 r. p. m.; loosen the speed regulator screw and set pointer to center of speed indicator scale; tighten screw and recheck turntable speed.

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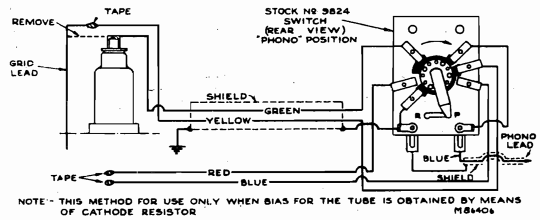
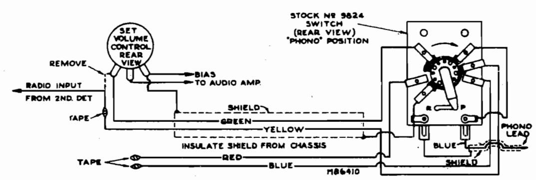
Lubrication.—All moving parts of the motor should be thoroughly cleaned and lubricated every six months to prevent excess wear and to assure proper operation. A small amount of grease should be applied to the worm gear of the governor, the gear of the winding shaft, and on the small pinion gear. All other points, including regulator friction pad, should be lubricated with light oil. All motor parts should be covered with a light film of oil to prevent rusting.

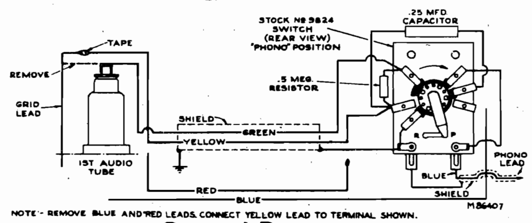
RADIO RECEIVERS WHOSE FIRST AUDIO AMPLIFIER TUBE IS OF THE GRID CAP TYPE.



RADIO RECEIVERS WHERE THE VOLUME CONTROL IS IN THE AUDIO INPUT CIRCUIT.



RADIO RECEIVERS WHOSE FIRST AUDIO TUBE IS OF THE GRID CAP TYPE, AND FIXED BIAS FOR TUBE IS OBTAINED THROUGH GRID LEAD.



General Description

The R-103-S is designed for use with a battery-operated receiver where a mechanical type unit is required having the characteristics necessary for record fidelity. The motor is of the mechanical, spring wound, variable speed type completely governed to maintain a constant speed. The pickup assembly is of the crystal type housed in a light weight, plastic shell of modern styling. A volume control is placed across the pickup output terminals providing a means of controlling the output voltage.

Connecting Victrola Attachment to Radio Receivers

In general, the Victrola Attachment must be used with radio receivers having at least two stages of high-gain audio amplification. The output of the Victrola Attachment should be connected to the input of the first audio tube, and at the same time the output of radio receiver portion of the chassis should be shorted or opened, to prevent radio signals being heard while the Victrola Attachment is in operation.

Methods of connecting the Victrola Attachment to various types of audio systems are given in the accompanying diagrams. The data given requires that an RCA Stock No. 9824 Radio-Phono switch be used for switching from radio to phonograph. For ease in connecting the "phono" lead to the Stock No. 9824 switch, the male plug on the end of the lead should be removed by unsoldering or by cutting it off.

Tone Compensation

Because of the widely varying frequency characteristics of various types of audio amplifiers with which the Victrola Attachment may be used, it may be desirable in some cases to alter the pickup circuit of the Victrola Attachment to compensate for the characteristics of the amplifier. The following circuits show means of making such refinements.

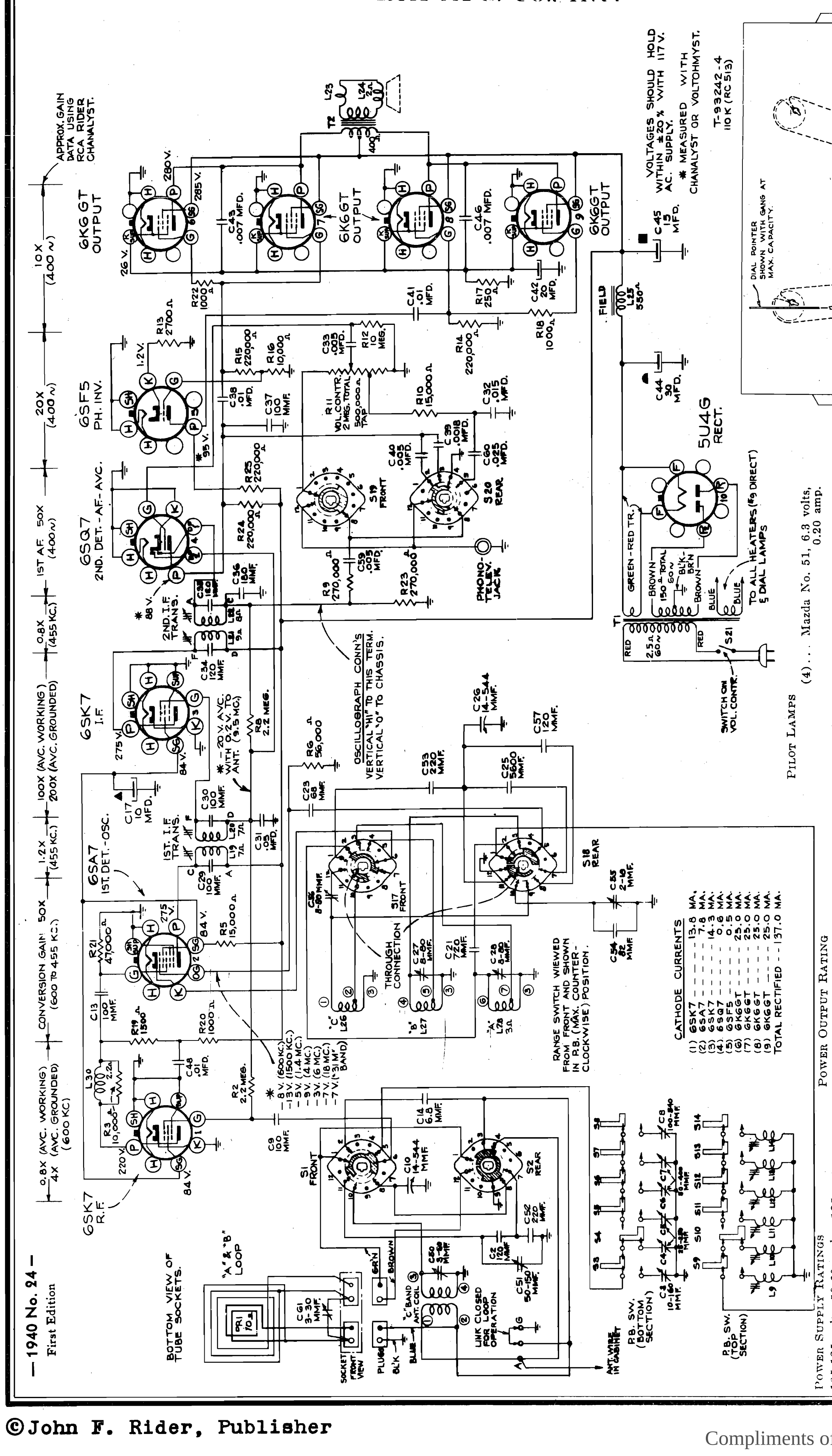
In "A" R1 controls the low-frequency response; larger values of R1 give increased lows. For maximum low-frequency response, remove R1. R2 controls pickup output, smaller values of R2 giving increased output. C1 controls high-frequency response; to increase highs, increase C1.

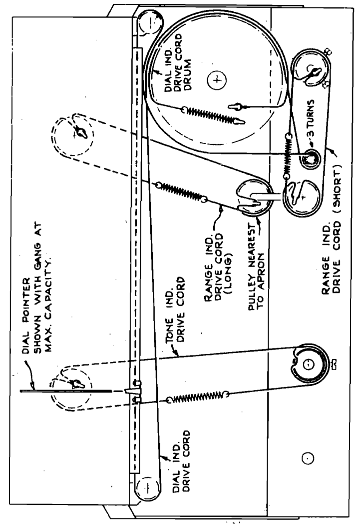
Where a decrease in high-frequency response may be desired (for example, as an aid in reducing "needle scratch" on worn records), the circuit in "B" is applicable. In this circuit, C2 acts as loading on the pickup and is also a controlling factor on the high-frequency response. Smaller values of C2 give more pickup output and also more highs. R3 gives a sharper high-frequency reduction; increasing R3 decreases highs.

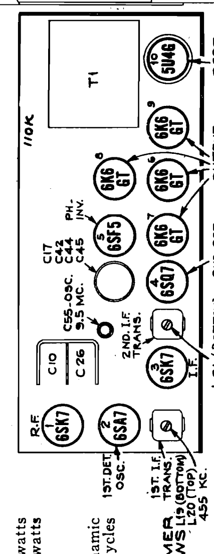
The suggested values shown in "A" and "B" should serve as a basis from which slight alterations may be made to suit individual cases

MODEL 110K
Ch. RC-513

RCA MFG. CO., INC.







Cathode Currents

(1)	6SK7	13.8 MA.
(2)	6SA7	7.8 MA.
(3)	6SK7	14.3 MA.
(4)	6SQ7	0.6 MA.
(5)	6SF5	0.5 MA.
(6)	6K6GT	25.0 MA.
(7)	6K6GT	25.0 MA.
(8)	6K6GT	25.0 MA.
(9)	6K6GT	25.0 MA.
	Total Rectified	137.0 MA.

Power Supply Ratings
105-125 volts, 50-60 cycles, 135 watts
105-125 volts, 25-60 cycles, 135 watts

Frequency Ranges
Broadcast "A" .... 540-1,600 kc
Medium Wave "B" .... 1.4-4.0 mc
Short Wave "C" .... 5.8-18.0 mc
Spread Band .... 9.35-9.85 mc

Intermediate Frequency .... 455 kc

Push-Button Ranges
One station between approximately 540-1,030 kc
Two stations between approximately 610-1,250 kc
Two stations between approximately 740-1,430 kc
One station between approximately 880-1,550 kc

Power Output Rating
Undistorted .... 10 watts
Maximum .... 12 watts

Loudspeaker (RL-70L-4)
Type .... 12-inch Electrodynamic
V.C. Impedance .... 2.2 ohms at 400 cycles

Pilot Lamps
(4)... Mazda No. 51, 6.3 volts, 0.20 amp.

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MODEL 110K
Ch. RC-513

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration for Alignment.—The dial calibration for alignment purposes can be set up in two ways:

1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial placed on the frame so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

Spread-Band Alignment.—Make final adjustment of C56 and C50 during actual reception of a station of known frequency near 9.5 megacycles.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"C" Band Quiet Point at 18 mc end of dial	L21 and L22 (2nd I.F. Trans.)
2	1st-det. grid in series with .01 mfd.			L19 and L20 (1st I.F. Trans.)
3	Antenna terminal (A), in series with 47 mmfd. (link closed)	15.2 mc	15.2 mc (149°) "C" band	C56 (osc.)* C50 (ant.)** Rock in
4		9.5 mc	9.5 mc (65.5°) "31M" band	C55 (osc.)* C51 (ant.)** Rock in
5	Stator of antenna section of gang, in series with 300 ohms	2.44 mc	2.44 mc (97°) "B" band	C27 (osc.)
6		600 kc	600 kc (30.5°) "A" band	L28 (osc.)
7		1,500 kc	1,500 kc (158°) "A" band	C28 (osc.)
8	Repeat steps 6 and 7.			
9	Fasten chassis in cabinet, see that link is closed on antenna terminal board, indicator at left end of dial scales with gang at maximum capacity.			
10	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	1,500 kc "A" band	C61 (ant.) (mounted on loop)
11		600 kc	600 kc "A" band	L28 (osc.) Rock in
12		Repeat steps 10 and 11		

* Use minimum capacity peak if two peaks can be obtained.
** Use maximum capacity peak if two peaks can be obtained.
NOTE: Oscillator tracks 455 kc above signal on all bands.

Push Button Adjustment

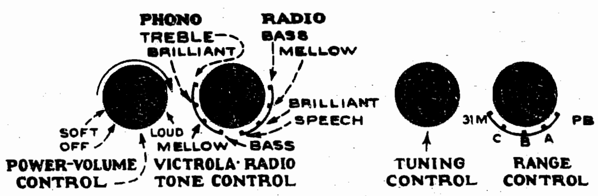
The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

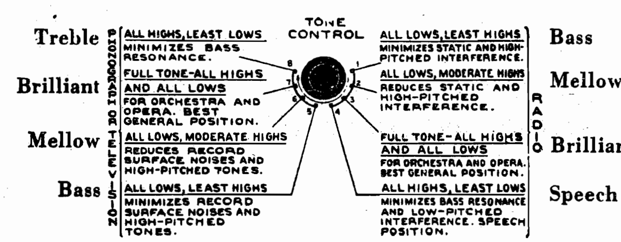
In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

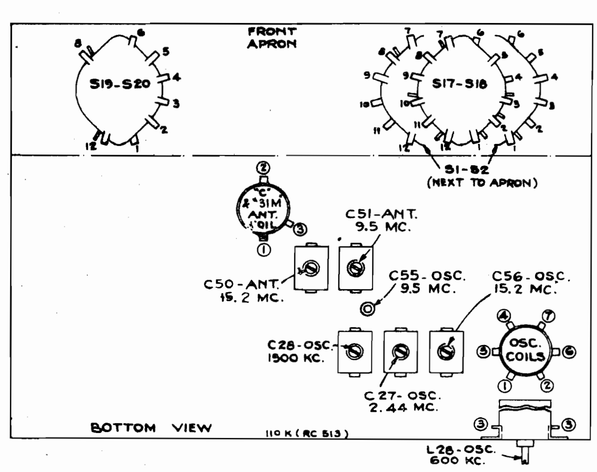
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-14) to receive the station.
4. After oscillator core is set correctly, adjust C-8 for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Owing to the relatively high r-f gain, it may be found that a given station can be tuned in at several different settings of the magnetite-core oscillator push-button coils. In such cases, it is advisable to unscrew the loop push-button trimmers to minimum capacity before adjusting the magnetite cores.

On the 880 to 1,550 kc push-button, the higher frequency stations may be received with L-9 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

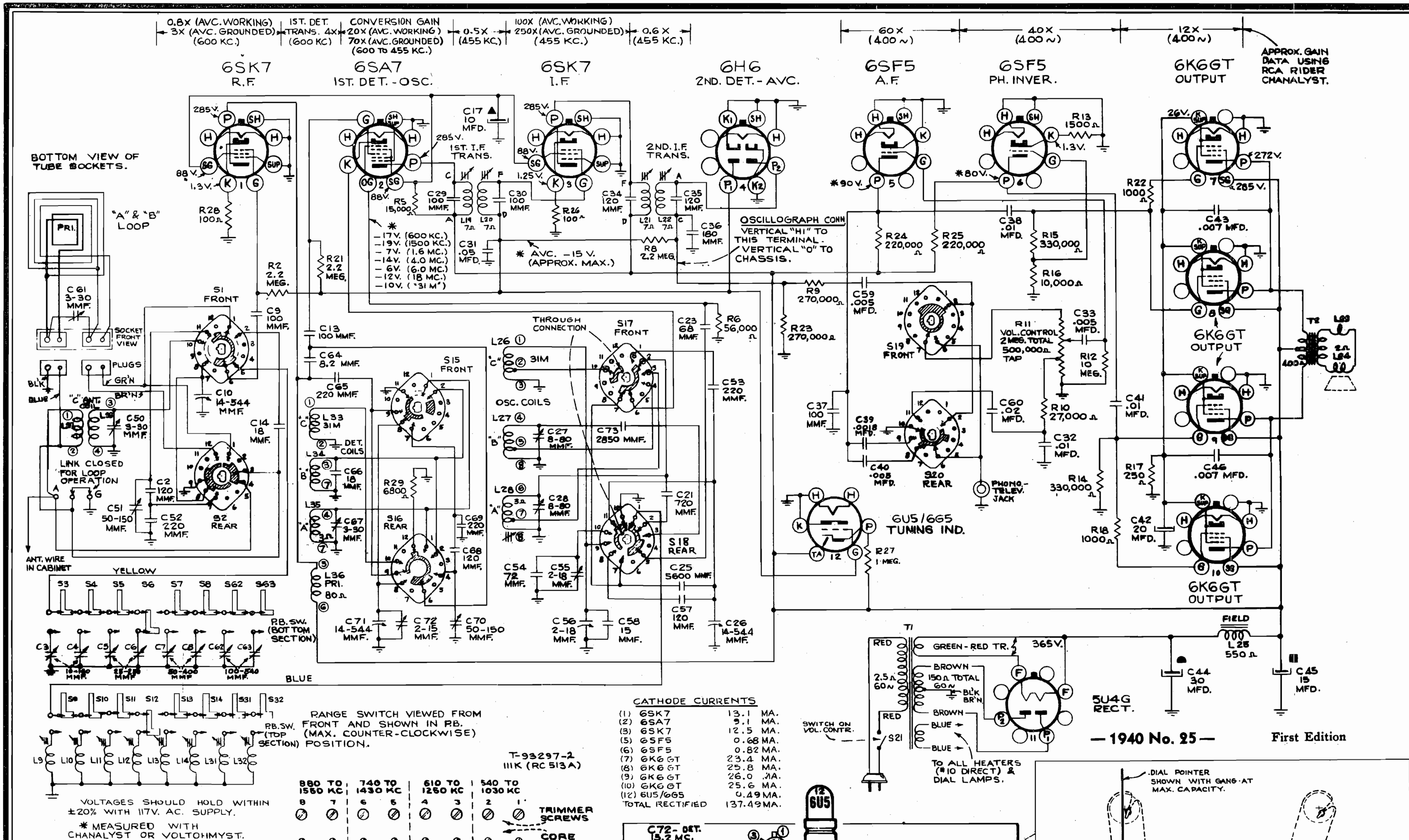






MODEL 111K
Ch. RC-513A

RCA MFG. CO., INC.



CATHODE CURRENTS

(1)	6SK7	13.1 MA.
(2)	6SA7	9.1 MA.
(3)	6SK7	12.5 MA.
(5)	6SF5	0.68 MA.
(6)	6SF5	0.82 MA.
(7)	6K6GT	23.4 MA.
(8)	6K6GT	25.8 MA.
(9)	6K6GT	26.0 MA.
(10)	6K6GT	25.6 MA.
(12)	6U5/6G5	0.49 MA.
	TOTAL RECTIFIED	137.49 MA.

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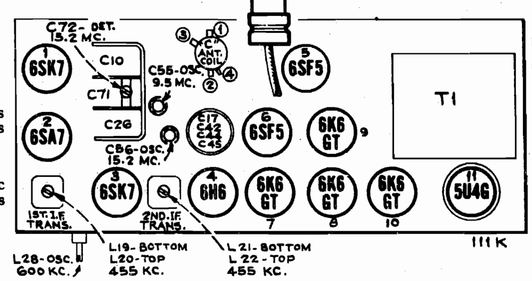
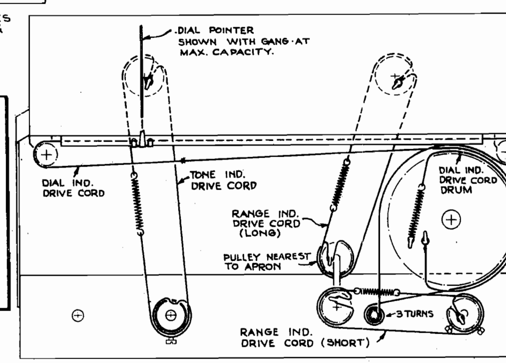




FREQUENCY RANGES
Broadcast "A" .... 540-1,600 kc
Medium Wave "B" .... 1.6-4.0 mc
Short Wave "C" .... 5.8-18.0 mc
SPREAD BAND .... 9.35-9.85 mc

INTERMEDIATE FREQUENCY .... 455 kc

PUSH-BUTTON RANGES
Two stations between approximately 540-1,030 kc
Two stations between approximately 610-1,250 kc
Two stations between approximately 740-1,430 kc
Two stations between approximately 880-1,550 kc

POWER OUTPUT RATING
Undistorted .... 10 watts
Maximum .... 12 watts

LOUDSPEAKER (RL-70L-4)
Type .... 12-inch Electrodynamic
V.C. Impedance .... 2.2 ohms at 400 cycles

POWER SUPPLY RATINGS
105-125 volts, 50-60 cycles, 140 watts
105-125 volts, 25-60 cycles, 140 watts

MODEL 111K
Ch. RC-513A

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or Volt Ohmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration for Alignment.—The dial calibration for alignment purposes can be set up in two ways:

1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial placed on the frame so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

Spread-Band Alignment.—Make final adjustment of C56, C72, and C50 "31-meter" trimmers during actual reception of a station of known frequency near 9.5 megacycles.

* Use minimum capacity peak if two peaks can be obtained.
** Use maximum capacity peak if two peaks can be obtained.
NOTE: Oscillator tracks 455 kc above signal on all bands.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"C" band quiet point at 18 mc end of dial	L21 and L22 (2nd I-F trans.)
2	1st det. grid in series with .01 mfd.			L19 and L20 (1st I-F trans.)
3	Antenna terminal (A) in series with 47 mmfd. (link closed)	15.2 mc	15.2 mc (150°) "C" band	C56 (osc.)* C72 (det.)** C50 (ant.)** Rock in C72, C50
4		9.5 mc	9.5 mc (64°) "31M" band	C55 (osc.)* C70 (det.) C51 (ant.) Rock in C70, C51
5	Green lead on loop plug, in series with 300 ohms	2.44 mc	2.44 mc (90.5°) "B" band	C27 (osc.)
6		600 kc	600 kc (30.5°) "A" band	L28 (osc.)
7		1,500 kc	1,500 kc (160°) "A" band	C28 (osc.) C67 (det.)
8	Repeat steps 6 and 7.			
9	Fasten chassis in cabinet, close ant. link, adjust indicator to left-hand end of dial scales with gang closed.			
10	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	1,500 kc	1,500 kc signal "A" band	C61 (ant.) (on loop)
11		600 kc	600 kc "A" band	L28 (osc.) Rock in
12	Repeat steps 10 and 11.			

Push Button Adjustment

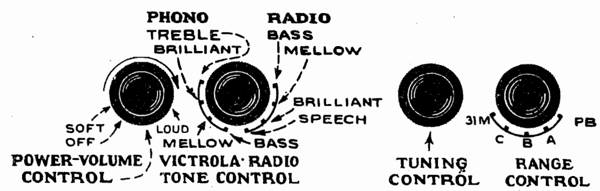
The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

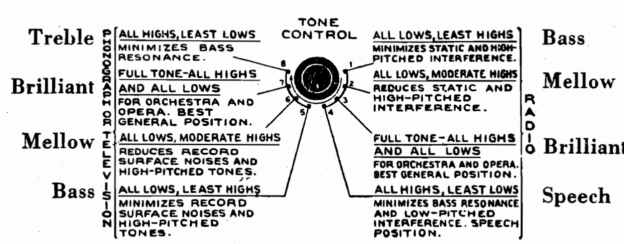
In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

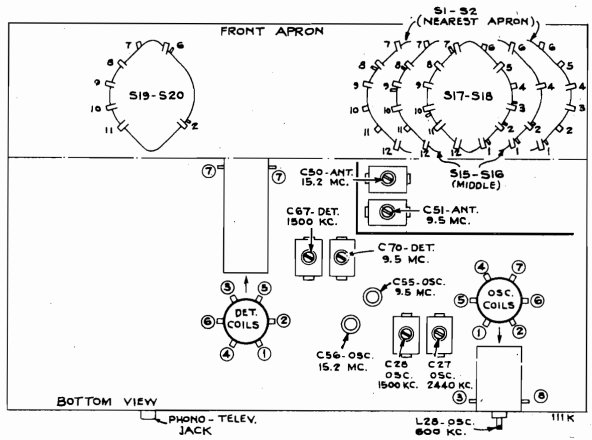
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (L-32) to receive the station.
4. After oscillator core is set correctly, adjust C63 for maximum output.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

Owing to the relatively high r-f gain, it may be found that a given station can be tuned in at several different settings of the magnetite-core oscillator push-button coils. In such cases, it is advisable to unscrew the loop push-button trimmers to minimum capacity before adjusting the magnetite-cores.

On the 880 to 1,550 kc push-button, the higher frequency stations may be received with L9 or L10 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

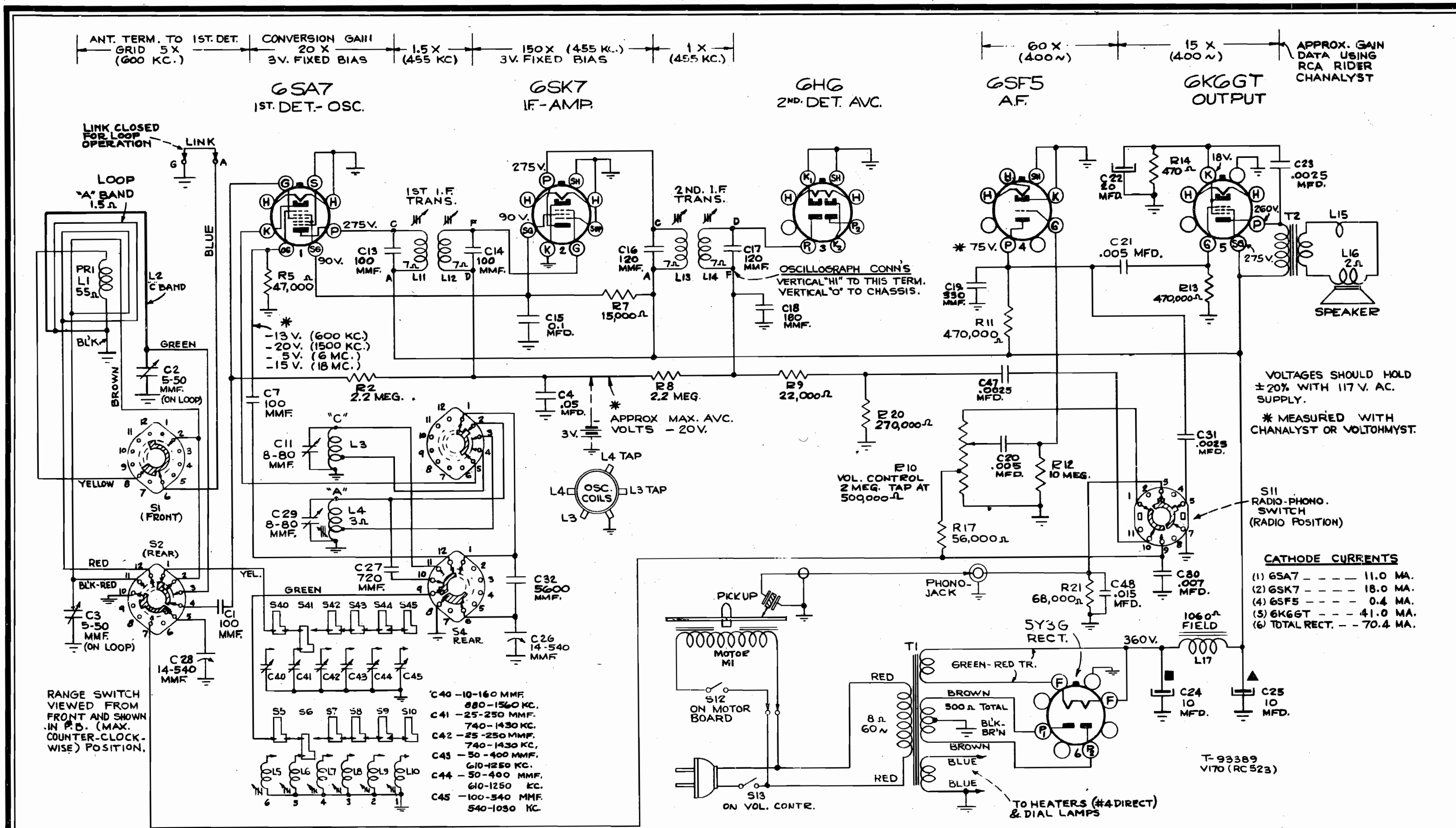






RCA MFG. CO., INC.

MODEL V-170
Ch. RC-523

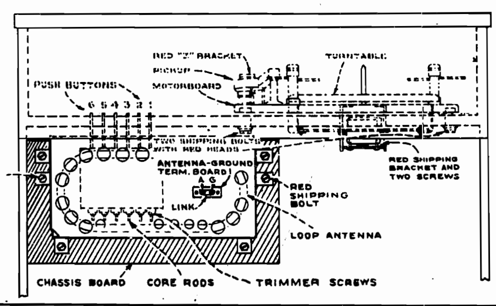


The R-F and I-F gain measurements are made using a 3-volt battery connected from the A.V.C. bus to chassis as shown in dotted lines.

FOR OTHER DATA
SEE INDEX

FOR OTHER DATA SEE INDEX

880 TO 1550 KC	740 TO 1430 KC		610 TO 1250 KC		540 TO 1030 KC	
6	5	4	3	2	1	TRIMMER SCREWS
6	5	4	3	2	1	CORE RODS



Frequency Ranges

Broadcast "A" .... 540-1,600 kc
Short Wave "C" .... 6-18.0 mc

Power Output Rating

Undistorted .... 2.5 watts
Maximum .... 4.5 watts

Loudspeaker (RL-70L-5)

Type .... 12-inch Electrodynamic
V.C. Impedance .... 2.2 ohms at 400 cycles

Phonograph

Type .... Automatic
Record Capacity .. Eight 10-inch or Seven 12-inch
Turntable Speed .... 78 r.p.m.
Type Pickup .... Crystal
Pickup Impedance. 100,000 ohms at 1,000 cycles
Average Output .... 1½ volts at 1,000 cycles across ½ meg.

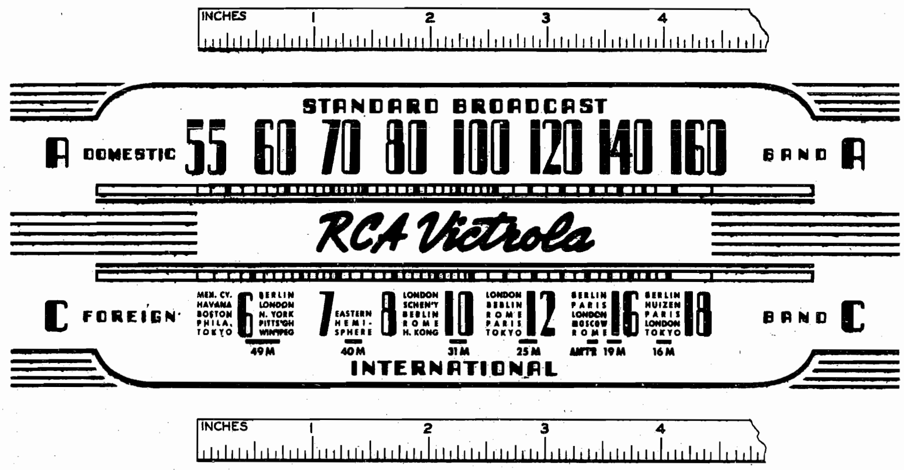
Power Supply Ratings

105-125 volts, 60 cycles, 110 watts
105-125 volts, 25 cycles, 110 watts

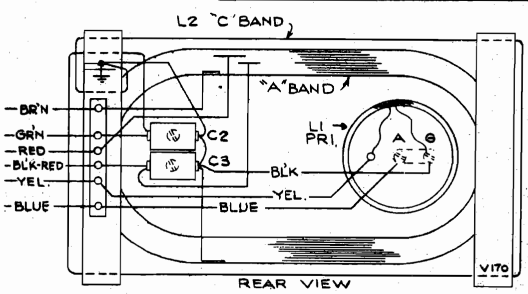
MODEL V-170
Ch. RC-523

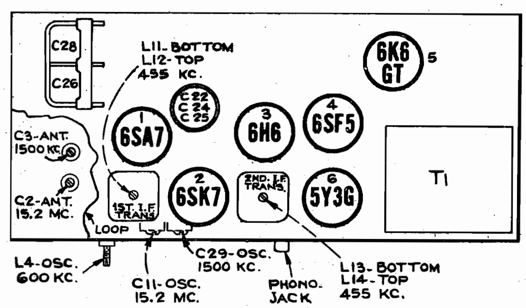
RCA MFG. CO., INC.

Alignment Procedure



Refer to RP-152 Service Data for information on Record-Changer Mechanism.





Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

Using Calibration Scale.—

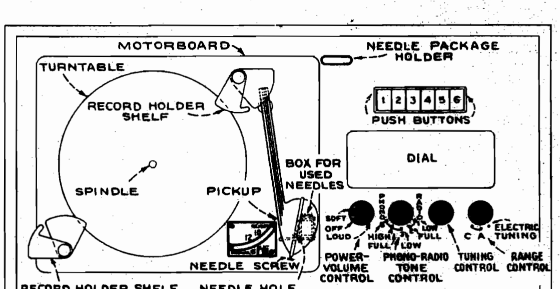
1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

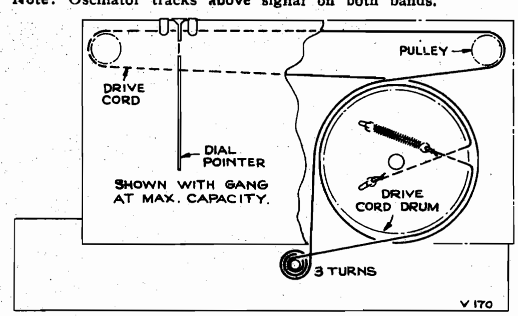
Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid, in series with .01 mfd.	455 kc	"C" band, Quiet Point at H-F end of dial	L13 and L14 (2nd I.F. Trans.)
2	1st. det. grid, in series with .01 mfd.			L11 and L12 (1st I.F. Trans.)
3	Antenna terminal, in series with 300 ohms (link open)	15.2 mc	15.2 mc "C" band	C11 (osc.)* C2 (ant.) Rock in C2
4	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band	C29 (osc.) C3 (ant.)
5		600 kc	600 kc "A" band	L4 (osc.) Rock in
6	Repeat steps 4 and 5.			

* Use **minimum** capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc, where a weaker signal should be received.

Note: Oscillator tracks above signal on both bands.

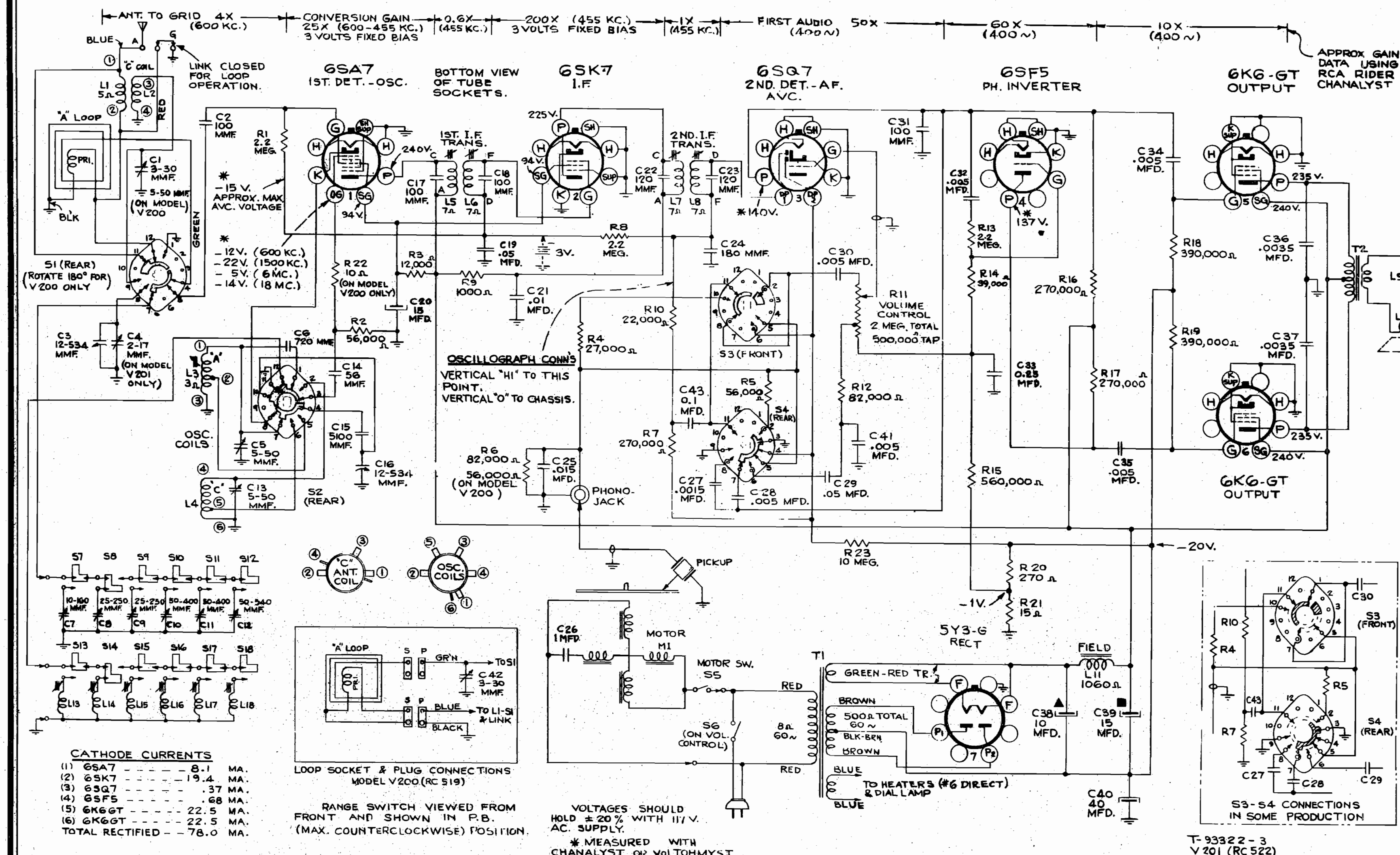




RCA MFG. CO., INC.

MODEL V-200, Ch. RC-519

MODEL V-201, Ch. RC-522



880 TO 1550 KC	740 TO 1430 KC		610 TO 1250 KC		540 TO 1030 KC	
6	5	4	3	2	1	TRIMMER SCREWS
6	5	4	3	2	1	CORE RODS

FOR OTHER DATA SEE INDEX

R-F and I-F gain measurements are made using a 3-volt battery connected from the A.V.C. bus to chassis, as shown in dotted lines.

Frequency Ranges

Broadcast .... 540-1,600 kc
Short Wave .... 5.8-18 mc

Intermediate Frequency .... 455 kc

Power Output Rating

Undistorted .... 5 watts
Maximum .... 5½ watts

Loudspeaker

Size 12-inch
V. C. impedance at 400 cycles .... 2.2 ohms
Identification Number RL-70L6

Power Supply Ratings

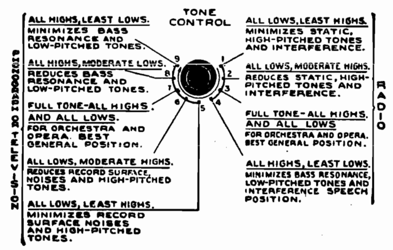
105-125 volts, 60 cycles .... 110 watts
105-125 volts, 50 cycles .... 110 watts
105-125 volts, 25 cycles .... 110 watts

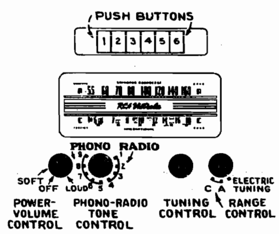
Phonograph

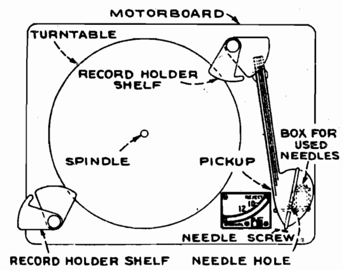
Type .... Automatic
Record Capacity .... Eight 10-inch or Seven 12-inch
Turntable Speed .... 78 r.p.m.
Type Pickup .... Crystal
Pickup Impedance .... 100,000 ohms at 1,000 cycles
Average Output .... 1½ volts at 1,000 cycles across ½ meg.

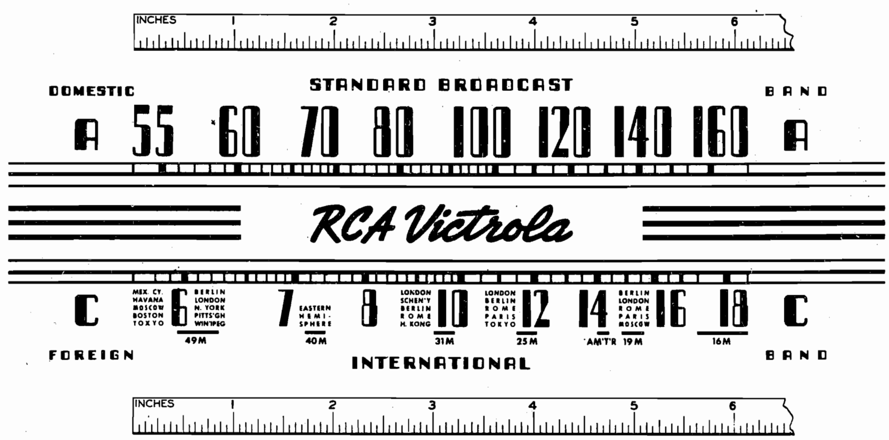
MODEL V-200, Ch. RC-519
MODEL V-201, Ch. RC-522

RCA MFG. CO., INC.

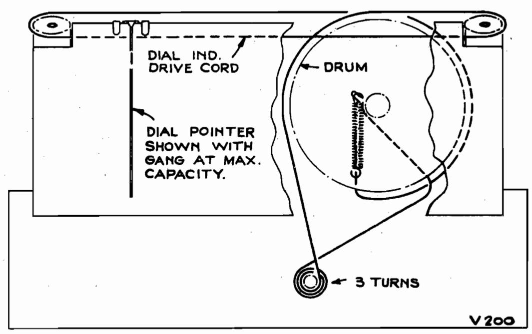




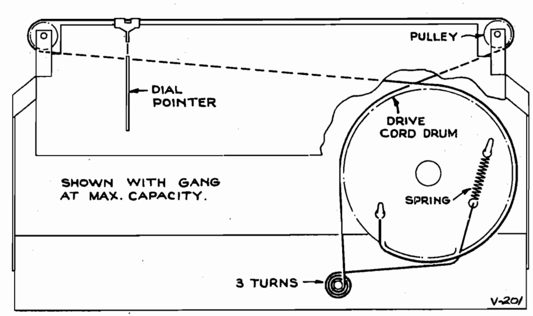




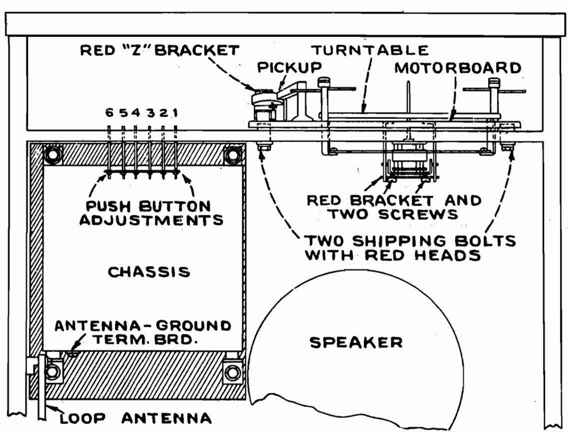
Model V-200 Calibration Scale



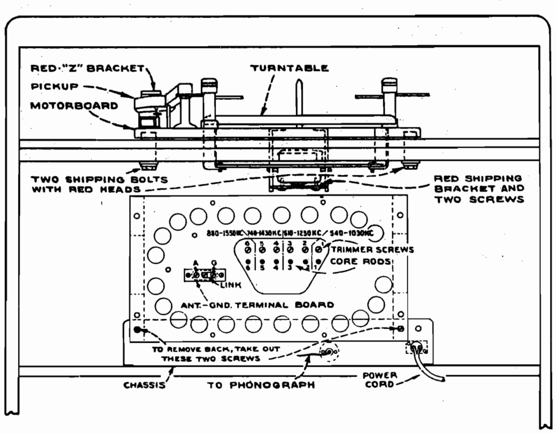
Model V-200



Model V-201



Model V-200



Model V-201

MODEL V-200, Ch. RC-519
MODEL V-201, Ch. RC-522
MODEL V-170, Ch. RC-523

RCA MFG. CO., INC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scales printed in this service note can be used as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate. (1/16-inch to left of this mark in V-201.)

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

Using Calibration Scale, Model V-200.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

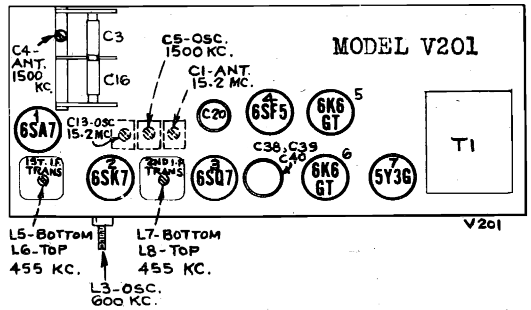
Using Calibration Scale, Model V-201.—

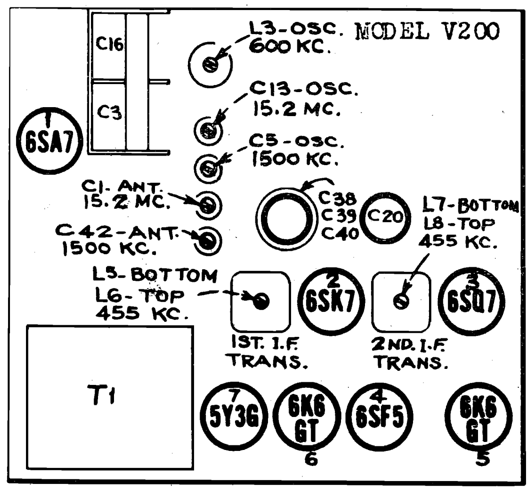
A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh. Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

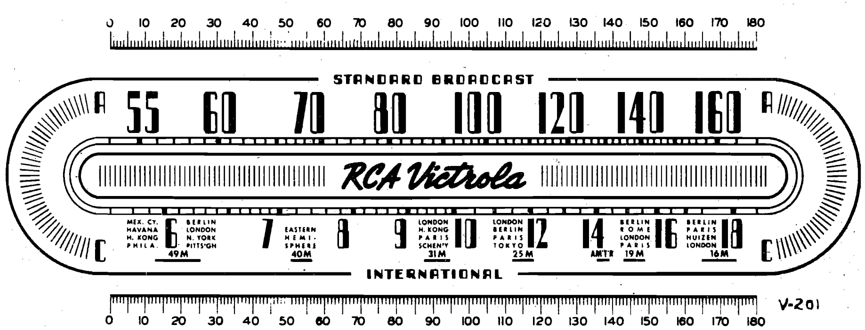
Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid, in series with .01 mfd.	455 kc	"C" band, Quiet Point at HF end of dial	L7 and L8 (2nd I.F. Trans.)
2	1st det. grid, in series with .01 mfd.			L5 and L6 (1st I.F. Trans.)
3	Antenna terminal, in series with 200 mmfd. (link open)	1,500 kc	1,500 kc "A" band 160°	C5 (osc.) C4 (ant. V-201) C42 (ant. V-200)
4		600 kc	600 kc "A" band 30.5°	L3 (osc.) Rock in
5	Repeat steps 3 and 4.			
6	Antenna terminal, in series with 47 mmfd. (link open)	15.2 mc	15.2 mc "C" band 148°	C13 (osc.)* C1 (ant.) Rock in C1

* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc, where a weaker signal should be received.
Note: Oscillator tracks above signal on both bands.







Model V-201 Calibration Scale

MODEL V-170 TUNER DATA

The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

The procedure is as follows:

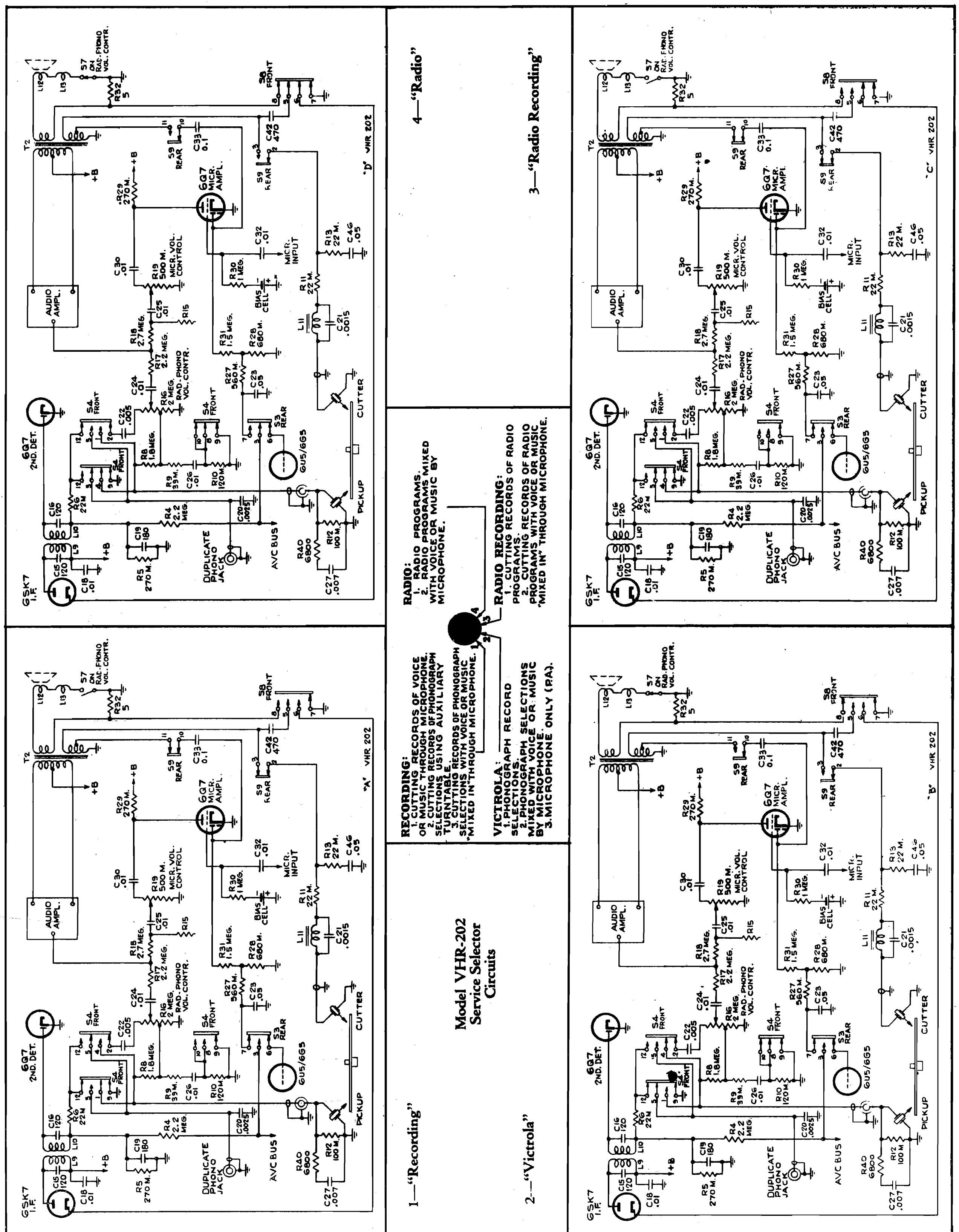
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast position and manually tune in the first station on the list.
3. Turn range switch to push-button position and press in the left-hand button.
4. Adjust L10 to receive the first station. To secure the best adjustment, rotate the set for least pickup, and adjust L10 for peak output.
5. Adjust C45 for peak output on the first station.
6. Proceed in the same manner to adjust for the remaining stations.

On the 880 to 1,560 kc push-button, the higher frequency stations may be received with L5 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

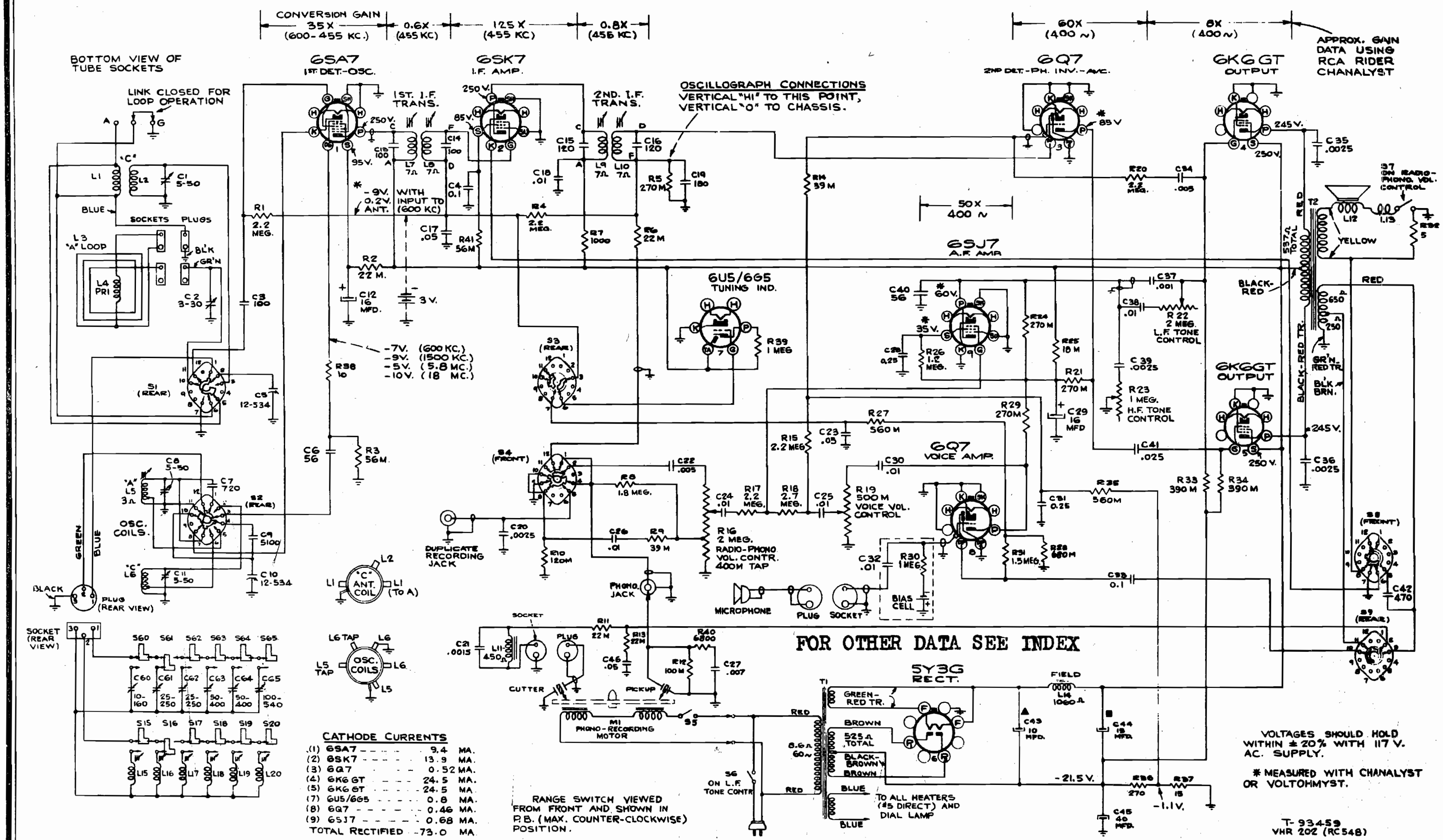
NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

MODEL VHR-202
Ch. RC-548

RCA MFG. CO., INC.



RCA MFG. CO., INC.



880 TO 1550 KC	740 TO 1430 KC		610 TO 1250 KC		340 TO 1030 KC	
6	5	4	3	2	1	TRIMMER SCREWS
6	5	4	3	2	1	CORE RODS

The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

1. Make a list of the desired stations, arranged in order from low to high frequencies.

2. Turn the range switch to the broadcast position and manually tune in the first station on the list.

3. Turn range switch to push-button position and press in the left-hand button.

4. Adjust core rod No. 1 to receive the first station. To secure the best adjustment, rotate the loop for least pickup, and adjust core rod No. 1 for peak output.

5. Adjust trimmer screw No. 1 for peak output on the first station.

6. Proceed in the same manner to adjust for the remaining stations.

7. Repeat adjustments for best results.

On the 880 to 1,550 kc push-button, the higher frequency stations may be received with core rod No. 6 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with this core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

MODEL VHR-202, Ch. RC-548
MODEL VHR-207, Ch. RC-547
MODEL VHR-407, Ch. RC. 547A

RCA MFG. CO., INC.

MODELS VHR-202, VHR-207, VHR-407

Chassis No. RC-548 RC-547 RC-547A

FREQUENCY RANGES
Broadcast, "A" Band .... 540-1,600 kc
Short Wave, "B" Band (VHR-207, 407) .... 1,550-4,000 kc
Short Wave, "C" Band .... 5,800-18,000 kc

INTERMEDIATE FREQUENCY .... 455 kc

TUBE COMPLEMENT

	VHR-202	VHR-207, 407
R-F Amplifier		RCA-6SK7
1st-Det., Oscillator	RCA-6SA7	RCA-6SA7
I-F Amplifier	RCA-6SK7	RCA-6SK7
2nd-Det., A.V.C., Phase Inverter	RCA-6Q7	RCA-6Q7
1st—A-F Amplifier	RCA-6SJ7	RCA-6SJ7
Power Output	RCA-6K6GT (2)	RCA-6F6G (2)
Microphone Pre-Amplifier	RCA-6Q7	RCA-12K7GT
"Contractor" Rectifier		RCA-6H6
"Magic Eye" Indicator	RCA-6U5	RCA-6U5
Rectifier	RCA-5Y3G	RCA-5U4G

POWER OUTPUT

	VHR-202	VHR-207, 407
Undistorted watts	5	10
Maximum watts	5.5	12

LOUDSPEAKER

(Electrodynamic)	RL-70M-6	RL-70M-5
Diameter	12-inch	12-inch
Voice-coil impedance at 400 cycles	2.2 ohms	2.2 ohms

POWER SUPPLY RATING
105-125 volts, 60 cycles ...... 140 watts .... 200 watts

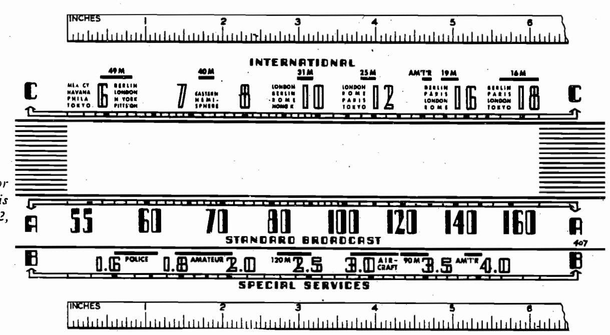
CABINET DIMENSIONS

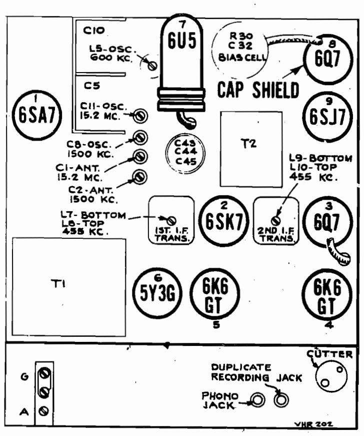
	VHR-202	VHR-207	VHR-407
Height (inches)	34	36	34
Width (inches)	32	35	34¾
Depth (inches)	17	17⅛	19

TUNING DRIVE RATIO .... 15 to 1

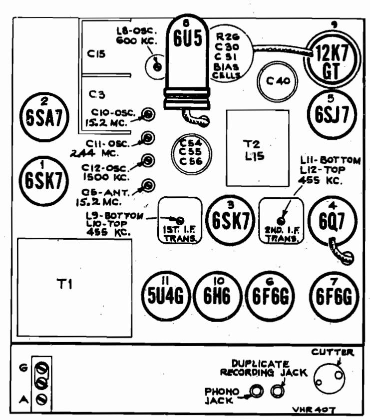
Alignment Procedure

At Right—Calibration Scale for VHR-207 and VHR-407. This also applies to Model VHR-202, except "B" Band is omitted.





Model VHR-202



Models VHR-207, 407

Model VHR-202

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid, in series with .01 mfd.	455 kc	Quiet Point at High-Freq. end of "C" Band	L9 and L10 (2nd I.F. Trans.)
2	1st-detector grid, in series with .01 mfd.			L7 and L8 (1st I.F. Trans.)
3	1st-detector grid, in series with .01 mfd.	600 kc	600 kc "A" Band	L5 (osc.)
4		1,500 kc	1,500 kc "A" Band	C8 (osc.)
5	Repeat steps 3 and 4.			
6	Antenna Terminal, in series with 47 mmfd.	15.2 mc	15.2 mc "C" Band	C11 (osc.)* C1 (ant.)**
7	Install and connect chassis in cabinet. Close link on antenna terminal board. Tune in a radiated signal at 1,500 kc and peak "A" band loop trimmer C2. Rock in L5 at 600 kc. Repeat these adjustments.			

* Use **minimum** capacity peak if two peaks can be obtained.
** Rock in C1 and use **maximum** capacity peak if two peaks can be obtained.

Models VHR-207, VHR-407

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I.F. Grid in series with .01 mfd.	445 kc	"C" Band Quiet Point at High Freq. end	L11 and L12 (2nd I.F. Trans.)
2	1st Det. Grid in series with .01 mfd.			L9 and L10 (1st I.F. Trans.)
3	R.F. Grid in series with .01 mfd.	600 kc	"A" Band 600 kc	L8 (osc.)
4		1,500 kc	"A" Band 1,500 kc	C12 (osc.)
5	Repeat steps 3 and 4.			
6	R.F. Grid in series with .01 mfd.	2.44 mc	"B" Band 2.44 mc	C11 (osc.)
7	Antenna Terminal in series with 47 mmfd.	15.2 mc	"C" Band 15.2 mc	C10 (osc.)* C5 (ant.)**
8	Install and connect chassis in cabinet. Close link on antenna terminal board. Tune in a radiated oscillator signal at 1,500 kc and peak the "A" band trimmer C1 (on loop). Rock in L8 at 600 kc. Repeat these adjustments.			

* Use **minimum** capacity peak if two peaks can be obtained.
** Rock in C5 and use **maximum** capacity peak if two peaks can be obtained.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Using Tuning Dial.—

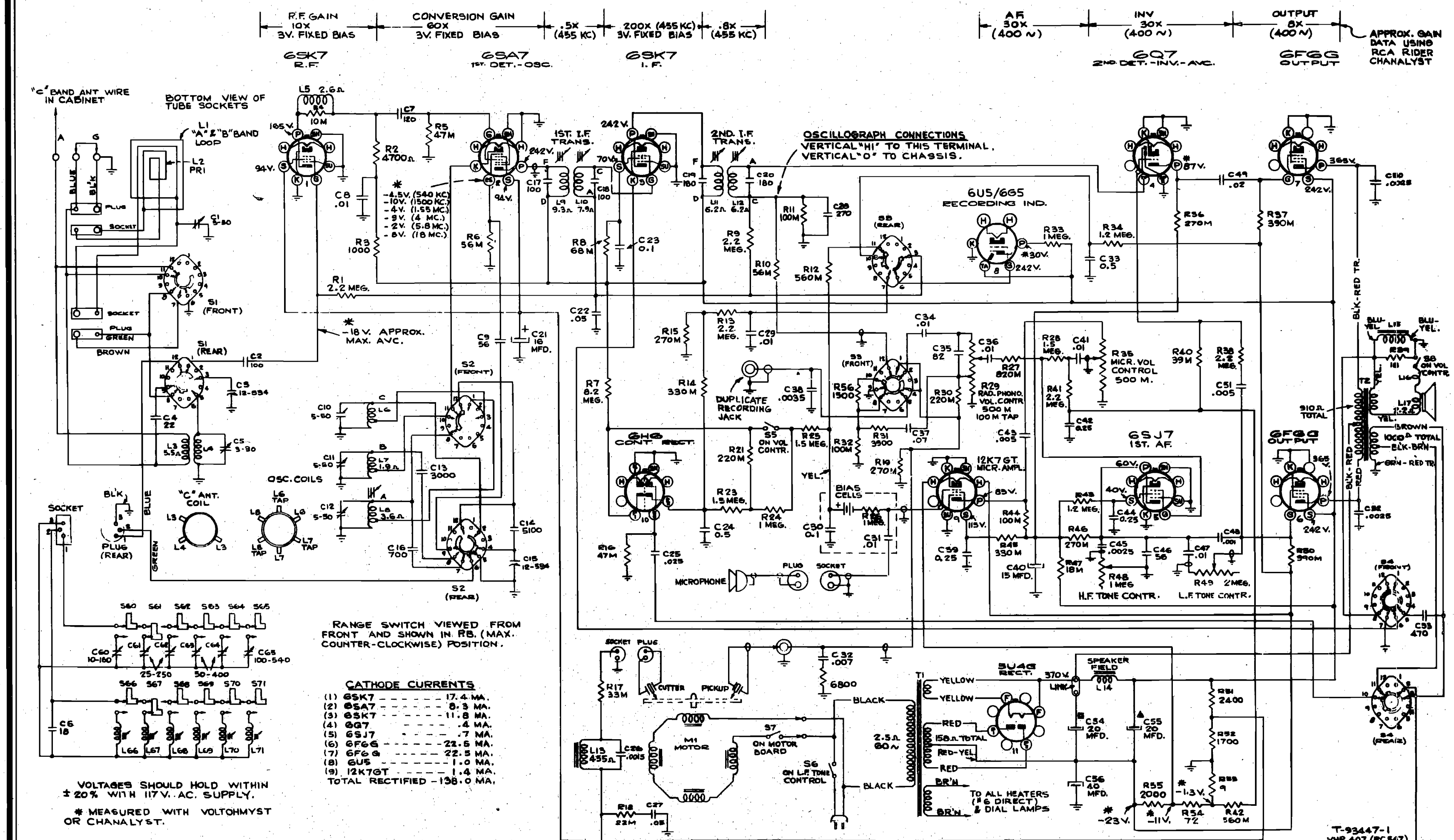
1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

RCA MFG. CO., INC.



PHONOGRAPH (RP-155)

Type.................................... Automatic
Record Capacity.......... Eight 10-inch or Seven 12-inch
Turntable Speed.......................... 78 r.p.m.
Drive... Motor drive through idler on inside rim of turntable
Type Pickup................................ Crystal
Pickup Impedance........... 100,000 ohms at 1,000 cycles
Average Output... 1½ volts at 1,000 cycles across ½ meg.

RECORDER

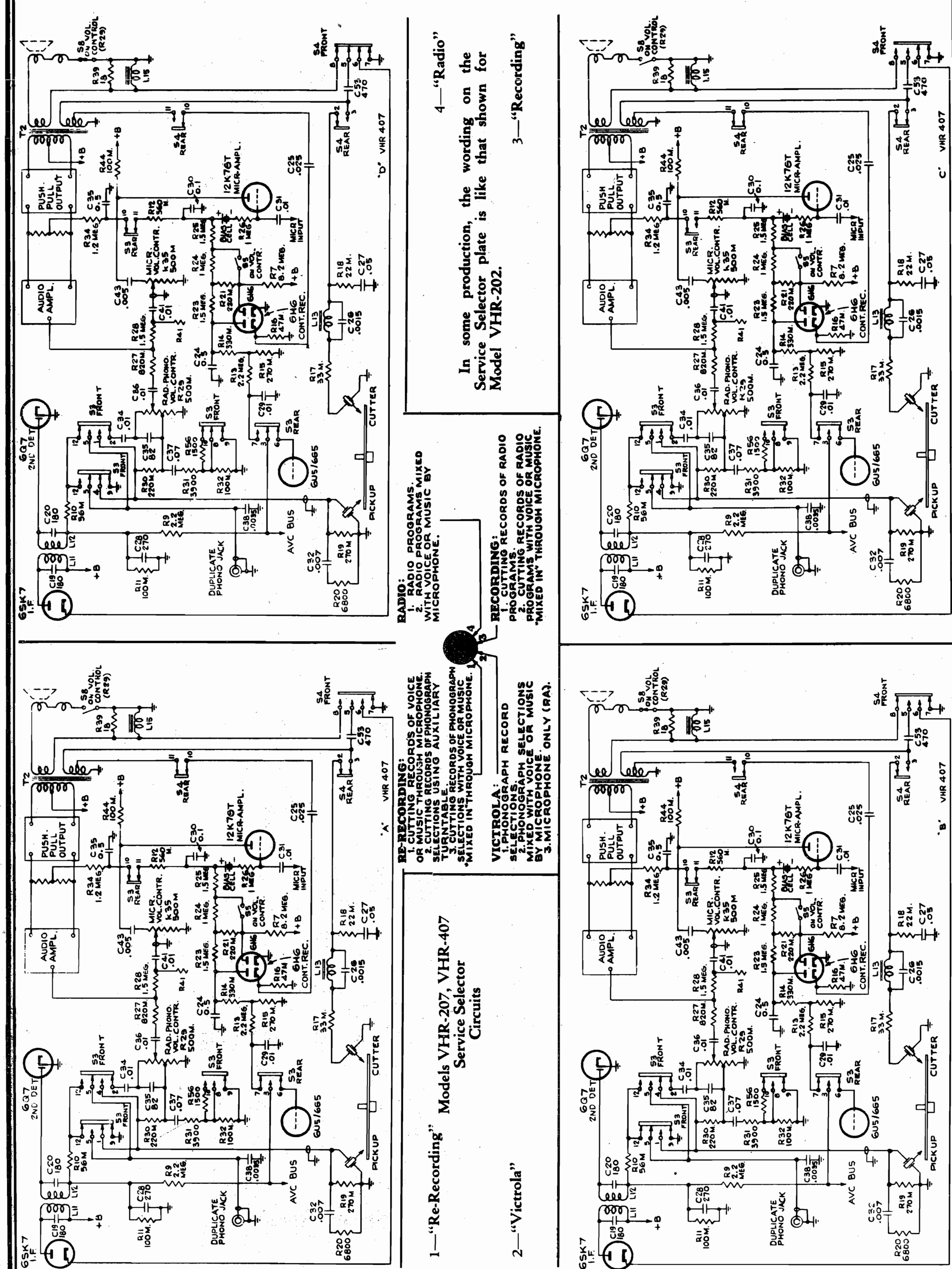
Recording Head (cutter)...................... Crystal
Impedance of Cutter at 1,000 cycles....... Approx. 60,000
Turntable Speed........................... 78 r.p.m.
Grooves Cut per Inch.................... Approx. 115
Inches Cut per Minute................ Approx. .713 inch
Recording Blank Discs.............. Coated metal-base or coated paper-base
Recording Disc Diameter................. Up to 10 inches
Drive...... Motor drive through idler on inside rim of turntable; the turntable spindle drives a lead screw which guides the recorder arm from outside of recording blank to inside

WHEN MEASURING RF AND IF GAIN, A 3-VOLT BIAS IS CONNECTED BETWEEN THE AVC BUS AND CHASSIS (PLUS TO CHASSIS)

FOR OTHER DATA SEE INDEX

MODEL VHR-207
MODEL VHR-407

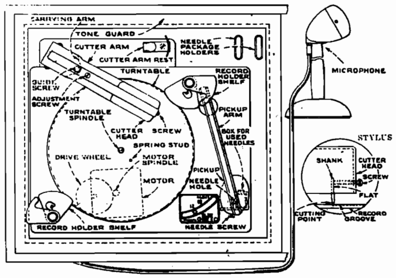
RCA MFG. CO., INC.



RCA MFG. CO., INC.

MODEL VHR-202
MODEL VHR-207
MODEL VHR-407

Recorder Cutting Adjustments



IMPORTANT

The cutting point of the stylus must be in perfect condition in order to make good recordings.

The condition of the stylus point can not be determined by ordinary visual inspection. If the recordings are noisy or poor in quality, first try a new stylus.

The stylus cutting point can be ruined by dropping the cutter on the record, by cutting into the base metal of the recording blank, or by cutting into the paper label on the blank.

Always stop the recorder before it reaches its inner limit as it will repeat in the last groove and may wear into the base metal, thereby ruining the stylus point.

To insert or change a stylus, lift the recorder arm, loosen the stylus screw, and insert the stylus as far as it will go in the hole at bottom of cutter head, with the flat on the shank of the stylus toward the screw. Tighten the screw against the flat on the shank. **Retighten the screw before making each recording.** Do not use pliers or wrench.

To adjust the stylus pressure for the correct depth and width of cut, the best procedure is to cut some "blank" grooves in a recording disc of the type that will be used: The stylus pressure can be regulated, by means of the adjustment screw on top of the cutter arm, to produce the correct thickness of the hair-like cuttings. The procedure is as follows:

1. See that the phonograph pickup is on its rest, the turntable cleared of records, the record-holder shelves rotated back away from the turntable, index lever at "manual," a perfect stylus correctly inserted in the cutter head, and the stylus screw firmly tightened.

2. Place the blank recording disc on the turntable, with the spring stud that protrudes from the turntable engaged with one of the three holes at inside of the disc. This prevents the disc from slipping during recording.

3. Turn on power-bass control and turntable switch. Turn radio-phono and microphone volume controls fully counter-clockwise.

4. Lift the cutter arm well up and move it over so the stylus is about ¼-inch inside the recording disc and lower GENTLY on to the disc.

5. The stylus will begin to cut, and the cuttings should collect toward the center of the recording disc. If they collect toward the outside, the stylus is not correctly inserted, and must be adjusted by removal and re-insertion. If the threads continue to collect toward the outside, use a new stylus.

6. When the stylus is correctly inserted, with the cuttings collecting toward the center of the disc, lift the cutter, place it on the cutter rest, and stop the turntable. Then examine the cuttings and the grooves in the disc.

The cuttings should be even, thin, hair-like threads about three-thousandths of an inch across or approximately the diameter of a human hair.

The groove width should almost equal, but not exceed, the distance between grooves. A magnifying glass is helpful in examining the grooves. **If the grooves are too shallow, the phonograph needle will slide over them on play-back. If the grooves are cut too deep, rumble will be excessive.**

After examining the cuttings and the groove width, adjust the cutter pressure as required by means of the adjustment screw on top of the cutter arm. Turn this **clockwise to increase pressure** and increase size of cuttings. Turn **counter-clockwise to decrease pressure** and decrease size of cuttings.

Check the new adjustment by running more blank grooves.

Check the cuttings and groove width each time a new stylus is inserted, and whenever a different type of recording disc is used.

The stylus pressure, when adjusted for correct cutting, is approximately 1¾ ounces, measured at the end of the stylus screw.

Always lift the cutter-arm well up while moving it into cutting position, and while moving it back to the rest. Failure to do this will cause the follower-arm guide to drag across the lead screw under the motorboard.

Recorder Mechanism Adjustments

"N" Recorder Arm Stop.—An extension on the cross-bracket under the motorboard limits the inward movement of the follower arm. In this stop position, the stylus screw should be 1½ inches from the spindle.

The correct distance can be obtained by loosening set screws "N," moving the recorder arm in the required direction, and tightening the set screws.

"O" Follower-Arm Guide Adjustment.—When the recorder arm is lifted, the follower-arm rises up so that the follower-guide will clear the lead screw and permit the recording arm to be moved inward or outward.

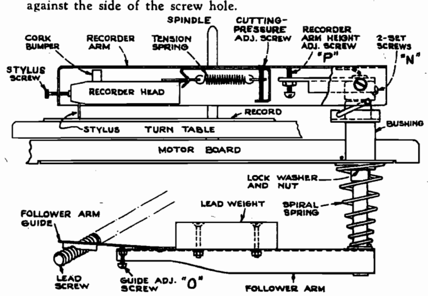
Adjust the set screw and locknut "O" so that the guide clears the lead screw when the bottom-front edge of recorder arm is 3 inches above record.

"P" Recorder-Arm Height Adjustment.—With the recording stylus resting on a metal-base recording disc, and adjusted for correct cutting pressure, the stylus screw should be approximately in the center of the hole in the recorder arm, and the cutter head should be free to move up and down. Adjust the recorder-arm height adjustment screw and locknut "P" to obtain these conditions.

If the arm is too low, the cork bumper on top of the cutter head will hit the inner top of recorder arm.

If the arm is too high, the stylus screw will hit the lower edge of the screw hole.

Also check to see that the stylus screw does not scrape against the side of the screw hole.



Recorder Operating Instructions

Preliminary.—

1. See that cutter is functioning correctly as outlined on facing page.

2. Place recording disc on turntable with stud engaged in one hole.

3. Turn on power-bass control, just past the click of the power switch. Turn treble tone control full clockwise. Set radio-phono volume control to soft, and microphone volume control fully counter-clockwise.

Radio Recording.—

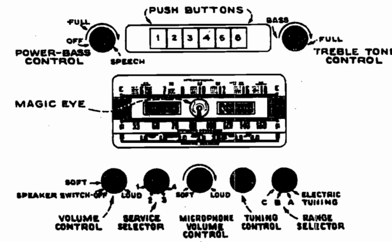
1. Tune in the desired radio program.
2. Turn service selector to position "3."
3. Turn radio-phono volume control so the "Magic Eye" just closes during loudest passages.
4. Push turntable switch "on."
5. Lift the recording arm, move it over so the stylus is about ¼-inch inside the recording disc, and lower gently on the disc.
6. During the recording, listen to the loudspeaker, watch the "Magic Eye," and increase or decrease the radio-phono volume control if the broadcast level becomes too low or too high.
7. Use a fine hair brush occasionally to keep the area immediately ahead of the stylus free from chips and threads.
8. Before the cutter reaches its inner limit, lift the cutter head and place on rest. Turn off the turntable switch and remove the cuttings from the disc.
9. The recording may be **"played-back"** immediately: Turn the service selector to "Victrola," push the turntable switch "on," **turn power-bass control fully clockwise,** place pickup needle in outer groove of the disc, and adjust the radio-phono volume control. **Use a new needle for play-back.**

Microphone Recording.—

1. Turn service selector to position "1."
2. Turn radio-phono volume control to its "off" position to prevent feed-back and "howl."
3. Turn power-bass control just past the click of the power switch. Turn treble-tone control full clockwise.
4. To obtain an approximate setting of the microphone volume control before making a recording, talk into the microphone (which should be left plugged into its receptacle at all times) and adjust the microphone volume control so the "Magic Eye" just closes. By talking in a fairly level tone, and by maintaining the same distance between the microphone and lips, the microphone volume control will not require continual readjustment.
5. Start the turntable and place cutter on the disc.
6. Talk into the microphone to make the desired recording, and re-adjust the microphone volume control if required, as indicated by the "Magic Eye."
7. Stop the recorder before it reaches its inner limit, turn the microphone volume control counter-clockwise and play back the recording as described in "9" above.

Re-Recording.—

A record may be re-recorded, or duplicated (that is, a "copy" may be made from an "original") by connecting an RCA Victrola Attachment (record player) to the "re-recording jack" on the rear of the radio chassis. The "original" record is played on the RCA Victrola Attachment, and the "copy" is cut or recorded on the Home Recorder.



Controls on VHR-207 and VHR-407. Model VHR-202 Controls are identical, except "B" Band is omitted.

The procedure is as follows:

1. Turn the service selector to position "1."
2. Connect the RCA Victrola Attachment pickup cable to the jack on rear of the Home Recorder radio chassis.
3. Place the "original" record on the RCA Victrola Attachment, turn its volume control fully clockwise, and place its pickup on the "original" record.
4. Adjust the radio-phono volume control so the "Magic Eye" just closes on loudest passages, then lift pickup off the RCA Victrola Attachment.
5. Start the recorder by pushing turntable switch "on," and placing the recorder arm on the recording disc.
6. Put the RCA Victrola Attachment pickup arm on the "original" record. The recorder will cut a duplicate of this record, which may be played-back as described previously.

Mixed Recording.—

The RCA Home Recorders have complete flexibility for mixed recordings of radio, microphone, and phonograph. The various possible combinations are clearly shown in the illustration of the service selector control.

In mixed recordings, the radio-phono volume control regulates the recording level for radio, and for the RCA Victrola Attachment.

The microphone volume control regulates the recording level of the microphone only. In using the microphone on mixed recordings, or mixed PA, it should be placed as far as possible from the loudspeaker and faced away from the loudspeaker to avoid feed-back howl. (An extension cord may be added if necessary.)

"Rumble".—

1. **Excessive cutting pressure will cause rumble.** The width of the groove should almost equal, but not exceed, the distance between grooves.

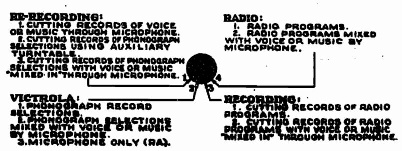
Check the groove width each time a new stylus is used, and each time a new disc is used.

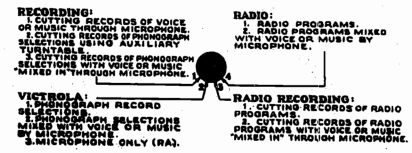
2. **When recording, use the maximum bass response,** by turning the power-bass control to "full" (just past the click of the power switch).

3. **On play-back, use the least bass response,** by turning the power-bass control to "speech" (full clockwise).

4. Be certain that the motor board and mechanism is "floating" free from the cabinet.

SERVICE SELECTOR





Two varieties of wording have been used on the Service Selector plate, as shown above: Also, in some production, the word "Phonograph" is used instead of "Victrola".

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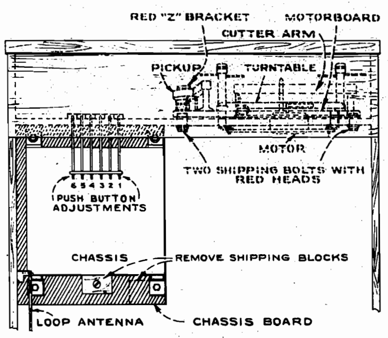
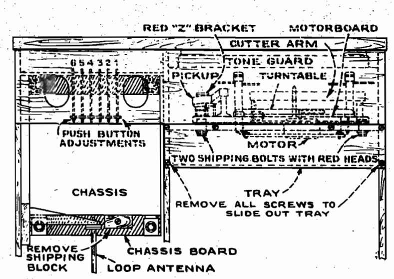
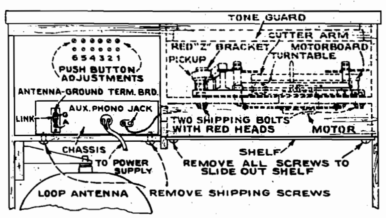


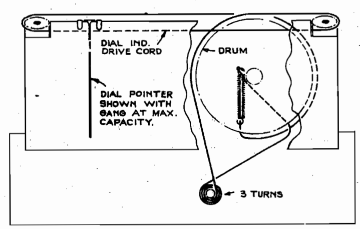
Model VHR-202



Model VHR-407



Model VHR-207

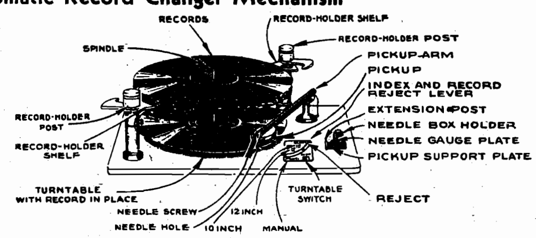


Dial Drive Cord Arrangement

Automatic Record Changer Mechanism

The RCA automatic record changer is the result of vast experience, continual improvements, precision manufacturing and rigid inspection. Hundreds of thousands of these mechanisms are giving satisfactory performance in everyday use in unskilled hands.

The mechanism is relatively simple, and as "foolproof" as human ingenuity can devise.



Cycle of Operation

In automatic operation (index lever set to "10" or "12"), when the pickup needle enters the eccentric or spiral groove at the inside of the record, the pickup arm swings in the groove, and this motion acts through a friction clutch to "trip" or start the cycle of the automatic record changer mechanism which:

1. Lifts up the pickup arm and swings it out clear of the records.

2. Turns the two record-holder posts, each of which has a "knife" and a "shelf": The knives enter between the bottom record and the rest of the stack. Continuing to turn, the shelves move from under the bottom record and it drops on the turntable, while the rest of the stack of records are supported by the "knives."

3. The pickup arm is then moved to correct position and lowered on the record, while—

4. The record-holder posts are turning back to their original positions, so that the records rest on the shelves, and the knives are in correct position to separate the next record from the stack.

The cycle is completed when the pickup comes down on the record. The pickup arm should not be moved while "in cycle."

Record-Separating Knives. 12-inch records are thicker than 10-inch records: To accommodate this difference, the "knife" or record-separating lever on each record post is raised slightly when a 12-inch record presses down against the ball-point screw that projects through a hole in the record-holder shelf on each post. (10-inch records do not rest on these screws, and the knife clearance is then correct for a 10-inch record.)

"Record Discriminating Lever." In playing a mixed group of 10-inch and 12-inch records, the index lever is set at "10." When the pickup arm moves out during the cycle of operation, the record discriminating lever (at left of the rear record-holder post) is moved to its forward position, toward the spindle, and sets the correct landing position of the pickup needle for a 10-inch record. If a 12-inch record drops down, it pushes the record discriminating lever back, and sets the correct landing position for the 12-inch record.

Cautions

1. This instrument is not recommended for playing 10-inch and 12-inch records in **mixed sequence.**

2. **Never use force** to start or stop the motor or any part of the record-changing mechanism or pickup arm.

3. **Warped or damaged records** may cause the mechanism to jam.

4. **Warped records** may slide on one another when playing, resulting in unsatisfactory reproduction.

5. **Do not leave records on the record-holder posts** as they may warp, particularly in warm climates. Warped records may be flattened by placing them on a flat surface with a flat heavy article placed on top of them for a few days.

6. **Do not leave pickup needle resting on a record** or on the turntable. Always place it on the pickup rest.

7. **Do not insert a used needle in the pickup,** and avoid turning a needle after it has been used.

8. If for any reason the phonograph stalls, turn off the turntable switch and remove the records from the record holder shelves. Start the turntable and allow the pickup arm to complete its cycle.

Manual Phonograph Operation

Inserting Needles.—To insert a needle, place pickup on its rest, loosen needle screw on the front of the pickup, place needle in hole at top of pickup so that it drops down against the polished gauge plate, press firmly on top of pickup so it sits squarely on the pickup rest, and then tighten the needle screw. This procedure ensures that the needle will project the correct distance from the pickup.

1. See that the recording arm is in its rest position at rear of turntable.

2. Turn power-bass control on, turn service selector to "Victrola," and turn microphone volume control fully counter-clockwise.

3. See that pickup is on the pickup rest.

4. Push index lever to "manual," lift the knobs on the top of the record holder posts, and rotate the shelves back, away from the turntable. Push back the vertical lever at left of the rear record post.

5. Place record on turntable.

6. Push turntable switch "on" and when turntable has attained speed, lift the pickup and lower it gently on the record so that the needle point enters the outside groove.

7. Adjust the radio-phonograph volume control for the desired volume, and adjust the tone controls for best reproduction.

8. To stop, place pickup on its rest and turn off the turntable switch.

Automatic Phonograph Operation

1. See that the recording arm is in its rest position at rear of turntable.

2. Turn power-bass control on, turn service selector to "Victrola," and turn microphone volume control fully counter-clockwise.

3. See that the pickup is on the pickup rest. If it is not, complete a cycle of operation as described previously.

4. Push index lever to "manual," lift the knobs on the top of the record-holder posts and rotate the shelves back, away from the turntable. Push back the vertical lever at left of the rear record post.

5. Select a series of eight 10-inch records, or seven 12-inch records, and place the first one on the turntable. Swing the record-post shelves into position and place the remainder of the series of records on the shelves as shown in the illustration.

6. Push the index lever to "10" for a series of 10-inch records, or to "12" for a series of 12-inch records.

7. Push turntable switch "on" and when turntable has attained speed, lift the pickup and lower it gently on the record, so that the needle point enters the outside groove.

8. Adjust the radio-phonograph volume control for the desired volume, and adjust the tone controls for best reproduction.

9. Close the lid of the cabinet to eliminate mechanical sound. The whole series of records will play without further attention, and the last record will repeat until the turntable switch or the power-bass control is turned off.

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 index 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 index lever, it will automatically return to the "10" position. If playing a series of 12-inch records, the lever should be returned to the "12" position after rejecting a record. Keep the lever in at "manual" when not actually playing records automatically.

To stop the mechanism while a record is being played, push the index lever to "manual," place the pickup on its rest, and turn off the turntable switch.

To stop the mechanism at the completion of a record, first allow the pickup to complete its cycle (the cycle is completed when the pickup comes down on the record). Then push the index lever to "manual," place the pickup on its rest, and turn off the turntable switch.

When discontinuing operation, turn off both the turntable switch and power-bass control.

To remove a record from the turntable, lift the knobs on top of the record-holder posts, swing the shelves back clear of the records, and push back the vertical lever at left of the rear record post.

RECORD CHANGER SERVICE DATA

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.

The changer can be 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.

A bind or jam in the mechanism can usually be relieved by rotating the turntable in the reverse direction. **The 10- and 12-inch records must be absolutely flat for smooth operation.**

A pickup shorting switch, located under the motorboard, operates when the pickup is moved outward to the pickup rest.

The turntable in RP-155 can be removed by tapping smartly on the top of the spindle while pulling upward on opposite sides of the turntable.

Lubrication.—Petrolatum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, lead screw and gears of record posts.

Light machine oil should be used in the tone arm vertical bearing, motor bearing, record post bearings, and all other bearings of various levers and pulleys on underside of motorboard and underneath turntable.

Do not allow oil or grease to come in contact with rubber idler wheel, bumper or rubber parts of the mechanism. Use quick drying naphtha to clean the rubber parts.

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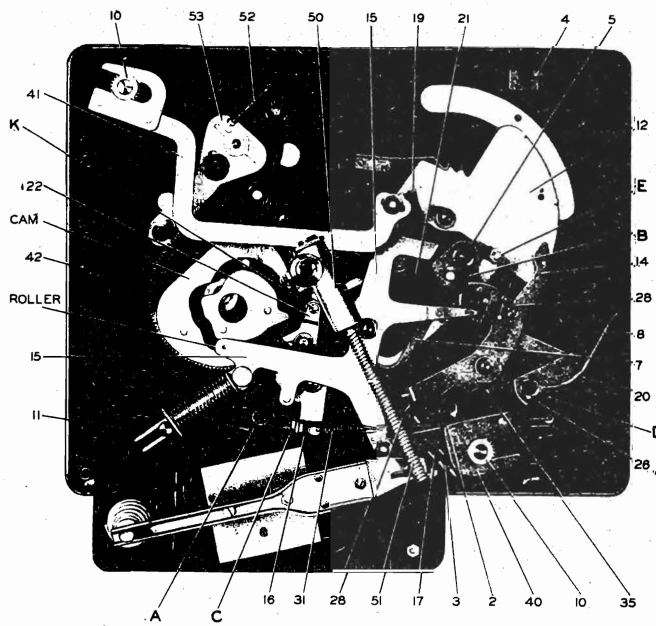
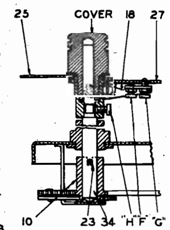
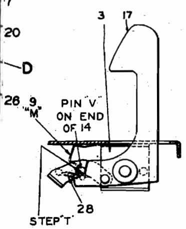
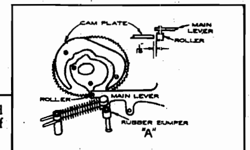
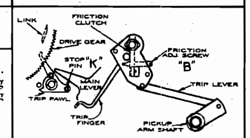
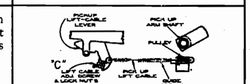
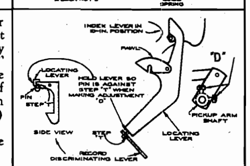
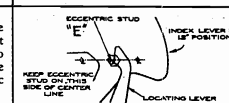
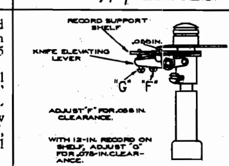
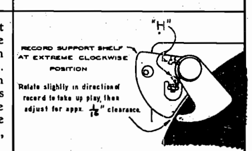






Quick-Reference Chart for Automatic Record Changer Adjustments

General irregularity of operation.	With changer "out-of-cycle," the roller on main lever should clear the cam plate by 1/16-inch. Bend the rubber bumper stud, if necessary, to obtain this clearance.	
Fails to trip at end of record.	**Increase** clutch friction by turning clutch screw clockwise.	
Needle repeats grooves (does not follow the groove). *Change cycle starts before record is finished.*	**Decrease** clutch friction by turning clutch screw counter-clockwise. These troubles may also be caused by a defective record, binding of the pickup-arm bearing, twisted pickup output cable, or rubbing between the friction finger and the index-lever finger.	
Pickup arm strikes lower record in stack. *Pickup needle drags across top record on turntable.*	Rotate the changer "in-cycle" to the point where the pickup arm is raised to its maximum height above turntable plate, and has not started to move outward. Adjust the lift-cable screw and locknuts so needle point is 1-inch above top surface of turntable.	
Needle doesn't land at correct point on 10-inch record. (The correct landing point is 4-5/8 inches from the nearest side of the turntable spindle).	Place 10-inch record on turntable, push record-discriminating lever to forward position, push index lever to "reject" and return it to "10." Rotate mechanism through cycle until needle is just ready to land on record. Hold pin on locating lever against step "T" as shown, loosen the two set screws at pickup arm shaft, and move pickup so needle is about 1/32-inch beyond the outer groove of record. See that there is 1/32-inch play between the pickup-arm bearing and set-screw collar, then tighten one (the blunt nose) set-screw. Run mechanism through cycle as a check, and then tighten the cone-pointed set screw.	
Needle doesn't land at correct point on 12-inch record. (The correct landing point is 5-5/8 inches from nearest side of spindle).	Adjust for correct 10-inch landing, as described above, then place 12-inch record on turntable, push index lever to "reject" and return it to "12." Rotate mechanism through cycle until needle is ready to land on the record. Turn eccentric stud to bring pickup needle about 1/32-inch beyond the outer groove in record. (Keep eccentric on stud toward rear of motorboard as indicated.)	
Record knives strike edge of records. (This is generally due to warped records, and records with rough edges).	It is essential that the spacing between the knife and the 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.	
Records are not released properly, or do not fall flat. (If record shelves are bent, or not perfectly horizontal, improper operation and jamming of mechanism will result).	Place a 12-inch record on the turntable, rotate mechanism to point in cycle where the shelves have turned clockwise as far as the mechanism will turn them. Lift record up so it is in contact with both knives and check clearance between record and edges of shelves. It should be 1/16-inch as shown. If the clearance at either or both shelves is not correct, loosen set screws "H" and shift the shelves to obtain this clearance, with the backlash taken up by pressing the shelves toward the record. Tighten one set screw (the blunt-nose one), run mechanism through cycle several times to check action, then tighten the other (cone-pointed) set screw.	
Pickup arm support bent too low, or too high.	Bend the support (which is associated with the pickup arm bearing, so that with the mechanism out of cycle, the lower front edge of the pickup arm is 5/16-inch above surface of motorboard.	
Roller on main-lever won't enter cam.	Bend the trip pawl stop pin so that the roller on end of main lever, when entering the cam, will definitely clear the cam outer guide plate as well as the nose of the cam plate. (Adjustment "K.")	
Needle lands in 10-inch position on 12-inch record, or misses record when playing both types mixed.	Increase pressure of flat spring "M" at bottom of record discriminating lever.	
Needle fails to enter starting groove.	Raise the right-hand side of cabinet by placing thin spacers under legs.	
Needle slides over a few grooves in landing.	Raise the left-hand side of cabinet by placing thin spacers under the legs.	

Names of Mechanism Parts

2	Guide	—Pickup-lift-cable guide.
3	Bracket	—Record-discriminating-lever bracket.
4	Switch	—Turntable motor switch.
5	Clutch	—Trip-lever friction clutch.
7	Finger	—Trip-lever friction finger.
8	Cable	—Pickup shielded cable.
9	Spring	—Record-discriminating-lever spring (flat).
10	Gear	—Record-separator-shaft gear.
11	Guide	—Main-lever-spring guide.
12	Lever	—Index lever.
14	Lever	—Locating lever and pawl.
15	Lever	—Main lever.
16	Lever	—Pickup lift-cable lever.
17	Lever	—Record-discriminating lever and pawl.
18	Lever	—Record-separator elevating lever.
19	Lever	—Trip-detaining lever.
20	Lever	—Trip lever.
21	Lever	—Trip-regulator lever.
22	Pawl	—Trip pawl.
23	Pin	—Separator-shaft pin (engages gear).
25	Separator	—Record-separator knife.
26	Spring	—Pickup-arm starting spring.
27	Shelf	—Record-support shelf.
28	Spring	—Record-discriminating-lever pawl spring, or locating-lever pawl spring.
31	Spring	—Pickup lift-cable spring.
34	Shaft	—Record separator shaft.
35	Spring	—Locating-lever spring.
40	Gear	—Short arm and rack gear.
41	Gear	—Long arm and rack gear.
42	Cam	—Cam and drive gear assembly.
43	Spring	—Main-lever spring.
50	Casting	—Casting and bearing for spindle and lead screw.
51	Screw	—Lead screw and pinion gear for recorder drive.
52	Spring	—Tension spring for motor idler pulley arm.
53	Arm	—Motor drive disc arm.

Names of Mechanism Adjustments

"A" Rubber Bumper.—Maintains 1/16-inch clearance between roller (on end of main lever) and cam plate.

"B" Friction Clutch Adjustment.—Regulates tripping of record-changing cycle when pickup swings in eccentric groove.

"C" Pickup Lift-Cable Adjustment.—Regulates height that pick-up arm is lifted during record-changing cycle.

"D" Needle Landing Position for 10-inch Records.—The relation between pickup shaft and trip lever "20," which are fastened by set screws "D," determines needle landing position for 10-inch records.

"E" Needle Landing Position for 12-inch Records.—Eccentric stud "E" adjusts position of lever "14" which determines landing position for 12-inch records.

"F" Record separator knife adjustment for 10-inch records, adjusts spacing of knife with relation to record shelf so knife will accurately slice in between the bottom 10-inch record and the rest of the stack.

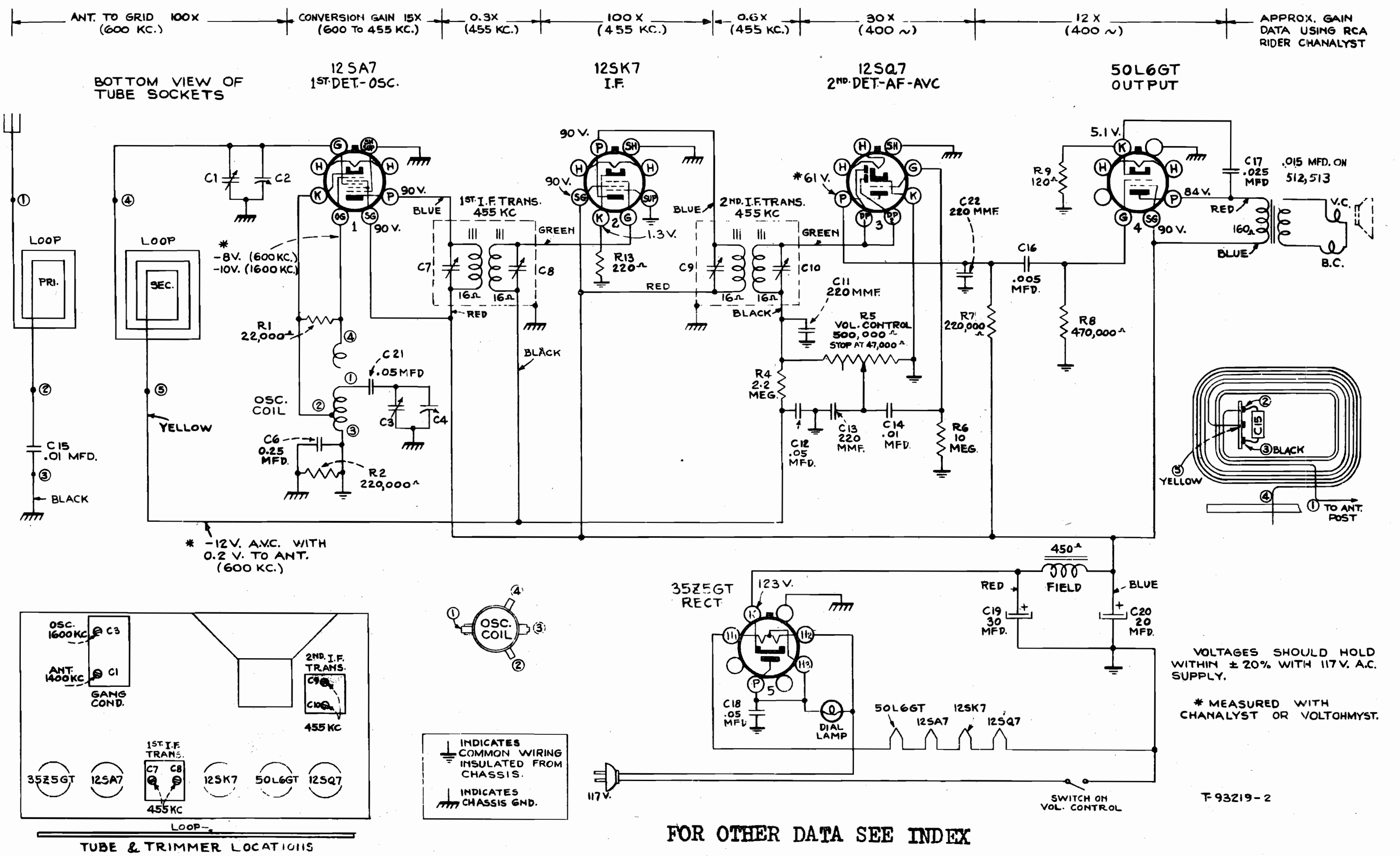
"G" Record separator knife adjustment for 12-inch records, adjusts movement of elevating lever which raises knife to compensate for greater thickness of 12-inch records.

"H" Record support shelf set screws, to adjust record support self on each record post, so the shelves move out from under the bottom record at the same instant, permitting record to drop properly.

"K" Trip-pawl stop pin, regulates point at which the roller on main lever enters the cam.

MODEL Radiola 500, 501
Ch. RC-464

RCA MFG. CO., INC.



FOR OTHER DATA SEE INDEX

Power-Supply Polarity. — For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

Frequency Range .... 535-1,720 kc

Intermediate Frequency .... 455 kc

Power Output (117 volt, 60 cycle supply)........... 1.0 watt

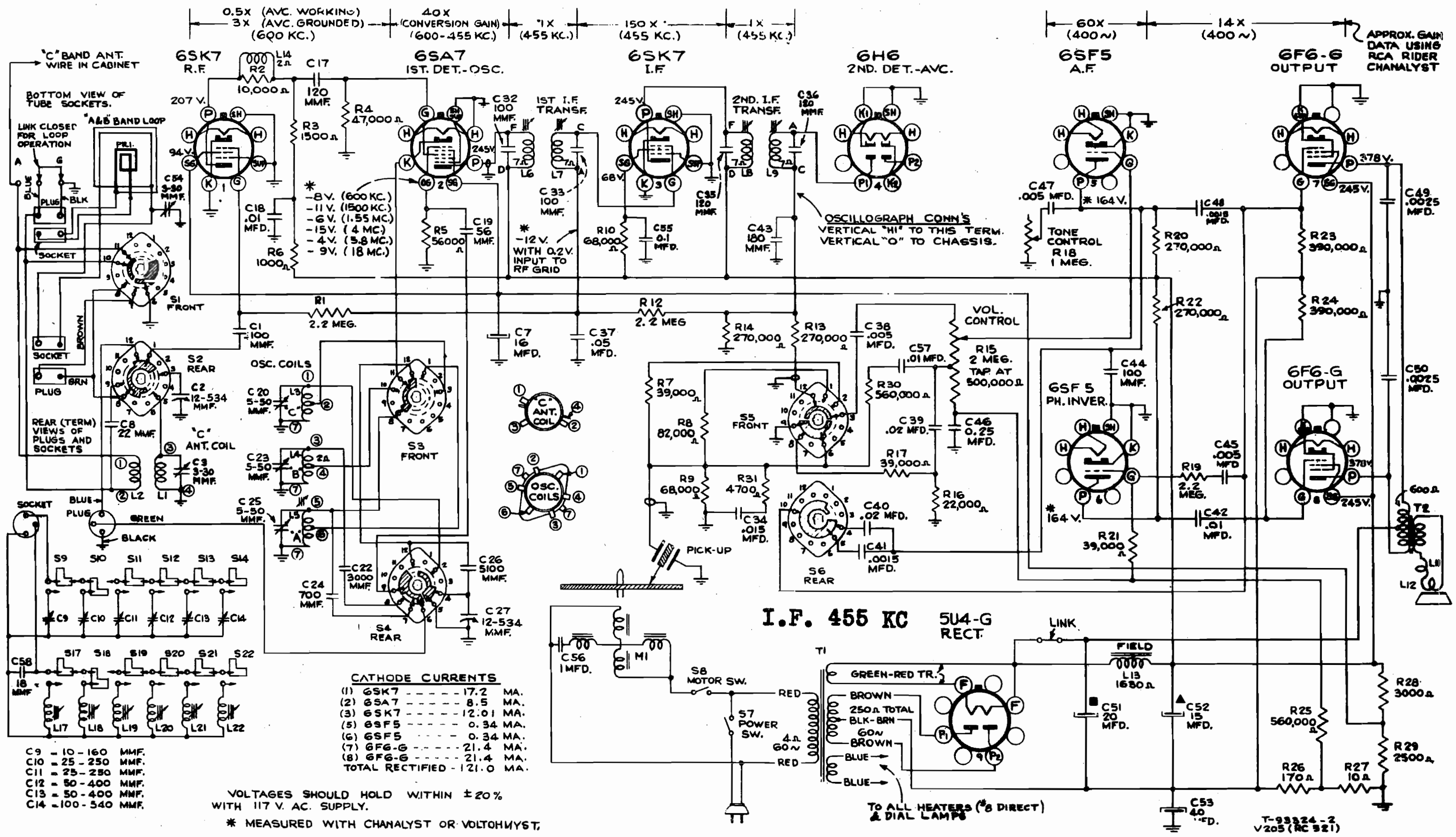
1. Dress grid lead of 12SK7 close to chassis under condenser (C12).
2. Dress green and blue leads from i-f transformers close to chassis and away from each other.
3. Dress leads from terminal board on loop support away from loop.

Loudspeaker .... 4-inch Electrodynamic

Power Supply Ratings ... 105-125 volts, direct current, or 50-60 cycles, 30 watts

RCA MFG. CO., INC.

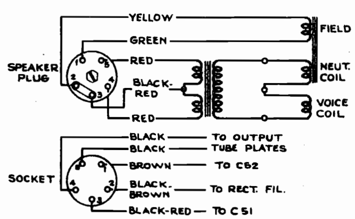
MODEL V-205, Ch. RC-521
MODEL V-405, Ch. RC-521B



CATHODE CURRENTS		
(1) 6SK7	17.2	MA.
(2) 6SA7	8.5	MA.
(3) 6SK7	12.01	MA.
(5) 6SF5	0.34	MA.
(6) 6SF5	0.34	MA.
(7) 6F6-G	21.4	MA.
(8) 6F6-G	21.4	MA.
TOTAL RECTIFIED	121.0	MA.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC. SUPPLY.
* MEASURED WITH CHANALYST OR VOLTOHMYST.

ON SOME MODELS R31 IS 3900 OHMS



Speaker Connections

FOR OTHER DATA SEE INDEX

Frequency Ranges

Standard Broadcast (A)	540-1,600 kc
Medium Wave (B)	1,550-4,000 kc
Short Wave (C)	5,800-18,000 kc

Electric Tuning

No. of Stations	Appr. Range
1	540-1,080 kc
2	610-1,250 kc
2	740-1,430 kc
1	880-1,550 kc

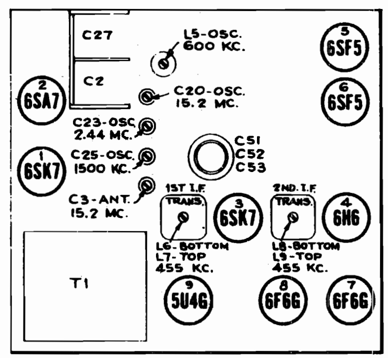
Pilot Lamps .... 4 Mazda Type 51—6-8 volts, 0.2 amps.
1 Mazda Type 55—6-8 volts, 0.4 amps.

Loudspeaker

Type	12-inch electrodynamic
Voice Coil Impedance	2.2 ohms at 400 cycles
Identification Number	RL-70M-2

Power Supply Ratings

105-125 volts, 25, 50 or 60 cycles	155 watts
105-125, 205-250 volts, 50 or 60 cycles	155 watts



MODEL V-205, Ch. RC-521
MODEL V-405, Ch. RC-521B

RCA MFG. CO., INC.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagrams.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Electronic Voltmeter.—The electronic voltmeter in the Chanalyst or VoltOhmyst provides an unexcelled output indicator. It should be connected to the AVC bus, and the test-oscillator output adjusted to produce several volts of AVC.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

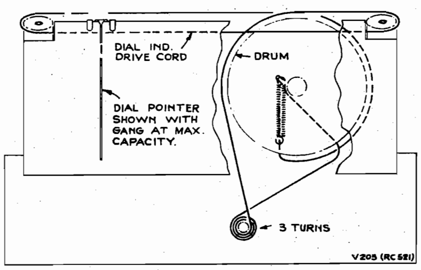
Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.
4. After completion of alignment, replace the glass dial in cabinet, taking care that the fibre light shields are in correct position at ends of dial.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale. For example, 1,100 kc is approximately 4 inches from the reference mark.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.



Phonograph Information

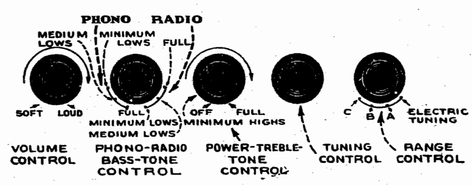
For information regarding the automatic record changer refer to service note covering RP-152 record changers.

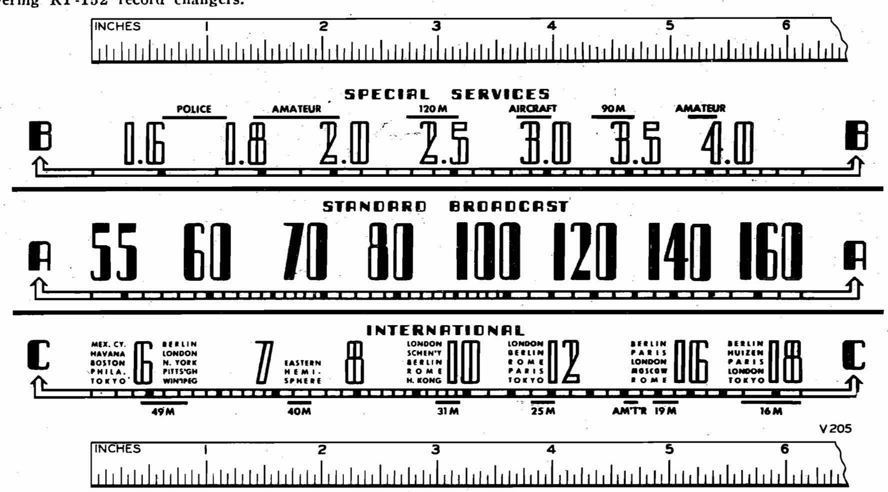
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet Point between 550 and 750 kc	L9, L8 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L7, L6 (1st I-F Trans.)
3		1,500 kc	"A" Band 1,500 kc	C25 (osc.)
4		600 kc	"A" Band 600 kc	L5 (osc.)
5	Repeat steps 3 and 4.			
6	6SA7 grid in series with 0.01 mfd.	2.44 mc	"B" Band 2.44 mc	C23 (osc.)
7	Ant. terminal in series with 47 mmf.	15.2 mc	"C" Band 15.2 mc	C20* (osc.) C3 (ant.)
	Assemble chassis in cabinet.			
8	Radiated signal 1,500 kc.		"A" Band Signal Frequency	C54 (ant.) (on loop assembly)
9	Radiated signal 600 kc.			L5 (osc.) (Rock in)
10	Repeat steps 9 and 10.			

* Use minimum capacity peak.

Precautionary Lead Dress:

1. "C" Band lead from antenna coil high side to No. 5 terminal on range switch must be held to correct length.
2. Lead from No. 3 terminal on rear switch to the variable condenser must be held to correct length and dressed away from side apron.
3. Lead from No. 4 terminal on front section of range switch must be held to correct length and dressed to rear of wafer.
4. Lead from No. 2 terminal on front section of range switch to oscillator must be held to length and dressed to the rear of the wafer.
5. Dress the leads to the power switch as free as possible.
6. Dress lead from pickup plug to terminal board on side apron down and towards the side apron.
7. Dress plate leads on output tubes toward the chassis.

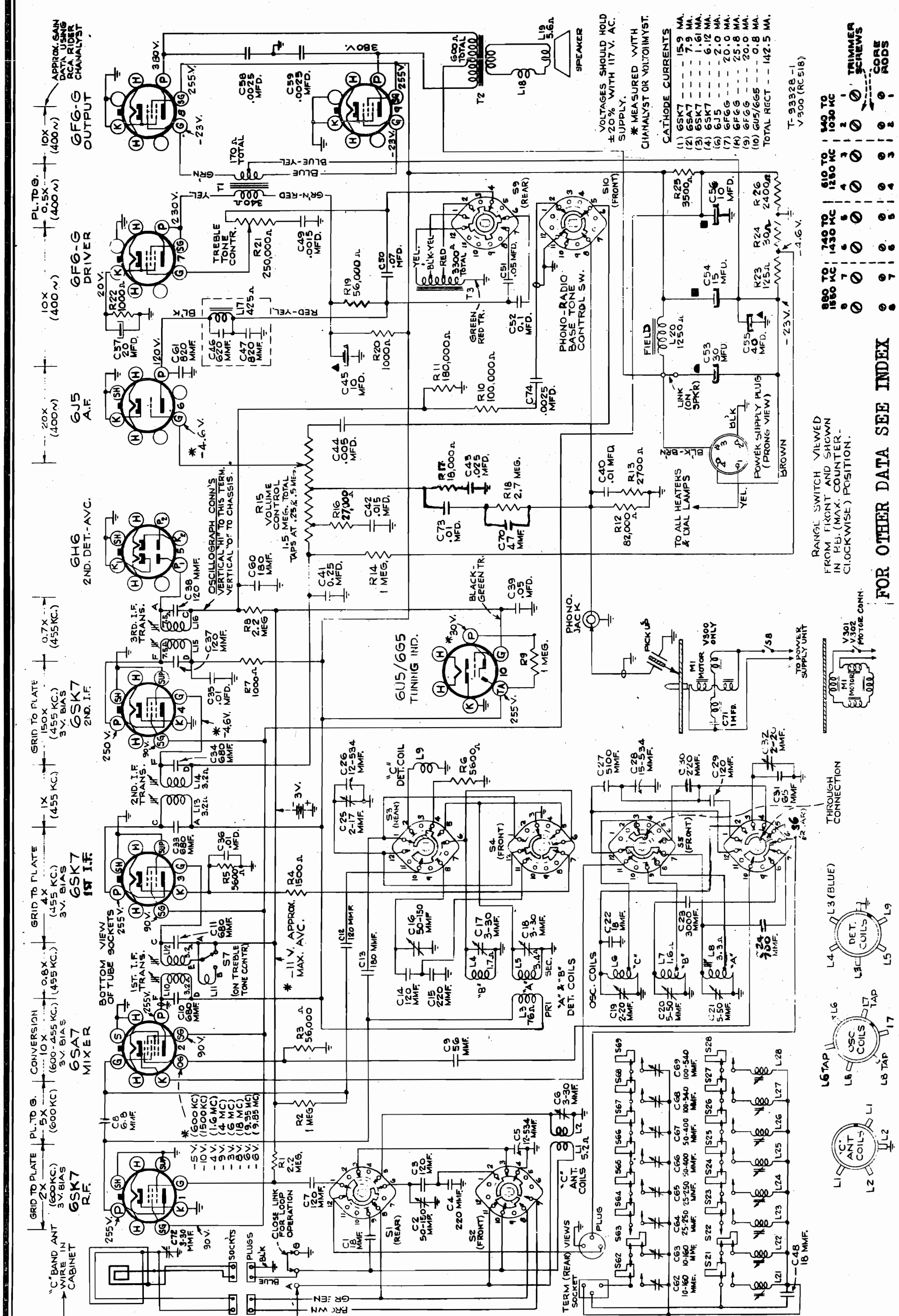




Calibration Scale

RCA MFG. CO., INC.

MODEL V-300, Ch. RC-518
MODEL V-301, Ch. RC-518A
MODEL V-302, Ch. R-518A



When measuring R-F and I-F gain, a 3-volt bias was connected between the A.V.C. bus and chassis, as shown in dotted lines.

V.C. Impedance .... 7.2 ohms at 400 cycles

FOR OTHER DATA SEE INDEX

FREQUENCY RANGES

Broadcast "A"	540-1,600 kc
Medium Wave "B"	1.55-4.0 mc
Short Wave "C"	5.8-18.0 mc
Spread Band	9.34-9.86 mc

POWER OUTPUT RATING

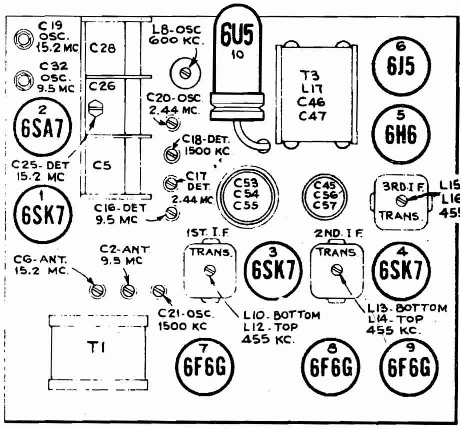
Undistorted	18 watts
Maximum	20 watts

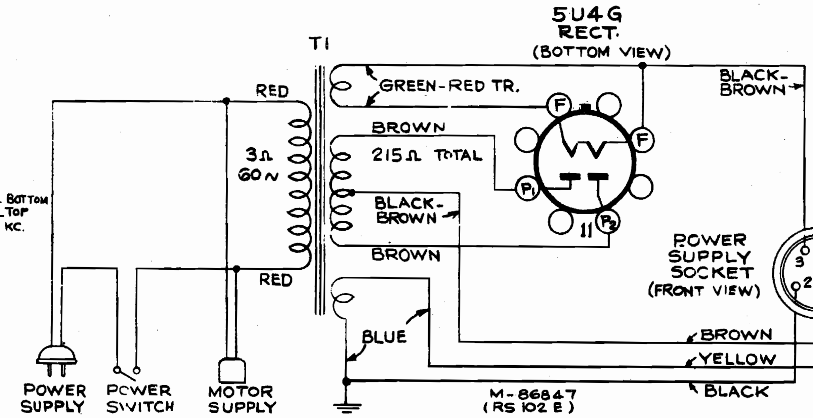
POWER SUPPLY RATINGS

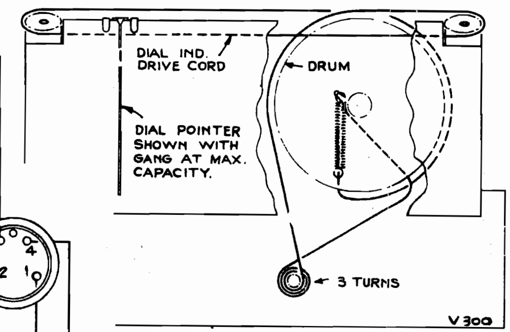
105-125 volts, 60 cycles	200 watts
105-125 volts, 25 cycles	200 watts

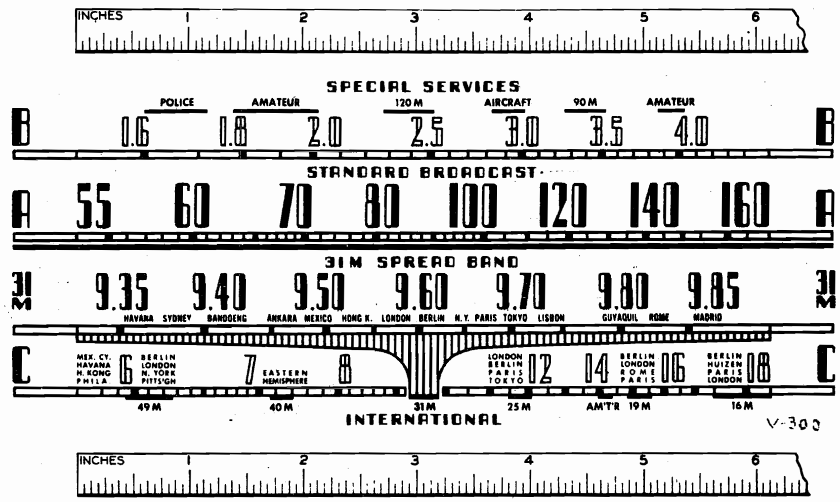
MODEL V-300, Ch. RC-518
MODEL V-301, Ch. RC-518A
MODEL V-302, Ch. R-518A

RCA MFG. CO., INC.









Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn "Treble Tone Control" (center knob) counter-clockwise so that I-F is in "Sharp" position.			
2	2nd I-F grid, in series with .01 mfd.	455 kc	"A" Band Quiet Point at HF end	L15 and L16* (3rd I-F Trans.)
3	1st I-F grid, in series with .01 mfd.			L13 and L14* (2nd I-F Trans.)
4	1st-Det. grid, in series with .01 mfd.			L10 and L12* (1st I-F Trans.)
5	Turn Treble Tone Control full clockwise to "Broad" position. Response on CRO should be the conventional double-humped type. If necessary, retouch 3rd I-F transformer slightly (so as not to disturb the "Sharp" curve appreciably). Leave control in sharp position for the following steps.			
6	Ant. terminal, in series with 47 mmfd. (link closed)	15.2 mc	"C" Band 15.2 mc	C19 (osc.)** C25 (det.) C6 (ant.)
7		9.5 mc	"31M" Band 9.5 mc	C32 (osc.)** C16 (det.) C2 (ant.)
8	Rear stator of gang, in series with .01 mfd.	2.44 mc	"B" Band 2.44 mc	C20 (osc.) C17 (det.)
9		600 kc	"A" Band 600 kc	L8 (osc.) Rock in
10		1,500 kc	"A" Band 1,500 kc	C21 (osc.) C18 (det.)
11	Repeat steps 9 and 10.			
12	Install and connect chassis in cabinet. Tune in a radiated oscillator signal at 1,500 kc and peak the "A" band trimmer C72 (on loop). Rock in L4 for peak output.			

* Adjust for coincidental curves and maximum gain.
** Use minimum capacity peak if two peaks can be obtained. (Check for correct peak on "C" band by tuning receiver to 14.29 mc, where a weaker signal should be received.)

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

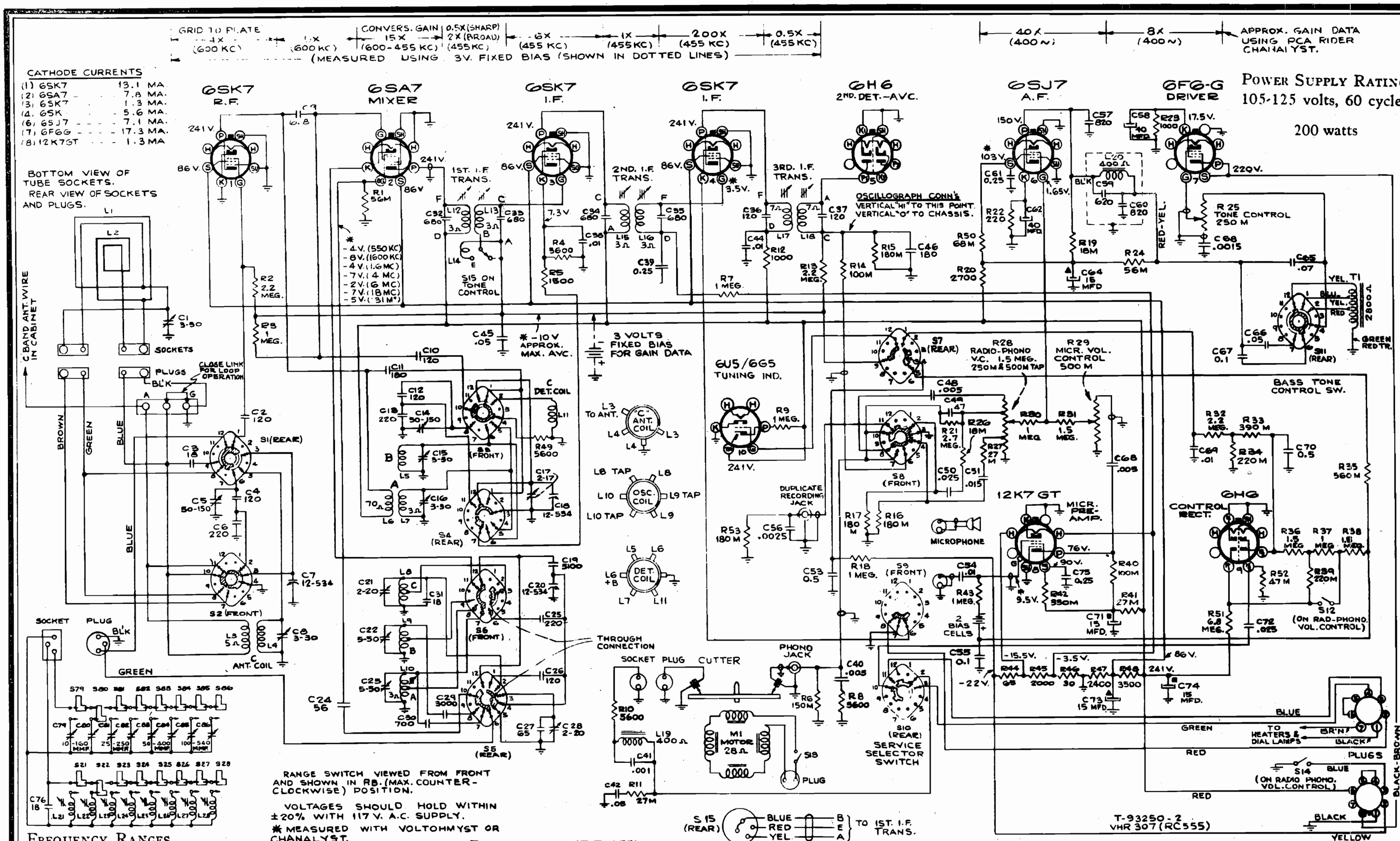
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

RCA MFG. CO., INC.

MODEL VHR-307
Ch. RC-555



Power Supply Rating
105-125 volts, 60 cycles
200 watts

Frequency Ranges

Broadcast, "A" Band	540-1,600 kc
Short Wave, "B" Band (VHR-207, 407)	1,550-4,000 kc
Short Wave, "C" Band	5,800-18,000 kc
Spread Band	9,340-9,860 kc

Intermediate Frequency .... 455 kc

Loudspeaker

(Electrodynamic)	RL-94-2
Diameter	15 inches
Voice-coil impedance at 400 cycles	7.2 ohms

Phonograph (RP-155)

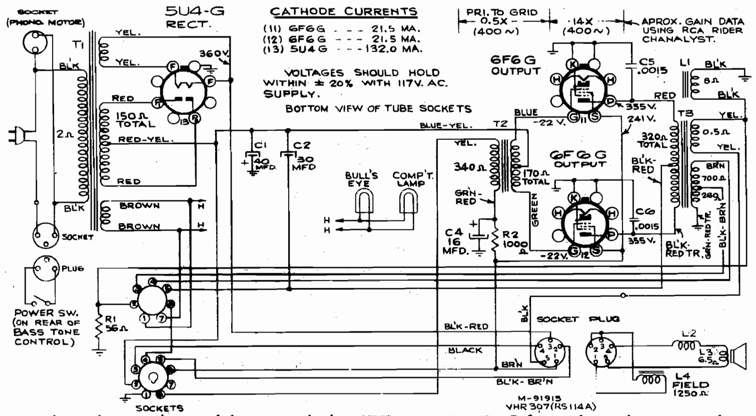
Type	Automatic
Record Capacity	Eight 10-inch or Seven 12-inch
Turntable Speed	78 r.p.m.
Drive...	Motor drive through idler on inside rim of turntable
Type Pickup	Crystal
Pickup Impedance	100,000 ohms at 1,000 cycles
Average Output...	1½ volts at 1,000 cycles across ½ meg.

Recorder (RP-155)

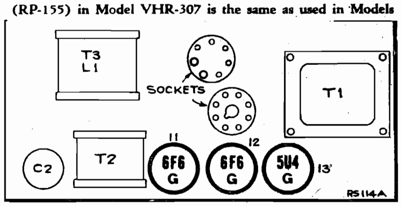
Recording Head (cutter)	Crystal
Impedance of Cutter at 1,000 cycles...	Approx. 60,000 ohms
Turntable Speed	78 r.p.m.
Grooves Cut per Inch	Approx. 115
Inches Cut per Minute	Approx. .713 inch
Recording Blank Discs	Coated metal-base or coated paper-base
Recording Disc Diameter	Up to 10 inches
Drive...	Motor drive through idler on inside rim of turntable; the turntable spindle drives a lead screw under motor board which guides the recorder arm from outside of recording blank to inside
Motor Wattage	35 watts

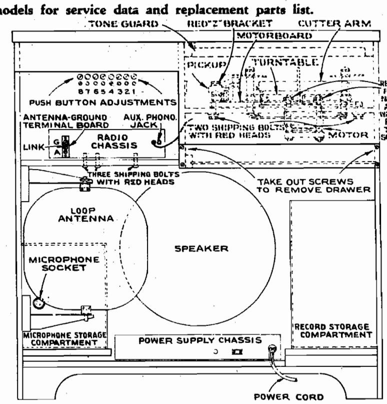
MODEL VHR-307
Ch. RC-555

RCA MFG. CO., INC.



The recorder and automatic record-changer mechanism (RP-155) in Model VHR-307 is the same as used in Models VHR-202, 207, 407. Refer to the service note on these models for service data and replacement parts list.





SERVICE SELECTOR

RECORDING:
1. CUTTING RECORDS OF VOICE OR MUSIC THROUGH MICROPHONE.
2. CUTTING RECORDS OF PHONOGRAPH SELECTIONS USING AUXILIARY TURNTABLE.
3. CUTTING RECORDS OF PHONOGRAPH SELECTIONS WITH VOICE OR MUSIC "MIXED IN" THROUGH MICROPHONE.

RADIO:
1. RADIO PROGRAMS.
2. RADIO PROGRAMS MIXED WITH VOICE OR MUSIC BY MICROPHONE.

PHONOGRAPH:
1. PHONOGRAPH RECORD SELECTIONS.
2. PHONOGRAPH SELECTIONS MIXED WITH VOICE OR MUSIC BY MICROPHONE.
3. MICROPHONE ONLY (RA).

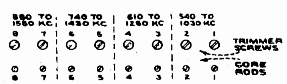
RADIO RECORDING:
1. CUTTING RECORDS OF RADIO PROGRAMS.
2. CUTTING RECORDS OF RADIO PROGRAMS WITH VOICE OR MUSIC "MIXED IN" THROUGH MICROPHONE.

Push Button Adjustments

The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

The procedure is as follows:

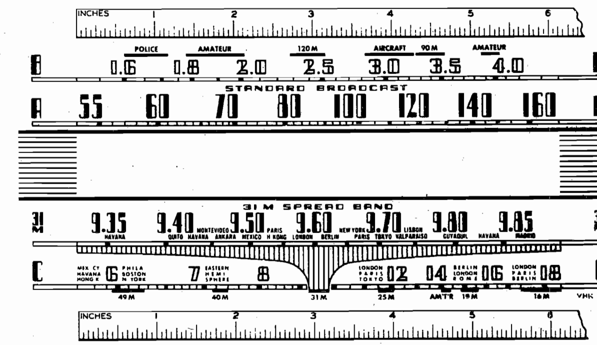
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast position and manually tune in the first station on the list.
3. Turn range switch to push-button position and press in the left-hand button.
4. Adjust core rod No. 1 to receive the first station. To secure the best adjustment, rotate the loop for least pickup, and adjust core rod No. 1 for peak output.
5. Adjust trimmer screw No. 1 for peak output on the first station.

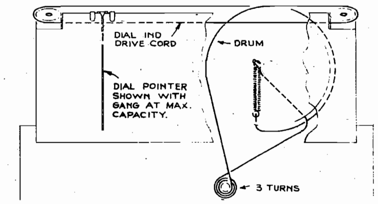


6. Proceed in the same manner to adjust for the remaining stations.
7. Repeat adjustments for best results.

On the 880 to 1,550 kc push-buttons, the higher frequency stations may be received with core rod No. 7 or 8 either in or out (oscillator frequency either 455 kc below or 455 kc above the station frequency). The adjustment with the core in its out position (oscillator frequency 455 kc above the station frequency) is the correct one.

NOTE: Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.





Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.

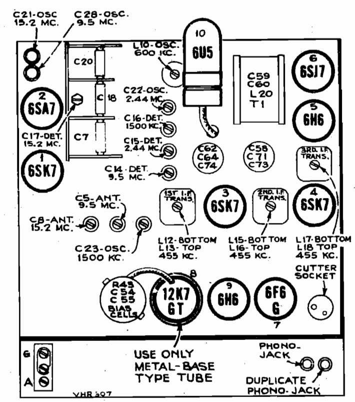
Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.

2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.



Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.

2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.

3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

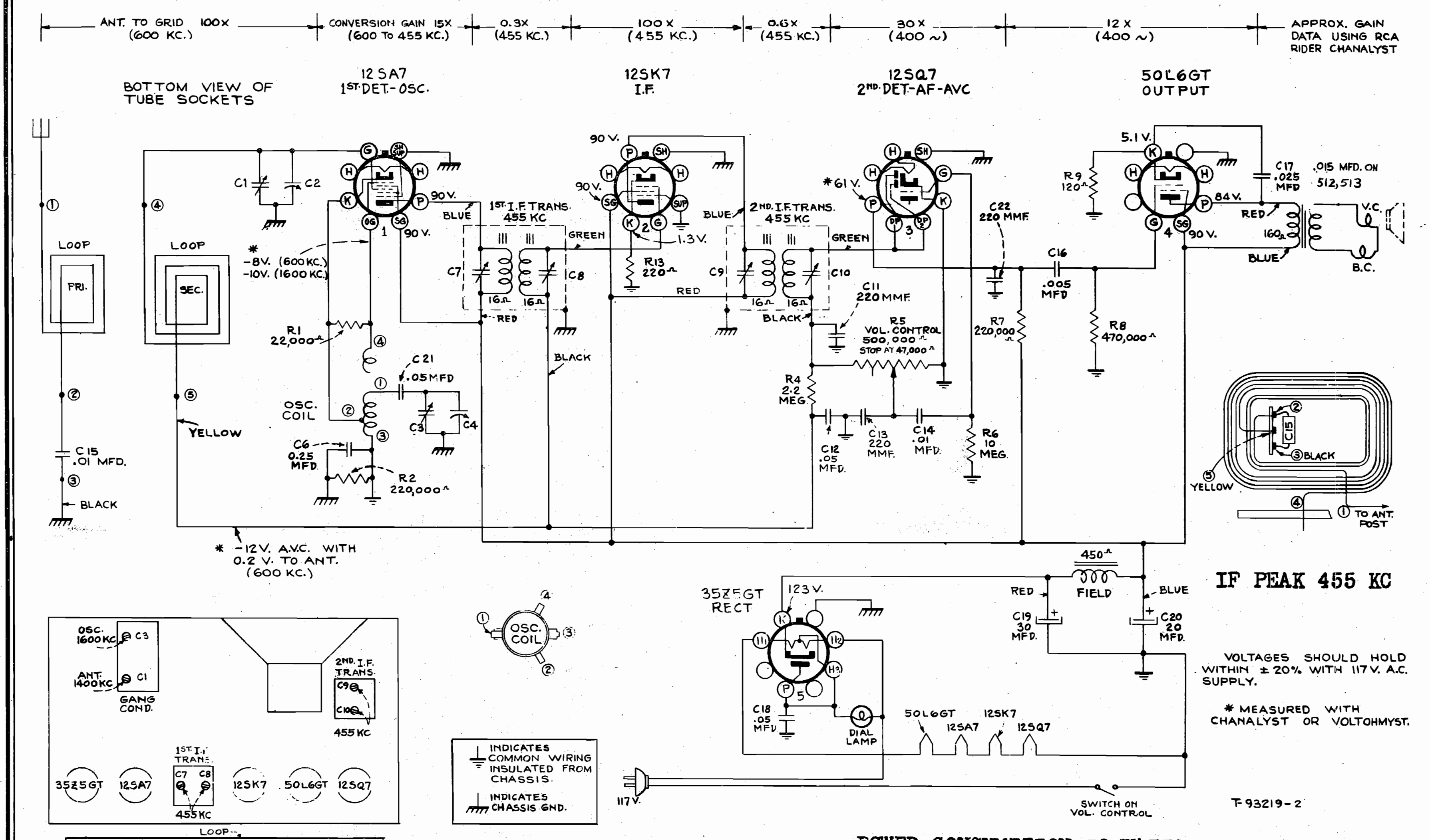
Dial-Pointer Adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn Radio dial to—	Adjust the following for maximum peak output
1	Turn "Treble Tone Control" counter-clockwise so that I-F is in "Sharp" position.			
2	2nd I-F grid, in series with .01 mfd.	455 kc	"A" Band Quiet Point at HF end	L17 and L18* (3rd I-F Trans.)
3	1st I-F grid, in series with .01 mfd.			L15 and L16* (2nd I-F Trans.)
4	1st-Det. grid, in series with .01 mfd.			L12 and L13* (1st I-F Trans.)
5	Turn Treble Tone Control full clockwise to "Broad" position. Response on CRO should be the conventional double-humped type. If necessary, retouch 3rd I-F transformer slightly (so as not to disturb the "Sharp" curve appreciably). Leave control in sharp position for the following steps.			
6	Ant. terminal, in series with 47 mmfd. (link closed)	15.2 mc	"C" Band 15.2 mc	C21 (osc.)** C17 (det.)*** C8 (ant.)***
7		9.5 mc	"31M" Band 9.5 mc	C28 (osc.)** C14 (det.)*** C5 (ant.)***
8	Rear stator of gang, in series with .01 mfd.	2.44 mc	"B" Band 2.44 mc	C22 (osc.) C15 (det.)
9		600 kc	"A" Band 600 kc	L10 (osc.) Rock in
10		1,500 kc	"A" Band 1,500 kc	C23 (osc.) C16 (det.)
11	Repeat steps 9 and 10.			
12	Install and connect chassis in cabinet with antenna link closed. Tune in a radiated oscillator signal at 1,500 kc and peak the "A" band trimmer C1 (on loop). Rock in L10 for peak output at 600 kc.			

* Adjust for coincidental curves and maximum gain.
** Use minimum capacity peak if two peaks can be obtained. (Check for correct peak on "C" band by tuning receiver to 14.29 mc, where a weaker signal should be received.)
*** Rock in.

RCA MFG. CO., INC.

MODELS 510, 511, 512, 513



IF PEAK 455 KC

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117V. A.C. SUPPLY.

* MEASURED WITH CHANALYST OR VOLTOHMYST.

T-93219-2

POWER CONSUMPTION 30 WATTS

Power-Supply Polarity.—For operation on d-c, the power plug must be inserted in the outlet for correct polarity. If the set does not function, reverse the plug. On a-c, reversal of the plug may reduce hum.

1. Dress grid lead of 12SK7 close to chassis under condenser (C12).
2. Dress green and blue leads from i-f transformers close to chassis and away from each other.
3. Dress leads from terminal board on loop support away from loop.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

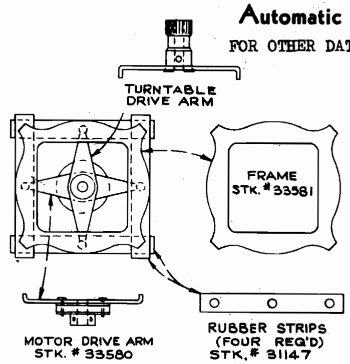
MODELS RP-152, -A, -B, -C, -D, -J
MODEL RP-153

RCA MFG. CO., INC.

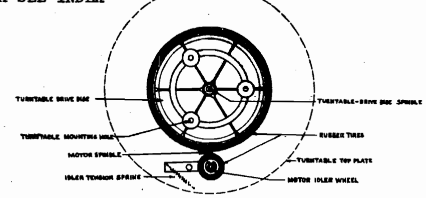
RP-152, -A, -B, -C, -D, -J and RP-153

Automatic Record Changers

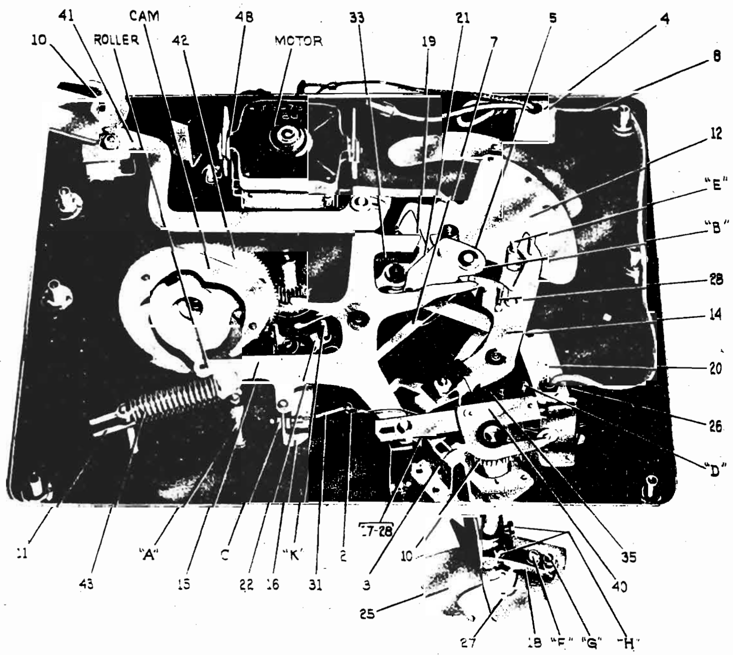
FOR OTHER DATA SEE INDEX



Motor Coupling Details on RP-153



Motor Drive Details on RP-152, -A, -B, -C, -D, -J



Bottom View of RP-152, -A, -B, -C, -J Automatic Record Changer

RP-153 mechanisms are similar to above but have flexible coupling turntable drive, and automatic switch.

RP-152-D mechanisms are similar to above but include automatic switch.

Note: Numbers refer to parts—letters refer to adjustments.

TECHNICAL INFORMATION AND SERVICE DATA

—1940 No. 38—

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. Rotate the turntable until the changer is out-of-cycle; and check rubber bumper bracket (A). The roller should clear the nose of the cam plate by approximately 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.

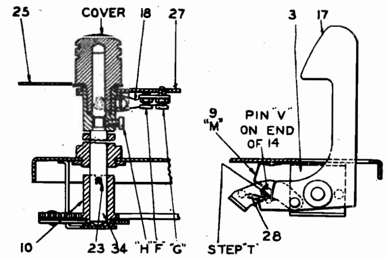
D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10-inch record. Position of eccentric stud "E" governs the landing of the needle on a 12-inch record; this, however, is dependent on the proper 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 4⅞ 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 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 motorboard, 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 .078 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—.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 .075—.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 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 "27" so that the curved inner edges of the shelves are uniformly spaced approximately 1/16-inch from the record edge. Some backlash will be present in the rotation of these shelves. They should be adjusted so that the backlash permits them to move away from the record but not closer than the approximate 1/16 inch specified above. Tighten the blunt tipped screw "H," run mechanism through cycle several times to check action, then tighten cone tipped 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 motorboard. 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 and pulleys on underside of motorboard.

Do not allow oil or grease to come in contact with rubber bumper or rubber parts of the mechanism.

MOTOR SERVICE DATA

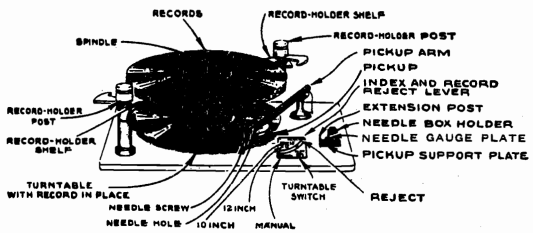
On the RP-152 drive motors a 0.014-inch feeler gage is recommended for centering the rotor in the field bore.

The field coils can be disassembled and reassembled if care is used in reassembling the field lamination block in a manner so that the dove tail joint will not be sprung.

When disassembling the rotor or rotor shaft bearing only, the field stacking should be held in a clamp to prevent the field springing when the bolts which hold the assembly together are loosened.

RCA MFG. CO., INC.

AUTOMATIC RECORD CHANGER REPLACEMENT PARTS



When the RP-152-D and RP-153 type record changers are operated in the "manual" position, power to the drive motor is controlled by an automatic starting and stopping switch. The mounting holes on this switch are elongated for adjustment purposes. Proper adjustment is obtained when power is disconnected with the pickup needle 1¾ inches from the center of the turntable spindle.

FOR OTHER DATA SEE INDEX

Replacement Parts Model RP-152

Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price
	PICKUP AND ARM ASSEMBLIES (RP-152)	
33906	Arm—Pickup arm only—less crystal, cable, and pivot arm	.45
36320	Arm—Pickup pivot arm and shaft—less lift cable and rubber bushings	1.00
34550	Bushing—Rubber bushing for pickup pivot arm	.05
32635	Cable—Pickup lift cable	.24
35694	Cable—Pickup shielded cable (8)	.40
35171	Crystal—Pickup crystal cartridge and needle screw	4.25
33529	Screw—Pickup needle screw	.10
	PICKUP AND ARM ASSEMBLIES (RP-152-A)	
36321	Arm—Pickup arm only—less crystal, cable, and pivot arm	.75
36320	Arm—Pickup pivot arm and shaft—less lift cable and rubber bushings	1.00
34550	Bushing—Rubber bushing for pickup pivot arm	.05
32635	Cable—Pickup lift cable	.24
35694	Cable—Shielded pickup cable (8)	.40
35171	Crystal—Pickup crystal cartridge and needle screw	4.25
33974	Screw—Pickup needle screw	.15
	PICKUP AND ARM ASSEMBLIES (RP-152-B)	
36322	Arm—Pickup arm only—less crystal, cable, and pivot arm and shaft	1.80
36320	Arm—Pickup pivot arm and shaft—less lift cable and rubber bushings	1.00
34550	Bushing—Rubber bushing for pickup pivot arm	.05
32635	Cable—Pickup lift cable	.24
35694	Cable—Pickup shielded cable	.40
37158	Crystal—Pickup crystal cartridge and needle screw	4.25
33529	Screw—Pickup needle screw	.10
	PICKUP AND ARM ASSEMBLIES (RP-152-C)	
36591	Arm—Pickup arm shell only	.75
36320	Arm—Pickup pivot arm and shaft—less lift cable and rubber bushings	1.00
34550	Bushing—Rubber bushing for pickup pivot arm	.05
32635	Cable—Pickup lift cable	.24
32556	Cable—Shielded pickup cable	.75
35171	Crystal—Pickup unit crystal cartridge	4.25
33974	Screw—Needle screw	.15
	PICKUP AND ARM ASSEMBLIES (RP-152-D)	
37181	Arm—Pickup arm (shell only)	1.80
36320	Arm—Pickup pivot arm and shaft—less lift cable and rubber bushings	1.00
34550	Bushing—Rubber bushing for pivot arm	.05
32635	Cable—Pickup lift cable	.24
33905	Crystal—Pickup crystal cartridge	4.25
33976	Pin—Support pin used to fasten arm shell to pivot arm	.03
33529	Screw—Needle screw	.10
	PICKUP AND ARM ASSEMBLIES (RP-152-J)	
36322	Arm—Pickup arm (shell only)	1.80
36320	Arm—Pickup pivot arm and shaft—less lift cable and rubber bushings	1.00
34550	Bushing—Rubber bushing for pivot arm	.05
32635	Cable—Pickup lift cable	.24
35694	Cable—Shielded pickup cable to shorting switch	.40
37158	Crystal—Pickup crystal cartridge	4.25
33976	Pin—Used to attach pickup arm to pivot arm	.03
33529	Screw—Needle screw	.10

STOCK No.	DESCRIPTION	Unit List Price
	MOTOR ASSEMBLIES (110 volts, 60 cycles) (Motor No. 91706-1) (RP-152 — RP-152-A)	
	NOTE: For complete 110 volts, 60 cycle motor replacement order: 1—Stock No. 36254 Motor—with capacitor 1—Stock No. 36274 Idler wheel 1—Stock No. 36275 Idler wheel arm 2—Stock No. 33726 "C" washer for idler wheel 1—Stock No. 30585 Spring for idler	
37108	Bearing—Bottom bearing and bracket	.40
37107	Bearing—Top bearing and bracket	.40
37109	Bracket—Motor mounting bracket	.40
37111	Coil—Motor field coil assembly	1.50
37110	Rotor—Motor rotor complete with fan	1.75
37106	Pad—Rotor thrust pad	.05
	MOTOR ASSEMBLIES (Motor No. 91655-1, 2, and 3)	
36954	Armature—Motor armature and shaft for 25 cycle motor	7.85
36953	Armature—Motor armature and shaft for 50 cycle motor	4.00
36255	Armature—Motor armature and shaft for 60 cycle motor	2.75
36952	Cap—Bakelite cap for motor	.50
36955	Capacitor—1.1 mfd. for 60 cycle motor	1.50
36951	Capacitor—1.25 mfd. for motors (1 required for 50 cycles) (2 required for 25 cycles)	1.75
36726	Motor—105-125 volts, 25 cycle, complete with capacitor	10.75
36725	Motor—105-125 volts, 50 cycle, complete with capacitor	8.00
36254	Motor—105-125 volts, 60 cycle, complete with capacitor	6.75
	MOTORBOARD ASSEMBLIES	
36259	Base—Pickup arm mounting base—RP-152 only	.40
36378	Base—Pickup arm mounting base—RP-152-A, RP-152-B, and RP-152-J only	.40
36512	Base—Pickup arm mounting base—RP-152-C only	.40
36811	Base—Pickup arm mounting base—RP-152-D only	.40
36257	Board—Motorboard complete with bearings and posts—less operating parts—RP-152 only	7.00
36375	Board—Motorboard complete with bearings and posts—less operating parts—RP-152-A, RP-152-B, and RP-152-J	7.00
36256	Board—Motorboard complete with bearings and posts—less operating mechanisms—RP-152-C only	7.00
36813	Board—Motorboard with welded and riveted studs and bearing—less operating parts—RP-152-D only	7.00
32556	Cable—Shielded pickup cable and plug, connects to shorting switch	.75
36262	Cup—Used needle (insert only for pickup rest)—RP-152, RP-152-A, RP-152-B, RP-152-C and RP-152-J)	.15
36518	Cup—Used needle cup (insert for pickup rest)—RP-152-D only	.40
36258	Escutcheon—Index escutcheon—RP-152, RP-152-A, RP-152-B, RP-152-C and RP-152-J	.25
36377	Escutcheon—Index escutcheon—RP-152-D only	.50
36260	Gauge—Pickup needle gauge	.15
34368	Grommet—Rubber grommet for motor mounting	.08
36263	Plate—Turntable shaft support and spring plate	.40
30870	Plug—2-contact male for motor leads	.35
31048	Plug—Plug for pickup leads—RP-152-D only	.15
36261	Rest—Pickup arm rest—RP-152 only	.35
36379	Rest—Pickup arm rest—RP-152-A, RP-152-B and RP-152-J	.25

Replacement Parts Model RP-152 (Continued)

STOCK No.	DESCRIPTION	Unit List Price
36812	Rest—Pickup arm rest—RP-152-D only	.35
36543	Rest—Pickup arm rest—RP-152-C only	.25
36798	Spring—Index lever spring (riveted to motor-board)	.20
32875	Switch—Motor switch (4)	.30
	OPERATING MECHANISMS	
36275	Arm—Motor idler wheel arm and studs—less wheel—for use with motor marked No. 91655	.25
10129	Ball—Steel ball for spindle shaft	.02
33984	Bracket—Bracket and pin for locating post and lever (3)	.20
36277	Bumper—Main lever rubber bumper	.10
33987	Cam—Cam and drive gear complete (42)	2.00
36531	Cam—Trip lever cam and link—RP-152-D only	.75
36266	Clutch—Trip lever clutch—less adjusting stud (5)	.25
36282	Disc—Turntable drive disc, rubber tire, and spindle shaft assembled—less turntable finished plate	2.80
36265	Finger—Trip lever friction finger (7)	.50
31121	Gear—Record separator shaft gear (10)	.90
36280	Gear—Turntable shaft drive gear	.75
33982	Guide—Main lever spring guide (11)	.10
31151	Guide—Pickup lift cable guide (spring) (2)	.10
36264	Lever—Index lever—RP-152 only (12)	.70
36380	Lever—Index lever—RP-152-A, RP-152-B, and RP-152-J	.70
36545	Lever—Index lever—RP-152-C only	.70
36816	Lever—Index lever—RP-152-D only	.70
36273	Lever—Locating lever and pawl—RP-152, RP-152-A, RP-152-B and RP-152-J	.50
31138	Lever—Locating lever and pawl—RP-152-C and RP-152-D (14)	.70
33985	Lever—Main lever (15)	1.05
31140	Lever—Pickup lift cable lever and spring (16)	.55
36814	Lever—Pickup discriminating lever and pawl—RP-152-D only	.85
36272	Lever—Record discriminating lever and pawl—RP-152 only (17)	.85
36381	Lever—Record discriminating lever and pawl—RP-152-A, RP-152-B, and RP-152-J	.85
36544	Lever—Record discriminating lever and pawl—RP-152-C only	.85
36476	Lever—Record separator elevating lever with adjustment screws (18)	.80
31132	Lever—Trip detaining lever (19)	.30
36530	Lever—Trip lever—less cam and link—RP-152-D only	1.60
36284	Lever—Trip lever—less friction finger and clutch—RP-152, RP-152-A, RP-152-B, RP-152-C, and RP-152-J (20)	1.25
36525	Link—Index link assembly—RP-152-D only	.20
31133	Pawl—Trip pawl (22)	.80
36268	Pin—Pin to fasten gear to separator shaft (23)	.05
36267	Rack—Long arm and gear (41)	.60
32880	Rack—Short arm and gear (40)	.55
36281	Ring—Retaining ring for set screw in turntable drive gear	.04
36477	Screw—No. 6-32 ball point screw for record separator elevating lever	.10

STOCK No.	DESCRIPTION	Unit List Price
36276	Screw—No. 6-32 x ⅛ cup point set screw for turntable drive gear	.02
31118	Screw—No. 10-32 x 5/16 cone pointed set screw for record separator shelf ("H")	.06
32869	Screw—No. 10-32 x 5/16 machine screw for record separator shelf	.01
4563	Screw—Pickup lift cable adjusting screw	.04
33983	Screw—Record separator elevating lever point screw	.15
36270	Separator—Record separator knife—RP-152 and RP-152-A only	1.85
33990	Separator—Record separator knife—RP-152-B, RP-152-J and RP-152-D (25)	1.85
34775	Separator—Record separator knife—RP-152-C only	1.95
33988	Shaft—Record separator shaft (34)	.70
36269	Shelf—Record separator rotating shelf—less set screw—RP-152, RP-152-A, and RP-152-C	1.25
33989	Shelf—Record separator rotating shelf—less set screws—RP-152-B, RP-152-D, and RP-152-J (27)	1.25
36269	Shelf—Record separator rotating shelf—less set screws—RP-152-C only	1.25
33994	Spring—Flat spring for record discriminator lever	.05
32882	Spring—Main lever spring (43)	.05
36580	Spring—Motor tension spring, for use with motor No. 91706-1—RP-152, RP-152-A, RP-152-B, RP-152-C, and RP-152-J	.08
36278	Spring—Pickup arm feed spring	.10
3666	Spring—Pickup lift cable spring (31)	.04
14190	Spring—Record discriminating lever pawl spring (28)	.08
3676	Spring—Tension spring for cam pawl	.04
30585	Spring—Tension spring for idler assembly, for use with motor marked No. 91655	.06
32436	Spring—Tension spring for locating lever and pawl (35)	.05
31136	Spring—Tension spring for roller index link—RP-152-D only	.05
36921	Spring—Tension spring for trip detaining lever	.03
36279	Spring—Tension spring for trip pawl	.02
36271	Stud—No. 4-40 hex stud for trip lever clutch adjustment	.08
36529	Switch—Automatic switch—RP-152-D only	1.10
34875	Switch—Pickup shorting switch—RP-152, RP-152-A, RP-152-B, RP-152-C, and RP-152-J	.45
36283	Turntable—Finished top plate only—RP-152, RP-152-A, RP-152-B, RP-152-C, and RP-152-J	1.25
36815	Turntable—Finished top plate only—RP-152-D only	1.00
31608	Washer—"C" washer for roller index link—RP-152-D only	.01
33726	Washer—"C" washer for motor idler—for use with motor marked No. 91655	.02
8078	Washer—Spring washer for mounting record discriminator lever	.06
2917	Washer—Spring washer for mounting levers	.03
36274	Wheel—Motor idler wheel and bearing—less arm—for use with motor marked No. 91655	.55

Replacement Parts Model RP-153

STOCK No.	DESCRIPTION	Unit List Price
	PICKUP AND ARM ASSEMBLIES	
36513	Arm—Pickup arm shell only	3.85
36320	Arm—Pickup support and pivot arm	1.00
34550	Bushing—Rubber bushing for pickup pivot arm	.05
32635	Cable—Pickup lift cable	.24
33905	Crystal—Pickup crystal cartridge and needle screw	4.25
33976	Pin—Pickup arm shell mounting pin	.03
	MOTOR ASSEMBLIES	
37300	Armature—Motor armature and worm gear for 50 cycle motor	XX
37298	Armature—Motor armature and worm gear for 60 cycle motor	XX
37303	Bearing—Fibre insert for motor spindle bottom bearing	XX
37296	Motor—105-120 volts, 50 cycles	XX
37295	Motor—105-120 volts, 60 cycles	32.00
37299	Spindle—Motor spindle and fibre gear for 50 cycle motor	XX
37297	Spindle—Motor spindle and fibre gear for 60 cycle motor	XX
37304	Support—Motor mounting support plate	.45
37301	Washer—"C" washer for motor armature shaft (thrust bearing)	XX
37302	Washer—Felt washer for motor armature shaft (thrust bearing)	XX

STOCK No.	DESCRIPTION	Unit List Price
	MOTORBOARD ASSEMBLIES	
36516	Base—Pickup arm mounting base	.40
36514	Board—Motorboard complete with bearings and posts—less operating parts	7.00
36517	Brace—Motorboard strain brace	.70
32556	Cable—Shielded pickup cable and plug, connects to shorting switch	.75
36518	Cup—Used needle cup	.40
36377	Escutcheon—Index escutcheon	.50
36260	Gauge—Pickup needle gauge	.15
30870	Plug—2-contact male for motor leads	.35
31572	Plug—Female, for switch leads	.15
36515	Rest—Tone arm rest and needle cup holder	.85
36798	Spring—Index lever spring (riveted to motor-board)	.20
	OPERATING MECHANISM	
34009	Arm—Motor coupling arm and gear—turntable end	.70
33580	Arm—Motor coupling arm and hub—motor end	.70
33984	Bracket—Bracket and pin for locating post and lever (3)	.20
36277	Bumper—Main lever rubber bumper	.10
33987	Cam—Cam and drive gear complete (42)	2.00
36531	Cam—Trip lever cam and link—less trip lever	.75

FOR BALANCE OF REPLACEMENT PARTS SEE INDEX

MODELS RP-152,
-A, -B, -C, -D, -J
MODEL RP-153

RCA MFG. CO., INC.

The RP-152 and RP-153 automatic record changers are very similar in design and construction. Most of the parts and adjustments are identical on both. The RP-153 turntable is driven through a worm gear in the motor housing while the RP-152 turntables are driven through a friction drive disc mounted under the turntable.

On Models RP-152 it is important that the drive motor spindle, and rubber tires on main driving disc and idler pulley be kept clean and free from oil, grease, dirt, or any foreign matter at all times. 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 rubber-tired drive disc on Models RP-152 is not removable from the spindle. The turntable is fastened to the driving disc by three bolts. If necessary to remove these parts the spindle drive gear set screw should first be removed. The driving disc, turntable and spindle assembly can now be lifted upward from the motorboard. If this is done, great care should be taken not to bend the spindle.

To remove the turntable and spindle on the RP-153 type it is necessary to first remove the tapered pin in the turntable drive arm assembly. The turntable and spindle can then be drawn up through the motorboard bearing.

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.

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.

The 10- and 12-inch records must be absolutely flat for smooth operation.

A pickup shorting switch, located under the motorboard, operates when the pickup is moved outward to the pickup rest.

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; oil, grease, dirt, or other foreign matter on motor spindle, main driving disc or idler pulley rubber tire. Clean with any quick drying naphtha.
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. 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".

Replacement Parts Model RP-153 (Concluded)

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
36266	Clutch—Trip lever clutch—less adjusting stud (5)	.25	14188	Screw—No. 10-32x7/16 set screw for motor coupling	.06
36265	Finger—Trip lever friction finger (7)	.50	4563	Screw—Pickup lift cable adjusting screw	.04
33581	Frame—Motor coupling frame only	.20	36528	Separator—Record separator knife (25)	2.00
31121	Gear—Record separator shaft gear (10)	.90	33988	Shaft—Record separator shaft (34)	.70
33982	Guide—Main lever spring guide (11)	.10	36527	Shelf—Record separator rotating shelf (27)	1.40
31151	Guide—Pickup lift cable guide (spring) (2)	.10	36524	Spindle—Turntable spindle	1.05
36520	Lever—Index lever (12)	.75	33994	Spring—Flat spring for record discriminator lever	.05
36273	Lever—Locating lever and pawl	.50	32882	Spring—Main lever spring (43)	.05
33985	Lever—Main lever (15)	1.05	36278	Spring—Pickup arm feed spring	.10
31140	Lever—Pickup lift cable and spring (16)	.55	3666	Spring—Pickup lift cable spring (31)	.04
36522	Lever—Record discriminating lever	1.30	14190	Spring—Record discriminating lever pawl spring (28)	.08
36476	Lever—Record separator elevating lever with adjustment screws (18)	.80	31136	Spring—Tension spring for automatic switch plunger	.05
31132	Lever—Trip detaining lever (19)	.30	3676	Spring—Tension spring for cam pawl	.04
36530	Lever—Trip lever less cam and link	1.60	32436	Spring—Tension spring for locating lever and pawl (35)	.05
36525	Link—Roller index link	.20	36521	Spring—Tension spring for trip lever cam	.05
31133	Pawl—Trip pawl (22)	.80	36921	Spring—Tension spring for trip detaining lever	.03
31535	Pin—Drive pin for turntable spindle shaft	.03	36279	Spring—Tension spring for trip pawl	.02
36268	Pin—Pin to fasten gear to separator shaft (23)	.05	31147	Strip—Complete set of rubber strips for motor coupling	.40
36267	Rack—Long arm and gear (41)	.60	36271	Stud—No. 4-40 hex stud for trip lever clutch adjustment	.08
32880	Rack—Short arm and gear (40)	.55	36529	Switch—Automatic switch	1.10
33983	Screw—Elevating lever pivot screw	.15	34875	Switch—Pickup shorting switch	.45
36519	Screw—No. 6-32 ball point screw for elevating lever	.30	36523	Turntable—Turntable less spindle shaft	4.50
36477	Screw—No. 6-32 ball point screw for record separator elevating lever	.10	8078	Washer—Spring washer for mounting record discriminating lever	.06
36526	Screw—No. 10-32x5/16 cup point set screw for record separator	.30	2917	Washer—Spring washer for mounting levers	.03
32869	Screw—No. 10-32x5/16 screw for record separator	.01	31608	Washer—Spring washer to hold index link	.01
31118	Screw—No. 10-32x5/16 set screw for trip lever cam	.06	31143	Washer—Washers for turntable bearing (1 steel, 1 bronze and 1 felt)	.15

XX—Price upon application to your local RCA Victor Parts Distributor.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

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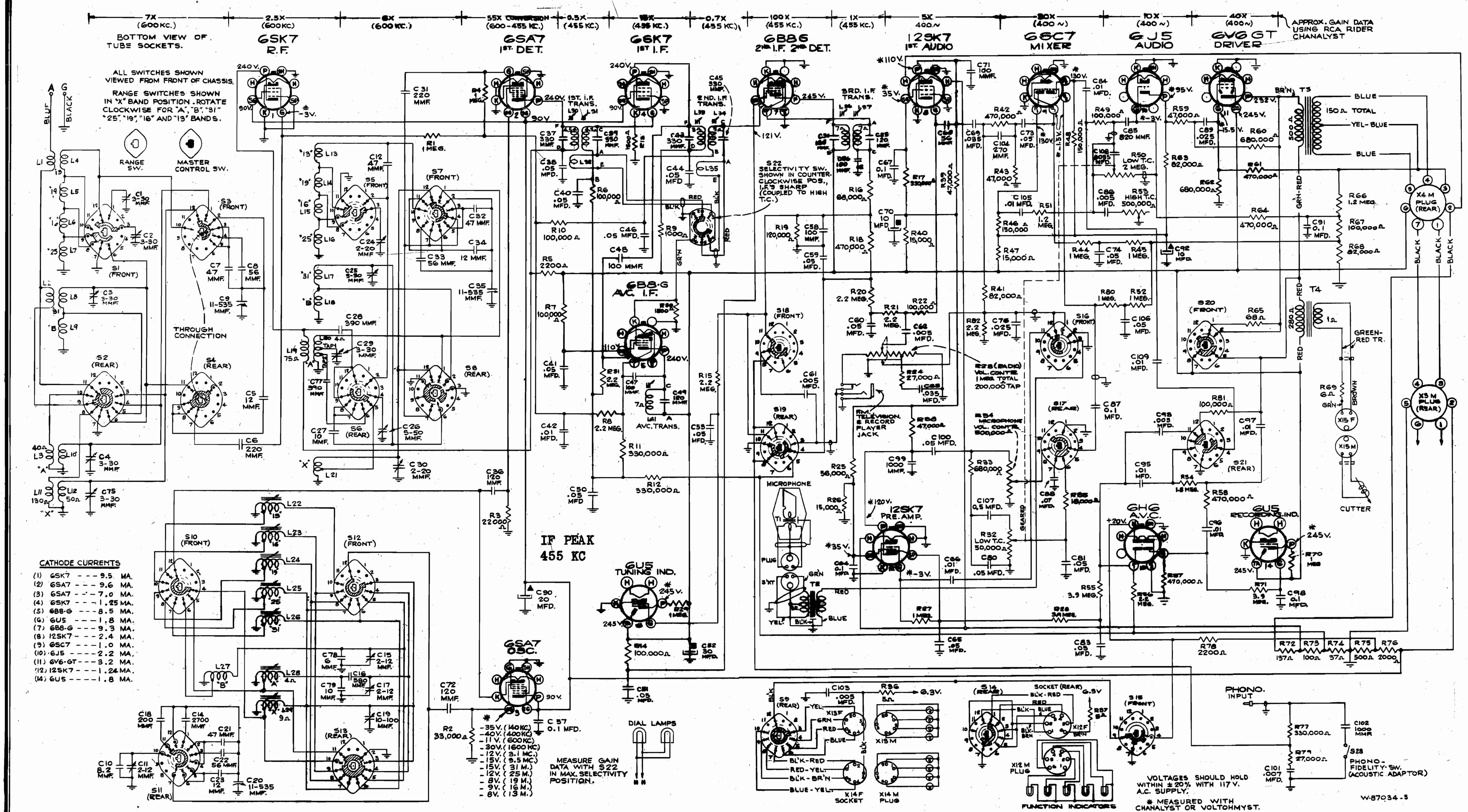

Frequency Ranges	
Long Wave ("X" Band)	140-410 kc (2145-735 m)
Medium Wave ("A" Band)	540-1,720 kc (555-174 m)
Short Wave ("B" Band)	3.1-9.5 mc (97.5-31.5 m)
31 Meter Spread Band	9.45-12 mc (31.8-25.4 m)
25 Meter Spread Band	11.65-15.2 mc (25.6-19.9 m)
19 Meter Spread Band	15.1-17.75 mc (19.9-16.9 m)
16 Meter Spread Band	17.73-18.5 mc (16.9-16.2 m)
13 Meter Spread Band	21.45-22.6 mc (13.95-13.3)

Intermediate Frequency .... 455 kc

Power Output Rating
Undistorted .... 50 watts
Maximum .... 60 watts

Loudspeakers (2)
Type .... 12 in. Electrodynamic
Voice Coil Impedance .... 11.5 ohms at 400 cycles

Phonograph
Type .... Fully Automatic
Record Capacity .... Twenty 10 or 12 inch or twenty mixed Records
Turntable Speed .... 78 r.p.m.
Drive .... Motor through reduction gear box direct to turntable
Type Pick-Up .... Magnetic
Pickup Impedance .... 96 ohms at 1,000 cycles

Watts Phono Motor 60 cycle 90
50 cycle 110

Power Supply Rating
100-130, 140-160, 195-250 volts, 40-60 cycles .... 410 watts

Public Address Use
Microphone Type .... Velocity (Ribbon) MI-4036-K
Microphone Input Impedance .... 250 ohms
Output to External Speakers .... 500 ohm line

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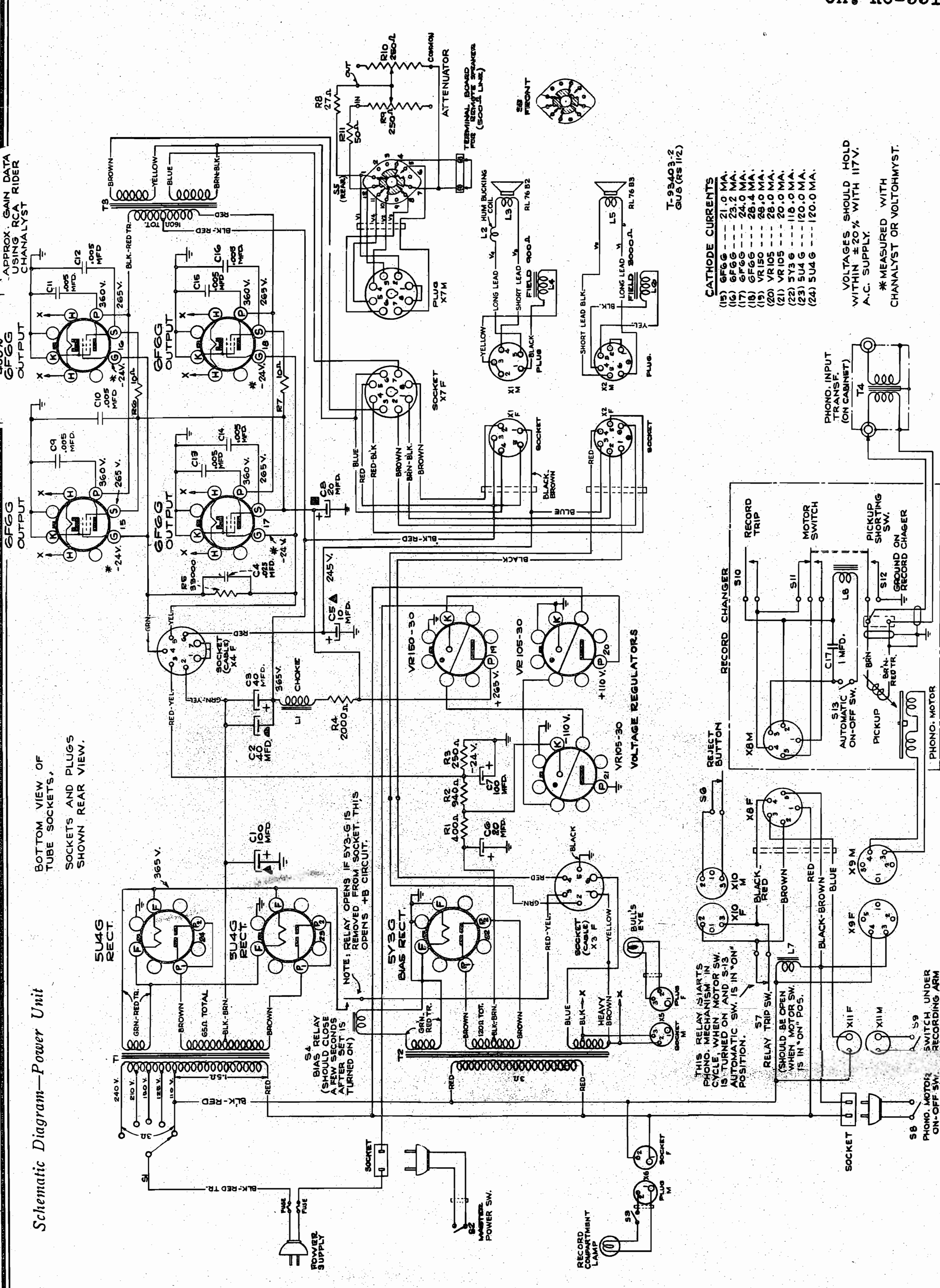

Schematic Diagram—Power Unit

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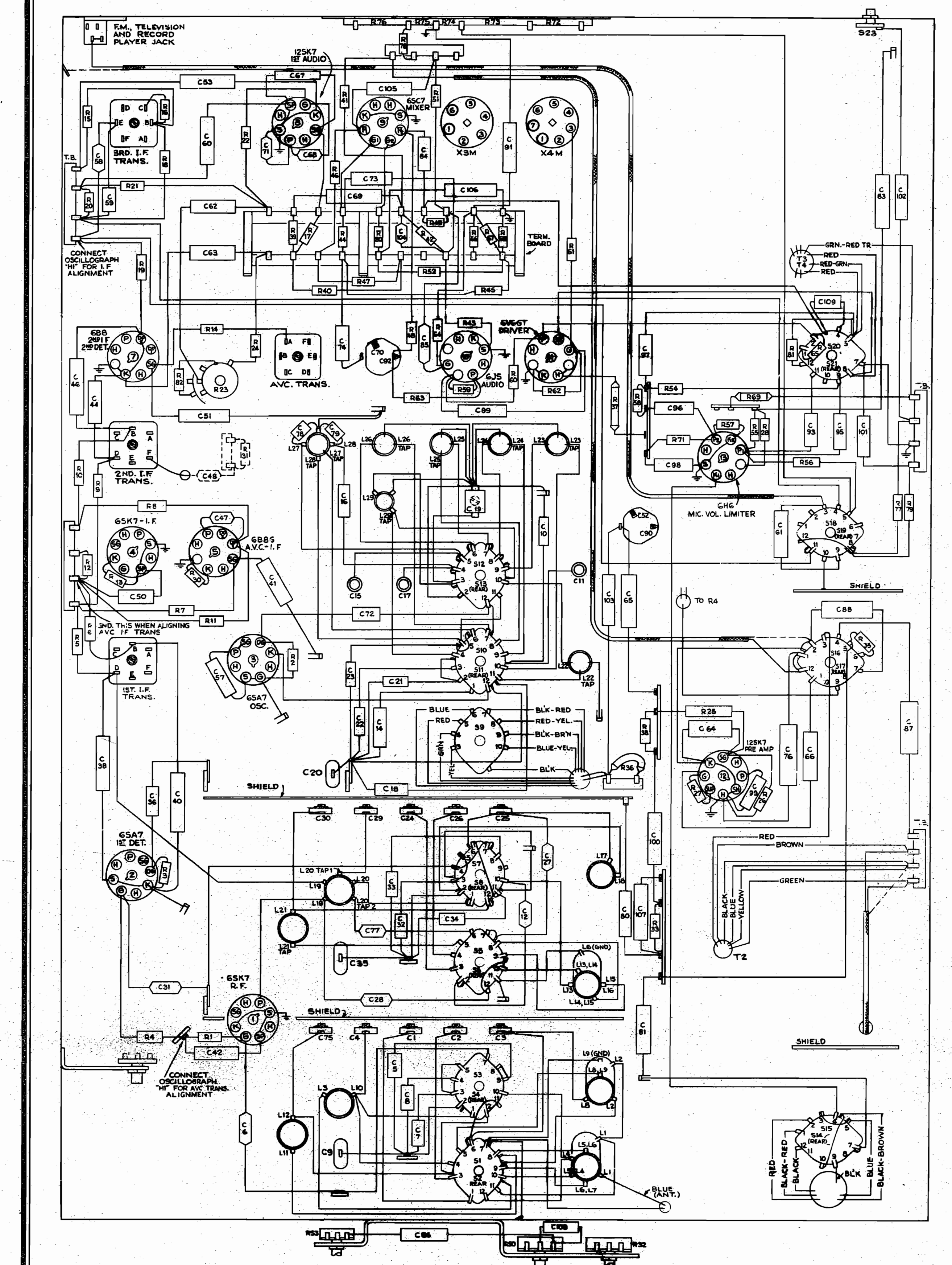

Bottom View—R. F. Unit—Showing Location of Parts

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REFERENCE TABLE FOR AUTOMATIC MECHANISM ADJUSTMENTS

Symptom	Check and Correct
Does not play automatically.	Solenoid relay circuit and S2, S5, S6, L1, L8. Section 19, 20. S4 under recording arm open.
Keeps on repeating automatically.	Check S1, S2. Section 15, 26, 27.
Trips before record is finished.	Section 27.
Does not trip at end of record.	Section 27, 26.
Does not feed new record.*	Section 2, 3, 1
Record does not center on turntable.	Section 1, 7, 9, 10.
Does not reverse records properly.	Section 1, 8, 11, 12, 13, 28.
Does not reverse record.	Section 1, 8, 18, 28, 25.
Pickup does not land correctly on record.	Section 5, 6, 16, 17, 14.
Chatter while changing record.	Section 21, or short circuit in relay trip system.
Ringing noise while changing record.	Section 4.
Record Selector Lever does not work properly.	Section 25, 23, 18.

* Make sure record is not warped or chipped or has rough edges.

NOTE: When Automatic Mechanism jams, shut Master "Power" Switch "OFF" before clearing the jam, as the turntable "Motor Switch" does not shut power to the motor off while the mechanism is in cycle.

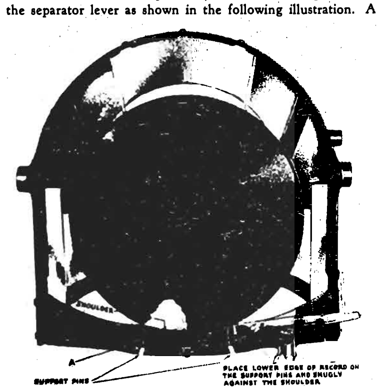
Note:—When mechanism jams upon first being played after being unpacked, check to see whether the record magazine is lined up as stated in Adjustment 7. Also check to see if the Record Reverse Arm Lock No. 46 Fig. 2 is on top of the Record Reverse Arm Lock Stop No. 48 Fig. 2.

1. MAGAZINE LINK ADJUSTING SCREWS ("D") (Fig. 1).

The record magazine should always come back snugly against the magazine stop screw, "C," Fig. 1. If it does not, it is necessary to loosen the two set screws ("D," Fig. 1) to a sliding tension and run the record changer through a cycle of change. When the magazine has reached the horizontal position, as shown in Fig. 1, press down on the lower end of the magazine; this will lengthen the link assembly. Then when the magazine returns to its normal position, the magazine link will adjust itself so that the magazine is snugly against the stop screw. Then tighten the magazine link screws "D."

2. RECORD SEPARATOR ADJUSTMENT.

The separator stop "J," Fig. 1, should be adjusted so that a small 10" record will positively clear the knife portion of the separator lever as shown in the following illustration. A



standard to use is to make certain that there is approximately 1/32" clearance between the edge of the small record and the point of the separator lever, as shown at "A" in illustration below. However, it may be necessary to vary one way or the other from this measurement, depending on whether or not the slotted end of the record separator lever goes over the hook (7) (Fig. 1) without binding.

3. RECORD SEPARATOR HOOK ADJUSTMENT.

After adjusting the record separator it will be necessary to check the record separator hook (7) (Fig. 1) to see that it enters the slot in the record separator without binding. This hook is threaded and by loosening the locknut the hook can be turned in either direction, to raise or lower it. After the correct adjustment is obtained, tighten the locknut.

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

SEPARATOR HOOK AND ARM (7) (Fig. 7).

Be sure set screw "K" in Fig. 4 is screwed all the way in.

4. RECORD MAGAZINE BUSHING (13) (Fig. 1).

If a ringing noise is heard while the instrument is changing records, i. e., such a noise that might be made by a spring, it will be found that the Durex bushing (13) (Fig. 1) is too tight, in which case it will be necessary to loosen the lock nut of the holding bolt, and back the bolt out, from a quarter to a half turn, then tighten the lock nut.

5. TO ADJUST THE TONE ARM HEIGHT.

To adjust the tone arm height, first place a 12" record on the turntable and adjust the tone arm stop lever (18) (Fig. 1) so that the record hits the rubber roller (21) (Fig. 1) in the center. Start the record changer through a cycle and stop it when the tone arm lever hook (22) (Fig. 1) just touches the stop lever assembly. In this position adjust the tone arm height so that the top of the stop lever is the same height as the center of the hook. This adjustment is made by loosening the two Allen set screws at the rear of the tone arm. These Allen set screws are accessible by raising the tone arm by hand. After making the height adjustment it is necessary to make certain that there is a clearance of approximately 3/8" between the pickup head and the record tray. This distance may be checked between the bottom of the record tray and the bottom of the pickup when the record tray is approximately parallel with the pickup.

6. TO ADJUST THE STOP LEVER HOOK (22) (Fig. 1).

Always adjust the tone arm position on a 12" record before adjusting for a 10" record. Adjust the tone arm stop lever hook (22) (Fig. 1) by moving it in or out. This hook is locked in place by a set screw in the stud whose nut is shown in Fig. 1 as No. 2. This set screw is at the bottom of this stud. Adjust the hook so that it will pass through the notch in the pickup arm lever (18) (Fig. 1) without binding against the top or bottom of the notch, when in the playing position. With a 12" record on the turntable, the rubber roller (21) (Fig. 1) against the edge of the record and the stop lever hook (22) against the blade of the stop lever (18) the needle should stop on the record exactly 3/32" from the edge of the record.

With the record changer in exactly the same position as described above, and with a 10" record on the turntable and the hook (22) (Fig. 1) against the blade, the stop lever should allow the needle to stop on the record 3/32" from the edge of the 10" record. A 6-32 screw shown in Fig. 1 is provided for making this adjustment, simply by screwing it in or out. A check should be made for clearance between the roller and the tray, this roller should never bind on the record tray. This can be taken care of by slightly bending the tone arm stop lever (18) (Fig. 1) up or down. If it is necessary to bend the stop lever it will be necessary to re-adjust for 12" records.

7. THE ADJUSTMENTS OF THE RECORD MAGAZINE.

Before attempting to adjust the magazine, be sure that the center of the magazine pivot pins (6) (Fig. 1) is 8⅜" above the base plate. This height is very important and we recommend checking the height of the right hand pin, when looking at the magazine, before any adjustments are made.

The record magazine is positioned by moving it sideways on its bearing or pivot pins. The two set screws underneath the pivot pins lock the magazine in position. Loosen these set screws, then see that the left hand side of the record reverse assembly fork (part of 4, Fig. 2) is between 1/32" and 1/16" inside the left hand side of the Reverse crank, when looking at the magazine. That is, the left hand edge of the record reverse fork is about 1/32" or 1/16" to the right of the left hand edge of the crank. After moving the magazine, lightly set up the set screws. Then with the selector arm in the "Repeat" position swing the record reverse arm around in front of the magazine, to see whether the record guide strikes either of the record support pins (55) (Fig. 2). If the guide strikes either of the support pins it will be necessary to bend the pin away from the guide so they can not strike. If it is necessary to bend either pin, set the control lever in the "Repeat" position, then raise the record tray by hand, with a 10" record on it, observing the way the record strikes the support pins, the record should hit both pins about 1/16" from the end of the pin; if it does not it will again be necessary to adjust the pin until the record hits both pins an equal distance from the ends. If it is necessary to bend the pins, check the clearance between the record guide arms and the pins and between the arm carrying the record guide and the right hand pin. Also if the magazine has been shifted it is necessary to see that the two points, which extend downward from the magazine, have ample clearance in the channels, in the record tray, which are provided for their passage. If there is possibility of the points striking it probably means the magazine has been shifted too much.

If the magazine has been adjusted, it is also necessary to see that the record separator hook (7) (Fig. 1) does not bind in the slot in the end of the record separator arm (45) (Fig. 2). If it does the section covering these parts give the adjustment.

8. MAGAZINE STOP SCREW.

The magazine stop screw "C," Fig. 1, should be adjusted so that the crank pin (part of 9, Fig. 1) is approximately 1/16" from the edge of the record reverse arm fork (part of 4, Fig. 2) which is furtherest from the magazine, when the record reverse guide is in front of the magazine, that is, in the reversing position.

9. TO LOCATE AND ADJUST THE RECORD TRAY (29) (Fig. 2).

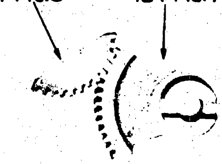
In assembling the record tray to the record changer, the first tooth of the driver quadrant (107) (Fig. 3) should mesh with the second tooth of the driven quadrant of the tray as shown.

With the two gears properly meshed, loosen the Allen set screws which hold pins No. 8, Fig. 1, in place. This will allow you to move the record tray sidewise, adjust tray sidewise until the turntable spindle is exactly in the center of the 10" record level of the record tray. (The 10" record level is that part of the tray where the felts No. 24 are indicated in Fig. 2.)

With the control lever in the "one side" position, run the record changer through its cycle until the large hole in the main cam is exactly half way past the upper edge of the record tray cam follower, as shown at "A," figure 1. At this position, the points of the ten-inch felts (24) (Fig. 2) should be level with the top of the turntable felt. If this tray is too low or too high, it may be adjusted to the proper level by loosening the eccentric screw (15) (Fig. 1) "B" and turning this screw until the proper level is obtained. Be sure to tighten the lock nut after adjustment.

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

107 FIG.3 134 FIG.7



10. TO ADJUST THE VERTICAL BUMPER GUIDE (10) (Fig. 2).

This guide is located back of the magazine cross bar (33) (Fig. 2). After the records are separated from the magazine they are guided in dropping off the separator so they hit the center of the record bumpers (31) (Fig. 2). This vertical bumper guide also guides the records when the elevating hook, on the rear of the record tray lifts the record. The vertical bumper should be set back just far enough to allow a 12" record to drop onto the record bumpers freely. The

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lower part of the vertical bumper, which extends into the record well, should extend toward the center of the well rubber bumpers far enough to make sure that the upper edges of the records fall behind the points of the upper record support (39) (Fig. 2). This adjustment is not critical. In most cases it will be found that the upper end of the vertical bumper will just clear the elevating hook on the rear of the tray. In cases where it is found that 10" records are chipping about the edges, due to bouncing against the points of the upper record support (39) (Fig. 2) it will be necessary to bend the vertical bumper (10) (Fig. 2) back at the top to a point where it just barely clears the elevating hook at the rear of the tray. It should never be bent back far enough to raise the front of the tray.

11. RECORD REVERSE GUIDE (41) (Fig. 2).

With a 12" record in the magazine the record reverse guide assembly (41) (Fig. 2) should be parallel with the record when in the reversing position, in front of the magazine.

If the record reversing assembly is parallel with a 12" record as above, it should come around and lay against the reverse guide pin tubing (42) (Fig. 2), if the eccentric cam (77) (Fig. 4) is properly adjusted. This cam can be adjusted, by loosening the screw through the cam and turning it so that the record reversing assembly returns to the reverse guide pin tubing. Care should be taken when making this adjustment so that the crank pin (part of 9, Fig. 1) does not hold the reverse guide away from the pin tubing. This cam should be turned so that the reverse guide assembly just touches the pin tubing; if the cam is turned too far it will allow the reverse guide assembly to hit the pin tubing, but in the reversing position the assembly will not be able to assume a position parallel with a 12" record.

12. REVERSE ASSEMBLY LINK ROD.

Loosen lock nut "H," Fig. 6, while the record changer is in the reversing position, that is, when the reversing assembly (41) (Fig. 2) is in front of the magazine. Remove the screw (79) (Fig. 4) holding the reverse segment link (80) (Fig. 4) to the reverse segment (61) (Fig. 4) and lengthen or shorten the link, by the link thread until the reversing crank (9) (Fig. 1) stands with the crank pin just barely touching, but not binding, against the front side of the fork (4) (Fig. 2). After the adjustment has been made, lock the link in place with the lock nut "H," Fig. 6.

13. TO ADJUST REVERSE CAM ARM AND ROLLER ASSEMBLY (57) (Fig. 3).

See Section 7 under Instructions For Replacing a Reverse Cam.

14. LATERAL LOCATION OF THE MAIN CAM SHAFT.

Both end bearings of the main cam shaft are movable, and are used to locate the cam shaft in its proper lateral position, as well as adjust the amount of end play. The main cam shaft is located laterally so that the ball in the end of the tone arm lift rod (87) (Fig. 5) travels in the exact center of the tone arm lift cam (86) (Fig. 5). As shown at "M" in Fig. 5.

15. TO ADJUST THE CLUTCH THROWOUT LEVER AND CAM.

The clutch throwout lever cam is shown as No. 125 in Fig. 7 and is adjusted by loosening the shoulder screw (69) (Fig. 4) to a sliding tension after the record changer has been stopped in the playing position. The clutch throwout lever cam should just clear the point of the turntable throwout cam (93) (Fig. 5) with the clutch disengaged. Unless clearance between the turntable throwout cam and the clutch lever throwout cam is maintained the record changer will jam. If too much clearance is allowed the turntable throwout cam will not disengage the clutch and the record changer will continue to change records without playing them.

16. TO ADJUST THE PICKUP ELEVATION.

When the tone arm swings in towards the record, the pickup arm lever hook (22) (Fig. 1) comes to rest against the pickup arm stop lever (18) (Fig. 1) and when the tone arm lowers the pickup toward the record it pauses momentarily before the pickup arm lever hook goes through the stop lever. If the record changer is stopped during this pause, it will be found that the ball in the end of the pickup arm lift shaft (87) (Fig. 5) is at the point marked "L" in Fig. 5 on the lift cam (86) (Fig. 5). Now if the pickup, with a needle in the proper position, is moved beyond the edge of the record, the point of the needle will extend below the top surface of the record a distance equal to half the thickness of the record. The correct elevation of the pickup is made by the screw in the underside of the tone arm fork against which the pickup cover rests. Loosen the locknut, adjust the screw to bring the needle to the position mentioned above, then lock the locknut.

17. PICKUP FEED IN ADJUSTMENT.

The collar of the pickup arm swing lever and collar assembly (84) (Fig. 5) should ride on the leather facing of the friction cam (96) (Fig. 5) until the pickup arm lever hook (22) (Fig. 1) has engaged the stop lever (18) (Fig. 1). Then a slight amount of friction should be maintained after the ball at the end of the pickup lift arm (87) (Fig. 5) has engaged with the lift cam (86) (Fig. 5). This friction should be maintained until the needle has touched the record, otherwise the pickup arm may move away from the stop lever and the needle miss the record. If the friction be maintained too long the needle may be forced beyond the first playing groove. To adjust this, the pin locking the friction cam to the main cam shaft should be driven out and the Allen set screw loosened to a sliding tension. The cam is rotated forward, in the direction of rotation of the main cam shaft, to maintain the friction a longer time and backward to maintain it for a shorter time.

18. TO ADJUST THE REVERSE CAM SHIFT LEVER (105) (Fig. 7).

This lever is moved by the record control shaft (116) (Fig. 7) and is held in position by an Allen set screw. It should be positioned on its shaft so that the record reverse cam (85) (Fig. 5) is firmly engaged with its pin (74) (Fig. 4) in the "Both Sides" position. In the "One Side" and "Repeat" positions it should have good clearance with the pin. If any adjustment of this lever is made be sure to check the setting of the Reverse Cam Arm and Roller Assembly (57) (Fig. 4) as instructed in Section 7 of the instructions on replacing a reverse cam.

19. TO ADJUST THE SOLENOID MOTOR SWITCH (108) (Fig. 6).

After the switch cover has been removed the switch is exposed. The upper switch points should make good electrical contact, while the main clutch is disengaged, in this position the clearance between the bottom points should be approximately 3/32". While the clutch moves from the disengaged to the engaged position the upper switch points should remain closed until the lower set of points are closed. When the clutch is fully engaged the lower points should make good contact and the clearance between the upper points should be approximately 3/32".

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

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

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

20. CLUTCH CLEARANCE.

The clearance between the driven (70) (Fig. 5) and driving (99) (Fig. 5) members of the clutch should be approximately .020" (Twenty thousandths), and is adjusted by loosening screw "N" Fig. 7 to a sliding tension and adjusting the clutch fork (121) (Fig. 7) and the solenoid to clutch lever and pin assembly until the proper clearance is obtained. After adjustment is made lock the screw "N," Fig. 6.

21. TO ADJUST SOLENOID WEDGE SPRING.

This phosphor bronze spring is located on one of the three spacers used to mount the solenoid plate bracket to the solenoid bracket. It is used to prevent clutch chatter or bounce when the clutch engages. The only adjustment is to bend the spring to a snug fit with a long screw driver so as to increase or decrease its pressure on the solenoid to clutch lever (118) (Fig. 7).

22. TO ADJUST THE RECORD REPEAT LOCK LEVER (82) (Fig. 7).

The purpose of this lever is to prevent accidental shifting of the Selector Arm while the instrument is not in the playing position. In the "Repeat" position this lever is on the side of the Solenoid to Clutch Lever (118) (Fig. 7) away from the main cam. In the "One Side" and "Both Sides" positions it is on the main cam side of the solenoid to clutch lever. With the tone arm in the playing position (Main Clutch Disengaged) this lock lever should clear the solenoid to clutch lever by approximately 3/16" when moved under it.

23. TO ADJUST THE REVERSE CAM LOCK LEVER (115) (Fig. 7).

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

24. TO ADJUST RECORD REPEAT THROW-OUT LEVER (119) (Fig. 7).

No adjustment of this part is necessary.

25. TO ADJUST RECORD REPEAT CLUTCH LEVER (83) (Fig. 7).

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

26. TO ADJUST THE STOP TRIP SWITCH (137) (Fig. 8).

This switch is accessible by removing the turntable, which will expose the switch cover. To remove the switch cover it is necessary to remove the trip arm, which goes through the switch cover and the two flat head screws which hold the cover in place. The clearance between the contact points on the fixed and movable arms of the switch should be 1/32". After replacing the trip arm (27) (Fig. 8) in the switch, after the switch cover has been removed, set the turntable on the spindle, push stop trip arm (142) (Fig. 8) slowly about 1/4" toward the magazine and then turn the turntable through one complete revolution. This will insure the fibre cam, on the turntable, resetting the trip switch, the clearance between the trip arm and the moveable arm of the switch should be 1/32". The distance between the trip arm and the switch trip guard finger should also be 1/32".

To adjust the clearance between the trip arm hook (27) (Fig. 8) and the moveable switch arm, loosen the screw in the bakelite switch base, at the end nearest the tone arm. Move the switch until 1/32" clearance is secured between the trip arm hook and the moveable arm of the switch, then tighten the screw holding the switch. In making this adjustment be sure that the stationary arm of the switch is not bent when tightening this screw.

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

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

The amount of friction necessary in the friction joint between the auto stop trip lever—long (27) (Fig. 8) and the auto stop trip lever—short (142) (Fig. 8) should be just sufficient to close the automatic stop trip switch (137) (Fig. 8). The friction is regulated by adjusting the screw which tightens the flat spring (141) (Fig. 8). If the tension is too great the instrument may trip before finishing a record, if not enough tension is had the instrument will not change records when the needle hits the automatic change groove.

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

1. Set record changer in the playing position. Carefully mark the drive gear (92) (Fig. 3) on the main shaft and the driven gear as shown 81, Fig. 3, by prick punch marks or scriber, so that the same teeth can be engaged after reassembly, thus insuring proper timing.

2. Remove the two bolts, one (60) (Fig. 3) securing the magazine slide and roller assembly to the magazine slide arm lever, and one (15) (Fig. 1) securing the record slide arm and stud assembly to the record tray drive crank.

3. Looking in from the rear of the instrument, remove the Durex bushing from the end of the main cam shaft, nearest the motor drive shaft. This is accomplished by loosening the bolt to the right of the main shaft. Care should be

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taken when replacing this bushing so as not to tighten the bolt enough to crush the bushing; a snug fit only is required.

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

5. Remove taper pin from gear and loosen set screw in the collar, both shown as 81 in Fig. 4, of the reverse cam shaft assembly, as well as the pin (74) (Fig. 5) over which the reverse cam forks, when in the reversing position. After removing the collar and sliding the gear to one side, file all burs from the edges of the holes in the reverse cam shaft. Slide the shaft through its Durex bushing toward the rear of the instrument far enough to allow the removal and replacement of the reverse cam (85) (Fig. 5).

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

7. Remove the reverse cam arm and roller assembly (57) (Fig. 4) and make sure that the roller pin and arm are not bent, if either of these items are found bent we suggest that you replace the reverse arm and roller assembly.

8. In reassembling the reverse cam arm and roller assembly (57) (Fig. 4) in its proper position for alignment with the reverse cam, be sure the roller is about 1/32" inside the ridge on the reverse cam, when the cam is in the reversing position.

9. Remove the taper pin from the gear (92) (Fig. 5) on the main shaft, which drives the gear on the reverse cam shaft assembly (81) Fig. 5) and remount the main shaft to the record changer chassis, pushing the above gear, from which the pin was removed, to one side so that it will not mesh with its driven gear.

10. Locate the main shaft so that the lower end of the pickup arm lift shaft travels in the center of the pickup arm lift cam, as shown at "M" in Fig. 5. With the main shaft in this position, adjust the main shaft Durex bushings so that there is no end play in the main cam shaft assembly.

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

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

13. Mesh the reverse cam assembly driver gear (92) (Fig. 5) with the reverse cam assembly driven gear so that the identifying punch marks correspond to the original position. The taper pin for the driver gear should be inserted next. If the assembly has been properly made there should be approximately 1/32" clearance between the roller or the reverse cam arm and the reverse cam. See "F," Fig. 5.

14. Throw the control lever to the "One Side" position and rotate the reverse cam with the fingers until it is in the reversing position. Again throw the control lever to the "Both Sides" position. Now there should be approximately 1/32" clearance between the reverse cam and the roller. See "G," Fig. 5. If the clearance is not approximately 1/32" for both positions of the reverse cam it indicates either the gears are not properly meshed or the reverse segment link rod may be bent. A careful check of the latter while the main shaft is out will save time and trouble later.

29. INSTRUCTIONS FOR REMOVING THE AUTOMATIC MECHANISM FROM THE CABINET.

In most cases, any repairs and adjustments on this mechanism can be made with the mechanism in the cabinet. If it is necessary to remove the mechanism for any reason, it is recommended that the following procedure be observed, and that two persons take part in the removal. Make sure the mechanism is not in cycle.

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

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

3. Remove the five prong socket cable from the solenoid assembly, remove the pickup lead from the terminal board, and free the shielded lead going to the shorting switch.

4. Remove the four bolts that hold mechanism to the shelf.

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

6. Remove the screw marked "P" in Fig. 2. This is the middle of the screws of the upper record support.

7. Remove the magazine link shoulder screw No. 40 Fig. 2. This will allow the magazine to be swung parallel to the turntable, and take up less room.

8. Remove the pickup arm assembly by removing the three screws in the pickup arm base, swinging the pickup arm to the back of the mechanism and working the bottom of the pickup assembly out of the hole.

9. Carefully mark the drive gear (92) (Fig. 3) on the main shaft and the driven gear shown as part of 81, Fig. 3, by prick punch marks or scriber, so that the same teeth can be engaged after reassembly, thus insuring proper timing.

10. Remove the two bolts, one (60) (Fig. 3) securing the magazine slide and roller assembly to the magazine slide arm lever, and one (15) (Fig. 1) securing the record slide arm and stud assembly to the record tray drive crank.

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

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

13. From the rear of the cabinet, lift the mechanism straight up, and carry it straight back until the rear bearing bracket of the main shaft has cleared the shelf; then rotate the mechanism 90°, turning it so that the record magazine comes toward the back of the cabinet until the record magazine is clear of the cabinet. Then drop the record magazine end of the mechanism slightly so that the drive shaft will clear the bottom shelf, and remove the mechanism.

To Replace Mechanism:—1. Replace mechanism by reversing procedure of step 13 above.

2. Replace the main cam shaft and its bushings, but do not tighten the bushings in place. Make sure that the gears marked in (9) above are meshing properly as marked. Make sure the throw-out cam 71 Fig. 4 is resting on top of the main shaft.

3. Replace the pickup arm assembly. Locate the main shaft so that the lower end of the pickup arm lift shaft travels in the center of the pickup arm lift cam, as shown at "M" in Fig. 5. With the main shaft in this position, adjust the main shaft Durex bushings so that there is no end play in the main cam shaft assembly.

4. Replace the two bolts removed in (4) (6) (7) and (10) above.

5. Adjust the position of the record tray as described under: "9. TO LOCATE AND ADJUST THE RECORD TRAY", by adjusting screw 15 (Fig. 1).

6. Turn the drive shaft or turntable with the fingers and put the mechanism thru a cycle to see that it is working correctly.

7. Replace the flexible coupling on drive shaft and replace connections to record changer.

Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the speaker voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep test-oscillator output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0°" mark on the drum scale must be horizontal, and a line drawn through the 0° and 180° marks on the scale should be parallel with the top of the chassis when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at the sides.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

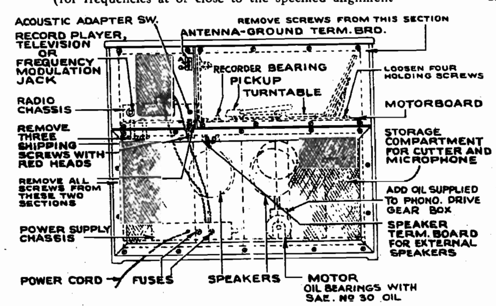
1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations by known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

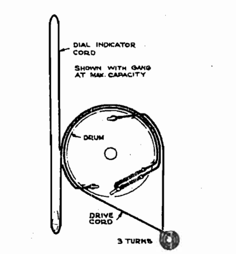
For additional information, refer to booklet "RCA Victor Receiver Alignment."

Precautionary Lead Dress:—

(1) All oscillator leads should be kept as short as possible.
(2) Lead from No. 8 on S1 must be held to 3 in. length and dressed toward the bottom end of coils, away from coil windings.
(3) Lead from No. 9 on S1 must be held to 3 in. length and dressed toward the bottom end of coils, away from coil windings.
(4) Lead from No. 5 on S2 must be held to 5 in. length.
(5) Lead from No. 8 on S5 must be held to 4¼ in. length.
(6) Lead from Det. coil L17 to trimmer must be held to 2¼ in. length.
(7) Lead from Det. coil L18 to No. 2 on S8 must be held to 5⅜ in. length.
(8) The leads from the top and arm of the microphone volume control should be dressed away from the pilot light leads and toward the pre-amplifier shield.
(9) The condenser from the volume control arm to the first audio tube must be shielded and the lead on the tube side as short as possible.
(10) The leads to the selectivity switch must be dressed along the side of the chassis away from the R.F. coils.
(11) Keep pilot light leads as far as possible away from oscillator coils.
(12) Dress leads to low frequency tone control on outside of chassis under bracket.
(13) The long ground lead from the oscillator heater must be kept away from all condensers, resistors, and leads to RF tubes.
(14) Dress all filament leads away from oscillator and detector grid lugs.
(15) C-14 (2700 mmf) and C-72 (120 mmf) must be dressed toward A osc. trimmer, C-17.



Rear View of Instrument



Tuning Drive Cord Assembly

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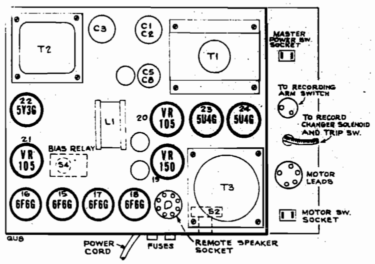
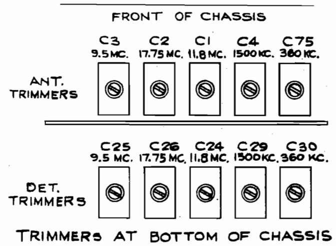
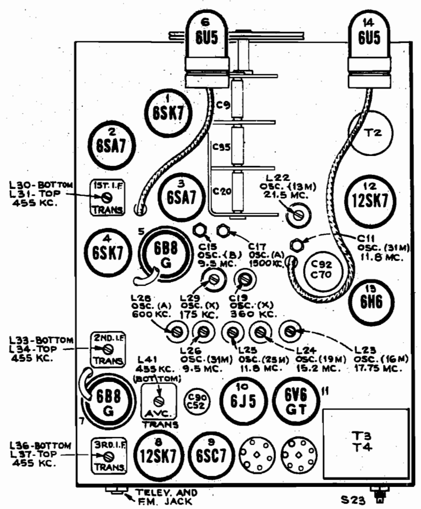


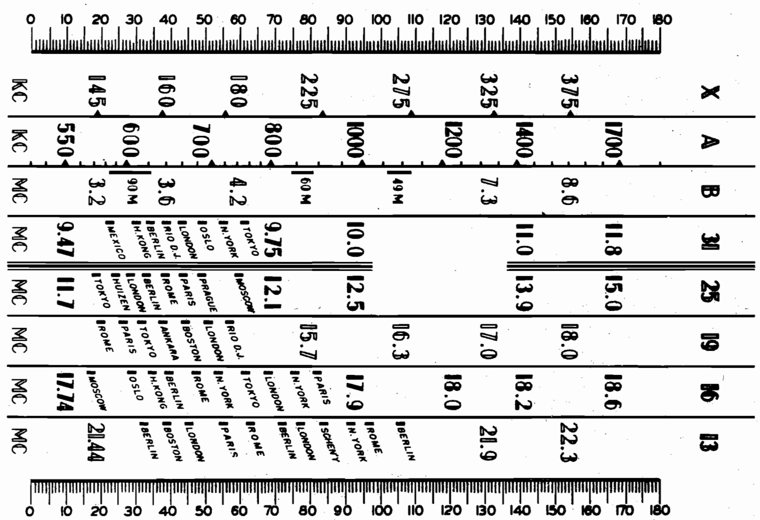
Top View—Power Unit





Tube and Trimmer Locations

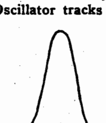
IMPORTANT:—IF ANY ONE OF THE VOLTAGE REGULATOR TUBES Nos. 19, 20, 21, ARE OUT OF THEIR SOCKETS THE INSTRUMENT WILL NOT OPERATE, AS THE A.C. CIRCUIT WILL BE OPEN.



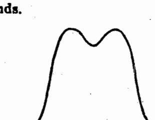
Dial Scale and Calibration Scale

Step	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	Turn selectivity control maximum counter-clockwise for maximum selectivity.			
2	6B8G 2nd I-F grid in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L37, L36 Third I-F Transformer
3	6SK7 1st I-F grid in series with .01 mfd.			L34, L33 Second I-F Transformer
4	6SA7 1st Det. grid in series with .01 mfd.			L31, L30 First I-F Transformer
5	With selectivity control in broad position retouch L37, L36 for selectivity curve 2.			
5A	With selectivity control in sharp position see that curve 1 has not changed appreciably.			
6	6SA7 1st Det. grid in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	L41 AVC Transformer See Note 1
7	Antenna Terminal in series with 200 mmfd.	360 kc	"X" Band 360 kc (149°)	C19 (osc.)** C30 (det.) C75 (ant.)
8		175 kc	"X" Band 175 kc (51°)	L29 (osc.) (Rock-in)
9	Repeat steps 7 and 8.			
10	Antenna Terminal in series with 200 mmfd.	1,500 kc	"A" Band 1,500 kc (150.5°)	C17 (osc.) C29 (det.) C4 (ant.)
11		600 kc	"A" Band 600 kc (26°)	L28 (osc.) (Rock-in)
12	Repeat steps 10 and 11.			
13	Antenna Terminal in series with 300 ohms	9.5 mc	"31M" Band 9.5 mc (21.5°)	L26 (osc.)*** C25 (det.) C3 (ant.)
14		11.8 mc	"31M" Band 11.8 mc (169.5°)	C11 (osc.)***
15		Repeat steps 13 and 14 until dial tracks correctly.		
16		9.5 mc	"B" Band 9.5 mc (172.5°)	C15 (osc.)***
17		11.8 mc	"25M" Band 11.8 mc (36°)	L25 (osc.)*** C24 (det.) C1 (ant.)
18		15.2 mc	"19M" Band 15.2 mc (37°)	L24 (osc.)***
19		17.75 mc	"16M" Band 17.75 mc (28°)	L23 (osc.)**** C26 (det.) C2 (ant.)
20		21.5 mc	"13M" Band 21.5 mc (59°)	L22 (osc.)****

NOTE 1: Connect oscilloscope to junction of R8 and C42. Also short junction of R11 and R12 to ground.
** Core of L29 should be approximately ⅛-inch out before adjusting C19.
*** Use minimum capacity or inductance peak.
**** Use maximum inductance peak.
NOTE.—Oscillator tracks above all signals except on 16 and 13 meter bands.


1.

I.F. Selectivity Curves
At Left—"Sharp"
At Right—"Broad"


2.

RCA MFG. CO., INC.

Public Address

External speakers may be connected to the terminal board located at the rear of the cabinet under the phono compartment. The total impedance of all the speakers connected to the instrument in parallel or series should be approximately 500 ohms.

Speakers recommended for use with this instrument are RCA MI-6247A, MI-6248B or MI-6233 Speakers. The MI-6247A, 6248B Speakers are rated about 10 watts. The MI-6233 Speaker is rated about 4 watts. These are speakers for handling low power in small rooms. For larger auditoriums and larger installations consult your local RCA Commercial Sound Distributor.

For outdoor, high volume applications the RCA MI-6260 (20 watts), MI-6255 (60 watts), or MI-6264 (50 watt co-axial speaker) Speakers are recommended. As all these speakers are 15 ohm impedance, a matching transformer will be needed to match them to the 500 ohms output of the instrument.

The following tables show the impedances of the speakers listed above.

AVAILABLE IMPEDANCES
MI-12315 Coupling Transformer
(Used in MI-6233 Permanent-magnet Speaker)

Voice coil impedance	6 ohms
Blue to green-red tracer	2 ohms
Yellow to green-red tracer	6 ohms
Blue to yellow	15 ohms
Black to green-red tracer	36 ohms
Blue to black	55 ohms
Red to black	225 ohms
Red to yellow	342 ohms
Red to green-red tracer	438 ohms
Red to blue	500 ohms

Note: As shipped from factory, MI-6233 Speakers have red and blue leads connected to terminal board.

AVAILABLE IMPEDANCES
RCA-MI-6247-A or MI-6248-B Permanent-magnet Dynamic Speaker

Voice coil impedance	2 ohms
Black to red	5,000 ohms
Red to blue	2,500 ohms
Red to red-black	1,250 ohms
Blue to black	410 ohms
Red-black to blue	225 ohms

Example: To match 2 MI-6233 Speakers to the instrument, connect each of the speakers for 342 ohms impedance as shown in the table above, and then connect the speakers in series.

To match 3 MI-6233 Speakers, connect each speaker for 225 ohms, then connect the three speakers in series.

To match 2 MI-6247A or 6248B Speakers choose the 225 ohm impedance, and connect the primaries of the transformers in series.

To match 3 MI-6247A or 6248B Speakers, choose the 1,250 ohm impedance and connect the speakers in parallel.

LOCATING LOUDSPEAKERS

When installing loudspeakers, either temporarily or permanently, the installation will be simplified if one considers the loudspeaker to be similar to a search light. The sound waves from the loudspeaker are distributed in much the same manner as light rays from a search light. If a sufficient amount of the sound waves, either direct from the loudspeakers or reflected from hard surfaces, reach the microphone the system will howl. This is technically termed acoustic feedback, because the amplified sound from the loudspeakers is picked up by the microphone and fed back through the amplifier, where it adds to the original sound until a continuous whistle or howl is produced. Directional projectors, such as the 25-watt loudspeaker (MI-6260) will, to a great extent, prevent howling by directing the sound waves to a restricted area and the amplifier can then be operated at much greater volume. When two speakers are used in an auditorium, hall, etc., the speakers and microphone should be so located that the speakers will be slightly in front of the microphone. Locate one speaker on each side of the microphone and as far from it as possible without destroying the allusion that the sound being heard is actually coming from the individual speaking. The speakers should be pointed in the direction of and at the proper angle to the audience so that as little of the sound waves as possible will be reflected from the side walls and hard surfaces.

It is not recommended that loudspeakers be located in the rear of the auditorium to provide coverage for this area, but rather that directional sound projectors be used and raised to a sufficient height to be directed into the audience at the rear of the seating area. The horns should be located so that the center of the sound beam will strike the floor at a point slightly more than two-thirds of the length of the room. There are occasions, however, where this is not practical, because of the high reverberation or poor acoustical conditions of the building. In this condition better results can be obtained by using a number of speakers operating at comparatively low volume. In an installation of this type a sufficient number of loudspeakers should be used and so located that the sound will be evenly distributed over the entire area in such a manner that an individual will hear the sound only from the speaker nearest him.

In a small room, the loudspeaker should be mounted fairly high, and in the center of one wall.

The RCA MI-6292, MI-6294 and MI-6233 loudspeaker housings are tilted downward twenty degrees for correct sound distribution.

MI-6292 and MI-6294 are tilted loudspeaker cabinets for MI-6248B and MI-6247A Speakers respectively.

The height of the loudspeaker should be such that the center axis points toward seats about two-thirds of the room length away from the speaker.

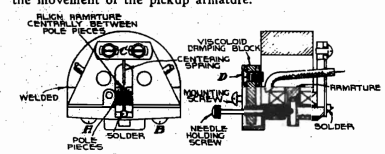
In a large room, it may be necessary to use two or more loudspeakers connected in parallel and correctly phased.

In an auditorium, RCA auditorium-type loudspeakers of correct type should be used. The auditorium speaker should be centered on the front wall, with its center axis pointing toward seats about two-thirds of the room length away from the speaker. If the speaker cannot be centered laterally on the front wall, it is advisable to use two speakers, one on each side of the proscenium arch. The height of the speaker or speakers should be sufficient to ensure good coverage of all seats, including the balcony.

Automatic Phonograph Service

Magnetic Pickup:—
The magnetic pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the pickup are as follows:

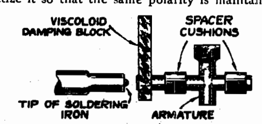
Centering Armature.—Refer to the figure showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm for re-adjustment. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.



Magnetic Pickup Detail

Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then reassemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing.—Loss of magnetization will not usually accur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.



Attaching Damping Block

Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves to reduce undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

Pickup Angle.—The pickup head should be set at 15° angle to the pickup arm. This may be done by loosening the nut No. 2, Fig. 1 on top of the pickup arm and adjusting the pickup bracket to the correct angle.

LUBRICATION.

Due to its careful design and precise workmanship, this record changer requires a minimum of oiling.

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

A very light coat of vaseline should be applied to the surfaces of the magazine, indicated at "E" in Fig. 2. It is best to apply this coating every six months. The vaseline should be applied with, and removed by, the fingers, on the magazine faces. DO NOT USE EXCESSIVE AMOUNTS OF LUBRICANT ANYWHERE ON THE RECORD CHANGER.

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

NEVER OIL THE "DUREX" BUSHINGS (one of which is shown as No. 17 in Fig. 1), AS THIS WILL CAUSE THEM TO DISINTEGRATE.

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

RECORD SIZE LIMIT.

The record changer will play any 10" or 12" record of standard size. The minimum size for 12" records is 11⅞". The minimum size for 10" records is 9²⁷⁄₃₂". Records smaller than these limits are very apt to miss centering over the turntable spindle and in most cases are broken.

These record changers will automatically trip on any record having an automatic stop change groove, either spiral or oscillating, where the blank space in the center of the record is not more than 6½" in diameter.

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

DRIVE CLUTCH.

The phono drive clutch is located on the drive shaft just above the reduction gear box. The clutch should be adjusted so that there is no slippage in the clutch during a cycle of the mechanism, yet the clutch should slip if the turntable is stopped by hand. To adjust clutch, loosen the two nuts above the clutch on the drive shaft, and move the lower nut down the shaft for more pressure in the clutch, or move the lower nut up for less clutch pressure.

MODEL QU8
Ch. RC-551

RCA MFG. CO., INC.

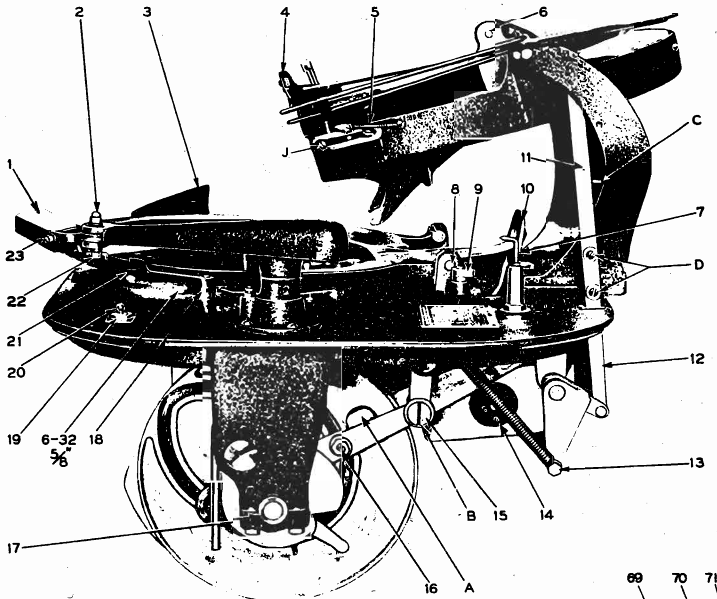


Fig. 1

Reference No.	Stock No.	Description
1	37293	Pickup Housing
2	38068	¼"—28 Hex. Cap Nut
3	38084	Record Tray Shield Felt—Outer
4	38117	Record Reverse Arm and Fork Assembly
5	38044	Spring—Separator
6	38017	Pin—Magazine Pivot
7	38116	Separator Hook and Arm Assembly
8	38018	Pin—Record Tray Pivot
9	38119	Reverse Pinion and Crank Assembly
10	38138	Record Bumper Guide and Felt Assembly
11	38075	Magazine Link Upper
12	38076	Magazine Link Lower
13	38057	Record Magazine Bushing
14	38118	Chassis Plug
15	38006	Shoulder Screw — Record Tray Slide
16	38024	Pin—Record Tray Slide
17	38055	Main Shaft Bushing
18	38131	Pickup Arm Stop Lever Assembly (Specify color)
19	38005	Escutcheon Plate Off-On
20	38001	Switch, Automatic
21	38004	Stop Lever Roller Tubing
22		Pickup Arm Lever Hook
23	38069	Lock Nut for Pivot Screw

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

Fig. 3

Reference No.	Stock No.	Description
56	38050	Spring—Reverse Arm
57	38128	Reverse Cam Arm and Roller Assembly
58	38038	Spring—Record Separator Hook Lever
59	38039	Spring—Magazine Slide Arm
60	38007	Shoulder Screw—Magazine Slide Arm
61	38031	Record Reverse Pinion Segment
62		Solenoid Plate Bracket
63	38000	Condenser—1.0 Mfd. 400-Volt (in can)
64	38037	Record Repeat Sliding Clutch Cam
65	38040	Spring—Record Repeat Clutch
66	38016	Screw—Turntable Shaft Collar
67	38012	Shoulder Screw—Repeat Lever
81	38121	Record Reverse Cam Shaft Assembly
92		Gear—Reverse Cam Shaft Driver

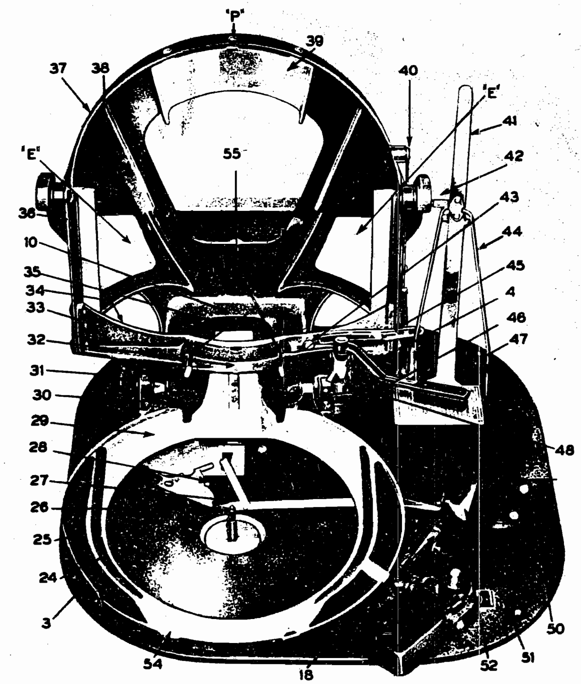
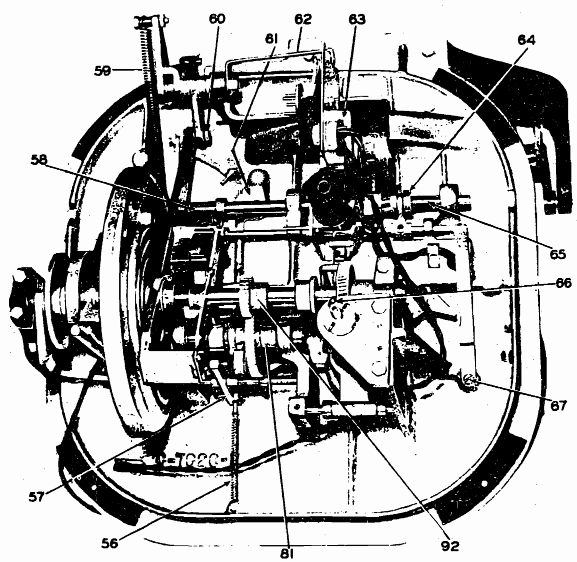


Fig. 2

Reference No.	Stock No.	Description
3	38084	Record Tray Shield Felt Outer
4	38117	Record Reverse Arm and Fork Assembly (specify color)
10	38138	Record Bumper Guide and Felt Assem.
18	38131	Pickup Arm Stop Lever Assembly (specify color)
24	38079	Record Tray Felt—Small
25	38078	Record Tray Felt—Large
26	38139	Turntable Drive Shaft Cap
27	38132	Automatic Stop Trip Lever Assembly
28	38023	Pin—Record Control Rod
29	38137	Record Tray Assembly
30	38089	Record Tray Bumper—Rear
31	38097	Record Bumper
32	38092	Reverse Arm Bumper
33	38135	Lower Record Support Assembly
34	38081	Lower Record Support Felt
35	38082	Record Bumper Guide Felt

Reference No.	Stock No.	Description
36	38083	Magazine Side Felt
37	38136	Record Magazine Assembly
38	38080	Record Magazine Felt
39	38106	Record Support—Upper
40	38008	Shoulder-Screw-Magazine Link
41	38126	Record Reverse Guide Assembly
42		Pin—Reverse Guide Stop
43	38011	Shoulder Screw—Separator
44	38108	Record Reverse Guide
45	38127	Record Separator and Hub Assembly
46	38072	Record Reversing Arm Lock
47	38052	Record Reverse Guide Spring
48	38074	Record Reverse Arm Lock Stop
50		Pickup Arm Base
51	38071	Automatic Stop Trip Lever, Short
52	38110	Pickup Arm Casting only
54	38088	Record Tray Bumper—Front
55	38140	Pin—Record Support



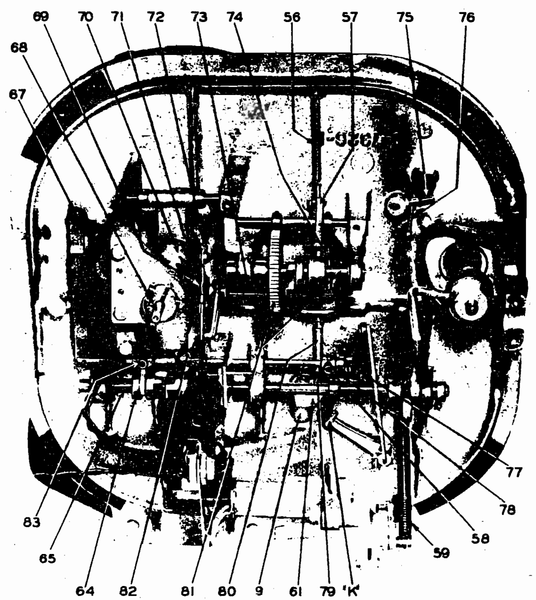


Fig. 4

Reference No.	Stock No.	Description
9	38119	Reverse Pinion and Crank Assembly
56	38050	Spring—Reverse Arm
57	38128	Reverse Cam Arm and Roller Assembly
58	38038	Spring—Record Separator Hook Lever
59	38039	Spring—Magazine Slide Arm
61	38031	Record Reverse Pinion Segment
64	38037	Record Repeat Sliding Clutch Cam
65	38040	Spring—Record Repeat Clutch
67	38012	Shoulder Screw—Repeat Lever
68		Turntable Drive Shaft Assembly
69	38015	Screw—Clutch Throwout Cam
70	38124	Worm and Bushing Assembly

Reference No.	Stock No.	Description
71	38130	Clutch Throwout Lever and Spring Assembly
72	38013	Shoulder Screw—Clutch Throwout Lever
73	38043	Spring—Record Reverse Cam Control
74	38022	Pin—Reverse Cam Shaft
75	38005	Stop Lever Collar Pin Tubing
76	38046	Spring—Tone Arm Lever
77	38036	Reverse Segment Stop Cam
78	38101	Record Repeat Throwout Hook Lever
79	38010	Shoulder Screw—Reverse Segment Link
80	38021	Pin—Short—Reverse Segment
81	38121	Record Reverse Cam Shaft Assembly
82	38104	Record Repeat Lock Lever
83	38102	Record Repeat Clutch Fork Lever

RCA MFG. CO., INC.

MODEL QU8
Ch. RC-551

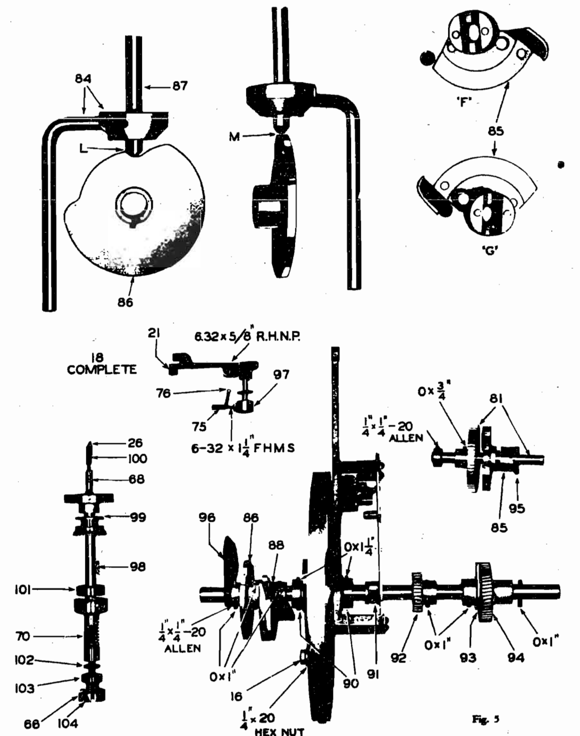


Fig. 5

Reference No.	Stock No.	Description
16	38024	Pin—Record Tray Slide
18	38131	Pickup Arm Stop Lever
21	38094	Stop Lever Roller Tubing
26	38139	Turntable Driveshaft Cap
66	38016	Screw—Turntable Shaft Collar
68		Turntable Shaft Assembly
70	68124	Worm and Bushing Assembly
74	38022	Pin—Reverse Cam Shaft
75	38095	Stop Lever Collar Pin Tubing
76	38046	Spring—Tone Arm Stop Lever
81	38121	Record Reverse Cam Shaft Assembly
84		Pickup Swing Lever and Collar Assembly
85	38123	Record Reverse Cam and Pin
86		Pickup Lift Cam and Hub Assembly
87		Pickup Arm Lift Shaft
88		Pickup Arm Swing Cam
90		Main Cam Collar
91		Magazine Slide Arm Cam
92		Gear—Reverse Cam Shaft Driver
93		Turntable Throwout Cam and Hub Assembly
94	38030	Gear—Main Drive
96		Pickup Arm Friction Cam Assembly
97		Pickup Arm Stop Lever Collar
98	38162	No. 2 Woodruff Key
99	38084	Turntable Shaft Clutch
100		Turntable Driveshaft Cap Tubing
101	38058	Ball Bearing—Upper
102	38060	Thrust Washer—Worm Shaft
103	38032	Ball Bearing—Lower
104	38064	Turntable Shaft Collar

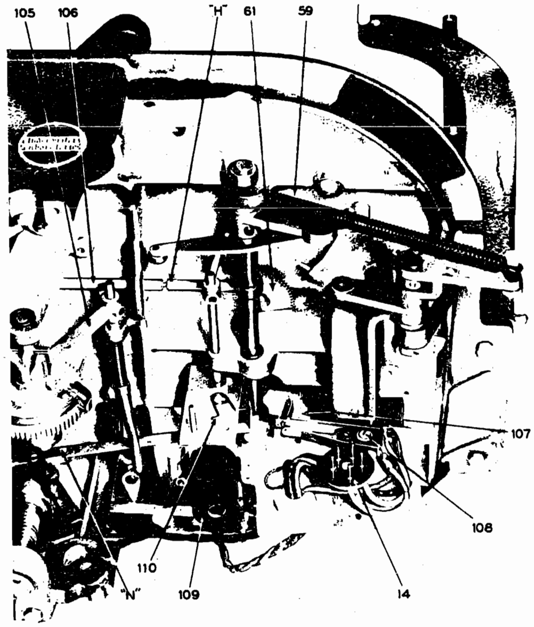


Fig. 6

Reference No.	Stock No.	Description
14	38113	Chassis Plug 5 Prong Male
59	38039	Spring—Magazine Slide Arm
61	38031	Record Reverse Pinion Segment
105	38100	Record Reverse Cam Shaft Lever
106	38020	Pin—Long, Reverse Segment
107	38111	Record Tray Gear—Driver
108	38008	Switch Assembly—Solenoid and Motor
109	38141	Solenoid Coil only
110	38047	Spring—Solenoid Lever Torsion

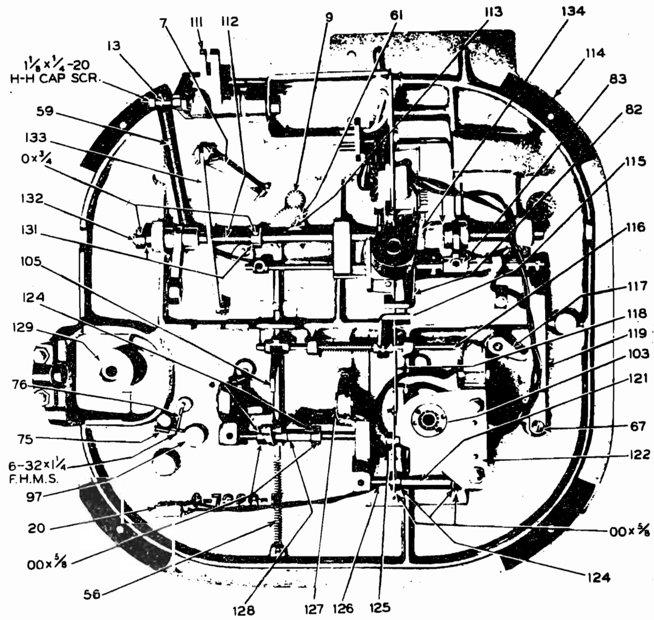
Fig. 7

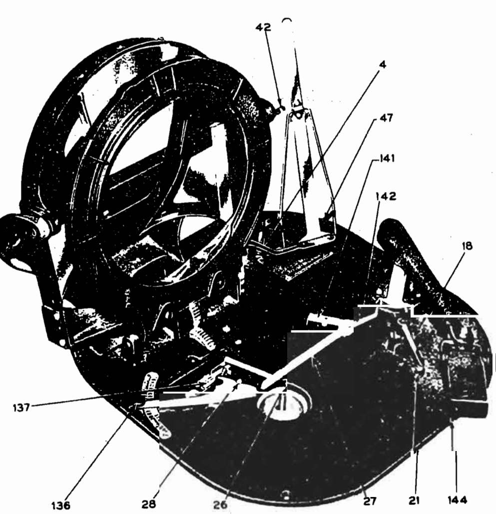
Reference No.	Stock No.	Description
7	38116	Separator Hook and Arm Assembly
9	38119	Reverse Pinion and Crank Assembly
13	38057	Record Magazine Bushing
20	38001	AC Line Toggle Switch
56	38050	Reverse Arm Spring
59	38039	Magazine Slide Arm Spring
61	38031	Record Reverse Pinion Segment
67	38012	Repeat Lever Shoulder Screw
75	38095	Stop Lever Collar Pin Tubing
76	38046	Tone Arm Stop Lever Spring
82	38104	Record Repeat Lock Lever
83	38102	Record Repeat Clutch Fork Lever
97		Pickup Arm Stop Lever Collar
103	38032	Ball Bearing
105	38100	Record Reverse Cam Shaft Lever
111		Magazine Slide Arm Lever
112	38045	Separator Hook Spring
113	38009	Reverse Segment Shoulder Screw
114	38098	Main Frame Pad
	38153	00x⅝ Taper Pin
	38154	0x¾ Taper Pin
115	38105	Reverse Cam Lock Lever
116		Record Control Shaft
117	38120	Record Control Lever and Stud Assembly
118	38129	Solenoid to Clutch Lever and Pin Assembly
119	38073	Record Repeat Throwout Lever
121	38103	Main Clutch Fork Lever
122	38066	Bearing Retainer Plug
124	38063	5/16" Shaft Collar
125	38107	Clutch Throwout Cam
126	38115	Solenoid Lever Shaft Assem.
127	38059	Record Tray Shaft Bushing
128	38114	Record Reverse Arm Shaft Assem.
129	38090	Pickup Arm Brake Facing
131	38062	7/16" Shaft Collar
132		Record Tray Drive Shaft Assembly
133	38144	Separator Hook Lever and Roller Assembly
134	38122	Record Tray Gear and Sliding Cam Clutch

Fig. 8

Reference No.	Stock No.	Description
4	38117	Record Reverse Arm and Fork Assembly (specify color)
18	38131	Pickup Arm Stop Lever Assembly (specify color)
21	38094	Stop Lever Roller Tubing
26	38139	Turntable Drive Shaft Cap
27	38132	Automatic Stop Trip Lever Assembly
28	38028	Pin—Record Control Rod
42		Pin—Reverse Guide Stop
47	38052	Record Reverse Guide Spring
136		Selector Knob
137	38004	Record Trip Switch Assembly—complete
141	38048	Spring—Automatic Trip Lever Pin
142	38071	Automatic Stop Trip Lever—Short
144	37292	Pickup Brush Assembly

STOCK No.	DESCRIPTION
	MAGNETIC PICKUP ASSEMBLIES
14291	Armature—Pickup armature and spring
37292	Brush—Pickup brush and mounting bracket
14672	Coil—Pickup coil and support assembly
14292	Damper—Pickup armature damper block
37293	Housing—Finished pickup housing only—less mechanism and cover
37291	Mechanism—Magnetic pickup unit only—less housing and brush
3811	Screw—Pickup needle screw
37294	Terminal—Pickup connector block with set screws and mtg. screw
37286	Pivot—Pickup unit pivot screw and locknut
37287	Bearing—Pickup unit pivot bearing





Recording and Playback Notes

IMPORTANT

The cutting point of the stylus must be in perfect condition in order to make good recordings.

The condition of the stylus point can not be determined by ordinary visual inspection. If the recordings are noisy or poor in quality, first try a new stylus.

The stylus cutting point can be ruined by dropping the cutter on the record, by cutting into the base metal of the recording blank, or by cutting into the paper label on the blank

Always stop the recorder before it reaches its inner limit as it will repeat in the last groove and may wear into the base metal, thereby ruining the stylus point. See that the instrument is perfectly level.

CUTTER ADJUSTMENT

To adjust the stylus pressure for the correct depth and width of cut, the best procedure is to cut some "blank" grooves in a recording disc of the type that will be used: The stylus pressure can be regulated, by means of the adjustment screw on top of the cutter bracket, to produce the correct thickness of the hair-like cuttings. The cuttings should collect toward the center of the recording disc. If they collect toward the outside the stylus is not correctly inserted, and must be adjusted by removal and re-insertion. If the threads continue to collect toward the outside, use a new stylus.

The cuttings should be even, thin, hair-like threads about three-thousandths of an inch across or approximately the diameter of a human hair.

The groove width should almost equal, but not exceed, the distance between grooves. A magnifying glass is helpful in examining the grooves. If the grooves are too shallow, the phonograph needle will slide over them on playback. If the grooves are cut too deep, rumble will be excessive.

After examining the cuttings and the groove width, adjust the cutter pressure as required by means of the adjustment screw on top of the cutter bracket. Turn this clockwise to increase pressure and increase depth of groove. Turn counter-clockwise to decrease pressure and decrease depth of groove.

Check the new adjustment by running more blank grooves.

Check the cuttings and groove width each time a new stylus is inserted, and whenever a different tpe of recording disc is used. Due to variations in material composition and hardness among different types of discs, the same cutting-pressure adjustment will not give an equal depth of cut on all types. Thus, it may be necessary to change the adjustment previously set for one type of disc, when recording on a different type.

Excessive cutting pressure will cause rumble. The width of the groove should almost equal, but not exceed, the distance between grooves.

Check the groove width each time a new stylus is used, and each time a new disc is used.

When recording, use the maximum bass response, by turning the bass control to the maximum clockwise position.

On play-back, use the least bass response, by turning the Bass control to the maximum counter-clockwise position.

Be certain that the motorboard and mechanism is "floating" free from the cabinet.

Recorder Service

Cutter Head Drive:—The cutting head drive screw (lead screw) should rotate freely and be free from end play. If end play is present loosen the jamb screw which locks the cone point bearing located at end away from driving gear and adjust this bearing until end play is eliminated (being careful not to cause binding), then tighten jamb screw.

Cutter Head Mounting:—Two cone pointed set screws support the cutter head and its mounting bracket. These should be adjusted to prevent end play but to permit free movement of the cutter head up and down.

Record Threads:—Keep the drive gears and lead screw free from record threads.

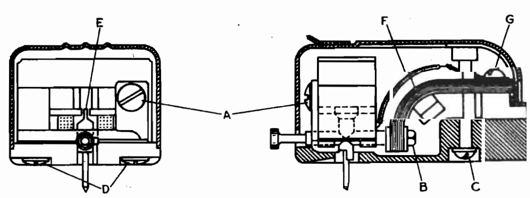
Equalizing Groove Width:—In order to keep the groove width cut at the inside and outside of record equal, it may be necessary to adjust the spindle bearing into which the swivel spindle of the recording arm is placed, and which is located at the right hand center of the phono board. To adjust this bearing loosen the set screw in the base and move bearing up or down as desired. If the grooves at the edge of record are shallower than those at center of record, lower the bearing. If grooves at edge of record are deeper than those at center of record, then raise the bearing.

Lubrication:—Keep the drive gears, lead screw, and other bearing surfaces well lubricated with Vaseline or Petroleum Jelly.

"Automatic" Cut-Off Switch Under Recorder Arm:—When the Recorder Arm is swung in position over a record to make a recording, the weight of the arm is brought down on a switch mounted under the recorder arm swivel bearing, opening the switch and making the Automatic Phonograph inoperative.

This switch should be adjusted so that when the Recording Arm is on its rest, the switch is closed; i. e. the switch plunger is all the way up; and there should be about 1/32-inch clearance between the top of switch, and the swivel shaft. When the Recording Arm is in the recording position, the switch is open; i. e. the switch plunger is pushed down.

Cutter Head:—



Cutter Head

The cutter head used is of an improved design. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the cutter are as follows:

Centering Armature:—Refer to the figure showing the cutter inner structure. The armature "E" is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. To center armature remove screw C and remove cutter cover. Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws D have not been disturbed, screw A should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screw A should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the cutter armature.

Replacing Coil:—Remove the cutter cover by removing screw C. Remove screws D and A and lift magnet off coil assembly. Unsolder coil leads. Remove coil and bakelite board on which it is mounted. Replace with new coil and mounting board. Replace magnet. Replace screws A and D. Solder new leads. Tighten screws D so that the armature is perpendicular to the pickup base. Center armature as described above.

To Replace Viscoloid Damping Block (F) or Replace Armature E:—Remove cover. Remove screws G. Remove screws D and A. Remove magnet assembly. Unsolder coil leads. Remove coil assembly. Remove armature and viscoloid block. Remove nut B. Remove viscoloid from armature. Replace either new armature, new viscoloid or both as desired. When replacing nut B make sure that viscoloid is parallel to the armature and that it will not twist the armature when clamped under screws G. Tighten nut B so that viscoloid is firmly fastened on shaft. Replace parts in reverse order as removed above. Center armature as described above.

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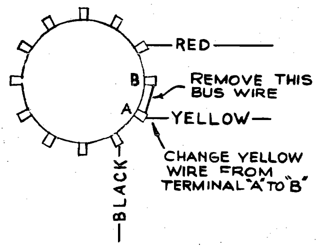
QU5

Radio Break-Through on Phono:

In localities where a strong local broadcast signal is present, it can sometimes be heard very faintly on Model QU5 when the receiver is tuned to the signal and the radio-phono switch turned to the phono position.

This condition can be eliminated by removing one bus wire connection and changing the yellow lead on the radio-phono switch as shown in accompanying illustration.

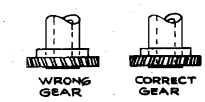


Model QU5 Revision to Prevent Radio Break-Through on Phono

VV2-35, VV2-55

Incorrectly Cut Winding Gear:

There is a possibility that several incorrectly cut gears (No. 10203) have reached the field. The gear teeth form a left-hand spiral when viewed from either side, whereas the correct cut is a right-hand spiral.



Winding Gear in VV2-35 and VV2-55

7QB

Transformer Polarity:

On some production receivers, the leads from the primary winding of the output transformer are color-coded in a manner reverse to that shown in the Service Notes wiring diagram. That is, the red lead and the black-with-red tracer lead are interchanged.

BP-10

Replacing Lid or Front Panel:

When the molded lid (which contains the loop antenna), or the chrome front panel requires replacement, it is not necessary to replace the complete assembly of lid and front panel, as either one may be replaced separately in a few minutes by taking out the hinge pins as described below.

The following parts are available for this purpose:

RCA Stock No.	
37855	Lid and antenna (type without lid support)
37856	Chrome front panel (type without lid support)
37853	Lid and antenna (type with lid support)
37854	Front chrome panel (type with lid support)
37857	Two hinge pins and two hinge springs for BP-10

The following parts are discontinued:

RCA Stock No.	
36510	Antenna loop and cover (discontinued)
36511	Lid and chrome panel (discontinued)

Installation Instructions:

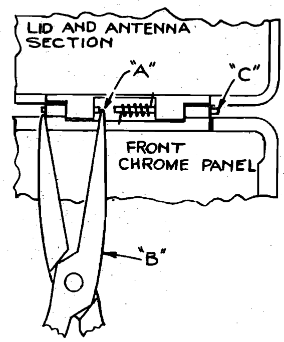
First remove the three self-tapping screws that hold the chassis in the center case, and remove the case. Unsolder the leads from the loop lugs.

(a) With lid closed, cut hinge pins at point "A" with sharp cutters.

(b) Start removal of pin sections as shown, using long-nose pliers.

(c) Grasp end of pin section with long-nose pliers and pull out of hinge.

(d) Install new lid, or new front panel, using the replacement hinge pins and springs that are provided with replacement lids and panels. Arrange springs as shown. Apply a small amount of "Thermoplastic Cement" (G.E. ZV 5057) near outer end of each pin to insure tight and permanent fit.



Replacing Lid or Chrome Panel on Model BP-10

Loose Control Knobs:

If for any reason either the tuning or volume control knob on Model BP-10 should become loose on its shaft, it may be rigidly mounted in the following manner:

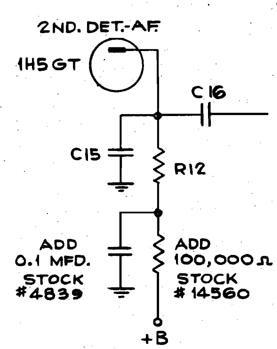
(a) Remove the loose control knob from its shaft and scrape off the old cement from both shaft and control knob.

(b) Apply a generous even coating of a good cement to the shaft region which is to engage the knob. G.E. Thermoplastic cement, ZV-5057, is excellent for this purpose; it is a green fluid, easily thinned with acetone if necessary.

(c) Allow the cement on the shaft to air-dry, to evaporate any acetone present.

(d) Apply a small amount of heat to the shaft, sufficient to soften the cement.

(e) Mount knob on shaft while cement is still soft, and allow a few minutes for drying.



"RC" Filter Inserted in Audio Plate Circuit of Model 15BP to Reduce Hum

"A" Battery Polarity:

In the battery layout diagram at the top left of page 2 of the BP-10 Service Note (1940, No. 32), the 1.5 v. "A" battery is shown incorrectly. The actual polarity is reverse to that shown, **minus being at the top, and plus at the bottom.**

10X

Hum:

Keep heater lead wiring away from audio input circuit.

14BT, 14BT-2, 14BK

Distortion and Loss of Sensitivity:

Some cases of loss of sensitivity, and distortion have been associated with frequency drift. In such an event, correction may be made by:

(a) Connecting a 9 mmfd. condenser (RCA Stock No. 37814) from the high side of the oscillator section, at the gang condenser, to ground.

(b) Realigning the 1st detector and oscillator tuned circuits.

(c) Realigning the I.F. circuits if necessary.

15BP

Fidelity Change:

Should accentuation of the higher audio frequency register be desired, capacitor C-15, connected across the 1st A.F. output, may be decreased from 390 mmfd. to 100 mmfd. Some production instruments will have this change already applied; therefore, circuit diagrams should be revised accordingly.

Hum:

Occasional cases of hum on Model 15BP instruments may often be reduced by application of the following:

(a) Shield the 1H5GT 2nd det. A.F. tube by means of a tube shield securely grounded.

(b) Insert a filter network in the 1st audio plate circuit as shown in the accompanying diagram.

Dial Cord Slippage:

To remedy dial cord slippage, on Model 15BP add an extra turn of cord around the drive shaft, without lengthening the cord, thus securing better grip and increased spring tension.

15BP-7, RC-527C

Service Data:

Model 15BP-7 chassis is similar to the Model 15BP (1940). Page 12-23

Model 15BP-7 has the late-type power switch circuit

Replacement parts for the 15BP-7 are the same as in the 15BP Series, except for the following:

Stock No.	Description	Unit List Price
36128	Dial—Dial scale (15BP-7)	$1.00
37385	Indicator—Power switch indicator plate (Power Line—Off—Battery)	.35
36842	Resistor—5 ohm resistor (1 watt) (Flexible)	.20
37681	Resistor—Resistance power cord, 545 ohms	1.00
37384	Switch—Power switch	.90
	SPEAKER ASSEMBLIES (RL-81-B1)	
32907	Cap—Dust cap	.02
35570	Cone—Cone complete with voice coil	1.20
36098	Transformer—Output transformer	1.25
	MISCELLANEOUS ASSEMBLIES	
36152	Crystal—Dial scale crystal less dial	.50
35392	Decalcomania — Trade-mark decal	.05
36222	Fastener—Snap fastener for power cord door	.10
37368	Handle—Carrying handle	.35
35121	Knob—Control knob	.10
36154	Spacer—Rubber spacers for control shafts	.10

(Prices subject to change or withdrawal without notice.)

VA-15

Stock Number Correction:

In the Replacement Parts List for Model VA-15 (published on the back page of "Supplementary Information No. 2"), the lamp shade should be changed to read Stock No. 37887 instead of 36727.

16K, 16T2, 16T3, 16T4, 17K, 19K, V-205, V-405

Increasing Sensitivity:

These models have an untuned R-F stage which is resistance-coupled to the 1st-detector. The sensitivity may be increased by changing the R-F plate load resistor to a higher value, between 6,000 and 10,000 ohms. This change is not recommended in metropolitan localities owing to possiblity of cross-modulation.

CHANGES NOTES & DATA

RCA MFG. CO., INC.

BT-40 and 94BP1 SERIES

Loudspeakers:

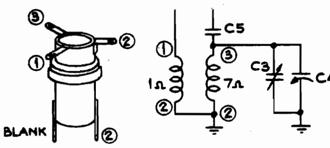
Three types of loudspeakers have been employed in Models BT-40 and 94BP1. Though of different design and using non-interchangeable cones, unfortunately, two of these speakers were identically marked. As a consequence, there has been considerable misunderstanding in ordering and in filling orders for replacement cones, with resultant delay.

In order to prevent delays in the filling of future orders, the complete speakers only will be stocked. This may be ordered by Stock Number 33058.

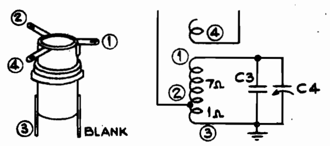
45X-11, -12, -13

Oscillator Coil Connections:

The oscillator coil in the 2nd production of these models is different from the 1st production. The correct connections are shown below. Note that when installing a No. 34443 coil, it is necessary to connect a jumper from the bottom lug No. 2 to the top lug No. 2.



STOCK NO. 34443 OSC. COIL
USED IN FIRST PRODUCTION 45X11,12,13
(RC 459 AND 459A)



STOCK NO. 35579 OSC. COIL
USED IN SECOND PRODUCTION 45X11,12,13
(RC459D AND 459E)

Oscillator Coil Connections in 1st and 2nd Production 45X-11, -12, -13

45X11, 12, 13 (2nd Prod.)

Circuit Revisions:

Schematic diagram for 2nd prod. 45X11, 12, and 13, given on page 233 of the 1939 RCA-Victor Service Notes Bound Volume has later revisions as follows:

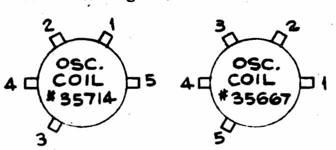
(a) R15 eliminated and a connection made from C16 direct to the 50L6GT grid.

(b) Terminal DP1 (1st diode plate) of tube 12SQ7 (2nd Det.-A.F.-AVC) connected direct to ground instead of to its illustrated connection.

46X21, 46X23

Correct Osc. Coil Connections:

The oscillator coil terminations shown at the bottom of the 46X21, 46X23, and 46X24 Service Notes (1940, No. 6) apply to coil No. 35667 used in Model 46X24 only. The terminations for coil No. 35714 used in Models 46X21 and 46X23 are shown below: The numbers refer to the oscillator coil connections in the schematic diagram.



MODEL 46X21,23 MODEL 46X24

Oscillator Coil Terminals in Models 46X-21, 46X-23

T64, T80

Control Knobs:

The correct listing of control knobs for Models T64 and T80 is as follows:

Stock No.

33471 Knob—Tuning knob
33553 Knob—Tone control knob
33470 Knob—Range selector knob
33505 Knob—Volume control knob

K-80

Hum Modulation and Howl:

Tendency of occasional receivers towards hum modulation and howl may be alleviated by:

(a) Rubber-mounting the loudspeaker by means of rubber grommets (Stock No. 33774).

(b) "Rigid-izing" loop antenna by taping winding in six places (2 each side, 1 top, and 1 bottom), using cellulose tape.

RP-145, RP-152 RECORD CHANGER

Centering Motor:

Should centering of the rotor be necessary, it may be accomplished quickly in the following steps:

(a) Remove the two long machine screws, and lift off plastic end cover.

(b) Loosen the two remaining screws sufficiently to permit adjustment of stator laminations.

(c) Insert a .010-inch speaker shim between the rotor and each of the four stator field poles. Rotor should now be equidistant from each pole, and accurately centered.

(d) Tighten screws and replace plastic cover.

RP-152 RECORD CHANGER

Stalling Going into Cycle:

The mechanism should be loaded with one record on the turntable. If stalling going into cycle takes place, it is probably due to insufficient tension in the main lever spring or booster spring (43). An additional metal washer should be inserted between the spring and its guide.

Stalling Coming Out of Cycle:

If the mechanism stalls just as it is coming out of cycle, that is, when the pickup is at its farthest distance laterally from the turntable, it is probable that there is too much tension in the booster spring. Any metal washers in this assembly should be removed.

CAUTION: The mechanism is designed to handle a total of 8—10-inch records or 7—12-inch records.

RP-153 RECORD CHANGER

Motor Data:

Should it be necessary to rebuild or service any of these motors in the field by replacing end heads or using new rotors and shafts, it must be noted that the rebuilt motors should be operated continuously for at least 48 hours before installation. The use of bronze bearings, diamond-bored for accuracy, together with the burnished steel shaft at the rotor provides a very close fit. As a result, the motor must be run in approximately 48 hours, after which the oil has had a chance to fairly cover all contact surfaces of shaft and bearings, and a very smooth-operating long life bearing results.

RCA 156 TUBE TESTER

1T5GT Data:

There has been some question as to the correct settings for testing 1T5GT tubes. On charts earlier than that included in the 156-D and E, the information is incorrect. Correct test data follows:

Tube	Fil.	Class	Type	Test Buttons
1T5GT	1.5	A	21	3, 4, 5

VHR-202, 207, 407

"Rumble":

Any instrument with the sensitivity and tone response of these home recorders is capable of picking up the mechanical vibrations of the motor. However, due to many preventives incorporated in the design of these instruments, rumble will not be recorded if the following precautions are observed:

LEVELING—See that the instrument is perfectly level.

FREENESS—Be certain that the motor-board and mechanism is "floating" free from the cabinet. All four mounting springs should be at approximately equal tension.

FOLLOWER ARM DAMPING WEIGHT—See that the lead weight is in place attached to the follower arm underneath the motorboard.

STYLUS—Make sure that a perfect stylus is tightly inserted in the cutter-head. Because both stylus and retaining screw are of hard steel there is a tendency towards loosening during cutting. Tightness should be checked before each cut.

INPUT LEVEL—Set for sufficient input level so that the "Magic Eye" just closes on modulation peaks.

TONE CONTROL SETTINGS—During recording, the power-bass control should be set for maximum lows, just beyond the click of power switch. The treble tone control setting will depend on the degree of potential rumble present. For extreme cases, it should be set for minimum highs during recording only, in order that the low frequencies in the selection or voice may have a full chance to mask any possible rumble.

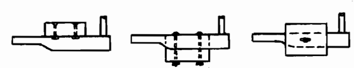
DEPTH OF CUT—During recording, the shavings should be directed towards the spindle and prevented from obstructing the cutter path. The thickness of these shavings should be about that of human hair, or approximately .003 inches. An additional check on depth of cut is to inspect the recording under a magnifying glass. The groove width should approach but not exceed the distance between grooves. Depth of cut may be varied by means of the cutting-pressure adjusting screw at the top of cutter arm.

TURNTABLE DRIVE—If rumble persists, inspect the idler wheel (between motor spindle and turntable) for possible runout, flat spots, and scraping against bottom of turntable.

RECORDING DISCS—Due to variations in material composition and hardness among different types of discs, the same cutting-pressure adjustment will not give an equal depth of cut on all types. Thus, it may be necessary to change the adjustment previously set for one type of disc, when recording on a different type.

Follower-Arm Weight:

Two other methods, besides the one shown in the Service Notes, have been used in attaching the lead weight to the recorder follower arm. These are indicated in the following sketches. All three provide similar results, "C" being the method used in latest production.



"A" WEIGHT TOP OF ARM "B" WEIGHT UNDERNEATH BOLTS VERTICAL "C" WEIGHT ON SIDE BOLT HORIZONTAL

Three Mounting Arrangements of Follower-Arm Weight on Home Recording Models

The weight is packed separately for methods "A" and "B" and must be mounted as shown when the instrument is installed in the consumer's home. Excessive "rumble" occurs when the weight is not in place.

Pickup Arm Starting Spring:

The pickup arm starting spring in RP-155 mechanism in the home-recorder models is Stock No. 36278.

Motorboard Mounting Spring:

Change Stock No. of Mounting Spring from 31470 to 37878 (4 required).

VHR-207, 407

12K7-GT Burnouts:

When shooting trouble or when testing Models VHR 207, and VHR 407 do not under any circumstances short the +B to ground with screwdriver or any other tool as a test for plate voltage.

A +B short will burn out the filament of the 12K7-GT microphone pre-amplifier tube. Always test for +B voltage on the chasses with a voltmeter and not with a screwdriver.

V-300, V-301, V-302

Increasing Phono Gain:

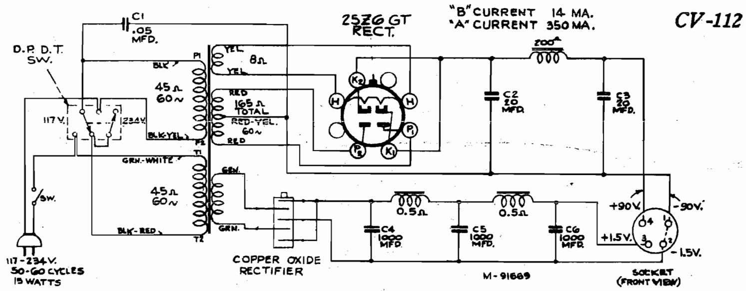
The audio output from low cut records may be increased somewhat by effecting the following changes:

Change R12 from 82,000 to 150,000 ohms.
Change R13 from 2,700 to 5,600 ohms.
Change C40 from .01 to .005 mmfd.

The above changes have been incorporated in 2nd production.

CHANGES NOTES & DATA

RCA MFG. CO., INC.



CV-112 CONVERTER

A-C Power Unit for QB2:

The CV-112 is designed to convert Model QB2 from battery to a-c operation.

Stock No.	Description	Unit List Price
4886	Capacitor—.05 mfd. — 400 volts (C1)	.20
30873	Capacitor—Electrolytic, 2 sections 20 mfd., 150 volts	1.35
36553	Capacitor—Electrolytic, 1,000 mfd., 3 volts	1.40
36547	Coil—High voltage choke coil —200 ohms	1.75
36548	Coil—Low voltage choke coil —marked 1B84	2.00
36549	Coil—Low voltage choke coil —marked 1B85	2.00
36551	Rectifier—1.5 volt rectifier	1.40
36552	Socket—4-contact power output socket	.30
18008	Socket—Tube socket	.25
36550	Switch—Power cord switch	1.00
33491	Switch—Voltage change switch	.35
36546	Transformer — Power transformer—110-220 volts, 50-60 cycle	5.00

MODELS 16T2, 16T3, 16T4

2nd Production (RC-509J, H, F):

In the 1st Production of these models, "A" band covers 540-1,560 k. c. In 2nd Production, the range is extended to cover 540-1,600 k. c.

Calibration scales for use in alignment of the 2nd Production receivers are printed on this page.

Also in 2nd Production, the volume control is changed from .25 meg. to 2 megs. and the circuit is revised to isolate the control from the diode d-c current as shown in the accompanying sketches. This isolation reduces the possibility of controls becoming "noisy." These changes should be made on any 1st Production receivers when this trouble is encountered.

For replacement parts lists, refer to the original Service Notes, except for the items which are used in 2nd Production:

MODELS 45X-11, -12, -13

Service Data for these models is given on pages 233 and 234 of the 1939 Bound Volume. Two changes have been made in 2nd Production:

(a) C-13 is connected to the grid of the 12SQ7 instead of to the arm of the volume control, to provide more effective I-F filtering.

(b) Diode plate No. 1 is connected to chassis instead of to diode plate No. 2, to reduce residual hum.

VHR-207, VHR-407

Changing 470 mmfd. Capacitor C-53:

Some cases have been reported of break down of capacitor C-53 in the cutter circuit. A higher voltage rating capacitor is now available under the same Stock Number, 30433. **The former type capacitor (black color) should be replaced with the new type (grey color) whenever these sets are serviced.**

V-205, V-405, VHR-207, VHR-407

Radio Break-Through on Phono:

Radio break through may occur in these models, due to capacity coupling between the I.F. 6SK7 plate lead and 6F6G grid leads. When this condition exists, dress the 6F6G grid leads down against the chassis well away from the 6SK7 I.F. plate lead.

MODELS 16K and 16T3

2,400 KC Police Band:

Where desirable, reception of a police station in the 2,400 kc band may be obtained by adding a jumper connection from trimmer C-3 to trimmer C-40, and lining up push button No. 5 to the desired police station. Re-alignment of C-3 at 1,500 kc will be necessary.

MODELS 16K, 16T3, 16T4

Station Selector Marker No. 36149:

The Service Notes for these models list the station selector marker incorrectly as Stock No. 33842. **The correct Stock Number is 36149.**

MODELS 16K, 16T3, 16T4, 17K, 18T, 19K, 110K, 111K

Failure to Oscillate on Push-Button Tuning:

Should a case of non-oscillation on any push-button range be experienced, check the oscillator grid leak to assure that it is 56,000 ohms. Some sets employed a 33,000 ohm leak which was occasionally found troublesome with low line voltage.

Low-Frequency Oscillator Push-Button Coil:

To ensure low-frequency coverage on the push-button oscillator coils in these models, a high-inductance coil, Stock No. 37133, is used for the 540-1,030 kc push-button oscillator ranges.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 16T4 (2nd Prod., RC-509F)

Stock No.	Description	Unit List Price
37133	Coil—Push button oscillator coil for 540-1,030 kc range (used in 1st and 2nd production)	$ .30
37955	Control—Tone control	1.10
36486	Control—Volume control and power switch	2.00
35883	Button—Push button, dark brown	.15
36300	Button—Push button, light brown	.15
37956	Dial—Glass dial scale	1.00
36149	Marker—Push button markers	.25

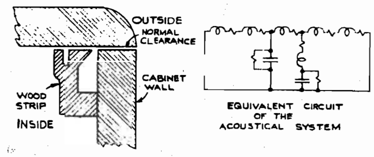
MODEL 16T2 (2nd Prod., RC-509J)
MODEL 16T3 (2nd Prod., RC-509H)

Stock No.	Description	Unit List Price
37133	Coil—Push button oscillator coil for 540-1,030 kc range (used in 1st and 2nd production)	.30
36486	Control—Volume control and power switch	2.00
12738	Resistor—27,000 ohm, ½ watt	.20
30651	Resistor—270,000 ohm, ½ watt	.20
37608	Switch—Tone switch	1.00
35883	Button—Push button, dark brown (16T3)	.15
36300	Button—Push button, light brown (16T3)	.15
37346	Dial—Glass dial scale for 16T2	1.10
37345	Dial—Glass dial scale for 16T3	1.10
36149	Marker—Push button markers (16T3)	.25

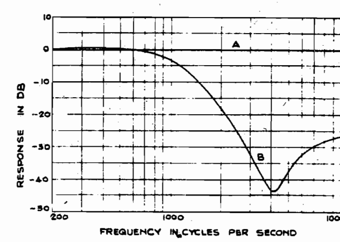
RCA TONE GUARD

The RCA Tone Guard is an acous-' network around the opening of the phonograph compartment in some models. It acts as a low-pass filter to reduce passage of the high-frequency sound that is generated and radiated directly into the air by the vibrating parts of the pickup.

A cross-section view of the Tone Guard and the equivalent electrical circuit are shown below. The series elements of the filter are formed by the normal slit between cabinet and lid. The shunt elements are formed by slots in the wood strip. The filtering action is very effective, as indicated in curve "B" below.

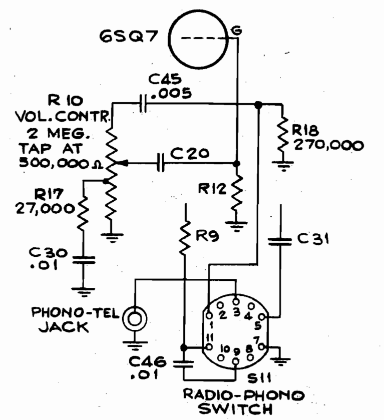


Tone Guard and Equivalent Circuit

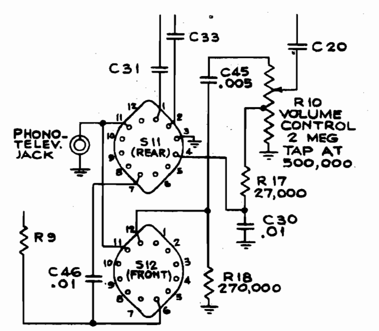


Curve "A"—Response Frequency Characteristic of Conventional Door and Cabinet (Taken as Unity)

Curve "B"—Response Frequency Characteristic of Tone Guard Relative to "A," Showing Reduction of High-Frequency Noise



Volume Control Circuit in 2nd Production 16T2, 16T3.



Volume Control Circuit in 2nd Production 16T4.

CHANGES
NOTES & DATA

RCA MFG. CO., INC.

CHANGES IN SERVICE NOTES PARTS LIST

10X, 11X1..C-3 is changed from .005 (Stock No. 33584) to .015 mfd. (Stock No. 11315).

14X........Delete Trade Mark Decal Stock No. 35392.

14X, 14AX..Change description of No. 37904 capacitor to read—"Mica trimmer comprising 1 section of 300-800 mmfd., and 1 section of 200-280 mmfd.
Change walnut range switch knob from Stock No. 32895 to No. 35121.

15X........C-5 is changed from 120 mmfd. (Stock No. 12724) to 150 mmfd. (Stock No. 12725).
C-8 is changed from .015 mfd. (Stock No. 11315) to .025 mfd. (Stock No. 30938).
C-9 is changed from 120 mmfd. (Stock No. 12724) to 300 mmfd.
C-9 is built in with C-10 (.005 mfd.) and the Stock Number on the combination is 37359.

15X,
16X1, 16X2.Change Stock Number of push-on fastener from 35069 to 37831.

16X11......Delete Stock No. 35681 Rotor —Cabinet rotor disc.

Q33........Change No. 31418 Spring to read "Drive-Cord Spring." Add No. 13638 Spring Dial-Cord tension spring.
Add the following parts:
37921 Crystal—"Magic Eye" crystal
37922 Indicator—Station selector indicator
30716 Clip—"Magic Eye" clip and thumb screw
33438 Screw—Thumb screw for "Magic Eye" clip

V-100......Change Stock No. 4109 cup to Stock No. 37933.

V-170......Change Stock No. 33444 output transformer to No. 31301.

VHR-202,
207, 407....Add under "Home Recording" Assemblies:
37969 Spring—"U" shaped spring for recorder-arm fulcrum
37970 Screw—Slotted, hex-head, cup-point, set screw to fasten recorder arm to pivot shaft

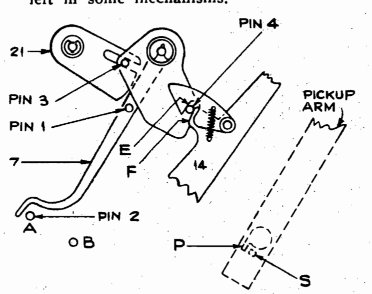
V-300......Add No. 18469 Socket for No. 36599 electrolytic.

VHR-307...Add No. 38324 Sleeve—Rubber sleeve for actuating arm No. 34133.

RCA VICTROLA MECHANISM DATA

RP-152, RP-153, RP-155:

The following changes have been made in these Record Changers:
(a) Removal of Trip Regulator Lever (Part 21).
(b) Removal of Pin 1 on Trip Lever Friction Finger (Part 7).
(c) Repositioning of Stop Pin 2 from position "A" to position "B."
(d) Removal of Pin 3. Since this pin does not interfere with the operation, it has been left in some mechanisms.



Trip Regulator Lever (21) is Removed in Some Production.

The Trip Regulator Lever was formerly used to prevent premature tripping due to a too early return of the Trip Lever Friction Finger at the end of each changing cycle. The same result is obtained by removing the Trip Regulator Lever and repositioning the Trip Finger Stop Pin as shown in the diagram.

Binding or Hesitation of Tone Arm:

This may be due to the following causes:
(1) Small burr on edge "E." Correction: Carefully remove burr with a fine file until edge is entirely smooth.
(2) Binding of Pin 4 between edges "E" and "F." Correction: File off edge "F" with a fine file to give just enough clearance for smooth operation.
(3) Too far an outward swing of the Pickup Arm. This causes Pin 4 to be caught in the upper curved portion of edge "F." Correction: On some models the Pick-up Arm Shaft can be rotated by loosening the nut under the motor board. Rotate sufficiently to prevent Pin 4 from riding into curved portion mentioned, when Pick-up Arm is in the outermost position.
On models where the Pick-up Arm Shaft is positioned by a locating key, it is necessary to bend Stop Guide "S" on Pick-up Arm towards Stop Ear "P" on Pick-up Arm Shaft so that the condition mentioned in the above paragraph is obtained.

RP-152 SERIES

No. 38304 Spindle Bearing and Washer:

The turntable spindle bearing and washer for the RP-152 Series automatic record changer mechanism, used in Models VA-15, V-170, V-200, V-201, V-205, V-300, and V-405, are now stocked as No. 38304.

"RP" vs. "MODEL" NUMBERS

RP-139A and RP-145 mechanisms are used in models U-40, U-42, U-43, U-44, and U-45.
RP-152 and RP-153 mechanisms are used in the following models:

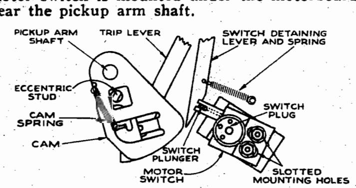
Model No.	Mech. No.	Model No.	Mech. No.
VA-15	RP152	V-300	RP-152J
V-170	RP-152	V-301	RP-153
V-200	RP-152A	V-302	RP-153
V-201	RP-152A	V-405	RP-152J
V-205	RP-152B		

RP155 mechanism is used in the home-recording models VHR-202, 207, 307, and 407.

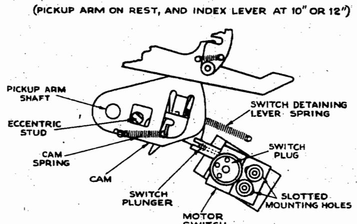
RP-152D AND RP-153

Automatic Switch Adjustment:

In RP-152D and RP-153, an automatic motor switch is mounted under the motorboard, near the pickup arm shaft.



RP-152D & 153 AUTOMATIC SWITCH
(PICKUP ARM ON REST, AND INDEX LEVER AT 10" OR 12")



RP-152D & 153 AUTOMATIC SWITCH
(PICKUP ARM 1⅞ FROM SPINDLE AND INDEX LEVER AT "MANUAL")

When the index lever is set at its "10-inch" or "12-inch" position, a detaining lever holds the switch plunger in and keeps the motor running.

When the index lever is set at its "manual" position, the detaining lever moves aside and the switch plunger is then actuated by a cam on the pickup arm shaft. In "manual" position, when the pickup is on its rest, the switch plunger is out and the motor circuit is open. When the pickup is moved from its rest to the edge of a 12-inch record, the cam pushes the switch plunger in and the motor starts. When the pickup needle reaches a point 1⅞ inches from the centerline of the turntable spindle, the switch plunger is released by the sharp corner of the cam, thus shutting off the motor.

When the pickup is lifted off the record and moved to its rest, the motor starts momentarily.

ADJUSTMENTS:

The slotted switch mounting holes permit positioning of the switch so that the plunger will be pushed in by the cam.

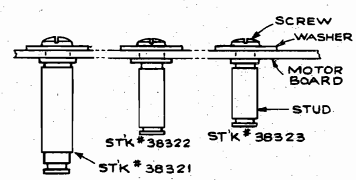
The eccentric stud on the cam should be turned so that the switch plunger is released by the sharp corner of the cam when the pickup needle is 1⅞ inches from the centerline of the turntable spindle.

REPLACEMENT STUDS

For Main Lever, Cam-and-Gear, or Trip Pawl:

In automatic record changers of the RP-139A, 145, 152, 153, 155, and similar types, loosening of the mounting studs on which the main lever, cam-and-gear, or trip pawl are pivoted may be caused by jamming of the main lever against the pawl pin at the end of the change cycle due to one or more of the following reasons:
(a) The long arm of the main lever slides over the thin pawl pin instead of pushing against it during first half of cycle. **Check for bent arm on main lever.**
(b) After being cleared out of the way, the trip pawl bounces back due to vibration (dancing near mechanism, etc.) **Check the trip-pawl phosphor-bronze spring for sufficient "drag" or pressure against the pawl.**
(c) **The index lever is put into "REJECT" position while the mechanism is still in its change cycle.** Caution customer against this.

Loose studs may be quickly and easily replaced by using special replacement studs that are fastened to the motorboard by means of a screw and washer. Three different studs are available:



Stock No.
38321 **Main Lever replacement stud,** with screw and washer...
38322 **Cam-and-Gear replacement stud, with screw and** washer.
38323 **Trip Pawl replacement stud,** with screw and washer...

VHR-202, 207, 407

50-Cycle Motor Parts:

Stock No.	Description	Unit List Price
37943	Bearing—Bottom bearing and bracket (50 cycle)......	$ .50
37945	Field—Motor field — 110 volts, 50 cycles........	7.75
37941	Motor—105-120 volts, 50 cycles	14.00
37944	Pulley—Motor shaft pulley (50 cycle)	.35
37942	Rotor—Motor armature (50 cycle)	4.25

Parts originally listed in RP-155 Service Notes (VHR-202, VHR-207, and VHR-407) are applicable to 110 volts, 60 cycle motor only, except Stock No. 37040 Ring, which is used on both 60 and 50 cycle motors.

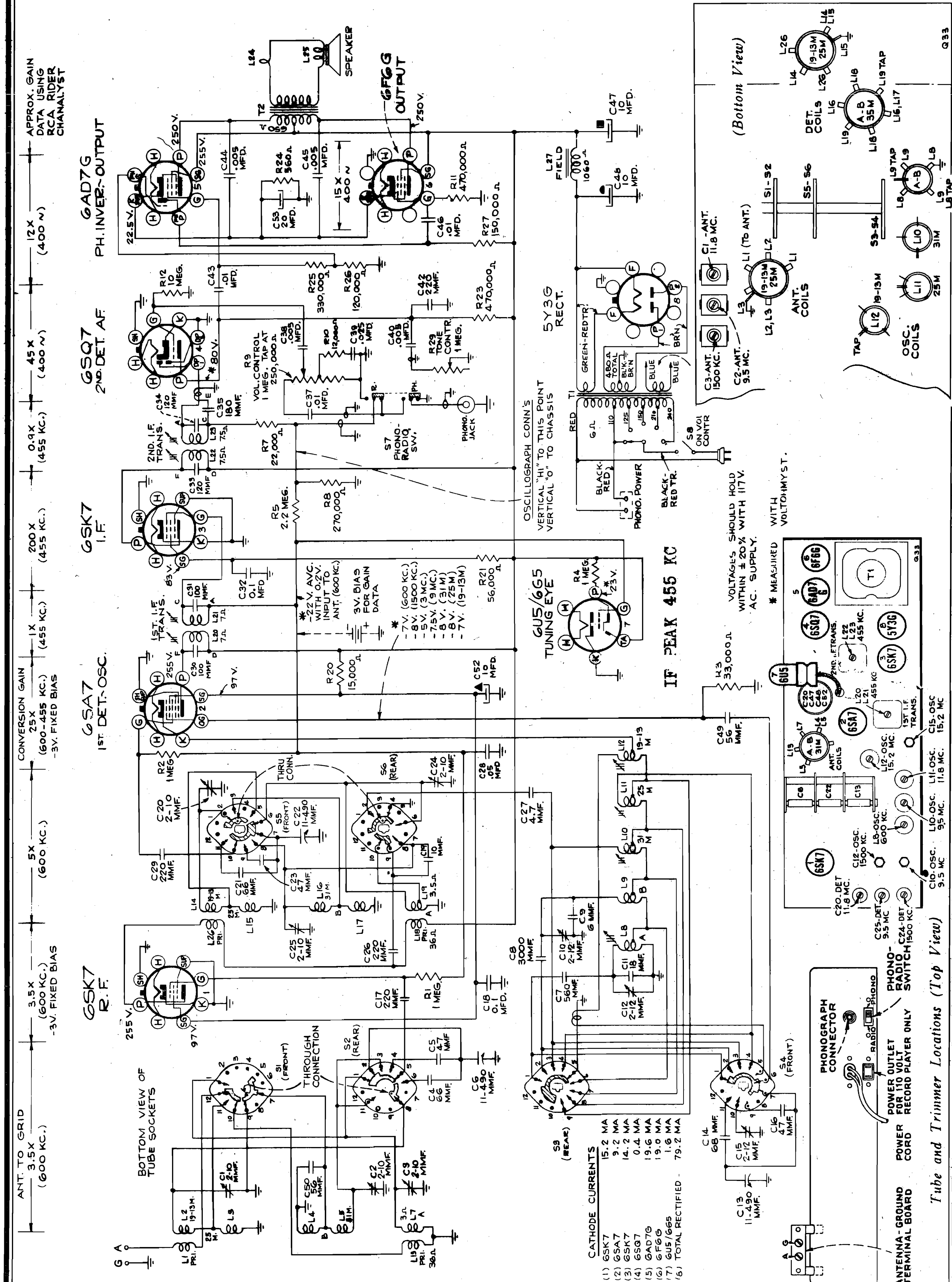
V-301, V-302

Mechanical Motor Noise:

Mechanical motor noise due to armature end play sometimes develops with wear in the above instruments which use type RP-153 record changers. This can be eliminated by tightening the armature thrust bearings. Care should be taken to avoid making them too tight which will cause binding.

RCA MFG. CO., INC.

MODEL Q33
Ch. RC-539



MODEL Q33
Ch. RC-539

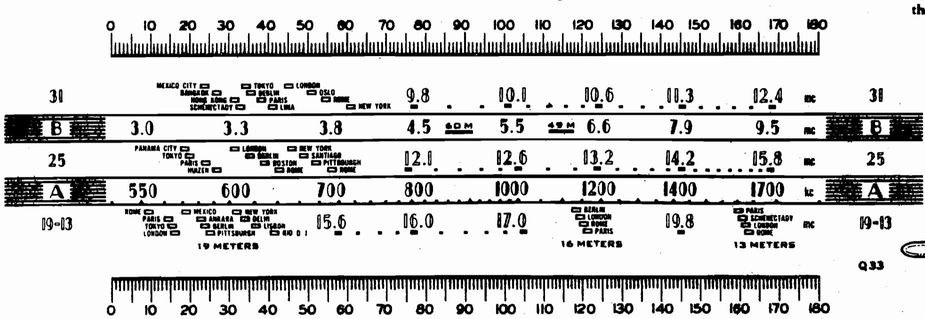
RCA MFG. CO., INC.

Alignment Procedure

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range Switch	Turn Radio Dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A" band	Quiet point 600 kc end of dial	L23-L22 2nd I-F transformer
2	6SA7 1st det, grid in series with .01 mfd.				L21-L20 1st I-F transformer
3	Antenna terminal in series with 300 ohms	11.8 mc	25 meter band	11.8 mc (41.5°)	L11 (osc.) C1 (ant.) C20 (det.)
4		15.2 mc		15.2 mc (161.7°)	C15 (osc.)*†
5	Repeat steps 3 and 4 until aligned.				
6	Antenna terminal in series with 300 ohms	15.2 mc	19-13 meter band	15.2 mc (24°)	L12 (osc.)**
7		9.5 mc	31 meter band	9.5 mc (23.8°)	L10 (osc.)** C2 (ant.) C25 (det.)***
8		9.5 mc	"B" band	9.5 mc (168.5°)	C10 (osc.)*
9	Antenna terminal in series with 200 mmfd.	1,500 kc	"A" band	1,500 kc (153°)	C12 (osc.) C3 (ant.) C24 (det.)
10		600 kc		600 kc (30.5°)	L8 (osc.) Rock in
11	Repeat steps 9 and 10.				

* Use minimum capacity peak if two can be obtained.
** Peak at minimum plunger position if two peaks can be obtained.
*** Use maximum capacity peak if two peaks can be obtained.
† Check image to determine that C15 has been adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

NOTE: **Oscillator tracks above signals on all bands.**



Calibration Scale

Reduced Reproduction of Receiver Dial and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 30° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the rear of the indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

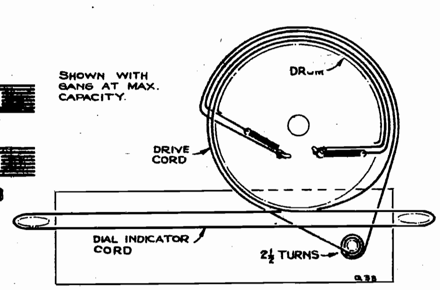
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations by known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.



Frequency Ranges
Standard Broadcast ("A" Band)..540-1,720 kc (556-174 m)
Medium Wave ("B" Band).......3.0-9.5 mc (100-31.6 m)
31 Meter Spread Band..........9.5-11.7 mc (31.6-25.6 m)
25 Meter Spread Band.........11.7-15.1 mc (25.6-19.9 m)
19-13 Meter Spread Band......15.1-22.5 mc (19.9-13.3 m)

Intermediate Frequency.......................455 kc

Pilot Lamps..........2—Type 44, 6.3 volts, 0.25 amps.

Power Supply Ratings
105-125 volts, 50-60 cycles.....................80 watts
105-125 volts, 25-60 cycles.....................80 watts
100-130, 140-160, 200-250 volts, 50-60 cycles......80 watts

Power Output
Undistorted.................................3 watts
Maximum.................................3.5 watts

Loudspeaker
Type.......................8-inch electrodynamic
V.C. Impedance.................2.2 ohms at 400 cycles
Indentification Number......................RL-63K5

Precautionary Lead Dress:

1. Dress green leads from antenna and R-F gang sections away from all metal including chassis shield plates. The spaghetti covered braid in the antenna section should be at least ¼ inch away from gang.
2. Black and brown twisted filament leads between 6SA7 and 6SK7-RF must run along front side of the shield plate.
3. Dress toothpick capacitors and switch leads away from and edge on to shield plates.
4. Closely twist ground lead about 2nd I-F transformer diode lead and dress close to chassis.
5. Dress volume control-arm lead and capacitor close to front apron and away from output tubes by-pass capacitors.
6. 6SQ7 10 megohm grid resistor should have no lead length on the grid side.
7. Dress capacitor high side of volume control toward base and as far as possible from a-c switch.
8. Leads to converter socket should not impede flexible mounting.
9. Converter control grid: clear of any other leads, especially filament leads which must be at least ¼ inch away. The megohm grid leak must have its body as close to grid as possible.
10. Dress oscillator grid and control grid capacitors apart. Dress oscillator grid coupling condenser away from coil form and ¼ inch from any other parts.
11. 6AD7G plate to cathode capacitor must be flat against chassis.
12. Dress all filament and B+ leads close to chassis.

Oscillation:

Audio oscillation may be encountered if the receiver is switched to the phonograph position and the pickup is not plugged into the jack provided in the rear chassis apron.

MODEL Q44
Ch. RC-531

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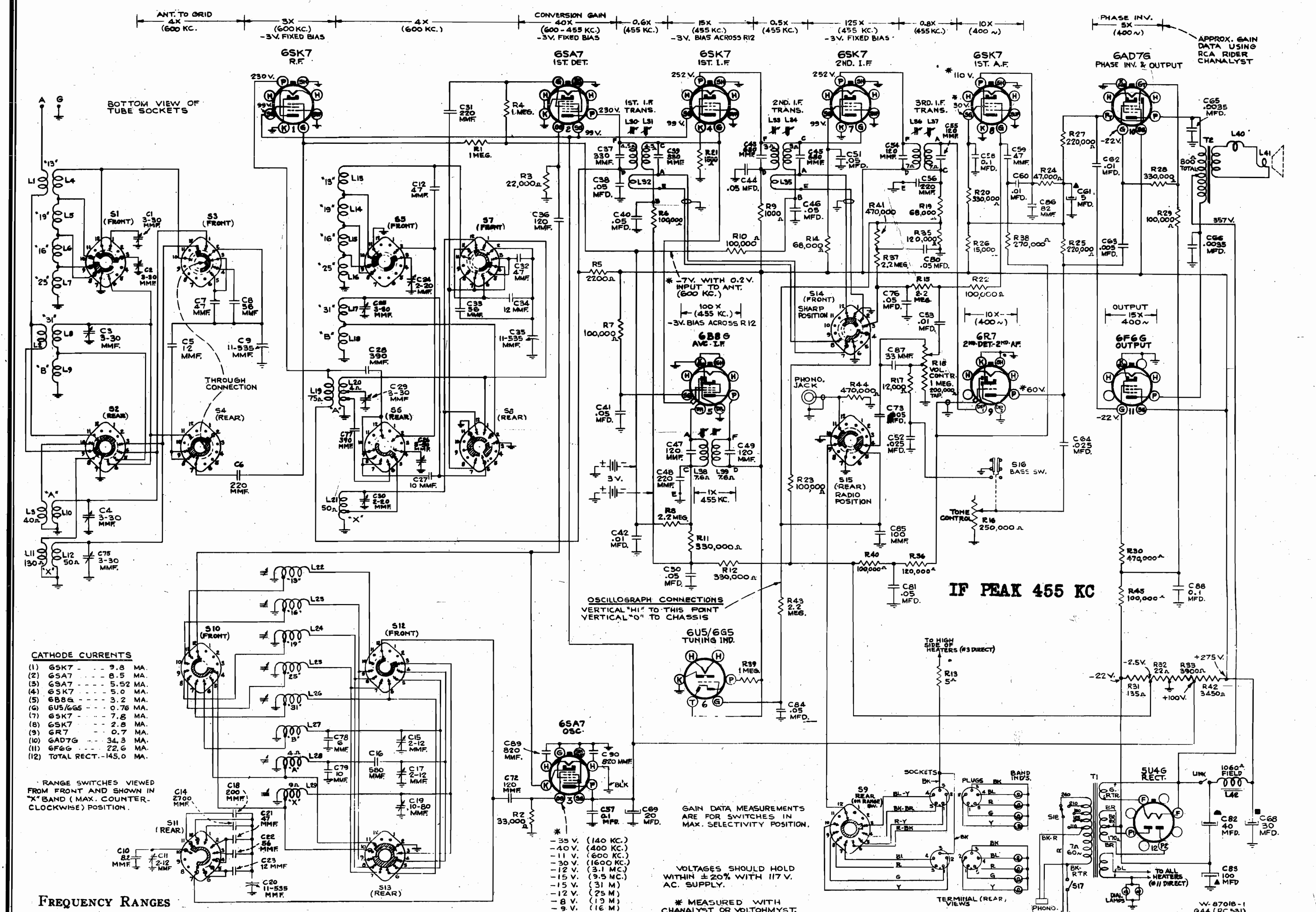
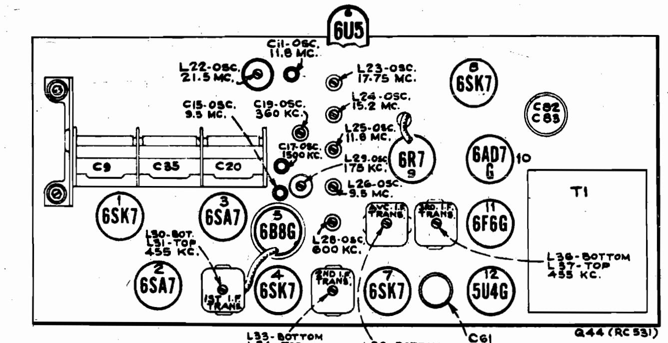
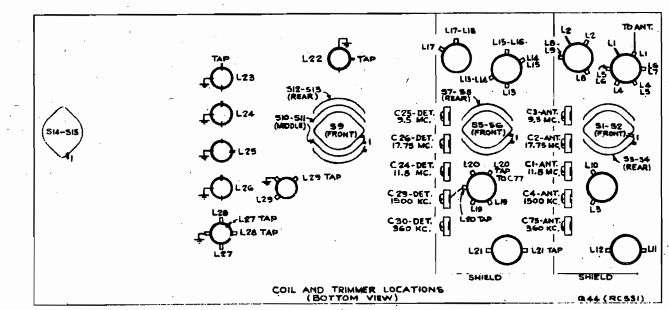




Tube and Trimmer Locations (Top View)



Coil and Trimmer Locations (Bottom View)

Precautionary Lead Dress:—

1. All oscillator leads should be kept as short as possible.
2. Both yellow leads in the antenna switch section must be dressed towards the lug end and away from the coil windings, and also held to length.
3. Both yellow leads to adjacent lugs on detector coil must be dressed towards lug end and away from the coil windings, and also held to length.
4. The following leads should be held to length
   from No. 8 on S1
   from No. 5 on S2
   from No. 8 on S5
5. Lead from No. 4 on S15 must be dressed along the chassis away from all heater leads.
6. Lead from No. 5 on S15: well away from all heater leads.
7. The diode lead and the ground lead from the third I-F must be twisted.
8. The diode lead and the ground lead from A.V.C. I-F transformer must be twisted.
9. The lead on No. 9 of S15 should be away from the volume control and first audio tube.
10. The two condensers on the oscillator heater must be as short as possible and dressed away by at least 1/4" from the bracket, parts wired to it, the yellow lead, and the oscillator grid lead.
11. Green, blue and double enamel leads from the oscillator coil nearest the rear apron must bear tightly against each other.
12. The oscillator grid coupling condenser must bear tightly against the styrol; the sprayed mica must likewise bear on the styrol from the opposite side.
13. The long ground lead from the oscillator heater must be kept away from all condensers, resistors, and leads to R-F tubes.

Frequency Ranges

Long Wave ("X" Band)	140-410 kc (2145-735 m)
Medium Wave ("A" Band)	540-1,720 kc (555-174 m)
Short Wave ("B" Band)	3.1-9.5 mc (97.5-31.5 m)
31 Meter Spread Band	9.45-11.8 mc (31.8-25.4 m)
25 Meter Spread Band	11.65-15.2 mc (25.6-19.9 m)
19 Meter Spread Band	15.1-17.75 mc (19.9-16.9 m)
16 Meter Spread Band	17.73-18.5 mc (16.9-16.2 m)
13 Meter Spread Band	21.45-22.5 mc (13.95-13.3)

Intermediate Frequency .... 455 kc

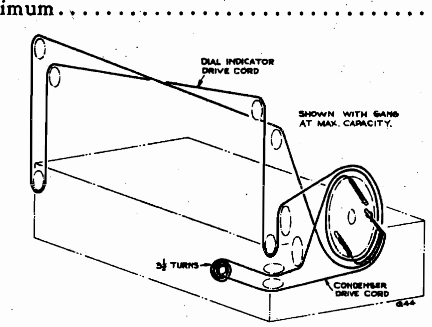
Pilot Lamps ....10 Type No. 51 6-8 volts, 0.2 amps.

Power Supply Rating

105-125 volts, 50-60 cycles.................... 125 watts
105-125 volts, 25-60 cycles.................... 125 watts
100-130, 140-160, 195-250 volts, 40-60 cycles.... 125 watts

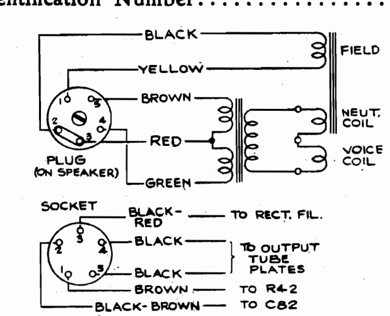
Power Output Rating

Undistorted.................................... 10 watts
Maximum.. 12 watts



Loudspeaker

Type.......................... 10-inch Electrodynamic
Voice Coil Impedance..............2.4 ohms at 400 cycles
Identification Number...................... 88885-502



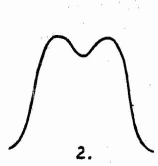
RCA MFG. CO., INC

MODEL Q44 Ch. RC-531

Step	Connect the high side of test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	Turn selectivity control maximum counter-clockwise for maximum selectivity.			
2	6SK7 2nd I-F grid in series with .01 mfd.	455 kc	"A" Band Quiet point between 550-750 kc	L37, L36 Third I-F Transformer
3	6SK7 1st I-F grid in series with .01 mfd.			L34, L33 Second I-F Transformer
4	6SA7 1st Det. grid in series with .01 mfd.			L31, L30 First I-F Transformer
5	With selectivity control in broad position retouch L37, L36 for selectivity curve 2.			
5A	With selectivity control in sharp position see that curve 1 has not changed appreciably.			
6	6SA7 1st Det. grid in series with .01 mfd.	455 kc	"A" Band quiet point 550-750 kc	L39, L38 AVC Transformer*
7	Antenna Terminal in series with 200 mmfd.	360 kc	"X" Band 360 kc (149°)	C19 (osc.)** C30 (det.) C75 (ant.)
8		175 kc	"X" Band 175 kc (51°)	L29 (osc.) (Rock-in)
9	Repeat steps 7 and 8.			
10	Antenna Terminal in series with 200 mmfd.	1,500 kc	"A" Band 1,500 kc (150.5°)	C17 (osc.) C29 (det.) C4 (ant.)
11		600 kc	"A" Band 600 kc (26°)	L28 (osc.) (Rock-in)
12	Repeat steps 10 and 11.			
13	Antenna Terminal in series with 300 ohms	9.5 mc	"31M" Band 9.5 mc (21.5°)	L26 (osc.)*** C25 (det.) C3 (ant.)
14		11.8 mc	"31M" Band 11.8 mc (169.5°)	C11 (osc.)***
15		Repeat steps 13 and 14 until correct on dial.		
16		9.5 mc	"B" Band 9.5 mc (172.5°)	C15 (osc.)***
17		11.8 mc	"25M" Band 11.8 mc (36°)	L25 (osc.)*** C24 (det.) C1 (ant.)
18		15.2 mc	"19M" Band 15.2 mc (37°)	L24 (osc.)***
19		17.75 mc	"16M" Band 17.75 mc (28°)	L23 (osc.)**** C26 (det.) C2 (ant.)
20		21.5 mc	"13M" Band 21.5 mc (59°)	L22 (osc.)****

* Connect oscilloscope to lug C of A.V.C. transformer.
** Core of L29 should be approximately ⅝ inches out before adjusting C19.
*** Use minimum capacity or inductance peak.
**** Use maximum inductance peak.
NOTE: Oscillator tracks above all signals except on 16 and 13 meter bands.

I.F. Selectivity Curves
At Left—"Sharp"
At Right—"Broad"

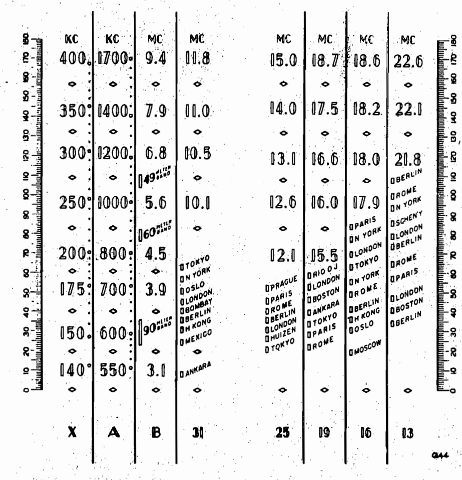


Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dials are fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "0°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at the sides.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.



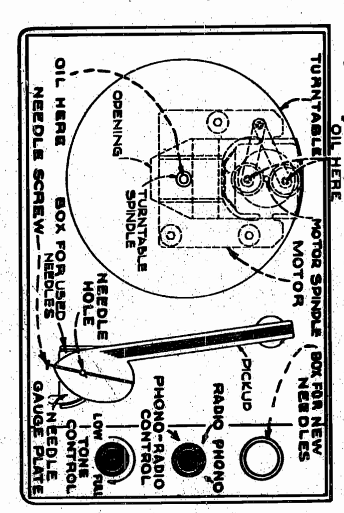
Spread-Band Alignment.—The most satisfactory method of aligning or checking the spread-band ranges is on actual reception of short-wave stations of known frequency, by adjusting the magnetite-core oscillator coil for each band so that these stations come in at the correct points on the dial.

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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

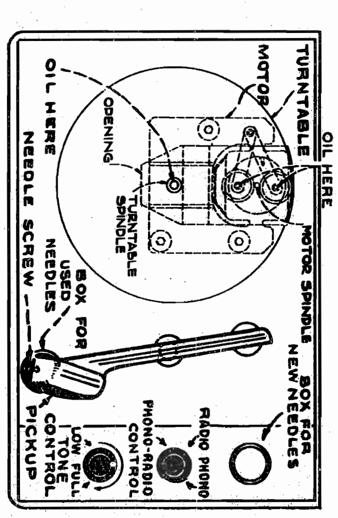
1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations by known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

MODEL Q26, Ch. RC-507J
MODEL QU3C, Ch. RC-507F
MODEL QU3M, Ch. RC-507H

RCA MFG. CO., INC.



Top View Model QU3C



Top View Model QU3M

The QU3M is equipped with a magnetic pickup, and the QU3C with a crystal pickup. The output of the crystal pickup is fed into the audio end of the receiver through a switch and compensating circuit. On instruments using a magnetic pickup, a transformer and compensating circuit are used between the pickup and the audio input (see schematic diagram). The transformer has two jacks, the larger one (primary) for input from the pickup and the smaller one (secondary) for output to the compensating circuit. The components of the compensating circuit are mounted externally to the chassis on a terminal board in the cabinet.

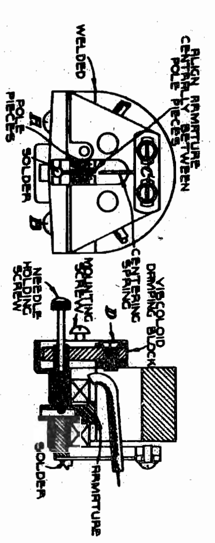
Crystal Pickup:

The crystal pickup is sealed in a metal case; if failure occurs, do not attempt to repair the unit, but install a new crystal unit.

Magnetic Pickup:

The magnetic pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is irremovable. There is a centering spring attached to the armature to maintain proper adjustment and to provide a limiting effect on the movement of the armature. Service operations which may be necessary on the pickup are as follows:

Centering Armature.—Refer to the figure showing the pickup inner structure. The armature is shown in its proper relation to the magnet pole pieces, i. e., exactly centered. Whenever this centering adjustment has been disturbed it will be necessary to remove the pickup mechanism from the tone arm for re-adjustment. Unsolder the two leads from the lugs on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screws C should be loosened which will permit the armature to be moved from side to side, the rod acting as a lever to perform this operation. The proper adjustment is obtained when the armature is brought to the mid position between the pole pieces. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. Check to make sure that the armature is not touching the coil. The air gap between the pole pieces and the armature should be kept free from dust, filings, and other foreign material which would obstruct the movement of the pickup armature.

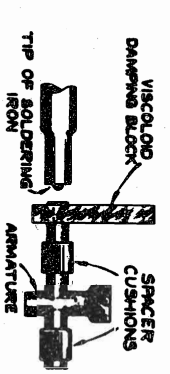


Magnetic Pickup Detail

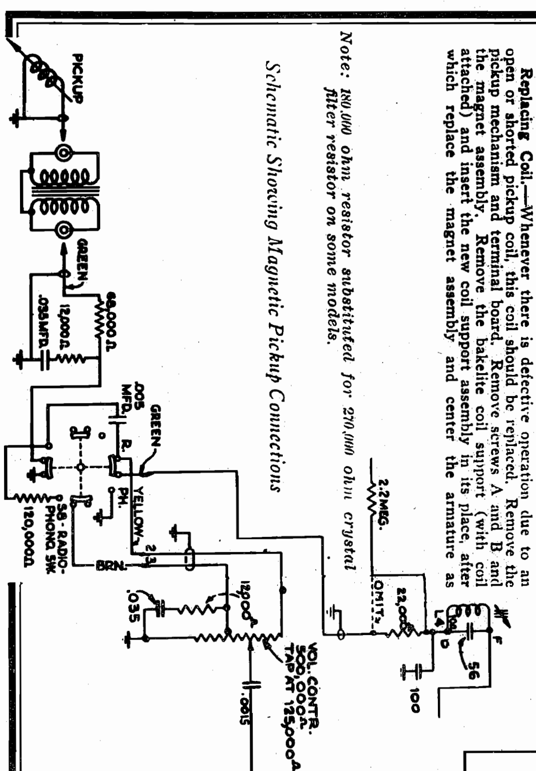
Replacing Coil.—Whenever there is defective operation due to an open or shorted pickup coil, this coil should be replaced. Remove the pickup mechanism and terminal board. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

Magnetizing.—Loss of magnetization will not usually occur when the pickup has received normal care because the magnet and pole pieces are one unit and the magnetic circuit remains practically closed at all times. When the pickup has been mishandled, subjected to a strong a-c field, jolted, or dropped, there may be an appreciable loss of magnetic strength, in which case it will be necessary to remagnetize the entire structure. To do this, it will be necessary to first remove the pickup mechanism from the tone arm, and then remove the magnet assembly. Place the magnet assembly on the poles of a standard pickup magnetizer such as the RCA Stock No. 9549 Pickup Magnetizer and charge the magnet in accordance with the instructions accompanying the magnetizer. It is preferable to check the polarity of the pickup magnet and to remagnetize it so that the same polarity is maintained.

Damping Block.—The viscoloid damping block which is attached to the front end of the armature shank serves to reduce undesirable resonances and to cause the frequency response to be uniform. Should it be necessary to replace this damping block, the pickup mechanism should be removed from the tone arm. Remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position as that of the original block, and is in correct vertical alignment with the armature. The hole in the block is somewhat smaller than the diameter of the armature in order to permit a snug fit. With the damping block properly aligned on the armature, screw D with its washer should then be replaced. Heat should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and become rigidly attached to the armature. A special-tip soldering iron, constructed as shown, will be found very useful in performing this operation. The iron should be applied only long enough to slightly melt the block, causing a small bulge on both sides.

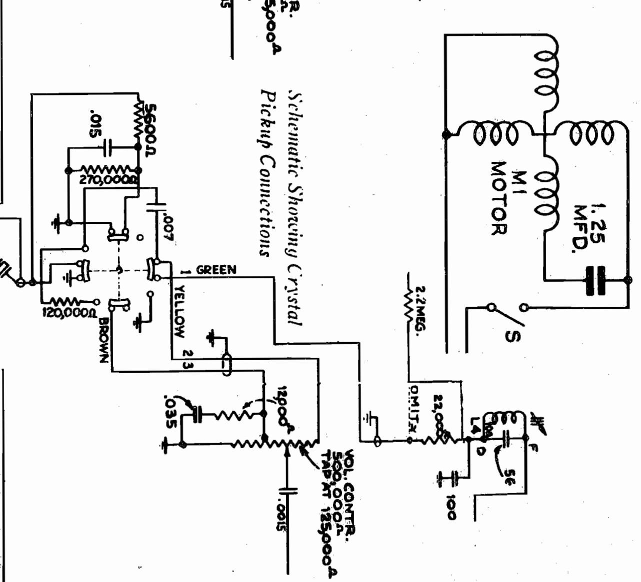


Attaching Damping Block



Note: 180,000 ohm resistor substituted for 270,000 ohm crystal filter resistor on some models.

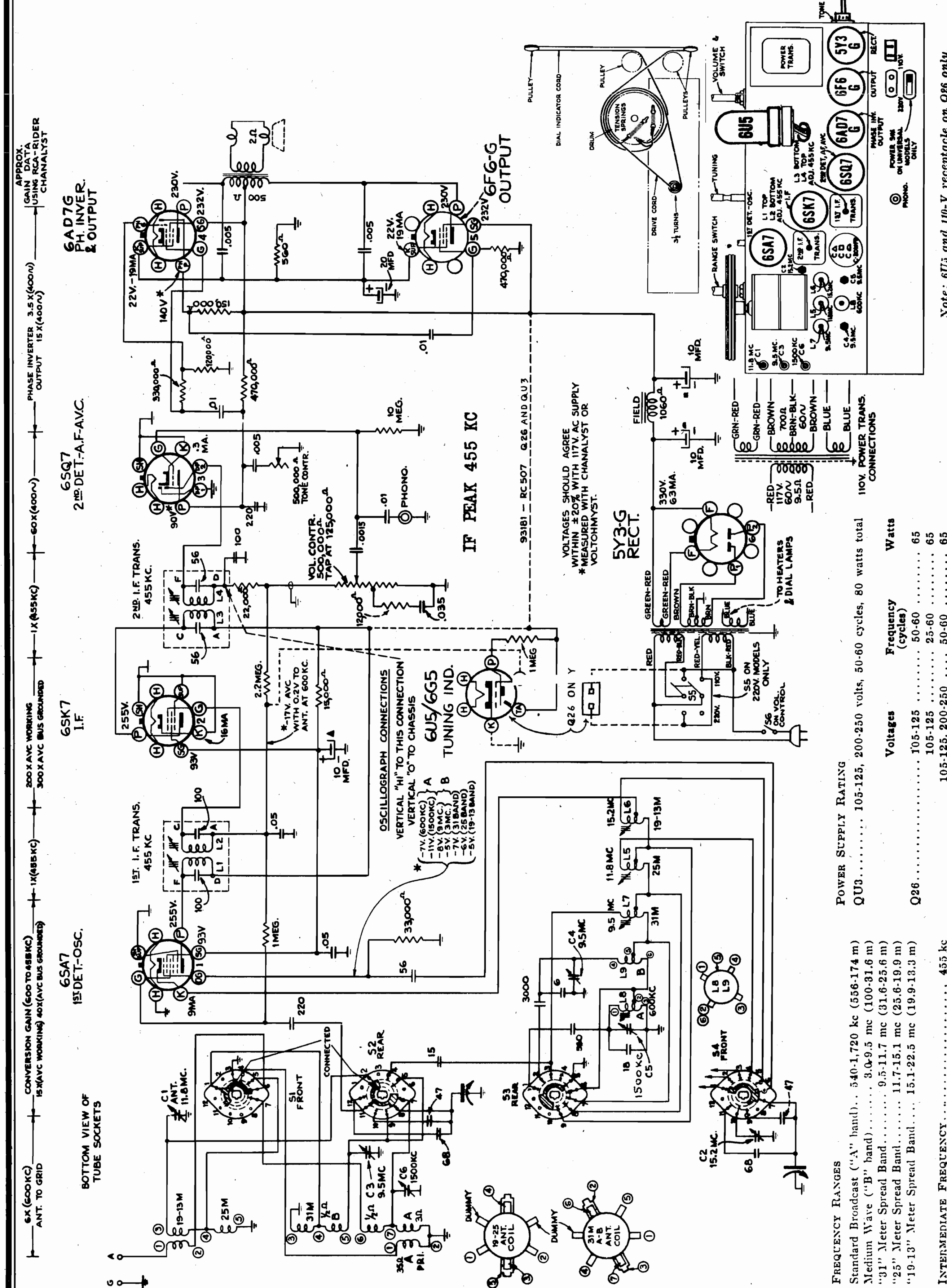
Schematic Showing Magnetic Pickup Connections



Schematic Showing Crystal Pickup Connections

RCA MFG. CO., INC.

MODEL Q26, Ch. RC-507J
MODEL QU3C, Ch. RC-507F
MODEL QU3M, Ch. RC-507H



FREQUENCY RANGES

Standard Broadcast ("A" band)	540-1,720 kc (556-174 m)
Medium Wave ("B" band)	3.0-9.5 mc (100-31.6 m)
"31" Meter Spread Band	9.5-11.7 mc (31.6-25.6 m)
"25" Meter Spread Band	11.7-15.1 mc (25.6-19.9 m)
"19-13" Meter Spread Band	15.1-22.5 mc (19.9-13.3 m)
INTERMEDIATE FREQUENCY	455 kc

POWER SUPPLY RATING

QU3 .... 105-125, 200-250 volts, 50-60 cycles, 80 watts total

	Voltages	Frequency (cycles)	Watts
Q26	105-125	50-60	65
	105-125	25-60	65
	105-125, 200-250	50-60	65

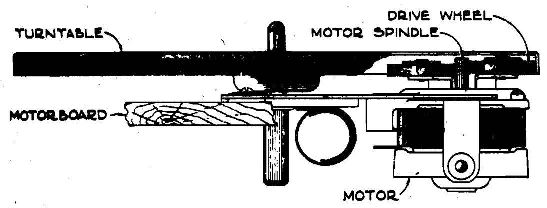
Note: 6U5 and 110-V receptacle on Q26 only.

MODEL Q26, Ch. RC-507J
MODEL QU3C, Ch. RC-507F
MODEL QU3M, Ch. RC-507H

RCA MFG. CO., INC.

The phonograph motor has its bearing filled with oil and sealed at the factory and hence should not require lubrication in the field. However the two rubber tired idler pulleys should have their bearings lubricated occasionally with S.A.E. 10 oil. Care should be taken not to get any oil, grease, or other foreign matter on the rubber tires. These tires and the motor spindle should be cleaned occasionally with quick drying naphtha.

The turntable spindle bearing should also be lubricated occasionally with S.A.E. 10 oil.



Motor Detail

Precautionary Lead Dress.—

1. **All leads between antenna coils and switch must be as short as possible and kept away from oscillator coil, leads and switches.**
2. **All oscillator coil leads must be kept apart from each other and other leads and parts.**
3. **Blue plate lead of 2nd I-F should be dressed under other leads and against chassis.**

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "180°" mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment. — After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Spread-Band Alignment.—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 these stations come in at the correct points on the dial.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	1st Det. grid in series with .01 mfd.				L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25M	138.5°	L5 (osc.) C1 (ant.)
4		15.2 mc		17°	C2 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13M	156°	L6 (osc.)**
7		9.5 mc	31M	156°	L7 (osc.)** C3 (ant.)
8		9.5 mc	B	11.5°	C4 (osc.)***
9	Ant. lead in series with 200 mmf.	1,500 kc	A	26°	C5 (osc.) C6 (ant.)
10		600 kc		150°	L8 (osc.) (Rock gang)
11		Repeat steps 9 and 10			

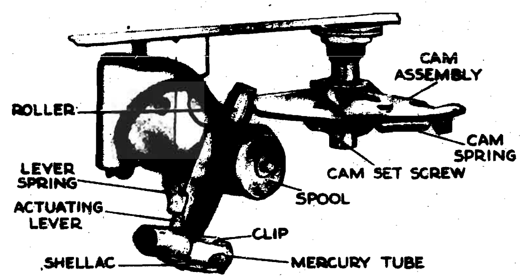
* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

**Peak at minimum position of plunger if two peaks can be obtained.

***Peak at minimum capacity if two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.

The motor switch is automatic for both starting and stopping, and when properly adjusted, will turn the motor on as the pickup is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is 1⅜ inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.



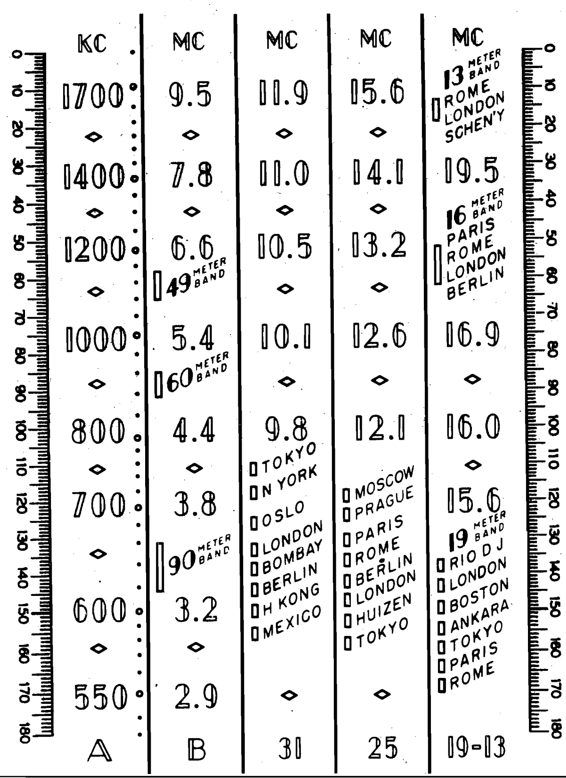
MERCURY SWITCH MECHANISM
(VIEWED FROM FRONT
SHOWN WITH PICKUP IN REST POSITION)

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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency settings on this range by means of a crystal calibrator (RCA Stock No. 9572), or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.



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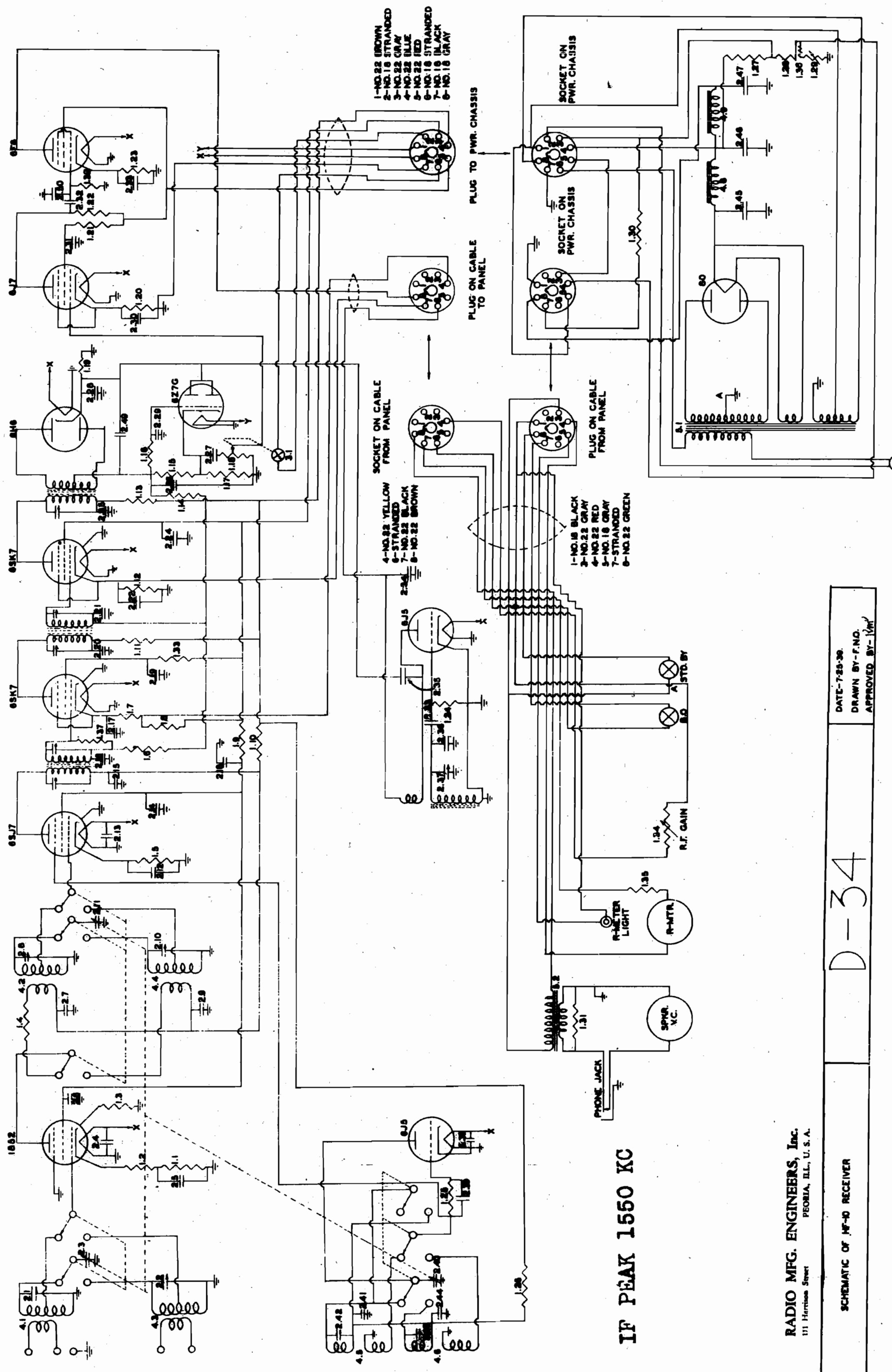
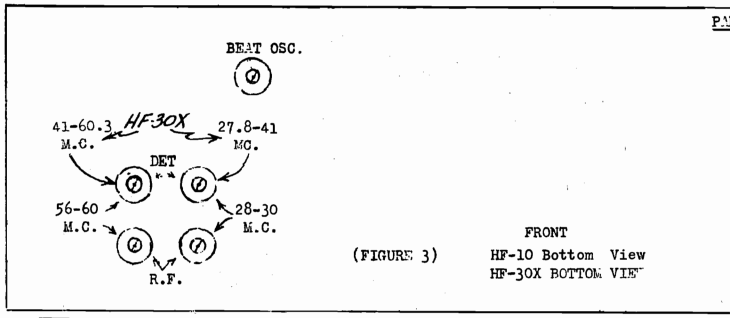
MODEL HF-10



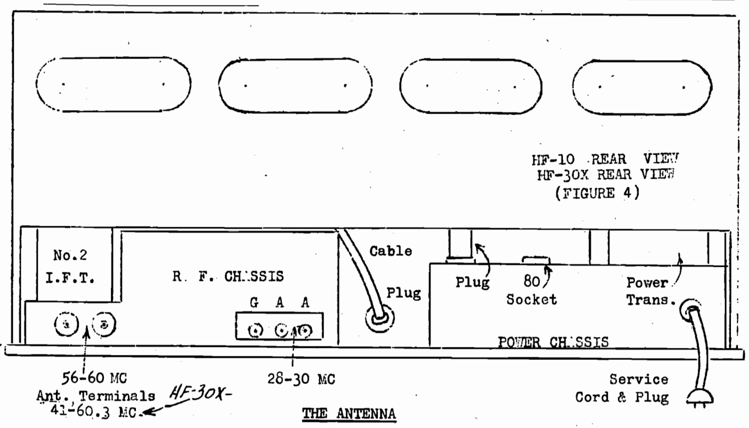
The HF-10 High Frequency Receiver is made in a standard model for operation when connected to supply lines supplying 115 volts at 50 or 60 cycles. Other voltages and frequencies may be used for operation of the instrument, if the receiver is specially made to accommodate them.

MODELS HF-10
HF-30X

RADIO MFG. ENGINEERS, INC.



(FIGURE 3) HF-10 Bottom View
HF-30X BOTTOM VIEW



HF-10 REAR VIEW
HF-30X REAR VIEW
(FIGURE 4)

PART CODE NUMBER	PART SPECIFICATION
1.1	200 ohm, 1/3 watt insulated resistor
1.2	35 ohm, 1/3 watt insulated resistor
1.3	35 ohm 1/3 watt insulated resistor
1.4	35 ohm 1/3 watt insulated resistor
1.5	5000 ohm 1/3 watt insulated resistor
1.6	250,000 ohm 1/3 watt insulated resistor
1.7	300 ohm 1/3 watt insulated resistor
1.8	20,000 ohm 1 watt resistor
1.9	2,000 ohm 1/3 watt insulated resistor
1.10	2,000 ohm 1/3 watt insulated resistor
1.11	2,000 ohm 1/3 watt insulated resistor
1.12	300 ohm 1/3 watt insulated resistor
1.13	2,000 ohm 1/3 watt insulated resistor
1.14	1 Megohm 1/3 watt insulated resistor
1.15	50,000 ohm 1/3 watt insulated resistor
1.16	1 Megohm 1/3 watt insulated resistor
1.17	50,000 ohm 1/3 watt insulated resistor
1.18	250,000 ohm 1/3 watt insulated resistor
1.19	100,000 ohm 1/3 watt insulated resistor
*1.20	1,500 ohm 1/3 watt insulated resistor
1.21	1 Megohm 1/3 watt insulated resistor
*1.22	250,000 ohm 1/3 watt insulated resistor
1.23	400 ohm 1/2 watt carbon resistor
1.24	50,000 ohm 1/3 watt carbon resistor
1.25	5,000 ohm 1/3 watt insulated resistor
1.26	10,000 ohm 1 watt insulated resistor
1.27	6,800 ohms of 10 watt bleeder section
1.28	7,200 ohms of 10 watt bleeder section
*1.29	300 ohm variable resistor
*1.30	100,000 ohm 1/3 watt insulated resistor
1.31	35 ohm 1/3 watt insulated resistor
1.32	1 Megohm 1/3 watt insulated resistor
1.33	2,000 ohm 1/3 watt insulated resistor
*1.34	30,000 ohm variable resistor
1.35	2,000 ohm 1/3 watt insulated resistor
2.1	20mmfd adjustable mica padding cond
2.2	20mmfd adjustable padding condenser
2.3	Number one section of 3 gang variable
2.4	400mmfd mica condenser
2.5	400mmfd mica condenser
2.6	400mmfd mica condenser
2.7	400mmfd mica condenser
2.8	20mmfd adjustable mica padding cond
2.9	400mmfd mica condenser
2.10	20mmfd adjustable padding condenser
2.11	Center section of 3 gang variable cond
2.12	400mmfd mica condenser
2.13	400mmfd mica condenser
2.14	400mmfd mica condenser
2.15	.01mfd paper condenser
2.16	.01mfd paper condenser
2.17	.01mfd paper condenser
2.18	.01mfd paper condenser
2.19	.01mfd paper condenser
2.20	.01mfd paper condenser
2.21	.01mfd paper condenser
2.22	.01mfd paper condenser
2.23	100mmfd mica condenser
2.24	.01mfd paper condenser
2.25	.01mfd paper condenser
2.26	50mmfd mica condenser
2.27	.1mfd paper condenser
2.28	100mmfd mica condenser
2.29	.01mfd paper condenser
2.30	20mfd 25 volt electrolytic
2.31	.1mfd paper condenser
2.32	.01mfd paper condenser
2.33	20mfd 25 volt electrolytic
*2.34	.002mfd paper condenser
2.35	15mmfd coupling condenser
2.36	100mmfd mica condenser
2.37	70mmfd adjustable mica condenser
2.38	400mmfd mica condenser
2.39	100mmfd ceramic condenser
2.40	Rear section of 3 gang variable condenser
*2.41	1500mmfd ceramic condenser
2.42	15mmfd adjustable air condenser
2.43	15mmfd adjustable air condenser
*2.44	500mmfd ceramic condenser
2.45	10mfd 450 volt electrolytic
2.46	15mfd 450 volt electrolytic
2.47	15mfd 450 volt electrolytic
2.49	250mmfd mica condenser
2.50	400mmfd mica condenser
3.1	Line switch
3.2	AVC-OFF switch in tandem with manual gain control
3.3 and 3.4	Combination beat oscillator and stand-by switch
4.1	10 meter RF coil
4.2	10 meter detector grid coil
4.3	5 meter RF coil
4.4	5 meter detector grid coil
4.5	10 meter oscillator coil
4.6	5 meter oscillator plate and grid coil
4.7	Beat oscillator grid coil
4.8	25 henry filter choke
4.9	30 henry filter choke
I.F.T.	Intermediate frequency transformer tuned to 1550KC

* FOR MODEL HF-10 ONLY - SEE SCHEMATIC OF MODEL HF-30X FOR HF-30X PARTS.

THE ANTENNA

Antennae are very important and should be given considerable attention when they are intended for use at the ultra high frequencies. Single pieces of wire of random specifications will sometimes perform, and sometimes give very poor performance, depending upon their length. In order to make sure that the antennae are adequate for the frequencies used in connection with the ultra high frequency type of receiver, it is best to cut the antennae to their proper length for operation in the middle portion of the band chosen.

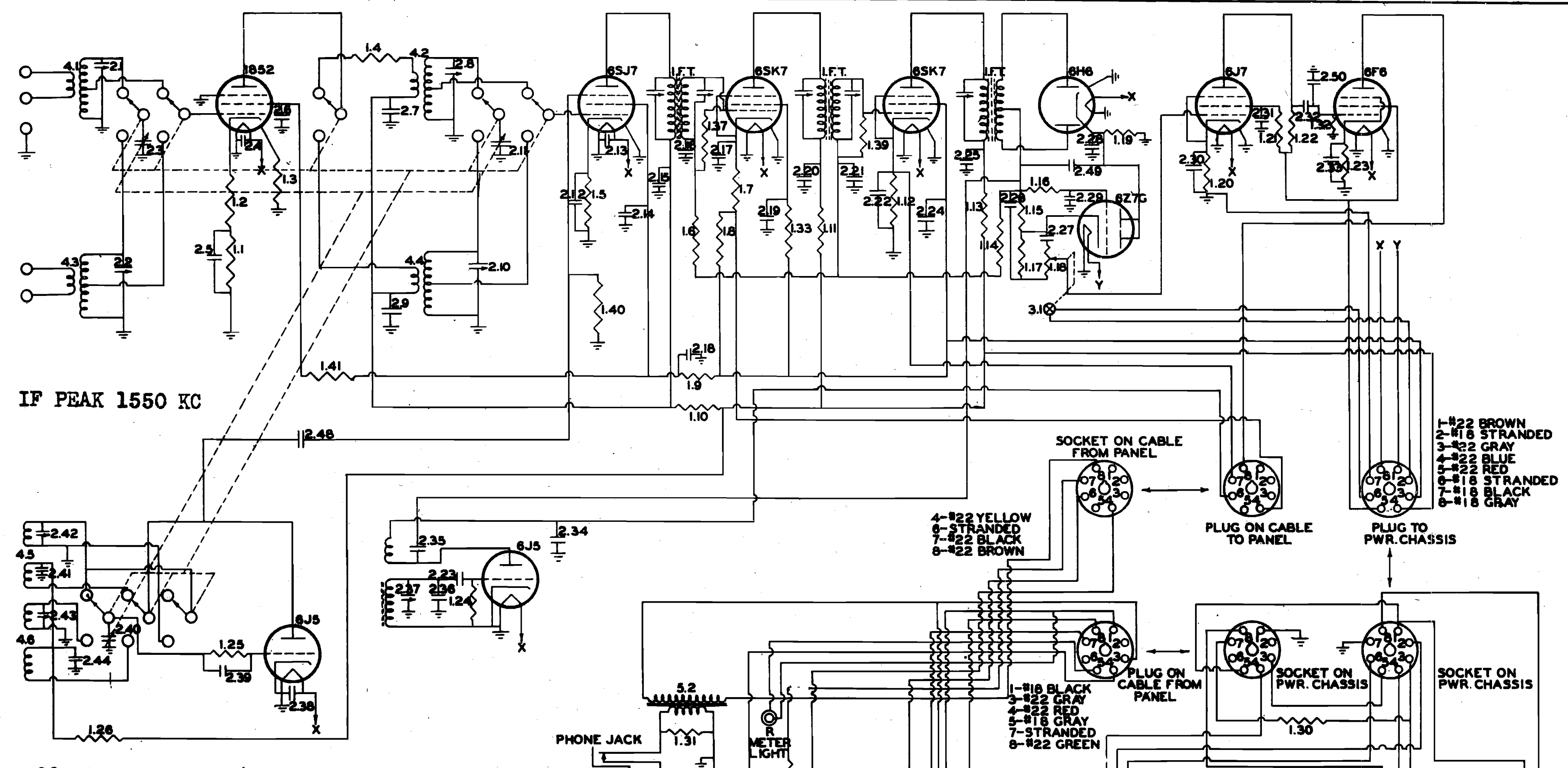
The simplest type of antenna is what is called a half-wave doublet, which is an antenna suspended either vertically or horizontally, having an over-all length of approximately one-half wave length--the wave length being the middle wave length of the frequency range to which the tuning is adjusted. This means that the antenna for the 5 meter band will be approximately 8 feet long; and for the 10 meter band approximately 16 feet long.

Connection can be made either by twisted pair in the center of the antenna, or by open wire type of line tapped off center in a "Y" connection, forming an antenna system commonly called the "Y" Connected Matched Impedance Type. The input impedance of the receiver, at all the frequencies of its operation, will average between 100 and 150 ohms. For this reason the twisted pair or the concentric cable type of feed will be superior to the high impedance open wire type of feed.

Separate terminals are provided for each band, since optimum results are obtained in this way. The antenna leads for the 28 to 30 megacycle coverage band, should be connected to terminals marked "A" and "A", with a good ground connected to the terminal "G". Terminal "G" serves as a ground for the entire equipment and is rather important, insofar as reducing noise to a minimum. The pair of leads coming from the 5 meter antenna are to be connected to the antenna terminals marked "56 and 60 MC".

With the proper antenna connected to the receiver, the instrument is ready to connect up and prepare for operation. In general, horizontal antennae are the most desirable, due to the fact that they will receive less local noise, since such noise is usually vertically polarized and consequently received considerably better on a vertical type of antenna. The horizontal antenna will receive signals coming over a longer path than the noise, and at the same time discriminate between that signal and the local noise level. The best type of antenna is one which is horizontally polarized and which will rotate. Horizontal doublet antennae are directional in a line perpendicular to the axis of the wire. Consequently, they will discriminate between signals at broadside and off the end of the wire. Being able to rotate them will overcome any handicap which might ensue from fixed directivity, because of the fact that the antenna can be pointed at any station, and the signal level will not be affected by the configuration of the antenna. While a vertical antenna will receive signals equally well in all directions, it will receive a much higher noise level than the horizontal type of antenna, and this is especially true of the high frequencies where a considerable portion of the noise level is due to automobile ignition interference, and similar types of radiation.

RADIO MFG. ENGINEERS, INC.



IF PEAK 1550 KC

1.20 1,000 ohm, 1/3 watt insulated resistor
1.22 150 ohm, 1/3 watt insulated resistor
1.29 200 ohm variable resistor
1.30 20,000 ohm, 1/3 watt insulated resistor
1.34 30,00 ohm variable resistor
1.37 100,000 ohm, 1/3 watt insulated resistor
1.39 100,000 ohm, 1/3 watt insulated resistor
1.40 1,000 ohm, 1/3 watt insulated resistor
1.41 5,000 ohm, 1/3 watt insulated resistor

2.34 400 μμfd. mica condenser
2.41 .002 μfd mica condenser
2.44 400 μμfd mica condenser
2.48 50 μμfd mica condenser

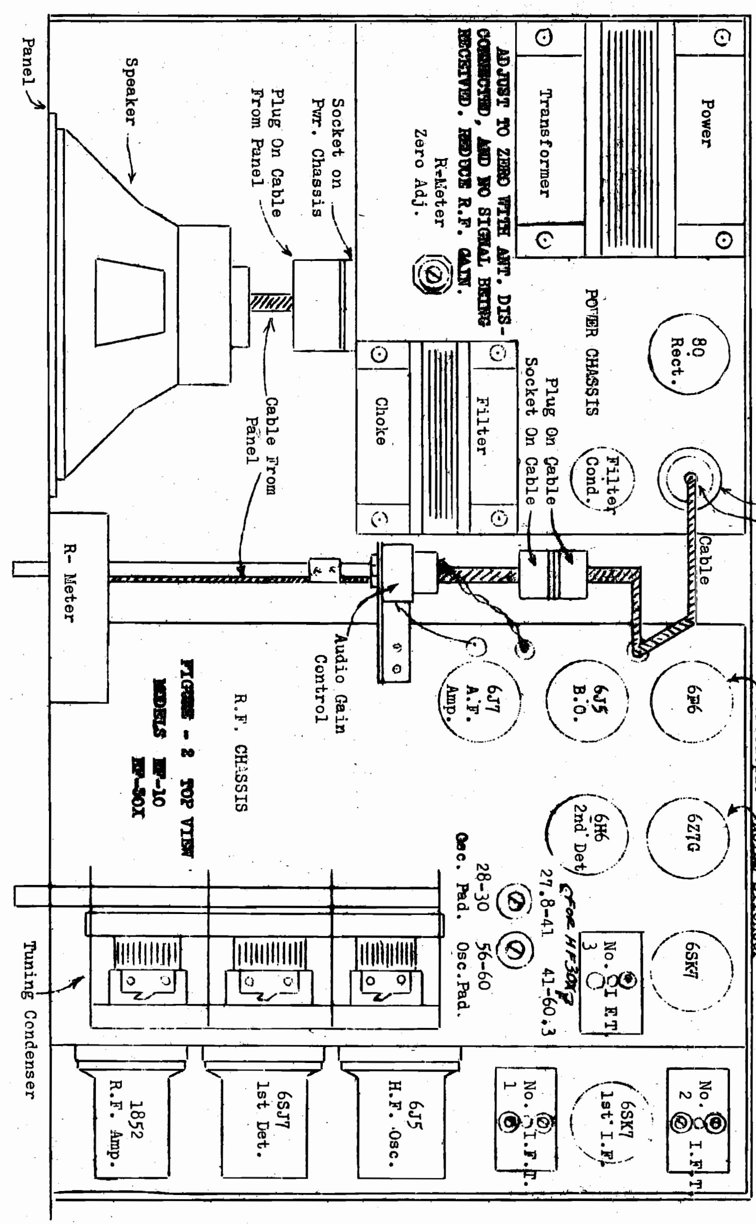
FOR OTHER PARTS – SEE INDEX

The HF-30X High Frequency Receiver is made in a standard model for operation when connected to supply lines supplying 115 volts at 50 or 60 cycles.

HF-30X RECEIVER	C-169		DATE-11-2-39. DRAWN BY-F.N.O. APPROVED BY-

MODELS HF-10
HF-30X

RADIO MFG. ENGINEERS, INC.



SERVICE NOTES

The HF-10 Receiver is designed for convenient dismantling by means of interconnecting cables and plugs, by which it is made possible to remove all of the units from the panel without having any of the components connected together. The panel may be removed from the instrument by disconnecting two cable plugs and removing the R meter illuminating lamp from the grommet and by taking the knobs off of the panel controls which protrude through the panel. Bolts fastening in the two chasses are easily removed from the bottom of the housing, permitting removal of each of the chasses. Figure 2 completely describes the visible components, as viewed through the top of the receiver.

The intermediate frequency used in the HF-10 is 1550 kilocycles and there are three intermediate frequency transformers--labeled 1, 2 and 3 (Figure 2). In order to adjust these intermediate frequency transformers, a test oscillator developing 1550 kilocycles may be fed into the first detector grid by means of connecting it to the stator connection of the variable condenser. This stator is the middle stator of the variable condensers. After the test oscillator has been set to 1550 kilocycles, and the Band Switch on the panel of the receiver (See Figure 1) is set to the *28 to 30 megacycles band, adjustment is made of the intermediate frequency transformers by means of an insulated alignment tool so that the R meter reads a maximum at a given input from the test oscillator. This provides a simple means of peaking the intermediate frequency transformers should they require it at any time.

All calibration is controlled by the two trimmers (See Figure 2) marked "OSC.PAD". One of these padders controls the calibration of the *28 to 30 megacycle band and the other for the ‡56 to 60 megacycle band. Of course, calibration is made using a signal input of an accurately determined frequency, but usually there will be no necessity for making this adjustment unless the receiver has been damaged in transit or thrown out of calibration by tampering. These two padders controlling the frequency calibration of the instrument are highly stable, air type, trimming condensers, and will remain in adjustment for long periods of time.

Sometimes the connection of various types of antennae to the equipment will slightly disturb the tuned circuits of the r.f. amplifier. Two padders are provided, one for each band, to correct for this misalignment if it does occur. Adjustment is made (See Figure 3) of the two r.f. padders with the antennae connected and a signal being received for maximum meter reading on that particular signal. It will seldom be found necessary to make any adjustment of the detector padders, but similar adjustment procedure is specified for the detector padders. All adjustments are made with the receiver set to the specified known frequency and left in a position providing maximum response, as indicated by maximum R meter reading on that signal.

MODEL HF-30X * 27.8 to 41 MEGACYCLE ‡ 41 to 60.3 MEGACYCLE

ADJUSTMENT OF THE BEAT OSCILLATOR PITCH CONTROL

The beat oscillator pitch is adjusted at the factory for approximately 1000 cycles off of exact tune of the I.F. amplifier. Reference to Figure 3 will point out the adjustment necessary to change the tuning of the beat oscillator. This adjustment is excessible through the bottom of the cabinet of the receiver.

For best alignment of the beat oscillator, tune in a station without the beat oscillator on--that is, with the Stand-by Control Switch thrown to the "PHONE" position until the meter reading is an absolute maximum. Under these conditions, place the Stand-By Switch in the "C.W." position and adjust the beat oscillator, through the access hole in the bottom of the cabinet, to any pitch desired.

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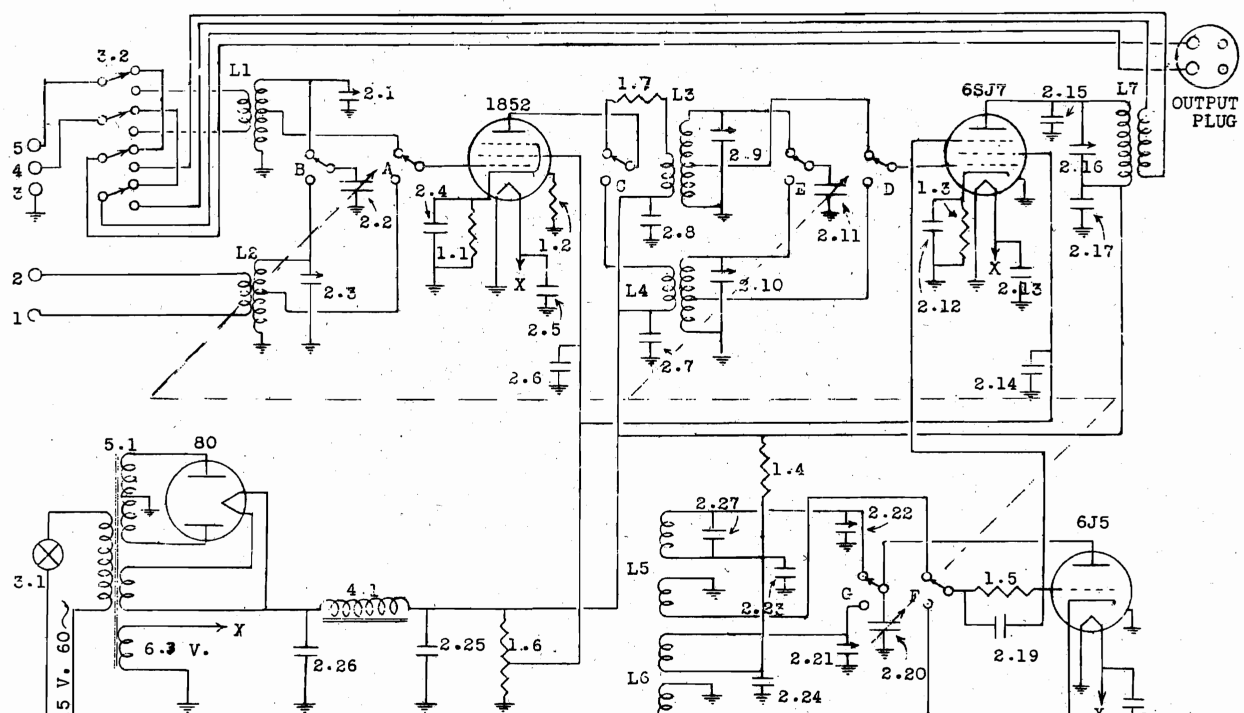
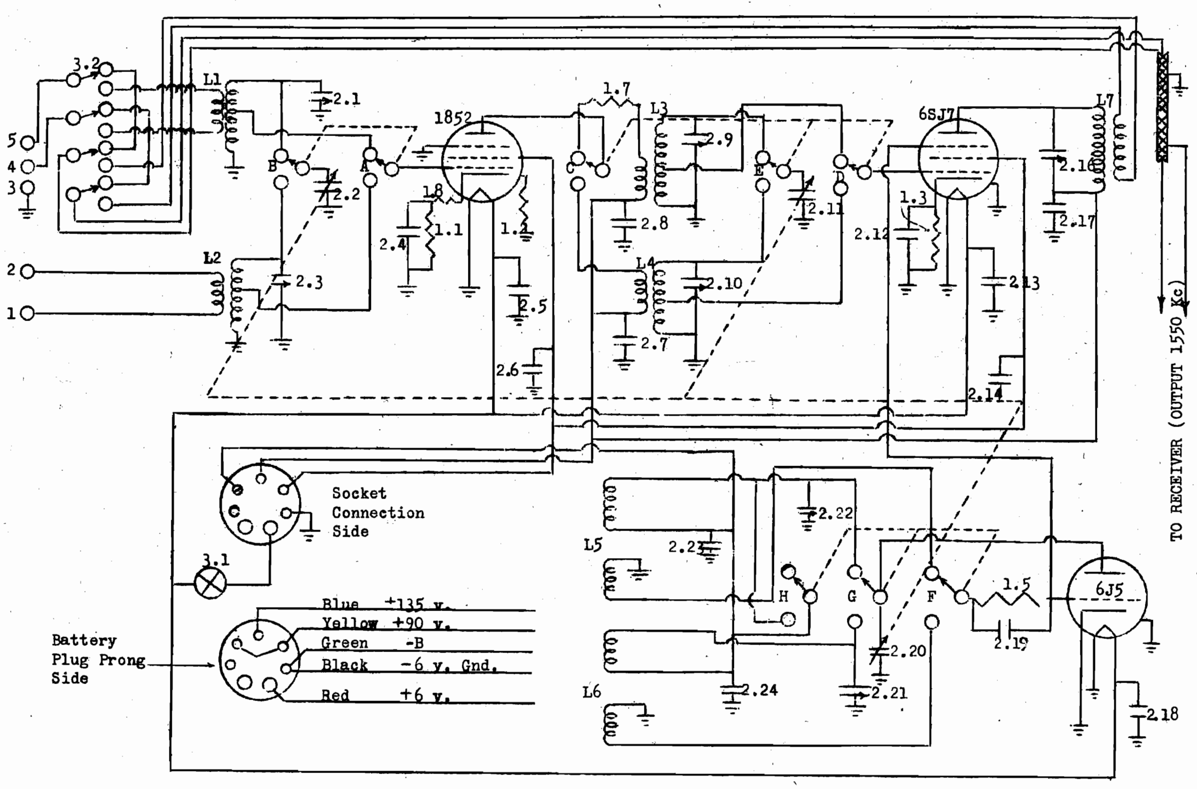
MODELS DM-36 (Late)
DM-36A
Band Expanders



--DM-36--
--SCHEMATIC--



DM-36A SCHEMATIC

MODEL DM-30X
MODELS DM-36 (Late)
DM-36A

RADIO MFG. ENGINEERS, INC.

PARTS LIST FOR THE RME MODEL DM-36 BAND EX

PART CODE NUMBER	SPECIFICATION
1.1	200 ohms, 1/3 watt resistor
1.2	35 ohms, 1/3 watt resistor
1.3	5000 ohms, 1/3 watt resitor
*1.4	10,000 ohms, 1 watt resistor
1.5	5000 ohms, 1/3 watt resistor
*1.6	15,000 ohms, 10 watts C.T.
1.7	35 ohms, 1/3 watt resistor
†1.8	35 ohms, 1/3 watt resistor
2.1	20 mmfd. condenser
2.2	Tuning condenser
2.3	20 mmfd. condenser
2.4	400 mmfd. condenser
2.5	400 mmfd. condenser
2.6	400 mmfd. condenser
2.7	400 mmfd. condenser
2.8	250 mmfd. condenser
2.9	20 mmfd. condenser
2.10	20 mmfd. condenser
2.11	Tuning Condenser
2.12	400 mmfd. condenser
2.13	400 mmfd. condenser
2.14	400 mmfd. condenser
*2.15	50 mmfd. condenser
2.16	30 mmfd. condenser
2.17	.01 mfd. condenser
2.18	400 mmfd. condenser
2.19	100 mmfd. condenser
2.20	Tuning Condenser
2.21	15 mmfd. Condenser
2.22	15 mmfd. condenser
2.23	1500 mmfd. condenser
2.24	500 mmfd. condenser
*2.25	15 mfd. condenser
*2.26	10 mfd. condenser
*2.27	15 mmfd. condenser
3.1	S.P.S.T. Switch
3.2	4.P.D.T. Switch
A,B,C,D, E,F,G. †(H)	Band Switch
*4.1	Choke, 30 henries
*5.1	Power transformer
L_1	10 M. R.F. coil
L_2	5 M. R.F. coil
L_3	10 M. Det. coil
L_4	5 M. Det. coil
L_5	10 M. Osc. coil
L_6	5 M. Osc. coil
	Output Coupling Transformer (10 M.C.)
†L_7	1550 Kc. I.F. Output Transformer
†Switch 3.2	Antenna Changeover Switch
†Switch 3.1	Line Snap Switch
†Output Shielded Cable.	3 feet of .25 inch tinned braided shield wire with female and male type of automobile antenna connector.

*DM 36 ONLY
†DM36A ONLY

The RME Model DM-36A Frequency Expander is identical in circuit arrangement, with certain exceptions, to the DM-36, and has the same sensitivity to the high frequencies. The exceptions to the similarity are; over-all size of the housing, and the intermediate frequency developed for injection into the associated receiver.

In all units of this type it is necessary, of course, to use a complete type of receiver in conjunction with the expander in order to provide the facilities of demodulation and audio reproduction, together with additional gain and selectivity. In the case of the DM-36A this associated receiver is intended to be an automobile type of receiver, which will tune to 1550 kilocycles. Practically all of the standard types of automobile receivers on the market today will tune to this frequency.

The DM-36 is in effect a frequency converter and therefore acts as a radio frequency amplifier and mixer tube with its oscillator in an over-all superheterodyne type of circuit. It must be used in connection with a regular receiver capable of tuning to a frequency of 10,000 KC (10 MC). The associated receiver therefore acts as an intermediate frequency amplifier unit and a demodulator and audio amplifier in order to reproduce the output of the expander.

ANTENNAE

It is suggested that for best results insofar as antennae are concerned for these DM-36A converters, that vertical radiators, grounded to the body of the car, be used. Figure 6 shows the suggested dimensions and general configuration of antennae recommended for use with the converter in the two frequency bands. It is to be understood, that for optimum results, one antenna will not be satisfactory for both frequencies. Reference to figure 6 will suggest various ways of constructing suitable pick-up antennae for use with these converters.

The input impedance to the converter is very low and therefore will work out very satisfactorily with the single wire feeders as suggested.

An antenna changeover switch is provided on the DM-36 for connecting the antenna used on the triple terminal strip (See Fig. 2) to either the DM-36 in combination with the associated receiver or directly to the receiver with which the instrument is associated. This is accomplished by setting the switch to the position marked "DM-36" on the left pointer position, or to the right pointer position marked "RECEIVER", as indicated in Figure 1.

The triple terminal strip is designed for connecting the antenna to be used for the 28 to 30 megacycle band and also the antenna which will probably be used on the receiver alone when the DM-36 is not connected in the circuit. In order to make it possible to get the best results from the five meter channel a separate pair of terminals have been provided so that a doublet antenna may be connected into the primary coil of the five meter channel (See Fig. 2). The best performance will be obtained when an antenna is used especially designed for the middle frequency of the five meter amateur band--that is, 58 megacycles. It can either be a half wave doublet fed from the center to the DM-36 by means of a twisted pair or it can be a single wire antenna a half wave long placed vertically or horizontally (preferrably horizontally) in space and fed to the receiver by connection to antenna terminal #1, in which case antenna #2, for the five meter band, can be connected directly to the terminal marked "G" on the DM-36, see the page appended giving various configurations of antenna construction and the method of connection to the DM-36 for the various frequencies (Fig. 5).

FOR 5 METERS
A= 4'- 1"
B= 8" Approx.

FOR 10 METERS
A= 8'-2"
B= 16" Approx.

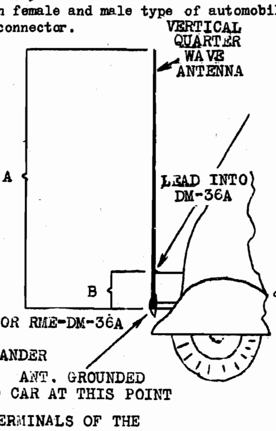
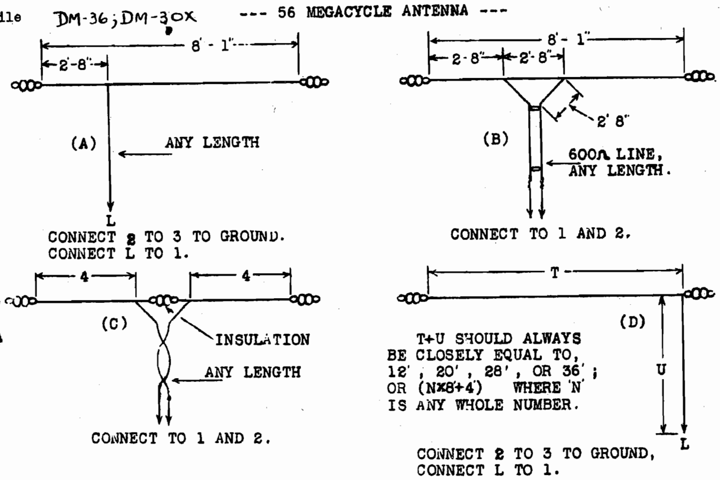


FIGURE 6

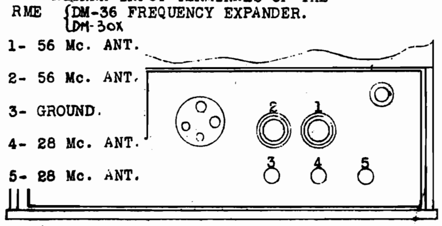
SUGGESTED ANTENNA FOR RME-DM-36A
MOBILE TYPE UHF EXPANDER

DM-36; DM-30X --- 56 MEGACYCLE ANTENNA ---



ANTENNA INPUT TERMINALS OF THE RME DM-36 / DM-30X FREQUENCY EXPANDER.

1- 56 Mc. ANT.
2- 56 Mc. ANT.
3- GROUND.
4- 28 Mc. ANT.
5- 28 Mc. ANT.



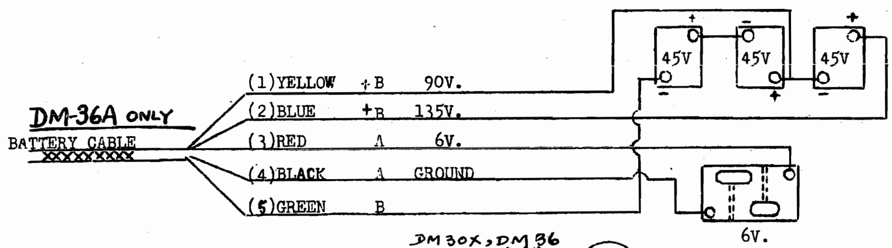
DM-36; DM-30X
--- 28 MEGACYCLE ANTENNA ---

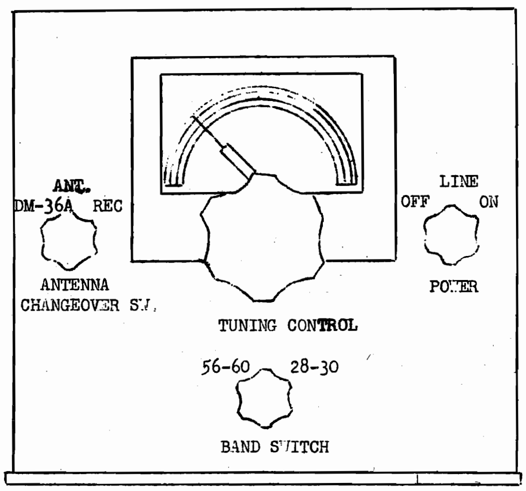
FOR ANY TYPE AS ABOVE, DOUBLE THE LENGTH OR OTHER DIMENSION INDICATED FOR 56 Mc., AND CONNECT AS FOLLOWS.

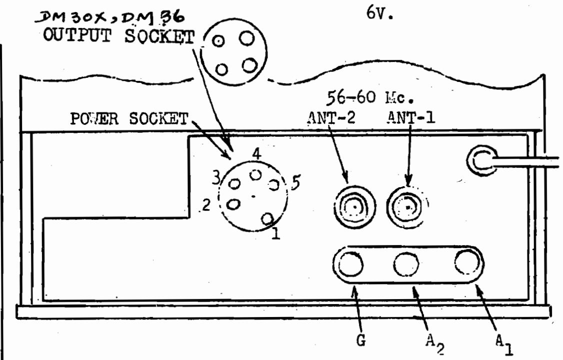
(A) CONNECT 3 AND 4. CONNECT L TO 5.
(B) CONNECT TO 4 AND 5. CONNECT 3 TO GROUND.
(C) SAME AS B.
(D) SAME AS A.

RADIO MFG. ENGINEERS, INC.

MODELS DM-30X
MODELS DM-36 (Late)
DM-36A





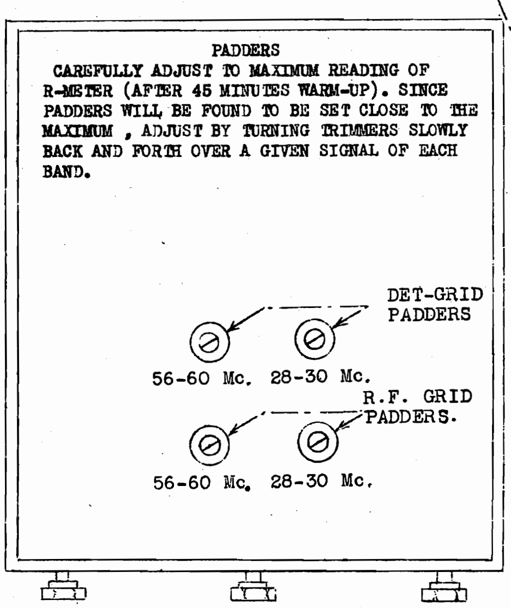


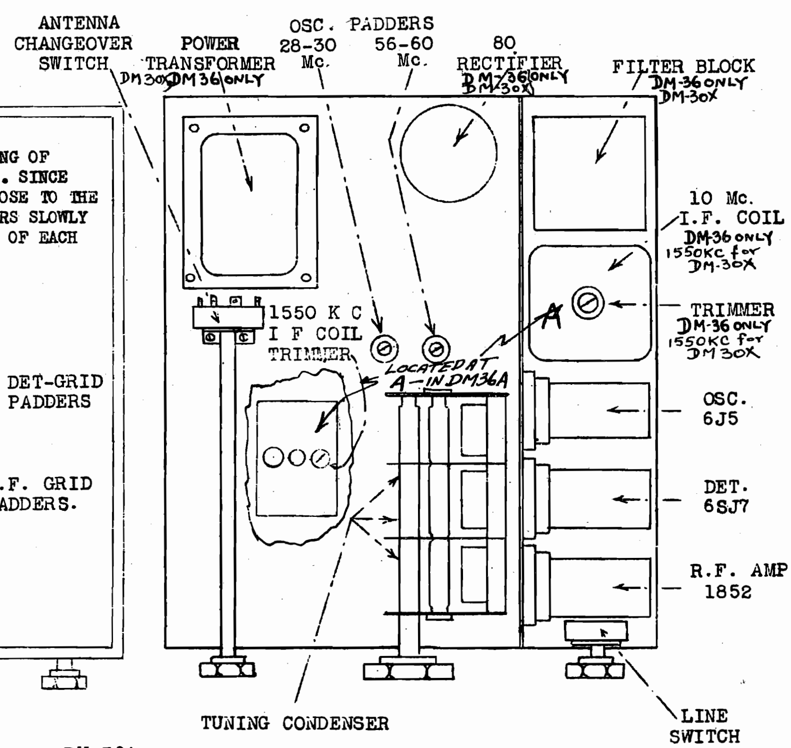
IF SINGLE WIRE IS USED ON BAND 28-30 Mc. CONNECT ANTENNA LEAD TO A_1, AND GROUND A_2 TO TERMINAL G.

IF SINGLE WIRE IS USED ON BAND 56-60 Mc. CONNECT ANTENNA LEAD TO ANT-1, AND GROUND ANT-2 TO TERMINAL 'G' DIRECTLY BELOW IT.

FRONT VIEW
--FIG.1--

REAR VIEW
--FIG.2--





---FIG. 3---
BOTTOM VIEW

--DM-36A
--DM-36--

--FIG. 4--
TOP VIEW

RADIO MFG. ENGINEERS, INC.

ALIGNMENT

One of the first evidences of misalignment in a receiver is low over-all gain of the receiver. In the RME-70 Receiver this is evidenced by low meter readings on signals which were formerly capable of producing higher meter readings. Due to the tremendous gain available in the audio system of the RME-70 Receiver, a misalignment due to loss of gain may not be noticed if the condition of the receiver is judged by audio output, since it may be possible to turn the volume control to the maximum output position and still obtain high values of audio output. Misalignment, however, does not effect the circuits of the audio amplifier and has solely to do with the intermediate frequency amplifier and the radio frequency amplifiers. Principal among the contributions to low gain is the part which the intermediate frequency amplifier plays in providing over-all sensitivity and selectivity of a satisfactory order.

Misalignment of the radio frequency section (principally that part of the section which is made up of the high frequency oscillator) shows up in the receiver calibration. This section also is susceptible to certain outside influences which can cause variations to such a degree that the stated calibration of the receiver is changed to other values. However, this effect is not a common effect and usually the calibration of the receiver, unless tampered with by inexperienced hands, will remain very close to its stated value indefinitely.

This loss of gain when occurring in the radio frequency section of the receiver is usually due to the fact that the oscillator has been grossly misaligned so that it is apparent in the frequency calibration of the receiver. In other words, it might well be said that a loss of sensitivity in the receiver occurring simultaneously with a wide-spread condition of off calibration might indicate the fact that the loss of gain is caused by misalignment of the radio frequency section of the receiver

On the other hand, if the gain of the receiver is low, but the calibration is correct, it might be said without hesitation that the most probable cause for the low gain is the misalignment of the intermediate frequency amplifiers relative to the trimming condensers of the intermediate frequency amplifier transformers.

It is for the purpose of realignment of these intermediate frequency transformers that the following test procedure is outlined. IMPORTANT NOTE. It is essential that the 465 KC intermediate signal which is used for realignment of the intermediate frequency amplifier is not set according to any arbitrary calibration on the test oscillator itself since it has been found that commercial test oscillators for service work vary considerably, at least to an extent which will not permit proper alignment of a communication type receiver in which is installed a quartz filter. It is therefore better if no test oscillator is had, since a broadcast station of constant signal strength will furnish adequate test signal for alignment of the intermediate frequency amplifier, using the quartz filter for establishing the proper I.F. frequency as indicated in the following procedure.

The meter on the RME-70 receiver affords an excellent method of indicating the peak alignment of each of the transformers. The location of the three intermediate frequency amplifier transformers, 5-3, 5-4, and 5-5 is given on Figure 4 of the illustrated sheet attached. The two padding condensers located in each of these transformers and accessible through apertures in the top of the shields can also be seen.

OTHER DATA IN VOLUME XI

OUTLINE OF PROCEDURE FOR CORRECT ALIGNMENT OF THE INTERMEDIATE FREQUENCY AMPLIFIER TRANSFORMER OF THE RME-70 RECEIVER.

The intermediate frequency amplifiers in the RME-70 Receiver are designed for a frequency of 465 KC. Since these receivers are always supplied with a quartz crystal filter, it is essential that the intermediate frequency amplifier transformers be accurately aligned with the crystal frequency. Crystals are supplied in frequencies slightly at variance from the above stated value of intermediate frequency by an amount not greater than one kilocycle plus or minus 465 KC. Rather therefore than align the intermediate frequency amplifier stages of the RME-70 to a set frequency of 465, it is essential that the alignment be done in conjunction with the quartz filter so that alignment of the intermediate frequency amplifier is achieved at the frequency of the filter. This is done as follows and when the process as herein outlined is followed accurately, maximum results will be obtained. The use of any other process of a general type will produce inferior results.

The first step in the alignment procedure is to tune in a broadcast station, preferrably in the low frequency portion of the broadcast band. The signal should be one of medium signal strength so that the R meter indicates a signal level of R9 or slightly less. If no station of this amplitude is available but a stronger station is available, a reduction in the efficiency of the antenna by the connection of a short wire to the antenna post may help to bring the signal strength as indicated down to R9. Usually between 550 and 800 KC in most any territory a station can be received at most any time for this test and adjustment.

When the station has been chosen, let us assume that its frequency is 700 KC, the next step is to slightly detune the main tuning control so that the frequency reads approximately 715 or 720 KC. This of course will tune the station out. It does not necessarily have to be the frequency mentioned or the exact frequency of detune, but the general procedure is to tune the main tuning control slightly higher than the chosen station so that it may be brought back to resonance by decreasing the scale reading of the band spread control. This is done merely to provide vernier tuning.

With the station chosen and resonated on the band spread scale, the crystal filter is switched into the circuit by setting the phasing control pointer to vertical upright position (approximately 90° clockwise from "OFF" position). The band spread scale is then adjusted with respect to the signal so that a maximum meter reading is obtained. This procedure is one which requires patience and accuracy of adjustment since the receiver is ultra sharp with the crystal filter in and there will be one definitely sharp peak indicating crystal resonance. The receiver should be tuned to this peak and left on it during all adjustments to be made regarding the intermediate frequency amplifier.

When this peak has been tuned to and the meter is at maximum reading, a small standard intermediate frequency trimmer tool of the insulated screw-driver type should be used. Then the selectivity control, should be set so that the condenser it adjusts is set at 50% mesh. Then, without particular attention to a course of procedure in tuning, any transformer may be adjusted at any particular time, the important factor being that they all be adjusted so that the R meter is brought to and left at a maximum meter reading. Usually this adjustment will not require very much turning of the adjustment screws. A good procedure to follow is to start with the 5.5 transformer and align in sequency 5.4 and 5.3. All adjustments should be made as before mentioned so that the meter reading is maximum.

It is advisable from time to time to make sure that the signal is still adjusted to peak resonance of the crystal by slightly varying the adjustment of the band-spread control. When this procedure has been completed as outlined and all transformers have been adjusted and left at maximum meter reading, the intermediate frequency amplifier of the receiver is in peak adjustment and the crystal aligned with it for maximum effectiveness in filter action.

PHASING CONTROL OPERATION

The phasing control of the RME-70 receiver, located on the front panel in the top right corner is indicated by the words "CRYSTAL PHASING". Directly to the left of the shaft is the word "OFF". There is a stop connected with the shaft so that when the receiver is to be used without the crystal filter, rotation of the crystal phasing control is set so that the pointer points to the "OFF" position and further counterclockwise rotation is impossible due to the stop. This indicates that the crystal filter has been removed from the circuit and normal receiver operation is possible. This function is provided by a cam operated switch connected with the phasing control of the crystal filter. In order to put the crystal into operation it is necessary to rotate the crystal phasing control clockwise to a position where the pointer is approximately in a vertical position, similar to that normally required of the selectivity control, located just below it.

Failure of the crystal to cut out of the circuit when the crystal phasing control pointer is set to the "OFF" position is due either to the fact that the knob has slipped or the switch contacts are bad and probably need adjustment. The cam switch closes when this pointer is in the "OFF" position, shorting out the crystal unit. Failure, of course, to short out the crystal unit will make it possible for the crystal filter to be in operation at all times. Slight pressure or bending of the contacts can improve this function should it fail.

When the crystal filter is being used the phasing function is provided by the variation in capacity of a phasing condenser controlled by the crystal phasing knob. Usually this is indicated by minimum noise or background response when the receiver is tuned off of the signal and the crystal is being used. This position, as before indicated, will be approximately one which allows the pointer to be vertical. Slight variations, either clockwise or counter clockwise, from this minimum noise response position change the rejection point of the crystal and make it possible to tune the rejection characteristic of the crystal to various slightly higher and lower frequencies for rejection purposes during QRM from a heterodyne on a desired signal.

If the phasing control does not work it is indicative of the fact that probably a connection is broken or that the R.F. choke connecting the A.V.C. to the grid of the tube (indicated on the schematic drawing by R.F.C. in the crystal filter circuit) is open. The continuity check between the grid of the first I.F. amplifier tube and the junction of resistor 1.8 on the automatic volume control terminal strip should show continuity when the crystal is in the operating position.

ALIGNMENT OF RADIO FREQUENCY SECTION OF THE RME-70 RECEIVER

Alignment of the radio frequency section of the receiver will effect principally the calibration of the receiver. Within certain limits this of course will also effect the sensitivity. Small variations in frequency (up to 2%) will not materially reduce the sensitivity of the receiver although they of course will show up as variations in the calibration as indicated by the required setting of the main tuning dial indicator. Correction for any variation is calibration can be made by following the suggestions outlined.

Band 1 includes the frequencies between 550 and 1500 KC. For band 1 there are two frequency adjustments for adjusting the indicator to proper calibration. The adjustments (condensers 2.51 and 2.50) are adjusted as indicated on Figure 4 through the top of the shield can just in the rear of the main tuning condenser assembly. 2.51 adjusts the band 1 oscillator calibration in the low frequency portion of the range and condenser 2.50 is the adjustment for the high frequency end of band 1. The procedure is this: Put the main tuning indicator to a position so that the main tuning condensers are fully meshed. The pointer of the main tuning control should then be set at maximum left end of scale so that the pointer falls just below the line above the numbers indicating the various channels. In this respect it will partially cover the top half of the numerals indicating the different tuning bands on this scale. In other words, the line which borders the semi-circular scale at the extreme counter-clockwise position should rest on the top edge of the pointer as it is turned to maximum counterclockwise rotation and the condenser plates are at full mesh.

The next step is to choose a station or a signal of accurately known frequency, around 700 KC, and set the main indicator to the frequency of the signal which is going to be used for the test. For example: There is a station available with fairly good signal strength or a test oscillator is available which can ACCURATELY be set at 700 KC. If the receiver indicator on the main tuning dial is set at 700, and the receiver is considerably out of calibration of course the signal will not be received. However, leave the indicator at the correct frequency of the signal being used for the test and set the bandspread control to a reading of 180 on the dial at which position it has no material effect on the tuning circuits of the receiver and permits the calibration of the main tuning dial to indicate accurately the frequency of setting.

Then by means of condenser (2.51) (Figure 4) accessible through the trimming hole in the oscillator shield can for Band 1, adjust until the signal is brought in with the pointer set at the proper frequency. Then choose a signal at about 1200 or 1300 kilocycles, and set the main tuning dial indicator to the correct frequency for that signal and bring the signal in on that setting with trimmer 2.50. It will then be necessary to return to the former frequency setting of 700 KC to make sure that the variation of 2.50 has not made some slight change in the setting for the lower frequency calibration point and it may be necessary to readjust condenser 2.50 slightly again. Then in order to make certain of the accuracy of both settings return to the frequency chosen between 1200 and 1300 KC and if necessary, slightly readjust condenser 2.51 again. After several checks on each frequency it will be found that the calibration can be made satisfactorily.

Calibrations on the higher frequency bands are controlled for Bands 2,3,4,5, and 6 by the trimmers 2.49, 2.48, 2.47, 2.46, 2.45, (Figure 3) respectively. High side beat is used on all frequencies on the RME-70 Receiver which means that all of the condensers 2.49, 2.48, 2.47, 2.46, 2.45, must be set to the lowest capacity setting which will provide a beat and the proper calibration for the frequencies in the respective bands. Calibration frequencies used are as follows:

Band 2:	2 megacycles and 3 megacycles.
Band 3:	4 megacycles, 5 megacycles, 6 megacycles.
Band 4:	7 megacycles, 9 megacycles, 11 megacycles, 13 megacycles.
Band 5:	14 megacycles, 15 megacycles, 17 megacycles.
Band 6:	30 megacycles.

After the calibration has been made accurately on all of the frequencies, or if the receiver has been found to be accurately set insofar as its calibration is concerned on all frequencies, the trimmers 2.2

MODEL RME-69 (Late)
MODEL RME-69 (All Models)
MODEL RME-70

RADIO MFG. ENGINEERS, INC.

and 2.1 have a distinct effect upon the RF grid circuits for bands 5 and 6 respectively. They are adjusted as follows: With a steady incoming signal on between 14 and 15 megacycles and the most effective setting of the resonator control for signal in that region, and with the antenna connected, the condenser 2.2 is adjusted for maximum meter reading. With these same conditions existing on 30 megacycles, with the band switch set on band 6 and the antenna connected, 2.1 is adjusted for maximum response on a given steady signal. All other trimming and adjusting is done manually by means of the resonator control, a variable RF amplifier and detector grid padder, which can be critically adjusted for peak resonance at any frequency it is desired to tune to.

It is of importance to note the setting of the condenser 2.4 (Figure 4). This is the antenna coupling condenser used when the receiver is set to Band 1. It should be set to practically its minimum capacity in order to provide constant alignment and proper coupling to the antenna when using Band 1. Excessive capacity in the condenser 2.4 will cause misalignment of the RF amplifier and hence promiscuous beating of harmonically related broadcast frequencies to the effect that a number of whistling tones will be received on the high frequency end of the broadcast band. When the receiver leaves the factory it is set at a very small capacity and should not be set at any other capacity or material reduction in the efficiency of operation will be produced.

The padders 2.2 and 2.1 materially contribute to the image signal rejection on the bands 5 and 6. Special care should therefore be taken in the adjustment of these condensers when the receiver is aligned.

ADJUSTMENT OF THE BEAT OSCILLATOR

The beat oscillator has its frequency adjustable on the panel by means of the C.W.Tone control. This control is normally set for zero beat with the condenser 2.59 (C.W.Tone control) set at 50% mesh. If it is found that zero beat does not occur or that the beat oscillator is not beating with the intermediate frequency to produce an audible solid beat, it is probably due to the fact that the beat oscillator is tuning to a frequency other than the intermediate frequency of the receiver. This can be remedied by the following procedure:

Set the Band Switch to position Number 1, and tune in a broadcast station so that it reads maximum on the R meter. With this condition existing, snap on the C.W.Tone Control. Then by making certain that the condenser 2.59 is set to 50% mesh, the condenser 2.60 (Figure 4) located in the beat oscillator compartment just below 2.59 (Figure 4) near the top plate of the chassis in front of the beat oscillator tube should be adjusted by means of a screw-driver so that zero beat is achieved with the signal tuned in as before mentioned. When this is achieved, variation of the beat oscillator from minimum to maximum mesh will give a total beat frequency variation of eight kilocycles (plus or minus 4 kilocycles from zero beat).

Figure 4A shows the component layout for 69 receiver with LS-1 noise silencer. Figure 4B shows the layout of the section which was changed to accommodate the silencer and therefore is standard form of chassis layout. If the receiver is connected for use, the line drawing in connection with the photograph in Figure 4A or 4B will indicate the socket locations of the respective tubes.

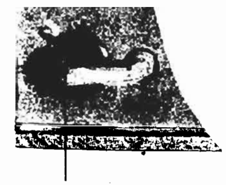


FIG. 7

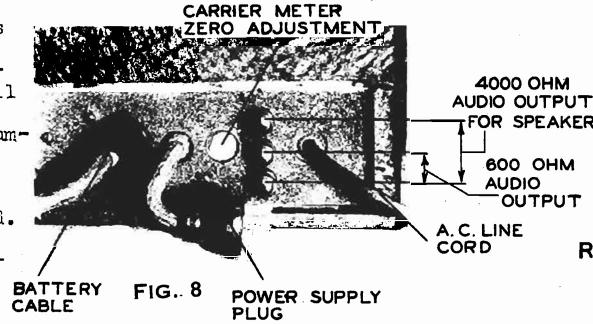


FIG. 8

MODEL
69 (late)

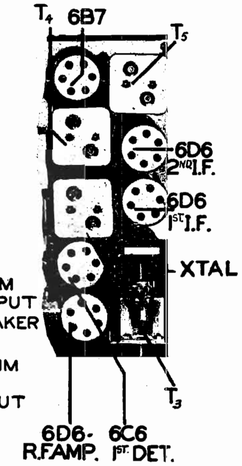


Fig. 4B

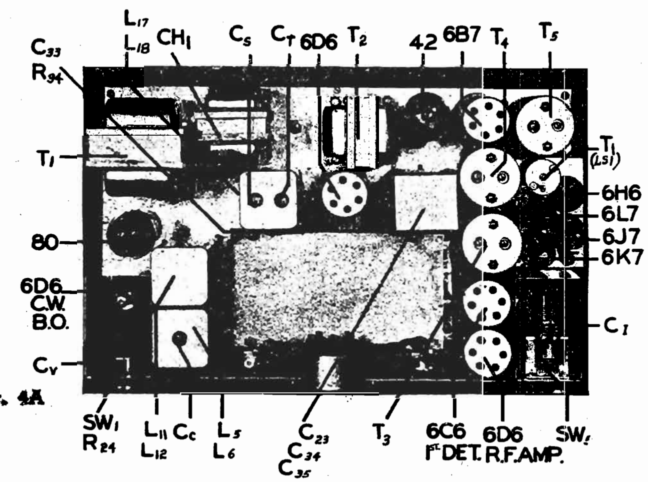


Fig. 4A

FOR ALIGNMENT AND FIGS. 3,6,11A, and 11B
SEE RME 69 VOLUME X Pages 3 through 6.

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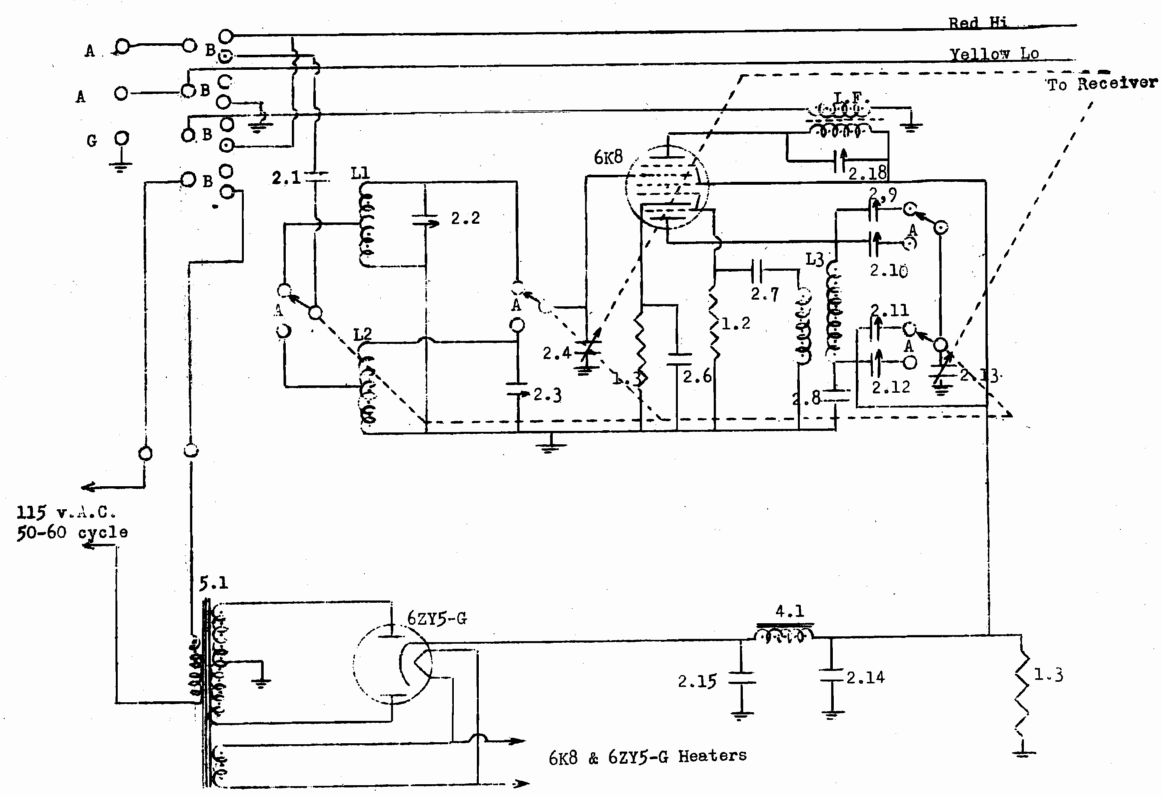
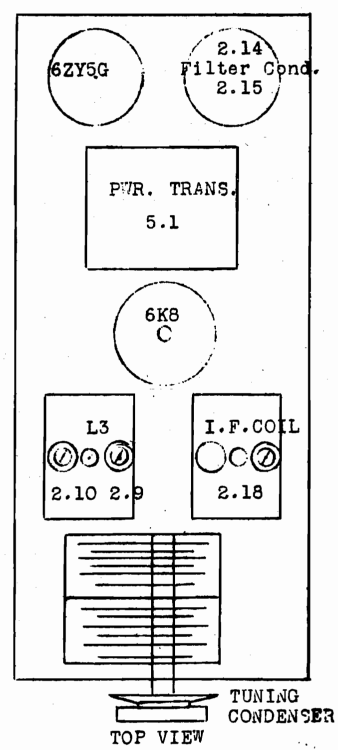


PART CODE NUMBER	PART SPECIFICATION
2.1	100 mmfd mica condenser
2.2	50 mmfd adjustable padder
2.3	50 mmfd adjustable padder
2.4	Rear section of variable condenser
2.6	.1 mfd, 400 volt, paper by-pass condenser
2.7	250 mmfd mica grid condenser
2.8	.1 mfd, 400 volt, paper condenser
2.9	Nominal 121 mmfd adjustable from 75 to 125
2.10	105 nominal, adjustable 75 to 125
2.11	70 mmfd adjustable plus 156 mica
2.12	70 mmfd adjustable
2.13	Front section of variable condenser
2.14	15 mfd, 450 volt, electrolytic — In common container
2.15	10 mfd, 450 volt, electrolytic — In common container
2.18	90 mmfd nominal capacity, adjustable from 75 to 125.
1.1	15,000 ohms, 10 watt resistor
1.2	50,000 ohms, 1/2 watt resistor
1.3	300 ohms, 1/2 watt resistor
L_1	Band 1 r.f. grid coil
L_2	Band 2 r.f. grid coil
L_3	Common oscillator coil for Band 1 and 2

I.F. Transformer tuned to 1550 KC with low impedance output.

Switch sections marked "A": Band change switch.
Switch sections marked "B": Antenna changeover switch and line switch combination.

4.1	30 henry filter choke.
5.1	Power Transformer



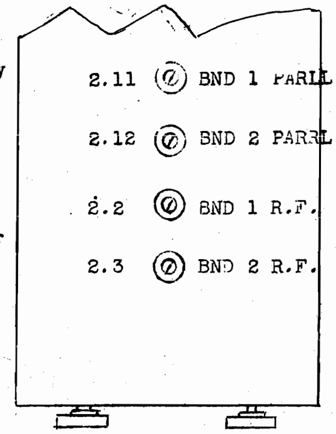
-FIG. 2 -

MODEL LF-90

RADIO MFG. ENGINEERS, INC.

The RME LF-90 Low Frequency Converter unit is designed to operate with any receiver which can be tuned to 1550 kilocycles, since this is the intermediate frequency generated by the converter unit. The function of the converter is to amplify and heterodyne all signals in the frequency range between 95 and 590 kilocycles to produce a constant frequency of 1550 kilocycles, which is fed out of the converter on a twisted pair line and into the input terminals of the associated receiver. This receiver can be either any of the RME Communication Receivers, or similar receivers, or even a broadcast type receiver which will tune to 1550 kilocycles. The sensitivity, of course, will depend upon the sensitivity of the receiver with which the unit is associated; but usually any receiver in fair operating condition will provide sufficient sensitivity for the long wave reception, since the converter itself has a substantial gain.

A switch in the lower right hand corner marked "LF-90 IN" and "LF-90 OUT" is an antenna changeover switch, which is used for cutting the LF-90 into the circuit ahead of the receiver, or cutting it out as conditions may warrant, permitting the operator to use either the combination for long wave reception, or the receiver itself for regular tuning purposes. When the position is set in the "OUT" position the converter circuits are switched off by means of a pair of contacts on this switch which removes the line voltage from the converter.



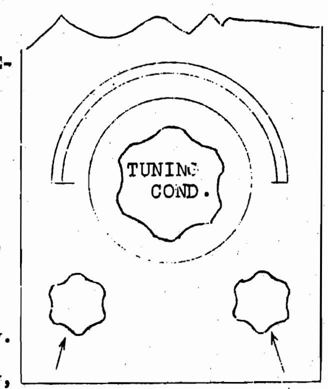
BOTTOM VIEW

-FIG.1 -

CAUTION: DO NOT REMOVE TOP OR BOTTOM COVER PLATES BEFORE REMOVING SERVICE CORD PLUG FROM LINE RECEPTACLE.

GENERAL INSTALLATION INSTRUCTIONS

The cabinet of the LF-90 unit is designed to match that of the RME-69 and RME-70 receivers, being identical in finish and in height to those cabinets. In general use it is intended to be set on the left hand side of the receiver cabinet as you face the instrument. On the rear of the LF-90 chassis (Figure 4) will be found three set screw terminals on a bakelite strip marked "G", "A" and "A" respectively. The ground terminal, marked "G", should be connected to a good ground. If a single wire antenna is used it should be connected to the topmost terminal marked "A"; the middle terminal marked "A" being connected to "G". If any type of doublet antenna is used, or any antenna of the two wire feed type, the ground terminal "G" should be grounded and the feed lines may be connected to "A" and "A" When the LF-90 is cut out of the circuit by having the switch on the front panel in the lower right set to "LF-90 OUT", these three terminals on the rear of the LF-90 (see Figure 4) will be connected that same sequence to similar terminals on the receiver; by-passing the LF-90 and providing reception on the receiver only.



BAND SWITCH

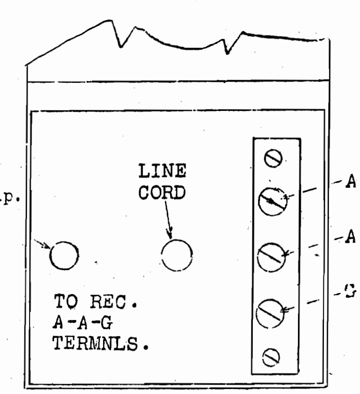
IN CIRCUIT OUT OF CIRCUIT SWITCH

FRONT VIEW

-FIG. 3-

The two wires in the output cable, having red and yellow tracers respectively, are connected to the outside terminal marked "A" and the inside terminal marked "A" respectively on the receiver with which the LF-90 is used. This is with reference to RME receivers. For receivers having only two terminal inputs--that is, antenna and ground--the yellow wire output from the LF-90 is connected to the ground terminal of the receiver and the red wire output is connected to the antenna terminal of the associated receiver.

After the unit has been connected up, as described, and plugged into the receptacle (make sure that the line voltage does not exceed 125 volts), the receiver with which the LF-90 is to be used should be connected up and adjusted to an operating condition. The intermediate frequency developed by the LF-90 unit is 1550 kilocycles. It is therefore necessary that the associated receiver be tuned to that frequency and all adjustments left so that the operating efficiency is a maximum. If it is not certain that the calibration of the receiver is exactly correct and that it may not be possible by merely reading the calibration on the dials to set the receiver to 1550 kilocycles, a close approximation may be achieved by adjusting the receiver tuning to a point giving maximum background response from the LF-90. It is, of course, necessary that the LF-90 switch be set to the "IN" position and that the proper antenna be connected to the LF-90 antenna terminal strip.



When the adjustments just described have been made the LF-90 dial may be tuned to the frequency desired and the response will depend upon the gain control setting of the associated receiver. When tuning Band 1 the innermost calibrated arc is to be used and the band range is 95 to 250 kilocycles. If it is desired to tune in the range between 250 and 590 kilocycles, the band switch must be set to Band 2 and tuning will then be indicated by the calibrated scale in the outermost position. The dial markings are in kilocycles and the white line on the skirt of the tuning knob is the indicator. There are no gain control facilities on the LF-90--the receiver being required to take care of any signal which the LF-90 develops for its operation. Outside of tuning, the other controls of the receiver can be used for developing beat frequency tones, for telegraph reception, for crystal filter operation, and for the control of audio level or radio frequency gain by either automatic or manual gain facilities, if they are provided in the particular receiver used. It is unnecessary to do any tuning adjustments on the associated receiver, since a constant frequency of 1550 KC. is developed by the LF-90 for input to the receiver. Any tuning is to be done on the LF-90 only, as indicated by the calibrated markings on the scale plate.

REAR VIEW

-FIG. 4-

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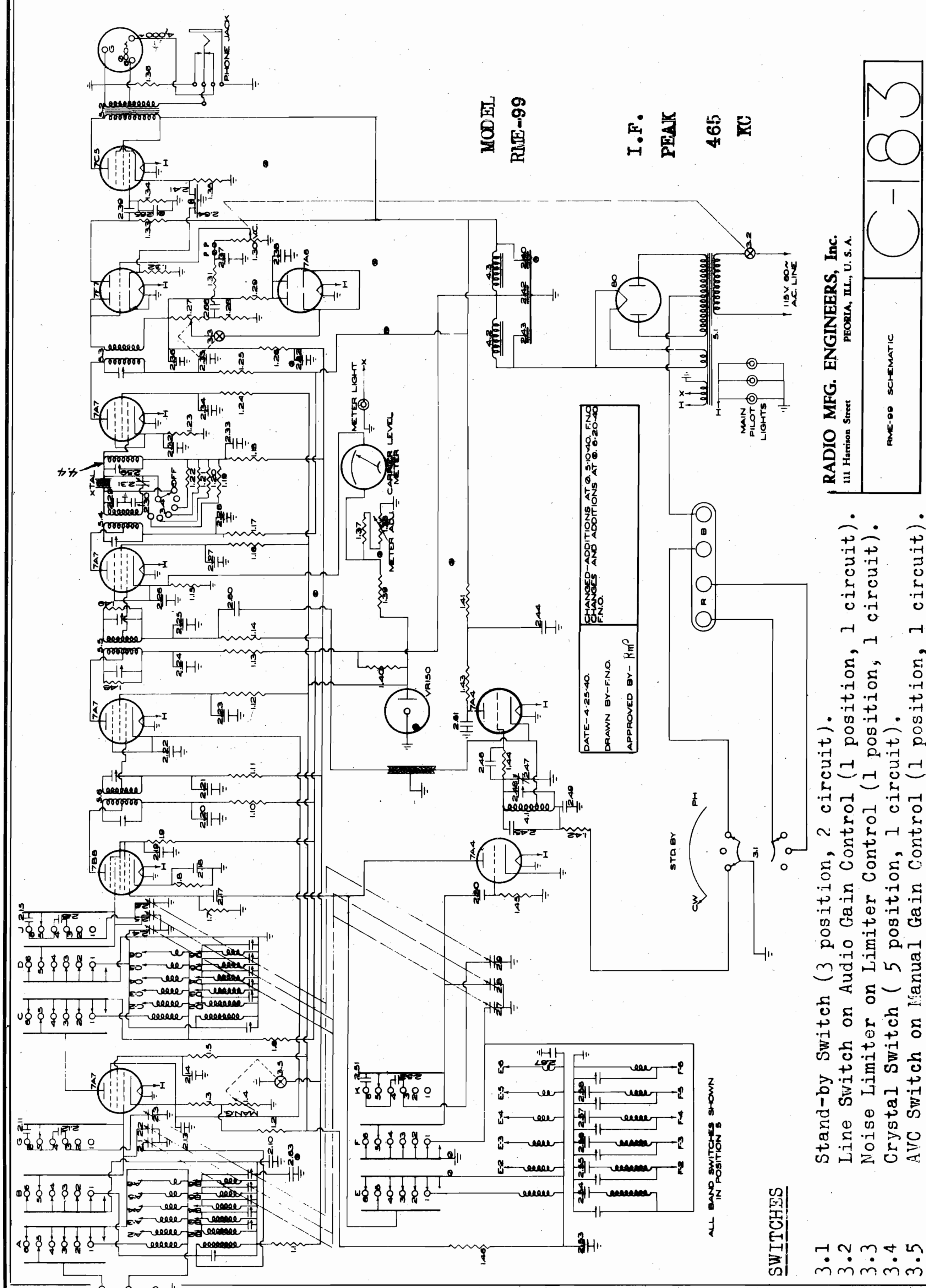
MODEL RME-99



SWITCHES

3.1 Stand-by Switch (3 position, 2 circuit).
3.2 Line Switch on Audio Gain Control (1 position, 1 circuit).
3.3 Noise Limiter on Limiter Control (1 position, 1 circuit).
3.4 Crystal Switch (5 position, 1 circuit).
3.5 AVC Switch on Manual Gain Control (1 position, 1 circuit).

MODEL RME-99

RADIO MFG. ENGINEERS, INC.

CONDENSERS

2.1	Main Tuning Condenser, Large RF section
2.2	Main Tuning Condenser, Small RF section
2.3	Band Spread Condenser, RF section
2.4	Main Tuning Condenser, Large Det. section
2.5	Main Tuning Condenser, Small Det. section
2.6	Band Spread Condenser, Detector section
2.7	Main Tuning Condenser, Large Osc. section
2.8	Main Tuning Condenser, Small Osc. section
2.9	Band Spread Condenser, Oscillator section
2.10	.01 µfd. 400 volt paper
2.11	50 µµfd. 1% Silver Mica
2.12	50 µµfd. 1% Silver Mica
2.13	.01 µfd. 400 volt paper
2.14	.01 µfd. 400 volt paper
2.15	50 µµfd. 1% Silver Mica
2.16	50 µµfd. 1% Silver Mica
2.17	50 µµfd. 5% Mica
2.18	.01 µfd. 400 volt paper
2.19	.01 µfd. 400 volt paper
2.20	.01 µfd. 400 volt paper
2.21	.01 µfd. 400 volt paper
2.22	.01 µfd. 400 volt paper
2.23	.01 µfd. 400 volt paper
2.24	.01 µfd. 400 volt paper
2.25	.01 µfd. 400 volt paper
2.26	.01 µfd. 400 volt paper
2.27	.01 µfd. 400 volt paper
2.28	.01 µfd. 400 volt paper
2.29	50 µµfd. 5% Mica
2.30	50 µµfd. 5% Mica
2.31	30 µµfd. Variable
2.32	.01 µfd. 400 volt paper
2.33	.01 µfd. 400 volt paper
2.34	.01 µfd. 400 volt paper
2.35	.01 µfd. 400 volt paper
2.36	100 µµfd. Mica
2.37	250 µµfd. Mica
2.38	.1 µfd. 400 volt paper
2.39	.1 µfd. 400 volt paper
2.40	15 µfd. 450 v. electrolytic
2.41	20 µfd. 25 v. electrolytic
2.42	15 µfd. 450 v. electrolytic
2.43	10 µfd. 450 v. electrolytic
2.44	.01 µfd. 400 volt paper
2.45	100 µµfd. Mica
2.46	250 µµfd. Mica
2.47	50 µµfd. Variable
2.48	70 µµfd. Mica Padder
2.49	.01 µfd. 400 volt paper
2.50	100 µµfd. Ceramic
2.51	50 µµfd. Silver Mica
2.52	50 µµfd. Silver Mica
2.53	.1 µfd. 400 volt paper
2.54	550 µµfd. Mica
2.55	600 µµfd. Mica
2.56	1300 µµfd. Mica
2.57	1700 µµfd. Mica
2.58	3900 µµfd. Mica
2.59	100 µµfd. Mica Padder
2.60	100 µµfd. Mica
2.61	.01 µfd. 400 volt paper
2.62	.01 µfd. 400 volt paper
2.63	.1 µfd. 400 volt paper
2.64	20 µfd. 25 v. electrolytic
2.65	250 µµfd. Mica
2.66	.1 µfd. 400 volt paper
2.67	.01 µfd. 400 volt paper

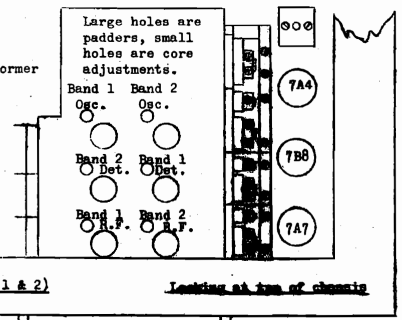
All osc. and detector parallel padders 10 µµfd.
All RF Parallel padders 30 µµfd.
All IF Trimmers 100 µµfd.

TRANSFORMERS

5.1	Power transformer
5.2	Audio Output transformer
5.3	#4 IF transformer
5.4	#3 IF transformer
5.5	#2 IF transformer
5.6	#1 IF transformer

INDUCTANCES

4.1	B. O. Coil
4.2	Filter Choke, 30 henry, 100 m.a.
4.3	Filter Choke, 30 henry, 50 m.a.
4.4	Crystal Filter Choke



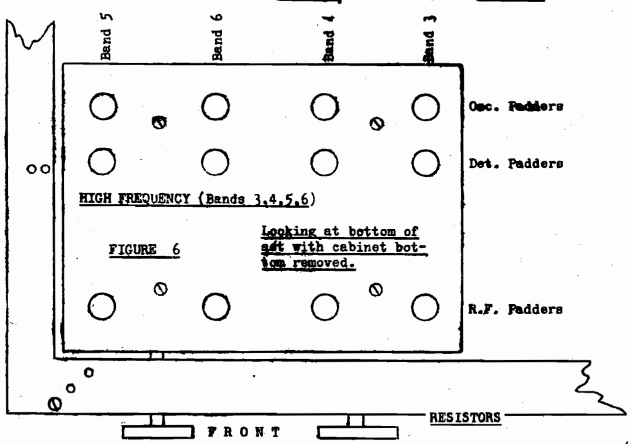


FIGURE 6

RESISTORS

1.1	100,000 ohms, 1/3 watt	1.25	2,000 ohms, 1/3 watt	1.38	200 ohms, Potentiometer
1.2	50,000 ohms, 1 watt	1.26	1 Megohm, 1/3 watt	1.39	10,000 ohms, 5 watt
1.3	150 ohms, 1/3 watt	1.27	50,000 ohms, Pot. w/switch	1.40	2,000 ohms, 10 watt
1.4	30,000 ohms, Pot. w/switch	1.28	50,000 ohms, 1/3 watt	1.41	2,000 ohms, 1/3 watt
1.5	5,000 ohms, 1/3 watt	1.29	1 Megohm, 1/3 watt	1.42	5,000 ohms, 1/3 watt
1.6	2,000 ohms, 1/3 watt	1.30	250,000 ohms, Pot. w/switch	1.43	1 Megohm, 1/3 watt
1.7	50,000 ohms, 1/3 watt	1.31	1 Megohm, 1/3 watt	1.44	100,000 ohms, 1/3 watt
1.8	1,000 ohms, 1/3 watt	1.32	1,000 ohms, 1/3 watt	1.45	50,000 ohms, 1/3 watt
1.9	70,000 ohms, 1/3 watt	1.33	50,000 ohms, 1/3 watt	1.46	2,000 ohms, 1/3 watt
1.10	2,000 ohms, 1/3 watt	1.34	250,000 ohms, 1/3 watt	1.48	100,000 ohms, 1/3 watt
1.11	100,000 ohms, 1/3 watt	1.35	240 ohms, 1 watt	1.49	100,000 ohms, 1/3 watt
1.12	5,000 ohms, 1/3 watt	1.36	5,000 ohms, 1/3 watt		
1.13	2,000 ohms, 1/3 watt	1.37	150 ohms, 1/3 watt		
1.14	100,000 ohms, 1/3 watt				
1.15	300 ohms, 1/3 watt				
1.16	5,000 ohms, 1/3 watt				
1.17	2,000 ohms, 1/3 watt				
1.18	100,000 ohms, 1/3 watt				
1.19	250,000 ohms, 1/3 watt				
1.20	100,000 ohms, 1/3 watt				
1.21	50,000 ohms, 1/3 watt				
1.22	5,000 ohms, 1/3 watt				
1.23	300 ohms, 1/3 watt				
1.24	5,000 ohms, 1/3 watt				

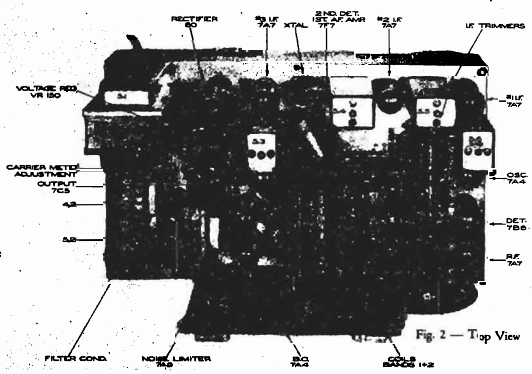


Fig. 2 — Top View

TEST VOLTAGES OBTAINED AT VARIOUS POINTS IN RECEIVER CIRCUIT

Measurements made with voltmeter having internal resistance of 1000 ohms per volt. Instruments with other internal resistances give entirely different readings. NOTE: Line voltage should be 115 volts, Stand-by Switch on.

PLACE TEST PRODS BETWEEN	CORRECT VOLTAGE
Radio frequency amplifier plate and ground	210 volts
Radio frequency amplifier screen and ground	130 volts
Radio frequency amplifier cathode and ground	4 volts
First detector plate and ground	250 volts
First detector cathode and ground	3.2 volts
First I.F. amplifier plate and ground	240 volts
First I.F. amplifier screen and ground	130 volts
First I.F. amplifier cathode and ground	4 volts
(The same voltages apply to the 2nd and 3rd I.F. Amplifier stages)	
First detector screen and ground	43 volts
First audio amplifier plate and ground	105 volts
First audio amplifier cathode and ground	1.5 volts
7C5 plate and ground	220 volts
7C5 screen and ground	230 volts
7C5 cathode and ground	12 volts
80 rectifier filament and ground	320 volts
Oscillator plate and ground	120 volts
Voltage regulator plate and ground (With stand-by switch on CW)	150 volts
B. O. plate and ground	11 volts

These voltages are subject to a fluctuation of plus or minus 15% without indication of material difficulties.

CONTINUITY CHECKS

(Receiver turned off. No jumper between A-2 and ground on antenna terminal strip.)

PLACE TEST PRODS BETWEEN		RESISTANCE VALUE
A-1 and ground		Infinite
A-2 and ground		Infinite
RF amplifier grid to ground		1.1 Megohm
First detector grid to ground	Band 1	3.5 Ohms
	Band 2	1.5 Ohms
	Band 3	.3 Ohm
	Band 4	.2 Ohm
	Band 5	.1 Ohm
	Band 6	.1 Ohm
First I.F. grid to ground		1.5 Ohms ±20%
Second I.F. grid to ground		1.5 Ohms ±20%
Third I.F. grid to ground		1.5 Ohms ±20%
Oscillator grid to ground		50,000 ohms ±20%
Beat Oscillator grid to ground		100 Megohms ±20%
First Audio grid and ground		250 Megohms to 0 ohm. (As audio gain control is rotated.)
7C5 grid and ground		250 Megohms ±20%
Oscillator section of main tuning condenser and ground		Bands 1,2,3,4, and 5 Infinite; Band 6 .1 ohm

RADIO MFG. ENGINEERS, INC.

One of the first evidences of misalignment in a receiver is low overall gain of the receiver. In the RME-99 this is evidenced by low meter readings on signals which were formerly capable of producing higher meter readings Due to the tremendous gain available in the audio system of the RME-99 a misalignment due to loss of gain may not be noticed if the condition of the receiver is judged by audio output, since it may be possible to turn the volume control to the maximum output position and still obtain high values of audio output. Misalignment, however, does not effect the circuits of the audio amplifier and has solely to do with the intermediate frequency amplifier and the radio frequency amplifiers. Principal among the contributions to low gain is the part which the intermediate frequency amplifier plays in providing over-all sensitivity and selectivity of a satisfactory order.

This loss of gain, when occurring in the radio frequency section of the receiver,is usually due to the fact that the oscillator has been grossly misaligned, so that it is apparent in the frequency calibration of the rec. In other words, it might well be said that a loss of sensitivity in the rec. occurring simultaneously with a wide-spread condition of 'off calibration' might indicate the fact that the loss of gain is caused by misalignment

I.F. AMPLIFIER ADJUSTMENT

It is for the purpose of realignment of these intermediate frequency transformers that the following test procedure is outlined:

IMPORTANT NOTE: It is essential that the 465 KC intermediate signal, which is used for realignment of the intermediate frequency amplifier, is not set according to any arbitrary calibration on the test oscillator itself. It has been found that commercial test oscillators for service work vary considerably, at least to an extent which will not permit proper alignment of a communication type receiver in which a quartz crystal is installed. It is therefore better if no test oscillator is used, since a broadcast station of constant signal strength will furnish adequate test signal for alignment of the intermediate frequency amplifier, using the quartz filter for establishing the proper I.F. frequency as indicated in the following procedure:

The meter on the RME-99 receiver affords an excellent method of indicating the peak alignment of each of the transformers. The location of the 4 intermediate frequency amplifier transformers, 5.3, 5.4, 5.5 and 5.6 is given on Figure 2 of the illustrated sheet attached. The padding condensers located in each of these transformers,and accessible through apertures in the top of the shields, can also be seen.

The intermediate frequency amplifiers in the RME-99 are designed for a frequency of 465 KC. Since these receivers are always supplied with a quartz crystal filter, it is essential that the intermediate frequency amplifier transformers be accurately aligned with the crystal frequency. Crystals are supplied in frequencies slightly at variance from the above stated value of intermediate frequency by an amount not greater than ±1 KC. Rather, therefore, than align the I.F. amplifier stages of the RME-99 to a set frequency of 465 KC, it is essential that the alignment be done in conjunction with the quartz filter so that alignment of the intermediate frequency amplifier is achieved at the frequency of the filter. This is done as follows and when the process as herein outlined is followed accurately, maximum results will be obtained. The use of any other process of a general type will produce inferior results.

The first step in the alignment procedure is to tune in a broadcast station, preferably in the low frequency portion of the broadcast band. The signal should be one of medium signal strength so that the R meter indicates a signal level of R9 or slightly less. If no station of this amplitude is available, a reduction in the efficiency of the antenna by the connections of a short wire to the antenna post may help to bring the signal strength as indicated down to R9. Usually between 550 and 800 kilocycles, in most any territory, a station can be received at most any time for this test and adjustment.

When the station has been chosen, let us assume that its frequency is 700 KC, the next step is to slightly detune the main tuning control so that the frequency reads approximately 715 or 720 KC. This, of course, will tune the station out. It does not necessarily have to be the frequency mentioned or the exact frequency of detune, but the general procedure is to tune the main tuning control slightly higher than the chosen station so that it may be brought back to resonance by decreasing the scale reading of the band spread control. This is done merely to provide vernier tuning.

With the station chosen and resonated on the band spread scale the crystal filter is switched on. The crystal selectivity switch should be tuned to position 3 or 4. The band spread scale is then adjusted with respect to the signal so that the maximum meter reading is obtained. This procedure is one which requires patience and accuracy of adjustment; since the receiver IS ULTRA sharp with the crystal filter in — there will be one definitely sharp peak indicating crystal resonance. The receiver should be tuned to this peak and left on it during all adjustments to be made on the intermediate frequency amplifier.

When the above adjustments have been made the intermediate frequency transformers may be peaked up. For this purpose a standard small trimmer tool of the insulated screw driver type is used. The four transformers to be adjusted may be located on Figure 2. They are marked 5.3, 5.4, 5.5 and 5.6. It will be noticed that the #1 and #2 transformers (5.5 and 5.6) have 2 trimmers; the #3 and #4 transformers (5.3 and 5.4) each have 1 trimmer. The order in which the transformers are adjusted is immaterial. However, each trimmer should be carefully adjusted to give the maximum reading on the meter.

It is advisable during the above procedure to check the tuning from time to time to see that the receiver is adjusted accurately on the crystal.

If the above procedure is followed carefully the intermediate frequency amplifier circuits will be adjusted to peak performance.

CRYSTAL FILTER CIRCUIT ADJUSTMENT

In order that the full capabilities of the wide band crystal operation on points 1 and 2 of the selectivity switch may be realized the tuned circuit in the filter circuit must be accurately adjusted. The trimmer for this circuit will be found on the rear apron (See Figure 3). The easiest way to adjust this trimmer is to tune in a station on the broadcast band, that is broadcasting music, preferably an orchestra. The crystal selectivity switch is turned to Position 1. The pointer on the phasing control should be set approximately vertical. When this is done it will be noticed that the higher frequencies of modulation and the background noise will be cut out. The trimmer should now be carefully adjusted. As the trimmer is turned it will be found that the character of the music changes. The trimmer should be set to the point that sounds the most natural. If this adjustment is made carefully there will be a regular sharpening of the receiver as the selectivity switch is turned from "off" to Position 5.

ALIGNMENT OF THE RADIO FREQUENCY SECTION

Alignment of the radio frequency section of the receiver will effect, principally, the calibration of the receiver. Within certain limits this, of course, will also effect the sensitivity. Small variations in frequency (up to 2%) will not materially reduce the sensitivity of the receiver, although they will, of course, show up as variations in the calibration as indicated by the setting of the main tuning dial. Correction of any variation of calibration can be made by following the suggestions outlined in the following paragraphs:

Band 1 includes frequencies between 550 and 1600 KC. For Band 1 there are two frequency adjustments for adjusting the main dial to the proper calibration. The adjustments are made on the top of the chassis through the dust cover over the Band 1 and 2 coils. The proper holes for making the adjustments are indicated on the top sketch on Figure 6. There are 6 sets of a large and a small hole each. The two sets toward the rear of the chassis are the oscillator adjustments. The set toward the front are the RF stage adjustments; and the center set are for the detector. Under the large hole is a padder for adjusting the high frequency end of the scale. Under the small hole is a screw which moves the core in the coil and adjusts the low frequency end. In aligning an RME-99 an output meter or such device is unnecessary since the carrier meter is available at all times to indicate resonance.

The next step is to choose a station or a signal of accurately known frequency on the low frequency end of the range (for example 600 KC) and set the main tuning scale to read this frequency.

IMPORTANT: DURING ALL CALIBRATING AND ALIGNMENT PROCEDURE THE BAND SPREAD POINTER MUST BE AT THE EXTREME RIGHT, OR 180° END OF THE SCALE.

If the station is not tuned in which the scale indicates its frequency it may be brought in by adjusting the oscillator coil core. This may be done with a small screw driver through the small hole marked "BAND 1 OSC" on Figure 6. Another station or signal is now selected near the high frequency end of the range (for example 1400 KC). If this signal is not heard when the dial is accurately set to its frequency it may be brought in by adjusting the padder under the large hole marked "BAND 1 OSC" by means of an insulated trimmer tool. When this signal is accurately brought in as indicated by a maximum reading on the carrier meter one should go back to the low frequency test point and readjust it if it has changed. It may be necessary to go back and forth several times until both frequencies are accurately calibrated.

When the calibration is accurate the alignment of the RF and detector circuits may be checked. This is done at the two points used in calibrating. With the low frequency test signal tuned in,the Band 1 RF and detector coil cores are adjusted until a maximum meter reading is obtained. Then the high frequency signal is tuned in and the padders are adjusted as was done in calibrating.

Note on Figure 6 that the osicllator and RF adjustments are on the left hand side, but the detector adjustments are on the right hand side. Band 2 oscillator and RF adjustments are on the right side while the Band2 detector adjustments are on the left side.

The accuracy of most service signal generators is not very great, especially on the higher frequencies. The owner of an RME-99 should hesitate in using one to calibrate his receiver unless he is sure that it is accurately calibrated.

The procedure in calibrating and aligning Band 2 is the same for Band 1. On this band two frequencies, such as 1800 and 2800 KC, may be used.

The four high frequency bands are calibrated and aligned by removing the bottom plate from the receiver. The screws holding the four rubber feet and the four small screws between them are removed. This allows the bottom plate to be removed. It will be found that an aluminum plate covers the coils. This plate has holes over the 12 padders and all adjustments should be made with this plate in position.

Since the inductance of the coils are accurately adjusted and set at the factory it is necessary only to calibrate one frequency on each band. The same applies to the alignment of the RF and detector padders. This calibration and alignment should preferably be made somewhere near the upper 3/4 of each range. Suggested calibration points for each band are as follows:

Band 3	5 MC.
Band 4	9 MC.
Band 5	17 MC.
Band 6	30 MC.

From the bottom sketch on Figure 6 the location of each of the 3 padders for each band may be readily located. Note in particular the location of Band 5 and 6 padders. Adjustments should be made with insulated screw driver type of trimmer tool.

High frequency beat is used on all bands. That is to say, that the oscillator is 465 KC higher in frequency than the signal received.

If sufficient input is used each signal can be received at two points, differing by 930 KC. The other signal is the image or "low beat" signal. The higher frequency signal received, according to the receiver dial, is the proper one and the circuits should be aligned to it.

When using a signal generator or test oscillator to align the set a resistor of about 150 or 200 ohms should be inserted between the signal generator and the antenna connection. This will prevent misaligning of the RF stage caused by the connection of the low impedance of the signal generators output circuit across the receiver input.

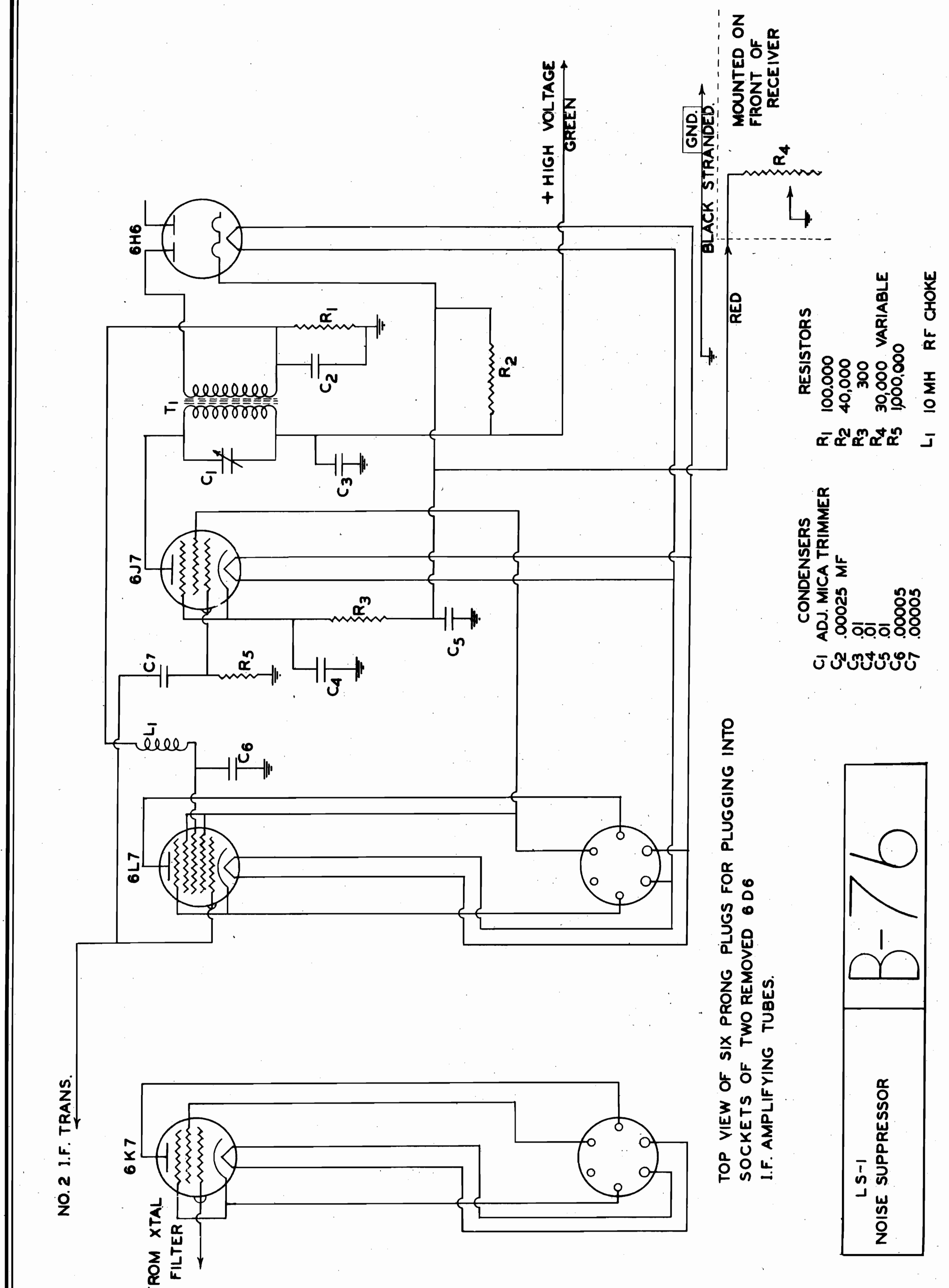
ADJUSTMENT OF THE BEAT OSCILLATOR

The beat oscillator has its frequency adjustable from the front panel. If it is found that zero beat does not occur with the pointer vertical, it may be adjusted as follows:

The cabinet bottom is removed and a signal should be tuned in,exactly on resonance as indicated by a maximum meter reading. The BO tone control ("F" Figure 1) pointer should be set vertical. The beat frequency is then adjusted by means of the padder that can be seen through the hole in the side of the beat oscillator shield can. When the padder is adjusted properly zero beat will be obtained when the control "F" is vertical and the beat frequency wil rise when the control is turned either to the right or left.

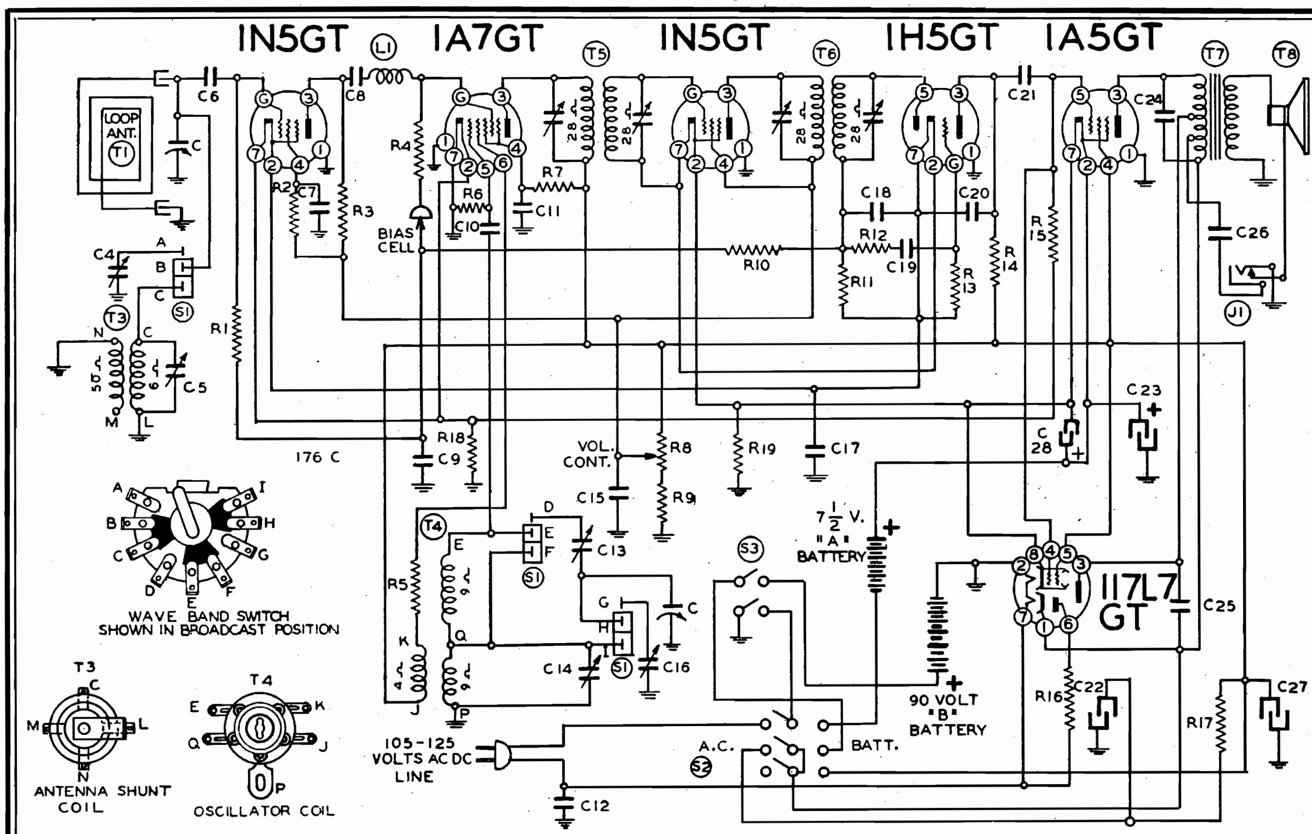
MODEL LS-1
Noise Silencer

RADIO MFG. ENGINEERS, INC.



SEA PAL RADIO CO.

MODELS 101,202
Radio Compass

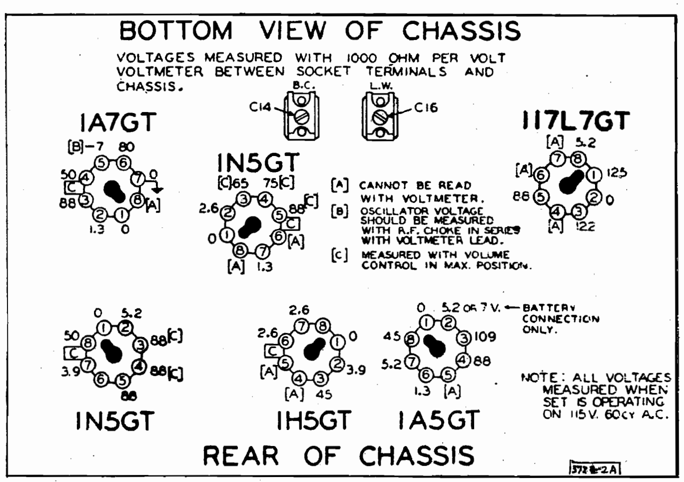


CONDENSERS

C	102130	2 gang variable
C4	124128	Long Wave Antenna Trimmer
C5	124128	Broadcast Antenna Trimmer
C6	12938	.00005 mica
C7	1009	.05 x 200 v.
C8	12912	.00025 mica
C9	1009	.05 x 200 v.
C10	12921	.0002 mica
C11	1009	.05 x 200 v.
C12	10013	.05 x 400 v.
C13	124133	Long Wave Padder Condenser
C14	124129	Broadcast Oscillator Trimmer
C15	10020	.1 x 200 v.
C16	124129	Long Wave Oscillator Trimmer
C17	100104	.5 x 100 v.
C18	1295	.0001 mica
C19	10025	.002 x 600 v.
C20	12936	.0003 mica
C21	10011	.01 x 400 v.
C22	119107	40 mfd. lytic 150 w.v.
C23	119107	200 mfd. lytic 6 w.v.
C24	10025	.002 x 600 v.
C25	10019	.006 x 600 v.
C26	10011	.01 x 400 v.
C27	119107	20 mfd. lytic 150 w.v.
C28	119113	200 Mfd. Lytic 10 w. v.

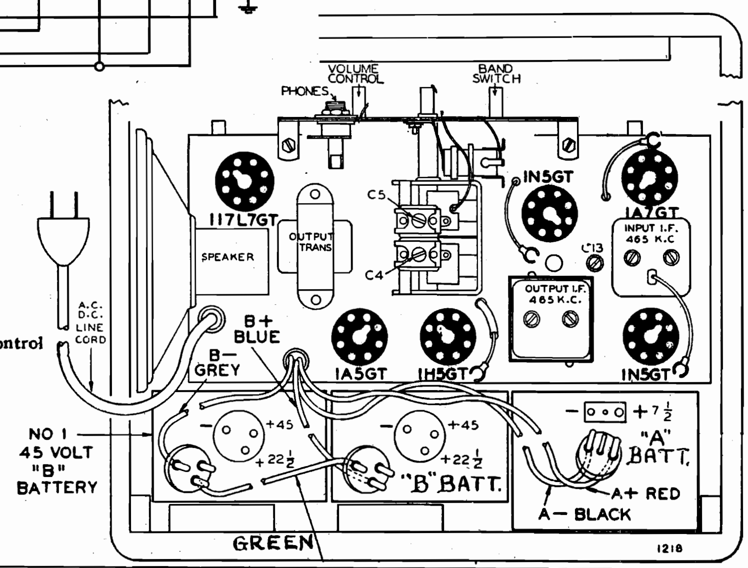
C22, C23 and C27 in same unit.
C4 and C5 in same unit.
C14 and C16 in same unit.

T1	111205	Loop Antenna (in cabinet)
T3	111175	Loop Antenna Shunt Coil
T4	110148	Oscillator Coil
T5	108174	Input I. F. Coil—465 kc.
T6	108175	Output I. F. Coil—465 kc.
T7	105107	Output Transformer
T8	114190	5" P. M. Speaker
S1	125109	Wave Band Switch
S2	125110	Power Supply Switch
S3		On Volume Control
L1	1238	R. F. Choke
J1	121255	Phones Jack



IF PEAK 465 KC

Code No.	Part No.	Description
		RESISTORS
R1	13019	1 megohm—1/3 w.
R2	130176	20M ohm—1/3 w.
R3	130176	20M ohm—1/3 w.
R4	13019	1 megohm—1/3 w.
R5	130218	5M ohm—1/3 w.
R6	1309	200M ohm—1/3 w.
R7	1307	40M ohm—1/3 w.
R8	101212	1 megohm volume control
R9	13020	100M ohm—1/3 w.
R10	130170	3 megohm—1/3 w.
R11	13019	1 megohm—1/3 w.
R12	13020	100M ohm—1/3 w.
R13	130257	5 megohm—1/3 w.
R14	130309	350M ohm—1/3 w.
R15	1303	500M ohm—1/3 w.
R16	130310	30 ohm—1/3 w.
R17	13071	4M ohm—1/3 w.
R18	13092	1M ohm—1/3 w.
R19	130294	1200 ohm—1/3 w.



MODELS 101,202
Radio Compass

SEA PAL RADIO CO.

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect generator ground to shell of antenna socket.
- 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., 50 Mmfd.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open (Plates out of mesh)	Four trimmers on top (See Fig. 1)	Output and input I. F.	(See Note "A") Adjust to maximum output
BROADCAST BAND (Band Switch in Broadcast Position)	1560 Kc.	.1 MFD.	Grid of 1A7GT	Rotor full open (Plates out of mesh)	Trimmer C14 (See Fig. 3)	Broadcast Oscillator	(See Note "A" and "C") Adjust to maximum output
	1400 Kc.	50 MMFD.	Antenna and Ground Terminals	Set dial at 1400	Trimmer C5—Front section of gang (See Fig. 1)	Broadcast Antenna	(See Note "B") Adjust to maximum output
LONG WAVE BAND (Band Switch in Long Wave Position)	410 Kc.	50 MMFD.	Grid of 1A7GT	Set dial at 410 (Rotor plates full open)	Trimmer C16 (See Fig. 3)	Long Wave Oscillator	(See Note "A" and "C") Adjust to maximum output
	400 Kc.	50 MMFD.	Antenna and Ground Terminals	Set dial at 400 Kc.	Trimmer C4—Rear Section of gang (See Fig. 1)	Long Wave Antenna	(See Note "B") Adjust to maximum output
	275 Kc.	50 MMFD.	Antenna and Ground Terminals	Set dial at 275 Kc.	Padder C13 (See Fig. 1)	Long Wave Oscillator Series Padder	Adjust to maximum output

NOTE "A"—The loop may be connected to the radio when making these adjustments. The ground of the signal generator is connected to the shell of the antenna socket and the other lead from the signal generator in series with the proper 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 shell of the antenna socket. The other lead of the signal generator is connected in series with a 50 Mmf. dummy to the antenna terminal.

NOTE "C"—Trimmers C14 and C16 can be reached by removing the Sea Pal Nameplate on the side of the cabinet.

Power Consumption............(On A.C. or D.C.) 35 Watts
Power Output............600 Milliwatts Undistorted, 1200 Milliwatts Maximum

FREQUENCY RANGES
535 to 1560 KC.
190 to 410 KC.

When carefully used the instrument will indicate points within ± 1 Degree.

A Radio Beacon Broadcast Chart may be obtained from the United States Coast Guard at Washington, D. C. This chart contains instructions for its use

The Sea Pal should not be installed too near your compass or the speaker magnet may affect the reading of the compass. It is advisable to keep the unit away from metal as much as possible to eliminate excessive error in the readings.

Place the unit in line with the ship, that is, if you want the controls directly in front when you face the bow the back of the cabinet should point directly toward the bow. If the unit is used on one side of your cabin then it should be lined up so that it is parallel with a line drawn between the bow and the stern. The reason for keeping the unit in a parallel relation to the boat is that it will be easier to set the compass scale on top of the cabinet to conform to your compass settings when taking bearing.

There is an index marker opposite the compass scale locking screw which aids you to set the scale in exact agreement with your compass when required.

In any radio compass there may be a deviation from a true reading due to the motor or other metal parts around the boat just as there is with a magnetic compass. The simplest method to determine the amount of deviation is to select a broadcast or beacon station which you can see from the ship—Point your ship directly at the station and then tune the loop to the "Null" point. If there is no error the loop pointer should point to the station straight ahead, parallel with a line from bow to stern. If there is a deviation the pointer will not point exactly straight ahead. You can either note how many degrees the variation is and allow for it in future readings or you can turn the radio case so the loop pointer points straight ahead. This will correct for the error and you won't need to make any future allowance.

Check for deviation on several stations and also with the boat turned 180 Degrees from the stations.

To use your compass as a homing device—Tune in the station near the harbor. Rotate the loop to the point where the signal is loudest. This point is quite broad and is therefore not accurate enough to follow. You must therefore find the "Null" point (the point at which the station is weakest).

The Null point will be where the flat side of the loop faces the station. The pointer on the Loop should then point to the station. Follow this "Null" point all the way in toward the station. When near the harbor of course you'll pick up the harbor lights and marker buoys.

Since the "Null' point can be obtained when the loop pointer points either to the station or directly away from it you should check with your magnetic compass just to be certain your direction is not away from the station.

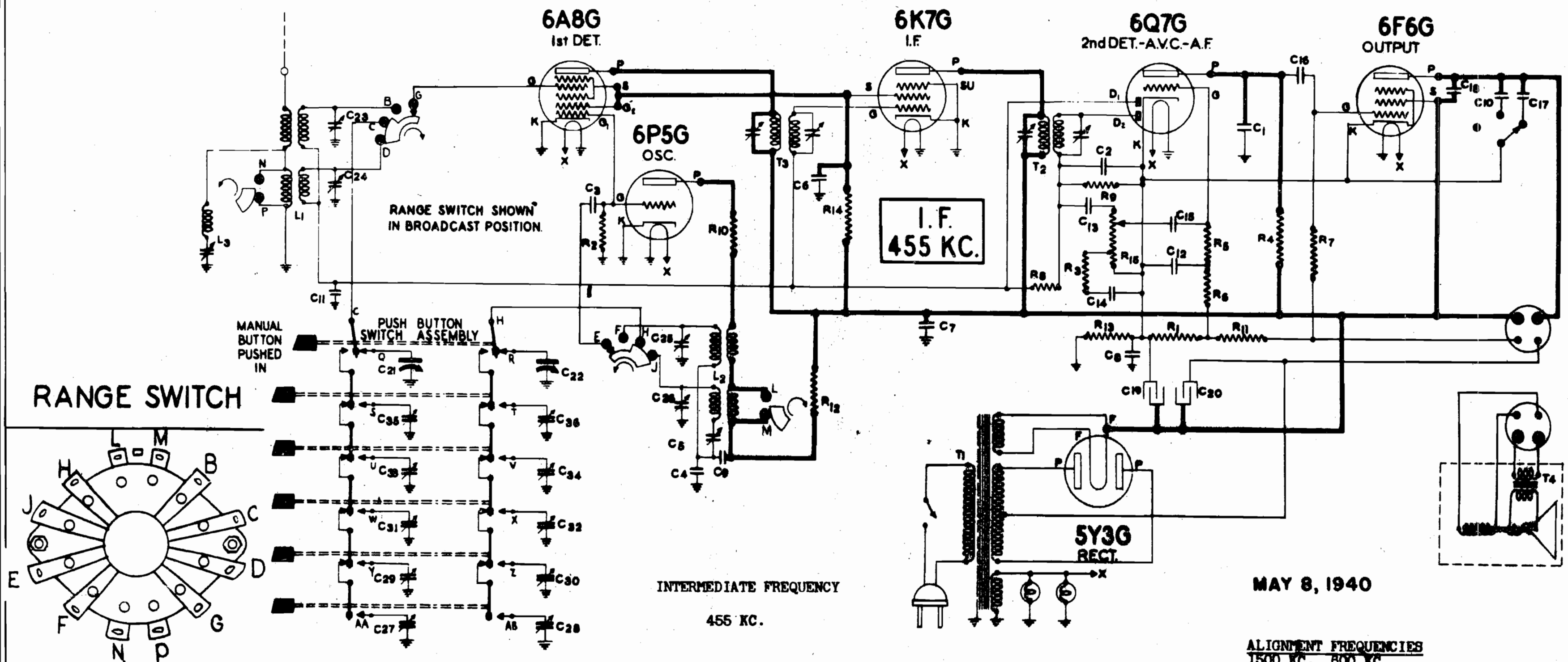
To determine your position at Sea it is only necessary to take bearings on two broadcast stations and transfer these bearings to your chart (map). To find your position first loosen the locking screws on the compass scale on top of the Sea Pal. Rotate the scale so it reads the same as your ships compass. Make the same correction as you would for your compass and hold the ships course steady.

Now tune in a broadcast or beacon station the position of which you know. Rotate the loop to a point where the signal is loudest—Now turn the loop approximately 90 degrees to the "Null Point" (The point of weakest signal). You may have to adjust the volume either up or down to find the "Null Point". Having found the "Null", the loop pointer should point directly at the station and on the loop scale you can now read in degrees the position of the station. Draw a line from this point on land with a parallel rule out to sea, on your chart.

Now repeat the same operation on another known station which is located farther along shore. When you draw your line from this station it will cross the first line at some point on the water—The point at which the lines cross is your position.

SEARS ROEBUCK & CO.

MODEL S61
Chassis 100.350



INTERMEDIATE FREQUENCY

455 KC.

MAY 8, 1940

ELECTRICAL PARTS

PART NUMBER	SCHEMATIC LOCATION	DESCRIPTION	LIST PRICE
10028119687	L1	Coil - antenna	1.10
10028119688	L2	Coil - oscillator	1.00
10031119754	L3	Coil - wave trap with trimmer	.40
1001983539	C1	Condenser - mica, 260 mmfd.	.20
1001983783	C2	Condenser - mica, 110 mmfd.	.20
1001985061	C3	Condenser - mica, 51 mmfd.	.15
1001988587	C4	Condenser - mica, .0042 mfd.	.35
10017112799	C5	Condenser - padder	.36
	C6-C7	Condenser - .1 mfd. 600 volt	.25
10020110377	C8	Condenser - 10 mfd. 35 volt	.80
	C9-C10	Condenser - .01 mfd. 600 volt	.15
	C11-C12	Condenser - .05 mfd. 600 volt	.20
	C13-C14-C15-C16	Condenser - .02 mfd. 600 volt	.15
	C17	Condenser - .04 mfd. 600 volt	.20
	C18	Condenser - .002 mfd. 600 volt	.15
10020118421	C19-C20	Condenser - electrolytic 10-15 mfd. 450V-	1.50
10016118619	C21-C22	Condenser - variable tuning	3.00
10017118920	C23-C24-C25-C26	Trimmer strip (2 section)	.30
10017119783	C27-C28-C29-C30	Push button trimmer condenser(540-1000KC)	.28
10017119663	C31-C32-C33-C34	Push button trimmer condenser(750-1375KC)	.24
10017119664	C35-C36	Push button trimmer condenser(980-1700KC)	.24
10049110629		Lamp - 6.3 volt - (Mazda #44)	.15
1002188465	R1	Resistor - 25 ohms 1/2 watt, wire wound	.16
	R2-R3	Resistor - carbon, 47,000 ohms 1/4 watt	.12
	R4	Resistor - carbon 220,000 ohms 1/4 watt	.12
	R5-R6	Resistor - carbon, 1 megohm 1/4 watt	.12
	R7	Resistor - carbon 470,000 ohms 1/4 watt	.12
	R8	Resistor - carbon, 2.2 meg. 1/4 watt	.15
	R9	Resistor - carbon 330,000 ohms 1/4 watt	.12
	R10	Resistor - carbon, 180 ohms 1/4 watt	.12
10021117075	R11	Resistor - 300 ohms 1 watt, wire wound	.16
	R12	Resistor - 10,000 ohms 1 watt	.12
	R13	Resistor - 110 ohms 1 watt	.25
	R14	Resistor - 22,000 ohms 2 watts	.30
10024119634	R15	Volume control - 1 megohm	.90
10058115096		Speaker - dynamic (8 in.)	6.50
10057119597		Cone & Voice coil for 10058115096 speaker	2.00
10037119626		Range swith	1.00
10038119715		Push button switch	2.40
10025119640		Tone control and switch	.85
10010118498	T1	Transformer - power (50-60 cycles)	3.20
10011119804	T1	Transformer - power (25 cycles)	5.35
10035119024	T2	Transformer - 2nd I.F.	1.15
10033119220	T3	Transformer - 1st I.F.	1.30
10013119596	T4	Transformer - output for(speaker 1005811-5096)	1.95

ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

ANTENNA SYSTEM

This radio is equipped with a built-in antenna which consists of a metal foil plate built into the cabinet back. An external antenna maybe connected to the set by connecting the antenna lead-in to the clip provided on the cabinet back. When removing the chassis from the cabinet for alignment or test purposes, unsolder the blue wire at the clip on the cabinet back.

ALIGNMENT FREQUENCIES
1500 KC., 600 KC.
16 MC.

POWER SUPPLY
Model 61 is supplied for either 25 or 60 cycle power supplies

105-125 volts - 25 cycle - 55 watts
105-125 volts - 50-60 cycle - 55 watts

FREQUENCY RANGES
"AMERICAN" Band....................540 to 1725 KC.
"FOREIGN" Band....................5.5 to 18.1 MC.

POWER OUTPUT
Type....................Pentode
Undistorted....................2 watts
Maximum....................3 watts

OPERATING FEATURES
Tone control....................Three point
Automatic tuning....................Five station
Dial lighting....................Edge lit.
Pointer....................Slide-rule type

LOUD SPEAKER
Type....................Dynamic
Size....................8"
Field coil resistance....................920 ohms
App. field coil voltage drop....................50 volts

CHASSIS FEATURES
Number of I. F. stages....................one
Built-in antenna....................plate type
Wave trap....................455 KC.
Number of condensers in gang....................two

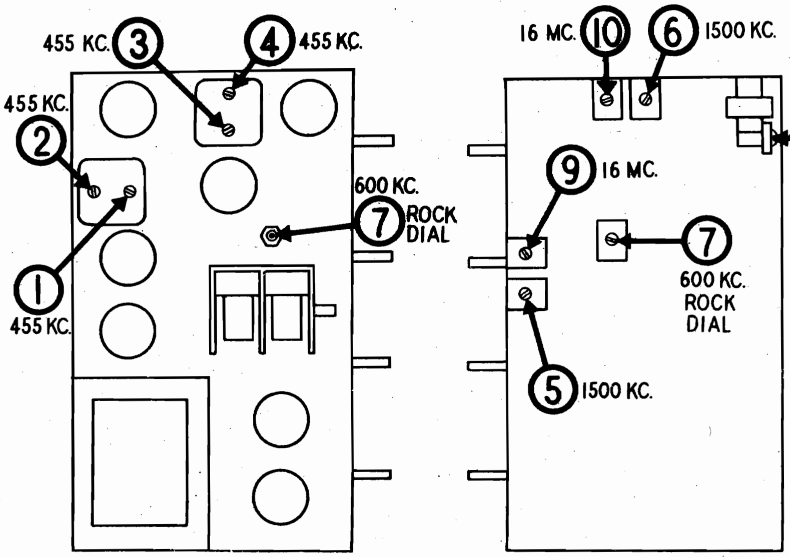
MODEL S61
Chassis 100.350

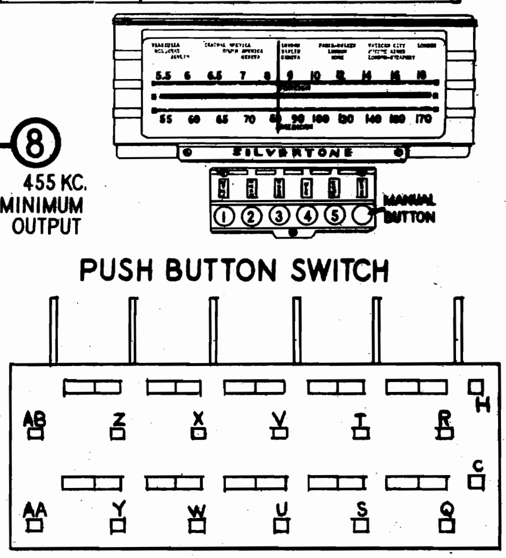
SEARS ROEBUCK & CO.

Before attempting to align the receiver see that the dial pointer is correctly set. 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 in the dial cord drive drum and push the gang condenser in full mesh with the pointer properly set, then retighten the set screw.

Output meter connection----------Across loud speaker voice coil
Output meter reading to indicate 200 milliwatts----------.831 volts
Dummy antenna value to be in series with generator output----------See chart below
Connection of generator output lead----------See chart below
Connection of generator ground lead----------External ground
Generator modulation----------30%, 400 cycles
Position of Volume control----------Fully clockwise
Position of Tone control----------HI
Position of Dial Pointer with variable fully closed----------On mark to left of 550 kc calibration mark

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6A8G TUBE	455 KC	AMERICAN	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. CONDENSER	ANTENNA TERMINAL	1500 KC	AMERICAN	1500 KC	5	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. CONDENSER	ANTENNA TERMINAL	1500 KC	AMERICAN	TUNE TO 1500 KC GENERATOR SIGNAL	6	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT.
200 MMFD. CONDENSER	ANTENNA TERMINAL	600 KC	AMERICAN	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.
200 MMFD. CONDENSER	ANTENNA TERMINAL	455 KC	AMERICAN	600 KC	8	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT. USING A STRONG GENERATOR SIGNAL
400 OHM CARBON RESISTOR	ANTENNA 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	ANTENNA 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.



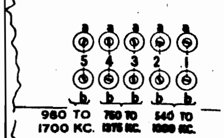


SOCKET VOLTAGES-ALL D.C. MEASURED TO CHASSIS

ANTENNA GROUNDED — DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	G_1	G_2	S	SU	P	D_1	D_2
6A8G	1st DET.	6.0A.C	0	Note A	-5	85	85		240		
6P5G	OSC.	6.0A.C	0	-5					168		
6K7G	I.F.	6.0A.C	0	Note A			85	0	240		
6Q7G	2nd DET.-A.V.C.-A.F.	6.0A.C	-2.4	Note B					95	Note A	Note A
6F6G	OUTPUT	6.0A.C	-2.4	Note C			240		225		
5W4G	RECT.	5.0A.C	PLATES=350 A.C. TO CENTER TAP								

PUSH BUTTON TRIMMERS



VIEWED FROM REAR OF CHASSIS

NOTE A: The bias on these elements is -2.4 volts measured across R 13.

NOTE B: The bias on the 6Q7G grid is -1.4 volts measured across R_1.

NOTE C: The bias on the 6F6G grid is -16 volts measured across R_1 and R_{11}.

USE A HIGH RESISTANCE VOLTMETER HAVING A RESISTANCE OF AT LEAST 1000 OHMS PER VOLT.

PUSH BUTTON ADJ. - BAND SW. AT "AM" POS.- "MANUAL BUTTON IN, TUNE IN DESIRED STATION WITH TUNING CONTROL. PUSH IN FREQ. RANGE BUTTON AND ADJUST CORRESPONDING SCREW "A".
ADJUST SCREW "B" (ONE BELOW "A") FOR DEEPEST TONE.
READJUST "A" & "B" SCREWS FOR DEEPEST TONE.
SEE ABOVE DWGS.

SEARS ROEBUCK & CO.

MODELS R71,671
Chassis 101.612
101.612A
MODEL R381

POWER SUPPLY:
All models available . . . . .105-125 v., 50-60 cycles AC; 70 watts
All models available . . . . .105-125 v., 25-60 cycles AC; 75 watts

POWER OUTPUT:
Type . . . . . .Pentode
Undistorted . 2.5 watts
Maximum . . . 4.5 watts

FREQUENCY RANGES:
Band "A" . . .540-1610 kc
Band "B" . .1475-2510 kc
Band "C" . . 5.95-18.2 mc

LOUDSPEAKER
Type . . . . .Dynamic
Size . . . . 8 inch
Field coil resistance. . . .1100 ohms
Approx.field coil voltage drop. .85 v.

PRELIMINARY:

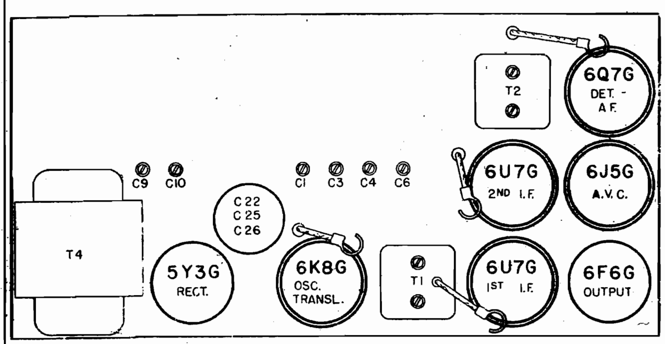
Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.2 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . .To chassis
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . .HI
Position of Dial Pointer with variable fully closed. . . . . At mark to left of 550 kc calibration mark.

MODELS R71,671 AND R381

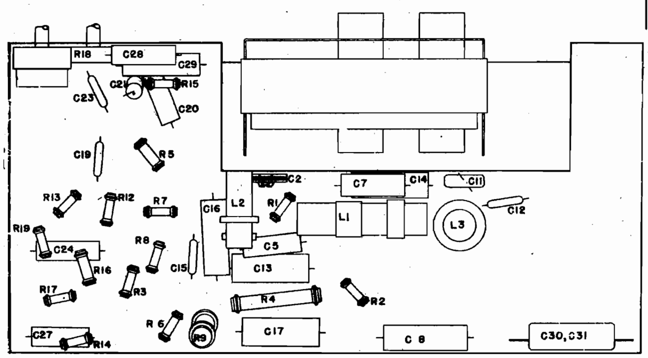
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	(FOR MODELS R71, 671 ONLY) APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	50
"A"	600 kc	455 kc	.00005 mfd.	Ant. Term.	C6*	Wave Trap	--
"A"	Open	1610 kc	.00005 mfd.	Ant. Term.	C9	Oscillator	--
"A"	1400 kc	1400 kc	.00005 mfd.	Ant. Term.	C1	Translator	85
"A"	600 kc(rock)	600 kc	.00005 mfd	Ant. Term.	C10	Padder	35
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C3	Translator	30
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C4	Translator	10

IMPORTANT ALIGNMENT NOTES

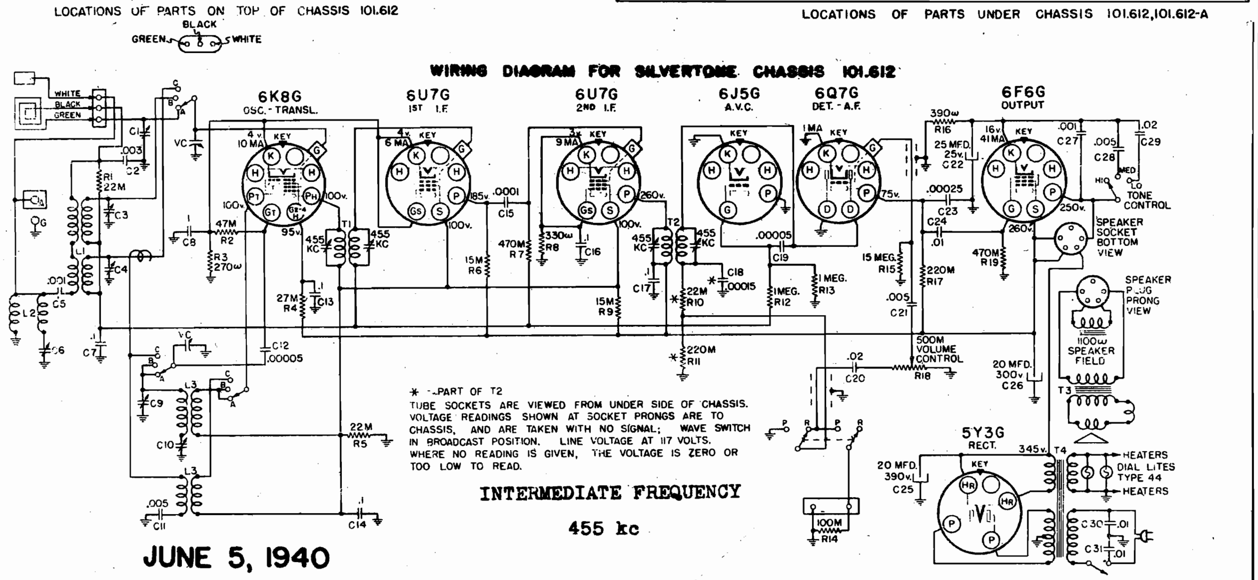
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.612



LOCATIONS OF PARTS UNDER CHASSIS 101.612,101.612-A



WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.612

INTERMEDIATE FREQUENCY
455 kc

JUNE 5, 1940

MODEL R81
Chassis 101.613

SEARS ROEBUCK & CO.

JUNE 18, 1940

POWER OUTPUT:
Type . . . . Push-pull pentodes
Undistorted . . . . .4 watts
Maximum . . . . .6 watts

FREQUENCY RANGES:
Band "A" . . . . . 540-1610 kc
Band "B" . . . . .1475-3510 kc
Band "C" . . . . .5.95-18.2 mc
Band "D" . . . . . 9.3-9.85 mc

POWER SUPPLY:
All models available .105-125 v., 50-60 cycles AC; 35 watts
All models available .105-125 v., 25-60 cycles AC;100 watts

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.55 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . To chassis
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . .HI
Position of Dial Pointer with variable fully closed . . . . At mark to left of 550 kc calibration mark

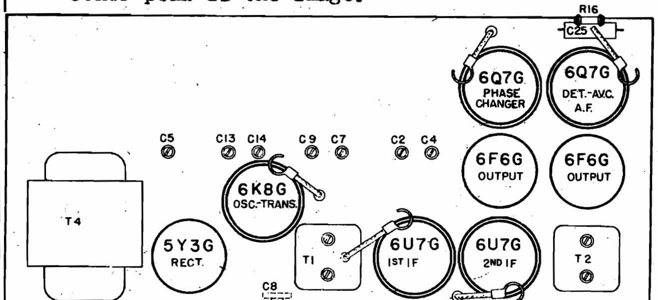
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	600 kc	455 kc	.00005 mfd	Ant. Term.	C4*	Wave Trap	--
"A"	Open	1610 kc	.00005 mfd	Ant. Term.	C13	Oscillator	--
"A"	1400 kc	1400 kc	.00005 mfd	Ant. Term.	C8	Translator	220
"A"	600 kc(rock)	600 kc	.00005 mfd	Ant. Term.	C5	Padder	85
"B"	2.4 mc(rock)	2.4 mc	400 ohms	Ant. Term.	C2	Translator	65
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C7	Translator	15
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C14**	Oscillator	--
"D"	9.55 mc(rock	9.55 mc	400 ohms	Ant. Term.	C9	Translator	60

IMPORTANT ALIGNMENT NOTES

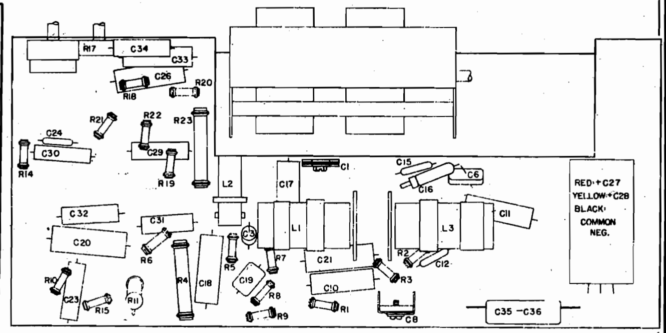
FOR TUNER DATA SEE INDEX

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** If two peaks can be had, the correct one is with the trimmer screw further out. The other peak is the image.



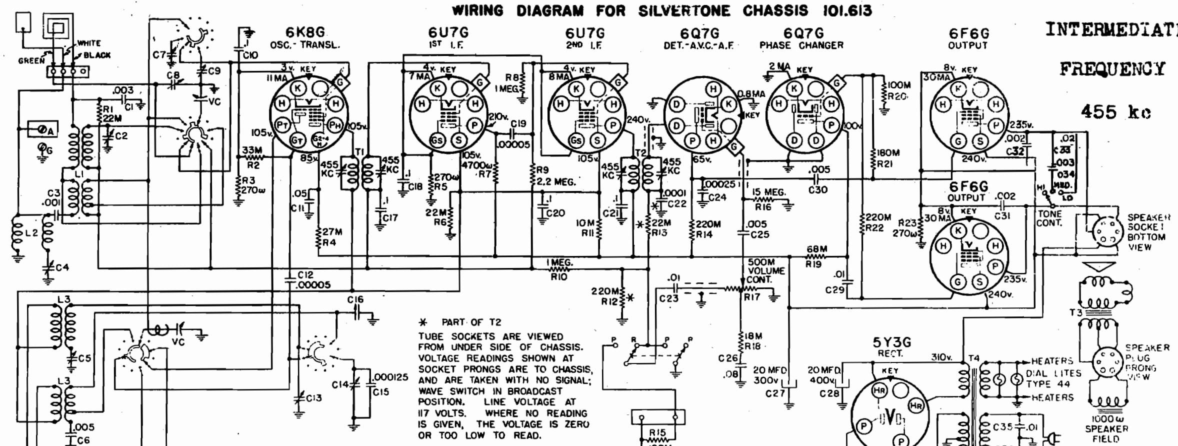
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.613



LOCATIONS OF PARTS UNDER CHASSIS 101.613

GREEN BLACK WHITE

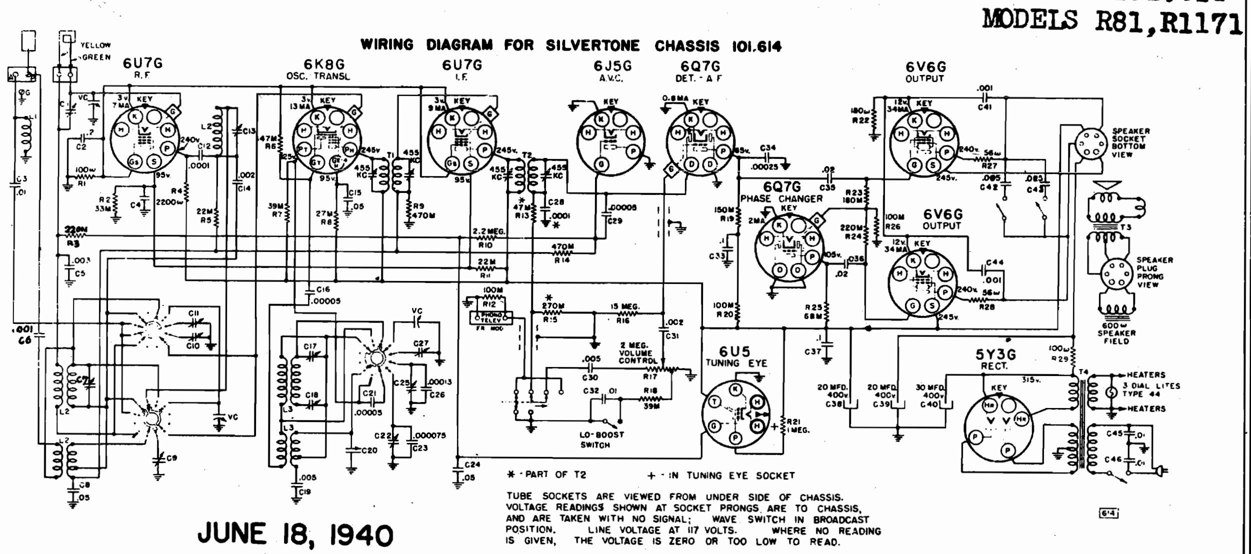
WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.613



INTERMEDIATE FREQUENCY 455 kc

SEARS-ROEBUCK & CO.

MODEL R101
Chassis 101.614
MODELS R81,R1171



JUNE 18, 1940

ALIGNMENT PROCEDURE

INTERMEDIATE FREQUENCY 455 kc

Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts .1.6 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . .Both buttons out
Position of Dial Pointer with variable fully closed . . . . .On first mark to left of 550 kc calibration mark

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Fully open	1650 kc	.00005 mfd	Ant. Term.	C17	Oscillator	--
"A"	1400 kc	1500 kc	.00005 mfd	Ant. Term.	C1,C13	Ant,Transl	160
"A"	600 kc(rock)	600 kc	.00005 mfd	Ant. Term.	C18	Padder	65
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C7	Translator	150
"C"	Open	18.3 mc	400 ohms	Ant. Term.	C27*	Oscillator	--
"C"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C11	Translator	60
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	--
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Term.	C10	Translator	90
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C22*	Oscillator	--
"E"	11.71 mc(rock)	11.71 mc	400 ohms	Ant. Term.	C9	Translator	90

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

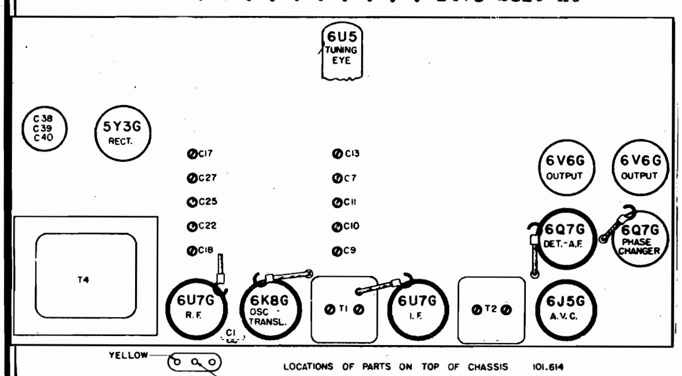
PUSH BUTTON TUNING MECHANISM: **MODELS R81, R101,R1171**

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment by holding the screw driver lightly in the screwhead allowing the spring tension to hold the plunger against the screw driver.

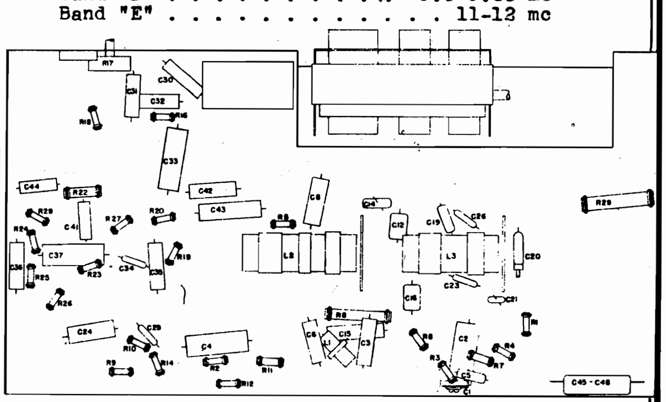
POWER SUPPLY:
All models available .105-125 volt AC; 50-60 cycle; 110 watts
All models available .105-125 volt AC; 25-60 cycle; 120 watts

POWER OUTPUT:
Type . . . . Push-Pull beam
Undistorted . . . . 6 watts
Maximum . . . . .11 watts

FREQUENCY RANGES:
Band "A" . . . . .540-1650 kc
Band "B" . . . . 1475-2510 kc
Band "C" . . . . 5.95-18.3 mc
Band "D" . . . . 9.3-9.85 mc
Band "E" . . . . 11-12 mc



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.614



LOCATIONS OF PARTS UNDER CHASSIS 101.614

MODEL R101 (Late)
Chassis 101.614-1

MODEL 1581
Chassis 101.572-2A

SEE PREVIOUS PAGE
FOR OTHER DATA

SEARS ROEBUCK & CO.

OCT. 15, 1940

MODEL R101

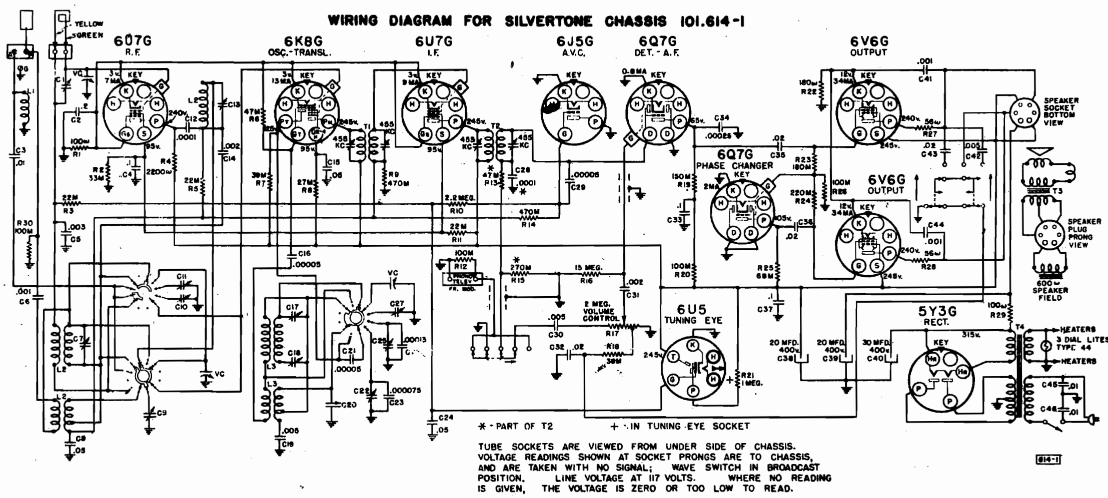
FACTORY IDENTIFICATION NO. 101.614-1

ADDITION OF SUFFIX NUMBER -1 TO CHASSIS IDENTIFICATION NUMBER 101.614:

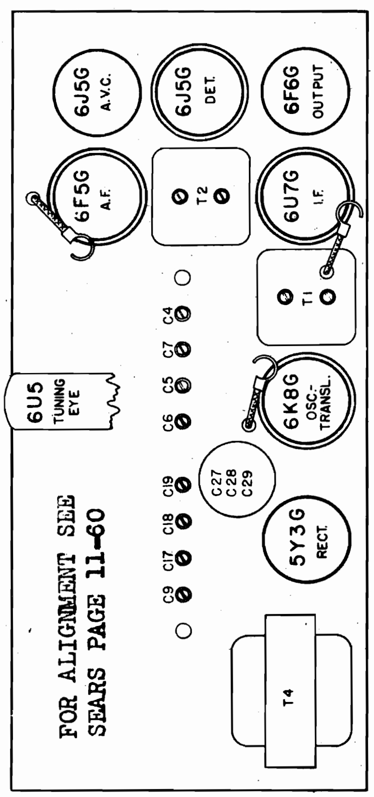
Chassis identified by 101.614-1 omit the low boost switch from the back of the chassis and incorporate its function in the tone push buttons.

The new Tone-Phono-Television-Frequency Modulation push button switch is part number 1013843862, selling price $1.02.

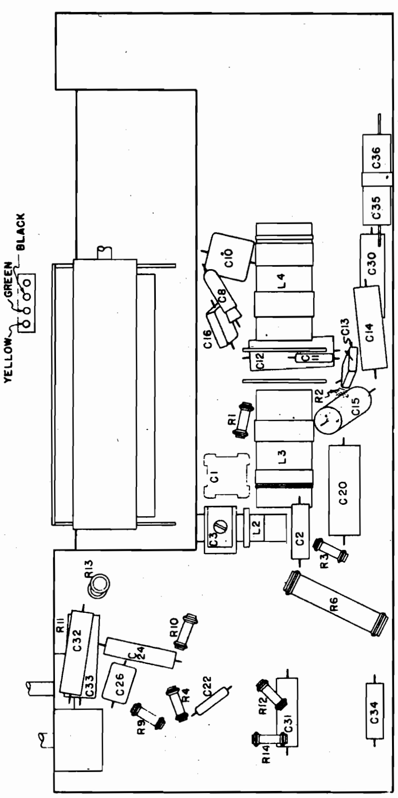
WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.614-1



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

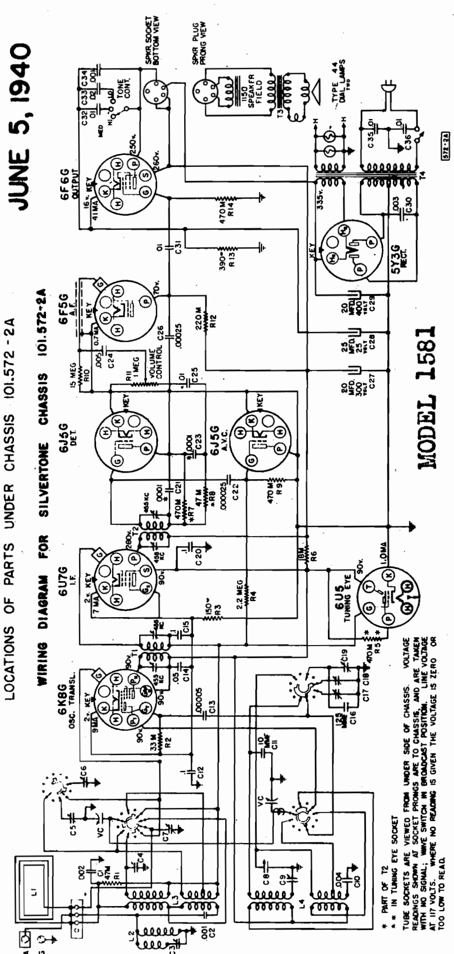


LOCATION OF PARTS ON TOP OF CHASSIS 101.572-2A



LOCATIONS OF PARTS UNDER CHASSIS 101.572-2A

JUNE 5, 1940



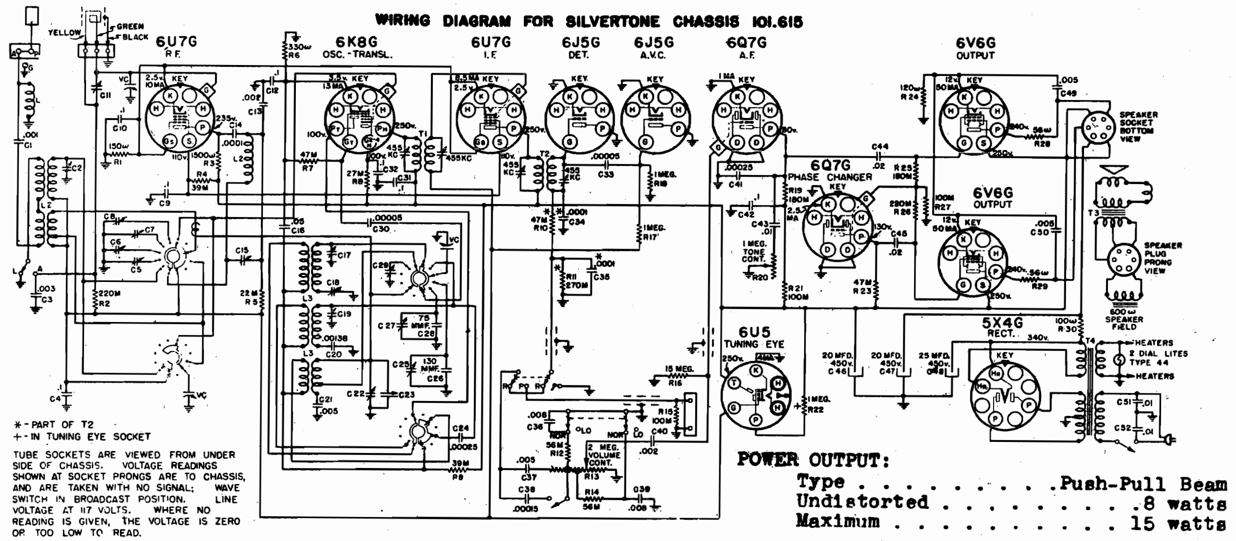
WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.572-2A

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

MODEL 1581

SEARS ROEBUCK & CO.

MODEL R111
Chassis 101.615



POWER OUTPUT:

Type . . . . Push-Pull Beam
Undistorted . . . . .8 watts
Maximum . . . . 15 watts

POWER SUPPLY:

All models available 105-125 volts, 50-60 cycles: 130 watts
All models available 105-125 volts, 25-60 cycles: 130 watts

INTERMEDIATE FREQUENCY . . . . . 455 kc

FREQUENCY RANGES:

Band "A" . . . . 540-1630 kc
Band "B" . . . . .1675-5200 kc
Band "C" . . . . 5.95-18.265 mc
Band "D" . . . . 9.3-9.85 mc
Band "E" . . . . .11-12 mc
Band "F" . . . . 12.9-15.95 mc

ALIGNMENT PROCEDURE

PRELIMINARY:

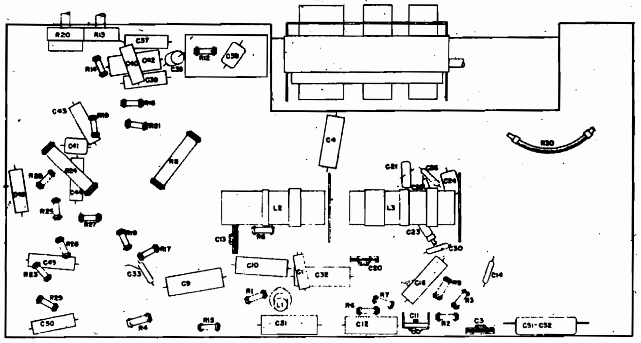
Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . .1.6 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . .Receiver chassis
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . .Both buttons out
Position of Dial Pointer with variable fully closed . . . . .On first mark to left of 550 kc calibration mark
Position of Antenna Switch . . . . .Antenna position

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Fully open	1630 kc	.00005 mfd	Ant. Term.	C17	Oscillator	--
"A"	1400 kc	1400 kc	.00005 mfd	Ant. Term.	C11,C15	Loop,Transl	120
"A"	600 kc(rock)	600 kc	.00005 mfd	Ant. Term.	C18	Padder	50
"B"	5 mc	5.2 mc	400 ohms	Ant. Term.	C19	Oscillator	--
"B"	4 mc	4 mc	400 ohms	Ant. Term.	C2	Translator	80
"C"	Open	18.265 mc	400 ohms	Ant. Term.	C23*	Oscillator	--
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C5	Translator	35
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	--
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Term.	C6	Translator	70
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C27*	Oscillator	--
"E"	11.71 mc(rock)	11.71 mc	400 ohms	Ant. Term.	C7	Translator	50
"F"	15.5 mc	15.5 mc	400 ohms	Ant. Term.	C29*	Oscillator	--
"F"	15.5 mc(rock)	15.5 mc	400 ohms	Ant. Term.	C8	Translator	40

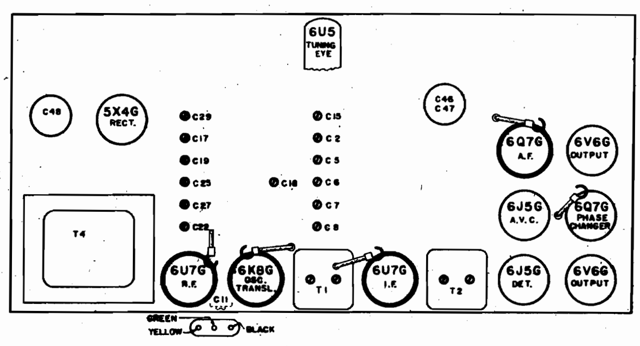
IMPORTANT ALIGNMENT NOTES

JUNE 18, 1940

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.



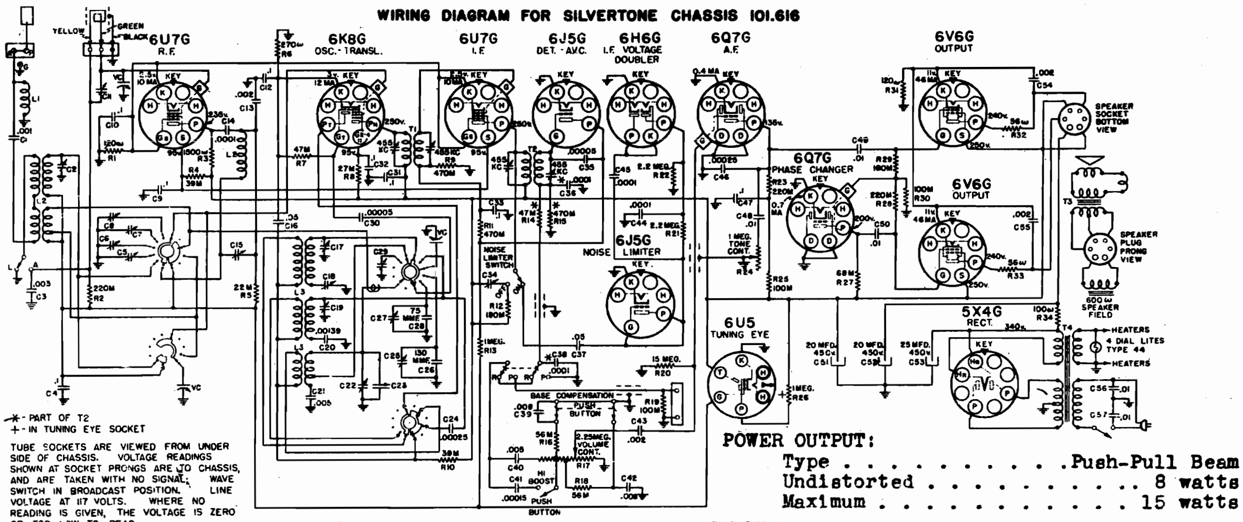
LOCATIONS OF PARTS UNDER CHASSIS - 101.615



LOCATIONS OF PARTS ON TOP OF CHASSIS - 101.615

MODELS R121,721
Chassis 101.616

SEARS ROEBUCK & CO.



POWER OUTPUT:
Type . . . . .Push-Pull Beam
Undistorted . . . . 8 watts
Maximum . . . . 15 watts

INTERMEDIATE FREQUENCY

. . 455 kc

POWER SUPPLY:
All models available

105-125 volts, 50-60 cycles: 125 watts
105-125 volts, 25-60 cycles: 135 watts

FREQUENCY RANGES:
Band "A" . . . . 540-1620 kc
Band "B" . . . . .1675-5200 kc
Band "C" . . . . .5.95-18.365 mc
Band "D" . . . . 9.3-9.85 mc
Band "E" . . . . .11-12 mc
Band "F" . . . . 12.9-15.95 mc

PRELIMINARY:

ALIGNMENT PROCEDURE

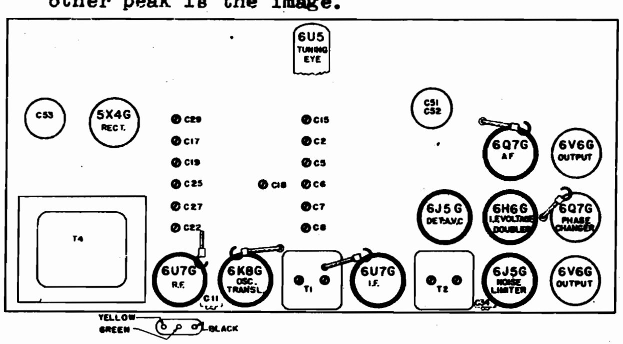
Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . .1.6 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . .Receiver chassis
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . .Tone knob counter-clockwise and both buttons out
Position of Dial Pointer with variable fully closed . . . . .On first mark to left of 550 kc calibration mark.
Position of Anti-Static Switch . . . . "Off" except when peaking T1 and T2

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	C34	Anti-Static	--
"A"	Fully open	1620 kc	.00005 mfd	Ant. Term.	C17	Oscillator	--
"A"	1400 kc	1400 kc	.00005 mfd	Ant. Term.	C11,C15	Loop,Transl	125
"A"	600 kc(rock)	600 kc	.00005 mfd	Ant. Term.	C18	Padder	65
"B"	5.2 mc	5.2 mc	400 ohms	Ant. Term.	C19	Oscillator	80
"B"	4 mc	4 mc	400 ohms	Ant. Term.	C3	Translator	75
"C"	Open	18.265 mc	400 ohms	Ant. Term.	C23*	Oscillator	--
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C5	Translator	35
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	--
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Term.	C6	Translator	60
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C27*	Oscillator	--
"E"	11.71 mc(rock)	11.71 mc	400 ohms	Ant. Term.	C7	Translator	50
"F"	15.5 mc	15.5 mc	400 ohms	Ant. Term.	C29*	Oscillator	--
"F"	15.5 mc(rock)	15.5 mc	400 ohms	Ant. Term.	C8	Translator	40

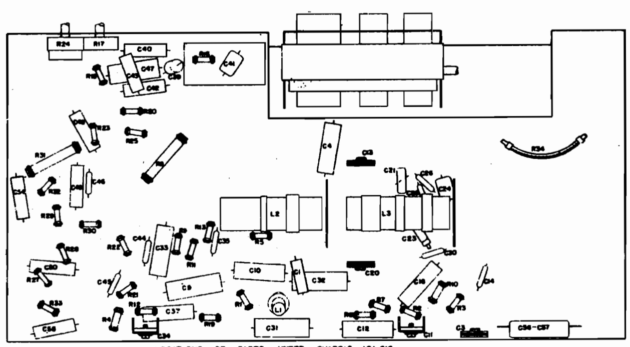
IMPORTANT ALIGNMENT NOTES

JUNE 18, 1940

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.



LOCATION OF PARTS ON TOP OF CHASSIS - 101.616

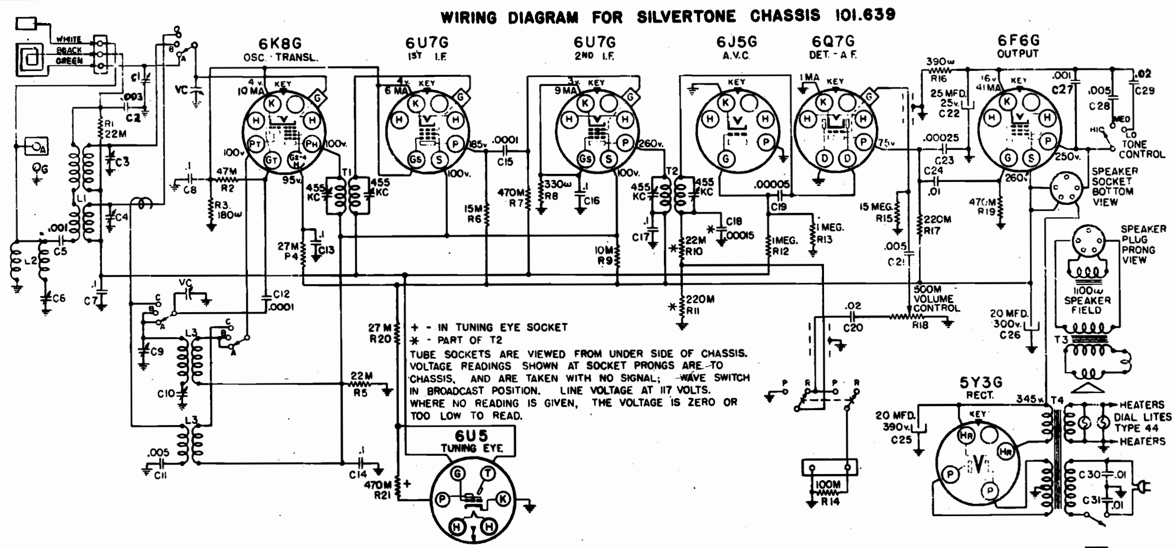


LOCATIONS OF PARTS UNDER CHASSIS - 101.616

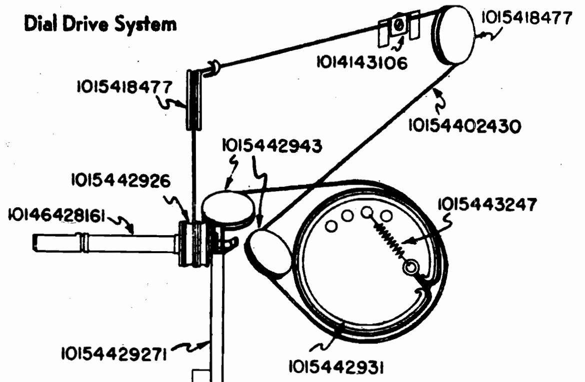
SEARS ROEBUCK & CO.

MODEL R381
Chassis 101.639

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.639



Dial Drive System

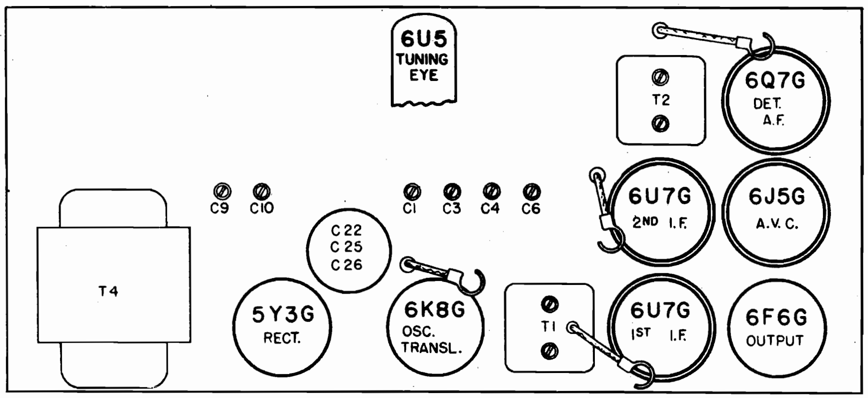


TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
IF	--
Wave Trap	--
Oscillator	--
Translator	100
Padder	45
Translator	35
Translator	10

ALIGNMENT IS THE SAME AS FOR MODEL R71 EXCEPT FOR MICROVOLT DATA

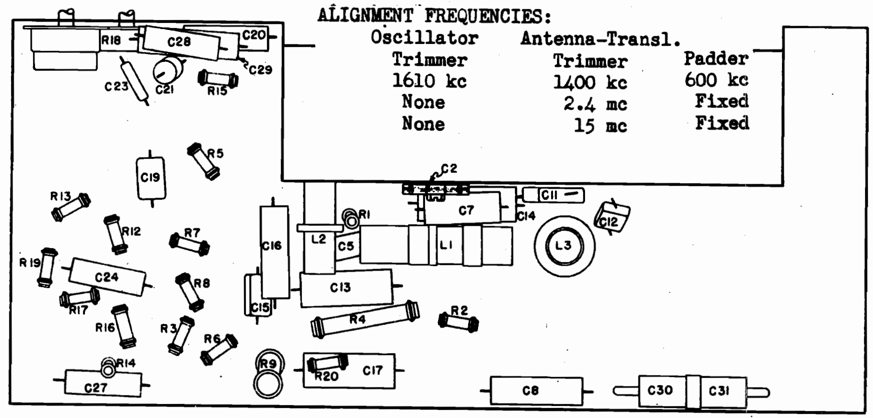
ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1610 kc	1400 kc	600 kc
None	2.4 mc	Fixed
None	15 mc	Fixed



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.639

GREEN BLACK WHITE



LOCATIONS OF PARTS UNDER CHASSIS 101.639

FREQUENCY RANGES:
Band "A" . . . . 540-1610 kc
Band "B" . . . . 1.45-2.54 mc
Band "C" . . . . 5.72-18.53 mc

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 2.5 watts
Maximum . . . . 4.5 watts

POWER SUPPLY:
All models available 105-125 v., 50-60 cycles AC; 75 watts
All models available 105-125 v., 25-60 cycles AC; 80 watts

OCTOBER 18, 1940

INTERMEDIATE FREQUENCY . . . . 455 kc

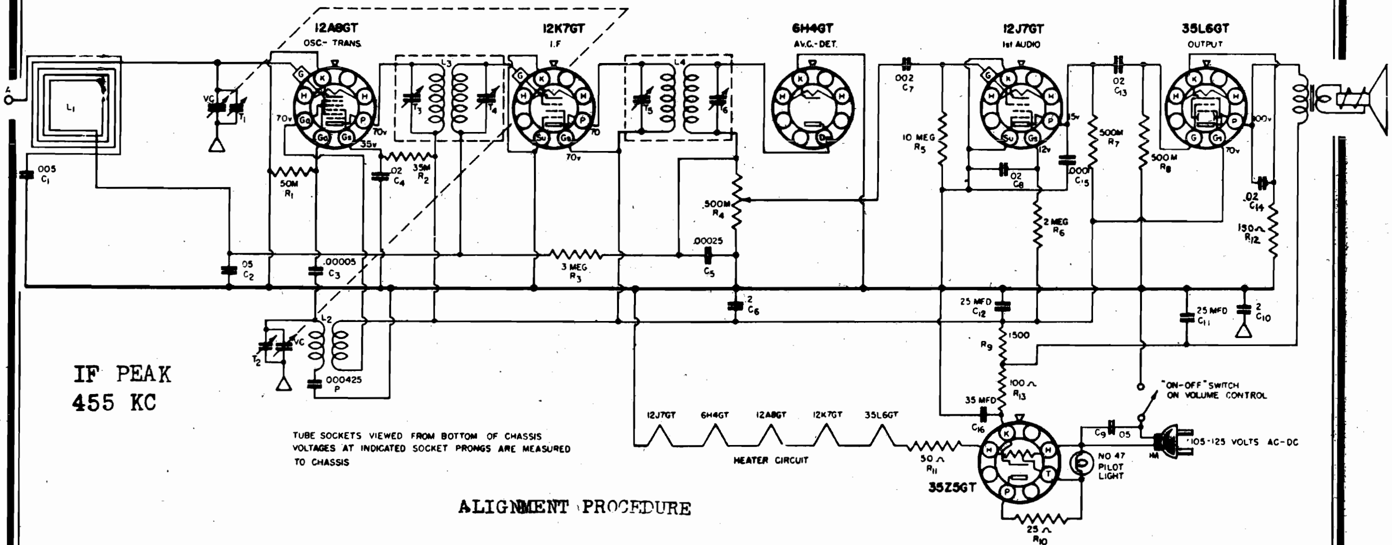
PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment.

LOUDSPEAKER
Type . . . . Dynamic
Size . . . . 8 inch
Approx. field coil res. . . . . . 1100 ohms
Approx. field coil voltage drop..85 volts

MODEL R1061
Ch. 110.400

SEARS-ROEBUCK & CO.



IF PEAK
455 KC

ALIGNMENT PROCEDURE

Output meter connections. . . . . Across primary output transformer

Output meter reading to indicate 0.050 watt
for Weston type 571 output meter on 15 volt scale. 9 volts

Connection of generator ground. . . . . B- Bus

Generator modulation. . . . . App. 30% @400 cycles

Position of volume control. . . . . .Fully clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
**	455 kc	12K7GT,Grid	T5,T6	I.F.
**	455 kc	12A8GT.Grid	T3,T4	I.F.
1500 kc	1500 kc	***	T2,T1	Osc.,R.F.

Important Alignment Notes

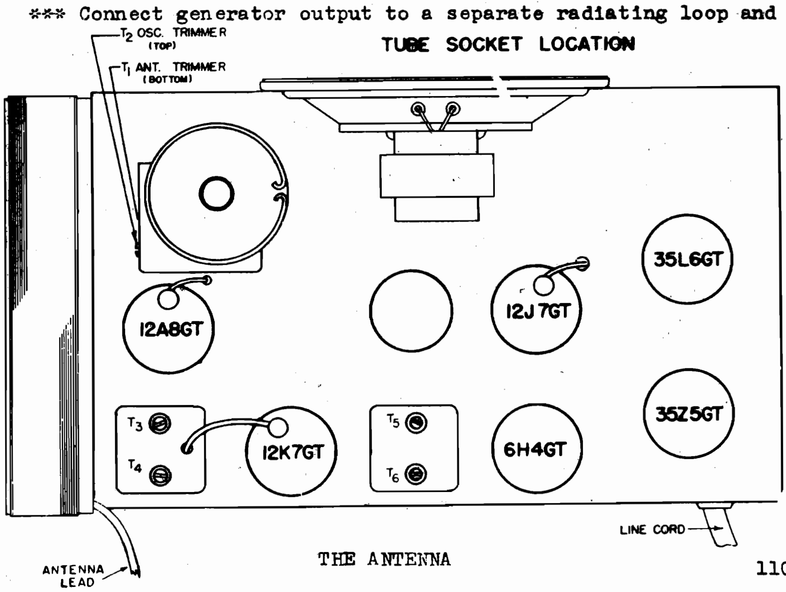
It is advisable to repeat the entire alignment procedure in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

** Short oscillator section of variable condenser.

*** Connect generator output to a separate radiating loop and pickup 1500 kc signal on receiver.

TUBE SOCKET LOCATION



THE ANTENNA

JUNE 5, 1940

ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Oscil. Padder
Broadcast. .	.1500 KC	Fixed

FREQUENCY RANGE:
Broadcast. . . . . . . .535-1700 KC

LOUD SPEAKER:
Type.........................Dynamic
Size.............................5"
Field..........................P.M.

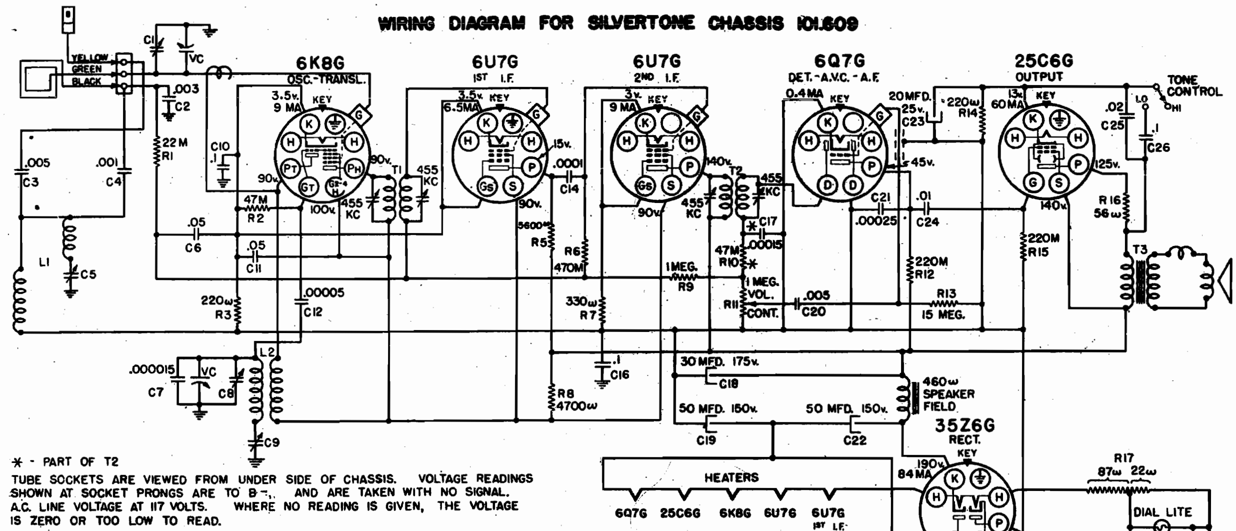
POWER OUTPUT
Type.....................Beam Power
Undistorted.......................1.0
Maximum..........................1.5

POWER SUPPLY:
All models available
110-125 volts, 25-60 cycle AC or DC, 30 watts

This receiver has a self-contained antenna loop and does not require an additional antenna connection. If it is desired to improve reception of weak or distant stations, an additional outdoor antenna may be used. For this purpose an antenna connection is provided on the loop.

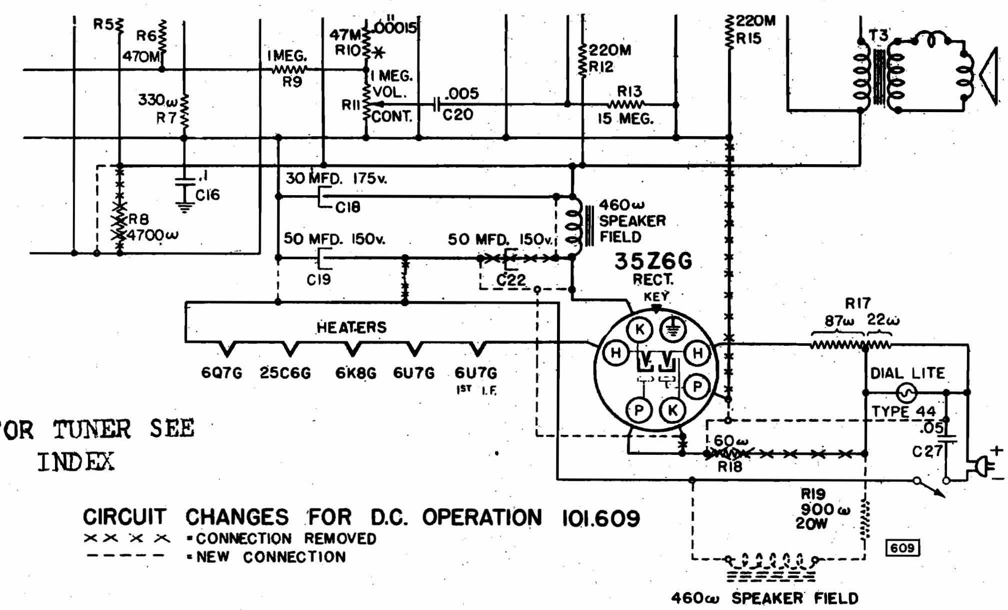
SEARS-ROEBUCK & CO.

MODEL R1161
Chassis 101.609



IF PEAK 455 KC

MAY 21, 1940



FOR TUNER SEE INDEX

CIRCUIT CHANGES FOR D.C. OPERATION 101.609
× × × × = CONNECTION REMOVED
- - - - - = NEW CONNECTION

POWER SUPPLY:
All models available . . . . .105-135 v. 25-60 cycle AC, 70 watts

FREQUENCY RANGE: . . . . .540-1650 kc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Translator Trimmer	Padder
1650 kc	1400 kc	600 kc

INTERMEDIATE FREQUENCY . . . . .455 kc

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . .1.9 watts
Maximum . . . . .3.5 watts

LOUDSPEAKER:
Type . . . . Dynamic
Size . . . . 5 inch
Field coil resistance . . . . 460 ohms

OPERATING FEATURES:
Tone Control . . . . .Two position
Automatic Volume Control
Push Button Tuning (5 Button)

CHASSIS FEATURES:
Number IF stages . . . . Two
Number condensers in gang . . . . .Two
Antenna..Built-in loop with provision for external antenna.

MODEL R1161
Chassis 101.609

SEARS ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.3 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Connection of generator ground lead . . . . External ground
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark.

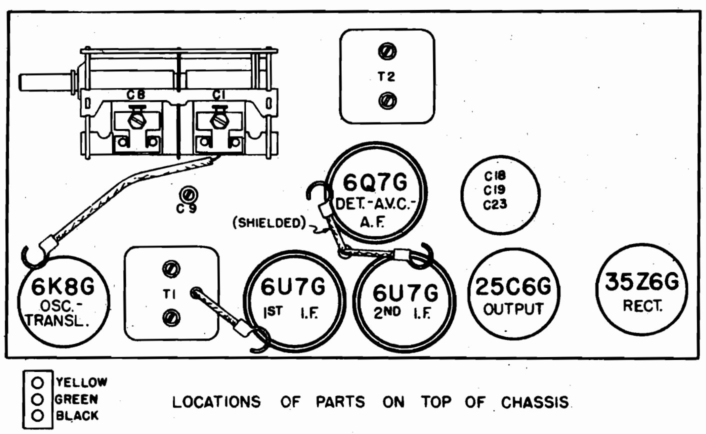
POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
600 kc	455 kc	.0002 mfd.	Ant. Clip	C5*	Wave Trap	--
Fully open	1650 kc	.0002 mfd.	Ant. Clip	C8	Oscillator	--
1400 kc	1400 kc	.0002 mfd.	Ant. Clip	C1	Translator	140
600 kc(rock)	600 kc	.0002 mfd.	Ant. Clip	C9	Padder	75

IMPORTANT ALIGNMENT NOTES

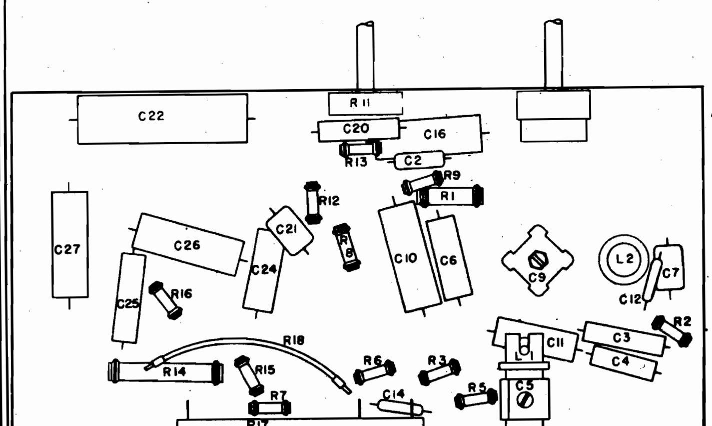
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



LOCATIONS OF PARTS ON TOP OF CHASSIS



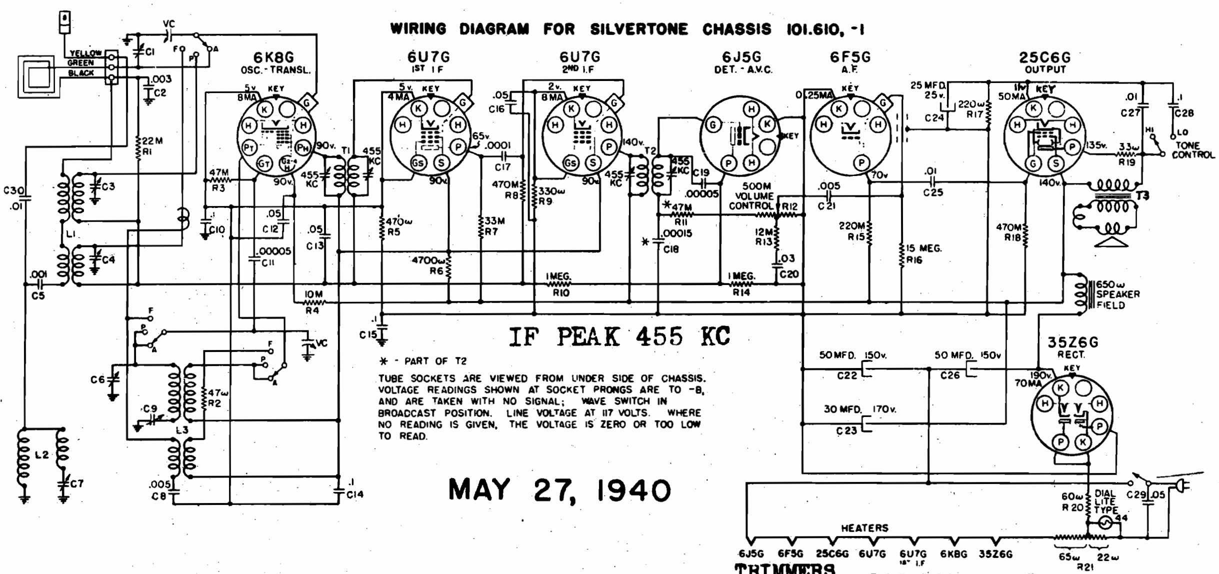
LOCATIONS OF PARTS UNDER CHASSIS - 101.609

PUSH BUTTON TUNING MECHANISM: Adj. for each button is locked or unlocked by tightening or loosening slotted screwhead when button knob is pulled off plunger. Stations are set by unlocking mechanism, tuning in station, pushing in plunger (do not detune station), releasing plunger, locking adj. by holding screw driver lightly in screwhead allowing spring tension to hold plunger against screw driver.

MODEL 1571
Chassis 101.610-1

SEARS ROEBUCK & CO.

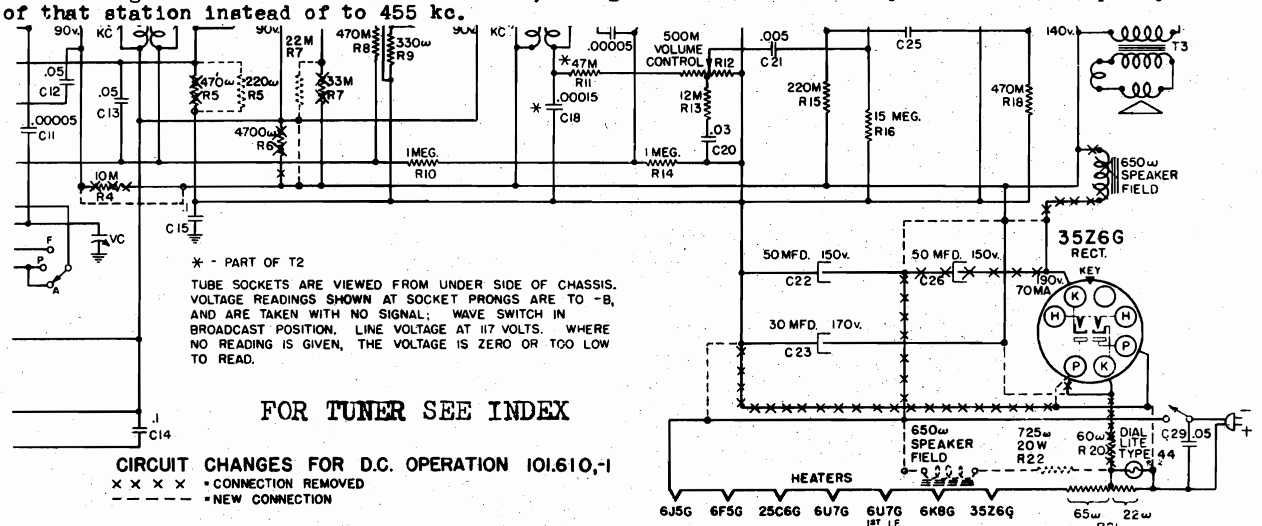
MODEL R1171
Chassis 101.610-1



105-135 v. AC, 65 watts

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	6K8G Grid	T3,T1	IF	--
"AM"	600 kc	455 kc	.00005 mfd.	Ant. Clip	C7*	Wave Trap	--
"AM"	Fully open	1620 kc	.00005 mfd.	Ant. Clip	C6	Oscillator	--
"AM"	1400 kc	1400 kc	.00005 mfd.	Ant. Clip	C1	Translator	275
"AM"	600 kc(rock)	600 kc	.00005 mfd.	Ant. Clip	C9	Padder	160
"POL"	2.4 mc	2.4 mc	400 ohms	Ant. Clip	C3	Translator	50
"FOR"	15 mc(rock)	15 mc	400 ohms	Ant. Clip	C4	Translator	35

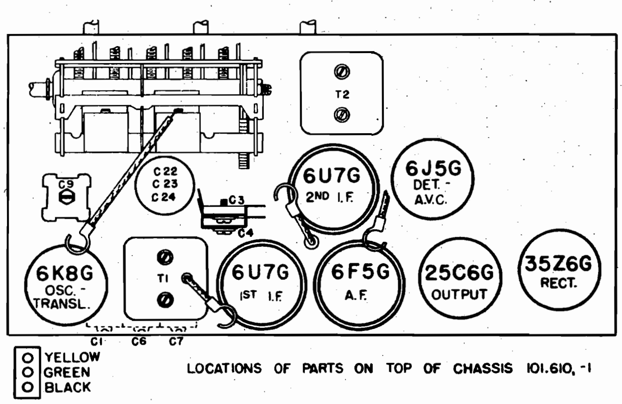
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.



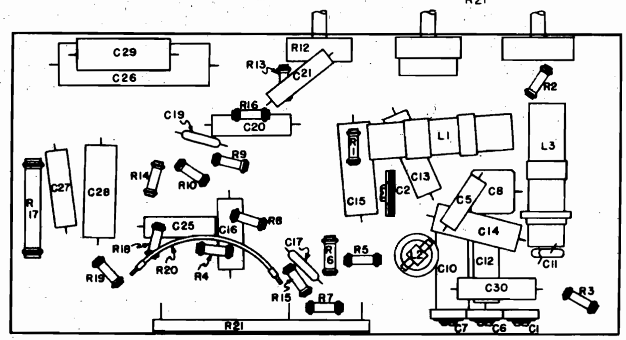
FOR TUNER SEE INDEX

CIRCUIT CHANGES FOR D.C. OPERATION 101.610,-1

× × × × = CONNECTION REMOVED
– – – – – = NEW CONNECTION



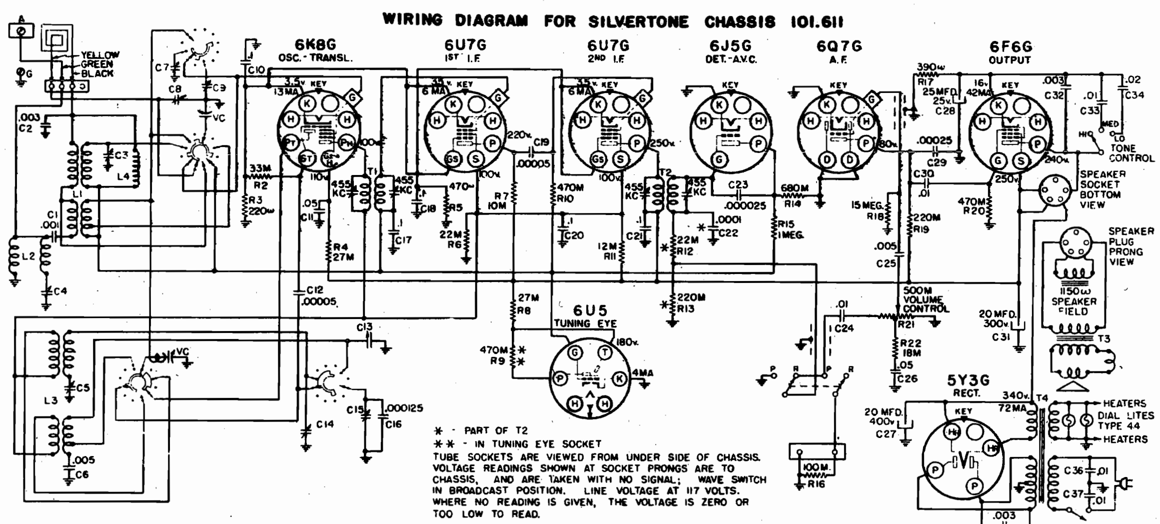
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.610, -1



LOCATIONS OF PARTS UNDER CHASSIS - 101.610, -1

MODEL R1181
Chassis 101.611

SEARS-ROEBUCK & CO.



INTERMEDIATE FREQUENCY . . . . . 455 kc

FREQUENCY RANGES:
Band "A" . . . . 540-1610 kc
Band "B" . . . . 1475-2510 kc
Band "C" . . . . 5.95-18.2 mc
Band "D" . . . . 9.3-9.85 mc

JUNE 5, 1940

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 2.5 watts
Maximum . . . . 4.5 watts

POWER SUPPLY:
All models available
105-125 v., 50-60 cycles AC; 75 watts
105-125 v., 25-60 cycles AC; 80 watts

PRELIMINARY:

ALIGNMENT PROCEDURE

Output meter connection . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.2 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . To chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . At mark to left of 550 kc calibration mark.

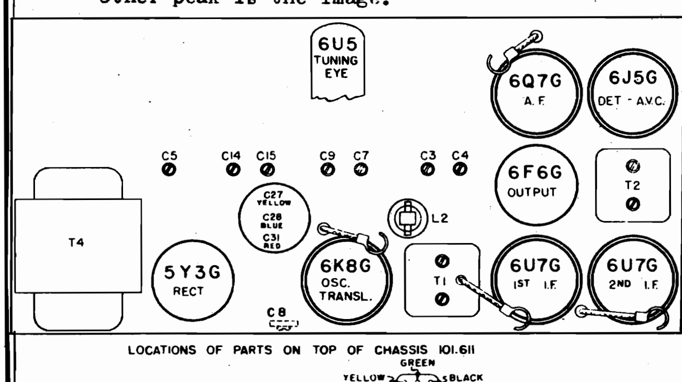
FOR TUNER, SEE MODEL R101

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	90
"A"	600 kc	455 kc	.00005 mfd	Ant. Term.	C4*	Wave Trap	--
"A"	Open	1610 kc	.00005 mfd	Ant. Term.	C14	Oscillator	--
"A"	1400 kc	1400 kc	.00005 mfd.	Ant. Term.	C8	Translator	150
"A"	600 kc(rock)	600 kc	.00005 mfd	Ant. Term.	C5	Padder	100
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C3	Translator	70
"C"	15 mc(rock)	15 mc	400 ohms	Ant. Term.	C7	Translator	10
"D"	9.55 mc(rock)	9.55 mc	400 ohms	Ant. Term.	C15**,C9	Osc.,Transl.	40

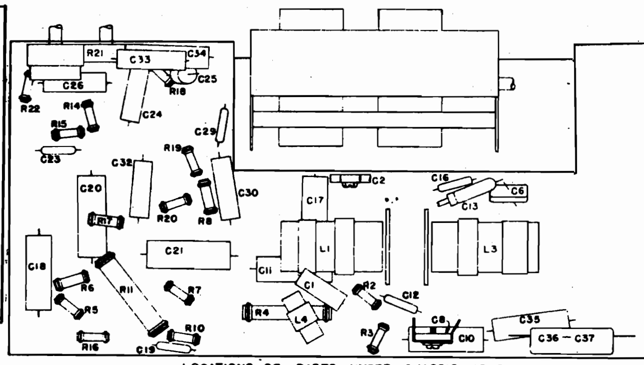
IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

** If two peaks can be had, the correct one is with the trimmer screw further out. The other peak is the image.



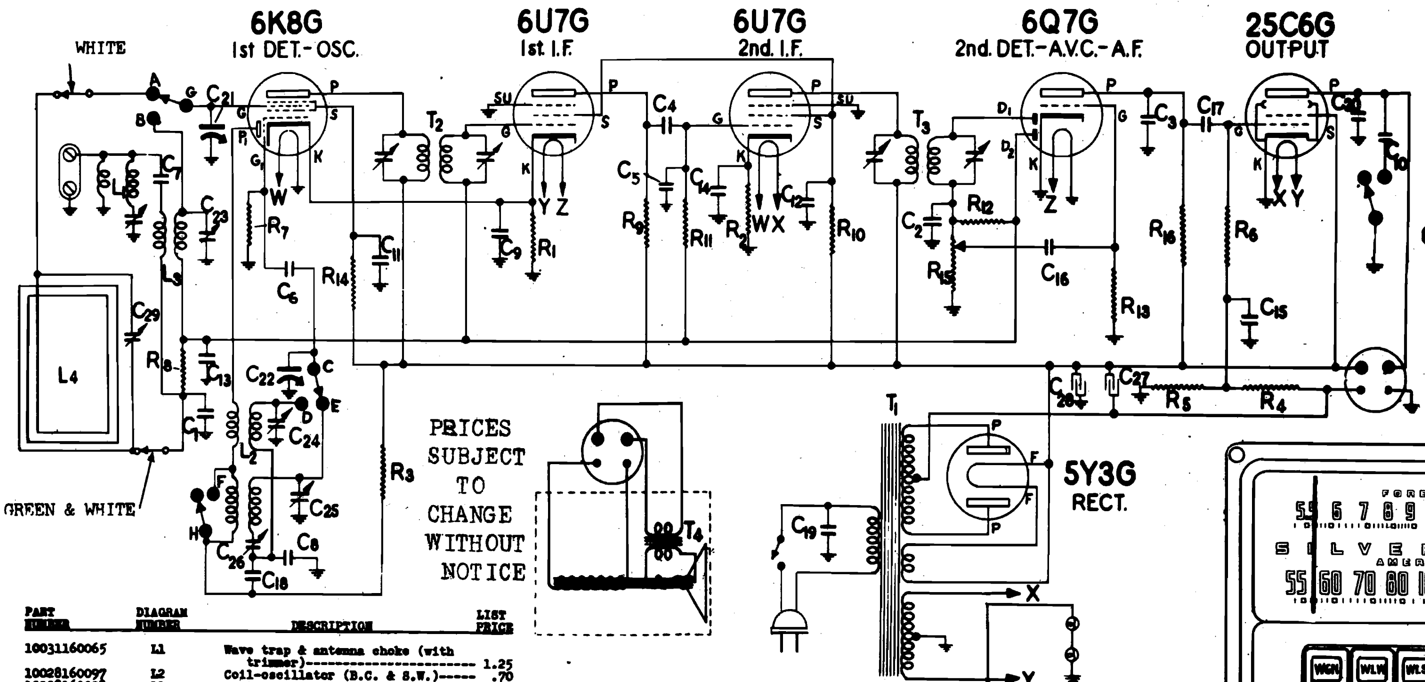
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.611



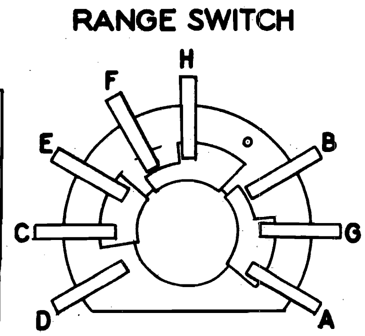
LOCATIONS OF PARTS UNDER CHASSIS - 101.611

SEARS-ROEBUCK & CO.

MODELS R1261,1561
Chassis 100.351

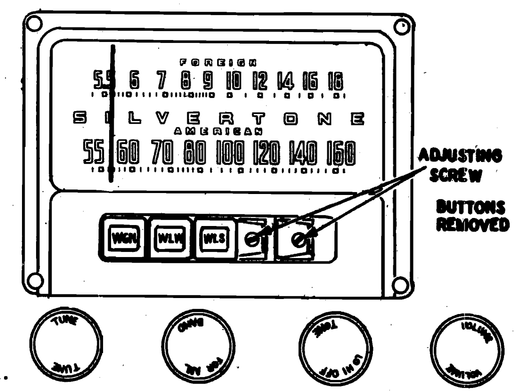


PRICES SUBJECT TO CHANGE WITHOUT NOTICE



REAR VIEW

I. F. = 455 KC.



PART NUMBER	DIAGRAM NUMBER	DESCRIPTION	LIST PRICE
10031160065	L1	Wave trap & antenna choke (with trimmer)	1.25
10028160097	L2	Coil-oscillator (B.C. & S.W.)	.70
10028160098	L3	Coil-short wave antenna	.60
10028160317	L4	Loop antenna complete	1.30
1001981282	C1	Condenser - mica, .003 mfd.	.50
1001983539	C2-C3	Condenser - mica, 260 mmfd.	.20
1001983783	C4-C5	Condenser - mica, 110 mmfd.	.20
1001985061	C6	Condenser - mica, 51 mmfd.	.15
1001985394	C7	Condenser - mica, 510 mmfd.	.25
1001988587	C8	Condenser - mica .0042 mfd.	.35
10019116625	C9-C10-C11	Condenser - .1 mfd. 600 volt	.25
10019116819	C12-C13-C14	Condenser - .05 mfd. 600 volt	.20
10019116706	C15	Condenser - .2 mfd. 600 volt	.35
10019119817	C16	Condenser - .004 mfd. 600 volt	.15
10019119193	C17	Condenser - .01 mfd. 600 volt	.15
10019119817	C18	Condenser - .004 mfd. 600 volt	.15
10019119857	C19	Condenser - .01 mfd. 600 volt	.20
10019119414	C20	Condenser - .02 mfd. 600 volt	.15
10016119966	C21-C22	Condenser-tuning with push button tuner	5.30
10017119174	C23-C24-C25	Condenser - trimmer 3 section	.45
10017119934	C26	Condenser - padder	.36
10020160095	C27	Condenser - 40 mfd. 300 volts	.90
10029160096	C28	Condenser - 20 mfd. 300 volts	.85
10017119132	C29	Condenser - loop trimmer	.12
1002388461	R1	Resistor-carbon 150 ohms ½ watt	.12
10023110556	R2	Resistor-carbon 330 ohms ½ watt	.12
10023110577	R3	Resistor-carbon 3300 ohms ½ watt	.12
10023118809	R4	Resistor-carbon 680000 ohms ½ watt	.10
10023118826	R5	Resistor-carbon 470000 ohms ½ watt	.12
10023112956	R6	Resistor-carbon 220000 ohms ½ watt	.12
10023110552	R7-R8	Resistor-carbon 47000 ohms ½ watt	.12
10023110550	R9-R10	Resistor-carbon 10000 ohms ½ watt	.15
10023110564	R11	Resistor-carbon 100000 ohms ½ watt	.12
10023110570	R12	Resistor-carbon 2.2 meg. ½ watt	.15
10023112975	R13	Resistor-carbon 10 meg. ½ watt	.12
10023118817	R14	Resistor-carbon 6800 ohms ½ watt	.12
10023160006	R15	Volume control 1/2 meg.	.90
10023112956	R16	Resistor-carbon 220000 ohms ½ watt	.12
10025160007		Switch - tone & on-off	.78
10049110629		Dial light - 6.3 volt (Mazda #44)	.15
10058115104-U		Speaker 6" (for Model R-1261)	5.50
10058115103-U		Speaker 5" (for Model 1561)	5.00
10037160104		Range switch	.60
10013160425-U	T4	Transformer - output for 10058115104-U speaker	1.80
10013160313-U		Transformer - output for 10058115103-U speaker	1.70
10057160426-U		Cone & Voice coil for 10058115104-U speaker	1.75
10057160314-U		Cone & Voice coil for 10058115103-U speaker	1.70

PART NUMBER	DIAGRAM NUMBER	DESCRIPTION	LIST PRICE
10010160100	T1	Transformer - power (50-60 cycles)	4.30
10011160470		Transformer - power (25 cycles)	8.00
10033160070	T2	Transformer - 1st I.F.	1.25
10035160270	T3	Transformer - 2nd I.F.	1.20

1. Turn the set on and remove the Push Button knobs by pulling them toward you.
2. Insert a screwdriver into the adjusting screw on one of the Push Buttons and loosen it by turning it counter-clockwise about one turn.
3. Turn Band Switch to the "AM" position and, keeping the screwdriver inserted in the slot, push against the screwdriver until it reaches a stop.
4. Still pushing against the screwdriver tune in the desired station by means of the Tuning Control and then retighten the screw by turning it clockwise.
   Set up the remaining buttons in the same way.

AUGUST 8, 1940

SOCKET VOLTAGES-ALL D.C. MEASURED TO CHASSIS

NO SIGNAL CONDITION — DIAL TUNED TO 540 KC.

TUBE	FUNCTION	H	K	G	G_1	P_1	S	SU	P	D_1	D_2
6K8G	1st DET.-OSC.	6.0A.C.	2.3	0	-5	118	100		135		
6U7G	1st I.F.	6.0A.C.	2.3	0			95	0	72		
6U7G	2nd I.F.	6.0A.C.	2.5	0			95	0	135		
6Q7G	2nd DET.-A.V.C.-A.F.	6.0A.C.	0	0					55	0	0
25C6G	OUTPUT	25 A.C.	0	Note A			135		122		
5Y3G	RECT.	5.0A.C.	PLATES=250 V A.C. TO CENTER TAP								

NOTE A: The bias on the 25C6G grid is -12.5 volts measured across R5. This voltage cannot be read on ordinary instruments. USE A HIGH RESISTANCE VOLTMETER OF AT LEAST 1000 OHMS PER VOLT.

MODELS R1261,1561
Chassis 100.351

SEARS ROEBUCK & CO.

ELECTRICAL SPECIFICATIONS

TUBE COMPLEMENT
1 6K8-G....................................1st Det. & Osc.
1 6U7-G....................................I. F. Amp.
1 6U7-G....................................I. F. Amp.
1 6Q7-G.................................... 2nd Det.-A.V.C.-A.F.
1 25C6-G....................................Output
1 5Y3-G....................................Rectifier

POWER SUPPLY
Models R-1261 & 1561 are supplied for either 25 or 60 cycle power supplies
105-125 volts - 25 cycle - 70 watts
105-125 volts - 50-60 cycle - 70 watts

FREQUENCY RANGES
"AMERICAN" Band....................................540 to 1620 KC.
"FOREIGN" Band....................................5.5 to 18.1 MC.

ALIGNMENT FREQUENCIES
1400 KC., 600 KC.
16 MC

INTERMEDIATE FREQUENCY....................................455 KC

POWER OUTPUT
Type....................................Pentode
Undistorted....................................1.8 watts
Maximum....................................3.0 watts

LOUD SPEAKER
Type....................................Dynamic
Size....................................5" for 1561, 6" for R-1261
Field coil resistance....................................350 ohms (cold)
App. field coil voltage drop....................................31 volts

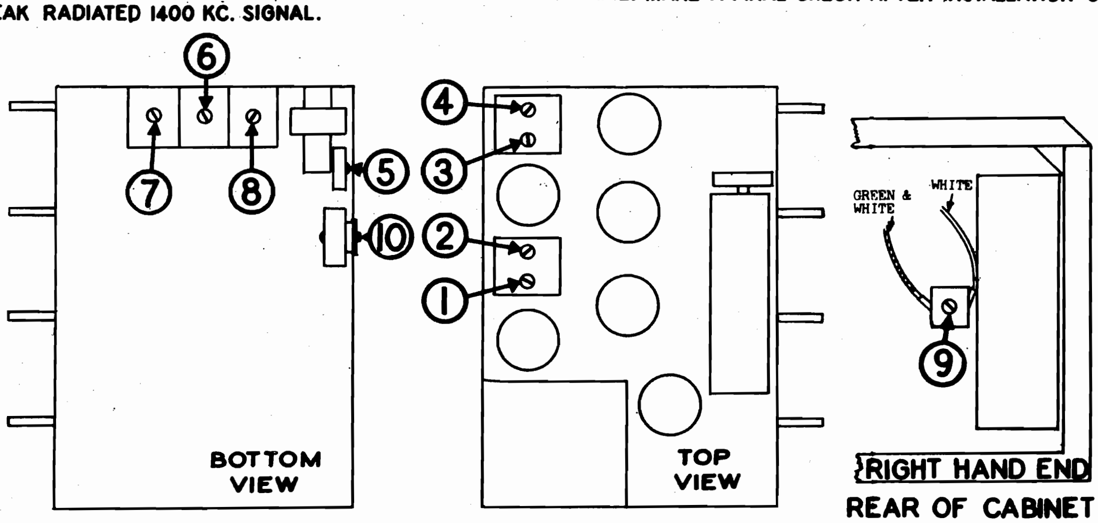
ALIGNMENT PROCEDURE

Before starting the alignment procedure the pointer should be set to the last division on the 550 KC end of the dial scale with the gang condenser in full mesh. Cement the pointer securely to the pointer cord in this position and allow to dry before moving.

Output meter connection----------------------------------Across loud speaker voice coil
Output meter reading to indicate .5 Watt----------------------------------1.32 volts
Dummy antenna value to be in series with generator output----------------------------------See chart below
Connection of generator output lead----------------------------------See chart below
Connection of generator ground lead----------------------------------External ground
Generator modulation----------------------------------30%, 400 cycles
Position of Volume Control----------------------------------Fully clockwise
Position of Tone Control----------------------------------HI
Position of Dial Pointer with variable fully closed----------------------------------On mark to left of 550 KC calibration mark.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION OF SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6K8G TUBE	455 KC	AMERICAN	ANY POINT WHERE IT DOES NOT AFFECT THE SIGNAL	1 - 2 3 - 4	2ND I. F. 1ST I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
200 MMFD. CONDENSER	ANTENNA TERMINAL	455 KC	AMERICAN	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	16 MC	FOREIGN	16 MC	6	FOREIGN OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT. IF TWO PEAK CAN BE HAD, THE CORRECT ONE IS WITH THE TRIMMER SCREW FARTHER OUT. THE OTHER PEAK IS THE IMAGE.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL	16 MC	FOREIGN	TUNE TO 16 MC GENERATOR SIGNAL	7	FOREIGN ANTENNA	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.
200 MMFD. CONDENSER	ANTENNA TERMINAL	1400 KC	AMERICAN	1400 KC	8	BROADCAST OSCILLATOR (TRIMMER)	ADJUST FOR MAXIMUM OUTPUT
200 MMFD. CONDENSER	ANTENNA TERMINAL	1400 KC	AMERICAN	TUNE TO 1400 KC. GENERATOR SIGNAL	9	BROADCAST ANTENNA	ADJUST FOR MAXIMUM OUTPUT
200 MMFD. CONDENSER	ANTENNA TERMINAL	600 KC	AMERICAN	TUNE TO 600 KC GENERATOR SIGNAL	10	BROADCAST OSCILLATOR (PADDER)	ADJUST FOR MAXIMUM OUTPUT. TRY TO INCREASE OUTPUT BY DETUNING TRIMMER AND RETUNING RECEIVER DIAL UNTIL MAXIMUM OUTPUT IS OBTAINED.

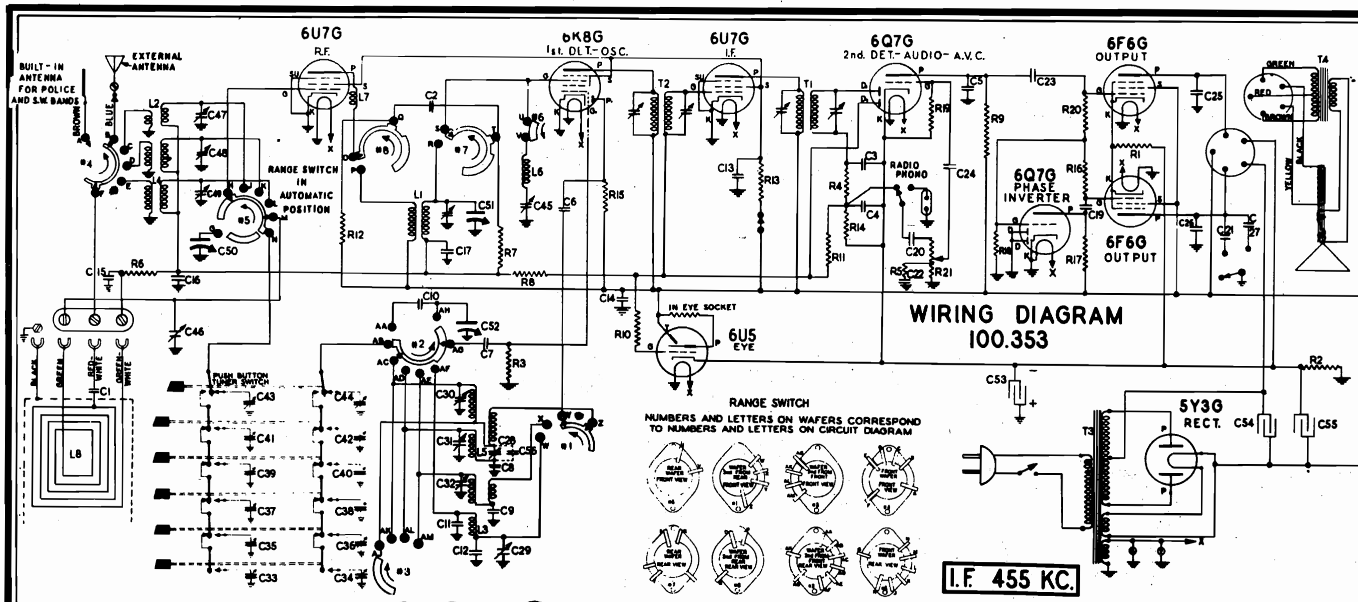
***NOTE: THE SET SHOULD BE PLACED IN THE CABINET BEFORE STEPS 9 & 10 ARE TAKEN. THE LOOP AND ITS LEADS MUST BE IN THEIR FINAL POSITION AT THIS TIME. MAKE A FINAL CHECK AFTER INSTALLATION USING A WEAK RADIATED 1400 KC. SIGNAL.**



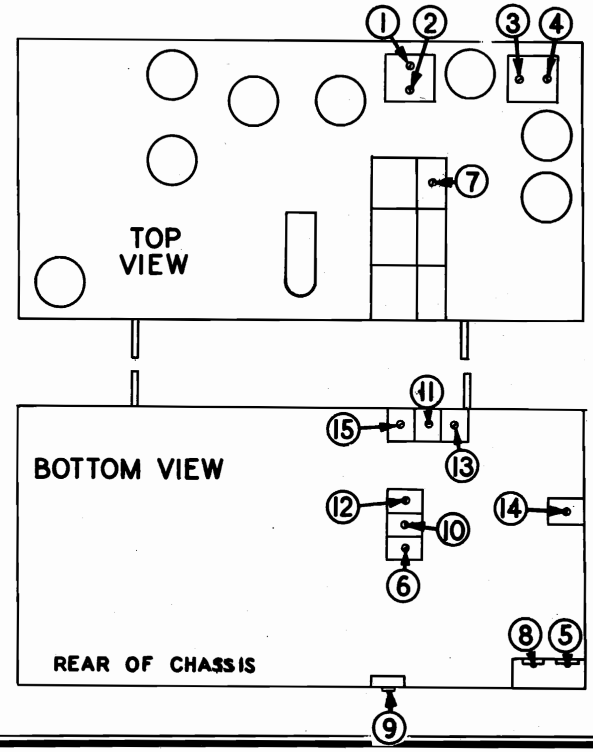
SEARS ROEBUCK & CO.

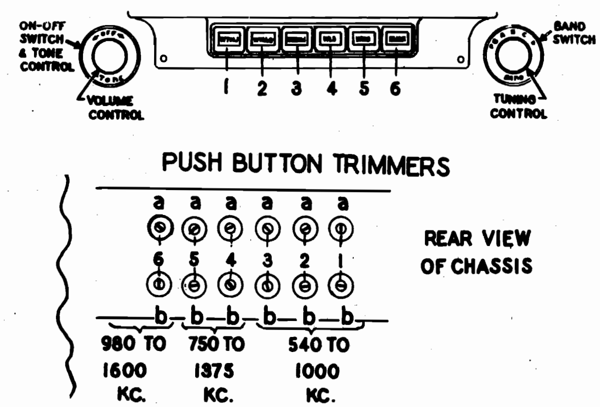
MODEL 1591
Chassis 100.353

SEPTEMBER 30, 1940



1. Turn the Band Switch to the "A" position and tune in the desired station by means of the Tuning Control.
2. Push in a button of the proper frequency range and turn the Band Switch to the "PB" position.
3. Adjust the "a" screw with the same number as that of the button you have pushed in, until you again hear the desired station.
4. Adjust the "b" screw (below the "a" screw) for deepest tone.
5. Readjust both "a" and "b" screws for deepest tone or maximum TUNING EYE closure.





PART NUMBER	DIAGRAM NUMBER	DESCRIPTION
1001983539	C1-C2	Condenser - mica 260 mmfd.............. .20
1001983783	C3-C4-C5	Condenser - mica 110 mmfd.............. .20
1001984833	C6	Condenser - mica 70 mmfd............... .26
1001985061	C7	Condenser - mica 51 mmfd............... .15
1001986473	C8	Condenser - mica .00123 mfd............ .25
10019110906	C9	Condenser - mica .00332 mfd............ .40
10019160625	C10	Condenser - mica .00006 mfd. (low drift) .25
10019160645	C11	Condenser - mica .0001 mfd. (Low drift). .20
10019160646	C12	Condenser - compensating .0001 mfd..... .28
10019116625	C13	Condenser - .1 mfd. 600 volt........... .25
10019116706	C14	Condenser - .2 mfd. 600 volt........... .35
10019116819	C15 to C19	Condenser - .05 mfd. 600 volt.......... .20
10019119193	C20-C21	Condenser - .01 mfd. 600 volt.......... .15
10019119414	C22-C23	Condenser - .02 mfd. 600 volt.......... .15
10019119817	C24	Condenser - .004 mfd. 600 volt......... .15
10019119875	C25-C26	Condenser - .002 mfd. 600 volt......... .15
10019161000	C27	Condenser - .03 mfd. 600 volt.......... .20
10017112799	C28	Condenser - padder - used on early sets .36
10017119934	C28	Condenser - padder - used on late sets.. .36
10017116879	C29	Condenser - trimmer .... .15
10017119174	C30-C31-C32	Condenser - trimmer 3 section.......... .45
10017119662	C33 to C38	Condenser - single trimmer (low freq.). .24
10017119663	C39 to C42	Condenser - single trimmer (med. freq.) .24
10017119664	C43-C44	Condenser - single trimmer (high freq.) .24
10017160526	C45-C46	Condenser - trimmer - 2 section........ .38
10017160629	C47-C48-C49	Condenser - trimmer - 3 section........ .50
10016160537	C50-C51-C52	Condenser - variable tuning............ .45
10020110377	C53	Condenser - electrolytic 10 mfd. 35 volt .80
10020160975	C54-C55	Condenser - dual elect. 30-20 mfd. 450 V.1.85
10019111575	C56	Condenser - mica - used on early sets.. .20
10035119024	T1	Transformer - 2nd I.F...................1.15
10033119220	T2	Transformer - 1st I.F...................1.30
10010160432	T3	Transformer - power (50-60 cycle)......5.60
10011160780	T3	Transformer - power (25 cycle).........8.00
10013160822-M	T4	Transformer - output for 10058115117-M spkr.2.00
10022118830	R1	Resistor - 430 ohms 1 watt............. .15
10022118831	R2	Resistor - 75 ohms 1 watt.............. .15
10023110552	R3-R4-R5	Resistor - carbon 47,000 ohms 1/4 watt. .12
10023110559	R6 to R9	Resistor - carbon 470,000 ohms 1/4 watt .12
10023110570	R10-R11	Resistor - carbon 2.2 meg. 1/4 watt.... .15
10023110573	R12	Resistor - carbon 2,200 ohms 1/4 watt.. .12
10023110575	R13	Resistor - carbon 12,000 ohms 2 watts.. .30
10023110584	R14	Resistor - carbon 330,000 ohms 1/4 watt .12
10023110592	R15	Resistor - carbon 22,000 ohms 1 watt... .12
10023112956	R16-R17-R18	Resistor - carbon 220,000 ohms 1/4 watt .12
10023112975	R19	Resistor - carbon 10 meg. 1/4 watt..... .12
10023118825	R20	Resistor - carbon 180,000 ohms 1/4 watt .12
10024160558	R21	Volume control - 1 meg..................1.00
10028160502	L1	Coil - Broadcast R. F.................. .65
10028160592	L2	Coil - Antenna (band spread)........... .25

PART NUMBER	DIAGRAM NUMBER	DESCRIPTION
10028160593	L3	Coil - Oscillator (band spread)... .... .25
10028160595	L4	Coil - Police & Short Wave antenna.............1.00
10028160598	L5	Oscillator coil & trimmer assembly.............2.30
10031160606	L6	Wave trap coil................................ .25
10030160626	L7	Compensating coil............................. .20
10028160725	L8	Loop antenna & cabinet back - complete.........3.10
10038160580		Switch - push button...........................2.50
10037160539		Switch - range.................................2.80
1003814141		Switch - D.P.D.T.............................. .44
10025160557		Tone control - with on-off switch............. .85
10058115117-M		Speaker - dynamic (8").........................6.70
10049112636		Lamp - dial (Mazda #44)....................... .25
10013160822-M		Transformer - output for 10058115117-M spkr....2.00
10057160823-M		Cone & voice coil for 10058115117 speaker......2.00

MODEL 1591
Chassis 100.353

SEARS ROEBUCK & CO.

ALIGNMENT PROCEDURE

Before starting the alignment procedure check to see if the pointer is set to the last mark on the 550 KC. end of the dial scale with the gang condenser in full mesh.

Output meter connection----------Across speaker voice coil
Output meter reading to indicate 500 milliwatts----------1.26 volts
Dummy antenna value to be in series with generator output----------See chart below
Connection of generator output lead----------See chart below
Connection of generator ground lead----------To chassis
Generator modulation----------30%, 400 cycles
Position of Volume Control----------Fully clockwise
Position of Tone Control----------Brilliant position
Position of Dial Pointer with gang fully closed.----------On mark to left of 550 KC. calibration mark

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECTION SIGNAL GENERATOR OUTPUT TO RECEIVER	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. CONDENSER	CONTROL GRID OF 6K8G TUBE	455 KC	"A" POSITION	500 KC.	1 - 2	2ND I. F.	ADJUST FOR MAXIMUM OUTPUT. THEN REPEAT ADJUSTMENT.
					3 - 4	1ST I. F.	
50 MMFD MICA CONDENSER	ANTENNA TERMINAL (BLUE WIRE)	455 KC	"PB" POSITION	PUSH ANY PUSH BUTTON IN WHICH DOES NOT AFFECT SIGNAL	5	WAVE TRAP	ADJUST FOR MINIMUM OUTPUT USING A STRONG GENERATOR SIGNAL.
50 MMFD. MICA CONDENSER	ANTENNA TERMINAL (BLUE WIRE)	1400 KC	"A" POSITION	1400 KC	6	BROADCAST OSCILLATOR (SHUNT)	ADJUST FOR MAXIMUM OUTPUT.
50 MMFD. MICA CONDENSER	ANTENNA TERMINAL (BLUE WIRE)	1400 KC	"A" POSITION	1400 KC	7	BROADCAST DETECTOR	ADJUST FOR MAXIMUM OUTPUT.
					8*	BROADCAST R.F.	
50 MMFD. MICA CONDENSER	ANTENNA TERMINAL (BLUE WIRE)	600 KC	"A" POSITION	600 KC	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 (BLUE WIRE)	5 MC	"B" POSITION	5 MC	10	POLICE BAND 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.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL (BLUE WIRE)	5 MC	"B" POSITION	5 MC	11	POLICE BAND ANTENNA	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 (BLUE WIRE)	16 MC	"C" POSITION	16 MC	12	SHORT WAVE 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.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL (BLUE WIRE)	16 MC	"C" POSITION	16 MC	13	SHORT WAVE ANTENNA	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 (BLUE WIRE)	9.5 MC	"D" POSITION	9.5 MC	14	BAND SPREAD OSCILLATOR	ADJUST FOR MAXIMUM OUTPUT.
400 OHM CARBON RESISTOR	ANTENNA TERMINAL (BLUE WIRE)	9.5 MC	"D" POSITION	9.5 MC	15	BAND SPREAD ANTENNA	ADJUST FOR MAXIMUM OUTPUT.

* Replace chassis and cabinet back in cabinet and repeat adjustment #8 using a weak radiated signal.

POWER SUPPLY
Model R-1591 is supplied for either 25 or 60 cycle power supplies

105-125 volts - 25 cycle - 85 watts
105-125 volts - 50-60 cycle - 85 watts

FREQUENCY RANGES
Broadcast..............540 to 1600 KC
Intermediate band......1.6 to 5.4 MC
Short Wave.............5.4 to 18.1 MC
Band Spread............9.25 to 9.9 MC

CHASSIS FEATURES
NO. of I.F. stages..................1
Built in antenna.....Short wave plate and loop
Wave trap.......in automatic position
T.R.F. Preselector......in Manual B.C. position

POWER OUTPUT
Type....................P.P. Pentode
Undistorted................2.8 Watts
Maximum.....................5 Watts

LOUD SPEAKER
Type..................Electro dynamic
Size...............................8"
Field resistance (cold)......450 ohms

USE A VOLTMETER OF 1000 OHMS PER VOLT

Note A. Due to the high value of resistance involved, this voltage cannot be measured with a voltmeter of 1000 ohms per volt.

Note B. This voltage is - 3 volts measured across resistor R 2.

SOCKET VOLTAGES—ALL D.C. MEASURED TO CHASSIS

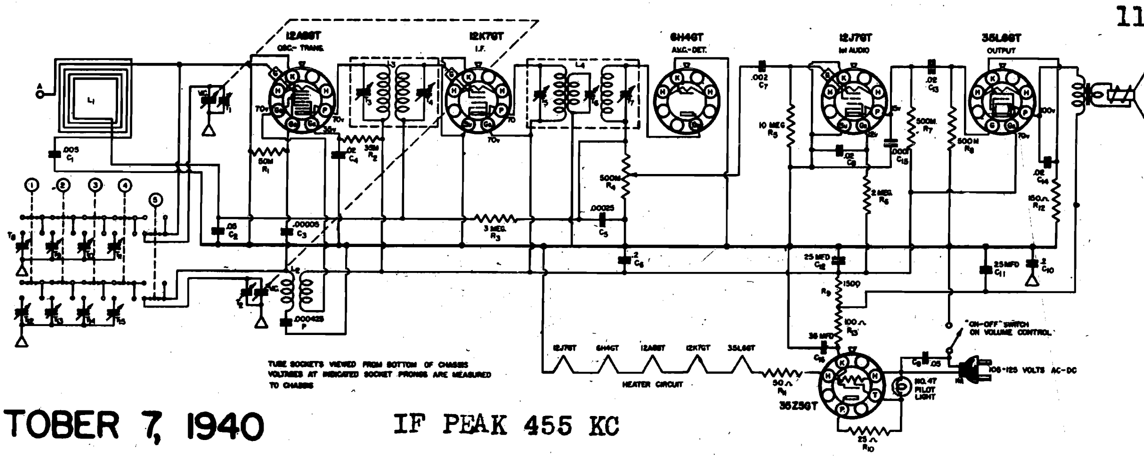
BAND SWITCH IN AUTOMATIC POSITION — DIAL TUNED TO 540 K.C.

TUBE	FUNCTION	H	K	G	G_1	P	S	SU	P_1	D_1	D_2	T
6U7G	R.F.	6.3 A.C.	0	NOTE B		216	105	0				
6K8G	1st DET.-OSC.	6.3 A.C.	0	NOTE B	-10	220	105		134			
6U7G	I.F.	6.3 A.C.	0	NOTE B		220	105	0				
6Q7G	2nd. DET.-A.V.C.-A.F.	6.3 A.C.	-3	NOTE A		50				NOTE B	NOTE B	
6Q7G	PHASE INVERTER	6.3 A.C.	0	0		55				0	0	
* 6F6G	OUTPUT	6.3 A.C.	14	0		212	220					
6U5	EYE	6.3 A.C.	-3	NOTE B		NOTE A						220
5Y3G	RECTIFIER	5.0 A.C.	PLATES-330 A.C. TO CHASSIS									

* Pushpull Stage - Data same for each tube.

SEARS-ROEBUCK & CO.

MODEL 1661
Chassis 110.414
110.415



OCTOBER 7, 1940 IF PEAK 455 KC

LOUD SPEAKER:
- Type.............................Dynamic
- Size.............................5"
- Field............................P.M.

POWER OUTPUT
- Type.............................Beam Power
- Undistorted 1.0
- Maximum..........................1.5

POWER SUPPLY
- All models available.......................... 110-125 volts, 25-60 cycle AC or DC, 30 watts

ALIGNMENT NOTES

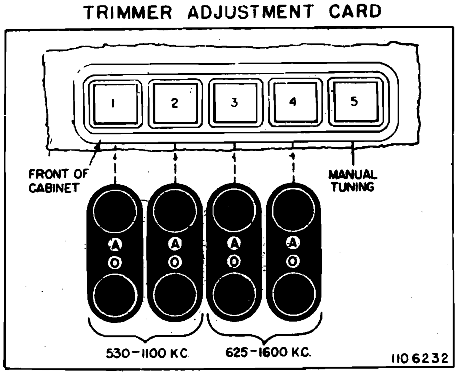
*First time T5 is misaligned by loosening center screw one turn.

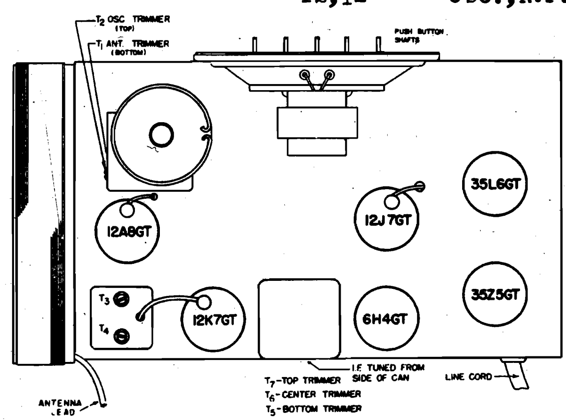
**Short oscillator section of variable condenser. Second I.F. alignment must be done twice to secure flat top tuning.

*** Connect generator output to a separate radiating loop and pickup 1500 KC signal on receiver.

PUSH BUTTON SWITCH POSITION	POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
Manual "IN"	**	455 kc	12K7GT,Grid	T6*,T5,T7	I.F.
"	**	455 kc	12A8GT,Grid	T3,T4	I.F.
"	1500 kc	1500 kc	***	T2,T1	Osc.,R.F.

TRIMMER ADJUSTMENT CARD





AUTOMATIC TUNING CONTROL ADJUSTMENT

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

Push this button "IN".

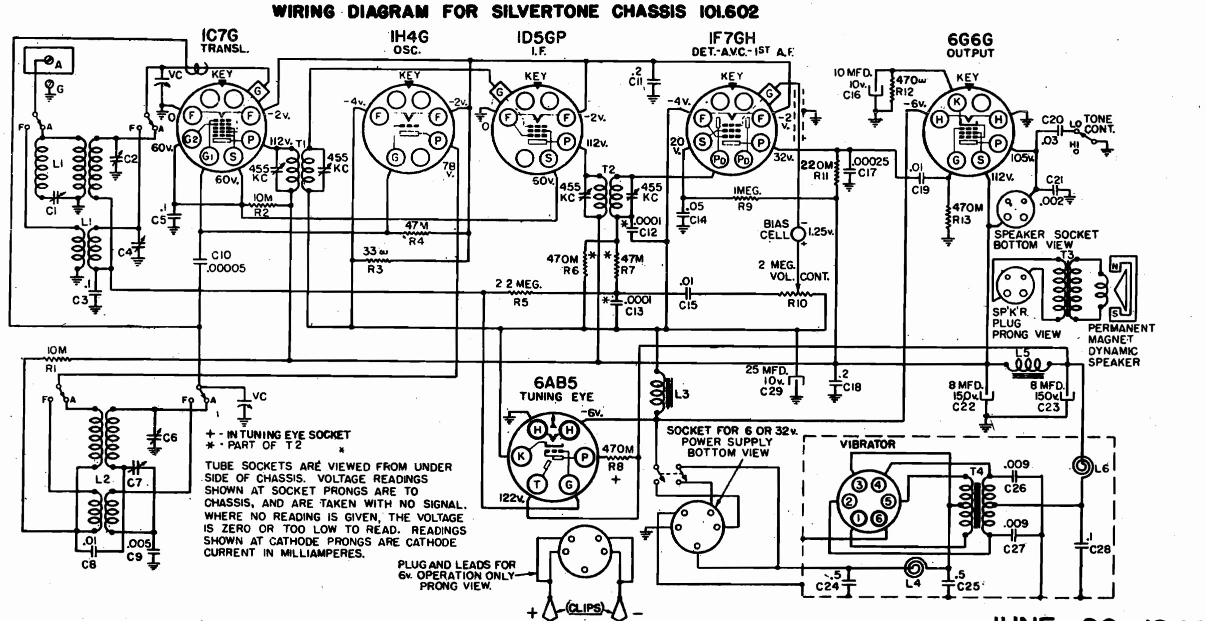
Turn the volume control knob on full(to the extreme right) and adjust screw marked "O" until the desired station is heard. If when making this adjustment, a number of stations can be brought in as the screw is turned and it is doubtful which station is the correct one, press button No. 5(Manual Tuning) "IN" and turn the station selector knob to the number on the dial that corresponds to the frequency of the station. Listening to the program being broadcast will identify the station when adjusting the screw "O".

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

Proceed in the same manner to adjust the tuning screws for the other stations on your list.

MODELS 2061,2421
Chassis 101.602

SEARS-ROEBUCK & CO.



JUNE 26, 1940

FREQUENCY RANGES:
Band "AM" . . . . .550-1700 kc
Band "FOR" . . . . .5.95-18.2 mc

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 0.25 watts
Maximum . . . . .0.5 watts

INTERMEDIATE FREQUENCY . . . . .455 kc

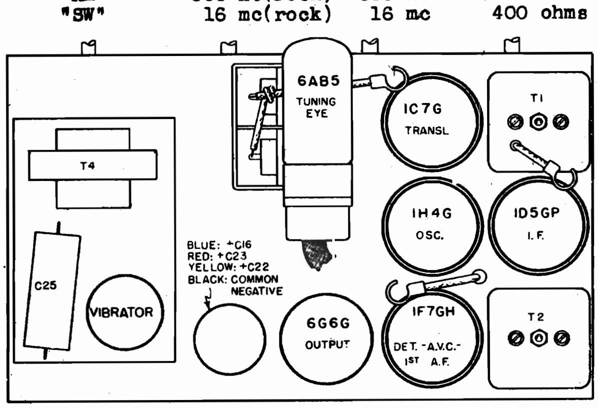
IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

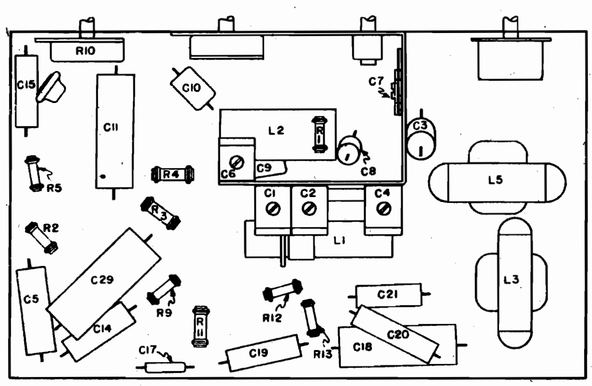
PRELIMINARY:

Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts . . . . .0.37 volts
Approximate microvolts input for 50 milliwatts output . . . . .See chart below
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 moudulation . . . . .30%, 400 cycles
Position of Volume Control . . . . .Fully clockwise
Position of Tone Control . . . . .HI
Position of Dial Pointer with variable fully closed . . . . Horizontal

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1C7G Grid	T2,T1	IF Output IF Input	--
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C6,C3	Osc.,Transl.	65
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder	50
"SW"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C4	Translator	30



LOCATIONS OF PARTS ON TOP OF CHASSIS.

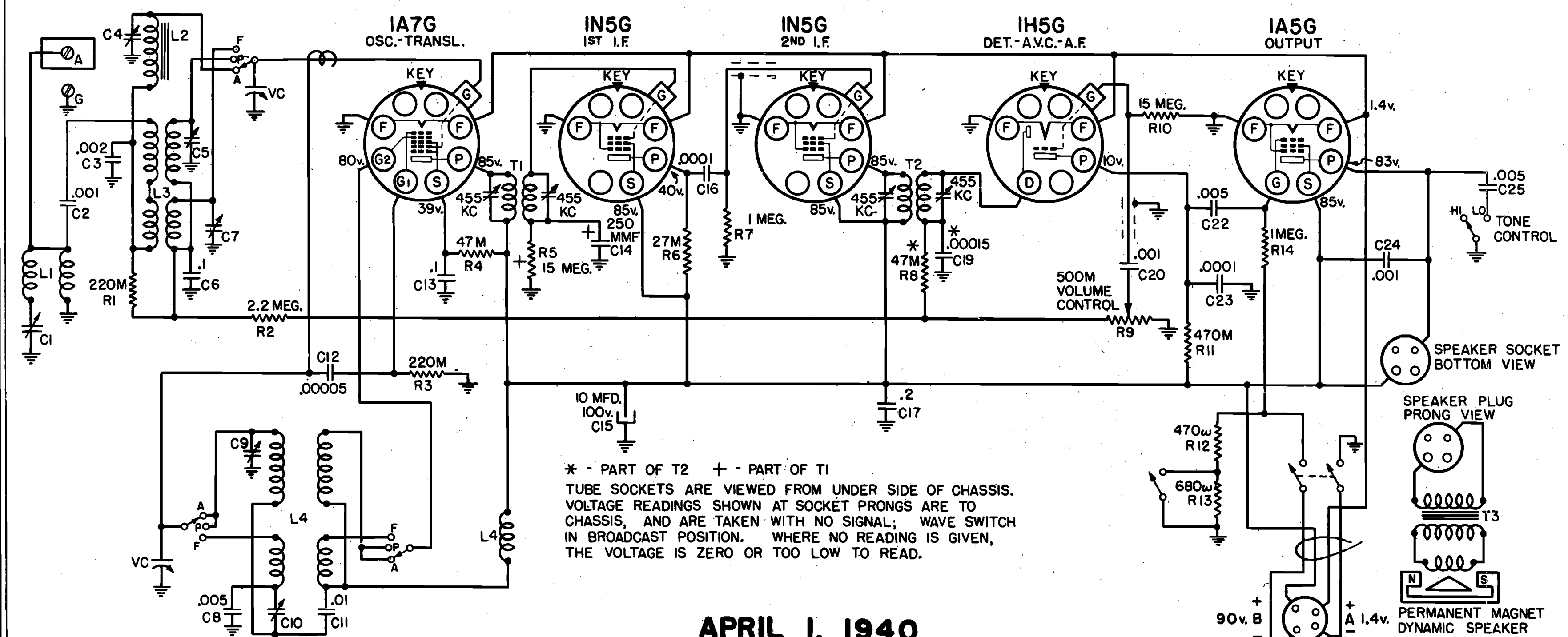


LOCATIONS OF PARTS UNDER CHASSIS 101.602

SEARS-ROEBUCK & CO.

MODELS 2511,2611,2711
Chassis 101,605

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.605



APRIL 1, 1940

IF PEAK 455 KC

POWER SUPPLY:
#5170. . A-B block(1.5v. "A",90v. "B")
or
#5300 . . . . .2v. Storage "A"
2 - #5150 . . . . 45v. "B" battery
#5071. . .Adaptor necessary with 2 volt Storage "A"

"A" Drain . . . . 0.25 Amperes
"B" Drain . . . . 10.25 ma.

FREQUENCY RANGES:

Broadcast	.545-1750 kc
Police	.1455-2650 kc
Short Wave	5.95-18.2 mc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1750 kc	1400 kc	600 kc
None	2.4 mc	None
None	16 mc	Fixed

INTERMEDIATE FREQUENCY . . . . .455 kc

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . .0.1 watts
Maximum . . . . 0.18 watts

LOUDSPEAKER:
Type . . . . PM Dynamic
Size . . . . 6 inch

OPERATING CONTROLS:
1. Left knob . . . . .Volume
2. Next to left knob . . . . . . .Tone
3. Next to right knob. . . Wave switch
4. Right knob . . . . Station Selector
5. Top knob. . . "On-Off" & Time Delay

6. Chassis rear..Battery Thrift Switch

CONTROL OPERATION:
Turning right: . . . . Volume increase
Turning right: . . . ."HI", "LO"
Turning right: . . ."AM", "POL", "FOR"
Tuning ratio: 6:1
Turning part way right: . . . . . .ON;
all way right: . . On-Time Delay
"LO": Maximum battery life
"HI": Increased volume and range

MODELS 2511,2611,2711
Chassis 101.605

SEARS ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.3 volts
Approximate microvolts input for 50 milliwatts output . . . . .See chart below
Generator ground lead connection . . . . .Receiver chassis
Dummy antenna value to be in series with generator output . . . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . Horizontal

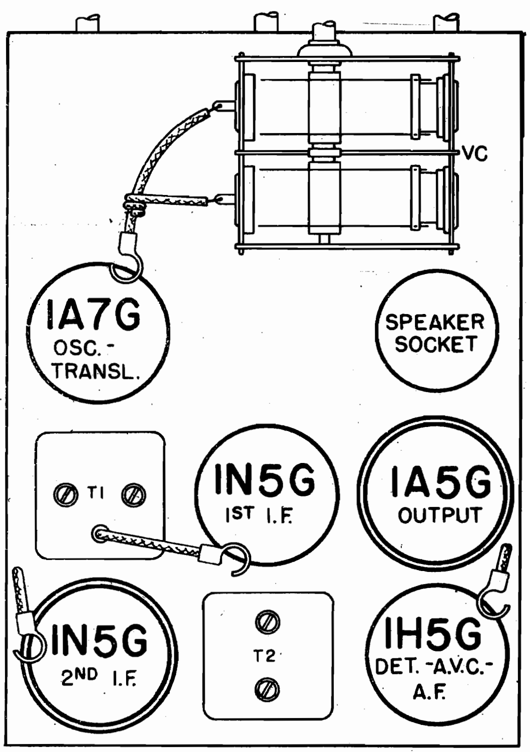
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid	T2,T1	IF Output IF Input	--
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C1*	Wave Trap	--
"AM"	Fully open	1750 kc	.0002 mfd.	Ant. Term.	C9	Oscillator	45
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C4	Translator	32
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C10	Padder	35
"POL"	3.4 mc	3.4 mc	400 ohms	Ant. Term.	C5	Translator	60
"FOR"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C7	Translator	30

IMPORTANT ALIGNMENT NOTES

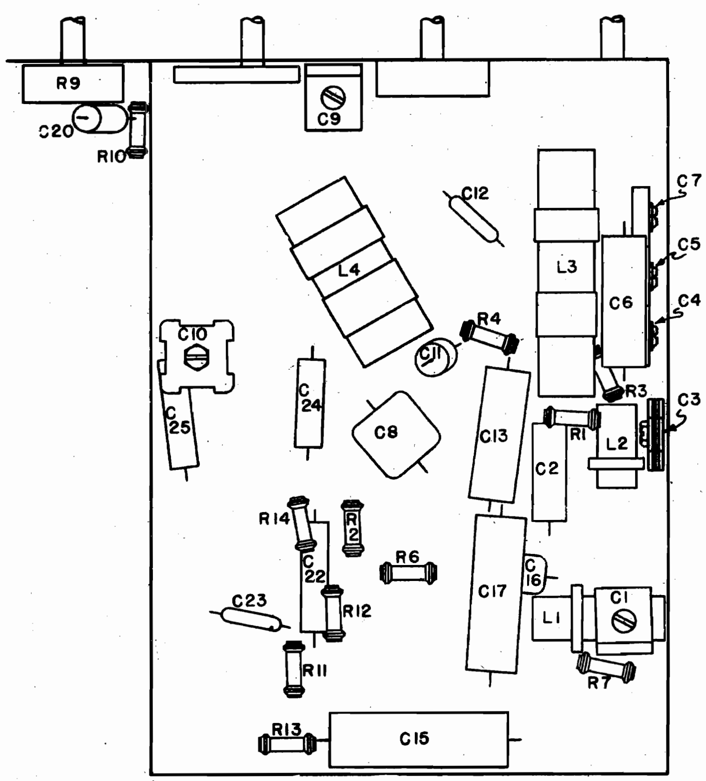
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



LOCATIONS OF PARTS ON TOP OF CHASSIS

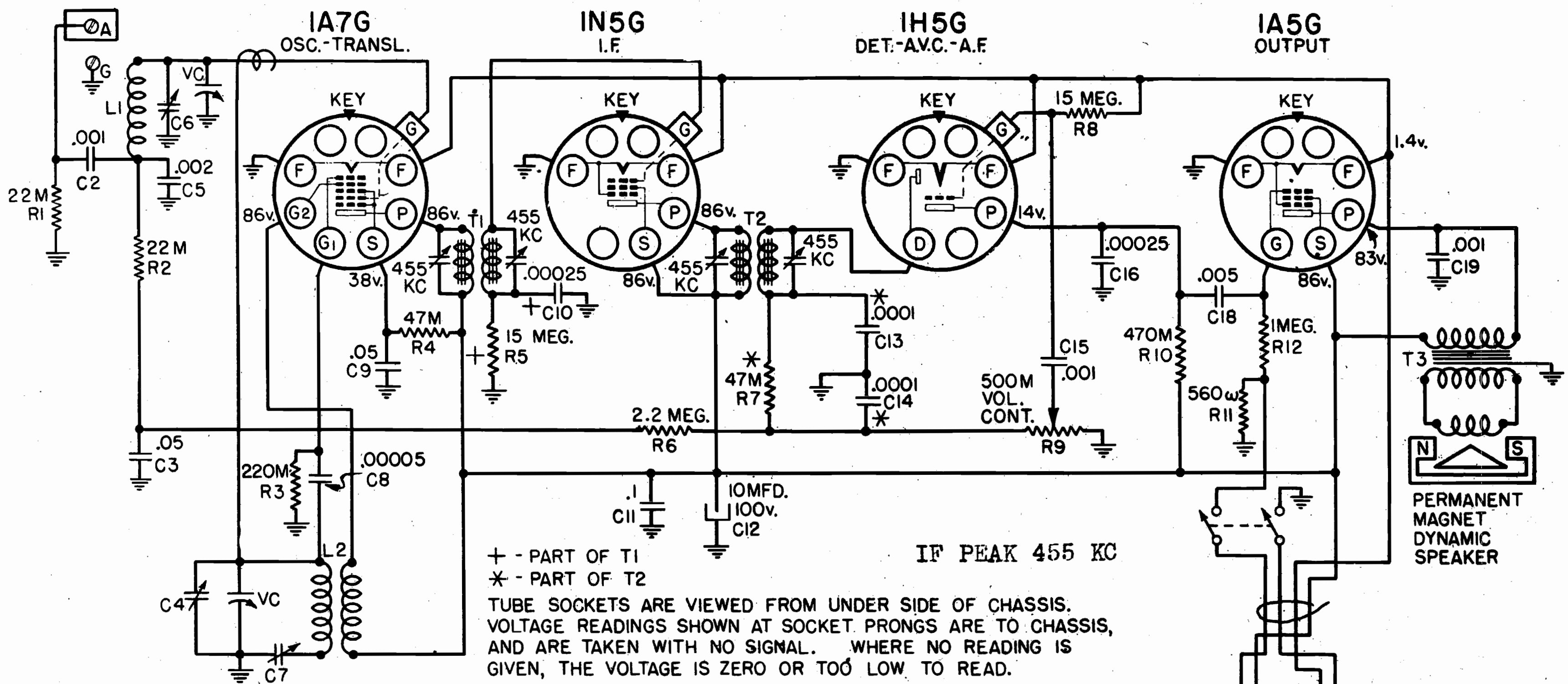


LOCATIONS OF PARTS UNDER CHASSIS 101.605

SEARS-ROEBUCK & CO.

MODELS 2541,2641,2741
Chassis 101.603

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.603



+ - PART OF T1
✳ - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

IF PEAK 455 KC

POWER SUPPLY:
#5170. . A-B block(1.5v. "A", 90v."B")
or
#5300 . . . . .2v. Storage "A"
2 - #5150 . . . . . . 45v. "B" battery
#5070 . . . Adaptor necessary with 2v. Storage "A"

"A" Drain . . . . .0.2 Amperes
"B" Drain . . . . .8.5 ma.

FOUR TUBE, BATTERY POWERED SUPERHETERODYNE
MODEL 2541, 2641, 2741

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Translator Trimmer	Padder
1750 kc	1400 kc	600 kc

FREQUENCY RANGE:
Broadcast . . . . .540-1750 kc

INTERMEDIATE FREQUENCY . . . . .455 kc

MARCH 22, 1940

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . .0.1 watts
Maximum . . . . 0.18 watts

LOUD SPEAKER:
Type . . . . .PM Dymanic
Size . . . . .5 inch

MODELS 2541,2641,2741
Chassis 101.603

SEARS ROEBUCK & CO.

PRELIMINARY:

ALIGNMENT PROCEDURE

Output meter connections . . . . .Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.3 volts
Approximate average sensitivity in microvolts for 50 milliwatts output. . . .See chart below
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 pointer with variable fully closed . . . . .Horizontal (To fall on block below 550 kc calibration mark.)

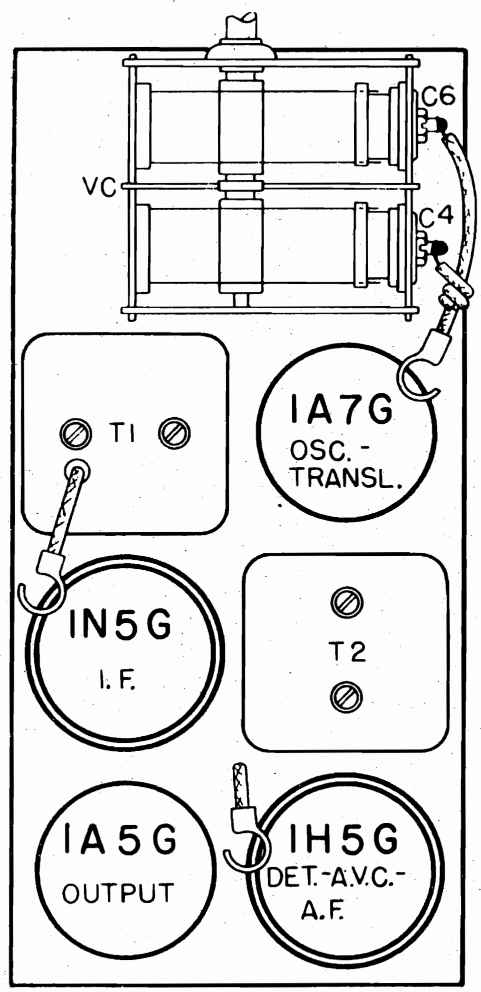
POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	1A7G Translator Grid	T2,T1	IF	--
Open	1750 kc	.0002 mfd.	Ant. Term.	C4	Oscillator	--
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C6	Translator	50
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder	50

IMPORTANT ALIGNMENT NOTES

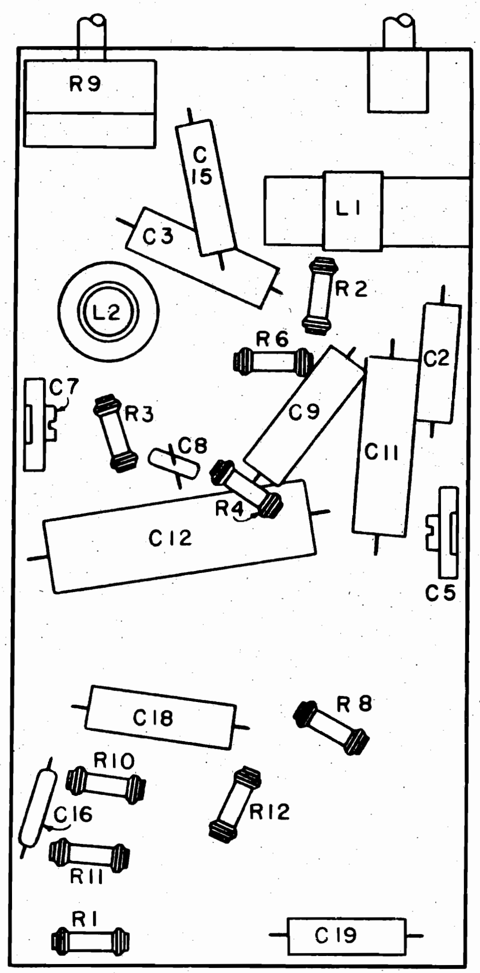
The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

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 AVC of the receiver from interfering with accurate alignment.



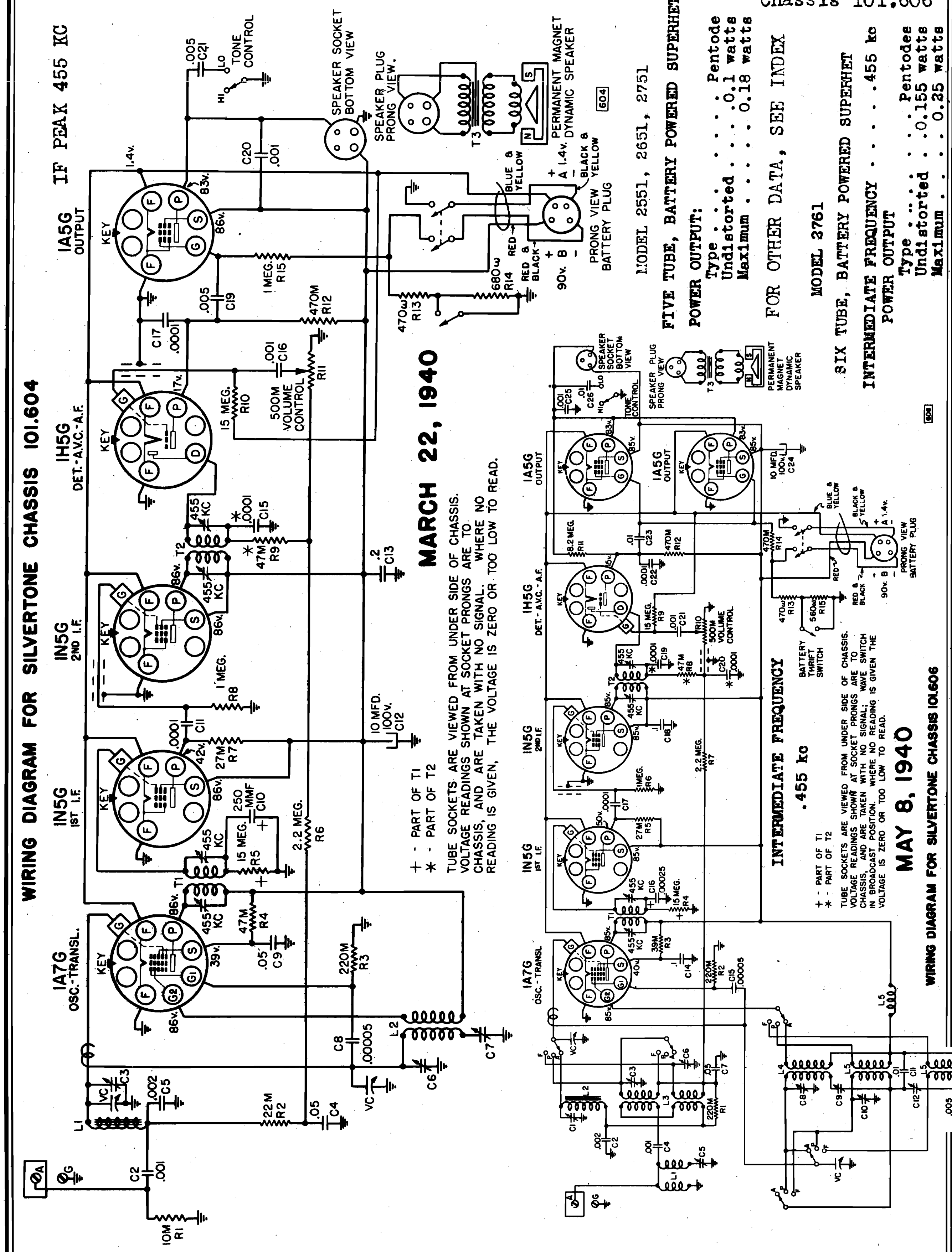
LOCATIONS OF PARTS ON TOP OF CHASSIS.



LOCATION OF PARTS UNDER CHASSIS 101.603

SEARS ROEBUCK & CO.

MODELS 2551, 2751
Chassis 101.604
MODEL 2761
Chassis 101.606



MODEL 2551, 2651, 2751

FIVE TUBE, BATTERY POWERED SUPERHET

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . .0.1 watts
Maximum . . . . . . 0.18 watts

FOR OTHER DATA, SEE INDEX

MODEL 2761

SIX TUBE, BATTERY POWERED SUPERHET

INTERMEDIATE FREQUENCY . . . . .455 kc

POWER OUTPUT
Type . . . . Pentodes
Undistorted . . . .0.155 watts
Maximum . . . . . . 0.35 watts

MODELS 3051,3151,3251
Chassis 109352-A
109352-B

SEARS ROEBUCK & CO.

MODELS 2551,2751
Chassis 101.604

THE LOOP ANTENNA: MODELS 3051,3151,3251, Chassis 109.352-A,-B

The loop antenna built into the receiver cabinet is directional in its reception characteristics. Therefore, reception may be improved or interference reduced by turning the set to a particular position. In locations where the signal strength is too low to give satisfactory reception from the loop antenna alone, an outside antenna may be connected to the wire projecting from the rear of the receiver. No attempt should be made to use a ground connection.

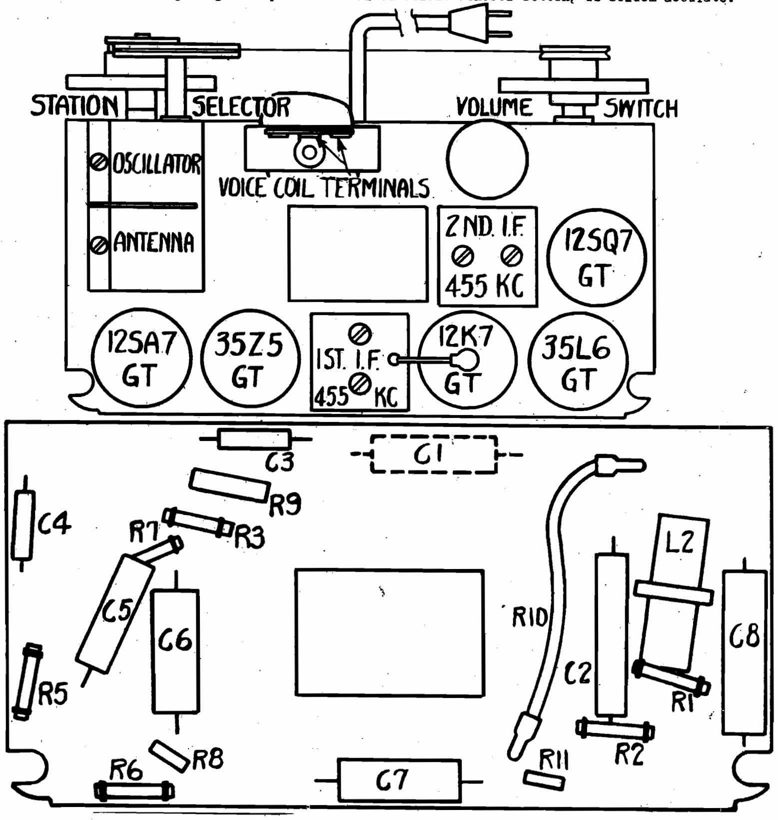
REMOVING THE CHASSIS FROM THE CABINET:

The chassis is held in the cabinet by two ordinary machine screws near the top edge of the chassis and by two fiber machine screws through the bottom of the cabinet. Since the power line is connected to the chassis the fiber screws should never be replaced with metal screws. Care should be exercised when inserting or removing the fiber screws not to damage them since they are not as strong as metal screws.

ALIGNMENT PROCEDURE

See tube layout diagram for location of trimmers. Alignment may be made without removing the set from the cabinet. Connect the output meter to the two terminals shown in the tube layout diagram. These terminals are mounted on an insulated terminal strip on top of the output transformer. These terminals connect to the voice coil.

Connect the signal generator ground to the receiver chassis through a 0.1 MFD condenser. Using a .05 to .25 MFD condenser in series with the high side of the generator output, apply a 455 KC signal to the grid of the 12K7GT I.F. amplifier tube and align the 2nd IF transformer. Repeat for the first I.F. transformer, applying the signal to the antenna section of the tuning condenser. Using a 50 MMF condenser as a dummy antenna apply the RF signal to the antenna lead. Turn the tuning condenser to minimum capacity, set the generator to 1580 KC and trim the oscillator section. Set the generator to 1400 KC, tune in the signal and adjust the antenna trimmer. (the antenna and oscillator trimmers are located on top of the tuning condenser.) NOTE: Best alignment is obtained with the volume control at maximum and the applied signal only strong enough to give satisfactory indications on the output meter. Alignment with high signal input and retarded volume control setting is seldom accurate.



ALIGNMENT PROCEDURE

PRELIMINARY: MODELS 2551, 2751, Chassis 101.604

Output meter connections . . . . .Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . .0.3 volts
Approximate microvolts input to indicate 50 milliwatts output . . . . .See chart below
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 Tone Control . . . . .HI
Position of pointer with variable fully closed . . . . .Horizontal (To fall on block below 550 kc calibration mark)

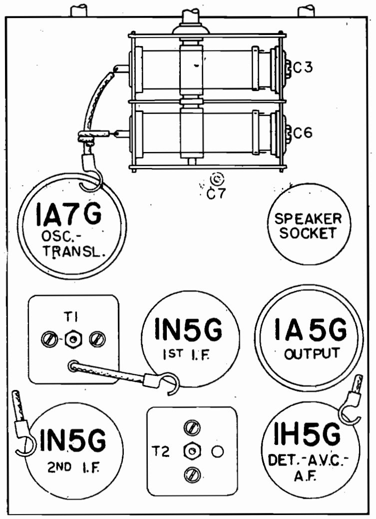
POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	1A7G Translator Grid	T2,T1	IF	--
Fully open	1750 kc	.0002 mfd.	Ant. Term.	C6	Oscillator	--
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C3	Translator	15
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C7	Padder	15

IMPORTANT ALIGNMENT NOTES

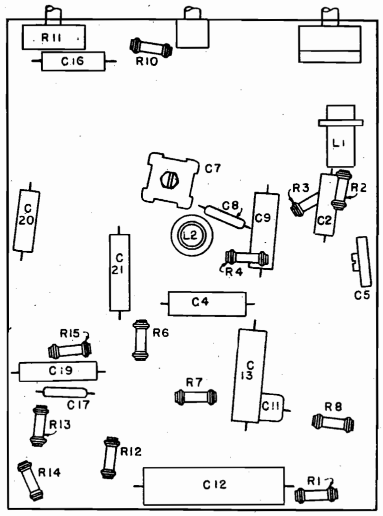
The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

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 AVC of the receiver from interfering with accurate alignment.



LOCATIONS OF PARTS ON TOP OF CHASSIS



LOCATION OF PARTS UNDER CHASSIS 101.604

POWER SUPPLY:
#5170. .A-B block (1.5v. "A", 90v."B")
or
#5300 . . . . 2v. Storage "A"
2 - #5150 . . . . 45v. "B" battery
#5071 . . . . . Adaptor necessary with 2v. Storage "A"

"A" Drain . . . . 0.25 Amperes
"B" Drain . . . . 10.25 ma

LOUD SPEAKER:
Type . . . . .PM Dynamic
Size . . . . .5 inch

SEARS ROEBUCK & CO.

MODEL 2761
Chassis 101.606

ALIGNMENT PROCEDURE

Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts . . . . .0.36 volts
Approximate microvolts input for 50 milliwatts output . . . . .See chart below
Generator ground lead connection . . . . .Receiver chassis
Dummy antenna value to be in series with generator output . . . . .See chart below
Connection of generator output lead . . . . .See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . HI
Position of Dial Pointer with variable fully closed . . . . .On mark past 550 kc
Position of Battery Thrift Switch . . . . .Right

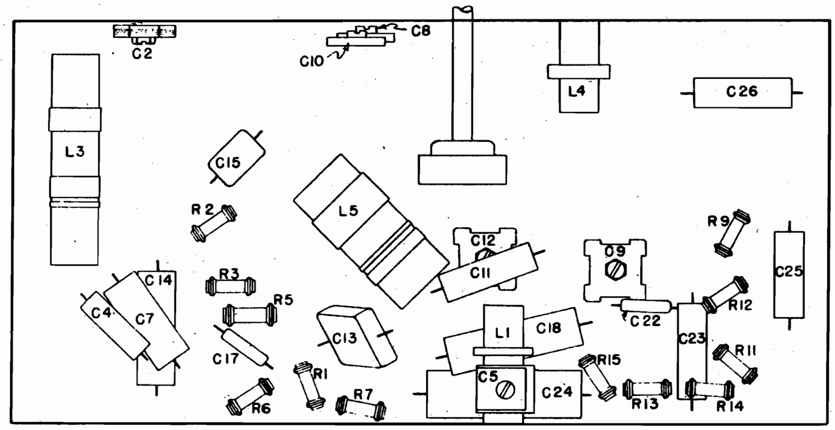
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	1A7G Grid	T2,T1	IF	75
"AM"	600 kc	455 kc*	.0002 mfd.	Ant. Term.	C5*	Wave Trap	--
"AM"	Fully open	1720 kc	.0002 mfd.	Ant. Term.	C8	Oscillator	--
"AM"	1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C1	Translator	20
"AM"	600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C9	Padder	15
"POL"	4.5 mc	4.5 mc	400 ohms	Ant. Term.	C10,C3	Osc., Transl.	20
"FOR"	16 mc(rock)	16 mc	400 ohms	Ant. Term.	C6	Translator	10

IMPORTANT ALIGNMENT NOTES

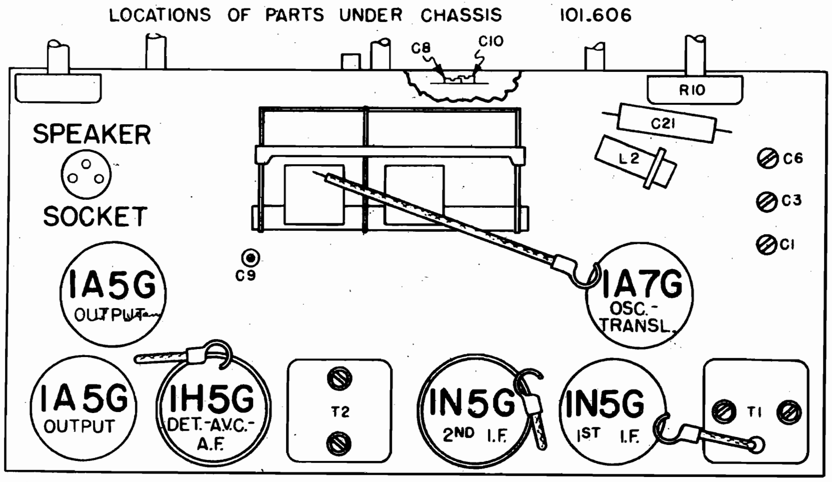
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Where indicated by the word, "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The alignment procedure should be repeated stage by stage, in the original order, for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.



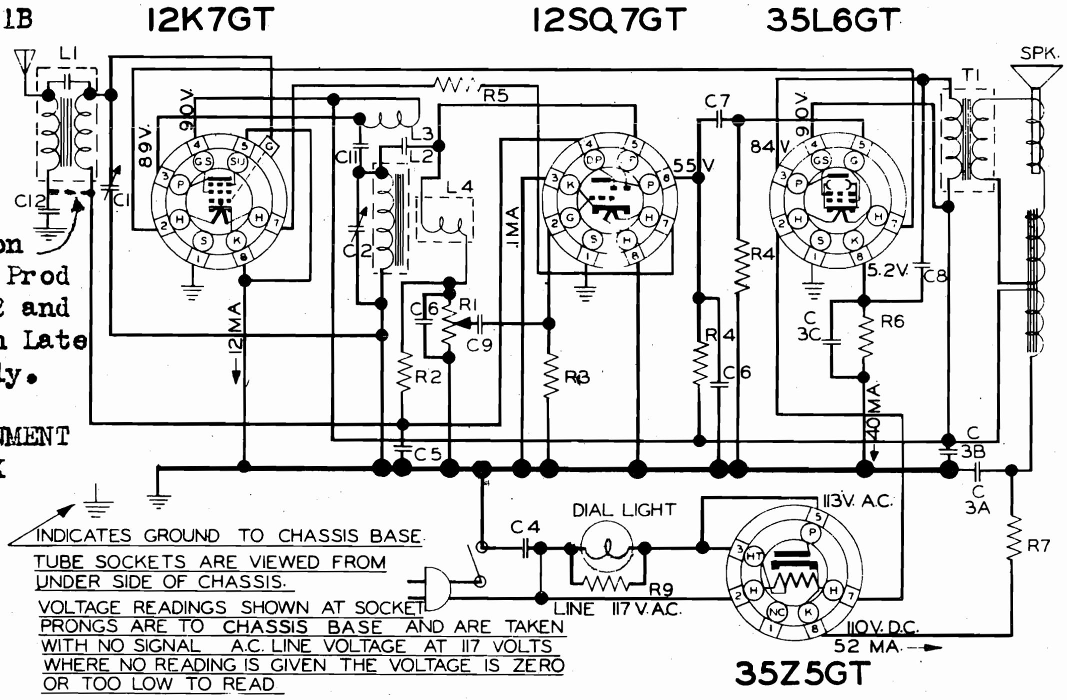
LOCATIONS OF PARTS UNDER CHASSIS 101.606



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.606

MODELS 3041,3141,3241
Chassis 132.804
132.804-1
132.804-1A
132.804-1B

SEARS ROEBUCK & CO.



Connection in Early Prod only. C12 and Ground in Late Prod. only.

FOR ALIGNMENT SEE INDEX

AUGUST 8, 1940

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
	1325514464	Antenna Hank	.15
L1	1325516769	Antenna Coil (includes blocking cond.	.90
	1324916378	Bulb-Dial Light #47 (C-12).	.10
	1326016941	Cabinet Assembly (Black)	1.25
	1326016942	Cabinet Assembly (Walnut)	1.35
	1326016943	Cabinet Assembly (Ivory)	1.60
L3&4	1323016771	Choke-Diode & Plate	.24
	1325413053	Grid Clip	.01
L2	1322817009	Coil-R.F.	.90
C1&2	1321616767	Condenser-Variable	1.40
C3	1322016838	Condenser-Electrolytic 40-20 mfd. 150 V. 20 mfd. 25 V.	.86
C4		Condenser .05 mfd. 400 V.	.10
C5		Condenser .05 mfd. 200 V.	.09
C6		Condenser .00025 mfd. 600 V.	.10
C7		Condenser .002 mfd. 400 V.	.10
C8		Condenser .04 mfd. 400 V.	.10
C9		Condenser .002 mfd. 400 V. metal-clad	.17
C11	1321914358	Condenser .000014 mfd. 600 V.	.08
C12		Condenser .01 mfd. 400 V.	.10
R1	1322416763	Control-Volume & Switch	.60
	1325516805	Cord-Power	.29
	1324016765	Dial Scale Plate (Maroon)	.45
	1324016773	Dial Scale Plate (Green)	.45
	1323916831	Knob-(Black)	.07
	1323916768	Knob-(walnut)	.07
	1323916830	Knob-(Ivory)	.07
R2		Resistor 2 megohm ¼ watt	.12
R3		Resistor 15 megohm ¼ watt	.12
R4		Resistor 500,000 ohm ¼ watt	.12
R5	1322114372	Resistor 154 ohm 3.5 watt	.25
R6		Resistor 150 ohm ¼ watt	.12
R7		Resistor 30 ohm ¼ watt	.12
R9		Resistor 100 ohm ¼ watt	.12
	1321816709	Socket-Tube-Wafer type	.09
	1321816353	Socket-Dial Light	.15
	1325816725	Speaker 4"	2.50
T1	1321316817	Transformer-Speaker	.75
	1326016766	Fyra lin Window	.15
	132603366	Carton (Complete with fillers)	.20

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:
12K7GT . . .R.F. Amp.
12SQ7GT . . Detector-AVC-AF
35L6GT . . . . . . Output
35Z5GT . . . . Rectifier

POWER SUPPLY:
All models available . .
105-125 volts, AC-DC, 30 watts

ALIGNMENT FREQUENCIES:
R.F. - 1400 kc
Ant. - 1400 kc

LOUD SPEAKER:
Type . . . Electro dynamic
SIZE . . . . 4 inch

FREQUENCY RANGE: 540 1725 kc

POWER OUTPUT:
Type . . . . Beam Tube
Undistorted .800 Milliwatts
Maximum . . .1.58 watts

OPERATING FEATURES:
Automatic Volume Control
AC-DC

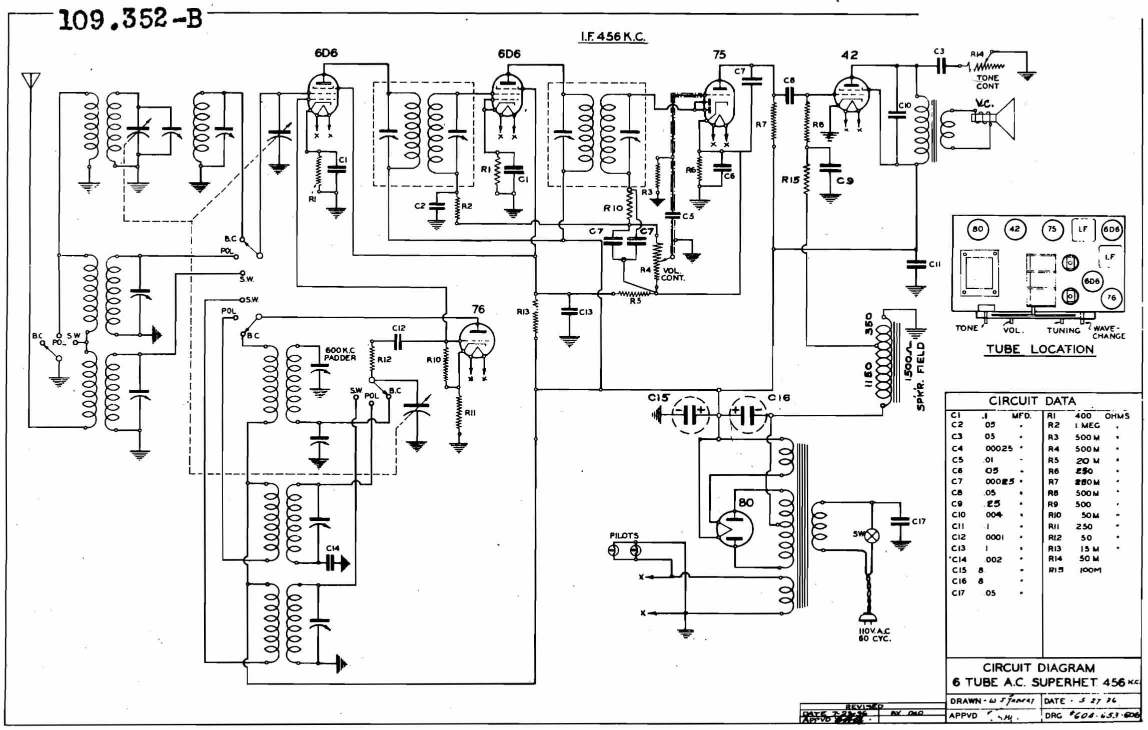
CONTROL OPERATION:
Turning right: On; Volume increase.
Tuning ratio: . . . 3:1

OPERATING CONTROLS:
Left Knob . . . On-Off switch & Volume
Right Knob . . . . Tuning

MODELS 3051,3151,3251
Chassis 109.352-A
109.352-B

SEARS ROEBUCK & CO.

MODEL 6 TUBE A.C. SUPER. (1936)

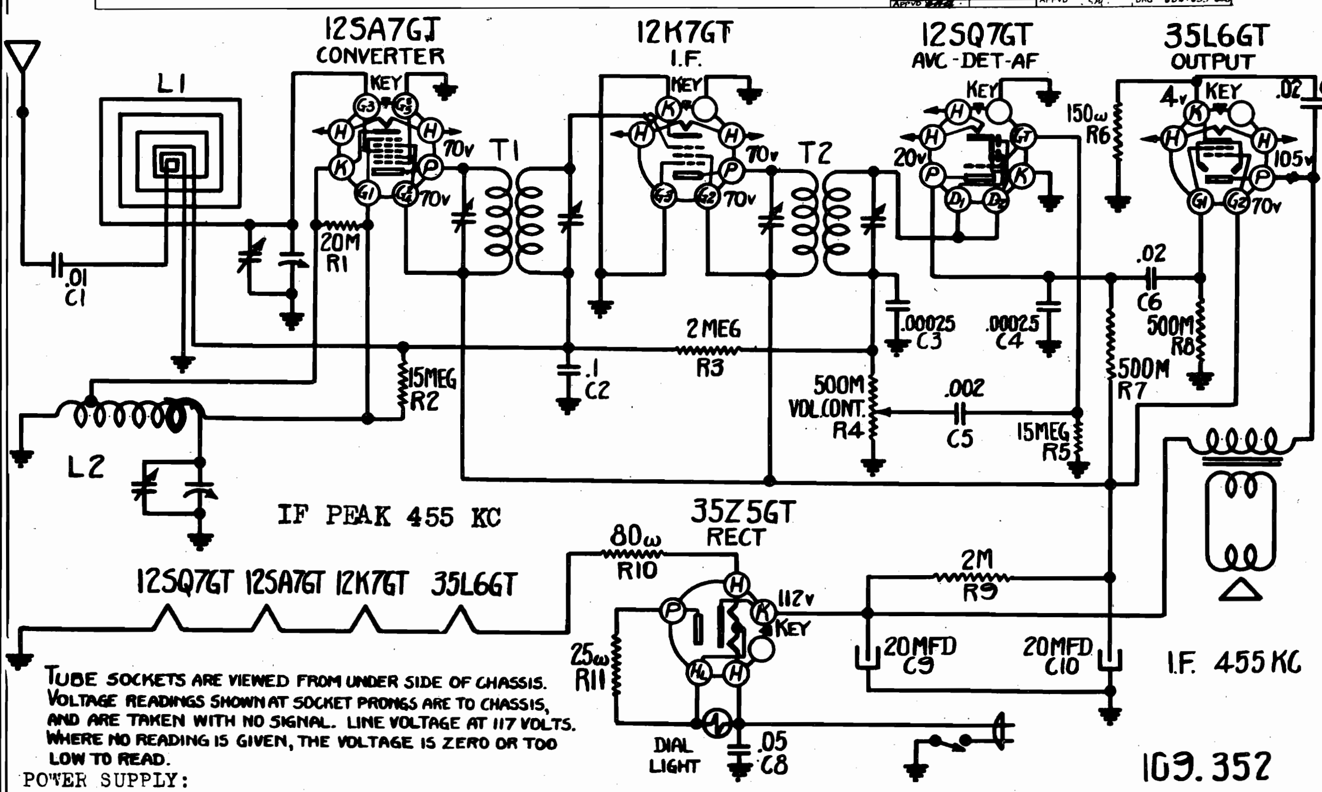


CIRCUIT DATA

C1	.1	MFD.	R1	400	OHMS
C2	05	"	R2	1 MEG	"
C3	05	"	R3	500 M	"
C4	00025	"	R4	500 M	"
C5	.01	"	R5	20 M	"
C6	05	"	R6	250	"
C7	00025	"	R7	250 M	"
C8	.05	"	R8	500 M	"
C9	.25	"	R9	500	"
C10	004	"	R10	50 M	"
C11	.1	"	R11	250	"
C12	0001	"	R12	50	"
C13	1	"	R13	15 M	"
C14	.002	"	R14	50 M	
C15	8	"	R15	100M	
C16	8	"			
C17	.05	"			

CIRCUIT DIAGRAM
6 TUBE A.C. SUPERHET 456 KC.

DRAWN - W. J. Jarvis DATE - 5 27 36
APPVD DRG #604-653-606



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY:
105-125 volts 50-60 cycle or DC . . . . 30 Watts

FREQUENCY RANGE 535kc-1580kc

ALIGNMENT FREQUENCIES Osc. 1580 Ant 1400 kc

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER OUTPUT:
Type . . . . Beam Tube
Undistorted . . . . . .7 Watts
Maximum . . . . . . 1.2 Watts

FIVE TUBE, AC-DC, SUPERHETERODYNE

MODELS 3051, 3151, 3251

JULY 11, 1940

LOUD SPEAKER:
Type . . . . P.M.Dynamic
Size . . . . 4 inch
Field Permanent Magnet

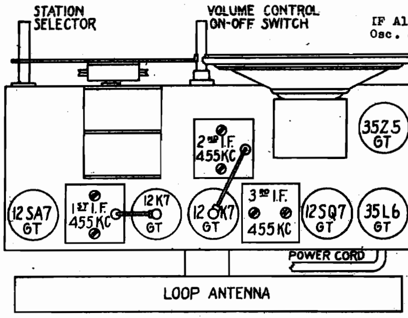
CHASSIS FEATURES:
Number IF stages . . . . one
Condenser tuned. Built-in loop with provision for external antenna

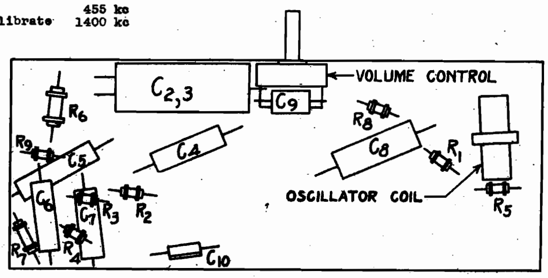
Chassis 109.354-A
109.354-B
109.354-C

SEARS-ROEBUCK & CO.

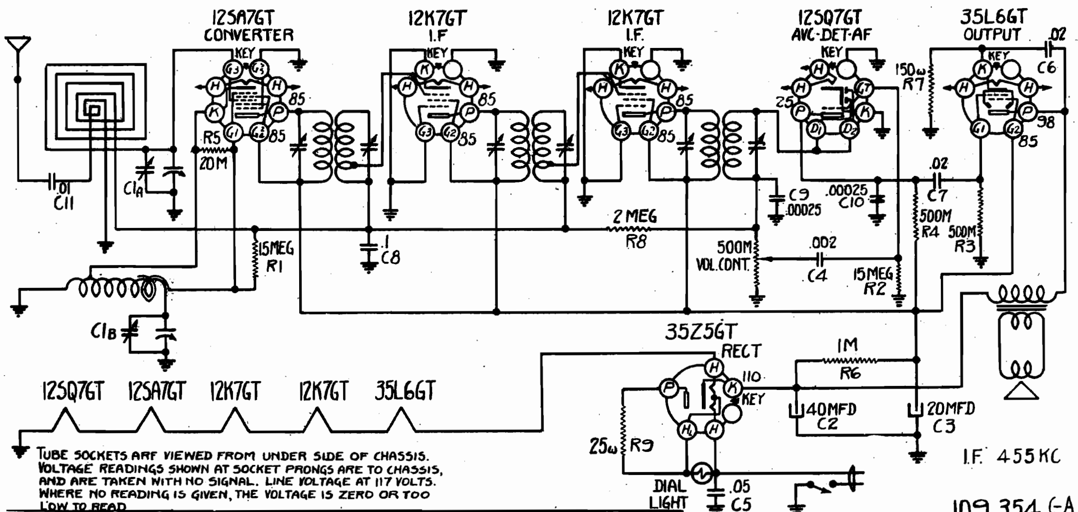
MODELS 3061,3161,3261 1521
MODELS 3041,3141,3241
Chassis 132.804 to
132.804-1B

IF Alignment frequency 455 kc
Osc. & Ant. Align & Calibrate 1400 kc





MODELS 3061,3161,3261, Chassis 109.354-A,-B,-C



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ

109.354 (-A,-B,-C)

ALIGNMENT PROCEDURE

PRELIMINARY: MODELS 3041,3141,3241, Chassis 132.804

Output meter connection	Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts	0.38 volts
Dummy antenna value to be in series with generator output	See chart below.
Connection of generator output lead	See chart below
Generator modulation	30%, 400 cycles
Position of Volume Control	Fully clockwise
Position of Dial Pointer with variable fully closed	See note below

POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (in order shown)	TRIMMER FUNCTION
1400 kc	1400 kc	.000075 mfd.	Ant. hank	C2, C1	R.F. Amp.
600 kc	600 kc	.000075 mfd.	Ant. hank	Check point	-----

IMPORTANT ALIGNMENT NOTES

With the variable condenser closed the pointer should point to the horizontal line just below the fig. "55".

The alignment procedure should be repeated stage by stage, in the original order for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

SEPTEMBER 16, 1940

ELECTRICAL SPECIFICATIONS

POWER OUTPUT:
Tube. . . . . Beam Tube
Undistorted . . . . .0.8 Watt
Maximum . . . . .1.4 Watt

OPERATING FEATURES:
Automatic Volume Control
AC-DC

LOUD SPEAKER:
Type . . Permanent Magnet Dynamic
Size . . . . 5 inch
Field . . . . . . Permanent Magnet

CHASSIS FEATURES:
Number of IF Stages . . . . . . two
Condenser tuned. Built in loop for broadcast reception with provision for external antenna for better reception where signals are weak.

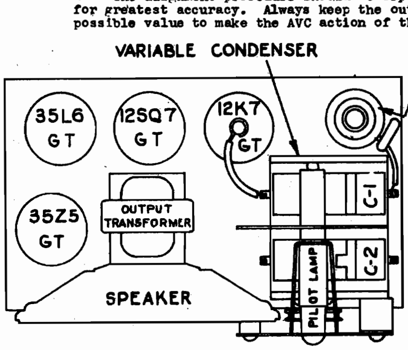
POWER SUPPLY. . . .
105-125 volts 50-60 cycles, or DC. 30 Watts

ALIGNMENT FREQUENCY. . . . . 1400 kc

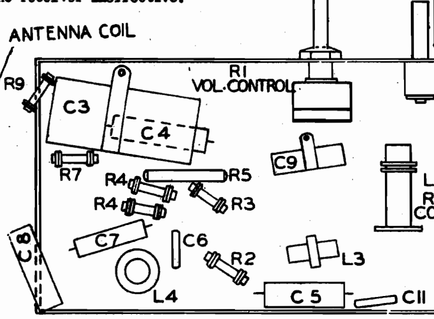
INTERMEDIATE FREQUENCY . . . . . 455 kc

FREQUENCY RANGE . . . . . . 540-1600 kc

TUBES AND FUNCTIONS:
12 SA7GT . . . . . .Oscillator-Trans
12 K7GT. . . . . First IF Ampl
12 K7GT. . . . . . . .Second IF Ampl
12 SQ7GT . . . . .Detector-AVC-AF
35 L6GT. . . . . Output
35 Z5GT. . . . . .Rectifier



LOCATION OF PARTS ON TOP OF CHASSIS

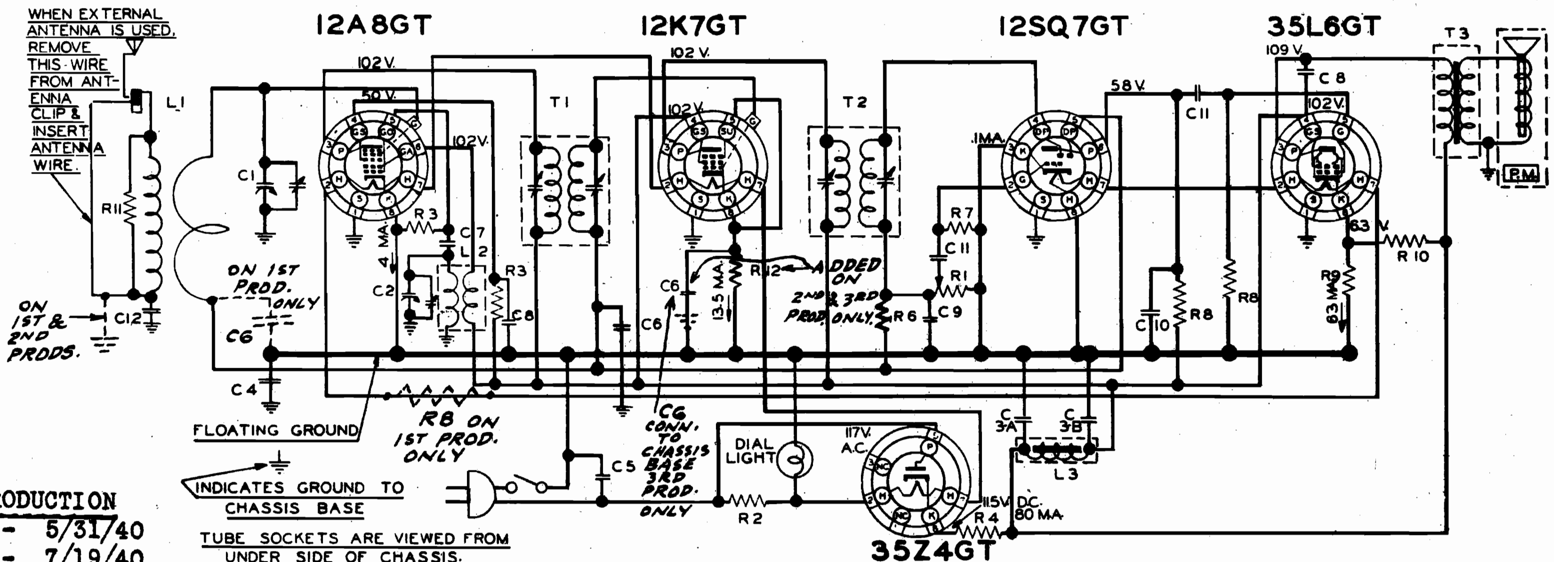


LOCATION OF PARTS UNDER CHASSIS
132.804

SEARS ROEBUCK & CO.

MODELS 3311,3411,3511
Chassis 132.803,-A,-B
132.803,-1A,-1B
132.803,-2C,-2D,-2E

PUSH BUTTON ADJUSTMENT: Each button is set up by loosening screw (under PB key), tuning in station, depressing button, and then tightening screw.



INDICATES GROUND TO CHASSIS BASE

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.

VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

132595388
132.803

PRODUCTION
1st - 5/31/40
2nd - 7/19/40
3rd - 10/30/40

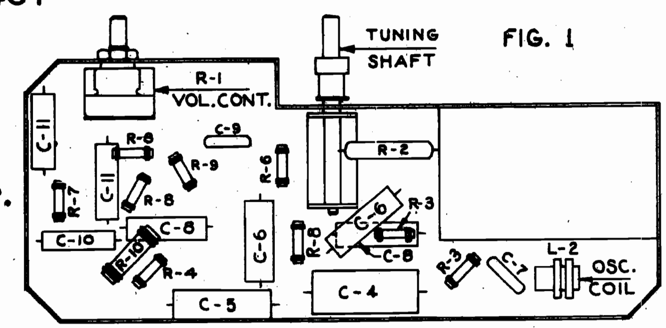
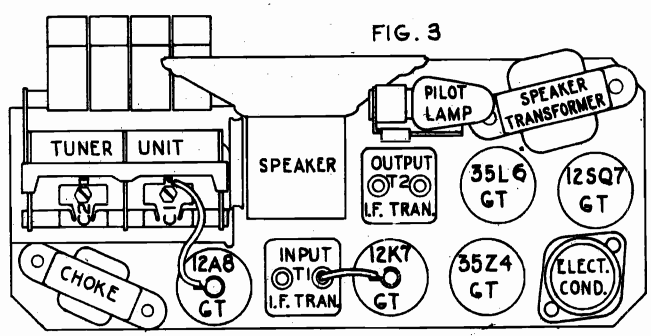


FIG. 1

LOCATION OF PARTS UNDER CHASSIS

FIG. 3



LOCATION OF PARTS ON TOP OF CHASSIS

ADD.of SUFFIX -1 to CHASSIS NO., CIRCUIT DIAGRAM CHANGES - 7/19/40 - To minimize variation in overall I.F. gain bet.receivers of this model 2 circuit changes were made,and -1 added to chassis no. Variation in I.F. gain was due to operating 12K7GT tube under "no bias" condition. Ref.to diagram in RL supp.shows bias has been applied to 12K7GT by addition of R-12 bypassed by C-6. Also R-8 and C-6 were unnecessary and eliminated. In a few receivers bias was placed on the 12K7GT and also the 12A8GT by conn. 15 megohm resistor from grid end of 50,000 ohm osc.leak to AVC cir. This did not produce uniform results and was abandoned.

ADD.of SUFFIX -2C,-2D,-2E to CHASSIS NO. 132.803 - CIRCUIT DIAGRAM & PARTS LIST CHANGES FOR ALL MODELS - 9/30/40 - Circuit change amounts to add.of C-12 to increase impedance bet.ant.clip and power line. To elim. discoloration of control knobs,push button caps,and dial background, the knobs and caps were moulded out of gold tenite and dial background paper changed to match. To reduce common coupling, bypass cond.C-6 was returned to chassis base instead of to ground.

ALIGNMENT

POS.OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONN(high)	GENERATOR CONN(low)	TRIM.ADJ. (ord.shown)	TRIMMER FUNC.
Closed	455 kc	.1mf.	12A8GT Grid	Floating Gnd.	T2, T1	IF
1400 kc	1400 kc	.00005mf.	Ant. clip	Chassis base	C2, C1	Translator
600 kc	600 kc	.00005mf.	Ant. clip	Chassis base	Check Point	----

MODELS 3321,3421,3521,3721
Chassis 109.357,-A,-B,-C

SEARS ROEBUCK & CO.

POWER SUPPLY . . . 105-125 volts 50-60 cycles or DC 30 Watts. 25 cycle models available

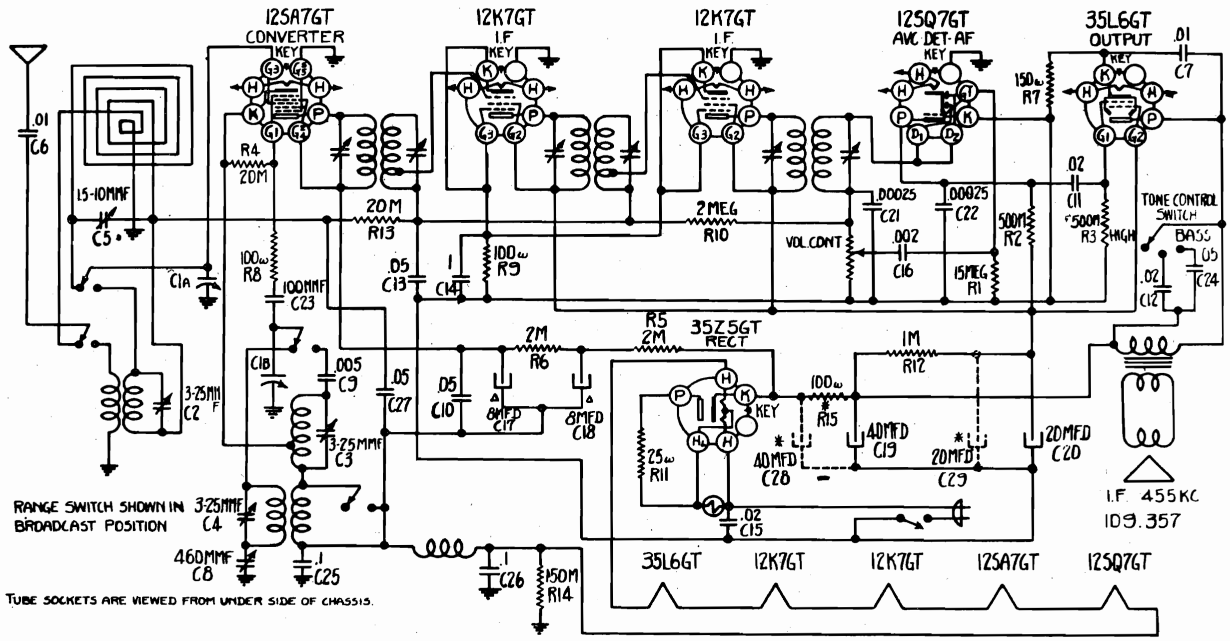
FREQUENCY RANGE. . . . . 540-1600 kc
5500-18500 kc

ALIGNMENT FREQUENCIES: . . 1400-600 kc
16000 kc

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER OUTPUT:
- Type. . . . . Beam Tube
- Undistorted . . . . 0.8 Watt
- Maximum . . . . 1.4 Watt

LOUD SPEAKER:
- Type . . Permanent Magnet Dynamic
- Size . . . . 5 inch
- Field . . . . . Permanent Magnet

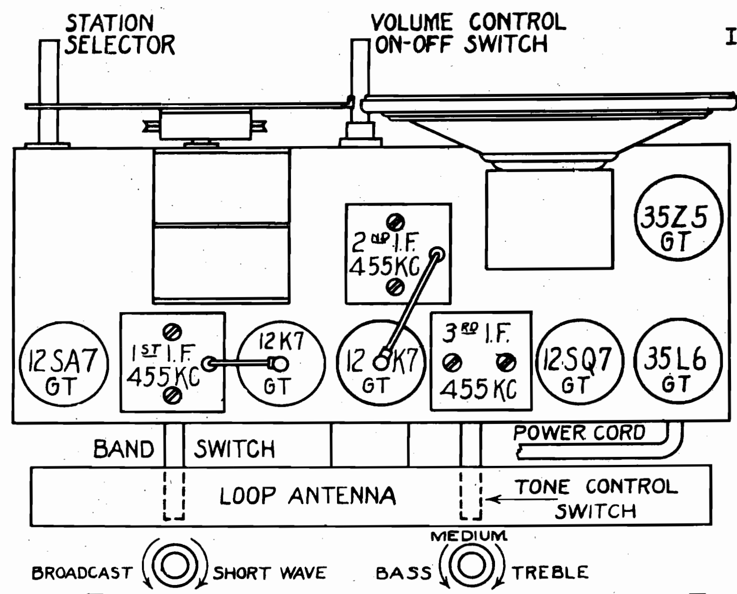


TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.

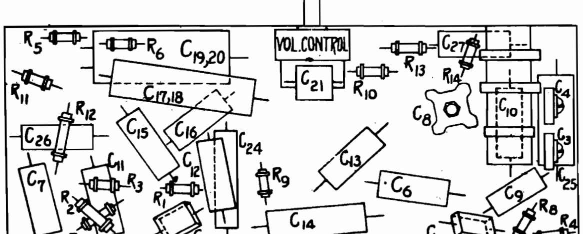
*USED ON 25 CYCLE ONLY. △ THESE CONDENSERS 20MFD ON 25 CYCLE

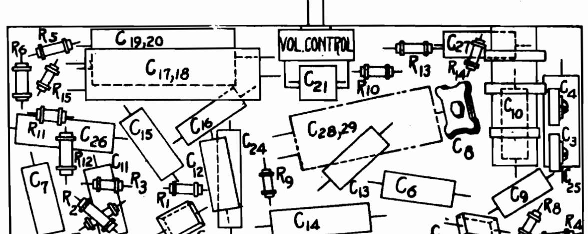
FOR ALIGNMENT SEE INDEX

IF PEAK 455 KC



SEPTEMBER 16, 1940



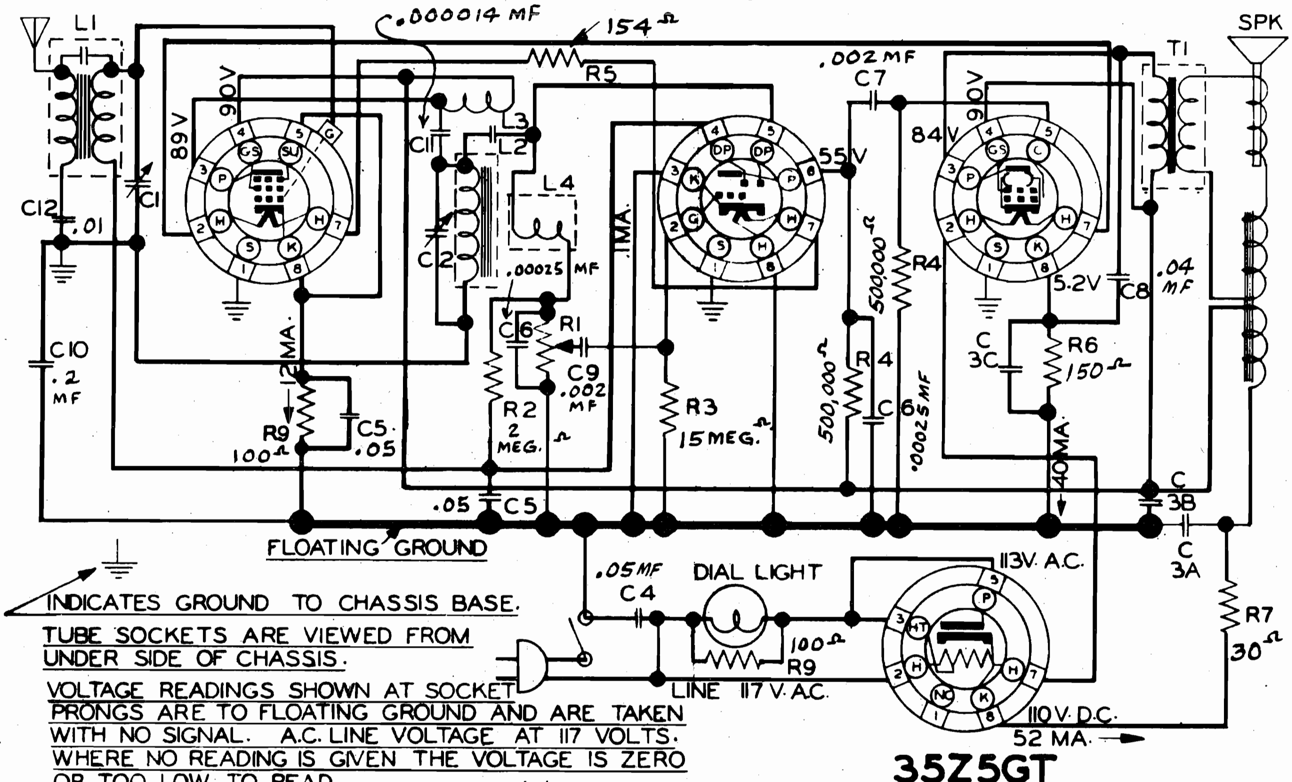


Chassis 132.805-1.-1A,-1B (late)

SEARS-ROEBUCK & CO.

MODELS 3341,3441,3541
Chassis 132.805,-A,-B (early)

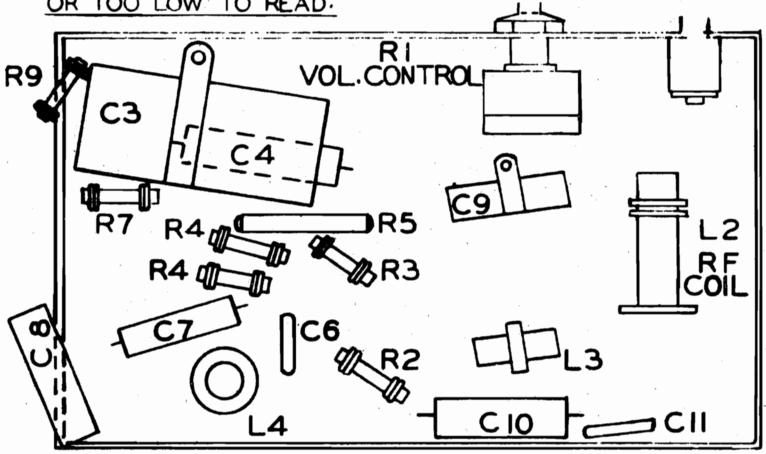
To comply with the requirements of the Underwriters Laboratories, a .0I mfd., 400 V. paper tubular condenser (C-12), was added in the antenna circuit, as isolation between the antenna and floating ground.



INDICATES GROUND TO CHASSIS BASE.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.

VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.



LOCATION OF PARTS UNDER CHASSIS

TUBES AND FUNCTIONS:

12K7GT	R.F. Amp.
12SQ7GT	Detector-AVC-AF
35L6GT	Output
35Z5GT	Rectifier

POWER SUPPLY:
All models available

105-125 volts, AC-DC, 30 watts

POWER OUTPUT:

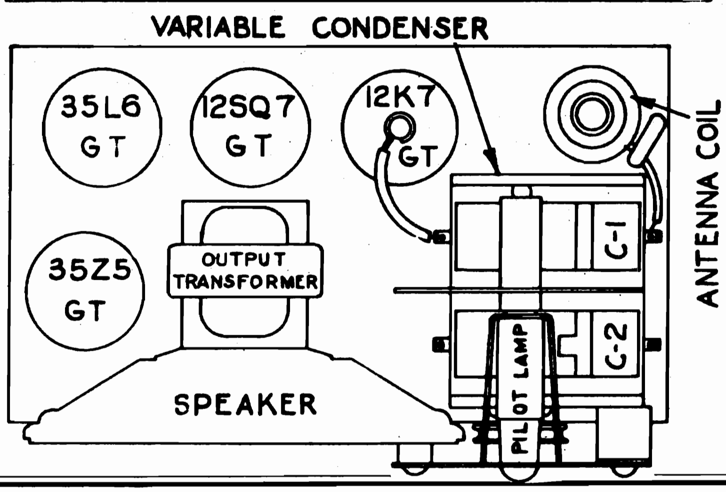
Type	Beam Tube
Undistorted . .	800 Milliwatts
Maximum	1.58 watts

FREQUENCY RANGE: . 540 - 1725 kc.

ALIGNMENT FREQUENCIES: R.F. - 1400 kc
Ant. - 1400 kc

POINTER AT 55 CHECK 600 K.C.

LOUD SPEAKER:
Type . . . .
Size . . . .

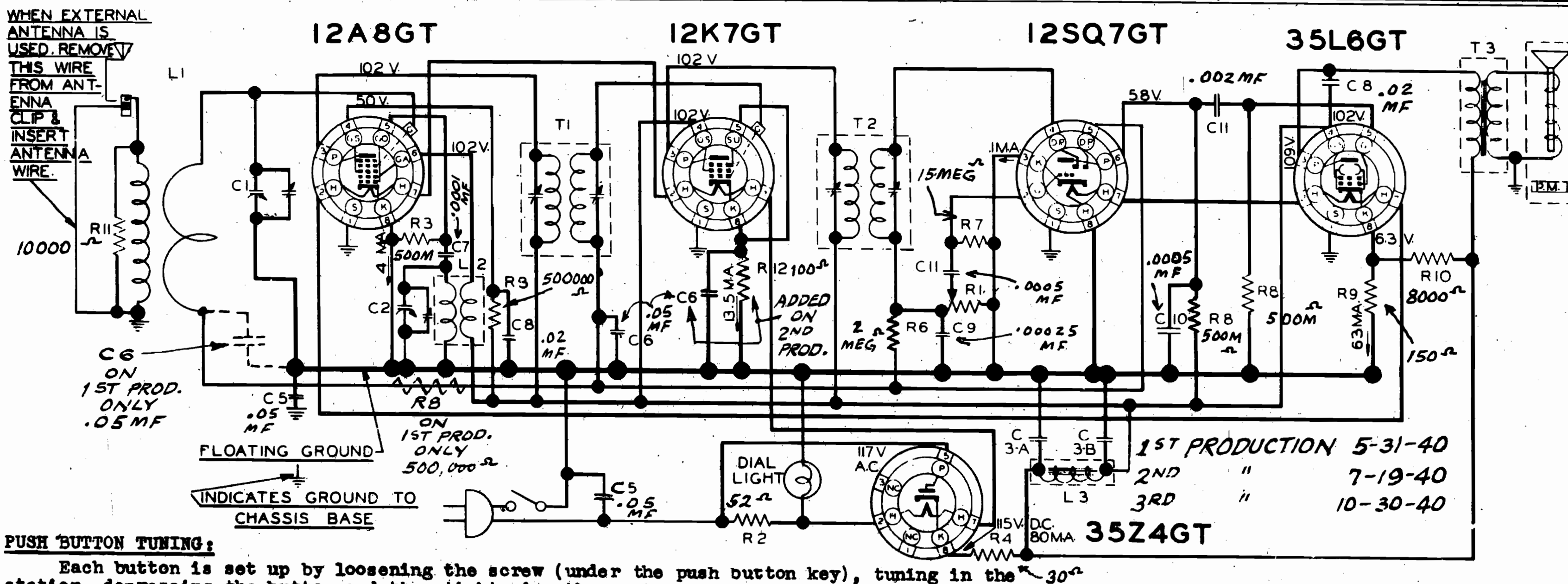


LOCATION OF PARTS ON TOP OF CHASSIS

SEPTEMBER 30, 1940

MODELS 3351, 3451, 3551
Chassis 132.802, -A, -B
132.802-1, -1A, -1B
132.802-1C, -1D, -1E

SEARS-ROEBUCK & CO.



PUSH BUTTON TUNING:

Each button is set up by loosening the screw (under the push button key), tuning in the station, depressing the button and then tightening the screw.

ALIGNMENT NOTES

With the variable condenser closed the pointer should point vertically upward. When properly set with the variable condenser closed the pointer will point just to the right of the "54" calibration mark.

Position of Volume Control . . . . Fully clockwise
Position of Dial Pointer with variable fully closed . . . . See note below
Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.38 volts

POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (High)	GENERATOR CONNECTION (Low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION
Closed	455 kc	.1 mfd.	12A8GT Grid	Var. Cond. Frame	T2, T1	IF
1400 kc	1400 kc	.00005 mfd.	Ant. clip	Chassis Base	C2, C1	Translator
600 kc	600 kc	.00005 mfd.	Ant. clip	Chassis Base	Check Point	- - - -

INTERMEDIATE FREQUENCY . . . . .455 kc

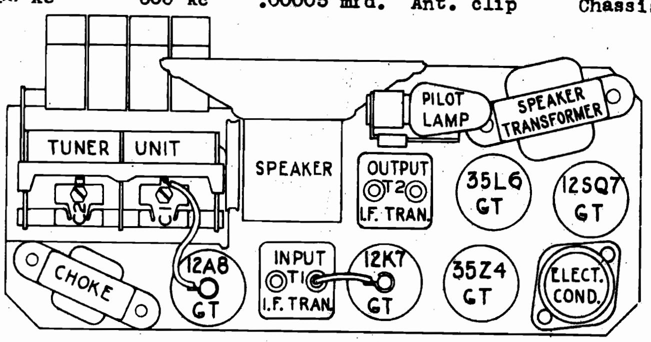
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

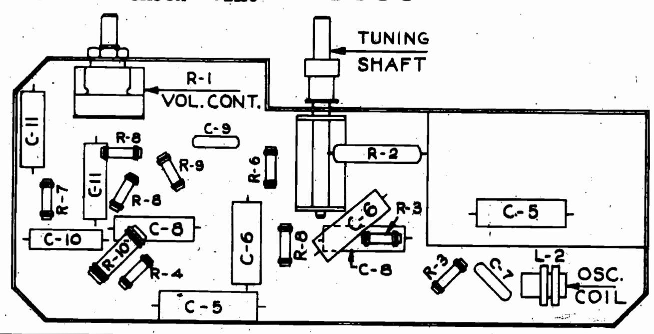
POWER SUPPLY:
All models available 105-125 volts, AC-DC, 35 watts

LOUD SPEAKER:
Type . . . . . . Permanent Magnet
Size . . . . 4 inch

POWER OUTPUT:
Type . . . . Beam Tube
Undistorted . . 1.0 watts
Maximum . . . . 2.6 watts

TUBES AND FUNCTIONS:
12A8GT Oscillator-Translator
12K7GT . . . . .IF
35Z4GT . . . . . Rectifier
12SQ7GT . . Detector-AVC-AF
35L6GT . . . . Output

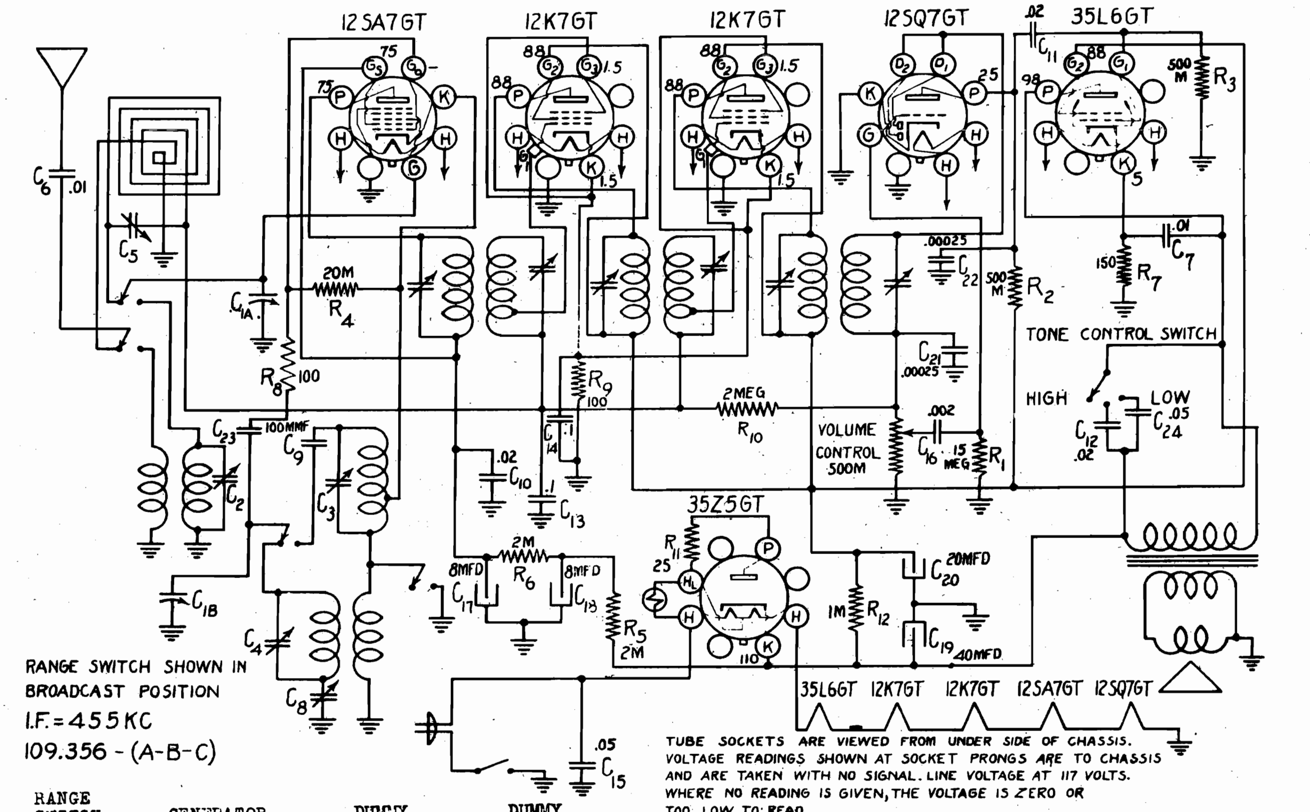




MODELS 3321,3421,3521,3721
Chassis 109.357,-A,-B,-C

SEARS-ROEBUCK & CO.

MODELS 3361,3461,3561,3621
Chassis 109.356-A,-B,-C



RANGE SWITCH SETTING	GENERATOR FREQUENCY	DUMMY ANTENNA	DUMMY CONNECTED TO	FUNCTION	OPERATION
Broadcast	455 KC exact	.1 MFD	2nd IF Grid	IF Trim	Align
Broadcast	455 KC exact	.1 MFD	1st IF Grid	IF Trim	Align
Broadcast	455 KC exact	.1 MFD	Ant. Gang	IF Trim	Align
Broadcast	1400 KC exact	50 MMF	Ant. lead	Osc. trim	Adjust gang to indicate 1400 KC and align osc. trimmer for max. response.
Broadcast	1400 KC exact	50 MMF	Ant lead	Loop trim	With gang as above, adjust loop trimmer for max. response. See Note 1.
Broadcast	600 KC approx.	50 MMF	Ant lead	Osc. pad	Adjust broadcast padding condenser while rocking gang condenser.
Short Wave	16000 KC exact	400 ohms	Ant lead	S.W. osc. trim	Set condenser to indicate 16000 KC and adjust osc. trimmer for max. response See Note 2.
Short Wave	16000 KC exact	400 ohms	Ant lead	S.W. ant. trim	Rock gang condenser through signal while adjusting antenna trimmer.

SEPTEMBER 16, 1940

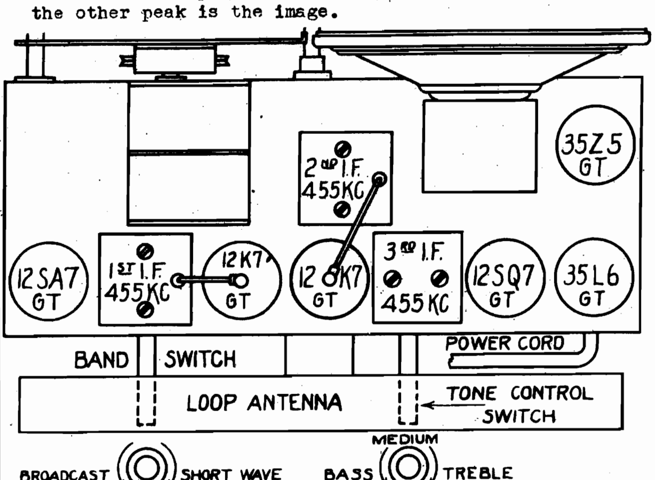
ALSO ALIGNMENT FOR MODELS 3321, 3421,3521 and 3721.

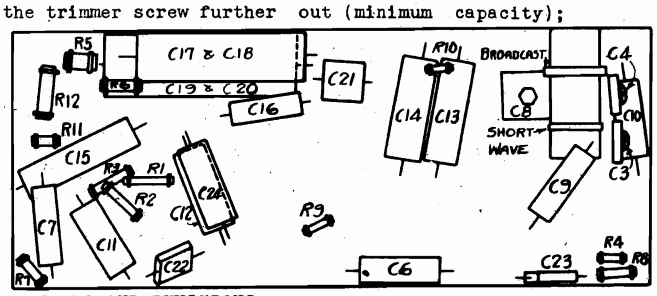
NOTE 1:

Due to productions variations in wiring and in condenser construction, a few loop trimmer condensers may peak wide open. Retrimming the oscillator to a 1400 KC signal when the pointer is set at a frequency slightly above 1400 KC may permit the loop trimmer to pass through a "peak".

NOTE 2:

If two peaks can be had, the correct one is with the trimmer screw further out (minimum capacity); the other peak is the image.





TUBES AND FUNCTIONS:
12 SA7GT . . . . . Oscillator-Translator
12 K7GT. . . . . . First IF Amplifier
12 K7GT. . . . . . Second IF Amplifier
12 SQ7GT . . . . Detector-AVC-AF
35 L6GT. . . . . Output
35 Z5GT. . . . . Rectifier

POWER OUTPUT:
Type. . . . . Beam Tube
Undistorted . . . . .0.8 Watt
Maximum . . . . .1.4 Watt

MODELS 3651,3751,3851
Chassis 109.353.-A.-B

SEARS-ROEBUCK & CO.

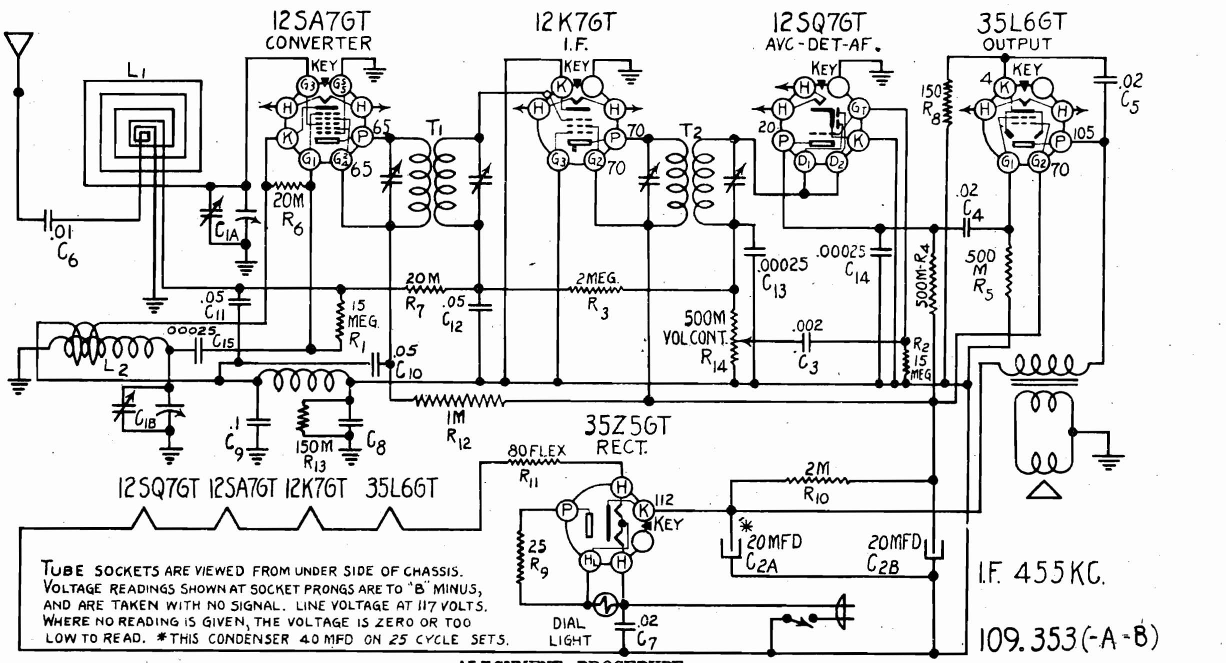
POWER SUPPLY:
105-125 volts 50-60 cycle or DC (25 cycle model available) . . . . . . 30 Watts

FREQUENCY RANGE . . . . . 535kc-1580kc ALIGNMENT FREQUENCIES Osc. 1580 Ant. 1400 kc

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER OUTPUT:
Type . . . . Beam Tube
Undistorted . . . . .7 Watts
Maximum . . . . .1.2 Watts

LOUD SPEAKER:
Type . . . . P.M.Dynamic
Size . . . . 4 inch
Field . . . . Permanent Magnet



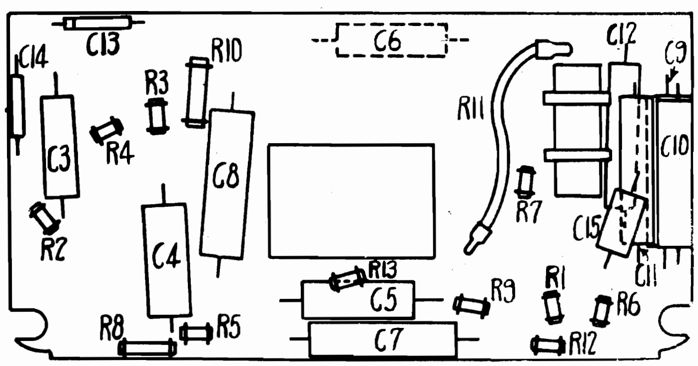
ALIGNMENT PROCEDURE

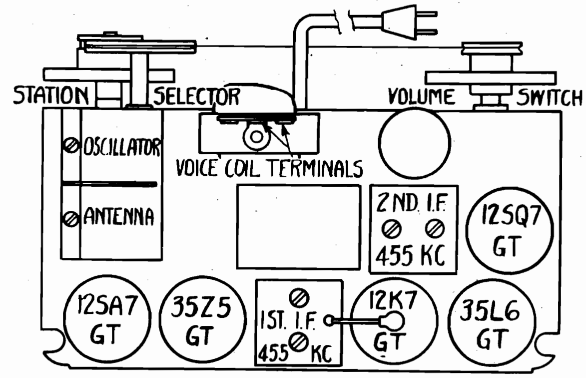
See tube layout diagram for location of trimmers. Alignment may be made without removing the set from the cabinet. Connect the output meter to the two terminals shown in the tube layout diagram. These terminals are mounted on an insulated terminal strip on top of the output transformer. These terminals connect to the voice coil.

Connect the signal generator ground to the receiver chassis through a 0.1 MFD condenser. Using a .05 to .25 MFD condenser in series with the high side of the generator output, apply a 455 KC signal to the grid of the 12K7GT I.F. amplifier tube and align the 2nd IF transformer. Repeat for the first I.F. transformer, applying the signal to the antenna section of the tuning condenser. Using a 50 MMF condenser as a dummy antenna apply the RF signal to the antenna lead. Turn the tuning condenser to minimum capacity, set the generator to 1580 KC and trim the oscillator section. Set the generator to 1400 KC, tune in the signal and adjust the antenna trimmer. (the antenna and oscillator trimmers are located on top of the tuning condenser.) NOTE: Best alignment is obtained with the volume control at maximum and the applied signal only strong enough to give satisfactory indications on the output meter. Alignment with high signal input and retarded volume control setting is seldom accurate.

THE LOOP ANTENNA:

The loop antenna built into the receiver cabinet is directional in its reception characteristics. Therefore, reception may be improved or interference reduced by turning the set to a particular position. In locations where the signal strength is too low to give satisfactory reception from the loop antenna alone, an outside antenna may be connected to the wire projecting from the rear of the receiver. No attempt should be made to use a ground connection.





SEARS ROEBUCK & CO. MODELS R5501, R5501-A, Chassis R5501-B 101.618. 101.618-1A

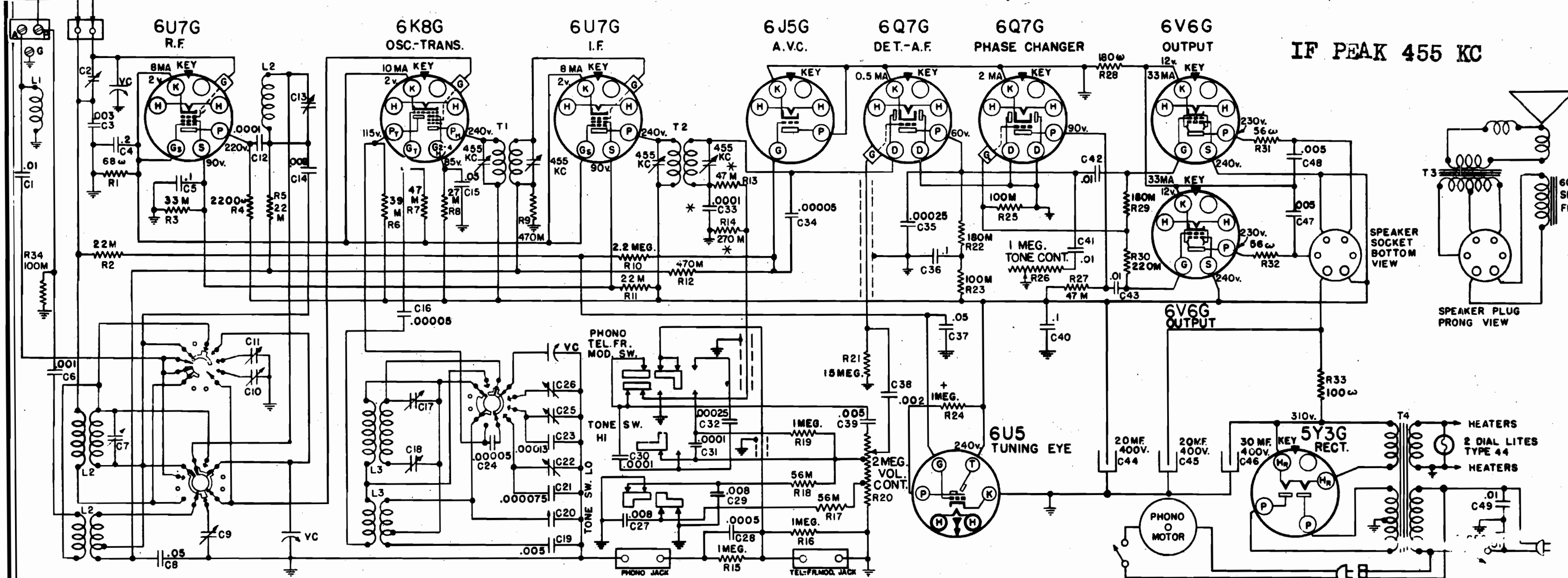
DIFFERENCES BETWEEN 101.618 AND 101.618-1A CHASSIS:

101.618-1A is identical with 101.618 except for different shaft lengths and different cabinet and appearance items.

SEPTEMBER 16, 1940

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.618, -1A

IF PEAK 455 KC



+ - IN TUNING EYE SOCKET * - PART OF T2

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1650 kc	1500 kc	600 kc
2.4 mc	2.4 mc	Fixed
18.3 mc	16 mc	Fixed
9.55 mc	9.55 mc	Fixed
11.71 mc	11.71 mc	Fixed

FREQUENCY RANGES:

Band "A" . . . . 540-1650 kc
Band "B" . . . . 1475-3510 kc
Band "C" . . . . 5.95-18.3 mc
Band "D" . . . . 9.3-9.85 mc
Band "E" . . . . 11-12 mc

INTERMEDIATE FREQUENCY . . . . 455 kc

LOUDSPEAKER:

Type . . . . Dynamic
Size . . . . 12 inch
Approx. field coil res. . . . . 600 ohms
Approx. field coil voltage drop. . 70 v.

POWER OUTPUT:

Type . . . . Push-Pull beam
Undistorted . . . . 5 watts
Maximum . . . . 10 watts

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment.

RECORD CHANGER:

101.320, 321, 322 Record Changer Unit.

POWER SUPPLY:

All models available . . . . 105-125 volt AC; 60 cycle; 140 watts
All models available . . . . 105-125 volt AC; 50 cycle; 140 watts
All models available . . . . 105-125 volt AC; 25 cycle; 150 watts

MODELS R5501, R5501-A
R5501-B

SEARS-ROEBUCK & CO.

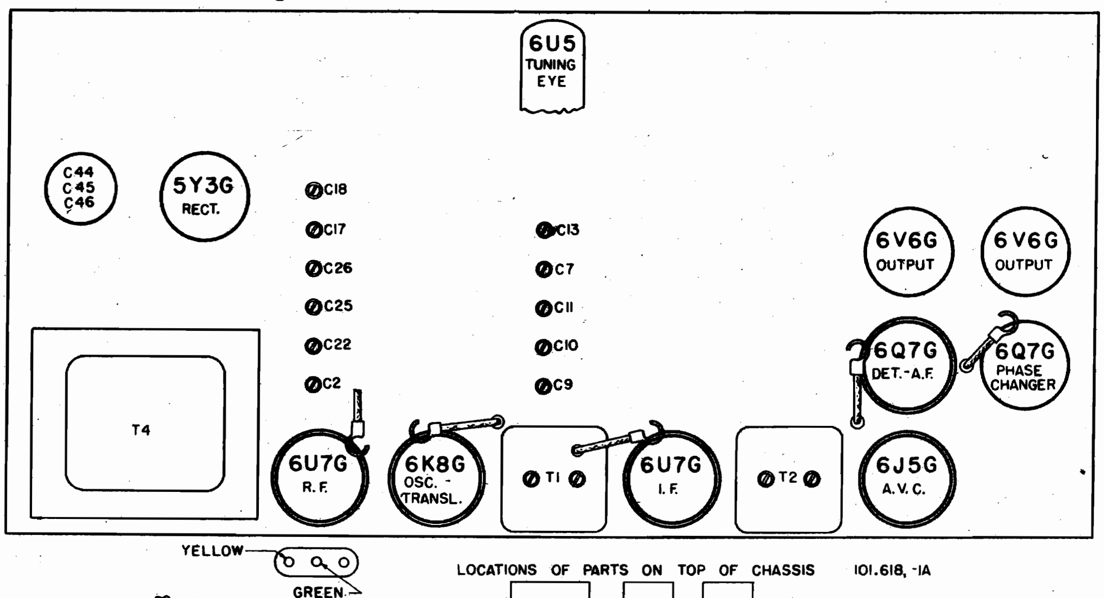
Chassis 101.618
101.618-1A

Output meter connection . . . . Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.6 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Generator ground lead connection . . . . Receiver chassis
Dummy antenna value to be in series with generator output . . . . See chart below
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . Both buttons out
Position of Dial Pointer with variable fully closed . . . . On first mark to left of 550 kc calibration mark.

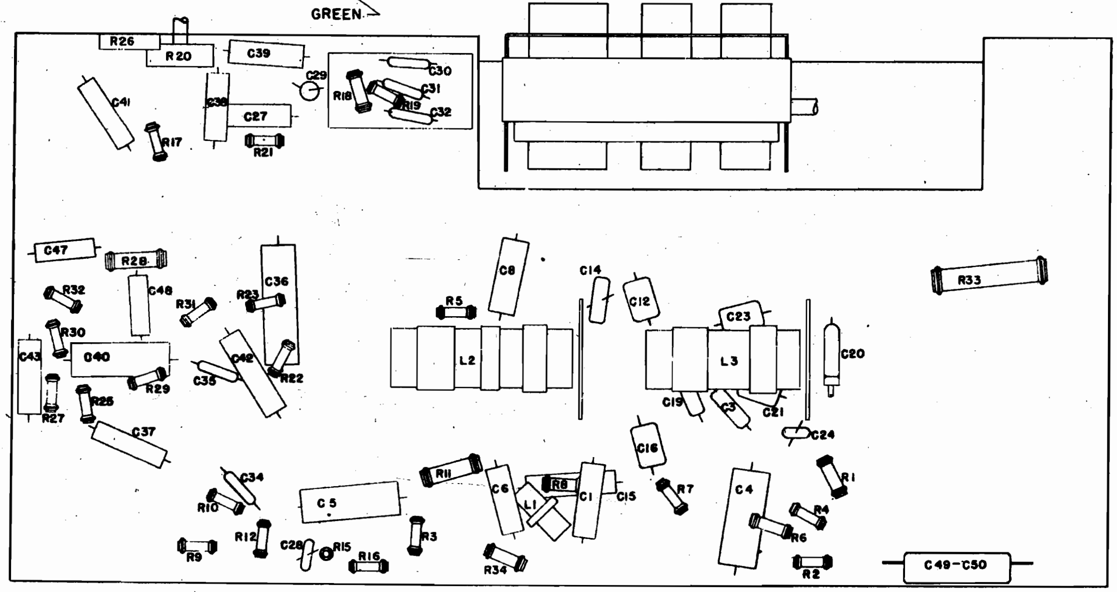
WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2, T1	IF	--
"A"	Fully open	1650 kc	.00005 mfd.	Ant. Term.	C17	Oscillator	--
"A"	1500 kc	1500 kc	.00005 mfd.	Ant. Term.	C2, C13	Ant, Transl.	180
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C18	Padder	55
"B"	2.4 mc	2.4 mc	400 ohms	Ant. Term.	C7	Translator	120
"C"	Open	18.3 mc	400 ohms	Ant. Term.	C26*	Oscillator	--
"C"	16 mc (rock)	16 mc	400 ohms	Ant. Term.	C11	Translator	35
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	--
"D"	9.55 mc (rock)	9.55 mc	400 ohms	Ant. Term.	C10	Translator	75
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C22*	Oscillator	--
"E"	11.71 mc (rock)	11.71 mc	400 ohms	Ant. Term.	C9	Translator	75

IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.



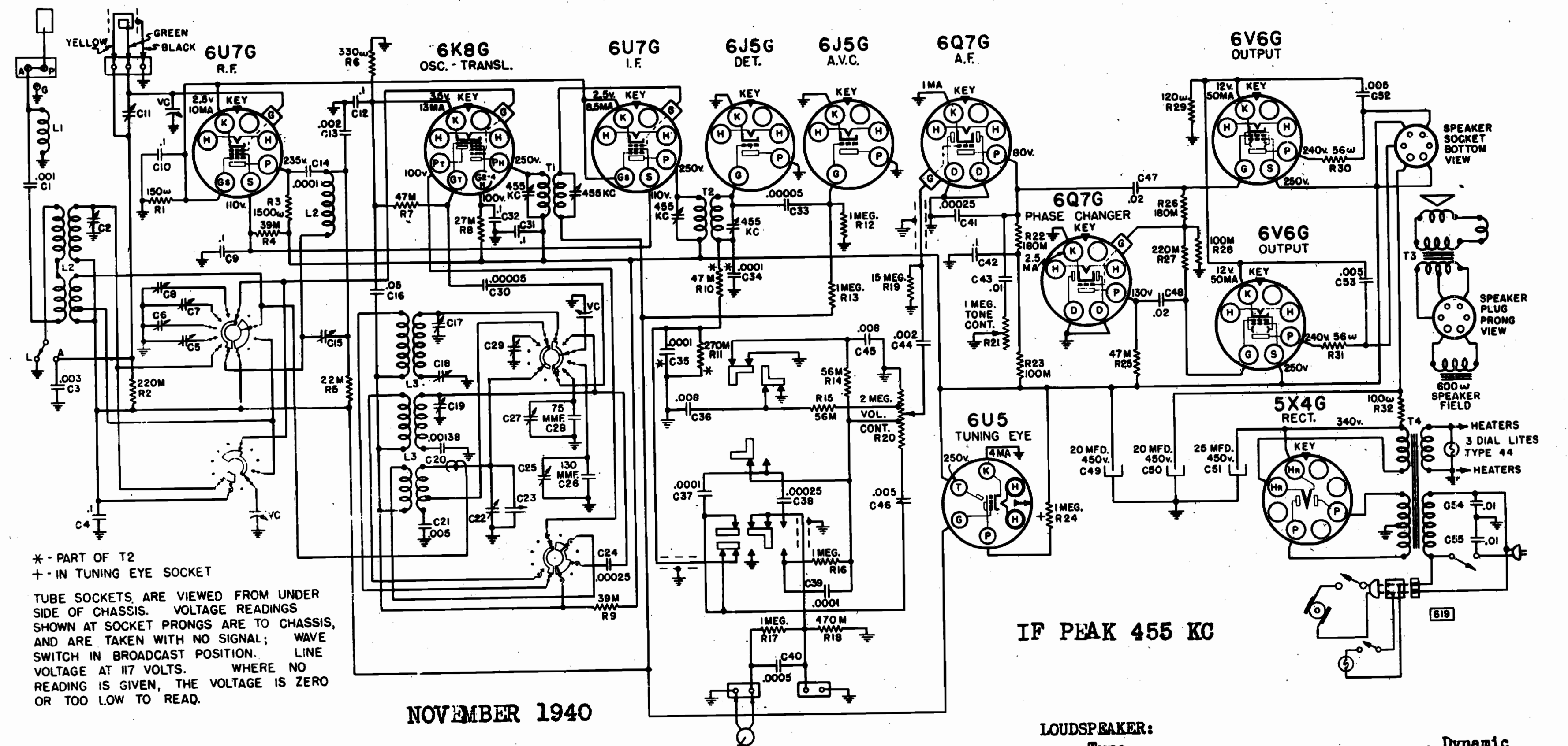
LOCATIONS OF PARTS ON TOP OF CHASSIS 101.618, -1A



LOCATIONS OF PARTS UNDER CHASSIS - 101.618, -1A

SEARS ROEBUCK & CO.

MODELS 5511, 5511-A
Chassis 101.619
101.619-A



* - PART OF T2
+ - IN TUNING EYE SOCKET

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

NOVEMBER 1940

POWER SUPPLY:

All models available . . . . 105-125 volts, 50-60 cycles; 150 watts
All models available . . . . 105-125 volts, 25-60 cycles; 160 watts

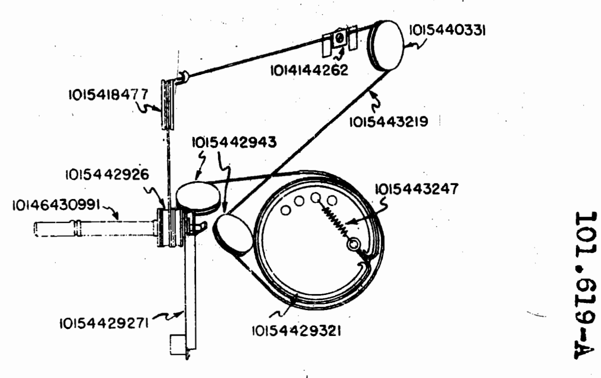
LOUDSPEAKER:

Type	Dynamic
Size	12 inch
Approx. field coil resistance	600 ohms
Approx. field coil voltage drop.	75 volts

ALIGNMENT FREQUENCIES:

FREQUENCY RANGES:		Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
Band "A"	538-1620 kc	1620 kc	1400 kc	600 kc
Band "B"	1.66-5.2 mc	5.2 mc	4 mc	Fixed
Band "C"	5.88-18.2 mc	18.3 mc	15 mc	Fixed
Band "D"	9.36-9.87 mc	9.55 mc	9.55 mc	Fixed
Band "E"	10.93-12.1 mc	11.71 mc	11.71 mc	Fixed
Band "F"	12.72-16 mc	15.5 mc	15.5 mc	Fixed

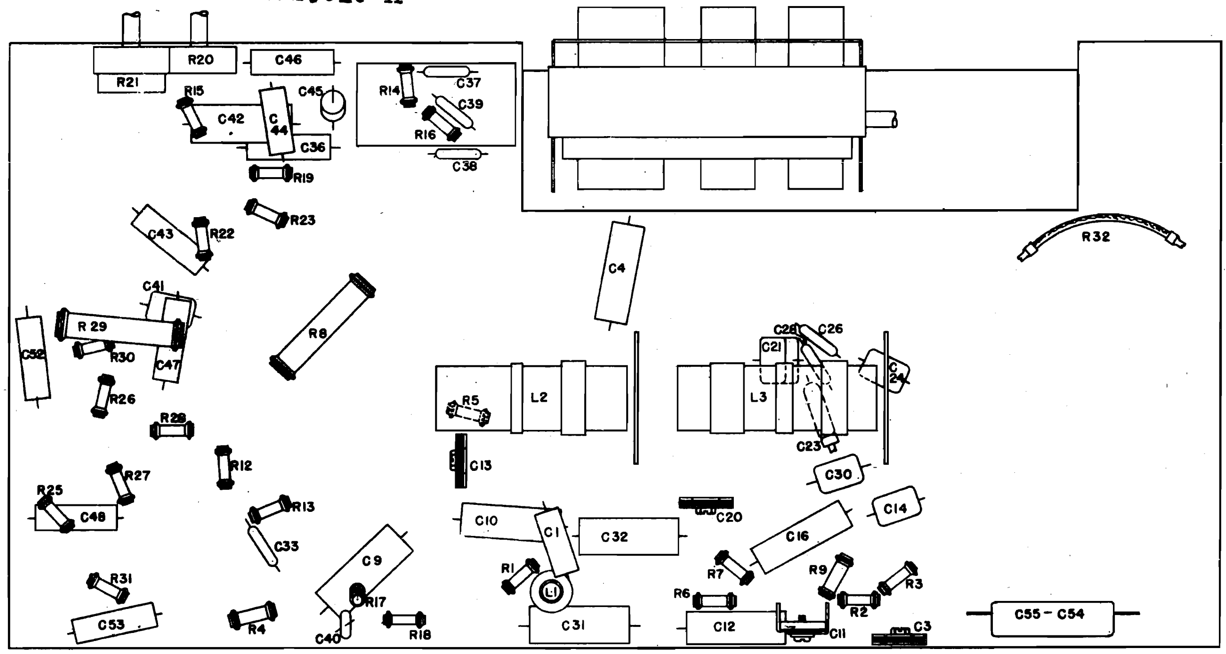
INTERMEDIATE FREQUENCY . . . . 455 kc



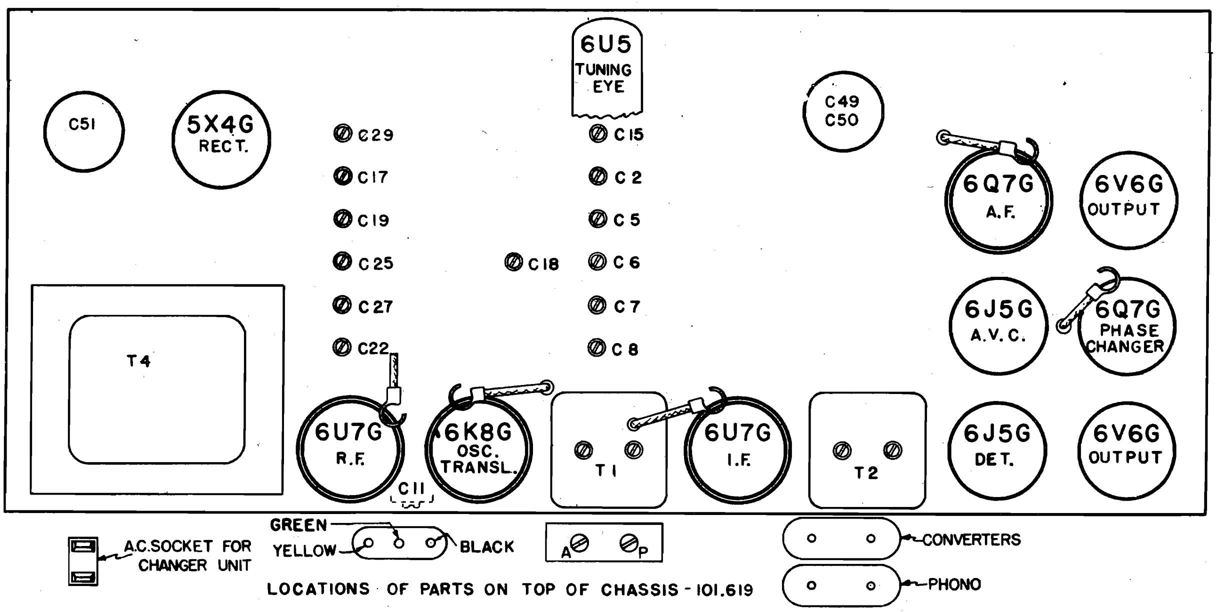
The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment.

MODELS 5511, 5511-A
Chassis 101.619 101.619-A

SEARS ROEBUCK & CO.



LOCATIONS OF PARTS UNDER CHASSIS 101.619



LOCATIONS OF PARTS ON TOP OF CHASSIS - 101.619

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"A"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	—
"A"	Fully open	1620 kc	.00005 mfd.	Ant. Term.	C17	Oscillator	—
"A"	1400 kc	1400 kc	.00005 mfd.	Ant. Term.	C11,C15	Loop,Transl.	150
"A"	600 kc (rock)	600 kc	.00005 mfd.	Ant. Term.	C18	Padder	60
"B"	5.2 mc	5.2 mc	400 ohms	Ant. Term.	C19	Oscillator	—
"B"	4 mc	4 mc	400 ohms	Ant. Term.	C2	Translator	90
"C"	Open	18.3 mc	400 ohms	Ant. Term.	C22*	Oscillator	—
"C"	15 mc (rock)	15 mc	400 ohms	Ant. Term.	C5	Translator	35
"D"	9.55 mc	9.55 mc	400 ohms	Ant. Term.	C25*	Oscillator	—
"D"	9.55 mc (rock)	9.55 mc	400 ohms	Ant. Term.	C6	Translator	70
"E"	11.71 mc	11.71 mc	400 ohms	Ant. Term.	C27*	Oscillator	—
"E"	11.71 mc (rock)	11.71 mc	400 ohms	Ant. Term.	C7	Translator	60
"F"	15.5 mc	15.5 mc	400 ohms	Ant. Term.	C29*	Oscillator	—
"F"	15.5 mc (rock)	15.5 mc	400 ohms	Ant. Term.	C8	Translator	40

IMPORTANT ALIGNMENT NOTES

* If two peaks can be had, the correct one is with the trimmer screw further out; the other peak is the image.

SEARS ROEBUCK & CO.

MODELS 3661, 3761, 3861, 1621
Chassis 109.355, -A, -B, -C

POWER SUPPLY. . . . 105-125 volts 50-60 cycles or DC - 30 Watts. 25 cycle models available.

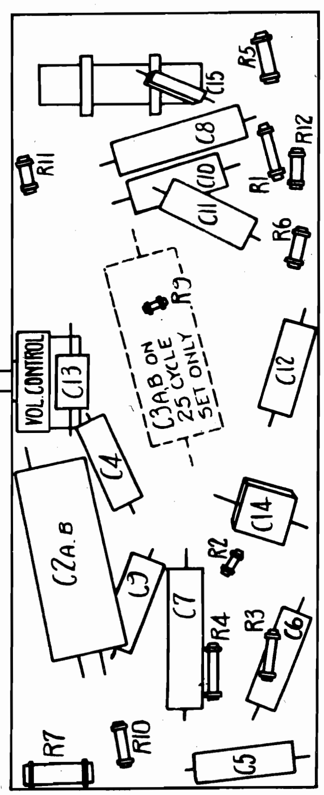
FREQUENCY RANGE . . . . 540-1600 kc ALIGNMENT FREQUENCIES: . . . . 1400 kc

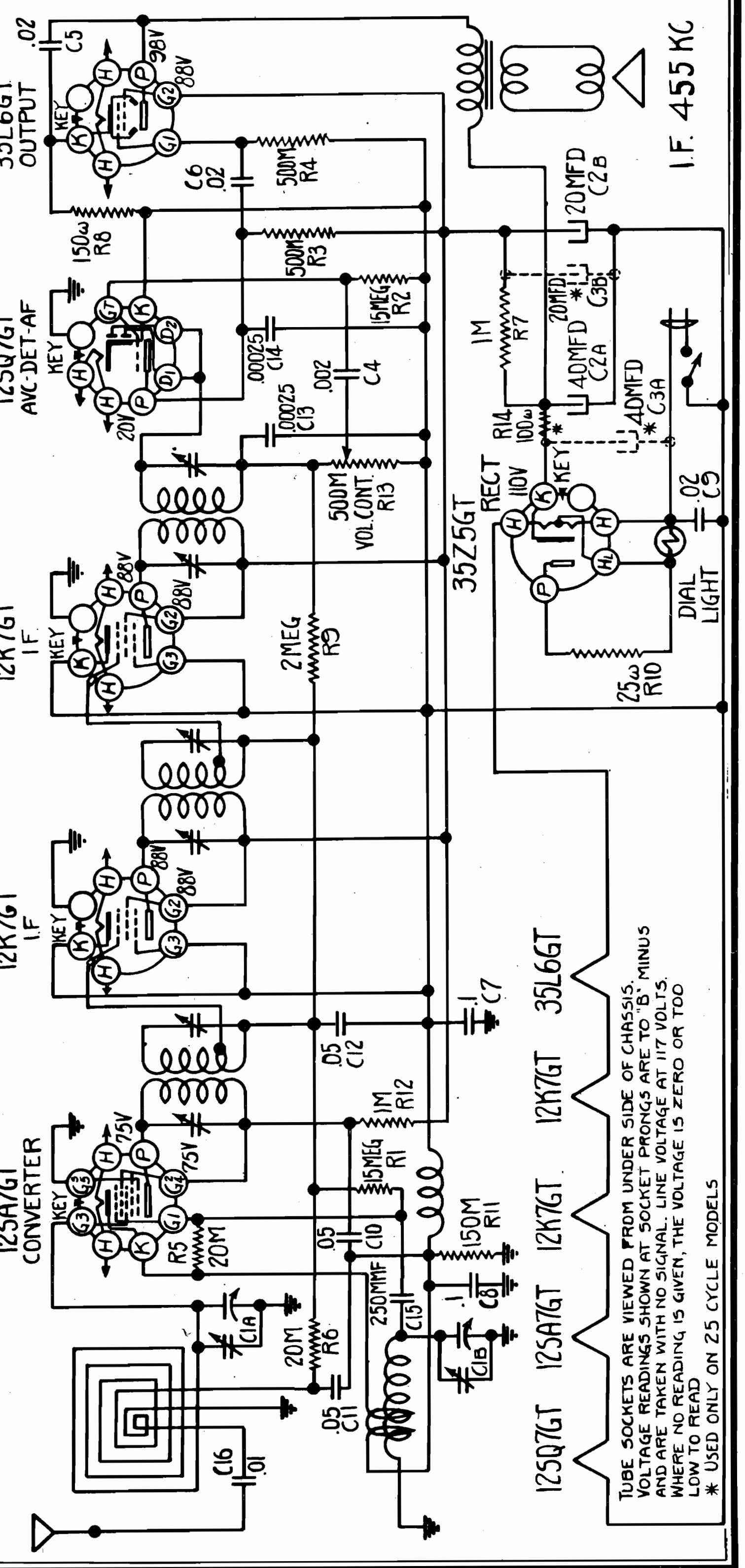
INTERMEDIATE FREQUENCY . . . . 455 kc

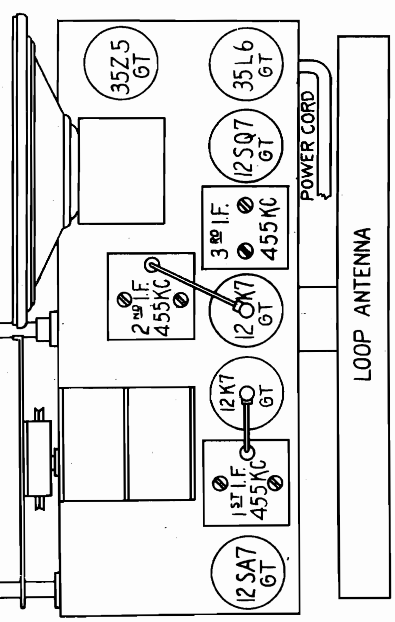
IF Alignment frequency . . . . 455 kc
Osc. & Ant. Align & Calibrate . . . . . 1400 kc

POWER OUTPUT:
Type. . . . . Beam Tube
Undistorted . . . . 0.8 Watt
Maximum . . . . 1.4 Watt

SEPTEMBER 16, 1940





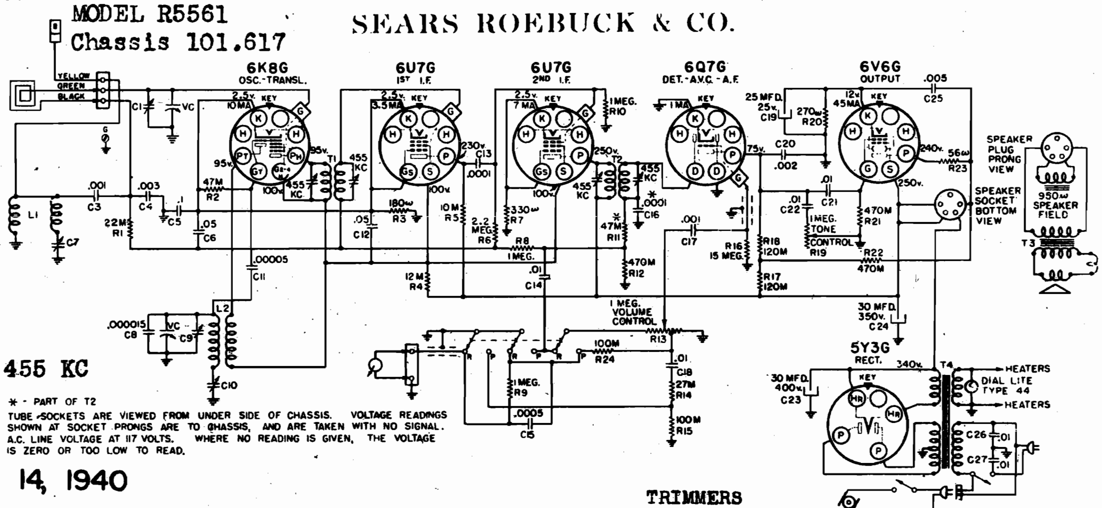


This receiver covers the broadcast band 540-1600 KC. A "tracking section" oscillator condenser is used to accomplish tracking without a padding condenser. The only adjustments provided on the RF portion of the receiver are the loop and oscillator trimmers. The circuit is quite conventional.

It is recommended that the aligning signal be induced from another loop into the loop on the set rather than to follow the conventional practice of introducing the signal through a dummy antenna into the antenna lead. A loop 5 or 6 inches in diameter made of ordinary hook-up wire, and placed 3 or 4 inches behind the loop of the set and fed through a carbon resistor of 400 to 2000 ohms is the recommended device for inducing the aligning signal into the receiver loop.

MODEL R5561
Chassis 101.617

SEARS ROEBUCK & CO.



IF PEAK 455 KC

* - PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. A.C. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

AUGUST 14, 1940

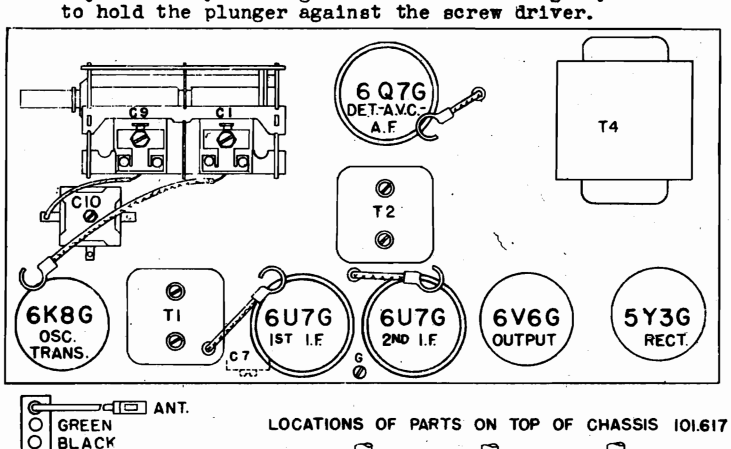
POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
600 kc	455 kc	.00005 mfd.	Ant. Clip	C7*	Wave Trap	--
Fully open	1620 kc	.00005 mfd.	Ant. Clip	C9	Oscillator	--
1400 kc	1400 kc	.00005 mfd.	Ant. Clip	C1	Translator	150
600 kc(rock)	600 kc	.00005 mfd.	Ant. Clip	C10	Padder	65

Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . .1.9 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Position of Tone Control . . . . .Counter-clockwise (HI)
Position of Dial Pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark

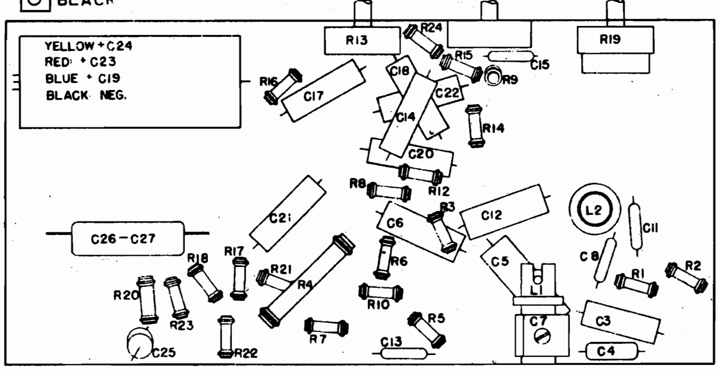
* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment by holding the screw driver lightly in the screwhead allowing the spring tension to hold the plunger against the screw driver.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.617



LOCATIONS OF PARTS UNDER CHASSIS 101.617

INTERMEDIATE FREQUENCY . . . . . .455 kc

POWER SUPPLY:
All models available . . . . . .
105-125 v. 60 cycle AC, 70 watts
105-125 v. 50 cycle AC, 70 watts
105-125 v. 25 cycle AC, 75 watts

POWER OUTPUT:
Type . . . . Beam tube
Undistorted . . . . 4 watts
Maximum . . . . 6 watts

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Translator Trimmer	Padder
1620 kc	1400 kc	600 kc

FREQUENCY RANGE: . . . . .540-1620 kc

LOUDSPEAKER:
Type . . . . Dynamic
Size . . . . 10 inch
Field coil resistance . . . . 950 ohms
Approx. field coil voltage drop. 90 V.

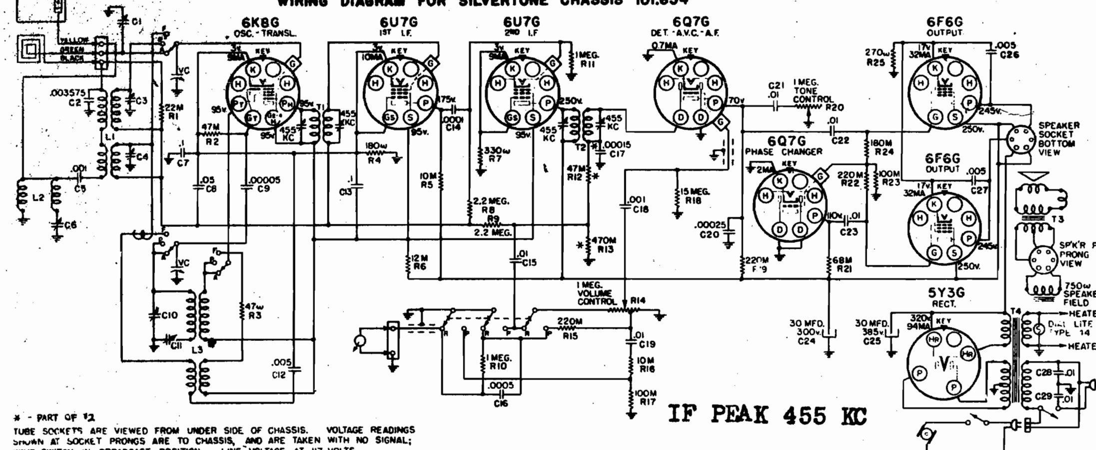
OPERATING FEATURES:
Tone Control. . .Continuously variable
Automatic Volume Control
Push Button Tuning (5 Button)
Combined with Automatic Record Changer

CHASSIS FEATURES:
Number IF stages . . . . Two
Number condensers in gang . . . . .Two
Antenna. .Built-in loop with provision for external antenna.

SEARS ROEBUCK & CO.

MODEL 5581
Chassis 101.634

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.634



* - PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL; WAVE SWITCH IN BROADCAST POSITION. LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

WAVE BAND SWITCH POSITION	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
"AM"	Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
"AM"	600 kc	455 kc	.00005 mfd.	Ant. Clip	C6*	Wave Trap	--
"AM"	Fully open	1620 kc	.00005 mfd.	Ant. Clip	C10	Oscillator	--
"AM"	1400 kc	1400 kc	.00005 mfd.	Ant. Clip	C1	Translator	200
"AM"	600 kc(rock)	600 kc	.00005 mfd.	Ant. Clip	C11	Padder	100
"POL"	2.4 mc	2.4 mc	400 ohms	Ant. Clip	C3	Translator	35
"FOR"	15 mc(rock)	15 mc	400 ohms	Ant. Clip	C4	Translator	10

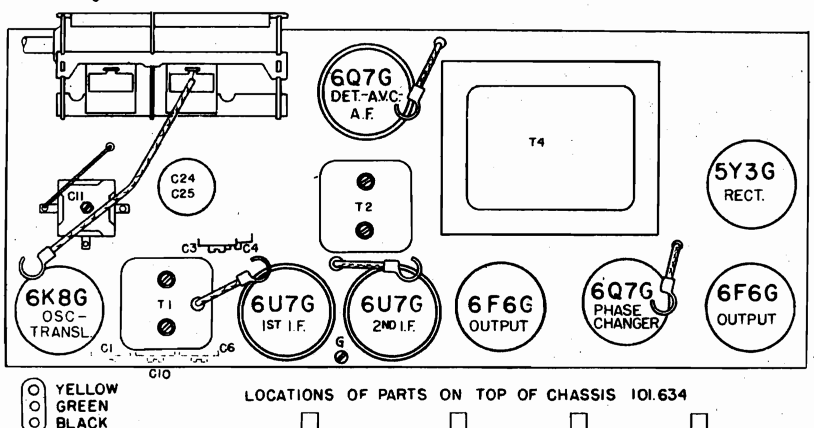
Output meter connection . . . . .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts .1.1 volts
Approximate microvolts input to indicate 500 milliwatts output . . . . See chart below
Position of Tone Control . . . . .Treble
Position of Dial Pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

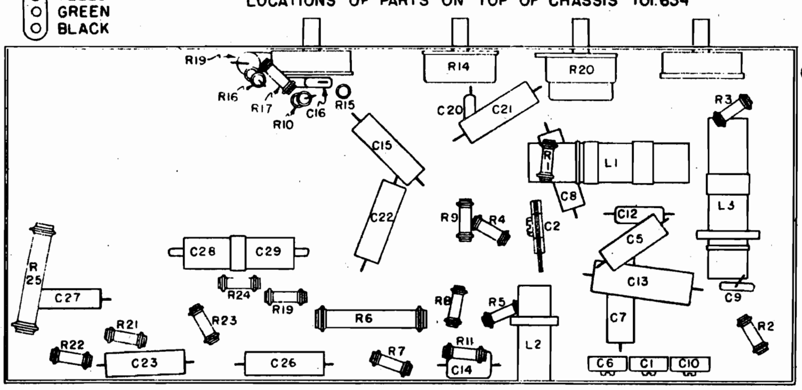
SEPTEMBER 6, 1940

PUSH BUTTON TUNING MECHANISM:

The adjustment for each push button is locked or unlocked by tightening or loosening the slotted screwhead made accessible when the push button knob is pulled off of its plunger. Stations are set up by unlocking the mechanism, tuning in the station, pushing in the plunger (being careful not to detune the station), releasing the plunger, then securely locking the adjustment.



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.634



LOCATIONS OF PARTS UNDER CHASSIS 101.634

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER SUPPLY:
All models available . . . . . .
105-125 volt, 60 cycles AC: 115 watts
105-125 volt, 50 cycles AC: 115 watts
105-125 volt, 25 cycles AC: 120 watts

POWER OUTPUT:
Type . . . . .Pentode
Undistorted . . . . 4 watts
Maximum . . . . 7 watts

FREQUENCY RANGES:
Band "A" . . . . 540-1620 kc
Band "B" . . . . 1450-2530 kc
Band "C" . . . . 5.8-18.5 mc

ALIGNMENT FREQUENCIES:

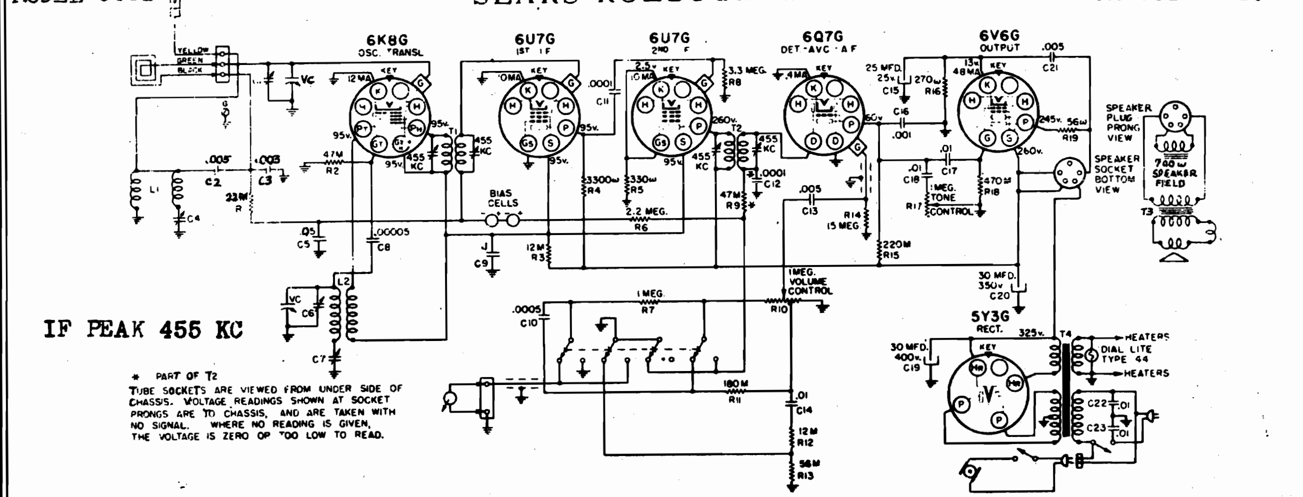
Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1620 kc	1400 kc	600 kc
None	2.4 mc	Fixed
None	15 mc	Fixed

OPERATING FEATURES:
Automatic Volume Control
Push Button Tuning (5 buttons)
Tone Control. . . Continuously variable
Combined with Automatic Record Changer

LOUDSPEAKER:
Type . . . . .Dynamic
Size . . . . .10 inch
Field coil resistance . . . .750 ohms
Approx.field coil voltage drop.. 70 v.

CHASSIS FEATURES:
Number IF stages . . . . .Two
Number condensers in gang . . . . Two
Underwriters Approved
Built-in rotatable loop for Broadcast band and plate for Short Wave bands (RADIONET Antenna System).
Built-in IF Wave Trap

MODEL 5661 — SEARS ROEBUCK & CO. — Chassis 101.633



IF PEAK 455 KC

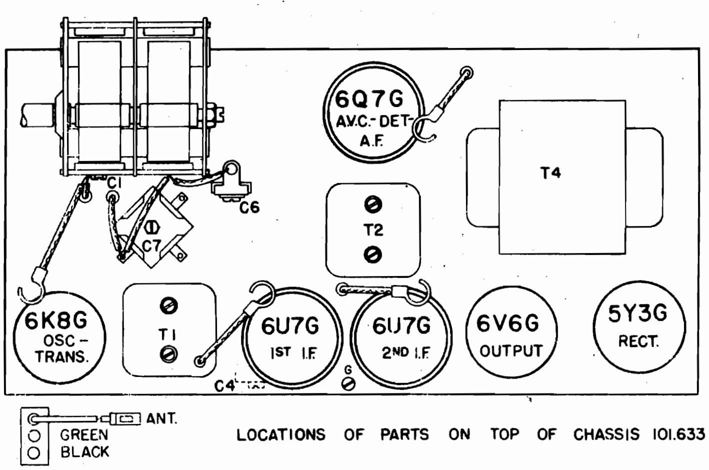
* PART OF T2
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROXIMATE MICROVOLTS
Closed	455 kc	.1 mfd.	6K8G Grid	T2,T1	IF	--
600 kc	455 kc	.00005 mfd.	Ant. Clip	C4*	Wave Trap	--
Fully open	1620 kc	.00005 mfd.	Ant. Clip	C6	Oscillator	--
1400 kc	1400 kc	.00005 mfd.	Ant. Clip	C1	Translator	135
600 kc (rock)	600 kc	.00005 mfd.	Ant. Clip	C7	Padder	55

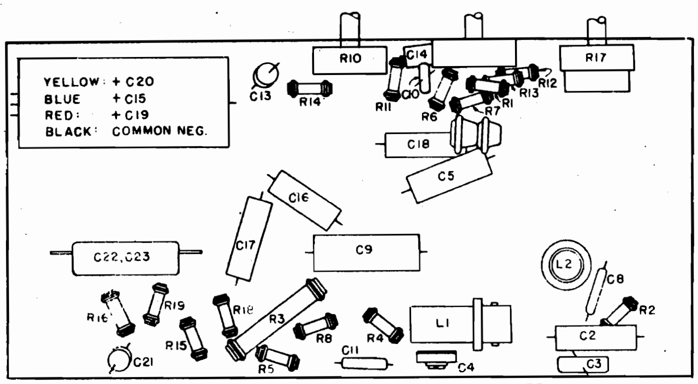
IMPORTANT ALIGNMENT NOTES

* The generator should be adjusted for high output. The trimmer should be adjusted for minimum output meter reading instead of the usual maximum reading. If the frequency of an interfering station around 455 kc is known, the generator should be adjusted to the frequency of that station instead of to 455 kc.

Output meter connection .Across loudspeaker voice coil
Output meter reading to indicate 500 milliwatts . . . . 1.9 volts
Approximate microvolts input for 500 milliwatts output . . . . See chart below
Position of Volume Control . . . . Fully clockwise
Position of Tone Control . . . . .Counter-clockwise (HI)
Position of Dial Pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark



LOCATIONS OF PARTS ON TOP OF CHASSIS 101.633



LOCATIONS OF PARTS UNDER CHASSIS 101.633

SEPTEMBER 17, 1940

INTERMEDIATE FREQUENCY . . . . 455 kc

FREQUENCY RANGE: . . . . 540-1620 kc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Translator Trimmer	Padder
1620 kc	1400 kc	600 kc

POWER SUPPLY:
All models available
105-125 v. 60 cycle AC, 85 watts
105-125 v. 50 cycle AC, 85 watts
105-125 v. 25 cycle AC, 90 watts

POWER OUTPUT:
Type . . . . Beam tube
Undistorted . . . . 2.5 watts
Maximum . . . . 5 watts

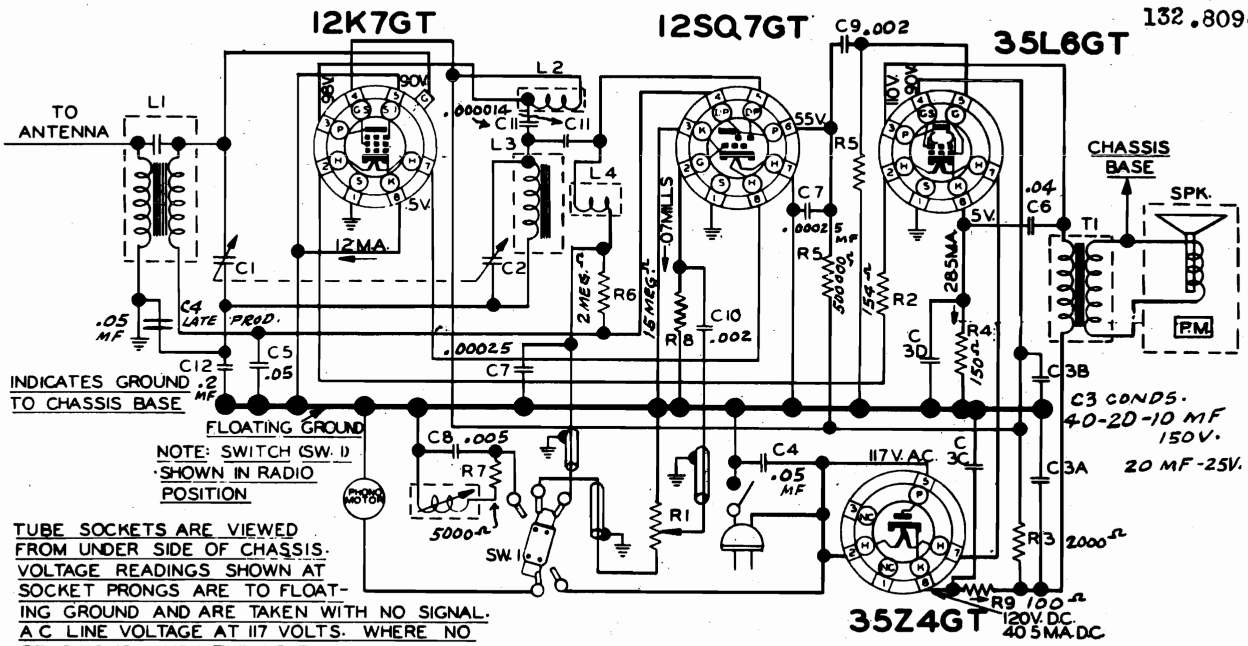
OPERATING FEATURES:
Tone Control. . .Continuously variable
Automatic Volume Control
Combined with Automatic Record Changer

LOUDSPEAKER:
Type . . . . Dynamic
Size . . . . 10 inch
Field coil resistance . . . . 700 ohms
Approx.field coil voltage drop... 65 v.

CHASSIS FEATURES:
Number IF stages . . . . Two
Number condensers in gang . . . . .Two
Antenna...Built-in loop with provision for external antenna

SEARS ROEBUCK & CO.

MODEL 5701
Chassis 132.809
132.809-1



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A C LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

ALIGNMENT PROCEDURE

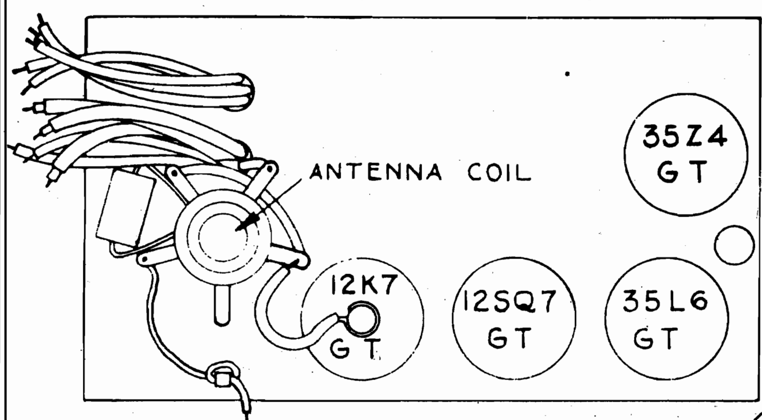
POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (high)	GENERATOR CONNECTION (Low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION
1400 kc	1400 kc	.00005 mfd.	Ant. hank	Chassis base	C2, C1	R.F. Tank
600 kc	600 kc	.00005 mfd.	Ant. hank	Chassis base	Check Point	R.F. Tank

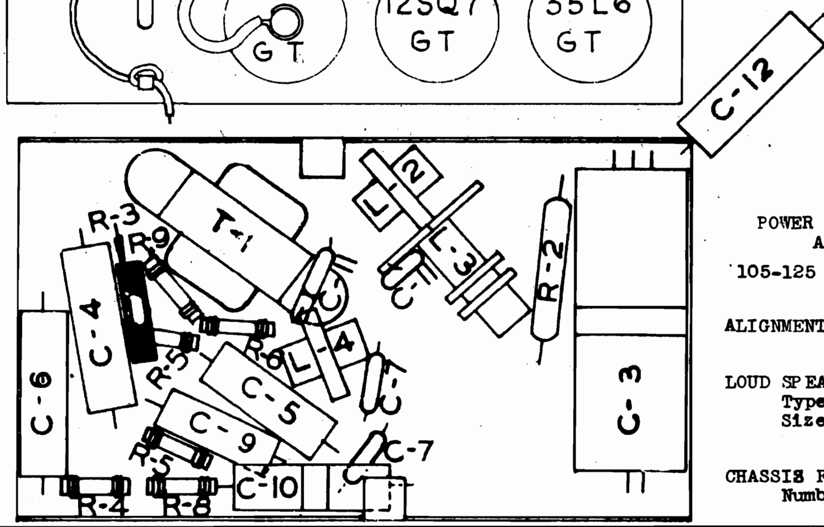
Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.38 volts

When properly set with the variable condenser closed the pointer will point to the "54" calibration mark.

The alignment procedure should be repeated stage by stage, in the original order for greatest accuracy. Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

Position of Volume Control . . . . Fully clockwise
Position of Dial Pointer with variable fully closed . . . . See note





FREQUENCY RANGE . . . . . . 540-1720 kc

POWER OUTPUT:
- Type . . . . . Beam Tube
- Undistorted . 1.0 watts
- Maximum . . . 2.6 watts

OPERATING FEATURES:
- Automatic Volume Control
- AC only; 60 cycles & 50 cycles *

JUNE 18, 1940

TUBES AND FUNCTIONS:
- 12K7GT . . . . RF
- 12SQ7GT . . Dectector-AVC-AF
- 35L6GT . . . . Output
- 35Z4GT . . . . Rectifier

POWER SUPPLY:
All models available . . . .
105-125 volts, AC-only-60 cycles, 45 watts
50 cycles

ALIGNMENT FREQUENCIES: Ant.- 1400 kc
R.F.-1400 kc

LOUD SPEAKER:
- Type . . . . . . Permanent Magnet
- Size . . . . 4 inch

CHASSIS FEATURES:
Number TRF stages . . . . . two

MODEL 5711
Chassis 110.409

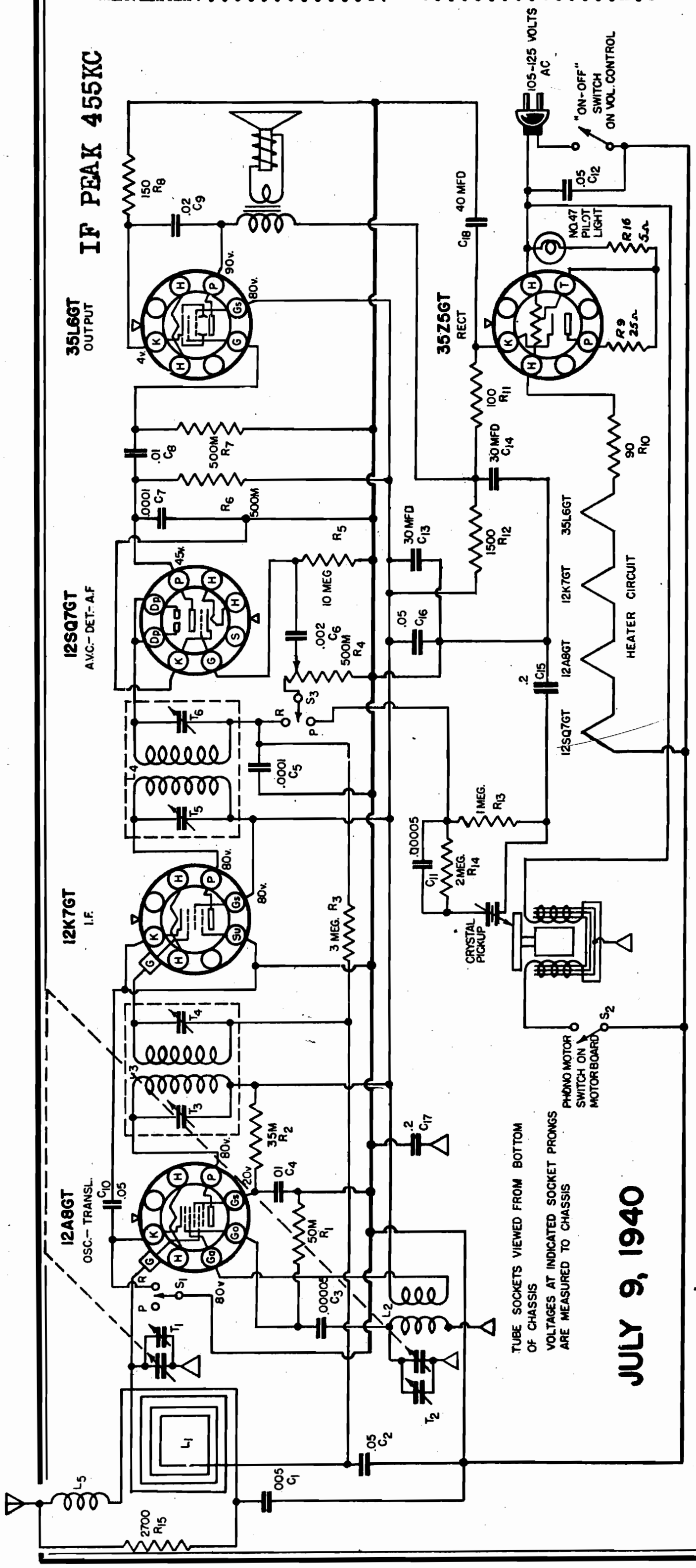
SEARS-ROEBUCK & CO.

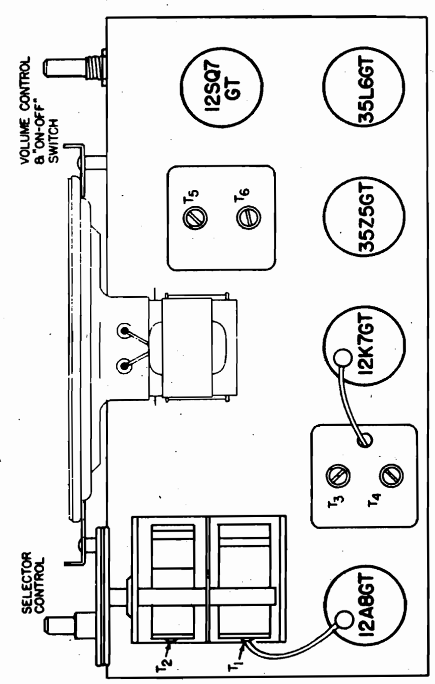
POWER SUPPLY:
All models available. . . . . .110-125 volts, 25-60 cycle AC or DC,30 watts

FREQUENCY RANGE:		ALIGNMENT FREQUENCIES:	Oscil. Trimmer	Oscil. Padder
Broadcast	.540-1730 KC	Broadcast	.1500 KC	Fixed

POWER OUTPUT:
Type...........................Beam Power
Undistorted 1.0
Maximum..............................1.5

LOUD SPEAKER:
Type......................................Dynamic
Size...5"
Field.......................................P.M.





ALIGNMENT PROCEDURE

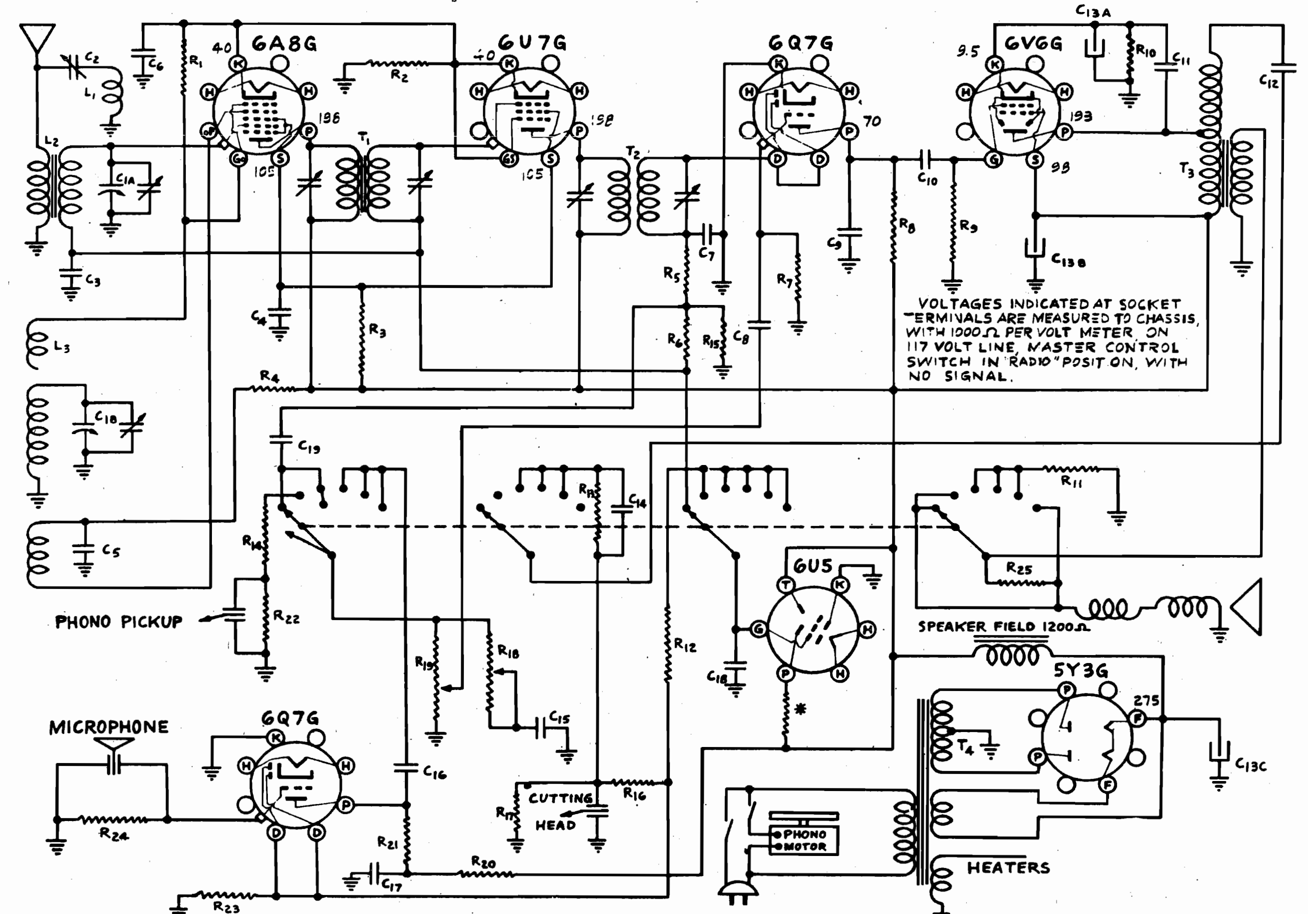
Output meter conn. ... Across primary o.p. transf.
Dummy ant. in series with gen. o.p. ... 100 mmfds.
Conn. of gen. ground .... B Minus Bus
Gen. Modulation .... App. 30% @ 400 cycles
Pos. of vol. control .... Fully clockwise

Always keep o.p. from test oscillator at its lowest possible value. As sensitivity is increased by alignment,the gen. o.p. should be reduced correspondingly. **Short Oscillator section of variable condenser. ***Connect gen. o.p. to a separate radiating loop and pickup 1500 KC signal on receiver.

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
**	455 KC	12K7GT,Grid	T5, T6	I.F.
**	455 KC	12A8GT,Grid	T3, T4	I.F.
1500 KC	1500 KC	***	T2, T1	Osc.,R.F.

SEARS-ROEBUCK & CO.

MODELS 5731,5761
Chassis 109.359



SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	PRICE EACH
R19	109288260	Control, Volume and Switch	1.25
R18	109258519	Control, Tone	.80
	109542562	Cap, Tube Shield	.10
L1	109288624	Coil, Wave Trap	.40
L2	109288261	Coil, Antenna	1.15
L3	109288446	Coil, Oscillator	.75
C1a,b	109168472	Condenser, Variable	2.75
C2	109173272	Condenser, Trimmer	.30
C3,17,18		Condenser, .1 mfd. 200 volt	.20
C4,6		Condenser, .2 mfd. 200 volt	.25
C5,16		Condenser, .01 mfd. 400 volt	.20
C7,9		Condenser, 250 mmf. mica	.25
C10		Condenser, .02 mfd. 400 volt	.20
C11,15,18		Condenser, .002 mfd. 600 volt	.20
C12		Condenser, .01 mfd. 600 volt	.20
C13a,b,c	109208339	Condenser, Electrolytic	1.65
C14		Condenser, .001 mfd. 400 volt	.20
R1,5,13		Resistor, 50 M 1/3 watt	.15
R2		Resistor, 200 ohm 1/3 watt	.15
R3		Resistor, 15 M 1 watt	.20
R4		Resistor, 20 M 1/3 watt	.15
R6,15		Resistor, 1 meg 1/3 wa tt	.15
R7		Resistor, 10 meg 1/3 watt	.15
R16,24		Resistor, 5 meg 1/3 watt	.15
R8,14,21,22		Resistor, 200 M 1/3 watt	.15
R9,20		Resistor, 500 M 1/3 watt	.15
R10		Resistor, 300 ohm 1/3 watt	.15
R11		Resistor, 5 ohm 1 watt	.20
R17		Resistor, 300 M 1/3 watt	.15
R12,23		Resistor, 2 meg 1/3 watt	.15
R25		Resistor, 20 ohm 1 watt	.20
T1	109338415	Transformer, 1st LF	2.25
T2	109358456	Transformer, 2nd IF	2.25
T3	109138278	Transformer, Output	2.00
T4	109108455	Transformer, Power 60 cycle	4.50
	109108625	Transformer, Power 50 cycle	5.50
	109408448	Dial Chart	.35
	109418451	Pointer	.35
	109542541	Tube Shield	.15
	109548298	Shaft, Pointer	.20
	109544313	Bracket, Tuning Tube	.20
	109598461	Book, Instruction	.30
	109598283	Dial Crystal	.25
	109668285	Microphone	
	109448477	Plate, Motor Switch	.25
	109388454	Switch, Motor	.65
	109588295	Speaker, 6½" Dynamic	5.00

IF PEAK 455 KC

TUBES AND FUNCTIONS
6A8G.............Oscillator-Translator
6U7G......................IF Amplifier
6Q7G...............Detector-AVC-Audio

6Q7G......Pre-amplifier for Microphone
6V6G.....................Power Output
5Y3G.......................Rectifier

6U5....Tuning/Volume Indicator

POWER SUPPLY.......

105-125 volts AC 78 Watts

50 and 60 cycle models available.

FREQUENCY RANGE... .... 540 to 1720 KC.

ALIGNMENT FREQUENCIES

Intermediate frequency 455 kc., Wave Trap 455 kc.
Oscillator 1720 kc., Antenna 1400 kc.

POWER OUTPUT
Type......................Beam Tube
Undistorted............. 2.0 Watts
Maximum................. 3.5 Watts

SPEAKER
Type........................Dynamic
Size........................6½ Inch
Field Resistance.........1150 Ohms

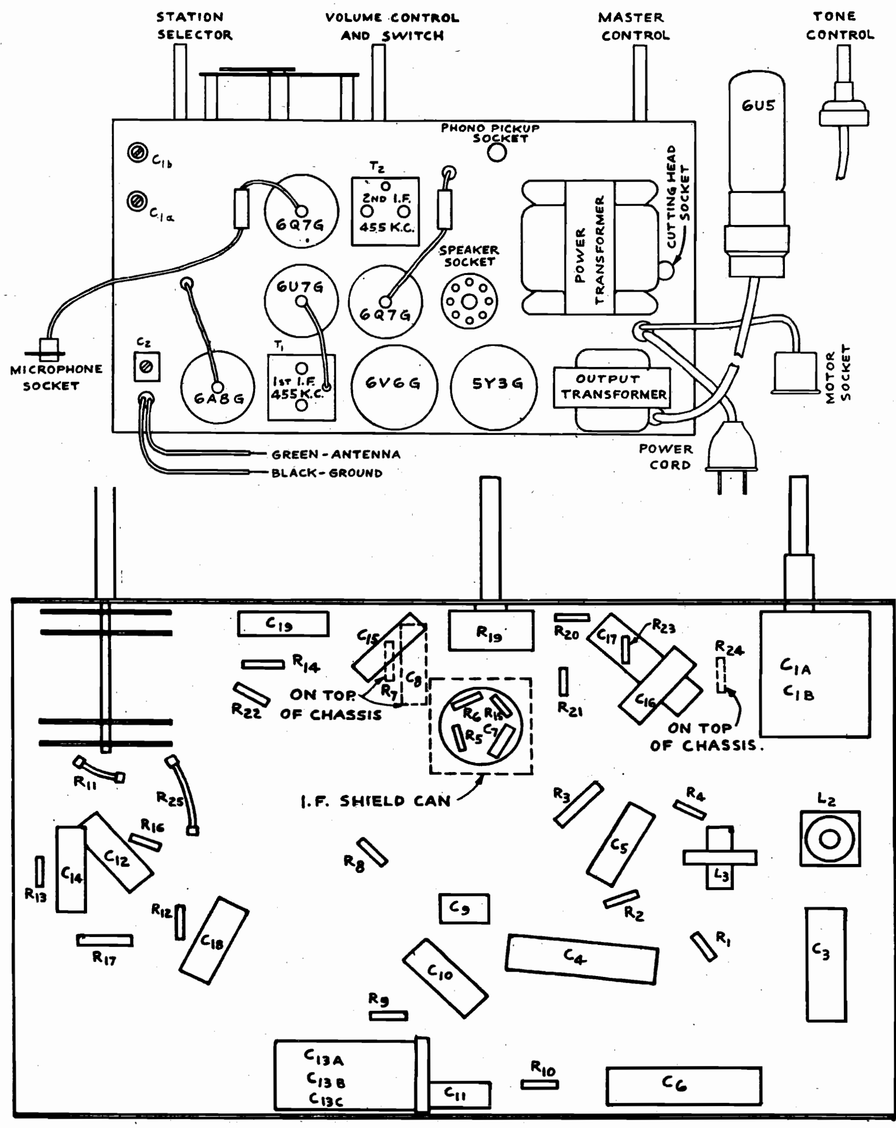
OPERATING FEATURES
Automatic Volume Control
Tuning Eye
Crystal Phono Pickup
Crystal Recording Head

SEPTEMBER 16, 1940

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 5731, 5761
Chassis 109.559

SEARS ROEBUCK & CO.



ALIGNMENT PROCEDURE

Output meter connection .... Across speaker voice coil
Connection of generator lead .... See chart below
Connection of generator ground lead .... To chassis
Dummy antenna value .... See chart below
Position of volume control .... Fully clockwise
Position of Master Control Switch ...."Radio" (Position No.1)

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
Open (Minimum capacity)	455 kc	.1 Mfd.	Grid of 6A8G	T2, T1	IF
Open	1720 kc	200 MMF.	Antenna lead	C1b	Oscillator
Tune in signal from generator	1400 kc	200 MMF.	Antenna lead	C1a	Antenna
Closed	455 kc	200 MMF.	Antenna lead	C2**	Wave trap

** Adjust C2 for minimum response.

The alignment procedure should be repeated stage by stage in the origional order for greatest accuracy.

Always keep the output from the generator at the lowest possible level so that the AVC action will be ineffective.

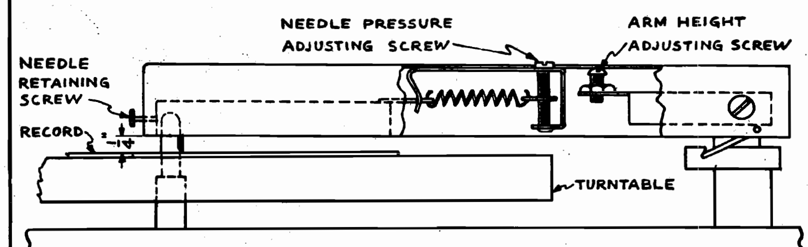
The location of all the alignment adjustments is shown on the top view of the chassis on the next page.

RECORDING ARM ADJUSTMENTS

The bottom of the recording arm should be exactly 1/4 inch from the surface of the record. This should be measured beside the needle retaining screw on the end of the arm. the screw for making this adjustment can be found when the arm is raised, on a small platform near the hinge. Turning the adjusting screw to the left raises the arm, turning to the right lowers it. In making an adjustment turn the screw only a small fraction of a turn at a time.

Make a cut of at least ten turns to see whether or not the needle is exerting the correct pressure on the record. This is correct when the groove cut by the needle is of approximately the same width as the space between grooves. On top of the recording arm is a flat head screw. Turning this screw to the right increases the depth of cut, to the left decreases it. This adjustment is quite critical and the screw should be turned not more than 1/4 turn at a time.

The diagram below shows the location of these adjustments.



RECORDING ARM ADJUSTMENTS

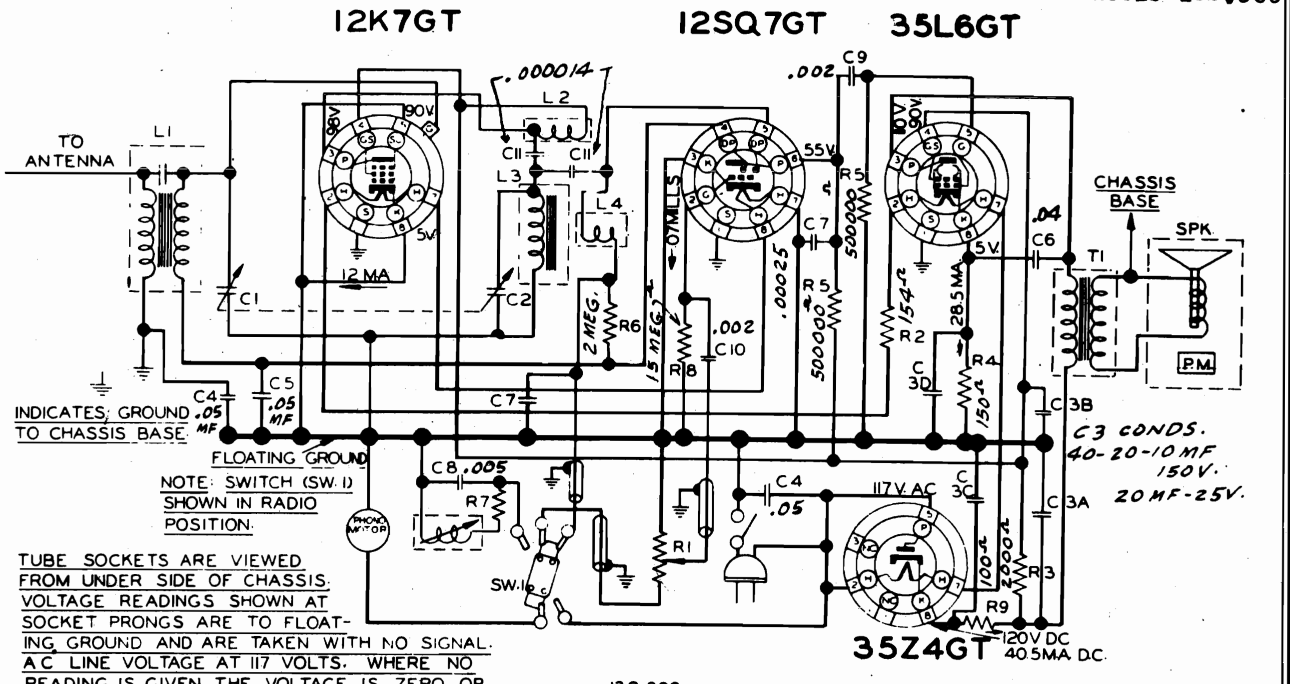
In the recording positions (Positions 3,4, and 5 of the Master Control Switch) the volume from the speaker is reduced. This is done automatically by the switch for three reasons, some of the power from the output tube is needed for operating the recording head, the volume level necessary for recording is too high for the average room, and to prevent the sound from the speaker from reaching the microphone.

If the recording needle is not very sharp the quality of the recording will be poor. A needle which has become dull through use or which has been otherwise damaged should be replaced.

The Master Control Switch should always be turned to the No. 1 (Radio) position when listening to radio programs.

SEARS-ROEBUCK & CO.

MODEL 5741
Chassis 132.808



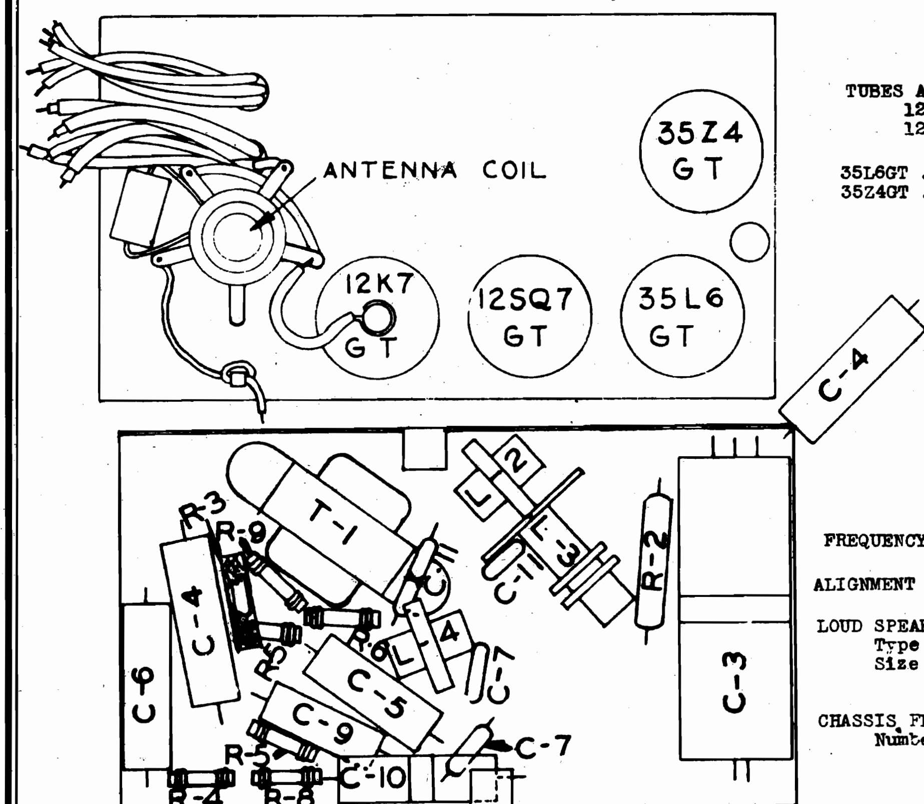
TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. A C LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POSITION OF VARIABLE	FREQUENCY GENERATOR	DUMMY ANTENNA	GENERATOR CONNECTION (High)	GENERATOR CONNECTION (Low)	TRIMMERS ADJUSTED (In order shown)	TRIMMER FUNCTION
1400 kc	1400 kc	.00005 mfd.	Ant. hank	Chassis base	C2, C1	R.F. Tank
600 kc	600 kc	.00005 mfd.	Ant. hank	Chassis base	Check Point	R.F. Tank

IMPORTANT ALIGNMENT NOTES

When properly set with the variable condenser closed the pointer will point to the "54" calibration mark.

Output meter connection . . . . Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.38 volts
Dummy antenna value to be in series with generator output . . . . See chart below
Position of Volume Control . . . . Fully clockwise
Position of Dial Pointer with variable fully closed . . . . See note below



JUNE 18, 1940

TUBES AND FUNCTIONS:
12K7GT . . . . R.F.
12SQ7GT . . Detector-AVC-AF

35L6GT . . . . Output
35Z4GT . . . . Rectifier

POWER SUPPLY:
All models available

105-125 volts, AC-only -60 cycles
45 watts

POWER OUTPUT:
Type . . . . . Beam Tube
Undistorted . .1.0 watts
Maximum . . . .2.6 watts

OPERATING FEATURES:
Automatic Volume Control
AC only; - 60 cycles

FREQUENCY RANGE . . . . 540-1720 kc.

ALIGNMENT FREQUENCIES. Ant.- 1400 kc; RF.- 1400 kc;

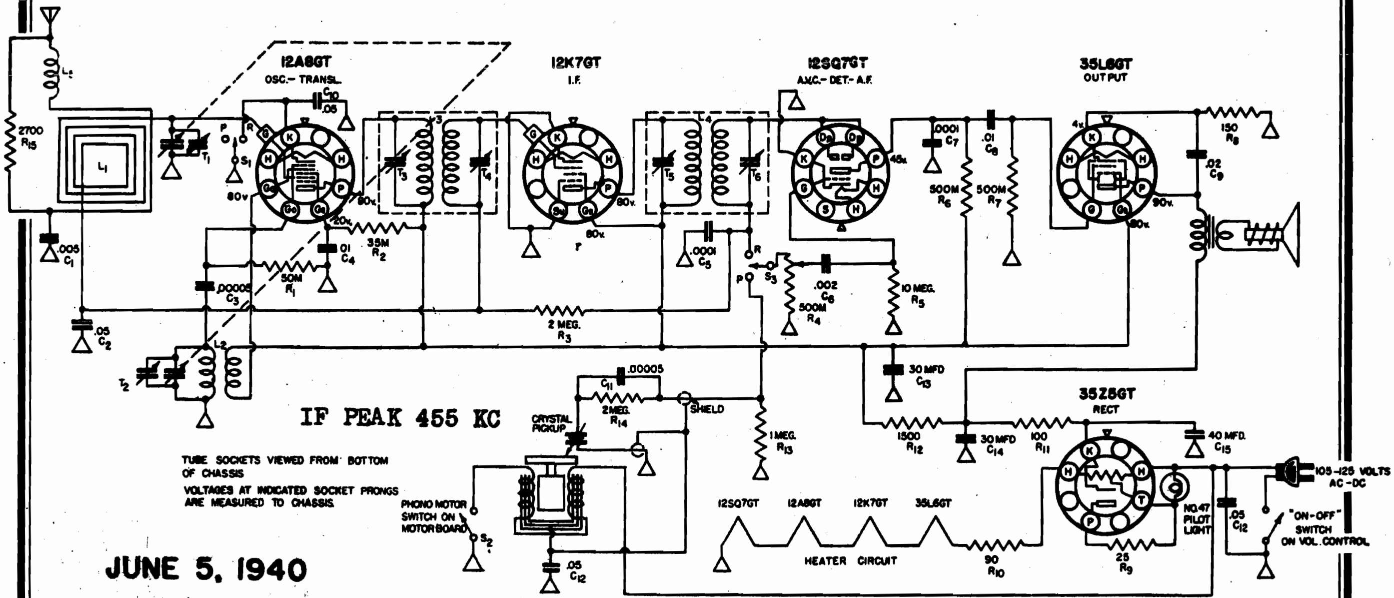
LOUD SPEAKER:
Type . . . . Permanent Magnet
Size . . . . 4 inch

CHASSIS FEATURES:
Number TRF stages . . . . two

MODEL 5751
Chassis 110.403

SEARS-ROEBUCK & CO.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 110.403



JUNE 5, 1940

ALIGNMENT PROCEDURE

Output meter connections. . . . . .Across primary output transformer

Connection of generator ground. . . . . .chassis

Generator modulation. . . . . .App. 30% @400 cycles

Position of volume control. . . . . .Fully clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
**	455KC	12K7GT,Grid	T5,T6	I.F.
**	455 KC	12A8GT,Grid	T3,T4	I.F.
1500 KC	1500 KC	***	T2,T1	Osc.,R.F.

IMPORTANT ALIGNMENT NOTES

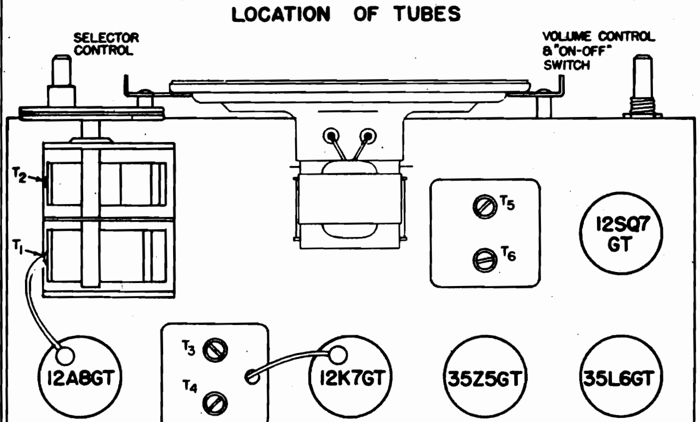
It is advisable to repeat the entire alignment proceedure in the original order to insure greater accuracy.

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

** Short oscillator section of variable condenser.

*** Connect generator output to a separate radiating loop and pickup 1500 KC signal on receiver.

LOCATION OF TUBES



FREQUENCY RANGE

Broadcast . . . . .540-1730 KC

POWER OUTPUT:
Type.........................Beam Power
Undistorted..............................1.0
Maximum.................................1.5

POWER SUPPLY:
All models available

110-125 volts, 25-60 cycle AC or DC, 30 watts

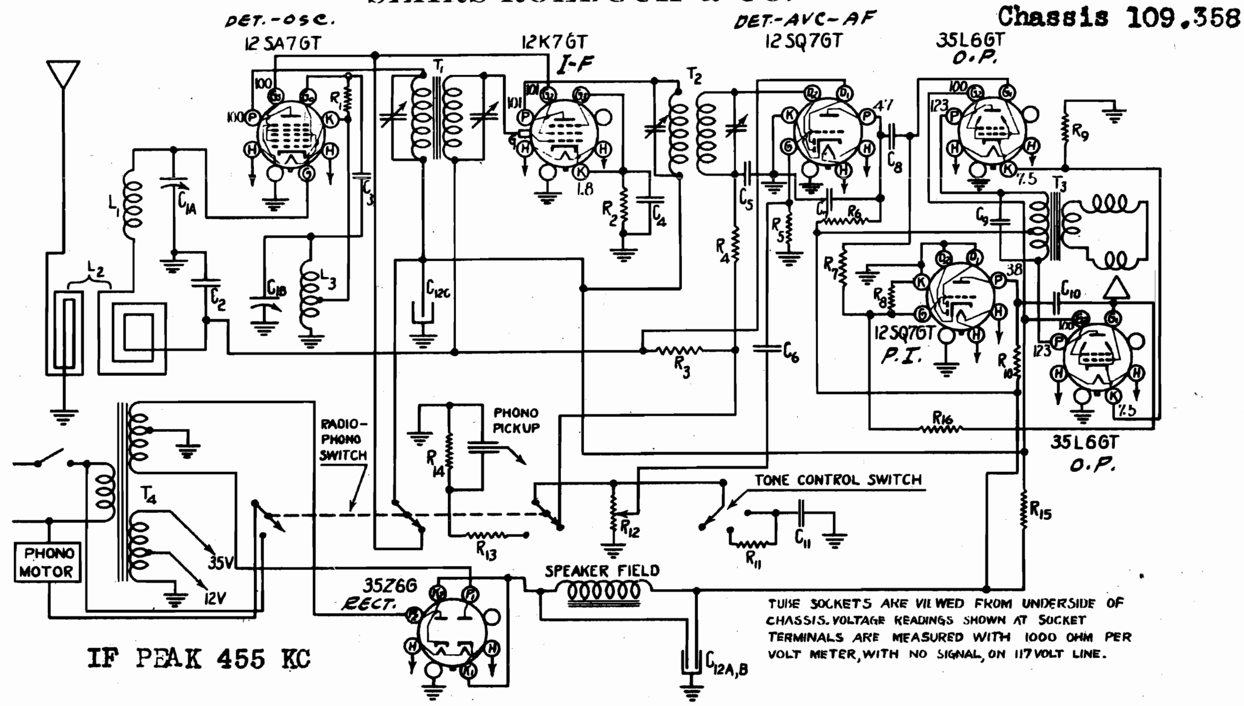
ALIGNMENT FREQUENCIES:

	Oscil. Trimmer	Oscil. Padder
Broadcast	1500 KC	Fixed

LOUD SPEAKER:
Type...................................Dynamic
Size...5"
Field......................................P.M.

SEARS-ROEBUCK & CO.

MODEL 5771
Chassis 109.358



PARTS LIST-

AUGUST 21, 1940

RETAIL SELLING PRICES PREPAID
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH
	109544417	Button, Snap (Dial mounting)	.02
	109542163	Cable, Drive	.05
	109543227	Cap, Grid	.03
R12	109248421	Control, Volume & Switch	1.25
	109551732	Cord, Line	.45
	109546424	Clamp, Line Cord	.10
L3	109288422	Coil, Oscillator	1.00
L1	109288423	Coil, Tracking	1.00
	109178504	Condenser, Dual Trimmer	.70
C1a,b	109168424	Condenser, Tuner (With pulley)	5.00
C12a,b,c	109208425	Condenser, Electrolytic	1.50
C10		Condenser, .05 mfd. 400 volt	.20
C9		Condenser, .001 mfd. 600 volt	.20
C2		Condenser, .1 mfd. 200 volt	.20
C8		Condenser, .01 mfd. 400 volt	.20
C6,11		Condenser, .002 mfd. 600 volt	.20
C4		Condenser, .05 mfd. 200 volt	.20
C3		Condenser, 100 mmf. Mica	.25
C5,7		Condenser, 250 mmf. Mica	.25
	109408436	Dial Chart	.35
	109542729	Grommet, Rubber (Dial bracket Mtg.)	.05
	109456244	Pulley, Idler	.10
	109415026	Pointer	.35
	109541207	Retainer ("C" washer)	.01
R2		Resistor, 200 ohm 1/3 watt	.15
R11		Resistor, 100 M ohm 1/3 watt	.15
R1		Resistor, 20 M ohm 1/3 watt	.15
R6,7,8,10 13,14,16		Resistor, 200 M ohm 1/3 watt	.15
R5		Resistor, 10 meg. 1/3 watt	.15
R9		Resistor, 120 ohm flexohm ½ watt	.20
R15		Resistor, 1000 ohm 1 watt	.25
	109188440	Socket, Dual Dial Lamp	.30
	109548648	Spring, Drive Cable	.10
	109388428	Switch, Tone Control	.50
	109388429	Switch, Radio/Phono	1.00
	109188267	Socket, 1 prong (For phono pickup)	.10
	109588442	Speaker, 6½ inch Dynamic	5.50
T4	109108433	Transformer, Power 60 cycle	5.00
	109108496	Transformer, Power 50 cycle	5.75
	109118501	Transformer, Power 25 cycle	7.50
T3	1091384421	Transformer, Output	1.25
T1	109338434	Transformer, 1st IF	2.25
T2	109358435	Transformer, 2nd IF	2.25
	109638481	Arm, Phono pickup (Complete)	6.00
		Crystal Cartridge only	5.00

MODEL 5771
Chassis 109.358

SEARS ROEBUCK & CO.

PUSH BUTTON TUNING

Pull the button off its shaft. Loosen the mechanism by turning the locking screw a turn or two counterclockwise. Continue to press in firmly with the screwdriver holding the shaft in as far as it will go. Carefully tune in the desired station while holding the shaft in. Continue to press in firmly with the screwdriver and lock the mechanism by turning the screw clockwise until it is tight. Tighten the screw just enough so that the adjustment is held firmly. If the screw is turned too tight the shaft may be forced out of line and make the buttons rub together.

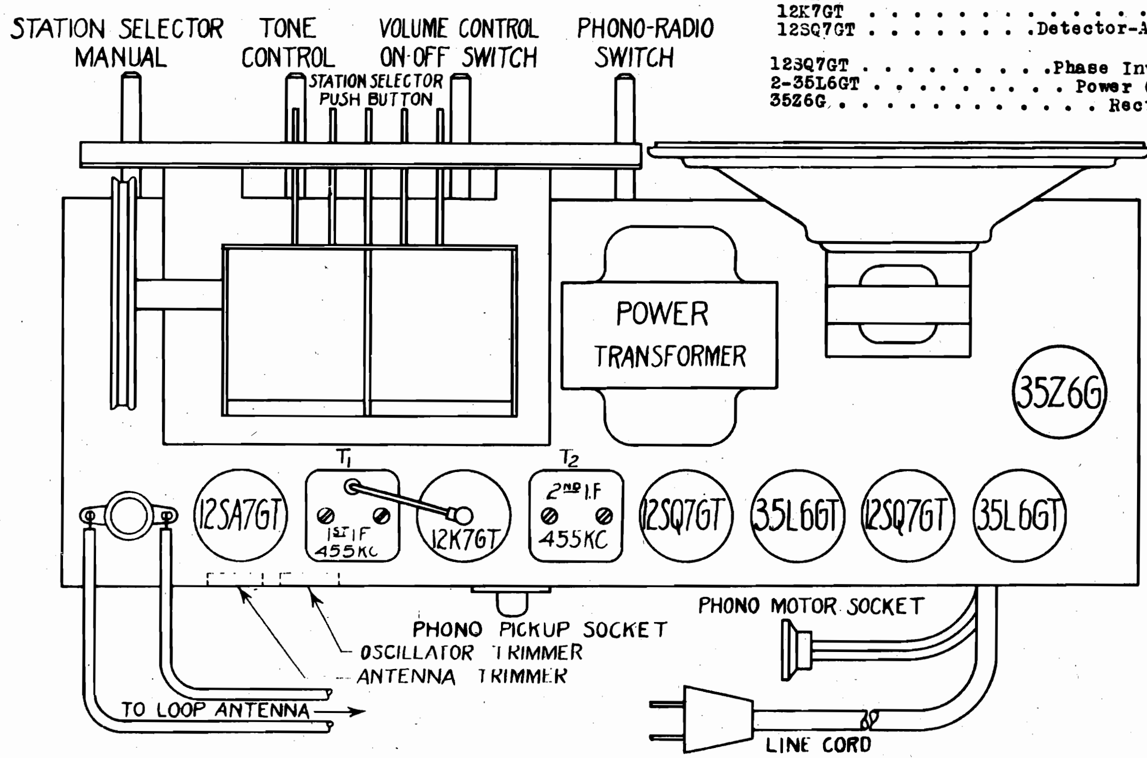
ALIGNMENT PROCEDURE

See diagram at the bottom of this page for the location of all trimmers.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (In order shown)
OPEN (Minimum capacity)	455 kc.	.1 Mfd.	Antenna section of variable	T2, T1.
MINIMUM CAPACITY	1720 kc.	50 mmf.	Antenna terminal	Oscillator Trimmer
TUNE IN SIG. FROM GENERATOR	1400 kc.	50 mmf.	Antenna terminal	Antenna Trimmer

The alignment procedure should be repeated stage by stage, in the origional order for greatest accuracy. Always keep the output from the generator at the lowest possible level so that the AVC action of the receiver is ineffective.

TUBES AND FUNCTIONS
12SA7GT . . . . . Oscillator-Translator
12K7GT . . . . IF
12SQ7GT . . . . Detector-AVC-AF
12SQ7GT . . . . Phase Inverter
2-35L6GT . . . . Power Output
35Z6G . . . . Rectifier



POWER SUPPLY . . . . 105-125 volts AC 65 watts
25,50 and 60 cycle models available.

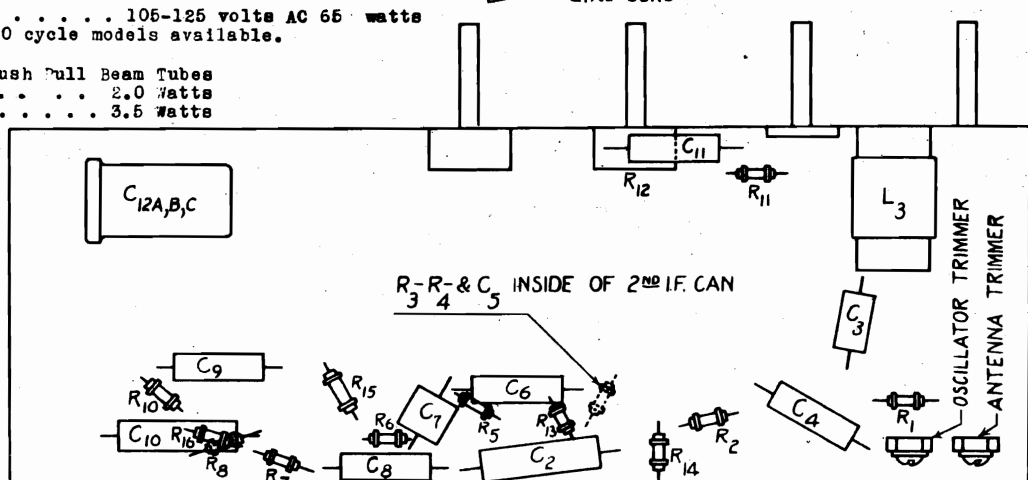
POWER OUTPUT
Type . . . . . . Push Pull Beam Tubes
Undistorted . . . . 2.0 Watts
Maximum . . . . 3.5 Watts

SPEAKER
Type . . . . Dynamic
Size 6½ Inch
Field Resistance 500 Ohms

FREQUENCY RANGE

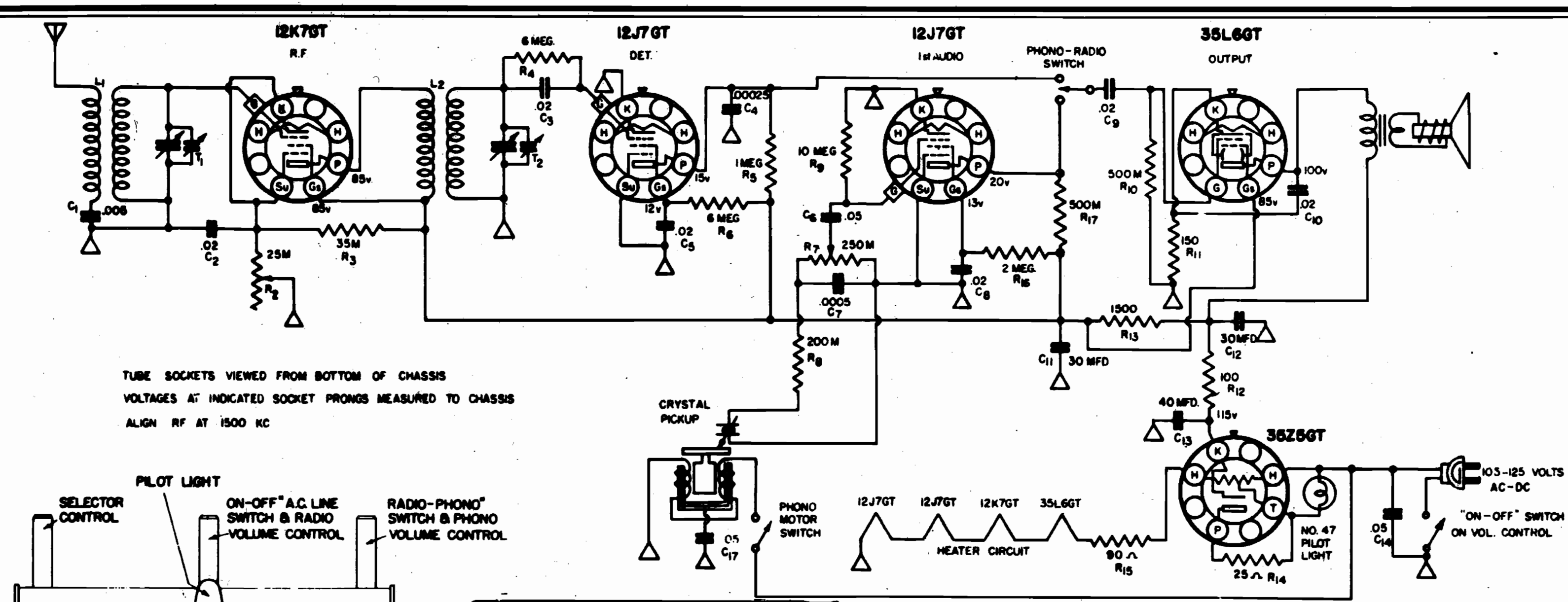
540 to 1720 kc.

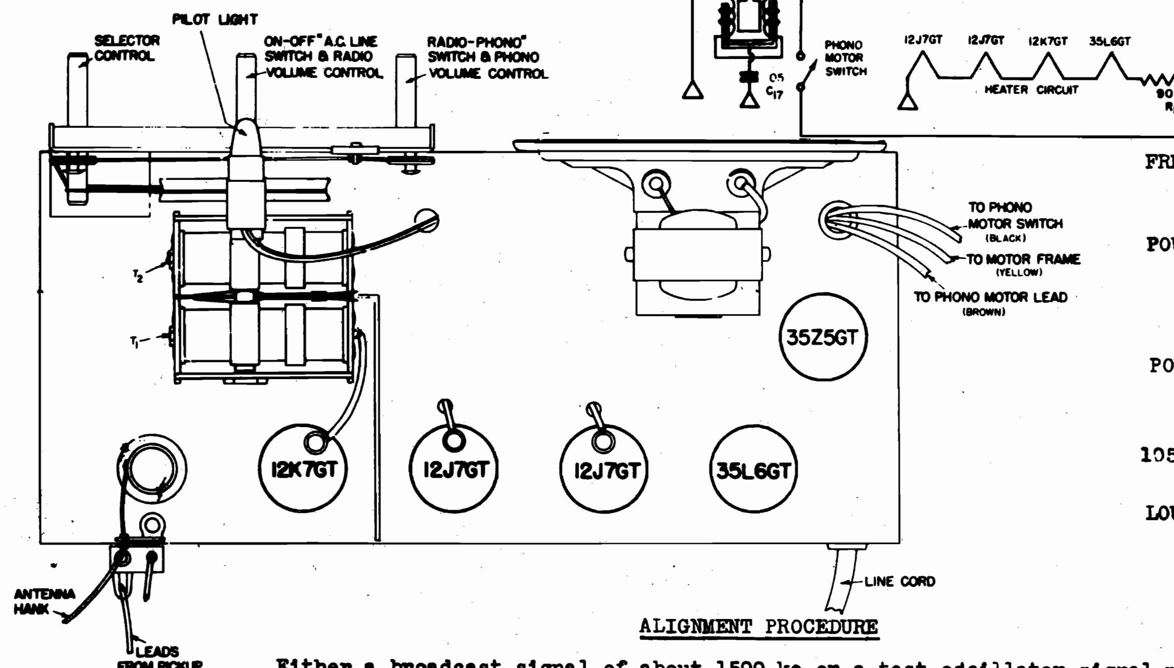
LOCATION OF PARTS UNDER CHASSIS



SEARS-ROEBUCK & CO.

MODEL 6326A
Chassis 110.987-1





FREQUENCY RANGE:

Broadcast...............530-1730 KC

POWER OUTPUT:

Type......................Beam Power
Undistorted.............. 1. watt
Maximum.................. 1.5 watts

POWER SUPPLY:

All models available.................

105-125 Volts, 60-cycle A.C........50 watts

LOUD SPEAKER:

Type........................... Dynamic
Size........................... 5"
Field.......................... P.M.

ALIGNMENT FREQUENCY:

1500 KC

APRIL 30, 1940

ALIGNMENT PROCEDURE

Either a broadcast signal of about 1500 kc or a test oscillator signal may be used. If abroadcast signal is used, the antenna of the receiver should be extended as in a normal installation. If a test oscillator signal is used, a wire should be connected to the test oscillator output and run parallel to but isolated from the receiver's antenna wire. The generator ground connection should be connected to ground.

Tune in the 1500 kc signal and adjust the trimmers for maximum loud speaker response. This can be done accurately if the volume control setting is reduced to give a low volume level. The location of this trimmer is shown in the tube socket location diagram.

MODEL 6491-A
Chassis 110.410

SEARS ROEBUCK & CO.

POWER SUPPLY:

All models available . . . . 105-125 volts, 60 cycle AC, 50 Watts

FREQUENCY RANGE:

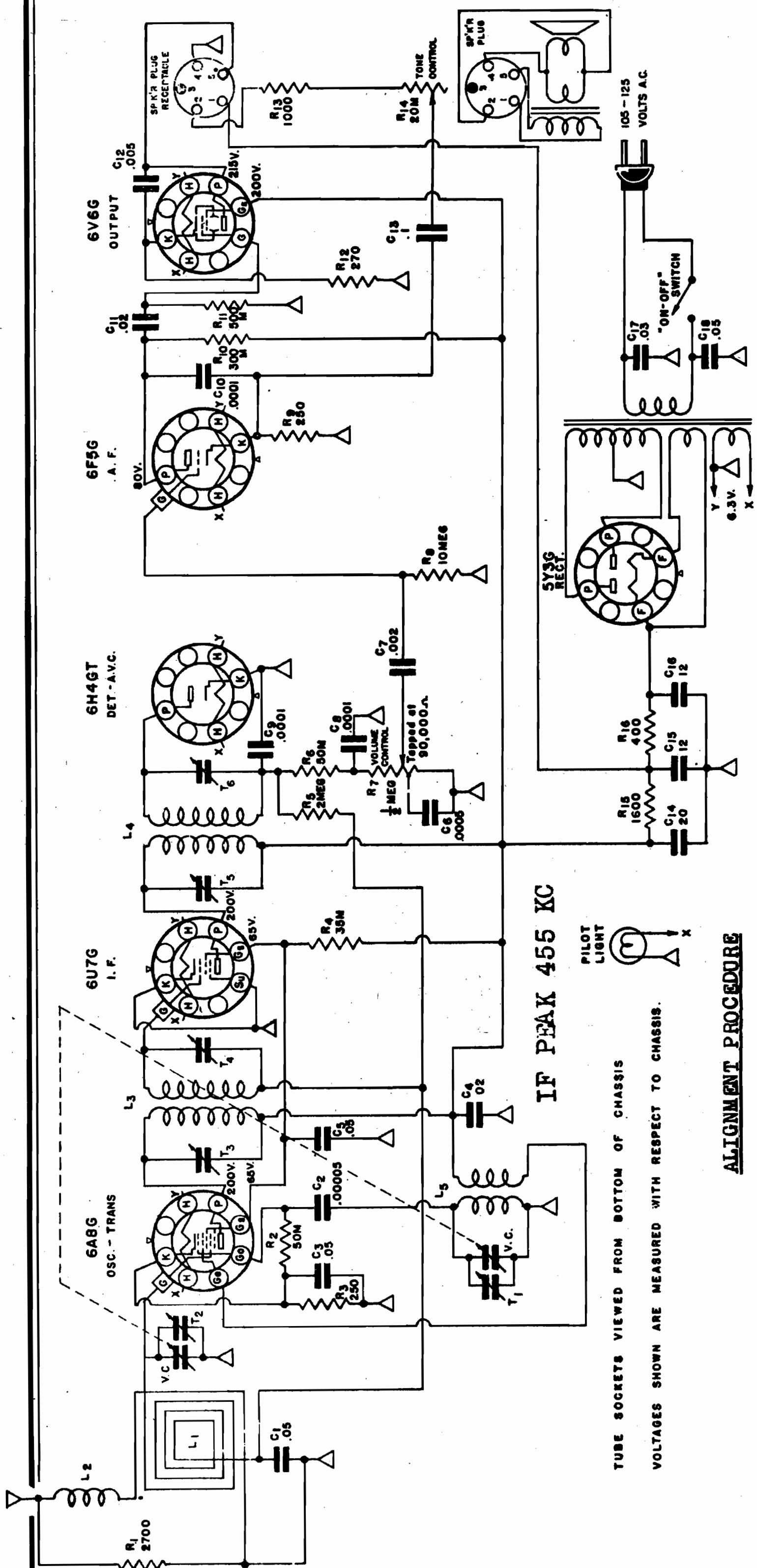
Broadcast . . . . 535 - 1700 KC

POWER OUTPUT:

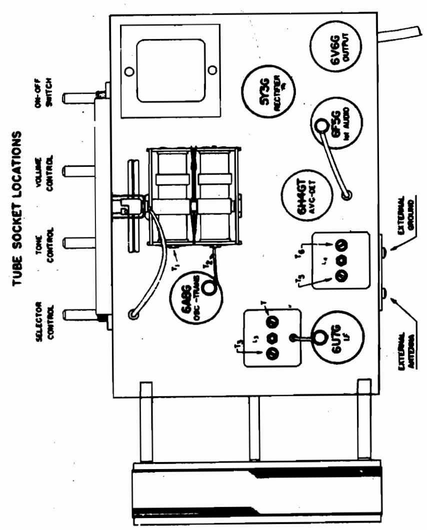
Type...................... Beam Power
Undistorted....................... 2.5
Maximum.......................... 3.75

LOUD SPEAKER:

Type.........................Dynamic
Size........................ 6 1/2"
Field .... P.M.



NOVEMBER 4, 1940



ALIGNMENT PROCEDURE

Output meter connection............ Across primary output transformer

Connection of generator ground....................... To chassis

Generator modulation........................ App. 30% @ 400 cycles

Position of volume control................. Fully clockwise

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
* *	455 kc	6A8G, Grid	T3, T4, T5, T6	I.F.
1500 kc	1500 kc	* * *	T1, T2	Osc., R.F.

See note below

IMPORTANT ALIGNMENT NOTES

Always keep the output from the test oscillator at its lowest possible value. As the sensitivity is increased by alignment, the generator output should be reduced correspondingly.

**Short oscillator section of variable condenser

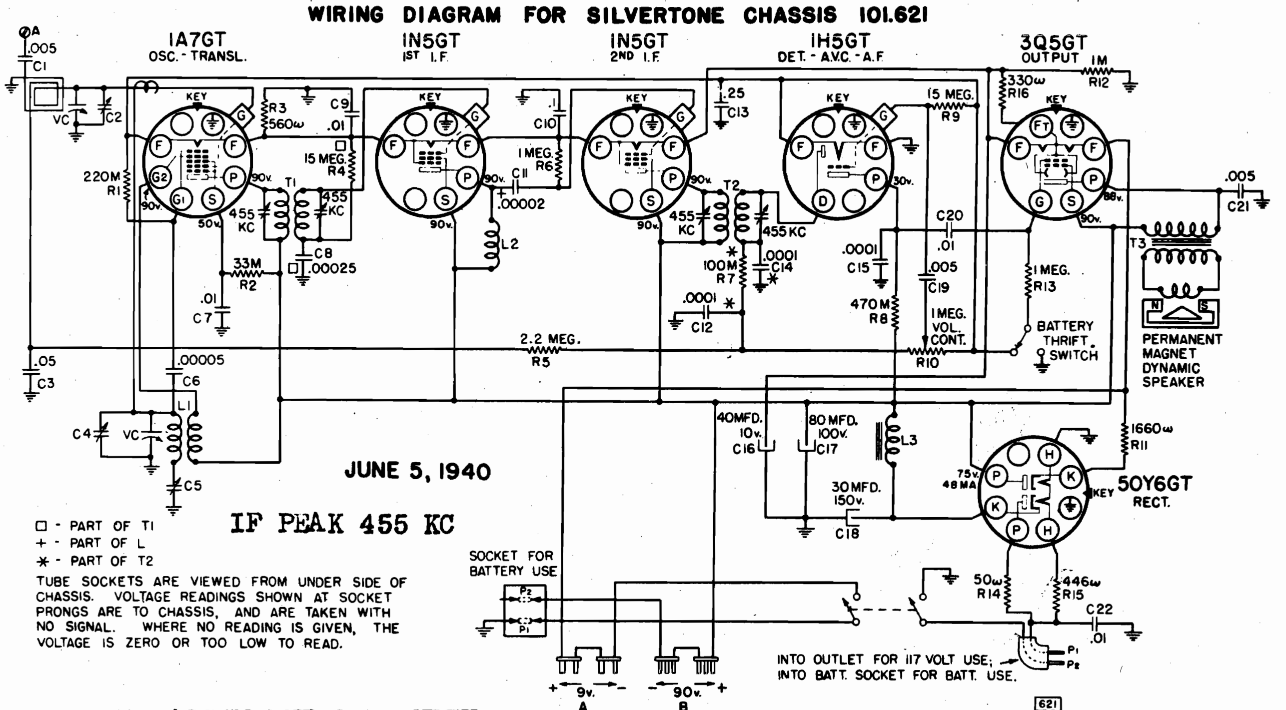
***Run a wire from the output terminal of the generator, having it come near the receiver. However, no metallic connection is made between the signal generator and the receiver.

Chassis 101.621-1,-1A, -1B,-1C (late)

SEARS ROEBUCK & CO.

MODELS 6561,6661,6961, 6521
Chassis 101.621,101.621-A (early)

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.621



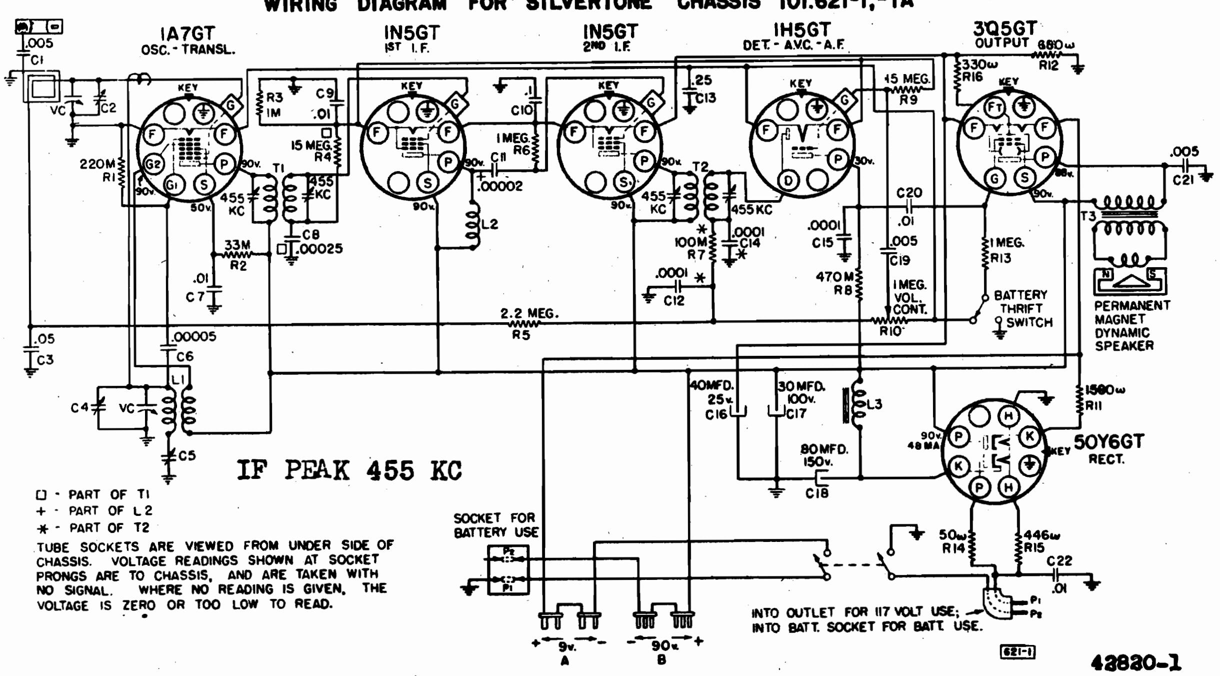
FOR ALIGNMENT SEE INDEX

SUBJECT: ADDITION OF SUFFIX NUMBER -1 TO 101.621 CHASSIS:

Chassis identified as 101.621-1, -1A, -1B, or -1C use a different loop than the original 101.621 chassis. On these chassis, the antenna terminal connection is accessible by opening the hinged part of the back cover. Be sure to order the correct loop on replacement orders. There are also filament circuit differences as shown in the following Wiring Diagram.

AUGUST 21, 1940

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.621-1,-1A



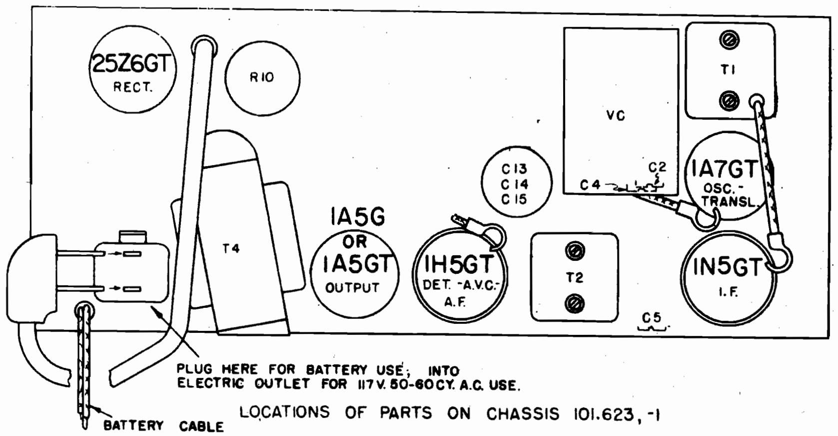
43830-1

MODEL 6751
Chassis 101.623,
101.623-1

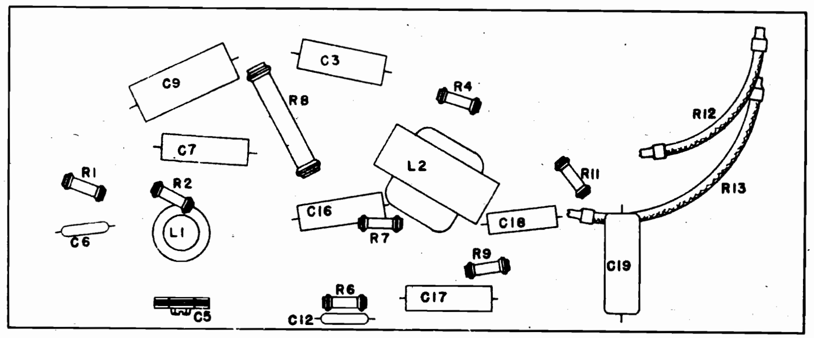
SEARS ROEBUCK & CO.

MODELS 6521,6561,6661,6961
Chassis 101.621 (early,late)

MODEL 6751



LOCATIONS OF PARTS ON CHASSIS 101.623,-1



LOCATIONS OF PARTS UNDER CHASSIS-101.623,-1

FREQUENCY RANGE:
Broadcast . . . . 550-1600 kc

POWER SUPPLY:
"A" Battery (6 volt) . . . . 1 - #5080
Service rating - 250 Hours
105-125 v., 60 cycle, AC, 30 watts
"A" Drain: 50 ma.

"B" Batteries . . . . 2 - #5079
Service rating - 250 Hours
"B" Drain: 8.7 ma.

ALIGNMENT FREQUENCIES:

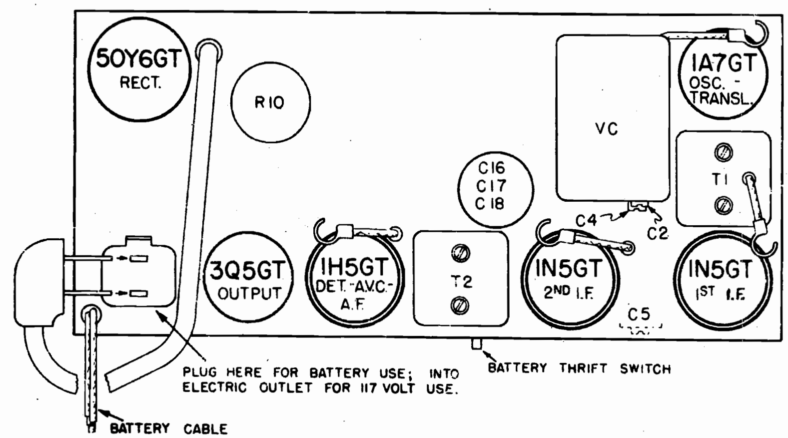
Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1400 kc	1400 kc	600 kc

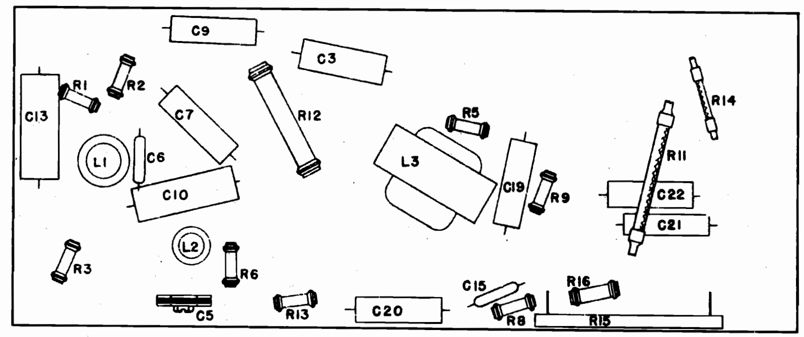
INTERMEDIATE FREQUENCY
. .455 kc

POWER OUTPUT:
Type . . . . . . Pentode
Undistorted 0.09 watts
Maximum . . .0.2 watts

LOUDSPEAKER:
Type . . . .PM Dynamic
Size . . . . . .5 inch

MODELS 6521,6561,6661,6961





LOCATIONS OF PARTS UNDER CHASSIS-101.621

FREQUENCY RANGE:
Broadcast . . . . 540-1630 kc

POWER SUPPLY:
"A" Battery (4-1/2 volt). . . 3 - #5085
Service rating - 250 Hours, with
thrift switch
105-125 volts AC or DC - 30 watts

"B" Batteries . . . . .3 - #5090
Service rating - 250 Hours with
thrift switch

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1400 kc	1400 kc	600 kc

INTERMEDIATE FREQUENCY
. . .455 kc

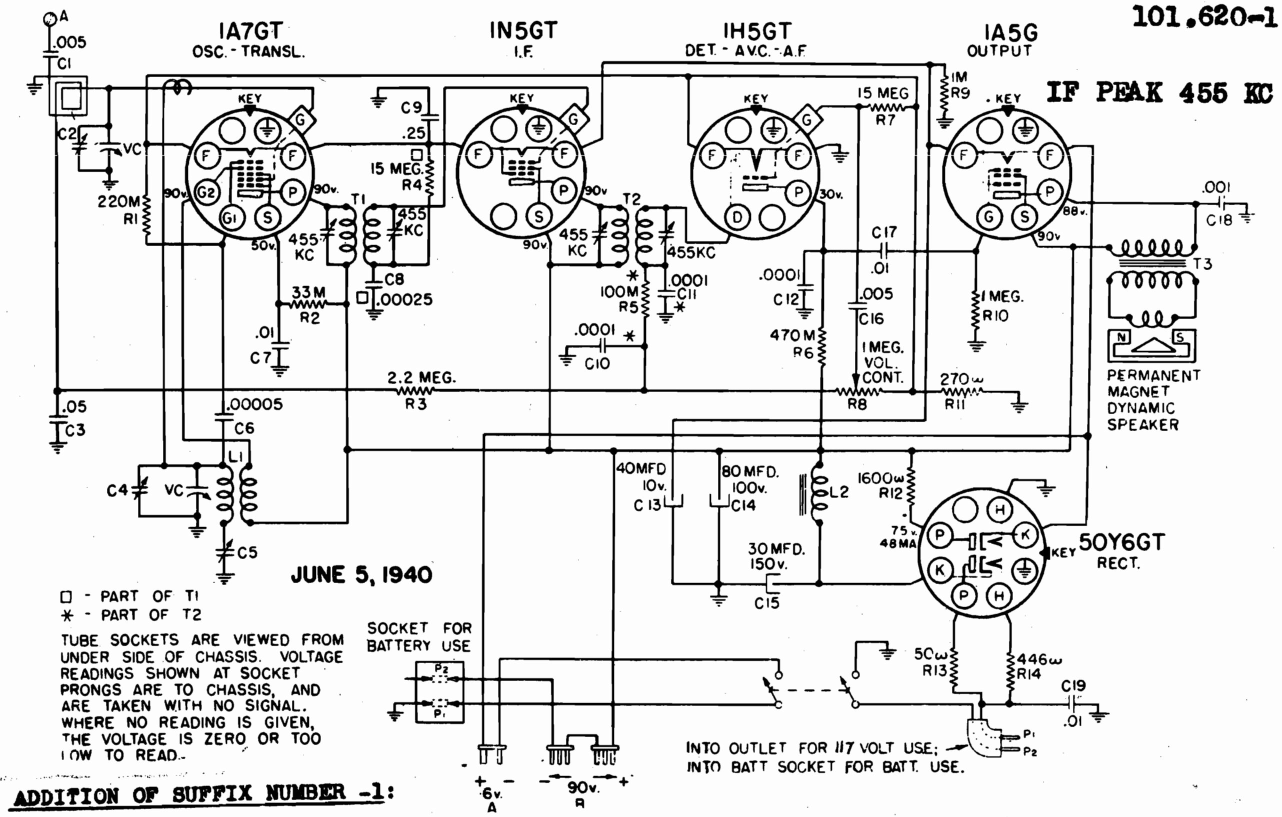
POWER OUTPUT:
Type . . . . Beam
Undistorted 0.165 watts
Maximum . . . 0.3 watts

LOUDSPEAKER:
Type . . PM Dynamic
Size . . . . . 5 inch

SEARS-ROEBUCK & CO.

MODEL 6551
Chassis 101.620
101.620-1

IF PEAK 455 KC



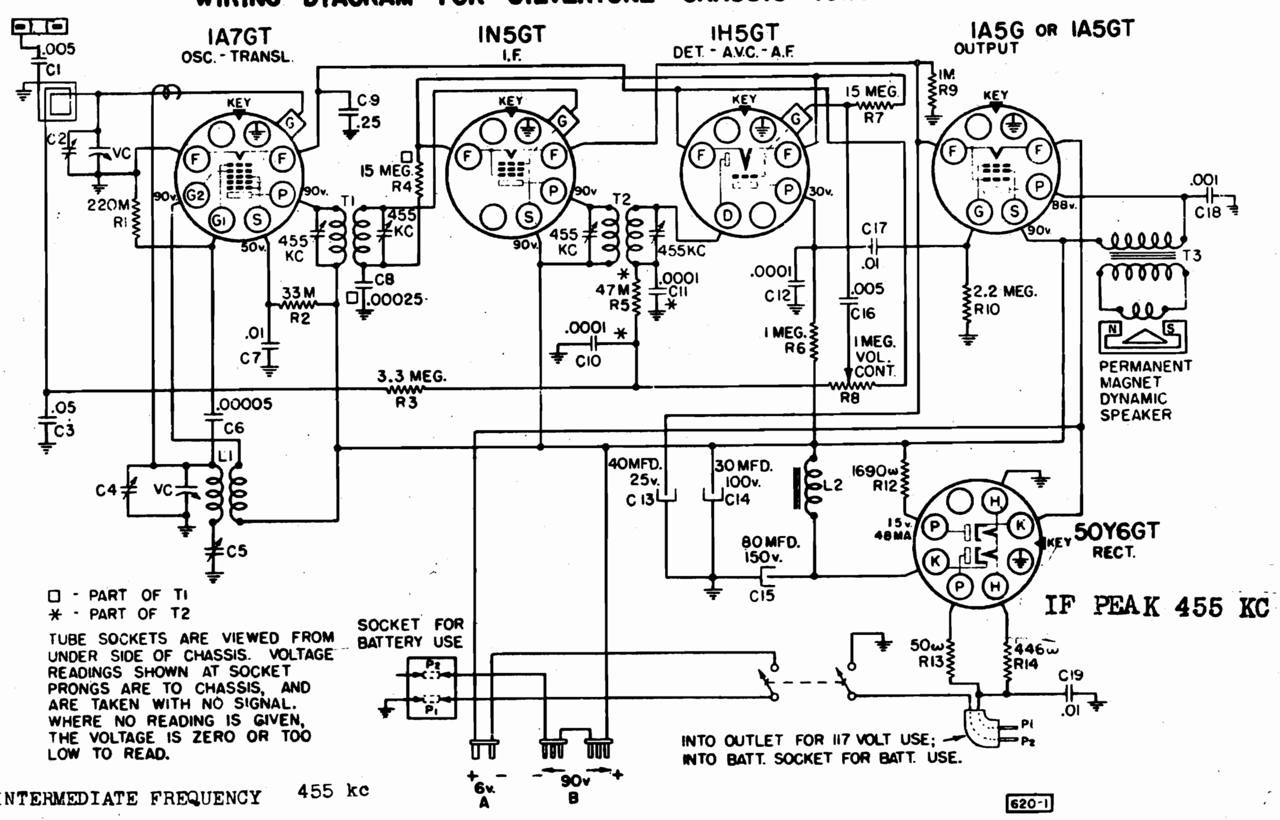
ADDITION OF SUFFIX NUMBER -1:

Chassis identified by the addition of suffix number -1 use a different loop. On these chassis, the antenna terminal connection is accessible by opening the hinged part of the back cover. Be sure to order the correct loop on replacement orders. There are also filament circuit differences as shown in the following Wiring Diagram.

JULY 30, 1940

Changes in the Parts

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.620-1



INTERMEDIATE FREQUENCY 455 kc

MODEL 6751
Chassis 101.623,-1
MODELS 6521,6561,6661,6961
Chassis 101.621 (early,late)

SEARS ROEBUCK & CO.

MODEL 6551
Chassis 101.620,-1

ALIGNMENT PROCEDURE

MODELS 6521,6561,6661,6961
MODEL 6751
MODEL 6551

PRELIMINARY:

Output meter connections . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts . . . . 0.39 volts
Generator ground lead connection . . . . To chassis through 0.1 mfd. cond.
Connection of generator output lead . . . . See chart below
Generator modulation . . . . 30%, 400 cycles
Position of Volume Control . . . . Fully on
Position of pointer with variable fully closed . . . . On mark to left of 550 kc calibration mark.

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION
Closed	455 kc	.1 mfd.	1A7GT Translator Grid	T2,T1	IF
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C2,C4	Translator Oscillator
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C5	Padder

IMPORTANT ALIGNMENT NOTES

The chassis is removed from the case in order to align the IF but the loop antenna must be left connected.

The trimmer and padder condensers are accessible by dropping the hinged part of the back cover.

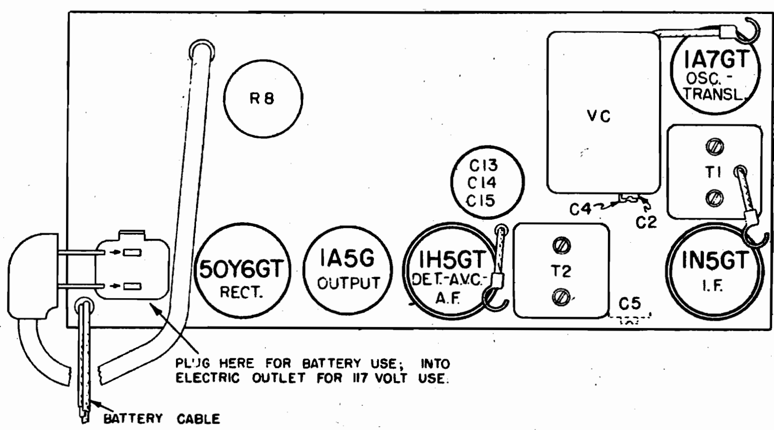
The chassis must be in place in the cabinet during alignment. If battery supply is used, the batteries must be in place in the cabinet.

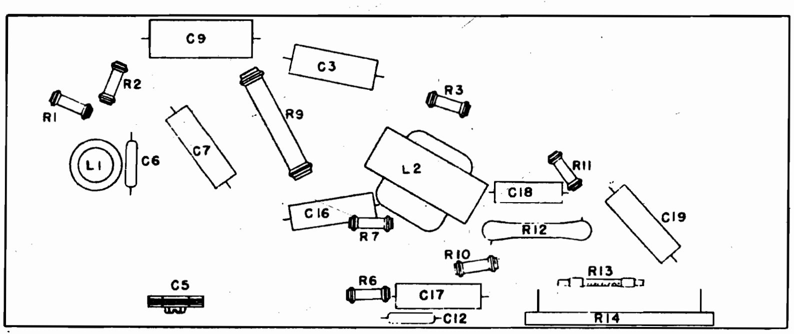
The variable should be rocked back and forth a degree or two while making the 600 kc adjustment.

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 AVC of the receiver from interfering with accurate alignment.

Whenever batteries are replaced, C2 should be repeaked using a weak signal at about 1400 kc.





LOCATION OF PARTS UNDER CHASSIS-101.620

TUBES AND FUNCTIONS:
1A7GT . . . . Osc.-Transl.
1N5GT . . . . IF
1H5GT . . . . Detector-AVC-AF
1A5G . . . . Output
50Y6GT . . . . Rectifier

FREQUENCY RANGE:
Broadcast . . . . 540-1620 kc

POWER SUPPLY:
"A" Battery (6 volt) . . . . . 1 - #5080
Service rating - 250 Hours
105-125 v. AC or DC, 30 watts
"B" Batteries . . . . 2 - #5079
Service rating - 250 Hours

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1400 kc	1400 kc	600 kc

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 0.09 watts
Maximum . . . . 0.2 watts

OPERATING FEATURES:
Automatic Volume Control
Battery or AC-DC Powered

LOUDSPEAKER:
Type . . . . PM Dynamic
Size . . . . 5 inch

CHASSIS FEATURES:
Number IF stages . . . . One
Self-contained loop antenna

SEARS-ROEBUCK & CO.

MODEL 6541
Chassis 110.401

MODEL 6651
Chassis 110.402

Alignment Notes

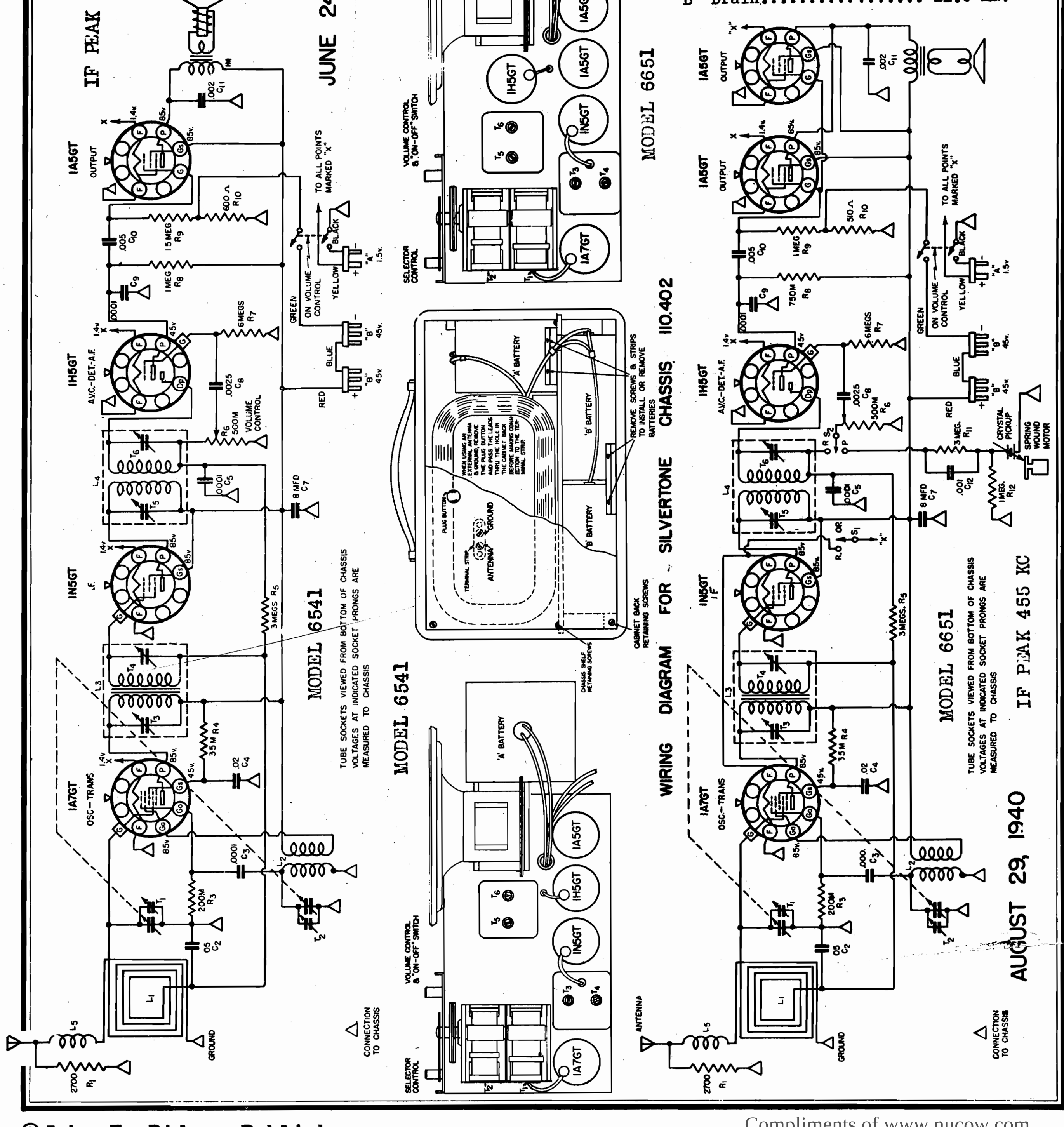
** Short oscillator section of variable condenser.

*** Connect generator output to a separate radiating loop and pickup 1500 kc signal on receiver.

POSITION OF DIAL POINTER	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMERS ADJUSTED	TRIMMER FUNCTION
**	455 kc	1N5GT,Grid	T5,T6	I.F.
**	455 kc	1A7GT,Grid	T3,T4	I.F.
1500 kc	1500 kc	***	T2,T1	Osc.,R.F.

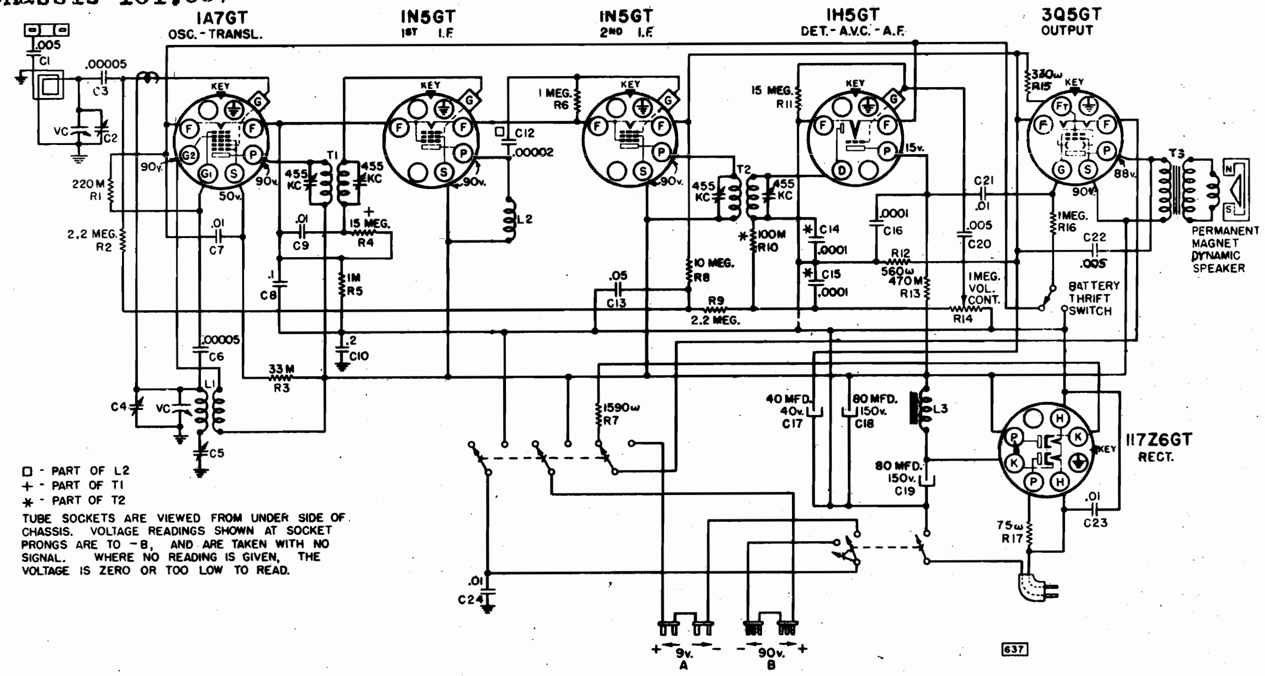
POWER SUPPLY
#5087.........1½ v. "A" Battery
2 -#5090.....45 v. "B" Battery

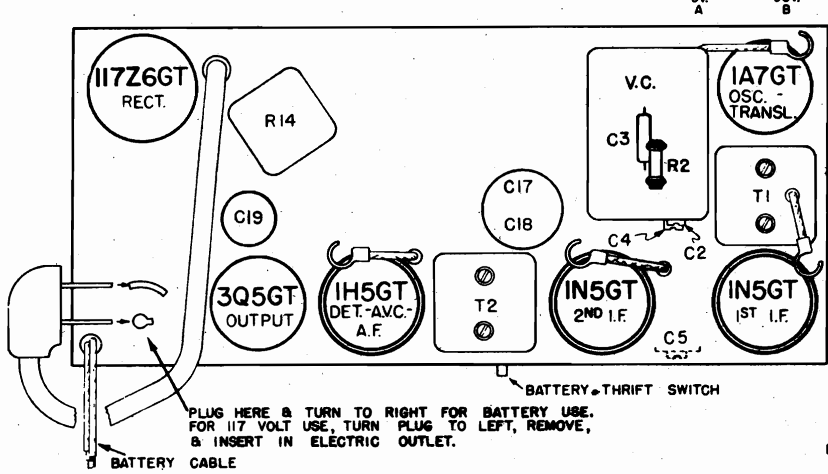
"A" Drain............. .25 Amperes
"B" Drain................. 11.5 ma.



MODELS 6621,6761A,6921
Chassis 101.637

SEARS ROEBUCK & CO.





SEPTEMBER 30, 1940

INTERMEDIATE FREQUENCY . . . . 455 kc

POWER SUPPLY:
"A" Battery (4-1/2 volt). . . 2 - #5085
Service rating - 200 Hours,
Drain: 50 ma.
105-135 volts, AC-DC - 25 watts
"B" Batteries . . . . 2 - #5090
Service rating - 200 Hours,
Drain: 13.9 ma.

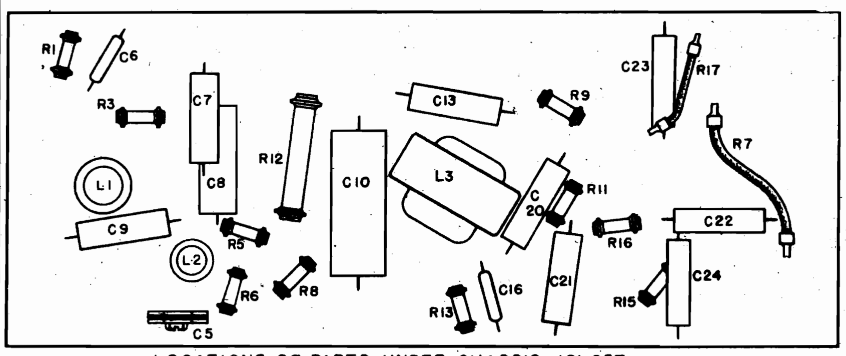
ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1620 kc	1400 kc	600 kc

FREQUENCY RANGE:
Broadcast . . . . 540-1620 kc

LOUDSPEAKER:
Type . . . . PM Dynamic
Size . . . . 5 inch

POWER OUTPUT:
Type . . . . Beam
Undistorted . . . . 0.165 watts
Maximum . . . . 0.3 watts



LOCATIONS OF PARTS UNDER CHASSIS-101.637

ALIGNMENT PROCEDURE

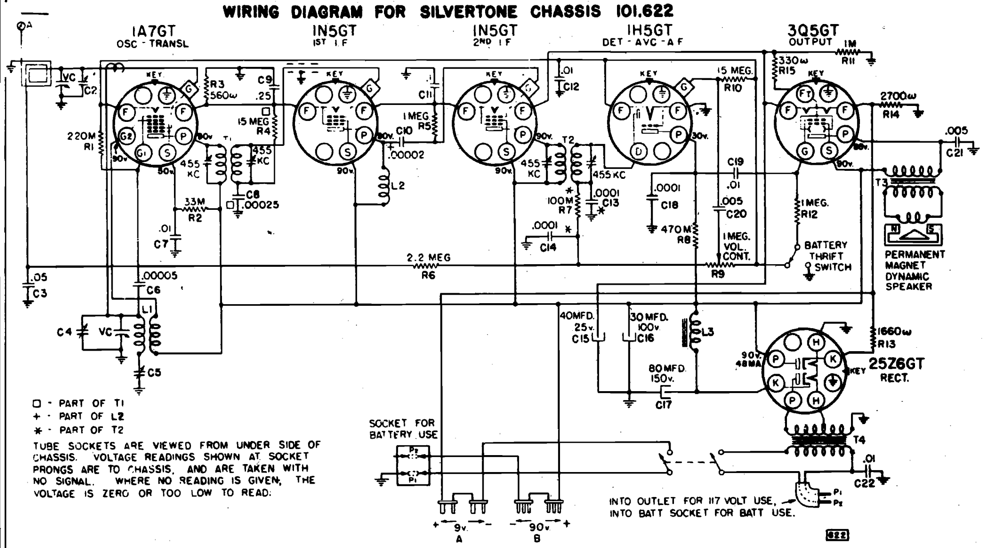
POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	TRIMMER FUNCTION
Closed	455 kc	.1 mfd.	1A7GT Translator Grid	T2,T1	IF
Open	1620 kc	.0002 mfd.	Ant. Term.	C4	Oscillator
1400 kc	1400 kc	.0002 mfd.	Ant. Term.	C2	Translator
600 kc(rock)	600 kc	.0002 mfd.	Ant. Term.	C5	Padder

Position of Volume Control . . . . .Fully on
Position of Pointer with variable fully closed . . . . .On mark to left of 550 kc calibration mark.
Output meter connections . . . . Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts . . . . .0.37 volts

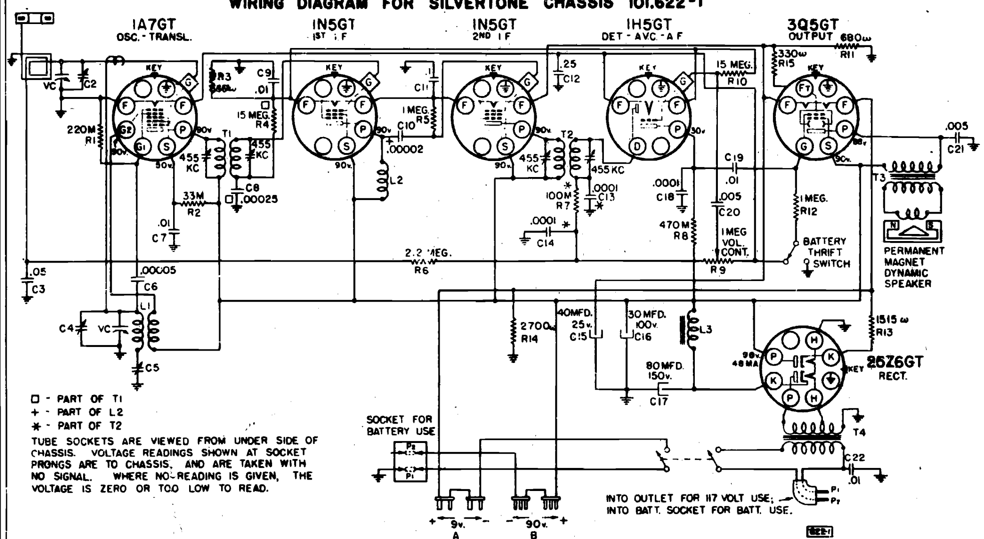
SEARS ROEBUCK & CO.

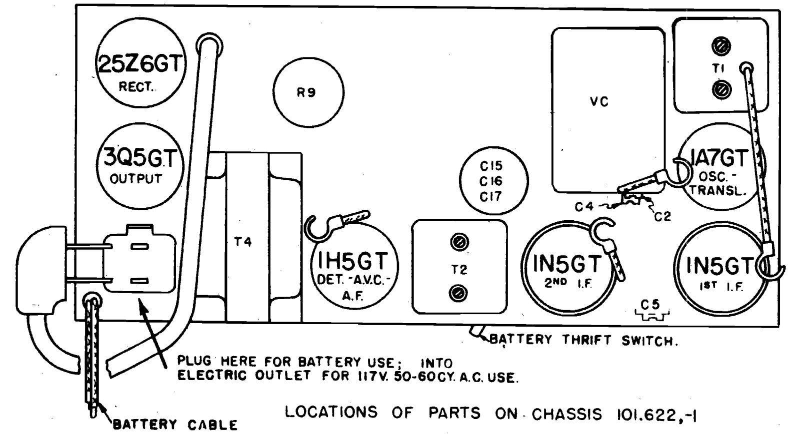
MODELS 6721,6761
Chassis 101.622
101.622-1

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.622

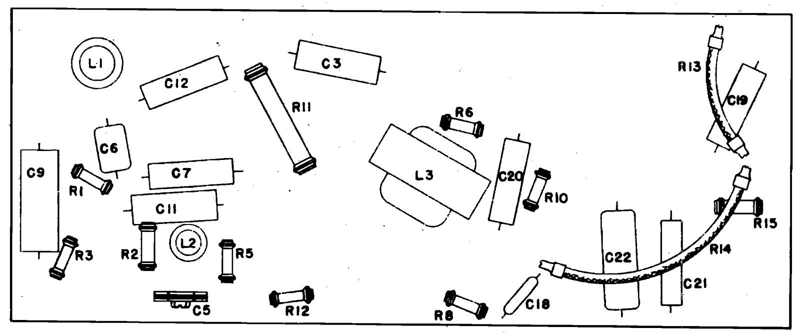


WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.622-1





LOCATIONS OF PARTS ON CHASSIS 101.622,-1



LOCATIONS OF PARTS UNDER CHASSIS-101.622,101.622-A,-1

CONVENTIONAL ALIGNMENT

JULY 3, 1940

FREQUENCY RANGE:
Broadcast . . . . 550-1600 kc

POWER SUPPLY:
"A" Battery (4-1/2 volt). . . 2 - #5085
Service rating - 250 Hours, with Thrift Switch. Drain: 50 ma.
105-125 volts, 60 cycle AC - 30 watts

"B" Batteries . . . . 2 - #5090
Service rating - 250 Hours, with Thrift Switch. Drain: 13.9 ma.

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1400 kc	1400 kc	600 kc

POWER OUTPUT:
Type . . . . Beam
Undistorted . . . . 0.165 watts
Maximum . . . . 0.3 watts

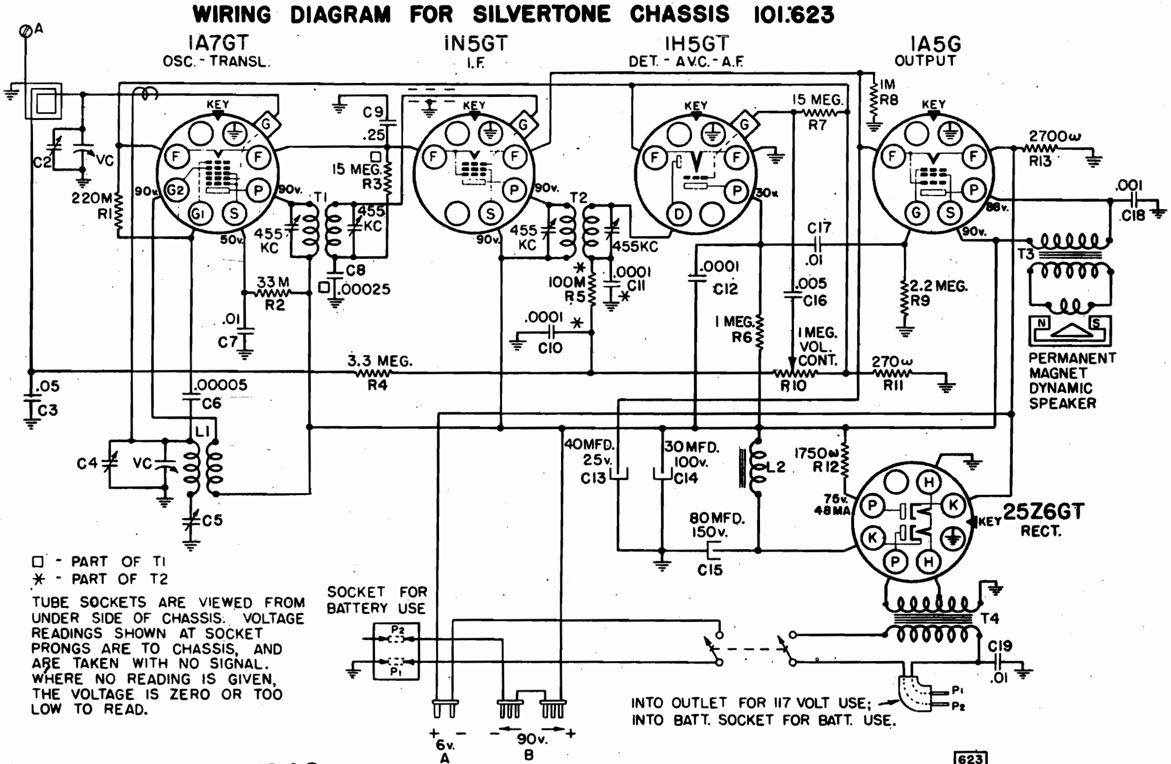
INTERMEDIATE FREQUENCY . . . . 455 kc

LOUDSPEAKER:
Type . . . . PM Dynamic
Size . . . . 5 inch

MODEL 6751
Chassis 101.623
101.623-1

SEARS ROEBUCK & CO.

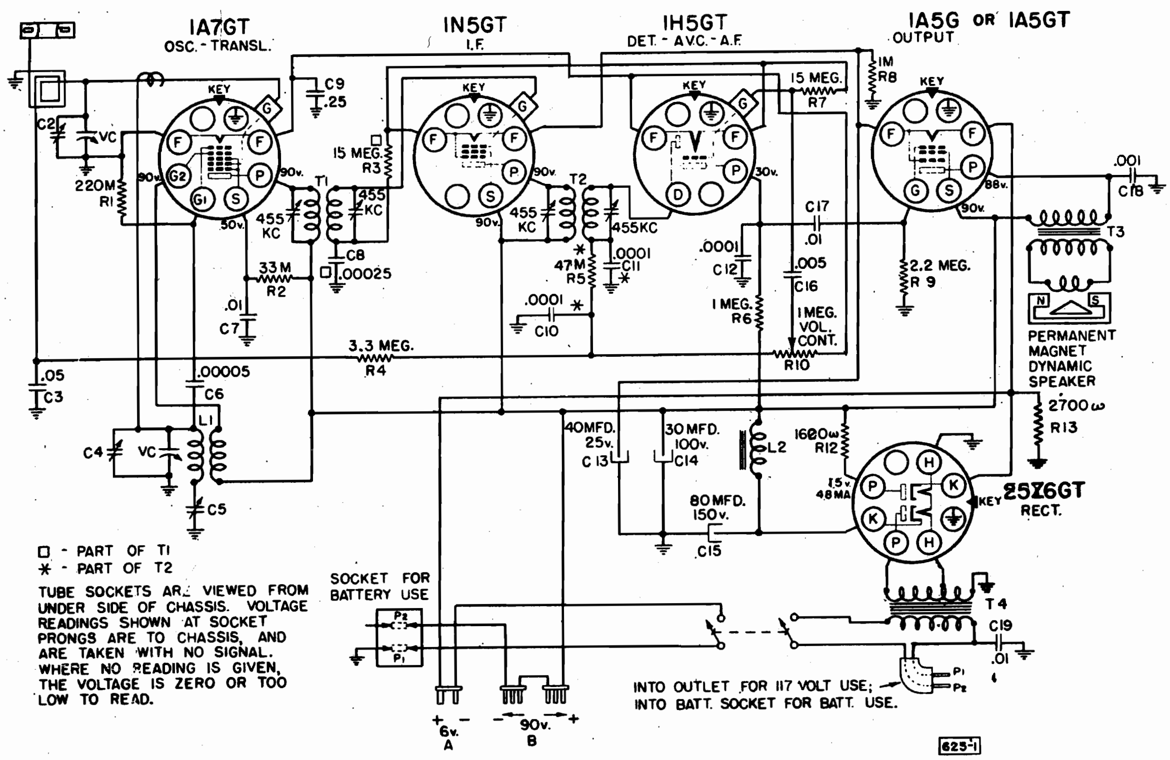
WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.623



JULY 3, 1940

IF PEAK 455 KC FOR OTHER DATA, SEE INDEX

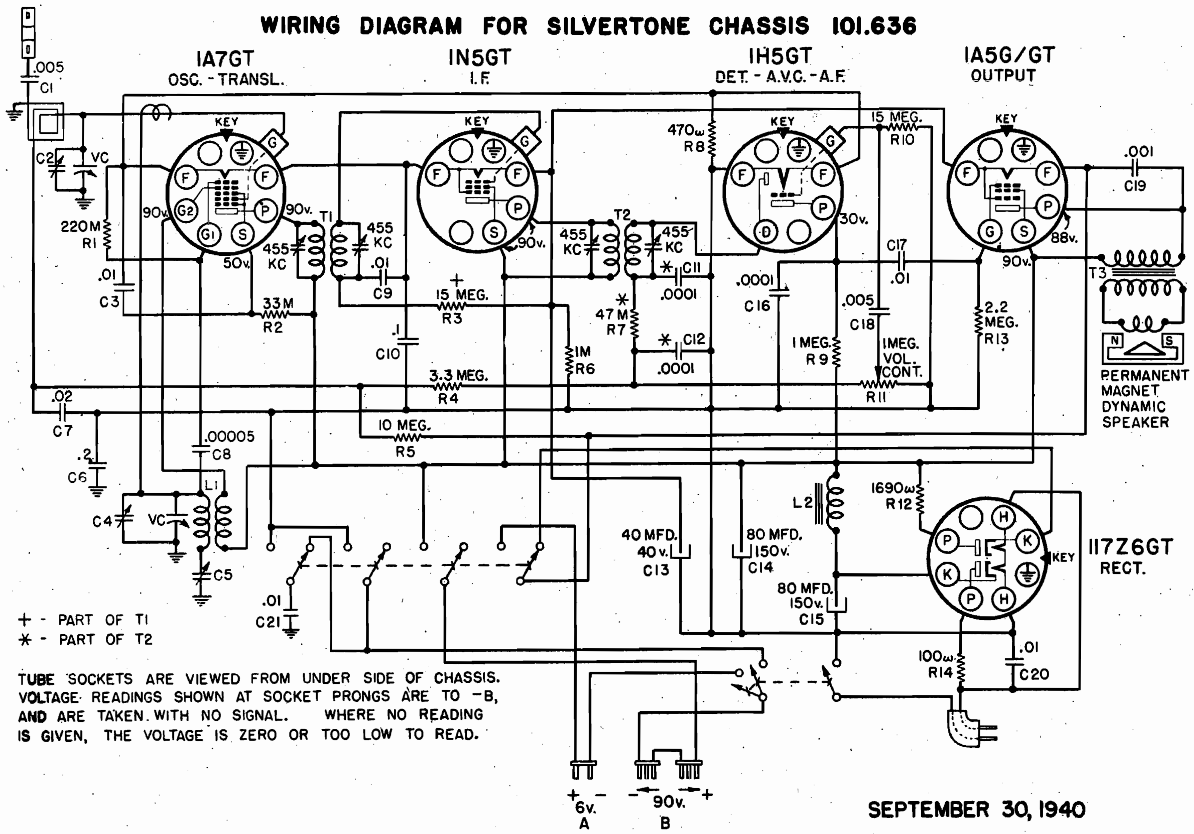
WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.623-1



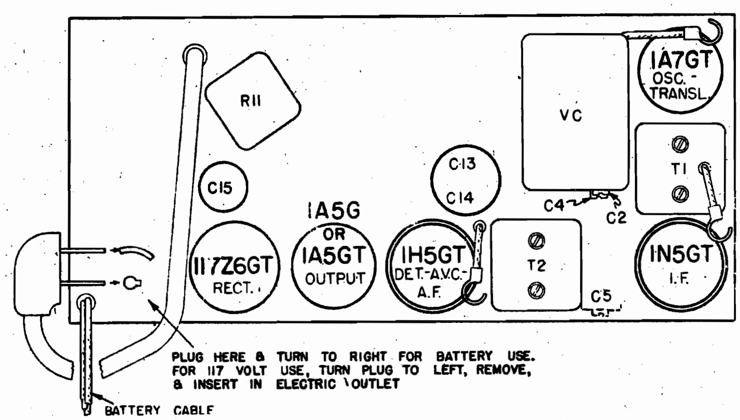
SEARS ROEBUCK & CO.

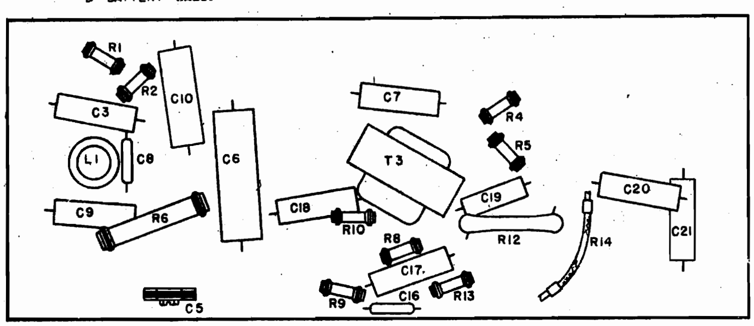
MODEL 6751-A
Chassis 101.636

WIRING DIAGRAM FOR SILVERTONE CHASSIS 101.636



SEPTEMBER 30, 1940





LOCATIONS OF PARTS UNDER CHASSIS - 101.636

INTERMEDIATE FREQUENCY . . .

. . . . . . 455 kc

FREQUENCY RANGE:
Broadcast . . . . 540-1620 kc

POWER SUPPLY:
"A" Battery (6 volt) . . . . 1 - #5080
Service rating - 200 hours
105-125 v., AC-DC, 25 watts
"A" Drain: 50 ma.

"B" Batteries . . . . 2 - #5079
Service rating - 200 hours
"B" Drain: 9.1 ma.

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1620 kc	1400 kc	600 kc

POWER OUTPUT:
Type . . . . Pentode
Undistorted . . . . 0.09 watts
Maximum . . . . .0.2 watts

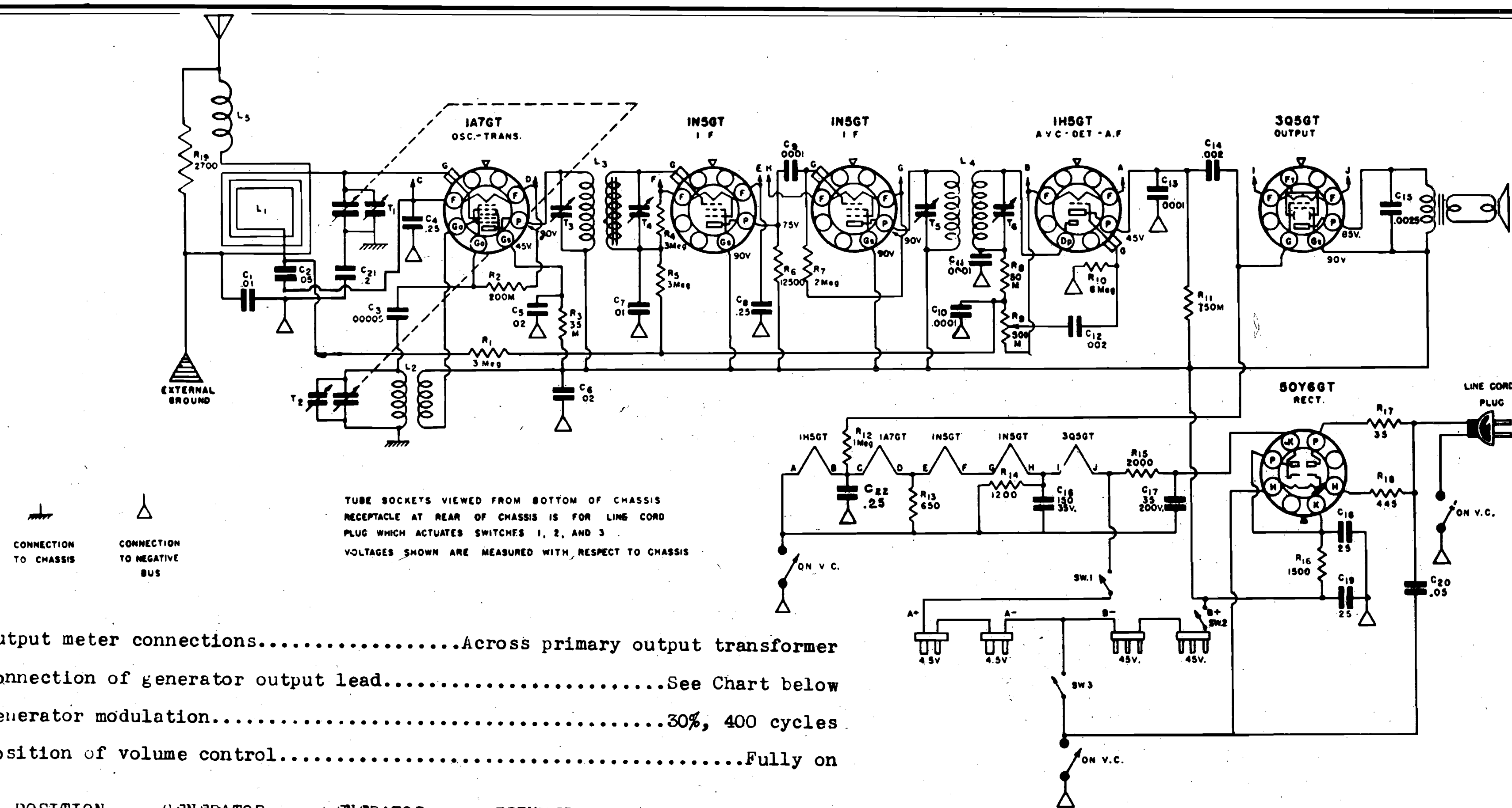
LOUDSPEAKER:
Type . . . . .PM Dynamic
Size . . . . 5 inch

CHASSIS FEATURES:
Number IF stages . . . . One
Self-contained loop antenna
Underwriters Approved

OPERATING FEATURES:
Automatic Volume Control
Battery or AC-DC Powered

MODEL 6821
Chassis 110.416,110.416A

SEARS-ROEBUCK & CO.



Output meter connections..................Across primary output transformer

Connection of generator output lead........................See Chart below

Generator modulation...................................30%, 400 cycles

Position of volume control.......................................Fully on

IF PEAK 455 KC

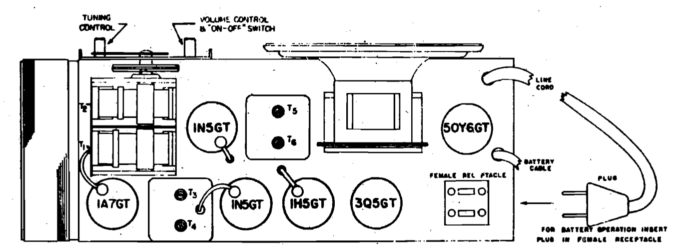
POSITION OF VARIABLE	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION
Closed	455 KC	1A7GT Grid	T3,T4,T5,T6	I.F.
1500 KC	1500 KC	*	T2, T1	Osc. R.F.

The complete assembly of loop mounting and chassis shelf should be removed as a unit in order to align the receiver.

The batteries should be in the proper position when aligning the receiver.

* Run a wire from the output terminal of the generator, having it come near the receiver. However, no electrical connection is made between the signal generator and the receiver.

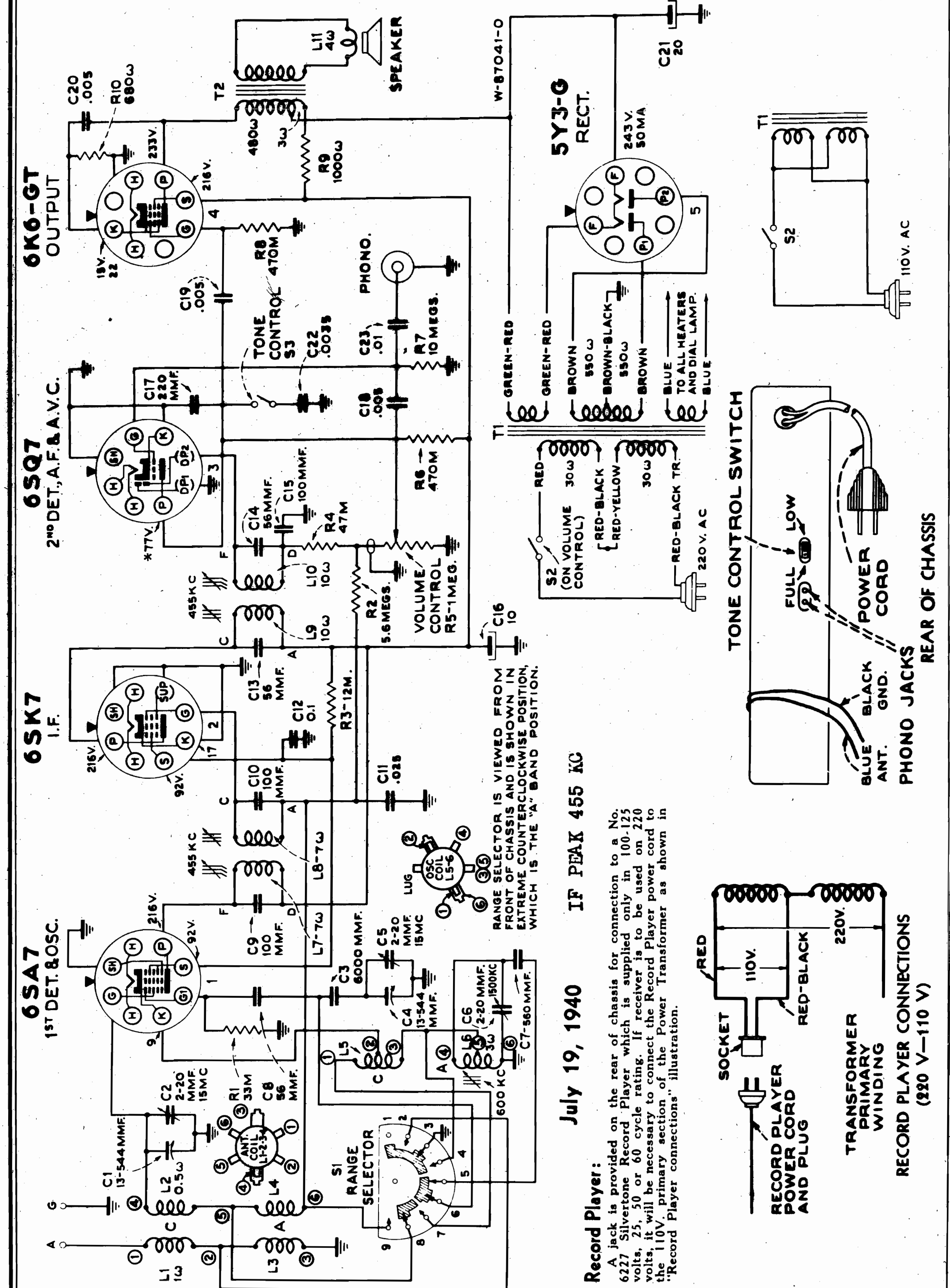
Always keep the output power from the generator at its lowest possible value tp prevent the AVC of the receiver from interfering with accurate alignment.



NOVEMBER 12, 1940

SEARS ROEBUCK & CO.

MODEL 7315 Export
Chassis 126,224



Record Player:

A jack is provided on the rear of chassis for connection to a No. 6227 Silvertone Record Player which is supplied only in 100-125 volts, 25, 50 or 60 cycle rating. If receiver is to be used on 220 volts, it will be necessary to connect the Record Player power cord to the 110V. primary section of the Power Transformer as shown in "Record Player connections" illustration.

MODEL 7315
Chassis 126.224

SEARS-ROEBUCK & CO.

Frequency Ranges:
Standard Broadcast (A) .... 540-1,800 kc (555-166m)
Short Wave (C) .... 4.5-18 mc (66.7-16.6m)

Loudspeaker:
Type .... 5-inch permanent-magnet dynamic
Voice Coil Impedance .... 4.5 ohms at 400 cycles

Power Output:
Type .... Pentode
Undistorted .... 1.5 watts
Maximum .... 2.3 watts

Power Supply
A .... 105 to 125 volts, 50 to 60 cycles, 40 watts
B .... 105 to 125 volts, 25 to 60 cycles, 40 watts
C .... 200 to 250 volts, 50 to 60 cycles, 40 watts

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
Broadcast	Low End	455 kc	0.1 mfd.	6SK7 I-F Grid	L9, L10	2nd I-F Transformer	5200
Broadcast	Low End	455 kc	0.1 mfd.	6SA7 Grid	L7, L8	1st I-F Transformer	92
Short Wave	15 mc	15 mc	300 ohms	Ant.	C5	Osc.*	
Short Wave	15 mc (Rock)	15 mc	300 ohms	Ant.	C2	Ant.**	50
Broadcast	1,500 kc	1,500 kc	0.0002 mfd.	Ant.	C6	Osc.	13
Broadcast	600 kc (Rock)	600 kc	0.0002 mfd.	Ant.	L6	Osc.	16
Broadcast	1,500 kc	1,500 kc	0.0002 mfd.	Ant.	C6	Osc.	

Output meter connections .... Across speaker voice coil
Output meter reading to indicate 1.0 watt output .... 2 volts

* Use minimum capacity peak if two peaks can be obtained.
** Use maximum capacity peak if two peaks can be obtained.

Values shown under "Microvolts" are only approximate.

Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

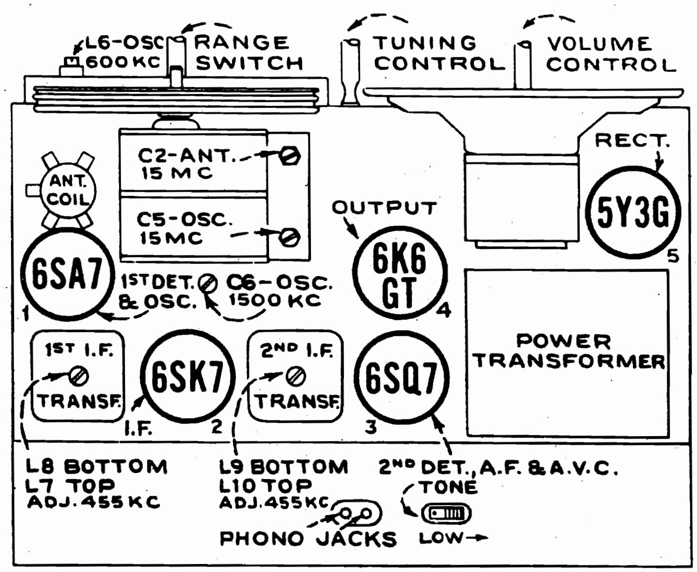
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output of the generator at its lowest possible value to prevent the AVC action of the set from interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

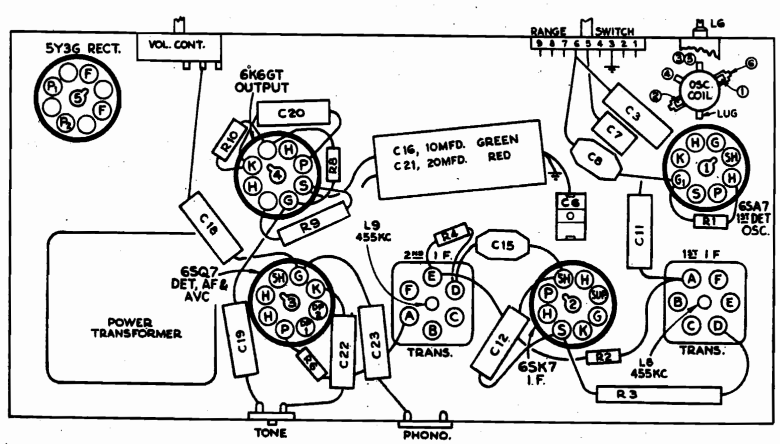
Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Position of Volume Control .... Fully clockwise
Position of Tone Control .... Full position
Position of Dial Pointer with variable tuning condenser fully closed .... Horizontal

Chassis Features:
Jack for Phonograph Attachment
Magnetite-Core Adjusted I-F Transformers, and "A" Band Oscillator Coil
Automatic Volume Control
Two-point Tone Control
Tuning Drive Ratio .... 25 to 1



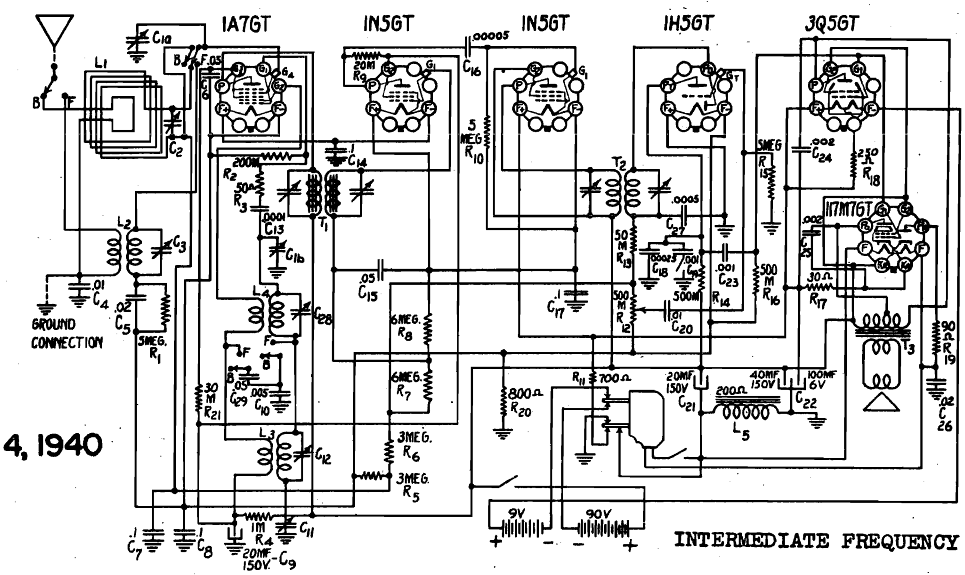
TUBE, TRIMMER AND PARTS LOCATION—TOP VIEW



TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

SEARS-ROEBUCK & CO.

MODEL 7318
Chassis 109.369



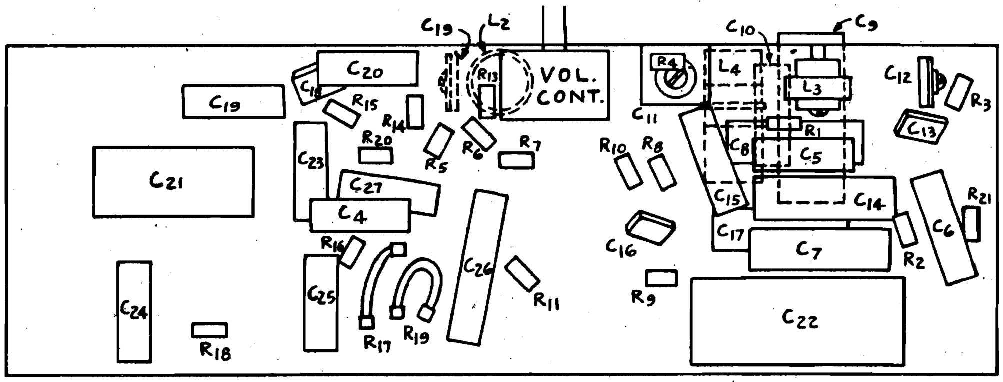
NOVEMBER 4, 1940

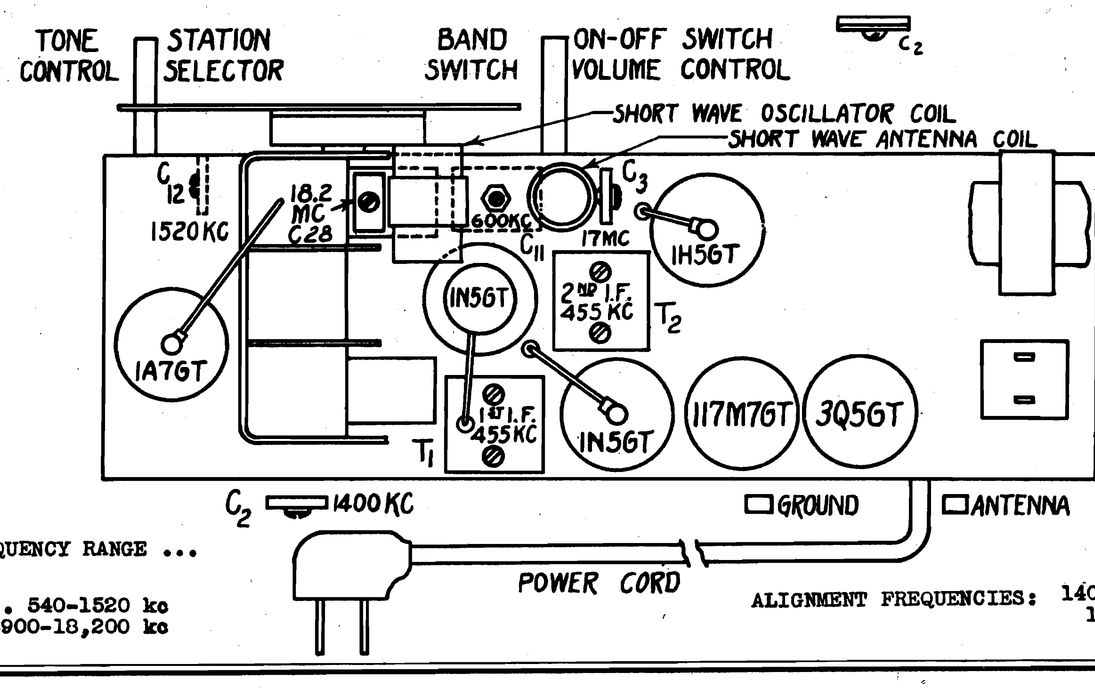
INTERMEDIATE FREQUENCY . . 455 kc

POWER SUPPLY . . . . . . Battery, 105-125 Volts 50-60 cycles or DC 20 Watts.

TUBES AND FUNCTIONS:

1A7GT ...... Oscillator-Translator
1N5GT .... First IF Amplifier
1N5GT .... Second IF Amplifier
1H5GT........... Detector-AVC-1st AF
3Q5GT .... Output, Battery
117M7GT ...... Rectifier-Output, Power





FREQUENCY RANGE ...

..... 540-1520 kc
5900-18,200 kc

ALIGNMENT FREQUENCIES: 1400-600 kc
17,000 kc

MODEL 7318
Chassis 109.369

SEARS ROEBUCK & CO.

MODEL 7814
Chassis 113.504

MODEL 7318 ALIGNMENT PROCEDURE

This receiver is a two band set covering the broadcast band 540-1520 kc, and the short wave band 5900-18,200 kc. The circuit is conventional. Two padding condensers are used for tracking. The broadcast padder is adjustable over a narrow range. The short wave padder is a fixed condenser of close tolerance. The gang condenser has both sections alike.

The normal alignment frequencies are shown below. It is to be noted that after aligning according to instructions, the top frequency of the set may not agree with the calibration. If an important station that should be received at the top end of the dial cannot be tuned in, the condenser should be opened and the oscillator trimmer adjusted to permit the reception of the desired signal, then the antenna circuit aligned at the specified aligning frequency.

PRELIMINARY:

Output meter connection	Across loudspeaker voice coil
Output meter reading to indicate 50 milliwatts	4 volts
Dummy to be used between high side of generator and receiver	See chart below
Position of volume control	fully on
Position of tone control	maximum high response
Position of band switch	as required.

RANGE SWITCH	POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	DUMMY CONNECTED TO	TRIMMERS ADJUSTED (in order shown)	FUNCTION
Broadcast	closed	455 kc	.1 mfd	Grid of 1A7GT	T2, T1	IF
Short Wave	open	18,200 kc	400 ohms	Antenna clip	C28	Oscillator
Short Wave	17,000 kc	17,000 kc*	400 ohms	Antenna clip	C3	RF Transl.
Broadcast	open	1520 kc	.1 mfd	Grid of 1A7GT	C12	Oscillator
Broadcast	1400 kc	1400 kc	Note	Note	C2	RF Transl.
Broadcast	600 kc	600 kc*	Note	Note	C11	Oscillator

* The variable condenser should be rocked back and forth a degree or two while making the adjustment.

NOTE In making the broadcast band adjustments (1400 kc and 600 kc), the loop antenna should be in the same position in relation to the chassis and batteries that it will be in the cabinet. Do not align the broadcast band with the loop near a large metal object such as the top of a metal workbench.

Connect a one turn loop to the terminals of the signal generator and couple this loop very loosely to the receiver loop.

If two peaks can be had, the correct one is with the trimmer screw further out (minimum capacity); the other peak is the image.

The alignment procedure should be repeated stage by stage in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value in order to make the AVC action of the receiver ineffective.

THE LOOP ANTENNA:

The self contained loop antenna is directional in its characteristic, therefore, reception may sometimes be improved, or interference reduced, by turning the set in a particular direction. In locations where the signal strength is too low to give satisfactory reception, either because of distance from the station, or because of shielding resulting from metal lath, steel girders or equivalent metal objects in the building, an outside antenna is necessary. This antenna should be connected to the clip in the rear of the receiver.

SHORT WAVE ANTENNA:

A reel antenna is provided for the short wave range of this receiver. This antenna should be fully unwound and may be strung around a picture moulding or under a rug. Where greater signal pickup is necessary a good outdoor antenna should be used.

GROUND:

When either the reel antenna or an outdoor antenna is used, a good ground is necessary for best reception when the receiver is operated on batteries. Do not connect a ground to this receiver when it is operating on a power line.

THE HEATER CIRCUIT:

The heater of the 117M7GT tube is connected directly across the power line. The 1A7GT, 1N5GT, 1H5GT, filaments in series are heated by the cathode current of the 117M7GT output section on AC-DC operation. The 1A7GT, 1N5GT, 1H5GT and 3Q5GT filaments in series are heated by a nine volt battery on battery operation. If any one of the battery tubes burn out it can be located through the fact that the full "A" battery voltage will appear across its filament terminals.

POSITION OF THE POWER CORD PLUG:

On AC, the power cord should be tried in both its possible positions in the receptacle and left in the position that gives the least hum. On DC, the receiver will work at only one position of the plug in its receptacle.

POWER OUTPUT:

Type		Beam Tube
Undistorted,	3Q5GT	0.12 watt
Undistorted,	117M7GT	0.53 watt
Maximum	3Q5GT	0.25 watt
Maximum	117M7GT	1.00 watt

LOUD SPEAKER:

Type	Permanent Magnet Dynamic
Size	5 inch
Field	Permanent Magnet

MODEL 7814

ALIGNMENT PROCEDURE

PRELIMINARY

MARCH 28, 1940

Output meter connections	Across loud speaker voice coil
Output meter reading to indicate 50 milliwatts	0.4 volts
Generator ground lead connection	Receiver chassis
Connection of generator output lead	See chart below
Dummy antenna value to be in series with generator output	See chart below
Approximate microvolts input to indicate 50 milliwatts output	See chart below
Generator modulation	30%, 400 cycles
Position of volume control	Fully on
Position of pointer with variable fully closed	Over first heavy line below 550 kc
Position of electric battery switch	Battery

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMERS ADJUSTED (IN ORDER SHOWN)	TRIMMER FUNCTION	APPROX. MICROVOLTS
Open	465 kc.	.05 Mfd.	1A7G Grid	T2, T1	I.F.	150
Open	1650 kc.	.00005 Mfd.	Antenna	C2	Oscillator	200
1400 kc.	1400 kc.	.00005 Mfd.	Antenna	C1	Translator	150
600 kc. (Rock)	600 kc.	.00005 Mfd.	Antenna	C3	Padder	150

Important Alignment Notes

Where indicated by the word "Rock", the variable should be rocked back and forth a degree or two while making the adjustment.

The chassis is removed from the case in order to make alignment adjustments, however, the loop antenna should be placed in the same relative position to the chassis as it occupies in the case.

Alignment should be done with the receiver operating from batteries.

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 AVC action of the receiver from interfering with accurate alignment.

ELECTRICAL SPECIFICATIONS

TUBES AND FUNCTIONS:
1A7G. . . . . . . Translator-Oscillator — 1H5G. . . . . . . Detector-AVC-AF
1N5G. . . . . . . IF — 1A5G. . . . . . . Output
35Z4GT. . . . . Rectifier

POWER SUPPLY:
105 - 120 Volts, A.C.-D.C. . . . . . . 35 Watts
Batteries
#5086. . . . . . 6v."A" battery — "A" Drain. . . . . . .56 ma
2 - #5090. . . . . 45v."B" battery — "B" Drain. . . . . . 8.5 ma

FREQUENCY RANGE:
Broadcast . . . . 540-1650 kc

ALIGNMENT FREQUENCIES:

Oscillator Trimmer	Antenna-Transl. Trimmer	Padder
1650 kc	1400 kc	600 kc

INTERMEDIATE FREQUENCY . . . . 465 kc

POWER OUTPUT:
Type. . . . . . . Pentode
Undistorted . . . . . . 0.095 watts
Maximum . . . . . . 0.15 watts

LOUD SPEAKER:
Type. . . . . . . PM Dynamic
Size. . . . . . . 5 inch

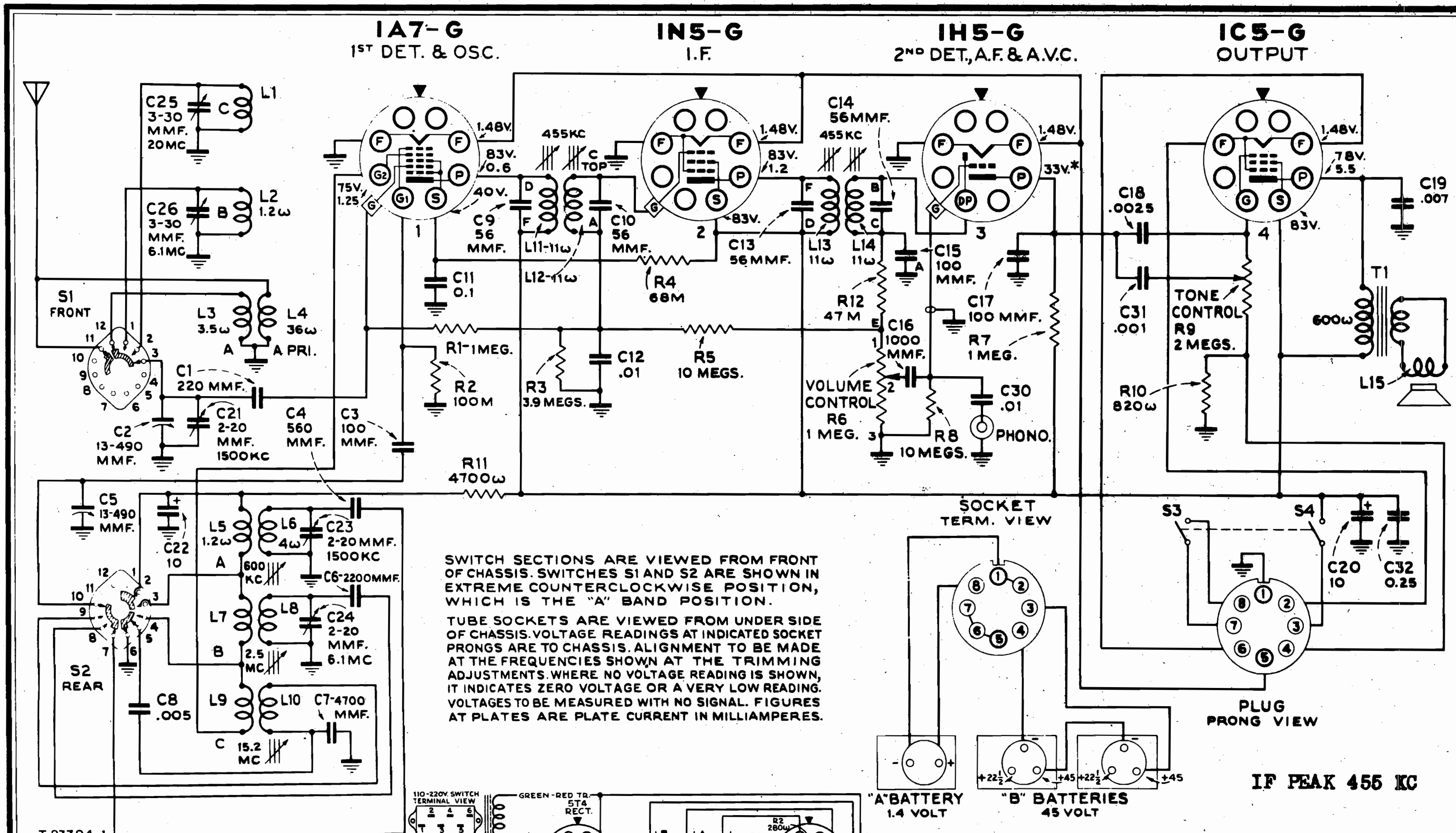
MECHANICAL SPECIFICATIONS

OPERATING CONTROLS:
1. Left knob. . . . . . . Volume
2. Center knob. .Batt.-Off-AC-DC Switch
3. Right knob. . . . .Station Selector

CONTROL OPERATION:
Turning right . . . . . . Volume increase
Turning right . . . . . Battery: Off: AC-DC
Tuning ratio. 5½:1

MODEL 7321 Export
Chassis 126.229

SEARS ROEBUCK & CO.



SWITCH SECTIONS ARE VIEWED FROM FRONT OF CHASSIS. SWITCHES S1 AND S2 ARE SHOWN IN EXTREME COUNTERCLOCKWISE POSITION, WHICH IS THE "A" BAND POSITION.

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS. ALIGNMENT TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES TO BE MEASURED WITH NO SIGNAL. FIGURES AT PLATES ARE PLATE CURRENT IN MILLIAMPERES.

IF PEAK 455 KC

Frequency Ranges:
Standard Broadcast.... 540-1,720 kc (555-174 m)
Medium Wave........ 2.3-7.0 mc (130-42.8 m)
Short Wave........... 7.0-22 mc (42.8-13.6 m)

Loudspeaker:
Type......... 5-inch permanent-magnet dynamic
Voice Coil Impedance...... 3 ohms at 400 cycles

Power Output:	Undistorted	Maximum
With Battery Supply...	0.13 watt.....	0.23 watt
With A-C Unit.......	0.20 watt.....	0.46 watt

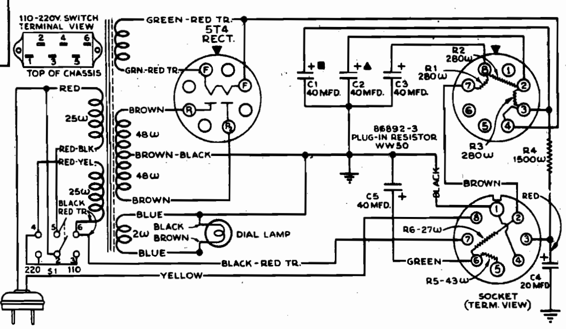


FIG. 7. POWER UNIT WIRING DIAGRAM

Socket Voltages, with the A-C Power Supply Unit.
(Line Supply Voltages, 117 or 234 Volts)

Tube	Filament Voltage	Plate Voltage	Screen Voltage	Plate Mils.	Bias Voltage
1A7-G	1.3	Det. 95 / Osc. 85	45	Det. 0.4 / Osc. 1.5	
1N5-G	1.3	95	95	1.5	
1H5-G	1.3	40*		.03	
1C5-G	1.28	92	95	9	6.1

Total "B" current, 15 mils.
Total filament current, 146 mils.
* With 750,000 ohm voltmeter.

NOVEMBER 1940

MODEL 7321 Export
Chassis 126.229

SEARS ROEBUCK & CO.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections........ Across speaker voice coil
Output meter reading to indicate 0.05 watt output........ 0.4 volts
Approximate average sensitivity in microvolts for 0.05 watt output........ See chart below
Dummy antenna value to be inserted in series with generator output........ See chart below
Connection of generator output lead........ See chart below
Connection of generator ground lead........ To chassis
Generator modulation........ 30%, 400 cycles
Position of Volume Control........ Fully Clockwise
Position of Tone Control........ Fully Clockwise

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"Broadcast"	High End	455 kc	.001 mfd.	1N5-G I-F Grid Cap	L13, L14	2nd I-F Trans.	4,000
"Broadcast"	High End	455 kc	.001 mfd.	1A7-G Det. Grid Cap	L11, L12	1st I-F Trans.	50
"Broadcast"	1,500 kc (152.5°)	1,500 kc	.0002 mfd.	Ant.	C23, C21	Osc., Ant.	12
"Broadcast"	600 kc (33°) (Rock).	600 kc	.0002 mfd.	Ant.	L6	Osc.	6
"Medium Wave"	6.1 mc (151°)	6.1 mc	300 ohms	Ant.	C24, C26	Osc.,* Ant.	12
"Medium Wave"	2.5 mc (29.5°) (Rock)	2.5 mc	300 ohms	Ant.	L8	Osc.	18
"Short Wave"	15.2 mc (122°)	15.2 mc	300 ohms	Ant.	L10	Osc.	15
"Short Wave"	20 mc (155.5°) (Rock)	20 mc	300 ohms	Ant.	C25	Ant.**	18
"Broadcast"	1,500 kc (152.5°)	1,500 kc	.0002 mfd.	Ant.	C23	Osc.	12

IMPORTANT ALIGNMENT NOTES

*Use minimum capacity peak if two peaks can be obtained.
**Use maximum capacity peak if two peaks can be obtained.

Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band. Grid cap leads should remain in place during alignment.

Note.—Oscillator tracks 455 kc above signal on all bands.

Values shown under, "Microvolts," are only approximate.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 45° mark on the drum scale (see "Dial Drive Drawing") must be in a horizontal position when the plates are fully meshed. The distance from the edge of the chassis to the drum must not exceed ⅛-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0°" mark on the calibration scale when the plates are fully meshed.

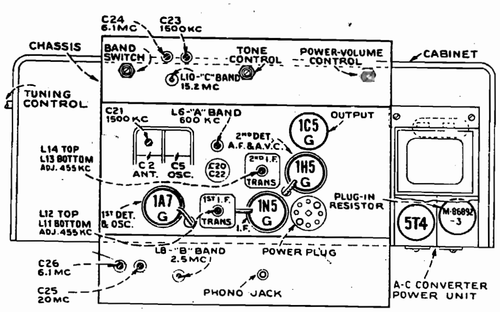
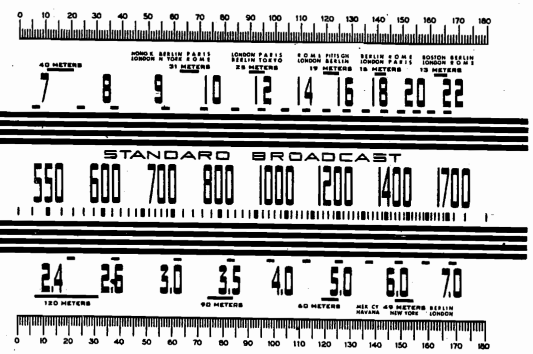


FIG. 2. TUBE TRIMMER AND PARTS LOCATION



Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 38° on the calibration scale corresponds to approximately 7.9 mc on "C" band, and 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

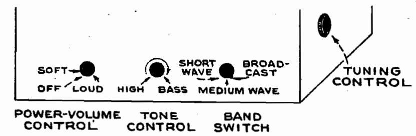


FIG. 3. CONTROLS

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

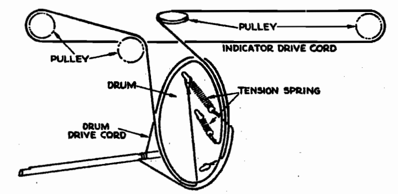


FIG. 4. CONDENSER AND INDICATOR DRIVE CORDS

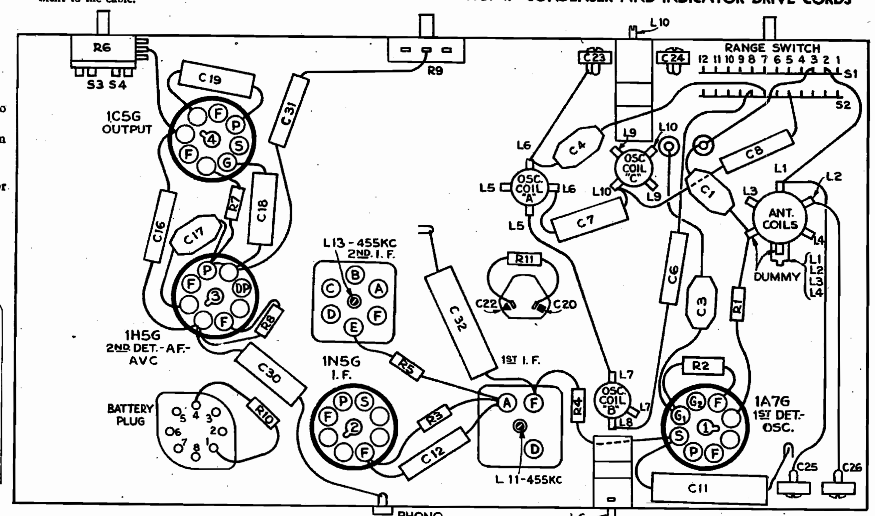
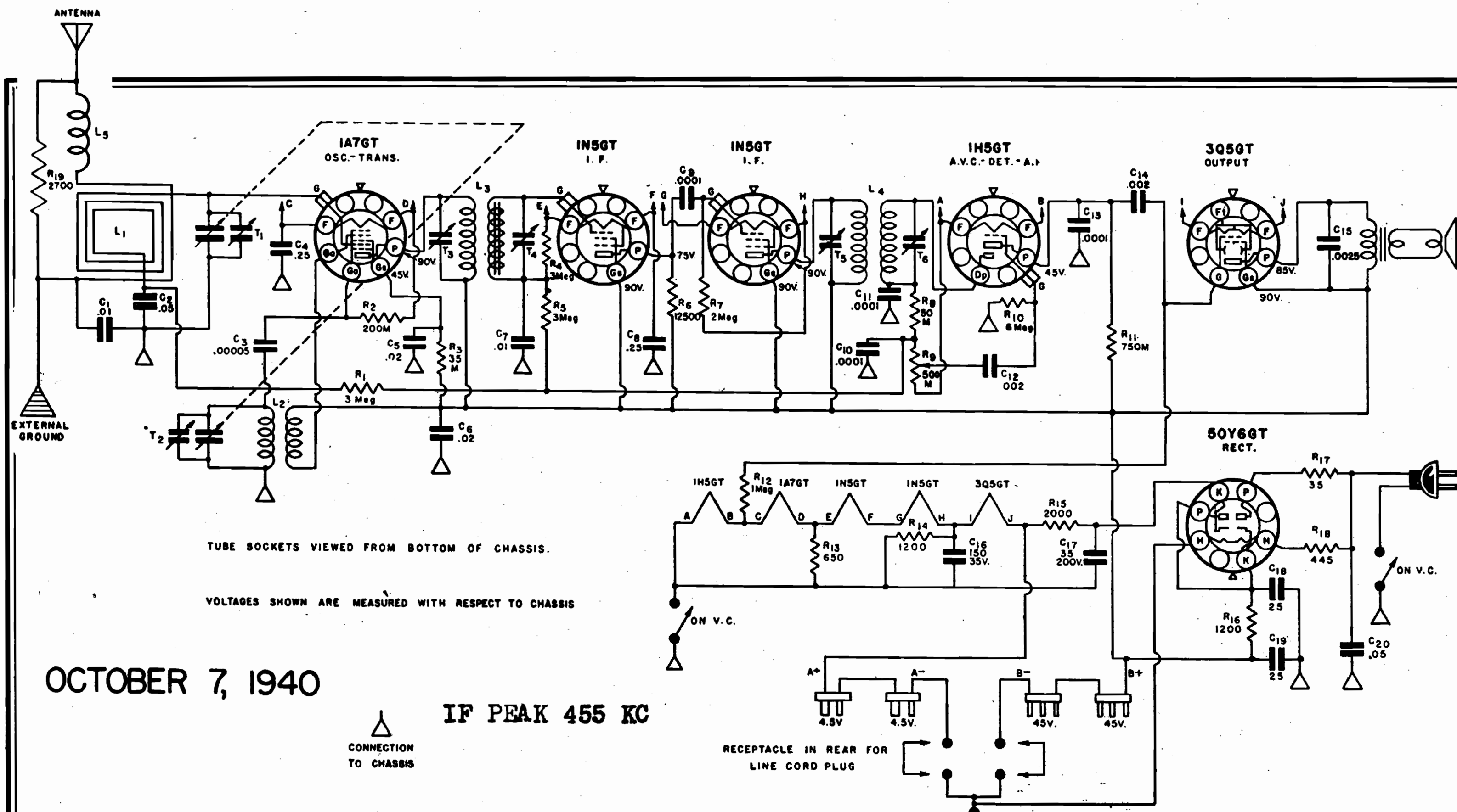


FIG. 5. TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

MODEL 6861
Chassis 110.412

SEARS ROEBUCK & CO.



OCTOBER 7, 1940

IF PEAK 455 KC

FREQUENCY RANGE
Broadcast........535-1730

POWER SUPPLY:
All models available....

BATTERY AND 110-125 VOLTS AC-DC

LOUD SPEAKER:
Type........ ...Dynamic
Size........ ....5"
Field....... ......P.M.

POWER OUTPUT
Type........ Beam Pentode
Undistorted........175 MW
Maximum............350 MW

POSITION OF VARIABLE	GENERATOR FREQUENCY	GENERATOR CONNECTION	TRIMMER ADJUSTMENTS	TRIMMER FUNCTION
Closed	455 KC	1A7GT Grid	T3,T4 T5,T6	I.F.
1500 KC	1500 KC	*	T2,T1	Osc. R.F.

The complete assembly of loop mounting and chassis shelf should be removed as a unit in order to align the receiver.

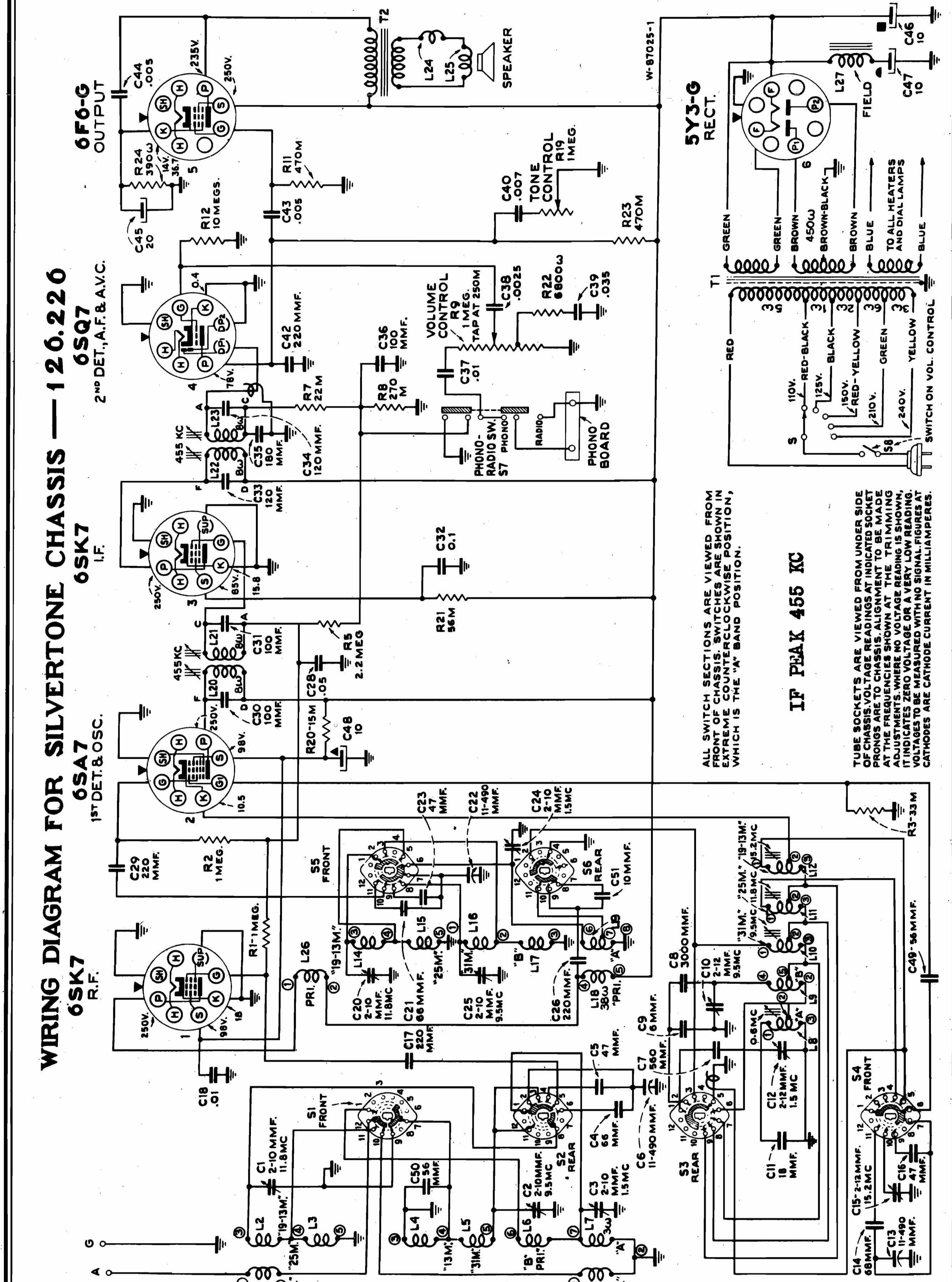
The batteries should be in the proper position when aligning the receiver.

* Run a wire from the output terminal of the generator, having it come near the receiver. However, no electrical connection is made between the signal generator and the receiver.

Always keep the output power from the generator at its lowest possible value to prevent the avc of the receiver from interfering with accurate alignment.

MODEL 7325 Export
Chassis 126.226

SEARS ROEBUCK & CO.



SEARS ROEBUCK & CO.

MODEL 7325 Export
Chassis 126.226

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connections .... Across speaker voice coil
Output meter reading to indicate 1.0 watt output .... 1.8 volts
Approximate average sensitivity in microvolts for 1.0 watt output .... See chart below
Dummy antenna value to be inserted in series with generator output .... See chart below
Connection of generator output lead .... See chart below
Connection of generator ground lead .... To chassis
Generator modulation .... 30%, 400 cycles
Position of Volume Control .... Fully clockwise
Position of Tone Control .... Fully clockwise

LOCATION OF PARTS AND ALIGNMENT ADJUSTMENTS ON TOP OF CHASSIS

Wave-Band Switch Position	Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Trimmers Adjusted (In order shown)	Trimmer Function	Approximate Microvolts
"A"	Low End	455 kc	.001 mfd.	6SK7 I-F Grid	L22, L23	2nd I-F Trans.	4,000
"A"	Low End	455 kc	.001 mfd.	6SA7 Det.-Osc. Grid	L20, L21	1st I-F Trans.	70
"25 Meter"	11.8 mc (138.5°)	11.8 mc	300 ohms	Ant.	L11, C1, C20	Osc.,* Ant., Det.	7
"25 Meter"	15.2 mc (18.5°)	15.2 mc	300 ohms	Ant.	C15	Osc.*	8.5
"19-13 Meter"	15.2 mc (156°)	15.2 mc	300 ohms	Ant.	L12	Osc.*	7
"31 Meter"	9.5 mc (156°)	9.5 mc	300 ohms	Ant.	L10, C2, C25	Osc.,* Ant., Det.	5.6
"Medium Band"	9.5 mc (11.5°)	9.5 mc	300 ohms	Ant.	C10	Osc.*	3
"Standard Band"	1,500 kc (27°)	1,500 kc	.0002 mfd.	Ant.	C12, C3, C24	Osc., Ant., Det.	2
"Standard Band"	600 kc (149.5°) (Rock)	600 kc	.0002 mfd.	Ant.	L8	Osc.	1.5

IMPORTANT ALIGNMENT NOTES

* Use minimum capacity peaks if two peaks can be obtained.

Where indicated by the word "Rock," the variable tuning condenser should be rocked back and forth a degree or two while making this adjustment.

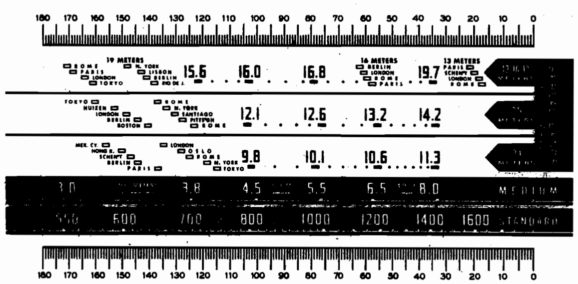
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value to prevent the a-v-c action of the set interfering with accurate alignment.

Adjustment locations are shown on the top and bottom parts location views of chassis.

Only the dummy antenna indicated in the chart for any particular band should be used. Remove the dummy used for alignment in any other band.

Note.—Oscillator tracks 455 kc above signal on all bands.

Values shown under, "Microvolts," are only approximate.



Calibration Scale

Reduced Reproduction of Receiver Dial, and Corresponding 180-0° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example: 150° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

Spread-Band Alignment.—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 these 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 test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a slight error will produce considerable inaccuracy on the spread-band dials. The frequency settings of the test-oscillator may be checked by one or both of the following methods:

1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, or by zero-beating against standard broadcast stations.

When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

Calibration Scale on Variable Condenser Drive Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment when chassis is out of cabinet; therefore, a calibration scale is attached to the rear of the drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale (see "Dial Drive Drawing") must be in a vertical position when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet attach the dial pointer to the drive cable with variable condenser fully closed and pointer on last calibration mark at 550 kc end of Broadcast "A" band. The dial pointer has a spring clip for attachment to the cable.

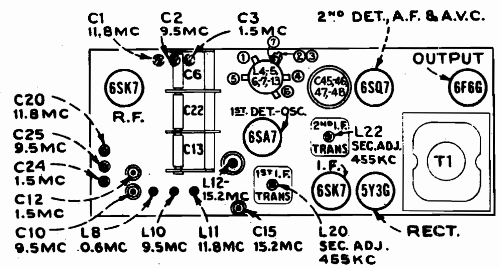


FIG. 3. TUBE, TRIMMER AND PARTS LOCATION

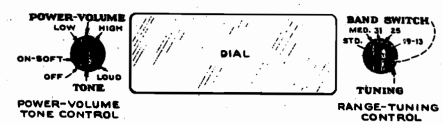


FIG. 4. CONTROLS

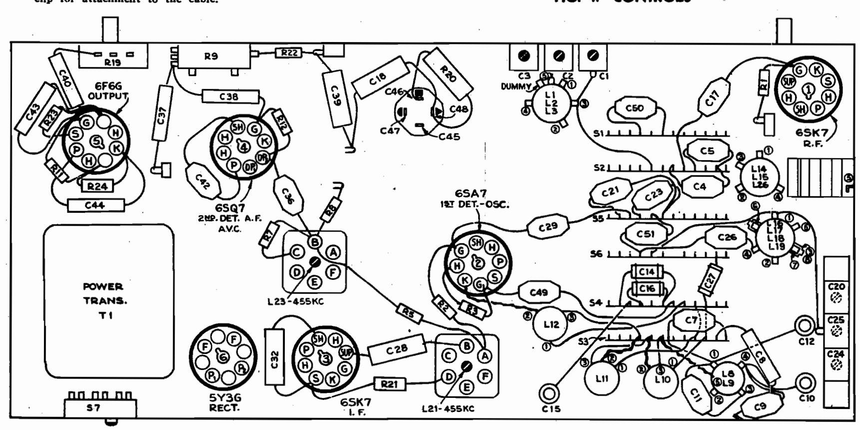


FIG. 5. TUBE, TRIMMER AND PARTS LOCATION—BOTTOM VIEW

MODEL 7325 Export
Chassis 126.226

SEARS ROEBUCK & CO.

Electrical and Mechanical Specifications

Tubes and Functions:
6SK7 .... R-F Amplifier
6SA7 .... First Detector-Oscillator
6SK7 .... I-F Amplifier
6SQ7 .... Second Detector, A-F Amplifier and A.V.C.
6F6-G .... Power Output
5Y3-G .... Rectifier

Frequency Ranges:
Standard Broadcast .... 540-1,720 kc (555-174 m)
Medium Wave .... 3,000-9,500 kc (100-31.5 m)
31 Meter Spread Band .... 9,500-12,500 kc (31.5-24.0 m)
25 Meter Spread Band .... 11,800-16,000 kc (25.5-18.8 m)
19-16-13 Meter Spread Band. 15,500-22,500 kc (19.5-13.3 m)

Chassis Features:
Jack and Switch for Phonograph Attachment
Magnetite-Core Adjusted I-F Transformers, and Oscillator Coils
Automatic Volume Control
High-Frequency Tone Control
Aural-Compensated Volume Control
No. R-F Stages (all bands) .... one
No. I-F Stages .... one
Spread Bands for Short Wave Reception

Intermediate Frequency .... 455 kc

Alignment Frequencies:
Standard Broadcast... 1,500 kc (osc.)—(ant.) 600 kc (osc.)
Medium Band .... 9.5 mc (osc.)
31 Meter Spread Band .... 9.5 mc (osc.) (det.) (ant.)
25 Meter Spread Band .... 11.8 mc (osc.) (det.) (ant.)
15.2 mc (osc.)
19-13 Meter Spread Band .... 15.2 mc (osc.)

Loudspeaker:
Type .... 6-inch electrodynamic
Voice Coil Impedance at 400 Cycles .... 3.4 ohms
Field Coil Resistance .... 1,060 ohms

Power Output:
Type .... Pentode
Undistorted .... 2.5 watts
Maximum .... 4.5 watts

Power Supply Rating:
105-120 volts, 25 cycle .... 75 watts
105-120 volts, 50-60 cycle .... 75 watts
105-130, 140-160, 200-250 volts, 50-60 cycle .... 75 watts

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

Schematic Location	Part No.	DESCRIPTION	Selling Price Each
	1265434502	Arm—Operating arm between knob shaft and range switch.	.25
	1265537053	Board—"Antenna-Ground" board	.20
	1265937153	Book—Instruction book	.25
	1265437054	Bracket—Pulley support bracket complete with pulley—fastened on bracket, Stock No. 1265434131	.20
	1265434130	Bracket—pulley support bracket complete with pulley—located on left hand side of chassis	.30
	1265434131	Bracket—Pulley support bracket complete with 2 pulleys—located on right hand side of chassis	.55
	1264035795	Calibrator—Drive drum calibrator	.25
L4, L5, L6, L7, L13	1262837055	Coil—Antenna coil—"A," "B" and "31 meter" bands	1.80
L1, L2, L3	1262837056	Coil—Antenna coil—"25, 19, 13 meter" band	1.00
L8, L9	1262837093	Coil—Oscillator coil—"A," and "B" bands	.85
L18	1262835624	Coil—Oscillator coil—"19-13 meter" band—25 meter	.45
L11	1262835625	Coil—Oscillator coil—"25 meter" band	.50
L10	1262835626	Coil—Oscillator coil—"31 meter" band	.45
L14, L15	1262837058	Coil—R.F. coil—"25 meter" and "19-13 meter" bands	.80
L16, L17, L18, L19	1262837057	Coil—R.F. coil—"A," "B" and "31 meter" bands	1.60
C45, C46, C47, C48	1262033014	Condenser—Electrolytic comprising three sections of 10 mfd.—450 volts each and one section of 20 mfd.—25 volts	1.90
C18, C32	126194839	Condenser—0.1 mfd., 400 volts, tubular	.30
C28	1261932787	Condenser—.05 mfd., 400 volts, tubular	.20
C39	1261936248	Condenser—.035 mfd., 400 volts, tubular	.20
C37	126194937	Condenser—.01 mfd., 1,000 volts, tubular	.25
C40	126195148	Condenser—.007 mfd., 500 volts, tubular	.20
C43, C44	1261933584	Condenser—.005 mfd., 1,200 volts, tubular	.25
C8	1261935643	Condenser—.003 mfd., tubular	.55
C38	1261934459	Condenser—.0025 mfd., 1,400 volts, tubular	.20
C7	1261931433	Condenser—.00056 mfd., silvered mica	.35
C35	1261936616	Condenser—.00022 mfd., mica	.30
C17, C26, C29, C42	1261912694	Condenser—.00022 mfd., moulded	.35
C33, C34	1261931813	Condenser—.00012 mfd., mica	.30
C30, C31	1261930904	Condenser—.0001 mfd., mica	.25
C36	1261912720	Condenser—.0001 mfd., moulded	.35
C14	1261935645	Condenser—.000068 mfd., ceramic	.35
C4, C21	1261936072	Condenser—.000066 mfd., silvered mica	.30
C49, C50	1261912723	Condenser—.000066 mfd., moulded	.35
C16	1261935644	Condenser—.000047 mfd., ceramic	.35
C5, C23	1261937329	Condenser—.000047 mfd., silvered mica	.35
C11	1261931350	Condenser—.000018 mfd., silvered mica	.30
C51	1261913200	Condenser—.00001 mfd., moulded	.35
C9	1261935646	Condenser—.000006 mfd., moulded	.35
C27	1261933097	Condenser—.0000047 mfd., ceramic	.35
C10, C12, C15	1261712714	Condenser—Air trimmer—medium, 2-12 mmfd.	.50
C20, C24, C25	1261737059	Condenser—Mica trimmer comprising 3 sections each, 2-10 mmfd.	.60
C1, C2, C3	1261737059	Condenser—Mica trimmer comprising 3 sections of 2-10 mmfd., each	.60
C6, C13, C22	1261637151	Condenser—Variable tuning condenser	6.25
R19	1262537052	Control—Tone control	1.00
R9, S8	1262437051	Control—Volume control and power switch	2.00
	1264534662	Cord—Indicator drive cord	.25
	1265432634	Cord—Tuning condenser drive cord	.10
	1261731259	Core—Adjustable core and stud	.15
	1261735788	Core—Adjustable core and stud for "A," "B" and "C" band oscillator coil	.15
	1261731259	Core—Adjustable core and stud for the 25 meter and 31 meter bands oscillator coils	.15
	1265435387	Decalcomania—"Power-Volume" decalcomania	.05
	1265437152	Decalcomania—"Range" decalcomania	.15
	1265435388	Decalcomania—"Tone" decalcomania	.05
	1265436909	Decalcomania—Trade mark decalcomania	.15
	1265435391	Decalcomania—"Tuning" decalcomania	.05
	1264037116	Dial—Glass dial scale	1.35
	1264633770	Drive—Planetary tuning drive less balls, shafts, and shaft retainer	.90
	1264533773	Drum—Tuning condenser drive drum	.90
	1265437216	Frame—Dial frame complete, less pointer and carriage, pointer carriage guide shafts and dial	2.00
	1265433185	Gear—Volume control gear and hub	.50
	1264911765	Lamp—Dial lamp—Mazda No. 55	.17
	1265433767	Link—Operating link between knob shaft and range switch.	.60
	1265435653	Mounting—Rubber mounting for speaker	.20
	126195119	Plug—3-contact female plug for speaker cable	.25
	1264137217	Pointer—Station selector pointer and carriage	.40
	1264536627	Pulley—Drive cord pulley only fastened to bracket, Stock No. 1265434130	.10
	1264535630	Pulley—Drive cord pulley only—fastened to brackets, Stock Nos. 1265434131 and 1265437054	.10
R12	1262313601	Resistor—10 megohm, ½ watt	.20
R5	1262312679	Resistor—2.2 megohm, ½ watt.	.20
R1, R2	1262313730	Resistor—1 megohm, ½ watt	.20
R23	1262330648	Resistor—470,000 ohms, ½ watt	.20
R11	1262312285	Resistor—470,000 ohms, ½ watt	.20
R8	1262312199	Resistor—270,000 ohms, ½ watt	.20
R21	1262330650	Resistor—56,000 ohms, ½ watt.	.20
R3	1262318454	Resistor—33,000 ohms, ½ watt.	.20
R7	1262313998	Resistor—22,000 ohms, ½ watt.	.20
R20	1262335875	Resistor—15,000 ohms, 3 watt.	.35
R22	1262312265	Resistor—6,8,000 ohms, ½ watt	.20
R24	1262331388	Resistor—390 ohms, 1 watt	.22
	1265414343	Ring—Retaining ring for tone control	.03
	1265431611	Screw—No. 8-32 milled head set screw for gear, Stock No. 1265433185	.02
	1265414350	Screw—No. 8-32 square head set screw for drive drum	.03
	1265434491	Shaft—Pointer carriage guide shaft	.15
	1265434134	Shaft—Range switch shaft	.80
	1265434132	Shaft—Shaft and gear for tone control	.55
	1264634135	Shaft—Tuning shaft	.70
	1261931864	Socket—Dial lamp socket	.20
	1261834187	Socket—Phono input socket	.15
	1261831251	Socket—Tube socket	.25
		Always show number on speaker when ordering replacement parts.	
	1265835848	Speaker—6-inch dynamic speaker complete—less output transformer and plug	3.50
	1265732907	Cap—Dust cap	.02
L27	1261533966	Coil—Field coil	1.70
L24	1265732906	Coil—Neutralizing coil	.25
L25	1265735441	Cone—Cone complete with voice coil, suspension and dust cap	1.25
	126575118	Plug—3-prong male speaker plug	.25
T2	1261332905	Transformer—Output transformer	1.35
	1265431418	Spring—Drive cord spring	.05
	1264633769	Spring—Planetary tuning drive spring	.15
	1265413638	Spring—Pointer cord spring	.08
	1265431261	Spring—Retaining spring for cores and studs	.01
	1265431261	Spring—Retaining spring for oscillator coil, No. 1262835624	.01
S7	1263833491	Switch—Radio-phono switch	.35
S1, S2, S3, S4, S5, S6	1263737050	Switch—Range switch	3.50
L20, L21, C30, C31	1263335636	Transformer—First I.F. transformer	1.70
L22, L23, C33, C34, C35	1263536615	Transformer—Second I.F. transformer	1.60
T1	1261131734	Transformer—Power transformer—105-120 volts, 25 cycle	10.35
T1	1261031733	Transformer—Power transformer—105-120 volts, 50-60 cycle	4.75
T1	1261031735	Transformer—Power transformer—105-130, 140-160, 200-250 volts, 50-60 cycle	10.80
	126462917	Washer—"C" washer for tuning drive	.03

General Information and Service Hints

Record Player:
A jack is provided on the rear of chassis for connection to a No. 6227 Silvertone Record Player which is supplied only in 100-125 volts, 25, 50 or 60 cycle rating. If receiver is to be used on 220 volts, it will be necessary to connect the Record Player power cord to the 110V. primary section of the Power Transformer as shown in "Record Player connections" illustration.

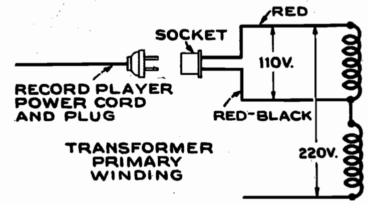


FIG. 1. RECORD PLAYER CONNECTIONS (220V—110V)

Loudspeaker:
The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

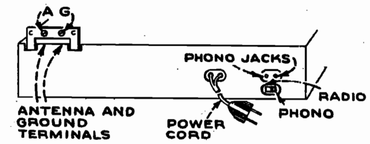


FIG. 2. REAR OF CHASSIS

Tuning Dial:
The tuning shaft is connected through a cord drive to a drum on the condenser shaft. A second cord drives the dial indicator by passing over a pulley on the chassis. Figure 6 shows the complete cord drive assembly and the correct number of turns which the cord should be wrapped around the drive shaft and condenser drum.

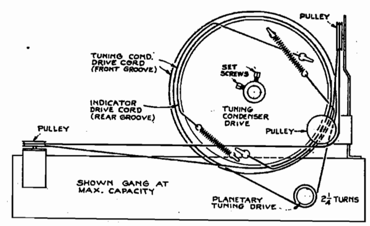


FIG. 6. CONDENSER AND INDICATOR DRIVE CORD

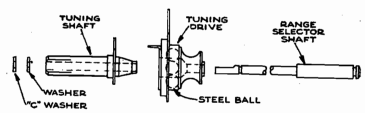


FIG. 7. PLANETARY TUNING DRIVE ASS'Y

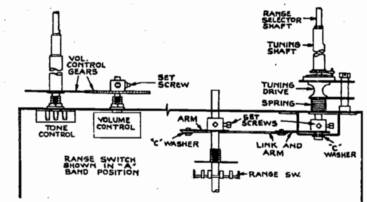
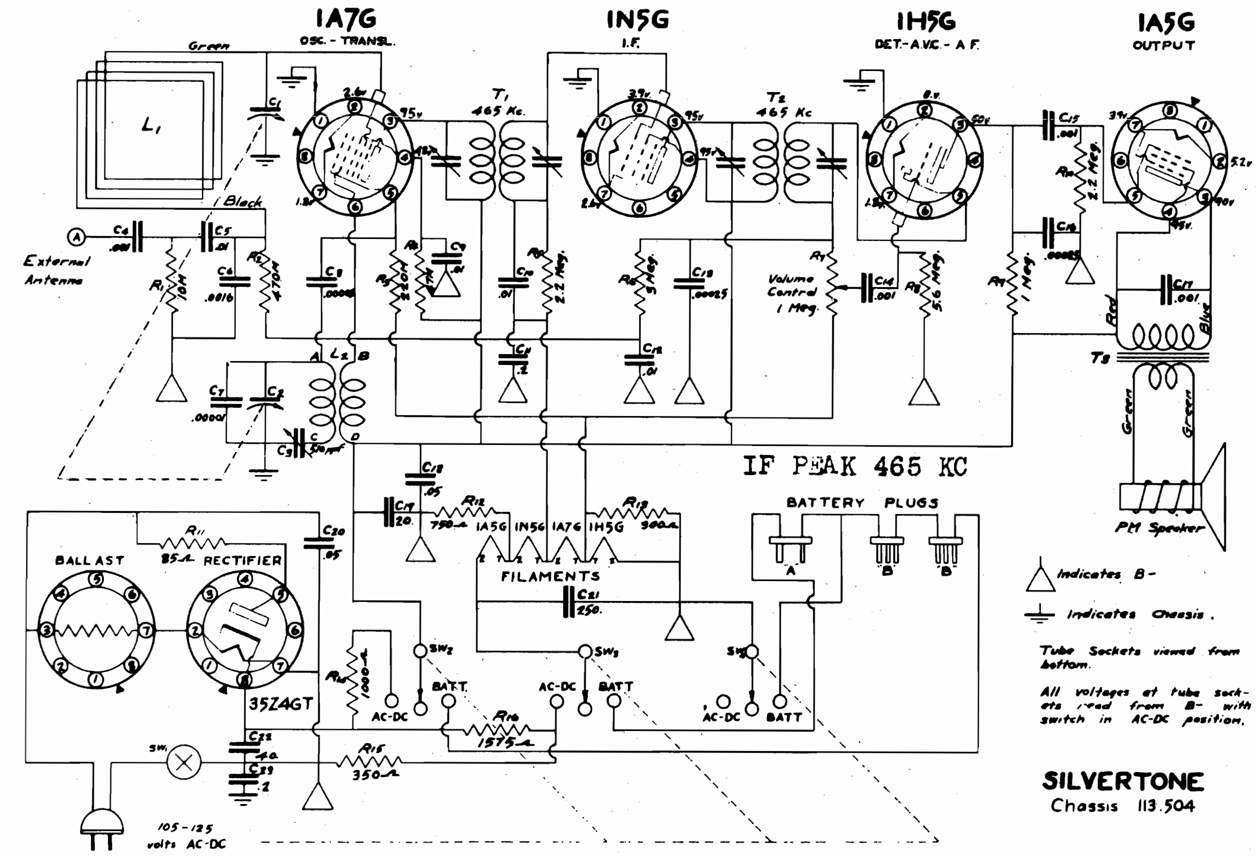


FIG. 8. BOTTOM VIEW OF CONTROLS

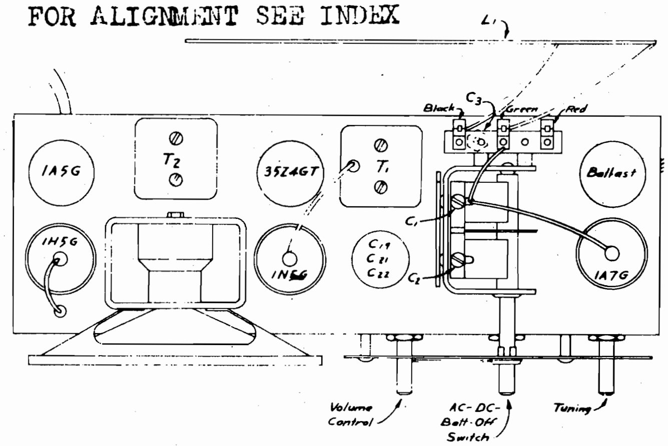
SEARS-ROEBUCK & CO.

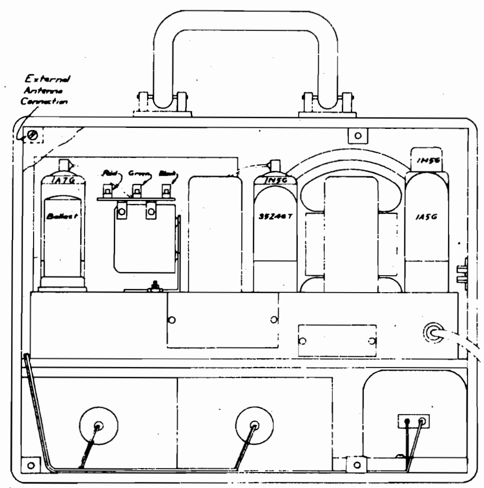
MODEL 7814
Chassis 113.304

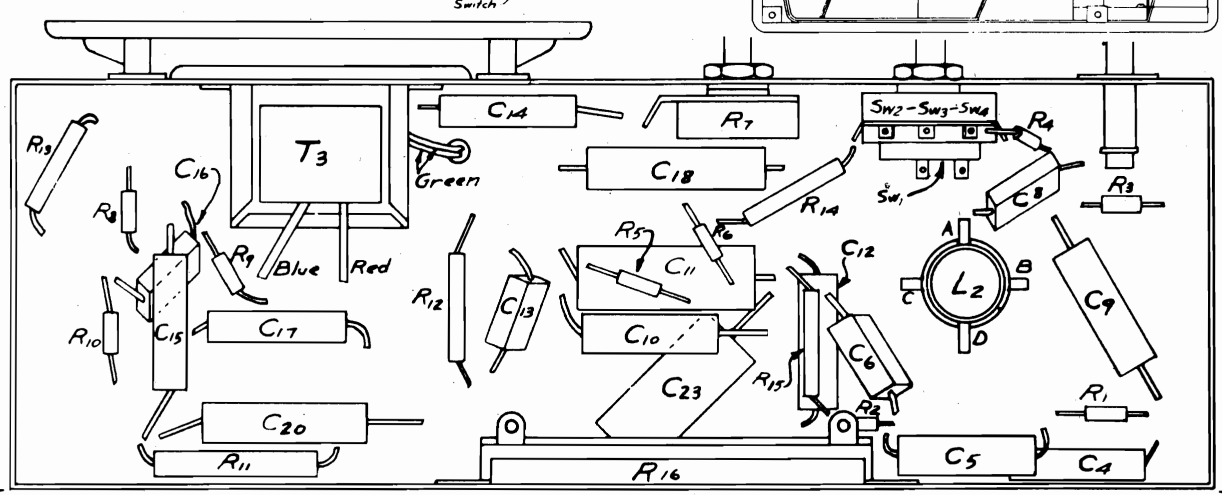


SILVERTONE
Chassis 113.504

FOR ALIGNMENT SEE INDEX







MODEL 7245
Chassis 107.375

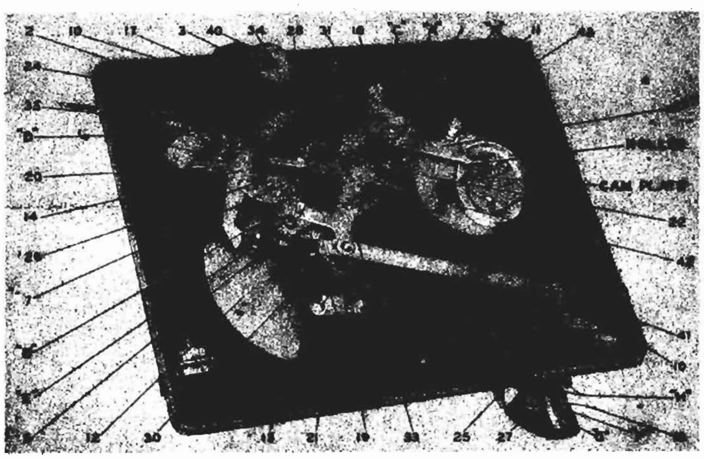
SEARS-ROEBUCK & CO.

AUTOMATIC RECORD CHANGER

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 hob 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 .005 -.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

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.

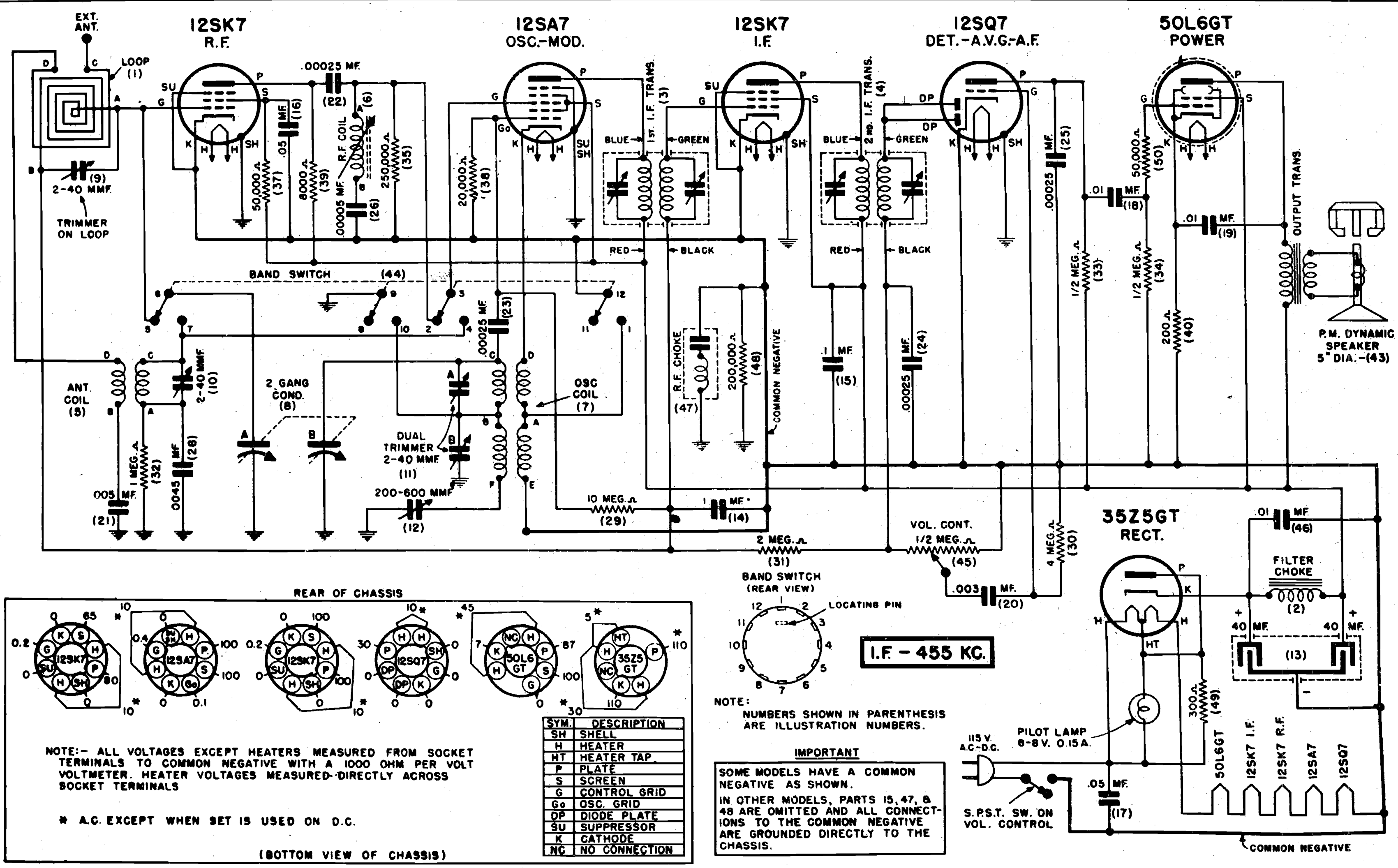
The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

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".

SENTINEL RADIO CORP.

MODELS 1U-212UL
212UL



SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	CONTROL GRID
Go	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTE: NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

IMPORTANT

SOME MODELS HAVE A COMMON NEGATIVE AS SHOWN.
IN OTHER MODELS, PARTS 15, 47, & 48 ARE OMITTED AND ALL CONNECTIONS TO THE COMMON NEGATIVE ARE GROUNDED DIRECTLY TO THE CHASSIS.

PART NO.- 1U-212UL, 212UL

VOLTAGE TABLE

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance — also on very loud signals the light may fluctuate.

Always use a 6.3 volt .15 ampere dial light.

OUTSIDE AERIAL

When the radio is used in shielded areas or when located a great distance from broadcast stations, the volume of stations operating in the 540-1600 K.C. band may not be ample in which case it would be necessary to ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT THE REAR OF THIS CHASSIS to obtain satisfactory results.

MODELS 1U-212UL, 212UL
MODELS 1U-214UL, 214UL

SENTINEL RADIO CORP.

Printed in U.S.A.—4-40—

MODELS 1U-212UL,212UL ALIGNMENT PROCEDURE

PART NO. A12050—212 & 1U-212

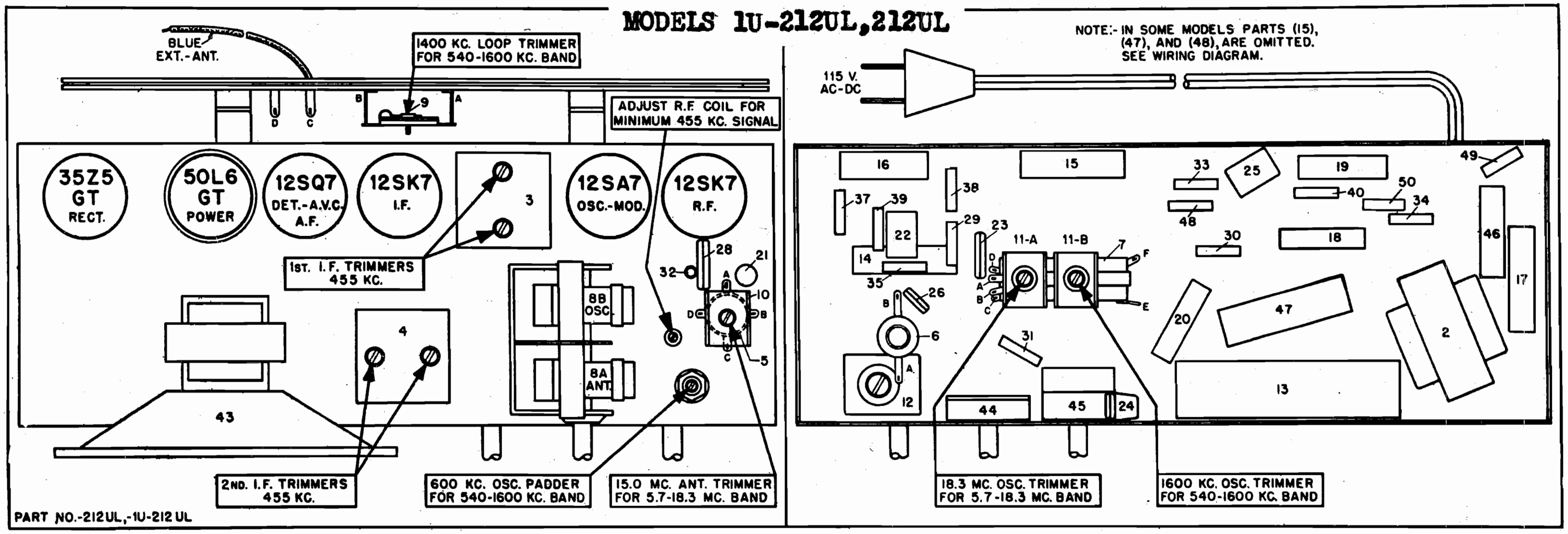
For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer 600 K.C. padder, 455 K.C. R.F. trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

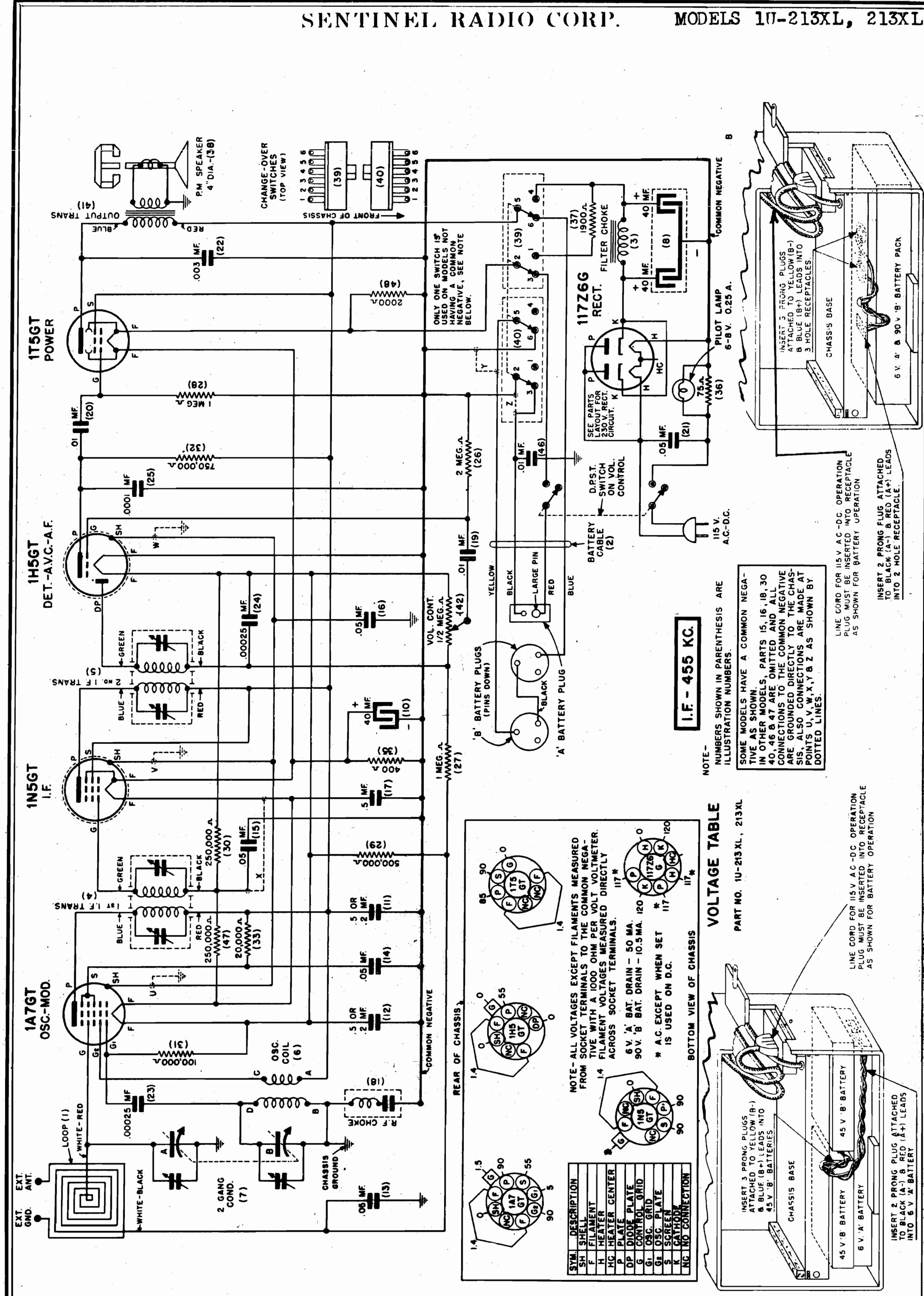
FOLLOW THIS PROCEDURE FOR MODELS 1U-214UL,214UL. FOR TRIMMERS SEE PAGE 12-14

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.	0.2 Mfd. condenser	High side to grid cap of 12SA7 tube. Low side to frame of condenser through .01 Mfd. condenser.	Adjust each of the second I.F. transformer trimmer for maximum output, then adjust each of the first I.F. transformer trimmers for maximum output.
1600 to 540 K.C. Band	1 Rotate gang condenser to Maximum Capacity	Exactly 455 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	Adjust R.F. coil for minimum 455 K.C. signal.
	2 Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	Adjust 1600 K. C. oscillator trimmer for maximum output.
	3 Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test Oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	4 Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.
5.7 to 18.3 M.C. Band	1 Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Blue Ant. Lead, Low side to frame of gang condenser through .01 Mfd. condenser.	Adjust 18.3 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. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead, Low side to frame of gang condenser.	While rocking gang condenser adjust 15 M. C. antenna trimmer for maximum output.

MODELS 1U-212UL,212UL



SENTINEL RADIO CORP. MODELS 1U-213XL, 213XL



SYM.	DESCRIPTION
SH	SHELL
F	FILAMENT
H	HEATER
HC	HEATER CENTER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
G2	OSC. GRID
S	SCREEN
K	CATHODE
NC	NO CONNECTION

MODELS 1U213XL, 213XL

SENTINEL RADIO CORP.

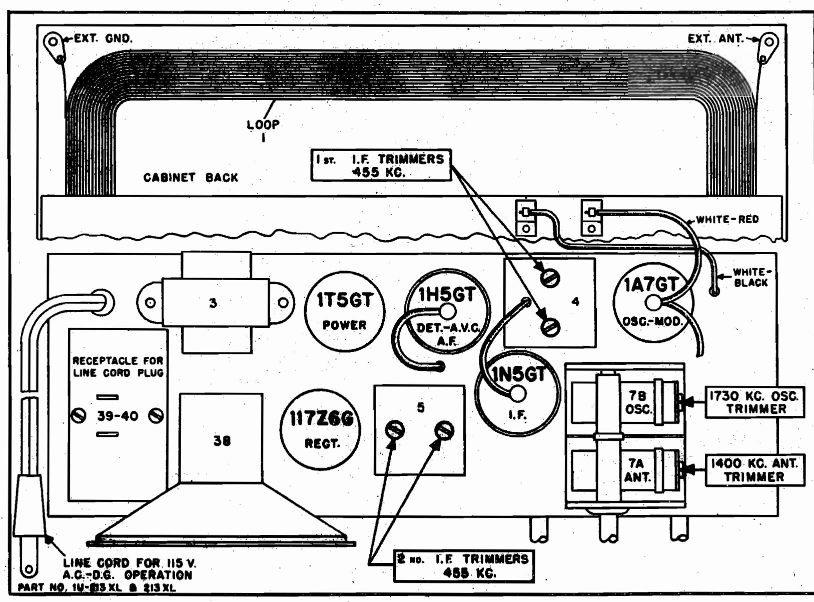
-1-41-

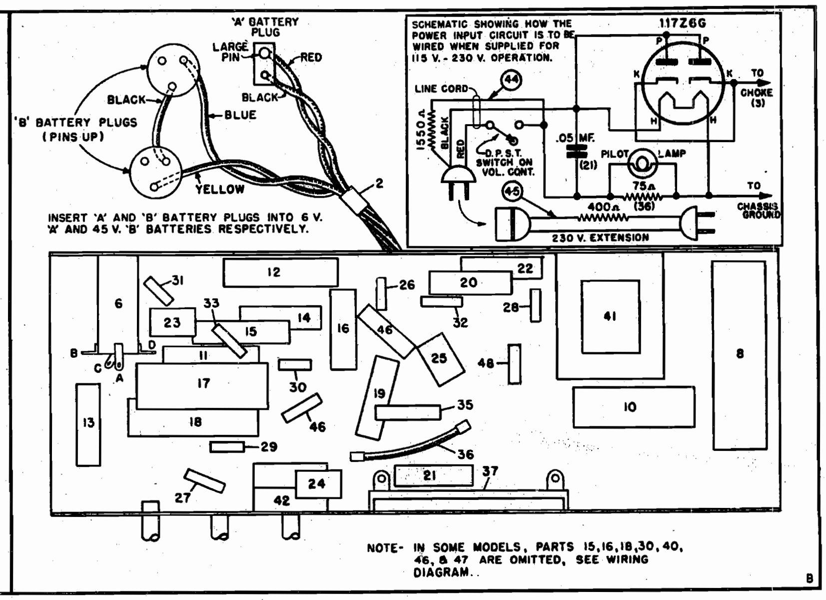
ALIGNMENT PROCEDURE

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. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

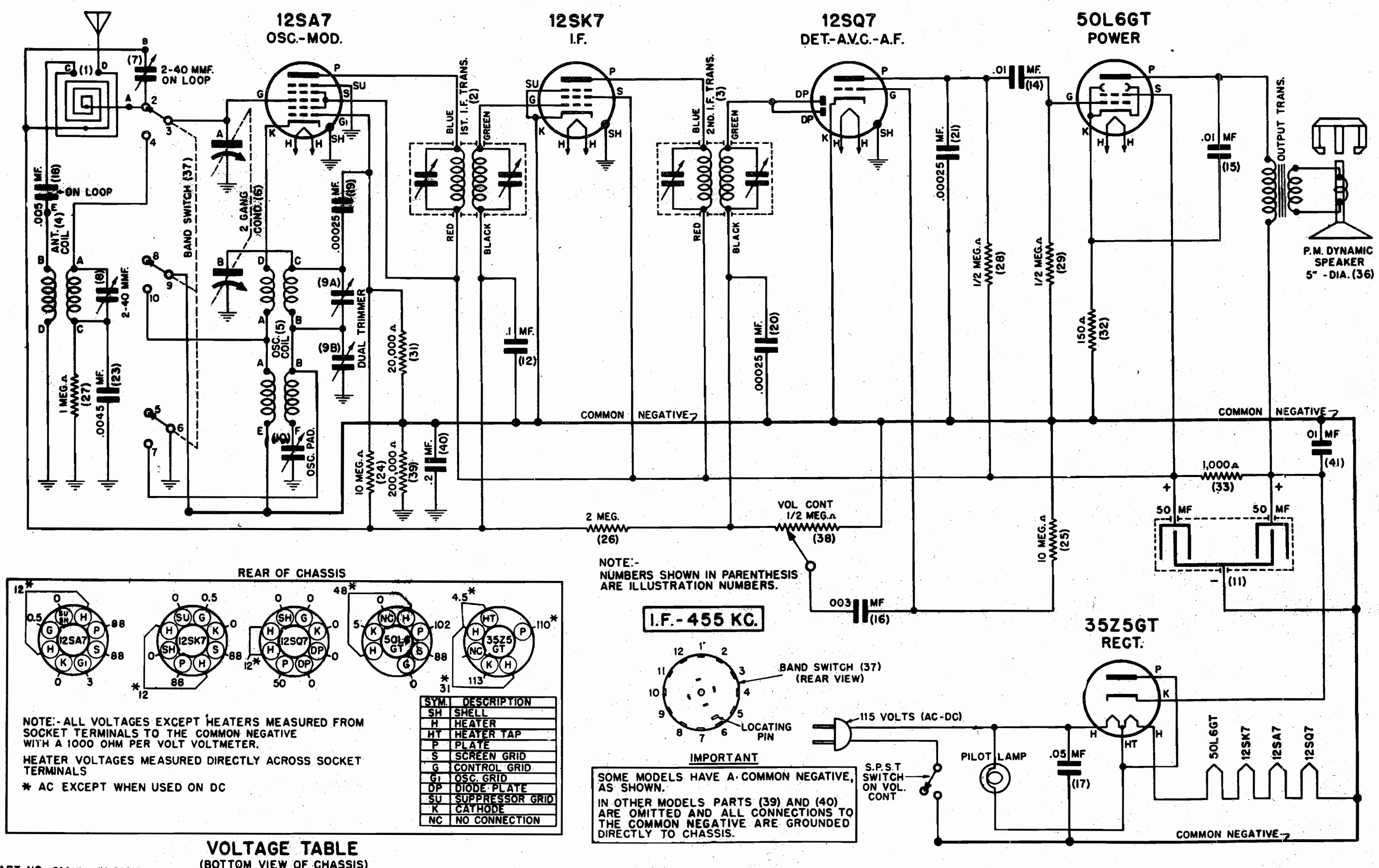
Place band switch for operation on:	Set receiver dial to:		TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position.	Any point where no interfering signal is received		Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 1A7GT 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.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1730 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.





SENTINEL RADIO CORP.

MODELS 1U-214UL, 214UL



FOR OTHER DATA, SEE INDEX

OUTSIDE AERIAL

When the radio is used in shielded areas or when located a great distance from broadcast stations, the volume of stations operating in the 540-1600 K.C. band may not be ample in which case it would be necessary to ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT THE REAR OF THIS CHASSIS to obtain satisfactory results.

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance — also, on very loud signals the light may fluctuate.

Always use a 6.3 volt .15 ampere dial light.

MODEL 170-BL

SENTINEL RADIO CORP.

ALIGNMENT PROCEDURE

BEFORE ALIGNING, PLACE LOOP ANTENNA AND THE "A" AND "B" BATTERIES IN THE SAME APPROXIMATE POSITION IN THE BACK OF CHASSIS THAT THEY WILL BE IN WHEN THE SET IS IN THE CABINET AND THE CABINET BACK CLOSED.

When adjusting 1400 kilocycle antenna and R. F. trimmer, do not connect test oscillator to terminals on bottom of cabinet back.

Couple test oscillator to receiver loop by:

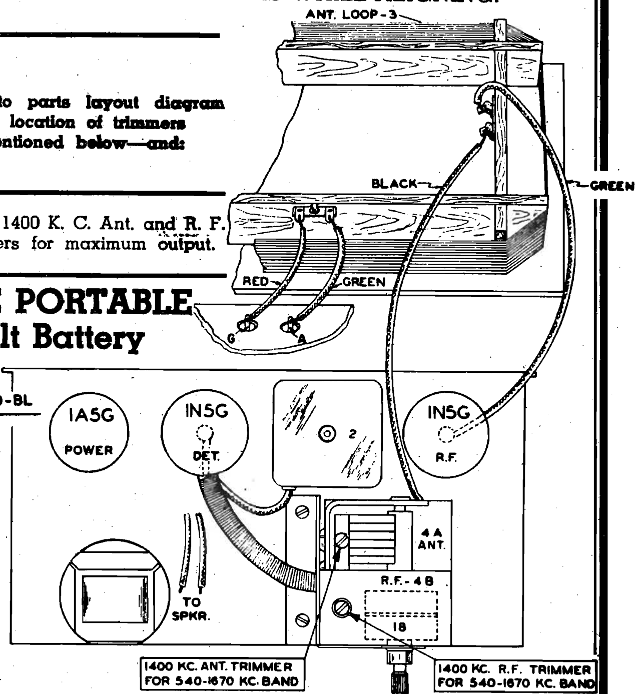
a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator.

b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

	TEST OSCILLATOR			
Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below—and:**
(1) Exactly 1400 K. C.	Exactly 1400 K. C.	None	Use small loop to couple test oscillator to receiver loop	Adjust 1400 K. C. Ant. and R. F. trimmers for maximum output.

3 TUBE PORTABLE
1½ Volt Battery

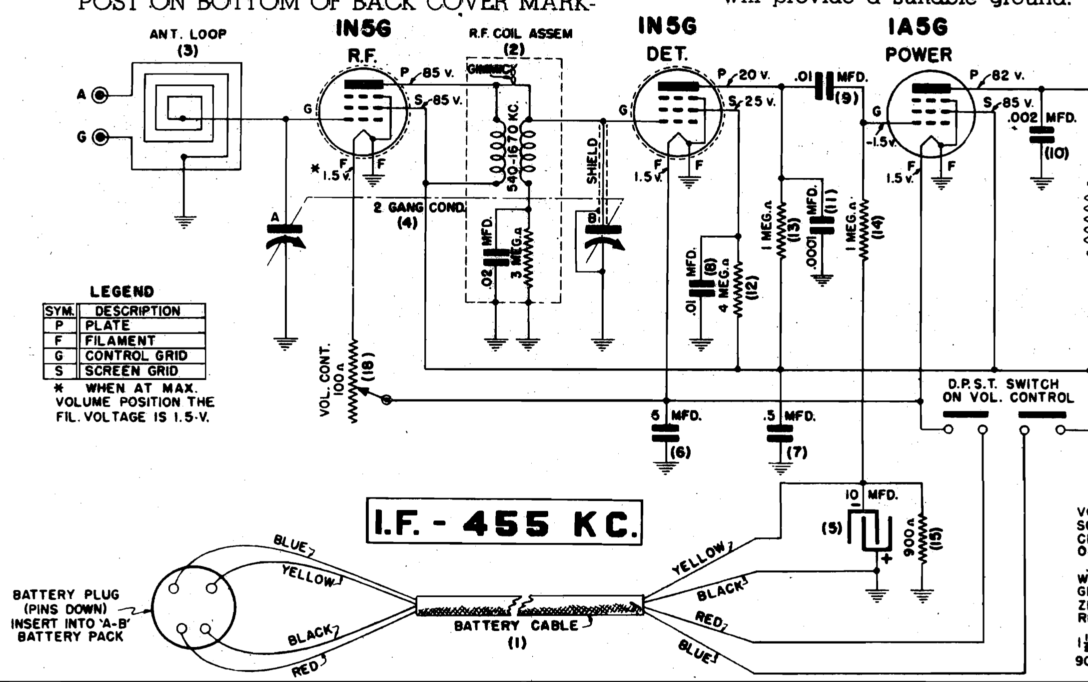
PART No.-170-BL



Because of the directional effect of the loop aerial, it is important TO TUNE IN THE SIGNAL TO THE POINT OF LOUDEST VOLUME AND CLEAREST TONE WITH THE TUNING KNOB AND THEN ROTATE THE RADIO TO THE POSITION OF GREATEST VOLUME.

THE DAYLIGHT RANGE OF THIS RADIO IS APPROXIMATELY 50 MILES—NIGHT TIME RANGE WILL BE GREATER THAN THIS. When the radio is used in a location a great distance from broadcast stations, or when the volume of the stations received is not ample, or when it is operated in boats, buildings, etc., constructed with a large amount of steel, IT MAY BE NECESSARY TO USE AN OUTSIDE AERIAL. The outside aerial should be 35 to 50 feet in length erected as high as possible and must be attached to the terminal post marked "A" mounted on the bottom of back cover.

WHEN USING AN EXTERNAL AERIAL A GROUND MUST BE ATTACHED TO OTHER POST ON BOTTOM OF BACK COVER MARKED "G." A wire attached to a metal stake driven two to four feet in moist ground or to a water pump or to a nail driven in a tree, or a bare wire thrown in any large body of water such as a stream, lake, brook, creek, well, etc., will provide a suitable ground.



NOTE

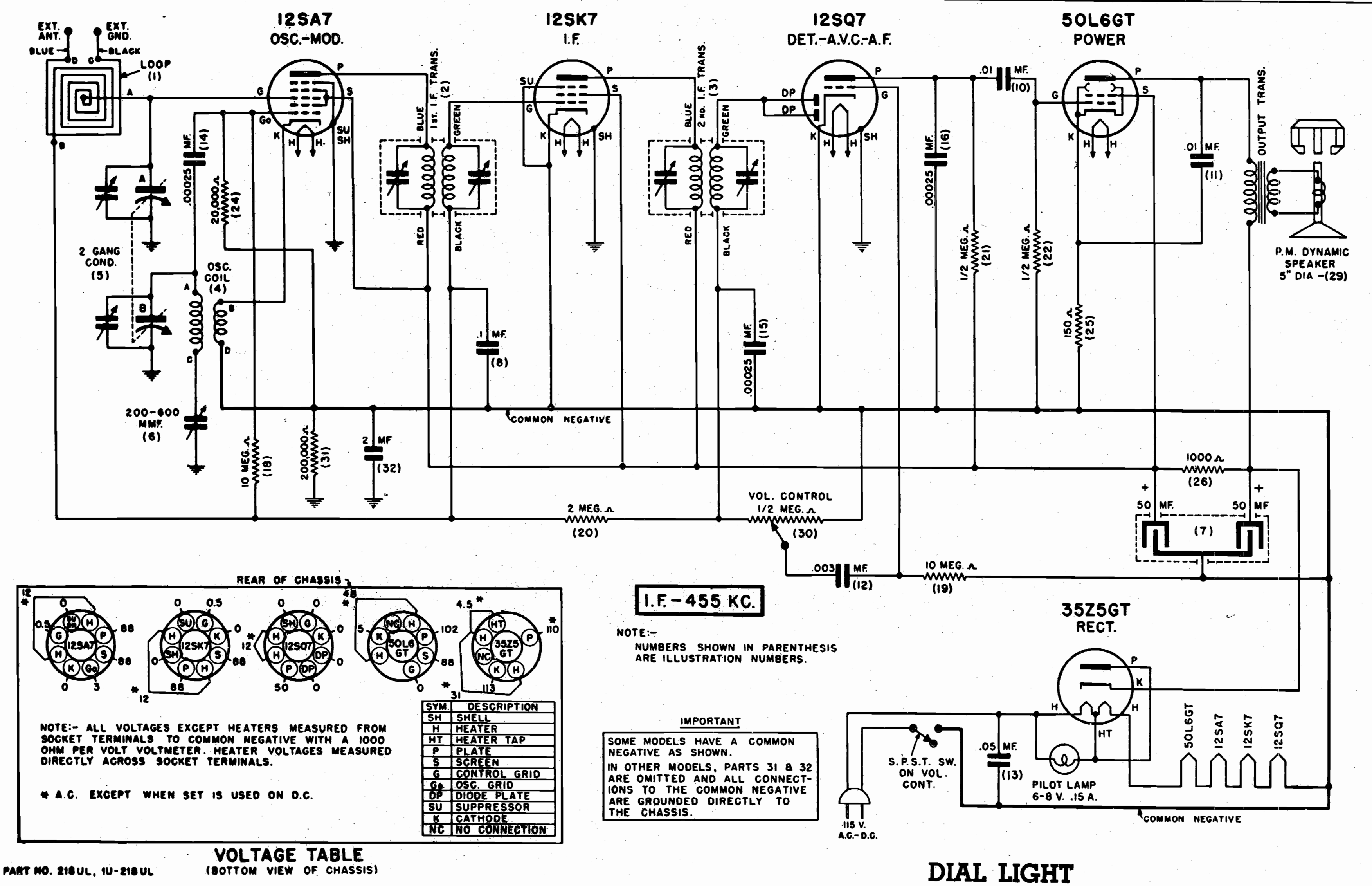
VOLTAGE READING AT SOCKET PRONGS ARE TO CHASSIS USING A 1,000 OHM PER VOLT VOLTMETER.

WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

1½ V. 'A' BAT.-DRAIN-150 MA.
90V. 'B' BAT.-DRAIN-5.5 MA.

SENTINEL RADIO CORP.

MODEL 1U-218UL, 218UL



I.F.-455 KC.

NOTE:- NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

IMPORTANT

SOME MODELS HAVE A COMMON NEGATIVE AS SHOWN. IN OTHER MODELS, PARTS 31 & 32 ARE OMITTED AND ALL CONNECTIONS TO THE COMMON NEGATIVE ARE GROUNDED DIRECTLY TO THE CHASSIS.

NOTE:- ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO COMMON NEGATIVE WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C. EXCEPT WHEN SET IS USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	CONTROL GRID
Go	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

PART NO. 218UL, 1U-218UL

DIAL LIGHT

It is normal for the dial light to be dim for approximately 60 seconds after set is turned "on" and then attain normal brilliance—also, on very loud signals the light may fluctuate.

Always use a 6.3 volt .15 ampere dial light.

WARNING—Do not attach a ground direct to the radio chassis—ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS WILL CAUSE A SHORT AND POSSIBLE DAMAGE.

MODELS 1U-218UL, 218UL

SENTINEL RADIO CORP.

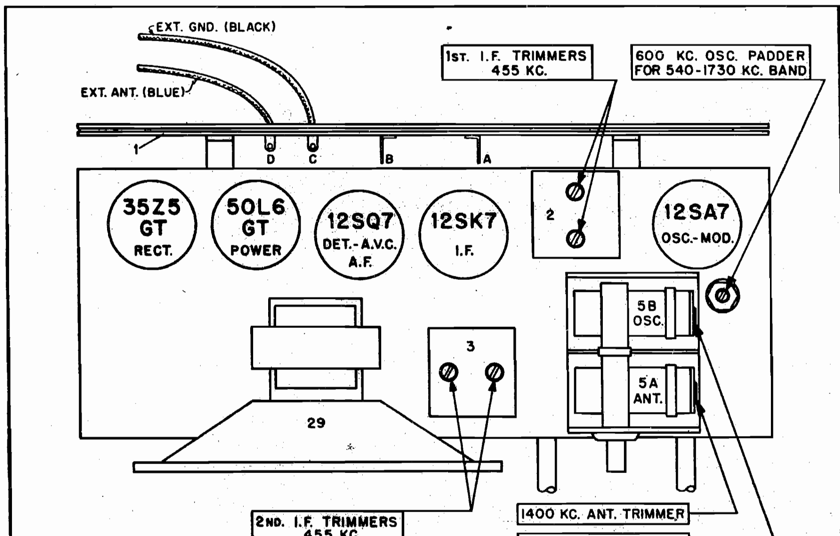
-10-40-

ALIGNMENT PROCEDURE

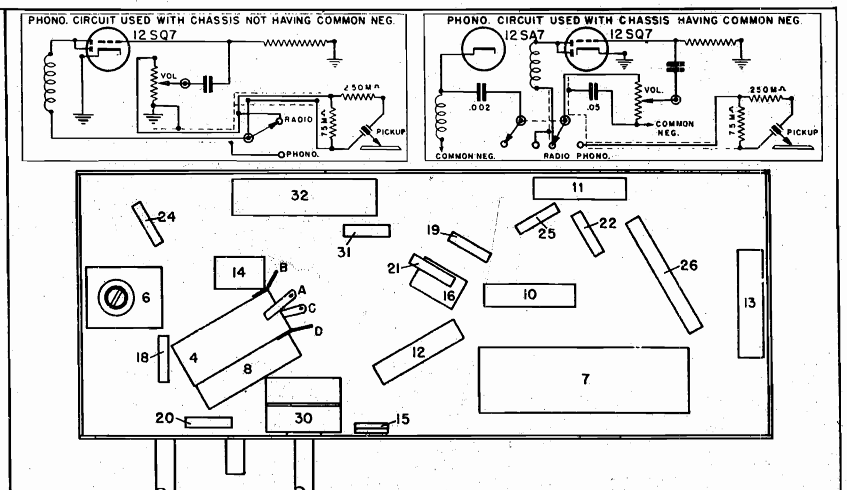
For alignment procedure read tabulations from left to right. If more than one adjustment is required on any one band, make the adjustment marked (1) first, (2) next, (3) third. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1730 kilocycle oscillator trimmer, 600 K.C. padder and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:		Set receiver dial to:	Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	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.	0.2 Mfd. condenser	High side to grid of 12SA7 tube. Low side to frame of gang condenser through .01 Mfd. condenser.	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.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of gang condenser through .01 Mfd. condenser.	Adjust 1730 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of gang condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop. Low side to frame of gang condenser through .01 Mfd. condenser.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.



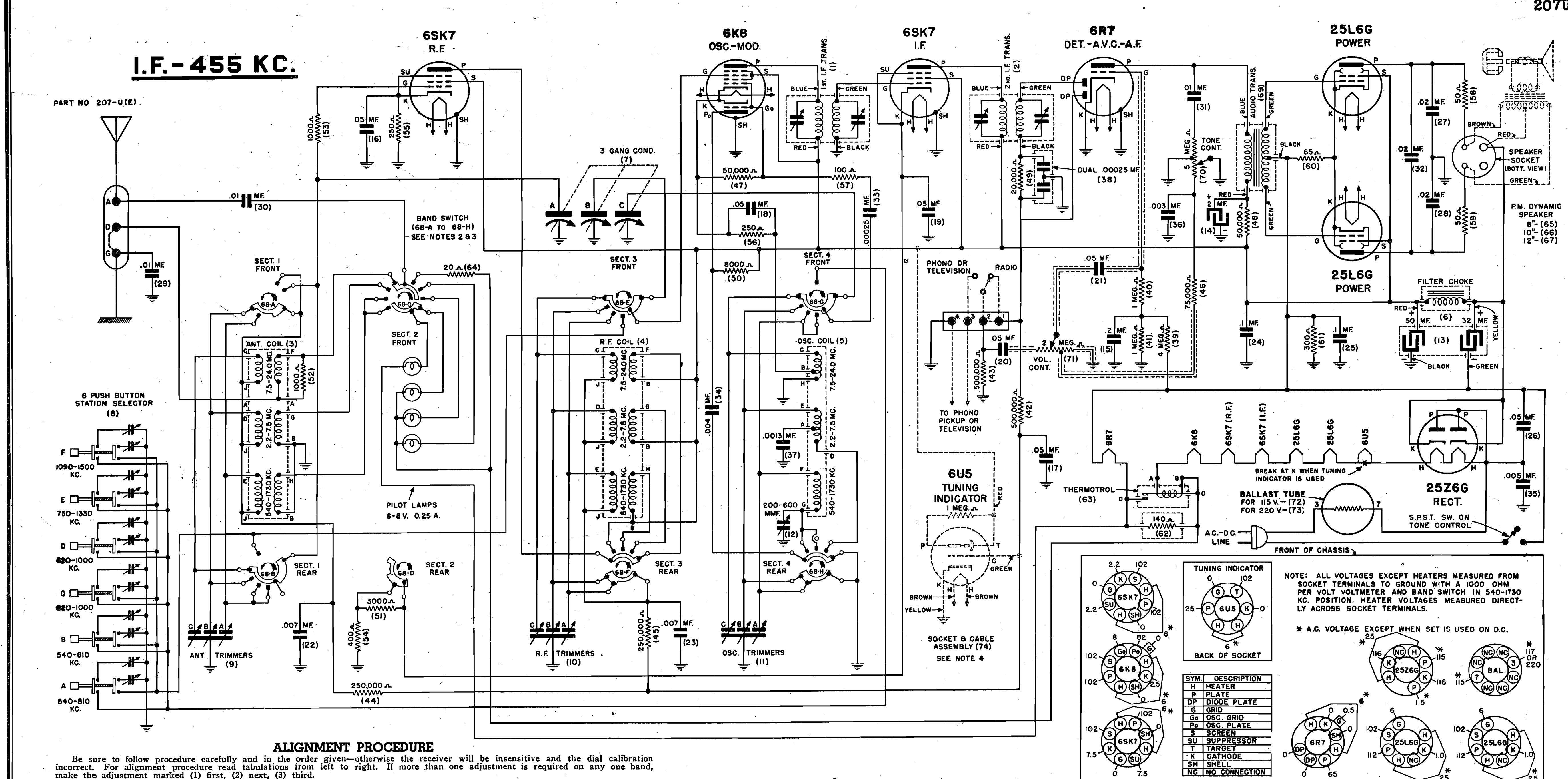
PART NO. 218 UL, 1U-218UL



NOTE: IN SOME MODELS, PARTS 31 & 32 ARE OMITTED. SEE WIRING DIAGRAM.

MODELS 207U, 207UE

SENTINEL RADIO CORP.



WIRING DIAGRAM FOR MODEL 207-U(E) RECEIVER

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

4-40

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. 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.	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

NOTES:

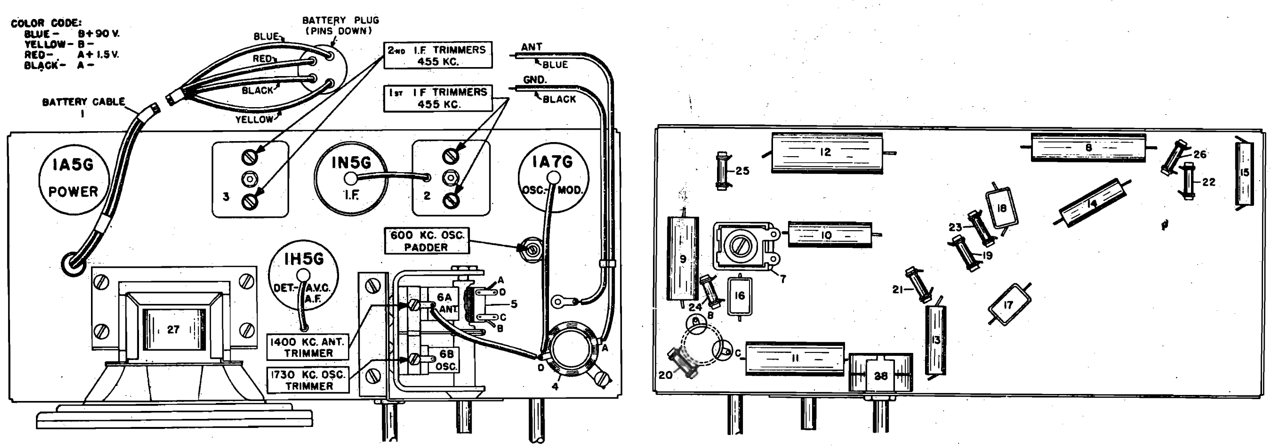
1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH VIEWED FROM REAR, SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION.
3. SECTIONS OF BAND SWITCH (68-A TO 68-H) ARE REFERRED TO ON DIAGRAM BEGINNING WITH SECTION Nº 1 WHICH IS AT KNOB END OF SHAFT.
4. SOME MODELS OF THIS SERIES ARE EQUIPPED WITH 6U5 TUNING INDICATOR, DOTTED LINES SHOW CONNECTIONS
5. REMOVE JUMPER BETWEEN TERMINALS 1 & 2 WHEN SET IS USED FOR PHONO OR TELEVISION OPERATION.

SENTINEL RADIO CORP.

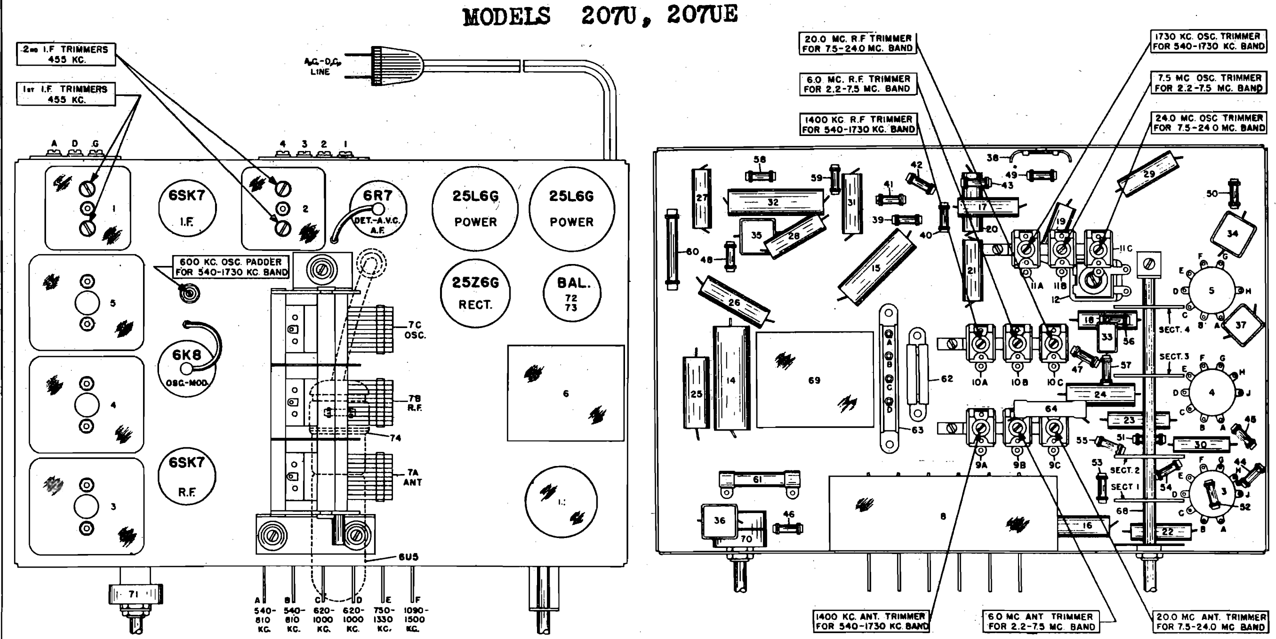
MODELS 207U, 207UE
MODEL 210B

MODEL 210B

Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7G 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. trimmers for maximum output.
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 Approx. 1400 K. C.	Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.
3 Approx. 600 K. C.	Approx. 600 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 600 K. C. padder to maximum output.

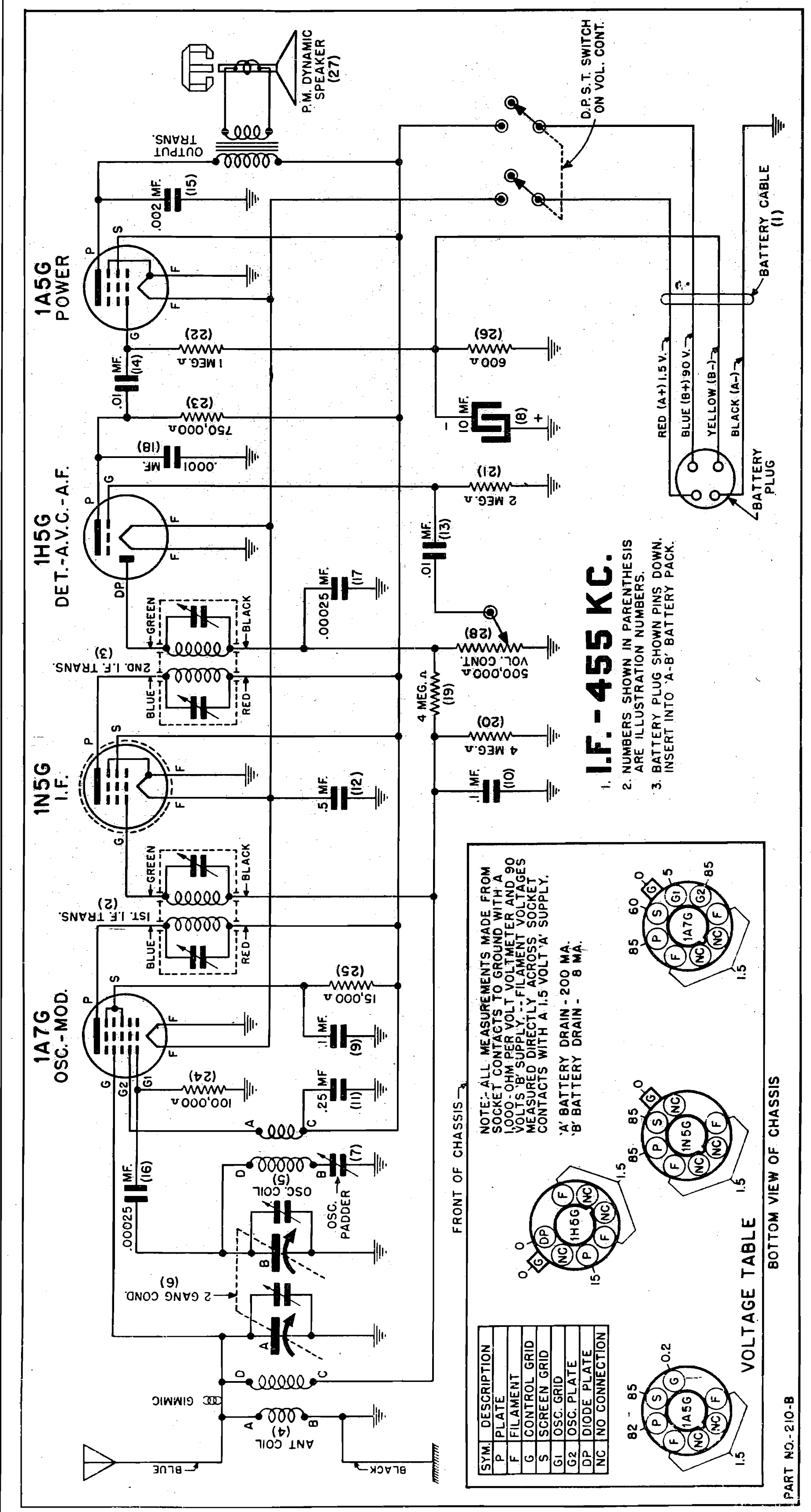


MODELS 207U, 207UE



MODEL 210B

SENTINEL RADIO CORP.



PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11125	Cable	Battery Assembly with 4 Prong Plug	$ .25
2	10967	Coil	1st I.F. Transformer	1.10
3	10769	Coil	2nd I.F. Transformer	1.10
4	12054	Coil	Antenna	.55
5	11955	Coil	Oscillator	.55
6	11954	Condenser	Tuning Two Gang	1.60
7	3287	Condenser	Padding 340-460 Mmf.	.45
8	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. 25 Volt D.C. Wkg.	.75
9	1151	Condenser	.1 Mfd. 200 Volt	.20
10	1151	Condenser	.1 Mfd. 200 Volt	.20
11	9032	Condenser	.25 Mfd. 200 Volt	.25
12	2131	Condenser	.5 Mfd. 200 Volt	.55
13	9468	Condenser	.01 Mfd. 400 Volt	.17
14	9468	Condenser	.01 Mfd. 400 Volt	.17
15	10762	Condenser	.002 Mfd. 400 Volt	.19
16	9458	Condenser	Mica .00025 Mfd.	.21
17	9458	Condenser	Mica .00025 Mfd.	.21
18	7934	Condenser	Mica .0001 Mfd.	.21
19	1694	Resistor	Carbon 4 Megohm 1/3 Watt	.19
20	1694	Resistor	Carbon 4 Megohm 1/3 Watt	.19
21	2705	Resistor	Carbon 2 Megohm 1/3 Watt	.19
22	7998	Resistor	Carbon 1 Megohm 1/3 Watt	.19
23	2673	Resistor	Carbon 750,000 Ohm 1/3 Watt	.19
24	8000	Resistor	Carbon 100,000 Ohm 1/3 Watt	.19
25	9385	Resistor	Carbon 15,000 Ohm 1/3 Watt	.19
26	1562	Resistor	Carbon 600 Ohm 1/3 Watt	.19
27	11128	Speaker	P. M. Dynamic 5 in.	4.00
28	11132	Volume Control	With D.P.S.T. Switch	.80

MISCELLANEOUS PARTS

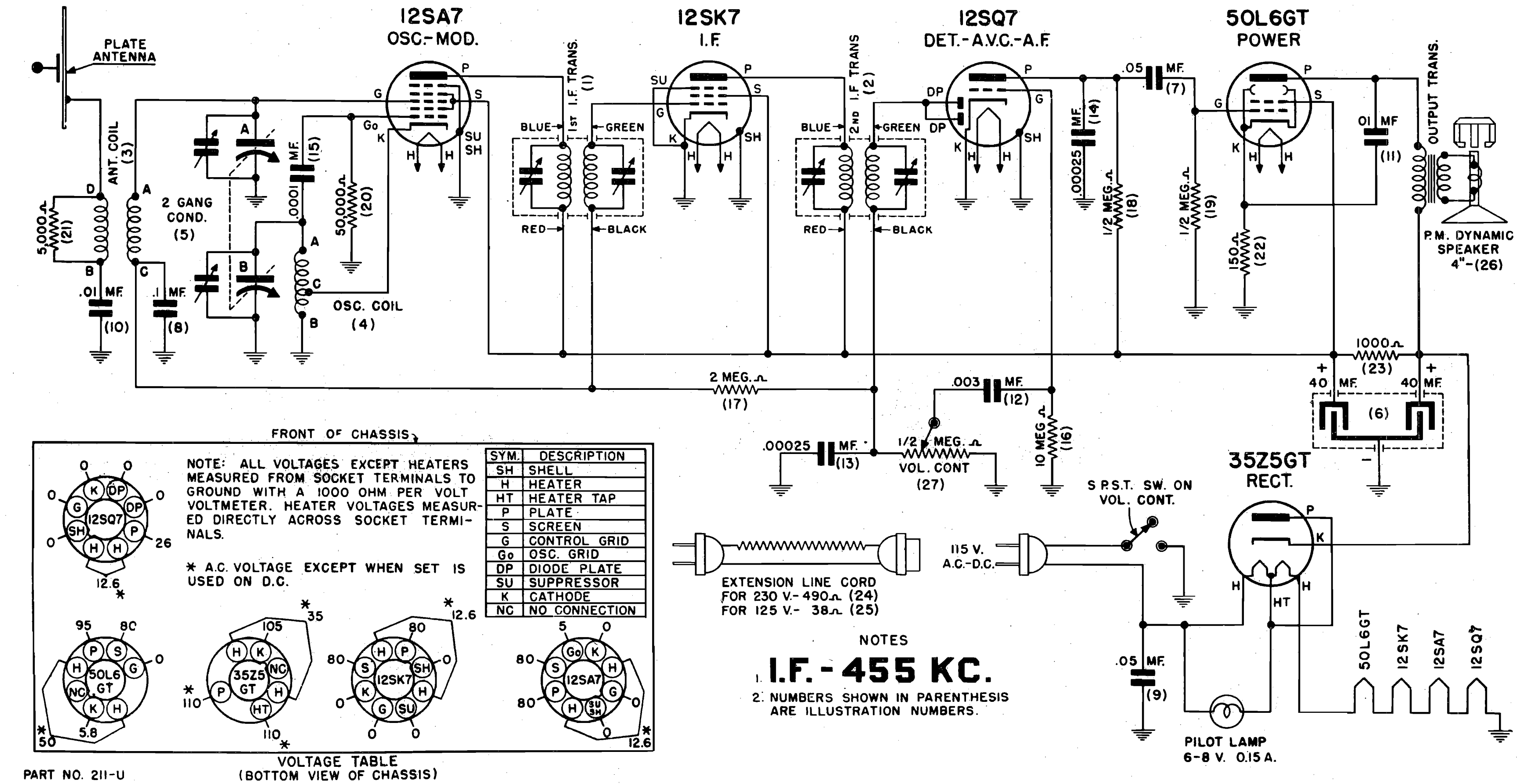
Illus. No.	Part No.		Description	List Price
	11108	Bulb	2 Cell 2.2. Volt White Bead Type	.07
	11961	Dial Scale	Calibrated Dial Scale	.25
	8184	Dial Cord	24 in. of 18 lb. Drive Cord	.15
	11017	Dial Shaft	Drive Shaft	.11
	11956	Dial Indicator	Off-On Indicator	.15
	11626	Dial Pointer	Needle	.30
	11963	Dial Crystal	Escutcheon	.75
	8301	Dial Screws	Phillips R.H. No. 2 x 1/4 for Mounting Dial	3.00M Net
	4978	Plug	4 Prong Battery Plug	.10
	10207	Knob	Antique Ivory	.08
	11733	Knob	Walnut	.10

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

4-40 PART NO. 210B

SENTINEL RADIO CORP.

MODEL 211U



NOTE: ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

* A.C. VOLTAGE EXCEPT WHEN SET IS USED ON D.C.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
HT	HEATER TAP
P	PLATE
S	SCREEN
G	CONTROL GRID
Go	OSC. GRID
DP	DIODE PLATE
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

PART NO. 211-U

NOTES

1. I.F. - 455 KC.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PARTS LIST

Illus. No.	Part No.		Description	List Price
1	11347	Coil	1st I.F. Transformer	.90
2	11376	Coil	2nd I.F. Transformer	.80
3	11386	Coil	Antenna	.50
4	11387	Coil	Oscillator	.45
5	11378	Condenser	Tuning Two Gang	1.75
6	11493	Condenser	Tubular Dry Electrolytic 40-40 Mfd. 150 Volt	1.00
7	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
8	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
9	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
10	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
11	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
12	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17

Illus. No.	Part No.		Description	List Price
13	9458	Condenser	Mica .00025 Mfd	.21
14	9458	Condenser	Mica .00025 Mfd	.21
15	7934	Condenser	Mica .0001 Mfd	.21
16	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
17	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
18	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
19	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
20	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
21	9693	Resistor	Carbon 5,000 Ohm ⅓ Watt	.19
22	9018	Resistor	Carbon 150 Ohm ⅓ Watt	.19
23	4998	Resistor	Carbon 1,000 Ohm 1 Watt	.21
24	11860	Resistor	230 Volt Line Cord Extension	1.50
25	11861	Resistor	125 Volt Line Cord Extension	1.50
26	11390	Speaker	P.M. Dynamic 4 in.	2.70
27	11389	Volume Control	With S.P.S.T. Switch	.80

MISCELLANEOUS PARTS

Part No.		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
11381	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord 12 in. of No. 18 lb. Drive	.10
11379	Dial Shaft	Dial Drive Shaft	.12
11985	Dial Pointer	For Dial—Red Enamel	.20
11384	Dial Pointer	For Dial	.15
11391	Dial Crystal	For Dial	.22
11733	Knob	Bakelite for Walnut Plastic Cabt.	.10
10207	Knob	Bakelite for Ivory Plastic Cabt.	.08
	Cabinet	Walnut Plastic	1.80
	Cabinet	Ivory Plastic	2.15
11968	Cabinet Back	Metal Back	.10

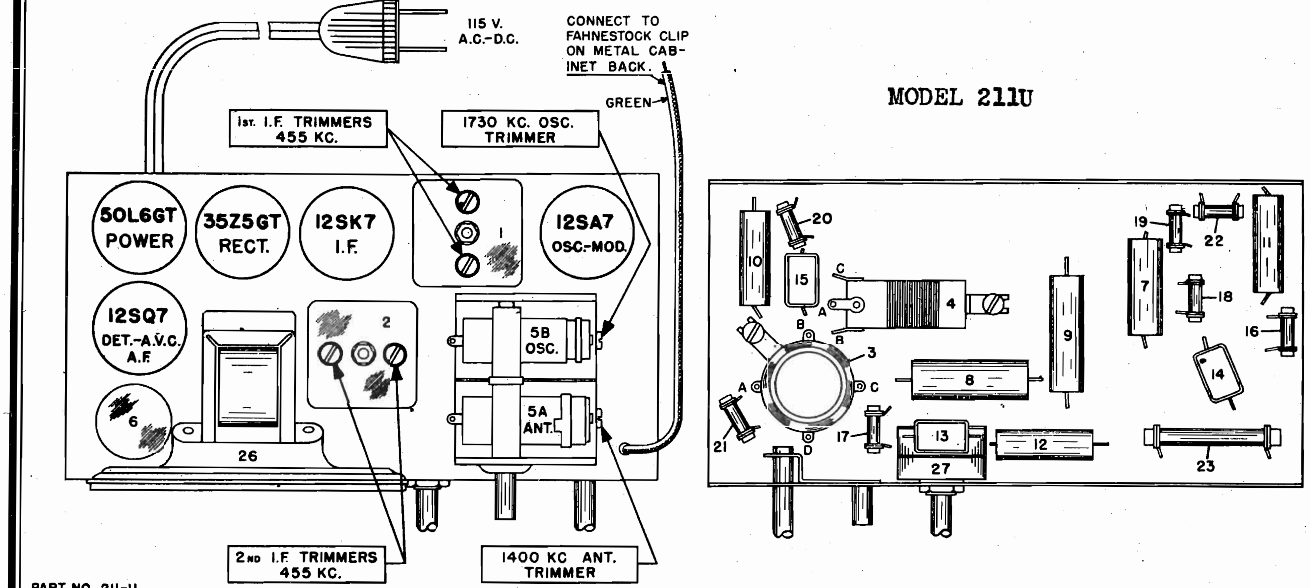
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

W. 3M 4-40 PART NO. 211U

MODEL 211U
MODELS 1U-214UL, 214UL

SENTINEL RADIO CORP.



PART NO. 211-U

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:

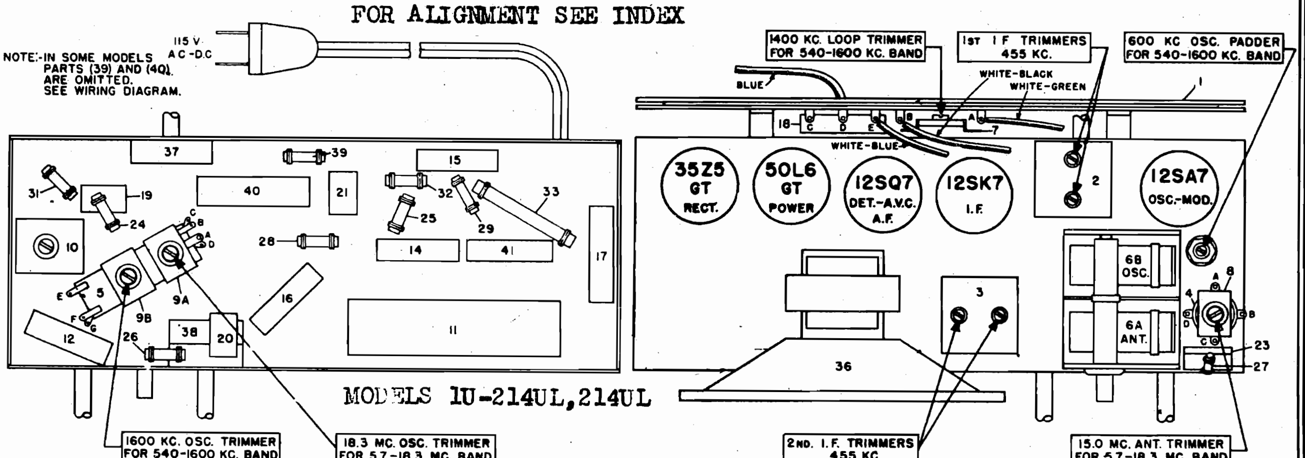
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to 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 gang condenser frame through .01 MFD Condenser.

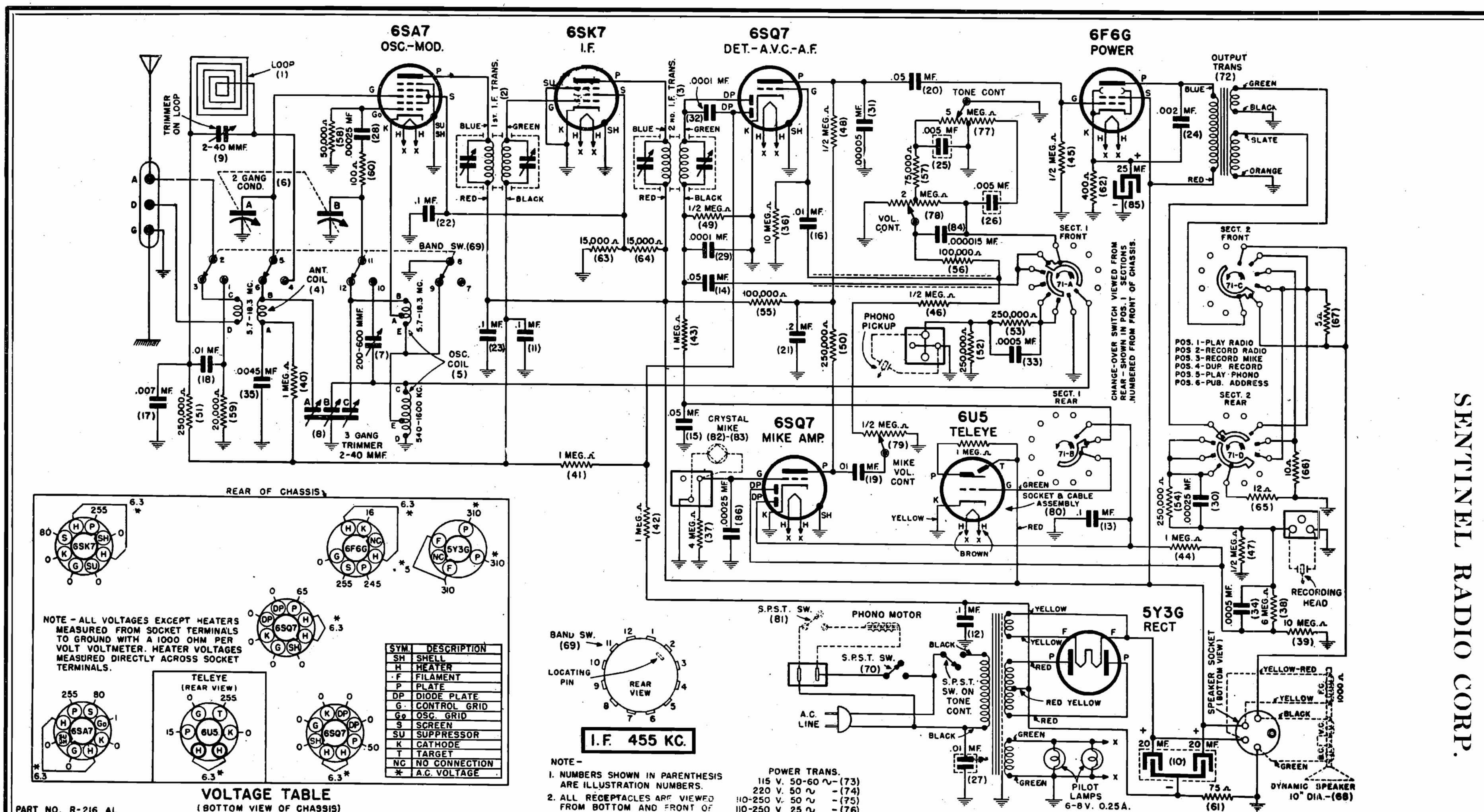
		TEST OSCILLATOR		
Set receiver dial to:	**Adjust test oscillator frequency to:**	**Use dummy antenna in series with output of test oscillator consisting of:**	**Attach output of test oscillator to:**	**Refer to parts layout diagram for location of trimmers mentioned below:**
I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of 12SA7 tube DO NOT REMOVE CAP.	Adjust the second I. F. transformer trimmers for maximum output then adjust each of the first I. F. trimmers for maximum output
1 Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Post on metal back	Adjust 1730 K. C. oscillator trimmer for maximum output.
2 Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD condenser	Post on metal back	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

FOR ALIGNMENT SEE INDEX



PART NO. 214UL,-1U-214UL

SENTINEL RADIO CORP.



VOLTAGE RATING

WHILE THE RADIO MAY BE OPERATED ON EITHER 50 OR 60 CYCLE 100-120 VOLT ALTERNATING CURRENT (A.C.), THE PHONOGRAPH MOTOR MUST BE USED ON THE FREQUENCY DESIGNATED ON THE PAPER LICENSE TAG, which will be found attached to the cabinet.

AERIAL

THE LOOP AERIAL SUPPLIED with the radio should provide ample 540-1600 kilocycle band reception in average locations.

LOOP AERIALS ARE NOT SATISFACTORY FOR SHORT WAVE RECEPTION, AND BECAUSE OF THIS AN EXTERNAL AERIAL MUST BE ATTACHED TO THE RADIO WHEN TUNING FOR SHORT WAVE STATIONS. Also, if the radio is used in shielded areas or when located a great distance from broadcast stations, the volume of the stations operating in the 560-1600 kilocycle band may not be ample, in which case it would be necessary to attach a 35 to 50 foot outdoor aerial to the receiver to obtain satisfactory results.

When a doublet type antenna is used, remove the small piece of wire connecting "G" and "D" posts together and attach one of the doublet antenna lead-ins to "A" post and the other to "D" post.

MODEL 216

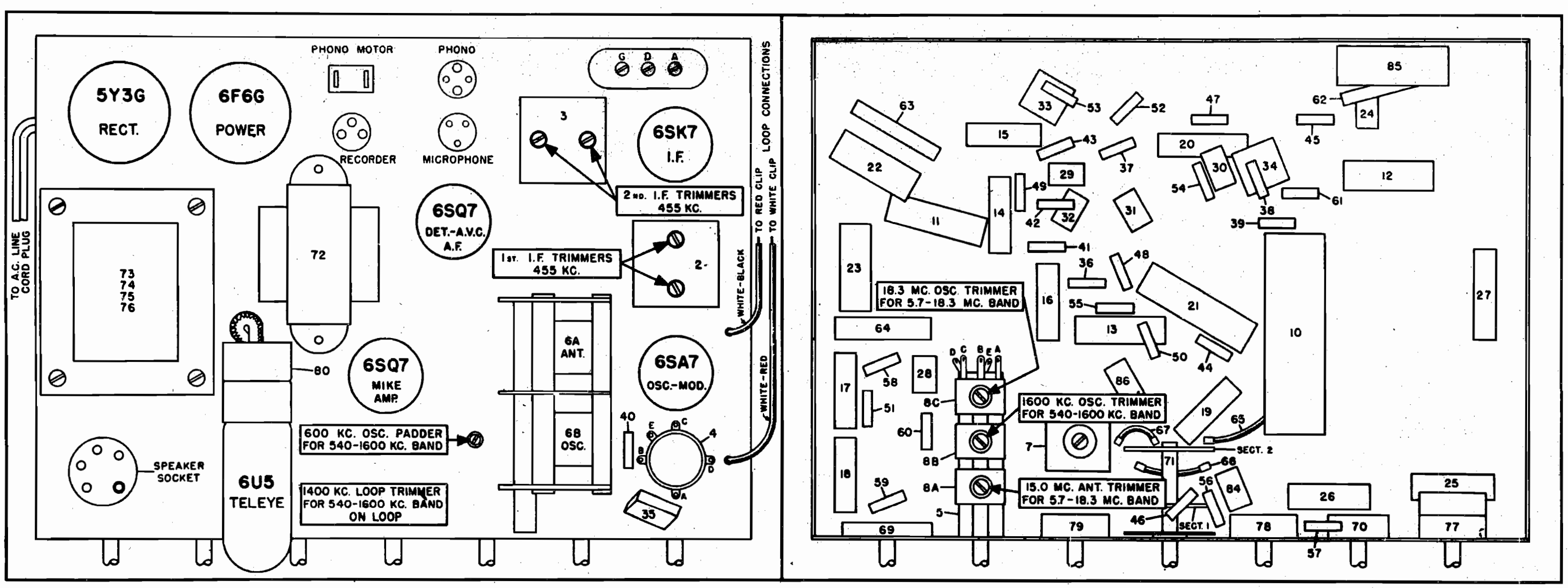
SENTINEL RADIO CORP.

ALIGNMENT PROCEDURE

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. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET, AND HAVE CHANGE OVER SWITCH KNOB IN "PLAY RADIO" POSITION.

When adjusting 1600 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

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.	0 2 Mfd. condenser	High side to grid of 6SA7 tube.	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.
1600 to 540 K.C. Band	1	Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1600 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	3	• Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.
5.7 to 18.3 M.C. Band	1	Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to "A" Post, Low side to chassis.	Adjust 18.3 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. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to "A" Post, Low side to chassis.	While rocking gang condenser adjust 15 M. C. antenna trimmer for maximum output.

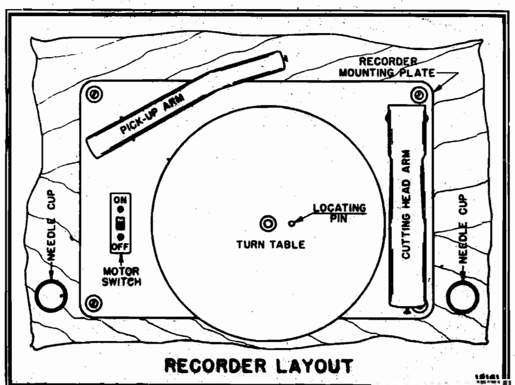


SENTINEL RADIO CORP.

MODEL 216

RECORDING INSTRUCTIONS

Properly made recordings will supply many satisfactory playings with quality equal to that of commercial phonograph recordings. Remember there is only one right way to make recordings—for best results carefully read all of the following instructions.



RECORDER LAYOUT

RECORDING NEEDLES

Handle cutting needles carefully—needle edges are razor sharp and can be easily damaged. Do not rest needle on table top or other metal surface.

When cutting edge becomes dull or if needle is dropped on metal surface and edge is damaged, the needle must be replaced. To install cutting needle in cutting head just:

1. Loosen needle retaining screw on front of cutting head arm and place cutting head needle all the way in hole on the underside of cutting head arm, with the flat portion of the needle shank towards the front and placed directly under the head of retaining screw. IF NEEDLE IS IN BACKWARDS OR AT WRONG ANGLE, IT WILL NOT CUT PROPERLY.
2. Each time a new needle is used, cut a few grooves on a test record, listening closely to be sure it is cutting quietly. IF EXCESSIVE HISSING OR SCRAPING NOISES ARE HEARD, THE NEEDLE IS DULL OR SET AT THE WRONG ANGLE. Remember, any noises made by the needle will be recorded on blank disc and will be heard when the record is replayed.

PLAY BACK NEEDLES

Use only soft steel needles to play recordings—never use thorn or wooden needles. A needle that has been used to play a regular commercial record should never be used on a recorded disc.

CUTTING ARM AND HEAD ADJUSTMENT

The cutting arm and head is properly adjusted when the recorder leaves the factory, and unless altered or damaged should not be touched. If it is believed that the cutting arm adjustment is not correct proceed to check by:

a) Place cutting needle on blank record and measure distance from top of record to bottom of front end of cutting head arm—this should be EXACTLY ONE-QUARTER OF AN INCH.
b) If less than one-quarter of an inch, lift cutting arm and turn the adjusting screw located underneath arm to the left.
   If more than one-quarter of an inch, turn adjusting screw to right.

THIS ADJUSTMENT IS VERY CRITICAL AND SHOULD BE CAREFULLY MADE—THE DISTANCE BETWEEN THE TOP OF THE RECORD AND THE BOTTOM OF THE CUTTING ARM SHOULD BE EXACTLY ONE-QUARTER OF AN INCH.

c) Next cut five to ten grooves on the blank record and examine the grooves made with magnifying glass. If depth screw is properly adjusted, the groove and the space between the groove will be approximately equal in width.
   If groove width is not correct—turn the screw on top of the cutting arm to the right to increase width of groove, and to the left to decrease. This is a critical adjustment and should be made by adjusting the screw in quarter turns, only, never full turn adjustments.

When the groove is properly made, the thread cut from record will be straight and black and about the thickness of a human hair.

When the groove is too wide, the thread will be coarse and kinky and there will be little or no space between the grooves.

If the groove is too narrow, the thread will be thin, silky, and grayish in color, and there will be more space between the grooves than the grooves occupy.

USE TUNING EYE IN DETERMINING CORRECT VOLUME LEVEL FOR RECORDING

As it is very important that neither too little nor too much volume be used when recording, the unit is so designed that the tuning eye can be used as a guide in selecting proper volume level for recordings.

IT IS A SIMPLE MATTER TO SET VOLUME TO PROPER RECORDING LEVEL—BEFORE STARTING TO CUT DISC, ALWAYS ROTATE THE "VOLUME CONTROL" OR THE "MIKE CONTROL" KNOBS SO THAT THE TWO ENDS OF THE GREEN INVERTED "V" ON THE TUNING EYE APPROXIMATELY TOUCH ON SIGNAL PEAKS. Do not set controls so that the ends overlap on the peaks, as this will be too much volume for recordings—never adjust controls to compensate for loud and soft passages when recording orchestras, otherwise orchestra expression will be lost and the volume will increase and decrease when record is played back.

TO RECORD RADIO PROGRAMS

FIRST ROTATE "TONE-ON-OFF SWITCH" KNOB TO "BRILLIANT"—MAXIMUM RIGHT HAND POSITION AND "MIKE CONTROL" KNOB TO MAXIMUM LEFT HAND MINIMUM MICROPHONE VOLUME POSITION.

a) Place a blank disc on turn table so that small locating pin on turn table protrudes through small hole in blank disc.
b) Place "CHANGE OVER SWITCH" knob to maximum left hand position—small indicator needle will point to "PLAY RADIO" printed on dial.
c) Carefully tune in the radio program which is to be recorded.
d) Rotate "CHANGE OVER SWITCH" knob to the next to maximum left hand position — small needle on dial will point to "RECORD RADIO." NOTE: VOLUME OF SIGNAL WILL DROP.
e) Set volume to proper recording level by adjusting "VOLUME CONTROL" knob until the ends of the green inverted "V" on the tuning eye approximately touch ON SIGNAL PEAKS.
f) Turn "MOTOR SWITCH" knob on front panel of radio to the right hand "ON" position and the "MOTOR SWITCH" adjacent to the recorder turn table to the "ON" position. The turn table will now start to revolve.
g) Carefully lift up needle end of cutting head arm to an angle of approximately 45°, swing arm to edge of record and gently place cutting needle on blank disc ⅛ of an inch from outer edge.

Just before needle reaches paper label on inside of disc, reduce volume to zero and cut three to five blank grooves in record, then lift cutting arm. Be sure to lift the cutting arm from disc before needle reaches the label, and always place it on arm rest. Failure to lift arm in time will cause needle to cut into the paper label with possible injury to the needle.

MICROPHONE RECORDING

Voice or music that can be picked up by the microphone with sufficient volume can be recorded. Remember, all extraneous noises picked up by the microphone will be recorded on the disc.

Any explanatory or introductory announcements, giving date, description, data, title, etc., can be faded into the recording being made from a radio program or from another record. To do this turn "VOLUME CONTROL" knob towards minimum volume position while at the same time speaking into the microphone and turning "MIKE VOLUME" knob towards right. To use the microphone for recording just:

1. Rotate "CHANGE OVER SWITCH" knob to the third position from the left, small needle will point to "RECORD MIKE" on dial.
2. Turn radio "VOLUME CONTROL" knob to minimum volume position.
3. Set volume to proper recording level by holding lips 4 to 6 inches from microphone and speaking into the microphone with a normal tone of voice and adjusting "MIKE VOLUME" knob until the two ends of the green inverted "V" on the tuning eye approximately touch on signal peaks.
4. Place blank disc on turn table.
5. Turn "MOTOR SWITCH" knob and "OFF AND ON SWITCH" adjacent to recorder turn table to "ON" position.
6. Lay cutting needle on revolving blank disc ⅛ of an inch from outer edge.
7. Talk in normal tone of voice into microphone keeping lips approximately 4 to 6 inches away.

Microphone can be placed near point where music or other subject to be recorded will be picked up by the microphone—be sure to adjust "MIKE VOLUME" control knob to proper level.

TO MAKE A RECORD FROM ANOTHER RECORD

Some models of this series are equipped with automatic record changer in addition to the regular recording unit and with this model duplicate records can be made of home recordings or commercial records by:

a) Place blank disc on recording turn table.
b) Place the record which you wish to duplicate on automatic record changer turn table.
c) Rotate "CHANGE OVER SWITCH" to third position from right—needle will point to "DUPLICATE RECORD" printed on dial.
d) Place automatic record changer pickup needle in outside groove of the record to be duplicated.
e) Lift cutting head arm and place needle on blank disc ⅛ of an inch from outer edge.
f) The recorder and automatic record changer turn tables must start to revolve at the same time. To do this simultaneously turn recorder and automatic record changer to "ON" position—then turn "MOTOR SWITCH" TO "ON" position.
g) Adjust "VOLUME CONTROL KNOB" until the two ends of the green inverted "V" on the tuning eye approximately TOUCH ON SIGNAL PEAKS.

A record from another record can be made with the type recorder not equipped with an automatic record changer providing another combination radio and phonograph is available. To do this:

1. Place a blank disc on recorder turn table.
2. Lift cutting head arm and place ⅛ of an inch from outer edge of blank disc.
3. Place the record you wish to duplicate on the combination radio-phonograph turn table.
4. Place the combination radio-phonograph pick-up needle in outside groove of record to be duplicated.
5. Rotate "CHANGE OVER" switch to third position from the left—indicator needle will point to "RECORD MIKE" printed on the dial.
6. Place microphone approximately one-half foot from other radio speaker.
7. Turn recorder "VOLUME CONTROL" knob to minimum volume position, and combination radio-phonograph volume control to approximately half volume position.
8. Adjust "MIKE VOLUME" control until the two ends of the green inverted "V" on the tuning eye approximately touch on signal peaks.
9. Turn recorder "MOTOR SWITCH" and "MOTOR SWITCH" of combination radio to "ON" position simultaneously so that the recorder and the combination radio turn tables start to revolve at the same time.

TO PLAY BACK RECORDINGS

To play home recordings or commercial records just:

(a) Rotate "CHANGE OVER SWITCH" to the next to the maximum right hand position—indicator needle will point to "PLAY PHONO" printed on the dial.
(b) Place record on turn table.
(c) Insert needle in pickup arm and place needle in the outside groove on record.
(d) Turn "MOTOR SWITCH" knob to "ON" position.
(e) Adjust "VOLUME" knob for desired volume.

USING MICROPHONE AND RADIO AS PUBLIC ADDRESS SYSTEM

The radio and microphone may be used as a public address system by:

(1) Turn the "CHANGE OVER SWITCH" knob to maximum right hand position—needle will point to "PUBLIC ADDRESS" printed on the dial.
(2) Speak into the microphone in a normal tone of voice or place microphone near point where it can pick up voice, music, or other subject to be amplified.
(3) Adjust "MIKE VOLUME" control knob for desired volume level.

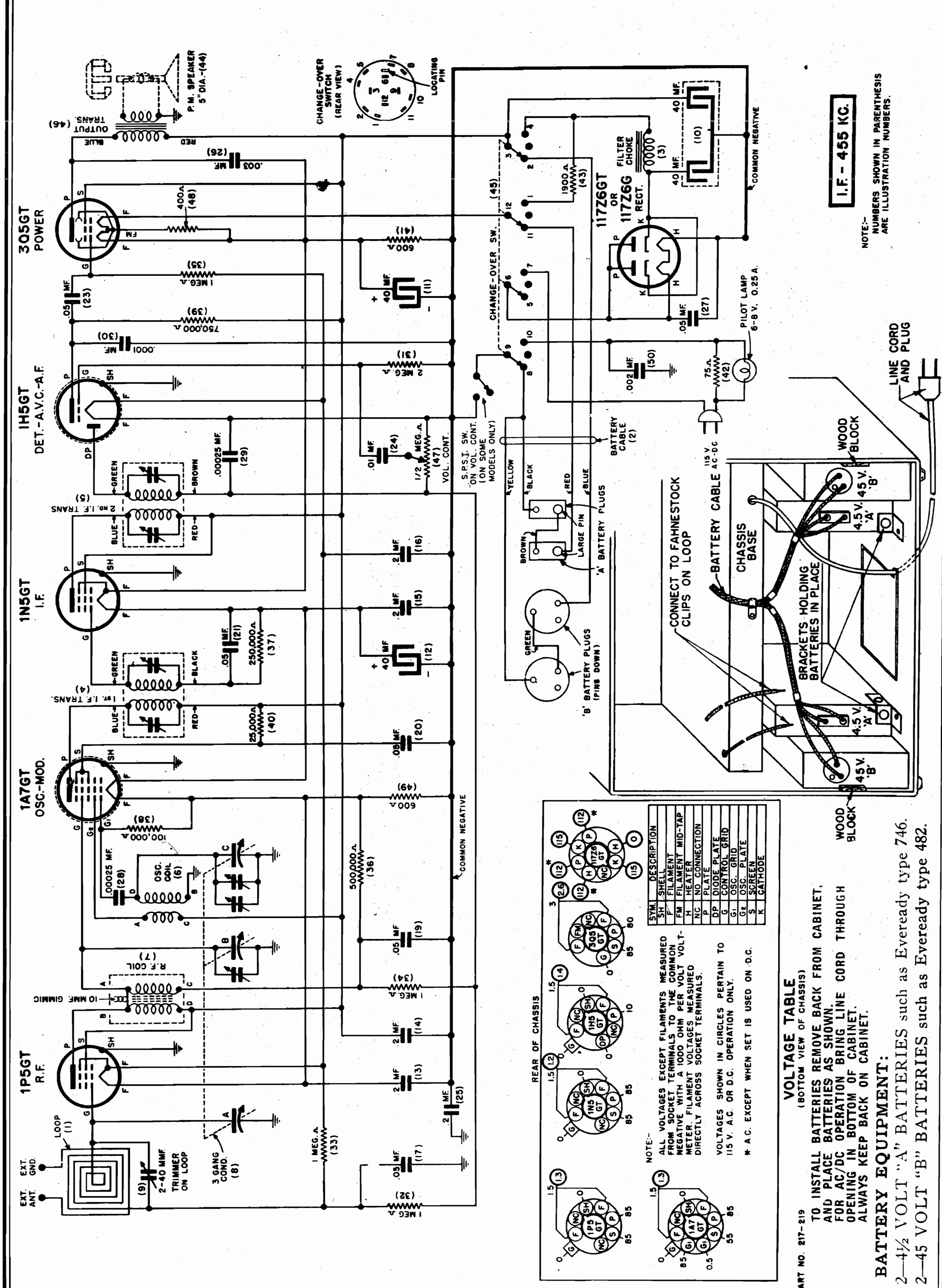
IF ACOUSTICAL FEEDBACK BETWEEN LOUD SPEAKER AND MICROPHONE—HEARD AS A HOWLING SOUND—IS ENCOUNTERED, place microphone as far to the side or rear of recorder as possible.

CAUTION: MICROPHONE VOLUME CONTROL KNOB MUST ALWAYS BE IN MINIMUM VOLUME—LEFT HAND POSITION—WHEN MICROPHONE IS NOT BEING USED. FAILURE TO DO THIS WILL RESULT IN A HOWLING SOUND AND THE MICROPHONE WILL PICK UP EXTRANEOUS AND UNWANTED VOICES, NOISES, ETC., ALL OF WHICH WILL BE RECORDED ON THE DISC.

WHEN RECORDING ALWAYS HAVE THE "TONE CONTROL" KNOB IN THE MAXIMUM RIGHT HAND "BRILLIANT" POSITION.

MODELS 217, 219

SENTINEL RADIO CORP.



SENTINEL RADIO CORP.

MODELS 217, 219

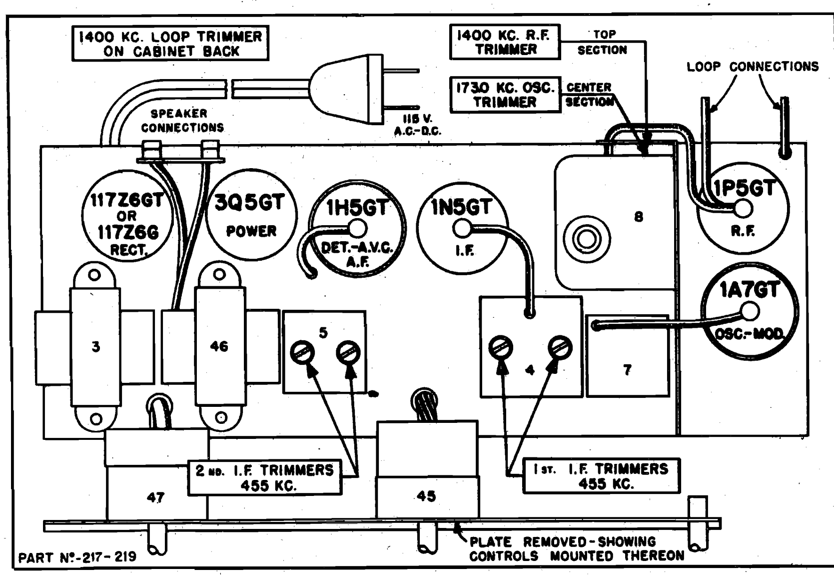
—10-40—

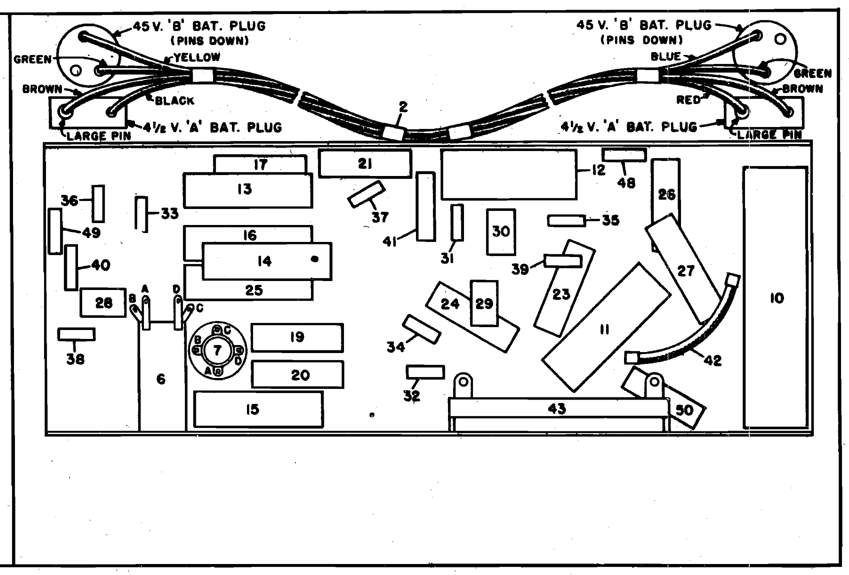
ALIGNMENT PROCEDURE

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. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1730 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

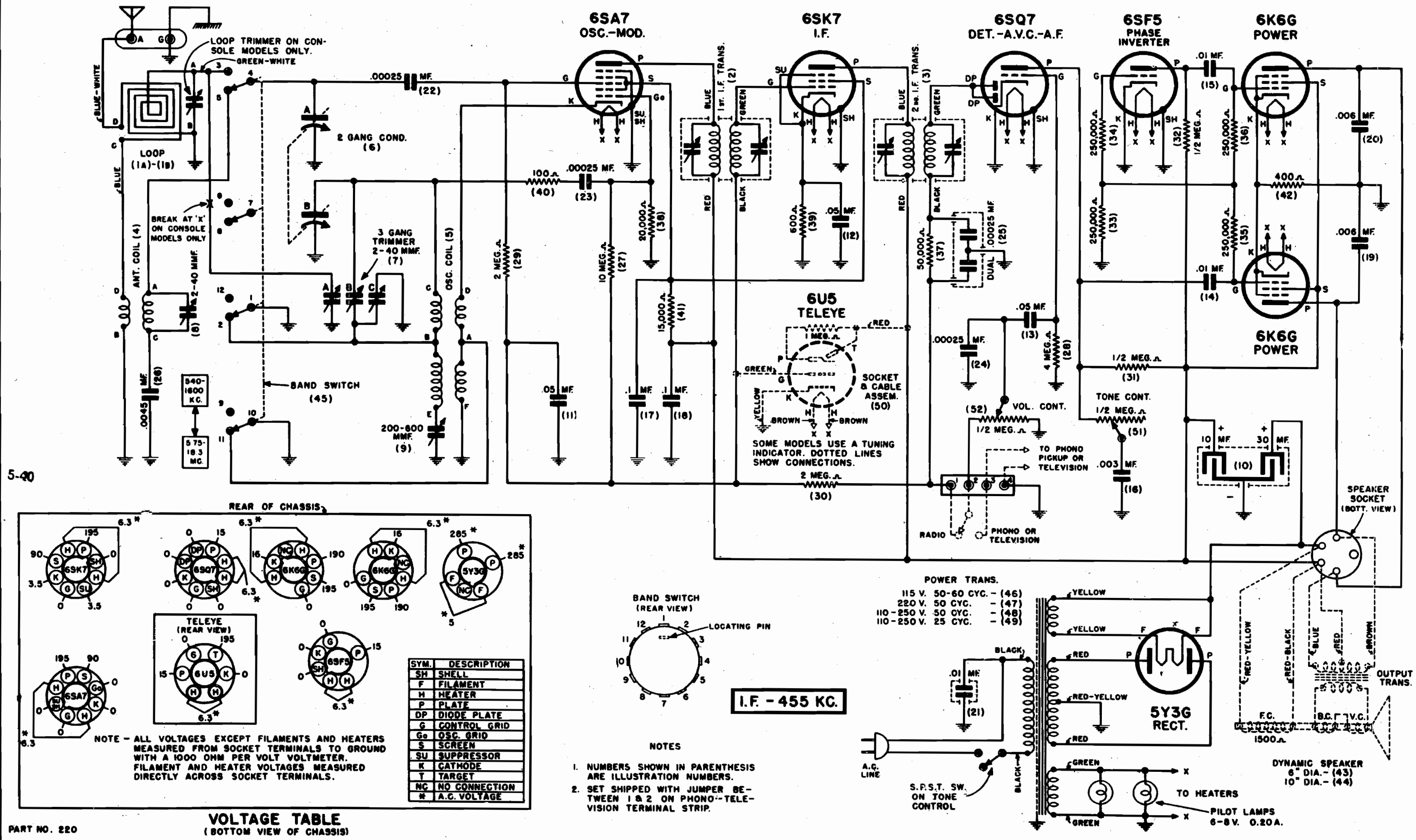
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position.		Any point where no interfering signal is received.	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 1A7GT 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.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1730 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1400 K.C. loop and R.F. trimmers for maximum output.





MODEL 220

SENTINEL RADIO CORP.



VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

OUTSIDE AERIAL

When the radio is used in shielded areas or when located a great distance from broadcast stations, the volume of stations operating in the 540-1600 K.C. band may not be ample in which case it would be necessary to ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE "A" TERMINAL ON THE REAR OF THIS CHASSIS to obtain satisfactory results.

SENTINEL RADIO CORP.

MODEL 220

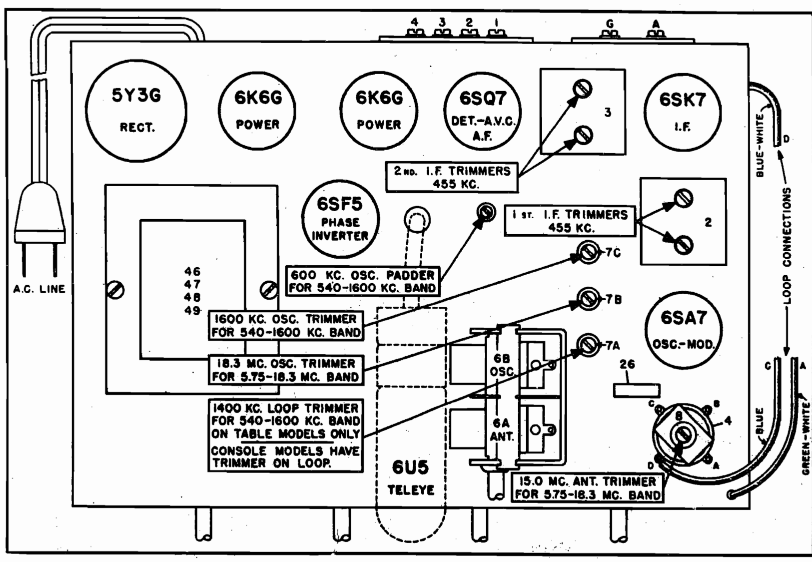
—10-40-

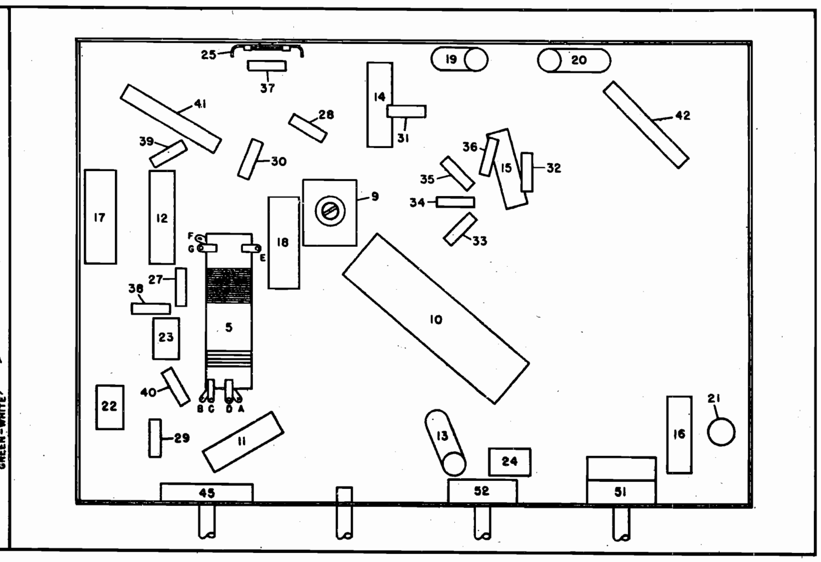
ALIGNMENT PROCEDURE

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. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
			Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
I. F. alignment use any band position.		Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid of 12SA7 tube. Low side to frame of gang condenser through .01 Mfd. condenser.	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.
1600 to 540 K.C. Band	1	Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1600 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K. C. oscillator padder for maximum output.
5.7 to 18.3 M.C. Band	1	Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to "A" Post. Lead, Low side to frame of gang condenser.	Adjust 18.3 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. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to "A" Post. Lead, Low side to frame of gang condenser.	While rocking gang condenser adjust 15 M. C. antenna trimmer for maximum output.





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.

.5 Mfd. 200 V. Condenser

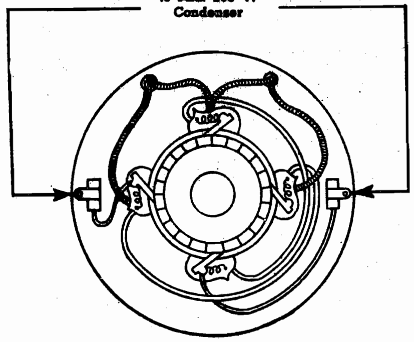


Fig. 1

Connect one .5 Mfd. 200 volt condenser between one positive brush and the generator frame and one condenser btween 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.

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

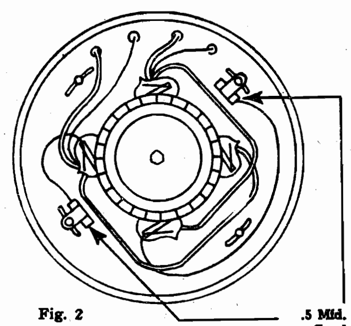


Fig. 2

.5 Mfd. 200 V. Condenser

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.

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.

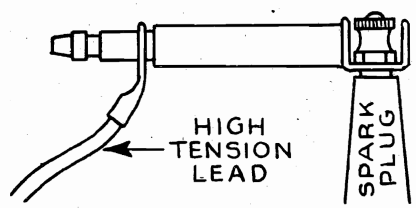


Fig. 3

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 ground 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."

IF RECEIVER SHOULD FAIL TO OPERATE, CHECK FOR:

1. Defective tubes.
2. Tubes not properly inserted in the sockets.
3. Grid caps not connected on grid terminal of tubes.
4. Not sufficient aerial.
5. Supply cord plug reversed.
6. Defective fuse.

MODEL 221

PUSH BUTTON TUNING

SIX STATIONS OPERATING IN THE 1500-540 K.C. BAND MAY BE "AUTOMATIC PUSH BUTTON" TUNED BY PROPERLY SETTING THE 6 SETS OF TRIMMER SCREWS LOCATED UNDERNEATH PUSH BUTTON ESCUTCHEON ON FRONT OF CABINET.

As the push buttons are not preset at the factory for any definite stations, be sure to set them by:

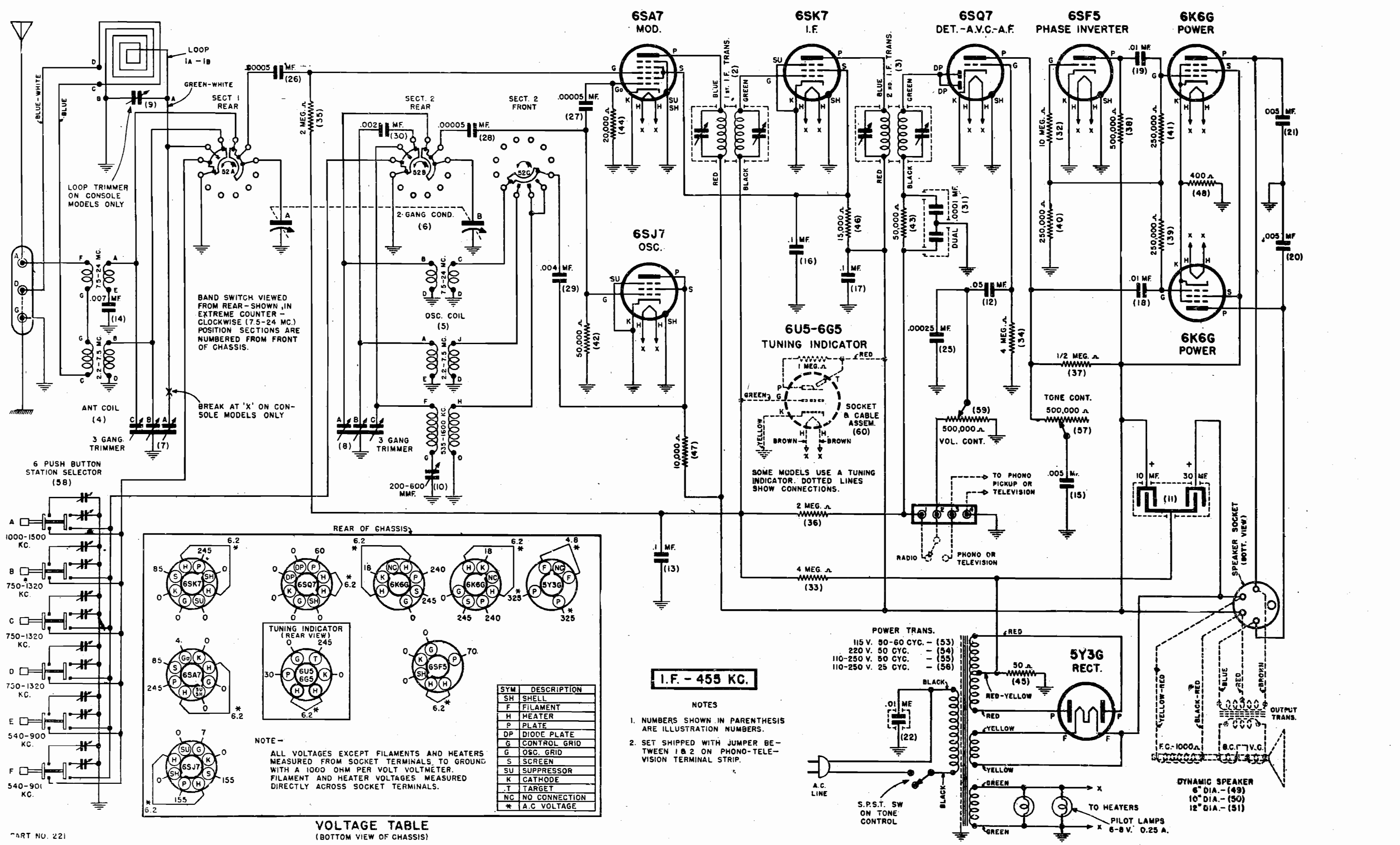
(a) It is important to have the aerial, if an outdoor antenna is to be used, attached to the radio when adjusting the trimmers.
(b) BE SURE TO OPERATE THE RADIO AT LEAST ONE-HALF HOUR BEFORE ADJUSTING TRIMMERS. If set is not thoroughly warmed up when trimmers are adjusted, the trimmers may shift position after they do become warm, resulting in poor tone, weak signals and excessive background noise.
(c) Obtain the transmitter frequency—number of kilocycles—and call letters of the six stations you wish to "Push Button" tune. FOR BEST RESULTS SET PUSH BUTTONS FOR LOCAL OR STRONG NEAR-BY STATIONS ONLY.
(d) Remove push button escutcheon from front of cabinet by unscrewing small wood screws that hold this in place.
(e) Rotate band switch to the next to the maximum right hand position.
(f) Using manual tuning knob, carefully tune in to the point of clearest tone, one of the selected stations whose transmitter frequency is somewhere between 540 and 900 kilocycles.
(g) Rotate band switch knob to the maximum right hand position.
(h) Press in either one of the two push buttons indicated on label adjacent to trimmers marked 540 to 900 K.C. Note: Station signal will disappear, or may be distorted and in some instances another station may be heard.
(i) Using a screwdriver ADJUST THE LARGE 540 TO 900 KILOCYCLE ADJUSTING SCREW, LOCATED ABOVE THE PUSH BUTTON THAT IS PUSHED IN—until the 540 to 900 kilocycle station that had been previously tuned in with the manual tuning knob, is heard with maximum volume and clearest tone. AFTER ADJUSTING THE LARGE SCREW CAREFULLY ADJUST THE SMALL SCREW DIRECTLY BELOW THE LARGE ONE FOR CLEAREST TONE AND MAXIMUM VOLUME.
(j) Remove the printed tab, having the call letters of the station tuned in, from the paper call letter sheet. Press this into the depression in the push button escutcheon that will be adjacent to the push button just adjusted when the escutcheon is remounted in place on the cabinet.
(k) Set other trimmers for selected stations operating between the frequency range of the trimmers, as indicated on the label.

IMPORTANT: THE WAVE SWITCH KNOB MUST BE IN THE MAXIMUM RIGHT HAND POSITION FOR PUSH BUTTON TUNING.

In some instances it may be necessary, after the set is operated for a period of time, to reset the trimmers as they may drift due to heat, humidity, etc.

SENTINEL RADIO CORP.

MODEL 221



AERIAL

THERE ARE THREE POSTS marked "A," "D," and "G" on the rear of the chassis. When the receiver is shipped from the factory a flexible wire is connected to post "D" and "G." When a straight aerial is used this wire should be left in this position and the aerial lead-in connected to the post marked "A."

When a doublet type antenna is used, remove the small piece of wire connecting "G" and "D" posts together and attach one of the doublet antenna lead-ins to "A" post and the other to "D" post.

VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

MODEL 221

SENTINEL RADIO CORP.

Printed in U.S.A.—S.P.—7-40—1100

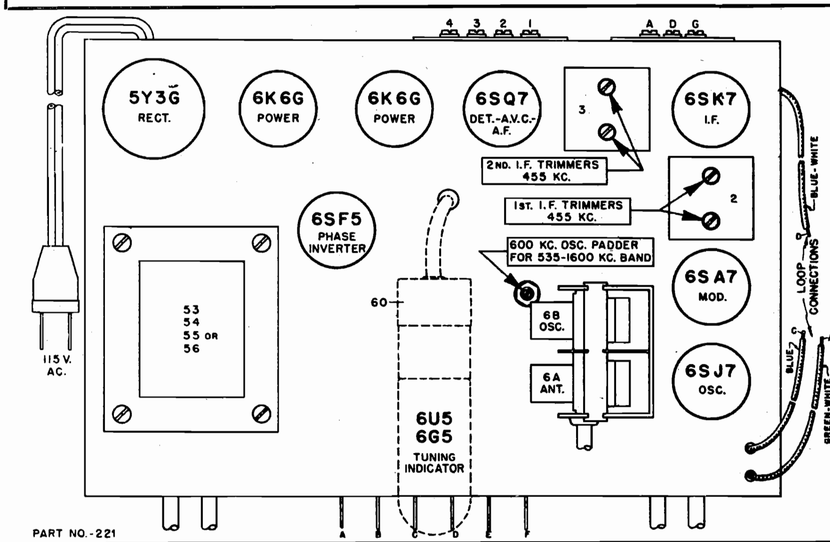
ALIGNMENT PROCEDURE

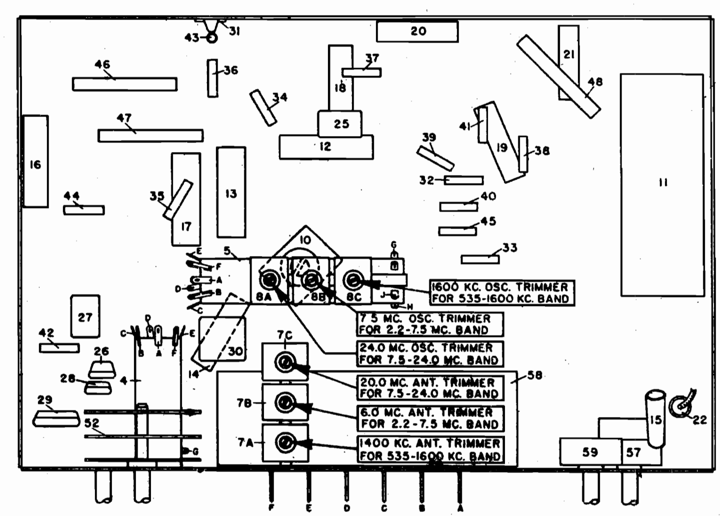
PART NO. 12407-221

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. IMPORTANT: BEFORE ALIGNING, PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET.

When adjusting 1600 kilocycle oscillator trimmer, 600 K.C. Padder and 1400 kilocycle antenna trimmer, do not connect test oscillator to loop. Couple test oscillator to receiver loop by: (a) Make a loop consisting of five to ten turns of No. 20 to 30 size wire wound on a three inch form and attach across output of test oscillator. (b) Place test oscillator loop near set loop—BE SURE THAT NEITHER MOVES WHILE ALIGNING.

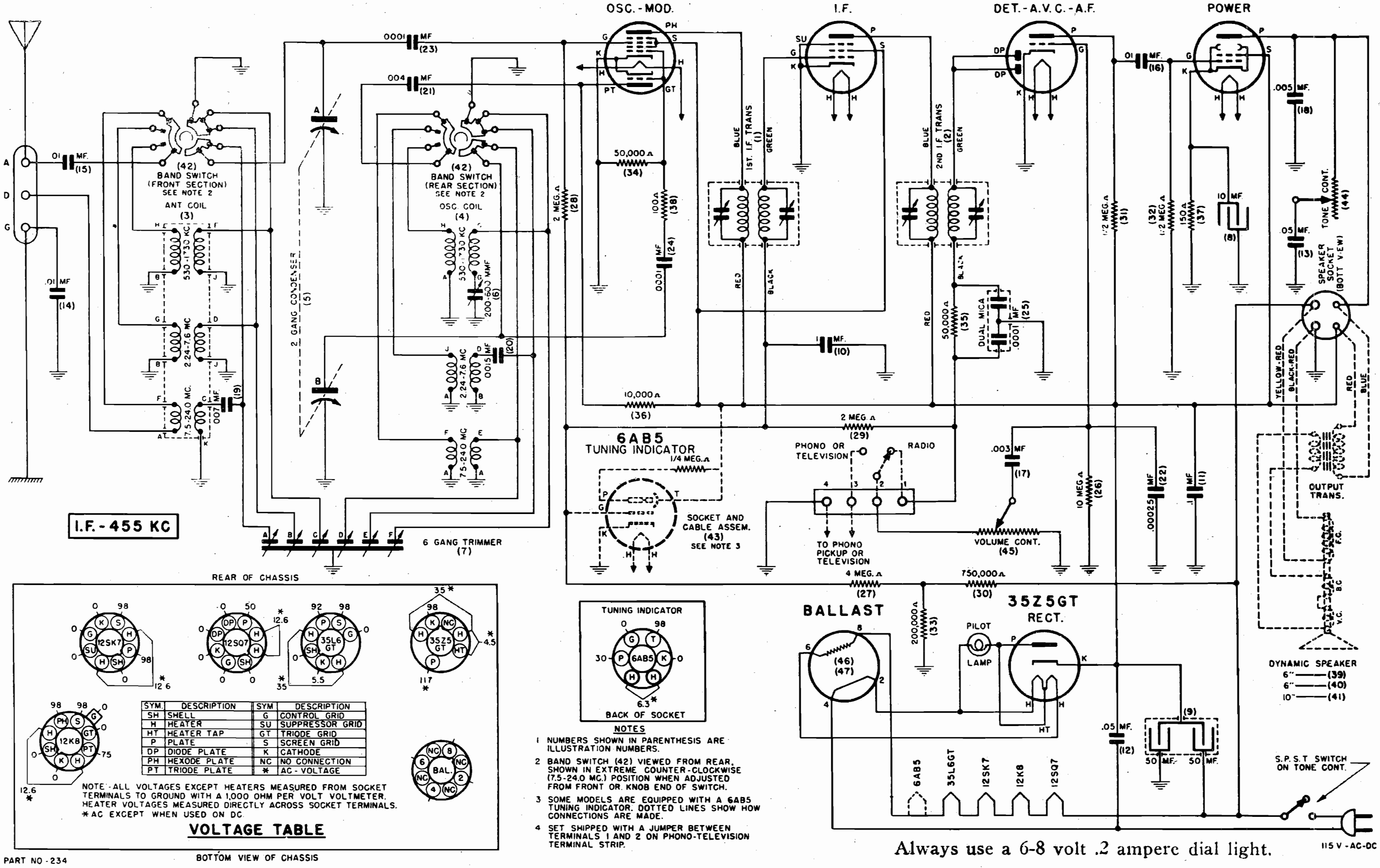
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position		Any point where no interfering signal is received	Exactly 455 K.C.	0.2 Mfd. condenser	High side to grid cap of 6SA7 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.
1600 to 535 K.C. Band Using Loop Aerial	1	Exactly 1600 K.C.	Exactly 1600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	Adjust 1600 K. C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Approx. 1400 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 1400 K. C. loop antenna trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C.	None	Use Small Loop to couple test oscillator to receiver loop.	While rocking gang condenser adjust 600 K. C. loop oscillator padder for maximum output.
2.2 to 7.6 M.C. Band	1	Exactly 7.6 M.C.	Exactly 7.6 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.6 M. C. oscillator trimmer for maximum output.
	2	Approx. 6. M.C.	Approx. 6. M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 6 M. C. antenna trimmer for maximum output.
7.4 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. 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.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M. C. antenna trimmer for maximum output.





SENTINEL RADIO CORP.

MODEL 234



SYM	DESCRIPTION	SYM	DESCRIPTION
SH	SHELL	G	CONTROL GRID
H	HEATER	SU	SUPPRESSOR GRID
HT	HEATER TAP	GT	TRIODE GRID
P	PLATE	S	SCREEN GRID
DP	DIODE PLATE	K	CATHODE
PH	HEXODE PLATE	NC	NO CONNECTION
PT	TRIODE PLATE	*	AC-VOLTAGE

NOTE - ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1,000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS. *AC EXCEPT WHEN USED ON DC

VOLTAGE TABLE

NOTES

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH (42) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
3. SOME MODELS ARE EQUIPPED WITH A 6AB5 TUNING INDICATOR. DOTTED LINES SHOW HOW CONNECTIONS ARE MADE.
4. SET SHIPPED WITH A JUMPER BETWEEN TERMINALS 1 AND 2 ON PHONO-TELEVISION TERMINAL STRIP.

AERIAL

THERE ARE THREE POSTS marked "A," "D," and "G" on the rear of the chassis. When the receiver is shipped from the factory a flexible wire is connected to post "D" and "G."

When a doublet type antenna is used, remove the small piece of wire connecting "G" and "D" posts together and attach one of the doublet antenna lead-ins to "A" post and the other to "D" post.

VOLTAGE RATING

THIS RECEIVER MAY BE OPERATED ON 100-120 VOLT DIRECT CURRENT (D.C.) and 100-120 volts, 50-60 cycle alternating current (A.C.) by using a No. 11222 line voltage regulator tube in regulator socket on top of radio chassis.

FOR 210-240 VOLT D.C. or 210-240 VOLT 50-60 CYCLE A.C. OPERATION, a No. 11223 line voltage regulator tube must be used in the regulator socket.

MODEL 234

SENTINEL RADIO CORP.

-1-41-

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.

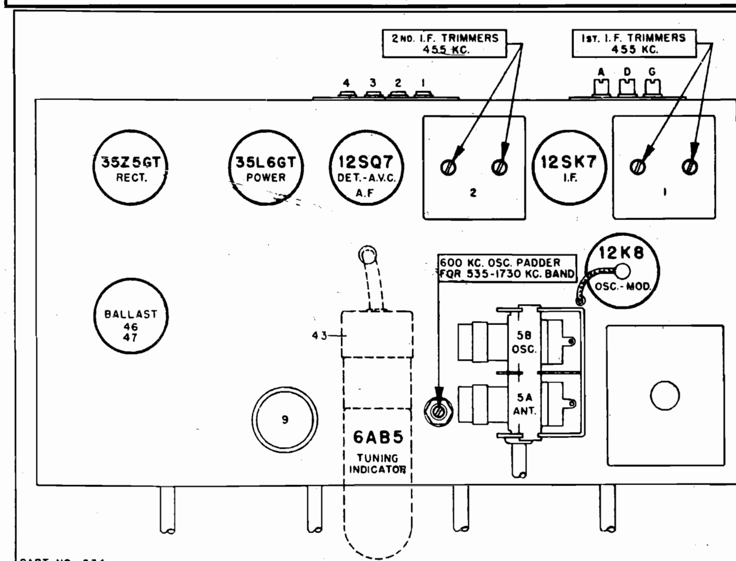
Before starting alignment:

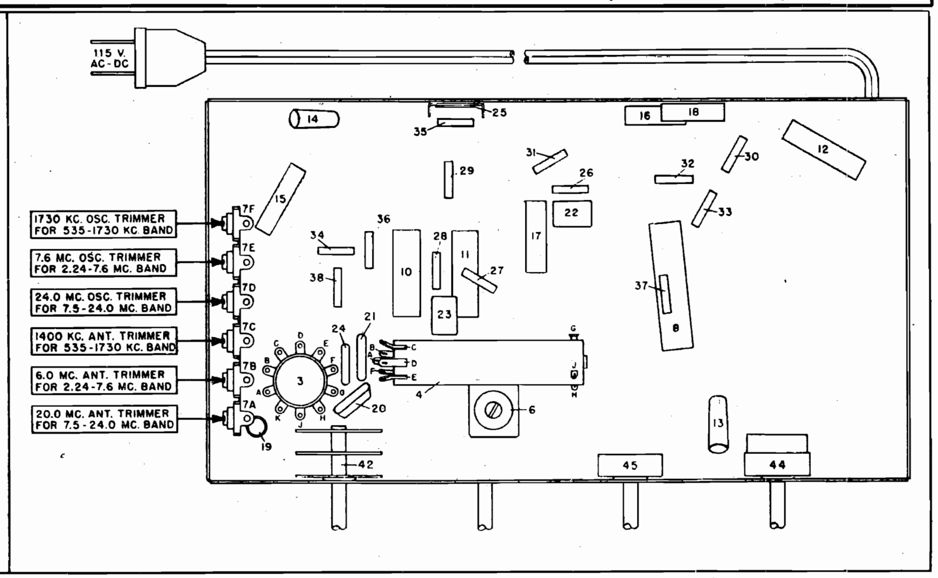
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle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

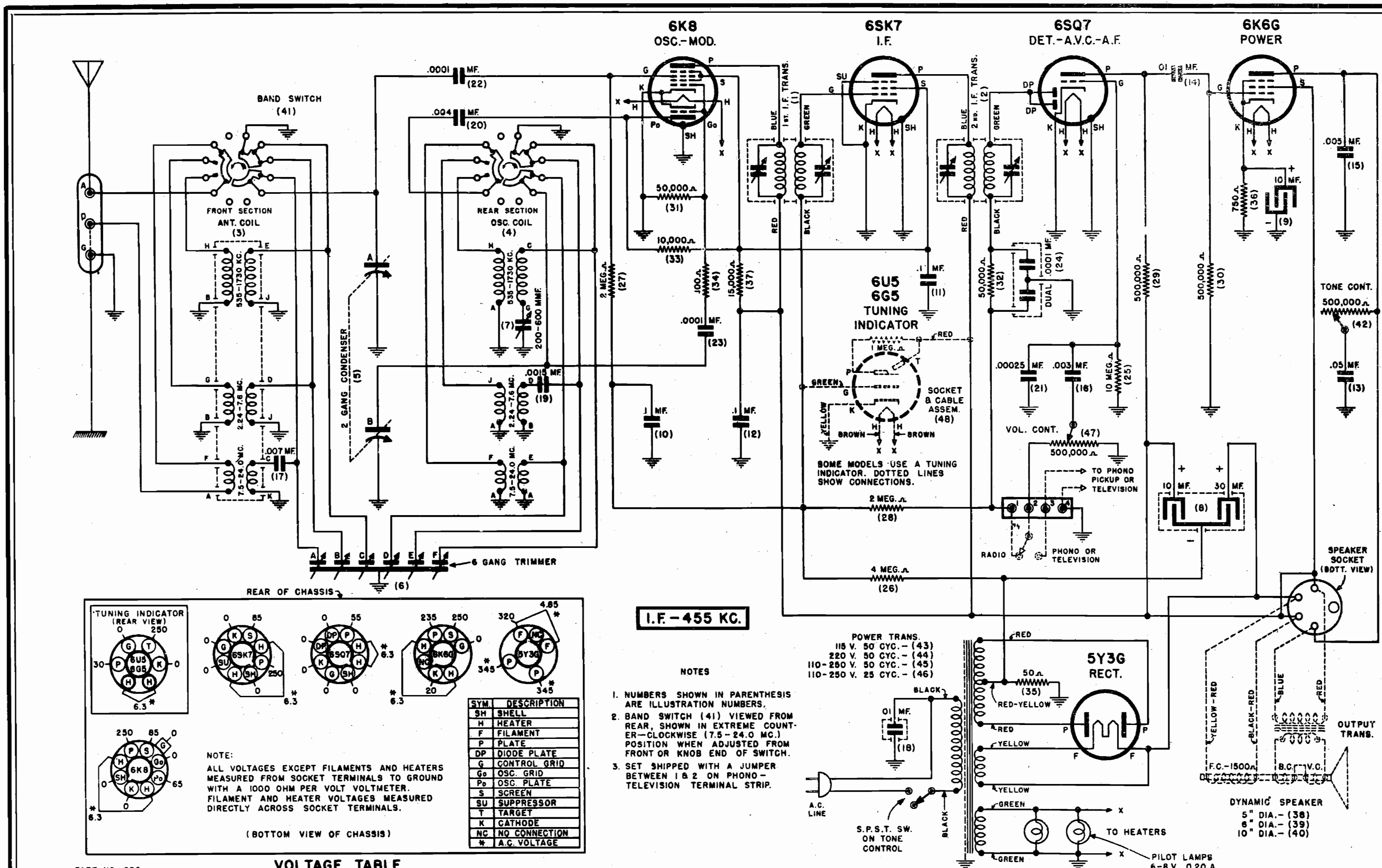
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator: consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location 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 12K8 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 trimmer 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.
2.24 to 7.6 M.C. Band	1	Exactly 7.6 M.C.	Exactly 7.6 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.6 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 trimmer 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. 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.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna trimmer for maximum output.





SENTINEL RADIO CORP

MODEL 235



SYM.	DESCRIPTION
SH	SHELL
H	HEATER
F	FILAMENT
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
Go	OSC. GRID
Po	OSC. PLATE
S	SCREEN
SU	SUPPRESSOR
T	TARGET
K	CATHODE
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTES

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH (41) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
3. SET SHIPPED WITH A JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP.

PART NO. 235

Printed in U. S. A.—7-40

AERIAL

THERE ARE THREE POSTS marked "A," "D," and "G" on the rear of the chassis. When the receiver is shipped from the factory a flexible wire is connected to post "D" and "G."

When a doublet type antenna is used, remove the small piece of wire connecting "G" and "D" posts together and attach one of the doublet antenna lead-ins to "A" post and the other to "D" post.

VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON 110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT—unless the marking on the white paper license notice which will be found attached either to bottom or inside the cabinet is marked differently, in which case the radio must only be used on the type of current shown on this notice.

BE SURE THAT THE CURRENT RATING GIVEN ON THE LICENSE TAG IS THE SAME AS THE HOUSE CURRENT SUPPLY.

MODEL 235

SENTINEL RADIO CORP.

-11-40-

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.

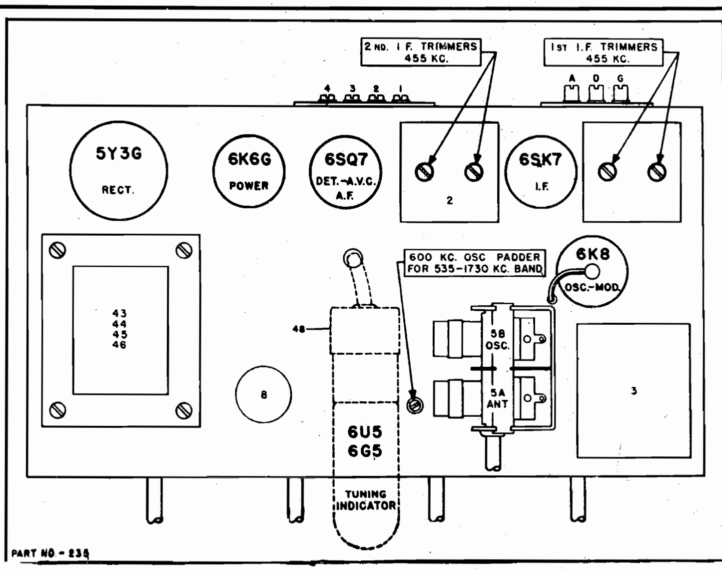
Before starting alignment:

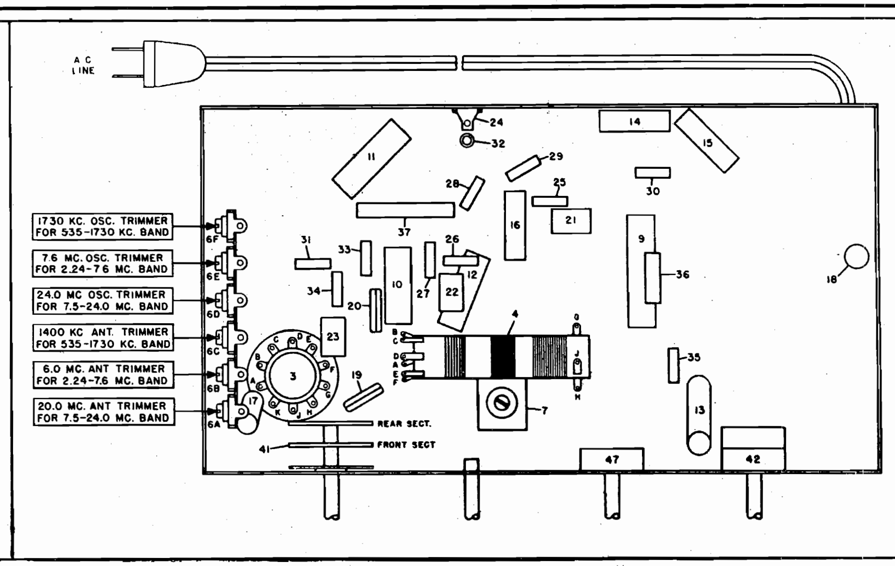
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle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

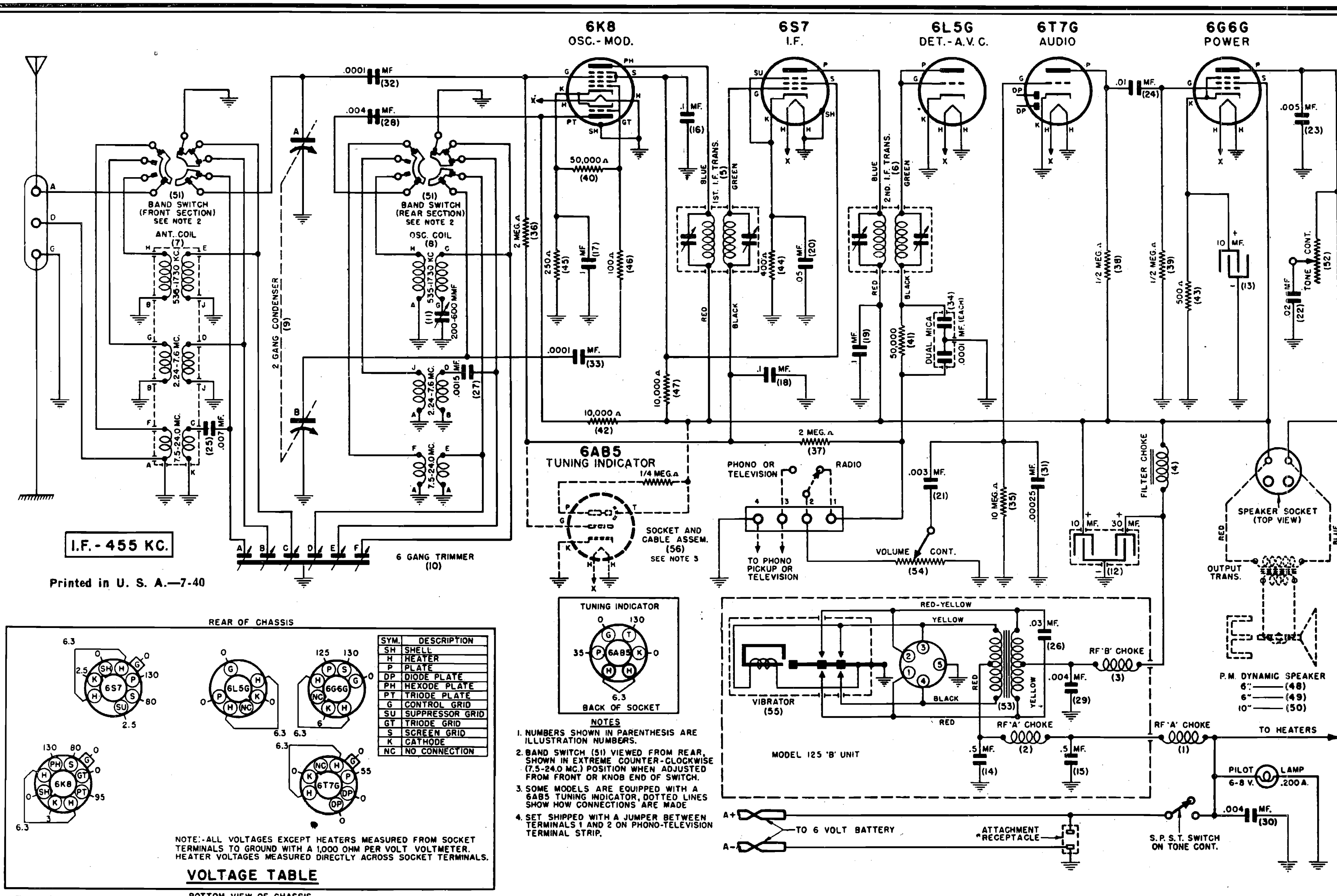
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location 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 535 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.	Approx. 1400 K.C.	.00025 Mfd. condenser	Receiver antenna "A" post	While rocking gang condenser adjust 1400 K.C. antenna trimmer 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.
2.24 to 7.6 M.C. Band	1	Exactly 7.6 M.C.	Exactly 7.6 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.6 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 trimmer 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. 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.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna trimmer for maximum output.





SENTINEL RADIO CORP.

MODEL 236



SYM.	DESCRIPTION
SH	SHELL
H	HEATER
P	PLATE
DP	DIODE PLATE
PH	HEXODE PLATE
PT	TRIODE PLATE
G	CONTROL GRID
SU	SUPPRESSOR GRID
GT	TRIODE GRID
S	SCREEN GRID
K	CATHODE
NC	NO CONNECTION

NOTES

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH (51) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
3. SOME MODELS ARE EQUIPPED WITH A 6AB5 TUNING INDICATOR, DOTTED LINES SHOW HOW CONNECTIONS ARE MADE.
4. SET SHIPPED WITH A JUMPER BETWEEN TERMINALS 1 AND 2 ON PHONO-TELEVISION TERMINAL STRIP.

PART NO.-236

THE RECEPTACLE ON BACK of chassis is connected to the storage battery operating the radio. A single six volt 15 or 25 watt light may be run on the battery by inserting male plug on end of light into receptacle. Light cord wire must not be smaller than No. 18 nor longer than six feet, and only one six volt light should be used, otherwise the light will be dim.

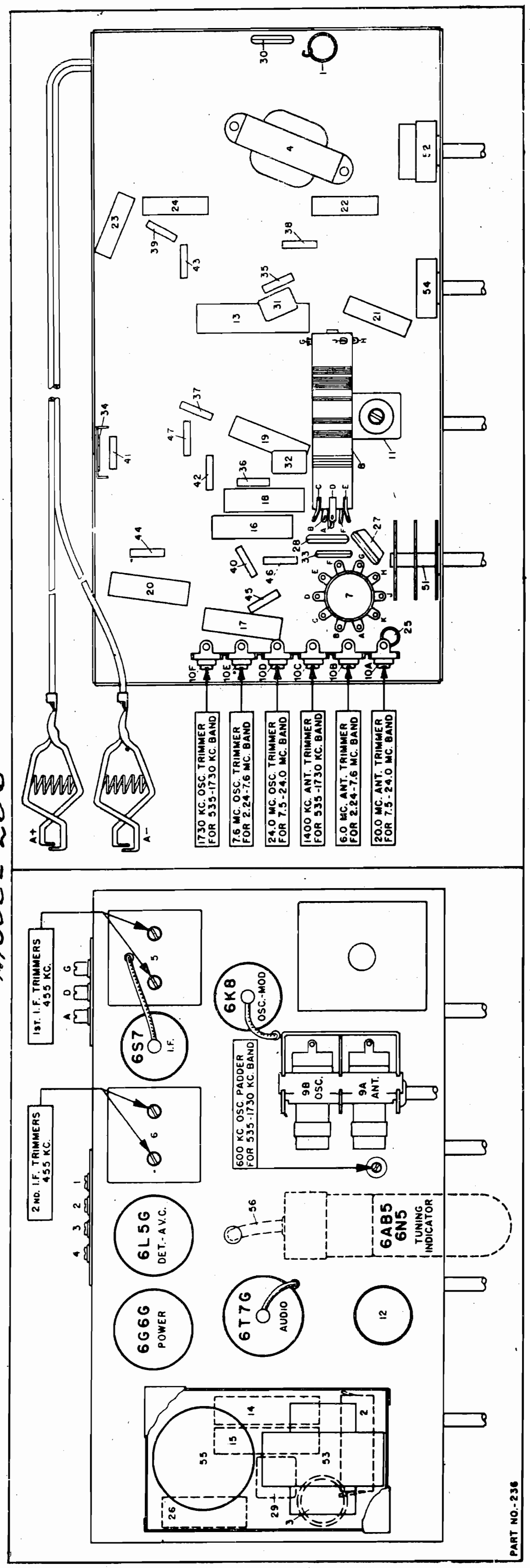
AERIAL

THERE ARE THREE POSTS marked "A," "D," and "G" on the rear of the chassis. When the receiver is shipped from the factory a flexible wire is connected to post "D" and "G."

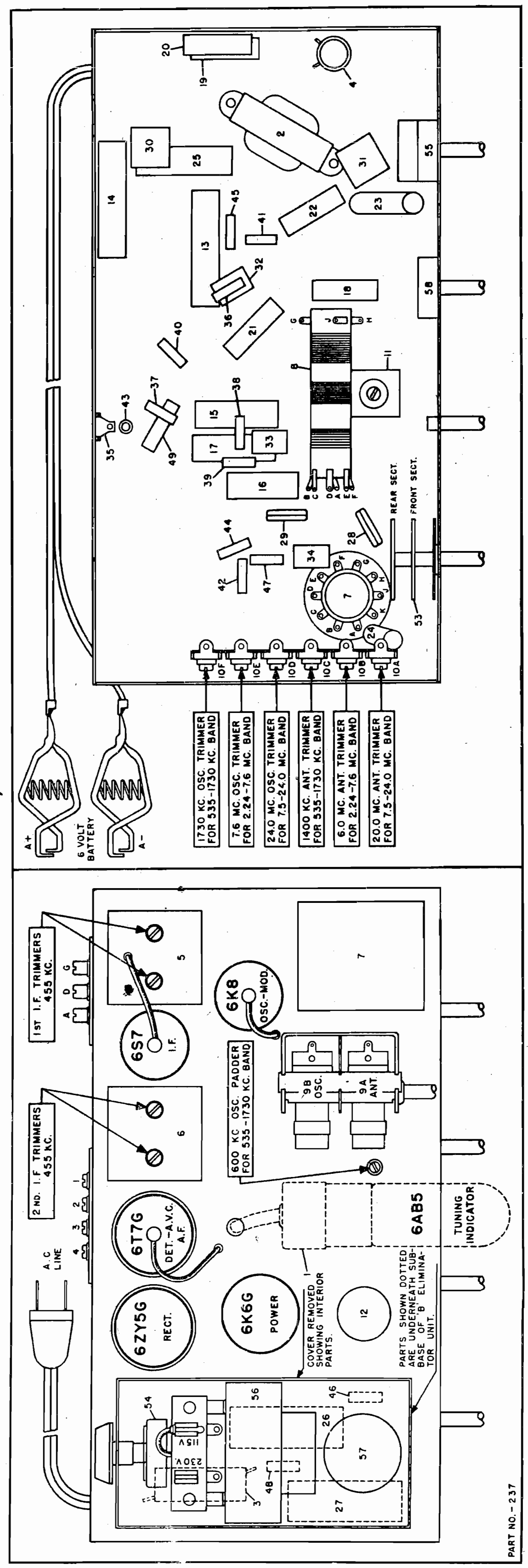
When a doublet type antenna is used, remove the small piece of wire connecting "G" and "D" posts together and attach one of the doublet antenna lead-ins to "A" post and the other to "D" post.

MODEL 236
MODEL 237

SENTINEL RADIO CORP.

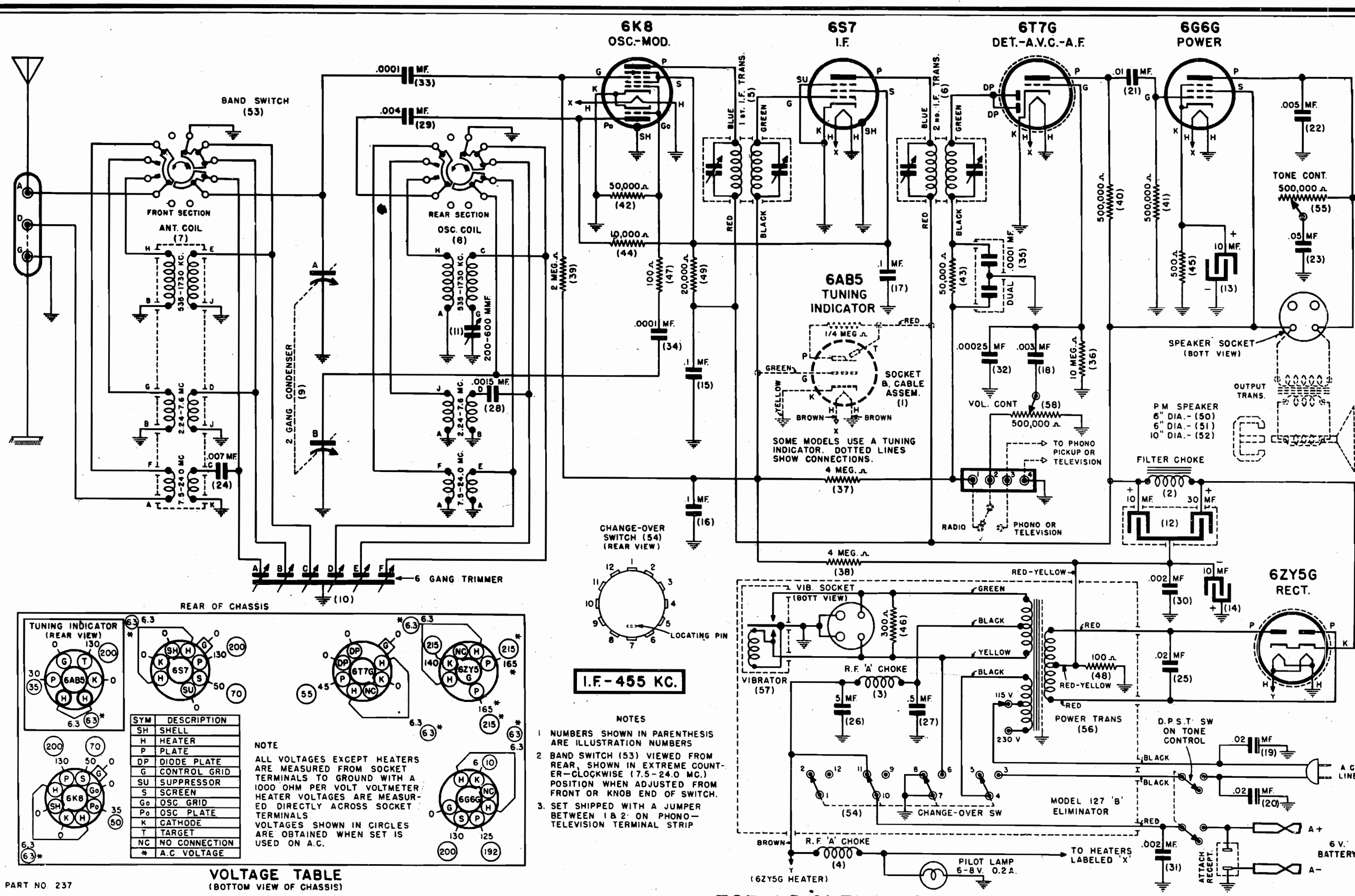


FOR ALIGNMENT AND OTHER DATA, SEE INDEX



SENTINEL RADIO CORP.

MODEL 237



NOTES

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS
2. BAND SWITCH (53) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
3. SET SHIPPED WITH A JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP

SYM	DESCRIPTION
SH	SHELL
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
SU	SUPPRESSOR
S	SCREEN
Go	OSC. GRID
Po	OSC. PLATE
K	CATHODE
T	TARGET
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTE
ALL VOLTAGES EXCEPT HEATERS ARE MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES ARE MEASURED DIRECTLY ACROSS SOCKET TERMINALS.
VOLTAGES SHOWN IN CIRCLES ARE OBTAINED WHEN SET IS USED ON A.C.

PART NO. 237

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

Printed in U. S. A.—7-40

VOLTAGE RATING

THIS RECEIVER CAN BE OPERATED WITH A SIX VOLT STORAGE BATTERY OR FROM 115 OR 230 VOLT 50 TO 60 CYCLE CURRENT.

NEVER ATTEMPT TO OPERATE THE RECEIVER WITH A 12 VOLT STORAGE BATTERY OR ON 25 CYCLE CURRENT OR ON DIRECT CURRENT (D.C.) OR WITH THE METAL TIPPED LEAD IN THE WRONG TERMINAL SOCKET BECAUSE THE SET WILL BE DAMAGED.

FOR AC OPERATION obtain from the Electric Supply Company the voltage and current rating of the local Electric Service and — — — remove top cover from power unit and insert metal tipped lead into proper terminal socket that will be found underneath top cover of power unit.

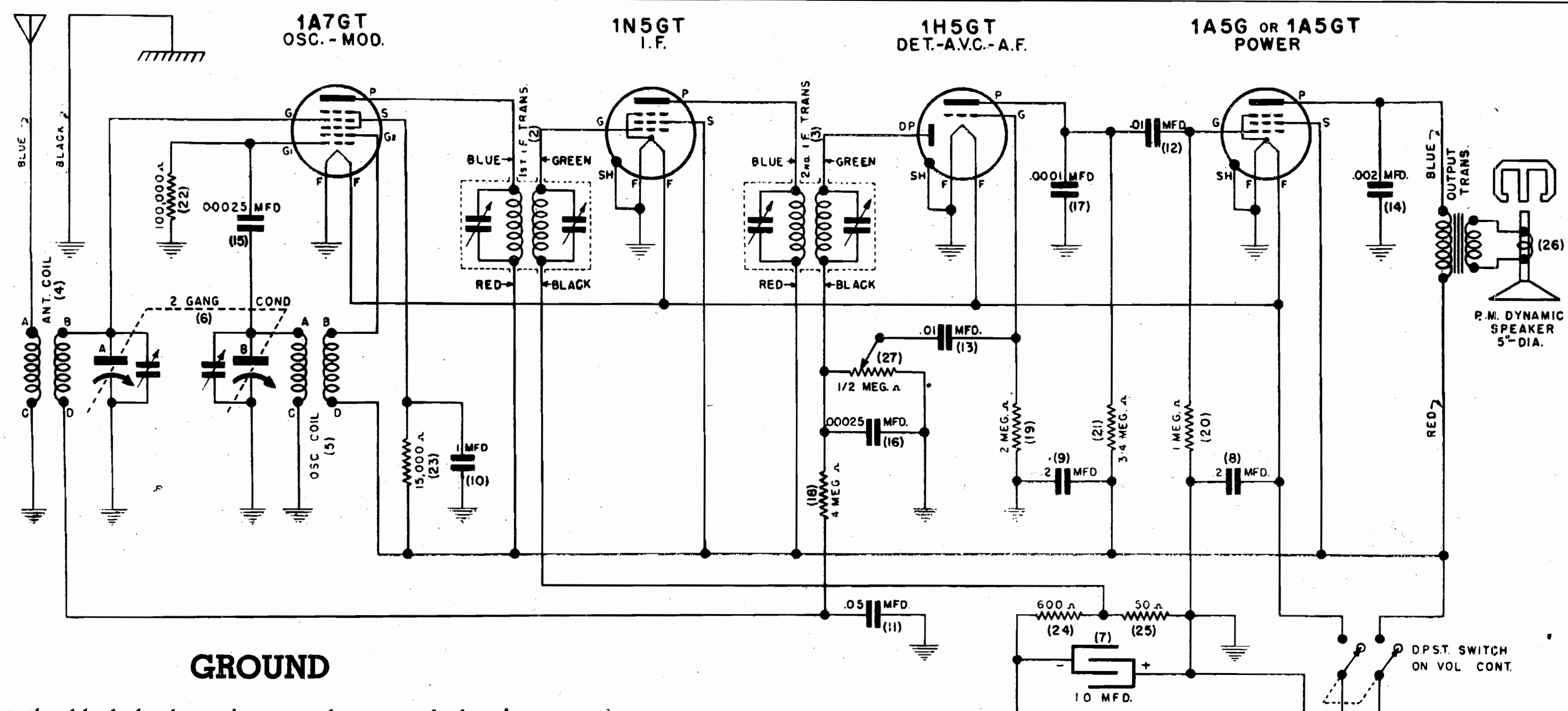
Place voltage selector switch knob in "115—230" position and plug set power cord plug into house lighting outlet.

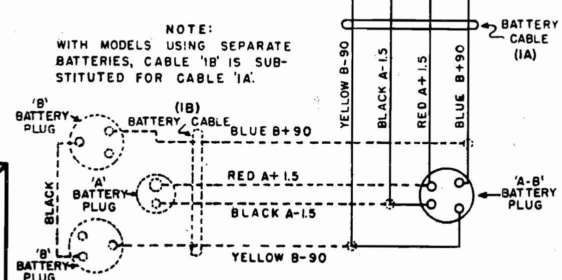
WITH 6 VOLT STORAGE BATTERY:

Place voltage selector switch on back of the "B" unit and accessible from the rear of the chassis to position marked 6.V.

MODEL 240

SENTINEL RADIO CORP.



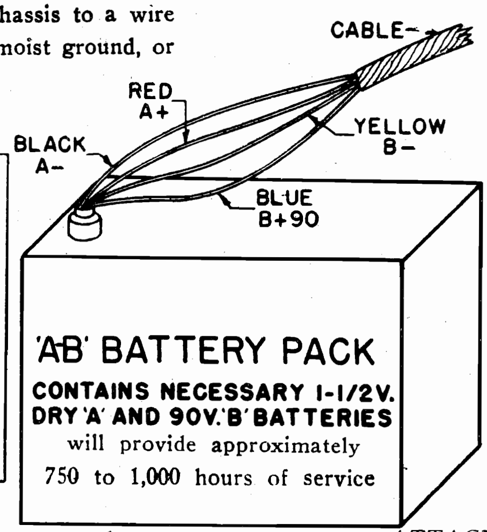


NOTE:
WITH MODELS USING SEPARATE BATTERIES, CABLE '1B' IS SUBSTITUTED FOR CABLE '1A'.

-5r40-

GROUND

Connect the black lead coming out the rear of chassis to a wire attached to a metal stake driven two to four feet in moist ground, or to a cold water pipe.



I.F. - 455 KC.

NOTE:
NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

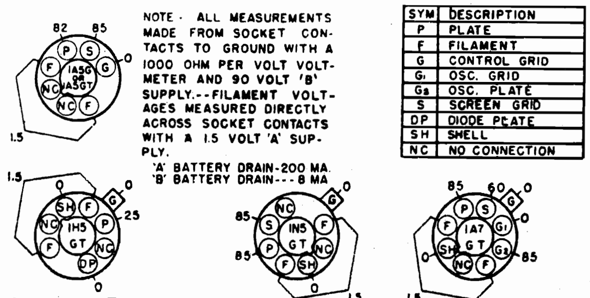
BATTERY PLUGS SHOWN PINS DOWN.

FRONT OF CHASSIS

NOTE - ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 90 VOLT 'B' SUPPLY.--FILAMENT VOLTAGES MEASURED DIRECTLY ACROSS SOCKET CONTACTS WITH A 1.5 VOLT 'A' SUPPLY.

'A' BATTERY DRAIN-200 MA.
'B' BATTERY DRAIN---8 MA.

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
G1	OSC. GRID
G2	OSC. PLATE
S	SCREEN GRID
DP	DIODE PLATE
SH	SHELL
NC	NO CONNECTION



VOLTAGE TABLE

BOTTOM VIEW OF CHASSIS

PART NO:-240

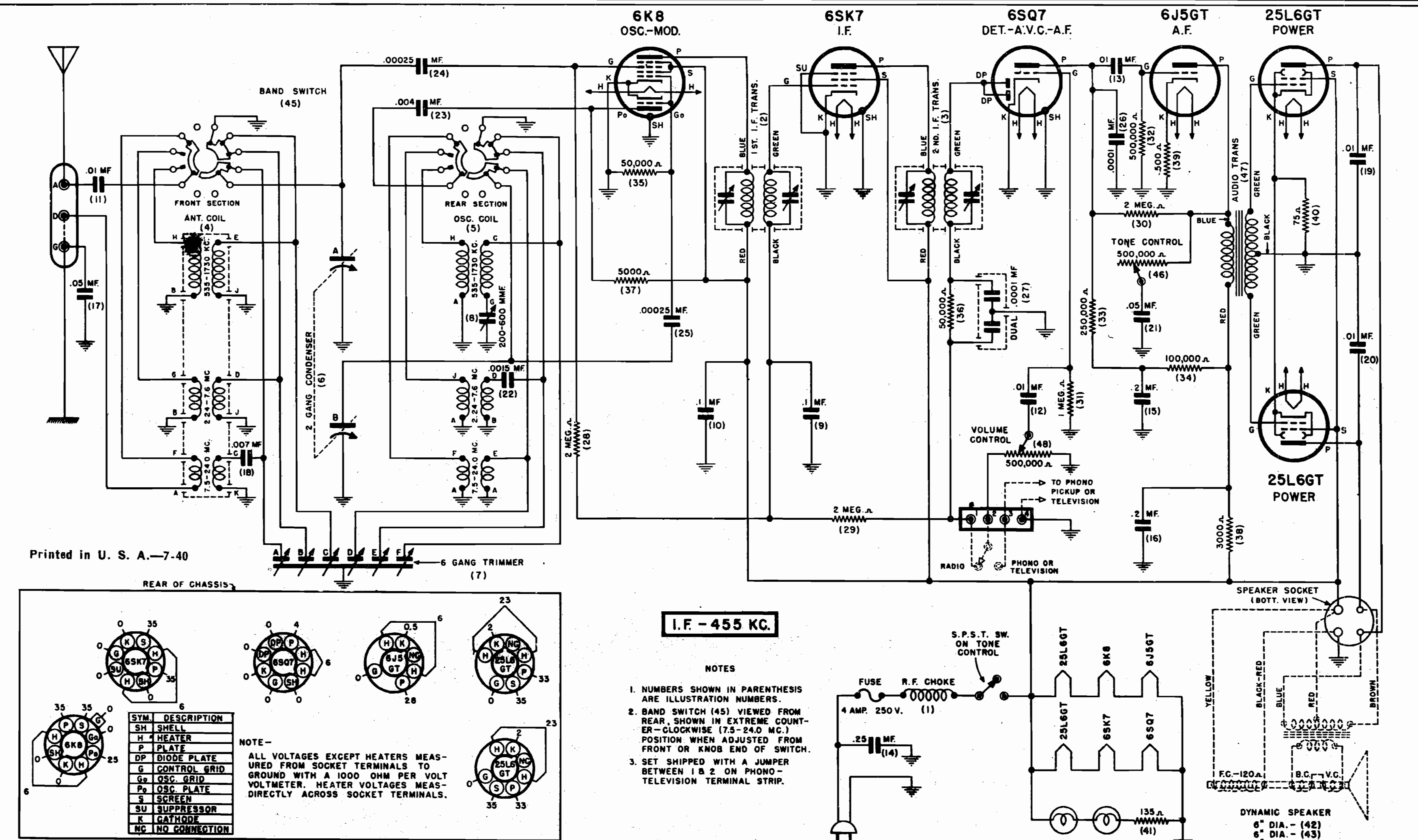
SHOWING 4 PRONG PLUG ON END OF SET BATTERY CABLE INSERTED INTO RECEPTACLE ON TOP OF "AB" BATTERY PACK

AERIAL

ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT THE REAR OF CHASSIS.

SENTINEL RADIO CORP.

MODEL 239



Printed in U. S. A.—7-40

I.F. - 455 KC.

NOTES

1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. BAND SWITCH (45) VIEWED FROM REAR, SHOWN IN EXTREME COUNTER-CLOCKWISE (7.5-24.0 MC.) POSITION WHEN ADJUSTED FROM FRONT OR KNOB END OF SWITCH.
3. SET SHIPPED WITH A JUMPER BETWEEN 1 & 2 ON PHONO-TELEVISION TERMINAL STRIP.

SYM.	DESCRIPTION
SH	SHELL
H	HEATER
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
Go	OSC. GRID
Po	OSC. PLATE
S	SCREEN
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION

NOTE— ALL VOLTAGES EXCEPT HEATERS MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER. HEATER VOLTAGES MEASURED DIRECTLY ACROSS SOCKET TERMINALS.

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

PART NO. 239

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. If set still does not operate examine the fuse on back of chassis.

FUSE: A 4 ampere fuse is located on the back of the chassis adjacent to the speaker plug and protects the receiver from damage should a defect occur in the set or if it is connected to the improper power supply.

AERIAL

THERE ARE THREE POSTS marked "A," "D," and "G" on the rear of the chassis. When the receiver is shipped from the factory a flexible wire is connected to post "D" and "G."

When a doublet type antenna is used, remove the small piece of wire connecting "G" and "D" posts together and attach one of the doublet antenna lead-ins to "A" post and the other to "D" post.

WARNING—Do not attach a ground direct to the radio chassis—ANY EXTERNAL GROUND CONNECTION TO ANY METAL PART OF THE CHASSIS MAY CAUSE A SHORT AND POSSIBLE DAMAGE.

MODEL 239
MODELS 236, 237

SENTINEL RADIO CORP.

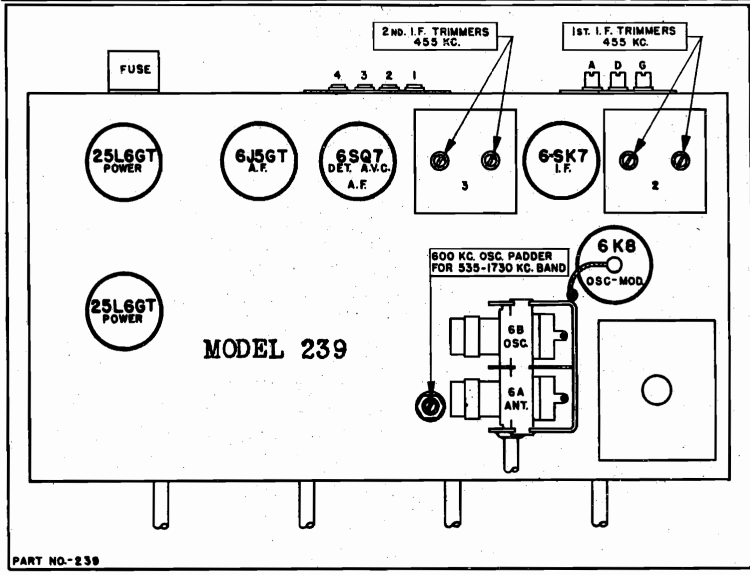
-1-41-

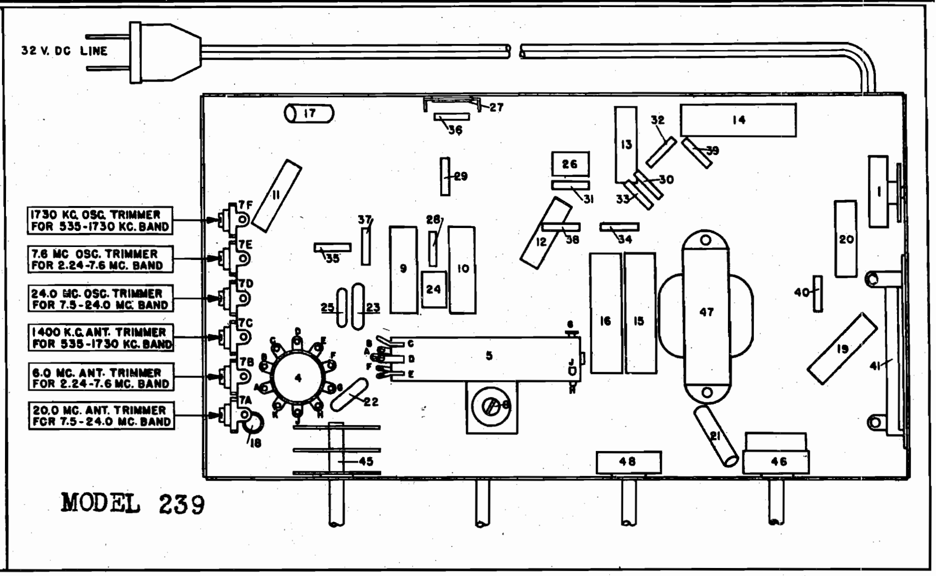
ALIGNMENT PROCEDURE MODELS 236, 237, 239

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.

(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.

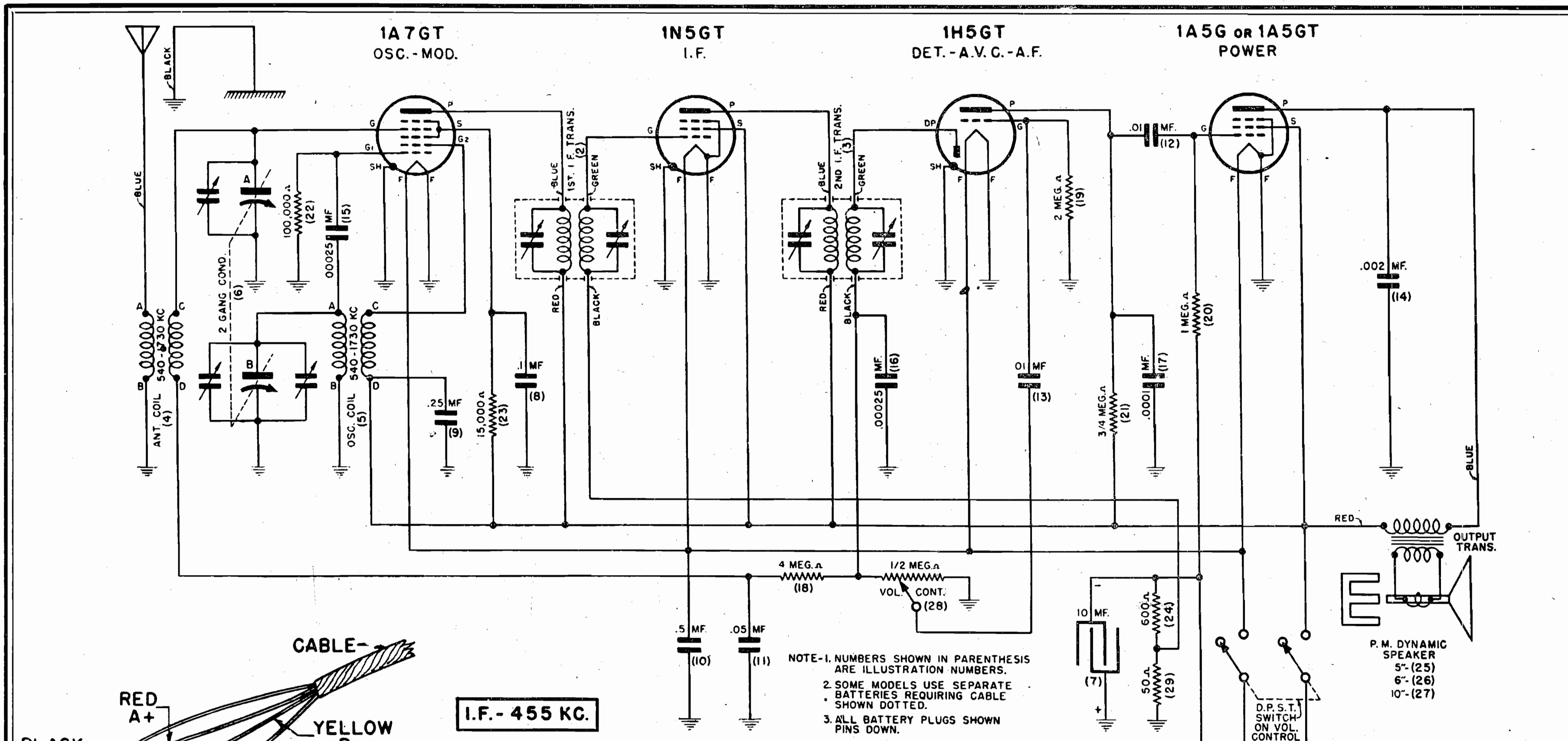
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR — Adjust test oscillator frequency to:	TEST OSCILLATOR — Use dummy antenna in series with output of test oscillator: consisting of:	TEST OSCILLATOR — Attach output of test oscillator to:	Refer to parts layout diagram for location 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 trimmer 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.
2.24 to 7.6 M.C. Band	1	Exactly 7.6 M.C.	Exactly 7.6 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	Adjust 7.6 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 trimmer 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. 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.	Approx. 20 M.C.	400 Ohm carbon resistor	Receiver antenna "A" post	While rocking gang condenser adjust 20 M.C. antenna trimmer for maximum output.



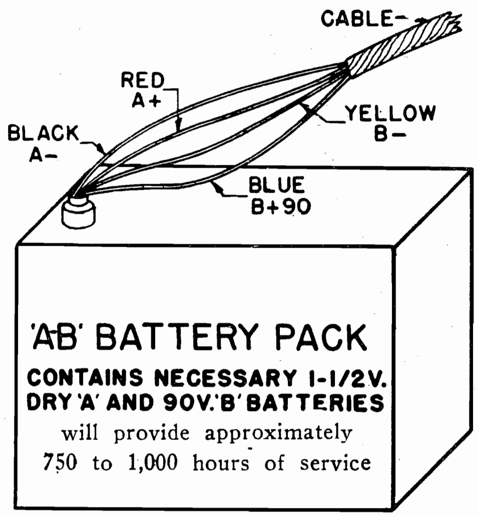


SENTINEL RADIO CORP.

MODEL 241



NOTE-1. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
2. SOME MODELS USE SEPARATE BATTERIES REQUIRING CABLE SHOWN DOTTED.
3. ALL BATTERY PLUGS SHOWN PINS DOWN.



SHOWING 4 PRONG PLUG ON END OF SET BATTERY CABLE INSERTED INTO RECEPTACLE ON TOP OF "AB" BATTERY PACK

PART NO.-241

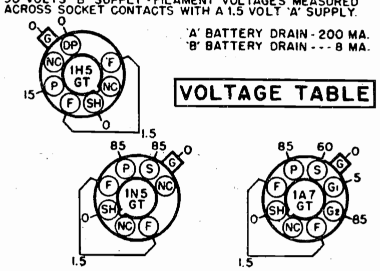
FRONT OF CHASSIS

SYM	DESCRIPTION
P	PLATE
F	FILAMENT
G	CONTROL GRID
S	SCREEN GRID
G_1	OSC. GRID
G_2	OSC. PLATE
DP	DIODE PLATE
SH	SHELL
NC	NO CONNECTION

NOTE:-ALL MEASUREMENTS MADE FROM SOCKET CONTACTS TO GROUND WITH A 1000 OHM PER VOLT VOLTMETER AND 90 VOLTS 'B' SUPPLY - FILAMENT VOLTAGES MEASURED ACROSS SOCKET CONTACTS WITH A 1.5 VOLT 'A' SUPPLY.

'A' BATTERY DRAIN - 200 MA.
'B' BATTERY DRAIN - - - 8 MA.

VOLTAGE TABLE



BOTTOM VIEW OF CHASSIS

AERIAL

ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT THE REAR OF CHASSIS.

GROUND

Connect the black lead coming out the rear of chassis to a wire attached to a metal stake driven two to four feet in moist ground, or to a cold water pipe.

MODEL 240
MODEL 241
MODEL 242

SENTINEL RADIO CORP.

ALIGNMENT PROCEDURE MODELS 240, 241, 242

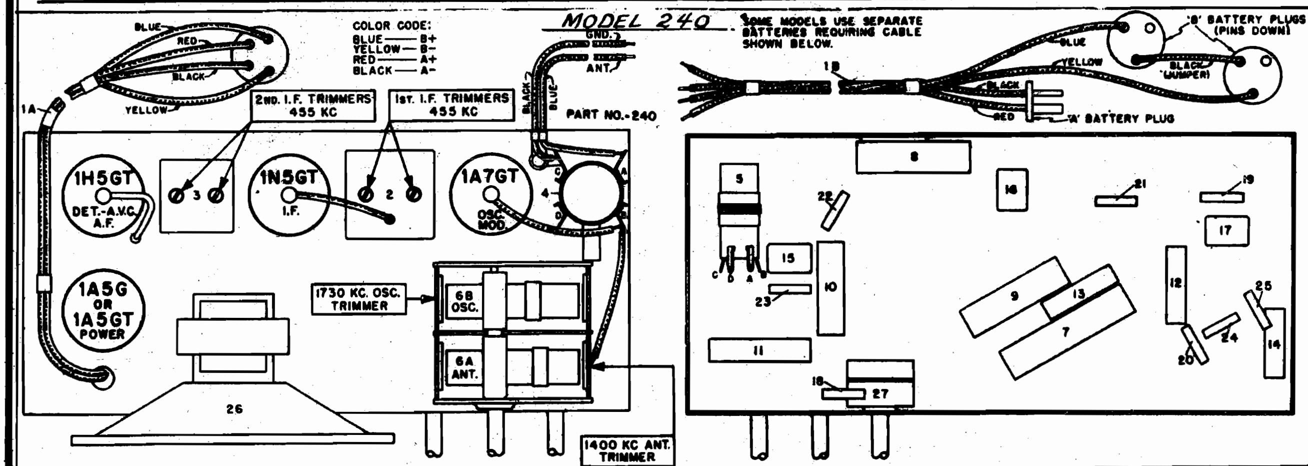
Before starting alignment:

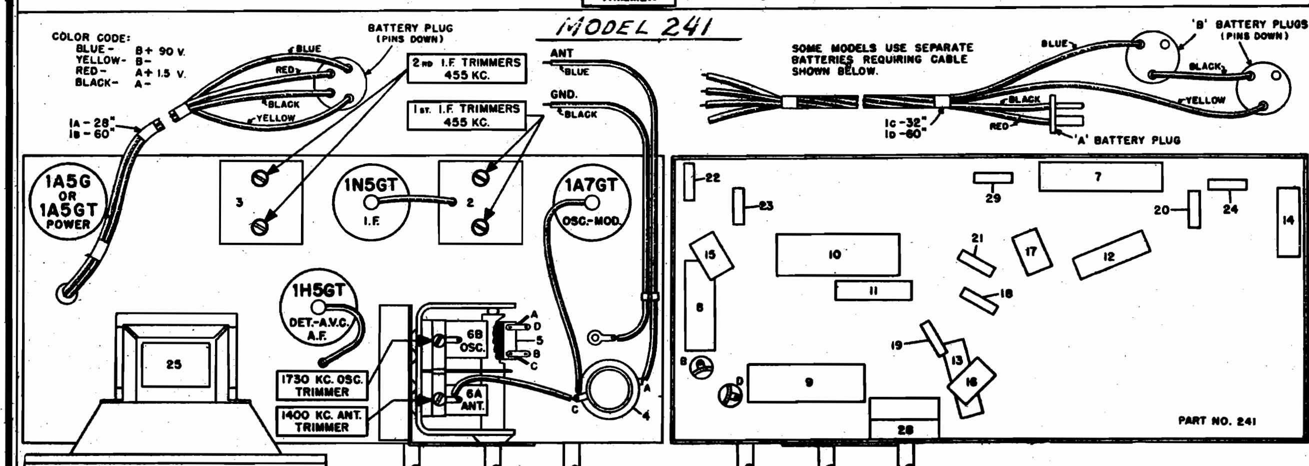
Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point to last line move to correct position.

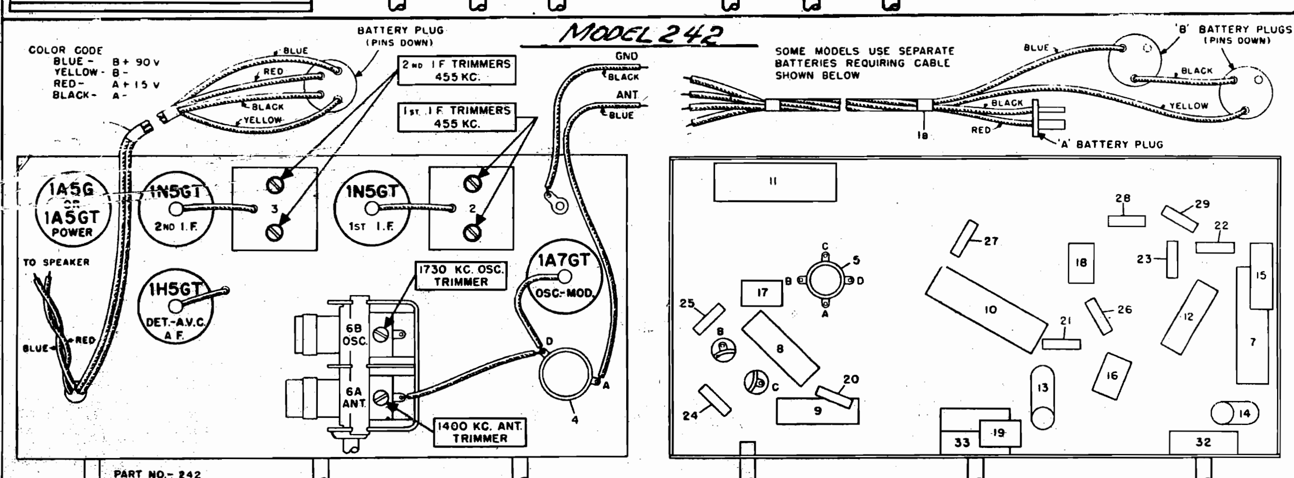
Use an accurately calibrated test oscillator with some type of output measuring device.

Have ground lead of test oscillator attached to chassis.

TEST OSCILLATOR			
Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
455 K. C.	.02 MFD. condenser	High side to grid terminal of 1A7G 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. trimmers for maximum output.
Exactly 1730 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	Adjust 1730 K. C. oscillator trimmer for maximum output.
Exactly 1400 K. C.	.00025 MFD. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

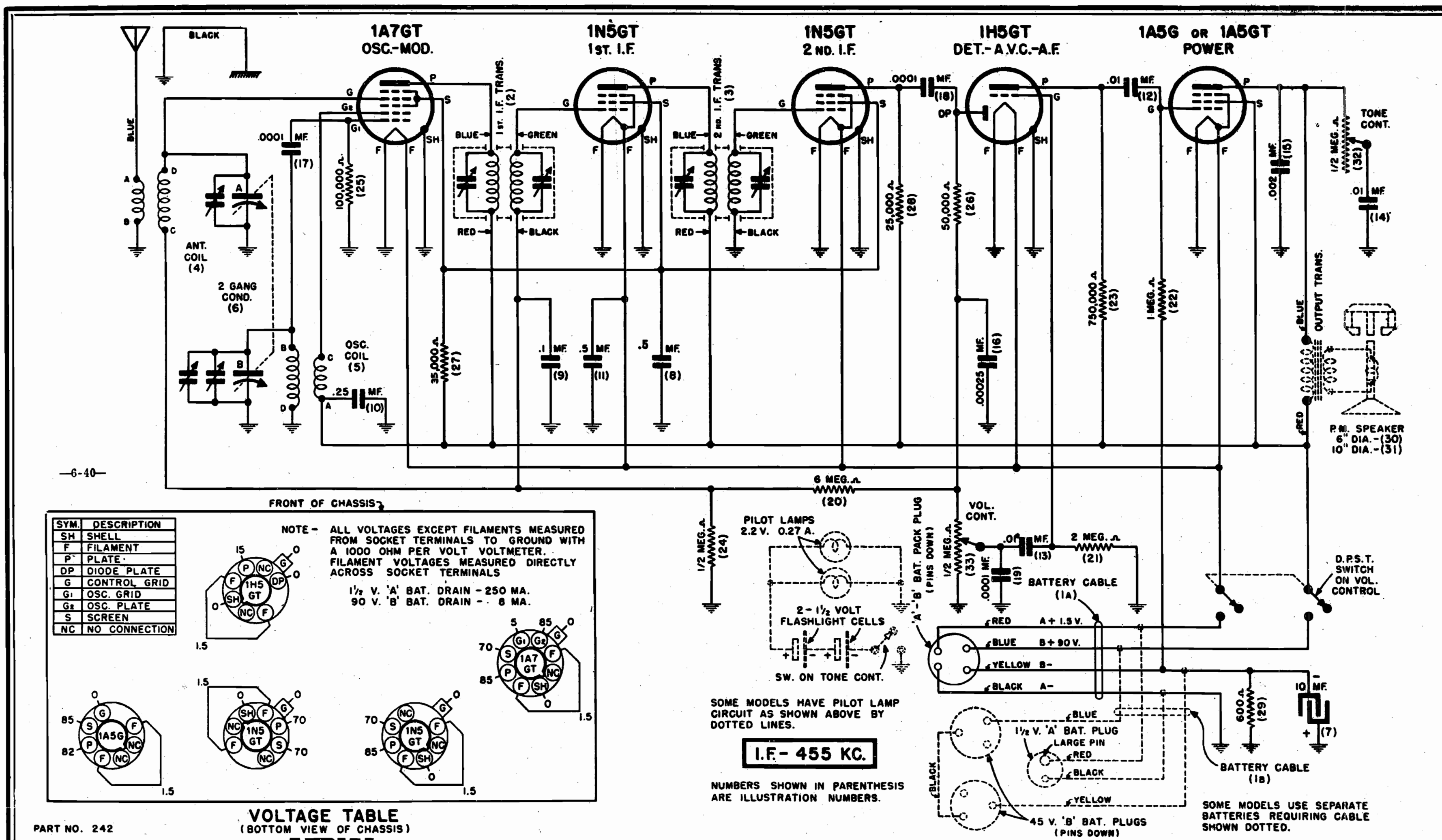






SENTINEL RADIO CORP.

MODEL 242



SYM.	DESCRIPTION
SH	SHELL
F	FILAMENT
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
G1	OSC. GRID
G2	OSC. PLATE
S	SCREEN
NC	NO CONNECTION

PART NO. 242

VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

AERIAL

ATTACH A 25-50 ft. OUTDOOR AERIAL TO THE BLUE LEAD COMING OUT THE REAR OF CHASSIS.

GROUND

Connect the black lead coming out the rear of chassis to a wire attached to a metal stake driven two to four feet in moist ground, or to a cold water pipe.

DIAL LIGHT

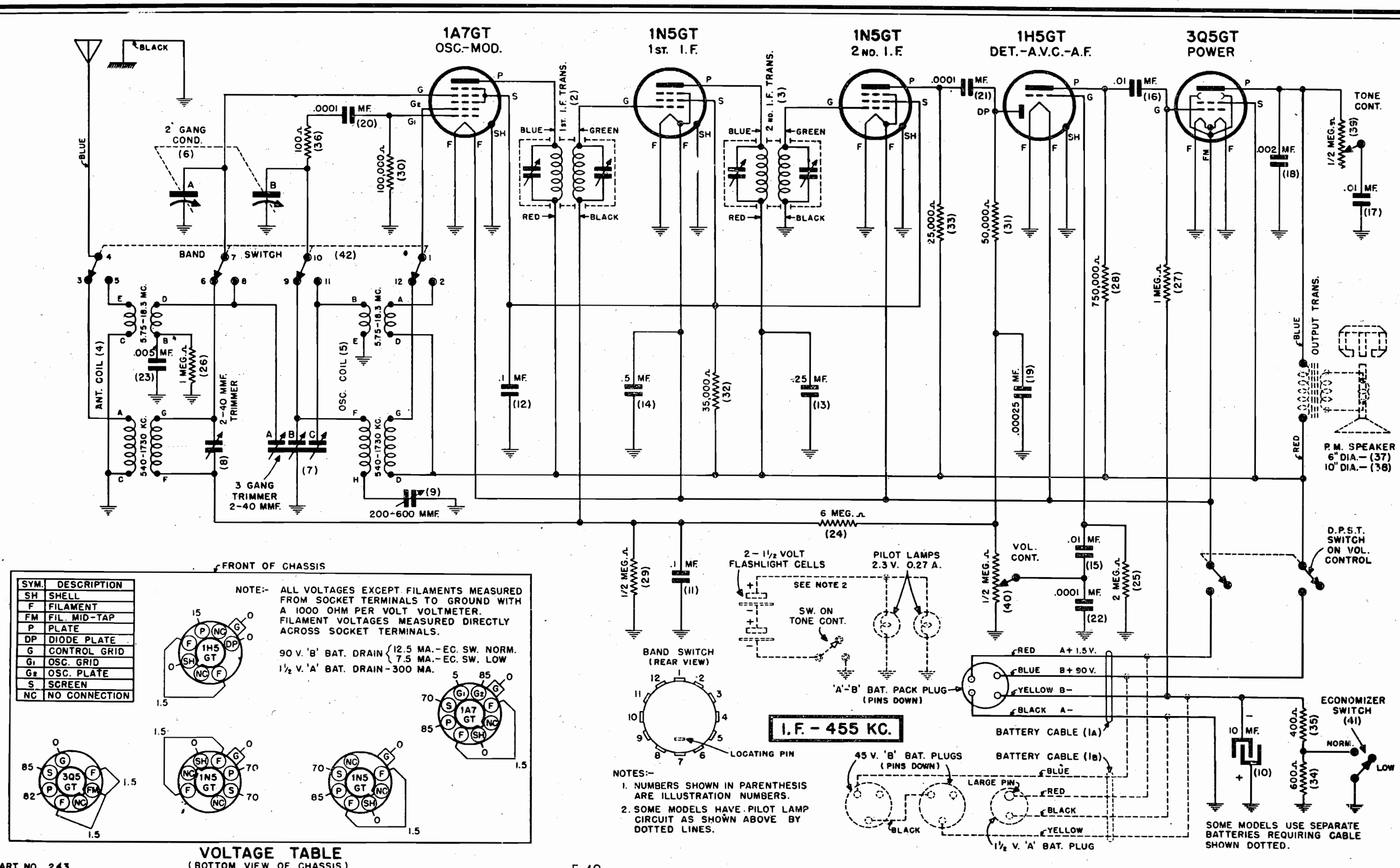
Some of this series of receivers have a pilot light which illuminates the dial when the tone control knob is pushed inward. A two cell 2.3 volt flash light bulb, type 710, is used, operated by TWO 1½ VOLT FLASH LIGHT BATTERIES which MUST BE PLACED IN THE METAL HOLDER THAT WILL BE FOUND INSIDE THE CABINET.

When manual tuning receiver—illuminate the dial by pushing inward on the tone control knob with the left hand and rotate the tuning knob with the right hand. After selected station has been correctly tuned in release knob and dial light will go out.

As the life of the 1½ volt flash light batteries would be shortened if the dial light were to remain lit at all times, the dial light is lit only when the tone control knob is pushed inward.

MODEL 243

SENTINEL RADIO CORP.



PART NO. 243

BATTERY LIFE

The life of the battery depends entirely on the average position of the "BATTERY ECONOMIZER" switch, the number of hours the set is operated daily and the quality and size of the battery.

The special "AB" Battery Pack, designed specifically for use with this radio, will provide approximately 600 to 800 hours of service under normal average operating conditions.

DIAL LIGHT

Some of this series of receivers have a pilot light which illuminates the dial when the tone control knob is pushed inward. A two cell 2.3 volt flash light bulb, type 710, is used, operated by TWO 1½ VOLT FLASHLIGHT BATTERIES which MUST BE PLACED IN THE METAL HOLDER FOUND INSIDE THE CABINET

When tuning receiver—illuminate the dial by pushing inward on the tone control knob with the left hand and rotate the tuning knob with the right hand. After selected station has been correctly tuned in release knob and dial light will go out.

SENTINEL RADIO CORP.

MODEL 243

-1-41-

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.

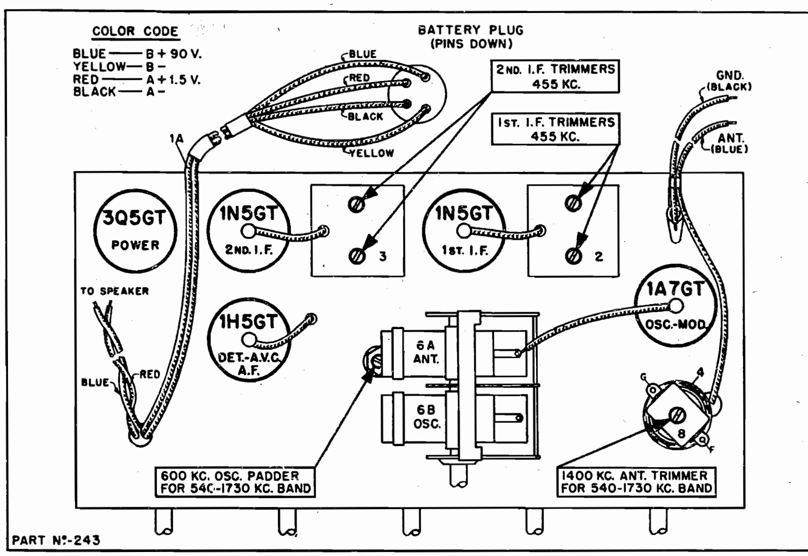
Before starting alignment:

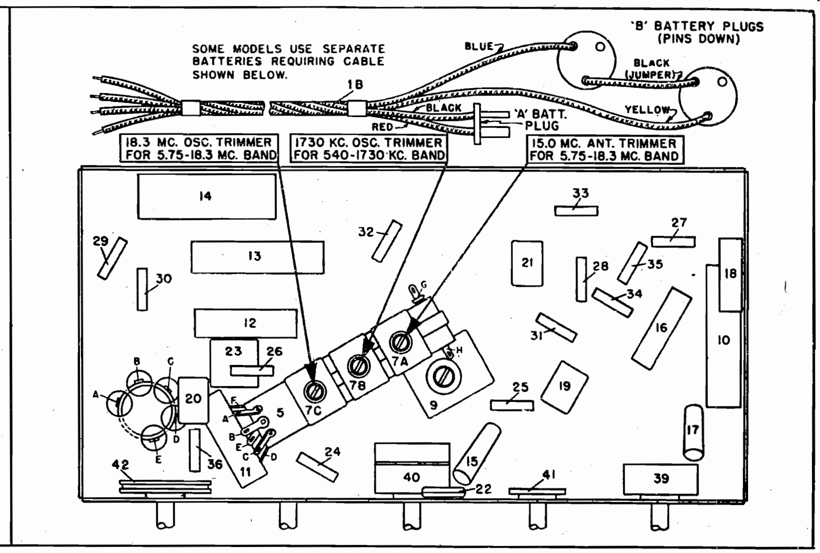
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to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

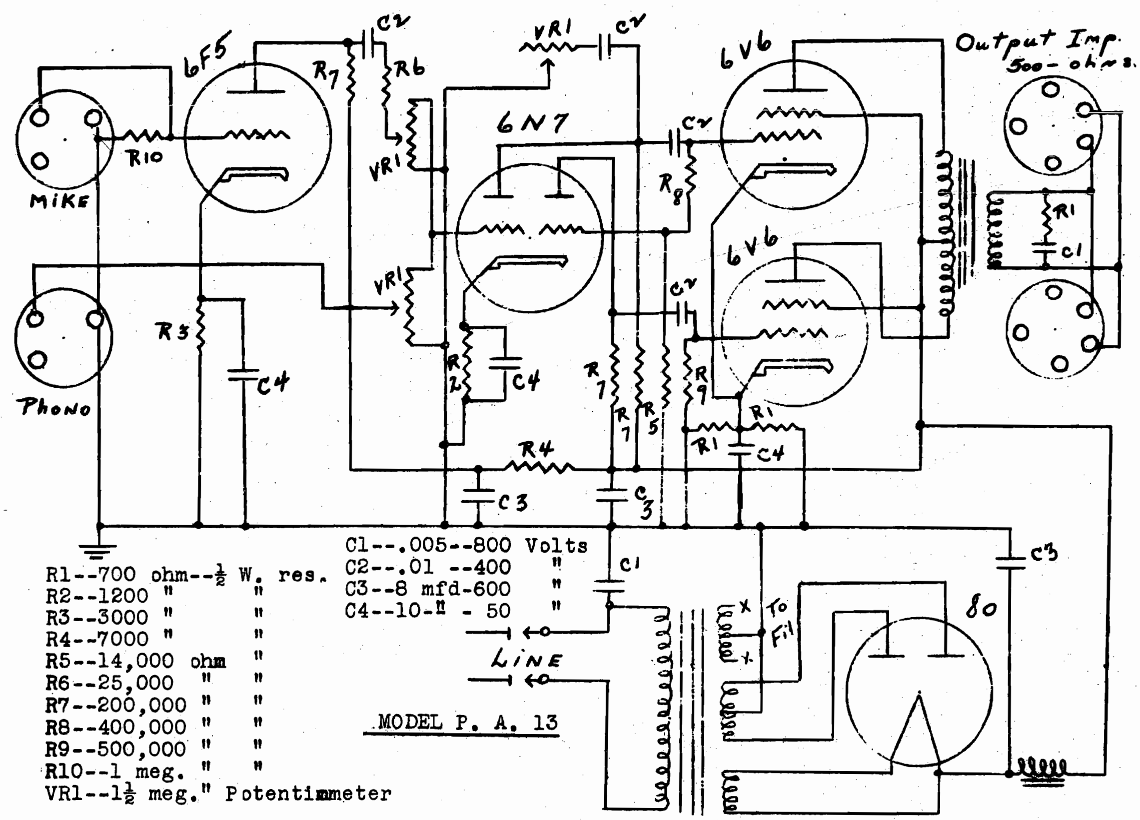
Place band switch for operation on:		Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	TEST OSCILLATOR: Use dummy antenna in series with output of test oscillator consisting of:	TEST OSCILLATOR: Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
I. F. alignment use any band position.	I.F.	Any point where no interfering signal is received	455 K.C.	.02 MFD. condenser	High side to grid terminal of 1A7G 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. trimmers for maximum output.
1730 to 540 K.C. Band	1	Exactly 1730 K.C.	Exactly 1730 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2	Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 MFD. condenser	High side to Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output.
	3	Approx. 600 K.C.	Approx. 600 K.C	None	High side to Receiver blue antenna lead	While rocking gang condenser adjust 600 K.C. oscillator padder for maximum output.
5.75 to 18.3 M.C. Band	1	Exactly 18.3 M.C.	Exactly 18.3 M.C.	400 Ohm carbon resistor	High side to Blue Ant. Lead	Adjust 18.3 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. 15 M.C.	Approx. 15 M.C.	400 Ohm	High side to Blue Ant. Lead	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.





SETCHELL CARLSON, INC.

MODEL PA-13
MODEL PA-25

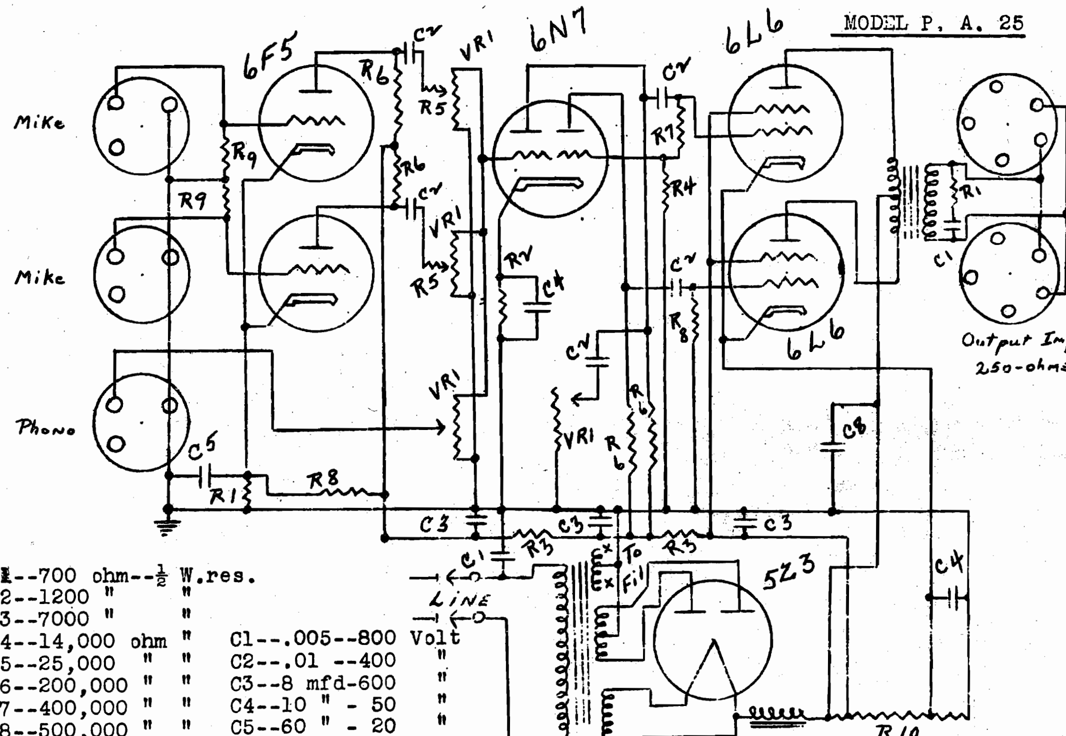


R1--700 ohm--½ W. res.
R2--1200 " "
R3--3000 " "
R4--7000 " "
R5--14,000 ohm "
R6--25,000 " "
R7--200,000 " "
R8--400,000 " "
R9--500,000 " "
R10--1 meg. " "
VR1--1½ meg." Potentimmeter

C1--.005--800 Volts
C2--.01 --400 "
C3--8 mfd-600 "
C4--10-" - 50 "

MODEL P. A. 13

MODEL P. A. 25

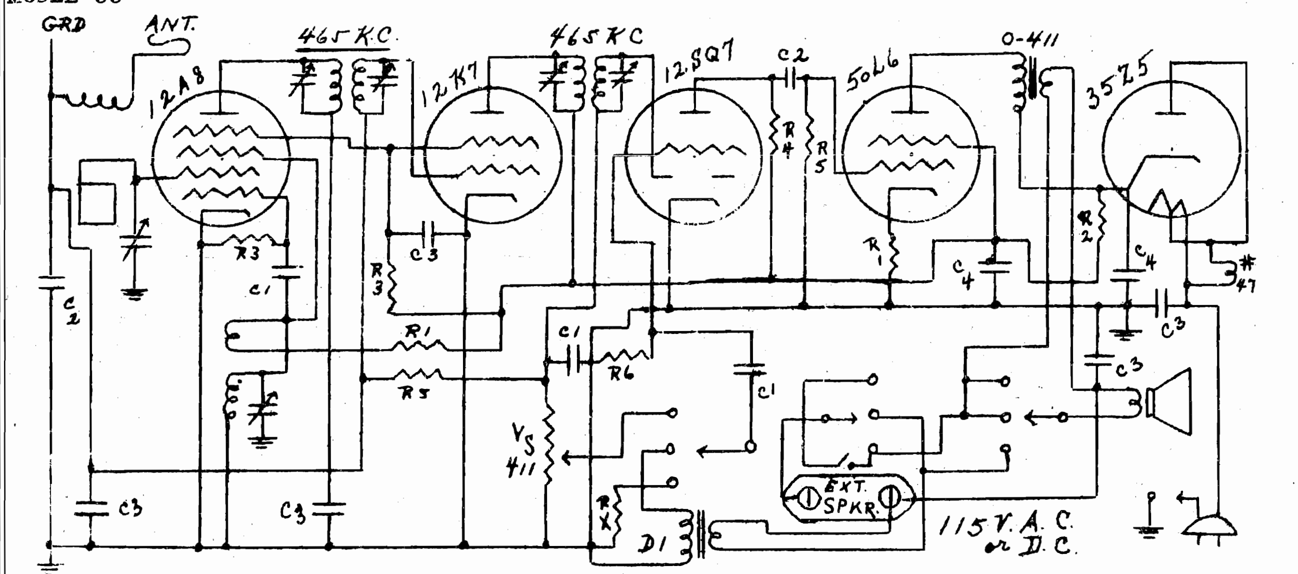


R1--700 ohm--½ W.res.
R2--1200 " "
R3--7000 " "
R4--14,000 ohm "
R5--25,000 " "
R6--200,000 " "
R7--400,000 " "
R8--500,000 " "
R9--1 meg. " "
R10--6635 Ohm tapped 100 W.
VR1--1½ meg." Potentiometer

C1--.005--800 Volt
C2--.01 --400 "
C3--8 mfd-600 "
C4--10 " - 50 "
C5--60 " - 20 "
C8--25 " -600 "

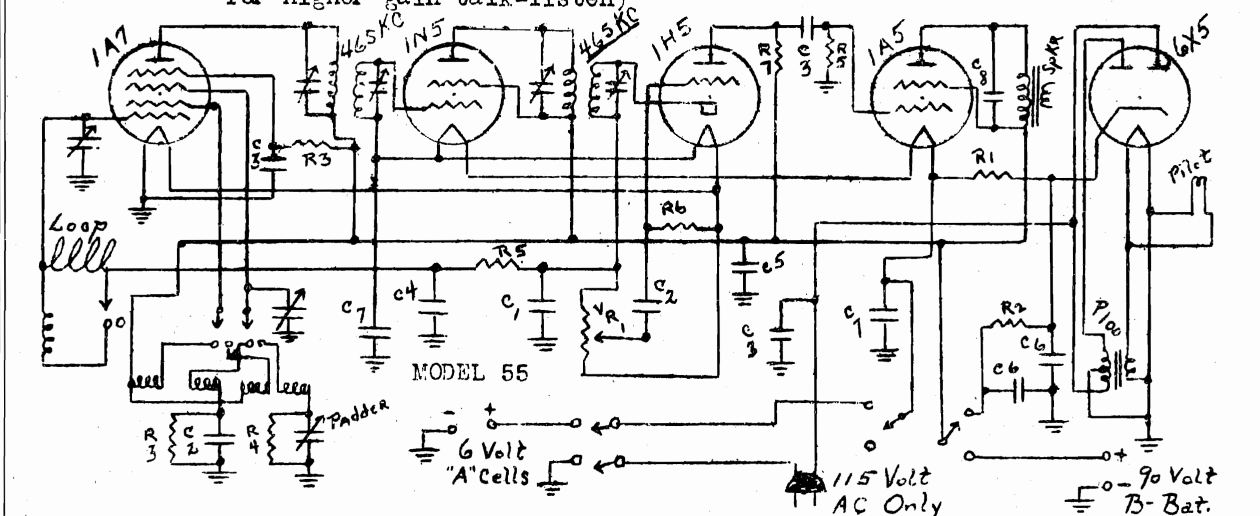
MODEL 411
RADIO-DOR-PHONE
MODEL 55

SETCHELL CARLSON, INC.

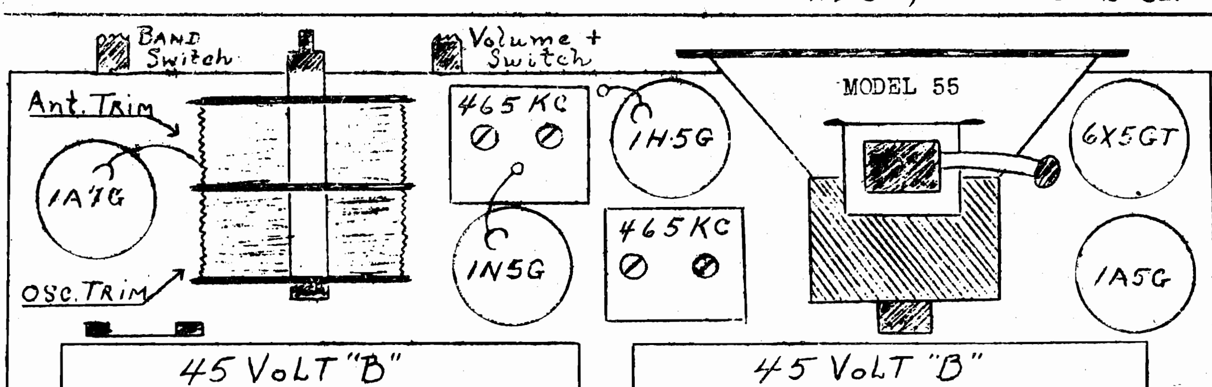


MODEL 411 RADIO-DOR-PHONE

R1 - 200 ohms	R5 - 500,000 ohms	C1 - .0005 mf	VS411 - 0.5 meg. Vol. Cont. with switch
R2 - 1200 "	R6 - 15 megohms	C2 - .01 "	
R3 - 50,000 "	RX - 100,000 ohms (Raise or omit for higher gain talk-listen)	C3 - .05 "	
R4 - 200,000"		C4 - 50-20 150V.	



MODEL 55

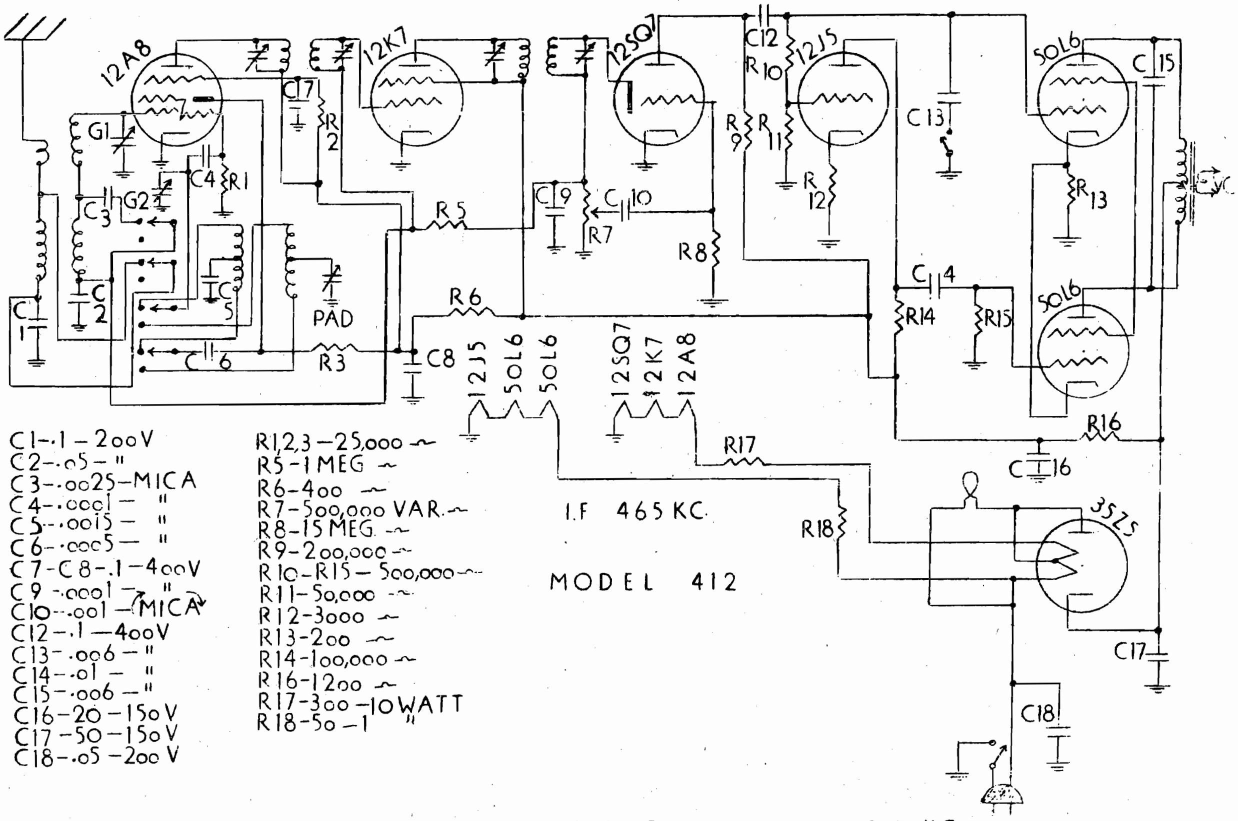


MODEL 55 PORTABLE

R1 - 2500 ohms	R5 - 1 megohm	C1 - .0001 mf	C5 - .25 mf
R2 - 3000 "	R6 - 15 "	C2 - .002 "	C6 - 20 "
R3 - 50,000 "	R7 - 200,000	C3 - .01 "	C7 - 75 "
R4 - 100,000"	VR1- 500,000	C4 - .1 "	C8 - .001 "

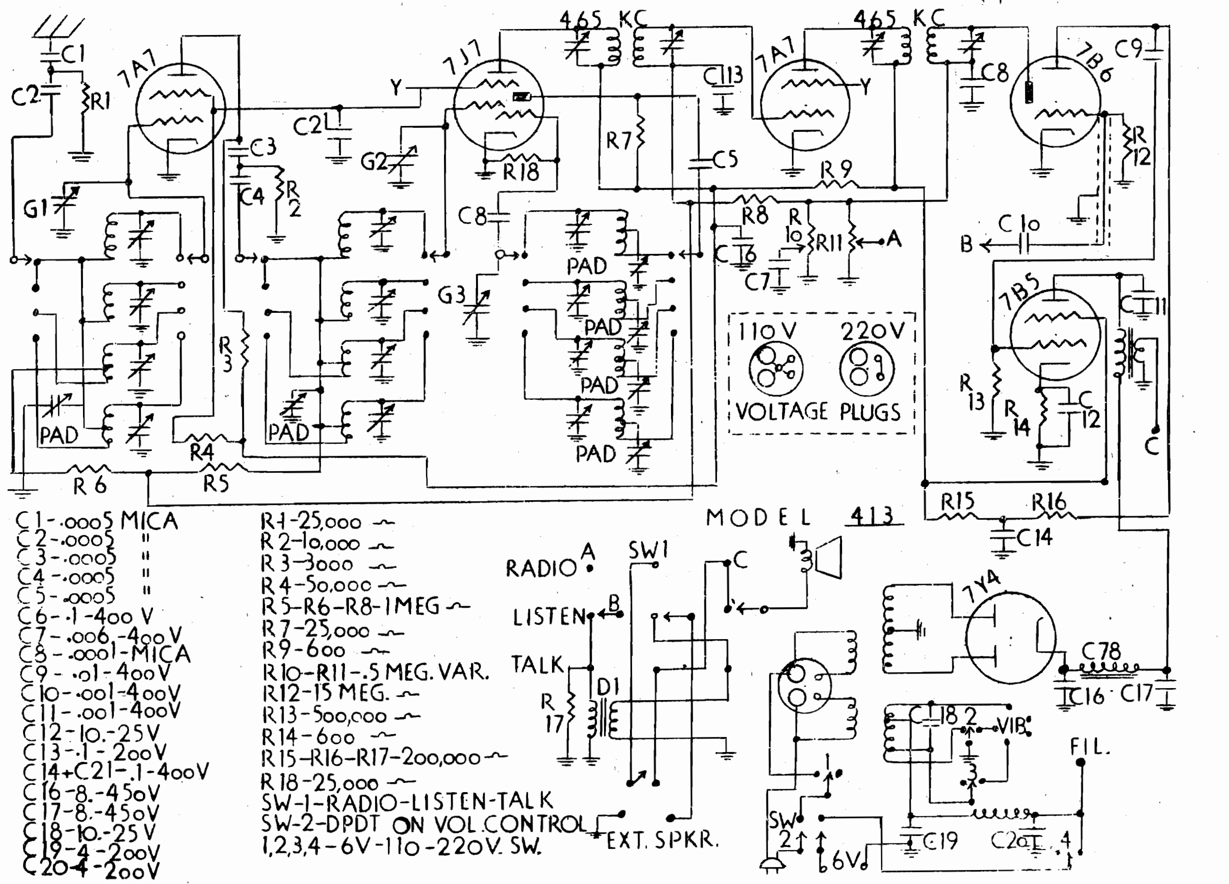
SETCHELL CARLSON, INC.

MODEL 412
MODEL 413



C1-.1-200V
C2-.05-"
C3-.0025-MICA
C4-.0001- "
C5-.0015- "
C6-.0005- "
C7-C8-.1-400V
C9-.0001- "
C10-.001-MICA
C12-.1-400V
C13-.006-"
C14-.01-"
C15-.006-"
C16-20-150V
C17-50-150V
C18-.05-200V

R1,2,3-25,000 ~
R5-1 MEG ~
R6-400 ~
R7-500,000 VAR. ~
R8-15 MEG. ~
R9-200,000 ~
R10-R15-500,000 ~
R11-50,000 ~
R12-3000 ~
R13-200 ~
R14-100,000 ~
R16-1200 ~
R17-300-10 WATT
R18-50-1 "

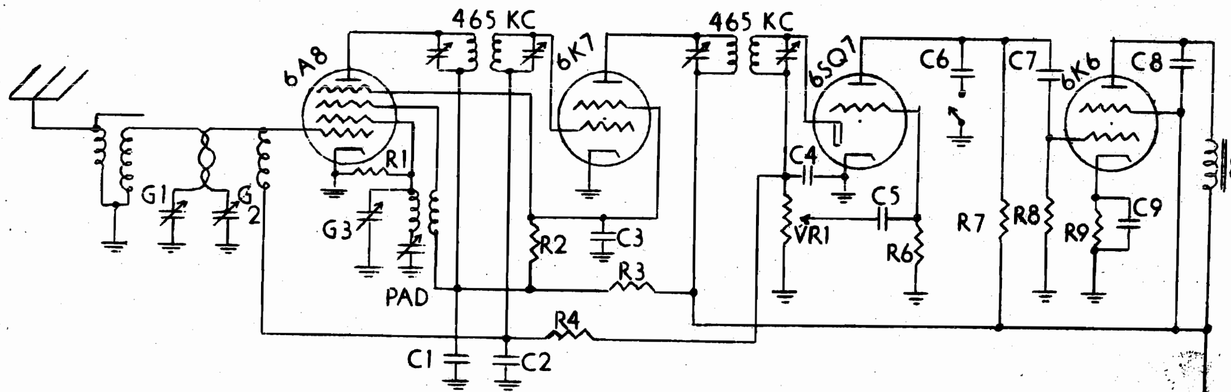


C1-.0005 MICA
C2-.0005 "
C3-.0005 "
C4-.0005 "
C5-.0005 "
C6-.1-400 V
C7-.006-400V
C8-.0001-MICA
C9-.01-400V
C10-.001-400V
C11-.001-400V
C12-10-25V
C13-.1-200V
C14+C21-.1-400V
C16-8.-450V
C17-8.-450V
C18-10.-25V
C19-4-200V
C20-4-200V

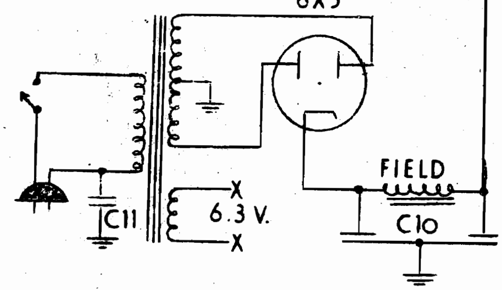
R1-25,000 ~
R2-10,000 ~
R3-3000 ~
R4-50,000 ~
R5-R6-R8-1MEG ~
R7-25,000 ~
R9-600 ~
R10-R11-.5 MEG. VAR.
R12-15 MEG. ~
R13-500,000 ~
R14-600 ~
R15-R16-R17-200,000 ~
R18-25,000 ~
SW-1-RADIO-LISTEN-TALK
SW-2-DPDT ON VOL.CONTROL
1,2,3,4-6V-110-220V. SW.

MODEL 589
MODEL 4160

SETCHELL CARLSON, INC.

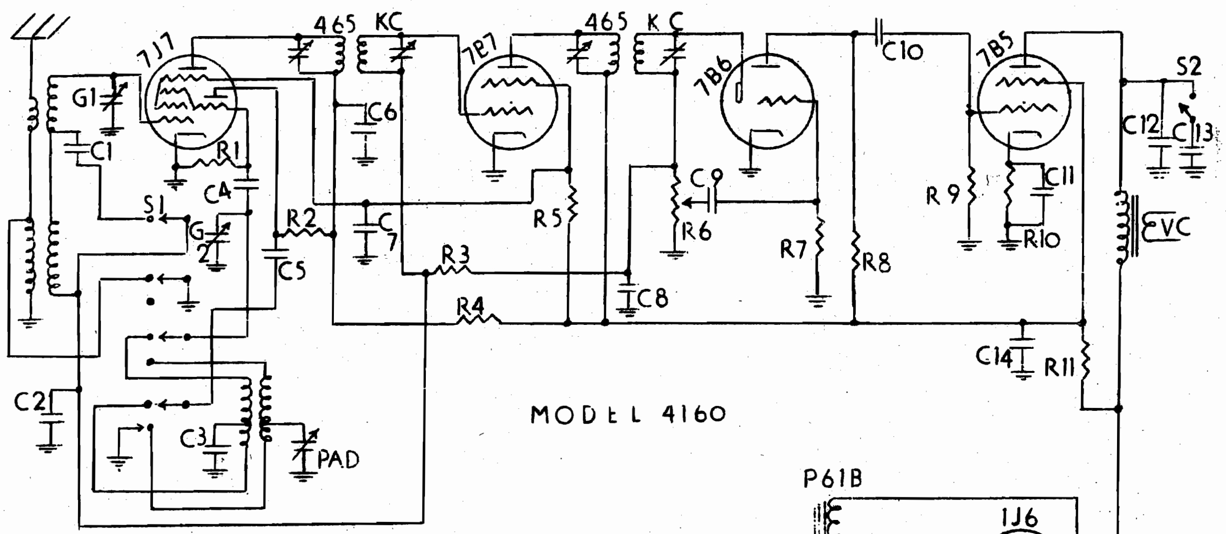


MODEL 589

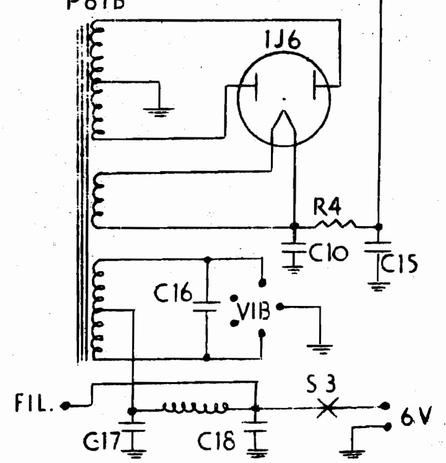


C1 – .1 – 400 V
C2 – .1 – 200 V
C3 – .1 – 400 V
C4 – .00025 – 800 V
C5 – .001 – 800 V
C6 – .006 – 800 V
C7 – .01 – 800 V
C8 – .001 – 800 V
C9 – 10. – 25 V
C10 – 8-8-450 V
C11 – .05 – 400 V

R1 – 50,000 Ω
R2 – 50,000 Ω
R3 – 3000 Ω
R4 – 1 MEG
VR1 – 500,000 Ω
R6 – 15 – MEG
R7 – 500,000 Ω
R8 – 500,000 Ω
R9 – 600 Ω



MODEL 4160

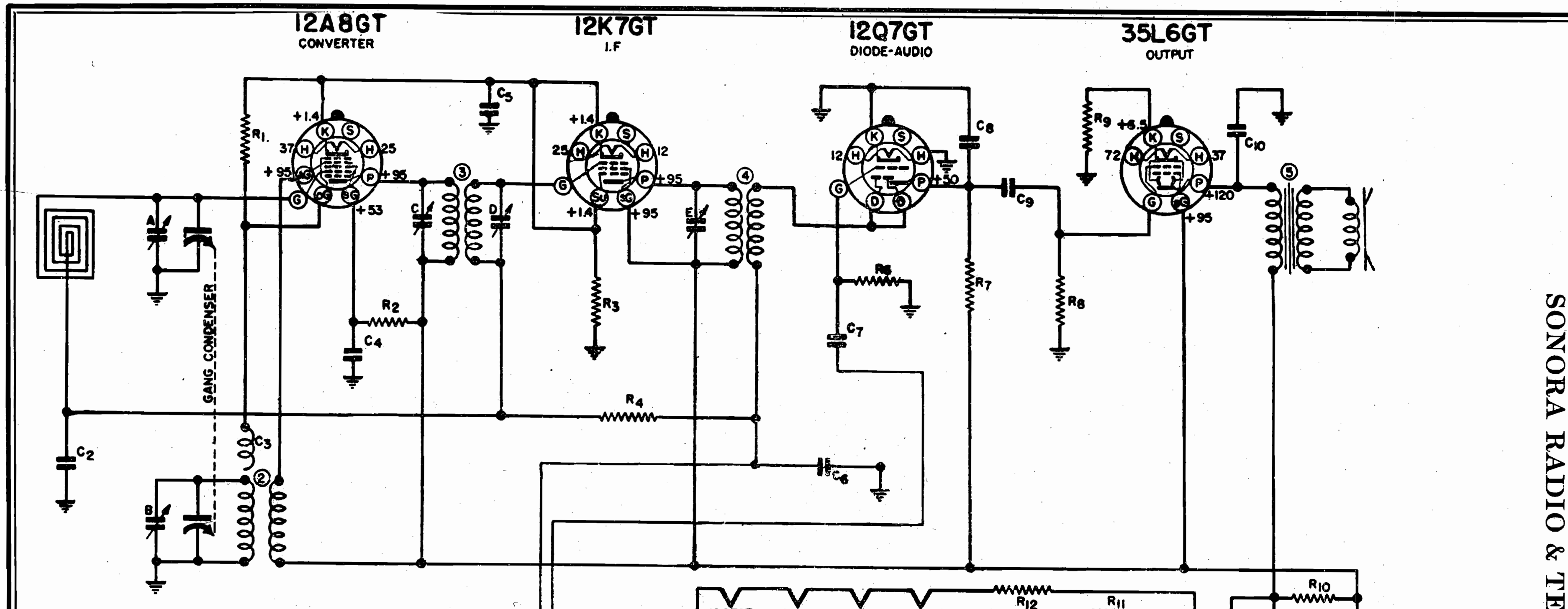


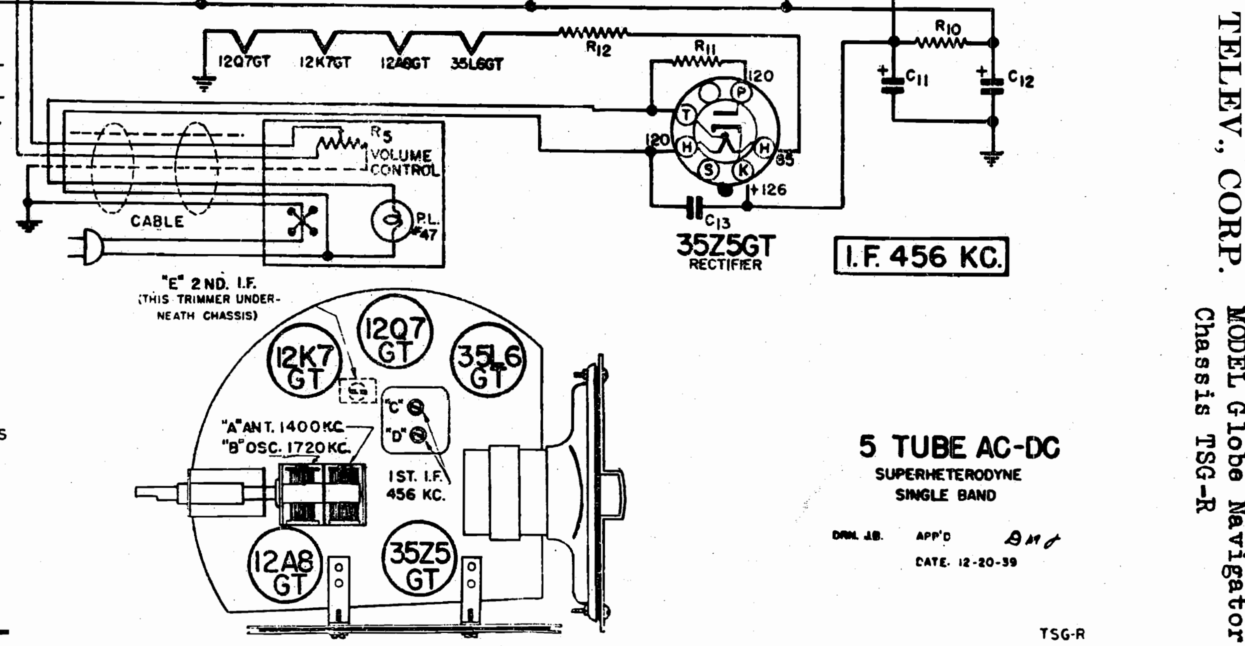
C1 - .0025 MICA
C2 - .05 - 200 V
C3 - .0015 MICA
C4 - .0001 "
C5 - .0005 "
C6 - .1 - 400 V
C7 - .1 - 400 V
C8 - .0001 MICA
C9 - .001 - 400 V
C10 - .01 - 400 V
C11 - 10. - 25 V
C12 - .001 - 400 V
C13 - .01 - 400 V
C14 - 20 - 150 V
C15 - 50 - 150 V
C16 - 10 - 25 V
C17 - .4 - 200 V
C18 - .4 - 200 V

R1 - 25,000
R2 - 25,000
R3 - 1 MEG
R4 - 150
R5 - 25,000
R6 - 500,000 VC
R7 - 15 MEG
R8 - 200,000
R9 - 500,000
R10 - 700
R11 - 1200
S1 - 4P2T WAVE SW.
S2 - SPST TONE SW.
S3 - POWER SW.

SONORA RADIO & TELEV., CORP.

MODEL Globe Navigator
Chassis TSG-R





I.F. 456 KC.

DIAG. NO.	PART NO.	DESCRIPTION		
R 1	N-1260	50,000 OHM	.5W.	20%
R 2	N-1627	20,000 OHM	.5W.	20%
R 3	N-1742	25 OHM	.5W.	20 %
R 4	N-1262	1 MEGOHM	.5W.	20%
R 5	N-2746	0.5 MEGOHM	VOL. CONT.	
R 6	N-1263	10 MEGOHM	.5W.	20%
R 7	N-1377	200,000 OHM	.5W.	20%
R 8	N-1264	500,000 OHM	.5W.	20%
R 9	N-1616	250 OHM	.5W.	10%
R 10	N-1617	2500 OHM	.5W.	20%
R 11	N-1614	50 OHM	.5W.	20%
R 12	N-1618	80 OHM	2W.	10%
C 2	N-1345	.05 MFD.	200V	
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL		
C 4	N-1345	.05 MFD.	200V.	
C 5	N-2725	.15 MFD.	200V	10%
C 6	N-1374	100 MMFD		

DIAG. NO.	PART NO.	DESCRIPTION	
C 7	N-1344	.01 MFD.	400V.
C 8	N-1447	.0005 MFD.	400V.
C 9	N-1344	.01 MFD.	400V.
C 10	N-1376	.02 MFD.	400V.
C 11	N-2763	35 MFD. 150V.	ELECTRO.
C 12		20 MFD. 150V	ELECTRO.
C 13	N-1346	.05 MFD.	400V.
1	N-2256	ANTENNA COIL LOOP	
2	N-1452	OSCILLATOR COIL	
3	N-2767	1ST. I.F. TRANSFORMER	
4	N-1596	2ND. I.F. TRANSFORMER	
5	N-2771	5" P.M. SPEAKER & TRANS	
E	N-1597	2ND. I.F. TRIMMING COND.	
	N-2750	GANG CONDENSER	

5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

DRN. J.B. APP'D BMf
DATE. 12-20-39

TSG-R

MODEL Globe Navigator
Chassis TSG-R
Chassis LD, LDU

SONORA RADIO & TELEV., CORP.

CHASSIS LD, LDU

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, 1720, 6000, 15000 and 18300 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 and Short Wave bands in the order given, should 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 (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the black lead of the electrolytic condenser. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. With the switch turned to the broadcast position, connect the antenna to the generator through a 200 MMF dummy and set the dial and generator at 1720 KC. Align the BC oscillator trimmer for maximum output. Set the generator at 1400 KC and tune-in signal with the dial. Adjust antenna trimmer for maximum output. Next set the generator at 600 KC and tune in the signal with the dial. Adjust the BC pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 1400 KC as the pad adjustment may have caused misalignment.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S. W. position, connect the generator to the antenna with a 400 ohm dummy. Adjust the S. W. oscillator to give a maximum output with the dial at 18300 KC (extreme end). Set the generator at 15000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18300 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

MODEL GLOBE NAVIGATOR
Chassis TSG-R

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 three I.F. trimmers to peak or maximum reading on the output meter.

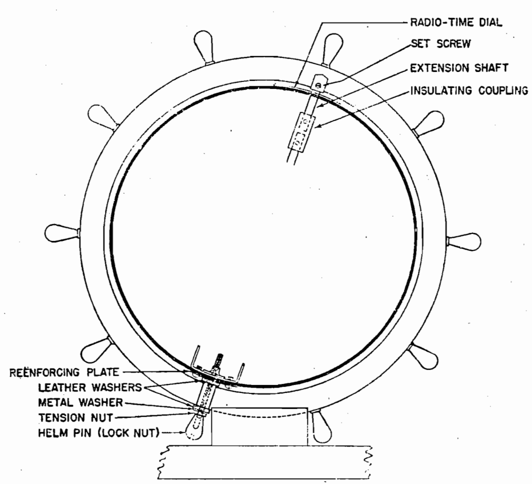
BROADCAST BAND ALIGNMENT. Remove chassis from the GLOBE and set it up on the bench. Care should be taken to have no iron or other metal near the loop. Do not make this set-up on a metal bench.

Make a loop consisting of 10 to 20 turns of wire approximately 3 to 4 inches in diameter and connect across the generator terminals. Place this loop parallel to the loop antenna and about six inches away from it.

Set the dial and generator at 1720 KC (gang at minimum capacity). Adjust the oscillator trimmer for maximum output. Set the generator at 1400 KC and tune in the signal. Adjust the antenna trimmer for maximum output. Check the sensitivity at 600 KC to determine if the gang or the coils have been damaged.

REMOVAL OF CHASSIS FOR SERVICING

To remove chassis for servicing and tube replacement, the following proceedure should be used:
(1) Slit the Equator band around the GLOBE with a sharp knife or razor blade. (The GLOBE consists of two halves joined at the horizontal center line or Equator.)



(2) Remove the helm pin, nut, washers and screw at the lower axial pivot on the meridian, the ring which encircles the GLOBE (South Pole.)
(3) Remove the set screw of the upper axial pivot on the meridian (North Pole.)
(4) Remove GLOBE from meridian ring mounting and separate upper half of GLOBE.
The lower half of the GLOBE can be detached from the chassis assembly by removing two screws at the bottom.

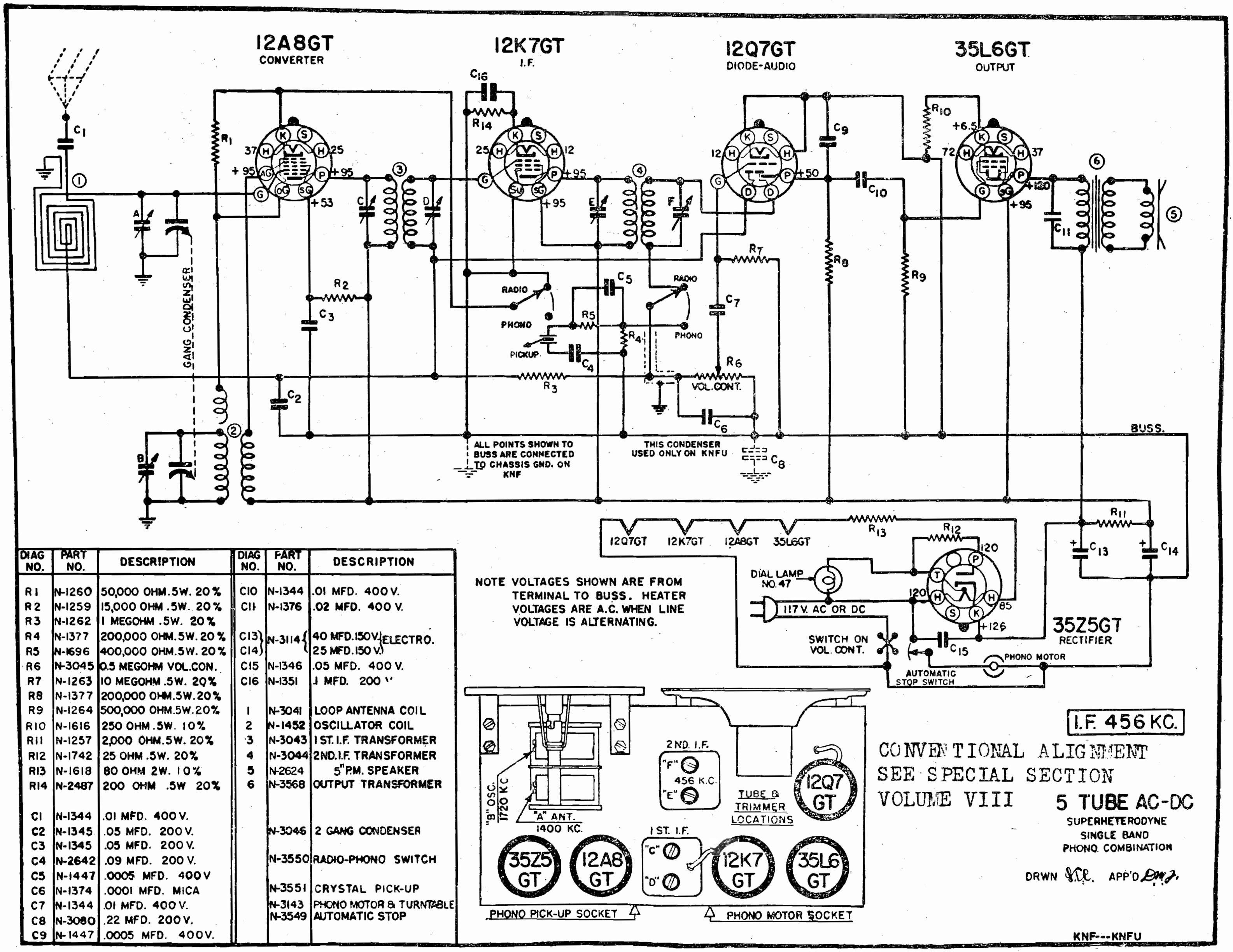
The chassis and GLOBE should be assembled by reversing the proceedure outlined above with the exception of the lower axial pivot fastening.

At this point the GLOBE tension should be adjusted. The hexagon nut serves this purpose and should be adjusted to a point whereby the GLOBE tension is sufficient to maintain an even balance of the GLOBE in any position and still permit the GLOBE to be rotated smoothly. When the adjustment is correct, screw on the helm pin tightly against the adjusting nut. This serves as a lock nut.

Two spare Equator bands are furnished attached to the inner side of the GLOBE. After the GLOBE is completely assembled, the Equator band tape should be cemented around the GLOBE where the upper and lower halves are joined.

SONORA RADIO & TELEV., CORP.

Chassis KNF, KNFU

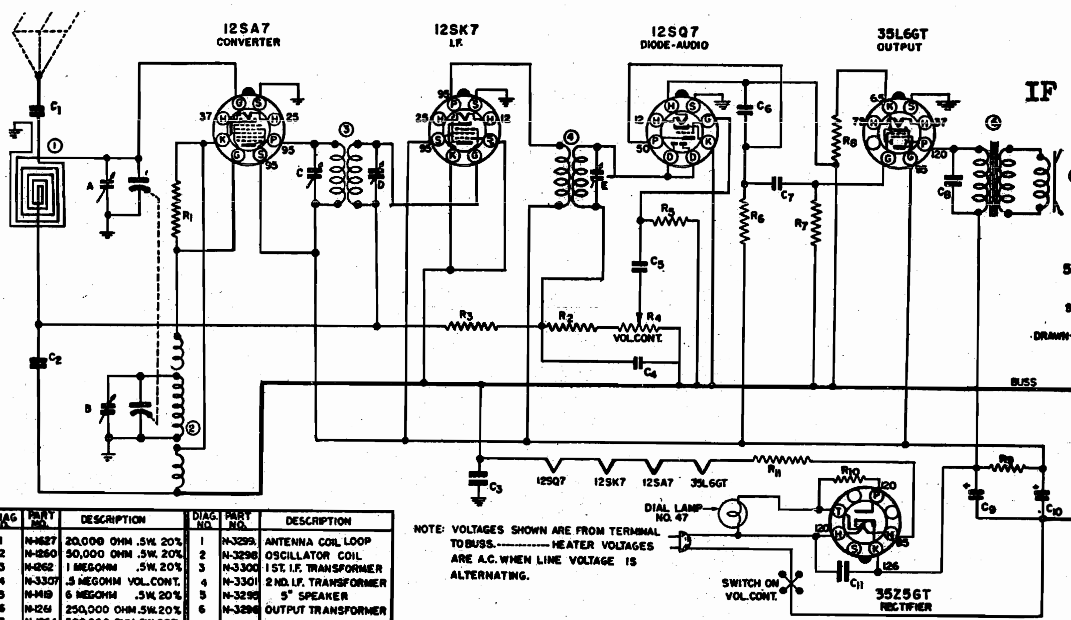


DIAG NO.	PART NO.	DESCRIPTION
R1	N-1260	50,000 OHM .5W. 20%
R2	N-1259	15,000 OHM .5W. 20%
R3	N-1262	1 MEGOHM .5W. 20%
R4	N-1377	200,000 OHM .5W. 20%
R5	N-1696	400,000 OHM .5W. 20%
R6	N-3045	0.5 MEGOHM VOL.CON.
R7	N-1263	10 MEGOHM .5W. 20%
R8	N-1377	200,000 OHM .5W. 20%
R9	N-1264	500,000 OHM .5W. 20%
R10	N-1616	250 OHM .5W. 10%
R11	N-1257	2,000 OHM .5W. 20%
R12	N-1742	25 OHM .5W. 20%
R13	N-1618	80 OHM 2W. 10%
R14	N-2487	200 OHM .5W 20%
C1	N-1344	.01 MFD. 400 V.
C2	N-1345	.05 MFD. 200 V.
C3	N-1345	.05 MFD. 200 V.
C4	N-2642	.09 MFD. 200 V.
C5	N-1447	.0005 MFD. 400 V
C6	N-1374	.0001 MFD. MICA
C7	N-1344	.01 MFD. 400 V.
C8	N-3080	.22 MFD. 200 V.
C9	N-1447	.0005 MFD. 400 V.

DIAG NO.	PART NO.	DESCRIPTION
C10	N-1344	.01 MFD. 400 V.
C11	N-1376	.02 MFD. 400 V.
C13, C14	N-3114	40 MFD. 150 V., 25 MFD. 150 V. ELECTRO.
C15	N-1346	.05 MFD. 400 V.
C16	N-1351	.1 MFD. 200 V.
1	N-3041	LOOP ANTENNA COIL
2	N-1452	OSCILLATOR COIL
3	N-3043	1 ST. I.F. TRANSFORMER
4	N-3044	2ND. I.F. TRANSFORMER
5	N-2624	5" P.M. SPEAKER
6	N-3568	OUTPUT TRANSFORMER
	N-3046	2 GANG CONDENSER
	N-3550	RADIO-PHONO SWITCH
	N-3551	CRYSTAL PICK-UP
	N-3143	PHONO MOTOR & TURNTABLE
	N-3549	AUTOMATIC STOP

Chassis KTU
Chassis KF, KFU

SONORA RADIO & TELEV., CORP.



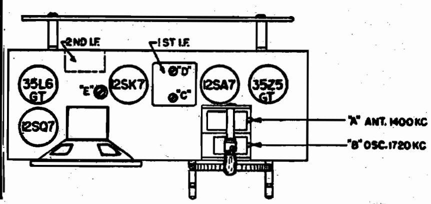
IF PEAK 456 KC

Chassis KTU

5 TUBE AC-DC

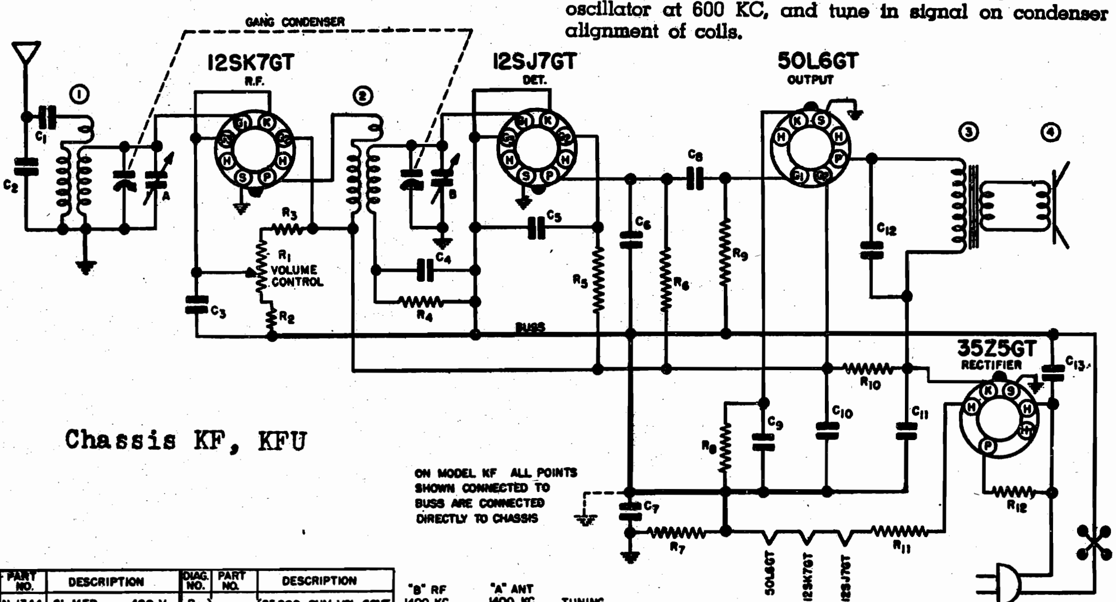
SUPERHETERODYNE
SINGLE BAND
DRAWN-W.E. APPROVED
JULY 3, 1940.

DIAG NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1627	20,000 OHM .5W. 20%	1	N-3299	ANTENNA COIL LOOP
R2	N-1260	50,000 OHM .5W. 20%	2	N-3298	OSCILLATOR COIL
R3	N-1262	1 MEGOHM .5W. 20%	3	N-3300	1 ST. I.F. TRANSFORMER
R4	N-3307	.5 MEGOHM VOL.CONT.	4	N-3301	2 ND. I.F. TRANSFORMER
R5	N-1419	6 MEGOHM .5W. 20%	5	N-3295	5" SPEAKER
R6	N-1261	250,000 OHM .5W. 20%	6	N-3296	OUTPUT TRANSFORMER
R7	N-1264	500,000 OHM .5W. 20%			
R8	N-1616	250 OHM .5W. 10%			
R9	N-3341	1,000 OHM .5W. 20%			
R10	N-1742	25 OHM .5W. 20%			
R11	N-1618	80 OHM .5W. 10%		N-3297	2 GANG CONDENSER
C1	N-1344	.01 MFD. 400V.			
C2	N-1345	.05 MFD. 200V.			
C3	N-3080	22 MFD. 200V.			
C4	N-1374	100 MMFD.			
C5	N-2712	.004 MFD. 400V.			
C6	N-1447	.0005 MFD. 400V.			
C7	N-1344	.01 MFD. 400V.			
C8	N-1376	.02 MFD. 400V.			
C9	N-3302	35 MFD. 150V. ELECT.			
C10		30 MFD. 150V. ELECT.			
C11	N-1346	.05 MFD. 400V.			



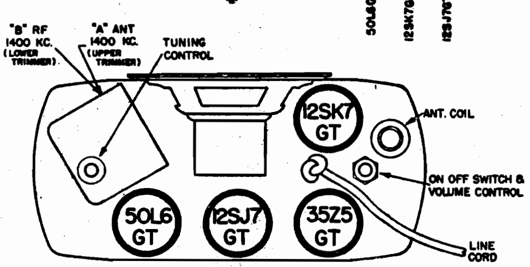
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (12SA7) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. 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 K.C. 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.



Chassis KF, KFU

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400. V.	R_1	N-3728	25,000 OHM VOL. CONT.
C_2	——	20. MMFD. BUILT IN	R_2		110 OHM 20% .5 W. IN VOLUME CONTROL
C_3	N-1345	.05 MFD. 200. V.			
C_4	N-1345	.05 MFD. 200. V.	R_3	N-1684	75,000 OHM 20% .5W.
C_5	N-1344	.01 MFD. 400. V.	R_4	N-1418	3.5 MEG. 20% .5 W.
C_6	N-1374	100. MMFD MICA	R_5	N-1835	6. MEG. 20% .5 W.
C_7	N-2642	.09 MFD. 200V. 20% USED ON MODEL KFU ONLY	R_6	N-1262	1. MEG. 20% .5W.
			R_7	N-1378	2. MEG. 20% .5W. USED ON MODEL KFU ONLY
C_8	N-1344	.01 MFD. 400. V.			
C_9	N-3734	20 MFD. 25V. ELECTROLYTIC	R_8	N-1787	250. OHM 10% .5 W.
C_{10}		15 MFD. 150 V. ELECTROLYTIC	R_9	N-1264	.5 MEG. 20% .5 W.
C_{11}		40 MFD. 150 V. ELECTROLYTIC	R_{10}	N-1417	3000. OHM 20% .5 W.
C_{12}	N-1344	.01 MFD. 400. V.	R_{11}	N-1618	80. OHM 10% 2. W.
C_{13}	N-1346	.05 MFD. 400 V.	R_{12}	N-1742	25. OHM 20% .5 W
			1	N-3722	ANTENNA COIL
	N-3731	GANG CONDENSER	2	N-3733	R.F. COIL
			3	N-3729	OUTPUT TRANS.
			4	N-3730	SPEAKER



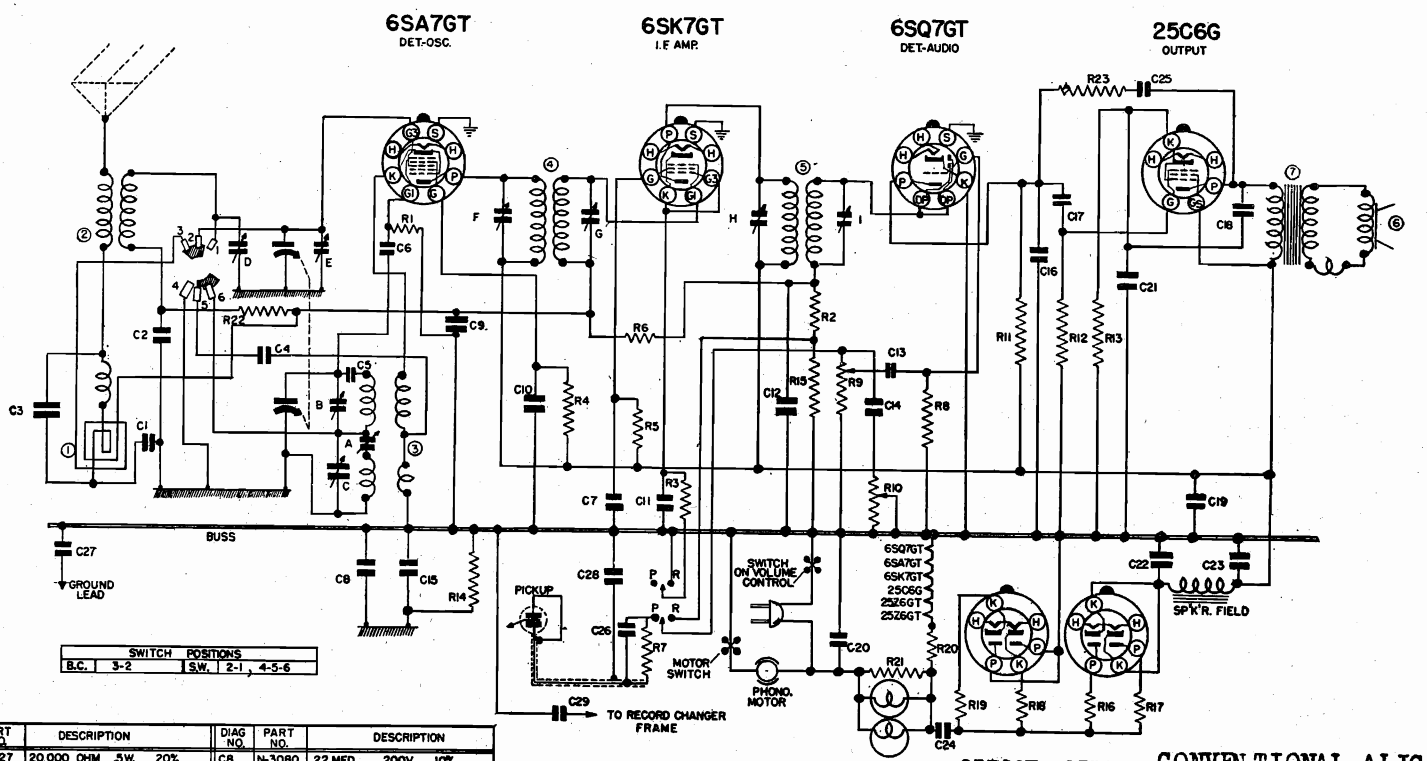
4 TUBE T.R.F.

DRWN. R.K. APP.
9-10-40

KF-KFU

SONORA RADIO & TELEV., CORP.

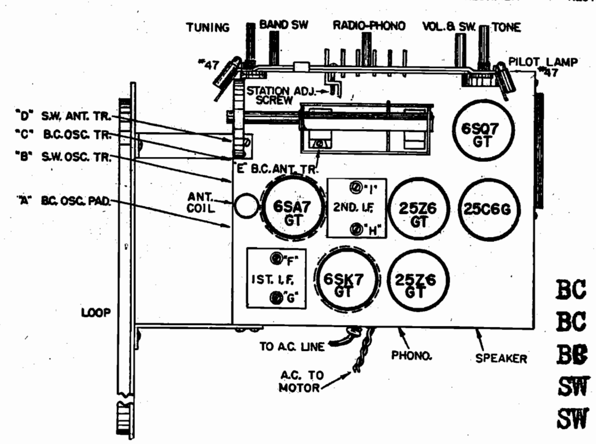
Chassis KXF, KXFU



SWITCH POSITIONS			
B.C.	3-2	S.W.	2-1, 4-5-6

DIAG NO.	PART NO.	DESCRIPTION
R1	N-1627	20,000 OHM .5W. 20%
R2	N-1260	50,000 OHM .5W. 20%
R3	N-3663	150. OHM .5W. 10%
R4	N-1683	7,500 OHM .5W. 20%
R5	N-1474	25,000 OHM .5W. 20%
R6	N-1262	1 MEGOHM .5W. 20%
R7	N-1264	.5 MEGOHM .5W. 20%
R8	N-1419	6 MEGOHM .5W. 20%
R9	N-2982	.5 MEGOHM VOL. CONTROL.
R10	N-3369	1 MEGOHM TONE CONTROL
R11	N-1261	250,000 OHM .5W. 20%
R12	N-1264	.5 MEGOHM .5W. 20%
R13	N-2453	235 OHM 1W. 10%
R14	N-1377	200,000 .5W. 20%
R15	N-1682	3 MEGOHM .5W. 20%
R16	N-2450	75 OHM 1W. 20%
R17	N-2450	75 OHM 1W. 20%
R18	N-2450	75 OHM 1W. 20%
R19	N-2450	75 OHM 1W. 20%
R20 } R21 }	N-3648	{62 OHM 6W. {17 OHM 4W.
R22	N-1262	1 MEGOHM .5W. 20%
R23	N-3450	1.5 MEGOHM .5W. 20%
C1	N-1344	.01 MFD. 400V.
C2	N-1344	.01 MFD. 400V.
C3	N-1343	250 MMFD.
C4	N-1344	.01 MFD. 400V.
C5	N-1344	.01 MFD. 400V.
C6	N-1690	.004 MFD. 5%
C7	N-1345	.05 MFD. 200V.

DIAG NO.	PART NO.	DESCRIPTION
C8	N-3080	.22 MFD. 200V. 10%
C9	N-1345	.05 MFD. 200V.
C10	N-1345	.05 MFD. 200V.
C11	N-1351	.1 MFD. 200V.
C12	N-1374	100 MMFD.
C13	N-1344	.01 MFD. 400V.
C14	N-3455	.004 MFD. 600V.
C15	N-1344	.01 MFD. 400V.
C16	N-1343	250 MMFD.
C17	N-1376	.02 MFD. 400V.
C18	N-1478	.01 MFD. 600V.
C19	N-1351	.1 MFD. 200V.
C20	N-1346	.05 MFD. 400V.
C21 } C22 } C23 }	N-2437	{20 MFD. 25V. {30 MFD. 250V. {30 MFD. 150V.
C24	N-2436	30 MFD. 150V.
C25	N-1834	.002 MFD. 800V.
C26	N-1374	100 MMFD.
C27	N-1346	.05 MFD. 400V.
C28	N-1345	.05 MFD 200V
C29	N-1345	.05 MFD 200V
1	N-3368	ANTENNA LOOP
2	N-2987	ANTENNA COIL
3	N-3722	OSCILLATOR COIL
4	N-3664	1ST. I.F. TRANS.
5	N-3657	2ND. I.F. TRANS.
6	N-3645	10" DYN. SPEAKER
7	N-3646	OUTPUT TRANS.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

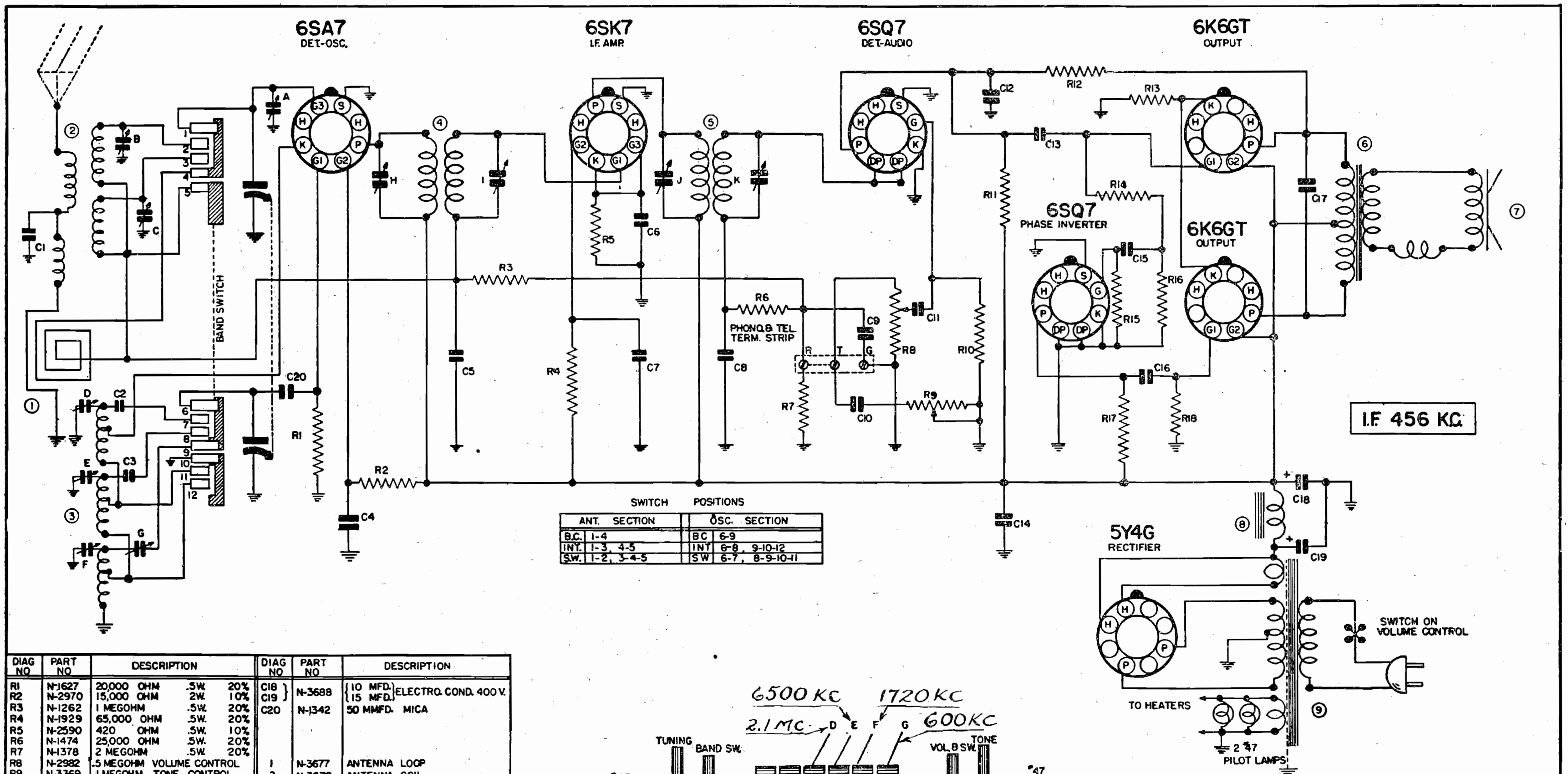
I.F. 456 KC.

6 TUBE A.C.
SUPERHETERODYNE
TWO-BAND
PHONO RECORD-CHANGER
DRAWN W.E. APP'D.
AUG. 14, 1940.
KXF-KXFU

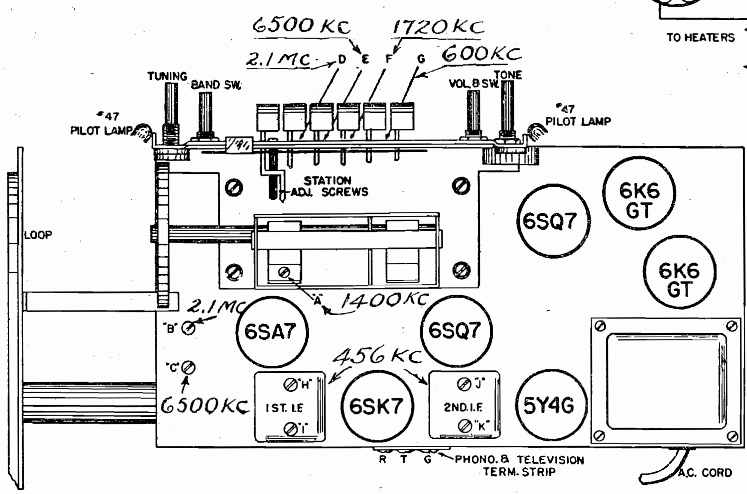
BC Osc Trim.	1720 KC	(200 mmf dummy)
BC Ant "	1400 KC	"
BC Padder	600 KC	"
SW Osc Trim	18.3 MC	(400 ohm dummy)
SW Ant ".	15.0 MC	"

Chassis KY, KYU

SONORA RADIO & TELEV., CORP.



SWITCH		POSITIONS	
ANT. SECTION		OSC. SECTION	
B.C.	1-4	BC	6-9
INT.	1-3, 4-5	INT	6-8, 9-10-12
S.W.	1-2, 3-4-5	SW	6-7, 8-9-10-11



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

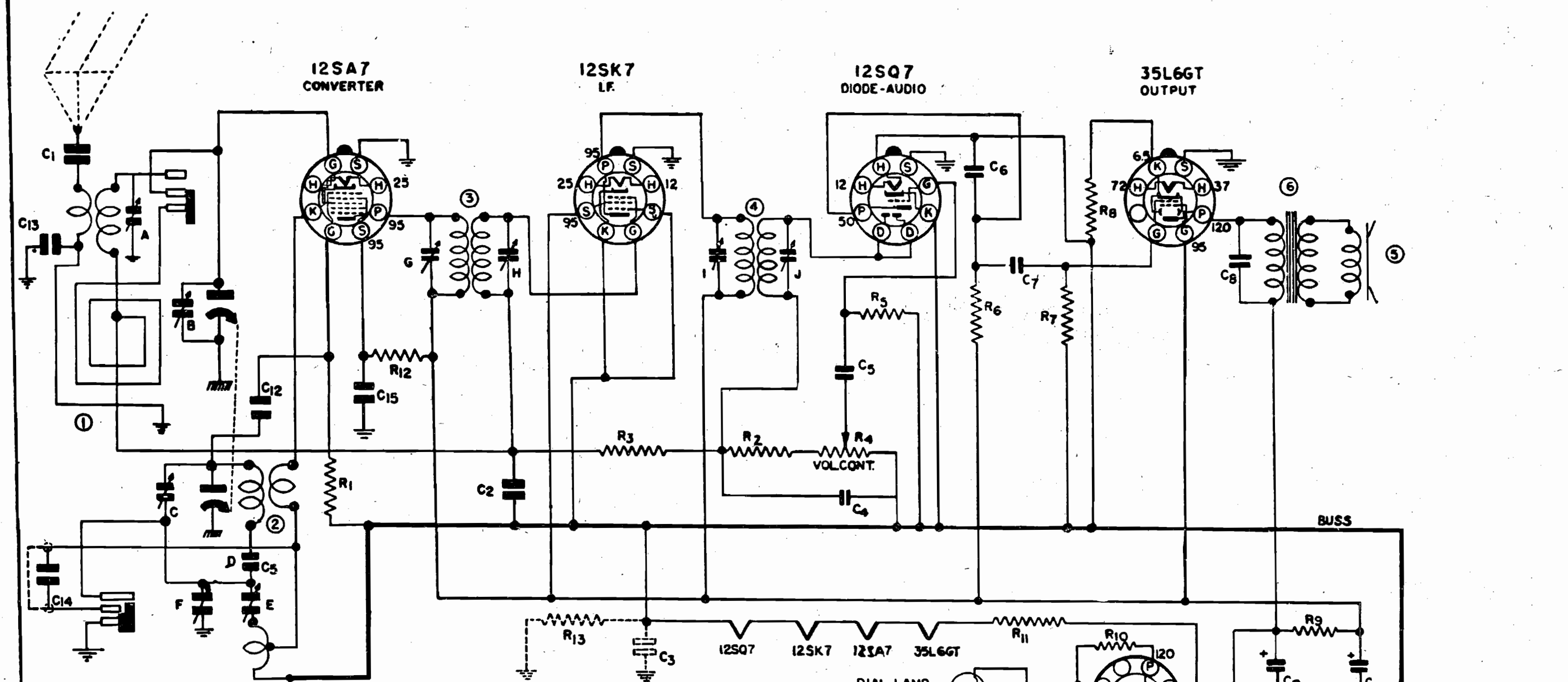
6 TUBE A.C.
SUPERHETERODYNE
THREE BAND
DRAWN V.I.F. APPROVED
AUG. 21, 1940.

DIAG NO	PART NO	DESCRIPTION	DIAG NO	PART NO	DESCRIPTION
R1	N-1627	20,000 OHM .5W. 20%	C18	N-3688	10 MFD. ELECTRO. COND. 400 V.
R2	N-2970	15,000 OHM 2W. 10%	C19		15 MFD.
R3	N-1262	1 MEGOHM .5W. 20%	C20	N-1342	50 MMFD. MICA
R4	N-1929	65,000 OHM .5W. 20%			
R5	N-2590	420 OHM .5W. 10%			
R6	N-1474	25,000 OHM .5W. 20%			
R7	N-1378	2 MEGOHM .5W. 20%			
R8	N-2982	.5 MEGOHM VOLUME CONTROL	1	N-3677	ANTENNA LOOP
R9	N-3369	1 MEGOHM TONE CONTROL	2	N-3678	ANTENNA COIL
R10	N-1419	6 MEGOHM .5W. 20%	3	N-3679 N-3680	OSCILLATOR COILS
R11	N-1377	200,000 OHM .5W. 20%			
R12	N-2977	2 MEGOHM .5W. 10%	4	N-3686	1ST. I.F. TRANS.
R13	N-3666	315 OHM 1W. 10%	5	N-3687	2ND. I.F. TRANS.
R14	N-2294	400,000 OHM .5W. 10%	6	N-3673	OUTPUT TRANS.
R15	N-1419	6 MEGOHM .5W. 20%	7	N-3668	10" DYN. SPEAKER
R16	N-3667	7,750 OHM .5W. 10%	8		800 OHM SPEAKER FIELD
R17	N-1779	150,000 OHM .5W. 20%	9	N-3665	POWER TRANSFORMER
R18	N-1696	400,000 OHM .5W. 20%			
C1	N-1343	250 MMFD. MICA	A		B.C. ANT. TRIMMER
C2	N-1690	4000 MMFD. 5% MICA	B		S.W. ANT. TRIMMER
C3	N-2290	1550 MMFD. 3% MICA	C		INT. ANT. TRIMMER
C4	N-1623	.1 MFD. 400V.	D		S.W. OSC. TRIMMER
C5	N-1345	.05 MFD. 200V.	E		INT. OSC. TRIMMER
C6	N-1345	.05 MFD. 200V.	F		B.C. OSC. TRIMMER
C7	N-1623	.1 MFD. 400V.	G		B.C. OSC. PAD
C8	N-1374	100 MMFD. MICA			
C9	N-1342	50 MMFD. MICA			
C10	N-2712	.004 MFD. 400V.			
C11	N-1347	.006 MFD. 600V.			
C12	N-2383	150 MMFD. MICA			
C13	N-1973	.02 MFD. 600V.			
C14	N-1623	.1 MFD. 400V.			
C15	N-1347	.006 MFD. 600V.			
C16	N-1973	.02 MFD. 600V.			
C17	N-2063	.003 MFD. 600V.			

KYU

SONORA RADIO & TELEV., CORP.

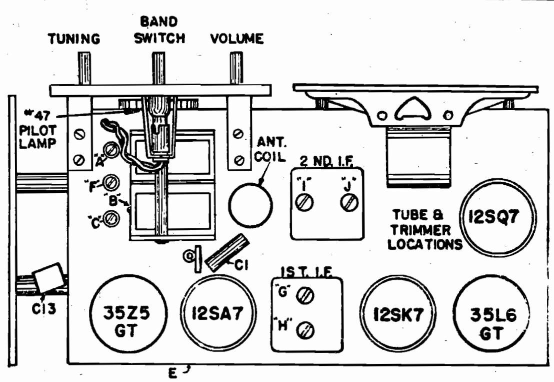
Chassis ID, LDU



NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO BUSS. ------------ HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.

DIAG NO.	PART NO.	DESCRIPTION
R1	N-1627	20,000 OHM .5W. 20%
R2	N-1260	50,000 OHM .5W. 20%
R3	N-1262	1 MEGOHM .5W. 20%
R4	N-3065	.5 MEGOHM VOL. CONT.
R5	N-1419	6 MEGOHM .5W. 20%
R6	N-1261	250,000 OHM .5W. 20%
R7	N-1264	500,000 OHM .5W. 20%
R8	N-1616	250 OHM .5W. 10%
R9	N-3341	1,000 OHM .5W. 20%
R10	N-1742	25 OHM .5W. 20%
R11	N-1618	80 OHM .5W. 10%
R12	N-1258	10,000 OHM .5W. 20%
R13*	N-1261	250,000 OHM .5W. 20%
C1	N-1344	.01 MFD. 400V.
C2	N-1345	.05 MFD. 200V.
C3*	N-3080	22 MFD. 200V.
C4	N-1374	100 MMFD.
C5	N-2712	.004 MFD. 400V.
C6	N-1447	.0005 MFD. 400V.
C7	N-1344	.01 MFD. 400V.
C8	N-1376	.02 MFD. 400V.
C9	N-3658	40 MFD. 150V. ELECT
C10	N-3658	40 MFD. 150V. ELECT
C11	N-1346	.05 MFD. 400V.
C12	N-1342	50 MMFD.
C13	N-1343	250 MMFD.

DIAG NO.	PART NO.	DESCRIPTION
1	N-3630	ANTENNA COIL LOOP
2	N-3633	OSCILLATOR COIL
3	N-3633	1ST. I.F. TRANSFORMER
4	N-3640	2ND. I.F. TRANSFORMER
5	N-3628	5" SPEAKER
6	N-3296	OUTPUT TRANSFORMER
	N-3634	BANDSWITCH
	N-3629	2 GANG CONDENSER
A		S.W. ANT. TR.
B		B.C. ANT. TR.
C		S.W. OSC. TR.
D		S.W. PAD
E		B.C. PAD
F		B.C. OSC. TR.
*		R13 C3 AND C14 USED ONLY ON LDU. BUSS IS GROUNDED AND C14 SHORTED ON LD ONLY.
C14*	N-1344	.01 MFD. 400 V.
C15	N-1345	.05 MFD. 400 V.



I.F. 456 KC.

5 TUBE AC-DC

SUPERHETERODYNE
TWO BAND

DRAWN· V.J.F. APPROVED ...

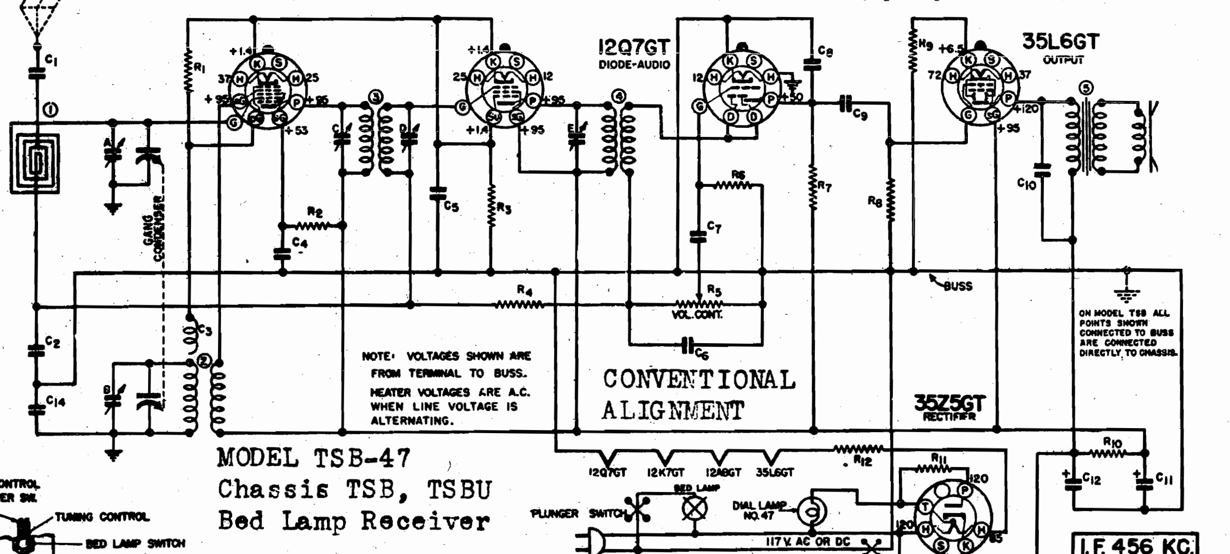
FOR ALIGNMENT
SEE INDEX

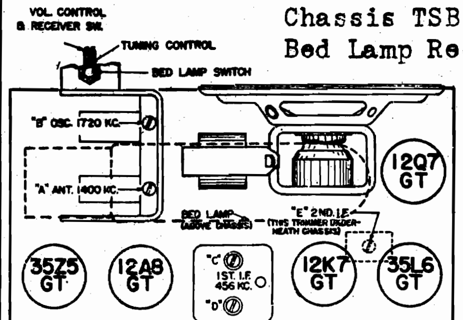
LD-LDU

MODEL TSB-47,
Chassis TSB, TSBU
MODEL TSU-105

SONORA RADIO & TELEV., CORP.

LAMP USED. Show case lamp 120 volt, 25 watts with medium screw base. (Never use a lamp larger than 25 watts.)





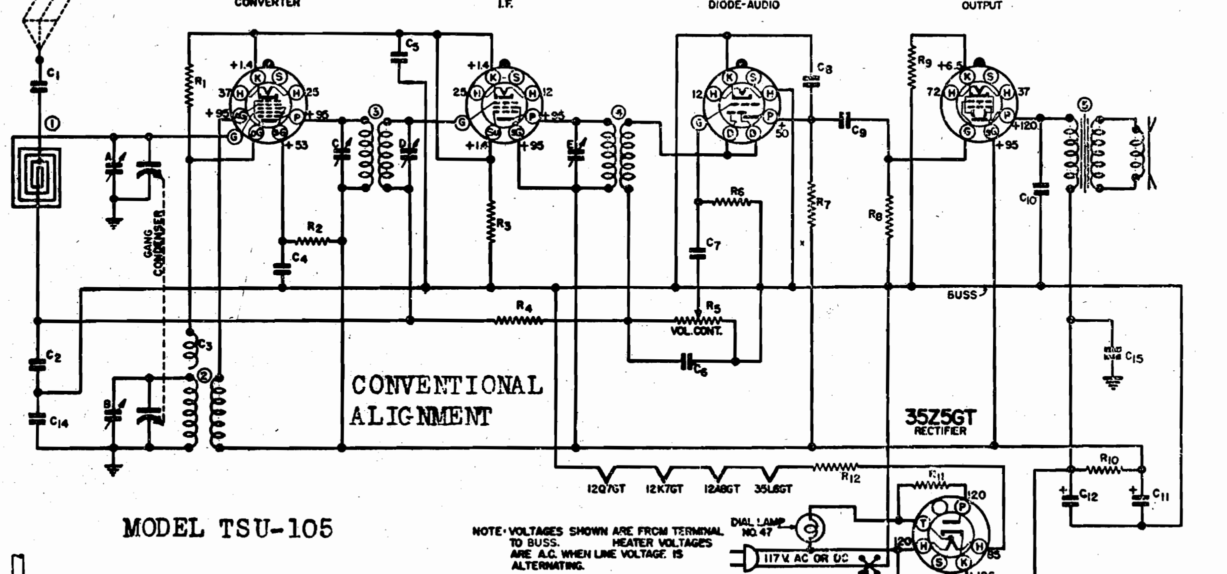
5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

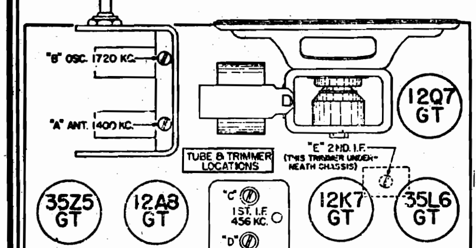
TSB
TSBU

SWITCH ON VOL. CONT.

DIAG. NO.	PART NO.	DESCRIPTION
R 1	N-1260	50,000 OHM .5W. 20%
R 2	N-1527	20,000 OHM .5W. 20%
R 3	N-1742	25 OHM .5W. 20%
R 4	N-1262	1 MEGOHM .5W. 20%
R 5	N-1595 N-1935	.5 MEGOHM VOL. CONT. (TSB) .5 MEGOHM VOL. CONT. (TSBU)
R 6	N-1263	10 MEGOHM .5W. 20%
R 7	N-1377	200,000 OHM .5W. 20%
R 8	N-1264	500,000 OHM .5W. 20%
R 9	N-1616	250 OHM .5W. 10%
R 10	N-1617	2500 OHM .5W. 20%
R 11	N-1614	50 OHM .5W. 20%
R 12	N-1618	80 OHM 2W. 10%
C 1	N-1344	.01 MFD. 400V.
C 2	N-1345 N-1351	.05 MFD. 200 V. (TSB) .1 MFD. 200 V. (TSBU)
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL
C 4	N-1345	.05 MFD. 200V.
C 5	N-1351	.1 MFD. 200V.
C 6	N-1374	100 MMFD.
C 7	N-1344	.01 MFD. 400 V.
C 8	N-1447	.0005 MFD. 400 V.
C 9	N-1344	.01 MFD. 400 V.
C 10	N-1376	.02 MFD. 400V.
C 11	N-1366 TSB	30 MFD. 150V. ELECTRO.
C 12	N-2599 TSBU	15 MFD. 150V. ELECTRO.
C 13	N-1346	.05 MFD. 400V.
C 14	N-1479	.25 MFD. 400 V.
1	N-2146	ANTENNA COIL LOOP
2	N-1452	OSCILLATOR COIL
3	N-1598 N-1954	1ST. I.F. TRANS. (TSB) 1ST. I.F. TRANS. (TSBU)
4	N-1596	2ND. I.F. TRANSFORMER
5	N-2074 N-2428	4" P.M. SPKR. & TRANS. (TSB) 4" P.M. SPKR. & TRANS (TSBU)
E	N-1597	2ND. I.F. TRIMMING COND.
	N-2088	GANG CONDENSER
	N-2595	BED, LAMP
	N-2094	BED LAMP SWITCH

VOLTAGE NOTES FOR BOTH SCHEMATICS 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.





5 TUBE AC-DC
SUPERHETERODYNE
SINGLE BAND

TSU

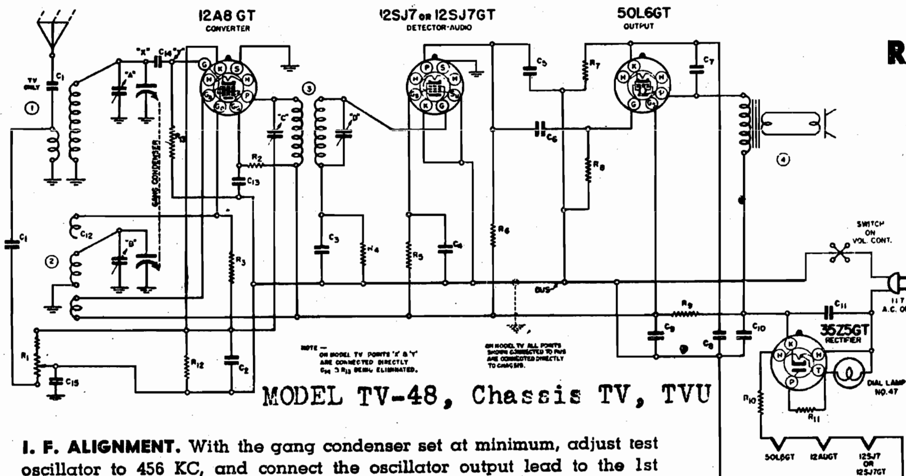
SWITCH ON VOL. CONT.

DIAG. NO.	PART NO.	DESCRIPTION
R 1	N-1260	50,000 OHM .5W. 20%
R 2	N-1460	30,000 OHM .5W. 20%
R 3	N-1615	100 OHM .5W. 10%
R 4	N-1862	1 MEGOHM .5W. 20%
R 5	N-1955	0.5 MEGOHM VOL. CONT.
R 6	N-1263	10 MEGOHM .5W. 20%
R 7	N-1377	200,000 OHM .5W. 20%
R 8	N-1264	500,000 OHM .5W. 20%
R 9	N-1616	250 OHM .5W. 10%
R 10	N-1617	2500 OHM .5W. 20%
R 11	N-1614	50 OHM .5W. 20%
R 12	N-1618	80 OHM 2W. 10%
C 1	N-1344	.01 MFD. 400V.
C 2	N-1351	.1 MFD. 200V.
C 3		CAPACITY INCLUDED IN OSCILLATOR COIL
C 4	N-1345	.05 MFD. 200V.
C 5	N-1351	.1 MFD. 200V.
C 6	N-1374	100 MMFD.
C 7	N-1344	.01 MFD. 400 V.
C 8	N-1447	.0005 MFD. 400 V.
C 9	N-1344	.01 MFD. 400 V.
C 10	N-1376	.02 MFD. 400V.
C 11	N-1366	25 MFD. 150V. ELECTRO.
C 12		15 MFD. 150V. ELECTRO.
C 13	N-1346	.05 MFD. 400V.
C 14	N-1479	.25 MFD. 200V.
C 15	N-1351	.1 MFD. 200V.
1	N-1594	ANTENNA COIL LOOP
2	N-1452	OSCILLATOR COIL
3	N-1954	1ST. I.F. TRANSFORMER
4	N-1596	2ND. I.F. TRANSFORMER
5	N-1952	4" P.M. SPEAKER & TRANS.
E	N-1597	2ND. I.F. TRIMMING COND.
	N-1953	GANG CONDENSER

SONORA RADIO & TELEV., CORP.

MODEL TV-48
Chassis TV, TVU
MODELS KVU-85, KVU-97

RANGE 535 to 1720 Kilocycles



MODEL TV-48, Chassis TV, TVU

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-2173 / N-2906	50,000 OHM VOL. CONT. (TV) / 50,000 OHM VOL. CONT. (TVU)	C_5	N-1374	100 MMFD.
R_2	N-1627	20,000 OHM .5W 20%	C_6	N-1344	.01 MFD. 400V.
R_3	N-1260	50,000 OHMS .5W. 20%	C_7	N-1344	.01 MFD. 400V.
R_4	N-2189	4 MEGOHMS .5W. 20%	C_8		20 MFD. 25V. ELYTC.
R_5	N-1419	6 MEGOHMS .5W. 20%	C_9	N-2174	15 MFD. 150V. ELYTC.
R_6	N-1262	1 MEGOHMS .5W. 20%	C_{10}		30 MFD. 150V. ELYTC.
R_7	N-2166	225 OHMS .5W. 10%	C_{11}	N-1346	.05 MFD. 400V.
R_8	N-1264	.5 MEGOHM .5W. 20%	C_{12}		CAPACITY BETWEEN COILS
R_9	N-1417	3000 OHMS .5W. 20%	C_{13}	N-1345	.05 MFD. 200V.
R_{10}	N-1618	80 OHMS 2W. 10%	C_{14}	N-1447	.0005 MFD 400V TVU ONLY
R_{11}	N-1458	25 OHMS .5W. 20%	C_{15}	N-1351	.1 MFD. 200V TVU ONLY
R_{12}	N-1258	10,000 OHMS .5W 20%	1	N-2170	ANT COIL
R_{13}	N-1378	2 MEGOHM (TVU ONLY) .5W 20%	2	N-4152	OSCILLATOR COIL
			3	N-2172 / N-2507	IF TRANSFORMER (TV) / IF TRANSFORMER (TVU)
			4	N-2162 / N-2503	3 1/2" SPKR. & TRANS. (TV) / 3 1/2" SPKR & TRANS. (TVU)
C_1	N-1344 / N-1447	.01 MFD 400V (TV) / .0005 MFD 400V (TVU)		N-2169	GANG CONDENSER
C_2	N-2175	.010 MFD 200V			
C_3	N-1345	.05 MFD. 200V			
C_4	N-1344	.01 MFD 400V			

4 TUBE A.C.-D.C.
SUPERHETERODYNE
SINGLE BAND

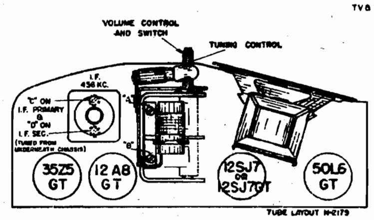
I.F. 456 KC.

DRWN. J.B. APPR. [illegible]

TV & TVU

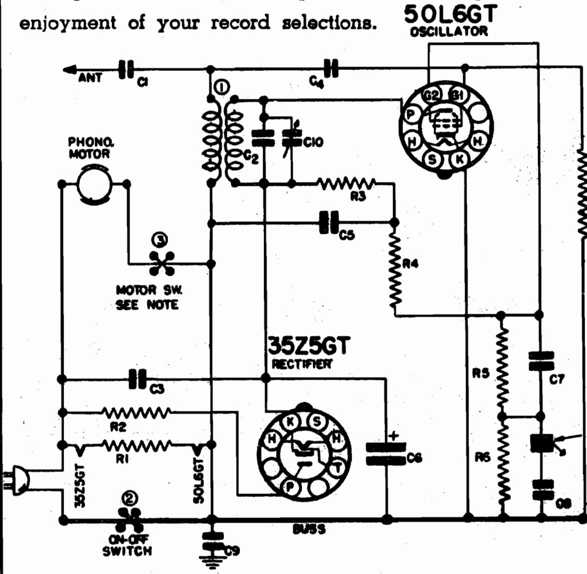
I. F. ALIGNMENT. With the gang condenser set at minimum, adjust test oscillator to 456 KC, and connect the oscillator output lead to the 1st detector tube (12A8-GT) through a .05 or .1 mfd. condenser. The test oscillator ground lead should be connected to the chassis base. Proceed by adjusting the two I.F. trimmers for maximum signal, or swing on output meter, if available. The two trimmers for the transformer I.F. will be found below the coil next to the base.

BROADCAST ALIGNMENT. Connect the test oscillator to the antenna of the set through a 100 mmfd. (.0001) 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.



TUBE & TRIMMER LAYOUT

RADIO RECEIVER CONTROLS — Volume will be controlled by the volume control on the radio receiver as for radio reception. Other radio controls will affect record reproduction. Adjustment of the radio set's fidelity and tone controls may add considerably to the enjoyment of your record selections.



DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R1	N-3488	220 OHM 5W. 10%	C7	N-1630	500 MMFD.
R2	N-1683	7,500 OHM .5W.	C8	N-2642	.09 MFD. 400V.
R3	N-1682	3 MEGOHM .5W.	C9	N-3080	.22 MFD. 200V.
R4	N-1262	1 MEGOHM .5W.	C10	N-3480	OSC. TRIMMER
R5	N-1684	75,000 .5W.			
R6	N-2974	5 MEGOHM .5W. 10%	1	N-3479	OSC. COILS
R7	N-1460	30,000 OHM .5W.	2	N-3614	UNIT ON-OFF SW.
			3	N-2094 OR N-3549	PUSH SW. ON KVU-85 / AUTO. STOP SW. ON KVU-97
C1	N-1897	25 MMFD.			
C2	N-3481	140 MMFD. CERAMIC 5%			
C3	N-1623	.1 MFD. 400V.			
C4	N-1374	100 MMFD.			
C5	N-1351	.1 MFD. 200V.			
C6	N-1675	20 MFD. 200V.			

MODELS
KVU-85
KVU-97

2 TUBE
PHONOGRAPH OSCILLATOR
DRAWN-W.F. APP'D. [illegible]
AUG. 15, 1940.

KVU-85 KVU-97

ANTENNA — The single lead attached to the record player is the transmitting antenna. If the record player is located within a distance of ten feet from the receiving set no additional antenna will be required. An antenna not longer than ten feet may be added to operate over greater distances.

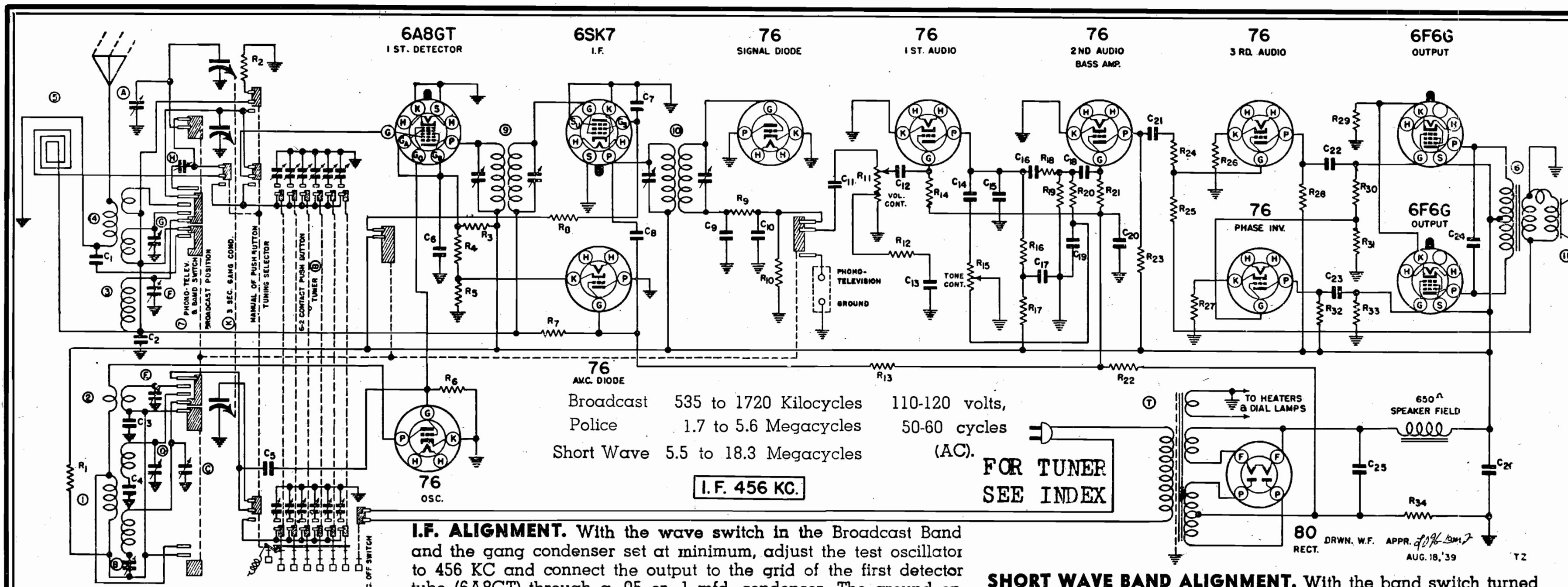
OPERATION — Turn on the power switch allowing about one minute for the tubes to warm up, place the selected record upon the turntable and start the motor. Lift pickup and lower the needle point gently to the outside record groove.

Next go to your radio and tune to approximately 600 K.C. at which setting the phonograph signal will be received.

FREQUENCY ADJUSTMENT — If a local station is operating at a frequency of approximately 600 KC, interference will be encountered in the form of a continuous squeal or howl. To avoid this interference tune the radio receiver to a point at which no local station can be heard. With the unit in operation insert a screw driver in the hole located underneath the unit on the metal chassis and adjust the screw. If the radio receiver has been set at a point below 600 KC, (for example 550 KC) turn to the right until the phonograph signal is heard. If the receiver has been set above 600 KC turn the adjusting screw to the left.

Chassis TZ

SONORA RADIO & TELEV., CORP.



DIAG. NO.	PART NO.		DIAG. NO.	PART NO.	
R_1	N-2568	50,000 OHM 1. W. 20%	R_{24}	N-2572	300,000 OHM .5W. 10%
R_2	N-1419	6 MEGOHM .5W. 20%	R_{25}	N-2570	200,000 OHM .5W. 10%
R_3	N-2573	25,000 OHM 1/3W. 20%	R_{26}	N-1695	5000 OHM .5W. 20%
R_4	N-1353	50,000 OHM .5W. 20%	R_{27}	N-1695	5000 OHM .5W. 20%
R_5	N-2567	7,500 OHM .5W. 10%	R_{28}	N-1778	100,000 OHM .5W. 20%
R_6	N-1260	50,000 OHM .5W. 20%	R_{29}	N-2566	240 OHM 2. W. 10%
R_7	N-1262	1 MEGOHM .5W. 20%	R_{30}	N-2571	250,000 OHM .5W. 10%
R_8	N-2569	75,000 OHM 1. W. 20%	R_{31}	N-1353	50,000 OHM .5W. 10%
R_9	N-1260	50,000 OHM .5W. 20%	R_{32}	N-1778	100,000 OHM .5W. 20%
R_{10}	N-1264	.5 MEGOHM .5W. 20%	R_{33}	N-1261	250,000 OHM .5W. 20%
R_{11}	N-2482	1. MEGOHM VOL. CONT.	R_{34}	N-2565	40 OHM .5W. 10%
R_{12}	N-2574	70,000 OHM .5W. 20%			
R_{13}	N-1262	1 MEGOHM .5W. 20%			
R_{14}	N-1262	1 MEGOHM .5W. 20%	C_1	N-1447	500 MMFD. 400V. 20%
R_{15}	N-2483	.5 MEGOHM TONE CONT.	C_2	N-2594	.05 MFD. 200V. 20%
R_{16}	N-1779	150,000 OHM .5W. 20%	C_3	N-1690	4000 MMFD. 5%
R_{17}	N-1778	100,000 OHM .5W. 20%	C_4	N-2290	1550 MMFD. 3%
R_{18}	N-1261	250,000 OHM .5W. 20%	C_5	N-1342	50 MMFD. 20%
R_{19}	N-2570	200,000 OHM .5W. 10%	C_6	N-2579	.25 MFD. 400V. 20%
R_{20}	N-1460	30,000 OHM .5W. 20%	C_7	N-1623	.1 MFD. 400V. 20%
R_{21}	N-1262	1 MEGOHM .5W. 20%	C_8	N-1342	50 MMFD. 20%
R_{22}	N-1261	250,000 .5W. 20%	C_9	N-1342	50 MMFD. 20%
R_{23}	N-1261	250,000 .5W. 20%	C_{10}	N-1342	50 MMFD. 20%

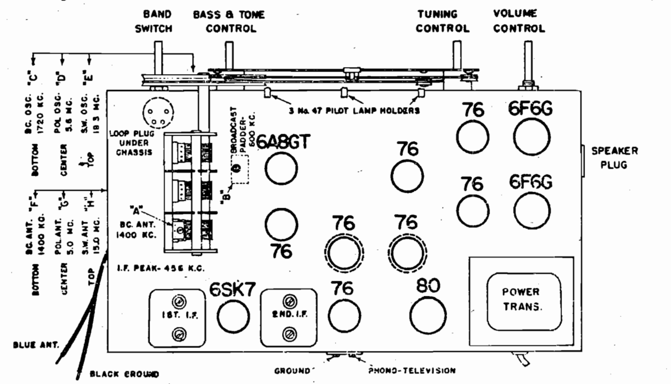
DIAG. NO.	PART NO.		DIAG. NO.	PART NO.	
C_{11}	N-1344	.01 MFD. 400V. 20%	4	N-2534	INT. & S.W. ANT. COIL
C_{12}	N-1344	.01 MFD. 400V. 20%	5	N-2003	LOOP ANT.
C_{13}	N-1347	.006 MFD. 600V. 20%	6	N-2513	OUTPUT TRANS.
C_{14}	N-1344	.01 MFD. 400V. 20%	7	N-2486	BAND SWITCH
C_{15}	N-1374	100 MMFD. 20%	8	N-2465	PUSH BUTTON TUNER & SWITCH
C_{16}	N-1376	.02 MFD. 400V. 20%	9	N-2531	1ST. I.F. TRANSFORMER
C_{17}	N-1623	.1 MFD. 400V. 20%	10	N-2532	2ND. I.F. TRANSFORMER
C_{18}	N-1344	.01 MFD. 400V. 20%	11	N-2512	12" DYN. SP. 650Ω FIELD
C_{19}	N-1378	.02 MFD. 400V. 20%			
C_{20}	N-1479	.25 MFD. 200V. 20%			
C_{21}	N-1376	.02 MFD. 400V. 20%	T	N-2514	POWER TRANSFORMER
C_{22}	N-1376	.02 MFD. 400V. 20%	K	N-2484	GANG CONDENSER
C_{23}	N-1376	.02 MFD. 400V. 20%			
C_{24}	N-2578	.006 MFD. 1000V. 20%	A	N-2315	BC. ANT. TRIM. COND. #1
C_{25}	N-2459	15 MFD. 450WV. 20%	B	N-2205	BC. PADDING COND.
C_{26}	N-2460	15 MFD. 450WV. 20%	C		BC. OSC. TRIM. COND.
			D	N-2158	POL. OSC. TRIM. COND.
			E		S.W. OSC. TRIM. COND.
			F		BC. ANT. TRIM. COND. #2
			G	N-2158	POL. ANT. TRIM. COND.
1	N-2535	BC. & INT. OSC. COIL	H		S.W. ANT. TRIM. COND.
2	N-2536	SW. OSC. COIL			
3	N-2533	BC. ANT. COIL			

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 (6A8GT) 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. With the switch turned to the broadcast position, connect the antenna to the generator through a 200 MMF dummy and set the dial and generator at 1720 KC. Align the BC oscillator trimmer for maximum output. Set the generator at 1400 KC and tune-in signal with the dial. Adjust both antenna trimmers for maximum output. Next set the generator at 600 KC and tune in the signal with the dial. Adjust the BC pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 1400 KC as the pad adjustment may have caused misalignment. In making the BC alignment the loop should be located in the same position with respect to the chassis as it occupies in the cabinet. No metal should be near the loop.

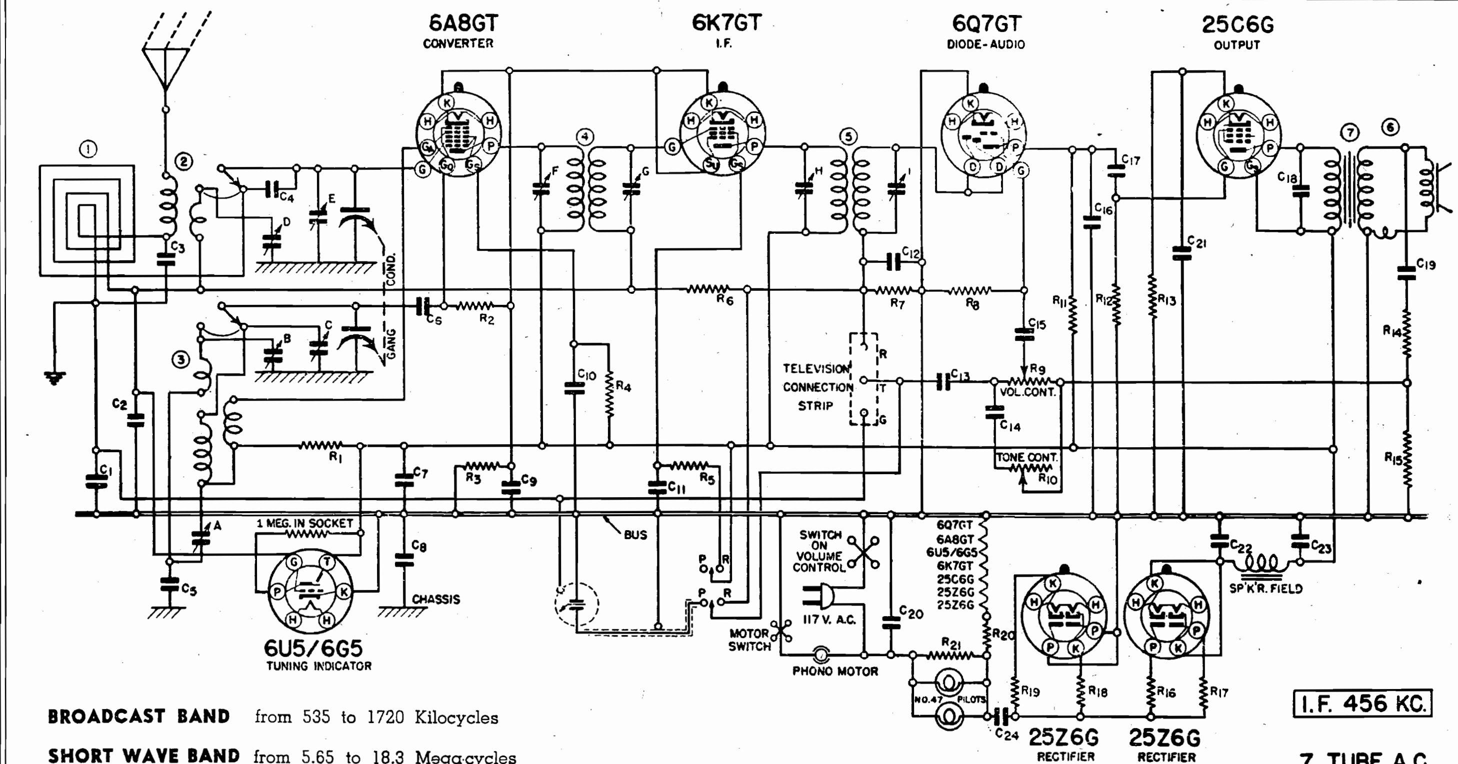
POLICE BAND ALIGNMENT. With the band switch turned to the Pol. position, connect the generator to the antenna with a 400 ohm dummy. Adjust the Pol. oscillator to give a maximum output with the dial at 5600 KC (extreme end). Set the generator at 5000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 5600 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 2000 KC to determine if the coils and pad are not defective.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S. W. position, connect the generator to the antenna with a 400 ohm dummy. Adjust the S. W. oscillator to give a maximum output with the dial at 18,300 KC (extreme end). Set the generator at 15000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M.C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18,300 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and pad are not defective.



SONORA RADIO & TELEV., CORP.

MODEL TXF-67
Chassis TXF

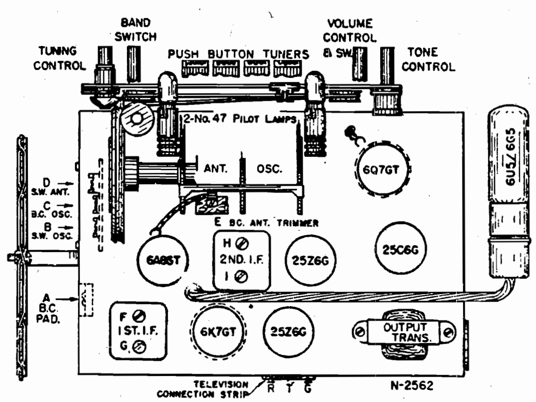


I.F. 456 KC.

7 TUBE A.C.
SUPERHETERODYNE
TWO BAND
PHONO RECORD-CHANGER
DRN. H.B. APP. BMJ
SEPT. 25, 1939

DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1627	20,000 OHM .5W. 20%
R_2	N-1260	50,000 OHM .5W. 20%
R_3	N-1787	250 OHM .5W. 10%
R_4	N-1460	30 000 OHM .5W. 20%
R_5	N-2455	40,000 OHM .5W. 20%
R_6	N-1262	1 MEGOHM .5W. 20%
R_7	N-1264	0.5 MEGOHM .5W. 20%
R_8	N-1419	6 MEGOHM .5W. 20%
R_9	N-2411	0.5 MEGOHM VOL. CONT.
R_{10}	N-2435	1 MEGOHM TONE CONT.
R_{11}	N-1261	.25 MEGOHM .5W. 20%
R_{12}	N-1264	0.5 MEGOHM .5W. 20%
R_{13}	N-2453	235 OHM 1W. 10%
R_{14}	N-2454	5000 OHM .5W. 10%
R_{15}	N-1473	200 OHM .5W. 10%
R_{16}	N-2452	100 OHM 1-3 W. 20%
R_{17}	N-2452	100 OHM 1-3 W. 20%
R_{18}	N-2451	75 OHM 1 W. 20%
R_{19}	N-2451	75 OHM 1 W. 20%
R_{20}	N-2430	42 OHM ARMORED WIRE RES.
R_{21}	N-2430	17 OHM ARMORED WIRE RES.
C_1	N-1344	.01 MFD. 400V. 20%
C_2	N-1345	.05 MFD. 200 V. 20%
C_3	N-1897	25 MMFD. 20%
C_4	N-1897	25 MMFD. 20%
C_5	N-1690	4000 MMFD. 5%
C_6	N-1342	50 MMFD. 20%
C_7	N-1351	0.1 MFD. 200V. 20%
C_8	N-1479	.25 MFD. 200 V. 20%
C_9	N-1479	.25 MFD. 200V. 20%
C_{10}	N-1345	.05 MFD. 200 V. 20%
C_{11}	N-1345	.05 MFD. 200 V. 20%
C_{12}	N-1374	100 MMFD. 20%
C_{13}	N-1344	.01 MFD. 400V. 20%
C_{14}	N-2450	.002 MFD. 400V. 20%
C_{15}	N-1344	.01 MFD. 400V. 20%
C_{16}	N-1343	250 MMFD. 20%
C_{17}	N-1376	.02 MFD. 400V. 20%
C_{18}	N-1344	.01 MFD. 400V. 20%
C_{19}	N-1351	0.1 MMFD. 200V. 20%
C_{20}	N-1346	.05 MFD. 400V. 20%
C_{21}	N-2437	20 MFD. 25V. ELECT. COND.
C_{22}	N-2437	30 MFD. 250V. ELECT. COND.
C_{23}	N-2437	30 MFD. 150V. ELECT. COND.
C_{24}	N-2436	30 MFD. 150V. ELECT. COND.
1	N-2154	ANTENNA LOOP
2	N-2010	S.W. ANTENNA COIL
3	N-2008	OSC. COIL
4	N-2461	1st. I.F. TRANS.
5	N-2462	2nd. I.F. TRANS.
6	N-2433	12" DYN. SPKR. (CONSOLE)
7	N-2447	OUTPUT TRANS.
A	N-2205	BC. PADDING COND.
B	N-2158	S.W. OSC. TRIM. COND.
C	N-2158	BC. OSC. TRIM. COND.
D	N-2158	S.W. ANT TRIM COND.
	N-2218	GANG COND. & TUNER
	N-2164	BAND SWITCH

TXF



BROADCAST BAND from 535 to 1720 Kilocycles

SHORT WAVE BAND from 5.65 to 18.3 Megacycles

ALIGNMENT PROCEDURE

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 and Short Wave bands in the order given, should 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 (6A8GT) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis buss. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. With the switch turned to the broadcast position, connect the antenna to the generator through a 200 MMF dummy and the ground of the set (Black wire) to the generator ground. Set the dial and generator at 1720 KC. Align the BC oscillator trimmer for maximum output. Set the generator at 1400 KC and tune-in signal with the dial. Adjust antenna trimmer for maximum output. Next set the generator at 600 KC and tune in the signal with the dial. Adjust the BC pad by rocking the gang back and forth while adjusting the pad until maximum output is attained. Recheck the adjustment at 1400 KC as the pad adjustment may have caused misalignment.

SHORT WAVE BAND ALIGNMENT. With the band switch turned to the S. W. position, connect the generator to the antenna with a 400 ohm dummy and the ground of the set (Black wire) to the generator ground. Adjust the S. W. oscillator to give a maximum output with the dial at 18300 KC (extreme end). Set the generator at 15000 KC and tune-in the signal with the dial. Adjust the antenna trimmer for maximum output. With a strong signal input turn the dial to approximately 1 M. C. lower in frequency and pick up the image frequency. If the image is not received, it will be necessary to return the dial to 18300 KC to reduce the capacity in the oscillator trimmer until a second signal is received. Proceed as before with the alignment of the antenna and recheck for image frequency. Check the sensitivity at 6000 KC to determine if the coils and mica pad are not defective.

TELEVISION CONNECTOR

This receiver is fully designed to provide sound reception when connected to a television receiver. To make this connection attach the two leads from your television receiver to terminals "T" and "G". The black lead or the outside shield (in case a shielded lead is used) should be connected to terminal "G", and the other lead to terminal "T". For complete directions consult the instruction sheet of your television receiver.

MODEL TXF-67
Chassis TXF
Chassis TZ

SONORA RADIO & TELEV., CORP.

AUTOMATIC TUNING

Chassis TZ

SETTING-UP PROCEDURE. To set up a list of stations on the automatic tuner proceed as follows:

(1) Make a list of the stations you listen to most frequently.

(2) Determine their frequencies from a station list or by adding a zero to their position on the dial, thus: 56 is 560 KC.

(3) Arrange them in order, starting with the lowest frequency first; then the next highest and so on until not more than six of your favorite stations have been selected.

(4) Select the proper button for each station, starting at the top of your list (the lowest frequency station) and determine if it is within the required range of button No. 7 as shown on the button diagram below. If it is in this range assign button No. 7 to this station. Take the second station on your list and determine if it can be assigned to the button to the left of the one already assigned. If it can be applied, assign the station to this button. If not, go to the next button to the left which has the proper range to accommodate the station. Proper assigning of stations to buttons will make it possible to set up the buttons to all principal stations in every locality.

(5) Turn the band switch to the broadcast position and depress button No. 8 (manual button at extreme right); then tune in with the manual tuning control, the station on the top of your list (the lowest frequency station).

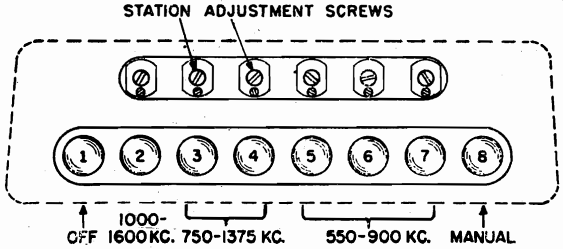
(6) Remove the push button escutcheon by unscrewing the screw at each end. Depress the button assigned to this station and with a screw driver carefully turn the large screw head above the depressed button until the desired station is tuned in. Turning to the right lowers the frequency and turning to the left raises the frequency. Never try to turn the screw past the ends of its travel as you will damage the tuner. The screw has approximately three complete turns. The small screw head located below the large screw should not be disturbed as it is set at the factory.

(7) When the station is picked up adjust the screw carefully for maximum volume and least noise. Push the manual button and the same station will be heard if you have tuned in the correct station.

(8) After all six stations have been set up replace the escutcheon. Select a gummed tab with the proper call letters and insert in each slot above the button.

PUSH BUTTON ARRANGEMENT

STATION ADJUSTMENT SCREWS



AUTOMATIC TUNER ALIGNMENT: With the band switch turned to the broadcast position connect the generator to the antenna lead through a 200 MMF dummy. Depress button No. 2, set the generator to 1200 KC and tune in the signal by adjusting the large head screw located above the button. After the signal is carefully turned in adjust the small screw located below the large screw head for maximum output. This procedure should be repeated on the remaining buttons using the frequencies as listed below:

Button	2	3	4	5	6	7
Freq. (KC):	1200	950	950	650	650	650

In any specific locality where the customer has already set up his stations, the tuner alignment may be made at the actual frequency being used on each button.

OPERATION. With the set turned on to a moderate level of volume the automatic tuner is operated by merely pressing the button set to the desired station. The volume and tone are then adjusted to suit individual requirements.

To tune in stations with the manual control depress the manual button, select the band desired with the band switch and tune in your stations with the manual control.

When using the automatic tuning the wave band selector switch must be turned to the broadcast position.

TELEVISION AND PHONOGRAPH CONNECTOR. This receiver is fully designed to provide sound reception when connected to a television receiver. To make this connection attach the two leads from your television receiver to terminals "T" and "G". The black lead or the outside shield (in case a shielded lead is used) should be connected to terminal "G", and the other lead to terminal "T". For complete directions consult the instruction sheet of your television receiver.

To use this attachment with a phonograph, connect the two terminals from the phonograph pick-up to terminals "T" and "G". If one of the pick-up leads is a shield connect it to the terminal "G". If both leads are unshielded, try reversing the terminals if the hum is excessive. If hum is still present reverse the power plug in the wall socket. Consult the instruction sheets on your phonograph for additional information.

With the connections made as described above simply turn the band change switch to the extreme left position and your television sound channel or phonograph pickup is connected in.

AUTOMATIC TUNING

MODEL TXF-67, Chassis TXF

ADJUSTMENT. All adjustments are simply made from the top of the cabinet using an ordinary screw driver.

To make adjustments remove all four buttons which pull off readily. The center buttons should be removed first since by depressing the adjacent buttons with thumb and finger a firm grip may be secured on either center button. The side buttons can then be easily removed.

Loosen the screw of the desired button and with the manual tuning knob tune to any desired station. Hold the manual tuning knob in position and depress the button shaft as far as possible. With the button fully depressed tighten up the screw firmly.

Be sure the push button knob is held down in position while being tightened.

After the stations are adjusted it is advisable to check each button to assure sufficient tightening.

To assur accurate adjustment, the volume control should be set at a moderate level and the station tuned in slowly to a point of maximum volume and clarity.

It is not necessary to follow any particular sequence of stations since each button is adjustable to any station.

With each button definitely set and securely tightened to the selected stations, the tuner is ready for operation.

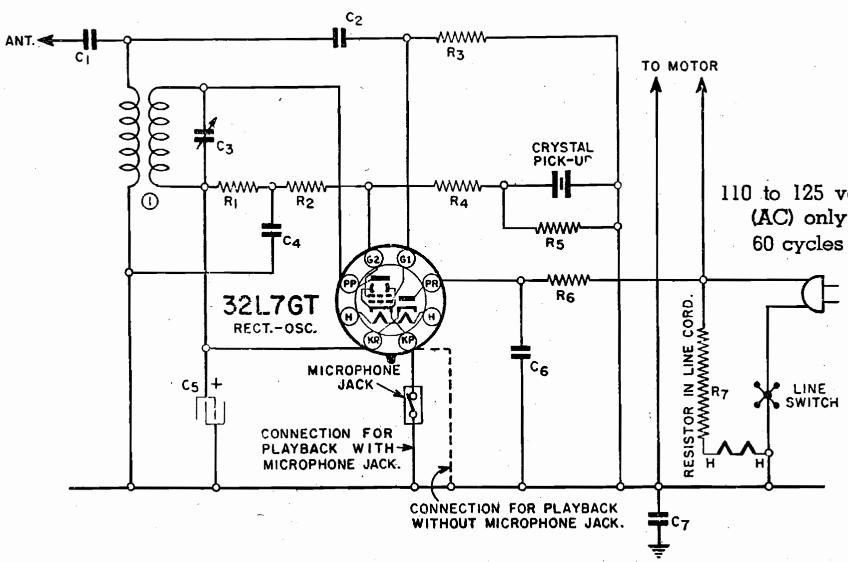
OPERATION. With the set turned on to a moderate level of volume, the automatic tuner is operated by merely pressing a button set to the desired station.

Station selection may be made automatically or manually at will since the manual tuning control operates free and independent of the automatic unit.

The station call letter tabs furnished should be inserted into the slot of the push-buttons using designations corresponding to the station selected for each button. After inserting call letter tabs the buttons may be replaced.

SONORA RADIO & TELEV., CORP.

MODELS W-17, W-19, W-24



WIRELESS RECORD PLAYER

DRWN. FLC APP. 3-24-39

W-19, W-17, W-24

DIAG. NO.	PART NO.	DESCRIPTION
C1	N-1681	10 MMFD. 20 %
C2	N-1374	100 MMFD. "
C3	N-1323	PADDER COND.
C4	N-1351	.10 MFD. 200 V.
C5	N-1675	20 MFD. "
C6	N-1351	.10 MFD. "
C7	N-1351	.10 MFD. "

DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1682	3 MEGOHM .5W 20%
R2	N-1262	1.0 MEGOHM " "
R3	N-1460	30,000 OHM " "
R4	N-1684	75,000 OHM " "
R5	N-1264	.5 MEGOHM " "
R6	N-1683	7,500 OHM " "
R7	N-1677	RESISTOR IN LINE CORD 285 OHM 25W. .3 AMP.
①	N-1671	OSC. COIL

1. **OFF-ON SWITCH**—This is the only knob on the device. Turn to the right to switch on the power.

2. **PICKUP**—The pickup is the new crystal type. To insert a needle, raise the pickup arm to a vertical position, loosen the needle holder screw on the front, insert a needle to its full depth, tighten up the needle holder screw and lower pickup arm to its non-playing position outside the record and slip into the pickup rest holder. When commencing to play, remove pickup from holder, lift and place gently the point of needle in outside starting groove of record.

3. **MOTOR SWITCH**—On models in wooden cabinets which have the automatic stop, the motor switch is incorporated in the automatic stop. To start motor move the lever at the right side of the turntable. The automatic stop can be adjusted so that the pickup arm will strike it at the conclusion of a record and thus turn off the motor.

   On models in metal cabinets the motor switch is located in the front panel on the right side.

4. **ANTENNA**—The single lead attached to the record player is the transmitting antenna. If the record player is located within a distance of ten feet from the receiving set no additional antenna will be required. An antenna not longer than ten feet may be added to operate over greater distances.

5. **OPERATION**—Turn on the power switch allowing about two minutes for the tube to warm up, place the selected record upon the turntable and start the motor. Lift pickup and lower the needle point gently to the outside record groove.

   Next go to your radio and tune to approximately 600 K.C. at which setting the phonograph signal will be received.

6. **FREQUENCY ADJUSTMENT**—If a local station is operating at a frequency of approximately 600 KC, interference will be encountered in the form of a continuous squeal or howl. To avoid this interference tune the radio receiver to a point at which no local station can be heard. Pry out the button located between the turntable and the ON-OFF switch. With the unit in operation insert a screw driver in the hole and adjust the screw.

   If the radio receiver has been set at a point below 600 KC, (for example 550 KC) turn to the right until the phonograph signal is heard. If the receiver has been set above 600 KC turn the adjusting screw to the left.

7. **RADIO RECEIVER CONTROLS**—Volume will be controlled by the volume control on the radio receiver as for radio reception. Other radio controls will affect record reproduction. Adjustment of the radio set's fidelity and tone controls may add considerably to the enjoyment of your record selections.

8. **HUM**—If hum is present it may be necessary to reverse the power plug in the wall socket.

NEEDLES

High quality needles are important to your enjoyment of recorded music. Use good full-tone steel needles. If long playing needles are used, do not change the position of the needle in the pickup after it has once been played, as this will injure the record grooves.

Note: The needle point wears down gradually in use and wears down in conformity with the shape of the record groove. Changing the position of the needle in the pickup after it has been played will provide a new fit to the groove and will damage the record groove by changing the shape of the groove. The life of the record depends upon maintaining the original record groove. To summarize this important message, never reinsert a used needle in the pickup, since this will do permanent injury to the record and shorten your record life materially.

On models in wooden cabinets a jack is provided in the rear of the cabinet for using a microphone. Use only a low impedance (200 ohms or less) carbon button microphone. Most low-priced microphones are of this type. To attach

MICROPHONE ATTACHMENT

microphone simply insert the phone tips in the jack.

Warning!! One of the terminals is directly connected to one terminal of the line cord. In using a microphone make certain all parts are fully insulated.

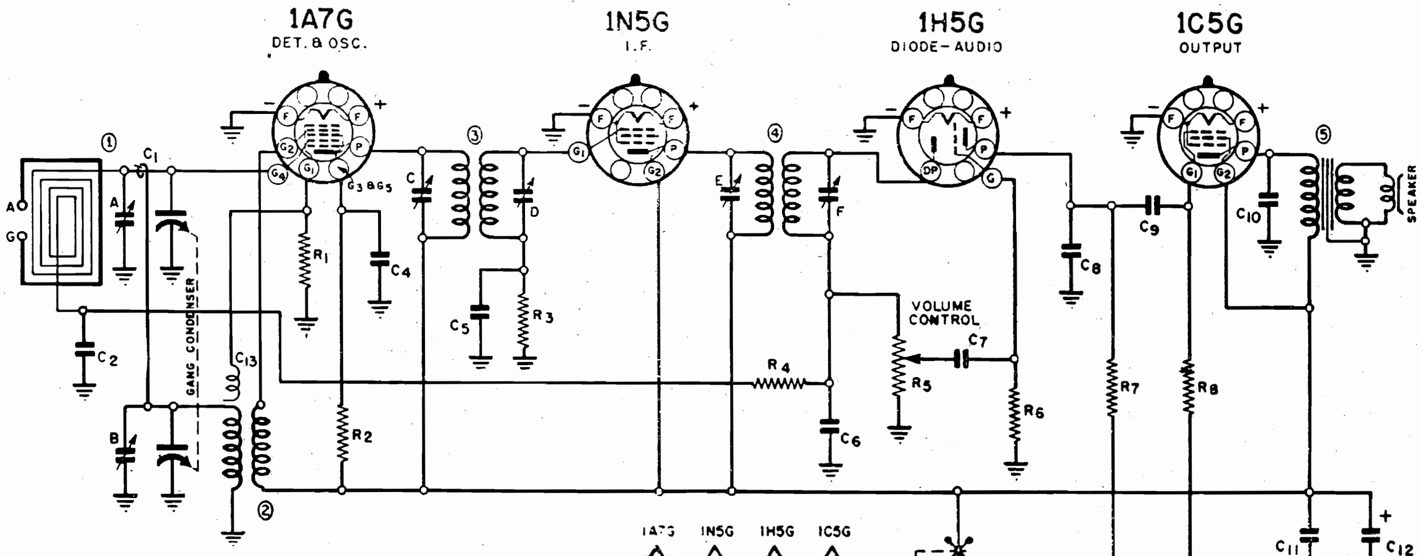
SERVICE

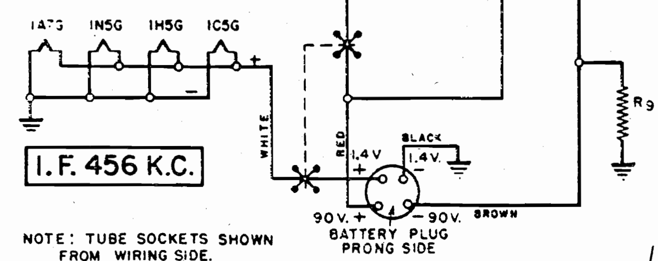
As the phonograph motor is the only moving part it is the only part of your record player that will require any attention.

A little oil applied to the motor, idler and turntable bearings about once every three months will suffice.

Chassis XL

SONORA RADIO & TELEV., CORP.





I. F. 456 K.C.

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

DIAG. NO.	PART NO.	DESCRIPTION
R1	N-1377	.2 MEGOHM 20% .5W.
R2	N-1353	50,000 OHM 10% "
R3	N-1378	2 MEGOHM 20% "
R4	N-1262	1 MEGOHM " "
R5	N-1504	.5 MEG. VOLUME CONT.
R6	N-1378	2 MEGOHM 20% .5W
R7	N-1262	1 MEGOHM " "
R8	N- "	" "
R9	N-1379	550 OHM 10% "
C1	——	GIMMIC
C2	N-1345	.05 MFD 200 V.
C4	N-1345	.05 MFD. 200 V.
C5	N-1376	.02 MFD. 400 V.
C6	N-1343	250 MMFD. 20%
C7	N-1344	.01 MFD. 400 V.
C8	N-1374	100 MMFD. 20%
C9	N-1344	.01 MFD 400 V.
C10	N-1347	.006 MFD. 600 V.
C11	N-1351	.10 MFD. 200 V.
C12	N-1367	6 MFD. ELECTROLYTIC
C13	-	CAPACITY INCLUDED IN OSCILLATOR COIL.
1	N-1508	LOOP ANTENNA
2	N-1532	OSCILLATOR COIL
3	N-1391	1ST I.F. TRANS.
4	N-1509	2ND I.F. TRANS.
5	N-1507	5" P.M. SPKR. & TRANS.
	N-1499	GANG CONDENSER
	N-1510	BATTERY CABLE

STANDARD BROADCAST BAND. 535 to 1612 Kilocycles.

POLICE STATIONS. 1612 to 1712 Kilocycles.

FIRE ALARM. 1628 and 1632 Kilocycles.

ALIGNMENT PROCEDURE

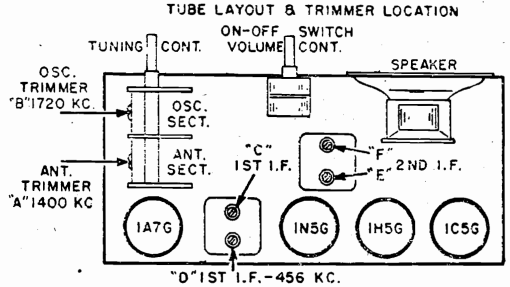
GENERAL DATA. The alignment of this receiver requires the use of a test oscillator that will cover the frequencies of 456, 600, 1400 and 1720 KC and an output meter to be connected across the primary or secondary of the output transformers. If possible, all alignments should be made with the volume control 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.) stages should be aligned properly as the first step. After the I.F transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (1A7G) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND ALIGNMENT. Connect the antenna terminal to the generator through a 200 MMF dummy and the ground terminal to the generator ground. Set the dial and generator at 1720 KC (gang at minimum capacity). Align the BC oscillator trimmer for maximum output. Set the test oscillator at 1400 KC and tune in the signal with the dial and adjust the antenna trimmer for maximum output. Check the sensitivity at 600 to determine if the gang or the coils have been damaged.

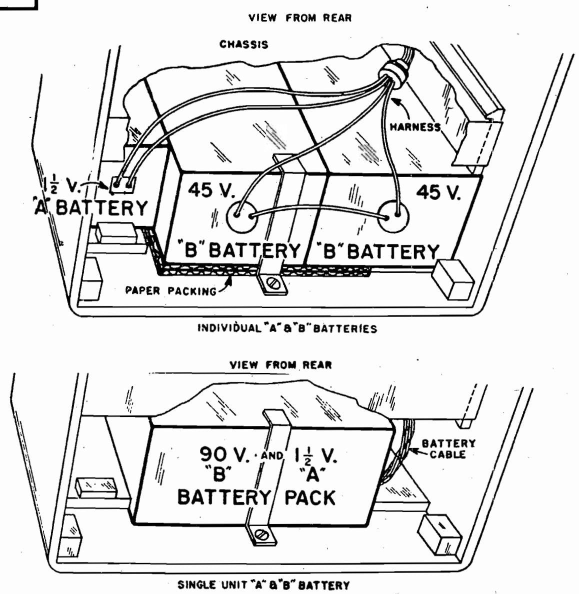
TUBE LAYOUT & TRIMMER LOCATION



PORTABLE
4 TUBE - $1\frac{1}{2}$ VOLT
SUPERHETERODYNE
SINGLE BAND

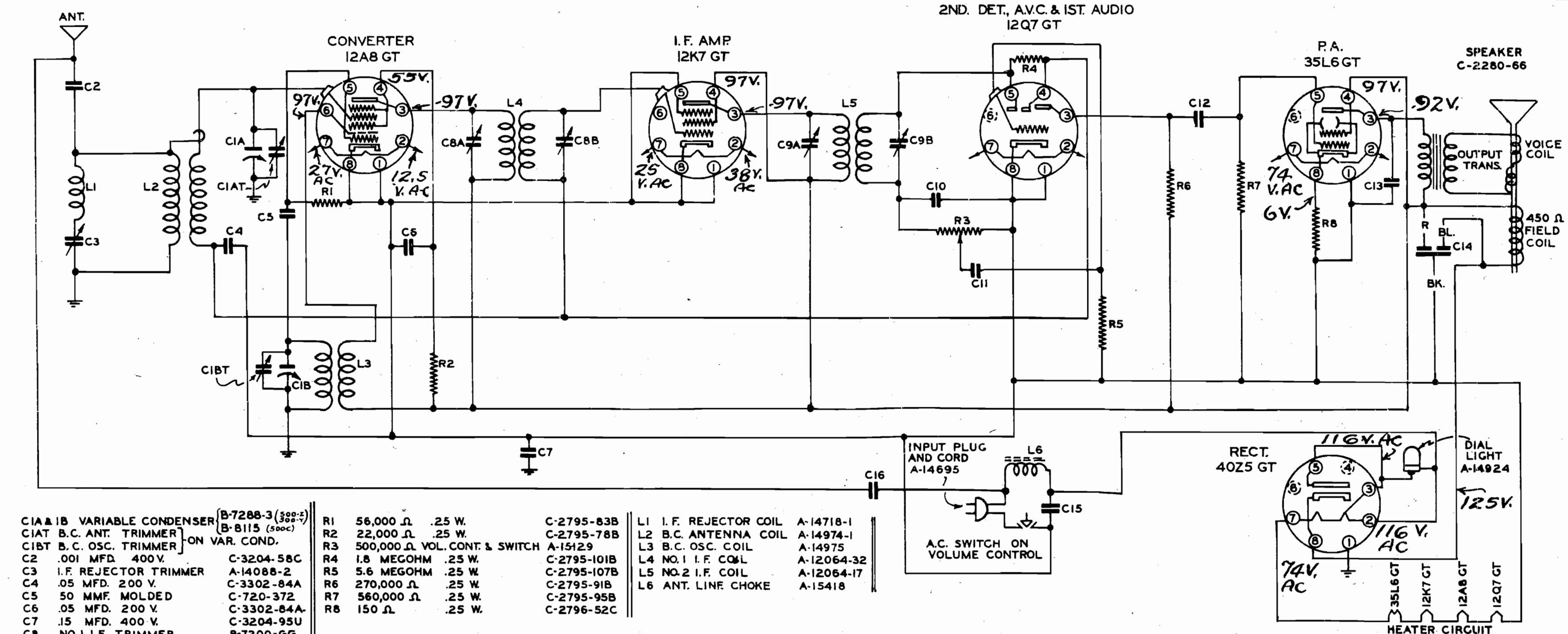
DRWN. F.L.C. APP. [signature] 1-24-39

XL



SPARKS WITHINGTON CO.

MODELS 500CB, 500CG, 500CR, 500Y, 500Z



C1A & 1B	VARIABLE CONDENSER	B-7288-3 (500-Z, 500-Y); B-8115 (500C)	
C1AT	B.C. ANT. TRIMMER	ON VAR. COND.	
C1BT	B.C. OSC. TRIMMER	ON VAR. COND.	
C2	.001 MFD. 400 V.	C-3204-58C	
C3	I.F. REJECTOR TRIMMER	A-14088-2	
C4	.05 MFD. 200 V.	C-3302-84A	
C5	50 MMF. MOLDED	C-720-372	
C6	.05 MFD. 200 V.	C-3302-84A	
C7	.15 MFD. 400 V.	C-3204-95U	
C8	NO. 1 I.F. TRIMMER	B-7200-GG	
C9	NO. 2 I.F. TRIMMER	B-7200-GN	
C10	500 MMF. MOLDED	C-720-316	
C11	.01 MFD. 200 V.	C-3302-20A	
C12	.01 MFD. 200 V.	C-3302-20C	
C13	.03 MFD. 400 V.	C-3304-80A	
C14	25-25 MFD. ELECT.	A-15124-1	
C15	.01 MFD. 400 V.	C-3304-20A	
C16	250 MMF. MOLDED	C-720-324	

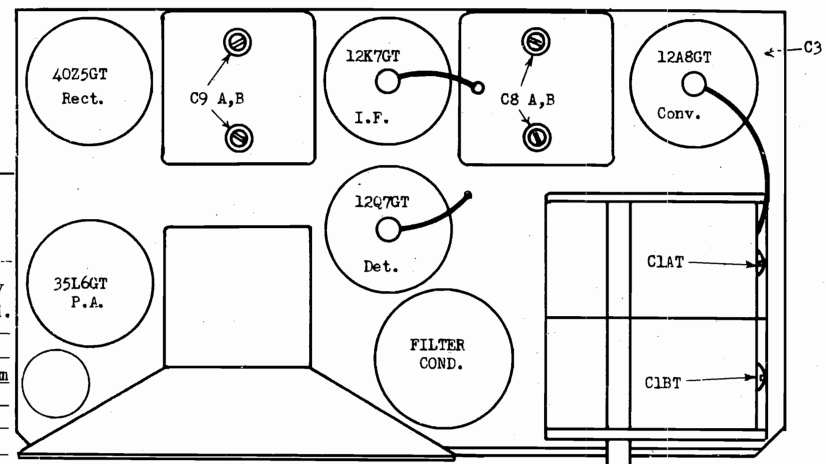
R1	56,000 Ω	.25 W.	C-2795-83B
R2	22,000 Ω	.25 W.	C-2795-78B
R3	500,000 Ω	VOL. CONT. & SWITCH	A-15129
R4	1.8 MEGOHM	.25 W.	C-2795-101B
R5	5.6 MEGOHM	.25 W.	C-2795-107B
R6	270,000 Ω	.25 W.	C-2795-91B
R7	560,000 Ω	.25 W.	C-2795-95B
R8	150 Ω	.25 W.	C-2796-52C

L1	I.F. REJECTOR COIL	A-14718-1
L2	B.C. ANTENNA COIL	A-14974-1
L3	B.C. OSC. COIL	A-14975
L4	NO. 1 I.F. COIL	A-12064-32
L5	NO. 2 I.F. COIL	A-12064-17
L6	ANT. LINE CHOKE	A-15418

SPARTON SUPERHETERODYNE MODEL 500-C, 500-Y, 500-Z
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS

December 28, 1939

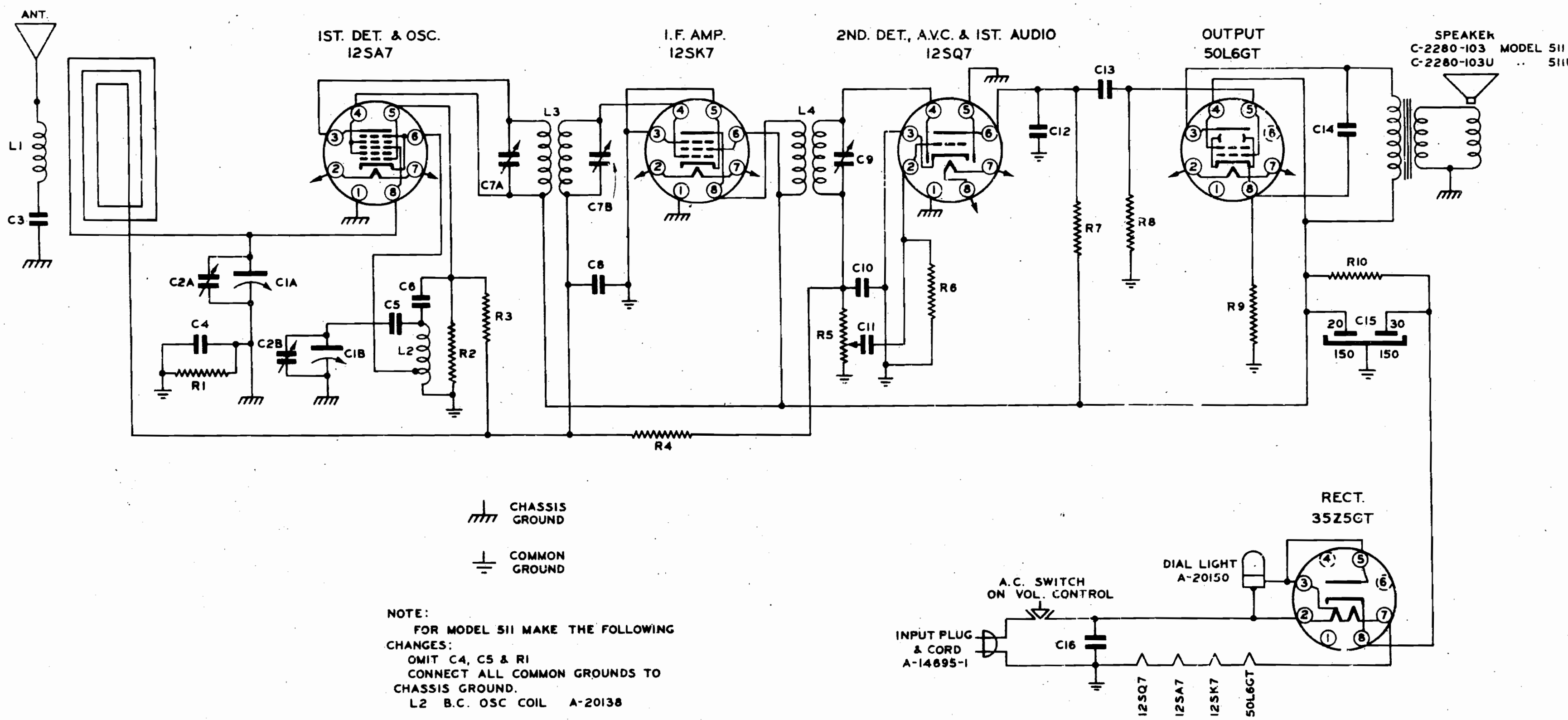


ALIGNMENT CHART

ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
Set pointer 3/16 inch from right-hand end of guide plate opening with condenser plates fully meshed.							
I.F.	12A8GT Grid Cap	200 mmf.	456KC	BC	Open	C9 A&B	2nd. I.F.
						C8 A&B	1st. I.F.
Rejector	Ant.	200 mmf.	456KC	BC	Closed	C3	Adjust to minimum
Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C1BT OSC.	Peak at max.
						C1AT	Peak at max.
(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)							
(Check operations 1 to 5 inclusive)							

SPARKS WITHINGTON CO.

SCHEMATIC DIACRAM
SPARTON SUPERHETERODYNE MODEL 511U & 511 (SEE NOTE)
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



NOTE:
FOR MODEL 511 MAKE THE FOLLOWING CHANGES:
OMIT C4, C5 & R1
CONNECT ALL COMMON GROUNDS TO CHASSIS GROUND.
L2 B.C. OSC COIL A-20138

C1A&B	VARIABLE CONDENSER	A-20158
C2A&B	TRIMMERS ON VARIABLE	
C3	.001 MFD. 600V.	C 3206-58C
C4	.2 MFD. 200V.	C-3202-98C
C5	.02 MFD. 200V.	C-3202-78C
C6	50 MMF. MICA	C-720-315
C7A&B	NO.1 I.F. TRIMMERS	
C8	.05 MFD. 200V.	C-3202-84C

C9	NO.2 I.F. TRIMMER	
C10	250 MMF. MICA	C-720-324
C11	.01 MFD. 400V.	C-3204-76C
C12	500 MMF. MICA	C-720-316
C13	.002 MFD. 600V.	C-3206-60C
C14	.01 MFD. 400V.	C-3204-76C
C15	20-30 MFD. ELECT.	A-20135
C16	.05 MFD. 400V.	C-3204-84C

R1	150,000 Ω	.5W.	C-2796-26C
R2	20,000 Ω	.5W.	C-2796-190C
R3	15 MEGOHM	.5W.	A-20136
R4	2 MEGOHM	.5W.	C-2796-238C
R5	500,000 Ω	V.C. & SW.	A-20137
R6	5 MEGOHM	.5W.	C-2796-248C
R7	250,000 Ω	.5W.	C-2796-216C
R8	500,000 Ω	.5W.	C-2796-94C
R9	150 Ω	.5W.	C-2796-52C
R10	1000 Ω	1W.	C-2797-13B

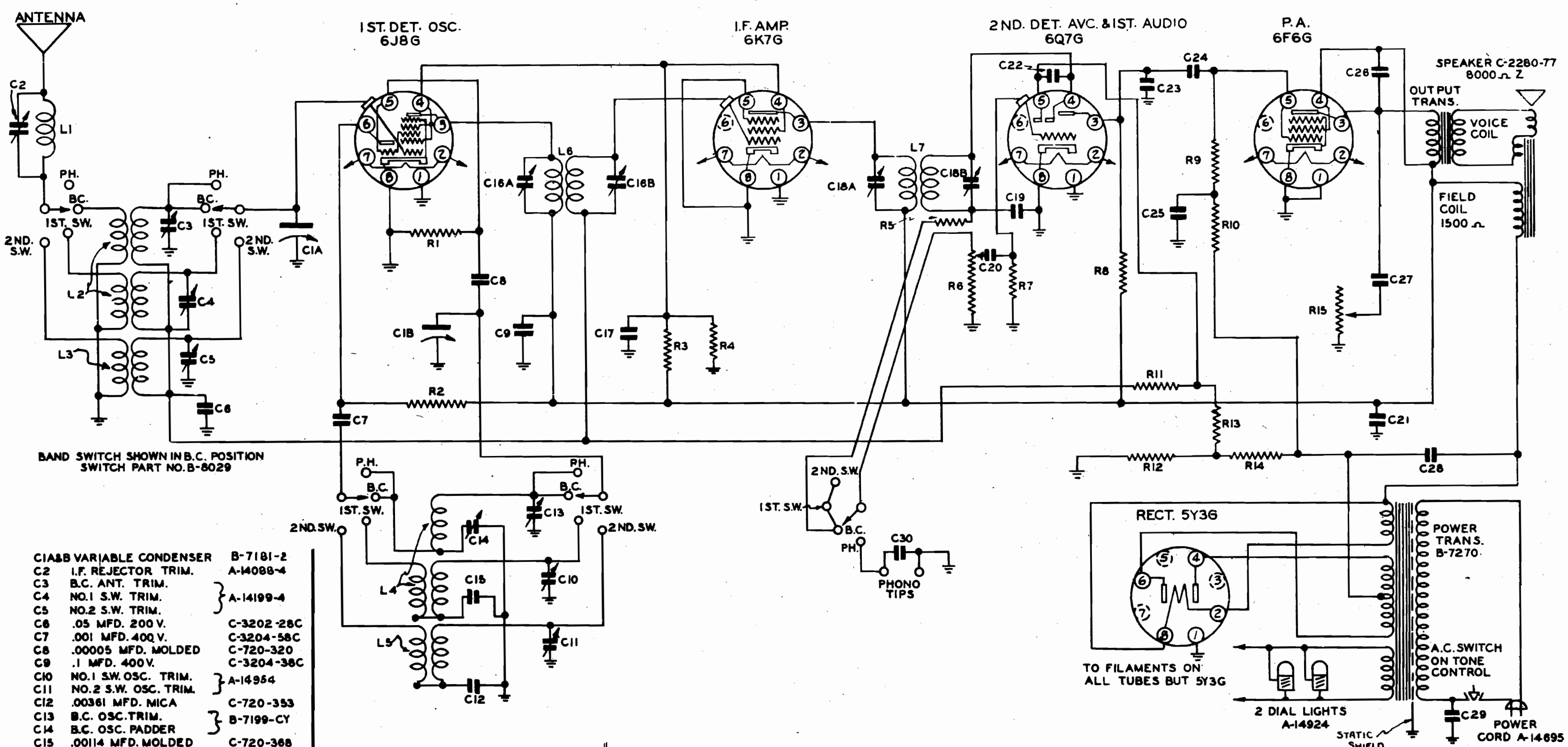
L1	LOOP ANTENNA	A-20159
L2	B.C. OSC. COIL	A-20138-U
L3	NO.1 I.F. COIL	A-20139
L4	NO.2 I.F. COIL	A-20140

SPARKS WITHINGTON CO.

MODEL 541SX

SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 541 SX
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEWS OF ALL SOCKET CONNECTIONS



C1A&B	VARIABLE CONDENSER	B-7181-2
C2	I.F. REJECTOR TRIM.	A-14088-4
C3	B.C. ANT. TRIM.	A-14199-4
C4	NO.1 S.W. TRIM.	A-14199-4
C5	NO.2 S.W. TRIM.	A-14199-4
C6	.05 MFD. 200 V.	C-3202-28C
C7	.001 MFD. 400 V.	C-3204-58C
C8	.00005 MFD. MOLDED	C-720-320
C9	.1 MFD. 400 V.	C-3204-38C
C10	NO.1 S.W. OSC. TRIM.	A-14954
C11	NO.2 S.W. OSC. TRIM.	A-14954
C12	.00361 MFD. MICA	C-720-353
C13	B.C. OSC. TRIM.	B-7199-CY
C14	B.C. OSC. PADDER	B-7199-CY
C15	.00114 MFD. MOLDED	C-720-368
C16A&B	NO1 I.F. TRIM.	B-7200-GG
C17	.1 MFD. 400 V.	C-3204-38C
C18A&B	NO.2 I.F. TRIM.	B-7200-GN.
C19	.00025 MFD. MOLDED	C-720-319
C20	.05 MFD. 200 V.	C-3202-28C
C21	30 MFD. 300 V. ELECT.	A-14072-A
C22	.0001 MFD. MOLDED	C-720-318
C23	.00025 MFD. MOLDED	C-720-319
C24	.05 MFD. 400 V.	C-3204-84C
C25	.1 MFD. 200 V.	C-3202-38C
C26	.006 MFD. 600V.	C-3206-68C
C27	.03 MFD. 600 V.	C-3206-80C
C28	16 MFD. 450 V. ELECT.	A-14073-A
C29	.006 MFD. 600 V.	C-3206-12C
C30	.003 MFD. 200 V.	C-3202-62C

R-1	56000 Ω .25 W.	C-2795-83B
R2	22000 Ω .5 W.	C-2796-78C
R3	24000 Ω 2 W.	C-2798-192A
R4	27000 Ω 1 W.	C-2797-79B
R5	27000 Ω .25 W.	C-2795-79B
R6	5 MEG. VOL. CONTROL	A-15130
R7	5.6 MEG. .25 W.	C-2795-107B
R8	270000 Ω .25 W.	C-2795-91B
R9	270000 Ω .25 W.	C-2795-91B
R10	270000 Ω .25 W.	C-2795-91B
R11	1 MEGOHM .25 W.	C-2795-98B
R12	82 Ω .25 W.	C-2795-133B
R13	1 MEGOHM .25 W.	C-2795-98B
R14	220 Ω 1 W.	C-2797-143B
R15	1 MEG. TONE CONTROL	A-15131

L1	I.F. REJECTOR COIL	A-14677
L2	B.C. & 1ST. S.W. ANT. COIL	A-14209-6
L3	2ND. S.W. ANT. COIL	A-14879-1
L4	B.C. & 1ST. S.W. OSC. COIL	A-14213-6
L5	2ND. S.W. OSC. COIL	A-14880-1
L6	NO.1 I.F. COIL	A-12064-29
L7	NO.2 I.F. COIL	A-12064-30

Power Transformer (All voltage) B-6775-25-4
25 Cycle
Power Transformer (All voltage) B-7270
50 Cycle
Power Transformer 115 volts B-8129
50 Cycle

January 2, 1940

MODEL 541SX

SPARKS WITHINGTON CO.

541-SX

VOLTAGE CHART

Line Voltage: 112 volts
Power Transformer Tap: 95-115

Position of Volume Control: Full with Ant. Disconnected
Position of Band Selector Switch: Broadcast (medium-wave)

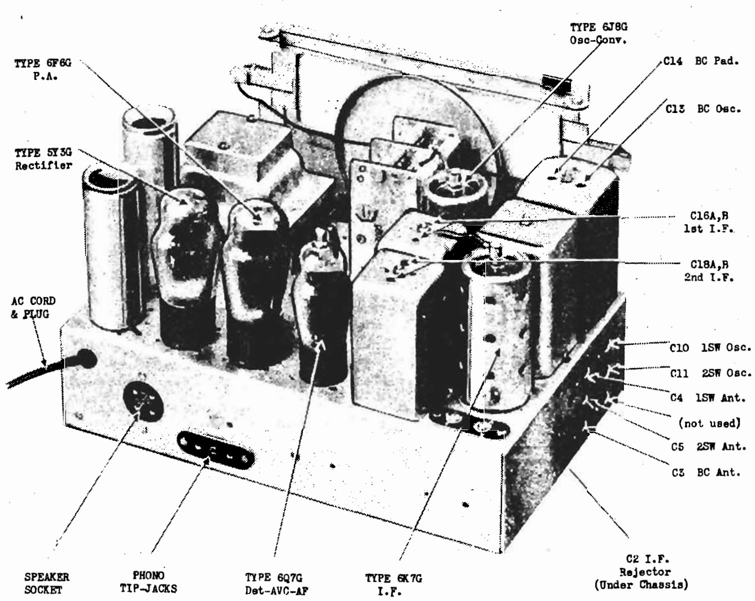
Tube	Function	Voltage of Socket Prongs to Gnd.(See Prong Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6J8G	Osc.-Conv.	0	0	250	95	-4 a	140	6.3*	0	-.3 a
6K7G	I-F Amp.	0	6.3*	250	95	0	-	0	0	-.3 a
6Q7G	Det. AVC AF	0	0	44 b	-1.5	-1.5	-.3 a	6.3*	0	-.2 a
6F6G	Power Amp.	0	0	230	250	-.4 a	-.6 a	6.3*	0	-
5Y3G	Rectifier	0	330	-	340*	-	340*	-	330	-

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts. a: 0-5 volt scale. b: 0-100 volt scale.

ALIGNMENT

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial pointer to last mark at end of scale with tuning condenser closed)							
2	I.F.	6J8G Grid	.1 mf.	456 KC	BC	Open	C18 A,B	2nd I.F.
							C16 A,B	1st I.F.
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1400 KC	BC	1400 KC	C13 Osc.	
							C3 Ant.	
5				600 KC	BC	600 KC	C14 Pad	Rock dial for peak adj.
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC, 1400 KC)							
8	1st SW Band	Ant.	*	7. MC	1 SW	7. MC	C10 Osc.	
							C4 Ant.	
9	(Check calibration and sensitivity at 2.5 MC, 4. MC and 7. MC)							
10	2nd SW Band	Ant.	*	22. MC	2 SW	22. MC	C11 Osc.	
							C5 Ant.	Rock dial for peak adj.
11	(Check calibration and sensitivity at 8. MC, 15. MC and 22. MC)							

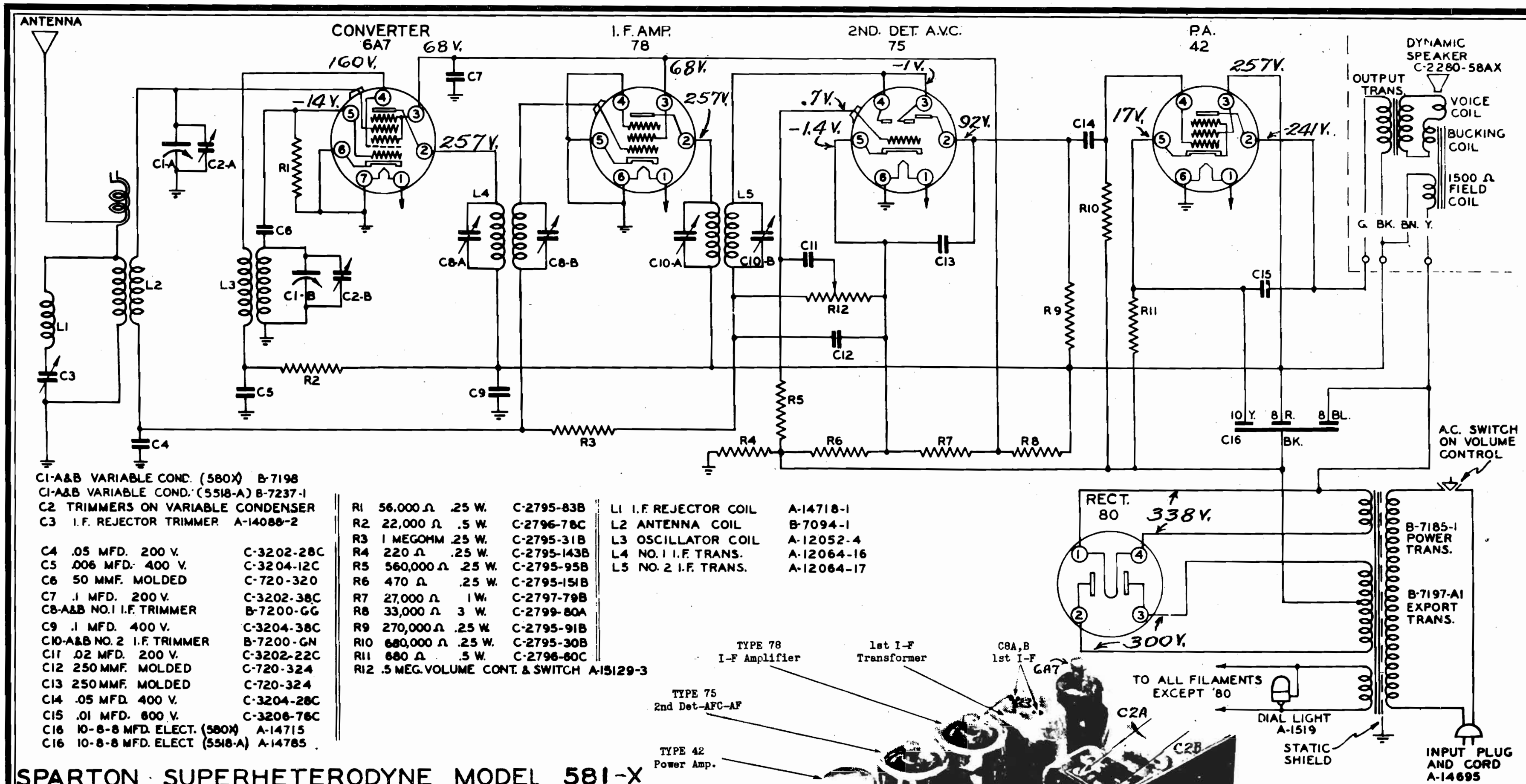
* Use 200 mmf. condenser and 100 ohm non-inductive resistor in series.



CHASSIS ILLUSTRATION

SPARKS-WITHINGTON CO.

MODEL 581X

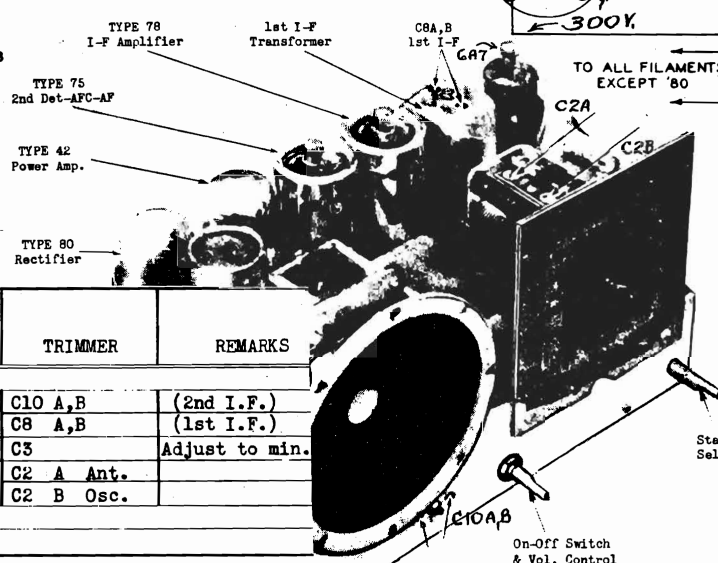


C1-A&B VARIABLE COND. (580X) B-7198
C1-A&B VARIABLE COND. (5518-A) B-7237-1
C2 TRIMMERS ON VARIABLE CONDENSER
C3 I.F. REJECTOR TRIMMER A-14086-2

C4	.05 MFD. 200 V.	C-3202-28C
C5	.006 MFD. 400 V.	C-3204-12C
C6	50 MMF. MOLDED	C-720-320
C7	.1 MFD. 200 V.	C-3202-38C
C8-A&B	NO.1 I.F. TRIMMER	B-7200-GG
C9	.1 MFD. 400 V.	C-3204-38C
C10-A&B	NO.2 I.F. TRIMMER	B-7200-GN
C11	.02 MFD. 200 V.	C-3202-22C
C12	250 MMF. MOLDED	C-720-324
C13	250 MMF. MOLDED	C-720-324
C14	.05 MFD. 400 V.	C-3204-28C
C15	.01 MFD. 600 V.	C-3206-76C
C16	10-8-8 MFD. ELECT. (580X)	A-14715
C16	10-8-8 MFD. ELECT. (5518-A)	A-14785

R1	56,000 Ω	.25 W.	C-2795-83B
R2	22,000 Ω	.5 W.	C-2796-78C
R3	1 MEGOHM	.25 W.	C-2795-31B
R4	220 Ω	.25 W.	C-2795-143B
R5	560,000 Ω	.25 W.	C-2795-95B
R6	470 Ω	.25 W.	C-2795-151B
R7	27,000 Ω	1 W.	C-2797-79B
R8	33,000 Ω	3 W.	C-2799-80A
R9	270,000 Ω	.25 W.	C-2795-91B
R10	680,000 Ω	.25 W.	C-2795-30B
R11	680 Ω	.5 W.	C-2796-80C
R12	.5 MEG. VOLUME CONT. & SWITCH		A-15129-3

L1	I.F. REJECTOR COIL	A-14718-1
L2	ANTENNA COIL	B-7094-1
L3	OSCILLATOR COIL	A-12052-4
L4	NO. 1 I.F. TRANS.	A-12064-16
L5	NO. 2 I.F. TRANS.	A-12064-17



SPARTON SUPERHETERODYNE MODEL 581-X
INTERMEDIATE FREQUENCY 456 K.C.

TOP VIEW OF ALL SOCKET CONNECTIONS

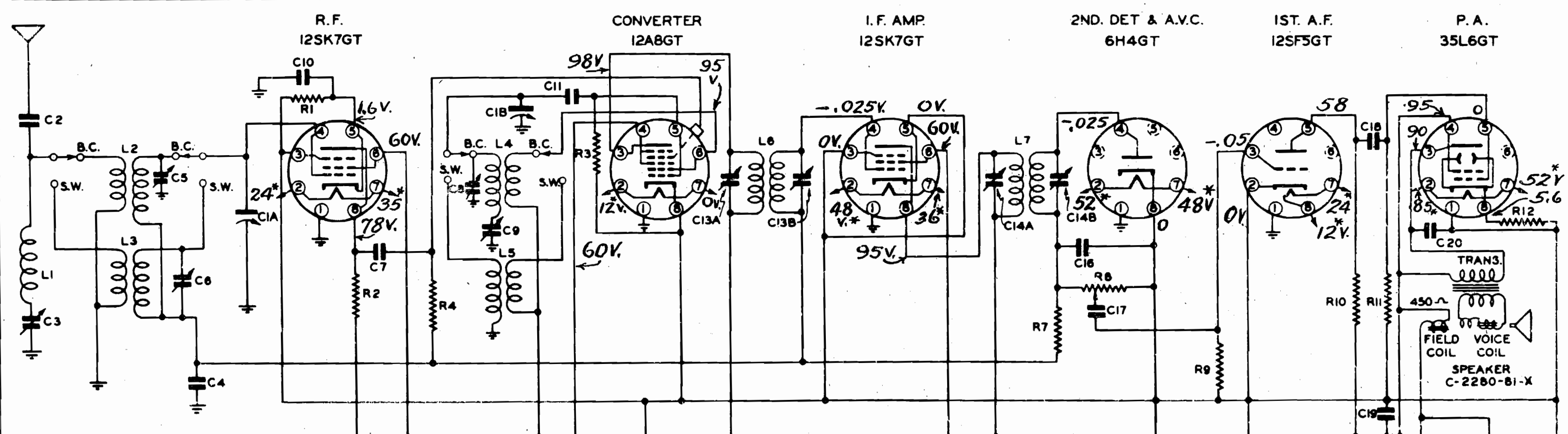
July 18, 1940

ALIGNMENT

ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
(Set dial pointer to end of scale with condenser gang closed)						
I.F.	6A7 Grid	.1 mf.	456	Closed	C10 A,B C8 A,B	(2nd I.F.) (1st I.F.)
Rejector	Ant.	150 mmf.	456	Closed	C3	Adjust to min.
Broadcast Band	Ant.	150 mmf.	1500	1500	C2 A Ant. C2 B Osc.	
(Check for dial reading and sensitivity at 600 kc., 1000 kc.)						
(Check operations 1 to 5 inclusive)						

MODEL 711X

SPARKS WITHINGTON CO.



WAVE BAND SWITCH A-15122-5
SHOWN IN B.C. POSITION.

C1A&B	VARIABLE CONDENSER	B 5181
C2	.001 MFD. 400V.	C-3204-58C
C3	I.F. REJECT. TRIMMER	A-14088-2
C4	.05 MFD. 200V.	C-3202-84C
C5	B.C. ANT. TRIMMER	A-14088-1
C6	S.W. ANT. TRIMMER	A-14088-1
C7	100 MMF. MICA	C-720-339
C8	B.C. OSC. TRIMMER	A-15573
C9	B.C. OSC. PADDER	A-15573
C10	.01 MFD. 200V.	C-3202-20C
C11	50 MMF. MICA	C-720-372
C12	.15 MFD. 400V.	C-3204-95C
C13A&B	NO.1 I.F. TRIM.	B-7200-GG
C14A&B	NO.2 I.F. TRIM.	B-7200-GN.
C15	.05 MFD. 200V.	C-3202-84C
C16	500 MMF. MICA	C-720-318
C17	.01 MFD. 200V.	C-3202-20C
C18	.01 MFD. 200V.	C-3202-20C
C19	.1 MFD. 200V.	C-3202-38C
C20	.03 MFD. 400V.	C-3204-80C
C21	25-25 MFD. ELECT.	A-15571
C22	.01 MFD. 400V.	C-3204-20C

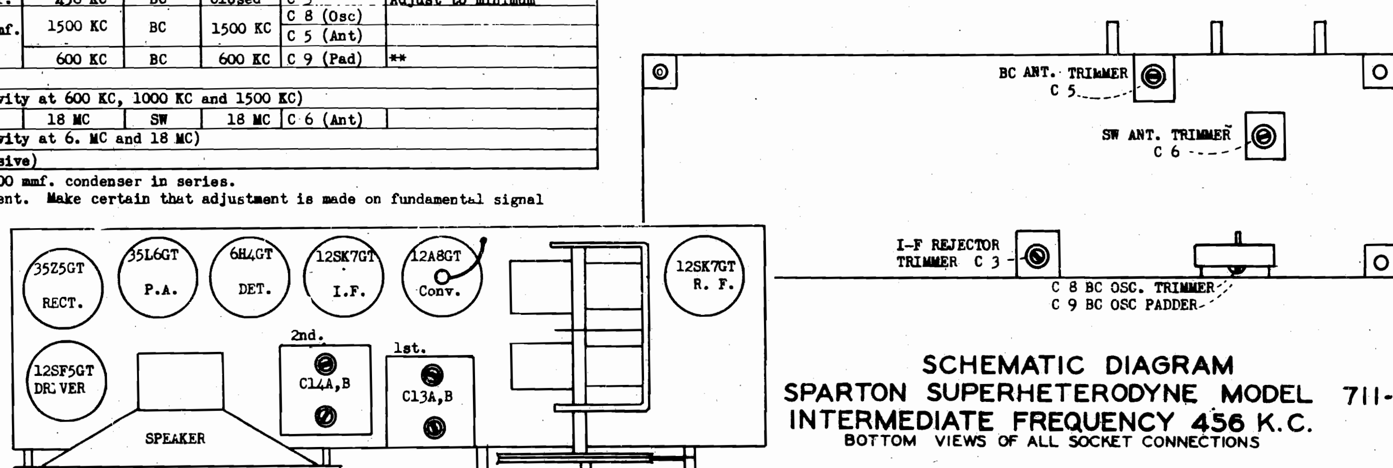
R1	470 Ω .25W.	C-2795-151B
R2	3900 Ω .25W.	C-2795-69B
R3	56,000 Ω .25W.	C-2795-83B
R4	56,000 Ω .25W.	C-2795-83B
R5	3300 Ω 5W.	C-2798-68C
R6	10,000 Ω .5W.	C-2796-74C
R7	1 MEGOHM .25W.	C-2795-98B
R8	500,000 Ω VOL. CONT. & SWITCH	A-15129-1
R9	5.8 MEGOHM .25W.	C-2795-107B
R10	270,000 Ω .25W.	C-2795-91B
R11	560,000 Ω .25W.	C-2795-95B
R12	180 Ω .5W.	C-2798-53C

L1	I.F. REJECTOR COIL	A-14716-1
L2	B.C. ANT. COIL	A-14974-2
L3	S.W. ANT. COIL	A-14682-9
L4	B.C. OSC. COIL	A-15232-4
L5	S.W. OSC. COIL	A-15233-4
L6	NO.1 I.F. COIL	A-12064-32
L7	NO.2 I.F. COIL	A-12064-17

ALIGNMENT CHART

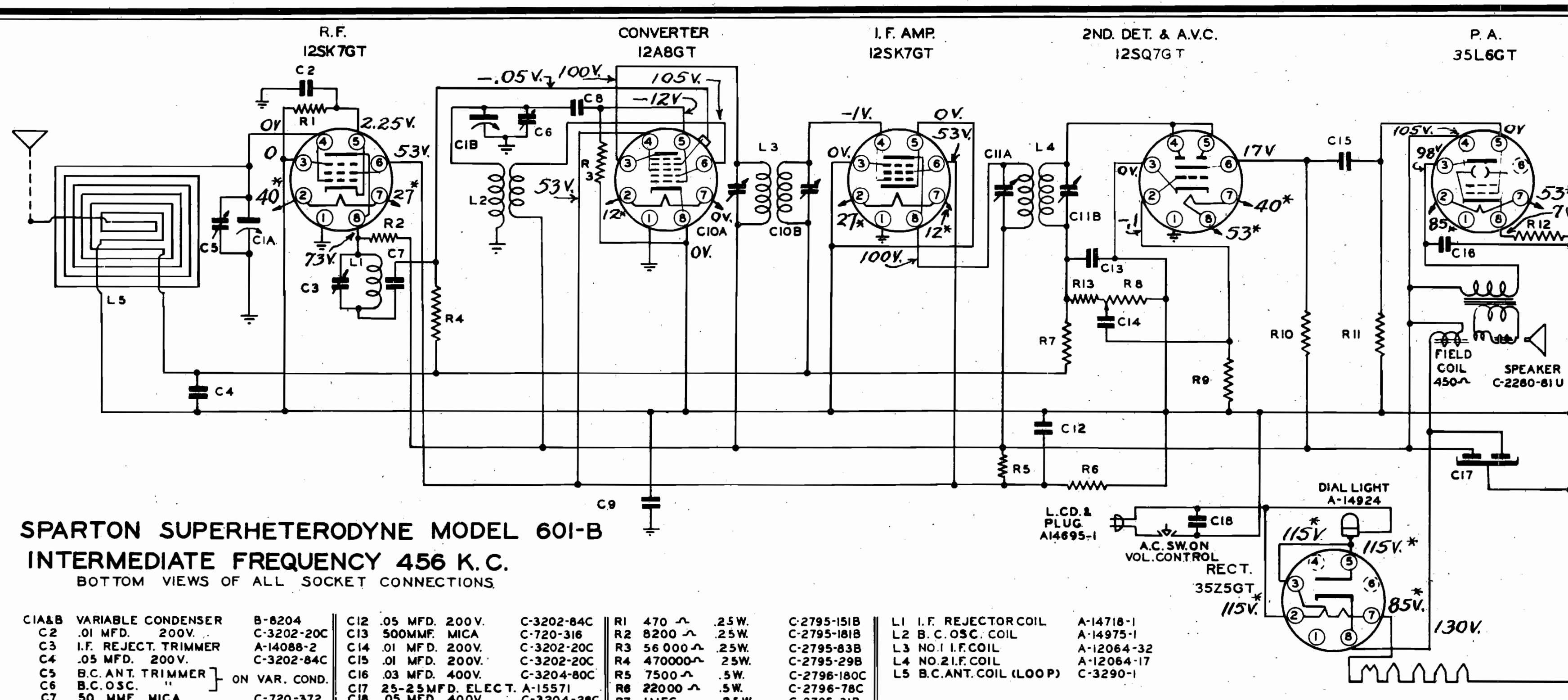
OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with horizontal dial marks with condenser gang closed)							
2	I. F.	12A8GT Grid	.1 mf.	456 KC	BC	Open	C13A,B;C14A,B	
3	Rejector	Ant.	200mmf.	456 KC	BC	Closed	C 3	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C 8 (Osc)	
							C 5 (Ant)	
5				600 KC	BC	600 KC	C 9 (Pad)	**
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	SW Band	Ant.	*	18 MC	SW	18 MC	C 6 (Ant)	
9	(Check calibration and sensitivity at 6. MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.



SCHEMATIC DIAGRAM
SPARTON SUPERHETERODYNE MODEL 711-X
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

SPARKS-WITHINGTON CO.



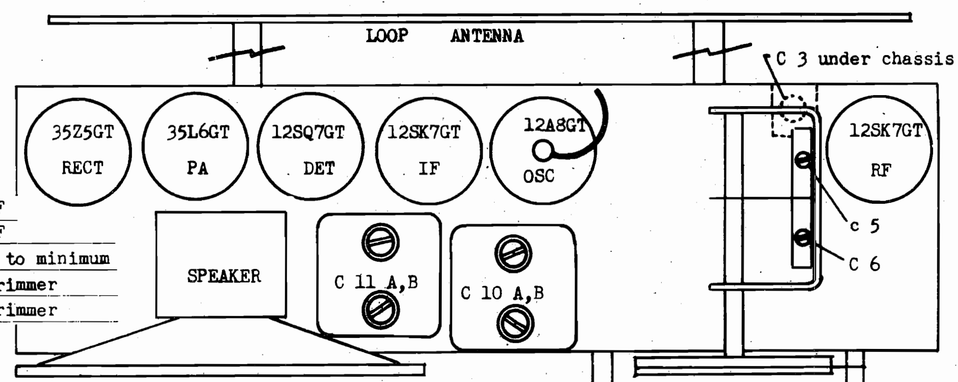
SPARTON SUPERHETERODYNE MODEL 601-B
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-8204
C2	.01 MFD. 200V.	C-3202-20C
C3	I.F. REJECT. TRIMMER	A-14088-2
C4	.05 MFD. 200V.	C-3202-84C
C5	B.C. ANT. TRIMMER } ON VAR. COND.	
C6	B.C. OSC. "	
C7	50 MMF. MICA	C-720-372
C8	50 MMF. MICA	C-720-372
C9	.15 MFD. 400V.	C-3204-95C
C10A&B	NO.1 I.F. TRIMMER	B-7200-GG
C11A&B	NO.2 I.F. TRIMMER	B-7200-GN
C12	.05 MFD. 200V.	C-3202-84C
C13	500 MMF. MICA	C-720-316
C14	.01 MFD. 200V.	C-3202-20C
C15	.01 MFD. 200V.	C-3202-20C
C16	.03 MFD. 400V.	C-3204-80C
C17	25-25 MFD. ELECT.	A-15571
C18	.05 MFD. 400V.	C-3204-28C

R1	470 Ω	.25W.	C-2795-151B
R2	8200 Ω	.25W.	C-2795-181B
R3	56000 Ω	.25W.	C-2795-83B
R4	470000 Ω	.25W.	C-2795-29B
R5	7500 Ω	.5W.	C-2796-180C
R6	22000 Ω	.5W.	C-2796-78C
R7	1 MEG.	.25W.	C-2795-31B
R8	500000 Ω VOL. CONT. & SWITCH		A-15129-7
R9	10 MEG.	.25W.	C-2795-37B
R10	270,000 Ω	.25W.	C-2795-91B
R11	560,000 Ω	.25W.	C-2795-95B
R12	180 Ω	.5W.	C-2796-141C
R13	27,000 Ω	.25W.	C-2795-79B

L1	I.F. REJECTOR COIL	A-14718-1
L2	B.C. OSC. COIL	A-14975-1
L3	NO.1 I.F. COIL	A-12064-32
L4	NO.2 I.F. COIL	A-12064-17
L5	B.C. ANT. COIL (LOOP)	C-3290-1



ALIGNMENT CHART

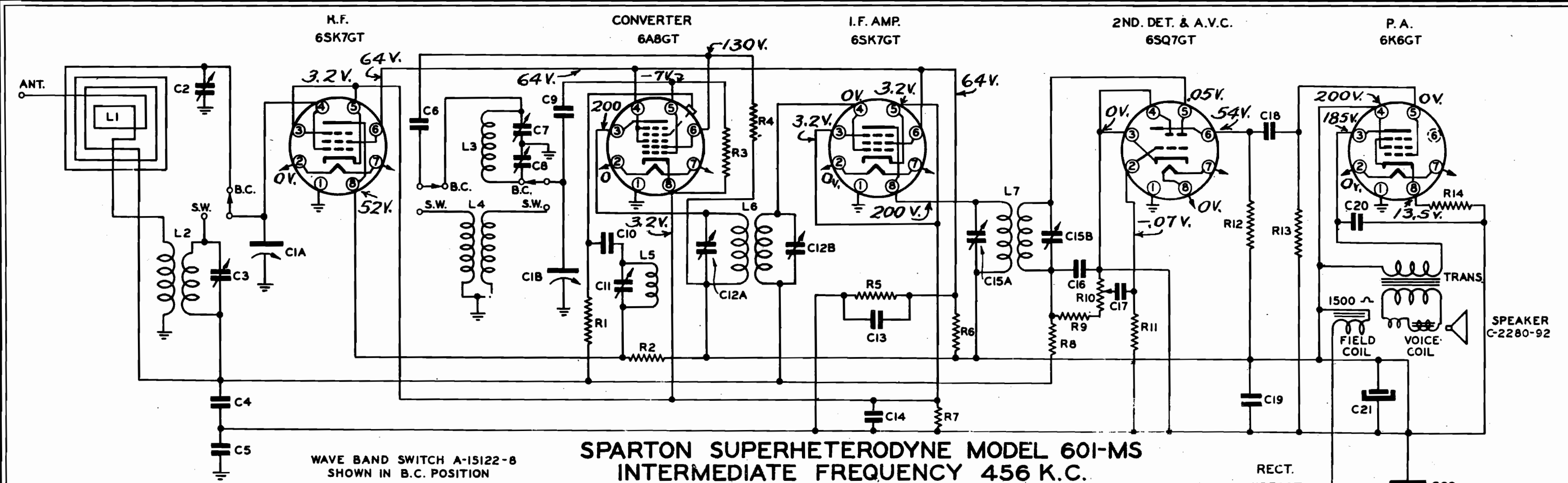
ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	
(Set pointer even with last calibration mark when condenser gang is closed.)						
I.F.	12A8GT Grid Cap	.1 mf.	456 KC	Open	C11 A & B	2nd I-F
					C10 A & B	1st I-F
Rejector	*	200 mmf.	456 KC	Closed	C3	Adjust to minimum
Broadcast Band	*	200 mmf.	1500 KC	1500 KC	C6	Osc. Trimmer
					C5	Ant. Trimmer
(Check calibration and sensitivity at 1500 KC, 1000 KC and 600 KC.)						
(Check operations 1 to 6 inclusive.)						

*Connect dummy antenna to blue wire of loop winding.

August 23, 1940

MODEL 601MS

SPARKS WITHINGTON CO.



WAVE BAND SWITCH A-15122-8 SHOWN IN B.C. POSITION

SPARTON SUPERHETERODYNE MODEL 601-MS
INTERMEDIATE FREQUENCY 456 K.C.

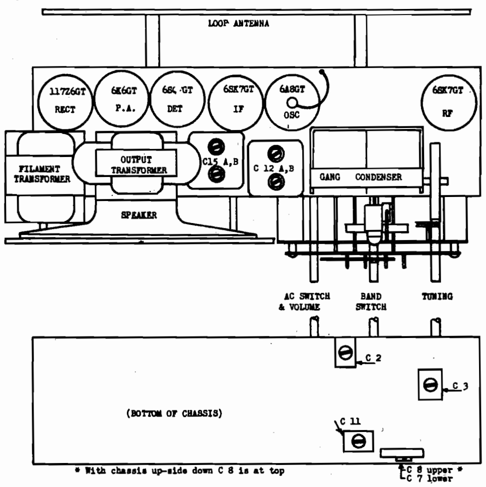
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-8189
C2	B.C. ANT. TRIMMER	A-14088-8
C3	S.W. ANT. TRIMMER	A-14088-1
C4	.05 MFD. 200V.	C-3202-28C
C5	.15 MFD. 400V.	C-3204-95C
C6	.001 MFD. 400V.	C-3204-2C
C7	B.C. OSC. TRIMMER	A-15573-1
C8	B.C. OSC. PADDER	A-15573-1
C9	50 MMF. MICA	C-720-372
C10	100 MMF. MICA	C-720-339
C11	I.F. REJECT. TRIMMER	A-14088-2
C12A&B	NO.1 I.F. TRIMMER	B-7200-GG
C13	.05 MFD. 200V.	C-3202-28C
C14	.2 MFD. 200V.	C-3202-40C
C15A&B	NO.2 I.F. TRIMMER	B-7200-GN
C16	250 MMF. MICA	C-720-324
C17	.01 MFD. 200V.	C-3202-20C
C18	.05 MFD. 400V.	C-3204-28C
C19	.1 MFD. 400V.	C-3204-38C
C20	.01 MFD. 600V.	C-3206-76C
C21	20 MFD. 300V. ELECT.	A-14782-5
C22	15 MFD. 300V. ELECT.	A-14782-4
C23	15 MFD. 300V. ELECT.	A-14782-4
C24	.01 MFD. 400V.	C-3204-20C

R1	5100 Ω .25W.	C-2795-176B
R2	33,000 Ω .25W.	C-2795-80B
R3	56,000 Ω .25W.	C-2795-201B
R4	22,000 Ω .25W.	C-2795-78B
R5	22,000 Ω .25W.	C-2795-78B
R6	20,000 Ω 1W.	C-2797-190B
R7	180 Ω .25W.	C-2795-141B
R8	1 MEGOHM .25W.	C-2795-98B
R9	47,000 Ω .25W.	C-2795-82B
R10	VOL. CONTROL & SW.	A-15129-6
R11	10 MEGOHM .25W.	C-2795-110B
R12	270,000 Ω .25W.	C-2795-91B
R13	680,000 Ω .25W.	C-2795-96B
R14	560 Ω .5W.	C-2796-153C

L1	LOOP ANTENNA	C-3290
L2	S.W. ANT. COIL	A-14682-11
L3	B.C. OSC. COIL	A-15232-5
L4	S.W. OSC. COIL	A-15233-12
L5	I.F. REJECT. COIL	A-14718-1
L6	NO.1 I.F. COIL	A-12064-32
L7	NO.2 I.F. COIL	A-12064-17

August 23, 1940



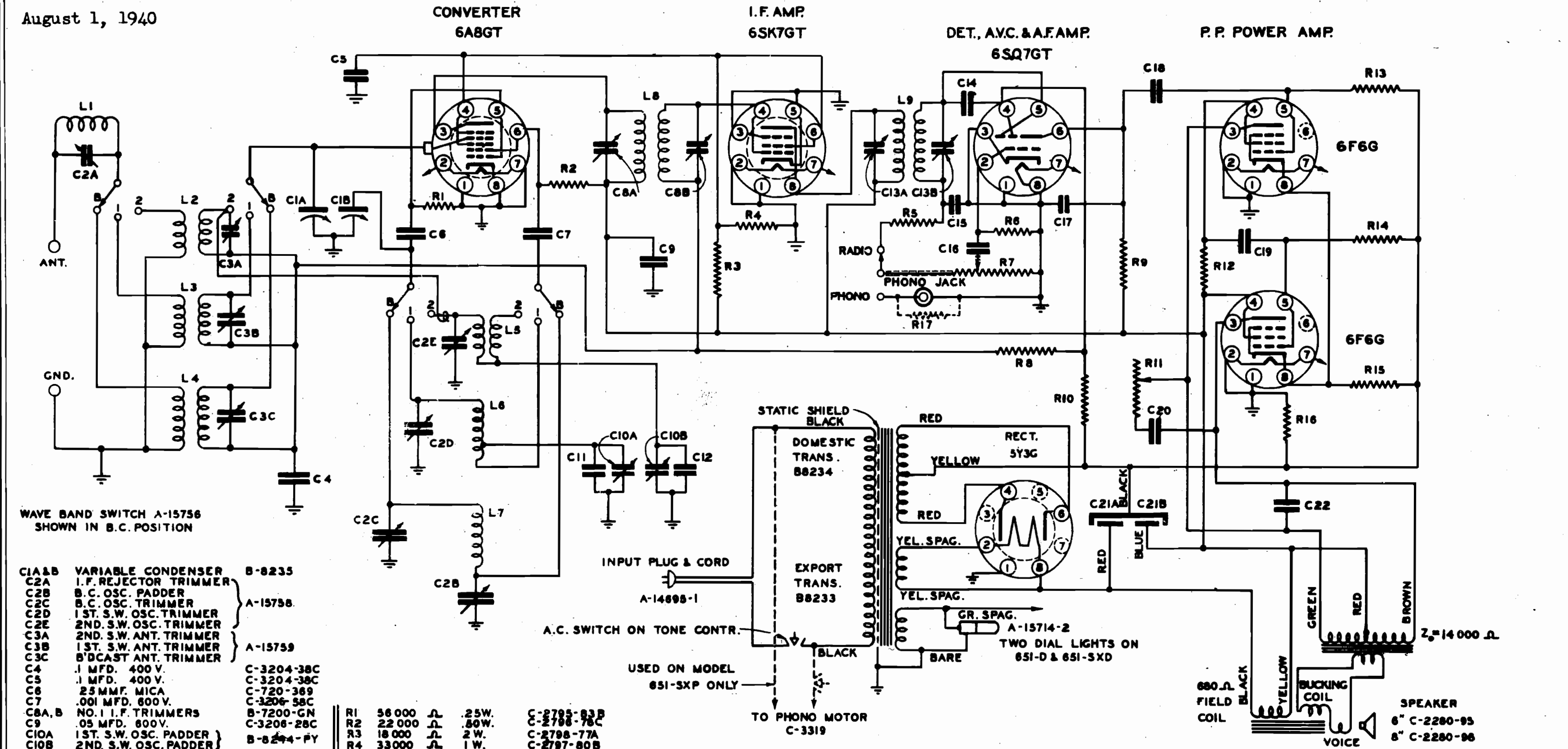
ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with last calibration mark when condenser gang is fully closed.)							
2	I. F.	6A8GT Grid Cap	.1 mf.	456 KC	BC	Open	C15 A & B	2nd I-F
							C12 A & B	1st I-F
3	Rejector	*	200 mmf.	456 KC	BC	Closed	C11	Adjust to minimum
4	Broad-cast band	*	200 mmf.	1500 KC	BC	1500 KC	C7	Osc. Trimmer
							C2	Ant. Trimmer
5				600 KC	BC	600 KC	C8	Osc. Pad.
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 1500 KC, 1000 KC and 600 KC.)							
8	SW Band	*	**	18. MC	SW	18.MC	C3	Ant. Trimmer
9	(Check calibration and sensitivity at 18. MC, 9. MC and 6 MC)							
10	(Check operation 1 to 9 inclusive.)							

Notes: *Connect dummy antenna to blue wire of loop winding.
**200 mmf. and 100 ohms in series.

SPARKS WITHINGTON CO. MODELS 651, 651D, 651-SX, 651-SXD, 651-SXP

August 1, 1940



C1A&B	VARIABLE CONDENSER	B-8235
C2A	I.F. REJECTOR TRIMMER	A-15758
C2B	B.C. OSC. PADDER	
C2C	B.C. OSC. TRIMMER	
C2D	1ST. S.W. OSC. TRIMMER	
C2E	2ND. S.W. OSC. TRIMMER	
C3A	2ND. S.W. ANT. TRIMMER	A-15759
C3B	1ST. S.W. ANT. TRIMMER	
C3C	B'DCAST ANT. TRIMMER	
C4	.1 MFD. 400 V.	C-3204-38C
C5	.1 MFD. 400 V.	C-3204-38C
C6	25 MMF. MICA	C-720-369
C7	.001 MFD. 600 V.	C-~~3206~~-58C
C8A, B	NO. 1 I.F. TRIMMERS	B-7200-GN
C9	.05 MFD. 600V.	C-3206-28C
C10A	1ST. S.W. OSC. PADDER	B-8244-PY
C10B	2ND. S.W. OSC. PADDER	
C11	1300 MMF. MICA	C-720-385
C12	3400 MMF. MICA	C-720-386
C13A, B	NO. 2 I.F. TRIMMERS	B-7200-GN
C14	100 MMF. MICA	C-720-339
C15	250 MMF. MICA	C-720-319
C16	.01 MFD. 400V.	C-3204-132C
C17	100 MMF. MICA	C-720-339
C18	.03 MFD. 600V.	C-3206-136C
C19	.03 MFD. 600V.	C-3206-136C
C20	.03 MFD. 800V.	C-3208-136C
C21A	15 MFD. 450V. ELECT.	A-15755
C21B	30 MFD. 300V. ELECT.	
C22	.003 MFD. 800V.	C-3208-118C

R1	56 000 Ω	.25W.	C-2795-83B	
R2	22 000 Ω	.50W.	C-2796-76C	
R3	18 000 Ω	2 W.	C-2798-77A	
R4	33000 Ω	1 W.	C-2797-80B	
R5	56000 Ω	.25W.	C-2795-83B	
R6	10 MEG.	.25W.	C-2795-110B	
R7	.5 MEG. VOL. CONTROL		A-15130-4	
R8	1 MEG.	.25W.	C-2795-98B	
R9	270 000 Ω	.25W.	C-2795-91B	
R10	1 MEG.	.25W.	C-2795-98B	
R11	1 MEG. T.C. & SWITCH		A-15131-1	
R12	2700 Ω	.25W.	C-2795-169B	
R13	470000 Ω	.25W.	C-2795-223B	
R14	470000 Ω	.25W.	C-2795-223B	
R15	330 Ω	1 W.	C-2797-147B	
R15	680 Ω 1W.		C-2797-155B	ON 25 ~ RECEIVERS ONLY
R16	100 Ω .25W.		C-2795-135B	
R17	10 000 Ω	.25W.	C-2795-74B	ON MODEL 651-SXP ONLY

L1	I.F. REJECTOR COIL	A-15772
L2	2ND S.W. ANT. COIL	A-15778
L3	1ST S.W. ANT. COIL	A-15774
L4	B.C. ANT. COIL	A-14664-1
L5	2ND S.W. OSC. COIL	A-15233-14
L6	1ST S.W. OSC. COIL	A-15773
L7	B.C. OSC. COIL	A-15771
L8	NO. 1 I.F. COIL	A-12064-39
L9	NO. 2 I.F. COIL	A-12064-17

MODELS 651, 651-D, 651-SX, 651-SXD, 651-SXP
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

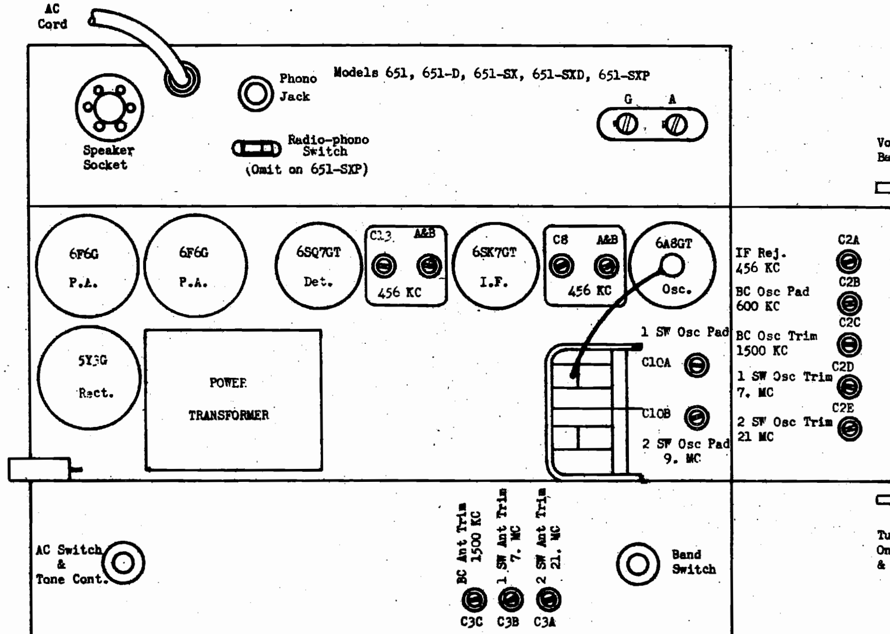
TUBE	FUNCTION Line Voltage: 117 volts	Voltage of Socket Prongs to Gnd. (See Schematic Diagram) No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid cap
6A8GT	Osc. - Converter	0	6.2*	230	82	-3	150	0	0	-.
6SK7GT	I-F Amplifier	0	0	0	-.2	0	80	6.2*	230	-
6SQ7GT	Det - AVC - 1st Audio	0	-.3	0	-.2	**	35	6.2*	0	-
6F6G	Power Amplifier	0	0	225	220	0	-3	6.2*	15	-
6F6G	Power Amplifier	0	0	225	235	0	-3	6.2*	15	-
5Y3G	Rectifier	0	320*	0	300*	0	300*	0	320*	-

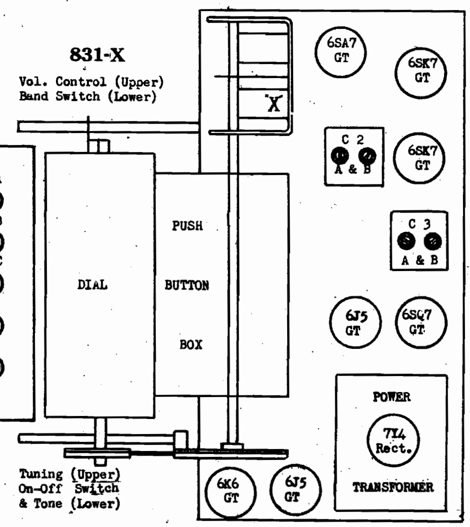
Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements.

*AC
** Cannot be measured with 1000 ohms/volt voltmeter.

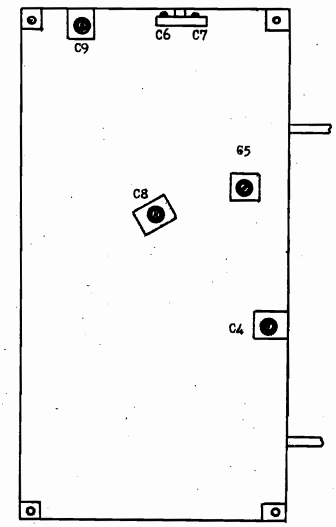
MODELS 651, 651D,
651-SX, 651-SXD, 651-SXP
MODEL 831-X

SPARKS WITHINGTON CO.





TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer even with last calibration at low frequency end of dial with gang closed.)							
2	I.F.	6A8GT Grid	.1 mf.	456 KC	BC	Open	C13 A&B C8 A&B	** **
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C2A	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C2C Osc. C3C Ant.	** **
5				600 KC		600 KC	C2B Pad.	***
6	(Repeat operation 4)							
7	1st Short-Wave Band	Ant.	*	7 MC	1 SW	7 MC	C2D Osc. C3B Ant.	** **
8				2.5 MC		2.5 MC	C10A Pad.	***
9	(Repeat operation 7)							
10	2nd Short-Wave Band	Ant.	*	21 MC	2 SW	21. MC	C2E Osc. C3A Ant.	** **
11				9. MC		9. MC	C10B Pad.	***
12	(Repeat operation 10)							
13	(Check operations 1 to 12 inclusive)							

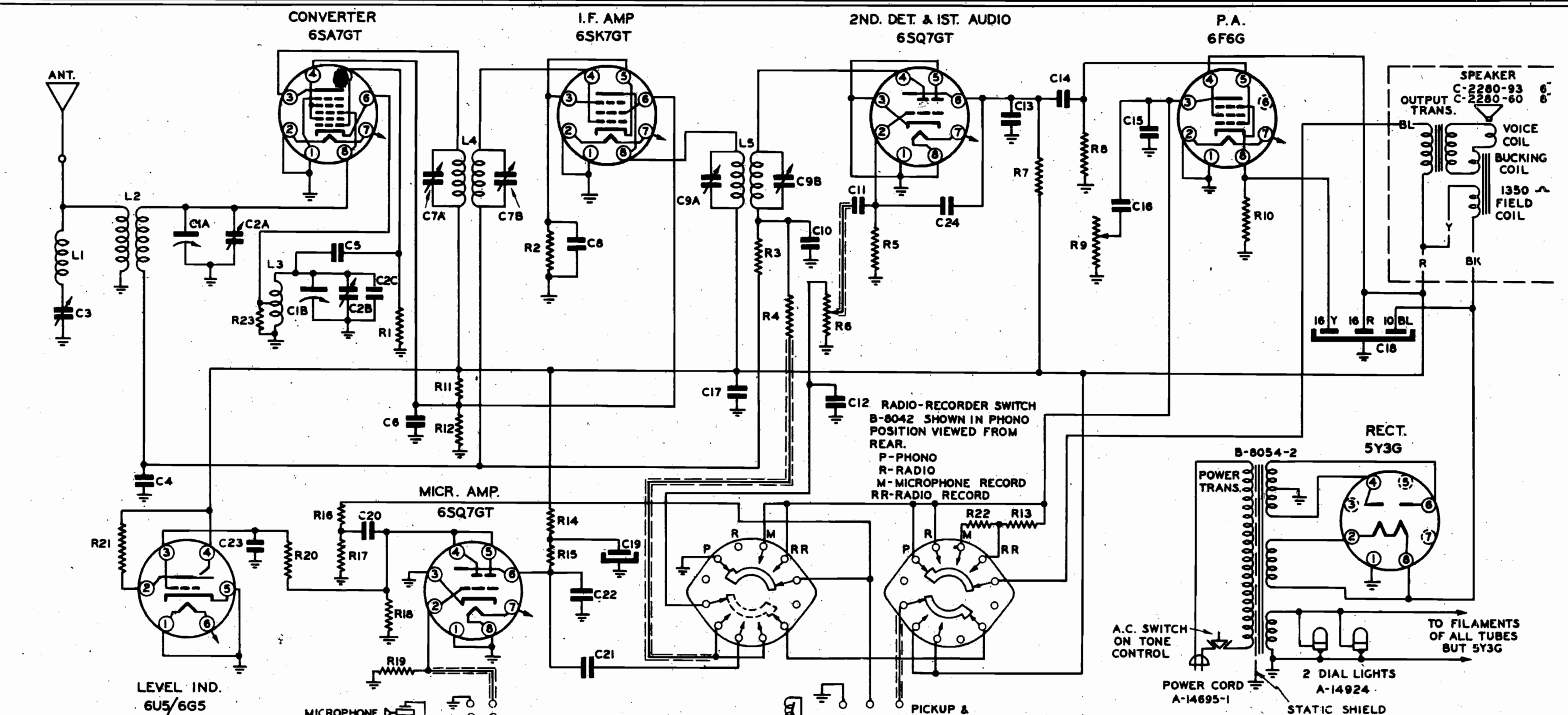
Notes: * 100 ohm non-inductive resistor and 200 mmf. condenser in series.
** Peak accurately.
*** Rock dial while making this adjustment. Adjust to fundamental signal and not to image. Peak accurately.

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark on BC scale is directly toward front of set when condenser plates are fully meshed.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C3 A&B C2 A&B	2nd I-F 1st I-F
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C6 Osc. C5 Ant.	
5				600 KC	BC	600 KC	C7 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Shortwave Band	Ant.	*	18 MC	SW	18 MC	C9 Osc. C8 Ant.	Rock dial while adjusting for maximum output
9	(Check calibration and sensitivity at 6 MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

Notes: *Connect to point "X" on Variable Condenser. See drawing below.
**100 ohm and 200 mmf. in series

SPARKS-WITHINGTON CO.



SPARTON SUPERHETERODYNE MODEL 661-RP
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-8225
C2A,B,C	TRIMMERS ON VAR. COND.	
C3	I.F. REJECT. TRIMMER	A-14088-2
C4	.05 MFD. 200 MFD	C-3202-28C
C5	50 MMF. MICA	C-720-372
C6	.05 MFD. 400 V.	C-3204-28C
C7A&B	NO. 1 I.F. TRIMMER	B-7200-GN
C8	.05 MFD. 200 V.	C-3202-28C
C9A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C10	100 MMF. MICA	C-720-339
C11	.02 MFD. 200 V.	C-3202-22C
C12	250 MMF. MICA	C-720-324
C13	100 MMF. MICA	C-720-339
C14	.02 MFD. 400 V.	C-3204-22C
C15	.003 MFD. 600 V.	C-3206-62C
C16	.03 MFD. 600 V.	C-3206-80C
C17	.05 MFD. 400 V.	C-3204-28C
C18	16-16-10 MFD. ELECT.	A-14780-2
C19	8 MFD. 250 V.	A-14782-1
C20	.01 MFD. 400 V.	C-3204-76C
C21	.02 MFD. 400 V.	C-3204-22C
C22	.01 MFD. 400 V.	C-3204-76C
C23	.01 MFD. 400 V.	C-3204-76C
C24	12 MMF. MICA	C-720-356
R1	27,000 Ω .25W.	C-2795-79B
R2	330 Ω .25W.	C-2795-56B
R3	1 MEGOHM .25W.	C-2795-98B
R4	27,000 Ω .25W.	C-2795-79B
R5	5.6 MEGOHM .25W.	C-2795-107B
R6	500,000 Ω VOL. CONT.	A-15130-5
R7	220,000 Ω .25W.	C-2795-90B
R8	560,000 Ω .25W.	C-2795-95B
R9	TONE CONTROL & SW.	A-15128
R10	470 Ω 1 W.	C-2797-58B
R11	15,000 Ω 2 W.	C-2798-76A
R12	68,000 Ω .25W.	C-2795-84B
R13	22,000 Ω 1 W.	C-2797-78B
R14	220,000 Ω .25W.	C-2795-90B
R15	100,000 Ω .25W.	C-2795-86B
R16	1.5 MEGOHM .25W.	C-2795-100B
R17	1.2 MEGOHM .25W.	C-2795-99B
R18	10 MEGOHM 25W.	C-2795-110B
R19	5.6 MEGOHM .25W.	C-2795-107B
R20	1 MEGOHM .25W.	C-2795-98B
R21	220,000 .25W.	C-2795-90B
R22	56,000 Ω .25W.	C-2795-83B
R23	330 Ω .25W.	C-2795-56B
L1	I.F. REJECT. COIL	A-14718-1
L2	B.C. ANT. COIL	A-14974-4
L3	B.C. OSC. COIL	A-15232-6
L4	NO. 1 I.F. COIL	A-12064-41
L5	NO. 2 I.F. COIL	A-12064-17

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer to last calibration mark at low end of dial with condenser gang fully closed)							
2	I. F.	Ant.	.1 mf.	456 kc	*	open	C8 A & B	2nd. I.F.
							C7 A & B	1st. I.F.
3	Rejector	Ant.	200 mmf.	456 kc	*	closed	C3	Adjust to minimum
4	Broadcast Band	Ant.	200 mmf.	1500 kc	*	1500 kc	C2B	oscillator
5				1500 kc	*	1500 kc	C2A	antenna
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 kc, 900 kc, and 1500 kc.)							

(Check operations 1 to 7 inclusive)

* "RECEIVE RADIO"

MODEL 661RP
MODEL 761

SPARKS WITHINGTON CO.

Sparton Superheterodyne Model 661-RP

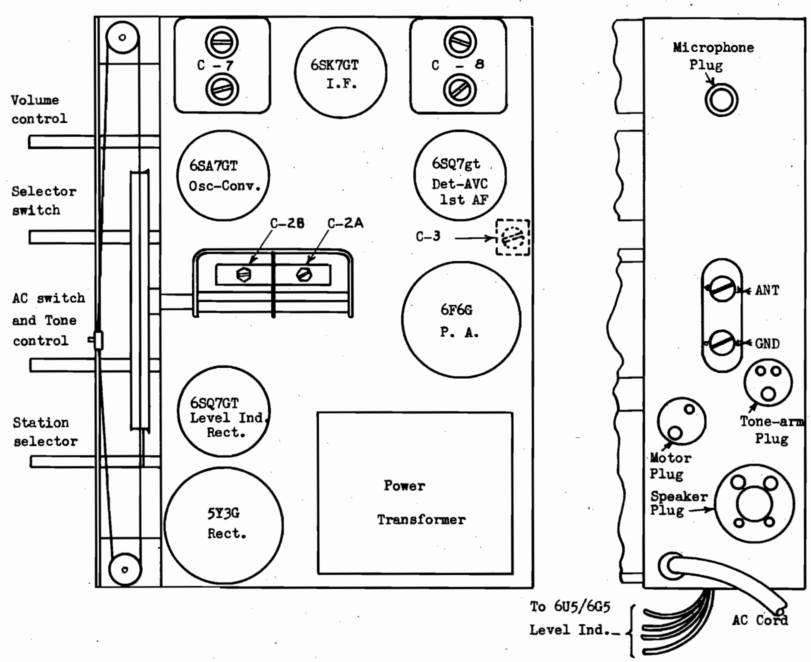
VOLTAGE CHART

Line voltage: 117 volts		Position of Volume Control; Full with Ant. disconnected. Position of Band Switch: Broadcast							
Tube	Function	Voltage of socket prongs to Gnd. (See prong no's. on diagram) No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8
6SA7GT	Oscillator-Converter	0	0	220	77	-7.2	0	6.1*	0
6SK7GT	I-f Amplifier	0	0	2.7	0	2.7	77	6.1*	220
6SQ7GT	Det-AVC-1st Audio	0	**	0	0	0	58	6.1*	0
6F6G	Power Amplifier	0	0	200	220	0	57	6.1*	15
6SQ7GT	Microphone Amplifier	0	**	0	**	**	45	6.1*	0
6U5/6G5	Record. Level Indicator	6.1*	19	0	220	0	0	-	-
5Y3G	Rectifier	0	320*	-	280*	-	280*	-	320*

Notes: Voltage readings are for schematic diagram on back of sheet. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless otherwise designated, voltages in table are + DC voltages.

* AC volts
** Cannot be measured with 1000 ohms/volt voltmeter.

Check cutting head voltage with cutting head connected using signal generator (1000 KC 30% modulated) connected to "Ant" and "Gnd". With Selector switch in "Record Radio" position, advance gain until Level Indicator (6U5/6G5 tube) closes without over-lapping. AC voltage as measured from 6F6G plate to ground (AC meter in series with .1 mf. 400 volt condenser) should be approximately 52 volts.



HOW TO ADJUST THE CUTTING HEAD

The Model 661-RP features a combination "cutting" and "play back" head on the tone arm. The adjustment is controlled by the position of a knurled screw on the side of the arm, and the correct position of the screw is very important, otherwise record discs may not be correctly cut (or played back).

Loosening the screw will allow it to be moved up or down - up for cutting records and down for playing records. The slot in which the screw travels is designed so that the screw may be tightened in several intermediate positions, as well as in the extreme up or extreme down positions. These intermediate positions actually compensate for exceptionally hard or soft discs and new or used needles.

In general, three (3) positions of the screw will take care of all grades of record hardness and sharpness of the cutting needle.

(1) With the screw midway between maximum up (cut position) and maximum down (play position) for "soft" records and new cutting needles.

(2) With the screw approximately two-thirds of the way toward "cut position" for average hardness (Presto) records and slightly used needles.

(3) With the screw up as far as possible for extremely hard records and dull needles.

NOTE: It is never good practice to use dull needles.

The screw must always be all the way "down" at "play position" when records are played.

IMPORTANT:

Don't forget to insert a cutting needle in the tonearm head when a recording is to be made, and don't forget to remove the cutting needle and insert a play-back needle before playing any type of record.

The cutting needle must be inserted correctly with the needle screw tightened firmly against the flat spot on the shank of the needle.

Play-back needles should not be used too many times or they will ruin the cut in the record and cause fuzzy distorted reproduction.

HOW TO ADJUST THE VOLUME FOR BEST RESULTS

In order to make good records there must be just the right amount of volume whether it is a radio program that is being recorded, or whether the microphone is being used.

To make it easy to tell when the volume is "just right", SPARTON Record Makers are equipped with a Level Indicator Tube which acts something like a Viso-Glo or Magic Eye Tuning Tube for radios. The circuits in the Record Makers are so arranged that the "eye" just closes without overlapping when the proper amount of volume is obtained. The volume control is used in the regular way to increase or decrease volume and the "eye" tells when the level is just right.

When a recording is being made do not attempt to turn the volume control up so that normal room volume is heard through the loud speaker.

SPARTON Engineers designed the Record Makers so that only a part of the music or speech comes through the speaker while a recording is being made, and this enables the user to know exactly what is "going on the record". This applies whether the selector switch is in the "Record Radio" position or in the "Record Microphone" position.

When recordings are being made the circuits are correctly matched for the cutting arm rather than the loud speaker. As a result, the tone volume is correct for the recording but the program will not sound natural through the loud speaker.

An important thing to remember is that the volume control should never be turned so high up that the "eye" over-laps on music or speech as this will cause "over-cutting" and spoil an otherwise good recording.

Model 761

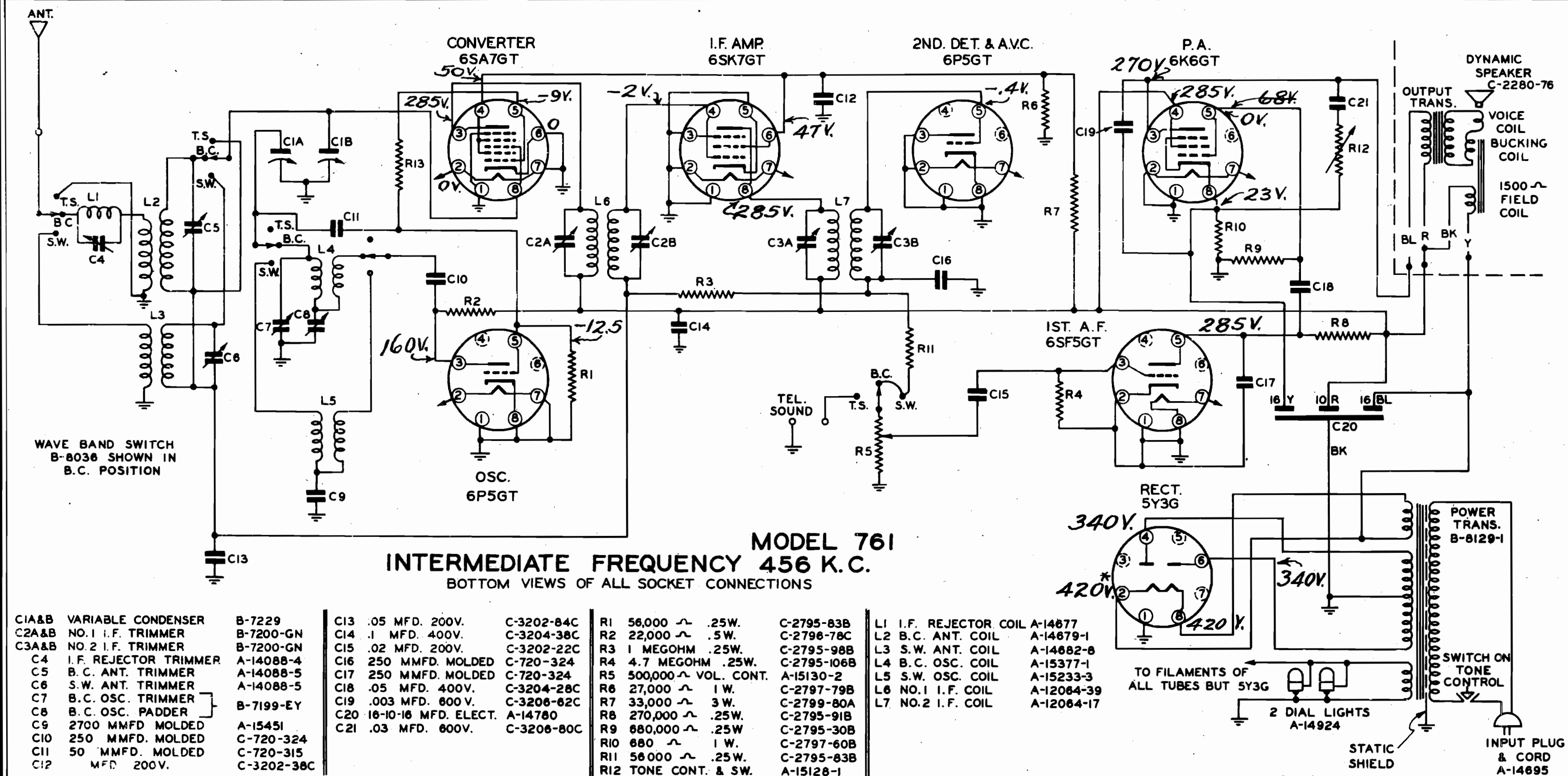
ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer at last calibrated mark with condenser gang closed.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C3 A&B C2 A&B	
3	I-F Rej.	Ant.	200 mf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broad-cast Band	Ant.	200 mf.	1500 KC	BC	1500 KC	C7 (Osc.) C5 (Ant.)	
5				600 KC	BC	600 KC	C8 (Pad.)	***
6	(Repeat operation 4).							
7	(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)							
8	SW Band	Ant.	**	18 MC	SW	18 MC	C6 (Ant.)	***
9	(Check calibration and sensitivity at 6. MC and 18. MC)							
10	(Check operations 1 to 9 inclusive.)							

*Connect to point marked "X" in drawing below.
**100 ohms and 200 mmf. in series.
***Rock dial while adjusting for maximum output. Be sure to adjust on fundamental signal and not on image.

MODEL 761

SPARKS WITHINGTON CO.



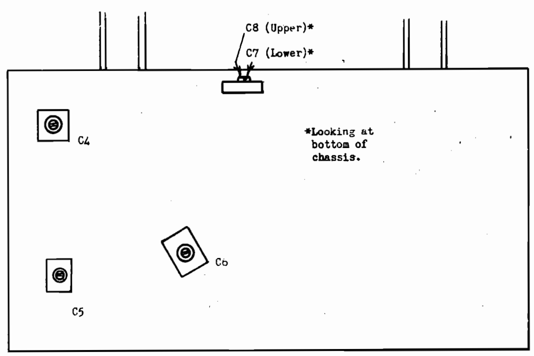
MODEL 761
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-7229
C2A&B	NO. 1 I.F. TRIMMER	B-7200-GN
C3A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W. ANT. TRIMMER	A-14088-5
C7	B.C. OSC. TRIMMER	B-7199-EY
C8	B.C. OSC. PADDER	B-7199-EY
C9	2700 MMFD MOLDED	A-15451
C10	250 MMFD. MOLDED	C-720-324
C11	50 MMFD. MOLDED	C-720-315
C12	MFD 200V.	C-3202-38C

C13	.05 MFD. 200V.	C-3202-84C
C14	.1 MFD. 400V.	C-3204-38C
C15	.02 MFD. 200V.	C-3202-22C
C16	250 MMFD. MOLDED	C-720-324
C17	250 MMFD. MOLDED	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.003 MFD. 600 V.	C-3206-62C
C20	16-10-16 MFD. ELECT.	A-14780
C21	.03 MFD. 600V.	C-3206-80C

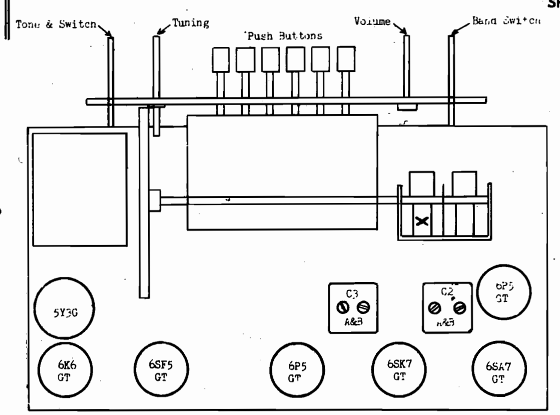
R1	56,000 Ω .25W.	C-2795-83B
R2	22,000 Ω .5W.	C-2798-78C
R3	1 MEGOHM .25W.	C-2795-98B
R4	4.7 MEGOHM .25W.	C-2795-106B
R5	500,000 Ω VOL. CONT.	A-15130-2
R6	27,000 Ω 1 W.	C-2797-79B
R7	33,000 Ω 3 W.	C-2799-80A
R8	270,000 Ω .25W.	C-2795-91B
R9	680,000 Ω .25W	C-2795-30B
R10	680 Ω 1 W.	C-2797-60B
R11	56000 Ω .25W.	C-2795-83B
R12	TONE CONT. & SW.	A-15128-1
R13	560 Ω .25W.	C-2795-59B

L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-8
L4	B.C. OSC. COIL	A-15377-1
L5	S.W. OSC. COIL	A-15233-3
L6	NO. 1 I.F. COIL	A-12064-39
L7	NO. 2 I.F. COIL	A-12064-17



BOTTOM VIEW OF CHASSIS

FOR OTHER DATA, SEE INDEX



TOP VIEW OF CHASSIS

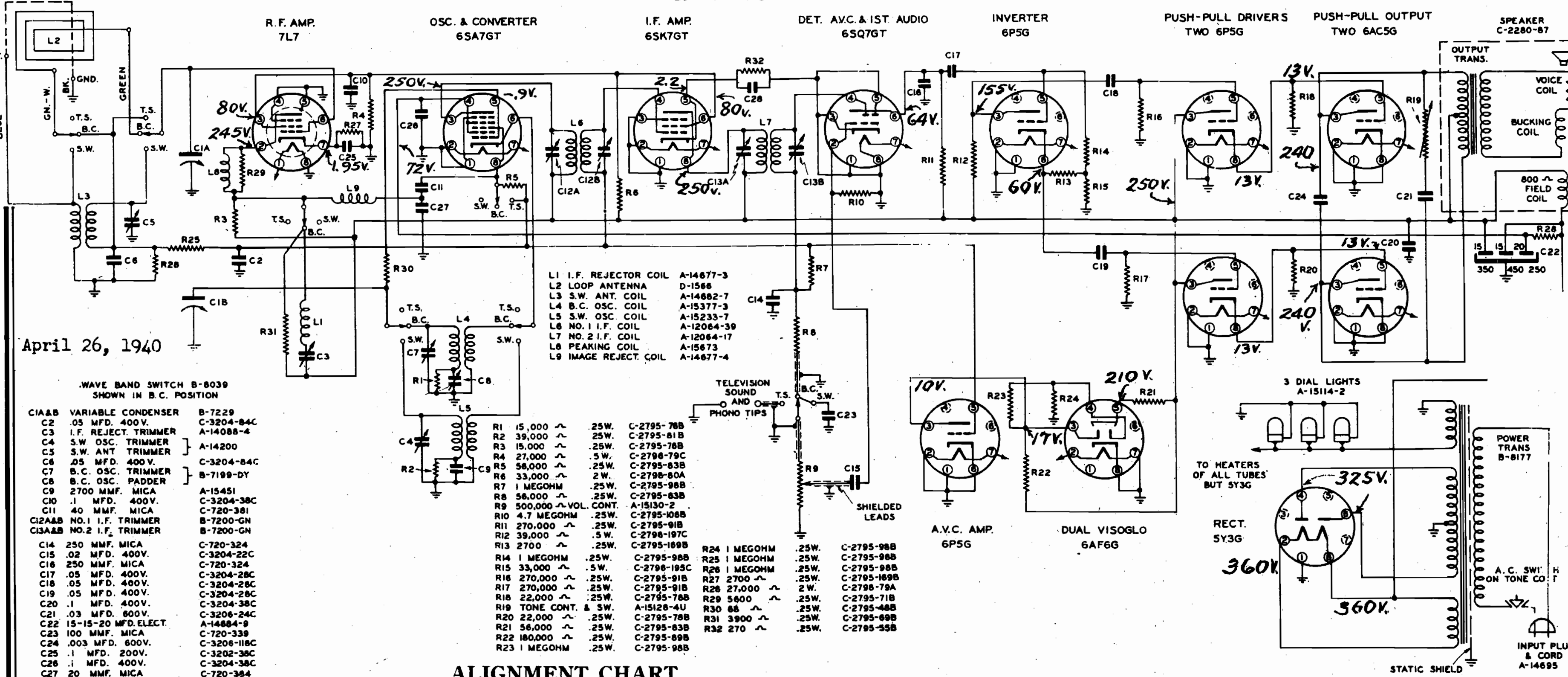
January 2, 1940

MODEL 1281

SPARKS WITHINGTON CO.

SPARTON SUPERHETERODYNE MODEL 1281
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



April 26, 1940

WAVE BAND SWITCH B-8039
SHOWN IN B.C. POSITION

C1A&B	VARIABLE CONDENSER	B-7229
C2	.05 MFD. 400 V.	C-3204-84C
C3	I.F. REJECT. TRIMMER	A-14088-4
C4	S.W. OSC. TRIMMER	A-14200
C5	S.W. ANT TRIMMER	A-14200
C6	.05 MFD. 400 V.	C-3204-84C
C7	B.C. OSC. TRIMMER	B-7199-DY
C8	B.C. OSC. PADDER	B-7199-DY
C9	2700 MMF. MICA	A-15451
C10	.1 MFD. 400 V.	C-3204-38C
C11	40 MMF. MICA	C-720-381
C12A&B	NO. 1 I.F. TRIMMER	B-7200-GN
C13A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C14	250 MMF. MICA	C-720-324
C15	.02 MFD. 400V.	C-3204-22C
C16	250 MMF. MICA	C-720-324
C17	.05 MFD. 400V.	C-3204-28C
C18	.05 MFD. 400V.	C-3204-28C
C19	.05 MFD. 400V.	C-3204-28C
C20	.1 MFD. 400V.	C-3204-38C
C21	.03 MFD. 600V.	C-3206-24C
C22	15-15-20 MFD. ELECT.	A-14884-9
C23	100 MMF. MICA	C-720-339
C24	.003 MFD. 600V.	C-3206-118C
C25	.1 MFD. 200V.	C-3202-38C
C26	.1 MFD. 400V.	C-3204-38C
C27	20 MMF. MICA	C-720-384
C28	.1 MFD. 200V.	C-3202-38C

L1	I.F. REJECTOR COIL	A-14677-3
L2	LOOP ANTENNA	D-1566
L3	S.W. ANT. COIL	A-14682-7
L4	B.C. OSC. COIL	A-15377-3
L5	S.W. OSC. COIL	A-15233-7
L6	NO. 1 I.F. COIL	A-12064-39
L7	NO. 2 I.F. COIL	A-12064-17
L8	PEAKING COIL	A-15673
L9	IMAGE REJECT. COIL	A-14677-4

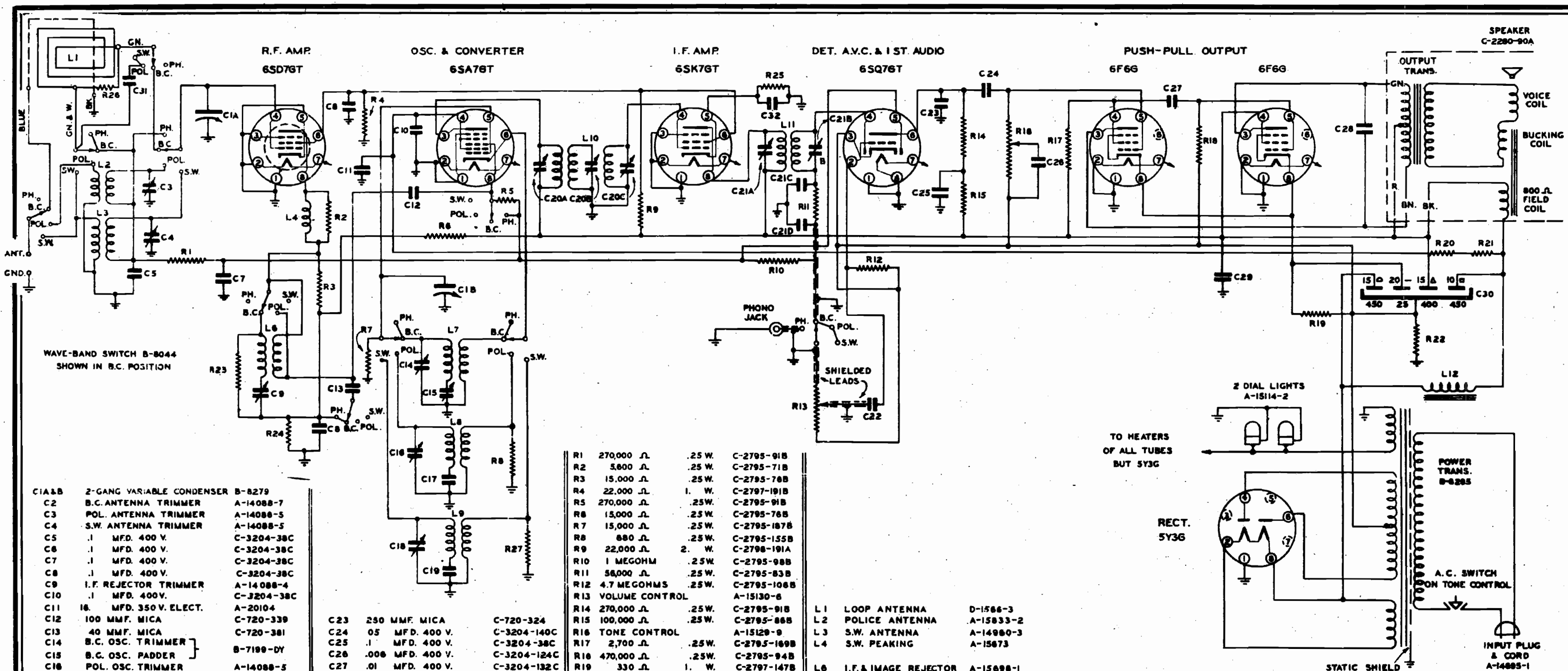
R1	15,000 Ω	.25W.	C-2795-78B
R2	39,000 Ω	.25W.	C-2795-81B
R3	15,000 Ω	.25W.	C-2795-78B
R4	27,000 Ω	.5W.	C-2798-79C
R5	56,000 Ω	.25W.	C-2795-83B
R6	33,000 Ω	2W.	C-2798-80A
R7	1 MEGOHM	.25W.	C-2795-98B
R8	56,000 Ω	.25W.	C-2795-83B
R9	500,000 Ω VOL. CONT.		A-15130-2
R10	4.7 MEGOHM	.25W.	C-2795-108B
R11	270,000 Ω	.25W.	C-2795-91B
R12	39,000 Ω	.5W.	C-2798-197C
R13	2700 Ω	.25W.	C-2795-169B
R14	1 MEGOHM	.25W.	C-2795-98B
R15	33,000 Ω	.5W.	C-2798-195C
R16	270,000 Ω	.25W.	C-2795-91B
R17	270,000 Ω	.25W.	C-2795-91B
R18	22,000 Ω	.25W.	C-2795-78B
R19	TONE CONT. & SW.		A-15128-4U
R20	22,000 Ω	.25W.	C-2795-78B
R21	56,000 Ω	.25W.	C-2795-83B
R22	180,000 Ω	.25W.	C-2795-89B
R23	1 MEGOHM	.25W.	C-2795-98B
R24	1 MEGOHM	.25W.	C-2795-98B
R25	1 MEGOHM	.25W.	C-2795-98B
R26	1 MEGOHM	.25W.	C-2795-98B
R27	2700 Ω	.25W.	C-2795-169B
R28	27,000 Ω	2W.	C-2798-79A
R29	5600 Ω	.25W.	C-2795-71B
R30	68 Ω	.25W.	C-2795-48B
R31	3900 Ω	.25W.	C-2795-69B
R32	270 Ω	.25W.	C-2795-55B

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is over left hand stop line of alignment scale with condenser fully meshed. See special note below.)							
2	I.F.	*	.1 mf	456	BC	1600 KC	C13 A&B	2nd I.F.
							C12 A&B	1st I.F.
3	Rejector	**	200 mmf	456	BC	600 KC	C3	Adjust to minimum
4	Broadcast Band	**	200 mmf	1500 KC	BC	1500 KC	C7 (Osc.)	***
5				600 KC	BC	600 KC	C8 (Pad.)	***
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 750 KC, 1000 KC and 1500 KC)							
8	Shortwave Band	**	****	18 MC	SW	18 MC	C4 (Osc.)	***
							C5 (Ant.)	***
9	(Check calibration and sensitivity at 6.0 MC, 9.0 MC and 18.0 MC)							
10	(Check operations 1 to 9 inclusive.)							

Notes: *Pin No. 8 of 6SA7GT Osc-Converter tube.
**Connect dummy antenna to "Antenna" of loop winding.
***Rock dial while adjusting for maximum output.
****100 ohms resistor and 200 mmf. condenser in series.

Special Note: For accurate alignment, the special scale found on page 12-22 should be used.



C1A&B	2-GANG VARIABLE CONDENSER		B-8279
C2	B.C. ANTENNA TRIMMER		A-14088-7
C3	POL. ANTENNA TRIMMER		A-14088-5
C4	S.W. ANTENNA TRIMMER		A-14088-5
C5	.1	MFD. 400 V.	C-3204-38C
C6	.1	MFD. 400 V.	C-3204-38C
C7	.1	MFD. 400 V.	C-3204-38C
C8	.1	MFD. 400 V.	C-3204-38C
C9	I.F. REJECTOR TRIMMER		A-14088-4
C10	.1	MFD. 400V.	C-3204-38C
C11	16.	MFD. 350 V. ELECT.	A-20104
C12	100	MMF. MICA	C-720-339
C13	40	MMF. MICA	C-720-381
C14	B.C. OSC. TRIMMER		B-7199-DY
C15	B.C. OSC. PADDER		B-7199-DY
C16	POL. OSC. TRIMMER		A-14088-5
C17	POL. OSC. PADDER		A-15451-3
C18	S.W. OSC. TRIMMER		A-14088-5
C19	S.W. OSC. PADDER		A-15451-4
C20A.B&C	NO.1 I.F. TRIMMER		A-14792
C21A.B.C.D	NO.2 I.F. TRIMMER		A-20014
C22	.02	MFD. 400 V.	C-3204-22C

C23	250	MMF. MICA	C-720-324
C24	05	MFD. 400 V.	C-3204-140C
C25	.1	MFD. 400 V.	C-3204-38C
C26	.006	MFD. 400 V.	C-3204-124C
C27	.01	MFD. 400 V.	C-3204-132C
C28	.003	MFD. 600 V.	C-3206-118C
C29	.1	MFD. 400 V.	C-3204-38C
C30A	15.	MFD. 400 V.	ELECT. A-20110
C30B	10.	MFD. 450 V.	ELECT. A-20110
C30C	20.	MFD. 25 V.	ELECT. A-20110
C30D	15.	MFD. 450 V.	ELECT. A-20110
C31	250	MMF. MICA	C-720-324
C32	.1	MFD. 200 V.	C-3202-38C

R1	270,000 Ω	.25 W.	C-2795-91B
R2	5,600 Ω	.25 W.	C-2795-71B
R3	15,000 Ω	.25 W.	C-2795-76B
R4	22,000 Ω	1. W.	C-2797-191B
R5	270,000 Ω	.25 W.	C-2795-91B
R6	15,000 Ω	.25 W.	C-2795-76B
R7	15,000 Ω	.25 W.	C-2795-187B
R8	680 Ω	.25 W.	C-2795-155B
R9	22,000 Ω	2. W.	C-2798-191A
R10	1 MEGOHM	.25 W.	C-2795-98B
R11	56,000 Ω	.25 W.	C-2795-83B
R12	4.7 MEGOHMS	.25 W.	C-2795-106B
R13	VOLUME CONTROL		A-15130-6
R14	270,000 Ω	.25 W.	C-2795-91B
R15	100,000 Ω	.25 W.	C-2795-86B
R16	TONE CONTROL		A-15129-9
R17	2,700 Ω	.25 W.	C-2795-169B
R18	470,000 Ω	.25 W.	C-2795-94B
R19	330 Ω	1. W.	C-2797-147B
R20	12,000 Ω	1. W.	C-2797-185B
R21	8,200 Ω	1. W.	C-2797-73B
R22	100 Ω	.25 W.	C-2795-135B
R23	5,600 Ω	.25 W.	C-2795-71B
R24	33,000 Ω	1. W.	C-2797-80B
R25	820 Ω	.25 W.	C-2795-154B
R26	5,600 Ω	.25 W.	C-2795-71B
R27	680 Ω	.25 W.	C-2795-187B

L1	LOOP ANTENNA	D-1566-3
L2	POLICE ANTENNA	A-15833-2
L3	S.W. ANTENNA	A-14960-3
L4	S.W. PEAKING	A-15673
L6	I.F. & IMAGE REJECTOR	A-15698-1
L7	B.C. OSC.	A-15377-4
L8	POL. OSC.	A-15835-1
L9	S.W. OSC.	A-14967-5
L10	NO. 1 I.F.	A-14794-3
L11	NO. 2 I.F.	A-12084-42
L12	FILTER CHOKE	A-15386

SPARTON SUPERHETERODYNE MODEL 782PA
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

(Original) Effective January 15, 1941

Line Voltage: 117 Volts AC

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

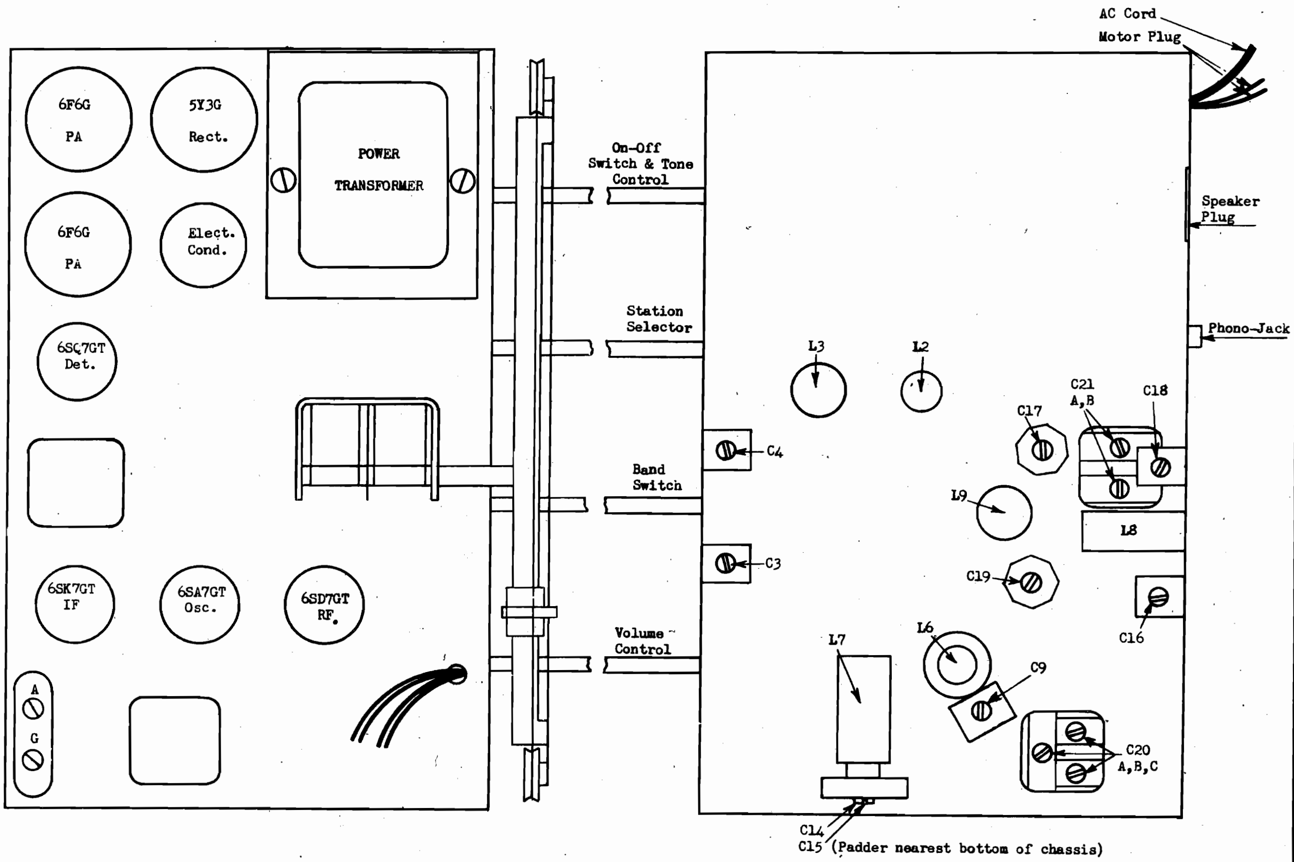
*AC volts.
**Cannot be measured with Model 665 Analyzer.

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Schematic Diagram)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SD7GT	R-F Amplifier	0	0	0	**	0	90	6*	125
6SA7GT	Oscillator & Converter	0	0	230	90	**	0	6*	**
6SK7GT	I.F. Amplifier	0	0	0	**	4	90	6*	**
6SQ7GT	Det AVC & 1st Audio	0	**	**	**	**	30	6*	0
6F6G	Power Amplifier	0	0	230	230	**	—	6*	14
6F6G	Power Amplifier	0	0	230	230	**	80	6*	14
5Y3G	Rectifier	0	325	200	325*	0	325*	—	325

MODEL 782-PA

SPARKS WITHINGTON CO.

Sparton Superheterodyne Model 782-PA



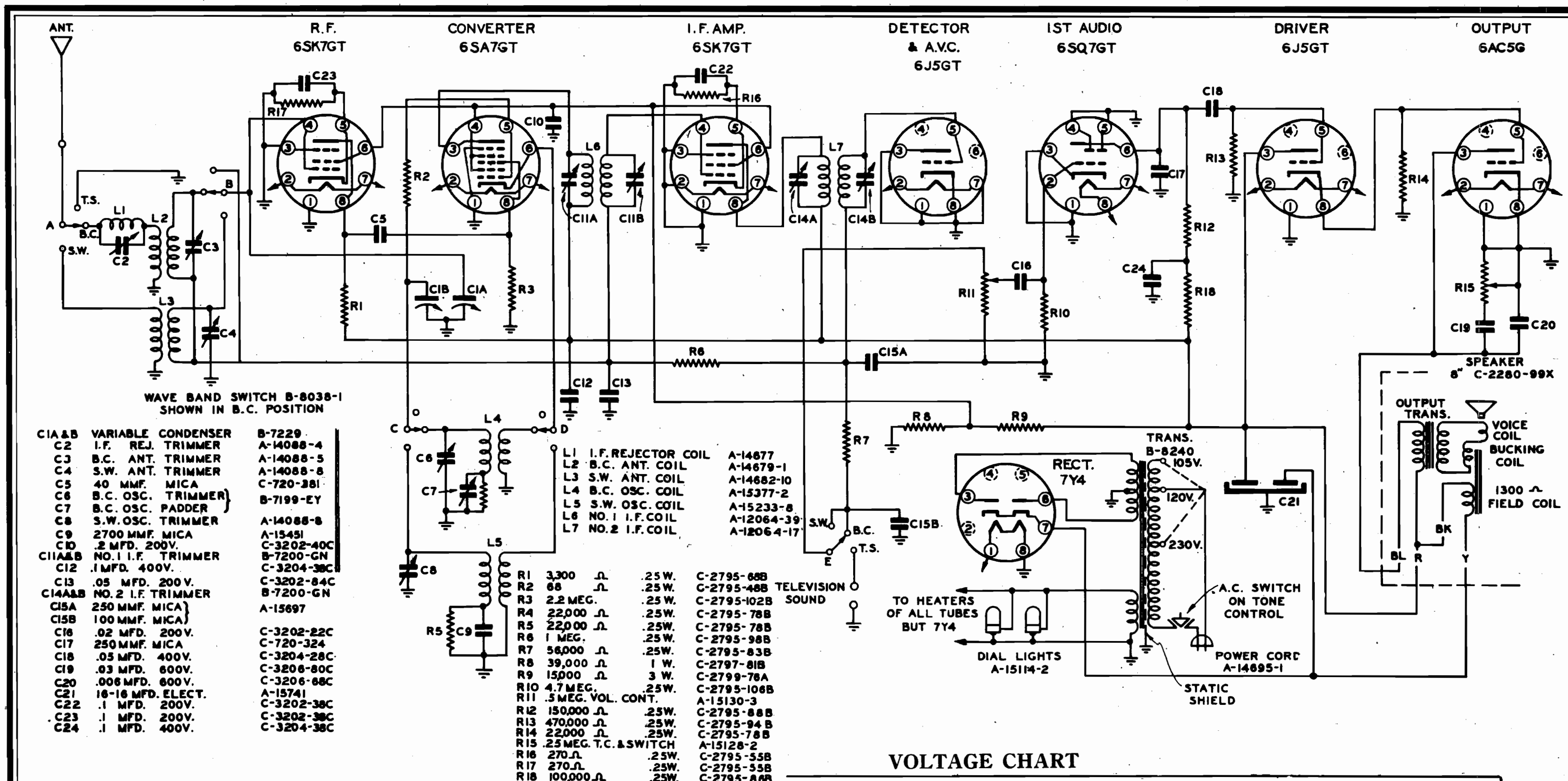
ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is over left hand stop line of alignment scale with condenser plates fully meshed.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C20 B **	***
3							C20 A&C C20 B	Peak accurately
4							C21 A&B	Peak accurately
5	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C9	Adjust to minimum
6	Broad cast Band	Ant.	200 mmf.	1600 KC	BC	1600 KC	C14 (Osc.)	Peak accurately
7				600 KC		600 KC	C15 (Pad.)	Peak accurately
8	(Repeat operation 6)							
9	(Check calibration and sensitivity at 600 KC, 1000 KC and 1600 KC)							
10	Police Band	Ant.	****	5. MC	Pol.	5. MC	C16 (Osc.) C3 (Ant.)	Peak accurately *****
11	(Repeat operation 10)							
12	(Check calibration and sensitivity at 2 MC, 3.5 MC and 5 MC)							
13	Short-Wave Band	Ant.	*****	18 MC	SW	18 MC	C18 (Osc.) C4 (Ant.)	Peak accurately *****
14	(Repeat operation 14)							
15	(Check calibration and sensitivity at 6 MC, 12 MC and 18 MC)							
16	(Check operations 1 to 15 inclusive.)							

Notes: *Connect to terminal No. 8 of type 6SA7GT Osc - Conv. tube.
**Bronze color trimmer screw.
***Turn trimmer screw all the way down.
****100 ohms, 200 mmf. in series.
*****Rock dial while adjusting for maximum output.

SPARKS WITHINGTON CO.

MODEL 831X



VOLTAGE CHART

Line voltage: 117 volts

Position of Volume control: Full with Antenna disconnected

Position of Band Switch: Broadcast

MODEL 831-X

INTERMEDIATE FREQUENCY 456 K.C

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

Tube	Function	Voltage of socket prongs to Gnd. (Prong no's. on Schematic) No 1	No 2	No 3	No 4	No 5	No 6	No 7	No 8
6SK7GT	R-f Amplifier	0	0	0	**	1.6	76	6.2*	237
6SA7GT	Oscillator-Converter	0	0	245	76	0	**	6.2*	0
6SK7GT	I-f Amplifier	0	0	0	**	1.6	76	6.2*	245
6J5GT	Detector-AVC	0	0	0	0	**	155	6.2*	0
6SQ7GT	1st Audio Amplifier	0	**	0	0	0	60	6.2*	0
6J5GT	Audio Driver	0	0	255	77	0	0	6.2*	11
6AC5G	Power Amplifier	0	0	240	0	11	0	6.2*	0
7Y4	Rectifier ***	0	0	300*	0	0	300*	0	0

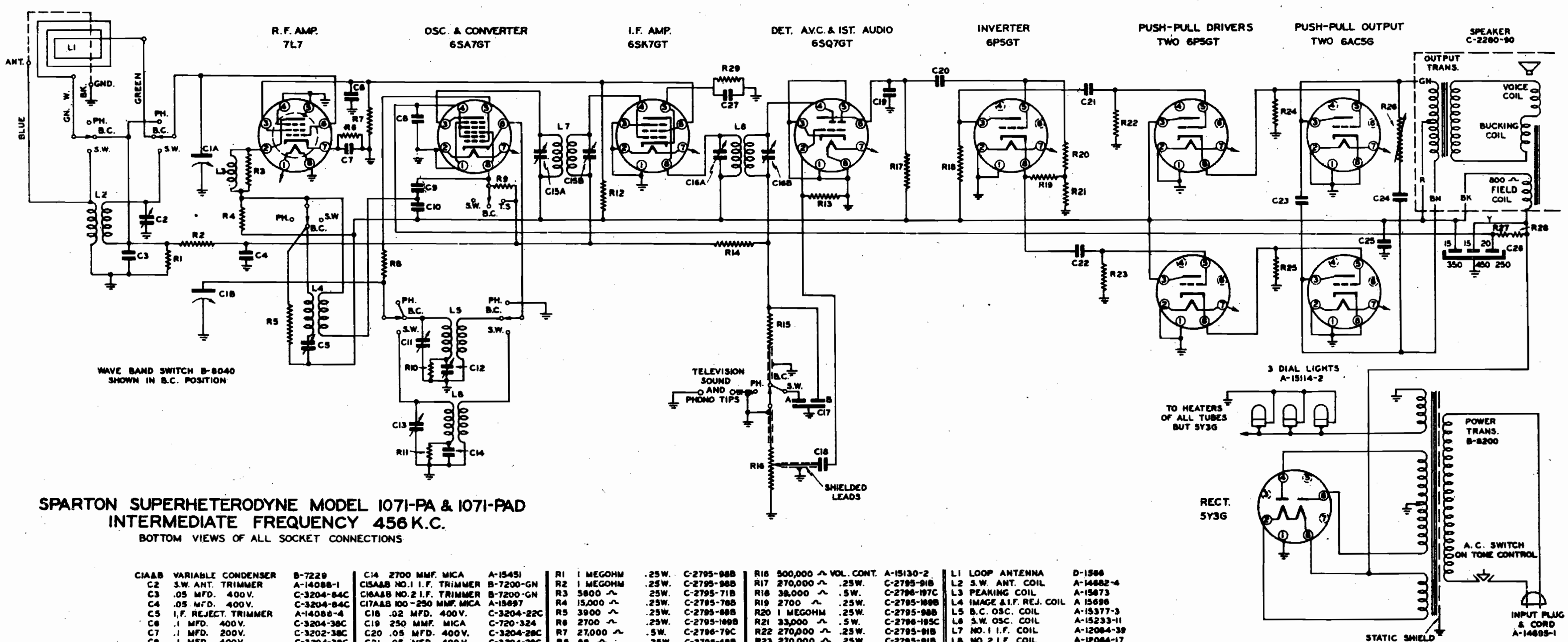
FOR OTHER DATA, SEE INDEX

* AC volts
** Cannot be measured with 1000 ohms/volt voltmeter.
*** Tube removed from socket to enable test prods to reach socket prongs.

August 1, 1940

MODELS 1071-PA, 1071-PAD

SPARKS WITHINGTON CO.



SPARTON SUPERHETERODYNE MODEL 1071-PA & 1071-PAD
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-7229
C2	S.W. ANT. TRIMMER	A-14088-1
C3	.05 MFD. 400V.	C-3204-84C
C4	.05 MFD. 400V.	C-3204-84C
C5	I.F. REJECT. TRIMMER	A-14088-4
C6	.1 MFD. 400V.	C-3204-38C
C7	.1 MFD. 200V.	C-3202-38C
C8	.1 MFD. 400V.	C-3204-38C
C9	40 MMF. MICA	C-720-381
C10	40 MMF. MICA	C-720-381
C11	B.C. OSC. TRIMMER	B-7199-DY
C12	B.C. OSC. PADDER	B-7199-DY
C13	S.W. OSC. TRIMMER	A-14088-5

C14	2700 MMF. MICA	A-15451
C15A&B	NO.1 I.F. TRIMMER	B-7200-GN
C16A&B	NO.2 I.F. TRIMMER	B-7200-GN
C17A&B	100-250 MMF. MICA	A-15697
C18	.02 MFD. 400V.	C-3204-22C
C19	250 MMF. MICA	C-720-324
C20	.05 MFD. 400V.	C-3204-28C
C21	.05 MFD. 400V.	C-3204-28C
C22	.05 MFD. 400V.	C-3204-28C
C23	.001 MFD. 600V.	C-3206-58C
C24	.03 MFD. 600V.	C-3206-24C
C25	.1 MFD. 400V	C-3204-38C
C26	15-15-20 MFD. ELECT.	A-15896
C27	.1 MFD 200V.	C-3202-38C

R1	1 MEGOHM	.25W.	C-2795-98B
R2	1 MEGOHM	.25W.	C-2795-98B
R3	5600 Ω	.25W.	C-2795-71B
R4	15,000 Ω	.25W.	C-2795-78B
R5	3900 Ω	.25W.	C-2795-69B
R6	2700 Ω	.25W.	C-2795-169B
R7	27,000 Ω	.5W.	C-2796-79C
R8	68 Ω	.25W.	C-2795-48B
R9	56,000 Ω	.25W.	C-2795-83B
R10	15,000 Ω	.25W.	C-2795-78B
R11	22,000 Ω	.25W.	C-2795-78B
R12	33,000 Ω	2W.	C-2798-80A
R13	4.7 MEGOHM	.25W.	C-2795-106B
R14	1 MEGOHM	.25W.	C-2795-98B
R15	56,000 Ω	.25W	C-2795-83B

R16	500,000 Ω VOL. CONT.		A-15130-2
R17	270,000 Ω	.25W.	C-2795-91B
R18	39,000 Ω	.5W.	C-2796-197C
R19	2700 Ω	.25W.	C-2795-169B
R20	1 MEGOHM	.25W.	C-2795-98B
R21	33,000 Ω	.5W.	C-2796-195C
R22	270,000 Ω	.25W.	C-2795-91B
R23	270,000 Ω	.25W.	C-2795-91B
R24	22,000 Ω	.25W.	C-2795-78B
R25	22,000 Ω	.25W.	C-2795-78B
R26	TONE CONT. & SW.		A-15128-4
R27	12,000 Ω	1W.	C-2797-75B
R28	12,000 Ω	1W.	C-2797-75B
R29	270 Ω	.25W.	C-2795-55B

L1	LOOP ANTENNA	D-1566
L2	S.W. ANT. COIL	A-14682-4
L3	PEAKING COIL	A-15673
L4	IMAGE & I.F. REJ. COIL	A 15698
L5	B.C. OSC. COIL	A-15377-3
L6	S.W. OSC. COIL	A-15233-11
L7	NO. 1 I.F. COIL	A-12084-39
L8	NO. 2 I.F. COIL	A-12084-17

VOLTAGE CHART

Line Voltage: 117 Volts

Position of Volume Control: Full with set tuned to quiet channel.
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7L7	R-F Amplifier	—	185	58	—	—	**	1.25b	6*
6SA7GT	Osc-Converter	—	—	190	78	-1.25b	0	6*	0
6SK7GT	I-F Amplifier	—	—	—	**	1.25b	58	6*	190
6SQ7GT	Det - AVC - 1st AF	—	0	—	0	—	17	6*	—
6P5GT	Inverter	—	—	145	245	**	43	6*	43
6P5GT	Driver	—	—	245	—	**	—	6*	12.5a
6P5GT	Driver	—	—	245	—	**	—	6*	12.5a
6AC5G	Power Amplifier	—	—	230	—	12.5a	—	6*	—
6AC5G	Power Amplifier	—	—	230	80	12.5a	—	6*	—
5Y3G	Rectifier	—	325	230	325*	0	325*	200	360

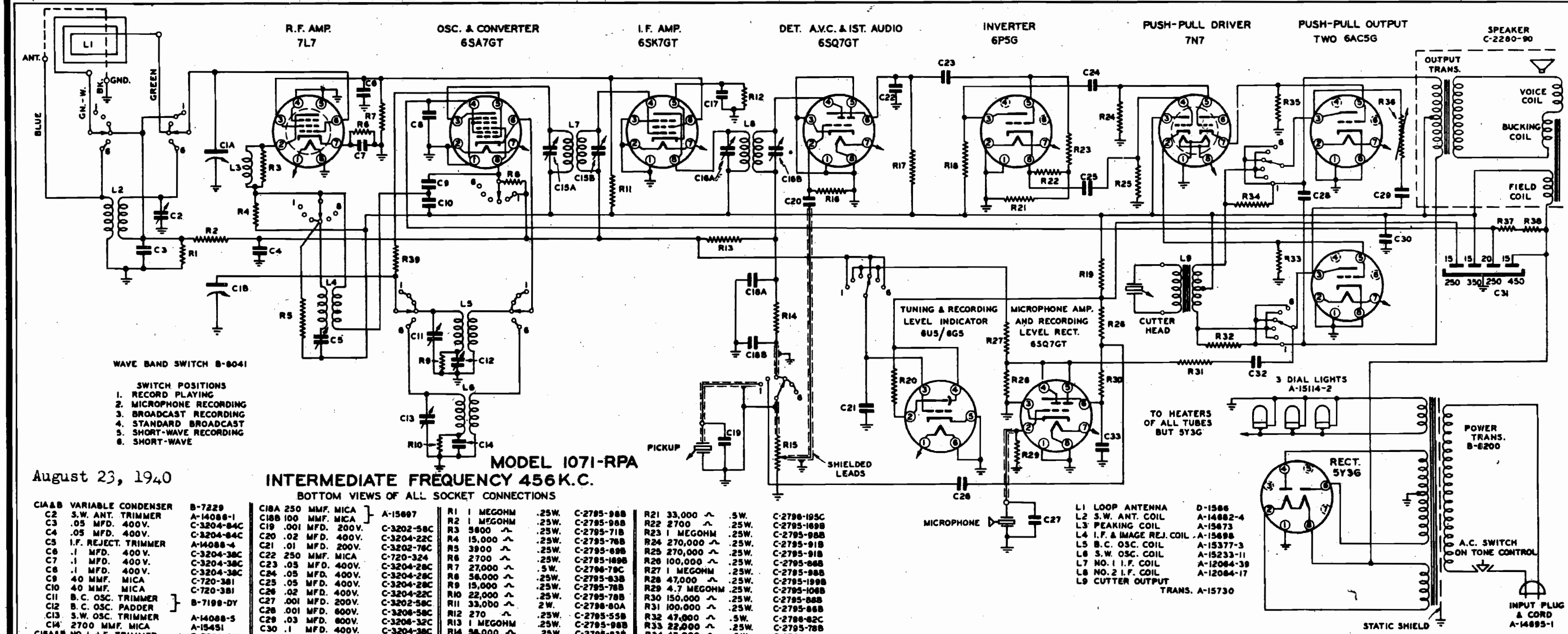
*-AC volts.
**-Cannot be measured with 1000 ohms per volt voltmeter.

A-25 volt DC scale.
B-2.5 volt DC scale

FOR OTHER DATA, SEE INDEX

MODEL 1071-RPA

SPARKS WITHINGTON CO.



WAVE BAND SWITCH B-8041

SWITCH POSITIONS
1. RECORD PLAYING
2. MICROPHONE RECORDING
3. BROADCAST RECORDING
4. STANDARD BROADCAST
5. SHORT-WAVE RECORDING
6. SHORT-WAVE

MODEL 1071-RPA

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

August 23, 1940

C1A&B	VARIABLE CONDENSER	B-7229
C2	S.W. ANT. TRIMMER	A-14088-1
C3	.05 MFD. 400V.	C-3204-84C
C4	.05 MFD. 400V.	C-3204-84C
C5	I.F. REJECT. TRIMMER	A-14088-4
C6	.1 MFD. 400V.	C-3204-38C
C7	.1 MFD. 400V.	C-3204-38C
C8	.1 MFD. 400V.	C-3204-38C
C9	40 MMF. MICA	C-720-381
C10	40 MMF. MICA	C-720-381
C11	B.C. OSC. TRIMMER	B-7198-DY
C12	B.C. OSC. PADDER	B-7198-DY
C13	S.W. OSC. TRIMMER	A-14088-5
C14	2700 MMF. MICA	A-15451
C15A&B	NO. 1 I.F. TRIMMER	B-7200-GN
C16A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C17	.1 MFD. 400V.	C-3204-38C
C18A	250 MMF. MICA	A-15697
C18B	100 MMF. MICA	A-15697
C19	.001 MFD. 200V.	C-3202-58C
C20	.02 MFD. 400V.	C-3204-22C
C21	.01 MFD. 200V.	C-3202-76C
C22	250 MMF. MICA	C-720-324
C23	.05 MFD. 400V.	C-3204-28C
C24	.05 MFD. 400V.	C-3204-28C
C25	.05 MFD. 400V.	C-3204-28C
C26	.02 MFD. 400V.	C-3204-22C
C27	.001 MFD. 200V.	C-3202-58C
C28	.001 MFD. 600V.	C-3206-58C
C29	.03 MFD. 600V.	C-3206-32C
C30	.1 MFD. 400V.	C-3204-38C
C31	ELECT. CONDENSER	A-15729
C32	.02 MFD. 400V.	C-3204-22C
C33	.006 MFD. 400V.	C-3204-68C

R1	1 MEGOHM	.25W.	C-2795-98B
R2	1 MEGOHM	.25W.	C-2795-98B
R3	5600 Ω	.25W.	C-2795-71B
R4	15,000 Ω	.25W.	C-2795-76B
R5	3900 Ω	.25W.	C-2795-69B
R6	2700 Ω	.25W.	C-2795-169B
R7	27,000 Ω	.5W.	C-2796-79C
R8	56,000 Ω	.25W.	C-2795-83B
R9	15,000 Ω	.25W.	C-2795-76B
R10	22,000 Ω	.25W.	C-2795-78B
R11	33,000 Ω	2W.	C-2798-80A
R12	270 Ω	.25W.	C-2795-55B
R13	1 MEGOHM	.25W.	C-2795-98B
R14	56,000 Ω	.25W.	C-2795-83B
R15	500,000 Ω	VOL. CONT.	A-15130-2
R16	4.7 MEGOHM	.25W.	C-2795-106B
R17	270,000 Ω	.25W.	C-2795-91B
R18	39,000 Ω	.5W.	C-2796-197C
R19	75,000 Ω	.5W.	C-2796-204B
R20	220,000 Ω	.25W.	C-2795-90B
R21	33,000 Ω	.5W.	C-2796-195C
R22	2700 Ω	.25W.	C-2795-169B
R23	1 MEGOHM	.25W.	C-2795-98B
R24	270,000 Ω	.25W.	C-2795-91B
R25	270,000 Ω	.25W.	C-2795-91B
R26	100,000 Ω	.25W.	C-2795-86B
R27	1 MEGOHM	.25W.	C-2795-98B
R28	47,000 Ω	.25W.	C-2795-199B
R29	4.7 MEGOHM	.25W.	C-2795-106B
R30	150,000 Ω	.25W.	C-2795-88B
R31	100,000 Ω	.25W.	C-2795-86B
R32	47,000 Ω	.5W.	C-2796-82C
R33	22,000 Ω	.25W.	C-2795-78B
R34	47,000 Ω	.5W.	C-2796-82C
R35	22,000 Ω	.25W.	C-2795-78B
R36	TONE CONTROL & SW.		A-15128-4
R37	12,000 Ω	1W.	C-2797-75B
R38	12,000 Ω	1W.	C-2797-75B
R39	68 Ω	.25W.	C-2795-48B

L1	LOOP ANTENNA	D-1586
L2	S.W. ANT. COIL	A-14882-4
L3	PEAKING COIL	A-15673
L4	I.F. & IMAGE REJ. COIL	A-15698
L5	B.C. OSC. COIL	A-15377-3
L6	S.W. OSC. COIL	A-15233-11
L7	NO. 1 I.F. COIL	A-12084-39
L8	NO. 2 I.F. COIL	A-12084-17
L9	CUTTER OUTPUT TRANS.	A-15730

VOLTAGE CHART

Line Voltage: 117 volts

Position of Vol. Control: Full, with Set Tuned to Quiet Channel
Position of Band Switch: Standard Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7L7	R-F Amplifier	0	270	72	0	0	0	9.3	6.2*
6SA7GT	Osc. - Converter	0	0	280	90	-4.3	0	6.2*	0
6SK7GT	I-F Amplifier	0	0	0	-.2	2.2	75	6.2*	280
6SQ7GT	Det - AVC - 1st Audio	0	-.2	0	-.2	0	44	6.2*	0
6P5G	Phase Inverter	0	0	175 a	280	**	48	6.2*	69
7N7	Push-pull Driver	0	11	275	0	0	275	11	6.2*
6AC5G	Power Amplifier	0	0	270	0	11	0	6.2*	0
6AC5G	Power Amplifier	0	0	270	90	11	0	6.2*	0
6SQ7GT	Mike Amp. & Indicator	0	0	0	0	0	23 b	6.2*	0
6U5/6G5	Viso-Glo & Indicator Tube Removed	6.2*	8 c	0	185	0	0	-	-
5Y3G	Rectifier	0	370*	74	330*	0	330*	210	370*

*A.C. volts.
**Cannot measure with M665 analyzer.
a. Use 250 V. scale.
b. Use 50 V. scale.
c. Use 10 V. scale.

FOR OTHER DATA, SEE INDEX

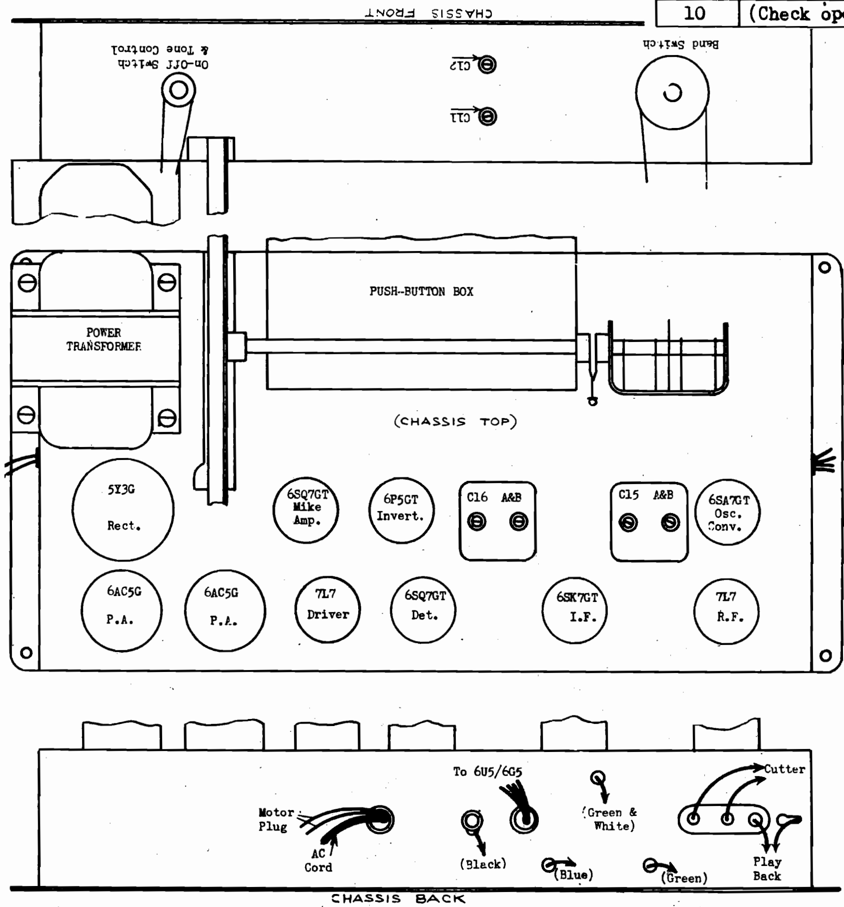
MODELS 1071-PA, 1071-PAD, 1071-RPA

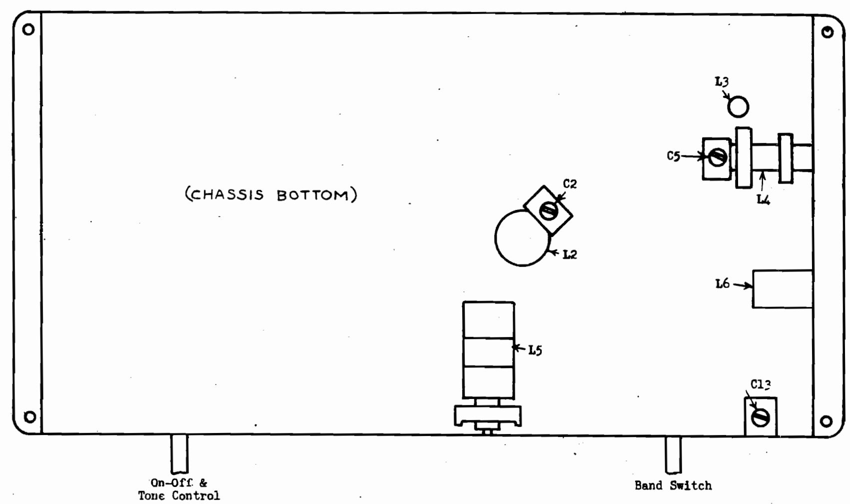
SPARKS WITHINGTON CO.

Sparton Superheterodyne Models
1071-PA 1071-PAD
1071-RPA

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is over left-hand stop line of alignment scale with condenser plates fully meshed. See special note below.)							
2	I.F.	*	.1 mf.	456 KC	BC	1600 KC	C16 A&B	2nd I.F.
							C15 A&B	1st I.F.
3	Rejector	**	200 mmf.	456 KC	BC	600 KC	C5	Adjust to minimum
4	Broadcast Band	**	200 mmf.	1500 KC	BC	1500 KC	C11 (osc.)	***
5				600 KC	BC	600 KC	C12 (pad.)	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 750 KC, 1000 KC and 1500 KC)							
8	Short-wave Band	**	****	18 MC	SW	18 MC	C13 (osc.)	***
							C2 (ant.)	
9	(Check calibration and sensitivity at 6. MC, 9. MC and 18 MC)							
10	(Check operations 1 to 9 inclusive.)							

NOTES: *Pin No. 8 of 6SA7GT Oscillator-Converter tube
**Connect dummy antenna to "Antenna" of loop winding
***Rock dial while adjusting for maximum output.
****100 ohms and 200 mmf. in series.



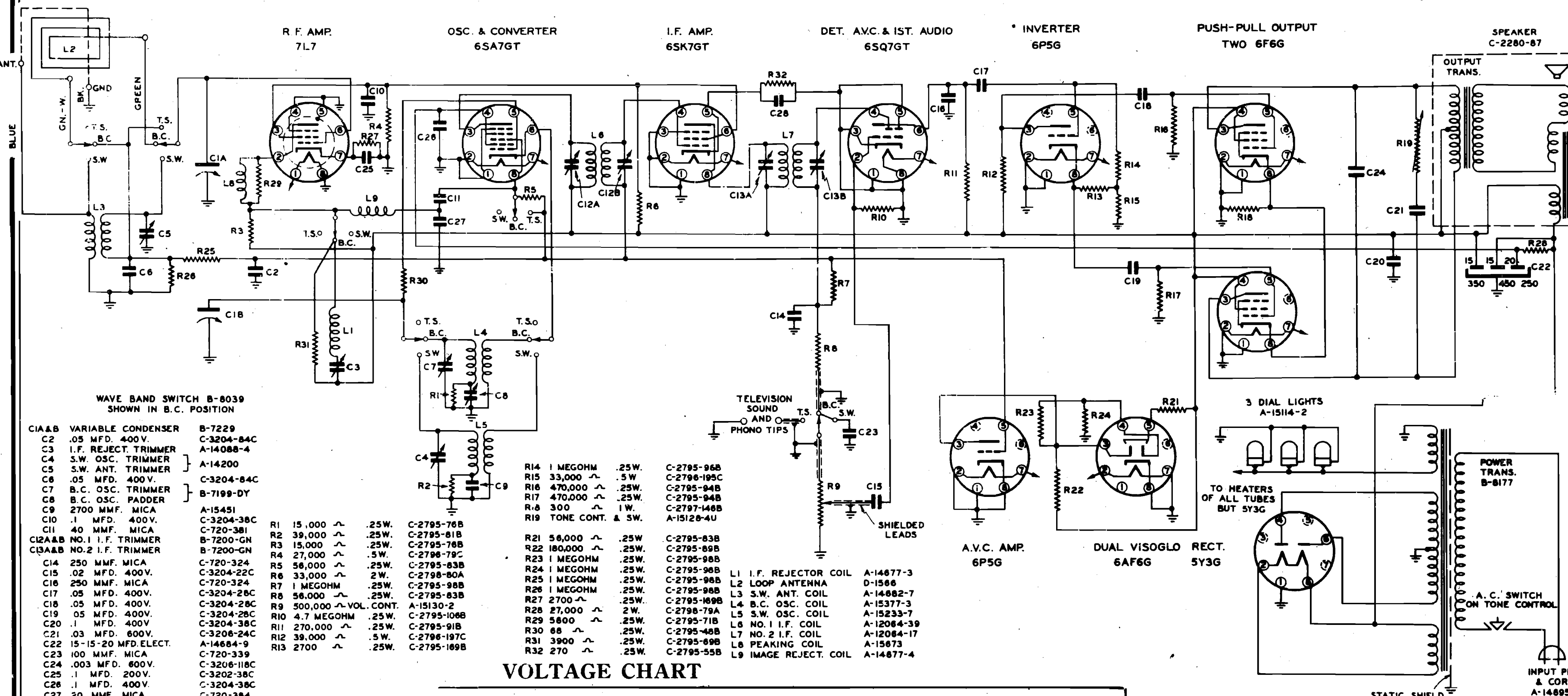


MODEL 1081

SPARKS-WITHINGTON CO.

SPARTON SUPERHETERODYNE MODEL 1081
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



WAVE BAND SWITCH B-8039
SHOWN IN B.C. POSITION

C1A&B	VARIABLE CONDENSER	B-7229
C2	.05 MFD. 400V.	C-3204-84C
C3	I.F. REJECT. TRIMMER	A-14088-4
C4	S.W. OSC. TRIMMER	A-14200
C5	S.W. ANT. TRIMMER	A-14200
C6	.05 MFD. 400V.	C-3204-84C
C7	B.C. OSC. TRIMMER	B-7199-DY
C8	B.C. OSC. PADDER	B-7199-DY
C9	2700 MMF. MICA	A-15451
C10	.1 MFD. 400V.	C-3204-38C
C11	40 MMF. MICA	C-720-381
C12A&B	NO.1 I.F. TRIMMER	B-7200-GN
C13A&B	NO.2 I.F. TRIMMER	B-7200-GN
C14	250 MMF. MICA	C-720-324
C15	.02 MFD. 400V.	C-3204-22C
C16	250 MMF. MICA	C-720-324
C17	.05 MFD. 400V.	C-3204-28C
C18	.05 MFD. 400V.	C-3204-28C
C19	.05 MFD. 400V.	C-3204-28C
C20	.1 MFD. 400V	C-3204-38C
C21	.03 MFD. 600V.	C-3206-24C
C22	15-15-20 MFD. ELECT.	A-14684-9
C23	100 MMF. MICA	C-720-339
C24	.003 MFD. 600V.	C-3206-118C
C25	.1 MFD. 200V.	C-3202-38C
C26	.1 MFD. 400V.	C-3204-38C
C27	20 MMF. MICA	C-720-384
C28	.1 MFD, 200V.	C-3202-38C

R1	15,000 Ω	.25W.	C-2795-76B
R2	39,000 Ω	.25W.	C-2795-81B
R3	15,000 Ω	.25W.	C-2795-76B
R4	27,000 Ω	.5W.	C-2796-79C
R5	56,000 Ω	.25W.	C-2795-83B
R6	33,000 Ω	2W.	C-2798-80A
R7	1 MEGOHM	.25W.	C-2795-98B
R8	56,000 Ω	.25W.	C-2795-83B
R9	500,000 Ω VOL. CONT.		A-15130-2
R10	4.7 MEGOHM	.25W.	C-2795-106B
R11	270,000 Ω	.25W.	C-2795-91B
R12	39,000 Ω	.5W.	C-2796-197C
R13	2700 Ω	.25W.	C-2795-169B
R14	1 MEGOHM	.25W.	C-2795-96B
R15	33,000 Ω	.5W	C-2796-195C
R16	470,000 Ω	.25W.	C-2795-94B
R17	470,000 Ω	.25W.	C-2795-94B
R18	300 Ω	1W.	C-2797-146B
R19	TONE CONT. & SW.		A-15128-4U
R21	56,000 Ω	.25W	C-2795-83B
R22	180,000 Ω	.25W.	C-2795-89B
R23	1 MEGOHM	.25W.	C-2795-98B
R24	1 MEGOHM	.25W.	C-2795-98B
R25	1 MEGOHM	.25W.	C-2795-98B
R26	1 MEGOHM	.25W.	C-2795-98B
R27	2700 Ω	.25W.	C-2795-169B
R28	27,000 Ω	2W.	C-2798-79A
R29	5600 Ω	.25W.	C-2795-71B
R30	68 Ω	.25W.	C-2795-48B
R31	3900 Ω	.25W.	C-2795-69B
R32	270 Ω	.25W.	C-2795-55B

L1	I.F. REJECTOR COIL	A-14677-3
L2	LOOP ANTENNA	D-1566
L3	S.W. ANT. COIL	A-14682-7
L4	B.C. OSC. COIL	A-15377-3
L5	S.W. OSC. COIL	A-15233-7
L6	NO. 1 I.F. COIL	A-12064-39
L7	NO. 2 I.F. COIL	A-12064-17
L8	PEAKING COIL	A-15673
L9	IMAGE REJECT. COIL	A-14677-4

VOLTAGE CHART

Line Voltage: 117 volts AC

Position of Volume Control: Full with set tuned to quiet channel.
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Prong Nos. on Schematic)							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7L7	R-F Amplifier	6.*	250	90	--	--	0	2a	--
6SA7GT	Osc-Converter	--	--	250	74	-.1b	0	6.*	***
6SK7GT	I-F Amplifier	--	--	--	-.1b	0	78	6.*	250
6SQ7GT	Det - AVC - 1st A-F	--	-.1b	--	0	--	60	6.*	--
6P5G	Inverter	--	--	155	45	0	250	6.*	62.
6F6G	Power Amplifier	--	--	245	250	0	0	6.*	0
6F6G	Power Amplifier	--	--	245	250	0	130	6.*	0
6P5G	AVC Amplifier	--	--	18.5	--	1.1b	--	6.*	--
6AF6G	Dual Viso-Glo	--	6.*	25	**	150	--	--	--
5Y3G	Rectifier	--	370*	0	320*	--	320*	260*	370*

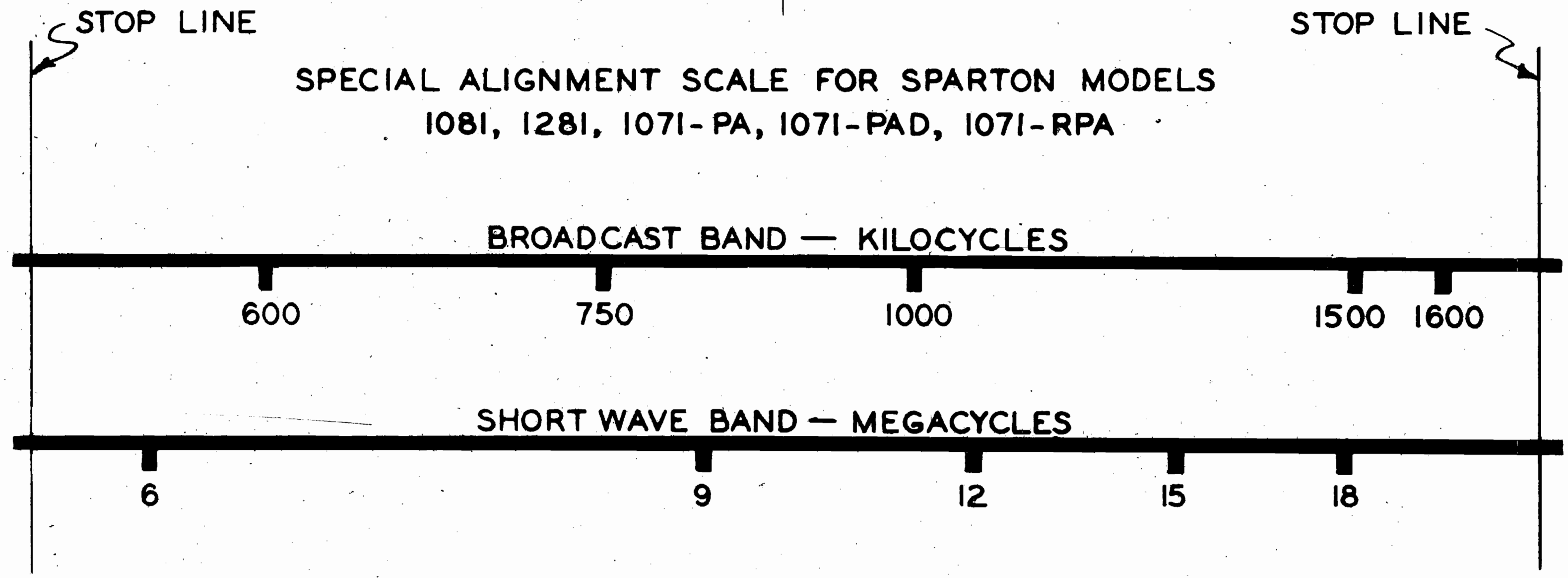
*-AC volts.
**-Cannot be measured with 1000 ohms per volt voltmeter.

A-2.5 volt DC scale.
B-1. volt DC scale.

Sept. 1940

Cut on dotted line

Make three holes as indicated



Cut on dotted line

TO USE SCALE PROCEED AS FOLLOWS:

1. **MAKE ACCURATE TRACING OF SCALE WITH CARBON PAPER ON CARDBOARD.**
2. **CUT OR PUNCH OUT THE HOLES AS INDICATED.**
3. **PLACE THE SCALE IN POSITION OVER THE CHASSIS DIAL PLATE SO THE SCALE HOLES AND PLATE HOLES COINCIDE. USE PINS OR SCREWS TO HOLD SCALE IN PLACE.**

These SPARTON Models are designed with the dial scale as a part of the cabinet escutcheon for the dial. Since the actual dial scale is not a part of the chassis, accurate calibration and setting of the pointer become difficult unless a duplicate or auxiliary scale is used.

ALIGNMENT NOTES:

A. "Stop Lines" on scale indicate actual stopping points of pointer travel with complete 180 degress rotation of variable tuning condenser. Therefore, the "STOP LINES" on the scale are reference points and allow correct positioning of the various parts associated with the dial indicating mechanism.

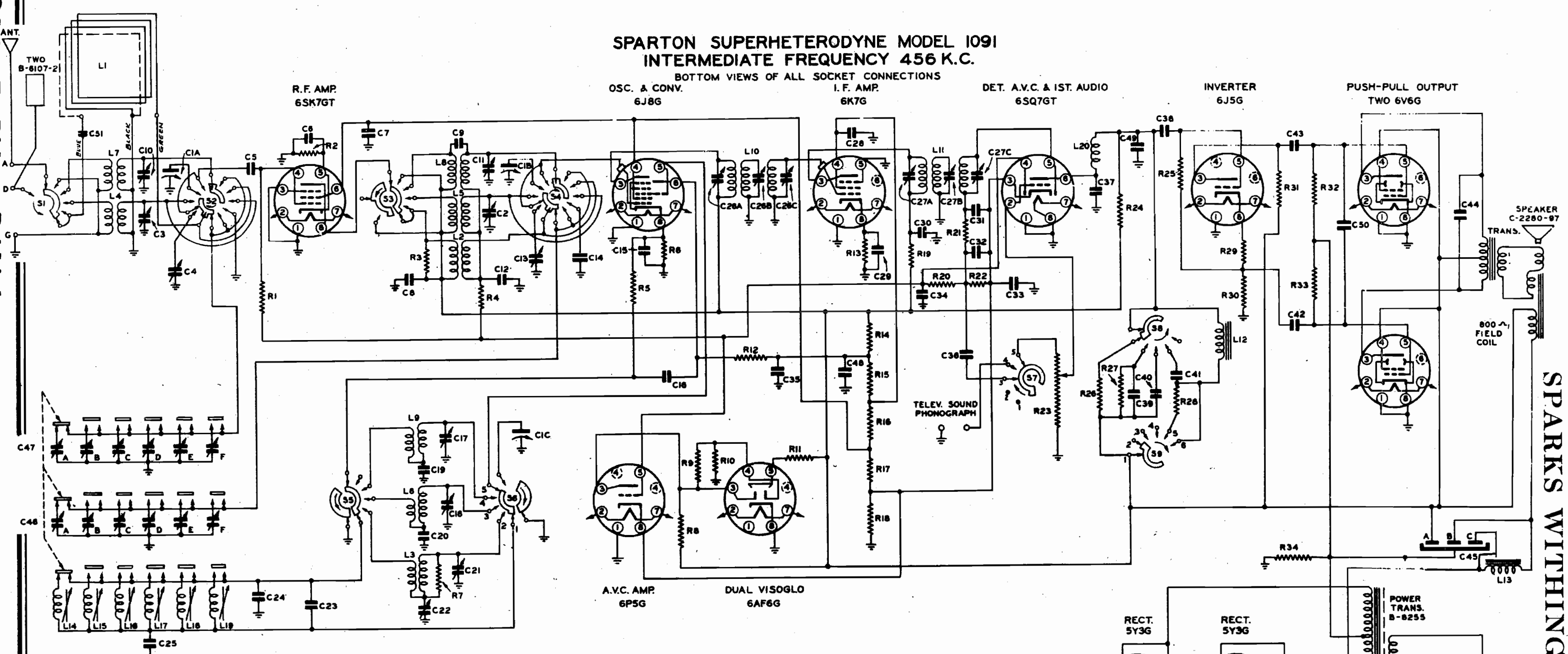
B. Pointer must always be at LEFT HAND Stop Line with condenser closed. Then if pointer is not at RIGHT HAND Stop Line with condenser fully open, make necessary adjustments.

SPARKS WITHINGTON CO.

MODEL 1091

SPARTON SUPERHETERODYNE MODEL 1091
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



WAVE BAND SWITCH B-8043 SHOWN IN B.C. PUSH-BUTTON TUNING POSITION
1. B.C. PUSH-BUTTON TUNING
2. B.C. MANUAL TUNING
3. POLICE BAND
4. SHORT-WAVE BAND
5. PHONO & TELEVISION SOUND

C1A,B,C	VARIABLE CONDENSER	B-8260
C2	POL. R.F. TRIMMER	A-15819
C3	POL. ANT. TRIMMER	A-15819
C4	B.C. ANT. TRIMMER	A-15819
C5	500 MMF. MICA	C-720-316
C6	.05 MFD. 200V.	C-3202-28C
C7	.05 MFD. 400V.	C-3204-28C
C8	.05 MFD. 400V.	C-3204-28C
C9	5 MMF. MICA	C-720-361
C10	S.W. ANT. TRIMMER	A-15820
C11	S.W. R.F. TRIMMER	A-15820
C12	.05 MFD. 200V.	C-3202-84C
C13	B.C. R.F. TRIMMER	A-15821
C14	.05 MFD. 200V.	C-3202-28C
C15	.05 MFD. 200V.	C-3202-28C
C16	50 MMF. MICA	C-720-320
C17	S.W. OSC. TRIMMER	A-15820
C18	POL. OSC. TRIMMER	A-15820
C19	3180 MMF. MICA	A-15451-2
C20	1120 MMF. MICA	A-15451-1
C21	B.C. OSC. TRIMMER	B-7199-BY
C22	B.C. OSC. PADDER	B-7199-BY
C23	20 MMF. COMPENSATOR	A-14922-1
C24	370 MMF. MICA	B-8265-1
C25	370 MMF. MICA	B-8265-1
C26ABC	NO. 1 I.F. TRIMMER	A-14792
C27ABC	NO. 2 I.F. TRIMMER	A-14792
C28	.05 MFD. 400V.	C-3204-28C
C29	.05 MFD. 200V.	C-3202-28C
C30	.05 MFD. 400V.	C-3204-28C
C31	100 MMF. MICA	C-720-339
C32	100 MMF. MICA	C-720-339
C33	50 MFD. 25V.	A-14782-6
C34	.05 MFD. 200V.	C-3202-28C
C35	.01 MFD. 400V.	C-3204-132C
C36	.02 MFD. 200V.	C-3202-134C
C37	100 MMF. MICA	C-720-339
C38	.02 MFD. 400V.	C-3204-134C
C39	.002 MFD. 400V.	C-3204-116C
C40	.004 MFD. 400V.	C-3204-120C
C41	.006 MFD. 400V.	C-3204-124C
C42	.1 MFD. 400V.	A-15851-1
C43	.1 MFD. 400V.	A-15851-1
C44	.003 MFD. 600V.	C-3206-118C
C45 A	15 MFD. 450V. ELECT	A-14684-7
C45 B	10 MFD. 450V. ELECT	A-14684-7
C45 C	15 MFD. 450V. ELECT	A-14684-7
C46 A	578-180 MMF.	A-15825-1
C46 B	578-180 MMF.	A-15825-1
C46 C	441-100 MMF.	A-15825-1
C46 D	441-100 MMF.	A-15825-1
C46 E	222-40 MMF.	A-15825-1
C46 F	65-12 MMF.	A-15825-1
C47 A	578-160 MMF.	A-15825-2
C47 B	578-160 MMF.	A-15825-2
C47 C	441-100 MMF.	A-15825-2
C47 D	441-100 MMF.	A-15825-2
C47 E	222-40 MMF.	A-15825-2
C47 F	65-12 MMF.	A-15825-2
C48	4 MFD. 400V.	A-14782-8
C49	50 MMF. MICA	C-720-320
C50	100 MMF. MICA	C-720-339
C51	200 MMF. MICA	C-720-350

R1	2.2 MEGOHM	.25W.	C-2795-102B
R2	1000 Ω	.25W.	C-2795-62B
R3	10,000 Ω	.25W.	C-2795-74B
R4	100,000 Ω	.25W.	C-2795-86B
R5	56,000 Ω	.25W.	C-2795-83B
R6	1000 Ω	.25W.	C-2795-62B
R7	47,000 Ω	.25W.	C-2795-82B
R8	180,000 Ω	.25W.	C-2795-89B
R9	1 MEGOHM	.25W.	C-2795-98B
R10	1 MEGOHM	.25W.	C-2795-98B
R11	56,000 Ω	.25W.	C-2795-83B
R12	22,000 Ω	.5W.	C-2796-78C
R13	620 Ω	.25W.	C-2795-154B
R14	12,000 Ω	3W.	C-2799-185A
R15	6800 Ω	1W.	C-2797-179B
R16	6800 Ω	1W.	C-2797-179B
R17	18,000 Ω	2W.	C-2798-188A
R18	360 Ω	.25W.	C-2795-148B
R19	1000 Ω	.25W.	C-2795-62B
R20	1 MEGOHM	.25W.	C-2795-98B
R21	18,000 Ω	.25W.	C-2795-77B
R22	200,000 Ω	.25W.	C-2795-214B
R23	2 MEG. VOL.	CONT.	A-15140
R24	560,000 Ω	.25W.	C-2795-95B
R25	470,000 Ω	.25W.	C-2795-94B
R26	560,000 Ω	.25W.	C-2795-95B
R27	680,000 Ω	.25W.	C-2795-96B
R28	13,000 Ω	.25W.	C-2795-186B
R29	2700 Ω	.25W.	C-2795-169B
R30	22,000 Ω	.25W.	C-2795-191B
R31	22,000 Ω	.25W.	C-2795-191B
R32	47,000 Ω	.25W.	C-2795-82B
R33	47,000 Ω	.25W.	C-2795-82B
R34	180 Ω	3W.	C-2799-141A

L1	LOOP ANTENNA	D-1586-1
L2	B.C. R.F. COIL	A-15836
L3	B.C. OSC. COIL	A-15394-1
L4	POL. ANT. COIL	A-15833
L5	POL. R.F. COIL	A-15834
L6	POL. OSC. COIL	A-15835
L7	S.W. ANT. COIL	A-14960-2
L8	S.W. R.F. COIL	A-15837
L9	S.W. OSC. COIL	A-14967-3
L10	NO. 1 I.F. COIL	A-14794-1
L11	NO. 2 I.F. COIL	A-14794-2
L12	TONE CONT. CHOKE	B-8266
L13	FILTER CHOKE	A-15386
L14	P.B. B.C. OSC. COIL	B-8263
L15	P.B. B.C. OSC. COIL	B-8263
L16	P.B. B.C. OSC. COIL	B-8263
L17	P.B. B.C. OSC. COIL	B-8263
L18	P.B. B.C. OSC. COIL	B-8263
L19	P.B. B.C. OSC. COIL	B-8263
L20	R.F. CHOKE	A-14718-2

S1	ANT. PRI. SECTION	WAVE BAND SWITCH B-8043
S2	ANT. SEC. SECTION	WAVE BAND SWITCH B-8043
S3	DET. PRI. SECTION	WAVE BAND SWITCH B-8043
S4	DET. SEC. SECTION	WAVE BAND SWITCH B-8043
S5	OSC. PRI. SECTION	WAVE BAND SWITCH B-8043
S6	OSC. SEC. SECTION	WAVE BAND SWITCH B-8043
S7	RADIO-PHONO SEC.	WAVE BAND SWITCH B-8043
S8	TONE CONTROL	
S9	" "	

TONE CONTROL A-15823 SHOWN IN HIGH FIDELITY POSITION.
1. OFF
2. ON – HIGH FIDELITY
3. BARITONE
4. BASS
5. TREBLE
6. SPEECH

December 2, 1940

MODEL 1091

SPARKS WITHINGTON CO.

Sparton Superheterodyne Model 1091

VOLTAGE CHART

Line Voltage: 117 Volts

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

TUBE	FUNCTION	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
6SK7GT	R.F. Amplifier	0	0	0	0	4.2	60	6.2*	300	-
6J8G	Osc. & Converter	0	0	300	60	**	80	6.2*	4.2	0
6K7G	I-F Amplifier	0	0	300	100	0	-	6.2*	4.2	0
6SQ7GT	Det. & AVC 1st Audio	0	0	**	**	**	130	6.2*	0	-
6J5G	Phase Inverter	0	0	225	300	**	80	6.2*	60	-
6V6G	Power Amplifier	0	0	300	300	**	0	6.2*	0	-
6V6G	Power Amplifier	0	0	300	300	**	0	6.2*	0	-
6P5G	AVC Amplifier	0	0	**	-	**	50	6.2*	0	-
6AF6G	Dual Visoglo	0	0	0	300	0	22	6.2*	0	-
5Y3G	Rectifier	0	400	-	375	375	375	0	400	-
5Y3G	Rectifier	0	400	-	375	-	375	-	400	-

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*AC volts.
**Cannot be measured with Weston Analyzer #665.

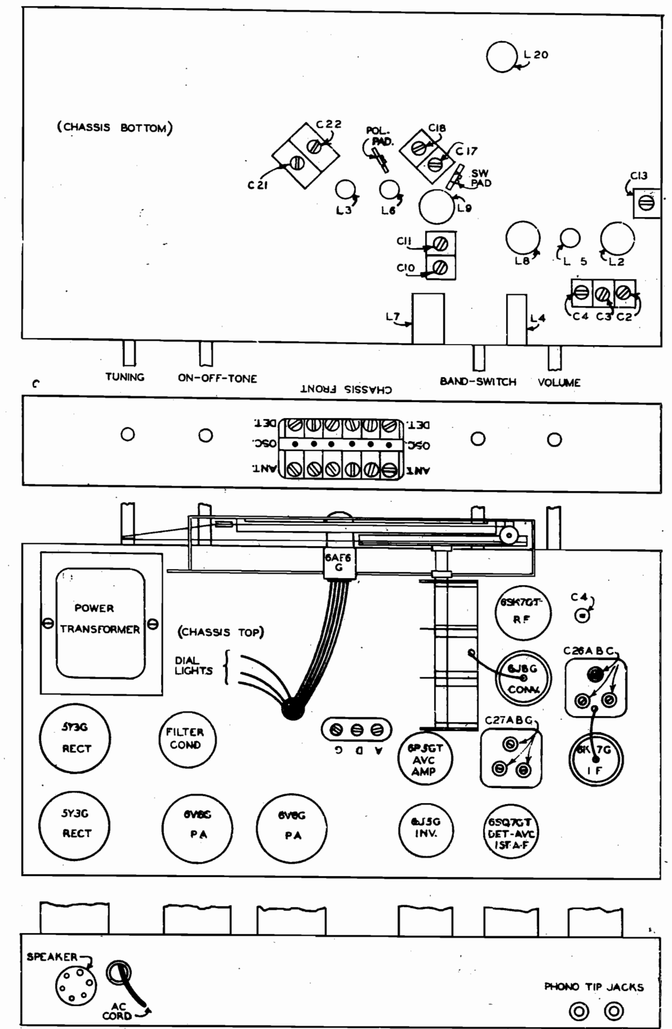
ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMEF	REMARKS
1	(Set drive wheel so that pointer is over left hand stop line of alignment scale with condenser gang fully meshed.)							
2	I.F.	Grid Cap of 6J8G Osc. Conv.	.1 mf.	456 KC	BC	Open	C27 B *	**
3							C27 A C27 C	Peak accurately
4							C27 B *	Peak accurately
5							C26 B *	**
6							C26 A C26 C	Peak accurately
7							C26 B *	Peak accurately
8	CAUTION: Do not readjust trimmers 27A&C and 26A&C after red spot trimmers 27B and 26B have been peaked.							
9	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C21 (Osc.) C13 (RF) C4 (ANT)	Peak accurately Peak accurately Peak accurately
10				600 KC	BC	600 KC	C22 (Pad.)	Rock ***
11	(Repeat operation 9)							
12	(Check calibration and sensitivity at 1500 KC, 1000 KC and 600 KC)							
13	Police Band	Ant.	100 ohms 200 mmf. series	5 MC	Police	5 MC	C18 (Osc.) C2 (RF) C3 (ANT)	Peak accurately Peak accurately Peak accurately
14	(Check calibration and sensitivity at 5 MC, 3 MC and 1.6 MC)							
15	Short Wave Band	Ant.	100 ohms 200 mmf. series	18 MC	S.W.	18 MC	C17 (Osc.) C11 (RF) C10 (ANT)	Peak accurately Rock *** Peak accurately
16	(Check calibration and sensitivity at 18 MC, 12 MC and 6 MC)							
17	(Check operations 1 to 14 inclusive)							

NOTES: *Bronze color trimmer screw
**Turn trimmer screw all the way down
***Rock dial while adjusting for maximum output.

Sparton Superheterodyne Model 1091

CHASSIS DIAGRAM



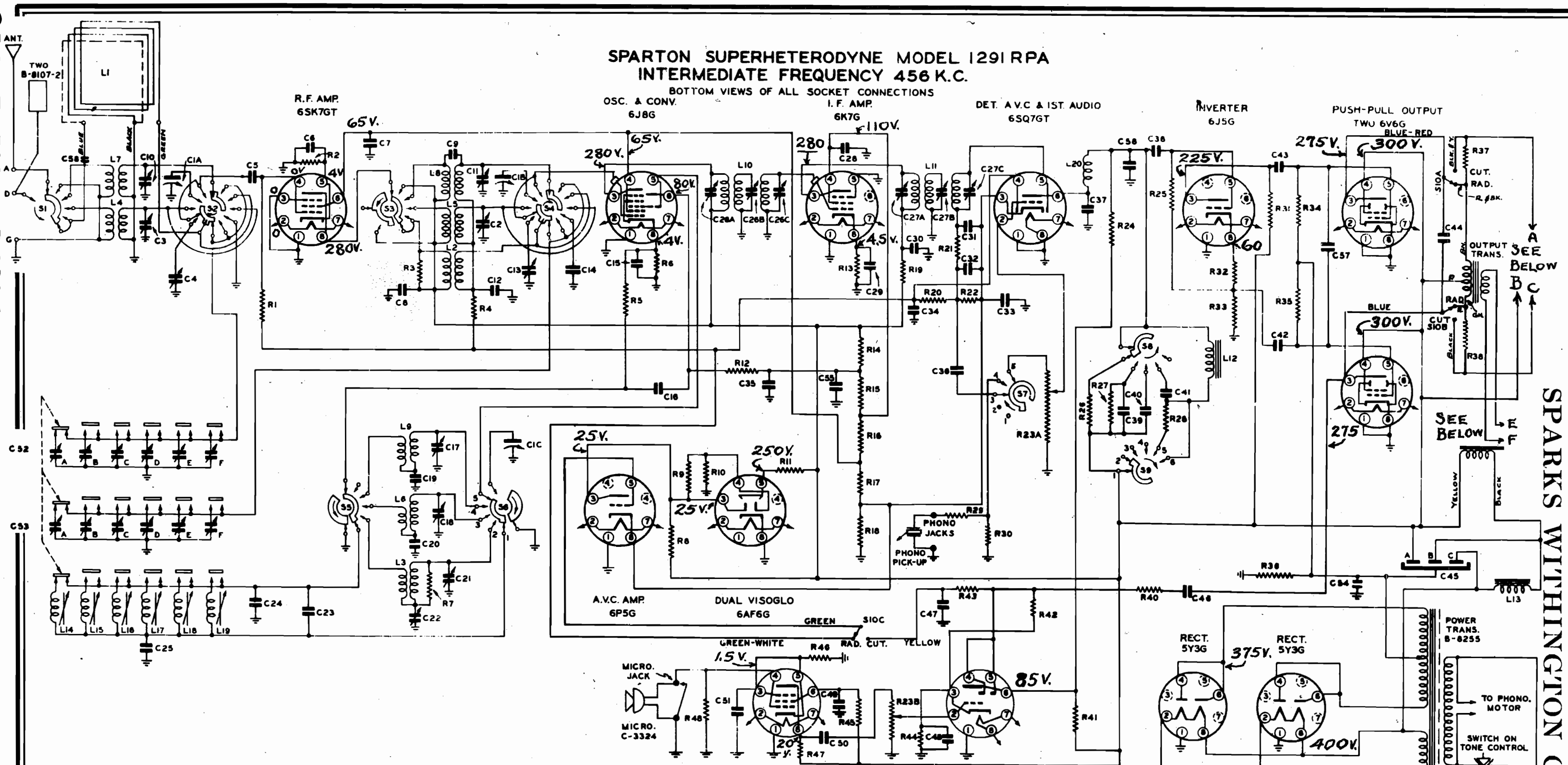
(CHASSIS BACK)

SPARKS WITHINGTON CO.

MODEL 1291-RPA

SPARTON SUPERHETERODYNE MODEL 1291 RPA
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



SPEAKER C-2280-97

CUTTER JACK

CUT. TRANS. A 15730

C1A,B,C	VARIABLE CONDENSER		B-8260
C2	POL. R.F TRIMMER	}	A-15819
C3	POL. ANT. TRIMMER	}	A-15819
C4	B.C ANT. TRIMMER	}	A-15819
C5	500 MMF. MICA		C-720-316
C6	.05 MFD. 200V.		C-3202-28C
C7	.05 MFD. 400V		C-3204-28C
C8	.05 MFD. 400V.		C-3204-28C
C9	5 MMF. MICA		C-720-361
C10	S.W ANT. TRIMMER	}	A-15820
C11	S.W R.F TRIMMER	}	A-15820
C12	.05 MFD 200V		C-3202-84C
C13	B.C R.F TRIMMER		A-15821
C14	.05 MFD 200V		C-3202-28C
C15	.05 MFD 200V		C-3202-28C
C16	50 MMF. MICA		C-720-320
C17	S.W OSC TRIMMER	}	A-15820
C18	POL OSC TRIMMER	}	A-15820
C19	3180 MMF MICA		A-15451-2
C20	1120 MMF MICA		A-15451-1
C21	B.C. OSC TRIMMER	}	B-7199-BY
C22	B.C. OSC. PADDER	}	B-7199-BY
C23	20 MMF COMPENSATOR		A-14922-1
C24	370 MMF MICA		B-8265-1
C25	370 MMF MICA		B-8265-1
C26ABC	NO.1 I.F TRIMMER		A-14792
C27ABC	NO.2 I.F TRIMMER		A-14792
C28	.05 MFD 400V		C-3204-28C
C29	.05 MFD 200V.		C-3202-28C
C30	.05 MFD 400V		C-3204-28C
C31	100 MMF MICA		C-720-339

C32	100 MMF. MICA		C-720-339
C33	50 MFD 25V		A-14782-6
C34	.05 MFD. 200V.		C-3202-28C
C35	.01 MFD. 400V.		C-3204-132C
C36	.02 MFD. 200V.		C-3202-134C
C37	100 MMF. MICA		C-720-339
C38	.02 MFD. 400V.		C-3204-134C
C39	.002 MFD. 400V.		C-3204-116C
C40	.004 MFD 400V		C-3204-120C
C41	.006 MFD. 400V.		C-3204-124C
C42	.1 MFD. 400V		A-15851-1
C43	.1 MFD. 400V		A-15851-1
C44	.003 MFD. 600V.		C-3206-118C
C45 A	15 MFD. 450V.	ELECT	A-14684-7
C45 B	10 MFD. 450V	ELECT	A-14684-7
C45 C	15 MFD. 450V.	ELECT	A-14684-7
C46	.02 MFD. 400 V.		C-3204-134-C
C47	.01 MFD. 200 V.		C-3202-132C
C48	3 MFD. 25 V.		A-14782-7
C49	.05 MFD. 400 V.		C-3204-28C
C50	.02 MFD. 400 V.		C-3204-134C
C51	3 MFD. 25 V.		A-14782-7
C52	P.B. TRIMMERS (A-F)		A-15825-1
C53	P.B. TRIMMERS (A-F)		A-15825-2
C54	10 MFD. 25V.		A-14782-2
C55	4 MFD. 400V.		A-14782-8
C56	50 MMF. MICA		C-720-320
C57	100 MMF. MICA		C-720-339
C58	200 MMF. MICA		C-720-350

R1	2.2 MEGOHM	.25W.	C-2795-102B
R2	1000 Ω	.25W.	C-2795-82B
R3	10,000 Ω	.25W.	C-2795-74B
R4	100,000 Ω	.25W.	C-2795-86B
R5	56,000 Ω	.25W.	C-2795-83B
R6	1000 Ω	.25W.	C-2795-82B
R7	47,000 Ω	.25W.	C-2795-82B
R8	180,000 Ω	.25W.	C-2795-89B
R9	1 MEGOHM	.25W	C-2795-98B
R10	1 MEGOHM	.25W	C-2795-98B
R11	56,000 Ω	.25W.	C-2795-83B
R12	22,000 Ω	.5W	C-2796-78C
R13	620 Ω	.25W.	C-2795-154B
R14	12,000 Ω	3W.	C-2799-185A
R15	6800 Ω	1W.	C-2797-179B
R16	6800 Ω	1W.	C-2797-179B
R17	16,000 Ω	2W	C-2798-188A
R18	180 Ω	.25W.	C-2795-141B
R19	1000 Ω	.25W.	C-2795-82B
R20	1 MEG.	.25W.	C-2795-98B
R21	18000 Ω	.25W.	C-2795-77B
R22	200000	.25W.	C-2795-214B
R23A	2 MEG.	VOL. CONT.	A-15141
R23B	1 MEG.	VOL. CONT.	A-15141
R24	390000 Ω	.25W.	C-2795-93B
R25	470000 Ω	.25W.	C-2795-94B
R26	560000 Ω	.25W.	C-2795-95B
R27	680000 Ω	.25W.	C-2795-96B
R28	13000 Ω	.25W.	C-2795-188B
R29	560000 Ω	.25W.	C-2795-95B
R30	180000 Ω	.25W.	C-2795-89B

R31	22000 Ω	.25W.	C-2795-191B
R32	2700 Ω	.25W.	C-2795-169B
R33	22000 Ω	.25W.	C-2795-191B
R34	47000 Ω	.25W.	C-2795-82B
R35	47000 Ω	.25W.	C-2795-82B
R36	180 Ω	3.W.	C-2799-141A
R37	47000 Ω	.5W.	C-2796-82C
R38	47000 Ω	.5W.	C-2796-82C
R39	8000 Ω	7.W.	A-14263-2
R40	100000 Ω	.25W	C-2795-86B
R41	180000 Ω	.25W.	C-2795-89B
R42	27000 Ω	.25W.	C-2795-79B
R43	1 MEG.	.25W.	C-2795-98B
R44	2000 Ω	.25W.	C-2795-166B
R45	1 MEG.	.25W.	C-2795-98B
R46	2000 Ω	.25W	C-2795-166B
R47	270000 Ω	.25W.	C-2795-91B
R48	1 MEG.	.25W.	C-2795-98B

L1	LOOP ANT. COIL	D-1568-1
L2	B.C. R.F. COIL	A-15836
L3	B.C. OSC. COIL	A-15394-1
L4	POL. ANT. COIL	A-15833
L5	POL. R.F. COIL	A-15834
L6	POL. OSC. COIL	A-15835
L7	S.W. ANT. COIL	A-14960-2
L8	S.W. R.F. COIL	A-15837
L9	S.W. OSC. COIL	A-14967-3
L10	NO.1 I.F. COIL	A-14794-1
L11	NO.2 I.F. COIL	A-14794-2
L12	TONE CONT. CHOKE	B-8286
L13	FILTER CHOKE	A-15386
L14–L19	P.B.B.C. OSC. COILS	B-8263
L20	R.F. CHOKE	A-14718-2

S1 ANT. PRI. SECTION
S2 ANT. SEC. SECTION
S3 DET. PRI. SECTION
S4 DET. SEC. SECTION
S5 OSC. PRI. SECTION
S6 OSC. SEC. SECTION
S7 RADIO-PHONO SEC.
} WAVE BAND SWITCH B-8043
SHOWN IN B.C. P.B. TUNING POS.
1. B.C PUSH BUTTON TUNING.
2. B.C. MANUAL
3. POLICE BAND
4. SHORT WAVE BAND
5. PHONO.-TELEV. SOUND

S8 TONE CONTROL
S9 " "
S10A-C RAD-CUT SW A-15898
TONE CONTROL A-15823
SHOWN IN HIGH FIDELITY
1. OFF
2. ON-HIGH FIDELITY
3. BARITONE
4. BASS
5. TREBLE
6. SPEECH

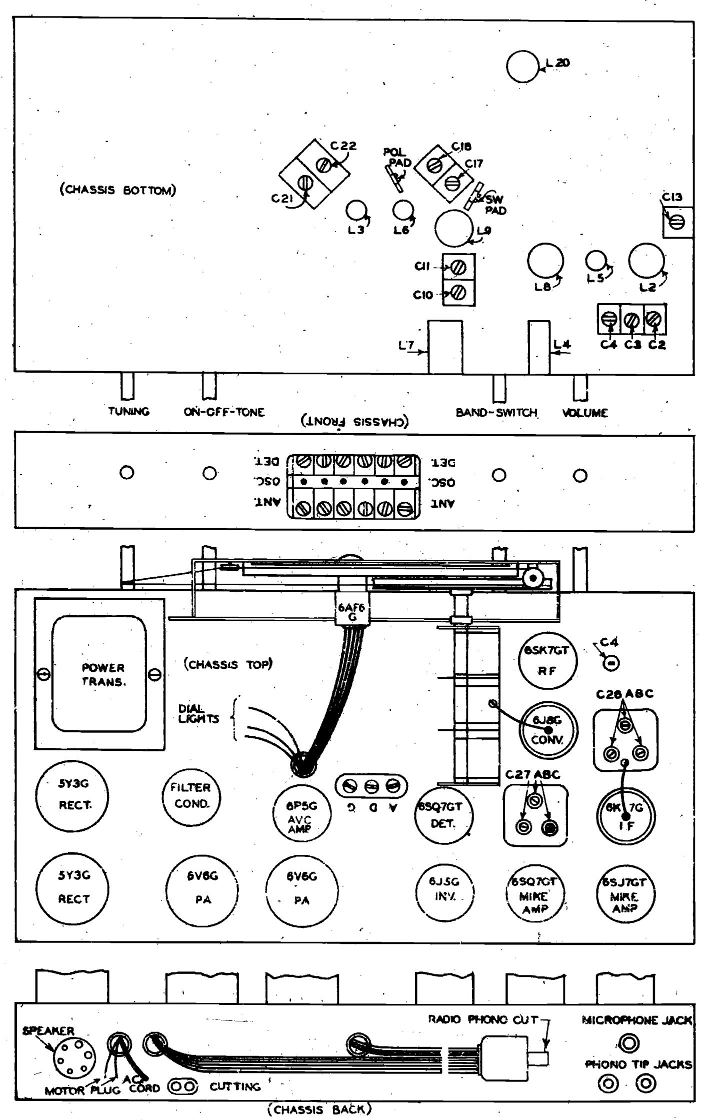
Dec. 2, 1940

MODEL 1081
MODEL 1291-RPA

SPARKS WITHINGTON CO.

Sparton Superheterodyne Model 1291-RPA

CHASSIS DIAGRAM



Sparton Superheterodyne Model 1291-RPA

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is over left hand line of alignment scale with condenser gang fully meshed)							
2	I.F.	Grid Cap of 6J8G Osc. Conv.	.1 mf.	456 KC	BC	Open	C27 B *	**
3							C27 A C27 C	Peak accurately
4							C27 B *	Peak accurately
5							C26 B *	**
6							C26 A C26 C	Peak accurately Peak accurately
7							C26 B *	Peak accurately
8	CAUTION: Do not readjust trimmers 27A&C and 26A&C after red spot trimmers 27B and 26B have been peaked.							
9	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C21 (Osc.) C13 (RF) C4 (ANT)	Peak accurately Peak accurately Peak accurately
10				600 KC	BC	600 KC	C22 (Pad)	Rock ***
11	(Repeat operation 7)							
12	(Check calibration and sensitivity at 1500 KC, 1000 KC and 600 KC)							
13	Police Band	Ant.	100 ohms 200 mmf. series	5 MC	Police	5 MC	C18 (Osc.) C2 (RF) C3 (ANT)	Peak accurately Peak accurately Peak accurately
14	(Check calibration and sensitivity at 5 MC, 3 MC and 1.6 MC)							
15	Short Wave Band	Ant.	100 ohms 200 mmf. series	18 MC	S.W.	18 MC	C17 (Osc.) C11 (RF) C10 (ANT)	Peak accurately Rock *** Peak accurately
16	(Check calibration and sensitivity at 18 MC, 12 MC and 6 MC)							
17	(Check operations 1 to 14 inculsive.)							

NOTES: *Bronze color trimmer screw
**Turn trimmer screw all the way down.
***Rock dial while adjusting for maximum output.

Model 1081

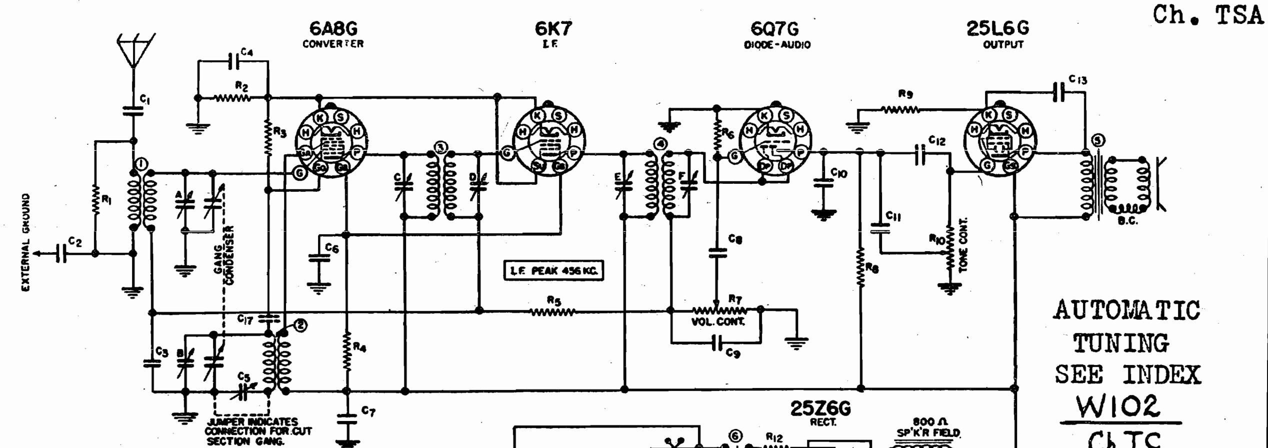
ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set drive wheel so that pointer is over left hand stop line of alignment scale with condenser fully meshed. See special note below.)							
2	I.F.	*	.1 mf	456	BC	1600 KC	C13 A & B C12 A & B	2nd I.F. 1st I.F.
3	Rejector	**	200 mmf.	456	BC	600 KC	C3	Adjust to minimum
4	Broadcast Band	**	200 mmf.	1500 KC	BC	1500 KC	C7 (Osc.)	***
5				600 KC	BC	600 KC	C8 (Pad.)	***
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 750 KC, 1000 KC and 1500 KC)							
8	Shortwave Band	**	****	18 MC	SW	18 MC	C4 (Osc.) C5 (ANT.)	*** ***
9	(Check calibration and sensitivity at 6.0 MC, 9.0 MC and 18.0 MC)							
10	(Check operations 1 to 9 inclusive.)							

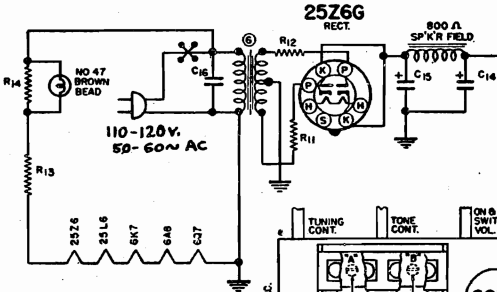
NOTES: *Pin No. 8 of 6SA7GT Osc-Converter tube.
**Connect dummy antenna to "Antenna" of loop winding.
***Rock dial while adjusting for maximum output.
****100 ohm resistor and 200 mmf. condenser in series.
Special Note: For accurate alignment, the special scale reproduced in this bulletin must be used. The scale and full directions for using it will be found on page

SPIEGEL, INC.

MODEL W102, Ch. TC
MODELS A2002, Z7006
Ch. TSA



AUTOMATIC TUNING SEE INDEX W102 Ch.TC

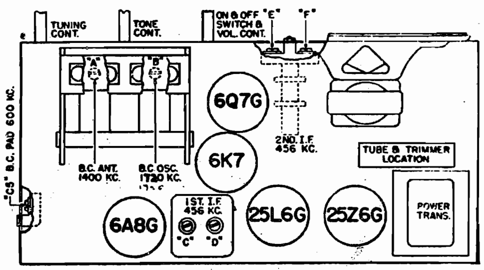


IF PEAK 456 KC

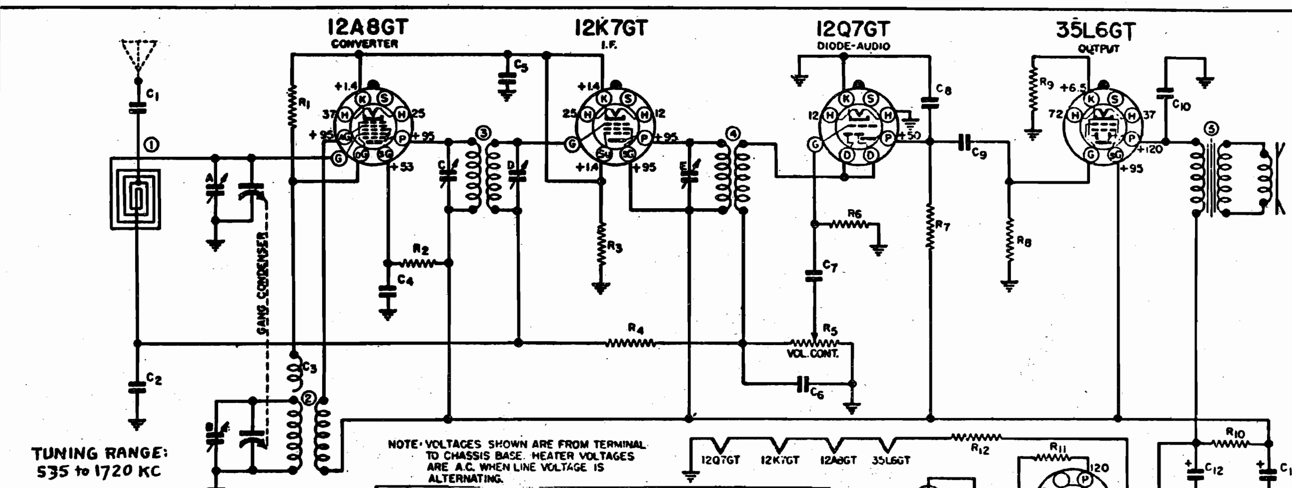
DIAG NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1344	.01 MFD. 400V.	R_{11}	N-1349	100 OHMS .5 W.
C_2	N-1344	.01 MFD. 400V.	R_{12}	N-1349	100 OHMS .5 W.
C_3	N-1345	.05 MFD. 200V.	R_{13}	N-1322	150 OHMS ARMORED WIRE RES.
C_4	N-1351	.1 MFD. 200V.	R_{14}	N-1322	30 OHMS ARMORED WIRE RES.
C_5	N-1323	300-600 MMFD. PADDER			
C_6	N-1345	.05 MFD. 200V.			
C_7	N-1345	.05 MFD. 200V.			
C_8	N-1347	.006 MFD. 600V.	1	N-1316	ANTENNA COIL
C_9	N-1343	250 MMFD.	2	N-1317	OSCILLATOR COIL
C_{10}	N-1343	250 MMFD.	3	N-1318	1ST. I.F. TRANSFORMER
C_{11}	N-1347	.006 MFD. 600V.	4	N-1319	2ND I.F. TRANSFORMER
C_{12}	N-1344	.01 MFD. 400V.	5	N-1314	SPEAKER & TRANSFORMER
C_{13}	N-1344	.01 MFD. 400V.	6	N-1315	POWER TRANSFORMER
C_{14}	N-1312	15 MFD. 150V.			
C_{15}	N-1312	20 MFD. 200V.		N-1273	GANG CONDENSER
C_{16}	N-1346	.05 MFD. 400V.			
C_{17}		CAPACITY INCLUDED IN OSCILLATOR COIL.			
R_1	N-1352	15,000 OHMS .5 W.			
R_2	N-1360	150 OHMS .5 W.			
R_3	N-1353	50,000 OHMS .5 W.			
R_4	N-1352	15,000 OHMS .5 W.			
R_5	N-1355	1 MEGOHM .5 W.	SET WITH CUT SECTION GANG		
R_6	N-1356	15 MEGOHMS .5 W.		N-1337	OSCILLATOR COIL
R_7	N-1320	1 MEGOHM VOLUME CONT.		N 1338	GANG CONDENSER
R_8	N-1354	300,000 OHMS .5W.	C_5	N 1323	PADDER, ELIMINATED
R_9	N-1350	150 OHMS .5 W. ±10%			
R_{10}	N-1321	.5 MEGOHM TONE CONT.			

RANGE: 535-1720 KC

5 TUBE A.C.
SUPERHETERODYNE
SINGLE BAND
CHASSIS-TC
DRN. J.B. APP. 11-5-38

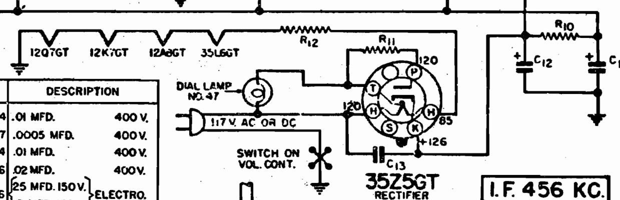


CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



TUNING RANGE: 535 to 1720 KC

NOTE: VOLTAGES SHOWN ARE FROM TERMINAL TO CHASSIS BASE. HEATER VOLTAGES ARE A.C. WHEN LINE VOLTAGE IS ALTERNATING.



I.F. 456 KC.

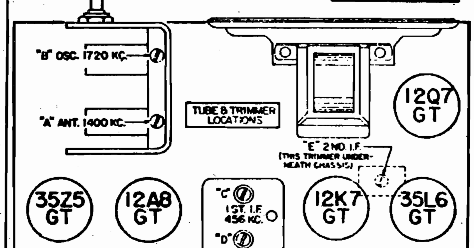
DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1260	50,000 OHM .5W. 20%	C_7	N-1344	.01 MFD. 400 V.
R_2	N-1460	30,000 OHM .5W. 20%	C_8	N-1447	.0005 MFD. 400 V.
R_3	N-1615	100 OHM 5W. 10%	C_9	N-1344	.01 MFD. 400 V.
R_4	N-1262	1 MEGOHM 5 W. 20%	C_{10}	N-1376	.02 MFD. 400V.
R_5	N-1595	0.5 MEGOHM VOL. CONT.	C_{11}	N-1366	25 MFD. 150 V. ELECTRO.
R_6	N-1263	10 MEGOHM .5W. 20%	C_{12}	N-1366	15 MFD. 150V. ELECTRO.
R_7	N-1377	200,000 OHM .5W. 20%	C_{13}	N-1346	.05 MFD. 400 V.
R_8	N-1264	500,000 OHM .5W. 20%			
R_9	N-1616	250 OHM .5W. 10%			
R_{10}	N-1617	2500 OHM .5W. 20%	1	N-1594	ANTENNA COIL LOOP
R_{11}	N-1614	50 OHM .5W. 20%	2	N-1452	OSCILLATOR COIL
R_{12}	N-1618	80 OHM 2W. 10%	3	N-1598	1ST. I.F TRANSFORMER
			4	N-1596	2ND. I.F. TRANSFORMER
			5	N-1585	4" P.M. SPEAKER & TRANS.
C_1	N-1344	.01 MFD. 400V.	E	N-1597	2ND. I.F. TRIMMING COND.
C_2	N-1345	.05 MFD. 200V.			
C_3		CAPACITY INCLUDED IN OSCILLATOR COIL		N-1431	GANG CONDENSER
C_4	N-1345	.05 MFD. 200V.			
C_5	N-1351	.1 MFD. 200V.			
C_6	N-1374	100 MMFD.			

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII

A2002, Z7006 Ch. TSA

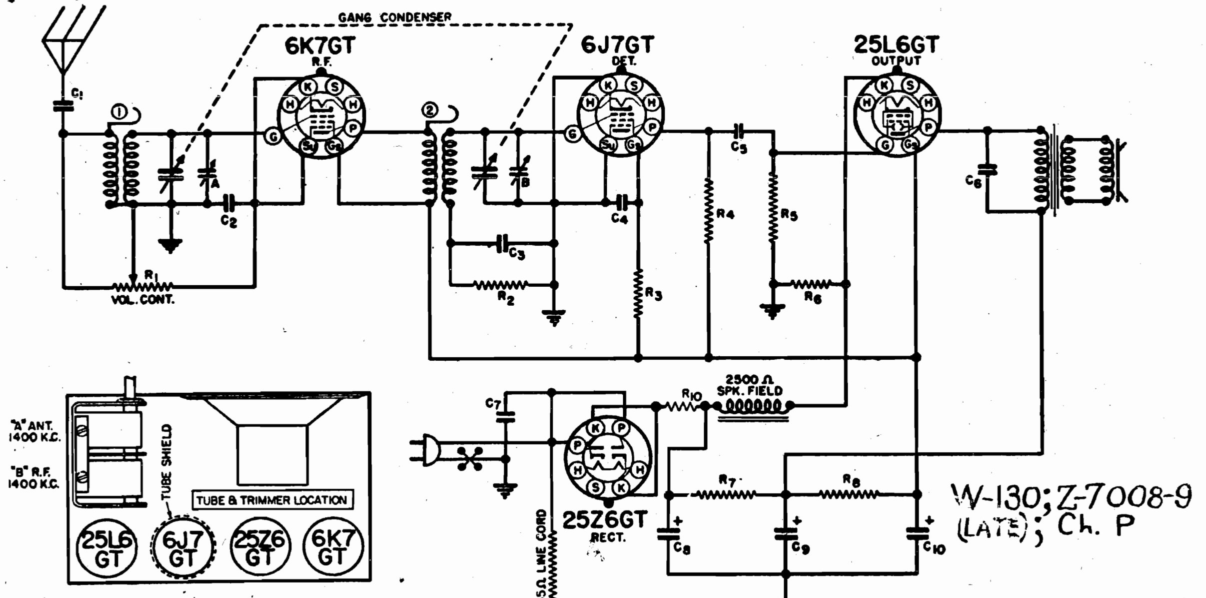
TSA: DRN. J.B. APP. 2-25-39

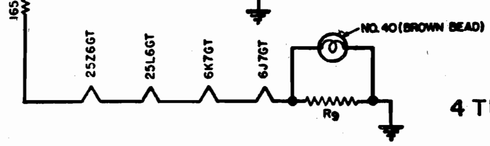
DO NOT USE EXTERNAL GROUND



MODELS W-130, Z-7008-9
(Late), Ch. P
MODEL Z-7008-9
(Late), Ch. TP

SPIEGEL, INC.

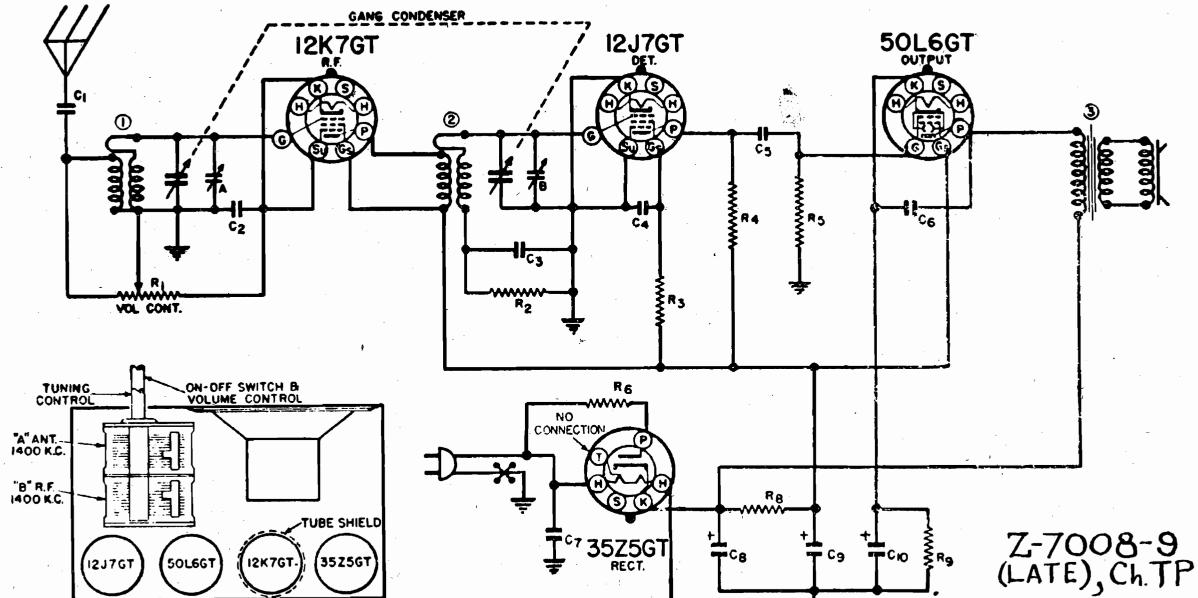


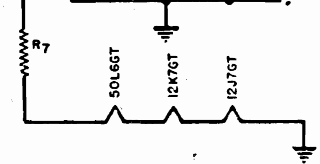


4 TUBE T.R.F.

DIAG NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION	
C_1	N-1344	.01 MFD.	400 V.	R_1	V-23	25,000 OHM	VOL.
C_2	N-1345	.05 MFD.	200 V.	R_2	N-1418	3.5 MEG.	.5 W.
C_3	N-1345	.05 MFD.	200 V.	R_3	N-1419	6 MEG.	.5 W.
C_4	N-1344	.01 MFD.	400 V.	R_4	N-1262	1 MEG.	.5 W.
C_5	N-1344	.01 MFD	400 V.	R_5	N-1264	.5 MEG.	.5 W.
C_6	N-1344	.01 MFD.	400 V.	R_6	N-1416	125 OHM ±10%	.5 W.
C_7	N-1346	.05 MFD.	400 V.	R_7	N-1420	125 OHM	1 W.
C_8	C-233	16 MFD.	150 W.V.	R_8	N-1417	3,000 OHM	.5 W.
C_9	C-233	8 MFD.	150 W.V.	R_9	N-1415	30 OHM	1.0 W.
C_{10}	C-233	6 MFD	150 W.V.	R_{10}	N-1251	25 OHM	1 W.
	S-300	SPEAKER		1	L-110	ANTENNA COIL	
	G-25	GANG CONDENSER		2	L-111	R.F. COIL	

OPERATES ON 110-120 V., 50-60~ AC or DC
DO NOT CONNECT TO EXTERNAL GROUND.





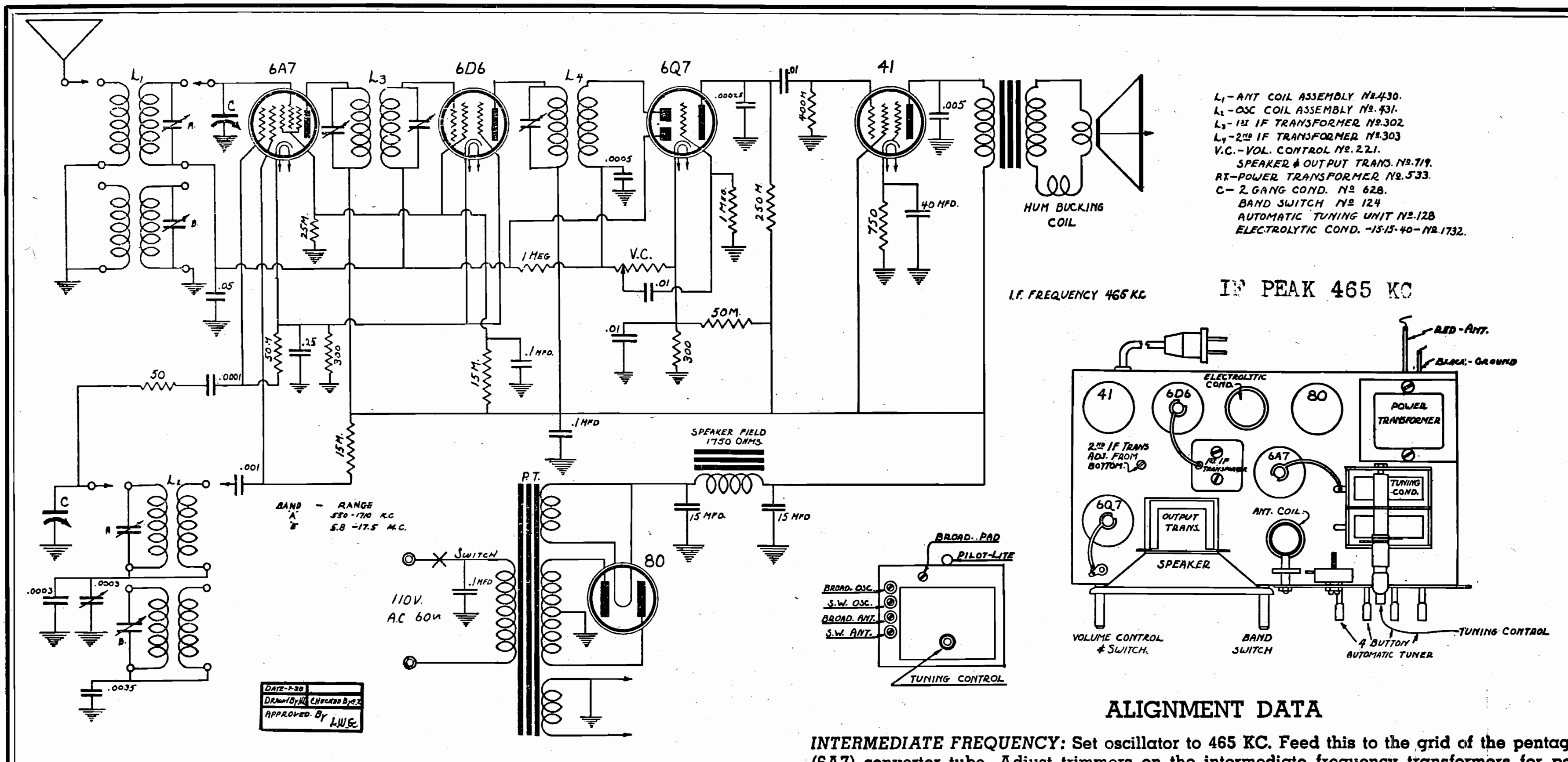
4 TUBE T.R.F.

DIAG NO	PART NO	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION		
C_1	N-1344	.01 MFD.	400 V.	R_1	N-1537	25,000 OHM		VOL.
C_2	N-1345	.05 MFD.	200 V.	R_2	N-1418	3.5 MEG.	20%	.5 W.
C_3	N-1345	.05 MFD.	200 V.	R_3	N-1835	6 MEG.	20%	.5 W.
C_4	N-1344	.01 MFD.	400 V	R_4	N-1262	1 MEG.	20%	.5 W.
C_5	N-1344	.01 MFD.	400 V.	R_5	N-1264	.5 MEG.	20%	.5 W.
C_6	N-1344	.01 MFD.	400 V.	R_6	N-1614	50 OHM	20%	.5 W.
C_7	N-1346	.05 MFD.	400 V.	R_7	N-1618	80 OHM	10%	2 W.
C_8	N-1850	25 MFD 150 V	ELECT.	R_8	N-1417	3,000 OHM	20%	.5 W
C_9	N-1850	10 MFD 150 V.	ELECT.	R_9	N-1718	250 OHM	10%	.5 W.
C_{10}	N-1850	20 MFD 25 V	ELECT.	1	N-1790	ANTENNA COIL		
	N-1401 N-1847	GANG CONDENSER		2	N-1791	R F. COIL		
				3	N-2047	SPEAKER & TRANS		

OPERATES ON 110-120V, 50-60~ AC or. DC.
DO NOT CONNECT TO EXTERNAL GROUND

SPIEGEL, INC.

MODELS W-132, V-1032
Chassis 601



This receiver is designed to operate over two tuning ranges. The **broadcast** range which extends from 540 K.C. to 1730 and the **foreign short** wave band which extends from 5800 K.C. to 18000 K.C.

STATION SELECTOR

The four button automatic tuner on this receiver can be adjusted to any station desired by the listener regardless of the frequency of the station. To adjust: Tune in the station desired with the manual control. Loosen the first automatic tuning button by turning the button counter-clockwise. Press it in all the way while holding the manual control knob tuned to the desired station. Rotate button clockwise to lock it. The remaining three buttons are adjusted in the same way. The adjustments can be changed at any time desired.

ALIGNMENT DATA

INTERMEDIATE FREQUENCY: Set oscillator to 465 KC. Feed this to the grid of the pentagrid (6A7) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

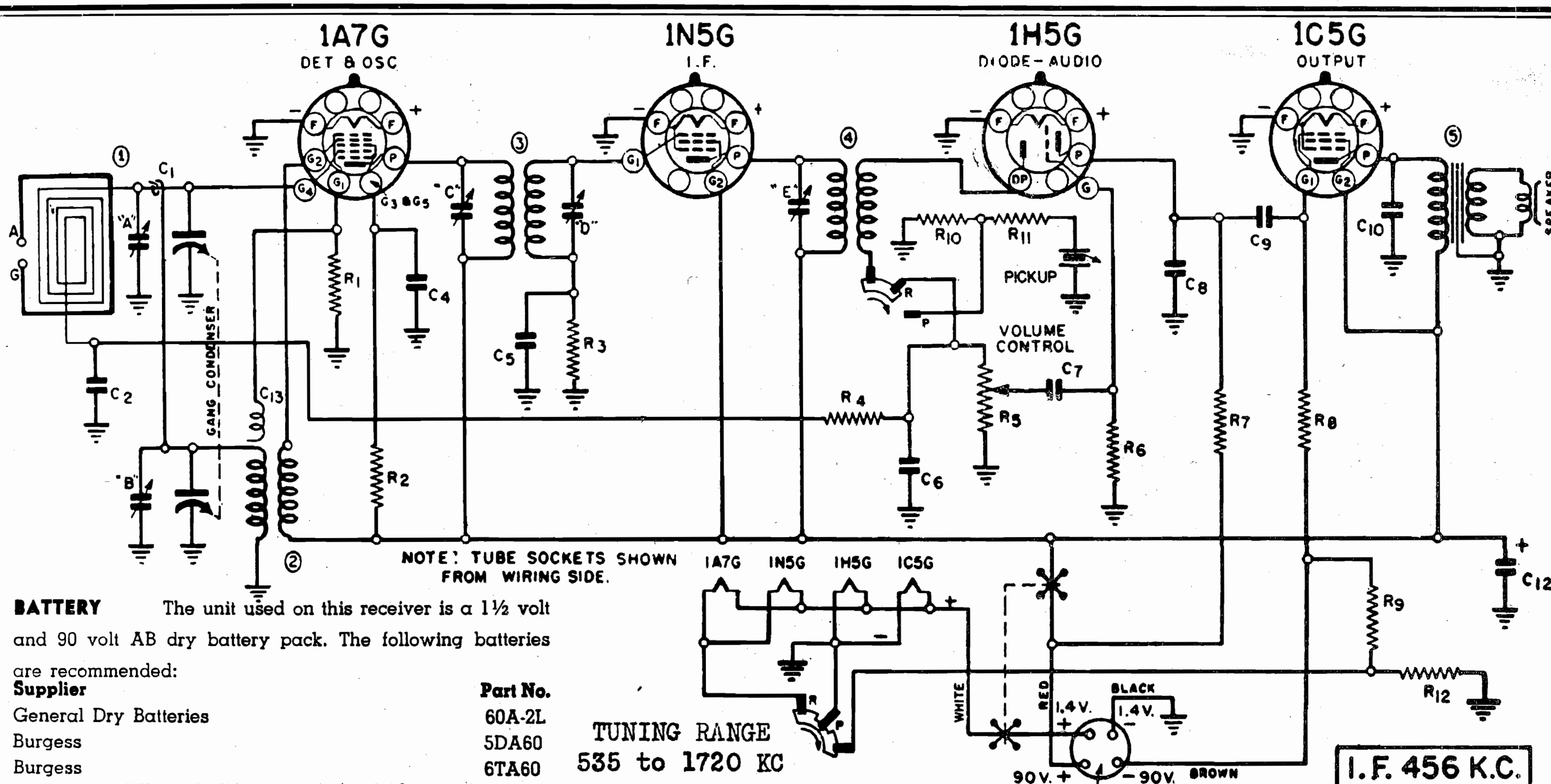
BROADCAST BAND: Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the *broadcast padding* condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

SHORT WAVE: Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.

MODELS W-134, Z7124
Chassis TF

SPIEGEL, INC.



NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

TUNING RANGE
535 to 1720 KC

BATTERY The unit used on this receiver is a 1½ volt and 90 volt AB dry battery pack. The following batteries are recommended:

Supplier	Part No.
General Dry Batteries	60A-2L
Burgess	5DA60
Burgess	6TA60

INDIVIDUAL "A" AND "B" BATTERIES.

A hook-up harness consisting of three plugs and a socket is required. This hook-up harness is not furnished with the receiver and should be purchased when obtaining separate A and B batteries.

SUPPLIER	1½ Volt A Battery (2½" x 2½" x 4")	45 Volt B Battery (2½" x 4⅛" x 5")
Eveready	No. 742	No. 762
Burgess	No. 4FAPI	No. B 30 PI
Ray-O-Vac	No. P94A	No. P 5303
General Dry Battery	No. 4H1	No. V-30-B

Use one "A" battery and two "B" batteries with the hook-up harness. Clamp down the batteries with support strap.

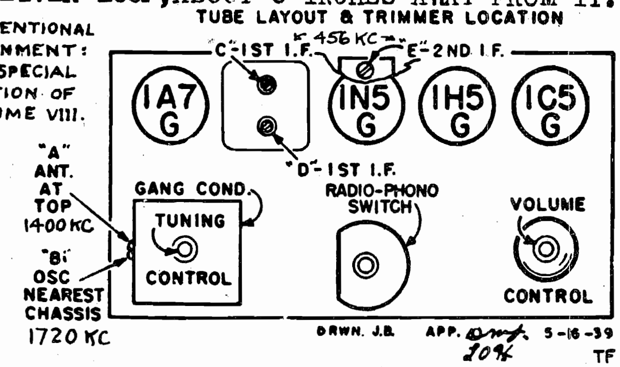
DIAG. NO.	PART NO.	DESCRIPTION
1	N-1804	LOOP ANTENNA
2	N-1452	OSCILLATOR COIL
3	N-1391	1ST I.F. TRANS.
4	N-1548	2ND I.F. TRANS.
5	N-1507	5" P.M. SPKR. & TRANS.
	N-1737	GANG CONDENSER
	N-1552	BATTERY CABLE
"E"	N-1453	TRIMMER COND.-2ND I.F.
	N-1883	RADIO-PHONO SWITCH

DIAG. NO.	PART NO.	DESCRIPTION
R_1	N-1377	.2 MEGOHM 20% .5W.
R_2	N-1353	50,000 OHM 10% "
R_3	N-1378	2 MEGOHM 20% "
R_4	N-1262	1 MEGOHM " "
R_5	N-1738	.5 MEG. VOLUME CONT.
R_6	N-1378	2 MEGOHM 20% .5W
R_7	N-1262	1 MEGOHM " "
R_8	N- "	" " "
R_9	N-1661	650 OHM 10% "
R_{10}	N-1929	65,000 OHM 20% "
R_{11}	N-1779	150,000 OHM 20% "
R_{12}	N-1844	300 OHM 10% "
C_1	——	GIMMIC
C_2	N-1345	.05 MFD 200 V
C_4	N-1345	.05 MFD. 200 V.
C_5	N-1376	.02 MFD. 400 V.
C_6	N-1343	250 MMFD. 20%
C_7	N-1344	.01 MFD. 400 V.
C_8	N-1374	100 MMFD. 20%
C_9	N-1344	.01 MFD 400 V.
C_{10}	N-1347	.006 MFD. 600 V.
C_{12}	N-1367	6 MFD. ELECTROLYTIC
C_{13}	-	CAPACITY INCLUDED
"		IN OSCILLATOR COIL.

CONNECT TO GENERATOR 2-TURN LOOP APPROX. 1 FOOT IN DIAM. PLACE THIS PARALLEL TO RECEIVER LOOP, ABOUT 6 INCHES AWAY FROM IT.

CONVENTIONAL ALIGNMENT: SEE SPECIAL SECTION OF VOLUME VIII.

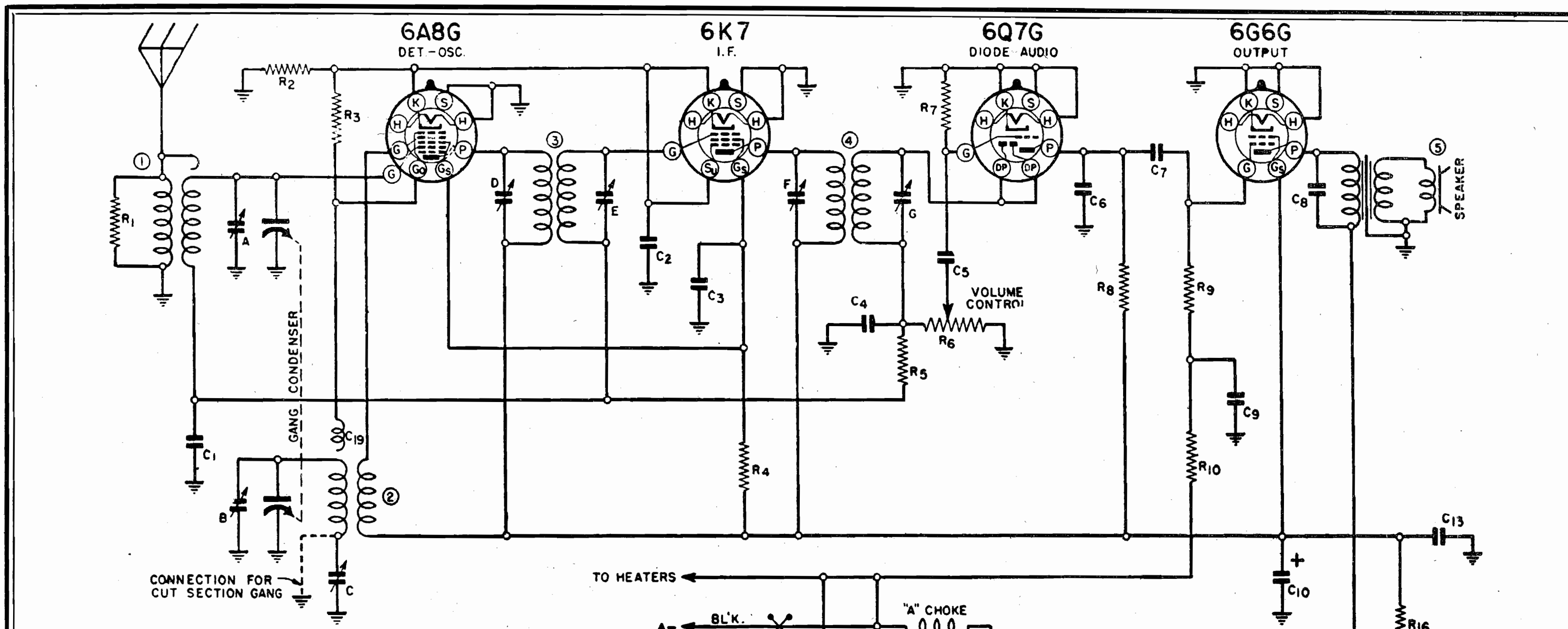
TUBE LAYOUT & TRIMMER LOCATION

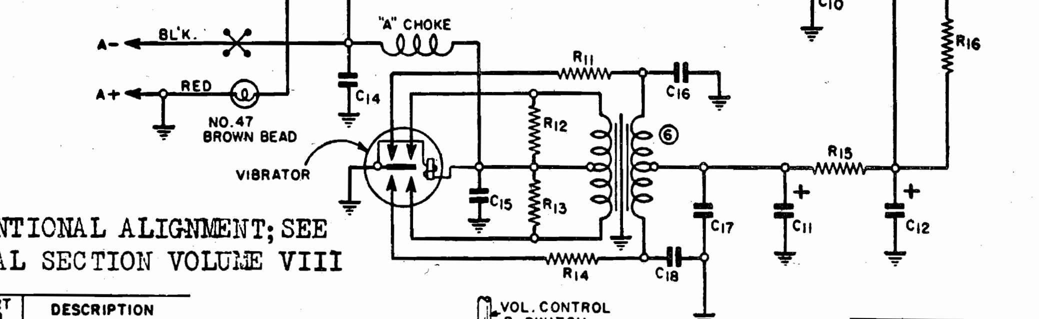


FOR PHONO DATA SEE INDEX

SPIEGEL, INC.

MODEL W216
Chassis TM





IMPORTANT NOTE: The battery must never be charged while set is in operation. If a windcharger is used, it should always be disconnected from the battery when the rec iver is being used. An inexpensive single pole switch can be used for disconnecting the windcharger from the battery. This will increase the life of the tubes and give additional economy to the use of the receiver.

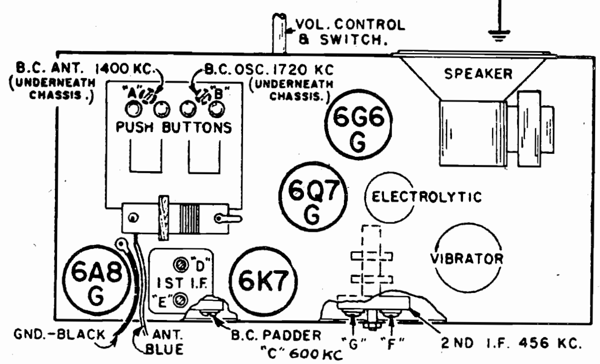
CONVENTIONAL ALIGNMENT; SEE SPECIAL SECTION VOLUME VIII

FOR AUTOMATIC TUNING SEE INDEX

DIAG. NO.	PART NO.	DESCRIPTION	
R1	N-1259	15,000 OHM	.5 W.
R2	N-1473	200 OHM	"
R3	N-1260	50,000 OHM	"
R4	N-1474	25,000 OHM	"
R5	N-1378	2.0 MEGOHM	"
R6	N-1320	1.0 MEG. VOL. CONT.	
R7	N-1263	10.0 MEGOHM	.5 W.
R8	N-1261	250,000 OHM	"
R9	N-1264	.5 MEG.	"
R10	N-1260	50,000 OHM	"
R11	N-1256	500 OHM	"
R12	N-1506	75 OHM	1. W.
R13	N-1506	75 OHM	1. W.
R14	N-1256	500 OHM	.5 W.
R15	N-1482	250 OHM	"
R16	N-1256	500 OHM	"

C1	N-1345	.05 MFD.	200 V.
C2	N-1479	.25 MFD.	"
C3	N-1351	.10 MFD.	"
C4	N-1374	100 MMFD.	—
C5	N-1347	.006 MFD.	600 V.
C6	N-1343	250 MMFD.	—
C7	N-1344	.01 MFD.	400 V.
C8	N-1347	.006 MFD	600 V.
C9	N-1345	.05 MFD.	200 V.
C10	N-1468	20 MFD.	150 V.
C11	N-1468	10 MFD.	250 V.
C12	N-1468	20 MFD.	150 V.
C13	N-1351	.10 MFD.	200 V.
C14	N-1471	.5 MFD.	50 V.
C15	N-1471	.5 MFD.	50 V.
C16	N-1480	.01 MFD. (OIL)	1000 V.
C17	N-1478	.01 MFD.	600 V.
C18	N-1480	.01 MFD. (OIL)	1000 V.
C19	—	CAPACITY INCLUDED IN OSCILLATOR COIL	

DIAG. NO.	PART NO.	DESCRIPTION
①	N 1461	ANTENNA COIL
②	N 1317	OSCILLATOR COIL
③	N 1318	1ST I.F. TRANS.
④	N 1319	2ND I.F. TRANS.
⑤	N 1472	5" P.M. SPEAKER
⑥	N 1476	POWER TRANS.
"C"	N 1323	PADDER COND.
	N 1475	VIBRATOR (SYNCHRO)
	N 1477	"A" CHOKE
	N 1273	2 GANG COND.-TUNER
	N 1485	BATTERY CABLE
SET WITH CUT SECT. GANG		
	N 1337	OSCILLATOR COIL
	N 1338	GANG CONDENSER
"C"	—	PADDER ELIMINATED



I.F. 456 KC.

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE.

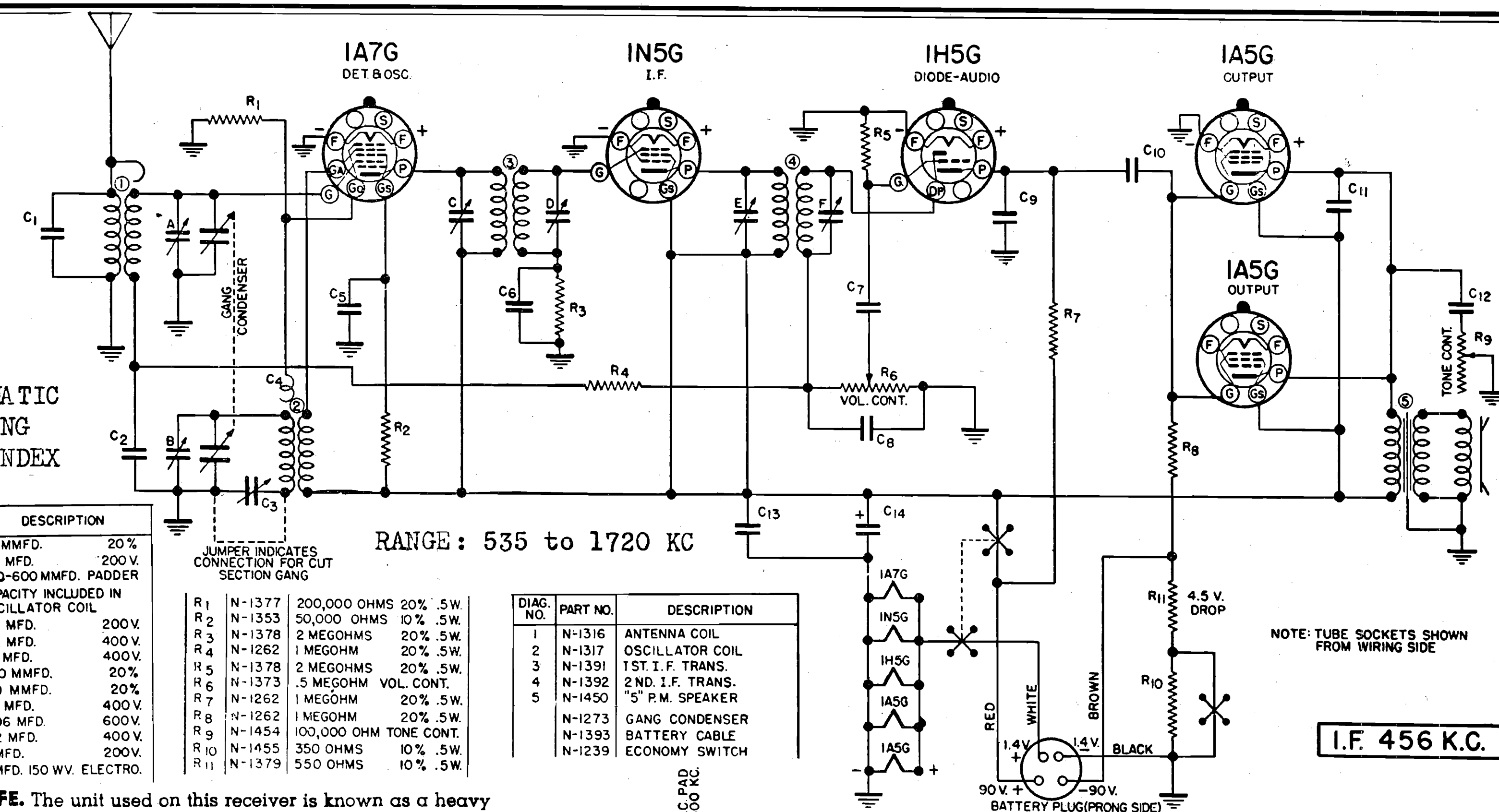
4 TUBE 6 VOLT
SUPERHETERODYNE
SINGLE BAND

DRWN. F.L.C. APP. 1-19-39

TM

MODELS W-300, W-312
Chassis SL

SPIEGEL, INC.



AUTOMATIC TUNING SEE INDEX

RANGE: 535 to 1720 KC

NOTE: TUBE SOCKETS SHOWN FROM WIRING SIDE

I.F. 456 K.C.

DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1342	50 MMFD. 20%
C_2	N-1345	.05 MFD. 200 V.
C_3	N-1323	300-600 MMFD. PADDER
C_4		CAPACITY INCLUDED IN OSCILLATOR COIL
C_5	N-1345	.05 MFD. 200 V.
C_6	N-1376	.02 MFD. 400 V.
C_7	N-1344	.01 MFD. 400 V.
C_8	N-1343	250 MMFD. 20%
C_9	N-1374	100 MMFD. 20%
C_{10}	N-1344	.01 MFD. 400 V.
C_{11}	N-1347	.006 MFD. 600 V.
C_{12}	N-1376	.02 MFD. 400 V.
C_{13}	N-1351	.1 MFD. 200 V.
C_{14}	N-1367	6 MFD. 150 WV. ELECTRO.

R_1	N-1377	200,000 OHMS 20% .5W.
R_2	N-1353	50,000 OHMS 10% .5W.
R_3	N-1378	2 MEGOHMS 20% .5W.
R_4	N-1262	1 MEGOHM 20% .5W.
R_5	N-1378	2 MEGOHMS 20% .5W.
R_6	N-1373	.5 MEGOHM VOL. CONT.
R_7	N-1262	1 MEGOHM 20% .5W.
R_8	N-1262	1 MEGOHM 20% .5W.
R_9	N-1454	100,000 OHM TONE CONT.
R_{10}	N-1455	350 OHMS 10% .5W.
R_{11}	N-1379	550 OHMS 10% .5W.

DIAG. NO.	PART NO.	DESCRIPTION
1	N-1316	ANTENNA COIL
2	N-1317	OSCILLATOR COIL
3	N-1391	1ST. I.F. TRANS.
4	N-1392	2ND. I.F. TRANS.
5	N-1450	"5" P.M. SPEAKER
	N-1273	GANG CONDENSER
	N-1393	BATTERY CABLE
	N-1239	ECONOMY SWITCH

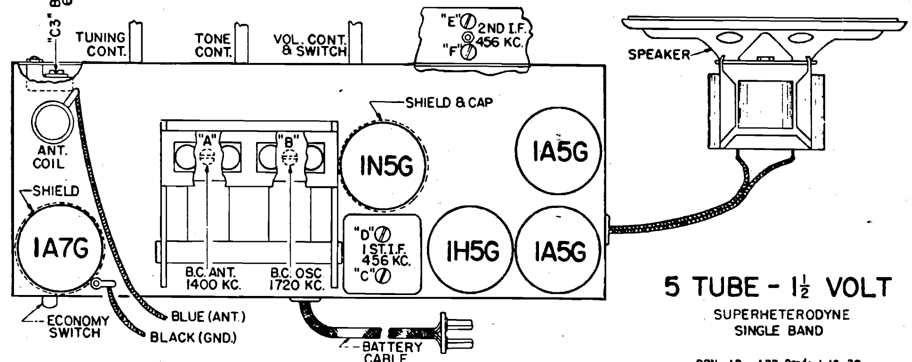
BATTERY LIFE. The unit used on this receiver is known as a heavy duty 1½ volt and 90 volt AB dry battery pack, approximately sixteen inches long, four and a half inches wide and six and a half inches high with a socket type connector. A battery of this type has a probable life of six to seven months with three hours daily use and a longer or shorter life as the daily usage is decreased or increased when the set is operated in the "power position"

REAR SWITCH. (Two Position Economy Switch.) The switch is provided to obtain the maximum of battery life without sacrificing the performance of the set.

The switch should be operated in the "Economy" (left hand) position until the performance of the radio receiver drops sufficiently to indicate the end of the batteries' **normal** life.

When the battery is new the set gives sufficient power output and sensitivity in the economy position and the life of the battery is materially increased.

When the battery becomes old the "Power" position (right hand) makes it possible to use the battery to the complete end of the batteries' useful life and still retain good reception.



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

SET WITH CUT SECTION GANG		
C_3	N-1323	PADDER, ELIMINATED
	N-1338	GANG CONDENSER
2	N-1337	OSCILLATOR COIL

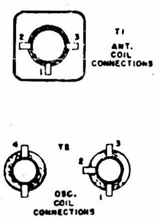
5 TUBE - 1½ VOLT
SUPERHETERODYNE
SINGLE BAND

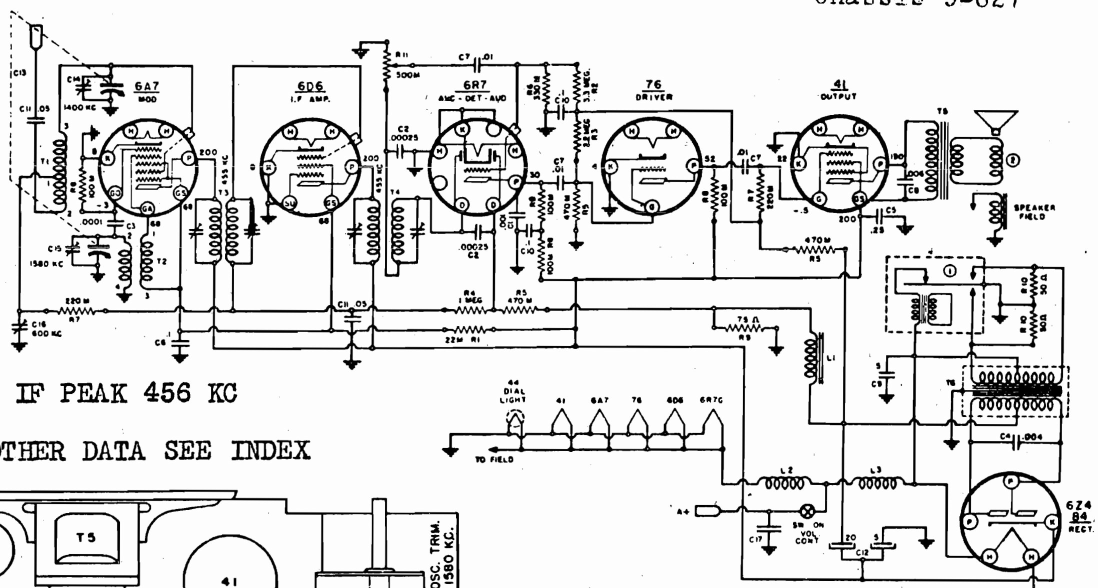
DRN. J.B. APP. 1-16-39

SL

SPIEGEL, INC.

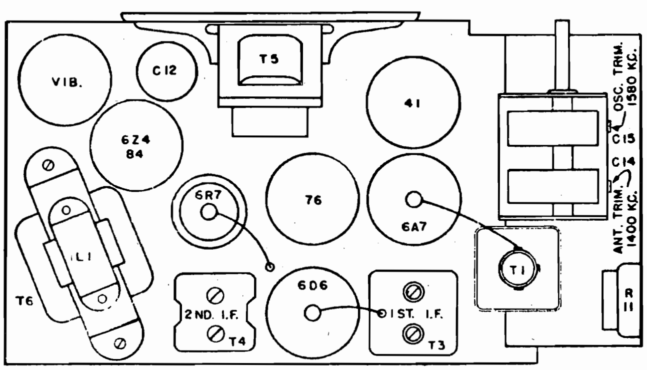
MODELS W400, V1148
Chassis 9-627





IF PEAK 456 KC

FOR OTHER DATA SEE INDEX



LOCATION OF PARTS ON TOP OF CHASSIS

WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS
VOLTAGES TAKEN WITH 6 6V. INPUT.

TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS
VOLTAGES MUST BE MEASURED WITH NO SIGNAL
ALIGNMENT IS TO MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS

CODE	PART NO.	DESCRIPTION 9-62
T1	10-223	ANTENNA TRANSFORMER
T2	10-224	OSCILLATOR "
T3	10-221	1 ST I.F. "
T4	10-222	2 ND I.F "
T5		OUTPUT TRANS. (ON SPKR.)
T6	80-169	POWER TRANSFORMER } 84-7
L1	33-219	FILTER CHOKE } 84-7
L2	33-210	FILAMENT CHOKE
L3	33-211	VIBRATOR CHOKE
1	34-102	VIBRATOR
2	78-240	5" SPEAKER

CODE	PART NO	DESCRIPTION
R1	60-214	22 M OHM 1 W CARBON RES.
R2	60-209	3.3 MEGOHM 1/2 W. " "
R3	60-208	2.2 " " " "
R4	60-167	1 " " " "
R5	60-206	470 M OHM " " "
R6	60-210	330 M " " " "
R7	60-207	220 M " " " "
R8	60-172	100 M " " " "
R9	60-211	75 " " " "
R10	60-212	50 " " " "
R11	24-119	VOLUME CONTROL 500 M OHMS

CODE	PART NO	DESCRIPTION
C1	15-111	.001 MFD. MICA CONDENSER
C2	1504	.00025 " " "
C3	1501	.0001 " " "
C4	16-129	.004 MFD 1600 V. BUFFER COND
C5	16-117	.25 " 400 V. TUB. CONDENSER
C6	16-118	.1 " " " "
C7	16-119	.01 " " " "
C8	16-128	.006 " " " "
C9	16-112	.5 " 200 V. OVAL "
C10	16-115	.1 " " TUB. "
C11	1622	.05 " " " "
C12	16-240	20 x 5 MFD ELECTROLYTIC 300 V.
C13	19-127	2 GANG VARIABLE COND. ALSO C14 & C15
C16	20-117	300-600 MFD. PADDING CONDENSER
C17	99-1	SPARK PLATE

ALIGNMENT PROCEDURE

PRELIMINARY

Output Meter Connections .... Across Loud Speaker Voice Coil
Output Meter Reading to Indicate 1 Watt .... 1.85 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.	6A7 Grid	T3 T4	I. F.
Fully Open	1580 K.C.	.0002 mfd.	Antenna Conn.	C15	Osc. Trimmer
1400 K.C.	1400 K.C.	.0002 mfd.	Antenna Conn.	C14	Ant. Trimmer
600 K. C.	600 K. C.	.0002 mfd.	Antenna Conn.	C16	Antenna Padder

The variable condenser should be at 600 k.c. for antenna adjustment.

The alignment procedure should be repeated in the original order, step by step, to insure greater accuracy. A final adjustment of antenna padder condenser C16 is always made after the receiver is installed in the car, in order to match the car antenna.

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.

THE AMMETER LEAD

The ammeter cable (See "H" in Fig. 1) has a spring clip at one end and a fuse receptacle at the other. Compress the spring clip and slide it over the ammeter stud on the back of the car's ammeter. When the clip is released it will spring out and grip the stud securely. (See fig 1.) (The cable clip may be connected to either stud of the ammeter. If connected to one stud, the current taken by the radio will register on the ammeter. If connected to the other stud, it will not register.) In a few cars such as the first models of the Ford V-8 the ammeter does not have terminals. In such cases the spring clip should be fastened to any available terminal behind the dash which is connected to the ungrounded side of the battery at all times. Some terminals will be so connected only when the ignition or light switches are turned "On." Insert the fibre sleeve and fuse (See "J" and "K" in Fig. 1) in the other end of the ammeter cable. The black wire coming from the radio receiver has a plug at its end which should be inserted into the fuse receptacle after the fuse sleeve and fuse have been inserted.

THE GENERATOR CONDENSER

The Generator Condenser should be mounted to the generator frame by means of any one of the generator assembly bolts. Scrape all dirt and paint away so that a clean metal to metal contact is made. The flexible lead from the Generator Condenser should be connected to the output terminal of the generator.

MODEL T-2307, Ch. 101505-599
MODEL V-1140, Ch. 101.505

SPIEGEL, INC.

MODELS W400, V1148, Ch. 9-627
MODELS 579, 1140, 1141, Ch. 559
MODELS 2307, 2308, Ch. 101.505

ANTENNA

Insert the single prong of the antenna cable (See "G" in Fig. 1) into its receptacle located on the bottom of the receiver case and near the front left hand corner. Note that the other end of this cable has a white covered wire protruding from its end and a bright metal pigtail. The white covered inner-wire and the bright metal pigtail are to be connected to the car's antenna in the following manner:

If an antenna was located coming from the corner post of the car, it will probably have an inner wire covered with the metal braid. (If it has a plug at its end, cut off the plug). Scrape clean and solder the white wire of the receiver's antenna lead to the inner wire of the car antenna lead. Be certain these inner wires do not at any time touch the outer shield. (See Fig. 5.)

After the connection is cleaned and connected, cover the joint carefully with tape. (See Fig. 6.)

Connect the pigtail of the receiver's antenna wire to the pigtail braid of the car's antenna lead-in. Wrap pigtails and solder together using rosin core solder. IMPORTANT—Make certain when bolting soldered pigtail ends to car that the section is scraped clean and a good chassis ground. (See Fig. 7.)

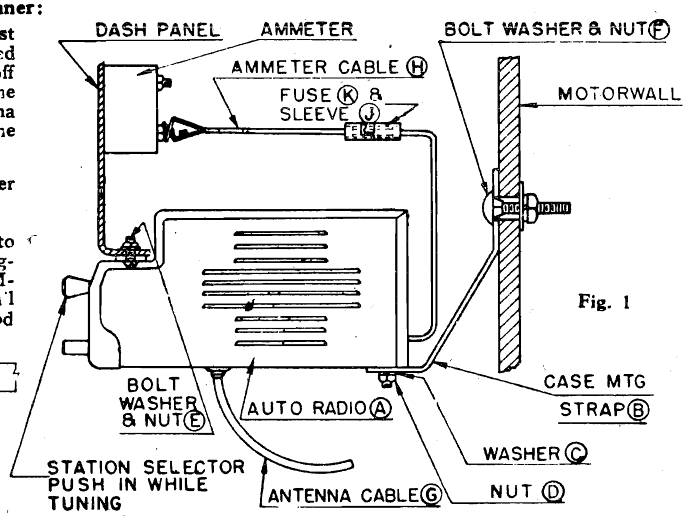
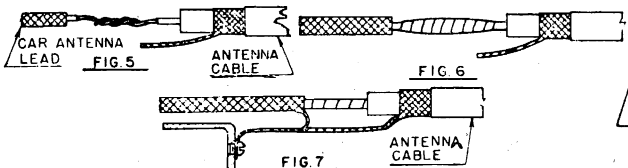


Fig. 1



If the lead-in from the car antenna is not shielded, it is advisable to do so to overcome motor noise. Slip a shielded loom over the entire length of the car antenna lead-in. In some cases where a roof antenna is used, the lead-in is brought down through a corner post of the car frame at the end of the windshield (See Figure 2). If the radio antenna cable is long enough to be inserted several inches into the corner post, connect antenna lead-in and the radio antenna cable as shown in Figures 5, 6 and 7, and after taping, insert the splice and all the unshielded portion of the lead-in up into the corner post. If this cannot be done, this type of lead-in should be covered with a shielded loom several inches into the corner post. Connect the lead-in and shielding as illustrated in Figures 5, 6 and 7. The other end of the shielding at the car antenna should be grounded. To eliminate crackling and noisy reception due to antenna lead-in pick-up, the shielded antenna lead-in should be either insulated from chassis (or car body) or grounded at interval points, leading from the radio antenna cable to the car antenna. Be sure to use car chassis or grounded section of body only for grounding.

THE DISTRIBUTOR SUPPRESSOR

To install the distributor suppressor, cut the CENTER lead from the distributor cap in two, as close as possible to the distributor cap. Screw the Distributor Suppressor to one end of the cut cable and then to the other end leading to the distributor cap.

SETTING PUSH-BUTTONS

1. By means of the Station Selector Knob, tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

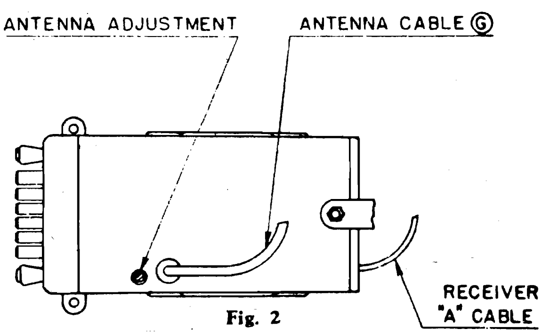


Fig. 2

3. Continuing to hold the Station Selector Knob in its exact position, PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holder.

Follow through with this same procedure, setting up the other 5 stations in the order of their frequency—that is, the second station set up will be second lowest in frequency and the third station set up will be third lowest in frequency.

Carefully check each Push-Button for the accuracy of its setting. If, when tuning in any station with its Automatic Push-Button it does not have equal volume or clarity to that obtained with manual tuning, this may indicate the automatic adjustment for that station was not made accurately. Should there be any inaccuracy in any one of the Push-Button adjustments, correction can be made by repeating the above procedure for that button only. Do not reset those Push-Buttons that are accurately adjusted.

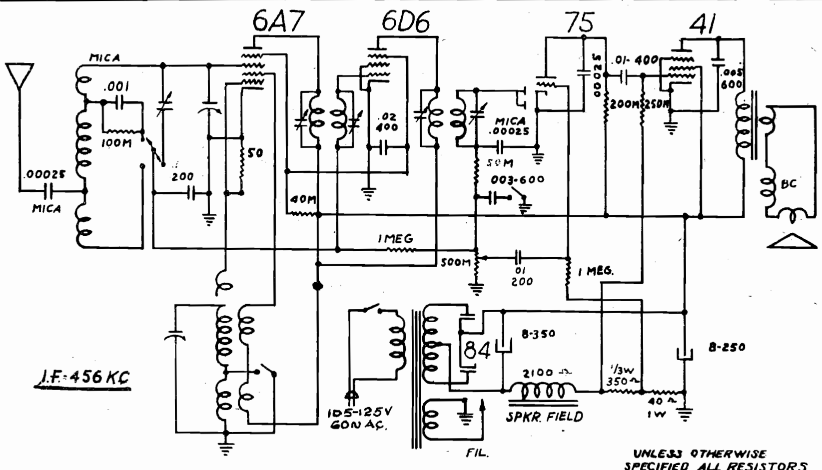
No further adjustments are necessary to operate your auto radio automatically or manually. To receive any one of your six selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station. To receive all other stations in the regular manner, push in the Station Selector Knob and turn it to the frequency of the station desired.

IMPORTANT: ANTENNA ADJUSTMENT

The antenna adjustment control is located close to the antenna cable receptacle as shown in Figure 2. To make the adjustment first, remove plug button from bottom of case by inserting a screwdriver between case and plug button, then tune in a weak station with full volume at or very close to 600 kilocycles (60) on the dial. Second, insert a small screwdriver into the antenna adjustment screw shown in Figure 2 and turn the screwdriver either to the left or right until the volume of the station is at its maximum point. While adjusting the antenna adjustment screw it is advisable to vary the station selector knob a degree or two to obtain the best adjustment. Now insert plug button into case. The receiver is now balanced and no further radio electrical adjustments are necessary.

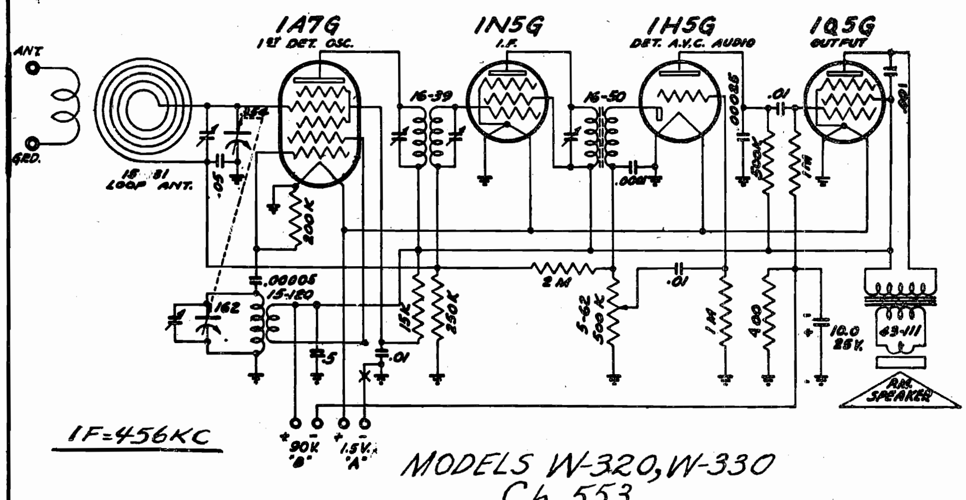
SPIEGEL, INC.

MODELS W320, W330, Ch. 553
MODEL 5002, Ch. 14-154-S



Tubes required are:

1—6A7 Oscillator-Translator
1—6D6 I. F. Amplifier
1— 75 Detector-A.V.C., Audio Amplifier
1— 41 Output
1— 84 Rectifier



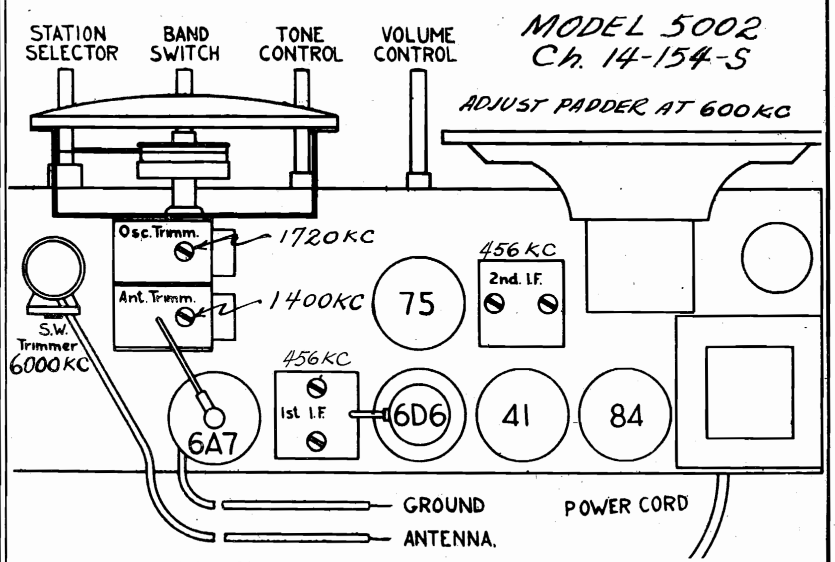
I. F. ALIGNMENT

From a good signal generator connect the proper leads, one to the radio chassis and the other thru a .1 mfd condenser to the grid cap of the 1A7G tube, with the tube's grid lead still in place. Set the receiver dial to 1720 K. C. and the signal generator to 456 K. C. With the receiver's volume control full on, adjust the signal generator's output until the signal is heard in the speaker and the output meter reads approximately .3 volts. Adjust the I. F. trimmers for maximum output, decreasing the generator output as the receiver output increases, so the meter always reads approximately .3 volt.

R. F. ALIGNMENT

When aligning the antenna and oscillator circuits the loop antenna should be placed in its approximate position in relation to the radio chassis and speaker as it is placed in the cabinet. No leads are connected from the signal generator, but the generator leads are connected to a three or four turn loop about three inches in diameter, of ordinary insulated hookup wire. This loop is placed about four inches from the loop antenna and parallel to it.

The radio dial and generator are set to 1720 K. C. and the oscillator trimmer set for maximum output, still using a .3 volt meter reading. The dial and generator are then set to 1400 K. C. so the signal comes thru, and the trimmer on the loop antenna is adjusted for maximum output. Check for alignment at 600 K. C.

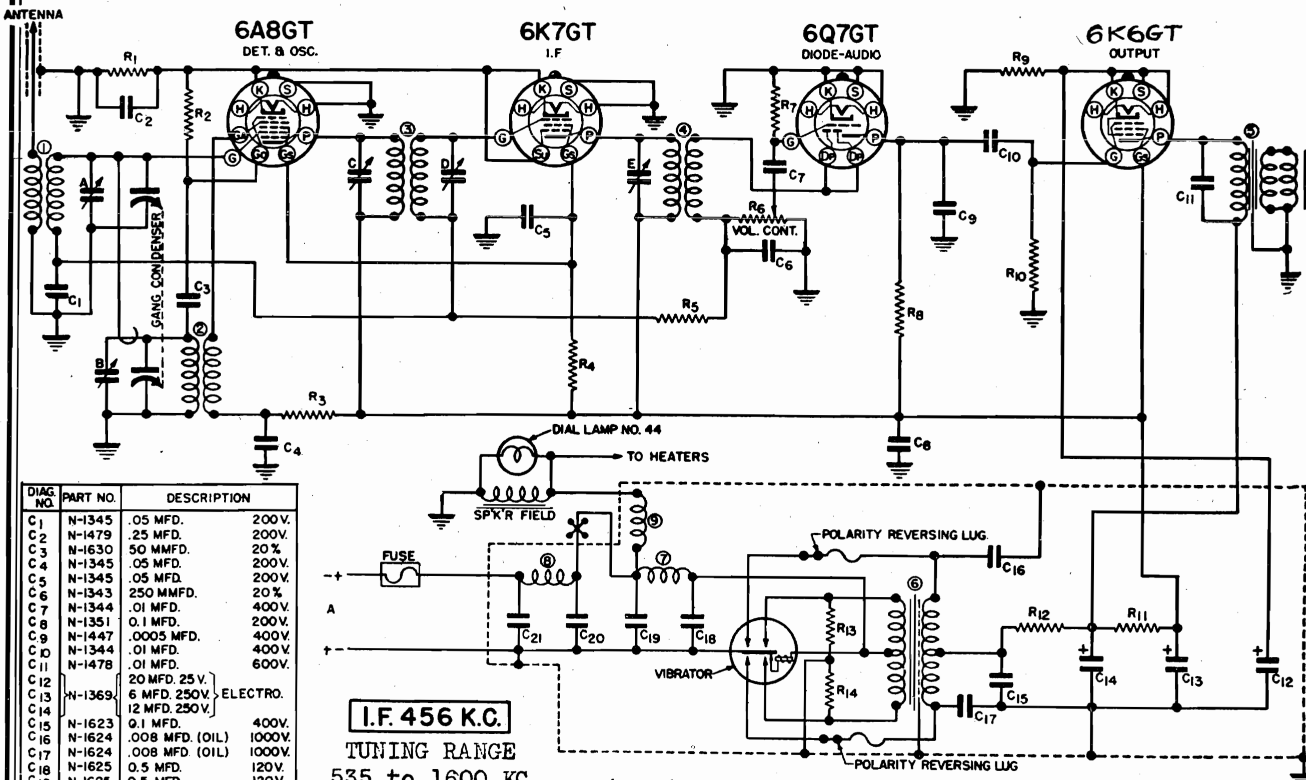


CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOLUME VIII

Tubes must be in proper position and connected as shown.

MODEL W408
Ch. AU-10

SPIEGEL, INC.



DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1345	.05 MFD. 200V.
C_2	N-1479	.25 MFD. 200V.
C_3	N-1630	50 MMFD. 20%
C_4	N-1345	.05 MFD. 200V.
C_5	N-1345	.05 MFD. 200V.
C_6	N-1343	250 MMFD. 20%
C_7	N-1344	.01 MFD. 400V.
C_8	N-1351	0.1 MFD. 200V.
C_9	N-1447	.0005 MFD. 400V.
C_{10}	N-1344	.01 MFD. 400V.
C_{11}	N-1478	.01 MFD. 600V.
C_{12}	N-1369	20 MFD. 25 V. ELECTRO.
C_{13}	N-1369	6 MFD. 250V. ELECTRO.
C_{14}	N-1369	12 MFD. 250V. ELECTRO.
C_{15}	N-1623	0.1 MFD. 400V.
C_{16}	N-1624	.008 MFD. (OIL) 1000V.
C_{17}	N-1624	.008 MFD. (OIL) 1000V.
C_{18}	N-1625	0.5 MFD. 120V.
C_{19}	N-1625	0.5 MFD. 120V.
C_{20}	N-1343	250 MMFD. 20%
C_{21}	N-1343	250 MMFD. 20%
R_1	N-1473	200 OHM .5W. 10%
R_2	N-1260	50,000 OHM .5W. 20%
R_3	N-1627	20,000 OHM .5W. 20%
R_4	N-1627	20,000 OHM .5W 20%
R_5	N-1262	1 MEGOHM .5W 20%
R_6	N-1238	0.5 MEGOHM VOL. CONT.
R_7	N-1419	6 MEGOHM .5W. 20%

I.F. 456 K.C.

TUNING RANGE
535 to 1600 KC

R_8	N-1261	250,000 OHM	.5W.	20%
R_9	N-1628	750 OHM	.5W.	10%
R_{10}	N-1264	0.5 MEGOHM	.5W.	20%
R_{11}	N-1256	500 OHM	.5W.	20%
R_{12}	N-1482	250 OHM	.5W.	20%
R_{13}	N-1629	100 OHM	1W.	20%
R_{14}	N 1629	100 OHM	1W.	20%

1	N-1249	ANTENNA COIL
2	N-1250	OSCILLATOR COIL
3	N-1248	1 ST. I.F. TRANS.
4	N-1596	2 ND. I.F. TRANS.
5	N-1235	4" SPEAKER & TRANS.
6	N-1540	VIBRATOR TRANS.
7	N-1477	HASH CHOKE
8	N-1632	MOTOR NOISE CHOKE
9	N-1631	HEATER CHOKE

N-1236	VIBRATOR (SYNCHRONOUS)
N-1237	GANG CONDENSER
N-1241	TUNING DIAL
N-1539	BATTERY LEADS
N-1239	TOGGLE SWITCH

4 TUBE-6 VOLT
SUPERHETERODYNE
SINGLE BAND
AUTO SET

DRN. J.B. APP. B.F.T. 2-25-39
AU

MOTOR NOISE ELIMINATION

1. Ground the antenna lead-in shield at one or more points to the cowl or any other metal surface in contact with the lead-in.

2. Move the battery lead around to a point of least noise pick-up and fasten in place with tying cord or tape.

3. Bond together the throttle rod, choke rod and any metal tubing with a piece of copper braid and ground to the fire wall. This should be done on the engine side.

4. Bond steering post to firewall.

5. Bond hood, side panel and other protective covering for engine if it is not making a positive contact to the body.

In extreme cases, a distributor resistor and generator condenser will reduce noise interference to a minimum. These parts are available at your dealer.

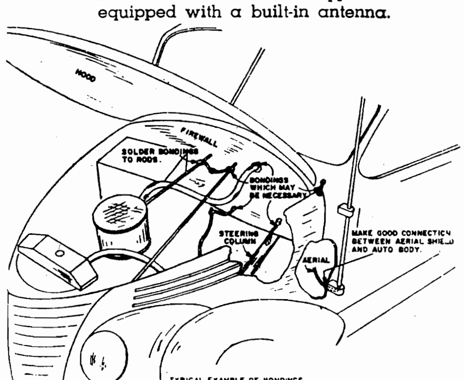
From the standpoint of motor noise, the whip type antenna recommended has been found to be the most satisfactory. It is advisable to use this type antenna even if the car is equipped with a built-in antenna.

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 (6A8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator should be connected to the chassis ground. Align all three trimmers to peak or maximum reading on the output meter.

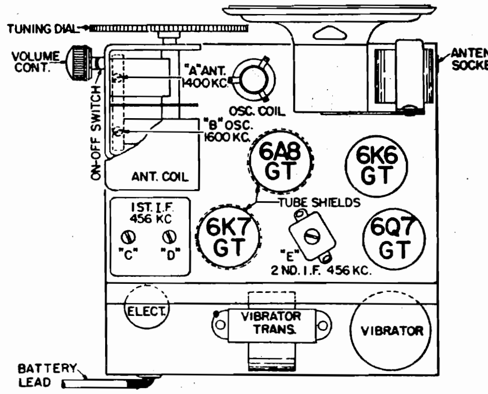
ANT. AND OSC. ALIGNMENT. Connect the antenna to the generator through a 65 MMF dummy* and set the dial and generator at 1600 KC (gang at minimum capacity). Align the BC oscillator trimmer for maximum output. Set the test oscillator at 1400 KC and tune in the signal with the dial and adjust the antenna trimmer for maximum output.

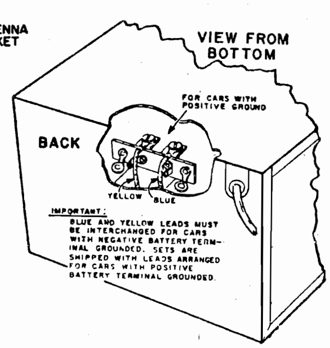
Next set the test oscillator at 600 KC and tune in the signal with the dial to check the sensitivity at this point.

*If the antenna is aligned using a whip antenna shielded lead use a 30 MMF dummy antenna.

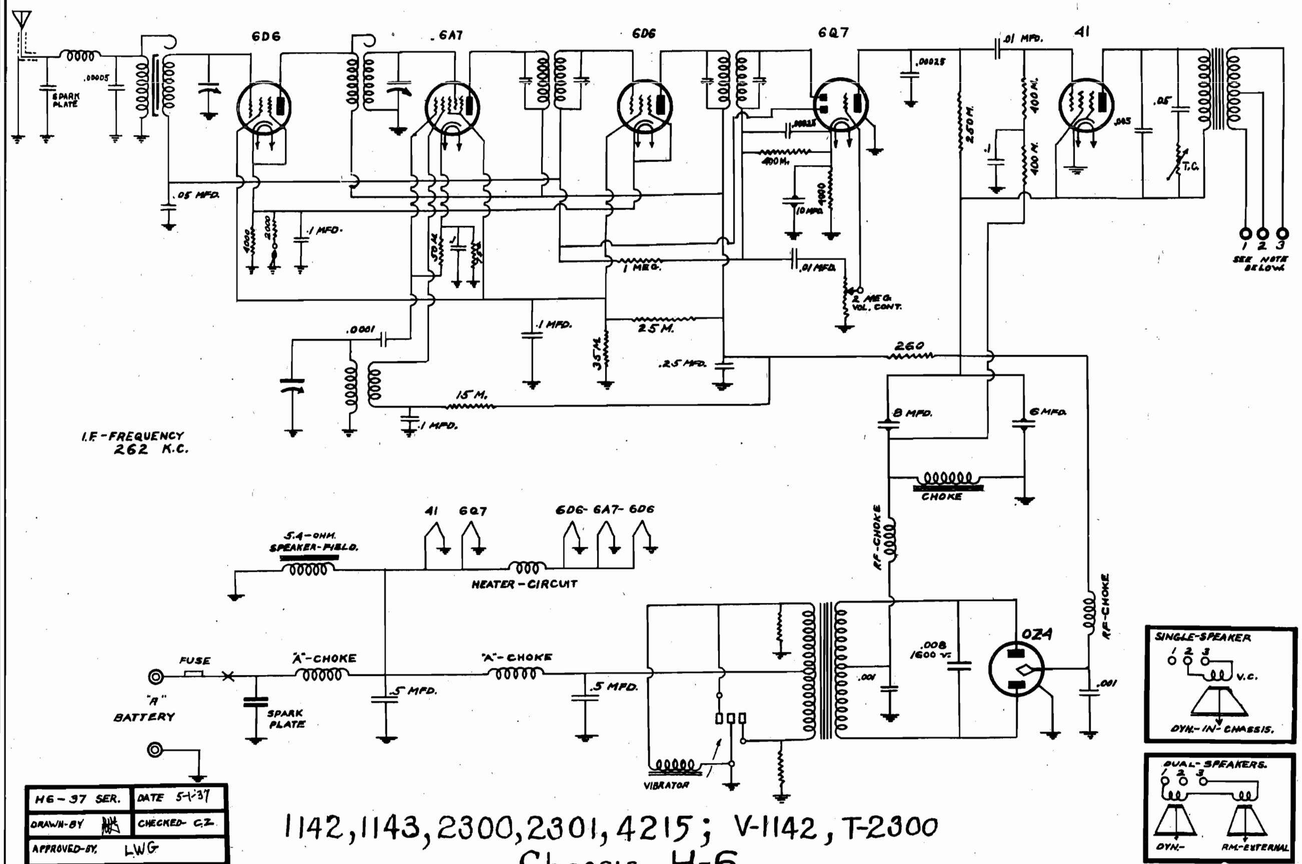


TYPICAL EXAMPLE OF BONDINGS





SPIEGEL, INC. MODELS 1142, 1143, 2300, 2301, 4215; V-1142, T-2300, Ch. H-6
MODEL A2026, Ch. 10-70
MODEL Z-7002, Ch. 0-51



1142,1143,2300,2301,4215; V-1142, T-2300
Chassis H-6

ADJUSTING PUSH BUTTONS FOR MODELS A2026 Ch. 10-70; Z-7002 Ch. 0-51

Cut the call letters of your four selected stations from the list supplied with your receiver and slip them into the top of the Push-Buttons, with the clear celluloid on top of the call letters to protect them. Arrange the call letters in the buttons from left to right, having the lowest frequency station (that is, the station closest to 600 K.C. at the left and work progressively towards the right, so that the highest frequency station is toward the right.

Follow the procedure outline below, in order to adjust the push-buttons properly:

1. By means of the tuning knob, tune in with the right hand as accurately as possible the desired station having the lowest frequency.

2. Continuing to hold the tuning control knob in its exact position with the right hand, loosen with the left hand the push-button to be set up for that station, (the one farthest toward the left) by unscrewing the push-button about one turn to the left (counter-clockwise).

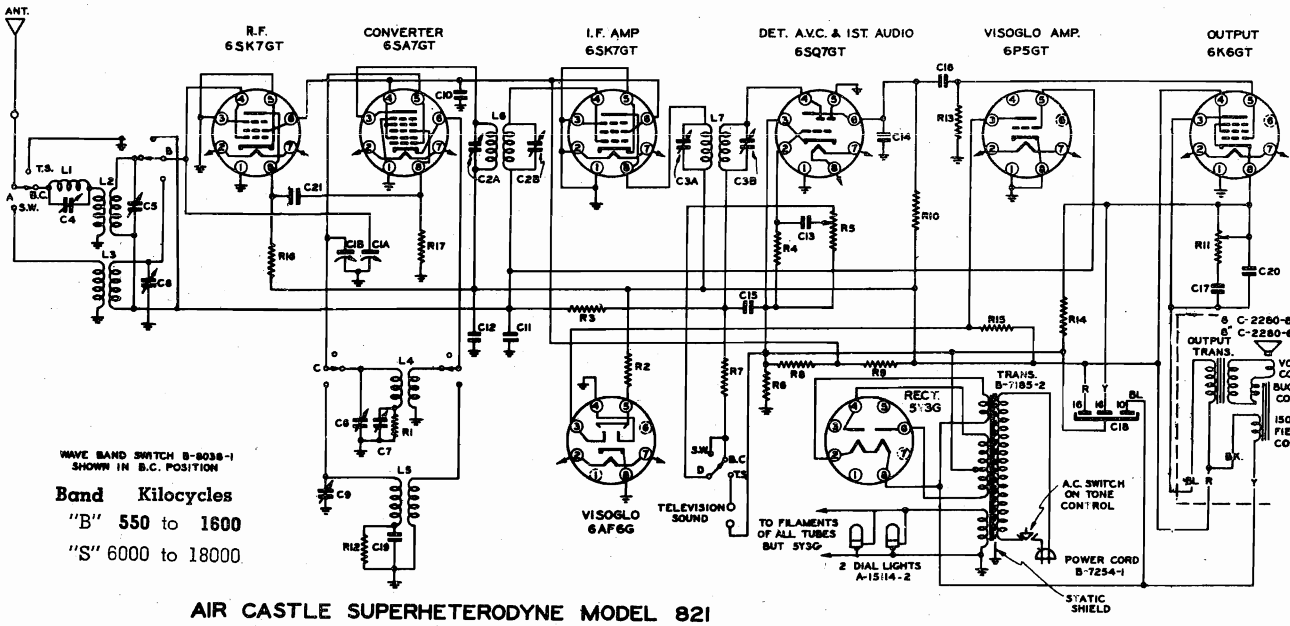
3. Push the push-button in all the way, and then tighten it gently toward the right (clockwise). Release push-button slowly and when in normal position grip button and tighten firmly.

The push-button tuning system is now correctly set up for your first selected station of lowest frequency.

Follow through with this same procedure, setting up the other three stations in the order of their frequency, that is, the second station set up will be second lowest in frequency, etc.

MODEL A-2000, Ch. 821

SPIEGEL, INC.



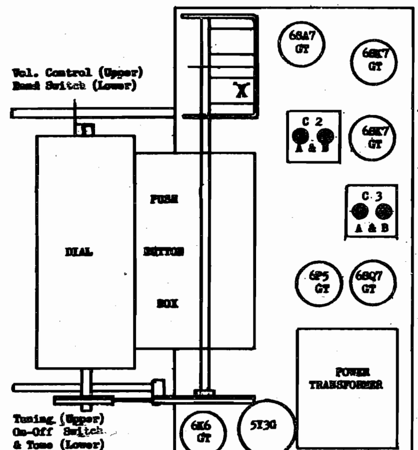
AIR CASTLE SUPERHETERODYNE MODEL 821
INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

C1A&B	VARIABLE CONDENSER	B-7229
C2A&B	NO. 1 I. F. TRIMMER	B-7200-GN
C3A&B	NO. 2 I. F. TRIMMER	B-7200-GN
C4	I. F. REJ. TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	B. C. OSC. TRIMMER	B-7199-BY
C7	B. C. OSC. PADDER	B-7199-BY
C8	S. W. ANT. TRIMMER	A-14088-8
C9	S. W. OSC. TRIMMER	A-14088-8
C10	.1 MFD. 200 V.	C-3202-36C
C11	.05 MFD. 200 V.	C-3202-84C
C12	.1 MFD. 400V.	C-3204-36C
C13	.02 MFD. 200 V.	C-3202-22C
C14	250 MMF. MICA	C-720-324
C15	250 MMF. MICA	C-720-324
C16	.05 MFD. 400 V.	C-3204-28C
C17	.03 MFD. 600 V.	C-3206-80C
C18	16-10-16 MFD. ELECT.	A-14780-1
C19	2700 MMF. MICA	A-15451
C20	.003 MFD. 600 V.	C-3206-62C
C21	40 MMF. MICA	C-720-381

R1	22,000 Ω	.25 W.	C-2795-78B
R2	56,000 Ω	.25 W.	C-2795-83B
R3	1 MEGOHM	.25 W.	C-2795-98B
R4	4.7 MEGOHM	.25 W.	C-2795-106B
R5	.5 MEG. VOL. CONTROL		A-15130-3
R6	150 Ω	.25 W.	C-2795-52B
R7	56,000 Ω	.25 W.	C-2795-83B
R8	39,000 Ω	1 W.	C-2797-81B
R9	15,000 Ω	3 W.	C-2799-76A
R10	270 000 Ω	.25 W.	C-2795-91B
R11	.25 MEG. T.C. & SWITCH		A-15128-2
R12	22,000 Ω	.25 W.	C-2795-78B
R13	680,000 Ω	.25 W.	C-2795-30B
R14	470 Ω	1 W.	C-2797-58B
R15	1 MEGOHM	.25 W.	C-2795-98B
R16	3,300 Ω	.25 W.	C-2795-68B
R17	2.2 MEG.	.25 W.	C-2795-102B

L1	I. F. REJECTOR COIL	A-14677
L2	B. C. ANT. COIL	A-14679-1
L3	S. W. ANT. COIL	A-14682-10
L4	B. C. OSC. COIL	A-15377-2
L5	S. W. OSC. COIL	A-15233-8
L6	NO. 1 I. F. COIL	A-12064-39
L7	NO. 2 I. F. COIL	A-12064-17



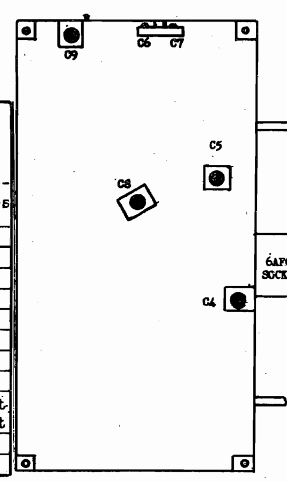
TOP VIEW OF CHASSIS

VOLTAGE CHART

Line Voltage: 110 volts
Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

Tube	Voltage of Socket Prongs to Gnd. See Prong Nos. on Schematic Diagram							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SA7	0	0	218	70	-.05	0	*5.8	-.015
6SK7 Rf	0	0	0	-.1	0	70	*5.8	190
6SK7 if	0	0	0	-.1	0	70	*5.8	210
6SQ7	0	-1.9	-3	-3	-.2	52	*5.8	0
6P5	0	0	.2	200	-.1	—	*5.8	0
6AF6	0	*5.8	A	—	200	—	0	0
6K6	0	0	190	210	0	—	*5.8	12.5
5Y3	0	270	—	*270	—	*270	—	270

Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter. Unless designated otherwise, voltages in table are + DC voltages.
*AC volts
A - Cannot be measured with 1000 ohms per volt voltmeter.



BOTTOM VIEW OF CHASSIS

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark on BC scale is directly toward front of set when condenser plates are fully meshed.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C3 A&B	2nd I-F
							C2 A&B	1st I-F
3	Rejector	Ant.	200 mmf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C6 Osc.	
							C5 Ant.	
5				600 KC	BC	600 KC	C7 Pad.	
6	(Repeat operation 4)							
7	(Check calibration and sensitivity at 600 KC, 1000 KC and 1500 KC)							
8	Shortwave Band	Ant.	*	18 MC	SW	18 MC	C9 Osc.	Rock dial while adjusting for maximum output
							C8 Ant.	
9	(Check calibration and sensitivity at 6 MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

Notes: *Connect to point "X" on Variable Condenser. See drawing below.
**100 ohm and 200 mmf. in series

SPIEGEL, INC. MODELS 2004, 2005, 2082, 2083, T-2004, T-2054, T-2082, Ch. 175E

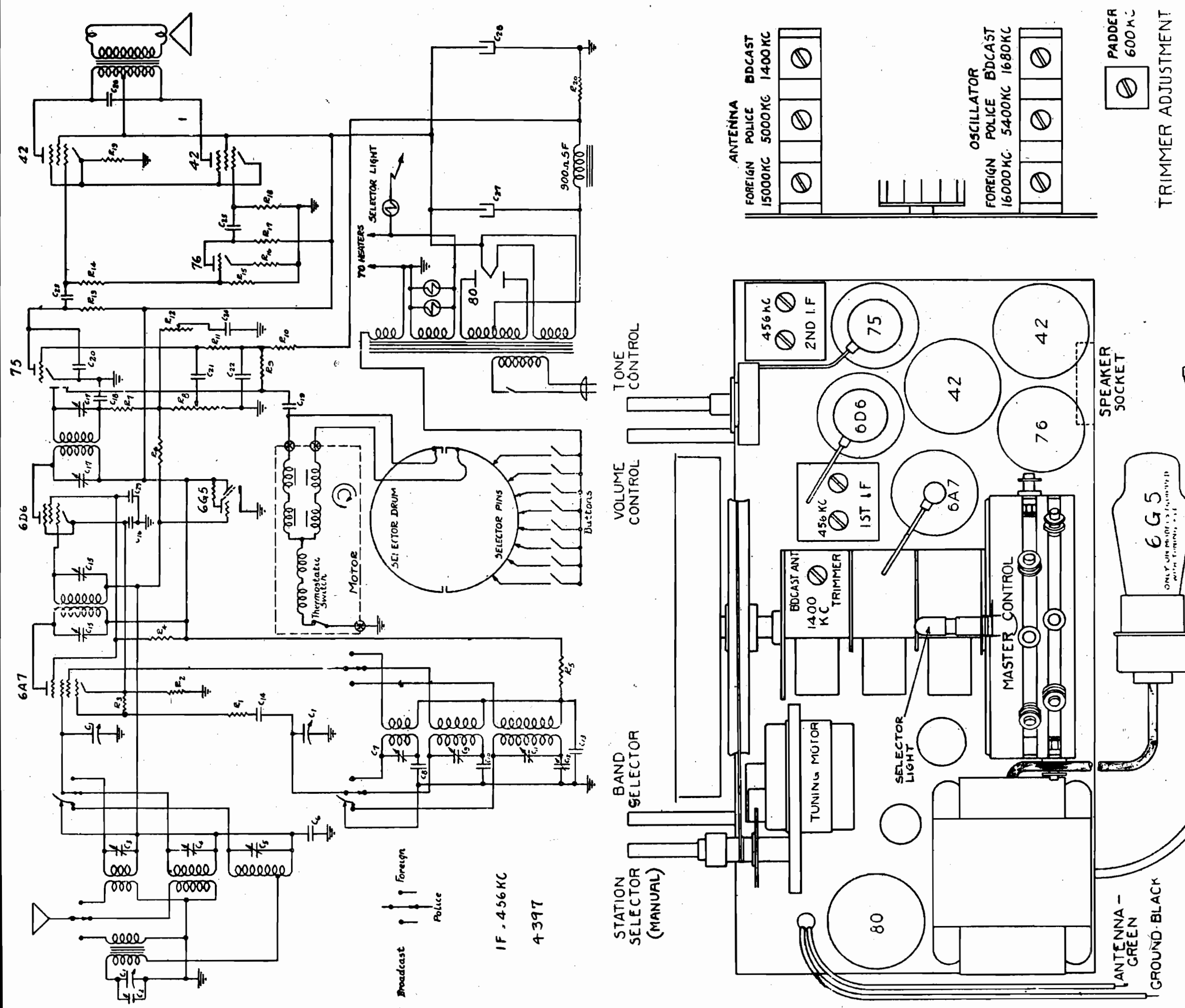
TUBES

Tubes required are:

1—6A7 Oscillator-translator
1—6D6 Intermediate Frequency Amplifier
1—75 Detector AVC—First Audio Amplifier
1—76 Driver—Phase Inverter
2—42 Power Output
1—80 Rectifier
1—6G5 Cathode Ray Tuning Tube (on models equipped with "eye" tuning indicator)

Do not use tubes of types different from those shown above. When replacing tubes or checking connections, refer to the ***Tube Layout Chart.***

Symbol	*Part No.*	*Description*
C1	4354	12-375 mmf Variable
C3,11	1611	3-35 mmf trimmer
C4,5,7,9	2597	1-10 mmf trimmer
C6,22	572	1-200v
C8	2793	006 padder
C10	2741	1330 padder
C12	2560	200-400 mmf padder
C13	575	.1-400v
C14	2780	50 mmf mica
C15,17		IF trimmers
C16	2792	.2-200v
C18,20	1286	250 mmf mica
C19	580	.05-200v
C21	565	.01-200v
C23,25	576	.02-400v
C24	581	.005-600v
C26	824	.002-600v
C27	3375	16 mf 450v
C28	3351	8 mf 225 V. reg.
C29	3358	.2-400v
R1,2	2689	100 ohm 1/3w
R3,7,17	631	50M 1/3w
R4	636	40M 1/3w
R5	617	20M 1/3w
R6,9,10,11	624	1 meg. 1/3w
R8	2726	500M VC
R12	2737	2 meg TC
R13	2730	200M 10% 1/3w
R14	2881	400M 10% 1/3w
R15	2880	100M 10% 1/3w
R16	2883	5M 10% 1/3w
R18	2731	500 M 10% 1/3w
R19	3353	250 ohm 2 W.
R20	2882	15 ohm 10% 1/3w
	4387	Power transformer
	3462-1	1st IF transformer
	3464-1	2nd IF transformer
	2724	Band Switch
	2771	Antenna Coil
	2772	Oscillator Coil
	2845	B. C. Antenna Coil
	4392	Contact Ribbon
	4377	Contact Pins
	4394	Motor Assembly
	3346	Speaker 8"
	3710	Speaker 10"



MODELS 2004, 2005, 2082, 2083, T-2004, T-2054, T-2082, Ch. 175E SPIEGEL, INC.

INSTRUCTIONS FOR ADJUSTMENT AND OPERATION OF THE ELECTRIC AUTOMATIC TUNING SYSTEM

Before attempting to adjust the automatic tuner, read the following instructions carefully and proceed exactly as directed. Setting up the ***Master Selector*** requires no tools, and is very easily accomplished when the proper procedure is followed.

The tuning unit consists essentially of three parts, which may be described briefly as follows:

Master Selector: This includes the ***Selector Drum,*** the ***Selector Pins,*** and the ***Selector Light.*** These parts are mounted on the rear of the variable condenser, together with their associated brackets and wiring.

Motor and Drive: This assembly consists of an induction motor having a mechanical drive clutch with magnetic throw-out, and a train of gears operating directly onto the ***Manual Station Selector*** drive shaft. No oiling is necessary.

Push Button Assembly: These buttons are located on the front of the chassis, and extend through the escutcheon below the dial. Stations are tuned in automatically when the button under the call letters of the desired station is depressed and held down until the motor stops and the station is heard. When the button is pushed down, an automatic silencer mutes the receiver until the desired station is exactly on tune.

SETTING UP THE MASTER SELECTOR

As a means of simplifying these operations, list eight of your favorite ***local*** or strong near-by stations according to frequency or position on the dial. Setting up weak or distant stations is not recommended. Call the station nearest the left-hand end of the dial (nearest 1600 kc) the ***No. 1*** station, and number the other stations similarly going from left to right across the dial. For example, assume that you favorite stations operate on frequencies of 1500 kc, 1400 kc, 1300 ks, 1200 kc, 1000 kc, 900 kc, 700 kc, and 600 kc. Then the 1500 kc station would be ***No. 1,*** the 1400 kc station would be ***No. 2,*** and so on down the list with the 600 kc station being designated ***No. 8.*** Reference to the push buttons is not necessary since they are not used until ***After*** the ***Master Selector*** has been set up.

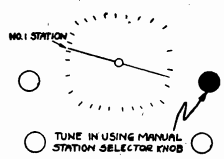
On the back of the receiver will be found the ***Selector Drum*** and the eight ***Contact Pins*** which determine the points at which the tuner will stop when the buttons are pressed. Referring to the diagrams, ***Fig. 1*** shows the general layout and relation of the drum and contacts. ***Fig. 2*** shows one of the contact pins in detail: note that while the position of the contact may be varied at will by sliding it along the slot in the bracket, it is held securely by a strong spring which will not allow it to move when the selector drum turns under it. ***Fig. 3*** shows the arrangement of the ***Contact Pins,*** each pin being numbered according to the system suggested for numbering the stations, thus ***pin No. 1*** will be used for ***Station No. 1, pin No. 2*** will be used for ***Station No. 2,*** and so on down the list.

On the ***Selector Drum*** are two pairs of ***Contact Ribbons.*** Note that there is a ***Paint Dot*** on the edge of the drum directly opposite the break in the ribbons on the upper half of the drum. This ***Paint Dot*** is for the purpose of locating the approximate position at which a given ***Contact Pin*** should be set in order to have the ***Drum*** stop for a particular station.

It is very important that the following steps be followed exactly as outlined; any deviation may necessitate re-setting some of the stations:

1. Set the receiver for reception of ***Standard Broadcast Stations*** as outlined previously under "***Operation.***" Turn the receiver "***On,***" let it run for ***at Least Ten Minutes*** to allow the tubes to reach their final operating temperature.

2. Using the ***Manual Station Selector*** (upper right) knob, tune in the No. 1 station, that is, the one nearest the 1600 kc end of the dial. Watch the tuning eye closely, making certain that the station is tuned in **perfectly.**



3. Face the rear of the chassis. Attach the lead from the ***Selector Light*** to the ***No. 1 Contact Pin;*** unless the pin happens to be set exactly, the lamp will glow when the lead is touched to the pin.

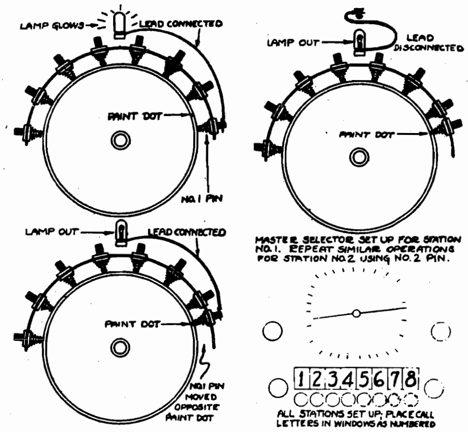
4. Observe the position of the ***Paint Dot*** on the edge of the ***Drum.*** Grasp the No. 1 pin firmly and slide it toward the ***Paint Dot,*** being careful not to break the connection between the ***Selector Light*** lead and the pin. When the pin is directly opposite the ***Paint Dot,*** the light will go out, indicating that the contact is properly set. To insure greatest accuracy in making this setting, slide the pin back and forth across the break between the ribbons, leaving it set half way between the points where the lamp lights. ***Be very careful not to move the Selector Drum while the pin is being set.*** When the pin is definitely in its proper position, ***Disconnect the Selector Light Lead from the Pin.***

5. Repeat the above procedure for the ***No. 2*** station; tune in the station, connect the ***Selector Light*** lead to the ***No. 2*** contact pin, move this pin opposite the ***Paint Dot*** so that the light goes out, then ***Disconnect the Selector Light Lead.***

6. Using similar procedure, set up the other six stations, in each case using the ***Contact Pin*** bearing the ***same number as that assigned to the station being set up.*** Always ***Disconnect the Selector Light Lead*** as soon as a station has been set up; failure to do so will cause the receiver to hum, and may result in the lamp being burned out.

7. After all the stations have been set up, locate the ***Call Letters*** of your stations on the printed sheets supplied with the receiver. Remove the desired call letter blocks from the sheets, and insert them in the proper pockets above the push buttons.

8. The only operations necessary to receive any of the eight stations set up as outlined above are: Turn the power switch on by rotating the lower left knob to the right—***turn the control a few degrees beyond the point at which the switch snaps on*** — allow about one minute for the tubes to heat, press the button under the call letters of the desired station ***Holding the Button Down Until the Pointer Stops Moving and the Station is Heard,*** then adjust the tone and volume. Be sure that the ***Band Selector*** switch is in the proper position for reception of ***Standard Broadcast Stations.***



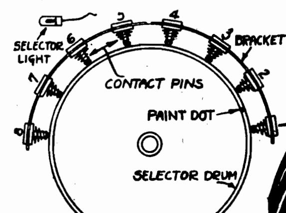


FIGURE 1

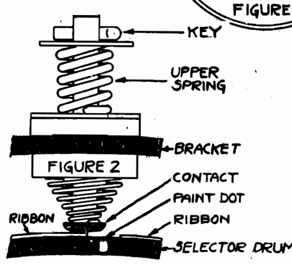


FIGURE 2

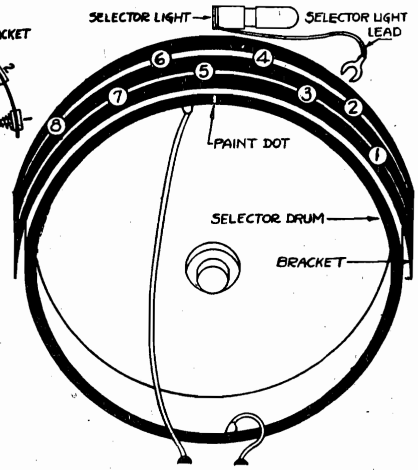


FIGURE 3

ALINEMENT PROCEDURE

IF. Connect the generator ground to receiver chassis. Using .1 mfd. condenser in series with high side of the generator, apply 456 kc. signal to the grid of the 6D6 IF amplifier tube and aline second IF transformer trimmers. Repeat for first IF transformer, applying signal to grid of the 6A7 tube. (See above diagram for location of tubes and transformers.)

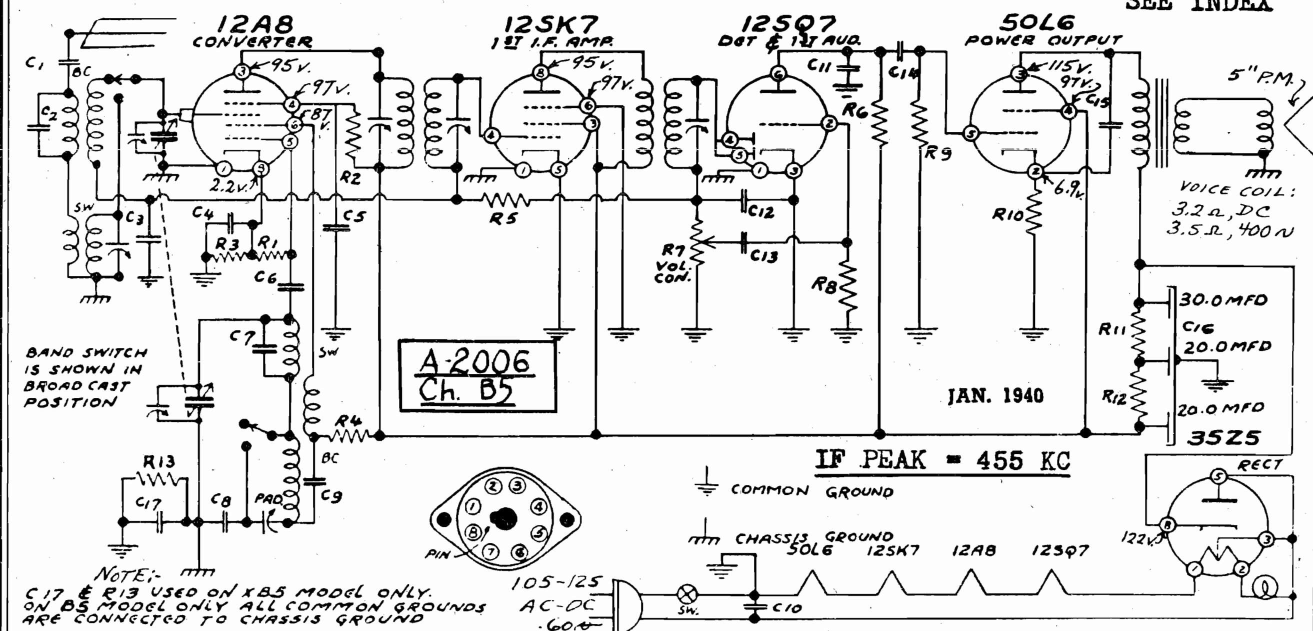
RF. (See circuit diagram foı location of trimmers.) Using a 200 mmf. condenser in series with the high side of the generator, turn band selector switch all the way to the left, tuning condenser to minimum capacity, feed 1680 kc. signal to antenna terminal and adjust broadcast oscillator trimmer for top frequency. Set generator frequency at some point around 1400-1500 kc., and adjust broadcast antenna and RF trimmers. 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.

A 400 ohm resistor must be used in series with the generator as a "dummy" antenna for proper alinement of the two short wave bands. Set the band selector switch in the center position, adjust the oscillator top frequency for 5400 kc., then aline the antenna trimmer at about 5000 kc. With the band selector in the extreme right position, adjust the top frequency of the high frequency band to 16,000 kc., and aline the antenna trimmer at about 15,000 kc. In order to make sure that the top end of the last band is set properly, it is best to screw the oscillator trimmed down tight, then unscrew to the second peak. The antenna trimmer should be screwed down tight, then unscrewed to the first peak. This procedure must be followed in order that the oscillator and RF circuits will be set in the correct relation to each other, otherwise a "dead" spot at a lower frequency will result, and the dial calibration will not be correct. Usually, it is best to rock the tuning condenser back and forth slightly while making these adjustments at high frequencies.

SPIEGEL, INC.

MODEL A-2006, Ch. B5

MODEL A-2132, Ch. F5 **FOR LAYOUT SEE INDEX**



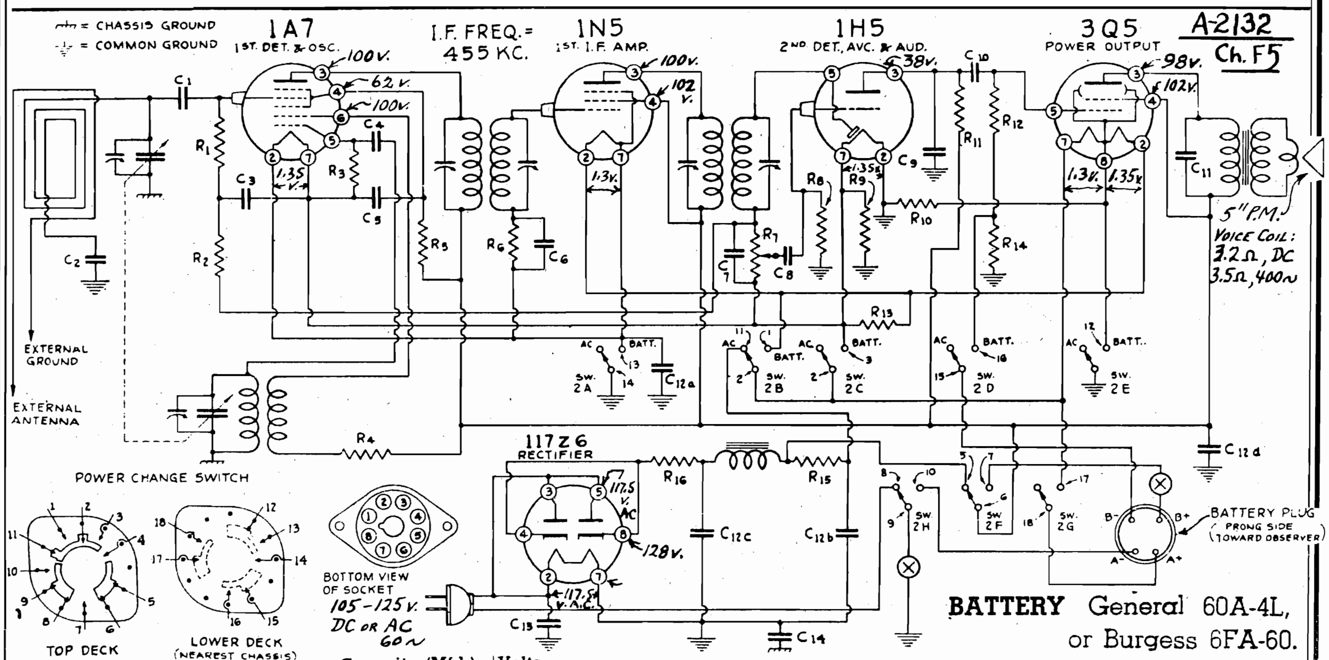
No.	Ohms		No.	Ohms		No.	Capacity	Volts
R1	50,000	¼ Watt	R12	500	½ Watt	C8	.003-5%	Mica
R2	20,000	¼ Watt	R13	150,000	¼ Watt	C9	.005	600
R3	440	¼ Watt				C10	.05	400
R4	3,000	¼ Watt				C11	.0005	Mica
R5	2,000,000	¼ Watt				C12	.00025	Mica
R6	250,000	¼ Watt				C13	.01	400
R7	500,000	Vol. Cont.				C14	.002	400
R8	5,000,000	¼ Watt				C15	.01	400
R9	500,000	¼ Watt				C16	30.0	150
R10	200	¼ Watt					20.0	150
R11	500	¼ Watt					20.0	150
						C17	.25	200

No.	Capacity	Volts
C1	.001	600
C2	.00005	Mica
C3	.05	200
C4	.05	200
C5	.05	200
C6	.0001	Mica
C7	.00001	Mica

VOLTAGES: Line = 117v. AC; Power = 30W. Volume Cont'l = Max. Meter = 1000 ohms/volt (150 v. scale). Measure with respect to common gnd

ALIGNMENT PROCEDURE (See 7C-PH Automatic):

Trim OSC. at 1730 KC (Broadcast)
Pad OSC. at 600 KC (Broadcast)
Trim ANT. at 1400 KC (Broadcast)
Trim ANT at 15000 KC (Short Wave)



BATTERY General 60A-4L, or Burgess 6FA-60.

No.	Ohms	Watts	No.	Ohms	Watts	No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
						C1	.00025	Mica			
R1	1,000,000	½	R9	110	½	C2	.1	200	C10	.01	400
R2	1,000,000	½	R10	750—10%	½	C3	.01	200	C11	.002	400
R3	200,000	½	R11	250,000	½	C4	.0005	Mica	C12a	40.	25
R4	500	½	R12	1,000,000	½	C5	.05	200	C12b	40.	25
R5	30,000	½	R13	400	½	C6	.01	200	C12c	30.	150
R6	5,000,000	½	R14	400—10%	½	C7	.00025	Mica	C12d	30.	150
R7	1,000,000	V.C.	R15	2,100	5	C8	.01	400	C13	.05	400
R8	5,000,000	½	R16	30	½	C9	.00025	Mica	C14	.25	200

VOLTAGES: Line = 117.5v. AC; Power = 25 W. Vol. Cont'l = Max. Meter = 1000 ohms/volt Measure with respect to common gnd.

ALIGNMENT (use common gnd): IF = 455KC

*Trim Osc. at 1550 KC, Ant. at 1400KC

*TRIM USING EXTERNAL GND.

APRIL 1940

In Model F5 switch points 4, 15, 16, 17 and 18 are not used. Switch points 4 is also not used on Model XF5. Power change switch 2A thru 2H and the pictorial view shown in the "AC-DC" position.

In late models C2 is not used.

MODELS W-134, Z-7124, Ch. TF
MODEL A-2132, Ch. F5
MODEL A-2006, Ch. B5

SPIEGEL, INC.

PHONOGRAPH OPERATION

W-134 Ch. TF ; Z-7124 Ch. TF

MOTOR. The motor is a strong mechanical type hand wound spring motor. Insert the crank in the hole at the right. When the motor is fully wound the phonograph will play two full ten-inch records before re-winding is required.

TURNTABLE. To start turntable move the brake lever forward. To stop turntable pull lever toward you. Speed may be regulated by the control arm. For correct pitch adjust this speed to 78 revolutions per minute.

WARNING: Do not forget to turn off radio set when through playing records or the battery will run down. Battery life is appreciably shortened by continuous operation over long periods of time.

PICKUP. The pickup is the new crystal type. To insert a needle, raise the pickup arm to a vertical position, loosen the needle holder screw on the front, insert a needle to its full depth, tighten up the needle holder screw and lower pickup arm to its non-playing position outside the record and slip into the pickup rest holder. When commencing to play, remove pickup from holder, lift and place gently the point of the needle on the smooth outer rim of the record and slide into the first groove of the record.

PLAYING RECORDS

(a) Turn on the volume control and "on-off" switch on the receiver.

(b) Turn the "Radio-phono" switch to the phono position.

(c) Place the selected record upon the turntable and move the starting lever forward. This will place the record in motion.

(d) Lift pickup and lower the needle point gently to the smooth outer rim of the record and slide into the first groove of the record.

(e) Adjust volume to proper level by rotation of the volume control knob. After the selection is completed, lift the pickup, swing the arm to the right beyond the edge of the record and lower and affix to the arm rest bracket.

(f) When you have finished playing, lift pickup and place in its rest position and remove record from turntable. Never leave pickup with needle resting on record or on turntable.

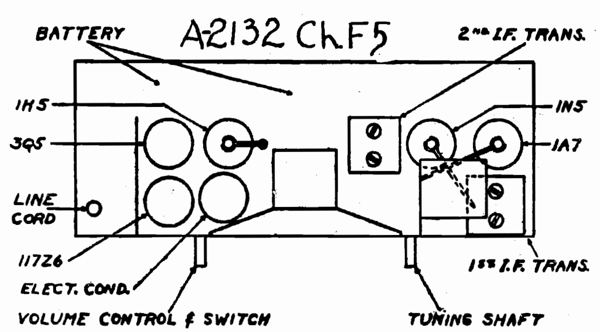
RECORD HOLDER. Eight ten-inch records may be carried in the record holder in the cabinet lid. To remove record holding clamp turn it ninety degrees. Place records in lid, replace clamp, sliding it up tight against records before turning it.

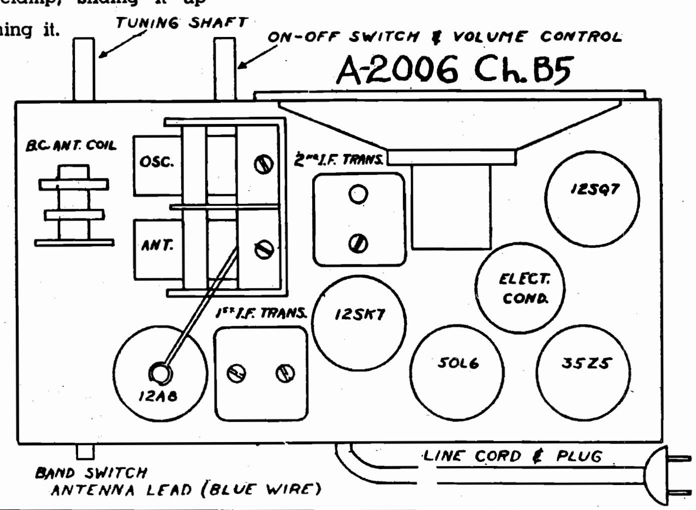
SERVICE. The phonograph motor will require oiling once every three months. Apply 3 or 4 drops of Number 10 S. A. E. oil to the turntable bearings, to the bearings at each end of the governor shaft, to the felt pad on the governor brake, and to the gears and bearings on the gear shafts.

NEEDLES

High quality needles are important to your enjoyment of recorded music. Use good half-tone steel needles or Kacti-needles to prolong the life of the records. If long playing needles are used, do not change the position of the needle in the pickup after it has once been played, as this will injure the record grooves.

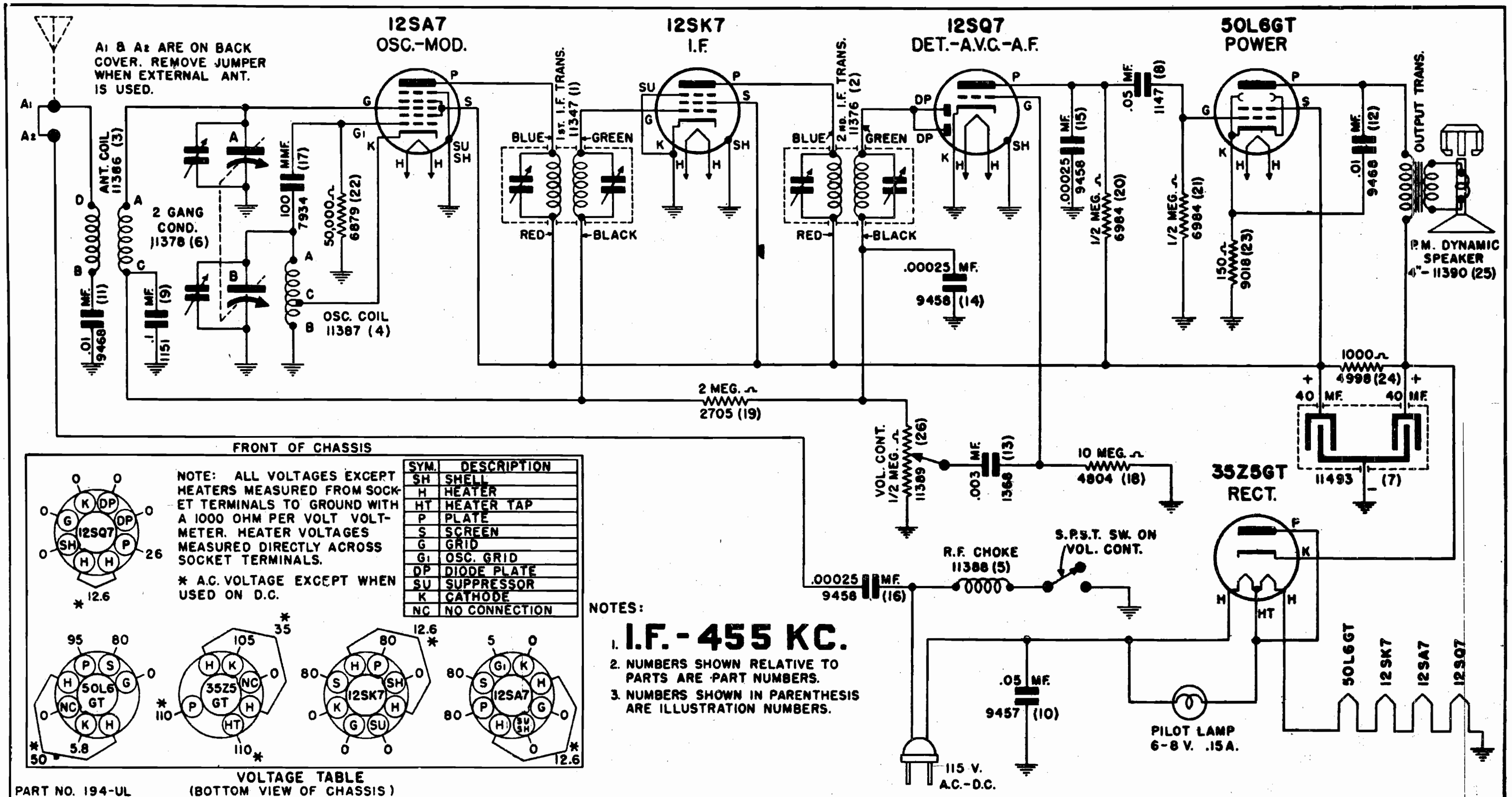
Note: The needle point wears down gradually in use and wears down in conformity with the shape of the record groove. Changing the position of the needle in the pickup after it has been played will provide a new fit to the groove and will damage the record groove by changing the shape of the groove. The life of the record depends upon maintaining the original record groove. To summarize this important message, never reinsert a used needle in the pickup, since this will do permanent injury to the record and shorten your record life materially.





SPIEGEL, INC.

MODEL A-2012
Ch. 194U



NOTES:
1. I.F.-455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PARTS LIST

Part No.			Description	List Price
1	11347	Coil	1st I. F. Transformer	$ .90
2	11376	Coil	2nd I. F. Transformer	.80
3	11386	Coil	Antenna	.50
4	11387	Coil	Oscillator	.45
5	11388	Coil	Antenna Line Choke	.25
6	11378	Condenser	Tuning Two Gang	1.75
7	11493	Condenser	Tubular Dry Elec. 40 Mfd.-40 Mfd.	1.00
8	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
9	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
10	9457	Condenser	Tubular .05 Mfd. 400 Volt	.18
11	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
12	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
13	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
14	9458	Condenser	Mica .00025 Mfd.	.21
15	9458	Condenser	Mica .00025 Mfd.	.21
16	9458	Condenser	Mica .00025 Mfd.	.21
17	7934	Condenser	Mica .0001 Mfd.	.21
18	4804	Resistor	Carbon 10 Megohm ½ Watt	.19
19	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
20	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
21	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
22	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
23	9018	Resistor	Carbon 150 Ohm ⅓ Watt	.19
24	4998	Resistor	Carbon 1000 Ohm 1 Watt	.21
25	11390	Speaker	P. M. Dynamic 4 in.	2.70
26	11389	Volume Control	With S.P.S.T. Switch	.80

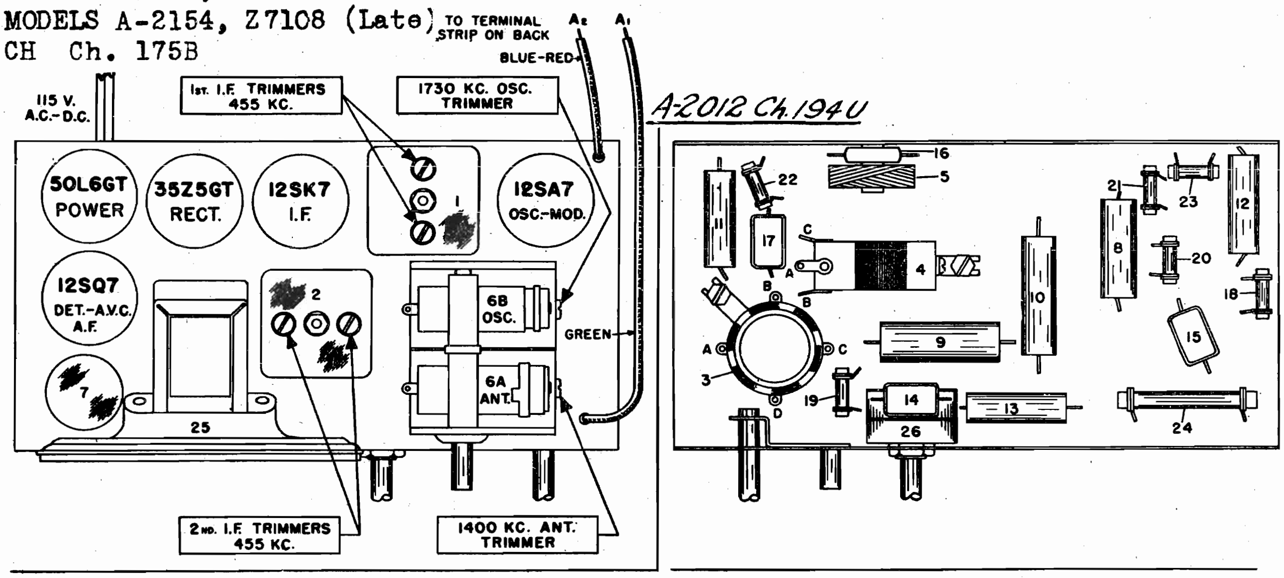
MISCELLANEOUS PARTS

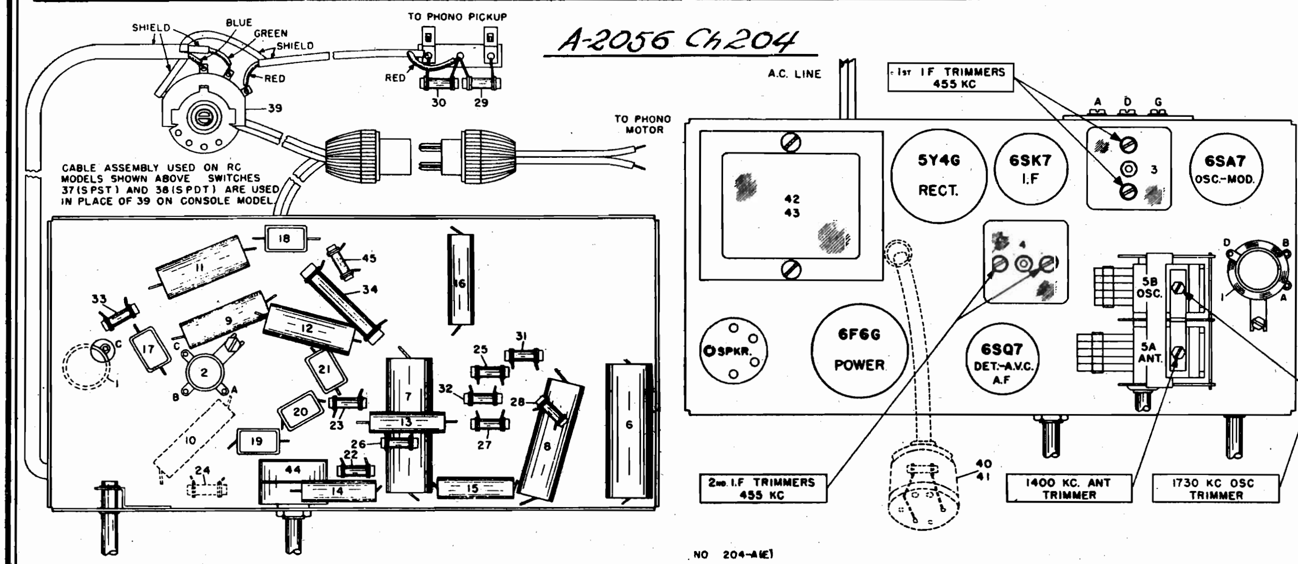
Part No.		Description	List Price
11304	Bulb	6-8 Volt .150 Ampere Dial Light No. 47 Bayonet Base	.10
11381	Dial Scale	Calibrated Scale	.30
8184	Dial Cord	Dial Drive Cord	.10
11379	Dial Shaft	Dial Drive Shaft	.12
11725	Dial Pointer	For Dial-Bronze	.15
11384	Dial Pointer	For Dial	.15
11391	Dial Crystal	For Dial	.22
11563	Knob	Bakelite Tuning for Walnut Plastic Cabinet	.10
10207	Knob	Bakelite Push Button for Ivory Plastic Cabinet	.08
	Cabinet	Walnut Plastic	1.80
	Cabinet	Ivory Plastic	2.15

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE. W. 4,000 10-39

MODEL A-2012, Ch. 194U
MODEL A-2056, Ch. 204
MODELS A-2154, Z7108 (Late)
CH Ch. 175B

SPIEGEL, INC.





MODELS A-2012, A2056 **ALIGNMENT PROCEDURE** *A-2154, Z7108 (LATE)*

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 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 gang condenser frame.

	Set receiver dial to:	TEST OSCILLATOR: Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	Refer to parts layout diagram for location of trimmers mentioned below:
	I.F. Any point where no interfering signal is received	455 K. C.	.02 MFD condenser	High side to grid terminal of *12SA7 tube DO NOT REMOVE CAP.	Adjust the second I. F. transformer trimmer for maximum output then adjust each of the first I. F. trimmers for maximum output
1	Exactly 1730 K. C.	Exactly 1730 K. C.	.00025 MFD condenser	Receiver "A1" post	Adjust 1730 K. C. oscillator trimmer for maximum output.
2	Approx. 1400 K. C.	Approx. 1400 K. C.	.00025 MFD condenser	Receiver antenna "A1" post	While rocking gang condenser adjust 1400 K. C. antenna trimmer for maximum output.

*1A7G tube *FOR A2154, Z7108 (LATE)*

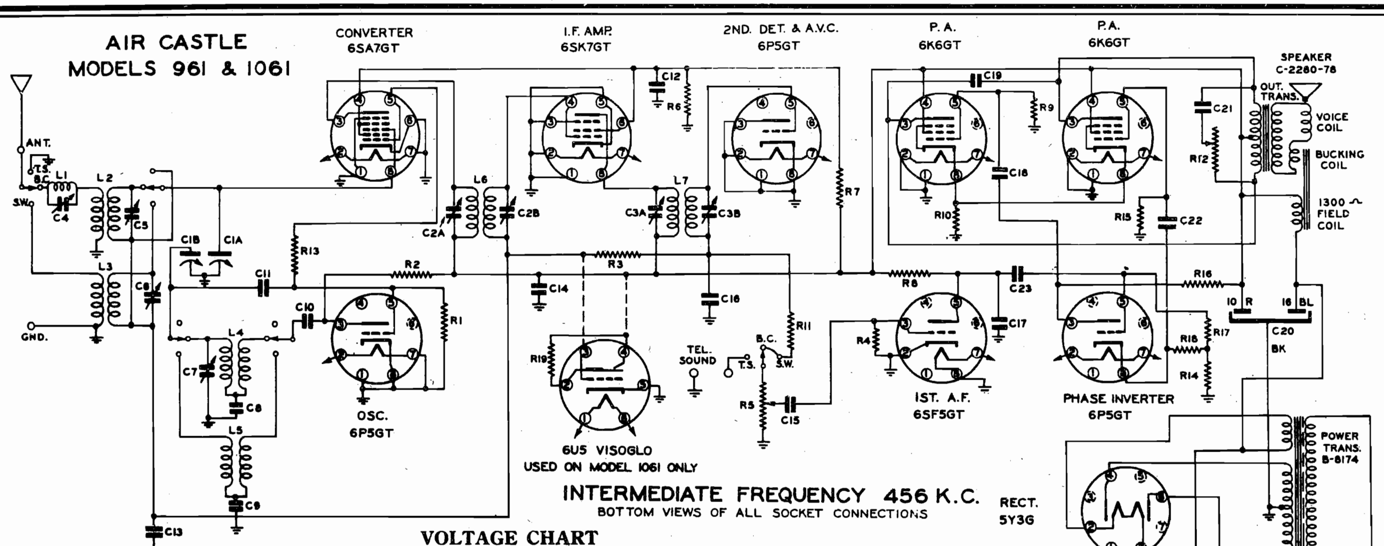
*6SA7 tube *FOR A-2056*

SPIEGEL, INC.

MODELS A2052, A2060, A2062
Ch. 961-1061

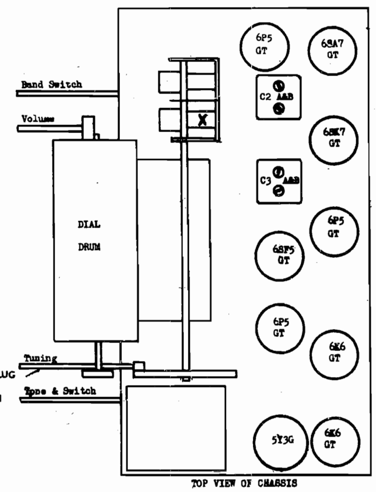
BROADCAST BAND
540 to 1720 Kilocycles

SHORT-WAVE BAND
5.7 to 21.5 Megacycles

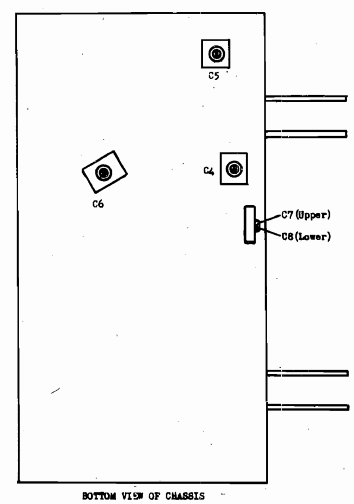


INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

WAVE BAND SWITCH B-8038
SHOWN IN B.C. POSITION



TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

C1A&B	VARIABLE CONDENSER	B-7229
C2A&B	NO. 1 I.F. TRIMMER	B-7200-GN
C3A&B	NO. 2 I.F. TRIMMER	B-7200-GN
C4	I.F. REJECTOR TRIMMER	A-14088-4
C5	B.C. ANT. TRIMMER	A-14088-5
C6	S.W. ANT. TRIMMER	A-14088-5
C7	B.C. OSC. TRIMMER	B-7199-EY
C8	B.C. OSC. PADDER	B-7199-EY
C9	2700 MMF. MICA	A-15451
C10	250 MMF. MICA	C-720-324
C11	50 MMF. MICA	C-720-315
C12	.1 MFD. 200V.	C-3202-38C
C13	.05 MFD. 200V.	C-3202-84C
C14	.1 MFD. 400V.	C-3204-38C
C15	.02 MFD. 200V.	C-3202-22C
C16	250 MMF. MICA	C-720-324
C17	250 MMF. MICA	C-720-324
C18	.05 MFD. 400V.	C-3204-28C
C19	.001 MFD. 600V.	C-3206-58C
C20	16-10 MFD. ELECT.	A-14799-2
C21	.015 MFD. 600V.	C-3206-77C
C22	.05 MFD. 400V.	C-3204-28C
C23	.05 MFD. 400V.	C-3204-28C
R1	56,000 Ω .25W.	C-2795-83B
R2	22,000 Ω .5W.	C-2796-78C
R3	1 MEGOHM .25W.	C-2795-98B
R4	4.7 MEGOHM .25W.	C-2795-106B
R5	500,000 Ω VOL. CONT.	A-15130-3
R6	27,000 Ω 1W.	C-2797-79B
R7	33,000 Ω 3W.	C-2799-80A
R8	270,000 Ω .25W.	C-2795-91B
R9	680,000 Ω .25W.	C-2795-30B
R10	330 Ω 1W.	C-2797-56B
R11	56,000 Ω .25W.	C-2795-83B
R12	TONE CONT. & SW.	A-15128-3
R13	560 Ω .25W.	C-2795-59B
R14	33,000 Ω .5W.	C-2796-195C
R15	680,000 Ω .25W.	C-2795-96B
R16	39,000 Ω .5W.	C-2796-197C
R17	1 MEGOHM .25W.	C-2795-98B
R18	2700 Ω .25W.	C-2795-169B
R19	220,000 Ω .25W. (USED ON MODEL 1061 ONLY)	C-2795-90B
L1	I.F. REJECT. COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-8
L4	B.C. OSC. COIL	A-15377-1
L5	S.W. OSC. COIL	A-15233-3A
L6	NO. 1 I.F. COIL	A-12064-39
L7	NO. 2 I.F. COIL	A-12064-17

VOLTAGE CHART

Line Voltage: 117 volts

Position of Volume Control: Full with Antenna Disconnected
Position of Band Switch: Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram) No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
6SA7GT	Converter	0	0	230	48	-.1C	0	*5.9	-.1c
6P5GT	Oscillator	0	0	125	230	-.1C	-	*5.9	0
6SK7GT	I-F Amplifier	0	0	0	-A	0	48	*5.9	230
6P5GT	Det - AVC	0	0	0	0	-A	-	*5.9	0
6SF5GT	1st Audio Amplifier	0	0	A	-	53B	230	*5.9	0
6P5GT	Phase Inverter	0	0	135	-	A	40	*5.9	55
6K6GT	Power Amplifier	0	0	225	230	0	-	*5.9	18.5
6K6GT	Power Amplifier	0	0	225	230	0	-	*5.9	18.5
5Y3G	Rectifier	0	*380	-	*325	-	*325	-	*380
6U5**	Tuning Indicator**	*5.9	90	-.02C	225	0	0	-	-

Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*A.C. **On Model 1061 only.
A - Cannot be measured on 1000 ohms/volt meter.
B - 100 volt scale. D - 10 volt scale.
C - 1 volt scale.

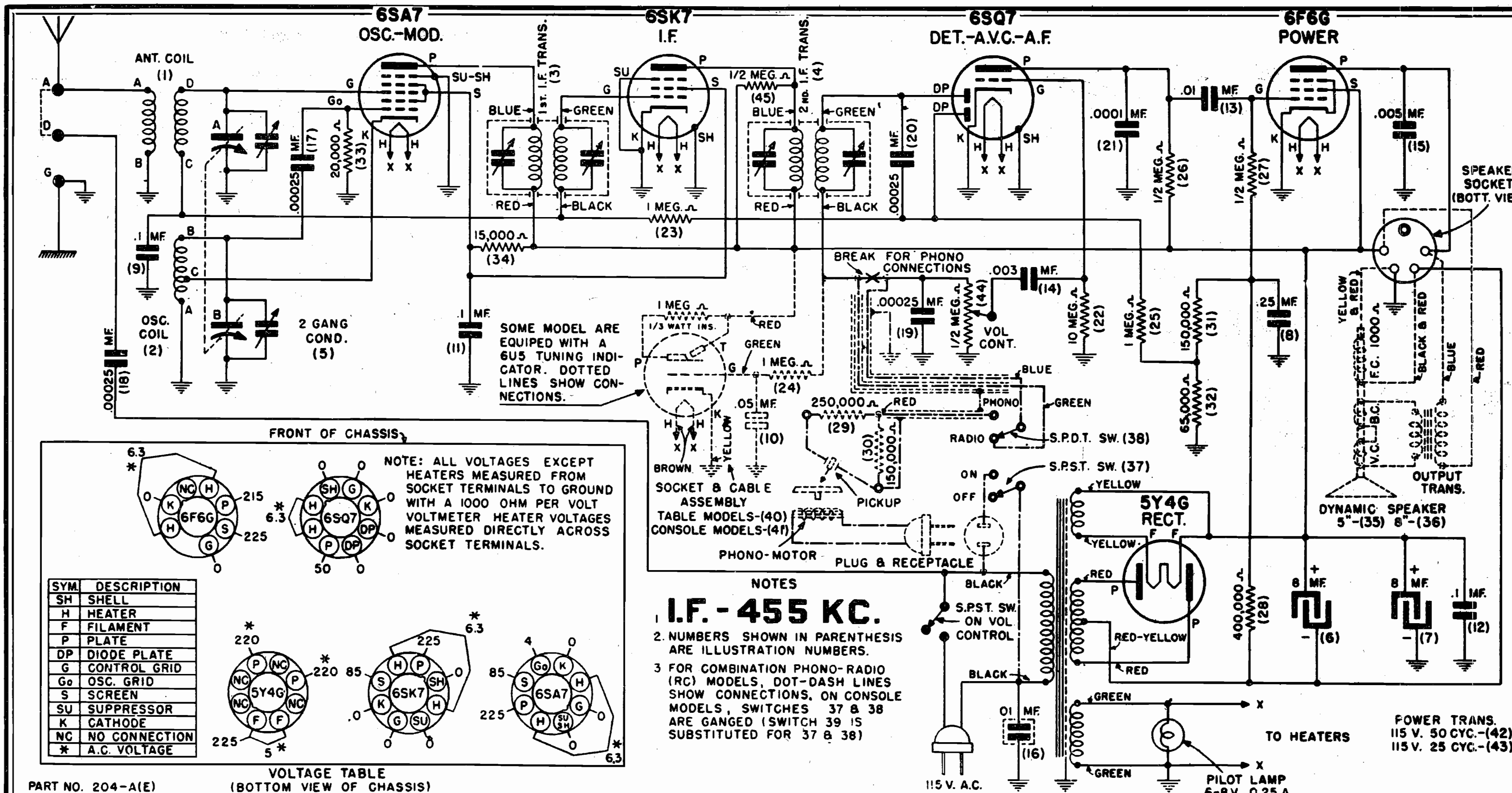
ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that indicator points to last mark with gang closed.)							
2	I.F.	*	.1 mf.	456 KC	BC	Open	C3 A&B C2 A&B	
3	I-F Rej.	Ant.	200 mf.	456 KC	BC	Closed	C4	Adjust to minimum
4	Broad-cast Band	Ant.	200 mf.	1500 KC	BC	1500 KC	C7 (Osc.) C5 (Ant.)	
5				600 KC	BC	600 KC	C8 (Pad.)	***
6	(Repeat operation 4).							
7	(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)							
8	SW Band	Ant.	**	18 MC	SW	18 MC	C6 (Ant.)	***
9	(Check calibration and sensitivity at 6. MC and 18. MC)							
10	(Check operations 1 to 9 inclusive.)							

*Connect to point marked "X" in drawing **100 ohms and 200 mmf. in series.
***Rock dial while adjusting for maximum output. Be sure to adjust on fundamental signal and not on image.

MODEL A2056, Ch. 204

SPIEGEL, INC.



SYM.	DESCRIPTION
SH	SHELL
H	HEATER
F	FILAMENT
P	PLATE
DP	DIODE PLATE
G	CONTROL GRID
Go	OSC. GRID
S	SCREEN
SU	SUPPRESSOR
K	CATHODE
NC	NO CONNECTION
*	A.C. VOLTAGE

NOTES

1. I.F.-455 KC.
2. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.
3. FOR COMBINATION PHONO-RADIO (RC) MODELS, DOT-DASH LINES SHOW CONNECTIONS, ON CONSOLE MODELS, SWITCHES 37 & 38 ARE GANGED (SWITCH 39 IS SUBSTITUTED FOR 37 & 38)

Part No.			Description	List Price
1	11269	Coil	Antenna	$ .70
2	11271	Coil	Oscillator	.60
3	4404	Coil	1st I. F. Transformer	1.20
4	4404	Coil	2nd I. F. Transformer	1.20
5	11526	Condenser	Tuning (Two Gang)	2.00
6	10625	Condenser	Dry Electrolytic 8 Mfd.-350 Volt D. C. Wkg.	.55
7	10625	Condenser	Dry Electrolytic 8 Mfd.-350 Volt D. C. Wkg.	.55
8	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
9	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
10	1147	Condenser	Tubular .05 Mfd. 200 Volt	.19
11	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
12	9203	Condenser	Tubular .1 Mfd. 400 Volt	.20
13	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
14	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
15	2075	Condenser	Tubular .005 Mfd. 600 Volt	.18
16	4305	Condenser	Tubular .01 Mfd. 220 Volt (Shielded)	.30
17	9458	Condenser	.00025 Mfd. Mica	.21
18	9458	Condenser	.00025 Mfd. Mica	.21
19	9458	Condenser	.00025 Mfd. Mica	.21
20	9458	Condenser	.00025 Mfd. Mica	.21
21	7934	Condenser	.0001 Mfd. Mica	.21
22	4804	Resistor	Carbon 10 Megohm ⅓ Watt	.19
23	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
24	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
25	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
26	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
27	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
28	3133	Resistor	Carbon 400,000 Ohm ⅓ Watt	.19
29	8906	Resistor	Carbon 250,000 Ohm ⅓ Watt	.19
30	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
31	3418	Resistor	Carbon 150,000 Ohm ⅓ Watt	.19
32	11599	Resistor	Carbon 65,000 Ohm ⅓ Watt	.19
33	1784	Resistor	Carbon 20,000 Ohm ⅓ Watt	.19
34	4599	Resistor	Carbon 15,000 Ohm 1½ Watt	.22
35	11278	Speaker	Electro-Dynamic 5"	3.00
36	11537	Speaker	Electro-Dynamic 8"	5.00
37	10573	Switch	S.P.S.T. (On-Off) Used with Phono Model Having Tuning Eye	.65
38	2434	Switch	S.P.D.T. (Rad-Phono) Used with Phono Model Having Tuning Eye	.70
39	10472	Switch	Radio-Phono (Used with Phono Model without Tuning Eye	1.00
40	4516	Socket & Cable Assembly	For 6U5 Tuning Eye Incl. Socket and Resistor	.65
41	10108	Socket & Cable Assembly	For 6U5 Tuning Eye Incl. Socket and Resistor (Used with Phono Model)	.65
42	11272	Transformer	Power 115 Volt 50 Cycle	2.80
43	11273	Transformer	Power 115 Volt 25 Cycle	5.00
44	4839	Volume Control		.85
45	6984	Resistor	Carbon 500,000 Ohm—⅓ Watt	.19

MISCELLANEOUS PARTS

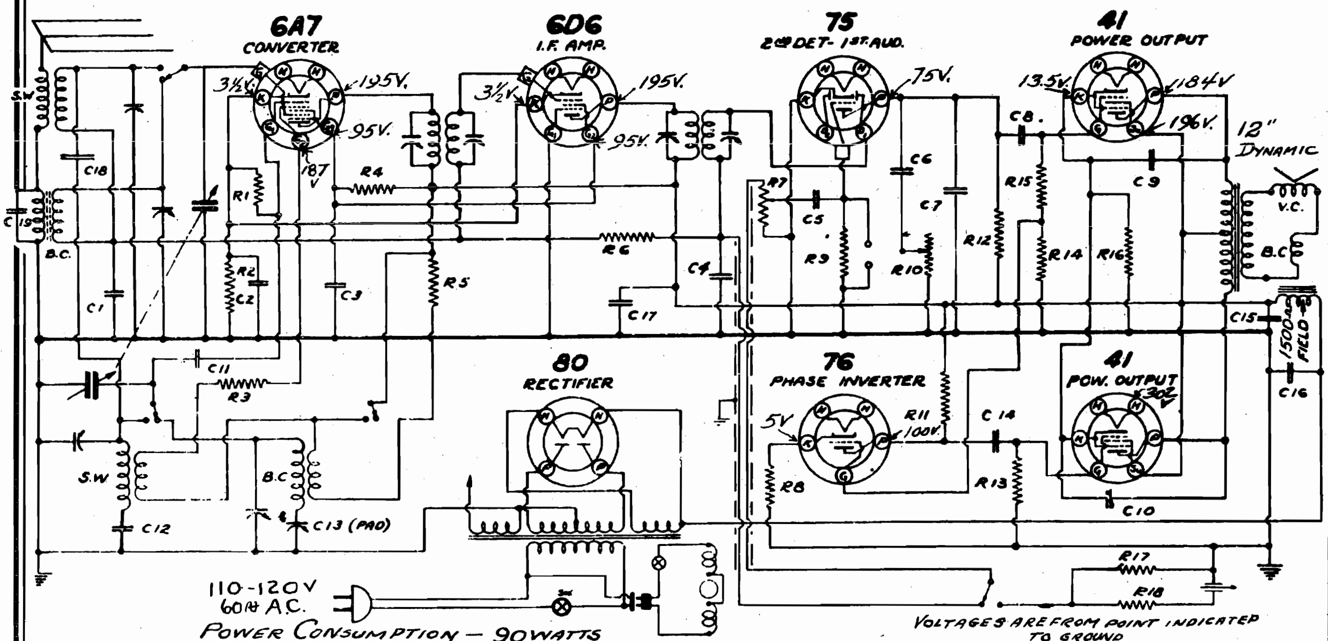
10292	Bulb	6-8 Volt .250 Amp. Type 3¼ No. 44	.10
11529	Dial Scale		.35
8184	Dial Cord	12" of 18 lb. Drive Cord	.10
11017	Dial Shaft	Dial Drive Shaft	.11
11489	Dial Pointer	Indicator Needle	.15
11140	Escutcheon	With Crystal for Dial	1.00
11339	Escutcheon	With Crystal for Dial	1.00
4519	Escutcheon	For Tuning Eye	.30
11796	Knob		.10
10473	Motor	Phono 110 Volt 60 Cycle less Turntable	7.00
10546	Motor	Phono 110 Volt 50 Cycle Less Turntable	7.50
10547	Motor	Phono 220 Volt 50 Cycle Less Turntable	8.00
10955	Pickup	Crystal Pickup and Arm	5.25
11797	Turntable	10" Velveteen Covered	1.50
11798	Turntable	12" Velveteen Covered	1.75

W. 4M PART NO. 204A

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

SPIEGEL, INC.

MODELS A2080, Z7080
Ch. 7C-PH



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.	R17	250,000	1/2
C8	.01	400	C18	GIMMICK		R8	3,000	1/2	R18	500,000	1/2
C9	.005	600	C19	.0001	MICA	R9	5 MEG.	1/2			
C10	.005	600				R10	500,000	TONE CON.			

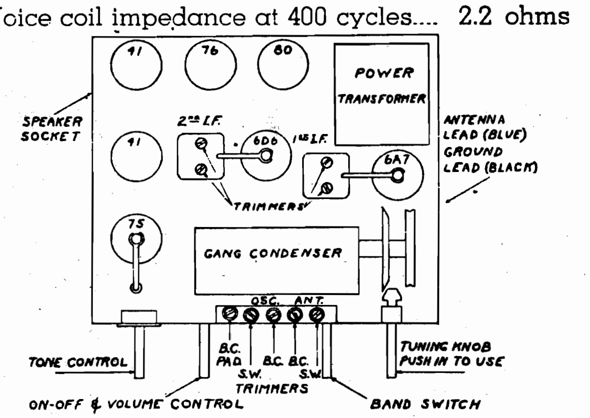
VOLTAGES ARE FROM POINT INDICATED TO GROUND

I.F.-455 K.C.

BAND SWITCHES SHOWN IN BROADCAST POSITION
BOTTOM VIEW OF TUBE SOCKETS SHOWN

GANG CONDENSER CAPACITY 443 mmfds.

D.C. voice coil resistance...................... 1.9 ohms
Voice coil impedance at 400 cycles.... 2.2 ohms



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 Fig. 3 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 mica padding condenser, should be tested.

MODELS A2080, Z7080
Ch. 7C-PH

SPIEGEL, INC.

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.

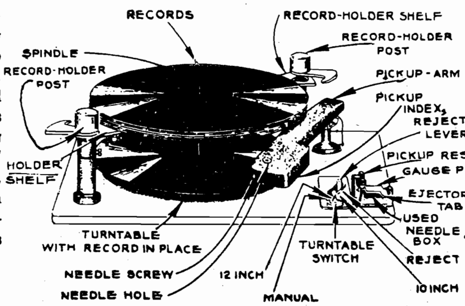


Fig. 2—Top View of Automatic Record Changer

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.

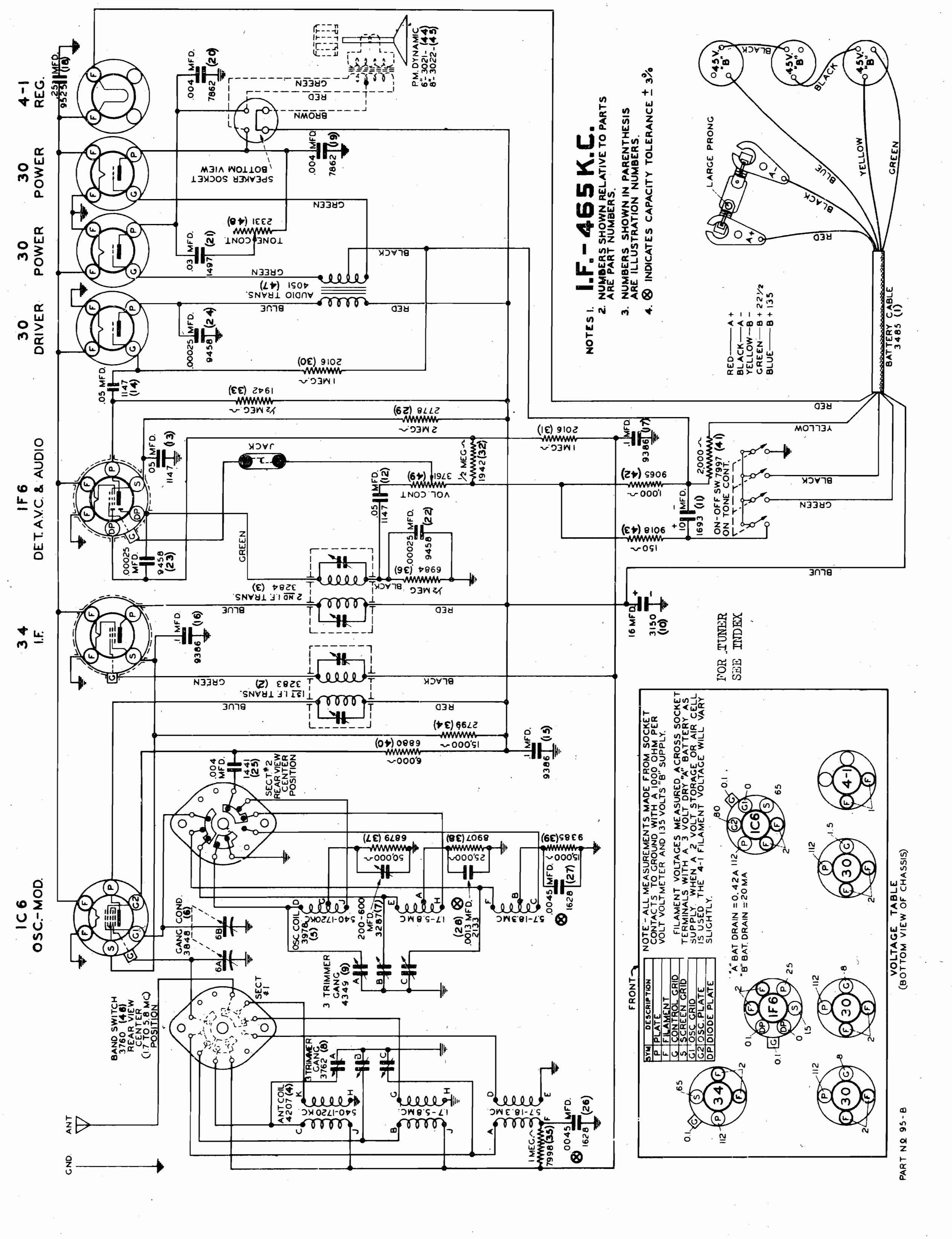
SETTING UP PUSH BUTTONS

Loosen one of the push buttons by turning the push button knob counter clockwise a turn or less and push it in; while holding the button in, tune in a desired station by means of the station selector knob. Turn the selector very slowly back and forth until the signal is clearest. Now while holding the push button in, tighten it by turning clockwise. Release the push button and turn the station selector to one end of the dial; push the tuning knob to the right and then check the button by pushing it in 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 loosen another push button and repeat the above procedure, doing this for the remaining buttons.

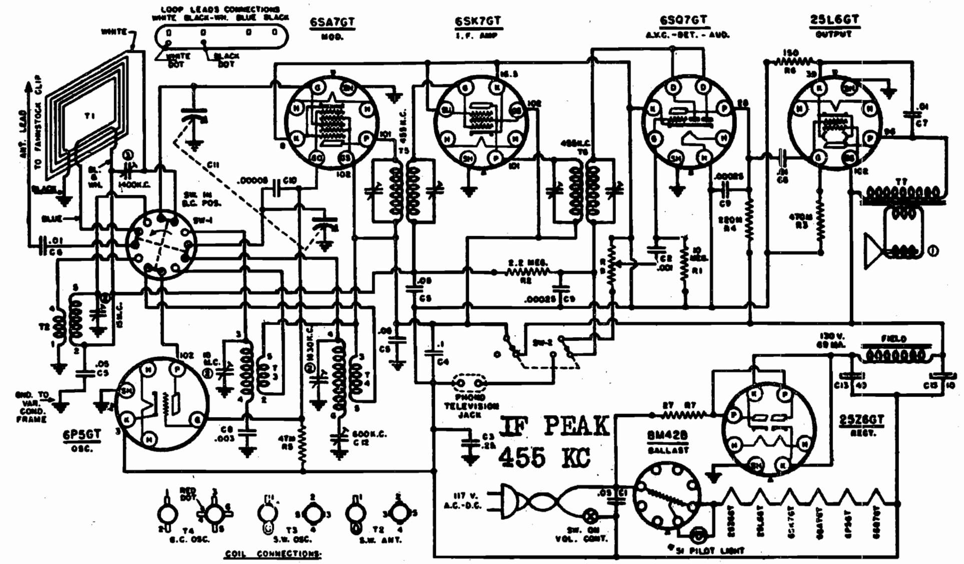
SPIEGEL, INC.

MODELS 2104, 2105, 2106, 2107, Ch. 1095B



MODEL A2026, Ch. 10-70
MODELS 2104, 2105,
2106, 2107, Ch. 1095B

SPIEGEL, INC.

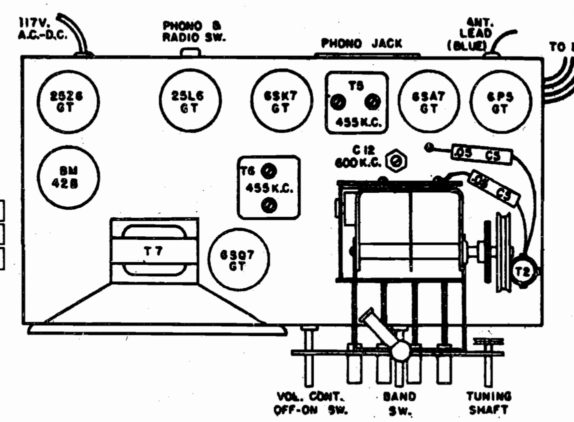


A-2026
Ch.10-70

CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII

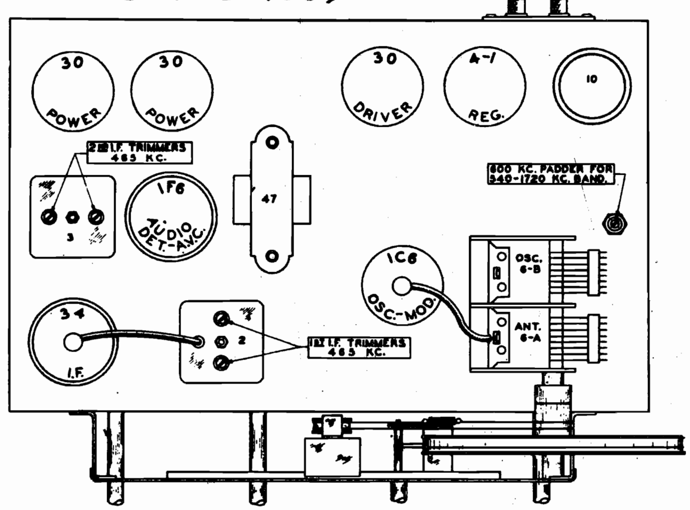
This model has been designed to cover two seperate frequency bands, a broadcast band from 540 K.C. to 1630 K.C. and a short wave band from 5.7 to 18 M.C. The dial scale has been calibrated directly in kilocycles (less the final 0) on the broadcast band, while the short wave band is calibrated directly in megacycles.

For push button data, see index.



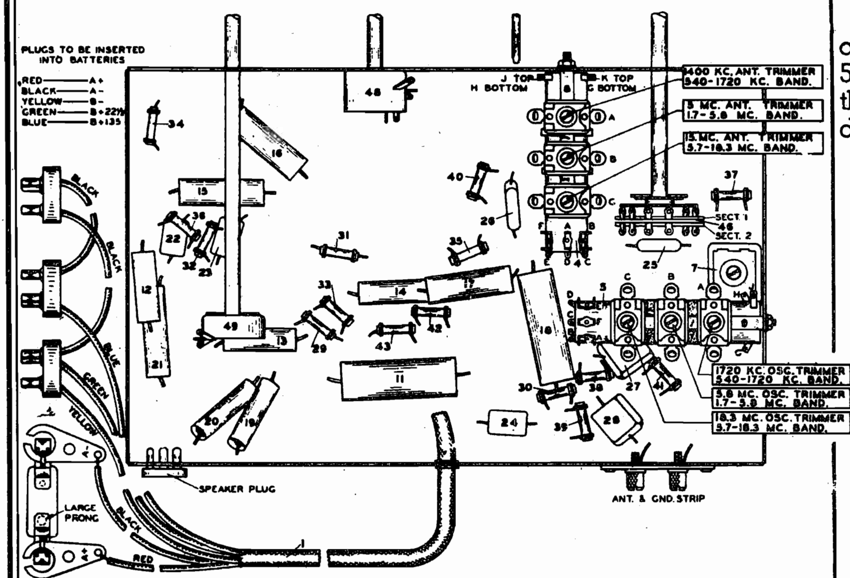
CODE	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400V. TUBULAR CONDENSER
C2	16-124	.001 " " " "
C3	16-120	.25 " 200V. " "
C4	16-113	.1 " " " "
C5	1622	.05 " " " "
C6	16-121	.01 " " " "
C7	16-119	.01 " 400V " "
C8	13-118	.003 MFD. MICA CONDENSER
C9	1504	.00025 " " "
C10	1503	.00005 " " "
C11	19-162	2 GANG VARIABLE CONDENSER
C12	20-130	PADDING CONDENSER
C13	12-255	40 X 10 MFD. 150 W.V. ELECTROLYTIC
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	24-146	500M " VOLUME CONTROL
SW1	69-145	BAND SWITCH
SW2	68-140	PHONO "
T1	82-11	LOOP ANTENNA (B.C.)
T2	10-337	S.W. ANTENNA COIL
T3	10-338	S.W. OSCILLATOR COIL
T4	10-316	B.C. " "
T5	10-317	1 ST. I.F. TRANSFORMER
T6	10-312	2 ND. "
T7	------	OUTPUT TRANS. (ON SPKR.)
1	79-283	5" DYNAMIC SPEAKER
2	20-127	TRIMMER BLOCK
3	20-129	TRIMMER (ON LOOP)

2104, 2105, 2106, 2107
Chassis 1095B



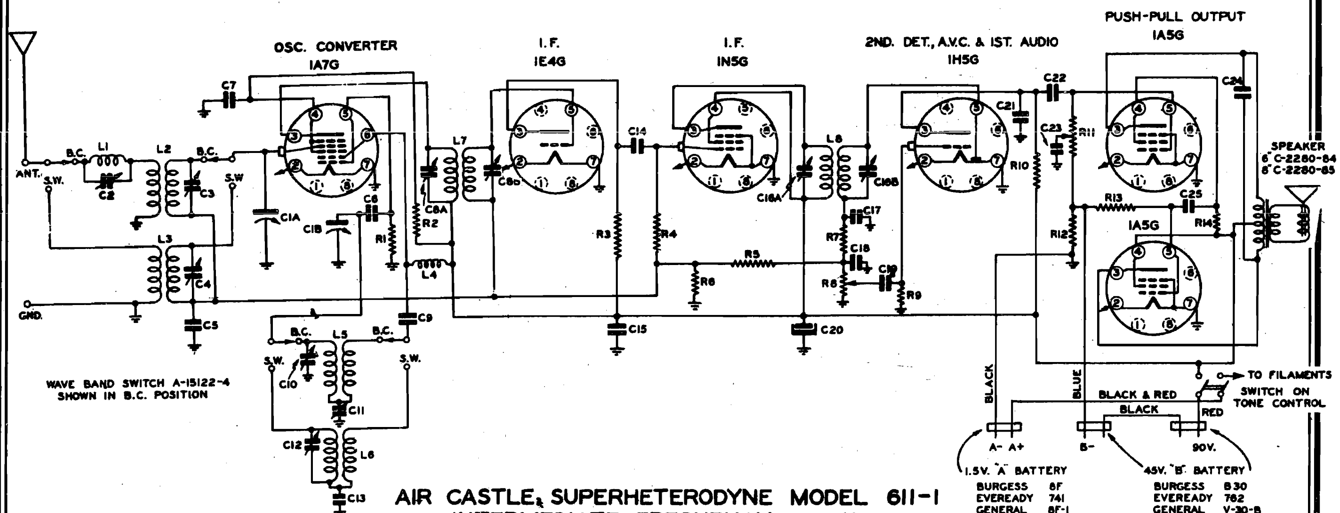
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.

DUMMY ANTENNAS:- I.F.-.02 MFD., 1720-540KC.-.00025MFD., 1.7-5.8MC.-.00025MF. WITH 400Ω IN SERIES, 5.7-18.3MC.-400Ω.



SPIEGEL, INC.

MODELS A2100, A2150
Ch. 611

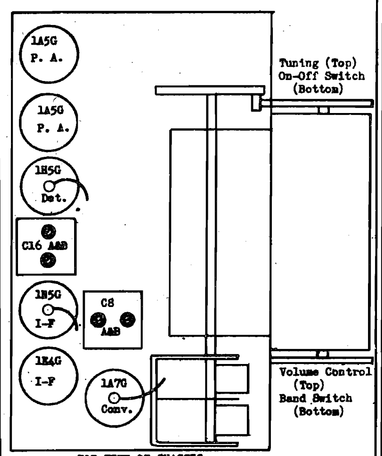


AIR CASTLE SUPERHETERODYNE MODEL 611-1
INTERMEDIATE FREQUENCY 456 K.C.
BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

BROADCAST BAND—540 to 1720 Kilocycles
SHORT-WAVE BAND—5.8 to 18 Megacycles

C1A&B	VARIABLE CONDENSER	B-7229
C2	I.F. REJECT. TRIMMER	A-14088-4
C3	B.C. ANT. TRIMMER	A-14088-5
C4	S.W. ANT. TRIMMER	A-14088-1
C5	.05 MFD. 200V.	C-3202-140C
C6	100 MMF. MICA	C-720-339
C7	.05 MFD. 200V.	C-3202-28C
C8A&B	NO. 1 I.F. TRIMMER	B-7200-GG
C9	.001 MFD. 200V.	C-3202-114C
C10	B.C. OSC. TRIMMER	B-7199-BY
C11	B.C. OSC. PADDER	B-7199-BY
C12	S.W. OSC. TRIMMER	A-15088-5
C13	2670 MMF. MICA	C-720-370
C14	250 MMF. MICA	C-720-324
C15	.05 MFD. 200V.	C-3202-140C
C16A&B	NO. 2 I.F. TRIMMER	B-7200-GG
C17	100 MMF. MICA	C-720-339
C18	100 MMF. MICA	C-720-339
C19	.01 MFD. 200V.	C-3202-76C
C20	8 MFD. 150V. ELECT.	A-14958
C21	100 MMF. MICA	C-720-339
C22	.01 MFD. 200V.	C-3202-76C
C23	.001 MFD. 200V.	C-3202-58C
C24	.001 MFD. 1000V.	C-3210-114C
C25	.01 MFD. 200V.	C-3202-76C

R1	180,000 Ω .25W.	C-2795-89B
R2	68,000 Ω .25W.	C-2795-84B
R3	6800 Ω .25W.	C-2795-72B
R4	470,000 Ω .25W.	C-2795-94B
R5	2.2 MEGOHM .25W.	C-2795-102B
R6	2.2 MEGOHM .25W.	C-2795-102B
R7	47,000 Ω .25W.	C-2795-82B
R8	500,000 Ω VOL. CONT.	A-15130-3
R9	10 MEGOHM .25W.	C-2795-110B
R10	1 MEGOHM .25W.	C-2795-98B
R11	2 MEGOHM TONE CONT.	A-15138
R12	470 Ω .25W.	C-2795-151B
R13	2.2 MEGOHM .25W.	C-2795-102B
R14	7500 Ω .25W.	C-2795-180B
L1	I.F. REJECTOR COIL	A-14677
L2	B.C. ANT. COIL	A-14679-1
L3	S.W. ANT. COIL	A-14682-4
L4	OSC. CHOKE COIL	A-14718-1
L5	B.C. OSC. COIL	A-15232
L6	S.W. OSC. COIL	A-14967-2
L7	NO. 1 I.F. COIL	A-12064-40
L8	NO. 2 I.F. COIL	A-12064-40



TOP VIEW OF CHASSIS

ALIGNMENT CHART

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that last mark is directly toward front of set with gang closed.)							
2	I. F.	1A7G Grid	.1 mf.	456 KC	BC	Open	C16 A&B	
							C8 A&B	
3	I.F. Rej.	Ant.	200 mmf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C10 Osc.	
							C3 Ant.	
5				600 KC	BC	600 KC	C11 Pad.	**
6	(Repeat operation 4)							
7	(Check calibration and sensivity at 1500 KC, 900 KC and 600 KC)							
8	Shortwave Band	Ant.	*	18 MC	SW	18 MC	C12 Osc.	
							C4 Ant.	
9	(Check calibration and sensitivity at 6 MC and 18 MC)							
10	(Check operations 1 to 9 inclusive)							

*100 ohms and 200 mmf. in series.
**Rock variable condenser while adjusting for maximum output.

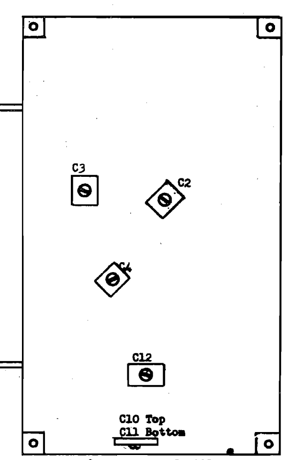
VOLTAGE CHART

"A" Battery voltage: 1½ volts
"B" Battery voltage: 90 volts

Position of Volume Control: Full with Antenna Disconnected
Position of Band Selector Switch: Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
1A7G	Osc. - Converter	0	+1.4	83	9.8B	-.2	83	0	0	0
1E4G	1st I-F	0	1.4	63	83	0	0	0	0	-
1N5G	2nd I-F	0	1.4	83	84	0	-	0	0	0
1H5G	Det. AVC-AF	-	1.4	A	83	0	0	-	-	0
1A5G	P.A.	-	1.4	80	75	-A	-	0	-	-
1A5G	P.A.	-	1.4	80	84	-A	-5.3	0	0	-

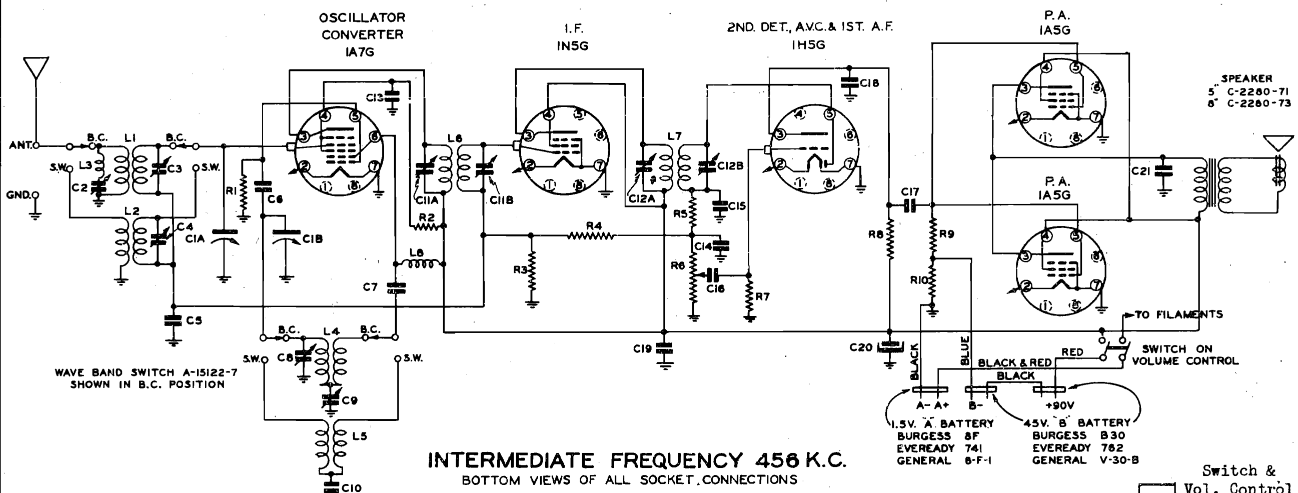
Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements.
Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
A - Cannot be measured with 1000 ohms per volt voltmeter.
B - On 10 volt scale.



BOTTOM VIEW OF CHASSIS

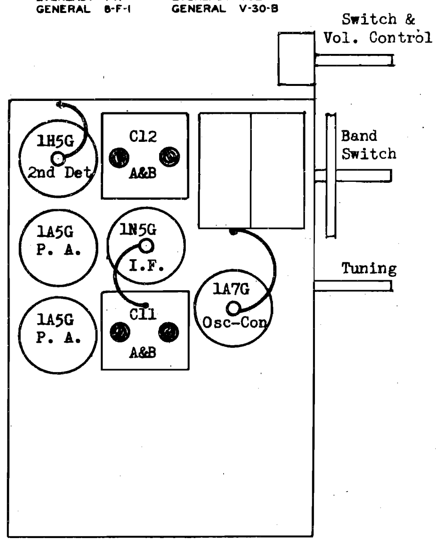
MODELS A-2108, A-2112, A-2116
Ch. 561-561M

SPIEGEL, INC.



INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS



TOP VIEW OF CHASSIS

C1A&B	VARIABLE CONDENSER	B-8173	C12A&B	NO. 2 I.F. TRIMMER	B-7200-GG
C2	I.F. REJECTOR TRIMMER	A-14088-2	C13	.05 MFD. 200V.	C-3202-28C
C3	B.C. ANT. TRIMMER	A-14200	C14	100 MMF. MICA	C-720-325
C4	S.W. ANT. TRIMMER		C15	100 MMF. MICA	C-720-325
C5	.05 MFD. 200V.	C-3202-140C	C16	.01 MFD. 200V.	C-3202-132C
C6	100 MMF. MICA	C-720-325	C17	.01 MFD. 400V.	C-3204-132C
C7	.001 MFD. 200V.	C-3202-58C	C18	100 MMF. MICA	C-720-325
C8	B.C. OSC. TRIMMER	B-7199-BY	C19	.05 MFD. 200V.	C-3202-140C.
C9	B.C. OSC. PADDER		C20	8 MFD. 150V. ELECT.	A-14958
C10	2950 MMF. MICA	C-720-382	C21	.001 MFD. 1000V.	C-3210-114C
C11A&B	NO. 1 I.F. TRIMMER	B-7200-GG			

R1	180,000 Ω .25W.	C-2795-89B	L1	B.C. ANT. COIL	A-15231
R2	68,000 Ω .25W.	C-2795-84B	L2	S.W. ANT. COIL	A-14682-12
R3	2.2 MEGOHMS .25W.	C-2795-102B	L3	I.F. REJECT. COIL	A-14718-1
R4	2.2 MEGOHMS .25W.	C-2795-102B	L4	B.C. OSC. COIL	A-15232-3
R5	56,000 Ω .25W.	C-2795-83B	L5	S.W. OSC. COIL	A-15233-6
R6	500,000 Ω V.C. & SW.	A-15132-1	L6	NO. 1 I.F. COIL	A-12064-35
R7	10 MEGOHM .25W.	C-2795-110B	L7	NO. 2 I.F. COIL	A-12064-35
R8	1 MEGOHM .25W.	C-2795-98B	L8	OSC. PLATE CHOKE	A-14718-1
R9	2.2 MEGOHMS .25W.	C-2795-102B			
R10	560 Ω .25W.	C-2795-153B			

BROADCAST BAND—530 to 1720 Kilocycles (565 to 174 Meters)

SHORT-WAVE BAND—5.8 to 18 Megacycles (52 to 16.6 Meters)

ALIGNMENT CHART

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set pointer parallel with horizontal lines on dial with gang fully closed.)							
2	I.F.	1A7G Grid	.1 mf.	456 KC	BC	Open	C12 A&B C11 A&B	
3	I-F Rej.	Ant.	200 mf.	456 KC	BC	Closed	C2	Adjust to minimum
4	Broad-cast Band	Ant.	200 mf.	1500 KC	BC	1500 KC	C8 (Osc.) C3 (Ant.)	
5				600 KC	BC	600 KC	C9 (Pad.)	**
6	(Repeat operation 4).							
7	(Check calibration and sensitivity at 1500 KC, 900 KC and 600 KC)							
8	SW Band	Ant.	*	18 MC	SW	18 MC	C4 (Ant.)	**
9	(Check calibration and sensitivity at 6. MC and 18. MC)							
10	(Check operations 1 to 9 inclusive.)							

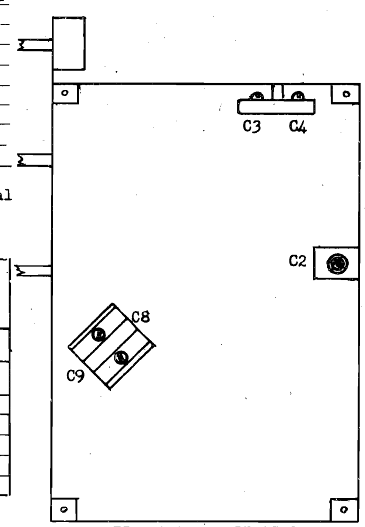
*100 ohm non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.

VOLTAGE CHART

"A" Battery voltage: 1½ volts Position of Volume Control: Full with Antenna Disconnected
"B" Battery voltage: 90 volts Position of Band Selector Switch: Broadcast

Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram)								
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	Grid Cap
1A7G	Osc. - Converter	83	1.3	83	18	*	83	0	83	0
1N5G	I.F Amp.	0	1.3	83	83	–	–	0	0	0
1H5G	Det. AVC-AF	–	1.3	*	–	0	0	0	–	0
1A5G	P.A.	–	1.3	78	83	0	–	0	0	–
1A5G	P.A.	–	1.3	88	82	0	-5	0	0	–

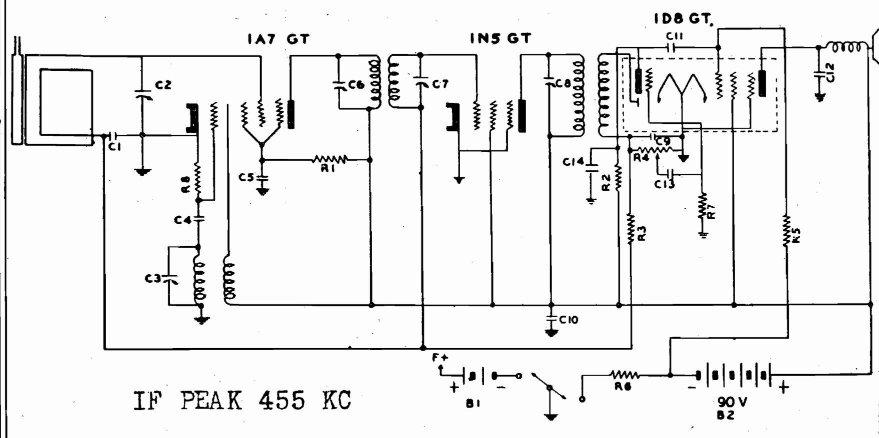
Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.
*Cannot be measured with 1000 ohms per volt voltmeter.



BOTTOM VIEW OF CHASSIS

SPIEGEL, INC.

MODEL A2120, Ch. 130, 130U
MODELS 2208, 2209, 2210, 2211, Ch. 184



IF PEAK 455 KC

A-2120

1—1A7GT Combined oscillator and 1st detector.
1—1N5GT Intermediate frequency amplifier.
1—1D8GT Combined second detector, Audio driver, and Power output.

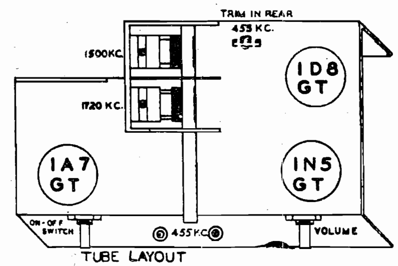
MODEL 130U

Schematic Location	Part No.	Description
R1	R-105	Carbon res. 5K ohm
R2	R-102	Carbon res. 1 meg.
R3, R5, R7	R-101	Carbon res. 2 meg.
R8	R-99	Carbon res. 200K ohm
R6	R-103	Carbon res. 600 ohm
B1	1—6F1	General Battery 1.5V
B2	2—V30B	General Battery 45V

Schematic Location	Part No.	Description
C1	C-45	Tubular cond. .05 mfd. 200V
C2, C3	Y-CV-46	Variable Condenser
C4	CM-31	Mica cond. 100 mmfd.
C5, C11	C-48	Tubular cond. .01 mfd. 400V
C6, C7	CT-1	Trimmer condenser
C8	CT-32	Trimmer condenser
C9, C14	CM-30	Mica cond. 250 mmfd.
C10	CE-58	4 mfd. 100V Electrolytic
C12, C13	C-47	Tubular cond. .004 mfd. 400V

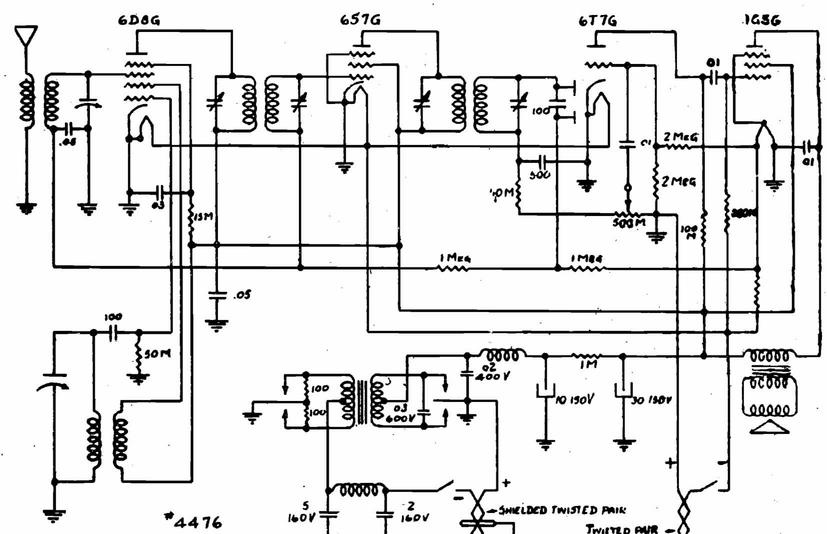
MODEL 130

Schematic Location	Part No.	Description
R1	R-105	Carbon res. 5K ohm
R2 R7	R-102	Carbon res. 1 meg.
R3 R5	R-101	Carbon res. 2 meg.
R8	R-113	Carbon res. 100K ohm
R6	R-103	Carbon res. 60 ohm
B1	No. 9	Air Castle Battery No. 9 1.5V
B2	No. 3A40P	Air Castle Battery No. 3A40P 60V



TUBE LAYOUT

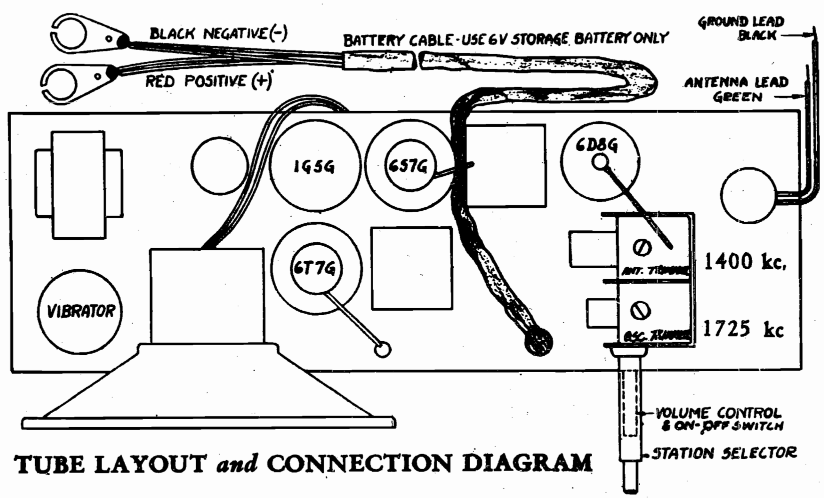
CONVENTIONAL ALIGNMENT



INTERMEDIATE FREQUENCY-456KC

MODELS 2208, 2209, 2210, 2211, ch. 184

CONVENTIONAL ALIGNMENT



TUBE LAYOUT *and* CONNECTION DIAGRAM

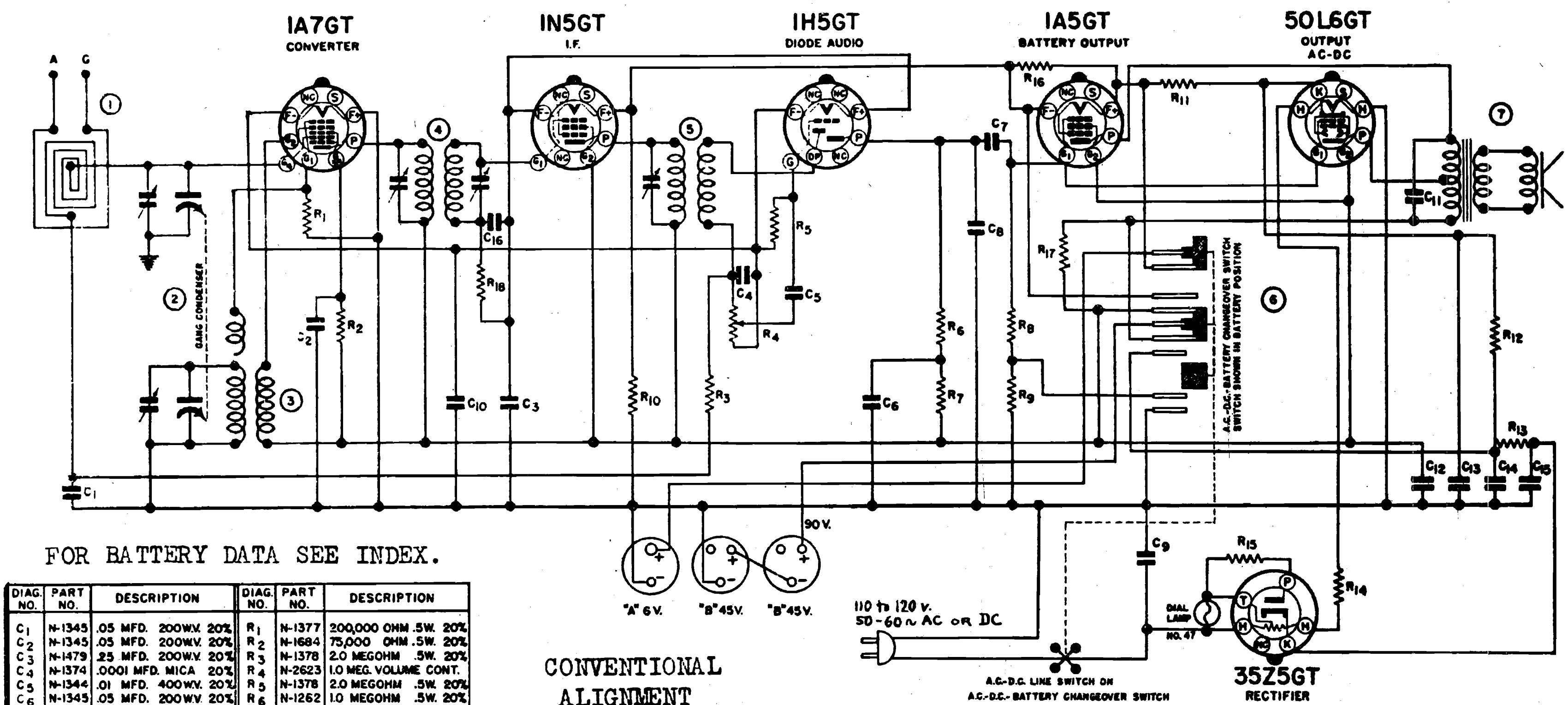
184

Range 540KC-1725KC

Tubes: Tubes required are:
1—6D8G Oscillator-Translator.
1—6S7G Intermediate frequency amplifier.
1—6T7G Detector—automatic volume control—first audio amplifier.
1—1G5G Power output.
Do not use tubes of types different from those shown above.

MODEL A-2122, Ch. KD

SPIEGEL, INC.



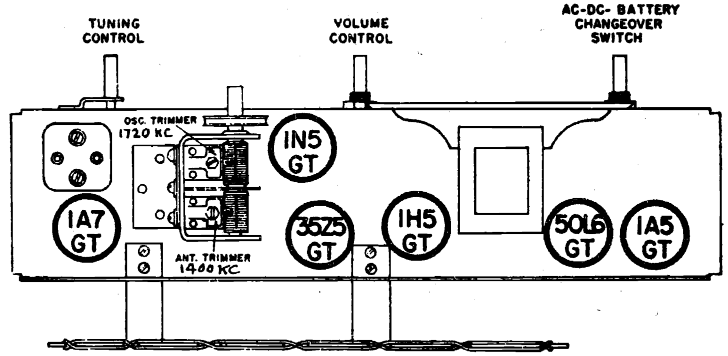
FOR BATTERY DATA SEE INDEX.

DIAG. NO.	PART NO.	DESCRIPTION	DIAG. NO.	PART NO.	DESCRIPTION
C_1	N-1345	.05 MFD. 200W.V. 20%	R_1	N-1377	200,000 OHM .5W. 20%
C_2	N-1345	.05 MFD. 200W.V. 20%	R_2	N-1684	75,000 OHM .5W. 20%
C_3	N-1479	.25 MFD. 200W.V. 20%	R_3	N-1378	2.0 MEGOHM .5W. 20%
C_4	N-1374	.0001 MFD. MICA 20%	R_4	N-2623	1.0 MEG. VOLUME CONT.
C_5	N-1344	.01 MFD. 400W.V. 20%	R_5	N-1378	2.0 MEGOHM .5W. 20%
C_6	N-1345	.05 MFD. 200W.V. 20%	R_6	N-1262	1.0 MEGOHM .5W. 20%
C_7	N-1344	.01 MFD. 400W.V. 20%	R_7	N-1778	100,000 OHM .5W. 20%
C_8	N-1343	.00025 MF. MICA 20%	R_8	N-1264	500,000 OHM .5W. 20%
C_9	N-1346	.05 MFD. 400W.V. 20%	R_9	N-1262	1.0 MEGOHM .5W. 20%
C_{10}	N-1351	.1 MFD. 200W.V. 20%	R_{10}	N-1694	1000 OHM .5W. 20%
C_{11}	N-2063	.003 MFD. 600W.V. 20%	R_{11}	N-2713	20 OHM INS. .5W. 10%
C_{12}	N-2627	20 MFD. 150.V ELECTROLYTIC COND.	R_{12}	N-2716	15,000 OHM 1.W. 10%
C_{13}	N-2627	100 MFD. 7.5V ELECTROLYTIC COND.	R_{13}	N-2715	160 OHM 1.W. 10%
C_{14}	N-2627	20 MFD. 150.V. ELECTROLYTIC COND.	R_{14}	N-2717	220. OHM INS. 5W. 10%
C_{15}	N-2627	40 MFD. 150.V. ELECTROLYTIC COND.	R_{15}	N-2714	50 OHM 1.W. 20%
C_{16}	N-1376	.02 MFD. 400W.V. 20%	R_{16}	N-1257	2000 OHM .5W. 20%
			R_{17}	N-1776	1500 OHM .5W. 20%
			R_{18}	N-1419	6. MEGOHM .5W. 20%
1	N-2629	LOOP ANTENNA COIL			
2	N-2612	TWO GANG COND.			
3	N-1452	OSCILLATOR COIL			
4	N-2647	FIRST I.F. TRANS.			
5	N-2648	SECOND I.F. TRANS.			
6	N-2614	CHANGEOVER SWITCH			
7	N-2624	5" P.M. SPEAKER & TRAN.			

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

TUNING RANGE
535 to 1720 KC

I.F.: 456 K.C.



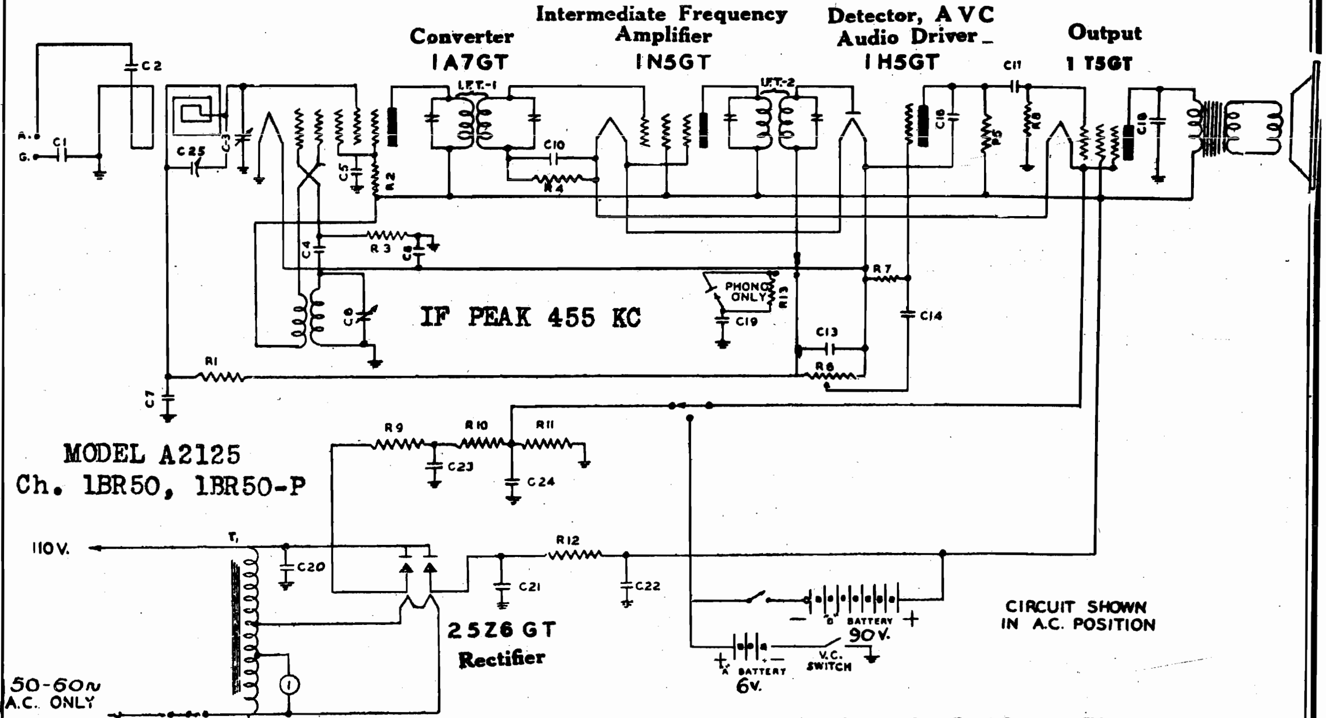
6 TUBE
BATTERY & 110-120V. AC-DC
SUPERHETERODYNE

DRWN. S.K. OCT. 31, '39
APP.

KD

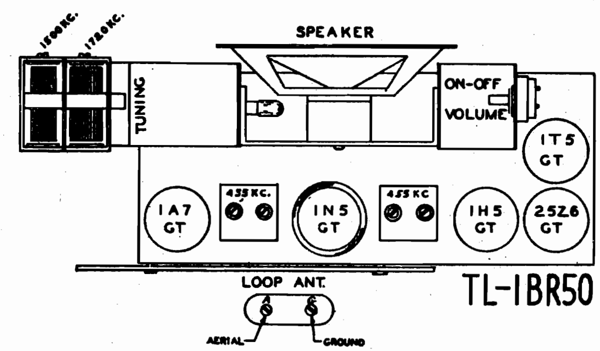
SPIEGEL, INC.

Chassis 611, 629, 631,721, 821, 961-1061, 1271
Chassis 1BR50. 1BR50P



CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION
VOLUME VIII

Schematic Location	Part No.	Description
C2,C1		
C10,C17	C-15754	Tubular cond. .01 mfd. 400 V
C3 C6	Y-CV-44	Variable Condenser
C13,C4,C16	CM-21	Mica cond. 100 mmfd. 30%
C5,C7	C-15752	Tubular cond. .05 mfd. 200 V
C8	C-15761	Tubular cond. .1 mfd. 200 V
C18 C14	C-15753	Tubular cond. .002 mfd. 600V
C19	C-15761	Tubular cond. .1 mfd. 200 V
C20	C 15756	Tubular cond. .05 mfd. 400 V
C21,C22	Y-CE-47	Electr. cond. 8-16 mfd. 150WV
C23,C24	Y CE-57	Electr. cond.40-100 mfd. 50WV
T1	Y-TP-55	Power Transformer
IFT-1	Y-CI-77	1st I. F. Transformer
IFT-2	Y-CI-78	2nd I. F. Transformer
R1,R4	R-15500	Carbon res. 2 meg. ¼W20%
R2	R-15617	Carbon res. 30K ohm ¼W20%
R3	R-15523	Carbon res 200K ohm ¼W20%
R5	R-15520	Carbon res. 500K ohm ¼W20%
R6	Y-VC-41	Volume Control
R7	R-15559	Carbon res. 3 meg. ¼W20%
R8	R-15517	Carbon res. 1 meg. ¼W20%
R9,R10,R11	Y-RC-10	Vol. Div. 350 800 300 ohm10%
R12	R-16	Carbon res. 8K ohm ¼W 20%
R13	R-15512	Carbon res. 250K ohm ¼W20%



ADJUSTING THE PUSH-BUTTON TUNER

MODELS W100, W110, W118, W152, W160, W162; 1000, 1001, 1004, 1005, 1006, 1007, 1020, 1021, 1054, 1055, 1056, 1057, 1080, 1081; V1000, V1004, V1006, V1014, V1020, V1054, V1056, V1060, V1064; Ch. 629

1. Select six favorite nearby broadcast stations and detach the corresponding call letter tabs from the station call letter tab sheets.

2. Any tab may be used for any button, but it is usually more convenient for the operator if the tabs are arranged in sequence so that the tab for the lowest frequency station (station having lowest number of kilocycles [K. C.]) will be at the low frequency end of the dial.

3. Using a small screwdriver or other tool that will fit the screw in the end of the button, push the button in as far as it will go and turn to the right or left until the dial pointer has moved to the desired station frequency. Be sure the button is pushed all the way in and the station is tuned in accurately.

4. Repeat the procedure in Paragraph 3 for each of the remaining five buttons.

5. Check all buttons by pushing them in, one at a time, to determine whether desired stations are tuned properly.

6. Insert the proper tab in each button by pressing it in position.

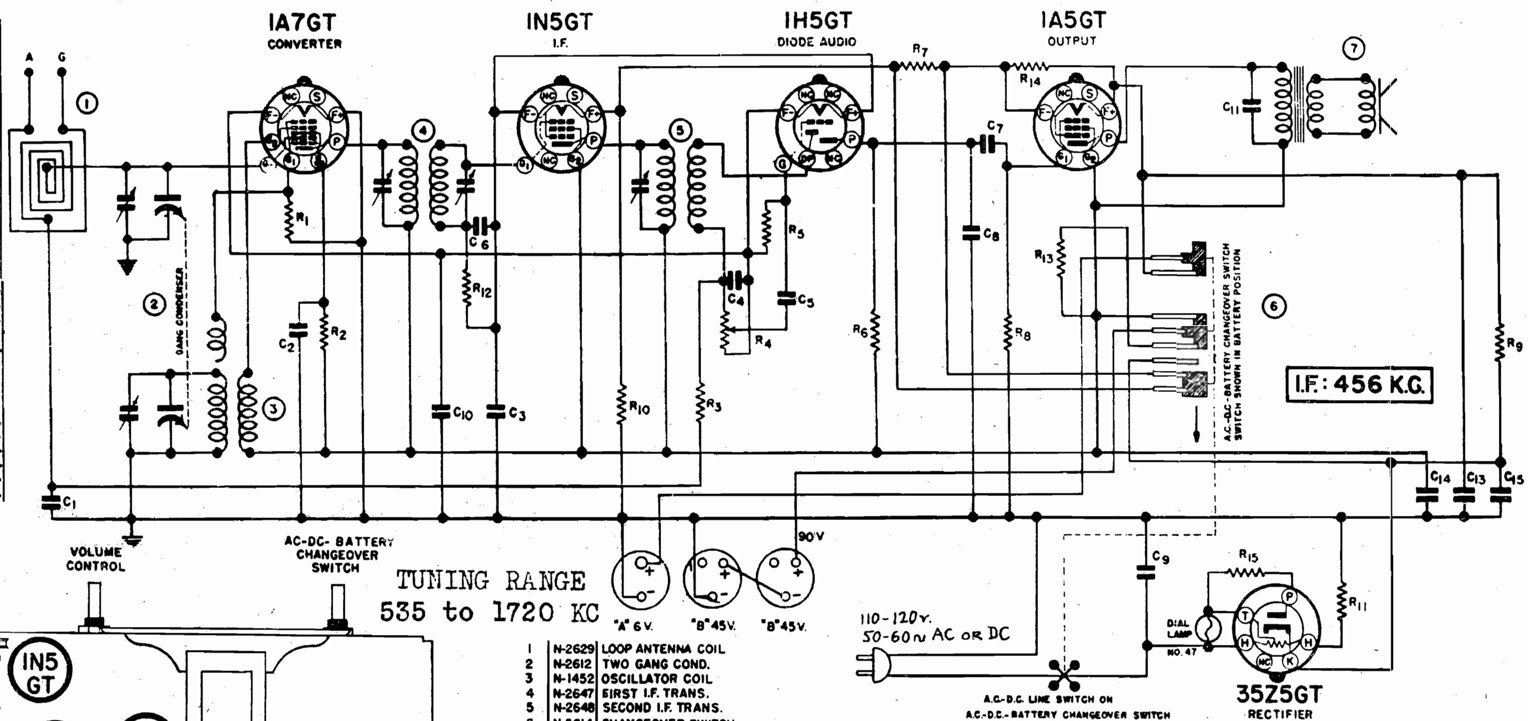
7. Any of the six stations to which the push-button tuner has been adjusted may now be received simply by pushing the button for the desired station.

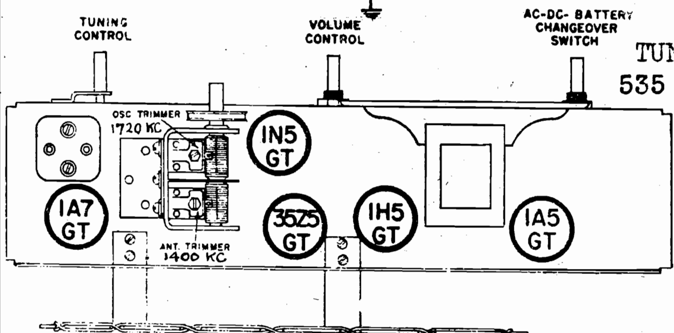
MODEL A2000, Ch. 82
MODELS A2200, A2250 Ch. 631
MODEL A2050, Ch. 721
MODELS A2052, A2060, A2062, Ch. 961-1061
MODEL A2062, Ch.1271
MODELS A2100, A2150 Ch. 611

MODEL A2130, Ch. KB
MODEL 2122, Ch. KD

SPIEGEL, INC.

DIAG NO.	PART NO.	DESCRIPTION
C_1	N-1345	.05 MFD. 200WV. 20%
C_2	N-1345	.05 MFD. 200WV. 20%
C_3	N-1479	.25 MFD. 200WV. 20%
C_4	N-1374	.0001 MFD. MICA 20%
C_5	N-1344	.01 MFD. 400WV. 20%
C_6	N-1376	.02 MFD. 400WV. 20%
C_7	N-1344	.01 MFD. 400WV. 20%
C_8	N-1343	.00025 MF. MICA 20%
C_9	N-1346	.05 MFD. 400WV. 20%
C_{10}	N-1351	.1 MFD. 200WV. 20%
C_{11}	N-2063	.003 MFD. 600WV. 20%
C_{13}	N-2748	100 MFD. 75V ELECTROLYTIC COND.
C_{14}	N-2748	20 MFD. 150V. ELECTROLYTIC COND.
C_{15}	N-2748	40 MFD 150V ELECTROLYTIC COND.
R_1	N-1377	200,000 OHM .5W. 20%
R_2	N-1684	75,000 OHM .5W. 20%
R_3	N-1378	2.0 MEGOHM .5W. 20%
R_4	N-2623	1.0 MEG. VOLUME CONT.
R_5	N-1378	2.0 MEGOHM .5W. 20%
R_6	N-1262	1.0 MEGOHM .5W. 20%
R_7	N-2755	12. OHM .5W 20%
R_8	N-1378	2. MEGOHM .5W. 20%
R_9	N-2754	1970. OHM 5.5W. 5%
R_{10}	N-1694	1000 OHM .5W. 20%
R_{11}	N-2753	550. OHM 12.5W. 10%
R_{12}	N-1263	10. MEGOHM .5W. 20%
R_{13}	N-1257	2000 OHM .5W. 20%
R_{14}	N-1257	2000 OHM 5W. 20%
R_{15}	N-2452	100 OHM 1.W 20%





TUNING RANGE
535 to 1720 KC

1	N-2629	LOOP ANTENNA COIL
2	N-2612	TWO GANG COND.
3	N-1452	OSCILLATOR COIL
4	N-2647	FIRST I.F. TRANS.
5	N-2648	SECOND I.F. TRANS.
6	N-2614	CHANGEOVER SWITCH
7	N-2747	5" P.M. SPEAKER & TRAN.

CONVENTIONAL
ALIGNMENT
SEE SPECIAL
SECTION
VOLUME VIII

5 TUBE
BATTERY & 110-120V. AC-DC
SUPERHETERODYNE

DRWN. S.K.
APP. DEC. 29, '39
KB

The following combined "AB" pack will give approximately 150 hours of life. The clamp arrangement is illustrated in Fig. 1. (The same clamp arrangement applies to either a pack or the type of "A" and "B" batteries illustrated.)

SUPPLIER	Combined "A" and "B" battery in one unit
Ray-O-Vac	AB694

The following batteries will give approximately 250 to 300 hours of life and are installed according to Figure 2. One "A" battery and two "B" batteries are required.

SUPPLIER	6 Volt "A" Battery (Approx. $3\frac{13}{16}$"x$2\frac{21}{32}$"x$5\frac{11}{32}$")	45 Volt "B" Battery (Approx. $4\frac{3}{16}$"x$2\frac{17}{32}$"x$5\frac{11}{32}$")
Eveready	718	762
Burgess	2F4	B30
Ray-O-Vac	698A	P5303
General Dry Battery	8F4	V-30-B
Marathon	896	3050
Usalite	638	624
Bond	4827	3017

The following batteries will give approximately 250 to 300 hours life and are installed according to Figure 1. One "A" battery and two "B" batteries are required.

SUPPLIER	6 Volt "A" Battery ($10\frac{3}{4}$"x$3\frac{21}{32}$"x$1\frac{13}{32}$")	45 Volt "B" Battery ($3\frac{1}{2}$"x$1\frac{3}{4}$"x$5\frac{7}{16}$")
Eveready	747	482

The following batteries will give approximately 100 to 125 hours of life and are installed according to Figure 2. Use a third clamp to anchor the center battery. One "A" battery and two "B" batteries are required.

SUPPLIER	6 Volt "A" Battery (Approx. $2\frac{5}{8}$"x$2\frac{5}{8}$"x4")	45 Volt "B" Battery (Approx. $3\frac{1}{2}$"x$2\frac{1}{4}$"x$4\frac{1}{2}$")
Burgess	F4PI	A30
Ray-O-Vac	694A	430P
General Dry Battery	4F4	V30A
Marathon	496	3040

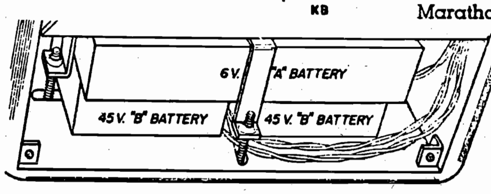


FIGURE 1

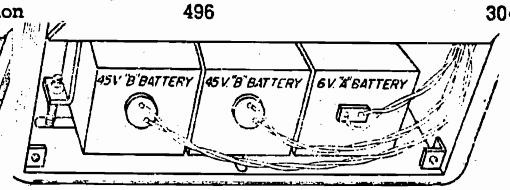
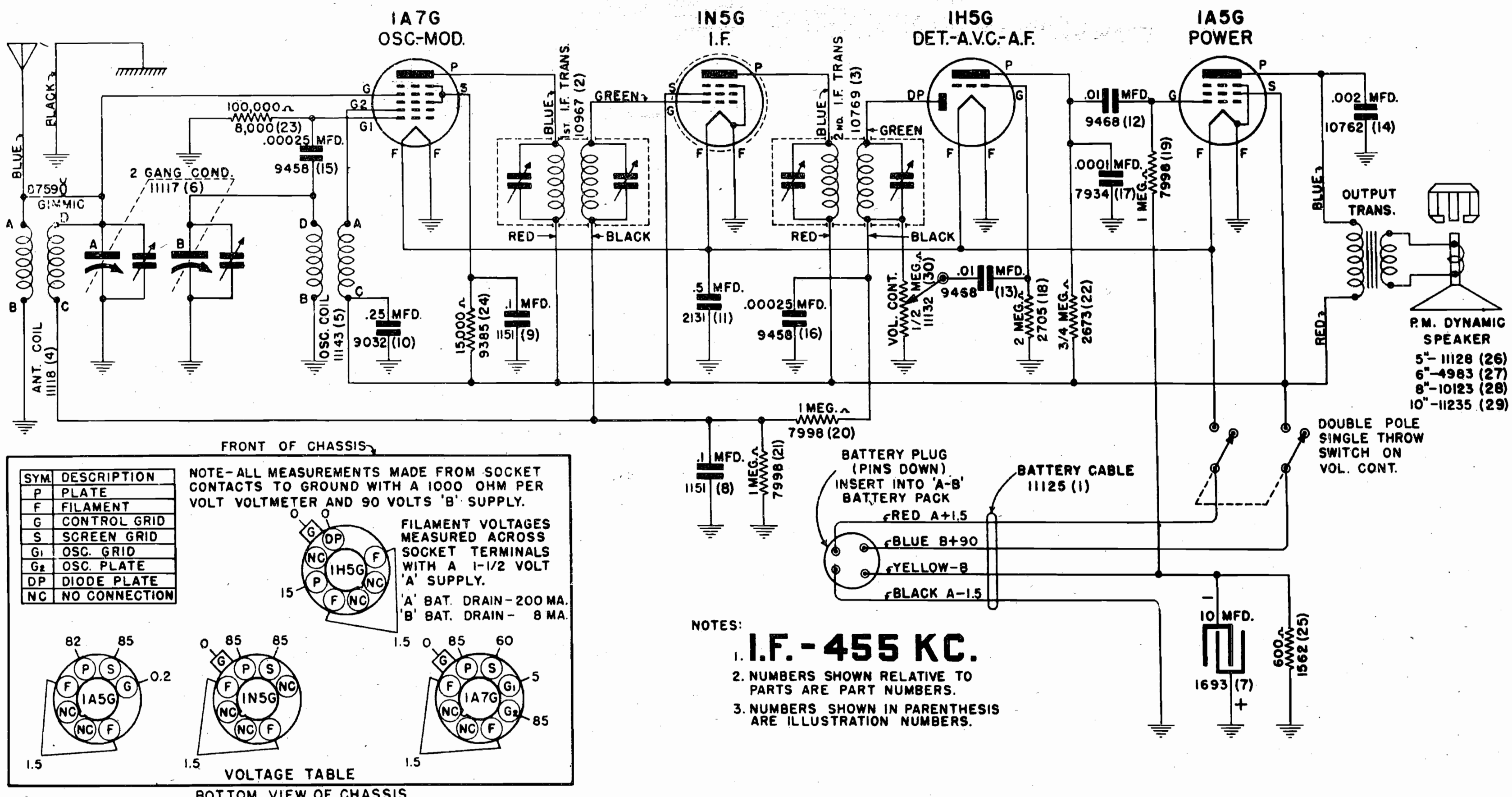


FIGURE 2

SPIEGEL, INC.

MODELS A2154; Z7108(Late)
Ch. 175B



NOTES:
1. I.F.-455 KC.
2. NUMBERS SHOWN RELATIVE TO PARTS ARE PART NUMBERS.
3. NUMBERS SHOWN IN PARENTHESIS ARE ILLUSTRATION NUMBERS.

PART NO. 175-B

PARTS LIST

Illus. No.	Part No.		Description	List Price
1(a)	11125	Cable	Battery (With 4 Prong Plug)	$ .25
1(b)	11332	Cable	Battery (With 2-3 Prong and 1-2 Prong Plug)	.37
2	10967	Coil	1st I. F. Transformer	1.10
3	10769	Coil	2nd I. F. Transformer	1.10
4	11118	Coil	Antenna	.55
5	11143	Coil	Oscillator	.45
6	11117	Condenser	Tuning (2 Gang)	2.00
7	1693	Condenser	Tubular Dry Elec. 10 Mfd. 25 V. D. C.	.75
8	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
9	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
10	9032	Condenser	Tubular .25 Mfd. 200 Volt	.25
11	2131	Condenser	Tubular .5 Mfd. 200 Volt	.55
12	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17

No. Illus.	No. Part		Description	Price List
13	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
14	10762	Condenser	Tubular .002 Mfd. 400 Volt	.19
15	9458	Condenser	Mica .00025 Mfd	.21
16	9458	Condenser	Mica .00025 Mfd	.21
17	7934	Condenser	Mica .0001 Mfd	.21
18	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
19	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
20	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
21	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
22	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
23	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
24	9385	Resistor	Carbon 15,000 Ohm ⅓ Watt	.19
25	1562	Resistor	Carbon 600 Oam ⅓ Watt	.19
26	11128	Speaker	P. M. Dynamic 5 in	4.00
27	4983	Speaker	P. M. Dynamic 6 in	4.25
29	11235	Speaker	P. M. Dynamic 10 in	7.50
30	11132	Volume	Control with "off-on" Switch	.95

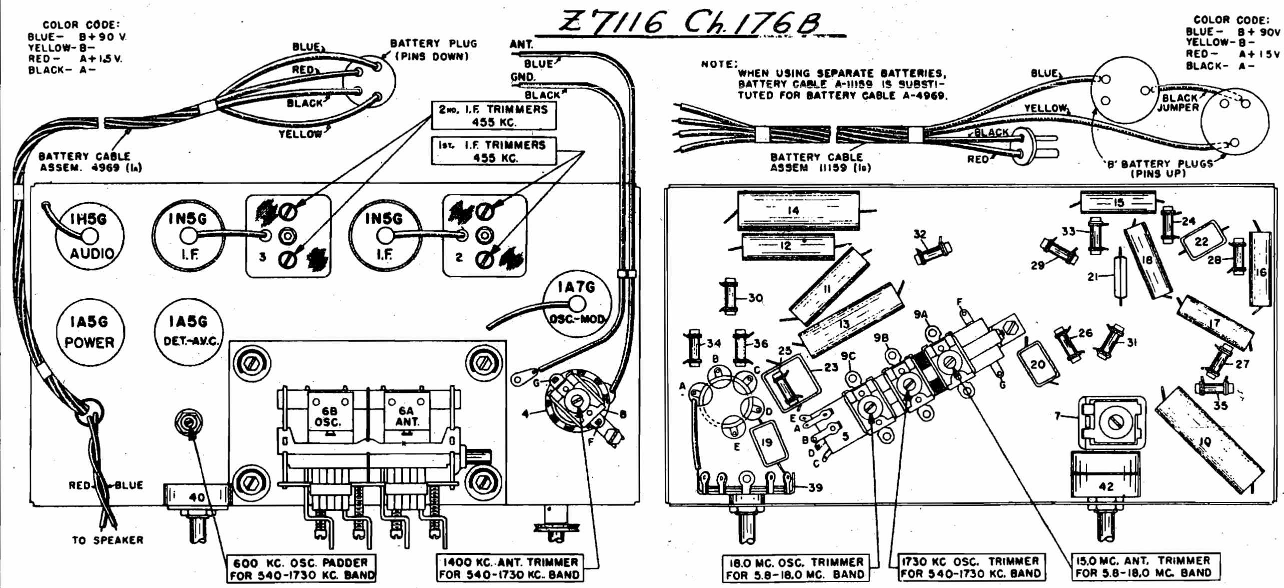
Part No.		Description	List Price
		MISCELLANEOUS PARTS	
11108	Bulb	2 Cell 2.2 Volt White Bead Type	.07
11121	Dial Scale	Calibrated Dial Scale	.40
8184	Dial Cord	24 in. of 18 lb. Cord	.10
11119	Dial Shaft		.15
11127	Dial Indicator	"Off-On" Switch	.15
11626	Dial Pointer		.30
11627	Dial Crystal	For Dial	.30
11140	Dial Escutcheon	For Cabinet	1.25
4978	Plug	4 Prong Battery Plug	.06
10207	Knob	Antique Ivory Tuning Control	.10
11145	Knob	Walnut Tuning Control	.10

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

W. 4M 9-39 PART NO. 175B

MODELS A2154, Z7108(Late) Ch. 175B
MODEL Z7116, Ch. 176B

SPIEGEL, INC.



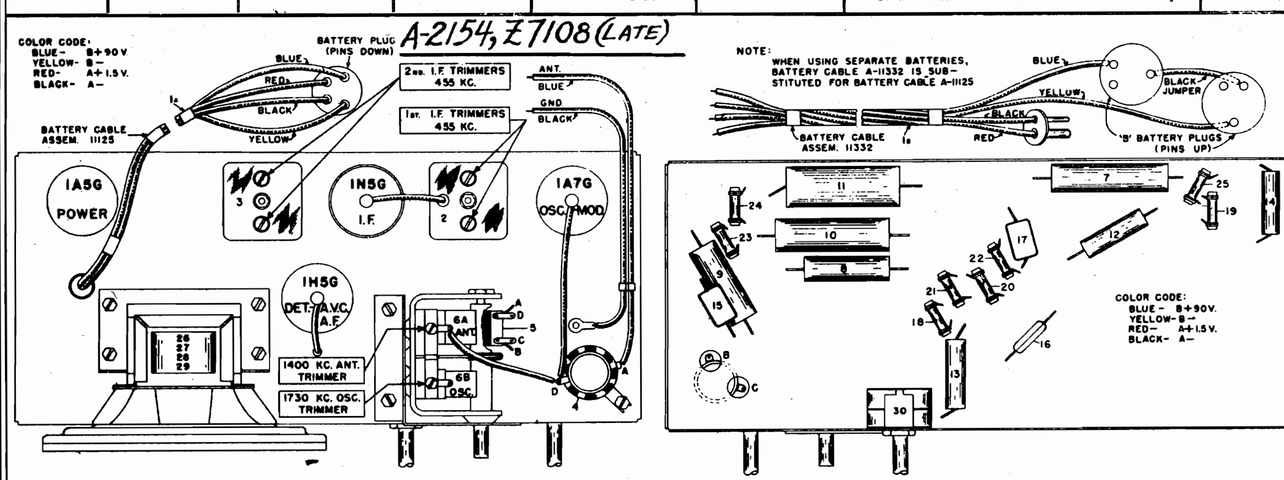
ALIGNMENT PROCEDURE

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:

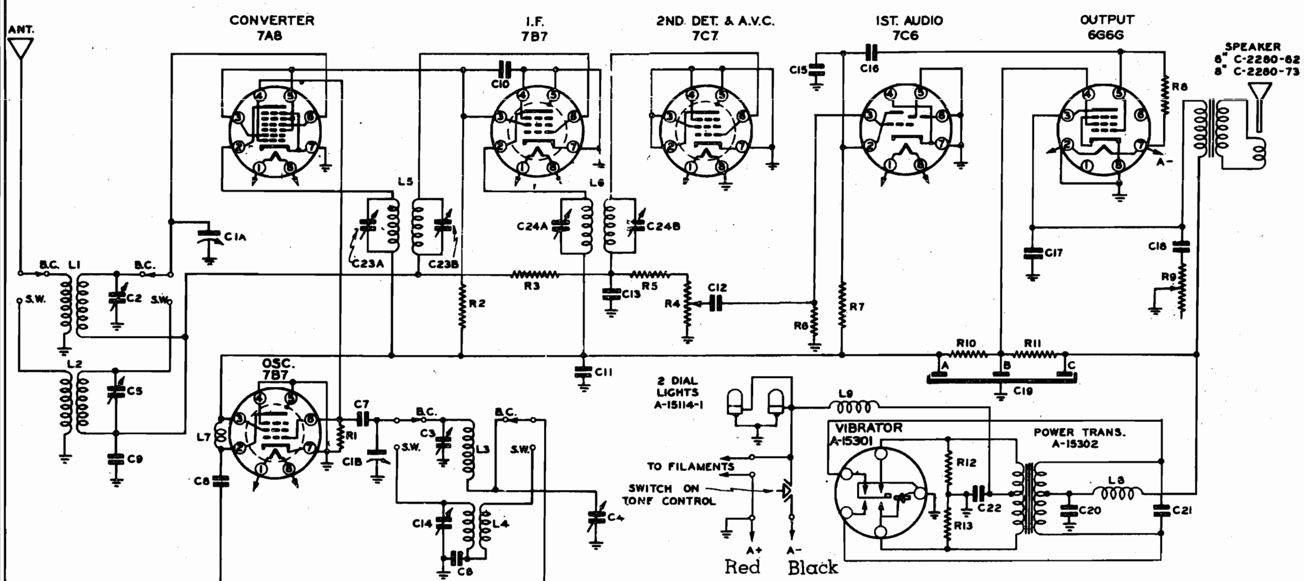
(a) Check tuning dial adjustment by turning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move needle 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 1A7G 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 blue antenna lead	Adjust 1730 K.C. oscillator trimmer for maximum output.
	2 Approx. 1400 K.C.	Exactly 1400 K.C.	.00025 Mfd. condenser	Receiver blue antenna lead	While rocking gang condenser adjust 1400 K.C. antenna trimmer for maximum output
	3 Approx. 600 K.C.	Approx. 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 M.C. Band	1 Exactly 18 M.C.	Exactly 18 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	Adjust 18 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. 15 M.C.	Exactly 15 M.C.	400 Ohm carbon resistor	Receiver blue antenna lead	While rocking gang condenser adjust 15 M.C. antenna trimmer for maximum output.



SPIEGEL, INC.

MODELS A2200, A2250
Ch. 631



6-volt Storage "A" Battery.
No "B" or "C" Batteries are required.

INTERMEDIATE FREQUENCY 456 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

AIR CASTLE SUPERHETERODYNE MODEL 631-6

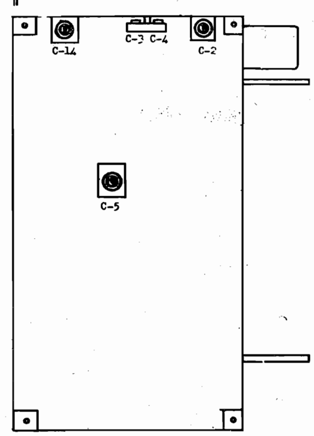
C1A&B	VARIABLE CONDENSER	B-7229
C2	B.C. ANT. TRIMMER	A-14088-8
C3	B.C. OSC. TRIMMER	B-7199-EY
C4	B.C. OSC. PADDER	B-7199-EY
C5	S.W. ANT. TRIMMER	A-14088-5
C6	2700 MMF. MICA	A-15451
C7	50 MMF. MICA	C-720-315
C8	250 MMF. MICA	C-720-324
C9	.05 MFD. 200V.	C-3202-84C
C10	.1 MFD. 200V.	C-3202-38C
C11	.1 MFD. 200V.	C-3202-38C
C12	.02 MFD. 200V.	C-3202-22C
C13	250 MMF. MICA	C-720-324
C14	S.W. OSC. TRIMMER	A-14088-8
C15	250 MMF. MICA	C-720-324
C16	.05 MFD. 200V.	C-3202-28C
C17	.001 MFD. 400V.	C-3204-58C
C18	.02 MFD. 400V.	C-3204-78C
C19A,B,C	20-20-20 MFD. 150V. ELECT.	A-14684-6
C20	1000 MMF. MICA	C-720-297
C21	.01 MFD. 600V.	C-3206-132C
C22	.5 MFD. 120V.	C-3203-46B
C23	NO.1 I.F. TRIMMER	B-7200-GN
C24	NO.2 I.F. TRIMMER	B-7200-GN

R1	56,000 Ω	.25W.	C-2795-83B
R2	18,000 Ω	.5W.	C-2796-77C
R3	1 MEGOHM	.25W.	C-2795-98B
R4	500,000 Ω VOLUME CONT.		A-15130-3
R5	47,000 Ω	.25W.	C-2795-23B
R6	4.7 MEGOHM	.25W.	C-2795-35B
R7	220,000 Ω	.25W.	C-2795-27B
R8	1 MEGOHM	.25W.	C-2795-98B
R9	TONE CONTROL & SWITCH		A-15128-2
R10	330 Ω	.5W.	C-2796-10C
R11	68 Ω	.5W.	C-2796-48C
R12	68 Ω	.5W.	C-2796-6C
R13	68 Ω	.5W.	C-2796-6C

L1	B.C. ANT. COIL	A-15349-1
L2	S.W. ANT. COIL	A-14682-3
L3	B.C. OSC. COIL	A-15352-1
L4	S.W. OSC. COIL	A-15233-5
L5	NO.1 I.F. COIL	A-12064-39
L6	NO.2 I.F. COIL	A-12064-17
L7	B+ PLATE CHOKE	A-14881-1
L8	B+ HASH CHOKE	A-14718-2
L9	"A" LEAD HASH CHOKE	A-14944

BROADCAST BAND—550 to 1600 Kilocycles (545 to 187 Meters)

SHORT-WAVE BAND—6 to 18 Megacycles (50 to 16.6 Meters)



BOTTOM VIEW OF CHASSIS

VOLTAGE CHART

Condition of Storage Battery Good (6 Volts) Position of Volume Control: Full with Antenna Disconnected
Band Switch - Broadcast

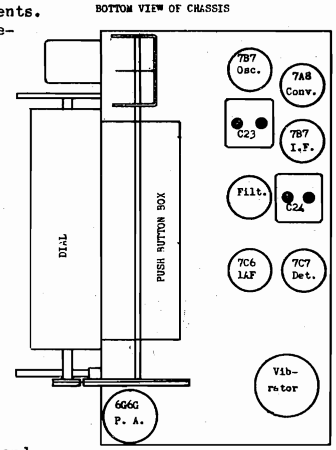
Tube	Function	Voltage of Socket Prongs to Gnd. (See Nos. on Schematic Diagram) No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
7A8	Converter	6	110	45	-20	45	0	0	0
7B7	Oscillator	6	110	110	0	0	-20	0	0
7B7	I. F. Amp.	6	110	45	0	0	0	0	0
7C7	2 Det. AVC	6	0	0	0	0	0	0	0
7C6	1st Aud. Amp.	6	16	0	--	0	0	0	0
6G6G	Power Amp.	0	0	110	115	0	--	6	0

Notes: Voltage readings are for schematic diagram. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 1000 ohms per volt voltmeter.

ALIGNMENT CHART

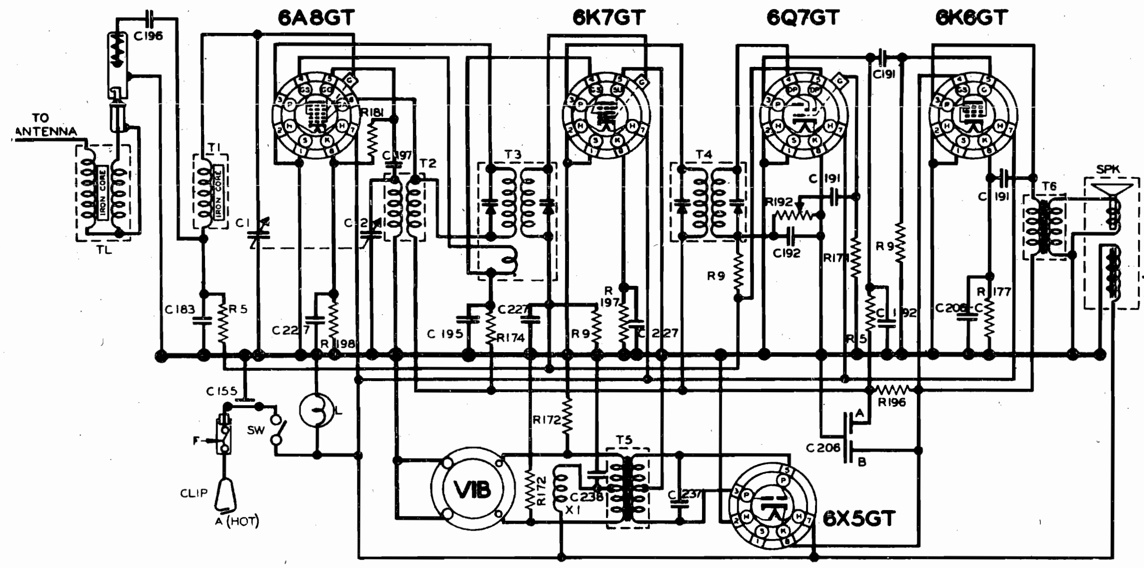
OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND. SETTING	TRIMMER	REMARKS
1	(Set dial drum so that indicator points to last dial mark when gang is fully closed.)							
2	I.F.	Ant.	.1 mf.	456 KC	BC	Open	C24 A&B	2nd I-F
							C23 A&B	1st I-F
3	Broad-cast Band	Ant.	200 mmf.	1500 KC	BC	1500 KC	C3 (Osc.)	Peak accurately
							C2 (Ant.)	Peak accurately
4				600 KC	BC	600 KC	C4 (Pad.)	Peak accurately
5	(Repeat operation 3)							
6	(Check calibration and sensitivity at 600 KC, 900 KC and 1500 KC)							
7	SW Band	Ant.	*	18 MC.	SW	18 MC	C14 (Osc.)	**
							C5 (Ant.)	**
8	(Check calibration and sensitivity at 6 MC and 18 MC)							
9	(Check operations 1 to 8 inclusive.)							

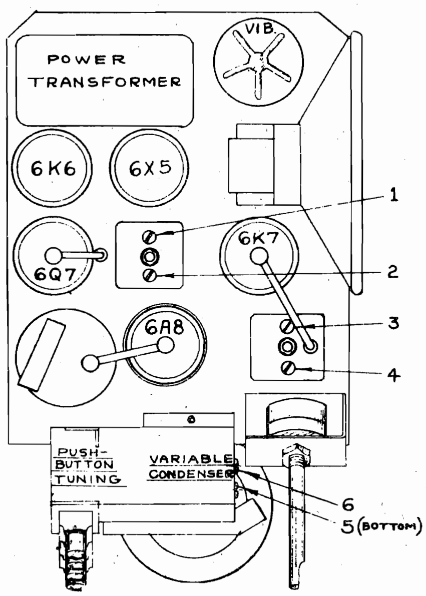
*100 ohms non-inductive resistor and 200 mmf. condenser in series.
**Rock dial while making this adjustment. Make certain that adjustment is made on fundamental signal and not on image. Peak accurately.



TOP VIEW OF CHASSIS

MODELS A2454, Z7460, Ch. 510; SPIEGEL, INC.
A2456, Z7462, Ch. 610





MODEL 610

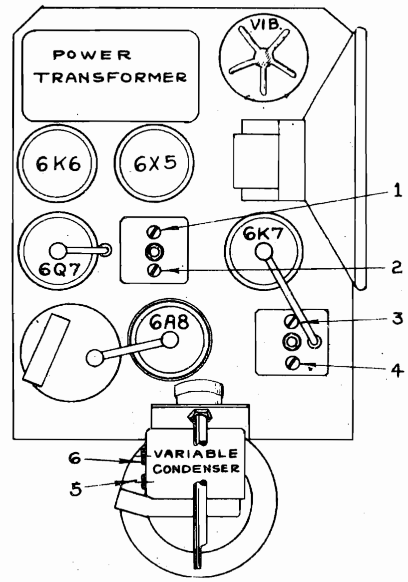
RESISTORS			
R	OHMS	W	PART NO.
5	500K	1/4	17-2070
9	1M	1/4	17-2080
171	15M	1/4	17-14288
172	100	1/4	17-14289
174	20K	1/4	17-14291
177	650	1/4	17-14296
181	100K	1/4	17-14303
192	1M	V.C	17-18422
196	500	1	17-14340
197	800	1/4	17-14342
198	400	1/4	17-14343

CONDENSERS			
C	CAPACITY	VOLT	PART NO
1	TWO - GANG		17-18431
2	VARIABLE		
155	.0002	200	17-14217
237	.005	1200	17-14345
208A	10 MFD.	300	17-14297
208B	10 MFD.	300	
208C	20 MFD.	25	
191	.01	400	17-14272
192	.00025	600	17-14273
183	.003	600	17-14294
195	.05	400	17-14276
196	.1	200	17-14277
197	.0001	600	17-14278
236	.5	150	17-14346
227	.05	200	17-14323

IF PEAK 455 KC
FREQUENCY RANGE 1575 TO 540 K.C.

CHOKES & TRANSFORMERS		
T-X	TYPE	PART NO
1	ANTENNA COIL	00-18441
2	OSCILLATOR COIL	00-18442
3	FIRST I F COIL	00-18443
4	SECOND I.F COIL	00-18444
5	POWER TRANS	00-18446
6	OUTPUT TRANS	00-18445
X	CHOKE	
1	SUPPRESSION CHOKE	29-18457

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
F	FUSE - 20 AMP	17-2228
L	DIAL LIGHT BULB - MAZDA NO 44	17-13905
SPK	SPEAKER ASSEMBLY	17-18458
SW	POWER SWITCH	17-18422
TL	TRANSMISSION LINE	00-18436
VIB	VIBRATOR	17-14747



MODEL 510

Model 610 PUSH BUTTON ADJUSTMENT:

Any button may be set to any station desired. First, tune in the desired station by means of the thumb wheel. Second, turn the push button counter-clockwise two full turns. Then depress this button the full length of its stroke, and while depressed, tighten the button again by turning it clockwise. The button may now be released. To check the correct setting for this button, turn the thumb wheel to some other point and depress the push button. This will return the tuning mechanism to the station just set up. If it does not, repeat the foregoing sequence of operations more carefully. Each of the remaining buttons may be set to other stations in a like manner.

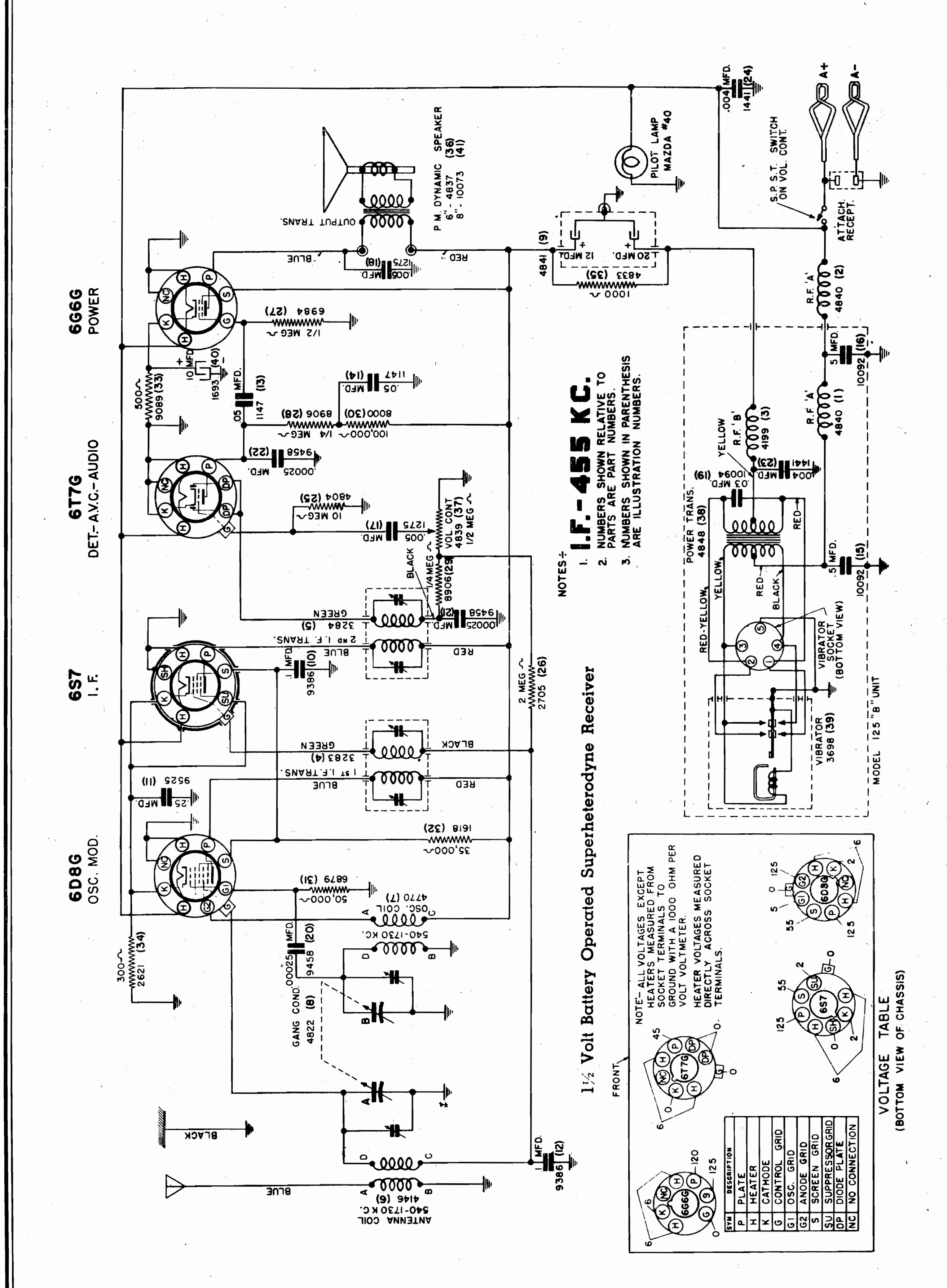
BALANCING INSTRUCTIONS:

All sensitivities given for ½ watt output = 1.4 V. across Voice Coil

Operation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	455	1, 2, 3 & 4	550 KC	50 uv
2	Ant. Coupler Through 20 uuf	1400	5	1400	
3	"	1400	6	1400	10 uv

SPIEGEL, INC.

MODELS A2204, Z7208
Ch. 119B

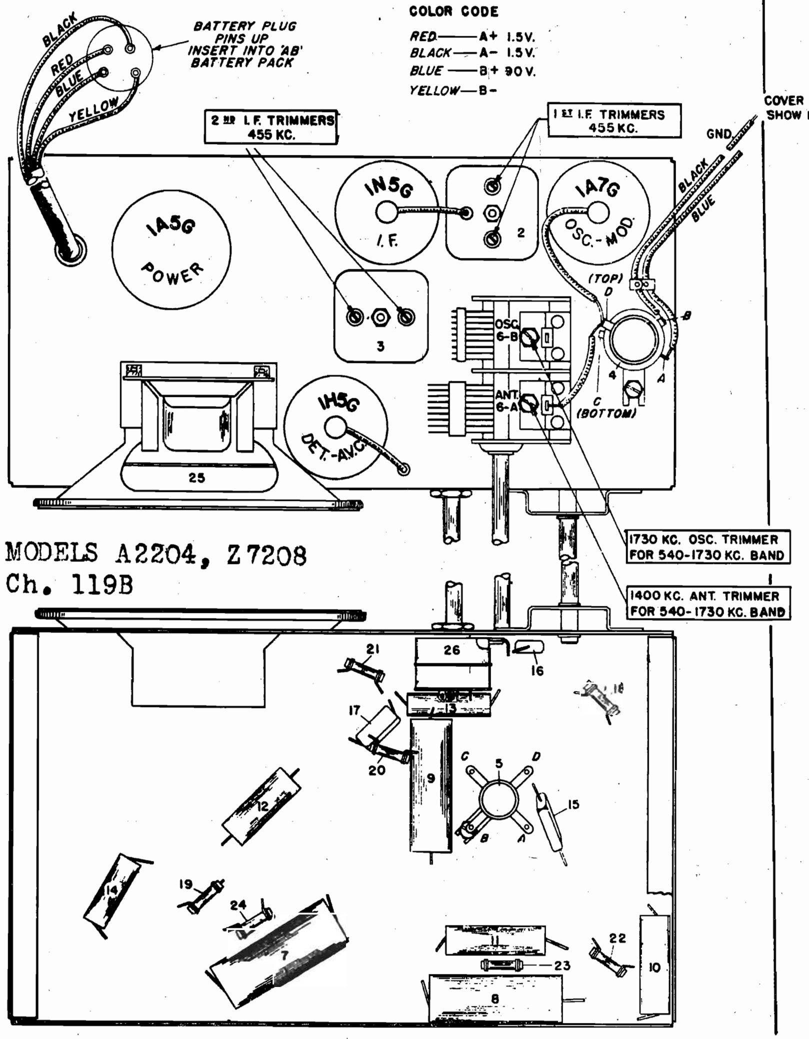


SYM	DESCRIPTION
P	PLATE
H	HEATER
K	CATHODE
G	CONTROL GRID
G1	OSC. GRID
G2	ANODE GRID
S	SCREEN GRID
SU	SUPPRESSOR GRID
DP	DIODE PLATE
NC	NO CONNECTION

MODEL Z7108(Early), Ch. 118B
MODELS A2204, Z7208, Ch. 119B

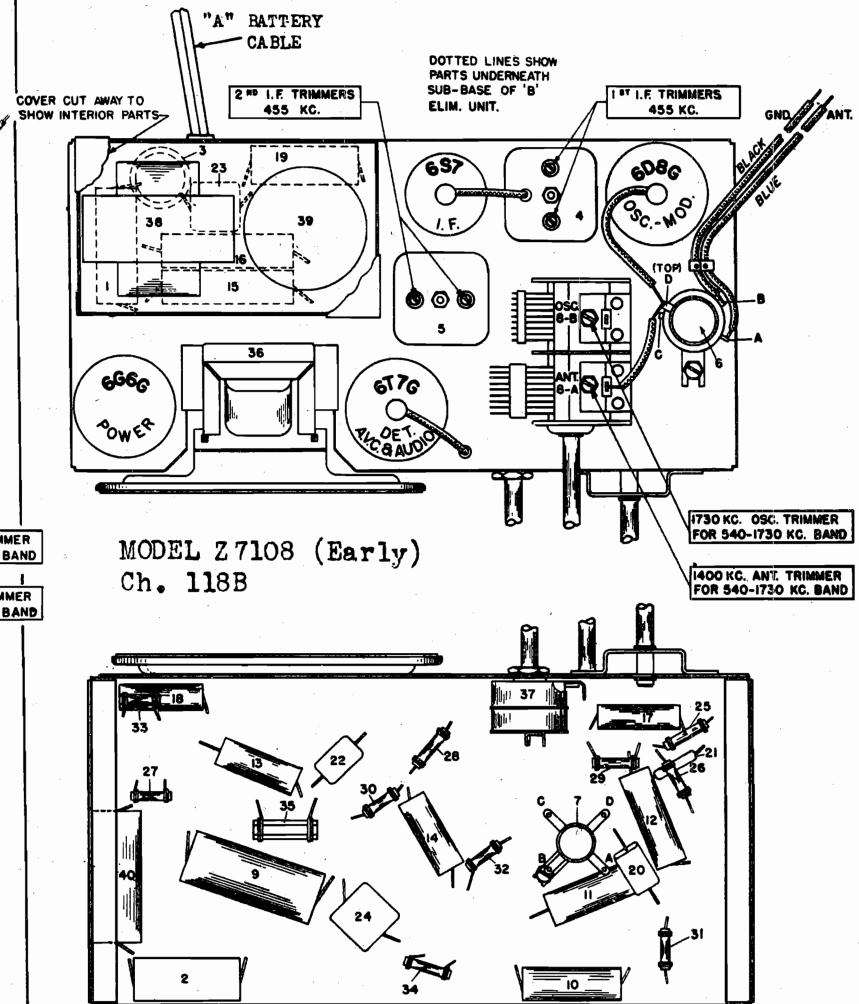
SPIEGEL, INC.

ALIGNMENT:-I.F. 455 KC THROUGH A .02 MFD. CONDENSER TO GRID CAP OF 1A7G TUBE--DO NOT REMOVE GRID CAP--ADJUST IF TRIMMERS TO MAXIMUM OUTPUT AT 1730 KC THROUGH .00025 MFD. CONDENSER TO RECEIVER ANTENNA (BLUE) LEAD,ADJUST OSCILLATOR TRIMMER TO MAXIMUM. AT 1400 KC ANT. TRIMMER TO MAX



MODELS A2204, Z7208
Ch. 119B

ALIGNMENT:- I.F. 455 KC THROUGH A .02 MFD. CONDENSER TO GRID CAP OF 6D8G TUBE--DO NOT REMOVE CAP-- ADJUST IF TRIMMERS TO MAXIMUM OUTPUT. AT 1730 KC THROUGH .00025 MFD. CONDENSER TO RECEIVER ANTENNA (BLUE) LEAD,ADJUST OSCILLATOR TRIMMER TO MAX. AT 1400 KC, ANTENNA TRIMMER TO MAX.

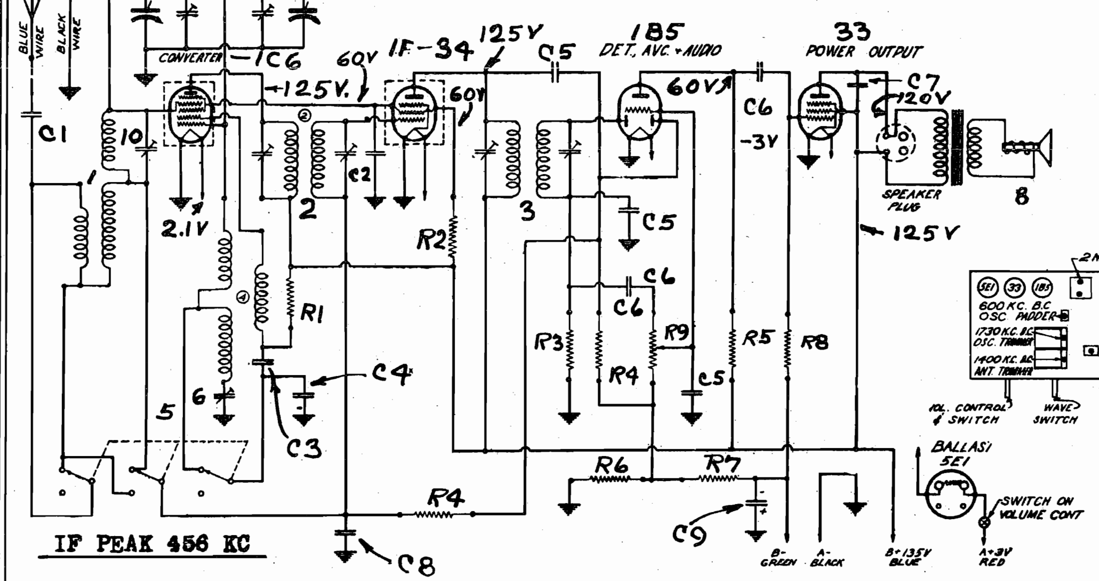


MODEL Z7108 (Early)
Ch. 118B

SPIEGEL, INC.

MODEL 6606, Ch. 536
MODEL Z7126, Ch 5N

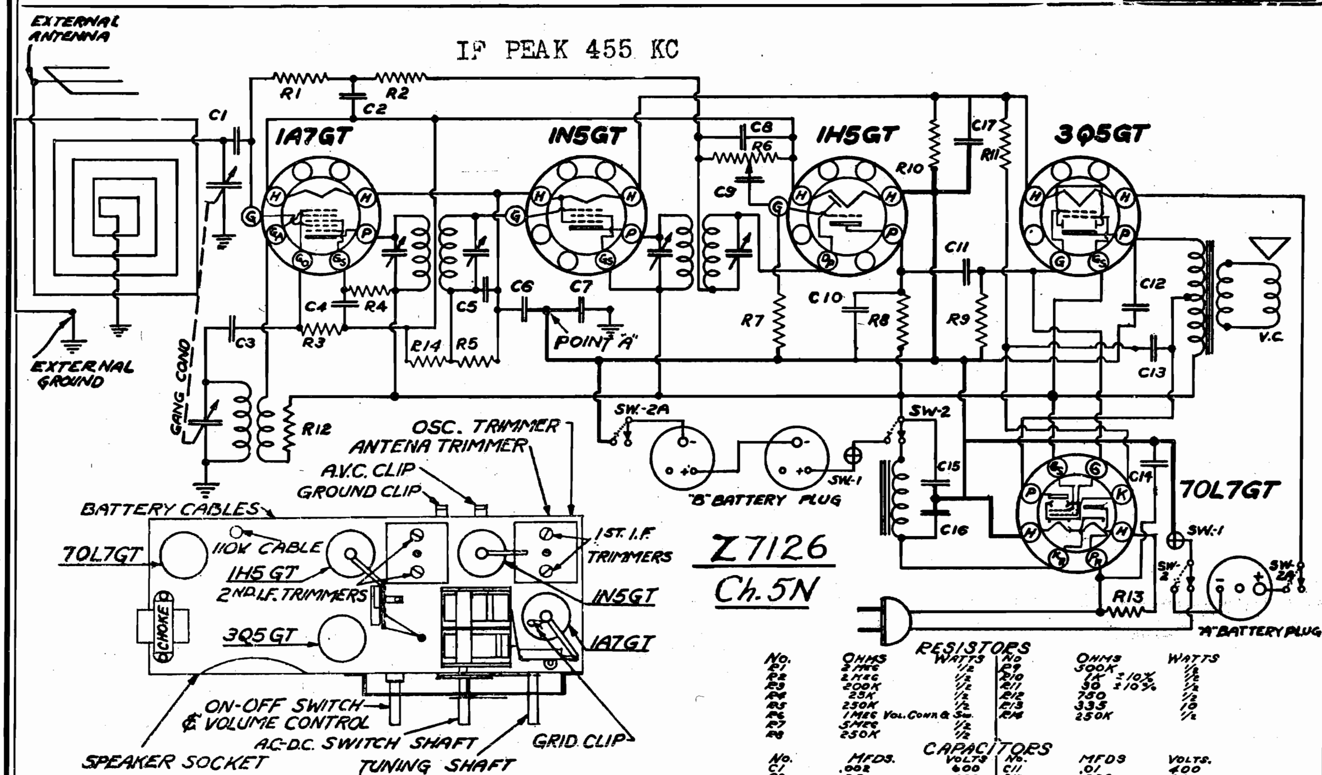
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOLUME VIII



	PART No.	DESCRIPTION
C1	1628	.01 MFD 200v
C2	1601	.1 400v
C3	1500	.001 " MICA
C4	1509D	.002 " ±5% MICA
C5	1504	.00025 MFD. "
C6	1604	.01 MFD 600v
C7	1611	.006 " 600v
C8	1600	.1 " 200v
C9	16-100	10 " 25v ELEC
R1	6022	15000 OHMS 1/3 W
R2	6027	25000 "
R3	6018	500,000 "
R4	6017	1.0 MEG "
R5	6024	250,000 "
R6	6011	100 "
R7	6052	800 "
R8	6018	500,000 "
R9	24-102	500,000 " VOL. CONT.

	PART No.	DESCRIPTION
1-	10-123	B.C. + S.W. ANT. COIL
2-	1156	1ST I.F. TRANSFORMER
3-	1157	2ND I.F. "
4-	10-124	B.C. + S.W. OSC. COIL
5-	89-101	WAVE BAND SWITCH
6-	20-100	OSC. PADDING COND.
7-	19-107	GANG VAR. COND.
8-	79-113	SPEAKER.
10-	2054	S.W. ANT. TRIMMER

IF PEAK 455 KC



RESISTORS

No.	OHMS	WATTS	No	OHMS	WATTS
R1	2 MEG	1/2	R9	500K	1/2
R2	2 MEG	1/2	R10	1K ±10%	1/2
R3	200K	1/2	R11	30 ±10%	1/2
R4	25K	1/2	R12	750	1/2
R5	250K	1/2	R13	335	10
R6	1 MEG Vol. Cont. & Sw.		R14	250K	1/2
R7	5 MEG	1/2			
R8	250K	1/2			

CAPACITORS

No.	MFDS.	VOLTS	No.	MFDS	VOLTS.
C1	.002	600	C11	.01	400
C2	.05	400	C12	.002	600
C3	.00005	Mica	C13	.01	400
C4	.05	400	C14	.05	400
C5	.02	400	C15	20 (ELECT)	150
C6 (C17)	40 (ELECT.)	25	C16	30 (ELECT)	150
C7	.25 (5NL ONLY)	200	C17 (C6)	40 (ELECT.)	25
C8	.00025	Mica			
C9	.01	400			
C10	.00025	Mica			

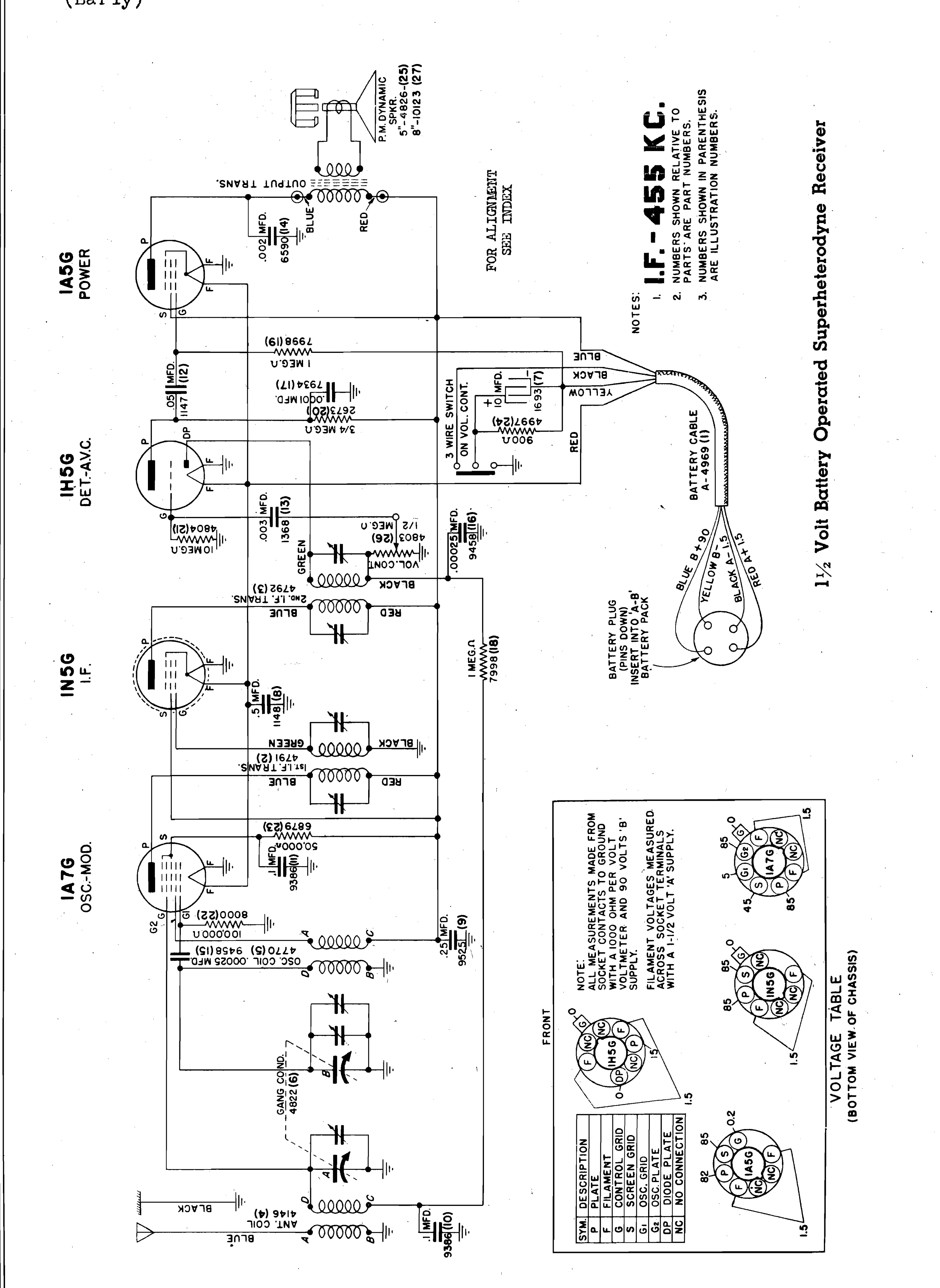
CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.
TRIM OSC- 1550 KC, TRIM ANT- 1400 KC
PAD- 600 KC

TUBE FUNCTIONS
1A7GT- MIXER-OSCILLATOR
1N5GT- I.F. AMPLIFIER
1H5GT- 2ND DET-AVC-1ST A.F.
3Q5GT- OUTPUT
70L7GT-RECTIFIER

NOTE:-
C7 USED ON MODEL 5NL ONLY.
ON MODEL 5N POINT "A" IS CONNECTED TO CHASSIS.
SWITCH-1 IS ON-OFF.
SWITCH-2 IS A.C.-D.C. & BATTERY.
SWITCH-2 SHOWN FOR A.C.-D.C.
I.F 455 K.C.
ON MODEL 5N SWITCH, SWITCH 2A NOT USED.

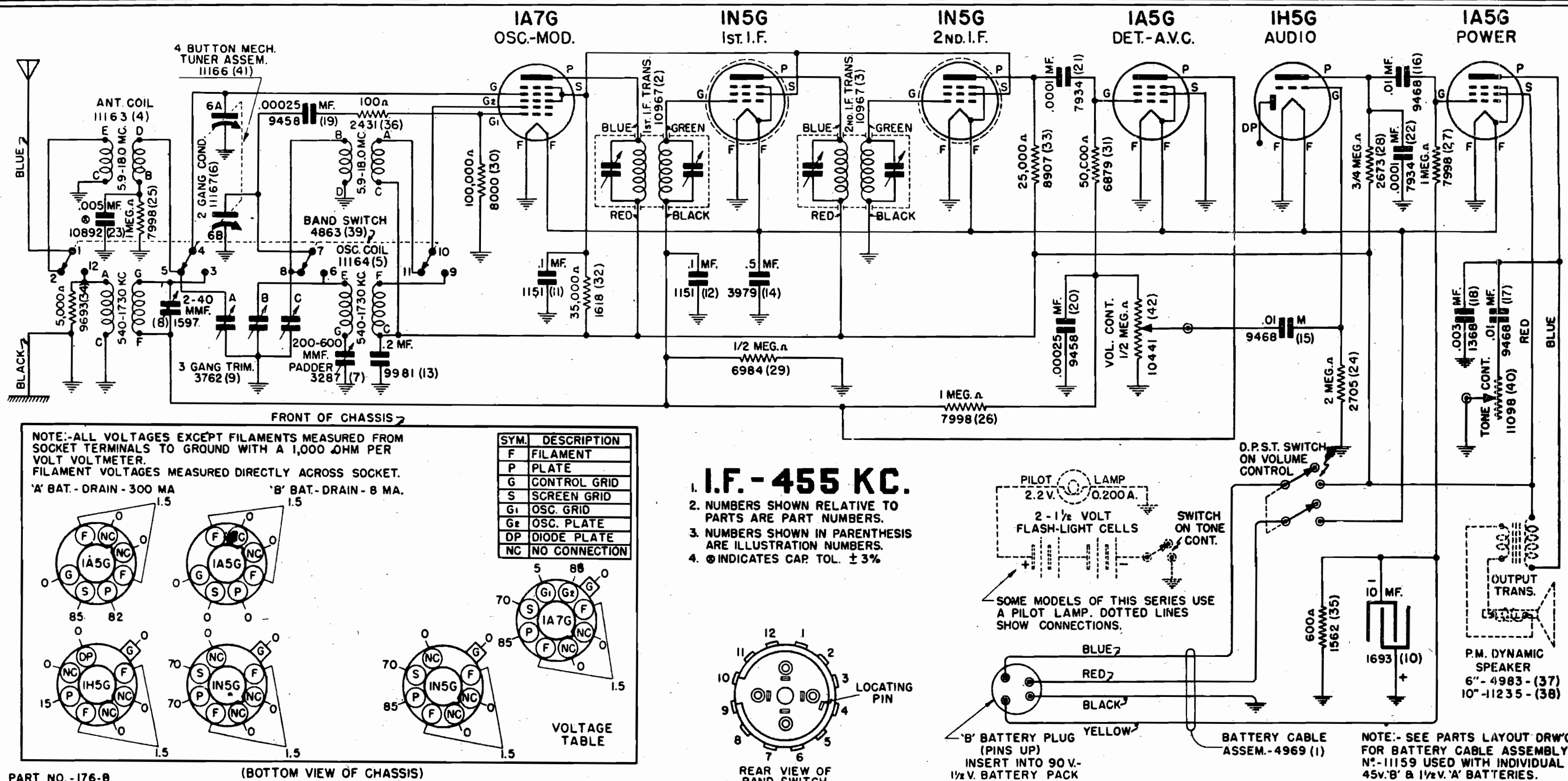
MODEL Z7108, Ch. 118B
(Early)

SPIEGEL, INC.



SPIEGEL, INC.

MODEL Z7116, Ch. 176B



SYM.	DESCRIPTION
F	FILAMENT
P	PLATE
G	CONTROL GRID
S	SCREEN GRID
G1	OSC. GRID
G2	OSC. PLATE
DP	DIODE PLATE
NC	NO CONNECTION

PARTS LIST

Illus. No.	Part No.		Description	List Price
1A	4969	Cable	Battery with Four Prong Plug	$ .35
1B	11159	Cable	Battery with 2-3 Prong "B" and 1-2 Prong "A" Plugs	.55
2	10967	Coil	1st I. F. Transformer	1.10
3	10967	Coil	2nd I. F. Transformer	1.10
4	11163	Coil	Antenna	.70
5	11164	Coil	Oscillator	.60
6	11167	Condenser	Two Gang with Four Button Mechanical Tuner Assembly	3.00
7	3287	Condenser	Padder 200-600 Mmf.	.45
8	1597	Condenser	Trimmer	.21
9	3762	Condenser	Trimmer Three Gang	.47
10	1693	Condenser	Tubular Dry Electrolytic 10 Mfd. - 25 Volt D.C. Wkg.	.75
11	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
12	1151	Condenser	Tubular .1 Mfd. 200 Volt	.20
13	9981	Condenser	Tubular .2 Mfd. 200 Volt	.29
14	3979	Condenser	Tubular .5 Mfd. 200 Volt	.40
15	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
16	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
17	9468	Condenser	Tubular .01 Mfd. 400 Volt	.17
18	1368	Condenser	Tubular .003 Mfd. 400 Volt	.17
19	9458	Condenser	Mica .00025 Mfd.	.21
20	9458	Condenser	Mica .00025 Mfd.	.21
21	7934	Condenser	Mica .0001 Mfd.	.21
22	7934	Condenser	Mica .0001 Mfd.	.21
23	10892	Condenser	Mica .005 Mfd. ± 3%	.30
24	2705	Resistor	Carbon 2 Megohm ⅓ Watt	.19
25	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
26	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
27	7998	Resistor	Carbon 1 Megohm ⅓ Watt	.19
28	2673	Resistor	Carbon 750,000 Ohm ⅓ Watt	.19
29	6984	Resistor	Carbon 500,000 Ohm ⅓ Watt	.19
30	8000	Resistor	Carbon 100,000 Ohm ⅓ Watt	.19
31	6879	Resistor	Carbon 50,000 Ohm ⅓ Watt	.19
32	1618	Resistor	Carbon 35,000 Ohm ⅓ Watt	.19
33	8907	Resistor	Carbon 25,000 Ohm ⅓ Watt	.19
34	9693	Resistor	Carbon 5,000 Ohm ⅓ Watt	.19
35	1562	Resistor	Carbon 600 Ohm ⅓ Watt	.19
36	2431	Resistor	Carbon 100 Ohm ⅓ Watt	.19
37	4983	Speaker	P. M. Dynamic 6"	4.25
38	11235	Speaker	P. M. Dynamic 10"	7.50
39	4863	Switch	Wave	.60
40	11098	Tone Control	With Dial Light Switch	.80
41	11166	Tuner Unit	Complete with Four Button Mech. Assem. Two Gang Condenser and Mechanical Drive Assembly	3.95
42	10441	Volume Control	With D. P. S. T. "On-Off" Switch	.95

MISCELLANEOUS PARTS

Illus. No.	Part No.		Description	List Price
	8184	Cord	12" of 18 lb. Drive Cord	.10
	11189	Dial Scale	Calibrated Scale Only	.55
	11173	Dial Assembly	Complete Drive Mechanism Less Scale	.75
	11193	Dial Pointer	For Dial	.16
	11198	Escutcheon	For Dial with Mtg. Screw Holes in Corners	1.25
	11199	Escutcheon	For Dial with Mtg. Screw Holes away from Corners	1.25
	11200	Escutcheon	Pushbutton Used with 11198 Dial Escutcheon	.35
	11201	Escutcheon	Pushbutton Used with 11199 Dial Escutcheon	.35
	4958	Knob	Marked "Tuning"	.12
	4959	Knob	Marked "Off-Volume"	.12
	4960	Knob	Marked "Tone"	.12
	4961	Knob	Marked "Band Switch"	.12
	3487	Plug	3 Prong "B"	.10
	10351	Plug	2 Prong "A"	.10
	4978	Plug	4 Prong "AB"	.10
	11197	Dial Spring	Gear Drive Shaft Tension	.16
	4589	Dial Spring	Cord Tension	.04
	11185	Dial Shaft	Gear Drive Shaft Assembly	.35

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

WHEN ORDERING PARTS BE SURE TO ORDER BY PART NUMBER

MODEL A-2462, Ch. 710

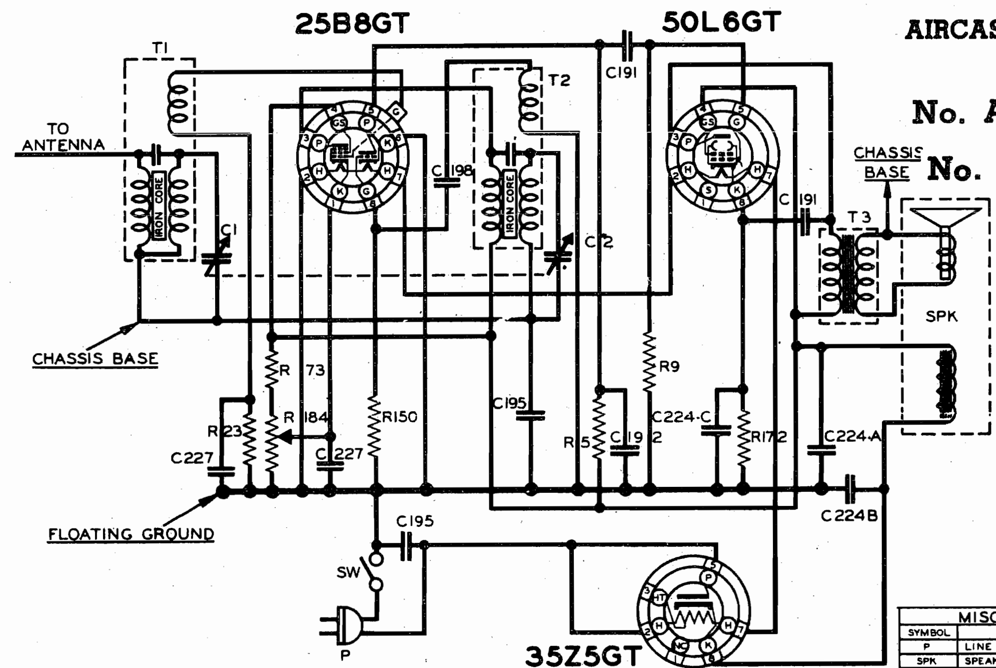
MODELS AP-2004, AP-2005, Ch. 402

SPIEGEL, INC.

AIRCASTLE HOME RADIO MODEL 402

No. AP-2004 Walnut

No. AP-2005 Ivory



RESISTORS			
R	OHM	W	PART NO.
5	500K	1/4	17-2070
9	1M	1/4	17-2080
23	250K	1/4	17-3011
73	30K	1/4	17-4276
150	5M	1/4	17-14242
172	100	1/4	17-14289
184	10K	V.C.	17-14320

CONDENSERS			
C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		17-16318
2	VARIABLE		
191	.01	400	17-14272
192	.00025	600	17-14273
195	.05	400	17-14276
198	.005	400	17-14279
224A	10 MFD.	150	17-14319
224B	20 MFD.	150	
224C	20 MFD.	25	
227	.05	200	17-14323

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO.
P	LINE CORD & PLUG ASSEMBLY	17-16336
SPK	SPEAKER ASSEMBLY	17-16489
SW	LINE SWITCH	17-14320
T1	ANTENNA COIL	00-16508
T2	R.F. COIL	00-16509
T3	OUTPUT TRANSFORMER	00-16510

115 volts AC or DC. Power consumption is 25 watts.

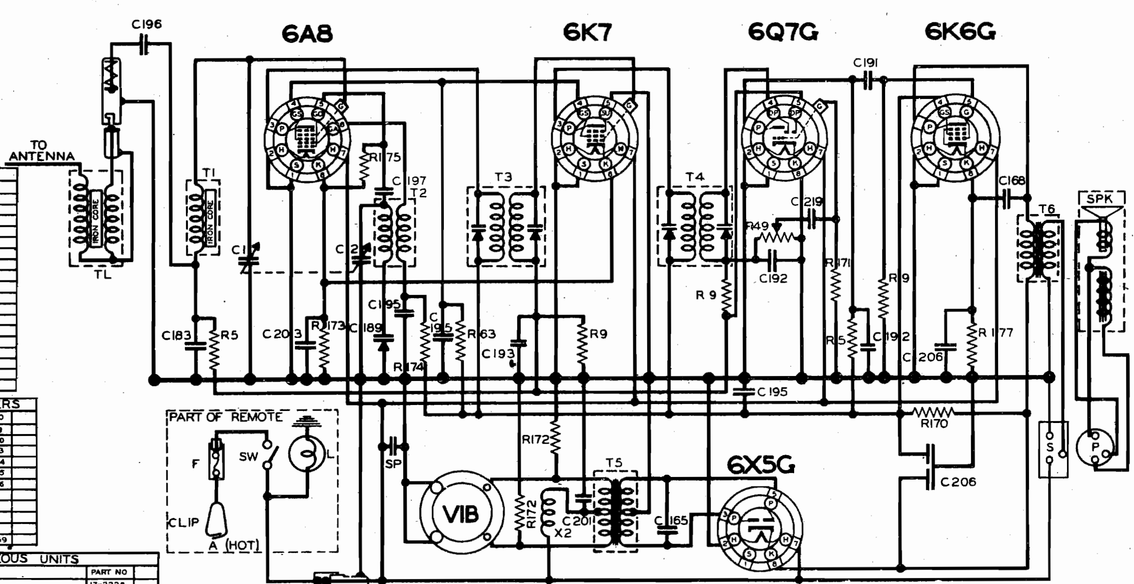
FREQUENCY RANGE 1700 K.C. TO 540 K.C.

RESISTORS			
R	OHMS	W	PART NO.
5	500K	1/4	17-2070
9	1M	1/4	17-2080
49	500K	VC	17-14536
63	25K	1/4	17-14091
170	800	1	17-14287
171	15M	1/4	17-14288
172	100	1/4	17-14289
173	200	1/4	17-14290
174	20K	1/4	17-14291
175	40K	1/4	17-14292
177	650	1/4	17-14296

CONDENSERS			
C	CAPACITY	VOLT	PART NO.
1	TWO-GANG		29-16254
2	VARIABLE		
165	.005	1200	17-14230
183	.003	600	17-14294
189	.0005	PAD	17-14266
191	.01	400	17-14272
192	.00025	600	17-14273
193	.05	200	17-14274
195	.05	400	17-14276
196	.1	200	17-14277
197	.0001	600	17-14278
219	.003	200	17-14312
201	.5	150	17-14285
203	.2	200	17-16242
206	10-10MFD.	300	17-14297
206	20MFD.	15	
168	.002	400	17-14234

CHOKES & TRANSFORMERS		
T-X	TYPE	PART NO
1	ANTENNA COIL	00-16219
2	OSCILLATOR COIL	00-16220
3	FIRST I.F. COIL	00-16263
4	SECOND I.F. COIL	00-16264
5	POWER TRANS.	00-16265
6	OUTPUT TRANS	00-16266
X	CHOKES	
2	SUPPRESSION CHOKE	29-13459

MISCELLANEOUS UNITS		
SYMBOL	DESCRIPTION	PART NO
F	FUSE - 20 AMP.	17-2228
L	DIAL LIGHT BULB - MAZDA NO. 51	17-13904
P	SPEAKER PLUG	17-4760
S	SPEAKER SOCKET	17-15631
SPK	SPEAKER ASSEMBLY	17-16517
SW	POWER SWITCH	———
TL	TRANSMISSION LINE	00-16233
SP	SPARK PLATE	———
VIB	VIBRATOR	17-14747



I.F. PEAK 455 K.C.
FREQUENCY RANGE 1575 TO 540 K.C.

MODEL A-2462 Ch. 710

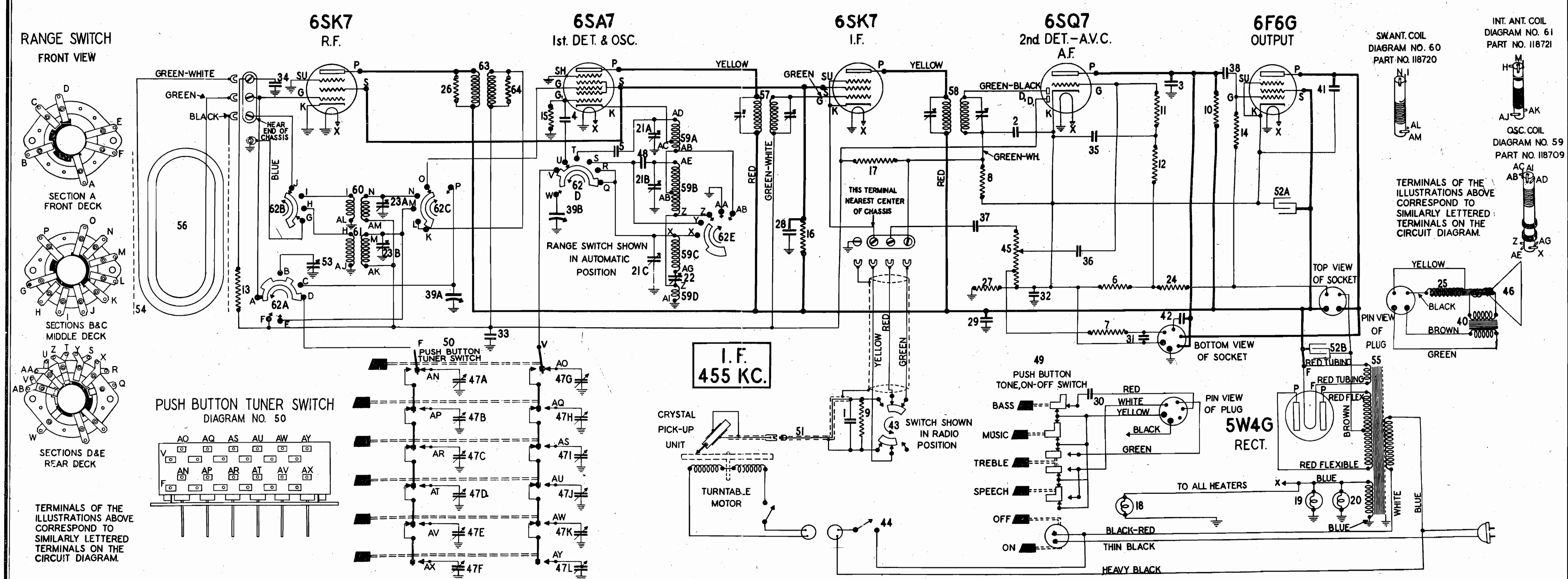
BALANCING INSTRUCTIONS

All sensitivities given for ½ watt output equals 1.4 V. across Voice Coil

Operation No.	Connect Bal. Oscillator to	Bal. Oscillator Frequency	Adjust Padder No.	Dial Setting	Sensitivity
1	6A8 Grid	455 kc	1, 2, 3 & 4	550 kc	50 uv
2	Ant. Coupler Through 20 uuf	1400 kc	5	1400 kc	
3	Through 20 uuf	1400 kc	6	1400 kc	10 uv
4	Through 20 uuf	600 kc	7	600 kc	10 uv

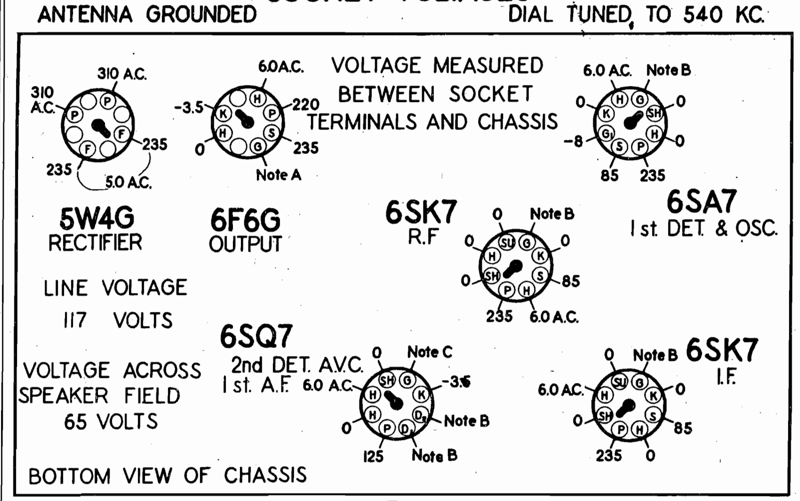
STEWART-WARNER CORP.

MODEL 01-6F9
Chassis 01-6F



SOCKET VOLTAGES

ANTENNA GROUNDED — DIAL TUNED TO 540 KC.



REAR OF CHASSIS

NOTE A: The bias on the control grid of the 6F6G tube is —16 volts measured across resistors No. 6 and 24.

NOTE B: The bias on control grids of the 6SK7 R.F., 6SK7 I.F., 6SA7 1st Det. tubes and the diode plates of the 6SQ7 tube, is —3.5 volts measured across resistor No. 27.

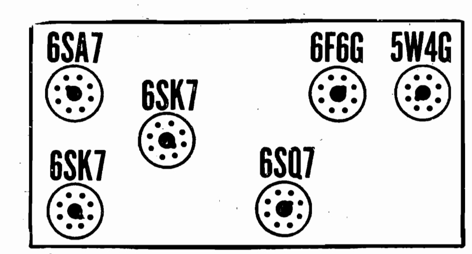
NOTE C: The bias on the control grid of the 6SQ7 tube is —1.5 volts measured across resistor No. 6.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL PARTS LIST

Diagram Number	Part Number	Description	List Price
1	81156	Condenser—mica—.001 mfd.	$0.30
2-3	83539	Condenser—mica 260 mmfd.	.20
4	85061	Condenser—mica 51 mmfd.	.15
5	85440	Condenser—mica .00351 mfd. 3%	.40
6	88465	Resistor—wire wound 25 ohms—½ watt	.15
7	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
8-9-10	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
11-12	110554	Resistor—carbon 1 megohm ¼ watt	.12
13-14	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
15	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
16	110575	Resistor—carbon 12,000 ohms 2 watts	.30
17	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
18	110629	Lamp—6.3 volt—.25 amps	.15
19-20	112636	Lamp—dial (frosted) 6-8 volt—.25 amp.	.25
21A-21B-21C	113319	Condenser—trimmer—(3 section)	.54
22	113346	Condenser—padding	.38
23A-23B	114937	Condenser—2 section trimmer	.40
24	114970	Resistor—wire wound 240 ohms 1 watt	.15
25	U-115061	Speaker—electro dynamic 12"	10.50
26	116053	Resistor—carbon 68,000 ohms 1/10 watt	.12
27	116077	Resistor—carbon 150 ohms ¼ watt 10%	$0.12
28-29	116625	Condenser—.1 mfd. 600 volt	.25
30-31	116640	Condenser—.01 mfd. 600 volt	.15
32	116706	Condenser—.2 mfd. 600 volt	.35
33-34-35	116819	Condenser—.05 mfd. 600 volt	.20
36-37-38	116893	Condenser—.02 mfd. 600 volt	.15
39A-39B	116996	Condenser—variable gang	3.30
40	U-117004	Transformer—output for U-115061 speaker	2.50
41-42	117022	Condenser—.002 mfd. 600 volt	.15
43	117067	Switch (radio phono)	.55
44	117068	Switch for phono motor	.60
45	117069	Volume control	.85
46	U-117071	Cone and voice coil assembly for U-115061 speaker	2.30
47A to 47L	117081	Push button trimmer gang condenser assembly	5.20
48	117113	Condenser—mica .00176 mfd.	.30
49	117115	Switch—push button for tone control etc.	2.30
50	117126	Switch—push button for tuning	2.40
51	117127	Cable (phono pickup)	.40
52A-52B	118421	Condenser—electrolytic 10-15 mfd. 450 volts	1.50
53	118431	Condenser—trimmer	$0.22
54	118475	Shield for loop antenna	1.00
55	118498	Power transformer	5.00
56	118696	Loop antenna assembly complete	2.75
57	118707	Transformer—1st I.F.	1.20
58	118708	Transformer—2nd I.F.	1.20
59A to 59D	118709	Coil—complete oscillator assembly	1.00
60	118720	Coil—short wave antenna	.50
61	118721	Coil—police antenna	.40
62A to 62E	118725	Range switch	2.10
63	118727	Transformer—R.F.	1.00
64	118801	Resistor—10,000 ohms 1/10 watt	.12

TUBE LOCATIONS



Rear of Chassis

STEWART-WARNER CORP.

MODEL 01-6F9
Chassis 01-6F

Connect the output meter across the voice coil or between the plate of the 6F6G output tube and ground through a .1 mfd. condenser. The connection will depend on the type of meter. (The more sensitive type should be connected across the voice coil.)

Connect the ground lead of the signal generator to the receiver chassis. Disconnect the blue wire coming from the antenna terminal strip and allow it to float free of the chassis. The loop wires should be connected to the terminal strip as shown in the circuit diagram when aligning.

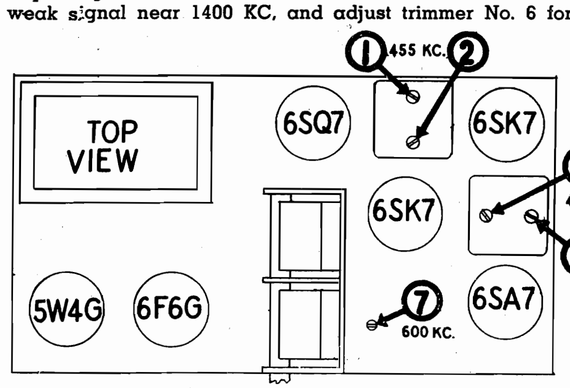
On the phonograph terminal strip, ground the terminal nearest the center of chassis. Connect the two remaining terminals together, using a short piece of wire.

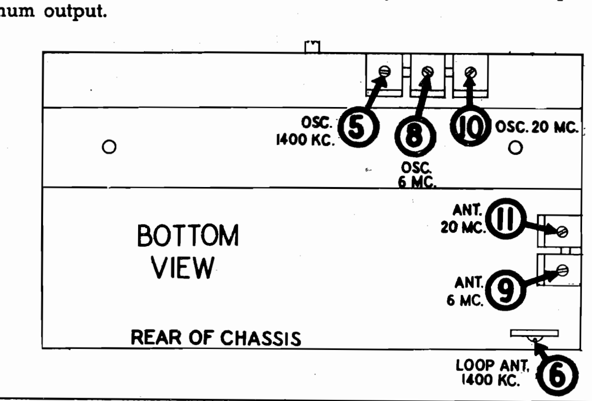
Turn the volume control to the maximum volume position and keep it in this position throughout the alignment procedure.

With the gang condenser in full mesh, set the pointer at a point 1⅜" from the left flange of the brown dial plate. This point corresponds to the last mark on the low frequency end of the dial scale. If the pointer is incorrectly set, it is only necessary to loosen the set screws on the dial drive drum and push the gang condenser in full mesh with the pointer set properly, then retighten the set screws. See paragraph on "Setting the Dial Pointer".

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Dial Pointer Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Stator of front 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.	
200 MMFD. Mica Condenser	Black loop wire on terminal strip	1400 KC	Broadcast	1400 KC (2⅛" from right Dial Plate End)	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Black loop wire on terminal strip	1400 KC	Broadcast	Tune to 1400 KC Generator Signal	6	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	Black loop wire on terminal strip	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	Black loop wire on terminal strip	6.0 MC	Intermediate	6.0 MC (2⅜" from Right Dial Plate Flange)	8	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	Black loop wire on terminal strip	6.0 MC	Intermediate	Tune to 6.0 MC Generator Signal	9	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Black loop wire on terminal strip	20 MC	Foreign	20 MC (2⅛" from Right Dial Plate End)	10	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	Black loop wire on terminal strip	20 MC	Foreign	Tune to 20 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.

After replacing the set in the cabinet, connect the blue wire coming from the terminal strip to the screw adjacent to this strip, tune in a weak signal near 1400 KC, and adjust trimmer No. 6 for maximum output.





MODEL 01-6F9
Chassis 01-6F

STEWART-WARNER CORP.

HINTS ON REMOVING AND REPLACING CHASSIS

The suggestions given here will facilitate the servicing of this receiver. To remove the chassis for service purposes, proceed as follows:

1. Pull off the volume control and range switch knobs at front of cabinet. Pull off tuning knob on top of cabinet. Take care not to lose the paper washers underneath the knobs.
2. Pull off the shaft extension on the tuning shaft.
3. Using a 5/16" socket wrench, remove the three screws holding down the chassis. Two of these screws are located in recesses in the wooden blocks at the sides of the chassis. The third one is located near the bottom of the receiver chassis at the front of the cabinet. The chassis then rests only on the rubber bushings which are on top of the three mounting blocks.
4. Slide chassis off blocks. The chassis will now drop down enough to permit placing it on a box or other support so it can be serviced without the necessity of removing any wires or cables.

When removing a chassis, put a few drops of speaker cement on each of the three rubber bushings and put them in their proper places on top of the mounting blocks. This will facilitate the replacement of the chassis, as the rubber bushings will be held in place by the cement.

If it becomes necessary to remove the chassis completely from the cabinet, in addition to the items mentioned, the following procedure must also be used:

a. Remove the five wood screws holding the wooden panel at the front of the record changer compartment. This panel will then lift out, exposing to view the tone control switch, on-off switches for both motor and receiver, radio-phono switch, and the pilot light.
b. Disconnect the green, red, and yellow leads from the terminals on the chassis. Also disconnect the shield covering these wires. Remove the speaker and tone control plugs from their respective sockets. Remove the wood screw mounting the pilot light bracket.
c. Disconnect the wires coming from the loop antenna.
d. Remove the wood screws holding the entire switch assembly. The thin black wire and the black and red wire can now be unsoldered from the on-off switch. Note to which terminal of the switch each wire goes, so that they can be replaced properly. Also remove the heavy black wire extending from the receiver chassis to the motor on-off switch. If one wishes to cut and splice these three wires steps "a" and "c" may be omitted. The chassis can now be removed from the cabinet.
e. When replacing either the tone control switch or the chassis into the cabinet, difficulty may be experienced because the push buttons will spring inwards. This slight difficulty can be overcome by lightly wedging a toothpick or other fairly soft material between each push button and the escutcheon to hold the buttons out.

LOOP CONNECTIONS

BUILT-IN ANTENNA: The loop forms the antenna coil for the broadcast position and must therefore be connected at all times. The loop shield should be grounded in the broadcast position by connecting the blue wire coming from the terminal strip to the terminal provided on the chassis. On the intermediate and short wave positions the shield serves as the antenna.

EXTERNAL ANTENNA: When an external antenna is to be used, connect it to the screw nearest the end of the chassis on the antenna terminal strip. The black wire should remain connected to this same screw at all times.

When the external antenna is to be used on all bands, disconnect the blue wire from the chassis and tape it.

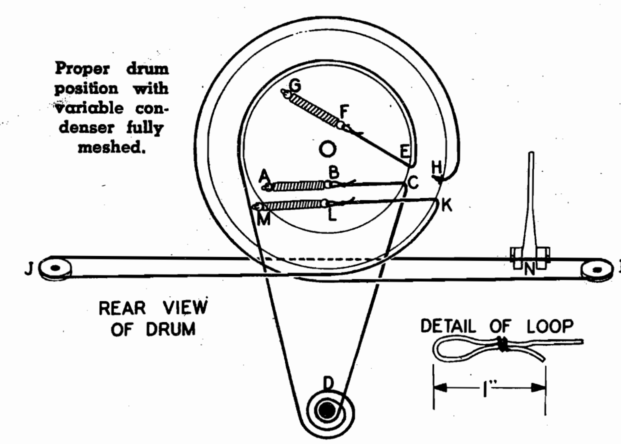
When you wish to use the built-in antenna on broadcast and the external antenna on the intermediate and short wave positions, connect the blue wire to the chassis.

SETTING THE DIAL POINTER

Since the dial scale is printed on the escutcheon glass, the serviceman will not know whether the pointer is set correctly unless the set is in place in the cabinet. With the gang condenser in full mesh, the dial pointer should be at a point 1⅜ inches from the left end of the brown dial plate. If the pointer is not set correctly, loosen the two set screws holding the dial drum to the condenser shaft. Then hold the condenser in full mesh and move the dial drum until the pointer reaches the proper point, then tighten the set screws.

When replacing the chassis in the cabinet, be sure it is in the position giving most accurate dial calibration.

REPLACING THE DRIVE CORDS



TO REPLACE THE DIAL DRIVE CORD

1. 19¾ inches of dial drive cord (Part No. 117057) are required. Make a one-inch loop in each end of this cord, using a dial cord clip, (Part No. 114955) (See sketch above for detail of loop).
2. Fasten a tension spring (Part No. 113177) to tab A and fasten one end of the cord to the spring at point B.
3. Pass the other end of the dial cord through hole C in the inner drum.
4. Make two and a half turns of the cord about tuning shaft D.
5. Continue the cord clockwise about the inner drum and pass it through hole E.
6. Fasten a tension spring, (Part No. 113177) to the other loop of the cord at point F and fasten the spring to the tab G.

TO REPLACE THE POINTER DRIVE CORD

1. 37" of pointer drive cord, (Part No. 116948) are required. Fasten an eyelet (Part No. 88348) at a point one-half inch from one end of this cord.
2. Fashion a one-inch loop at the other end of the pointer cord, (see detail of loop in illustration), using a dial cord clip (Part No. 114955).
3. Pass the loop end of the cord outward through hole H in the larger drum.
4. Continue the cord counter-clockwise around the larger drum and around the rear of pulley I.
5. Go from pulley I around the front of pulley J and counter-clockwise around the larger drum to hole K.
6. Pass the loop through hole K and fasten it to one end of a tension spring (Part No. 113177) at point L, the other end of the spring being fastened to point M.
7. Clip the dial pointer to the cord. With the drum in the position shown, and with the gang condenser in full mesh, fasten the pointer so that it is at a point 1⅜" from the left end of the brown dial plate.

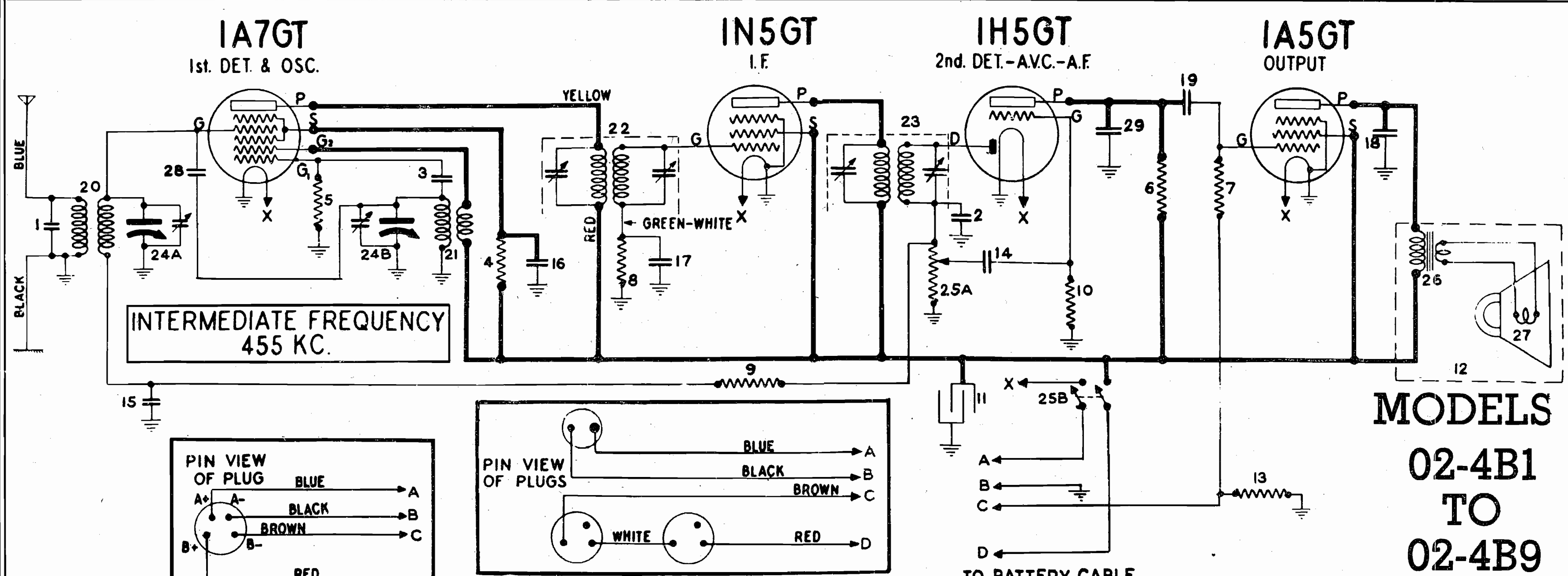
FOR AUTOMATIC RECORD CHANGER, SEE VOLUME XI, PAGES 11-9, 11-10, 11-11

MISCELLANEOUS PARTS

Part Number	Description	List Price	Part Number	Description	List Price
117117	Cable—motor	$0.38	81145	Retaining ring—for drive shaft .... Per C	$0.50
118747	Call tabs and instructions	.45	113463	Rubber bushing—chassis mtg.	.03
114955	Clamp—for dial cord	.01	83624	Screw—self tapping 8 x ¼	.01
112745	Clip—coil mounting	.01	85040	Screw—No. 6 Hex. Hd. .... Per C	.35
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18	85827	Set Screw—8-32 Square Head	.02
117057	Cord—drive (supplied in 2 ft. lengths)	.15	113191	Screw—special No. 8-32 x 1⅛	.01
117028	Dial plate & pulley assembly	1.00	114914	Screw—special head—for mtg. .... Per Dz.	.15
118712	Dial scale & escutcheon	1.65	81834	Socket—6 prong	.10
117029	Drive drum & bushing	.50	110501	Socket—4 prong (for speaker)	.16
116998	Escutcheon for push buttons	.30	116690	Socket—small octal base	.12
88348	Eyelet—for dial cord .... Per Dz.	.05	114117	Socket—dial lamp	.18
117131	Indicator button (bulls eye)	.12	117123	Socket—for pilot light	.26
116773	Knob—tuning or volume	.10	111090	Spacer—steel, mechanism mtg. to chassis	.02
117586	Light shield	.12	113177	Spring—dial cord tension	.09
84571	Needle cup for phono	.10	116981	Spring—for pointer	.02
116952	Pin for push buttons	.02	117458	Spring—for push buttons	.05
117114	Plug (male for motor cable)	.15	84412	Terminal strip—phono	.03
117036	Pointer assembly	.28	117103	Tuning shaft	.06
116999	Push buttons	.08	117102	Tuning shaft extension	.10
116970	Record changer unit	44.95	111456	Washer—spring washers .... Per C	.50
117019	Reflector—for pilot lights	.04	116530	Washer (paper) for back of knobs	.005

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

STEWART-WARNER CORP MODELS 02-4B1 to 02-4B9
Chassis 02-4B



MODELS 02-4B1 TO 02-4B9

THIS BATTERY CABLE USED ON EARLY MODELS.

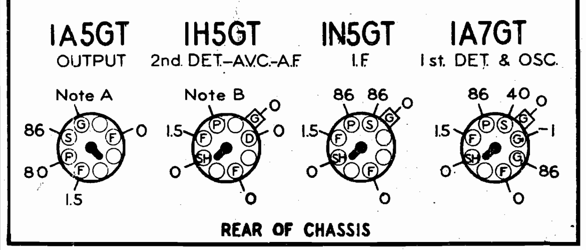
THIS BATTERY CABLE USED ON LATE MODELS.

SOCKET VOLTAGES

ANTENNA GROUNDED — DIAL TUNED TO 540 KC.

VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS

BOTTOM VIEW OF CHASSIS
AVERAGE "B" DRAIN-8.0 MA.
"B" BATTERY = 90 VOLTS



NOTE A: The bias for the control grid of the 1A5GT tube is —4 volts measured across resistor 13.

NOTE B: Due to the high resistance of plate resistor No. 6 only a slight deflection will be obtained when using a meter having a resistance of 1000 ohms per volt.

MISCELLANEOUS PARTS

Part Number	Description	List Price
119453	Battery cable (3 plug type)	$0.80
119906	Battery—cable (single plug, 4 prong type)	.90
119439	Cabinet—complete with window and decalcomania (02-4B1 only)	2.40
119438	Cabinet back	.08
119150	Cabinet (wood)—see decal 119427 below (02-4B4 only)	7.20
112745	Clip—coil mounting	.01
116948	Cord—dial drive (supplied in 6 ft. lengths)	.18
119427	Decal—"Off"—for cabinet 119150 (02-4B4 only)	.16
119444	Dial scale	.10
119441	Knob—ivory—Volume (02-4B1)	.16
119442	Knob—ivory—Tuning (02-4B1)	.16
118175	Knob—tan—(02-4B4)	.10
88631	Plug—4 prong male—for 119906 cable	.06
116397	Plug—2 prong male—for 119453 cable	.05
116567	Plug—3 prong male—for 119453 cable	.04
119011	Pointer	.06
85040	Screw—No. 6 Hex. Hd. Per C	.35
118953	Shaft—tuning	.15
116592	Shield—tube	.10
116690	Socket—small octal base	.12
111981	Spring—for dial cord tension	.03
117411	Trimount stud	.01

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83783	Condenser—mica 110 mmfd.	$0.20
3	85061	Condenser—mica 51 mmfd.	.15
4	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
5	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
6	110554	Resistor—carbon 1 meg. ¼ watt	.12
7	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
8-9-10	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
11	113118	Condenser—electrolytic 8 mfd. 150 volt	.56
12	R-115090	Speaker—P.M. 4"	5.25
13	116078	Resistor—560 ohms ¼ watt	.12
14	116647	Condenser—.004 mfd. 600 volt	.15
15-16-17	116819	Condenser—.05 mfd. 600 volt	.20
18	117022	Condenser—.002 mfd. 600 volts	.15
19	119193	Condenser—.01 mfd. 600 volt	.15
20	119407	Coil—antenna	.52
21	119408	Coil—oscillator	.32
22	119409	Transformer—1st I.F.	1.10
23	119411	Transformer—2nd I.F.	1.10
24A-24B	119425	Condenser—variable tuning	3.00
25A-25B	119426	Volume control (1 meg.) with switch	1.10
26	R-119457	Transformer—output for R-115090 spkr.	1.65
27	R-119458	Cone & Voice Coil for R-115090 speaker	1.65
28	119466	Capacitor—wire (2 mmfd.)	.12
29	83783	Condenser—mica, 110 mmfd.	.20

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 02-4B1 to 02-4B9
Chassis 02-4B

STEWART-WARNER CORP.

02-4B . 02-4C CHASSIS

ALIGNMENT PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

Connect the output meter across the voice coil or between the plate of the 1A5GT output tube and ground through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

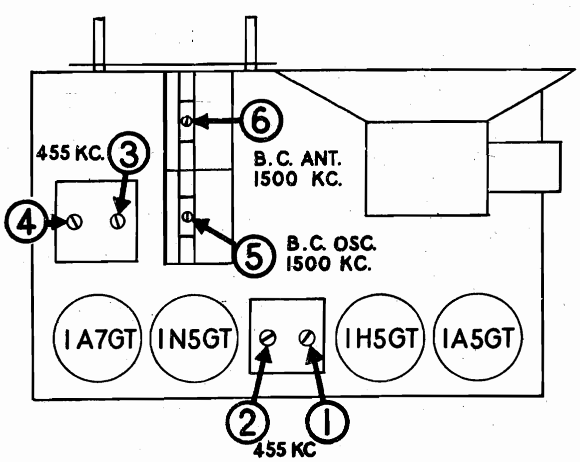
Connect the ground lead of the signal generator to the Ground Terminal or the chassis.

Turn the volume control to the maximum volume position and keep it in this position while aligning.

With the gang condenser in full mesh, set the dial pointer to the last mark on the left hand end of the dial scale.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	Control Grid of 1A7GT	455 KC	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD. Condenser	Antenna Lead (Blue Wire)	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	Antenna Lead (Blue Wire)	1500 KC	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.

MODELS 02-4B1 TO 02-4B9



BATTERY CABLES

Two types of battery cables were used on this model. On the early production a battery cable having 3 plugs was used (Part No. 119453). The three-pronged plugs on this cable will fit the sockets on standard 45 volt "B" batteries and the two-pronged plug will fit the socket on a standard 1½ volt "A" battery. Single unit battery packs suitable for use with this cable are listed in the adjoining column. Late models of this radio use a battery cable having a single four-pronged plug. This plug will fit the socket on a standard combination "A"-"B" battery pack, some of which are listed in the adjoining column.

SINGLE UNIT BATTERIES

FOR USE WITH 3 PLUG BATTERY CABLE	FOR USE WITH SINGLE PLUG BATTERY CABLE
Eveready No. 748	Eveready No. 748
Burgess 17G-D60 (with adapter)	Burgess 17G-D60
General 60DL-11L	General 60DL-11L
Ray-O-Vac AB28U	Ray-O-Vac AB82

POWER LINE OPERATION

To use this set on 110 volt 50-60 cycle A.C. power lines, use one of the following power packs:

Porta-Power Model "G"
Porta-Power Model "U"

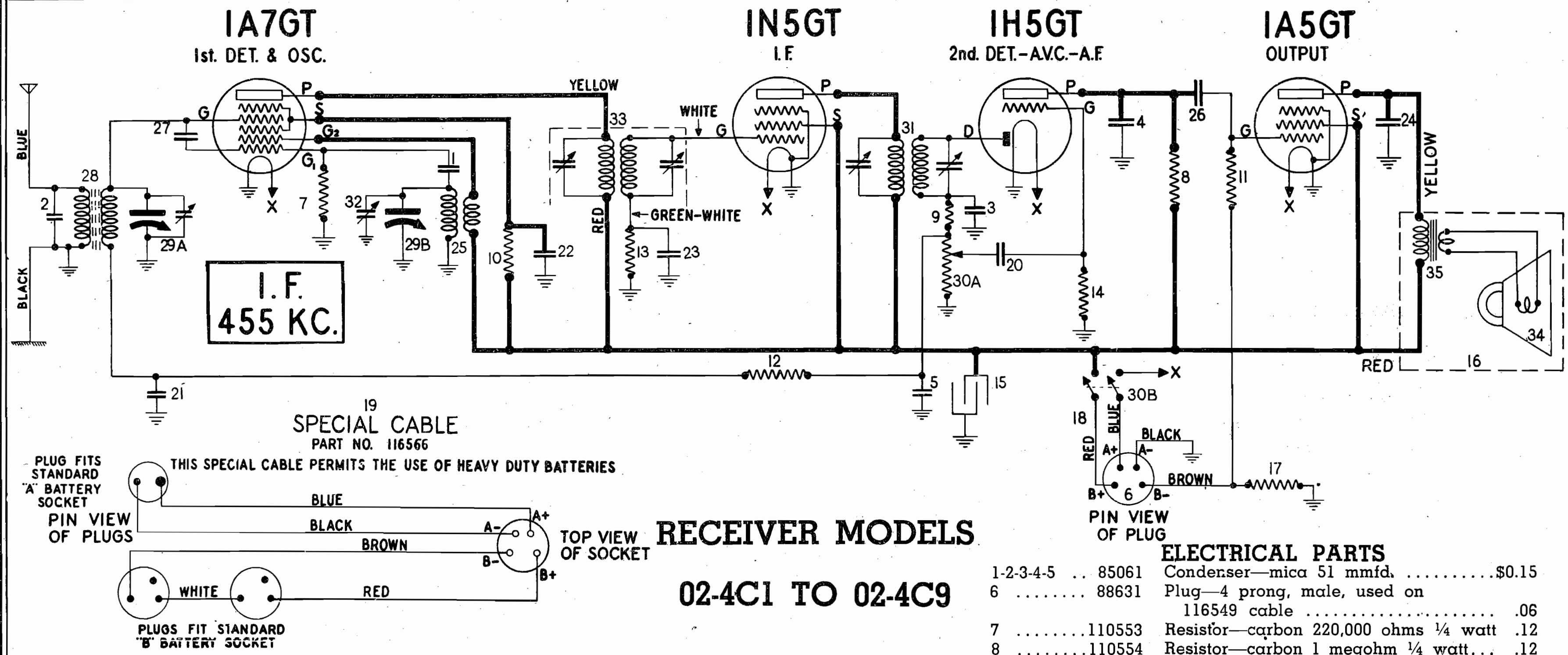
These units are manufactured by the General Transformer Corporation, 1250 W. Van Buren, Chicago, Ill.

SPECIAL BATTERY CABLE

A special battery cable assembly (Part No. 116566) is available for use with sets using the single plug battery cable. This cable will allow the use of heavy duty batteries which are larger than those contained in the single unit battery packs and will give longer service. The special cable available is 30 inches in length and it will permit locating these batteries beneath the table or behind the receiver cabinet. Complete instructions for use are packed with each cable, which may be purchased from the Stewart-Warner Corporation, Chicago, Illinois. It has a list price of 85c.

STEWART-WARNER CORP.

Chassis 02-4C
MODELS 02-4C1 to 02-4C9

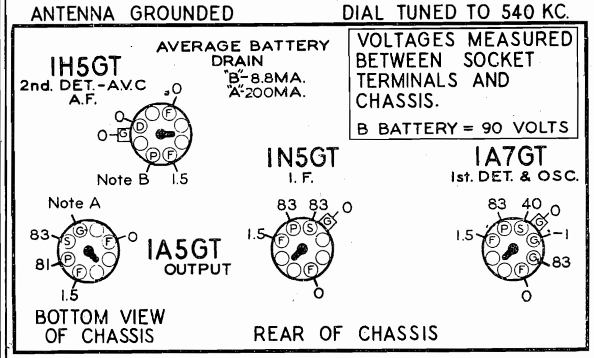


RECEIVER MODELS

02-4C1 TO 02-4C9

SOCKET VOLTAGES

ANTENNA GROUNDED DIAL TUNED TO 540 KC.



NOTE A: The bias for the control grid of the 1A5GT tube is —8 volts measured across resistor 17.

NOTE B: Due to the high resistance of plate Resistor No. 8 only a slight deflection will be obtained when using a meter having a resistance of 1000 ohms per volt.

MISCELLANEOUS PARTS

Part Number	Description	List Price
114955	Clamp—for dial cord	$0.01
110140	Clip—grid	.01
117057	Cord—drive supplied in 3 ft. lengths	.15
119532	Dial scale	.24
119710	Escutcheon dial	1.50
116411	Indicator lever assembly	.09
119167	Knob—tuning or volume	.10
12349	Nut—8-32 for speaker mtg. ... Per C	.45
119718	Pointer	.14
81145	Retaining ring—for drive shaft .. Per C	.50
119587	Screw—Escutcheon Mounting	.02
83624	Screw—self tapping 8 x 1/4	.01
116690	Socket—small octal base	.12
114968	Spring—dial cord tension	.03
119525	Tuning Shaft	.10
111456	Washer—spring washer ... Per C	.50

ELECTRICAL PARTS

1-2-3-4-5	85061	Condenser—mica 51 mmfd.	$0.15
6	88631	Plug—4 prong, male, used on 116549 cable	.06
7	110553	Resistor—carbon 220,000 ohms 1/4 watt	.12
8	110554	Resistor—carbon 1 megohm 1/4 watt	.12
9	110565	Resistor—carbon 22,000 ohms 1/4 watt	.12
10	110568	Resistor—carbon 33,000 ohms 1/4 watt	.12
11	110570	Resistor—carbon 2.2 meg. 1/4 watt	.15
12-13-14	110580	Resistor—carbon 3.3 meg. 1/4 watt	.12
15	112898	Condenser—electrolytic 16 mfd. 150 volt	.50
16	M-115095	Speaker—P.M. 6"	7.10
17	116078	Resistor—560 ohms 1/4 watt	.12
18	116549	Cable—Battery	.45
19	116566	Battery cable—for heavy duty batteries (not supplied with receiver)	.85
20	116647	Condenser—.004 mfd. 600 volt	.15
21-22-23	116819	Condenser—.05 mfd. 600 volt	.20
24	117022	Condenser—.002 mfd. 600 volt	.15
25	117741	Coil—oscillator	.35
26	119193	Condenser—.01 mfd. 600 volt	.15
27	119466	Capacitor—wire (2 mmfd.)	.12
28	119473	Coil—B. C. antenna	1.10
29A-29B	119528	Condenser—tuning (with drum)	2.90
30A-30B	119529	Volume control 1 meg. (with switch)	1.25
31	119673	Transformer—2nd I.F.	1.25
32	119719	Condenser—trimmer	.16
33	119720	Transformer—1st I.F.	1.25
34	M-119748	Cone & Voice coil for M-115095 speaker	1.60
35	M-119749	Transformer—output for M-115095 speaker	1.75

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

June 4, 1940

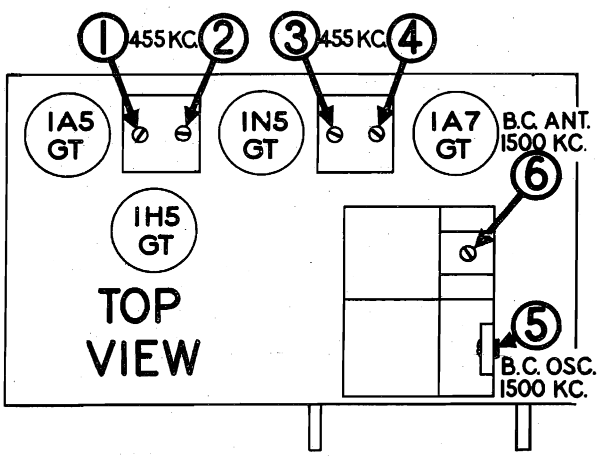
Chassis Number	Radio Model
02-4B	02-4B1, 02-4B4
02-4C	02-4C1
02-5T	02-5T1

The first production release of the 02-4B chassis used a three plug type of battery cable so that it could be connected to separate A and B batteries. Most battery packs on the market are equipped with sockets for this three plug cable as well as for a single large plug so that they could be used with this set if desired. However, some battery manufacturers put out special battery packs that were equipped only with the single large socket. To use this special battery pack with the early production 02-4B chassis, obtain the correct adapter from the battery manufacturer.

Later production 02-4B as well as all 02-4C and 02-5T sets used the single large plug to connect to any battery pack. For those preferring to use separate A and B batteries, we provide our part #116566 battery cable and adapter. This cable is priced at $.85 list.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 02-4C1 TO 02-4C9



OSCILLATION

Be sure the antenna and ground wires are pulled straight out from the set and that they do not pass close to the antenna coil or to the tubes.

These wires have been attached to the cabinet at the factory and should be reattached in a similar manner after the set has been serviced.

Failure to observe this precaution may cause oscillation and instability in this receiver.

FOR POWER LINE OPERATION

To use this set on 110 volt 50-60 cycle A.C. power lines, use one of the following power packs:

Porta-Power Model "G"
Porta-Power Model "U"

These units, are manufactured by the General Transformer Corporation, 1250 W. Van Buren, Chicago, Ill.

INSTALLATION OF BATTERIES

BATTERIES REQUIRED: This receiver is designed to operate from a single unit battery pack which fits into the receiver cabinet directly behind the chassis. The following battery packs will fit into the receiver cabinet in back of the chassis:

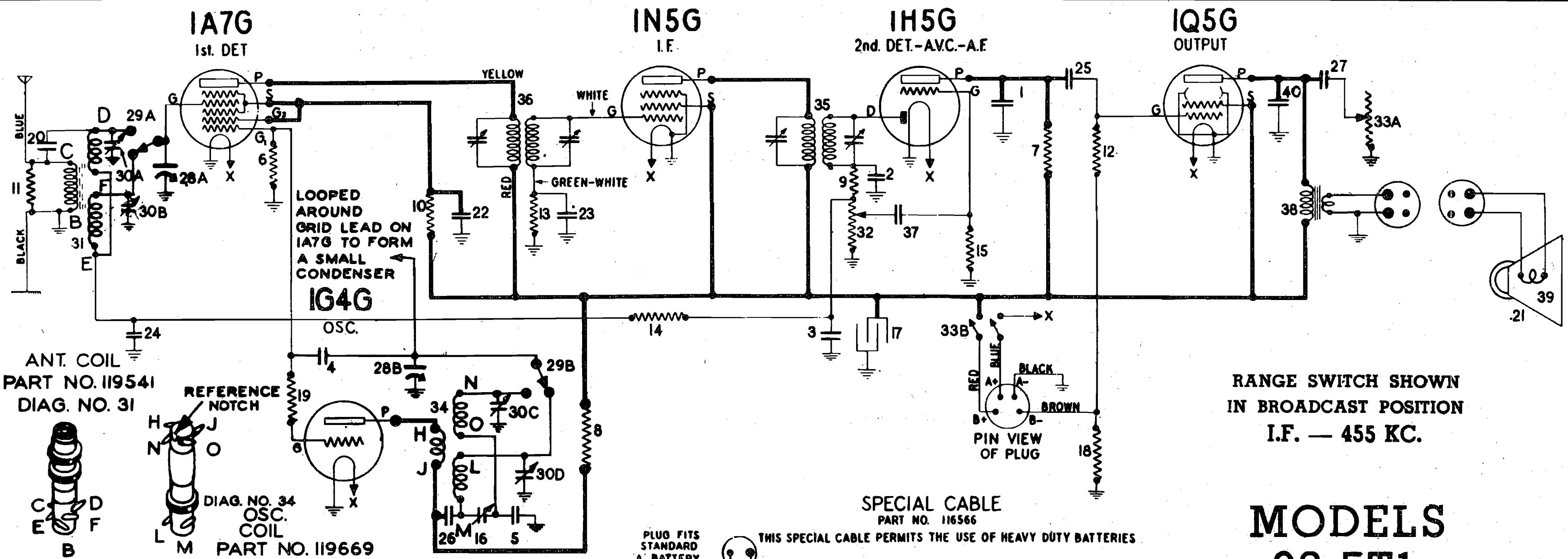
Burgess 17G-D60
General 60DL-11L
Eveready No. 748
Ray-O-Vac AB82
or equivalent

The 4-prong plug on the end of the cable extending from the chassis is plugged into the 4-hole socket on top of the battery pack. No other battery connections are necessary.

HEAVY-DUTY BATTERIES: A special battery cable assembly (Part No. 116566) is available so that heavy duty batteries may be used with this receiver. These batteries are larger than those contained in the single unit power pack and will give considerably longer service, but due to their larger size, they will not fit into the cabinet. The special cable available is 30 inches in length and it will permit locating these batteries beneath the table, behind the receiver cabinet, or in the bottom portion of the console cabinet. Complete instructions for use are packed with each cable, which may be purchased from the Stewart-Warner Corporation, Chicago, Illinois.

STEWART-WARNER CORP.

MODELS 02-5T1 to 02-5T9
Chassis 02-5T

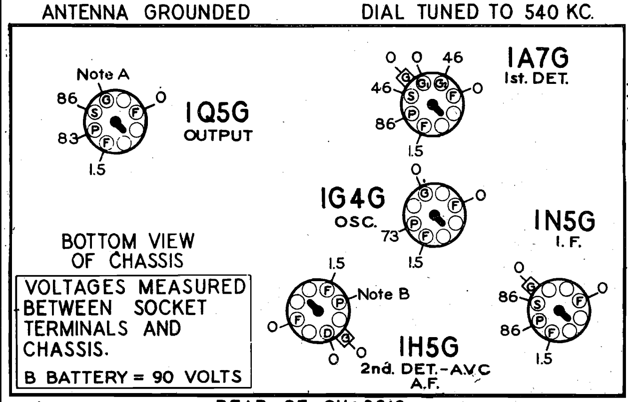


RANGE SWITCH SHOWN IN BROADCAST POSITION
I.F. — 455 KC.

MODELS 02-5T1 TO 02-5T9

SOCKET VOLTAGES

ANTENNA GROUNDED   DIAL TUNED TO 540 KC.



REAR OF CHASSIS

NOTE A: The bias for the control grid of the 1Q5G tube is —4 volts measured across resistor 18.

NOTE B: Due to the high resistance of plate Resistor No. 7 only a slight deflection will be obtained when using a meter having a resistance of 1000 ohms per volt.

Diagram Number	Part Number	Description	List Price
1	83783	Condenser—mica, 110 mmfd.	$0.20
2-3-4	85061	Condenser—mica, 51 mmfd.	.15
5	88587	Condenser—mica .0042 mfd.	.35
6	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
7	110554	Resistor—carbon 1 megohm ¼ watt	.12
8	110557	Resistor—carbon 4,700 ohms ¼ watt	.12
9	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
10	110566	Resistor—carbon 33,000 ohms ¼ watt	.12
11	110569	Resistor—carbon 10,000 ohms ¼ watt	.12
12	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
13-14-15	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
16	112799	Condenser—padder	.36
17	112898	Condenser—electrolytic 16 mfd. 150 volt	.50
18	112951	Resistor—carbon 400 ohms ¼ watt	.12
19	112994	Resistor—carbon 220 ohms ¼ watt	.16
20	114969	Condenser—mica 15 mmfd.	.12
21	O-115099	Speaker—P. M. (6")	7.00
22-23-24	116819	Condenser—.05 mfd. 600 volt	.20
25-26	119193	Condenser—.01 mfd. 600 volt	.15
27	119414	Condenser—.02 mfd. 600 volt	.15
28A-28B	119533	Condenser—tuning (with drum)	3.00
29A-29B	119534	Range switch	.80
30A-30D	119536	Condenser—trimmer (4 section)	.60
31	119541	Coil—antenna	1.25
32	119551	Volume control—1 meg.	.95
33A-33B	119552	Tone control—100,000 ohms with switch	.95
34	119669	Coil—oscillator	.75
35	119673	Transformer—2nd I.F.	1.25
36	119720	Transformer—1st I.F.	1.25
37	119817	Condenser—.004 mfd. 600 volt	.15
38	O-119862	Transformer—output for O-115099 speaker	1.20
39	O-119873	Cone & Voice Coil for O-115099 speaker	1.86
40	119875	Condenser—.002 mfd. 600 volt	.15

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 02-5T1 to 02-5T9
Chassis 02-5T

STEWART-WARNER CORP.

PRICES BELOW ARE SUBJECT TO CHANGE WITHOUT NOTICE

RECEIVER MODELS 02-5T1 TO 02-5T9
ALIGNMENT PROCEDURE

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

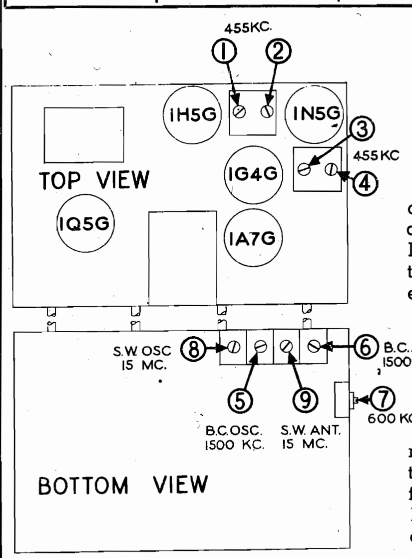
Connect the output meter across the voice coil or between the plate of the 1Q5G output tube and ground through a 0.1 Mfd. condenser, depending on the type of meter. (The more sensitive type should be connected across the voice coil.)

Connect the ground lead of the signal generator to the black wire or the chassis.

Turn the volume control to the maximum volume position and keep it in this position while aligning.

With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

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	Control Grid of 1A7G	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	Antenna Lead (Blue Wire)	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	1500 KC	Broadcast	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Lead (Blue Wire)	600 KC	Broadcast	Tune To 600 KC Generator Signal	7	Broadcast Oscillator (Series Pad	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 Lead (Blue Wire)	15 MC	Foreign	15 MC	8	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak was obtained by tuning in image at approx. 14.1 MC. If image does not appear realign at 15 MC, with trimmer screw farther out. Recheck image.
400 OHM Carbon Resistor	Antenna Lead (Blue Wire)	15 MC	Foreign	Tune To 15 MC Gen. Signal	9	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.



FOR POWER LINE OPERATION

To use this set on 110 volt 50-60 cycle A.C. power lines, use one of the following power packs:

Porta-Power Model "G"

Porta-Power Model "U"

These units are manufactured by the General Transformer Corporation, 1250 W. Van Buren, Chicago, Ill.

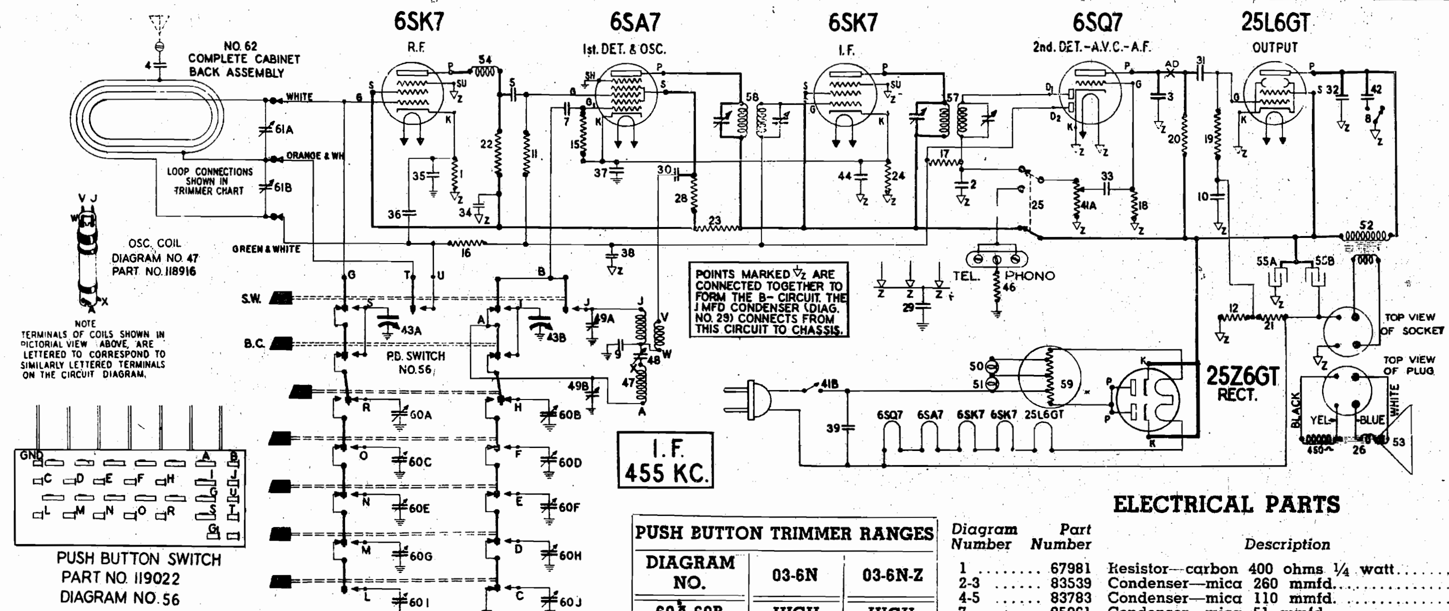
BATTERIES REQUIRED: One of the following or its equivalent is required: Eveready No. 748, Burgess 17G-D60, General 60DL-11L, Ray-O-Vac AB82. A special battery cable assembly (Part No. 116566) is available so that heavy duty batteries may be used with this receiver.

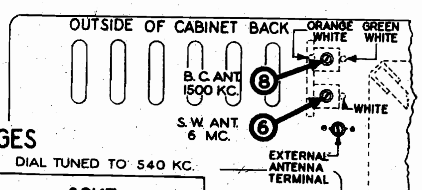
MISCELLANEOUS PARTS

Part Number	Description	List Price
116566	Battery cable—for heavy duty batteries	$0.85
116549	Cable—battery	.45
114955	Clamp—for dial cord	.01
112745	Clip—coil mounting	.01
110140	Clip—grid	.01
117057	Cord—drive—supplied in 3 ft. lengths	.15
119828	Dial escutcheon	.20
119830	Dial scale	.38
77208	Flat steel washer for gang condenser mtg.	.01
119167	Knob—tuning or volume	.10
12349	Nut—8-32 for gang mtg. Per C	.45
88631	Plug—4 prong, male (for battery cable)	.06
119855	Pointer	.16
81145	Retaining ring—for drive shaft Per C	.50
119587	Screw—for escutcheon	.02
116392	Shield base—tube	.03
116395	Shield-tube	.08
110501	Socket—4 prong (for speaker)	.16
85427	Socket—octal base (standard)	.15
111090	Spacer—steel mtg. (for gang condenser)	.02
114968	Spring—dial cord tension	.03
113169	Spring—for indicator lever	.01
119525	Tuning shaft	.10
116530	Washer (paper) for back of knobs	.005
111456	Washer—spring washer Per C	.50

STEWART-WARNER CORP.

MODELS 03-6N-1, 03-6N1-Z
Chassis 03-6N
03-6NZ





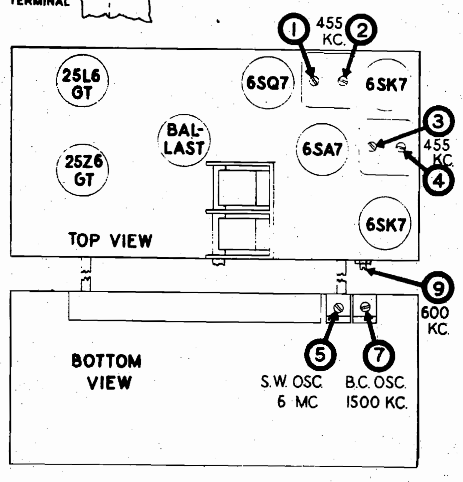
PUSH BUTTON TRIMMER RANGES

DIAGRAM NO.	03-6N	03-6N-Z
60A-60B	HIGH	HIGH
60C-60D	MED.	HIGH
60E-60F	LOW	MED.
60G-60H	LOW	MED.
60I-60J	LOW	LOW

SEE PARTS LIST BELOW FOR RANGES IN KILOCYCLES

ELECTRICAL PARTS

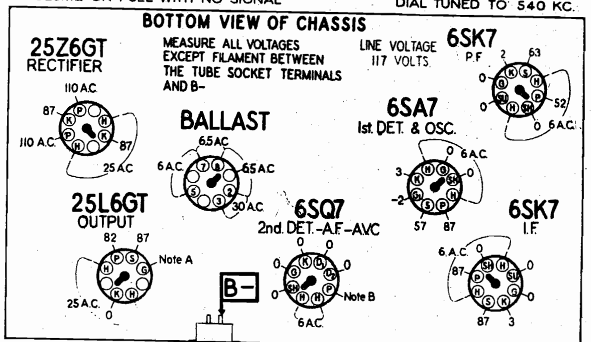
Diagram Number	Part Number	Description	List Price
1	67981	Resistor—carbon 400 ohms ¼ watt	$0.25
2-3	83539	Condenser—mica 260 mmfd.	.20
4-5	83783	Condenser—mica 110 mmfd.	.20
7	85061	Condenser—mica 51 mmfd.	.15
8	88054	Switch—tone	.30
9	89275	Condenser—mica .002 mfd.	.40
10	116625	Condenser—.1 mfd. 600 volt	.25
11	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
12	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
15	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
16	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
17-18	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
19	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
20-21	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
22	112952	Resistor—carbon 3,300 ohms ¼ watt	.10
23	112964	Resistor—carbon 1,500 ohms ¼ watt	.15
24	112994	Resistor—carbon 220 ohms ¼ watt	.12
25	114141	Switch—D.P.D.T.	.44
26	R-115083	Speaker—dynamic (5")	4.00
28	116068	Resistor—carbon 680 ohms ¼ watt	.12
29	116625	Condenser—.1 mfd. 600 volt	.25
30-31-32	116640	Condenser—.01 mfd. 600 volt	.15
33	116647	Condenser—.004 mfd. 600 volt	.15
34	116706	Condenser—.2 mfd. 600 volt	.35
35 to 39	116819	Condenser—.05 mfd. 600 volt	.20
41A-41B	116834	Volume control—1 megohm (with switch)	1.10
42	116984	Condenser—.04 mfd. 600 volts	.20
43A-43B	117625	Condenser—tuning (with drum)	3.00
44	118206	Condenser—.25 mfd. 600 volts	.35
46	110553	Resistor—220,000 ohms ¼ watt (on Underwriters' approved sets)	.12
47	118916	Coil—oscillator	.52
48	118919	Condenser—padding	.40
49A-49B	118920	Trimmer strip (2 section)	.30
50-51	110629	Lamp—dial 6.3 volts .25 amps.	.15
52	118996	Transformer—output	1.00
53	R-118999	Cone & Voice coil for R-115083 speaker	1.70
54	119001	Coil—R. F.	.28
55A-55B	119021	Condenser—electrolytic—20-40 mfd. 150 volt	1.00
56	119022	Switch—push button	3.00
57	119024	Transformer—2nd I.F.	1.15
58	119042	Transformer—1st I.F.	1.10
59	119109	Ballast tube	.75
60A-60J	119662	Push button trimmer (Low 540 to 1000 KC)	.24
	119663	Push button trimmer (Med. 750 to 1375 KC)	.24
	119664	Push button trimmer (High 980 to 1550 KC)	.24
61A-61B	119126	Trimmer condenser—2 section	.35
62	119946	Cabinet back & loop antenna assembly	1.40



FOR ALIGNMENT SEE INDEX

SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL   DIAL TUNED TO 540 KC.



These readings taken using a voltmeter of 1000 ohms per volt.

NOTE A: The bias on the 25L6GT grid is —4 volts measured across resistor No. 12.

NOTE B: Due to the high resistance of resistor No. 20, only a small voltage will be read at the plate of the 6SQ7 when using a voltmeter having a resistance of 1000 ohms per volt.

Note: If excessive hum is encountered, placing a 40 mfd.—150 volt condenser (Part No. 113472) across 55B and changing condenser No. 33 from .004 mfd. to .04 mfd. (Part No. 119880) will correct the condition in many cases.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 11-7A1 to 11-7A9
Chassis 11-7A

STEWART-WARNER CORP.

MODELS 03-6N-1, 03-6N1-Z
Chassis 03-6N, 03-6N-Z

03-6N and 03-6N-Z CHASSIS

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 using a .1 mfd. condenser in series connect between the 25L6GT tube plate and B— as shown on the voltage chart.
2. Connect the ground lead of the signal generator through a .25 mfd. condenser to B— as shown on the voltage chart.
3. Connect the loop antenna to the radio, being sure to connect the wires to the proper receptacles on the loop antenna as shown in drawing below.
4. With the gang condenser in full mesh, the pointer should be in a horizontal position. If it is not, it should be moved to this position before alignment.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Push Button Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	Lug on Rear Section of Variable Condenser	455 KC	"Broadcast" Button Pushed In	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 Aerial Terminal	6 MC	"Short Wave" Button Pushed In	6 MC	5	Short Wave 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.
200 MMFD. Mica Condenser	External Aerial Terminal	6 MC	"Short Wave" Button Pushed In	Tune to 6 MC Generator Signal	6*	Short Wave Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	1500 KC	"Broadcast" Button Pushed In	1500 KC	7*	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	1500 KC	"Broadcast" Button Pushed In	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for Maximum Output.
200 MMFD. Mica Condenser	External Aerial Terminal	600 KC	"Broadcast" Button Pushed In	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.

*NOTE: When making these adjustments, the loop should be in the same relative position to the chassis as when mounted in the cabinet. Adjustments 6 & 8 should be repeated after the set and loop have been replaced in the cabinet.

ALIGNMENT PROCEDURE FOR 11-7A CHASSIS

NOTE: This chassis may be completely aligned while in the cabinet.

1. Connect the output meter across the voice coil or from plate to plate of the 6F6G output tubes through a .1 mfd. condenser.
2. Connect the ground lead of the signal generator to the receiver chassis. Turn the volume control to position of maximum volume and keep it in this position throughout the alignment procedure.
3. Connect the loop as shown in diagram on back page. The loop must remain in the circuit at all times.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Gen. Frequency	Band Switch Position	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Section of Gang Cond Nearest the Dial Drum	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	Orange and White Wire from Loop	16 MC	Short Wave	16 MC	5	Short Wave 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	Orange and White Wire from Loop	16 MC	Short Wave	Tune to 16 MC Generator Signal	6	Short Wave Antenna	Adjust for Maximum Output.
Chassis must be in cabinet before the following adjustments are made.							
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. Placed Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	9	Broadcast Oscillator (Series Padder)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

CHASSIS 11-7A

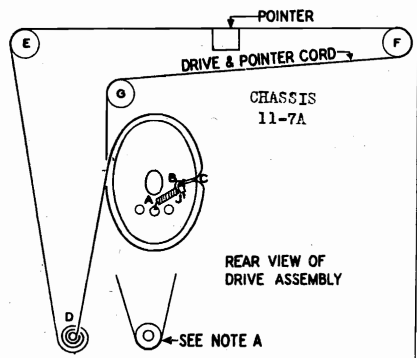
REPLACING DIAL AND POINTER DRIVE CORD

1. Hook a tension spring (Part No. 119823) through small hole at point A and fasten end of dial cord (Part No. 113178) to spring at point B.
2. Pass the other end of the dial cord through hole C in drum.
3. Make three and one half turns of the cord about tuning shaft D. (NOTE A: In some sets of this model there is a grommet (Part No. 113672) on the drive shaft. In this case the drive cord is simply passed under the grommet—approximately ½ turn.)
4. Continue cord around pulley E and thence to and around pulley F.
5. From Pulley F pass cord over pulley G and around drum in counter-clockwise direction (in reference to diagram) to hole C in drum.
6. Slip cord through loop at end of spring B, adjust tension until spring is stretched to approximately seven-eighths inch, and tie securely.

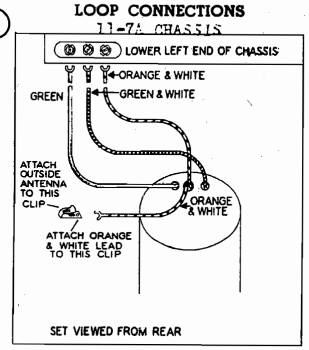
TO SET POINTER

The pointer should be set to 540 K.C. on the dial scale when the tuning condenser is in full mesh. Cement pointer to cord at this point and allow to dry before moving.

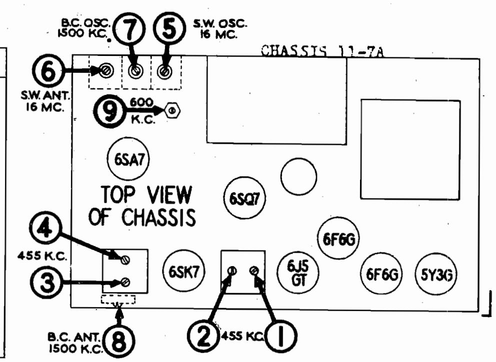
REPLACING THE DRIVE CORD



LOOP CONNECTIONS
11-7A CHASSIS

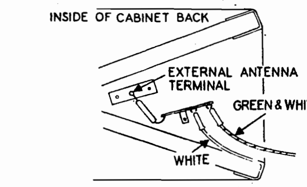


SET VIEWED FROM REAR

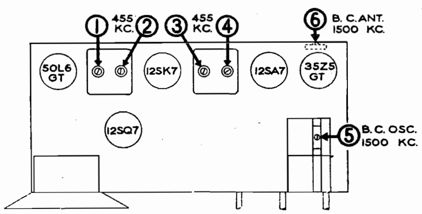


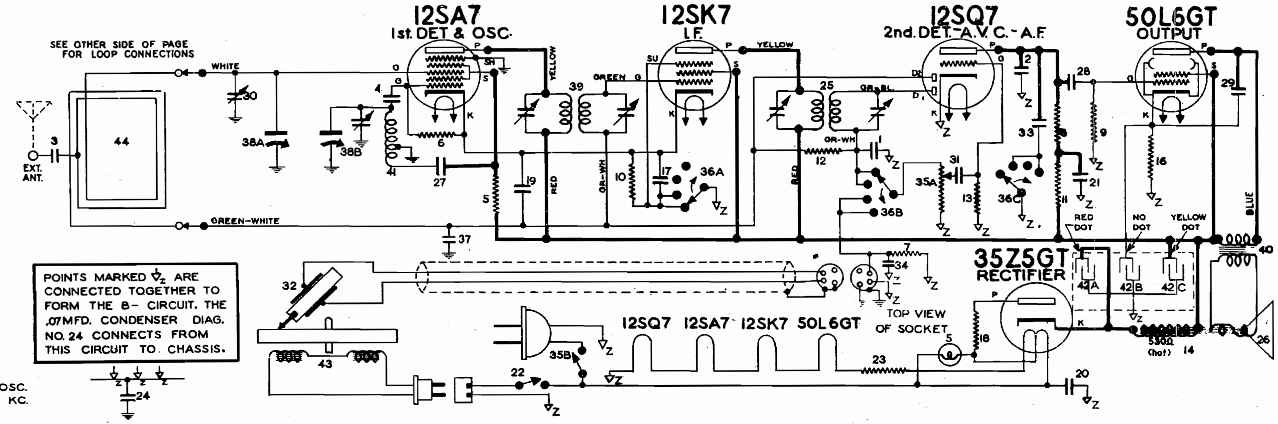
STEWART-WARNER CORP.

MODEL 11-5V9
Chassis 11-5V



LOOP CONNECTIONS





POINTS MARKED ∇_Z ARE CONNECTED TOGETHER TO FORM THE B- CIRCUIT. THE .07MFD. CONDENSER DIAG. NO. 24 CONNECTS FROM THIS CIRCUIT TO CHASSIS.

I.F. 455 KC

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, using a condenser in series, connect between the plate of the 50L6GT output tube and B— as shown on the voltage chart. The more sensitive type should be connected across the voice coil.
2. Connect the ground lead of the signal generator to the B— lug (shown on the voltage chart) through a .25 mfd. condenser and keep it connected in this manner throughout the entire alignment procedure. Failure to use the series condenser may have serious results, as one side of the power line may be grounded in the signal generator, or hum may be encountered.
3. Turn the volume control to the maximum volume position and leave it in this position throughout the entire alignment procedure.
4. Set the Dial Pointer to last mark after 55 on the dial with the gang condenser in full mesh.
5. The loop must be connected at all times.

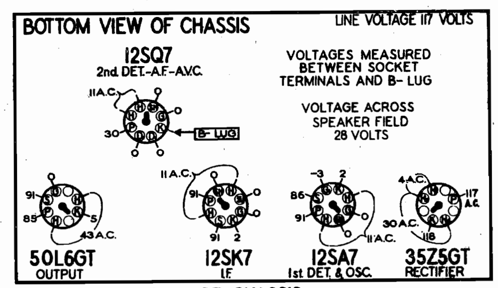
Dummy Ant. in Series with Signal Generator	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Mica Condenser	White wire of Loop (loop must be connected)	455 KC	Any point where it does not affect the signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
No Connection	Place Lead from Signal Generator near Loop	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for maximum output.
No Connection	Place Lead from Signal Generator near Loop	1500 KC	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna (Shunt)	Adjust for maximum output.

*Make adjustment of trimmer No. 6 with the chassis in the cabinet, and with the loop mounted to the cabinet by the top-center mounting screw. The loop and cabinet back may be tilted on this screw to permit reaching the trimmer.

ELECTRICAL PARTS

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	83783	Condenser—mica 110 mmfd.	.20
4	85061	Condenser—mica 51 mmfd.	.15
5	85296	Lamp—dial 6 to 8 volt (Mazda 51)	.16
6	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
7	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
8 9	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
10	110560	Resistor—carbon 100 ohms ¼ watt	.12
11	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
12	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
13	112975	Resistor—carbon 10 meg. ¼ watt	.12
14	R-115102	Speaker—dynamic (5")	$4.30
15	118803	Resistor—680 ohms ¼ watt	.12
16	116092	Resistor—140 ohms 1 watt W.W.	.15
17	116706	Condenser—.2 mfd. 600 volt	.35
18	116752	Resistor—33 ohms 1 watt wire wound	.15
19 to 21	116819	Condenser—.05 mfd. 600 volt	.20
22	116964	Switch—"on-off" for phono motor	.32
23	117395	Resistor—20 ohms 1 watt	.16
24	118487	Condenser—.07 mfd. 600 volts	.25
25	118903	Transformer—2nd I.F.	1.10
26	118999	Cone & Voice Coil for R-115102 speaker	1.70
27 to 29	119193	Condenser—.01 mfd. 600 volt	.15
30	119345	Condenser—trimmer	.20
31	119817	Condenser—.004 mfd. 600 volt	.15
32	119864	Crystal cartridge with leads and needle screw	5.25
33-34	119875	Condenser—.002 mfd. 600 volt	.15
35A-35B	119912	Volume control—1 meg. (with switch)	1.40
36A-38B-36C	119921	Switch—tone & phonograph (See table for switch positions)	1.00
37	119193	Condenser—.01 mfd. 600 volt	.15
38A-38B	119928	Condenser—variable tuning	2.40
39	119935	Transformer—1st I.F.	1.10
40	R-119944	Transformer—output for R-115102 Speaker	1.60
41	119854	Coil—oscillator	.36
42A-42B-42C	160012	Condenser—electrolytic, A—40 mfd.—200 volt; B—20 mfd.—25 volt; C—20 mfd.—200 volt	1.15
43	160093	Phonograph motor—60 cycle (less turntable)	6.00
44	160140	Loop antenna & back (complete)	1.40



REAR OF CHASSIS

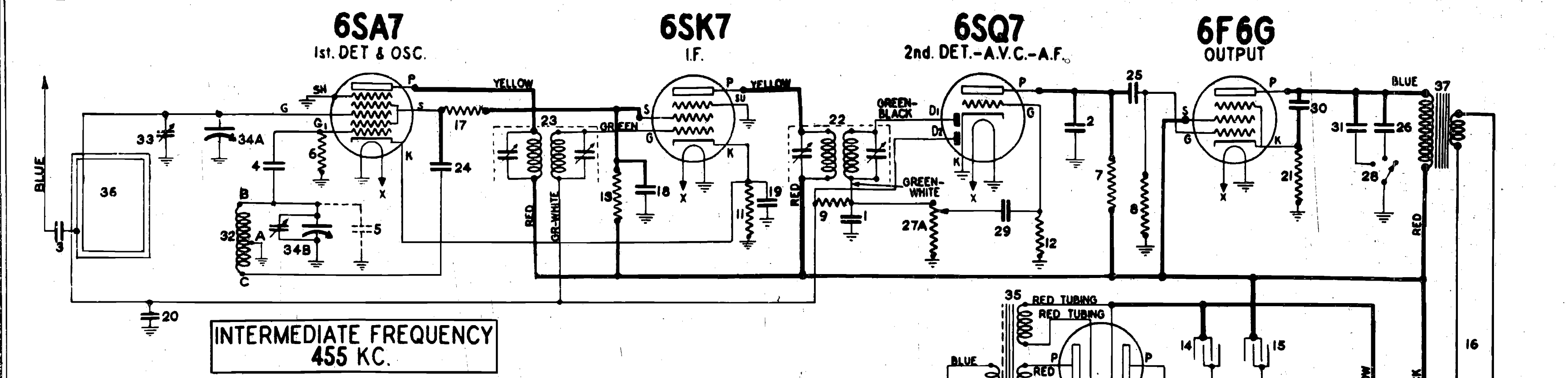
Use a Voltmeter of 1000 ohms per volt.

Sept.10,1940

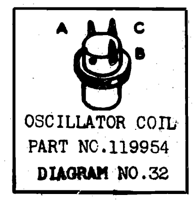
CIRCUIT CHANGE--TOP OF PHONO. PICK-UP SOCKET HAS ONE OF ITS TERMINALS CONNECTED DIRECTLY TO "Z" (B- return lead) AS SHOWN ABOVE. ON LATER PRODUCTION, A 220,000 ohm 1/4 watt RESISTOR (carbon) is connected BETWEEN THIS SOCKET TERMINAL AND "Z".

MODELS 11-5W1 to 11-5W9
Chassis 11-5W

STEWART-WARNER CORP.



FOR ALIGNMENT, SEE INDEX

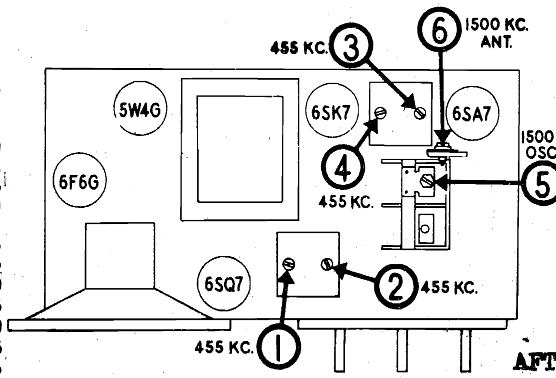


NOTE: TERMINALS OF OSCILLATOR COIL ARE LETTERED TO CORRESPOND TO SIMILARLY LETTERED TERMINALS ON THE CIRCUIT DIAGRAM.

ELECTRICAL PARTS

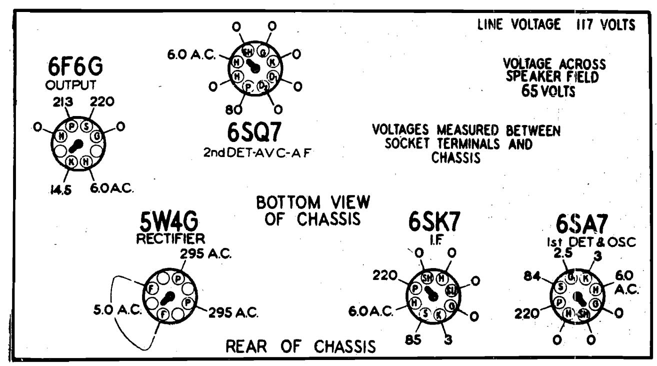
Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—Mica, 260 Mmfd.	$ .20
3	83783	Condenser—Mica, 110 Mmfd.	.20
4	85061	Condenser—Mica, 51 Mmfd.	.15
5	85563	Condenser—Mica, 26 Mmfd. (used only on some sets)	.15
6	110552	Resistor—Carbon, 47,000 Ohms, ¼ Watt	.12
7-8	110553	Resistor—Carbon, 220,000 Ohms, ¼ Watt	.12
9	110580	Resistor—Carbon 3.3 meg. ¼ W.	.12
10	110629	Dial Light—6.3 Volt (Mazda No. 44)	.15
11	112974	Resistor—Carbon—220 Ohms, ¼ Watt	.15
12	112975	Resistor—Carbon—10 Meg, ¼ W.	.12
13	112997	Resistor—Carbon—22,000 Ohms, 1 Watt	.15
14-15	114258	Condenser—Electrolytic—8 mfd., 450 Volt	.98
16	U-115114	Speaker—Dynamic (5")	4.50
17	116068	Resistor—680 Ohms, ¼ Watt	.12
18-19	116625	Condenser—.1 Mfd., 600 Volt	.25
20	116819	Condenser—.05 Mfd., 600 Volt	.20
21	116978	Resistor — 420 Ohm — ½ Watt Wire Wound	.15
22	119024	Transformer—2nd I. F.	1.15
23	119042	Transformer—1st I.F.	1.10
24-25-26	119193	Condenser—.01 Mfd., 600 Volt	.15
27A-27B	119629	Vol. Control—(1 meg.) & Switch	1.30
28	119630	Tone Switch	.65
29-30	119817	Condenser—.004 Mfd., 600 Volt	.15
31	119880	Condenser—.04 Mfd., 600 Volt	.20
32	119954	Coil—Oscillator	.36
33	160346	Condenser—Trimmer	.18
34A-34B	160347	Condenser—Variable Tuning	2.30
35	160367	Transformer—Power (50-60 Cycle)	3.60
35	161230	Transformer—Power (25 Cycle)	3.90
36	160388	Loop Antenna (Complete)	.80
37	U-160458	Transformer—Output for U-115114 Speaker	1.50
38	U-160459	Cone & Voice Coil for U-115114 Speaker	1.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE



SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL DIAL TUNED TO 540 KC

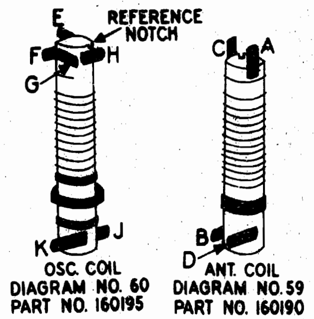


USE A 1000 OHM PER VOLT — VOLTMETER

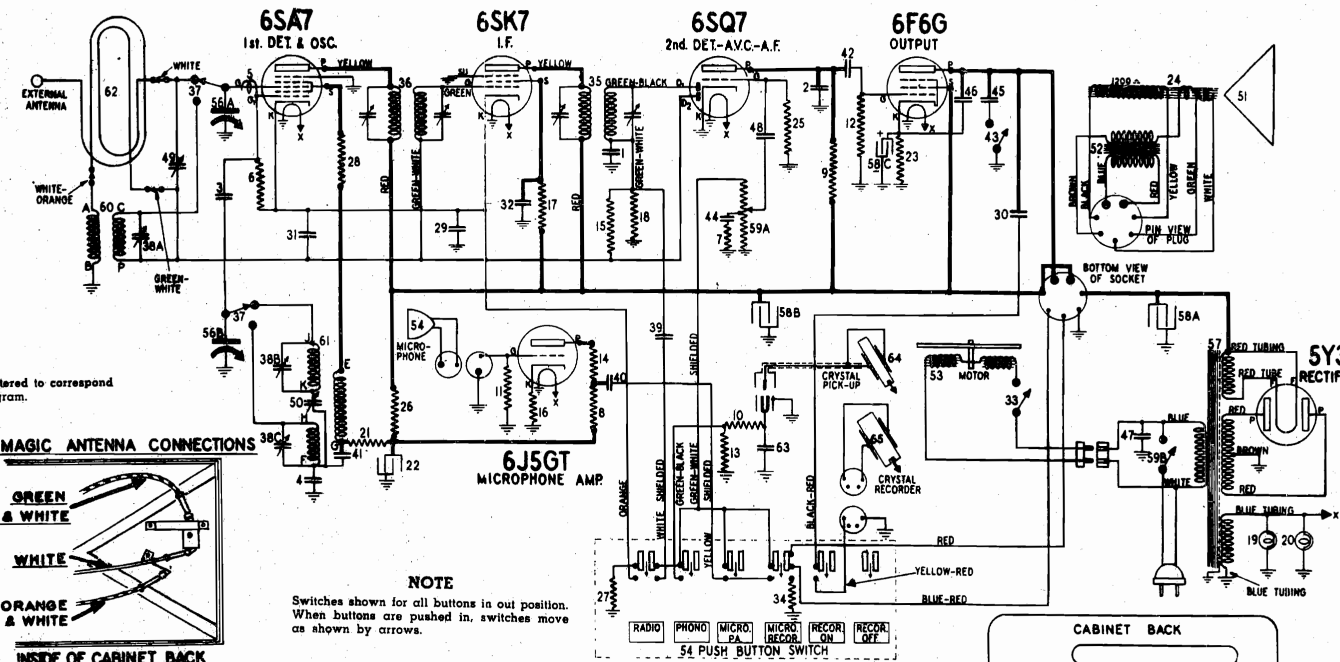
AFTER ALIGNMENT— Replace the set in the cabinet and using a weak signal generator or station signal at 1500 KC., readjust trimmer No. 6.

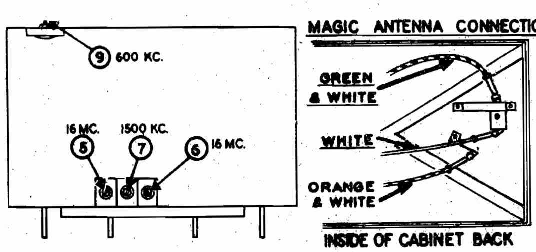
Reduce to 9⅞"

STEWART-WARNER CORP. MODELS 11-6T1 to 11-6T9
11-6T1S to 11-6T9S
Chassis 11-6T, 11-6T8



The terminals of the coils illustrated above are lettered to correspond to similarly lettered terminals on the circuit diagram.



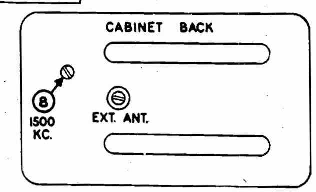


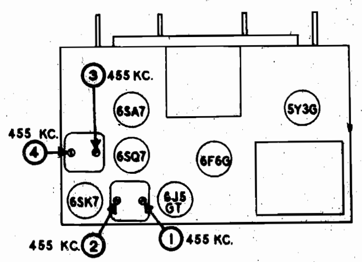
NOTE

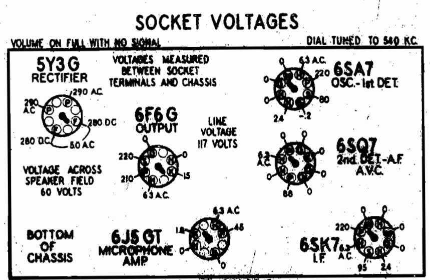
Switches shown for all buttons in out position. When buttons are pushed in, switches move as shown by arrows.

FOR ALIGNMENT SEE INDEX

I.F. 455 KC







Use a high resistance voltmeter of 1000 ohms per volt.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	88173	Condenser—mica 50 mmfd.	.20
4	88587	Condenser—mica .0042 mfd.	.35
5	110510	Condenser—wire 3 mmfd.	.12
6-7-8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9-10	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
11	110554	Resistor—carbon 1 megohm ¼ watt	.12
12	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
13	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
14	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
15	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
16	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
17	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
18	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
19-20	110629	Dial light—6.3 volt	.15
21	112952	Resistor—carbon 3,300 ohms ¼ watt	.10
22	114009	Condenser—electrolytic 4 mfd. 350 volt	.72
23	114335	Resistor—wire wound 430 ohms 2 watts	.20
24	U-115107	Speaker—dynamic 6"	6.10
25	116050	Resistor—insulated 10 meg. ¼ watt	.12
26	116055	Resistor—carbon 22,000 ohms ½ watt	.12
27-28	116062	Resistor—150 ohms ¼ watt	.12
29-30	116625	Condenser—.1 mfd. 600 volt	.25
31-32	116819	Condenser—.05 mfd. 600 volt	.20
33	116964	Switch—on-off for phono motor with escutcheon	.32
34	118819	Resistor—5 ohms 1 watt wire wound	.14
35	119024	Transformer—2nd I.F.	1.15
36	119042	Transformer—1st I.F.	1.10
37	119085	Range switch	.50
38A to 38C	119174	Condenser—trimmer—3 section	.45
39-40-41-42	119193	Condenser—.01 mfd. 600 volt	.15
43	119214	Switch—tone control	.48
44-45	119414	Condenser—.02 mfd. 600 volt	.15
46	119416	Condenser—.008 mfd. 600 volt	.15
47	119757	Condenser—(metal clad) .01 mfd. 600 volt	.20
48	119817	Condenser—.004 mfd. 600 volt	.15
49	119845	Condenser—trimmer (on loop)	.16
50	119934	Condenser—padder	.36
51	U-160028	Cone & voice coil for U-115107 speaker	1.60
52	U-160029	Transformer—output for U-115107 speaker	1.55
53	160036	Motor (less turntable)	8.00
54	160038	Microphone	12.50
55	160111	Push button switch	2.30
56A-56B	160170	Condenser—variable tuning	2.40
57	160172	Transformer—power (50-60 cycles)	4.20
58A to 58C	160174	Condenser—electrolytic: Section A—20 mfd. 400 volt; Section B—15 mfd. 400 volt; Section C—10 mfd. 25 volt	1.30
59A-59B	160175	Volume control—1 meg. (with switch)	1.40
60	160190	Coil—antenna (S.W.)	.44
61	160195	Coil—oscillator	.75
62	160279	Loop antenna & cabinet back (complete) (Model 11-6T9)	1.40
62	160783	Loop antenna & cabinet back (with trimmer) (Model 11-6T8)	1.40
63	160430	Condenser—.001 mfd. 600 volt	.15
64	161289	Crystal Pickup Cartridge	5.00
65	161288	Crystal Recorder Cartridge	9.50

Part Number	Description	List Price
117117	Cable—motor	$0.38
114955	Clamp—for dial cord	.01
113019	Clip—dial scale retaining	.01
117057	Cord—drive (supplied in 3 ft. lengths)	.15
160200	Dial scale	.28
119208	Escutcheon—dial	.80
119167	Knob	.10
119166	Knob—push button	.08
117769	Name Plate (S.W.) (Model 11-6T8)	.07
117779	Name Plate (Off-Vol.) (Model 11-6T8)	.05
117780	Name Plate (Tuning) (Model 11-6T8)	.05
161206	Name Plate (Tone) (Model 11-6T8)	.06
161207	Name Plate (F-B) (Model 11-6T8)	.06
160033	Needle cup	.08
160127	Phonograph needles. Envelope of 10	.10
116883	Pointer	.16
81145	Retaining ring for drive shaft Per C	.50
119218	Screw—escutcheon mounting	.02
119204	Shaft—tuning	.10
111008	Socket—dial lamp	.12
160037	Socket—2 prong	.10
160171	Socket—4 prong	.12
160158	Socket—7 prong for speaker	.14
119791	Socket—8 prong	.12
114876	Socket—octal	.15
160039	Socket for pick up	.08
113177	Spring—dial cord tension	.09
161245	Tabs & windows for recorder push buttons	.10
111456	Washer—spring washer Per C	.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODELS 11-6T1 to 11-6T9
11-6T1S to 11-6T9S
Chassis 11-6T, 11-6TS

STEWART-WARNER CORP.

MODELS 11-9B1 to 11-9B9
11-9B1-Z to 11-9B-Z
Chassis 11-9B, 11-9B-Z

ALIGNMENT PROCEDURE FOR 11-9B & 11-9B-Z CHASSIS

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 change the black wire from the outer to the inner clip on top of the loop drum.
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.
5. The loop must be connected as indicated in circuit diagram at all times.
6. With some signal generators, it may be found that the signal cannot be reduced to a useable value using the dummy antennas recommended below. On the Short Wave and Intermediate positions the shield wire (black) may be disconnected from its jack and the output of the signal generator connected to the black wire terminal through a 400 ohm resistor.

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.	
No Connection	Place Lead from Signal Generator Near Loop	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
No Connection	Place Lead from Signal Generator Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Place Lead from Signal Generator Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	7*	Broadcast Oscillator (Series Padder)	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 Side of 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 Side of Loop Drum	5 MC	Intermediate	Tune to 5 MC Generator Signal	9	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Clip on Side of 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 Side of 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.

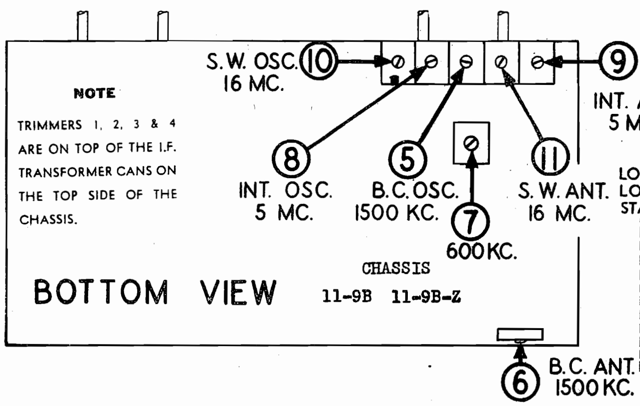
*Realign trimmer No. 6 on 1500 KC, and trimmer No. 7 on 600 KC, after set is in cabinet.

ALIGNMENT PROCEDURE FOR 11-6T & 11-6T-S CHASSIS

IMPORTANT:
1. The loop must be connected to the receiver at all times.
2. Push in button marked "Radio."
3. Connect an output meter to the receiver. Connect the ground lead of the signal generator to the receiver chassis.
4. With gang condenser in full mesh, set the dial pointer so that its position is horizontal.
5. Turn the volume control to maximum and keep it in this position throughout the alignment procedure.

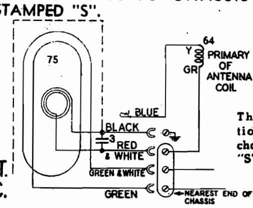
Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Gen. Output to Receiver	Sig. Gen. Frequency	Band Switch Position	Receiver Dial Setting	Trimmer No.	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Stator Lug on Rear Section of Gang Condenser	455 KC	Broadcast	Any Point Where It Does Not Affect the Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I.F.	
No Connection	Disconnect Signal Generator Leads from Set and Place Near Loop	16 MC	Foreign	16 MC	5	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.
No Connection	Disconnect Signal Generator Leads from Set and Place Near Loop	16 MC	Foreign	Tune to 16 MC. Gen. Signal	6	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and re-tuning receiver dial.
200 MMFD Mica Condenser	Antenna Terminal on Loop	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal on Loop	1500 KC	Broadcast	Tune to 1500 KC Gen. Signal	8	Broadcast Antenna	Place loop antenna in same position relative to chassis as it occupies when in cabinet. Adjust for maximum output.
200 MMFD. Mica Condenser	Antenna Terminal on Loop	600 KC	Broadcast	Tune to 600 KC Gen. Signal	9	Broadcast Oscillator Series Padder	Adjust for maximum output. Try to increase output by detuning trimmer and re-tuning receiver dial until maximum output is obtained.

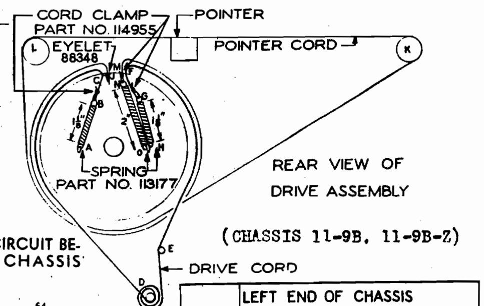
Install speaker, chassis and loop in the cabinet, then repeat adjustment of trimmers 8 and 9.



BOTTOM VIEW

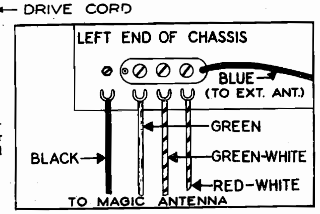
LOOP CONNECTION CIRCUIT BELOW APPLIES TO CHASSIS STAMPED "S".



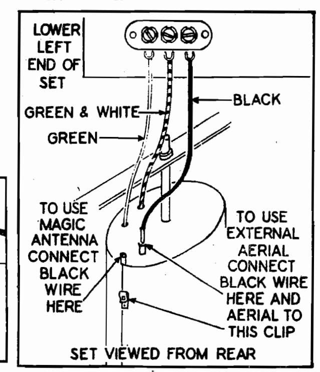


REAR VIEW OF DRIVE ASSEMBLY

(CHASSIS 11-9B, 11-9B-Z)



CHASSIS 11-9B, 11-9B-Z CONNECTIONS SHOWN BELOW APPLY TO THE CHASSIS NOT STAMPED WITH A LETTER ON THE BACK



SET VIEWED FROM REAR

STEWART-WARNER CORP. MODELS 11-6T1 to 11-6T9
11-6T1S to 11-6T9S
Chassis 11-6T, 11-6TS

RECORDER SERVICE DATA

PUSH BUTTONS

The six push buttons shown on this circuit control the various functions of this receiver. The **"RADIO," "PHONO," "MICRO.-P.A."** and **"MICRO.-RECOR."** buttons are mechanically interconnected so that when any one of them is pushed in, it releases any of the other three buttons which was pushed in.

The **"RECOR. ON"** and **"RECOR. OFF"** buttons are mechanically coupled to each other, but are independent of the other four buttons. Pushing in the "RECOR. ON" button releases the "RECOR. OFF" button, and vice versa.

ACTION OF VARIOUS PUSH BUTTONS

RADIO—Button in: Cathode circuits of 6SA7 and 6SK7 completed to ground through resistor No. 27. Volume control connected across diode load resistor No. 18.

Button out: 6SA7 and 6SK7 Cathode circuits opened. Volume control disconnected from diode load resistor No. 18.

PHONO—Button in: Output of crystal pick-up connected across Volume Control.

Button out: Crystal pick-up disconnected from Volume Control.

MICRO-P.A.—Button in: Output of microphone amplifier connected across volume control. Loudspeaker connected to reproduce sound.

Button out: Output of microphone amplifier disconnected from Volume Control.

MICRO-RECOR.—Button in: Microphone amplifier connected as under "MICRO-P.A." In addition speaker is silenced by disconnecting the voice coil and connecting the output transformer secondary to resistor No. 34. This prevents acoustical feed-back from speaker to microphone when recording.

Button out: Microphone amplifier disconnected from volume control. Voice coil of speaker connected to output transformer secondary.

RECOR-ON—Button in: This button connects the crystal recorder to the output of the receiver.

Button out: Crystal recorder disconnected from receiver output.

RECOR.-OFF—Button in: This releases "RECOR.-ON" button, as it is mechanically coupled to it.

Button out: This indicates "RECOR.-ON" button has been pushed in, thus connecting the recorder to the set's output stage. The "RECOR.-ON" and "RECOR.-OFF" buttons operate independently of the four buttons described previously.

GENERAL RECORDER TROUBLE DATA

For complete recording mechanism service data, refer to the separate Recorder Service Manual, Form No. 9948, which will be published later. The receiver instructions, Form 9741, give complete data for the use of this recorder.

IMPORTANT: It is essential that the recorder be placed on a level surface when making recordings. If the recorder does not stand in a level position, it will change the effective pressure of the cutting head and proper results cannot be obtained.

ADJUSTMENT OF CUTTING HEAD

Before attempting any adjustments of the cutting head, first make certain that such adjustments are required. It is advisable to try a new cutting needle, or one known to be in perfect condition. Also the serviceman should have available a record blank of known quality. If a cutting head is suspected of being out of adjustment, make a test recording, using the new needle.

DEFECTIVE CUTTING NEEDLE

A cutting needle is considered worn when the background hiss becomes objectionable, or when the thread cut from the record becomes ragged. A dull needle may also cause the depth of cut to be incorrect.

The condition of the cutting needle can be determined by examining the point by means of a powerful magnifying glass or low power microscope, and comparing it with a good needle viewed in a similar manner. Another good check on the condition of the cutting needle is the appearance of a freshly cut record. If the record has a dull or grayish appearance instead of its usual shiny appearance, the needle should be replaced.

ADJUSTING THICKNESS OF SHAVING

The proper thickness of the shaving produced when a record is cut is about the thickness of a human hair. If the cutting needle is sharp and in good condition, and the cutting head adjusted to give the correct depth of cut, the shaving should come off as a long continuous ribbon. With some types of recording blanks, the ribbon cut by the cutting needle will come off as a straight band, while with others it may produce a curly thread. This ribbon should not, however, be too fine or extremely crinkly as this indicates a dull cutting needle or insufficient pressure of the recording head.

When the cutting head is placed on a record blank, the needle locking screw should be halfway between the top and bottom of the hole in the head. The position of the cutting needle screw may be changed by raising the cutter arm and adjusting the screw and locknut under this arm. Turning this screw clockwise will raise the stylus screw—counter clockwise rotation will lower it.

The depth of cut can be varied by means of the adjusting screw on the recorder arm. This screw is located on top of the arm and is readily accessible for adjustment. Turning this screw clockwise increases the thickness of the shaving, while turning it counter-clockwise decreases the thickness. However, if the cutting needle is dull or damaged, turning this adjusting screw will have very little effect on the depth of cut.

The proper depth of cut may be determined by cutting several grooves with no voltage impressed on the cutter head (RECOR.-OFF button pushed in). Then examine these blank grooves by reflecting light from the record and viewing the grooves through a low-power microscope. The width of the space between the grooves should be slightly less than the width of the grooves.

PROPER RECORDING LEVEL

When recording, the volume control should be adjusted to a setting somewhat higher than that required for good room volume, but below the point of overloading and distortion. If too high a volume level is used, an echo may be heard when playing back or "overcutting" of the grooves may result—that is, on loud passages one groove may actually cut into the adjacent groove, causing distortion when the record is being played. If this occurs the volume control setting should be decreased while recording, until the recorded level is normal.

On the other hand, if the level of the program being recorded is too low, it will necessitate increasing the volume control setting when playing back the recording, and the hiss and background noise will be excessive.

RECORDER HEAD INOPERATIVE

A quick check of the recorder head can be made by pushing in the "RECOR.-ON" button and the "RADIO" button and then tuning in a station. If the recorder is operating, this fact is easily determined by holding the cutting stylus of the cutter between the thumb and forefinger. Vibration of this stylus indicates that the cutter head is in operating condition.

If the recorder does not operate, check first to determine if an A.C. voltage exists across the terminals of the recorder socket. This can best be measured using the 0-150 volt scale of a rectifier type A.C. Voltmeter. With proper recording volume the peaks of the voltage appearing across these terminals should be 80 to 120 volts. If no voltage exists under these conditions, check the contacts of the "RECOR.-ON" switch, and the condenser No. 30 coupling the recorder to the 6F6G plate. If these circuits are found to be all right check the recorder crystal cartridge and replace if necessary.

CORRECT NEEDLE ANGLE

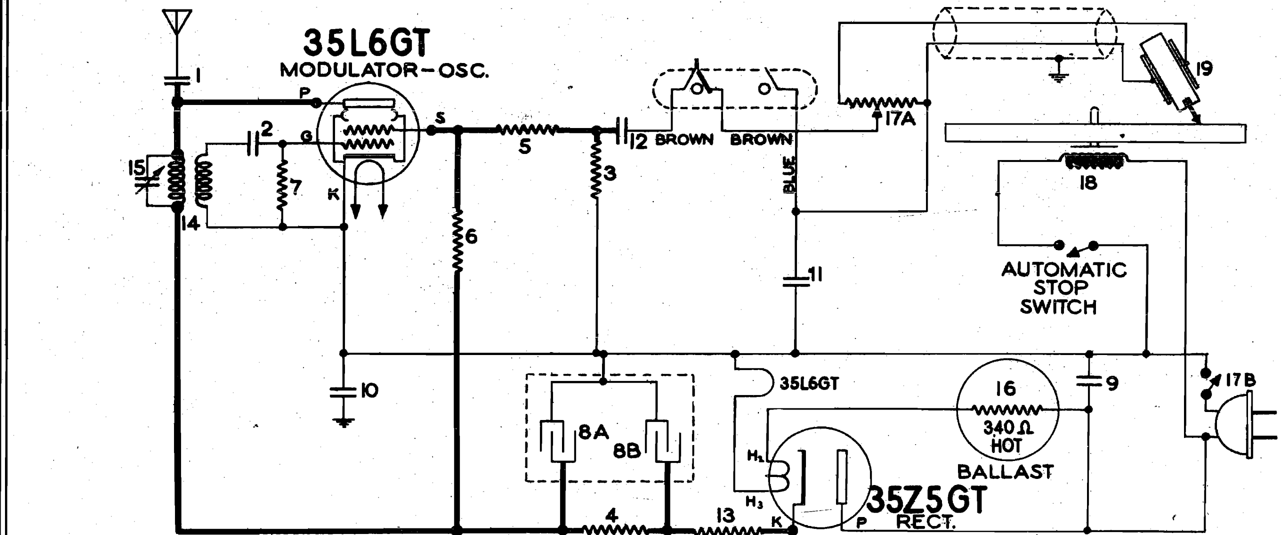
When making a recording, the cutting needle should be set at such an angle that the thread cut from the record will be thrown toward the center of the record. Otherwise the thread may be caught under the cutting needle, causing it to cut the grooves improperly.

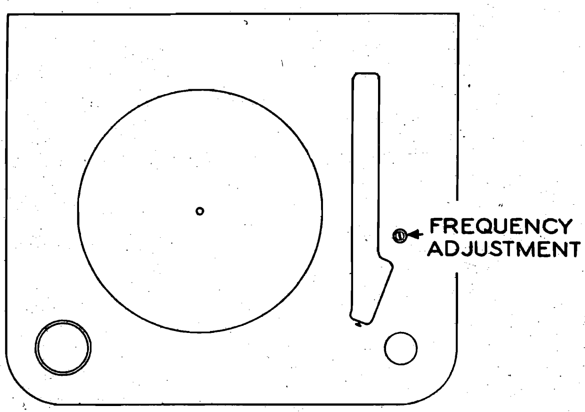
If the thread is not thrown toward the center of the record, loosen the thumb screw holding the recording needle in the cutter head, then retightening it again. This will generally change the angle of the needle slightly, causing the thread to wind about the center pin of the turntable.

CAUTION: Never use thorn, cactus or wooden playback needles on home recordings. Their friction coefficient is high, and they score the grooves.

MODEL 11-2A1 Chassis 11-2A
Wireless Record-Player
Chassis 11-2A

STEWART-WARNER CORP.





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
19	160617	Crystal cartridge	4.50

ADJUSTMENTS

Set the receiver that is to be used with this record player to some frequency between 540 and 750 KC. Choose a frequency that is clear and free from interfering stations. Keep in mind the fact that strong signals may be present at night where there are no signals in the daytime. 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. Turning the adjusting screw clockwise increases the frequency and turning it counter-clockwise lowers the frequency.

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.

TO REMOVE THE CHASSIS

1. Unsolder the shielded pickup lead from the chassis.
2. Unsolder the two brown leads from the microphone input jack and the black lead from the volume control.
3. Remove the two nuts holding the chassis to the cabinet.
4. Remove the strap holding the power cord.
5. The chassis may now be turned for inspection or repair.

HOWLS OR SQUEALS

Howls or squeals from this unit may be caused by the following:

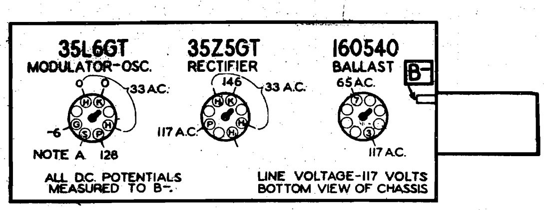
1. Interference caused by choosing a frequency which is not clear. To remedy, change the record player frequency to one where there is no interference.
2. Too weak a signal permitting interference from a weak station. To remedy, uncoil some of the wire from the coil under the record player, or move the record player nearer the set.
3. Too strong a signal permitting vibration from the speaker to cause microphonics. (The record player and receiver are in this case usually very close together.) To remedy, place the record player on another support or mount it on sponge rubber. Coiling up the wire coming from the chassis may help if the signal is too strong.

MISCELLANEOUS PARTS

Part Number	Description	List Price
119619	Automatic stop for phonograph	$1.70
116467	Base for mtg. electrolytic condenser	.04
112798	Clip—for mtg. oscillator coil	.01
160617	Crystal cartridge	4.50
160588	Escutcheon plate & terminal strip	.32
161104	Idler wheel with rubber rim	1.00
160219	Knob—push on	.06
160033	Needle cup	.08
160575	Phono pickup arm complete	6.25
113463	Rubber bushing—motor mtg.	.03
119791	Socket—8 prong	.12
114876	Socket—octal base	.15
119729	Turntable—9"	1.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

SOCKET VOLTAGES

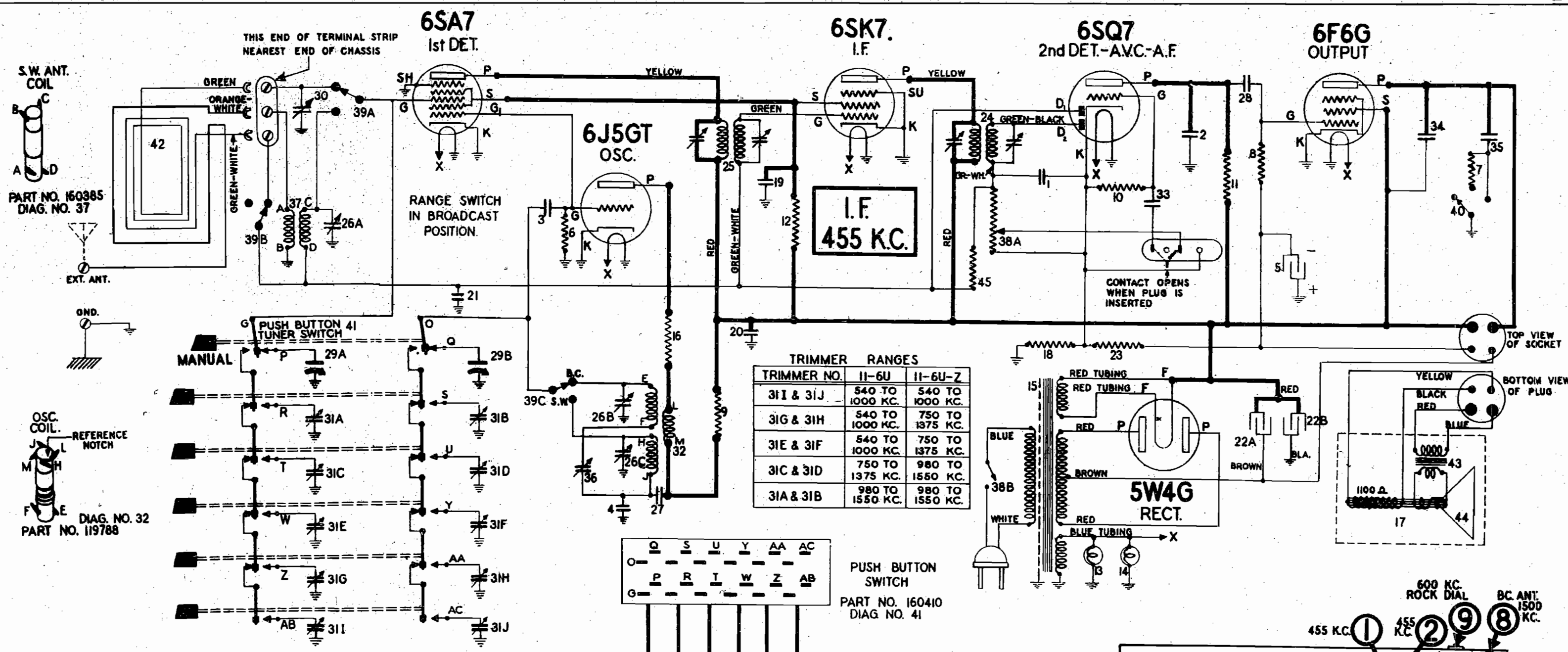


NOTE A: Voltage on the screen of the 35L6GT cannot be measured with the ordinary voltmeter because of the high resistance of resistor No. 6.

Use a voltmeter of at least 1000 ohms per volt.

STEWART-WARNER CORP. MODELS 11-6U1 to 11-6U9, 11-6U1-Z to 11-6U9-Z

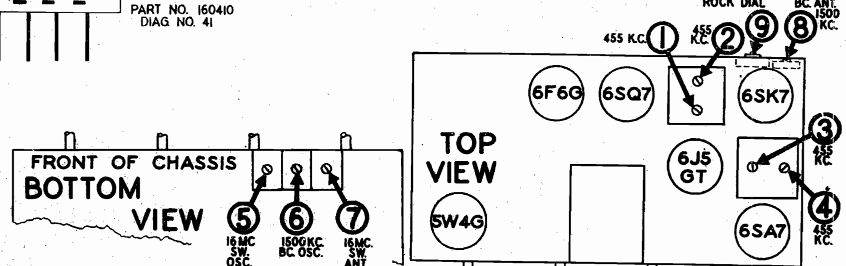
Chassis 11-6U, 11-6U-Z



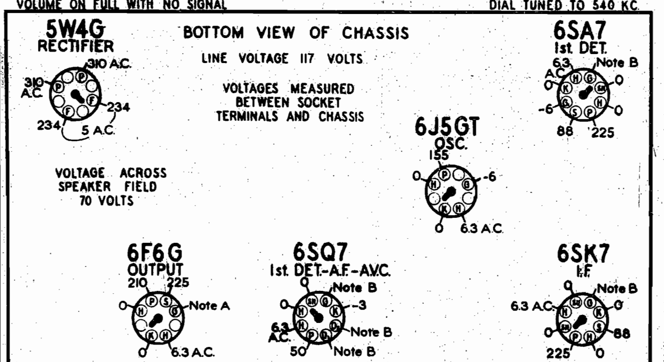
TRIMMER RANGES

TRIMMER NO.	11-6U	11-6U-Z
31I & 31J	540 TO 1000 KC.	540 TO 1000 KC.
31G & 31H	540 TO 1000 KC.	750 TO 1375 KC.
31E & 31F	540 TO 1000 KC.	750 TO 1375 KC.
31C & 31D	750 TO 1375 KC.	980 TO 1550 KC.
31A & 31B	980 TO 1550 KC.	980 TO 1550 KC.

FOR ALIGNMENT, DRIVE CORD DATA, SEE INDEX



SOCKET VOLTAGES



NOTE A: Bias for the 6F6G output tube is 14 volts measured across resistors 18 and 23.
NOTE B: Bias for the 6SA7 1st selector, and 6SK7 I. F. tubes and the voltage appearing on the diodes and grid of the 6SQ7 is 3 volts measured across resistor No. 18.

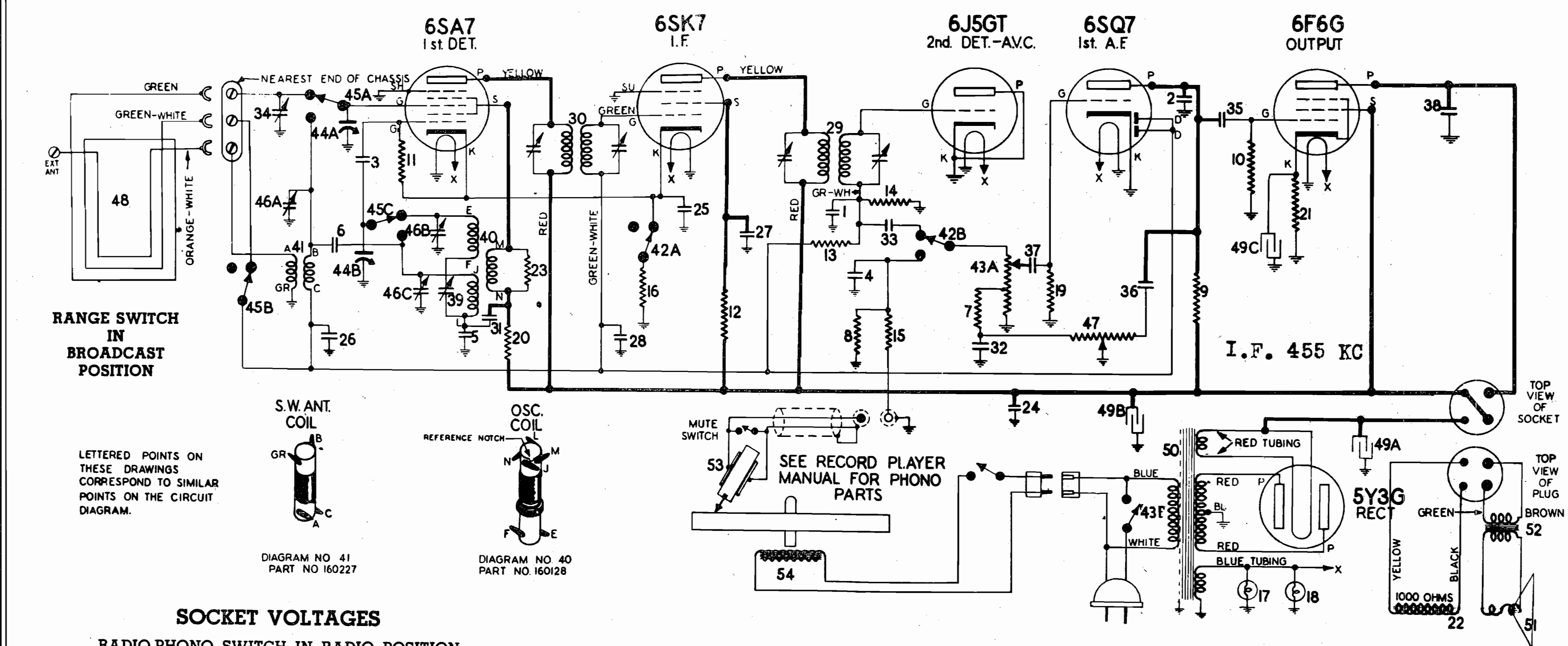
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	85061	Condenser—mica 51 mmfd.	.15
4	88587	Condenser—mica .0042 mfd.	.35
5	110377	Condenser—electrolytic 10 mfd. 35 volt	.80
6	110552	Resistor—carbon 47,000 ohms 1/4 watt	.12
7	110557	Resistor—carbon 4,700 ohms 1/4 watt	.12
8	110559	Resistor—carbon 470,000 ohms 1/4 watt	.12
9	110576	Resistor—carbon 10,000 ohms 1/2 watt	.12
10	110580	Resistor—carbon 3.3 meg. 1/4 watt	.12
11	110591	Resistor—carbon 680,000 ohms 1/4 watt	.12
12	110592	Resistor—carbon 22,000 ohms 1 watt	.12
13-14	112636	Lamp—dial (frosted) 6-8 volt .25 amp.	.25
15	112887	Transformer—power 117 volt 60 cycle	3.50
	112836	Transformer—power 117 volt 25 cycle	5.00
16	112994	Resistor—carbon 220 ohm 1/4 watt	.16
17	M-115115	Speaker—dynamic—8"	6.80
18	116275	Resistor—wire wound 50 ohms 1/2 watt	.15
19-20	116625	Condenser—.1 mfd. 600 volt	.25
21	116819	Condenser—.05 mfd. 600 volt	.20
22A, 22B	117034	Condenser (Electrolytic) 15 mfd. 450 volt, 10 mfd. 450 volt	1.45
23	118812	Resistor—180 ohms 1 watt wire wound	.12
24	119024	Transformer—2nd I. F.	1.15
25	119042	Transformer—1st I. F.	1.10
26A to 26C	119174	Condenser—trimmer (3 section)	.45
27-28	119193	Condenser—.01 mfd. 600 volt	.15
29A-29B	119291	Condenser—variable tuning	2.75
30	119345	Condenser—trimmer	.20
31A to 31J	119663	Condenser—P. B. trimmers (med. freq.)	.24
	119664	Condenser—P. B. trimmers (high freq.)	.24
	119753	Condenser—P. B. trimmers (low freq.)	.24
32	119788	Coil—oscillator	.85
33-34	119817	Condenser—.004 mfd. 600 volt	.15
35	119880	Condenser—.04 mfd. 600 volt	.20
36	119934	Condenser—padder	.36
37	160385	Coil—short wave antenna	.60
38A-38B	160407	Volume control—with switch	1.40
39A to 39C	160408	Switch—range	.76
40	160409	Switch—tone	.60
41	160410	Switch—push button	2.50
42	160454	Loop antenna—complete	1.60
43	M-160618	Transformer—output for M-115115 spkr.	1.50
44	M-160619	Cone & Voice coil for M-115115 spkr.	1.25
45	110580	Resistor—carbon 3.3 meg. 1/4 watt	.12

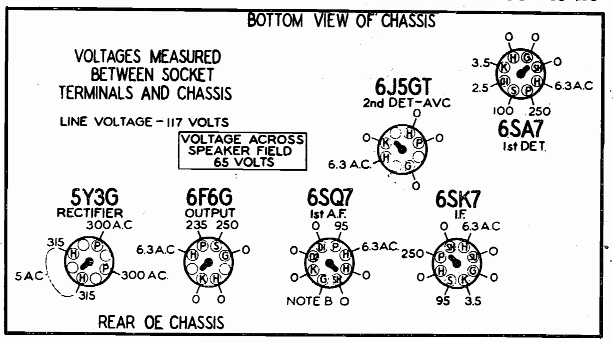
MODELS 11-6V1 to 11-6V9
Chassis 11-6V

STEWART-WARNER CORP.



SOCKET VOLTAGES

RADIO-PHONO SWITCH IN RADIO POSITION
VOLUME ON FULL WITH NO SIGNAL DIAL TUNED TO 540 KC



USE A 1000 OHM PER VOLT — VOLTMETER

NOTE B: The bias for 6SQ7 grid, provided by resistor No. 19, can not be measured with any ordinary instrument.

FOR ALIGNMENT, TRIMMER LOCATIONS, DIAL DRIVE, SEE INDEX

ELECTRICAL PARTS

Diagram No.	Part No.	Description	List Price
1-2	83783	Condenser—mica 110 mmfd.	$ .20
3	85061	Condenser—mica 51 mmfd.	.15
4	85394	Condenser—mica 510 mmfd.	.25
5	88587	Condenser—mica .0042 mfd.	.35
6	161315	Condenser—wire 5 mmfd.	.18
7	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
8-9	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
10	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
11-12	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
13	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
14-15	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
16	110590	Resistor—carbon 180 ohms ¼ watt	.12
17-18	110629	Dial Light Bulb—6.3 volt (Mazda No. 44)	.15
19	112975	Resistor—carbon 10 meg. ¼ watt	.12
20	112997	Resistor—carbon 22,000 ohms 1 watt	.15
21	114335	Resistor—wire wound 430 ohms 2 watts	.20
22	M-115112	Speaker—dynamic (10")	8.20
23	116068	Resistor—680 ohms ¼ watt	.10
24	116625	Condenser—.1 mfd. 600 volt	.25
25	116706	Condenser—.2 mfd. 600 volt	.35
26 to 28	116819	Condenser—.05 mfd. 600 volt	.20
29	119024	Transformer—2nd I.F.	1.15
30	119042	Transformer—1st I.F.	1.10
31-32-33	119193	Condenser—.01 mfd. 600 volt	.15
34	119345	Condenser—trimmer	.20
35	119414	Condenser—.02 mfd. 600 volt	.15
36	119417	Condenser—.006 mfd. 600 volt	.15
37	119817	Condenser—.004 mfd. 600 volt	.15
38	119875	Condenser—.002 mfd. 600 volt	.15
39	119934	Condenser—padder	.36
40	160128	Coil—oscillator	.70
41	160227	Coil—S. W. antenna	.58
42A-42B	160237	Switch—"Radio-Phono"	.60
43A-43B	160238	Volume control—1 meg. (with switch)	1.40
44A-44B	160247	Condenser—tuning—complete with P. B. tuner	5.15
45A to 45C	160334	Range switch	.70
46A to 46C	160344	Condenser—trimmer (3 section)	.45
47	160361	Tone control—1 meg.	.95
48	161189	Loop antenna complete	1.70
49A to 49C	161193	Condenser—electrolytic A-20 mfd.—450 volt, B-15 mfd.—450 volt, C-10 mfd.— 25 volt	1.60
50	161200	Transformer—power (50-60 cycles)	4.20
51	M-161214	Cone & Voice coil for M-115112 speaker	1.80
52	M-161215	Transformer—output for M-115112 speaker	1.60
53	161289	Crystal cartridge	5.00
54	160086	Motor (60 cycle)	6.95

STEWART-WARNER CORP.

Chassis 11-6U, 11-6U-Z
Chassis 11-6V
Chassis 15-5Y

ALIGNMENT PROCEDURE

CHASSIS 15-5Y

1. Connect the output meter across the voice coil of the speaker between the plate of the 3Q5GT output tube and chassis through a .1 mfd. condenser, 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 chassis through a .25 mfd. condenser.
3. The set can be aligned either using battery or power line operation.
4. Turn the volume control to the maximum volume position and keep it in this position while aligning. The cabinet back must be connected as shown in the figure below.
5. With the gang condenser in full mesh, the dial pointer should point to the last mark on the low frequency end of the dial scale. If the pointer is incorrectly set, hold the gang in full mesh and move the pointer to the correct position by hand.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
200 MMFD. Condenser	Lug on Front Section of Gang Condenser	455 KC.	Any Point Where It Does Not Affect Signal	1*	2nd I.F.	Adjust the screws on the top of each I.F. can for maximum output. Then repeat adjustment.
				2-3	1st I.F.	
200 MMFD. Condenser	"A" Terminal	1500 KC.	1500 KC	4 (On rear section of variable condenser)	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	"A" Terminal	1500 KC.	Tune To 1500 KC Generator Signal	5 (Located on cabinet back)	Broadcast Antenna	Adjust for maximum output.

Now disconnect the output meter and signal generator leads and replace the chassis and batteries in the cabinet being sure to connect the loop. Bring the antenna lead of the signal generator near the loop until the 1500 KC. signal is heard weakly and re-adjust trimmer No. 5 for maximum output by ear.

ALIGNMENT PROCEDURE FOR 11-6U and 11-6U-Z CHASSIS RECEIVER MODELS 11-6U1 to 11-6U9 and 11-6U1-Z to 11-6U9-Z

1. Connect the ground lead of the signal generator to the chassis.
2. Turn the volume control to maximum volume during entire alignment.
3. Set the pointer to last mark on low frequency end of dial with gang in full mesh.
4. Connect an output meter to read audio output.

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	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.
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	1500 KC	6	Broadcast Oscillator (Shunt)	Adjust for maximum output.
400 OHM Carbon Resistor	External Antenna Terminal	16 MC	Foreign	Tune to 16 MC Generator Signal	7	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and retuning receiver dial until maximum output is obtained.
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	PLACE CHASSIS IN CABINET BEFORE MAKING ADJUSTMENTS No. 8 & 9. Adjust for maximum output.
No Connection	Lead from Sig. Gen. Placed Near Loop	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: Chassis must be in cabinet when making adjustments 8 & 9.

ALIGNMENT PROCEDURE FOR 11-6V CHASSIS

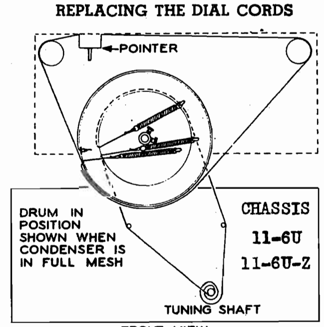
NOTE: THIS SET MAY BE COMPLETELY ALIGNED WITHOUT REMOVING FROM THE CABINET.

1. Connect the loop as indicated in the circuit diagram and keep it in the circuit at all times.
2. Connect the output meter across the voice coil or from the plate of the 6F6G output tube to ground through a .1 mfd. condenser. Connect the ground lead of the signal generator to the receiver chassis.
3. Turn volume control to the maximum position and keep it in this position throughout alignment 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	Lug on Section of Gang Cond. Nearest Drum	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	Screw on Side of Loop Antenna	16 MC	Short Wave	16 MC	5	Short Wave 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	Screw on Side of Loop Antenna	16 MC	Short Wave	Tune to 16 MC Generator Signal	6	Short Wave 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	Screw on Side of Loop Antenna	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator	Adjust for maximum output.
200 MMFD. Mica Condenser	Screw on Side of Loop Antenna	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8*	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	Screw on Side of Loop Antenna	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.

*NOTE: ADJUSTMENTS No. 8 AND No. 9 MUST BE MADE WITH THE SET IN THE CABINET AND WITH LOOP LEADS IN THEIR FINAL POSITION.

REPLACING THE DIAL CORDS

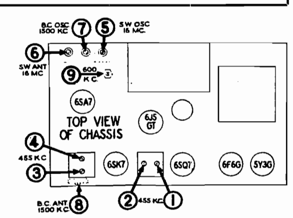


FRONT VIEW

The set-screws holding the drum may be loosened so that the most convenient positions for stringing the cords may be found, since it will be necessary to turn the drum on the condenser shaft in order to reach the tabs.

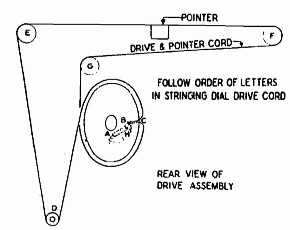
A pair of long-nosed pliers is useful for attaching the springs.

If the dial scale is to be replaced, it will be found that there is a notch in the metal dial plate behind it, permitting easy access to the drive mechanism.



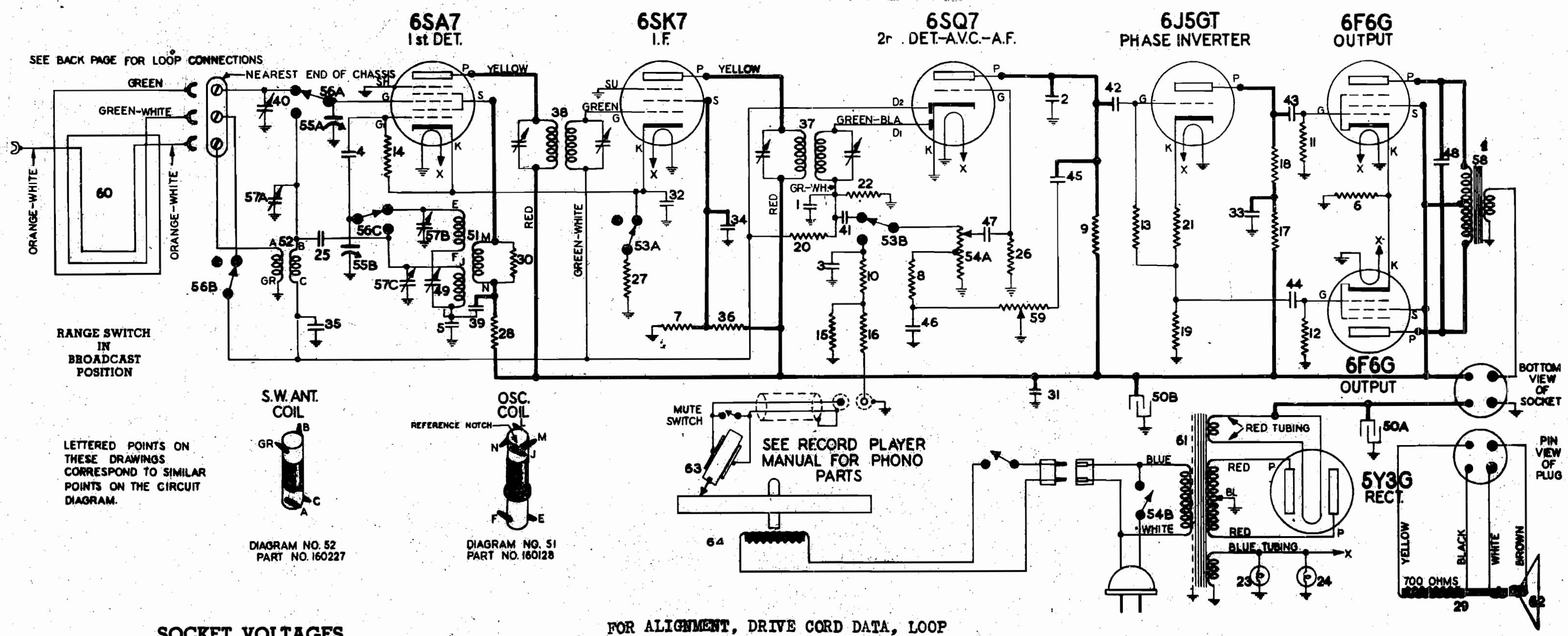
CHASSIS 11-6V

DIAL DRIVE ASSEMBLY



MODELS 11-7A1 to 11-7A9
Chassis 11-7A

STEWART-WARNER CORP.

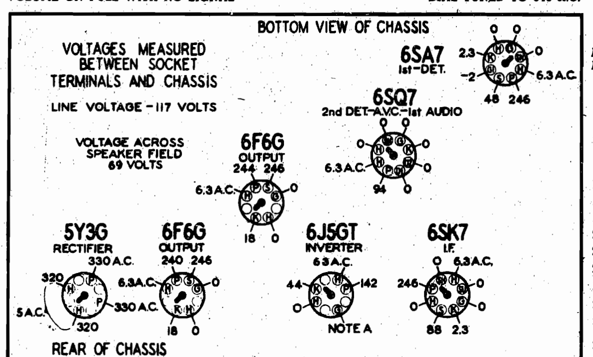


FOR ALIGNMENT, DRIVE CORD DATA, LOOP CONNECTIONS AND TRIMMER LOCATIONS, SEE INDEX

I.F. 455 KC

SOCKET VOLTAGES

RADIO-PHONO SWITCH IN RADIO POSITION.
VOLUME ON FULL WITH NO SIGNAL
DIAL TUNED TO 540 K.C.



USE A HIGH RESISTANCE VOLTMETER OF 1000 OHMS PER VOLT.

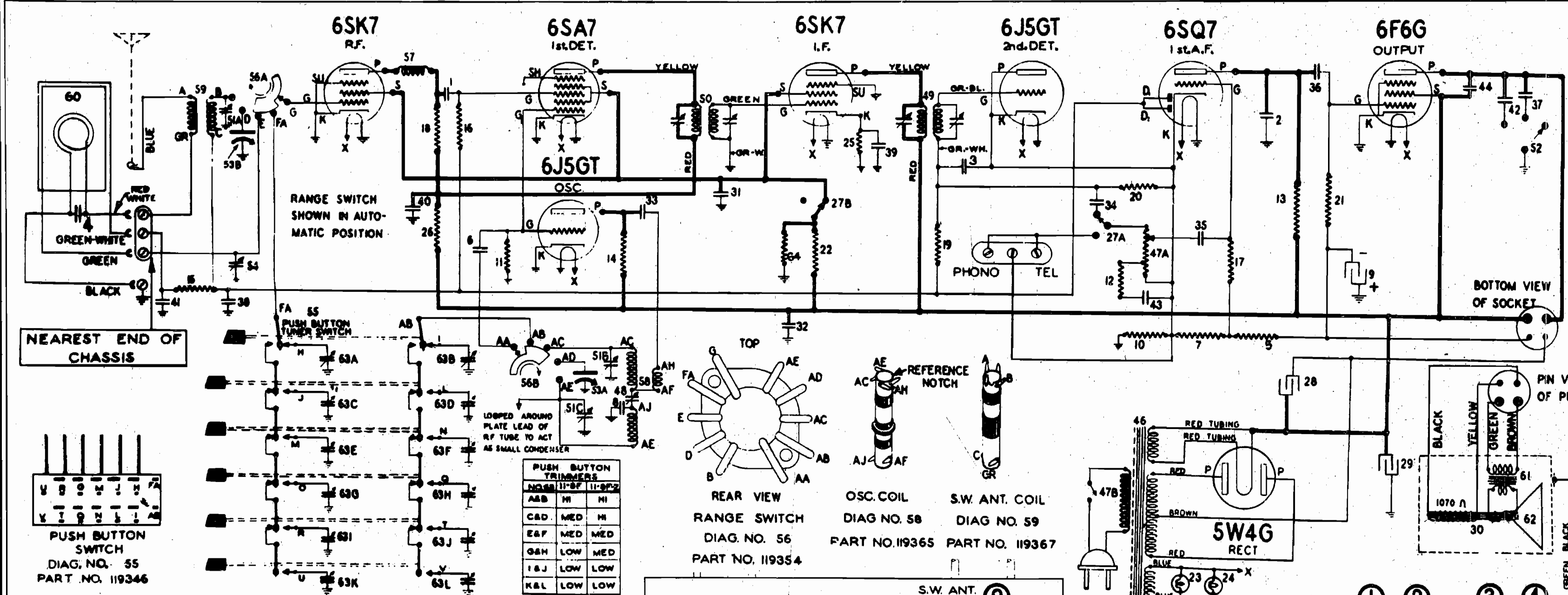
NOTE A: Bias for the 6J5GT phase inverter is -2.5 volts measured across resistor No. 21.

ELECTRICAL PARTS

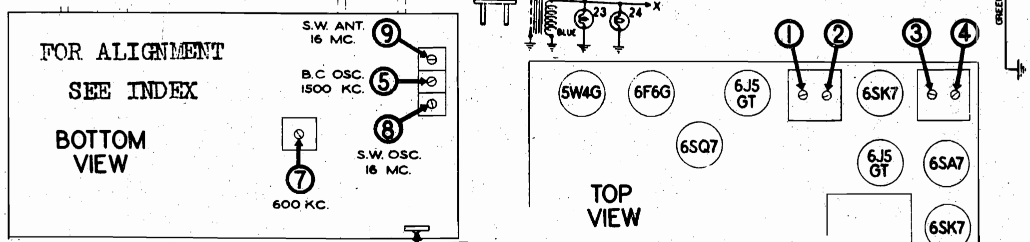
Diagram Number	Part Number	Description	List Price
1-2-3	83539	Condenser—mica 260 mmfd.	$ .20
4	85061	Condenser—mica 51 mmfd.	.15
5	88587	Condenser—mica .0042 mfd.	.35
6	89439	Resistor—240 ohms 2 watts wire wound	.12
7-8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9-10	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
11 to 13	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
14 to 16	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
17 to 19	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
20	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
21	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
22	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
23-24	110628	Dial Lamp—6.3 volt (Mazda No. 44)	.15
25	161315	Condenser—(twisted wire) 5 mmfd.	.18
26	112975	Resistor—carbon 10 meg. ¼ watt	.12
27	112994	Resistor—carbon 220 ohms ¼ watt (used in some sets)	.16
	88461	Resistor—carbon 150 ohms ¼ watt	.12
28	112997	Resistor—carbon 22,000 ohms 1 watt	.15
29	M-115109	Speaker	7.00
30	116068	Resistor—680 ohms ¼ watt	.10
31	116625	Condenser—.1 mfd. 600 volt	.25
32-33	116706	Condenser—.2 mfd. 600 volt	.35
34-35	116819	Condenser—.05 mfd. 600 volt	.20
36	118820	Resistor—carbon 47,000 ohms 1 watt	.12
37	119024	Transformer—2nd I.F.	1.15
38	119042	Transformer—1st I.F.	1.10
39	119193	Condenser—.01 mfd. 600 volt	.15
40	119345	Condenser—trimmer	.20
41	119875	Condenser—.002 mfd. 600 volt	.15
42 to 44	119414	Condenser—.02 mfd. 600 volt	.15
45	119417	Condenser—.006 mfd. 600 volt	.15
46	119817	Condenser—.004 mfd. 600 volt	.15
47-48	119875	Condenser—.002 mfd. 600 volt	.15
49	119934	Condenser—padder	.36
50A-50B	160008	Condenser—electrolytic (A-30 mfd. 450 volts, B-15 mfd. 450 volts)	1.50
51	160128	Coil—oscillator	.70
52	160227	Coil—S. W. Antenna	.58
53A-53B	160237	Switch—(Radio-Phono)	.60
54A-54B	160238	Volume control—1 meg. (with switch)	1.40
55A-55B	160247	Condenser—tuning—complete with P.B. tuner	5.15
56A to 56C	160334	Range switch	.70
57A to 57C	160344	Condenser—trimmer (3 section)	.45
58	160358	Transformer—output	1.58
59	160361	Tone control—1 meg.	.95
60	160377	Loop antenna—complete (for Model 11-7A8 only)	3.00
	160383	Loop antenna—complete (for Model 11-7A9 only)	3.00
61	160390	Transformer—power (50-60 cycle)	4.80
62	M-160457	Cone & Voice coil for M-115109 Speaker	1.80
63	161289	Crystal cartridge	5.00
64	160086	Motor (60 cycle)	6.95

STEWART-WARNER CORP.

MODELS 11-8F1 to 11-8F9
11-8F1-Z to 11-8F9-Z
Chassis 11-8F, 11-8F-Z

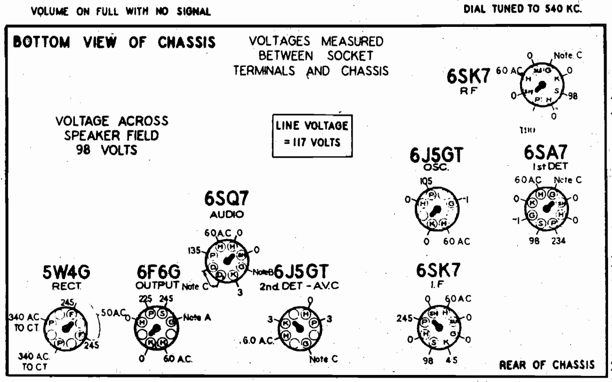


PRICES SUBJECT TO CHANGE WITHOUT NOTICE



SOCKET VOLTAGES

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.



All measurements made with a voltmeter of 1000 ohms per volt.

NOTE A: Bias for the 6F6G output tube is —23.5 volts measured across resistors No. 10, 7 & 5.

NOTE B: Voltage on the triode grid of the 6SQ7 audio tube is —2 volts measured across resistor No. 7.

NOTE C: Bias for the 6SK7 R.F and 6SA7 1st det. grids and voltage on the 6J5GT 2nd det. grid and diode plates on 6SQ7 is —3 volts measured across resistor No. 10.

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	88460	Resistor—wire wound 150 ohms ½ watt	.12
6	85061	Condenser—mica 51 mmfd.	.15
7	88465	Resistor—25 ohms ½ watt W.W.	.15
8	88587	Condenser—mica .0042 mfd.	.35
9	110377	Condenser—electrolytic 10 mfd. 35 volt	.80
10	110534	Resistor—wire wound 40 ohms ½ watt	.12
11-12	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
13	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
14	110558	Resistor—carbon 33,000 ohms ½ watt	.12
15	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
16	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
17	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
18	112954	Resistor—carbon 10,000 ohm—1 watt	.16
19	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
20-21	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
22	112953	Resistor—carbon 10,000 ohms 3 watts	.25
23-24	110629	Lamp—6.3 volt—.25 amps.	.15
25	112978	Resistor—insulated 470 ohms ¼ watt	.12
26	112980	Resistor—carbon 1000 ohms ¼ watt	.15
27A-27B	114141	Switch—D.P.D.T.	.44
28-29	114972	Condenser—electrolytic 16 mfd. 450 volt	.78
30	U-115091	Speaker—dynamic 10"	8.75
31-32	116625	Condenser—.1 mfd. 600 volt	.25
33 to 37	116640	Condenser—.01 mfd. 600 volt	.15
38 to 41	116819	Condenser—.05 mfd. 600 volt	.20
42-43	116893	Condenser—.02 mfd. 600 volt	$0.15
44	117022	Condenser—.002 mfd. 600 volt	.15
46	118665	Transformer—power	6.00
47A-47B	118669	Volume control with switch 1 meg.	1.40
48	118919	Condenser—padding	.40
49	119024	Transformer—2nd I.F.	1.15
50	119042	Transformer—1st I.F.	1.10
51A-51B-51C	119174	Condenser—trimmer—3 section	.45
52	119289	Switch—tone	.60
53A-53B	119291	Condenser—variable tuning	2.75
54	119345	Condenser—trimmer	.20
55	119346	Switch—push button	2.25
56A-56B	119354	Switch—range	.90
57	119362	Coil—compensating	.25
58	119365	Coil—oscillator	.75
59	119367	Coil—S. W. antenna	.65
60	161301	Loop Antenna Complete	3.00
61	U-119464	Transformer—output for U-115091 speaker	1.50
62	U-119465	Cone & Voice coil for U-115091 speaker	2.50
63A to 63L	119662	Condenser—push button trimmer (Low) 540 to 1000 KC.	.24
63A to 63L	119663	Condenser—push button trimmer (Med.) 750 to 1375 KC.	.24
63A to 63L	119664	Condenser—push button trimmer (Hi) 980 to 1550 KC.	.24
64	112999	Resistor—carbon 33,000 ohm 1 watt	.20

Chassis 11-8F, 11-8F-Z
Chassis 11-10A, 11-10A-Z

STEWART-WARNER CORP.

ALIGNMENT PROCEDURE FOR 11-8F & 11-8F-Z CHASSIS

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 position and keep it in this position throughout the alignment procedure.
4. 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 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.	
No Connection	Lead from Sig. Gen. placed near Loop	1500 KC	Broadcast	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. placed near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	6*	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. placed near Loop	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	Blue Wire from Chassis	16 MC	Foreign	16 MC	8	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	Blue Wire from Chassis	16 MC	Foreign	Tune to 16 MC Generator Signal	9	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.

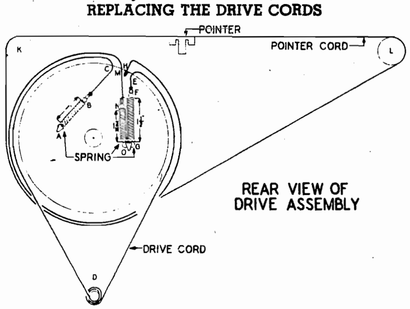
NOTES FOR 11-10A and 11-10A-Z CHASSIS

AUDIO HOWLS

For proper operation, this chassis must be allowed to float on the rubber cushions on which it is mounted. If this is not done, the set may howl when receiving strong signals. Loosen the four bolts holding the chassis to the cabinet. The wood strips which support some chassis during shipment should be removed. Make sure that neither the control knobs, their shafts, nor any part of the dial mechanism touches the cabinet or the set may still howl.

NOTE: On chassis not stamped with the letter "S", tendency to howl or rumble may be eliminated in most cases by changing the value of condenser No. 60 from .01 mfd. to .002 mfd. Removing the rear rubber grommet on which the gang condenser is mounted and replacing it with a soft gum rubber grommet will also help. The washers and mounting bolt should not be replaced if this is done.

REPLACING THE DRIVE CORDS



REAR VIEW OF DRIVE ASSEMBLY

TO SET DRUM ON CONDENSER SHAFT

With the tuning condenser plates in the horizontal (half mesh) position, the holes in the drum should be at the top. To change position of drum, loosen set screws.

TO REPLACE DIAL DRIVE CORD

1. Make a one inch loop in end of cord (Part No. 117057) using a dial cord clip (Part No. 114955).
2. Fasten a tension spring (Part No. 113177) to tab A and one end of the cord to the spring at point B.
3. Pass the other end of the dial cord through hole C on the rear of the drum.
4. Make two and one half turns of the cord about tuning shaft D.
5. Continue the cord to hole E in the rear of the drum.
6. The cord length should be adjusted so that the springs will be stretched to approximately the dimension indicated. Fasten a tension spring (Part No. 113177) to the cord by forming a new loop at F and then fasten spring to tab G.

TO REPLACE THE POINTER DRIVE CORD

1. Fasten an eyelet (Part No. 88348) at a point one-half inch from one end of the cord (Part No. 117057).
2. Pass cord through hole H at the front of the drum.
3. Continue cord clockwise around drum and around pulley K.
4. From pulley K go over pulley L and around front of drum through hole M.
5. The length of cord should be adjusted until the spring is stretched to approximately the length indicated. Fasten cord to spring at point N with a loop and clip as indicated.
6. Fasten spring to tab O.

TO SET POINTER

The pointer should be set to 540 K.C. on the dial scale when the tuning condenser is in full mesh. Cement pointer to cord at this point and allow to dry before moving.

ALIGNMENT PROCEDURE FOR 11-10A & 11-10A-Z CHASSIS

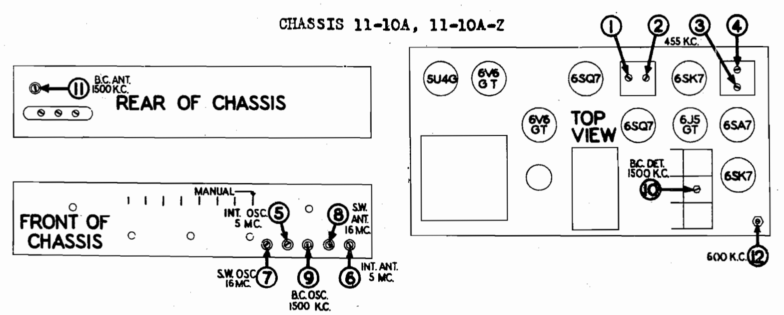
1. Connect the output meter across the voice coil or from plate to plate of the 6V6GT output tubes through a .1 mfd. condenser. (The more sensitive type should be connected across the voice coil.)
2. Connect the ground lead of the signal generator to the receiver chassis and change the black wire from the outer to the inner clip on top of the loop drum.
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.
5. The loop must be connected as indicated in circuit diagram at all times.
6. With some signal generators, it may be found that the signal cannot be reduced to a useable value using the dummy antennas recommended below. In such cases the signal generator may be disconnected entirely from the set and the R. F. lead of the signal generator placed in the vicinity of the loop. On the Short Wave position the shield wire (black) may be disconnected from its jack and the output of the signal generator connected to the black wire through a 400 ohm resistor.

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	Black Wire from Loop	5 MC	Intermediate	5 MC	5	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	Black Wire from Loop	5 MC	Intermediate	Tune to 5 MC Generator Signal	6	Intermediate Antenna	Adjust for Maximum Output.
400 OHM Carbon Resistor	Black Wire from Loop	16 MC	Short Wave	16 MC	7	Short Wave 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	Black Wire from Loop	16 MC	Short Wave	Tune to 16 MC Generator Signal	8	Short Wave 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	Clip on Side of Loop Drum	1500 KC	Broadcast	1500 KC	9	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
Trimmers 10, 11 & 12 must be aligned after chassis and loop are placed in the cabinet.							
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	1500 KC	Broadcast	1500 KC	10	Broadcast Detector	Adjust for Maximum Output.
					11*	Broadcast Antenna	
200 MMFD. Mica Condenser	Clip on Side of Loop Drum	600 KC	Broadcast	Tune to 600 KC Generator Signal	12*	Broadcast Oscillator (Series Padder)	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

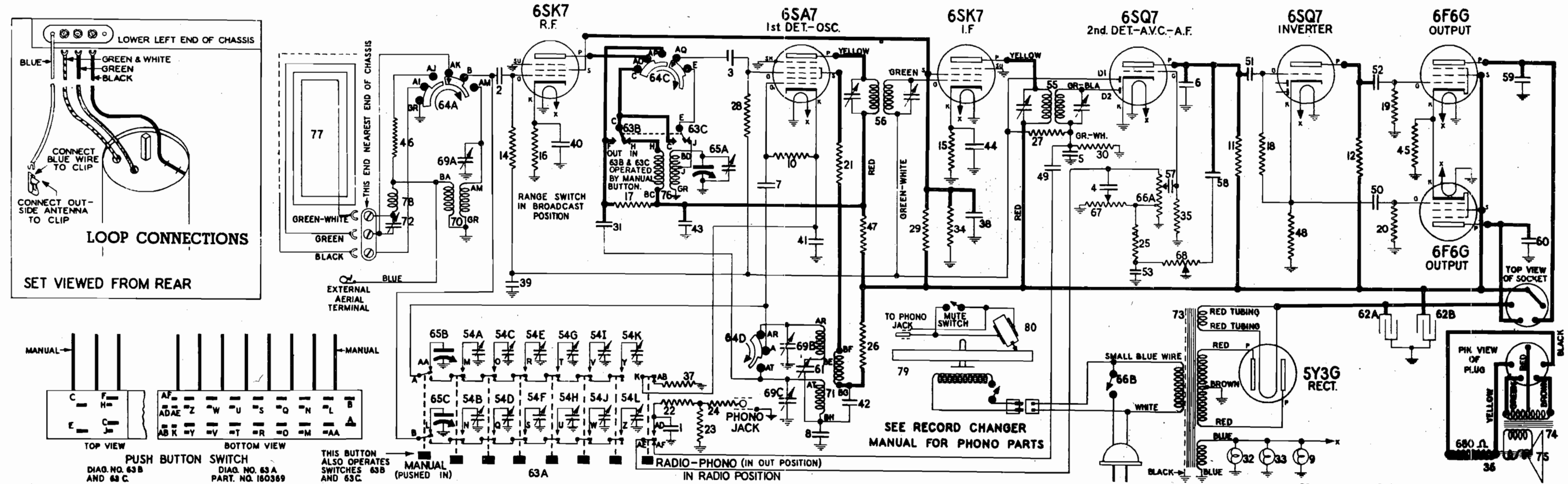
*Trimmers 11 and 12 may be adjusted using the radiated signal from the signal generator.

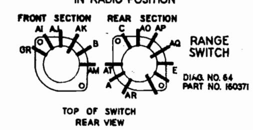
TRIMMER LOCATIONS

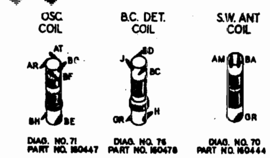
CHASSIS 11-10A, 11-10A-Z



STEWART-WARNER CORP. MODELS 11-8D1 to 11-8D9
11-8D1-Z to 11-8D9-Z
Chassis 11-8D, 11-8D-Z







PUSH BUTTON TRIMMER RANGES

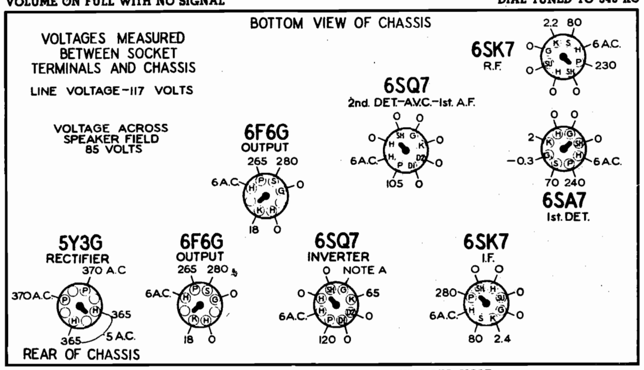
TRIMMER CONDENSERS	11-8D RANGE	11-8D-Z RANGE
54K & 54L	540 KC. to 1000 KC.	540 KC. to 1000 KC.
54I & 54J	540 KC. to 1000 KC.	540 KC. to 1000 KC.
54G & 54H	540 KC. to 1000 KC.	750 KC to 1375 KC.
54E & 54F	750 KC to 1375 KC.	750 KC to 1375 KC.
54C & 54D	750 KC to 1375 KC.	980 KC. to 1550 KC.
54A & 54B	980 KC. to 1550 KC.	980 KC. to 1550 KC.

I.F. 455 KC

SOCKET VOLTAGES

RANGE SWITCH IN BROADCAST POSITION
VOLUME ON FULL WITH NO SIGNAL

MANUAL BUTTON PUSHED IN
DIAL TUNED TO 540 KC



USE A HIGH RESISTANCE VOLTMETER OF 1000 OHMS PER VOLT

NOTE A: The voltage between chassis and the grid of the 6SQ7 Phase Inverter is 65 volts. This voltage cannot be measured with a meter of 1000 ohms per volt because of the high resistance of resistor No. 18.

FOR OTHER DATA SEE INDEX

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	81155	Condenser—500 mmfd. mica	$ .25
2 to 4	83539	Condenser—mica, 260 mmfd.	.20
5-6	83783	Condenser—mica, 110 mmfd.	.20
7	85563	Condenser—mica 26 mmfd.	.15
8	88587	Condenser—mica .0042 mfd.	.35
9	85296	Lamp—Turntable light, 6 to 8 volt (Mazda 51)	.16
10	110552	Resistor—carbon 47,000 ohms 1/4 watt	.12
11 to 13	110553	Resistor—carbon 220,000 ohms 1/4 watt	.12
14	110554	Resistor—carbon 1 megohm 1/4 watt	.12
15-16	110556	Resistor—carbon 330 ohms 1/4 watt	.12
17	110557	Resistor—carbon 4700 ohms 1/4 watt	.12
18 to 20	110559	Resistor—carbon 470,000 ohms 1/4 watt	.12
21	110560	Resistor—carbon 100 ohms 1/4 watt	.12
22 to 24	110564	Resistor—carbon 100,000 ohms 1/4 watt	.12
25	110566	Resistor—carbon 33,000 ohms 1/4 watt	.12
26	110567	Resistor—carbon 15,000 ohms 1/2 watt	.15
27	110570	Resistor—carbon 2.2 meg. 1/4 watt	.15
28	110578	Resistor—carbon 68,000 ohms 1/4 watt	.12
29	110581	Resistor—carbon 18,000 ohms 2 watt	.30
30	110584	Resistor—carbon 330,000 ohms 1/4 watt	.12
31	161315	Condenser—5 mmfd. (twisted wire)	.18
32-33	112636	Lamp—dial (frosted) 6-8 volt	.25
34	112954	Resistor—carbon 10,000 ohms 1 watt	.16
35	112975	Resistor—carbon 10 meg. 1/4 watt	.12
36	M-115110	Speaker—12 inch	12.00
37	116077	Resistor—carbon 150 ohms 1/4 watt	.12
38	116625	Condenser—.1 mfd. 600 volt	.25
39 to 44	116819	Condenser—.05 mfd. 600 volt	.20
45	117570	Resistor—wire wound 260 ohms 2 watt	.24
46	118804	Resistor—carbon 400 ohms 1/4 watt	.10
47	118824	Resistor—carbon 1500 ohms 1/2 watt	.12
48	118825	Resistor—carbon 180,000 ohms 1/4 watt	.12
49 to 52	119193	Condenser—.01 mfd. 600 volt	.15
53	117571	Condenser—.008 mfd. 600 volt	.15
54A to 54L	119662	Condenser—P. B. Trimmer (low freq.)	.24
54A to 54L	119663	Condenser—P. B. Trimmer (med. freq.)	.24
54A to 54L	119664	Condenser—P. B. Trimmer (high freq.)	.24
55	119024	Transformer—2nd I. F.	1.15
56	119042	Transformer—1st I. F.	1.10
57-58	119817	Condenser—.004 mfd. 600 volt	.15
59-60	119875	Condenser—.002 mfd. 600 volt	.15
61	113934	Condenser—padder	.36
62A-62B	160008	Condenser—electrolytic {A-30 mfd. 450 volts / B-15 mfd. 450 volts}	1.50
63A to 63C	160369	Push button switch	3.00
64A to 64D	160371	Range switch	1.00
65A to 65C	160373	Condenser—variable tuning	3.20
66A-66B	160412	Volume control—2 meg. (with switch)	1.40
67	160413	Tone control (5 meg.) treble	.85
68	160414	Tone control (1 meg.) bass	.95
69A to 69C	160415	Condenser—trimmer 3 section	.48
70	160444	Coil—short wave antenna	.54
71	160447	Coil—oscillator	.80
72	160449	Condenser—trimmer for loop	.18
73	160450	Transformer—power (50-60 cycle)	6.35
74	M-160464	Transformer—output for M-115110 speaker	1.60
75	M-160465	Cone & voice coil for M-115110 speaker	1.60
76	160478	R. F. coil (interstage B.C.)	.60
77	160572	Loop antenna complete	3.60
78	161228	Coil—loop compensating	.25
79	160086	Motor (60 cycle)	6.95
80	161289	Crystal cartridge	5.00

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Chassis 11-8D, 11-8D-Z
Chassis 11-8R

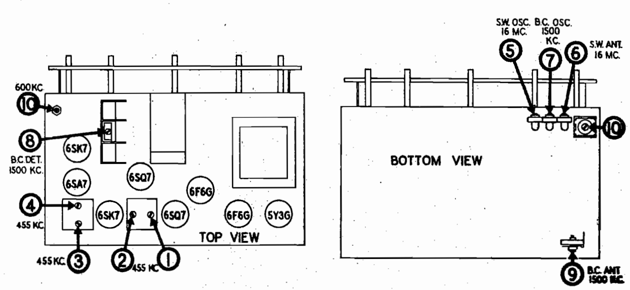
STEWART-WARNER CORP.

ALIGNMENT PROCEDURE FOR 11-8D & 11-8D-Z CHASSIS
RECEIVER MODELS 11-8D1 TO 11-8D9 & 11-8D1-Z TO 11-8D9-Z

1. PUSH THE MANUAL BUTTON IN AND KEEP IT PUSHED IN.
2. Connect the signal generator ground lead to the receiver chassis. Adjust the volume control to the maximum volume position and leave it in this position during entire alignment procedure.
3. Connect the output meter across the voice coil or from plate to plate of the 6F6G output tubes through a .1 mfd. condenser.

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	Blue Lead on Lower Left Chassis End	16 MC	Shortwave	16 MC	5	Shortwave 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	Blue Lead on Lower Left Chassis End	16 MC	Shortwave	Tune to 16 MC Generator Signal	6	Shortwave Antenna	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	1500 KC	7	Broadcast Oscillator (Shunt)	Adjust for Maximum Output.
Place chassis in cabinet before making adjustments 8, 9 and 10.							
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	8	Broadcast Detector	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. Placed Near Loop	1500 KC	Broadcast	Tune to 1500 KC Generator Signal	9	Broadcast Antenna	Adjust for Maximum Output.
No Connection	Lead from Sig. Gen. Placed Near Loop	600 KC	Broadcast	Tune to 600 KC Generator Signal	10	Broadcast Oscillator Series Padder	Adjust for Maximum Output. Try to Increase Output by Detuning Trimmer and Retuning Receiver Dial until Maximum Output is Obtained.

TRIMMER LOCATIONS- CHASSIS 11-8D and 11-8D-Z



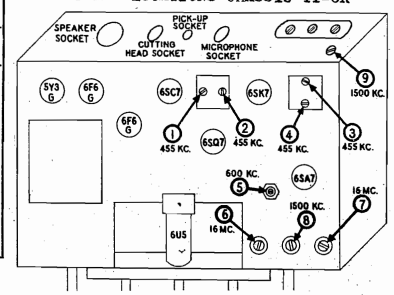
ALIGNMENT PROCEDURE FOR 11-8R CHASSIS

NOTE: This receiver may be completely aligned without removing the chassis from the cabinet.

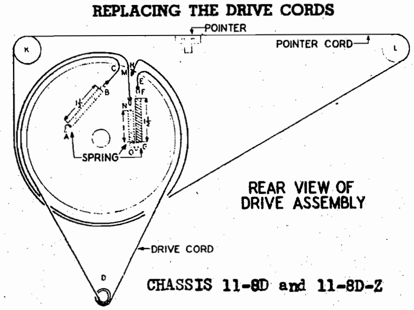
1. Connect the ground lead of the signal generator to the chassis, and the loop antenna to the proper terminals on the chassis back.
2. Push in the buttons marked "RADIO" and "RECOR.-OFF."
3. Connect the output meter across the voice coil or from plate to plate of the 6F6G output tubes through a .1 mfd. condenser.
4. Turn the volume and mixer control to the maximum clockwise position and keep it in this position throughout the entire alignment procedure.
5. With the gang condenser in full mesh, set the pointer so that it is in line with the graduation at the extreme left end of the dial scale.

Dummy Ant. In Series with Sig. Gen.	Connection of Sig. Generator Output To Receiver	Signal Generator Frequency	Band Switch Position	Receiver Dial Position	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD. Condenser	Lug on Gang Condenser Farthest From Drum	455 KC	Broadcast Position "B"	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
					3-4	1st I.F.	
400 OHM Resistor	Ext. Antenna Terminal	16 M.C.	Foreign Position "F"	16 M.C.	6	Foreign Oscillator (Shunt)	Adjust for maximum output. Check to see if proper peak is obtained by tuning in image at approx. 15.1 M.C. If image does not appear realign at 16 M.C. with trimmer screw farther out.
400 OHM Resistor	Ext. Antenna Terminal	16 M.C.	Foreign Position "F"	Tune in 16 M.C. Generator Signal	7	Foreign Antenna	Adjust for maximum output. Try to increase output by detuning trimmer and re-tuning receiver dial until maximum output is obtained.
200 MMFD. Mica Condenser	Ext. Antenna Terminal	1500 KC	Broadcast Position "B"	1500 KC	8	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	Ext. Antenna Terminal	1500 KC	Broadcast Position "B"	Tune in 1500 KC Generator Signal	9	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Condenser	Ext. Antenna Terminal	600 KC	Broadcast Position "B"	Tune in 600 KC Generator Signal	5	Broadcast Oscillator (Series)	Adjust for maximum output. Try to increase output by detuning trimmer and re-tuning receiver dial until maximum output is obtained.

TRIMMER LOCATIONS-CHASSIS 11-8R



REPLACING THE DRIVE CORDS



CHASSIS 11-8D and 11-8D-Z

DRIVE ASSEMBLY DATA
CHASSIS 11-8D, 11-8D-Z

TO REPLACE DIAL DRIVE CORD

1. Make a loop in end of cord (Part No. 117057) using a dial cord clip (Part No. 114955).
2. Fasten a tension spring (Part No. 113177) to tab A and one end of the cord to the spring at point B.
3. Pass the other end of the dial cord through hole C on the rear of the drum.
4. Make two and one half turns of the cord about tuning shaft D.
5. Continue the cord to hole E in the rear of the drum.
6. The cord length should be adjusted so that the springs will be stretched to approximately the dimension indicated. Fasten a tension spring (Part No. 113177) to the cord by forming a loop at F and then fastening spring to tab G.

TO REPLACE THE POINTER DRIVE CORD

1. Fasten an eyelet (Part No. 88348) at a point one-half inch from one end of the cord (Part No. 117057).
2. Pass cord through hole H at the front of the drum.
3. Continue cord around drum and around pulley K.
4. From pulley K go over pulley L and around front of drum through hole M.
5. The length of cord should be adjusted until the spring is stretched to approximately the length indicated. Fasten a spring to the cord at point N with a loop and clip as indicated.
6. Fasten spring to tab O.

TO SET POINTER

The pointer should be set to 540 K.C. on the dial scale when the tuning condenser is in full mesh. Cement pointer to cord at this point and allow to dry before moving.

REPLACING RANGE SWITCH

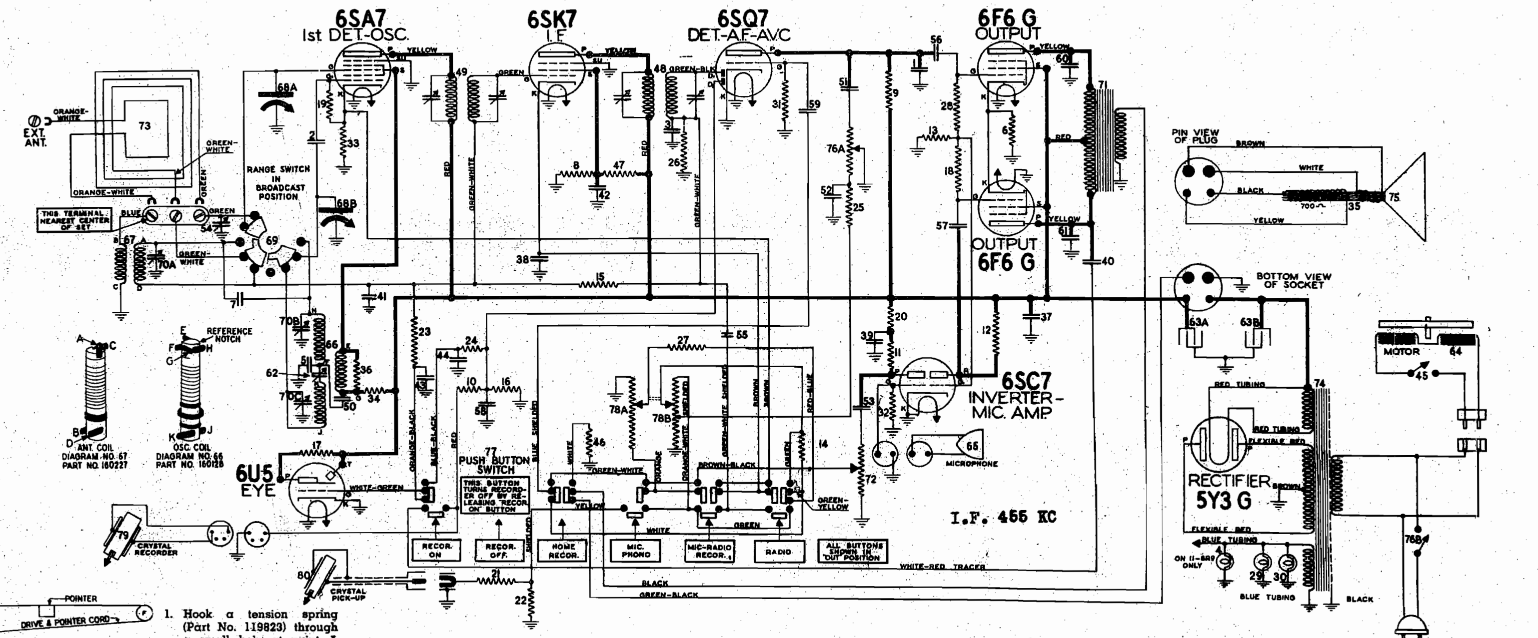
When replacing range switch, the simplest method of installation is to connect section nearest the top of the chassis first.

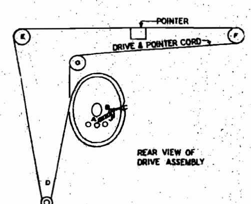
TO SET DRUM ON CONDENSER SHAFT

With tuning condenser plates in the horizontal (half mesh) position, the holes in the drum should be approximately in the position shown in the diagram. To change position of drum, loosen set screws.

STEWART-WARNER CORP. MODELS 11-8R8, 11-8R9

Chassis 11-8R



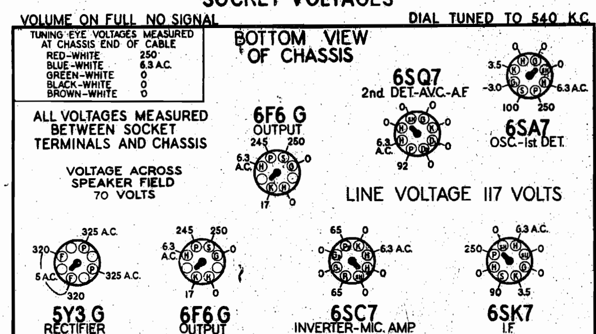


1. Hook a tension spring (Part No. 119823) through a small hole at point A and fasten end of cord (Part No. 113178) to spring at point B.
2. Pass the other end of the dial cord through hole C in Drum.
3. Continue up over dial drum, down through hole in dial mounting plate, around rubber grommet on tuning shaft and up to pulley E.
4. Pass cord over pulley E, thence around pulley F, and back over pulley G.
5. From pulley G place cord down around drum and up through hole C.
6. Slip cord through loop at end of spring B, adjust tension until spring is stretched to approximately seven-eighths inch and tie securely.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

FOR ALIGNMENT AND TRIMMER LOCATIONS, SEE INDEX

SOCKET VOLTAGES



USE A 1000 OHM PER VOLT — VOLTMETER

NOTE: ALL voltages measured with push button marked "Radio" pushed in.

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	83539	Condenser—mica 260 mmfd.	$ .20
2-3	85061	Condenser—mica, 51 mmfd.	.15
4	85296	Lamp—6 to 8 volt (Mazda 51) (11-8R9 only)	.16
5	88587	Condenser—mica .0042 mfd.	.35
6	89439	Resistor—240 ohms 2 watt wire wound	.12
7	161315	Condenser—wire 5 mmfd.	.16
8	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
9-10-11-12-13-14	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
15-16-17	110554	Resistor—carbon 1 megohm ¼ watt	.12
18	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
19-20-21-22	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
23-24	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
25	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
26	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
27	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
28	110594	Resistor—carbon 390,000 ohms ¼ watt	.12
29-30	110629	Dial light—6.3 volt	.15
31-32	112975	Resistor—carbon 10 meg. ¼ watt	.12
33	112894	Resistor—carbon 220 ohms ¼ watt (on early sets)	.16
	116077	Resistor—carbon 150 ohms ¼ watt (on late sets)	.12
34	112997	Resistor—carbon 22,000 ohms 1 watt	.15
35	M-115109	Speaker—dynamic 10"	7.00
36	116068	Resistor—680 ohms ¼ watt	.10
37	116625	Condenser—.1 mfd. 600 volt	.25
38-39-40	116706	Condenser—.2 mfd. 600 volt	.35
41-42-43-44	116819	Condenser—.05 mfd. 600 volt	.20
45	116964	Switch—"on-off" for phono motor (with escutcheon)	.32
46	118818	Resistor—3 ohms 2 watts wire wound	.15
47	118820	Resistor—carbon 47,000 ohms 1 watt	.12
48	119024	Transformer—2nd I.F.	1.15
49	119042	Transformer—1st I.F.	$1.10
50-51-52-53	119193	Condenser—.01 mfd. 600 volt	.15
54	119345	Condenser—trimmer	.20
55-56-57	119414	Condenser—.02 mfd. 600 volt	.15
58	119416	Condenser—.008 mfd. 600 volt	.15
59	119817	Condenser—.004 mfd. 600 volt	.15
60-61	119875	Condenser—.002 mfd. 600 volt	.15
62	119934	Condenser—padder	.36
63A-63B	160008	Condenser—electrolytic 30-15 mfd. 450 W. V.	1.50
64	160036	Motor for recorder (60 cycle)—11-8R8 & 11-8R9	8.00
65	160038	Microphone	12.50
66	160128	Coil—oscillator	.70
67	160227	Coil—S. W. antenna	.58
68A-68B	160247	Condenser—tuning—complete with P. B. tuner	5.15
69	160334	Range switch	.70
70A-70B-70C	160344	Condenser—trimmer (3 section)	.45
71	160358	Transformer—output	1.58
72	160361	Microphone Gain Control	.95
73	160377	Loop antenna—complete for model 11-8R8 only	3.00
	160383	Loop antenna—complete for model 11-8R9 only	3.00
74	160390	Transformer—power (50-60 cycle)	4.80
75	M-160457	Cone & voice coil for M-115109 speaker	1.80
76	160486	Tone control with switch	.95
77	160487	Switch—push button	2.30
78A-78B	160489	Volume control & mixer dual 1 meg.	2.00
79	161288	Crystal cartridge (recorder)	9.50
80	161289	Crystal cartridge (pickup)	5.00

MODELS 11-8R8, 11-8R9
Chassis 11-8R

STEWART-WARNER CORP.

RECORDER SERVICE DATA

ADDITIONAL RECORDER DATA GIVEN IN RECORDER SERVICE MANUAL FORM 9948

PUSH BUTTONS

The six push buttons shown on this circuit control the various functions of this receiver. The "RADIO," "MIC-RADIO-RECOR.", "MIC-PHONO" and "HOME RECOR." buttons are mechanically interconnected so that when any one of them is pushed in, it releases any of the other three which was pushed in.

The "RECOR. ON" and "RECOR. OFF" buttons are mechanically coupled to each other, but are independent of the other four buttons. Pushing in the "RECOR. ON" button releases the "RECOR. OFF" button and vise versa.

FUNCTIONS OF PUSH BUTTON CONTROLS

RADIO

Button In: Top of volume control, section (78B) of "Mixer & Volume Control" connects to diode load resistor No. 26 through coupling condenser No. 55. Slider of this control connects directly to grid of 6SQ7 through condenser No. 59, as resistor No. 14 is shorted out. Cathode circuit of 6SK7 tube completed through resistor No. 33.

Button Out: 6SK7 cathode circuit broken. Volume control disconnected from diode load resistor. Grid of 6SQ7 connected to slider of volume control section (78B) of "Mixer & Volume Control" through resistor No. 14 and to slider of Mixer Control, section 78A through resistor No. 27.

MIC-RADIO-RECOR.

Button In: Volume Control section, 78B of "Mixer & Volume Control" connected to diode load resistor No. 26 through coupling condenser No. 55. 6SK7 cathode circuit completed through resistor No. 33. Mixer Control, section 78A connected to slider of microphone gain control.

Button Out: Volume control, section 78B disconnected from diode load resistor. 6SK7 cathode circuit opened. Mixer, section 78A of control disconnected from slider of microphone gain control.

MIC. PHONO

Button In: Volume control, section 78B of "Mixer & Volume Control" connected to output of crystal pickup. Mixer, section 78A of control connected to slider of microphone gain control.

Button Out: "Mixer & Volume Control" disconnected from phonograph pickup and from microphone gain control.

HOME RECOR.

Button In: Silences speaker by opening voice coil and connecting secondary of output transformer to resistor No. 46. It also connects the grid of the 6SQ7 tube to the slider of the microphone gain control. "Mixer & Volume Control" is disconnected from the circuit.

Button Out: Speaker again operative—microphone gain control disconnected from 6SQ7 grid.

RECOR. OFF

Button In: Releases "RECOR. ON" button thus disconnecting recorder and volume indicator circuits.

Button Out: This indicates "RECOR. ON" button is pushed in, as described below.

RECOR. ON

Button In: Recorder crystal connected to 6F6G plate through condenser No. 40. Also causes recorder head voltage to be applied across resistors No. 10 and No. 16 and applies part of this voltage to diode of 6SQ7. The other section of this switch disconnects the 6U5 eye tube from the A.V.C. circuit and connects it to indicate the rectified voltage appearing across resistor No. 16 thus the eye indicates the voltage across the recorder crystal.

Button Out: This disconnects the recorder from the output tube and at the same time connects the 6U5 tube to the A.V.C. circuit so it functions as a conventional tuning indicator.

GENERAL RECORDER TROUBLE DATA

For complete recording mechanism service data, refer to the separate Recorder Service Manual, Form No. 9948, which will be published later. For data on the automatic record changer mechanism, refer to the service notes, in Form No. J-22200.

Receiver instructions, Form 9893, give complete data for the use of the recorder used in Model 11-8R8, Form 9895 Instructions give data for the operation of the recorder and record changer used in the model 11-8R9.

NOTE: Always turn the microphone gain control fully counter-clockwise when microphone is not being used. Howling may occur if this precaution is not observed.

IMPORTANT: It is essential that the recorder be placed on a level surface when making recordings. If the recorder does not stand in a level position, it will change the effective pressure of the cutting head and proper results cannot be obtained.

ADJUSTMENT OF CUTTING HEAD

Before attempting any adjustments of the cutting head, make certain that such adjustments are necessary by making a test recording using a new needle and a record blank of known quality.

DEFECTIVE CUTTING NEEDLE

A cutting needle is considered worn when the background hiss becomes objectionable, or when the thread cut from the record becomes ragged. A dull needle may also cause the depth of cut to be incorrect.

The condition of the cutting needle can be determined by examining the point by means of a powerful magnifying glass or low power microscope, and comparing it with a good needle viewed in a similar manner. Another good check on the condition of the cutting needle is the appearance of a freshly cut record. If the record has a dull or grayish appearance instead of its usual shiny appearance, the needle should be replaced.

ADJUSTING THICKNESS OF SHAVING

The proper thickness of the shaving produced when a record is cut is about the thickness of a human hair. If the cutting needle is sharp and in good condition, and the cutting head adjusted to give the correct depth of cut, the shaving should come off as a long continuous ribbon. With some types of recording blanks, the ribbon cut by the cutting needle will come off as a straight band, while with others it may produce a curly thread. This ribbon should not, however, be too fine or extremely crinkly as this indicates a dull cutting needle or insufficient pressure of the recording head.

When the cutting head is placed on a record blank, the needle locking screw should be halfway between the top and bottom of the hole in the head. The position of the cutting needle screw may be changed on the Model 11-8R8 by raising the cutter arm and adjusting the screw and lock nut under this arm. On Model 11-8R9 it is only necessary to adjust the screw near the pivot end of the recording arm, with a screwdriver.

The depth of cut can be varied on Model 11-8R8 by adjusting the screw at the center of the recording arm with a screwdriver. Clockwise rotation increases the thickness, while counter-clockwise rotation decreases the thickness of the shaving. This adjustment will have little effect if the needle is dull or damaged.

On Model 11-8R9 this adjustment is made by varying the position of the knob on the top of the recording arm. This knob has engraved upon it the letters "L," "M" and "H" indicating light, medium and heavy shavings. Adjustment should be made to compensate for different types of needles and record blanks if an examination of the record and shavings indicates that an adjustment is necessary. BEFORE ADJUSTING FOR THICKNESS OF SHAVING MAKE CERTAIN THAT THE CUTTING NEEDLE IS PROPERLY MOUNTED. ALSO TRY A NEW CUTTING NEEDLE, SINCE THE OLD ONE MAY BE WORN OR DAMAGED.

RECORDER HEAD INOPERATIVE

A quick check of the recorder head can be made by pushing in the "RECOR. ON" button and the "RADIO" button and then tuning in a station. If the recorder is operating, this fact is easily determined by holding the cutting needle of the cutter between the thumb and forefinger. Vibration of the needle indicates that the cutter head is in operating condition.

If the recorder does not operate, check first to determine if an A.C. voltage exists across the terminals of the recorder socket. This can best be measured using the 0-150 volt scale of a rectifier type A. C. Voltmeter. With proper recording volume the peaks of the voltage appearing across these terminals should be 80 to 120 volts. If no voltage exists under these conditions, check the contacts of the "RECOR. ON" switch, and the condenser No. 40 coupling the recorder to the 6F6G plate. If these circuits are found to be all right check the recorder crystal cartridge and replace if necessary.

CORRECT NEEDLE ANGLE

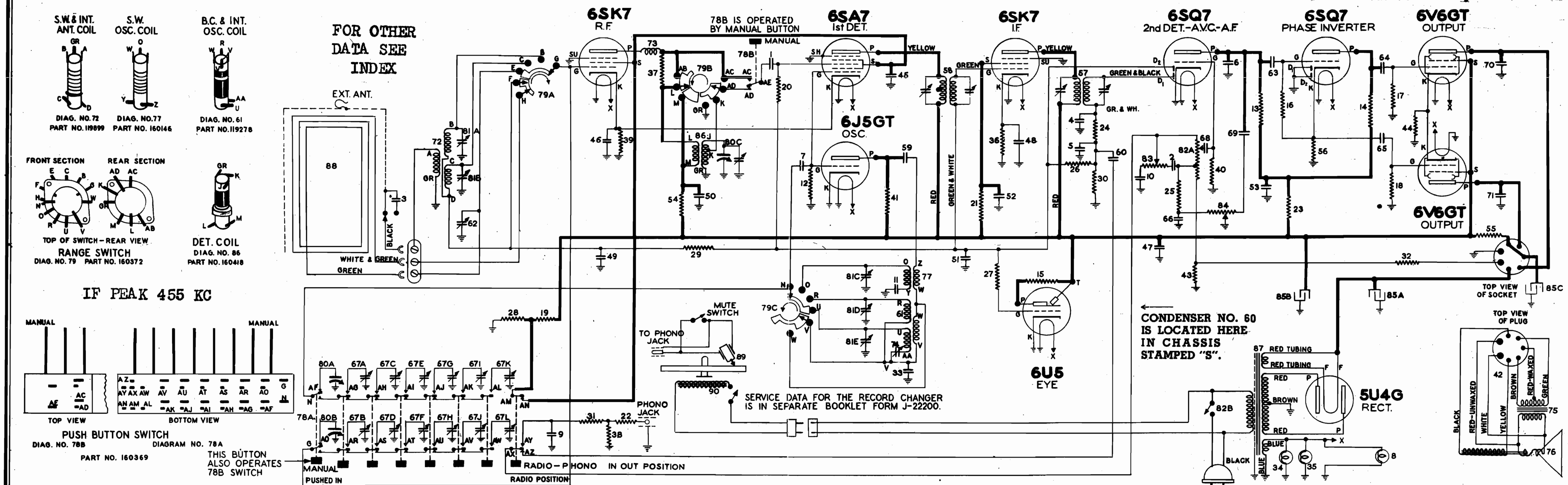
When making a recording, the cutting needle should be set at such an angle that the thread cut from the record will be thrown toward the center of the record. Otherwise the thread may be caught under the cutting needle, causing it to cut the grooves improperly.

If the thread is not thrown toward the center of the record, loosen the thumb screw holding the recording needle in the cutter head, turn the needle VERY SLIGHTLY so that the flat side of the cutting tip faces more toward the center of the record and retighten thumb screw. This will change the angle of the needle sufficiently to cause the thread to wind about the center pin of the turntable.

Use care in making this adjustment as the needle will not cut properly if it is turned too far.

STEWART-WARNER CORP.

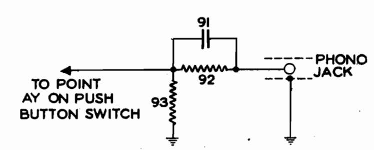
MODELS 11-10A1 to 11-10A10, Ch.11-10A
11-10A1-Z to 11-10A10-Z, Ch.11-10-Z



PUSH BUTTON TRIMMER RANGES

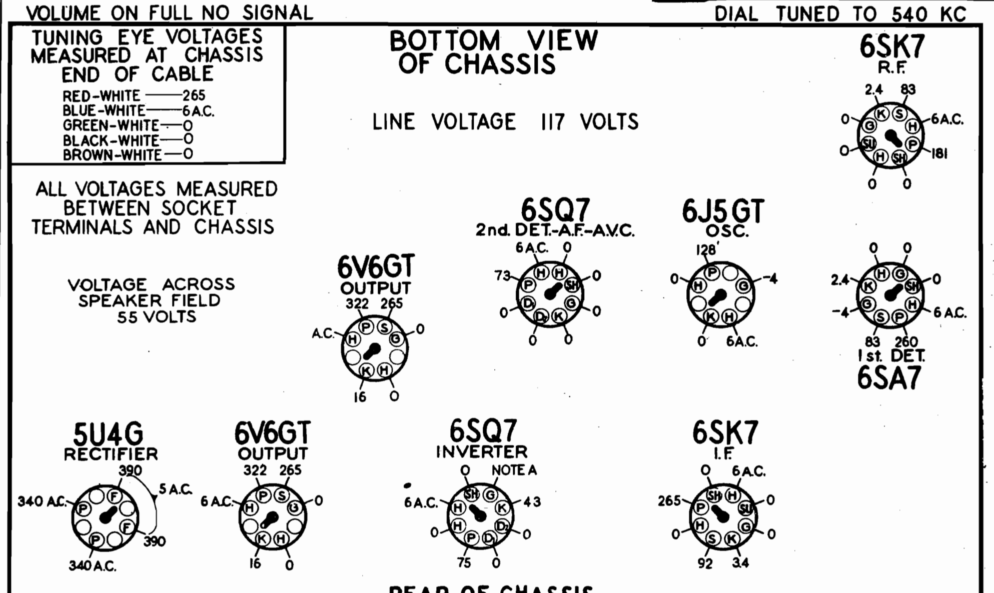
TRIMMER CONDENSERS	11-10A RANGE	11-10A-Z RANGE
67L & 67K	540 KC. to 1000 KC.	540 KC. to 1000 KC.
67J & 67I	540 KC. to 1000 KC.	540 KC. to 1000 KC.
67H & 67G	540 KC. to 1000 KC.	750 KC. to 1375 KC.
67F & 67E	750 KC. to 1375 KC.	750 KC. to 1375 KC.
67D & 67C	750 KC. to 1375 KC.	980 KC. to 1550 KC.
67B & 67A	980 KC. to 1550 KC.	980 KC. to 1550 KC.

PHONO INPUT CONNECTIONS FOR CHASSIS STAMPED "S"



VOLUME ON FULL NO SIGNAL

DIAL TUNED TO 540 KC



USE A VOLTMETER OF 1000 OHMS PER VOLT.
NOTE A: The grid of the 6SQ7 inverter tube is at a positive potential with respect to chassis.

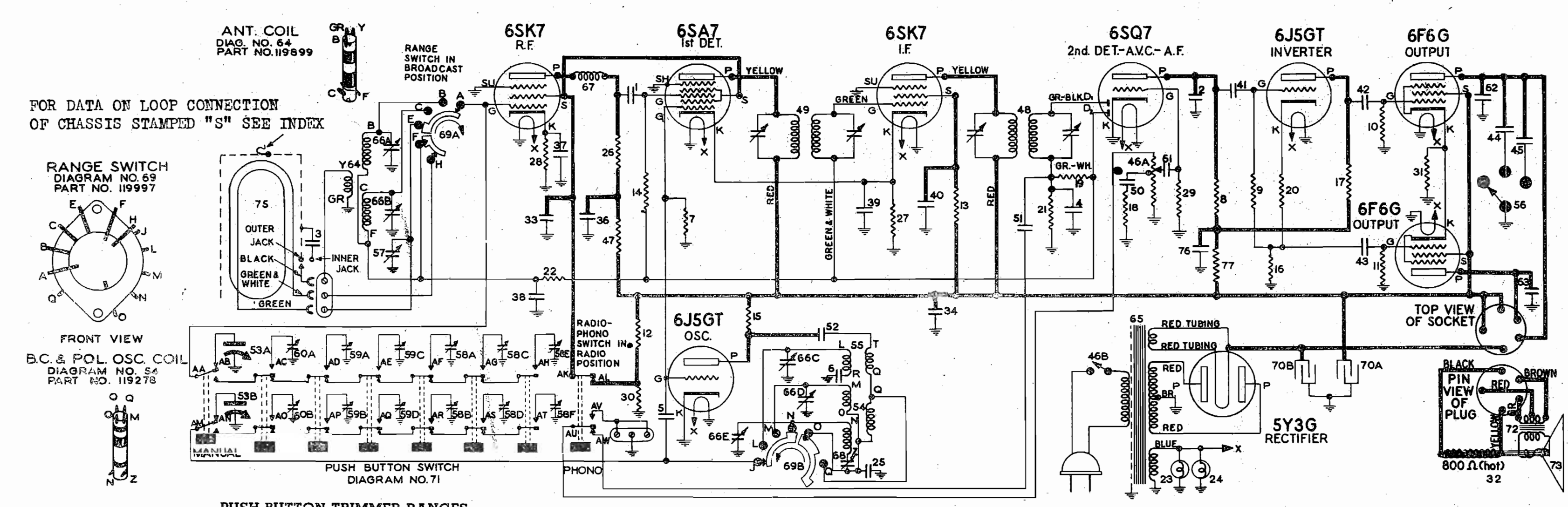
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$ .20
3 to 6	83783	Condenser—mica 110 mmfd.	.20
7	85061	Condenser—mica, 51 mmfd.	.15
8	85296	Lamp—turntable light 6 to 8 volt (Mazda 51)	.16
9-10	85394	Condenser—mica 510 mmfd.	.25
11	88587	Condenser—mica .0042 mfd.	.35
12	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
13-14	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
15	110554	Resistor—carbon—1 meg. ¼ watt	.12
16-17-18	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
19	110561	Resistor—carbon 15,000 ohms 2 watts	.30
20 to 23	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
24-25	110566	Resistor—carbon 33,000 ohms ¼ watt	.12
26-27	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
28	110575	Resistor—carbon 12,000 ohms 2 watts	.30
29-30-31	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
32	110588	Resistor—carbon 6,800 ohms ¼ watt	.12
33	112426	Condenser—mica 1,650 mmfd.	.30
34-35	112636	Lamp—dial (frosted) 6-8 volt .25 amp.	.25
36	112951	Resistor—carbon 400 ohms ¼ watt	.12
37	112952	Resistor—carbon 3,300 ohms ¼ watt	.10
38	112962	Resistor—carbon 150,000 ohms ¼ watt	.12
39	112974	Resistor—carbon 220 ohms ¼ watt	.15
40	112975	Resistor—carbon 10 meg. ¼ watt	.12
41	112997	Resistor—carbon 22,000 ohms 1 watt	.15
42	M-115113	Speaker—dynamic 12"	10.00
43	116062	Resistor—carbon 150 ohms ¼ watt	.12
44	116094	Resistor—220 ohms 2 watts—wire wound	.20
45 to 48	116625	Condenser—.1 mfd. 600 volt	.25
49 to 53	116819	Condenser—.05 mfd. 600 volt	.20
54	118805	Resistor—carbon 10,000 ohms 1 watt	.12
55	118821	Resistor—carbon 1,500 ohms 2 watts	.25
56	118825	Resistor—carbon 180,000 ohms ¼ watt	.12
57	119024	Transformer—2nd I. F.	1.15
58	119042	Transformer—1st I. F.	1.10
59	119193	Condenser—.01 mfd. 600 volt	.15
60	119193	Condenser—.01 mfd. 600 volt	.15
	119875	Condenser—.002 mfd. 600 volt (used only on chassis stamped "S")	.15
61	119278	Coil—B. C. & Intermediate oscillator	.60
62	119345	Condenser—trimmer	.20
63	119414	Condenser—.02 mfd. 600 volt	.15
	119193	Condenser—.01 mfd. 600 volt (used only on chassis stamped "S")	.15
64-65	119414	Condenser—.02 mfd. 600 volt	.15
66	119416	Condenser—.008 mfd. 600 volt	.15
67A to 67L	119662	Condenser—P.B. trimmers (low freq.)	.24
	119663	Condenser—P.B. trimmers (med. freq.)	.24
	119664	Condenser—P.B. trimmers (high freq.)	.24
68	119817	Condenser—.004 mfd. 600 volt	.15
	119875	Condenser—.002 mfd. 600 volt (used only on chassis stamped "S")	.15
69	119817	Condenser—.004 mfd. 600 volt	.15
70-71	119875	Condenser—.002 mfd. 600 volt	.15
	160430	Condenser—.001 mfd. 600 volt (used only on chassis stamped "S")	.15
72	119899	Coil—intermediate and S. W. antenna	.70
73	119903	Coil—compensating	.18
74	119934	Condenser—padder	.36
75	M-160132	Transformer—output for M-115113 speaker	2.00
76	M-160133	Cone & Voice coil for M-115113 speaker	1.75
77	160146	Coil—S. W. Oscillator	.58
78A-78B	160369	Switch—push button	3.00
79A to 79C	160372	Switch—range	1.50
80A to 80C	160373	Condenser—variable tuning	3.20
81A to 81E	160406	Condenser—trimmer (5 section)	.70
82A-82B	160412	Volume control—2 meg. (with switch)	1.40
83	160413	Tone control (treble) 5 meg.	.85
84	160414	Tone control (bass) 1 meg.	.95
85A to 85C	160417	Condenser—electrolytic A (20 mfd.), B (15 mfd.), C (5 mfd.) 450 W. V.	2.00
86	160418	Det. Coil	.90
87	160420	Transformer—power (50-60 cycle)	7.00
88	160568	Loop antenna complete	3.70
89	161289	Crystal cartridge	5.00
90	160086	Motor—60 cycle, phono (See separate manual)	5.95
91	83539	Condenser—mica 260 mmfd.	.20
92	110554	Resistor—carbon 1 meg. ¼ watt	.12
93	110564	Resistor—carbon 100,000 ohms ¼ watt	.12

STEWART-WARNER CORP. 11-9B1-Z to 11-9B9-Z

Chassis 11-9B, 11-9B-Z

MODELS 11-9B1 to 11-9B9



FOR DATA ON LOOP CONNECTION OF CHASSIS STAMPED "S" SEE INDEX

PUSH BUTTON TRIMMER RANGES

TRIMMER CONDENSERS	11-9B RANGE	11-9B-Z RANGE
58E & 58F	540 to 1000 KC.	540 to 1000 KC.
58C & 58D	540 to 1000 KC.	540 to 1000 KC.
58A & 58B	540 to 1000 KC.	750 to 1375 KC.
59C & 59D	750 to 1375 KC.	750 to 1375 KC.
59A & 59B	750 to 1375 KC.	980 to 1550 KC.
60A & 60B	980 to 1550 KC.	980 to 1550 KC.

LETTERED POINTS ON PICTORIAL VIEWS CORRESPOND TO IDENTICAL POINTS ON THE CIRCUIT DIAGRAM.

NOTE
RESISTOR 26 AND COND. 36 ARE OMITTED ON CHASSIS STAMPED "S". RESISTOR 47 CONNECTS DIRECTLY TO COIL 67.

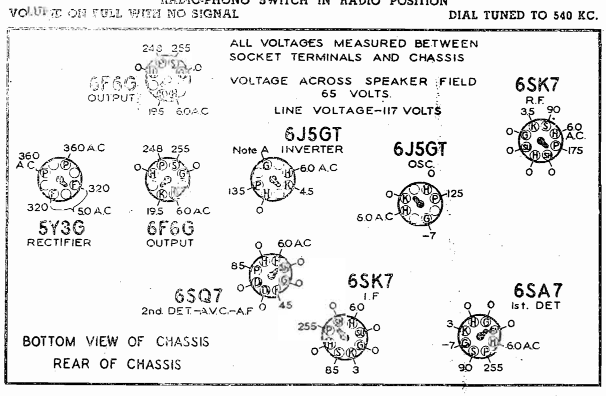
I.F. 455 KC

FOR OTHER DATA SEE INDEX

SOCKET VOLTAGES

RADIO-PHONO SWITCH IN RADIO POSITION

VOLUME ON FULL WITH NO SIGNAL — DIAL TUNED TO 540 KC.



USE A HIGH RESISTANCE VOLTMETER OF 1000 OHMS PER VOLT.

NOTE A: The bias on the 6J5GT inverter grid is —5 volts measured across resistor No. 20.

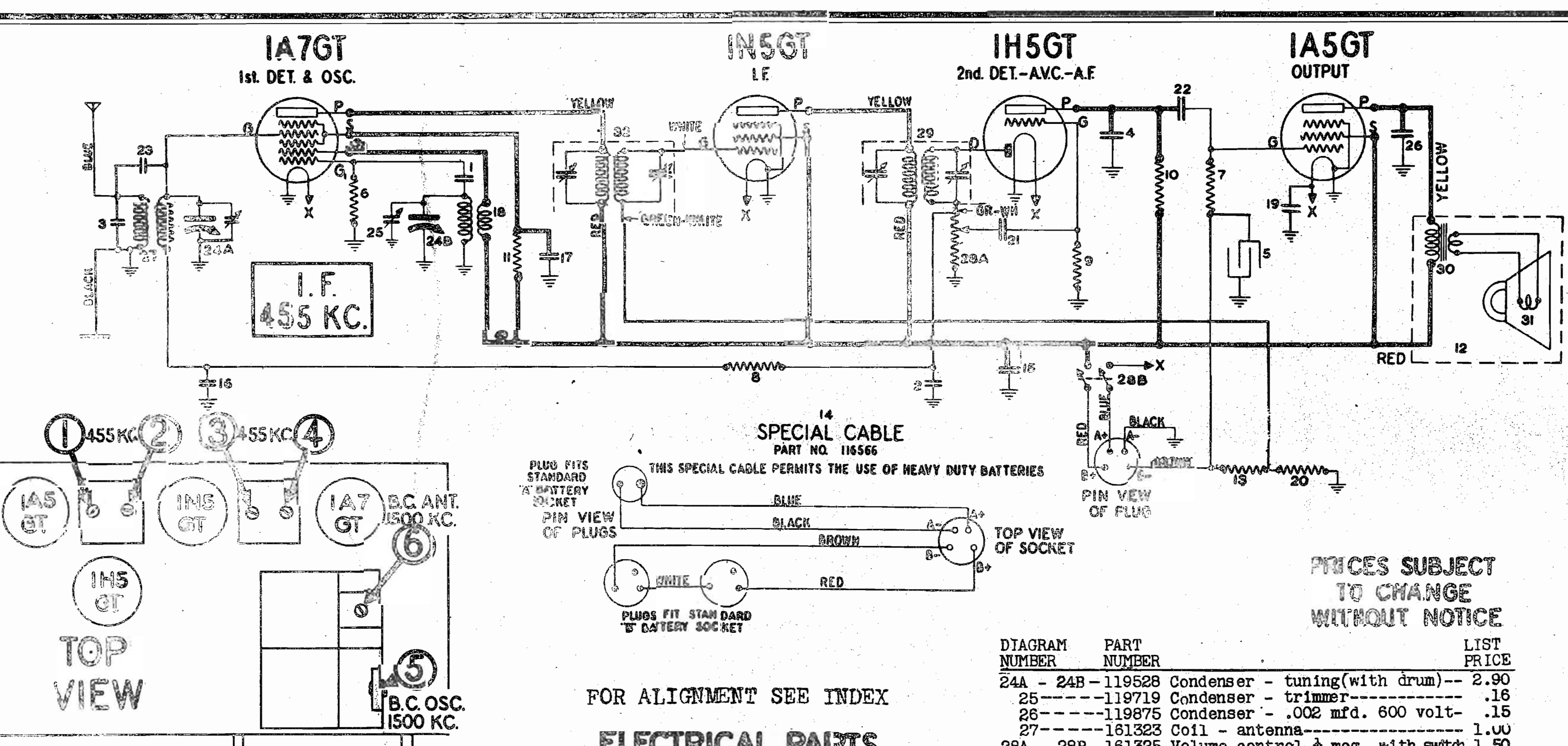
ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3-4	83783	Condenser—mica, 110 mmfd.	.20
5	85061	Condenser—mica, 51 mmfd.	.15
6	88587	Condenser—mica .0042 mfd.	.35
7	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
8	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
9 to 11	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
12	110561	Resistor—carbon 15,000 ohms 2 watts	.30
13-14	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
15 to 17	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
18	110578	Resistor—carbon 68,000 ohms ¼ watt	.12
19	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
20	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
21-22	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
23-24	112636	Lamp—6.3 volt—.25 amps (frosted)	.25
25	112426	Condenser—mica 1650 mmfd.	.30
26	112952	Resistor—carbon 3,300 ohms ¼ watt (see note above)	.10
27	112974	Resistor—carbon 220 ohms ¼ watt	.15
28	112978	Resistor—insulated 470 ohms ¼ watt (used only in chassis not stamped with letter)	.12
	110556	Resistor—330 ohms ¼ watt (used only on chassis stamped "S")	.12
29	112975	Resistor—carbon 10 meg. ¼ watt	.12
30	112997	Resistor—carbon 22,000 ohms 1 watt	.15
31	114334	Resistor—wire wound 360 ohms 2 watts	.20
32	M-115110	Speaker—Dynamic—12" (11-9B8 only)	14.00
	M-115111	Speaker—Dynamic—10" (11-9B6 only)	8.60
	M-115118	Speaker—Dynamic—12" (11-9B7 only)	14.00
33 to 35	116625	Condenser—.1 mfd. 600 volt	.25
36	116819	Condenser—.05 mfd. 600 volt (see note at left)	.20
37 to 40	116819	Condenser—.05 mfd. 600 volt	.20
41 to 44	116893	Condenser—.02 mfd. 600 volt	.15
45	118487	Condenser—.07 mfd. 600 volts	.25
46A-46B	118669	Volume control—1 meg. (with switch)	1.40
47	118805	Resistor—carbon 10,000 ohms 1 watt	.12
48	119024	Transformer—2nd I.F.	1.15
49	119042	Transformer—1st I.F.	1.10
50	116893	Condenser—.02 mfd. 600 volt	.15
51-52	119193	Condenser—.01 mfd. 600 volt	.15
53A-53B	119291	Condenser—variable tuning	2.75
54	119278	Coil—B.C. & Police Oscillator	.60
55	160146	Coil—Short Wave Osc.	.58
56	119289	Switch—tone	.60
57	119345	Condenser—trimmer for loop	.20
58A to 60B	119753	Trimmer—for P.B. trimmers (low freq.) (see table)	.24
	119663	Trimmer for P.B. trimmers (med. freq.) (see table)	.24
	119664	Trimmer for P.B. trimmers (high freq.) (see table)	.24
61 to 63	119817	Condenser—.004 mfd. 600 volt	.15
64	119899	Coil—antenna	.18
65	119900	Transformer—power (50-60 cycle)	4.80
	160460	Transformer—power (25 cycle)	6.90
66A to 66E	119902	Trimmer condenser—five sections	.75
67	119903	Coil—compensating	.12
68	119934	Condenser—padder	.36
69A-69B	119997	Range switch	1.10
70A-70B	160008	Condenser—electrolytic 15-30 mfd. 450 volt	1.50
71	119288	Switch—push button	2.50
72	M-160464	Transformer—output (11-9B8)	1.60
	M-160427	Transformer—output (11-9B6)	1.80
	M-160462	Transformer—output (11-9B7)	1.80
73	M-160465	Cone & Voice coil (11-9B8)	1.60
	M-160428	Cone & Voice coil (11-9B6)	1.80
	M-160463	Cone & Voice coil (11-9B7)	1.80
75	160157	Loop antenna (complete) (used on chassis not stamped with letter)	3.60
	161290	Loop antenna (complete) (used only on chassis stamped "S")	3.60
76	116706	Condenser—.2 mfd. 600 volt	.35
77	110565	Resistor—22,000 ohms ¼ watt	.12

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODEL 12-4D1
Chassis 12-4D

STEWART-WARNER CORP.



FOR ALIGNMENT SEE INDEX

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL PARTS

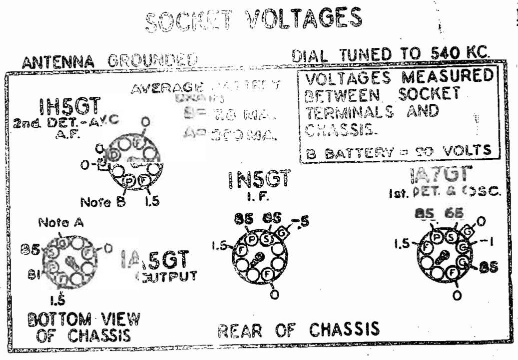
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION	LIST PRICE
1	83539	Condenser - mica 260 mmfd.	.20
2	83783	Condenser - mica 110 mmfd.	.20
3-4	85061	Condenser - mica 51 mmfd.	.15
5	110377	Condenser - elect. 10 mfd. 35V.	.80
6	110553	Resistor - carbon 220,000 ohms 1/4 watt	.12
7	110554	Resistor - carbon 1 meg. ½ watt	.12
8-9	110580	Resistor - carbon 3.3 meg. ½ W.	.12
10	110591	Resistor - carbon 680,000 ohms 1/4 watt	.12
11	112995	Resistor - carbon 15,000 ohms 1/4 watt	.12
12	M-115126	Speaker - P.M. (6")	5.50
13	116078	Resistor - 560 ohms 1/4 watt	.12
14	116566	Battery cable - for heavy duty batteries	.85
15	118206	Condenser - .25 mfd. 600 volt	.35
16-17	116819	Condenser - .05 mfd. 600 volt	.20
18	117741	Coil - oscillator	.35
19	118206	Condenser - .25 mfd. 150 volt	.35
20	118843	Resistor - carbon 47 ohms ½ W.	.15
21	119817	Condenser - .004 mfd. 600 volt	.15
22	119193	Condenser - .01 mfd. 600 volt	.15
23	119466	Capacitor - wire (2 mmfd.)	.12
24A - 24B	119528	Condenser - tuning(with drum)	2.90
25	119719	Condenser - trimmer	.16
26	119875	Condenser - .002 mfd. 600 volt	.15
27	161323	Coil - antenna	1.00
28A - 28B	161325	Volume control-½ meg. with switch	1.50
29	161330	Transformer - 2nd I.F.	1.00
30	M-161332	Transformer - output for M-115126 speaker	.90
31	M-161334	Cone & Voice coil for M-115126 speaker	1.20
32	161340	Transformer - 1st I.F.	1.00

MISCELLANEOUS PARTS

PART NUMBER	DESCRIPTION	LIST PRICE
116549	Cable - battery	.45
114955	Clamp - for dial cord	.01
112745	Clip - coil mounting	.01
113019	Clip - dial scale retaining	.01
117057	Cord - drive (supplied in 3 foot lengths)	.15
161333	Dial scale	.24
116411	Indicator lever assembly	.09
160219	Knob - push on	.06
88631	Plug - 4 prong, male	.06
119718	Pointer	.14
81145	Retaining ring - for tuning shaft----Per C	.50
116690	Socket - octal base	.12
115369	Spring - for indicator lever	.01
114968	Spring - dial cord tension	.03
161327	Tuning shaft	.18
111456	Washer - spring washer----Per C	.50
161328	Window - dial	.38

SOCKET VOLTAGES

ANTENNA GROUNDED — DIAL TUNED TO 540 KC.

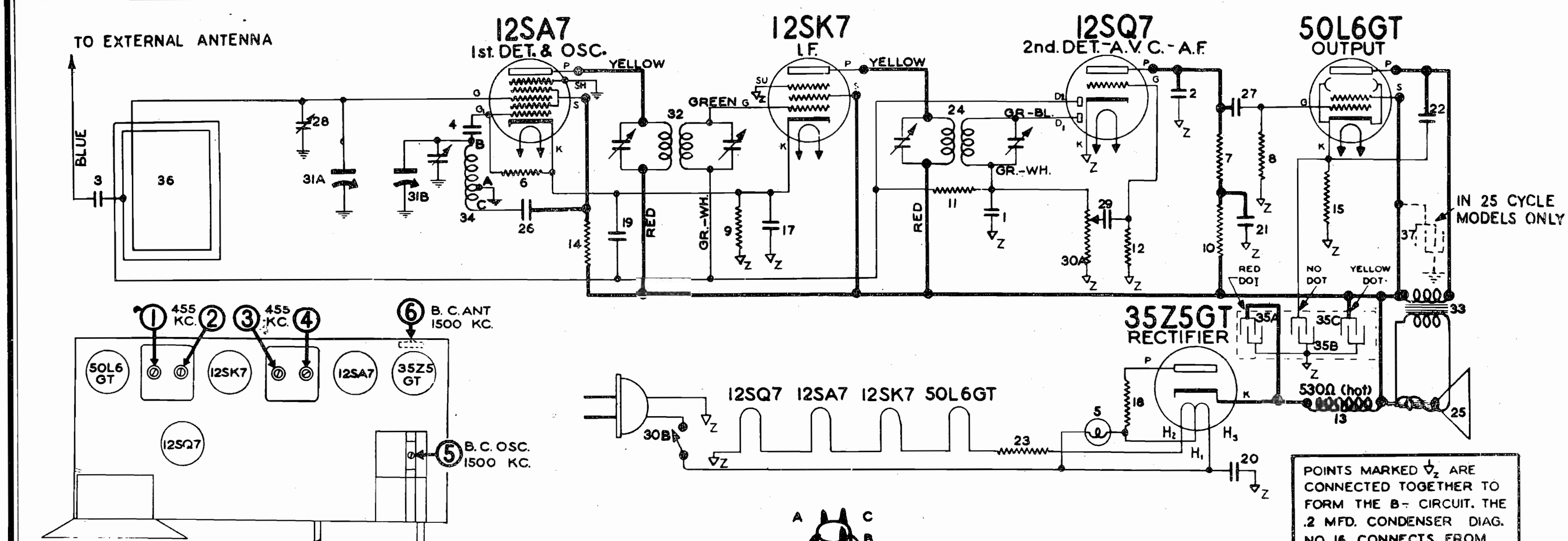


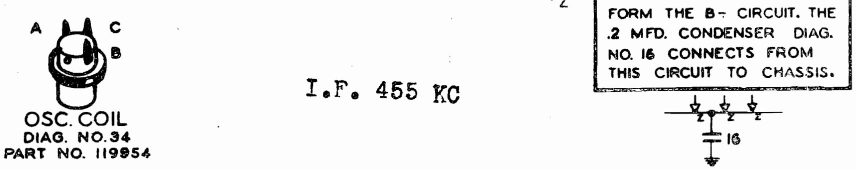
NOTE A: The bias for the control grid of the 1A5GT tube is -5 volts measured across resistors 13 & 20.

NOTE B: Due to the high resistance of plate resistor No. 10 only a slight deflection will be obtained when using a meter having a resistance of 1000 ohms per volt.

STEWART-WARNER CORP.

MODELS 13-5U1 to 13-5U9
Chassis 13-5U

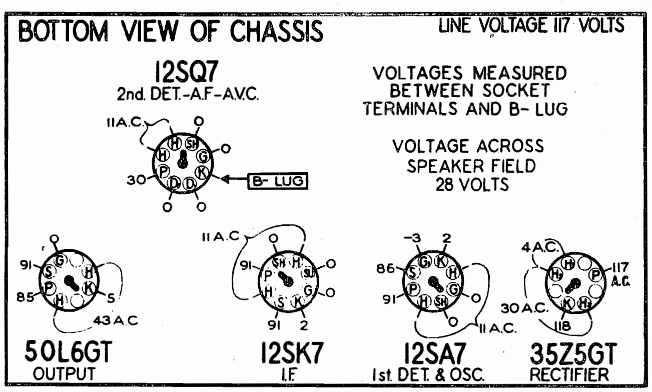




CONVENTIONAL ALIGNMENT. ADJUST TRIMMERS AT FREQUENCIES SHOWN ABOVE. USE BLOCKING CONDENSERS IN SERIES WITH EACH SIGNAL GENERATOR LEAD.

SOCKET VOLTAGES

Volume on full with no signal. Dial tuned to 540 KC



REAR OF CHASSIS

Use a voltmeter of 1000 ohms per volt.

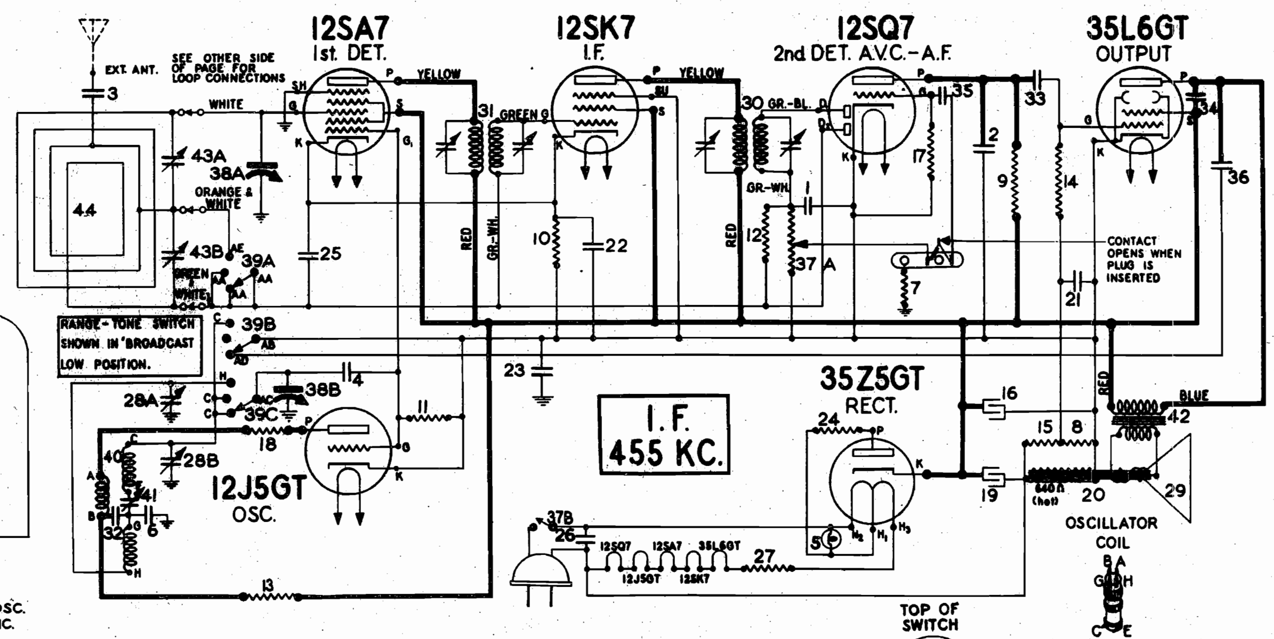
ELECTRICAL PARTS

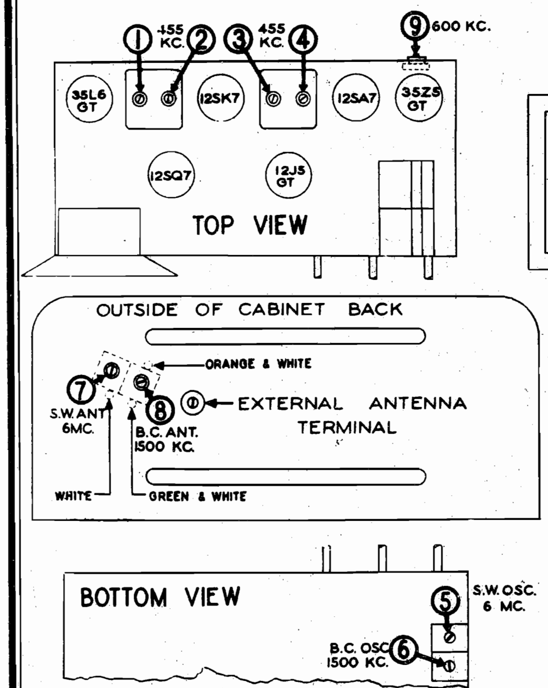
Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica 260 mmfd.	$0.20
3	83783	Condenser—mica, 110 mmfd.	.20
4	85061	Condenser—mica, 51 mmfd.	.15
5	85296	Lamp—dial 6 to 8 volt (Mazda 51)	.16
6	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
7-8	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
9	110560	Resistor—carbon 100 ohms ¼ watt	.12
10	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
11	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
12	112975	Resistor—carbon 10 meg. ¼ watt	.12
13	R-115102	Speaker—dynamic (5")	4.30
14	118803	Resistor—680 ohms ¼ watt	.12
15	116092	Resistor—140 ohms 1 watt Wire Wound	.15
16-17	116706	Condenser—.2 mfd. 600 volt	.35
18	116752	Resistor—33 ohms 1 watt wire wound	.15
19 to 21	116819	Condenser—.05 mfd. 600 volt	.20
22	116893	Condenser—.02 mfd. 600 volt	.15
23	117395	Resistor—20 ohms 1 watt wire wound	$0.16
24	118903	Transformer—2nd I.F.	1.10
25	R-118999	Cone & Voice coil for R-115102 speaker	1.70
26-27	119193	Condenser—.01 mfd. 600 volt	.15
28	119345	Condenser—trimmer for loop	.20
29	119817	Condenser—.004 mfd.—600 volt.	.15
30A-30B	119912	Volume control—1 meg. (with switch)	1.40
31A-31B	119928	Condenser—variable tuning	2.40
32	119935	Transformer—1st I.F.	1.10
33	R-119944	Transformer—output for R-115102 speaker	1.60
34	119954	Coil—oscillator	.36
35A-35B-35C	160012	Condenser—Electrolytic {A—40 mfd.—200 volts; B—20 mfd.—25 volts; C—20 mfd.—200 volts}	1.15
36	160081	Loop Antenna	.60
37	118911	Condenser — Electrolytic — 20-20 mmfd.—150 v., one section used	.75

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODELS 13-6P1 to 13-6P9
Chassis 13-6P

STEWART-WARNER CORP.





CONVENTIONAL ALIGNMENT. REPEAT ALIGNMENT OF RF AND OSC AFTER REPLACING CHASSIS IN CABINET.

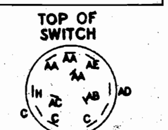


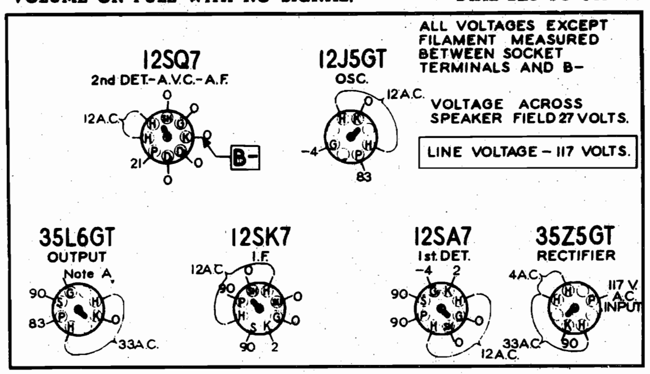
DIAGRAM NO. 39
PART NO. 119916

DIAGRAM NO. 40
PART NO. 119933

ALL LETTERED POINTS ON THESE DRAWINGS CORRESPOND TO SIMILAR POINTS ON CIRCUIT DIAGRAM.

SOCKET VOLTAGES

RANGE-TONE SWITCH IN BROADCAST "HI" POSITION. (CENTER) VOLUME ON FULL WITH NO SIGNAL. DIAL SET TO 540 KC.



REAR OF CHASSIS

NOTE A: The bias on the grid of the 35L6GT output tube is —6.4 volts. This voltage can not be measured on a 1000 ohm per volt meter because of the high resistance of resistors 15 and 8. **(Use a voltmeter of 1000 ohms per volt.)**

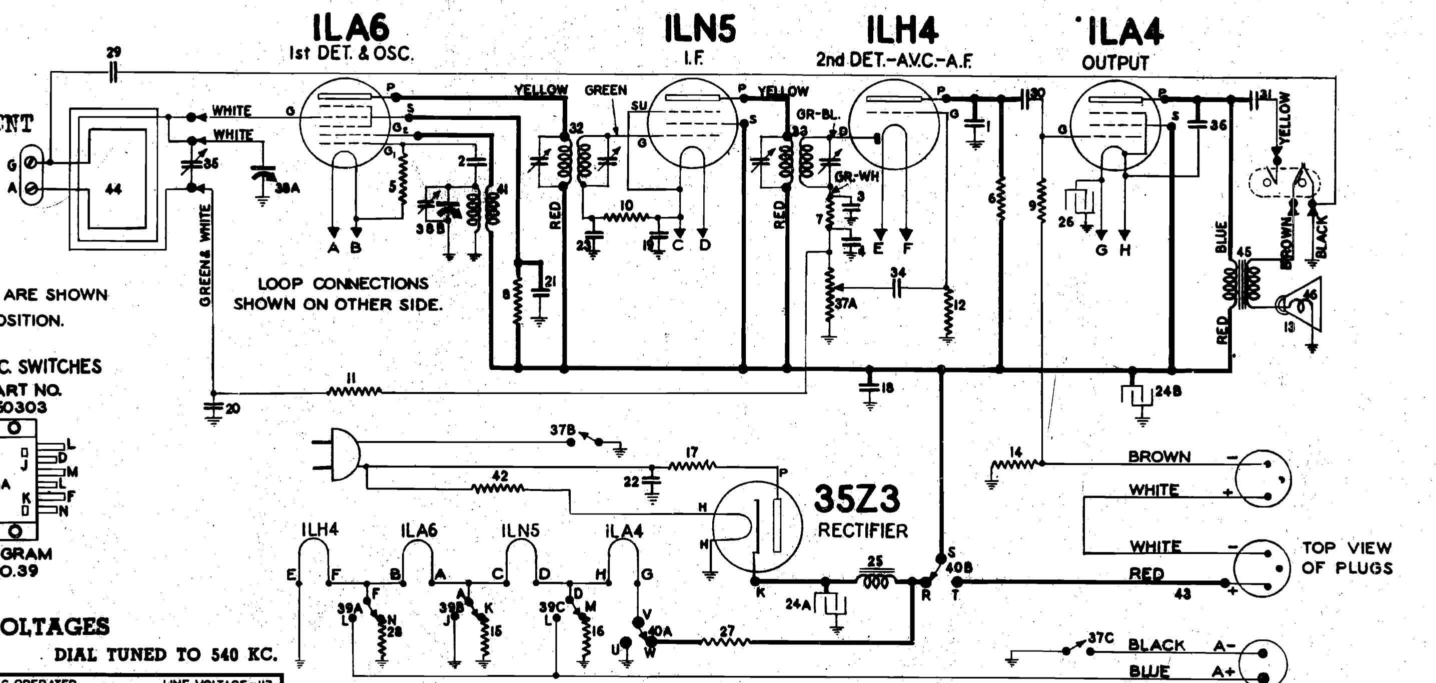
PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1-2	83539	Condenser—mica, 260 mmfd.	$0.20
3-4	83783	Condenser—mica, 110 mmfd.	.20
5	85296	Lamp—dial 6 to 8 volt (Mazda 51)	.16
6	89275	Condenser—mica .002 mfd.	.40
7-8	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
9	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
10	110560	Resistor—carbon 100 ohms ¼ watt	.12
11	110564	Resistor—carbon 100,000 ohms ¼ watt	.12
12	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
13	110573	Resistor—carbon 2,200 ohms ¼ watt	.12
14	110584	Resistor—carbon 330,000 ohms ¼ watt	.12
15	110591	Resistor—carbon 680,000 ohms ¼ watt	.12
16	112898	Condenser—electrolytic 16 mfd. 150 volt	.50
17	112975	Resistor—carbon 10 meg. ¼ watt	.12
18	112994	Resistor—carbon 220 ohms ¼ watt	.16
19	113472	Condenser—electrolytic 40 mfd. 150 volt	.56
20	R-115102	Speaker—dynamic (5")	$4.30
21	116625	Condenser—.1 mfd. 600 volt	.25
22-23	116706	Condenser—.2 mfd. 600 volt	.35
24	116752	Resistor—33 ohms 1 watt wire wound	.15
25-26	116819	Condenser—.05 mfd. 600 volt	.20
27	117395	Resistor—20 ohms 1 watt wire wound	.16
28A-28B	118920	Trimmer strip (2 section)	.30
29	R-118999	Cone & voice coil for R-115102 Speaker	1.70
30	119024	Transformer—2nd I. F.	1.15
31	119042	Transformer—1st I. F.	1.10
32 to 34	119193	Condenser—.01 mfd. 600 volt	.15
35	119817	Condenser—.004 mfd. 600 volt	.15
36	119880	Condenser—.04 mfd. 600 volt	.20
37A-37B	119912	Volume control—1 meg. (with switch)	1.40
38A-38B	119914	Condenser—variable tuning	2.30
39A to 39C	119916	Switch—tone & range (see table)	.90
40	119933	Coil—oscillator	.36
41	119934	Condenser—padder	.36
42	R-119944	Transformer—output for R-115102 Speaker	1.60

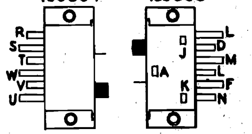
STEWART-WARNER CORP. **MODELS 15-5X1 to 15-5X9**
Chassis 15-5X

I.F. 455 KC
CONVENTIONAL ALIGNMENT
TRIM OSC AND ANT AT
1500 KC. READJUST
AFTER INSTALLING
CHASSIS IN CABINET.



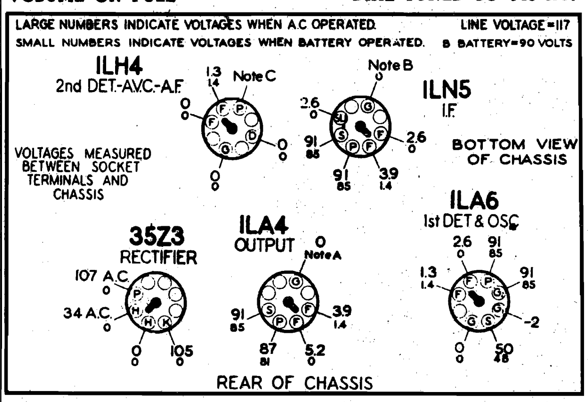
SWITCHES 39 & 40 ARE SHOWN IN A.C.-D.C. POSITION.

BATTERY & A.C.-D.C. SWITCHES



SOCKET VOLTAGES

VOLUME ON FULL — DIAL TUNED TO 540 KC.



NOTE A: The 1LA4 grid bias during battery operation is —5 volts measured across resistor 14.

NOTE B: During A.C.-D.C. operation the grid of the 1LN5 is slightly positive with respect to chassis. This voltage cannot be measured properly on ordinary meters.

NOTE C: Due to the high resistance of resistor 6, only a small voltage will be read on a meter having a resistance of 1000 ohms per volt.

NOTE: Later sets have an iron core 2nd I.F. transformer (Part No. 161248) which has only one adjustment for alignment. Adjust the large screw projecting from the top of the can for maximum output.

ELECTRICAL PARTS

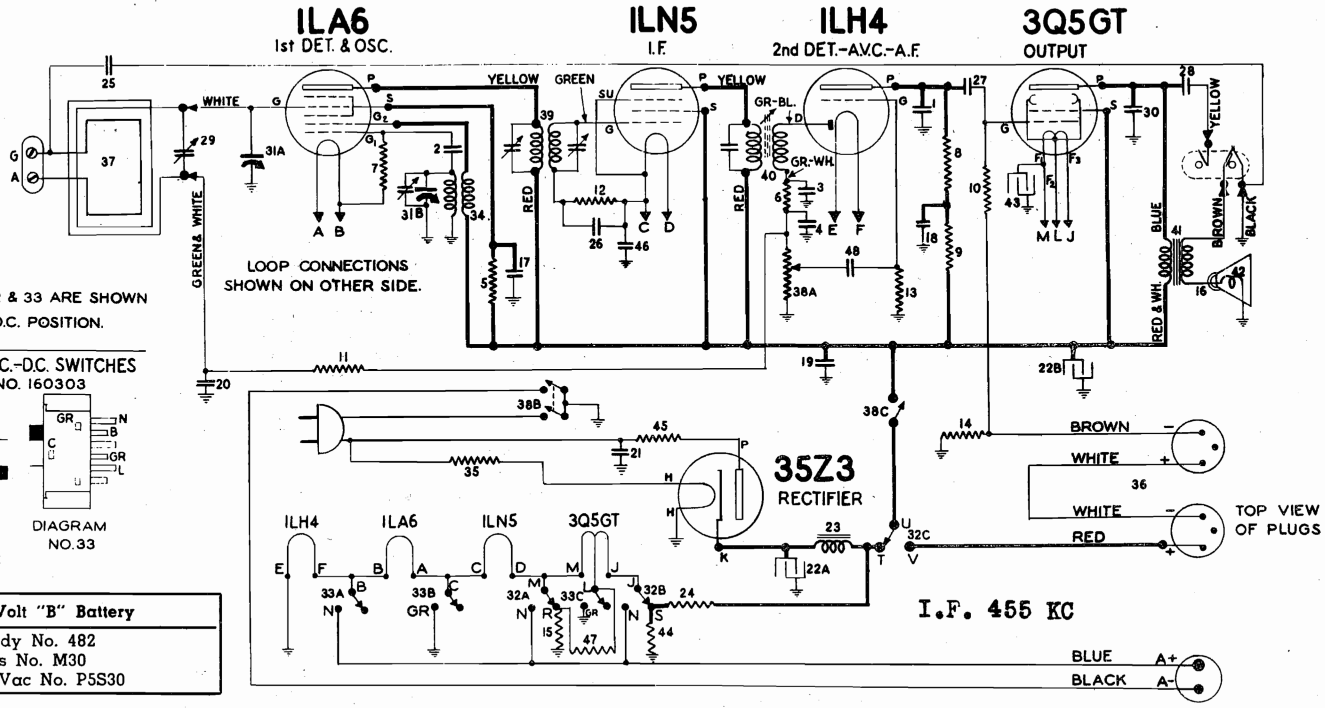
Diagram Number	Part Number	Description	List Price
1	83783	Condenser—mica, 110 mmfd.	$ .20
2-3-4	85061	Condenser—mica, 51 mmfd.	.15
5	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
6	110554	Resistor—carbon 1 megohm ¼ watt	.12
7	110565	Resistor—carbon 22,000 ohms ¼ watt	.12
8	110566	Resistor—carbon 33,000 ohms ¼ watt	.12
9-10	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
11-12	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
13	R-115119	Speaker—dynamic (4")	4.50
14	116078	Resistor—560 ohms ¼ watt	.12
15-16	116079	Resistor—carbon 1200 ohms ¼ watt	.12
17	116088	Resistor—100 ohms 1 watt W. W.	.14
18	116625	Condenser—.1 mfd. 600 volt	.25
19	116706	Condenser — .2 mfd. 600 volt (used only on sets having 119411 I.F.)	.35
	118290	Condenser—.5 mfd. 150 volt (used on sets having 161248 I.F.)	.50
20 to 23	116819	Condenser—.05 mfd. 600 volt	.20
24A-24B	117559	Condenser—electrolytic 30-30 mfd. 150 volt	1.20
5	117888	Filter choke	.85

Diagram Number	Part Number	Description	List Price
26	118452	Condenser—electrolytic—100 mfd. 8 v.	.55
27	118822	Resistor—2000 ohms 5 watts W. W.	.40
28	118827	Resistor—carbon 270 ohms ¼ watt	.10
29 to 31	119193	Condenser—.01 mfd. 600 volt	.15
32	119409	Transformer—1st I.F.	1.10
33	119411	Transformer—2nd I.F.	1.10
	161248	Transformer—2nd I.F. (iron core) used on some sets	1.35
34	119817	Condenser—.004 mfd. 600 volt	.15
35	119845	Condenser—trimmer (on loop)	.16
36	119875	Condenser—.002 mfd. 600 volt	.15
37A to 37C	160297	Volume control—1 meg.—with switch	1.30
38A-38B	160298	Condenser—variable tuning with drum	2.80
39A to 39C	160303	Battery & A.C.-D.C. switch	.68
40A-40B	160304	Battery & A.C.-D.C. switch	.48
41	160475	Coil—oscillator	.44
42	160492	Power cord (resistor type)	.95
43	160493	Battery cable	.54
44	160570	Loop antenna—complete with condenser & terminals	1.50
45	R-160632	Transformer—output for R-115119 spkr.	1.60
46	R-160633	Cone & Voice coil for R-115119 spkr.	1.50

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

MODELS 15-5Y1 to 15-5Y9
Chassis 15-5Y

STEWART-WARNER CORP.



MISCELLANEOUS PARTS

Part Number	Description
161219	Block—battery retaining
112745	Clip—coil mounting
113019	Clip—dial scale retaining
116948	Cord—dial drive (supplied in 6 ft. lgths.)
161250	Dial scale
160490	Knob—volume
160491	Knob—tuning
117769	Name plate—(Stewart-Warner)
117779	Plate (Off-Volume)
117780	Plate (tuning)
116397	Plug—2 prong male for cable
116398	Plug—3 prong male for cable
119911	Phono—terminal strip
81145	Retaining ring for tuning shaft
160392	Socket—octal
160294	Socket—8 prong Loktal
111981	Spring—for dial cord
160621	Terminal strip G-A
160301	Tube shield
111456	Washer—spring washer for tuning shaft
160291	Window—dial
116488	Wing Nut—No. 8-32 (for battery support block)

SWITCHES 32 & 33 ARE SHOWN IN A.C.-D.C. POSITION.

BATTERY & A.C.-D.C. SWITCHES
PART NO. 160303

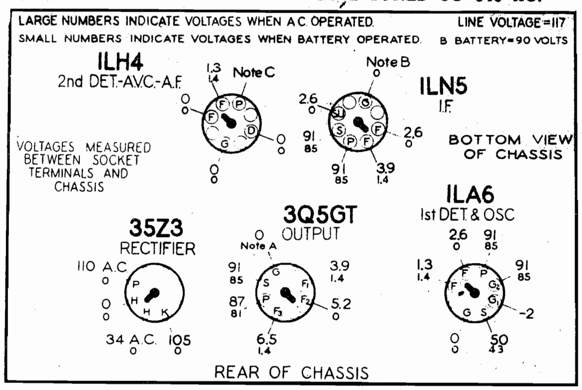
DIAGRAM NO.32 DIAGRAM NO.33

$1\frac{1}{2}$ Volt "A" Battery	45 Volt "B" Battery
Eveready No. 745	Eveready No. 482
Burgess No. 8FL	Burgess No. M30
Ray-O-Vac No. P98L	Ray-O-Vac No. P5S30

*NOTE: If I.F. oscillation is encountered, it may be reduced in some cases by reversing the connections of the red and yellow wires coming from the 2nd I.F. transformer (Part No. 161248).

SOCKET VOLTAGES

VOLUME ON FULL DIAL TUNED TO 540 KC.



NOTE A: The 3Q5GT grid bias during battery operation is —5 volts measured across resistor 14.
NOTE B: During A.C.-D.C. operation the grid of the ILN5 is slightly positive with respect to chassis. This voltage cannot be measured properly with ordinary meters.
NOTE C: Due to the high resistance of resistor 8, only a small voltage will be read on a meter having a resistance of 1000 ohms per volt.

FOR ALIGNMENT SEE INDEX

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ELECTRICAL PARTS

Diagram Number	Part Number	Description	List Price
1	81158	Condenser—mica, 100 mmfd.	$ .25
2-3-4	85061	Condenser—mica, 51 mmfd.	.15
5-6	110552	Resistor—carbon 47,000 ohms ¼ watt	.12
7	110553	Resistor—carbon 220,000 ohms ¼ watt	.12
8	110554	Resistor—carbon 1 megohm ¼ watt	.12
9	110559	Resistor—carbon 470,000 ohms ¼ watt	.12
10	110570	Resistor—carbon 2.2 meg. ¼ watt	.15
11-12-13	110580	Resistor—carbon 3.3 meg. ¼ watt	.12
14-15	112977	Resistor—insulated 470 ohm ¼ watt	.15
16	U-115120	Speaker—P.M. (5")	5.50
17-18-19	116625	Condenser—.1 mfd. 600 volt	.25
20-21	116819	Condenser—.05 mfd. 600 volt	.20
22A-22B	117559	Condenser—electrolytic 30-30 mfd. 150 volt	1.20
23	117888	Filter choke	.85
24	118842	Resistor—1680 ohms 5 watts W. W.	.15
25 to 28	119193	Condenser—.01 mfd. 600 volt	.15
29	119845	Condenser—trimmer (on loop)	.16
30	119875	Condenser—.002 mfd. 600 volt	$ .15
31A-31B	160298	Condenser—variable tuning with drum	2.80
32-33	160303	Battery & A.C. switches	.68
34	160475	Coil—oscillator	.44
35	160492	Power cord (resistor type)	.95
36	160493	Battery cable	.54
37	160570	Loop antenna—complete	1.50
38A to 38C	161227	Volume control—(1 meg.) & switch	1.30
39	161247	Transformer—1st I.F.	1.20
40	161248	Transformer—2nd I.F. (iron core)	1.35
41	U-161255	Transformer—output for U-115120 spkr.	1.50
42	U-161256	Cone & Voice coil for U-115120 speaker	1.40
43	161273	Condenser—electrolytic 50 mfd. 25 volt	.50
44	116082	Resistor—insulated 1500 ohms ¼ watt	.15
45	116275	Resistor—50 ohms, ½ watt W. W.	.15
46	118290	Condenser—.5 mfd. 150 volt	.50
47	118827	Resistor—carbon, 270 ohms, ¼ watt	.10
48	119817	Condenser—.004 mfd., 600 volt	.15

STEWART-WARNER CORP.

MODEL J
Record-Changer

(2)

GENERAL INSTRUCTIONS

1. FUNCTION OF RECORD CHANGER WHEN IT IS GOING THRU A CHANGE CYCLE --

The Model "J" 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. 4) to "ON" this starts the motor and moves trip rod (Item 32, Fig. 1), which rotates trip lever assembly (Item 20, Fig. 1), causing it to disengage from Engagement Clutch Cam, (Item 79, Fig. 2). The Engagement Clutch Cam will then rotate due to tension from spring, (Item 27, Fig. 1). This causes it to contact the pin on the top side of Drive Gear Assembly, (Item 4, Fig. 1), as it rotates, and in turn, moves the Drive Link Assembly, (Item 31, Fig. 1), and the Selector Shaft Crank Assembly #1 and #2 to the position shown in Fig. 2. Also the tone arm reset link (Item 80, Fig. 2), has moved to where it has released the latch, (Item 18, Fig. 1), and carried the tone arm to its extreme outward position. The Tone Arm lifter link (Item 81, Fig. 2), has raised the tone arm to its extreme height, by means of the Lifter Plate Assembly, (Item 21, Fig. 1). 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. 1) due to its very light tension.

The Drive Gear Assembly (Item 4, Fig. 1), 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 fiber 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.

<u>It is very important to remember not to remove and then replace any needle that has been used.</u>

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) <u>Setting Record Changer to Play Ten Inch Records:</u>
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) <u>Setting Record Changer to Play Twelve Inch Records:</u>
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 (<u>ten inch only</u>) 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 (<u>twelve inch only</u>) 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 <u>while the tone arm is still on the record.</u> 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.

MODEL J
Record-changer

STEWART-WARNER CORP.

Figure 1

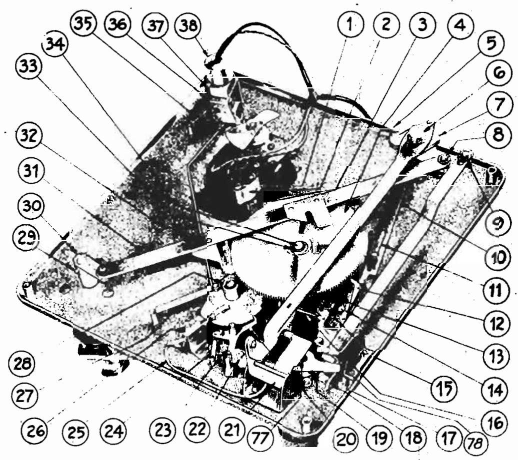
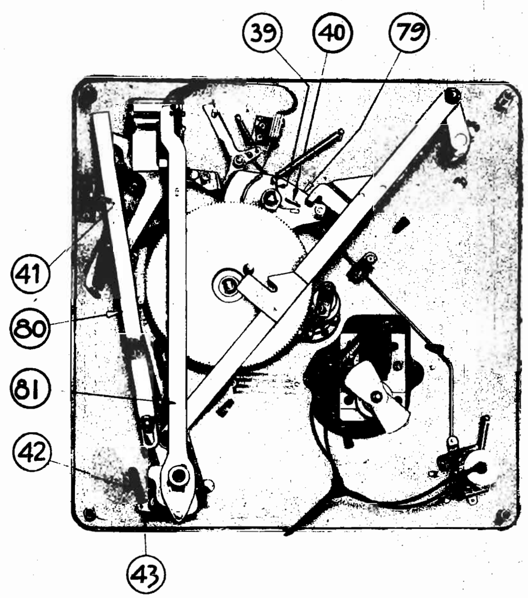


Figure 2



MODEL "J" RECORD CHANGER

Fig. 1

ITEM NO.	PART NO.	DESCRIPTION	NO. USED
1	J-22096	Spindle Thrust Plate	1
2	J-22808	Spindle Bearing Housing Assy.	1
3	J-22010	Drive Pinion	1
4	J-22810	Drive Gear Assy.	1
5	J-22149	Panel, Post & Stud Assy.	1
6	F-1063	Selector Shaft Collar	1
7	J-22803	Selector Shaft Crank Assy. Post #1	1
8	J-72021	Flat Washer	3
9	H-22065	"C" Washer	3
10	J-22041	12" Set Link	1
11	J-22121	12" Reset Link Spring	1
12	J-22147	Tone Arm Locator & Bushing Assy.	1
13	H-20129	Tone Arm Booster Spring	1
14	J-22036	Tone Arm Locator Shoe 12"	1
15	J-22037	Tone Arm Locator Shoe 10"	1
16	J-22094	Tone Arm Locator Spring	1
17	J-22038	Tone Arm Latch & Guide Bracket	1
18	J-22101	Tone Arm Latch Lever	1
19	J-22807	Tone Arm Lever Assy.	1
20	J-22812	Trip Lever Assy.	1
21	J-22813	Tone Arm Lift Plate Assy.	1
22	J-10380	Thumb Nut	1
23	J-10355	Tone Arm Trip Shoe	1
24	J-22058	Trip Lever Spring	1
25	J-22136	Pickup Shielded Wire	1
26	J-22116	Muting Switch	1
27	J-22090	Clutch Spring	1
28	J-72024	Flat Washer	1
29	J-80035	Taper Pin	3
30	J-22805	Selector Shaft Drive Crank Assy. Post #2	1
31	J-22816	Drive Link Assy.	1
32	J-22055	Trip Rod	1
33	J-72024	Flat Washer	1
34	J-22002	Drive Gear Stud	1
35	J-22121	Switch Spring	1
36	J-22102	Switch Mounting Bracket	1
37	J-22103	Switch Retainer Bracket	1
38	J-22118	Switch	1
77	J-22067	Tone Arm Shaft	1
78	J-22134	Reset Arm Stop Washer	1
		Fig. 2	
39	J-22017	Clutch Reset Pawl Spring	1
40	J-22016	Clutch Reset Pawl	1
41	J-22123	Latch Lever Shoulder Screw	1
43	J-22811	12" Set Arm Assy.	1
79	J-22802	Engagement Clutch Cam Assy.	1
80	J-22804	Tone Arm Reset Link	1
81	J-22806	Tone Arm Lifter Link Assy.	1

Figure 3

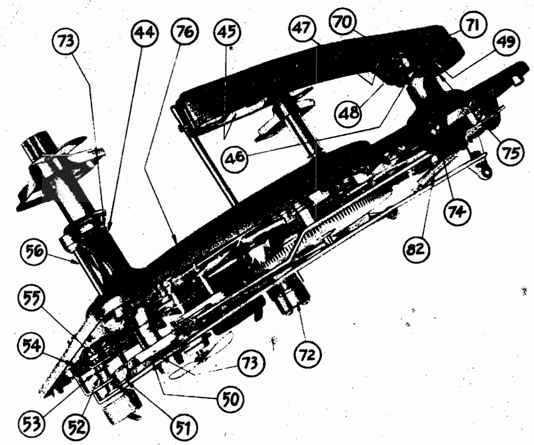
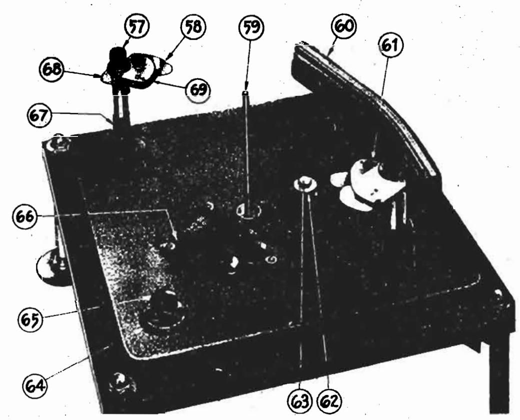


Figure 4



MODEL "J" RECORD CHANGER

Fig. 3

ITEM NO.	PART NO.	DESCRIPTION	NO. USED
44	J-22061	Record Support Post #1	1
45	J-22125	Tone Arm Cartridge	1
46	J-22080	Tone Arm Swivel Bracket	1
47	J-22081	Tone Arm Mounting Bracket	1
48	J-22068	Tone Arm Lift Pin	1
49	J-22133	Counter Balance Spring	1
50	J-22129	Spring Washer	1
51	J-22014	Roller	2
52	J-22131	Switch Return Spring	1
53	J-72050	Flat Washer	2
54	J-22104	Switch Reject Slide	1
55	J-22809	Switch Collar & Reject Pin Assy.	1
56	J-22063	12" Set Rod	1
70	H-20157	Tone Arm Adjusting Screw	1
71	H-20039	Adjusting Screw Lock Spring	1
72	J-22117	Thrust Wafer	1
73	H-20014	Thrust Washer	5
74	H-20513	Ball Race Assy.	1
75	H-20101	Rubber Bumper	1
76	J-22078	Turntable	1
82	J-22025	Tone Arm Lifter Reset Spring	1
		Fig. 4	
57	J-22077	Control Knob	2
58	J-22098	Selector Blade 10"	2
59	J-22148	Turntable Spindle	1
60	J-22079	Tone Arm	1
61	J-22071	Selector Arm #1	1
62	J-22152	Special Washer	1
63	J-22150	Drive Gear Stud Locknut	1
64	J-22106	Switch Escutcheon	1
65	J-22105	Switch Control Knob	1
66	J-22009	Motor	1
67	J-22062	Record Support Post #2	1
68	J-22099	Selector Blade 12"	2
69	J-22072	Selector Arm #2	1

STEWART-WARNER CORP.

MODEL J
Record-changer

(3)

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 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.

SERVICE NOTES

1. ADJUSTMENT FOR REST POSITION OF TONE ARM --

(A) 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 setscrews.

(B) 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. 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).

(C) Next loosen the clamping screw in the Swivel Bracket Assembly (Item 46, Fig. 3.)

(D) Now move tone arm, (Item 60, Fig. 4) 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.

(4)

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 fron 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.

MODEL J
Record-changer

STEWART-WARNER CORP.

Chassis 11-5W
Chassis 12-4D
Alignment

(5)

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. 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" reocrd.

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 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. 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 setscrews in the Selector Shaft Collar (Item 6, Fig. 1) should be loosened and the Selector Shaft Collar pressed upward slightly and set screws tightened.

NEEDLE DRAGS ACROSS RECORD:

If the needle drags across the record, the long portion of the Tone Arm Lever Assembly (Item 19, Fig. 1) is contacting the pin on the top side of the gear assembly (Item 4, Fig. 1) and is being moved by it. The remedy is to bend the long portion of the Tone Arm Lever Assembly upward so that it clears the pin.

(6)

In some radios models the lever may be reached without removing the record changer from the cabinet; however, if easy access is not possible, removal of the complete record changer is recommended.

TONE ARM LANDS IMPROPERLY ON BOTH 10" AND 12" RECORDS:

If the Tone Arm lands improperly on one size of record but properly on the other size, the adjustments described under 6 or 7 of "Service Notes" should be made. Improper landing on both 12" and 10" records is due to a dislocated Tone Arm. This may be remedied by loosening the screw located on the Tone Arm Swivel Bracket (Item 46, Fig. 3) and moving the Tone Arm to the proper position and then retightening the screw. A rough check as to the proper position is to place the Tone Arm in its rest position and see if the outside of the Tone Arm is flush with the edge of the Motorboard. The two set screws on the Tone Arm Shaft (Item 77, Fig. 2) should be checked to see if they are tight.

ALIGNMENT PROCEDURE
MODELS 11-5W1 TO 11-5W9 & 12-4D1 TO 12-4D9

FOR ALIGNMENT an output meter and an accurately calibrated signal generator are required.

1. Connect the output meter across the voice coil or between the plate of the 1A5GT** output tube and ground through a 0.1 Mfd. condenser, 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 Black Wire or the chassis.
3. Turn the volume control to the maximum volume position and keep it in this position while aligning.
4. With the gang condenser in full mesh, set the dial pointer in a horizontal position. If the pointer is incorrectly set, it is merely necessary to move the pointer to the correct position by hand, while holding the gang in the full mesh position.

Dummy Ant. in Series with Sig. Gen.	Connection of Sig. Generator Output to Receiver	Signal Generator Frequency	Receiver Dial Setting	Trimmer Number	Trimmer Description	Type of Adjustment
.1 MFD Condenser	* Control Grid of 1A7GT	455 KC	Any Point Where It Does Not Affect Signal	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 MMFD Condenser	Antenna Lead (Blue Wire)	1500 KC	1500 KC	5	Broadcast Oscillator (Shunt)	Adjust trimmer for maximum output.
200 MMFD. Condenser	Antenna Lead (Blue Wire)	1500 KC	Tune To 1500 KC Generator Signal	6	Broadcast Antenna	Adjust for maximum output.

ON CHASSIS 11-5W --- *CONNECT TO GANG-COND. FRONT-SECTION LUG ** 6F6G output tube

MODELS 505H, 505HB

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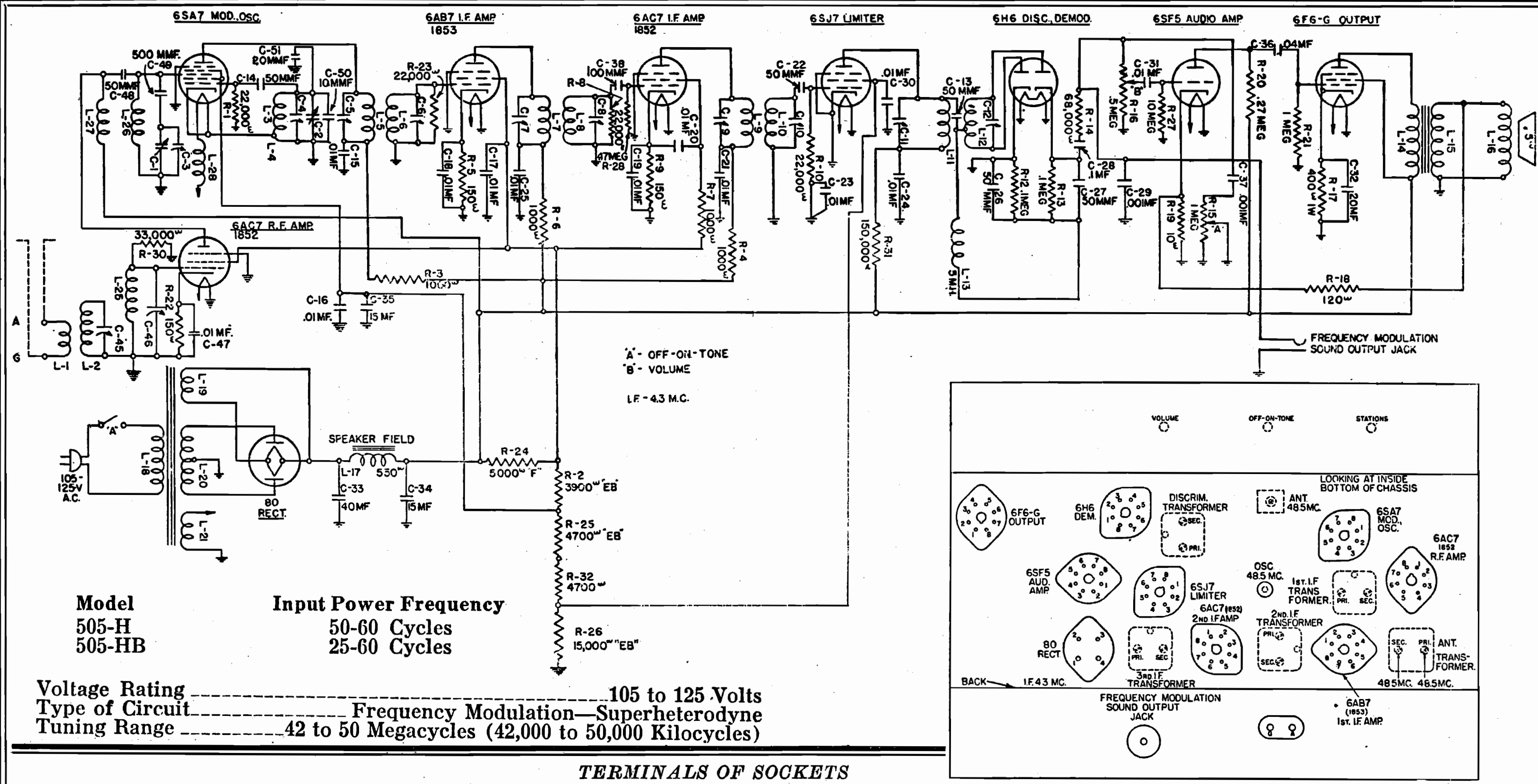


Model
505-H
505-HB

Input Power Frequency
50-60 Cycles
25-60 Cycles

Voltage Rating .... 105 to 125 Volts
Type of Circuit .... Frequency Modulation—Superheterodyne
Tuning Range .... 42 to 50 Megacycles (42,000 to 50,000 Kilocycles)

TERMINALS OF SOCKETS

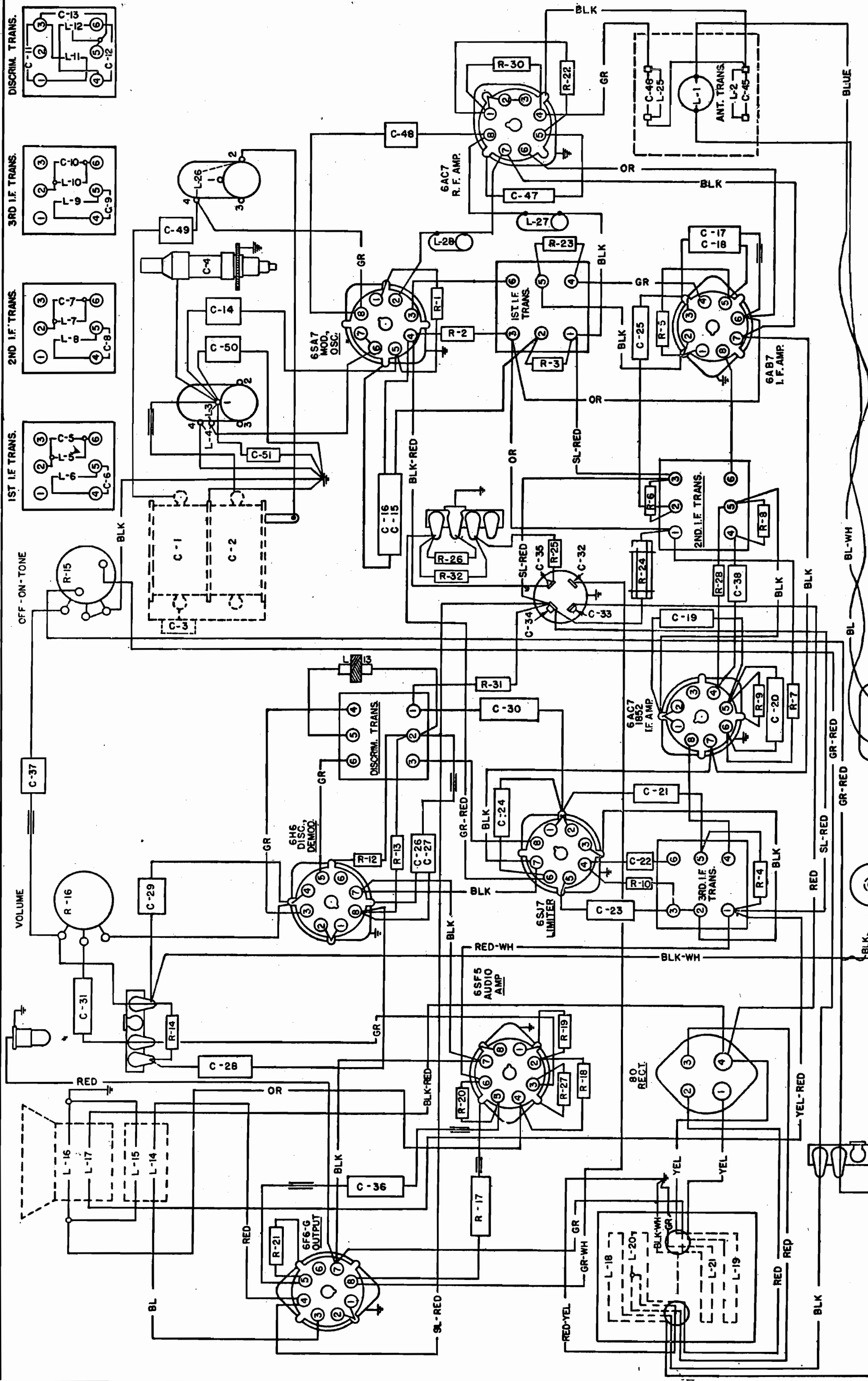
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
6AC7	R. F. Amp.	—	0	0	0	0	+2*	+75	6.3	+220
6SA7	Osc. and Mod.	—	0	0	+240	+90	0	0	6.3	0
6AB7	1st I. F. Amp.	—	0	0	0	0	+2*	+75	6.3	+230
6AC7	2nd I. F. Amp.	—	0	0	0	0	+2*	+145	6.3	+230
6SJ7	Limiter	—	0	0	0	0	0	+50	6.3	+57
6H6	Demod. (Discr.)	—	0	0	0	0	—10*	0	6.3	0
6SF5	Audio Amp.	—	0	0	0	0	+90	+245	6.3	0
6F6G	Output	—	0	0	+230	+245	0	0	6.3	+15*
80	Rectifier	—	+300	310	310	+300	—	—	—	—

***Read on lowest possible scale of voltmeter.**

ALIGNMENT FOR MODEL 505 IS THE SAME AS THE F-M ALIGNMENT OF MODEL 515 WITH THE EXCEPTIONS AS NOTED.
ALSO SEE NOTES ON USING MODEL 505 AS A CONVERTER AND ON PLAYING RECORDS

MODELS 505H
505HB

STROMBERG-CARLSON TEL. MFG. CO.



ADJUSTING DIAL LAMP. One dial lamp is used to illuminate the dial on the No. 505 Receiver. To adjust the dial lamp for proper illumination of the dial, slide the lamp socket back and forth on its mounting bracket until maximum illumination is obtained.

Input Power Rating (120 Volt line) ---------- 79 Watts
Intermediate Frequency ---------- 4.3 Megacycles (4300 Kilocycles)
Speaker Voice Coil Impedance at 400 Cycles ---------- Approximately 5 Ohms
Speaker Field Coil Resistance ---------- Approximately 550 Ohms

STROMBERG-CARLSON TEL. MFG. CO.

MODEL 505
MODEL 515

Important. Before proceeding to align the frequency modulation chassis of this receiver tune the receiver to 48.5 megacycles and mark this point with a pencil on the large pulley of the frequency modulation chassis. Carefully remove the drive cord from this pulley noting the relation of the point marked with the setting of the variable capacitor.

This note applies only to Model 515

I. **Discriminator Adjustment.** (Frequency Modulation)

1. Tune the set to the extreme low frequency, plates of variable capacitor all the way in.
2. Connect the center "O" microammeter with a one megohm resistor in series across the whole discriminator load from the high side of R-13 to ground.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce an unmodulated signal of 4.3 megacycles to the grid (Terminal No. 4) of the 6SJ7 limiter tube using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Approximately one volt signal is necessary).
5. Adjust the secondary of the discriminator transformer for "O" reading of the microammeter.
6. Remove the microammeter and one megohm resistor from the high side of R-13 Resistor and connect them across one half of the discriminator load (from ground to the junction of the two 100,000 ohm resistors R-12 and R-13).
7. Adjust the primary of the discriminator transformer for maximum reading of the microammeter.

NOTE: To check for correct adjustment of the discriminator circuit connect the center "O" microammeter across the whole discriminator load, noting that the microammeter reads "O". If a discrepancy exists it may be corrected by readjusting the secondary trimmer for "O" reading of the microammeter, then tune the receiver on either side of 4.3 megacycles, noting that the reading of the microammeter is approximately the same on either side of "O". If a discrepancy exists it may be corrected by adjusting the primary trimmer for maximum swing of the microammeter on either side of "O".

II. **Intermediate Frequency Adjustments.** (Frequency Modulation)

Important: All intermediate frequency adjustments are made using the same unmodulated signal of 4.3 megacycles. Each I. F. stage must be adjusted independently and in the order given. **Do not make any overall adjustments after the previous stage is aligned.**

*1. Disconnect the jumper wire from the low side of the limiter grid resistor (R-10) and connect the microammeter directly to this wire without using the one megohm resistor.

1. Disconnect the 10000 ohm resistor (R17) from ground and connect the microammeter between the resistor and ground.
2. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AC7 second I. F. tube (Terminal No. 4).
3. Adjust the secondary of the third I. F. transformer for maximum reading of the microammeter.
4. Adjust the primary of the third I. F. transformer for maximum reading of the microammeter.
5. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to the grid of the 6AB7 first I. F. tube (Terminal No. 4).
6. Adjust the secondary of the second I. F. transformer for maximum reading of the microammeter.
7. Adjust the primary of the second I. F. transformer for maximum reading of the microammeter.
8. Disconnect the green wire to the R. F. coil from the grid terminal of the 6SA7 modulator tube (Terminal No. 8), connect a 150000 ohm resistor from Terminal No. 8 to ground, and connect the output lead from the signal generator with the 0.1 microfarad capacitor in series to this terminal.
9. Adjust the secondary of the first I. F. transformer for maximum reading of the microammeter.
10. Adjust the primary of the first I. F. transformer for maximum reading of the microammeter.

III. **Radio Frequency Adjustments.** (Frequency Modulation)

(Leave the signal generator connected to the grid of the 6SA7 tube in the same manner as when adjusting the first I. F. transformer).

1. Set the signal generator frequency and the receiver tuning dial to exactly 48.5 megacycles.
2. Adjust the oscillator aligning capacitor (air trimmer) for maximum reading of the microammeter.
3. Remove the output lead and the 0.1 microfarad capacitor in series with it from the grid of the 6SA7 tube and re-solder in its original position the wire which was removed from this terminal. Remove the 150,000 ohm resistor.
4. Remove the green wire from the grid of the 6AC7 R. F. tube (Terminal No. 4) and connect the output lead from the signal generator with a 0.1 microfarad capacitor in series with it to this terminal. Adjust the R. F. Aligning Capacitor for maximum reading of the microammeter. A slight adjustment of the oscillator (air trimmer) may also be made at this point to obtain maximum reading of the microammeter. Resolder the green wire in its original position.
5. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm carbon type resistor and connect it to the antenna terminal of the receiver.
6. Adjust the antenna aligning capacitor for maximum reading of the microammeter.
7. Check for correct antenna circuit adjustment by setting the signal generator and tuning the receiver to 42 megacycles, noting that the sensitivity is approximately the same as at 48.5 megacycles. If a discrepancy exists the secondary of the antenna transformer may be adjusted to obtain maximum reading of the microammeter. Set the signal generator frequency and the receiver tuning dial to 48.5 megacycles and readjust both the primary and secondary of the antenna transformer for maximum reading of the microammeter.
8. Re-solder the 10000 ohm resistor (R17) to its original position.

*8. Re-solder the jumper wire to the low side of the limiter grid resistor (R-10).

* Apply to Model 505

ALIGNMENT DATA FOR A-M CHASSIS AND OTHER
NOTES BELOW APPLY ONLY TO MODEL 515

IV. **Intermediate Frequency Adjustments.** (Amplitude Modulation)

1. Set the range switch to Standard Broadcast position.
2. Tune set to extreme low frequency end of the dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 Kilocycles to the grid cap of the 6A8 tube, using a 0.1 microfarad capacitor in series with the output lead of the signal generator. (Do not remove the grid clip from this tube.)
5. Adjust the I. F. Aligners for maximum output in the following order:
   A. Secondary of second I. F. transformer.
   B. Primary of second I. F. transformer.
   C. Secondary of first I. F. transformer.
   D. Primary of first I. F. transformer.

V. **Radio Frequency Adjustments.** (Amplitude Modulation)

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm carbon type resistor, and connect it to the antenna terminal of the chassis.
2. Set the range switch to the short-wave range (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycles oscillator and antenna (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycles oscillator and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm carbon type resistor in series with the output lead from the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the Standard Broadcast Range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 Kc.
4. Adjust the 600 Kc. oscillator, Bi-Resonator and antenna (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 Kc.
6. Adjust the 1500 Kc. oscillator, Bi-Resonator and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

VI. **Wave Trap Adjustment.**

(Leave the receiver connected in the same manner as when adjusting the Standard Broadcast Range (A Band)).

1. Tune set to 1000 Kc.
2. Set the signal generator frequency to 455 Kc. and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

REMOVING THE CHASSIS FROM CABINET

Do not remove the chassis from the shelves; instead, remove the chassis and shelf assembly by taking out the six wood screws from the top shelf and the four wood screws from the bottom shelf, thus removing chassis and shelves as a unit.

ADJUSTING DIAL LAMP

The dial on this receiver is edge lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass. To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

1. Remove the dial escutcheon by removing the screws and pulling downward and outward.
2. Put the call letters of the selected stations in place above the push buttons. The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial. (The call letters will be found inside the envelope stapled inside or underneath the cabinet.)
3. Tune in manually the highest frequency station to be set up and note carefully the program being transmitted.
4. Turn the range switch to the push button position and push the highest frequency button.
5. Using a very small screwdriver adjust the slot in the inner screw until it coincides with the slot in the outer screw.
6. Using a larger screwdriver, adjust both screws at the same time until the desired station is tuned in as well as possible.
7. Using the small screwdriver again, adjust the small inner screw for maximum closing of the tuning indicator. (Be sure the outer screw does not move while adjusting the inner screw.)
   Operations 5, 6 and 7 can be greatly simplified by using Stromberg-Carlson SD-70 Adjusting Tool which is a double screwdriver designed to fit both of these screws at the same time.
8. Set up the other stations in the same manner.
9. Recheck the adjustment of each adjusting screw.

MODEL 505
MODEL 515

STROMBERG-CARLSON TEL. MFG. CO.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 Kc. or 47 Mc.—no signal.

Use a line voltage of 120 volts, or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale except when an asterisk appears.

Read from indicated terminals to chassis base.

See location chart for position of terminals.

A. C. voltages are indicated by italics.

To measure voltages of 6AF6G tube remove the metal cover on the tuning indicator socket and read from indicated terminals.

			TERMINALS OF SOCKETS							
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
	AMPLITUDE MODULATION CHASSIS									
6A8	Mod. and Osc.	0	0	0	+250	+110	—8*	+173	*6.3*	+3*
6K7	I. F. Amp.	0	0	0	+253	+108	+4*	—	*6.3*	+4*
6H6	Dem. and A. V. C.	—	0	0	0	0.	0	0	*6.3*	0
6SQ7	Audio Amp.	—	0	0	0	0	0	+108	*6.3*	0
6SQ7	Audio Inv.	—	0	0	0	0	0	+108	*6.3*	0
6V6G	Output	—	0	0	+250	+254	0	—	*6.3*	+14
6V6G	Output	—	0	0	+250	+254	0	—	*6.3*	+14
6AF6G	Tuning Indicator	—	—	0	+52	+110	+220	—	*6.3*	+90
80	Rectifier	—	+382	*375*	*375*	+382	—	—	—	—
—	Speaker Socket	—	—	+382	0	0	+382	+382	—	—
	FREQUENCY MODULATION CHASSIS									
6AC7	R. F. Amp.	—	0	0	0	0	+2*	+148	*6.3*	+230
6SA7	Mod. and Osc.	—	0	0	+240	+90	0	0	*6.3*	0
6AB7	1st I. F. Amp.	—	0	0	0	0	+2*	+148	*6.3*	+230
6AC7	2nd I. F. Amp.	—	0	0	0	0	+2*	+145	*6.3*	+230
6SJ7	Limiter	—	0	0	0	0	0	+50	*6.3*	+57
6H6	Demod. (Discr.)	—	0	0	0	0	—10*	0	*6.3*	0
6SK7	Tun. Ind. Amp.	—	0	0	0	0	0	+275	*6.3*	+275
80	Rectifier	—	+300	*310*	*310*	+300	—	—	—	—

*Read on lowest possible scale of voltmeter
5 volts AC between terminals 1 and 4 of rectifier sockets (No. 80 tube)

PLAYING RECORDS. To obtain the best quality of phonograph reproduction, a Stromberg-Carlson record player is recommended. They are designed for use with this receiver and all that is necessary is to connect the record player to the single prong socket provided in the chassis, operate the "Radio-Phono" switch located on the back of the chassis to "Phono" position, push in the frequency modulation button on the front of the receiver and proceed to operate. The volume and tone may be controlled with the controls at the receiver•or (if such is provided), the volume control on the record player may be used.
A low impedance pick-up may be used, but a matching transformer must be placed between the phonograph pick-up and the chassis.

USING THE 505 RECEIVER AS A CONVERTER. This receiver may be used as a converter so that the audio system of a good high fidelity receiver of the ordinary amplitude modulation type may be utilized to provide the type of high fidelity reception only possible with frequency modulation.

It is only necessary to connect the single pin jack on the back of the chassis (labeled Frequency Modulation Sound Output Jack) to the Phono Input of any other receiver or sound system by means of the cord provided.

•In this way, the speaker of the 505 Receiver will act as a "tweeter" or treble speaker and the speaker system of the amplitude modulation receiver will serve as the bass speaker. The balance between the two speakers can be controlled by operating the two volume controls.

PLAYING RECORDS. To obtain the best quality of phonograph reproduction, a Stromberg-Carlson record player is recommended. If this set is used as a converter, the phonograph should be attached to the amplitude modulation receiver in the regular way. (The installation of a simple switch will eliminate plugging and unplugging).

If this set is used as a receiver, the sound output jack may be readily converted to a phonograph input jack by removing the black-white wire which comes from this jack from the terminal block to which it is connected and connecting it to the high side of the volume control (this is the terminal on the volume control to which resistor R-11 is attached).

After this has been done, it is only necessary to plug in a record player, tune to a quiet place on the dial and proceed to operate.

MODELS 505 and 515
WEAK OR NO SIGNAL ON F-M BAND
Remove R8 (22,000 ohms) connected between 2nd i-f transformer and ground. If regeneration or oscillation occurs afterwards, connect 22,000-ohm resistor between the secondary of 2nd i-f transformer (terminals 4 and 5) and ground.

CONTINUITY TEST

Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out.

Leave speaker plug in socket for all other tests of the amplitude modulation chassis.

Use a good meter capable of measuring up to several megohms.

The resistances given are often approximate owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test-leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart on Page 5 for position and numbering of terminals.

			TERMINALS OF SOCKETS							
Tube	*Circuit*	*Cap*	1	2	3	4	5	6	7	8
	AMPLITUDE MODULATION CHASSIS									
6A8	Mod. and Osc.	3M	S	S	20000Ω	200000Ω	48000Ω	200000Ω	S	270Ω
6K7	I. F. Amp.	3M	S	S	19000Ω	200000Ω	390Ω	200000Ω	S	390Ω
6H6	Dem. and A. V. C.	—	S	S	500000Ω	S	500000Ω	20000Ω	S	S
6SQ7	Audio Amp.	—	S	10M	S	S	S	300000Ω	S	S
6SQ7	Audio Inv.	—	S	10M	S	S	S	300000Ω	S	S
6V6G	Output (A)	—	S	S	16000Ω	16000Ω	270000Ω	100000Ω	S	200Ω
6V6G	Output	—	S	S	16000Ω	16000Ω	400000Ω	O	S	200Ω
6AF6G	Tuning Indicator	—	O	S	O	200000Ω	16000Ω	O	S	6500Ω
80	Rectifier	—	19000Ω	100Ω	120Ω	19000Ω	—	—	—	—
—	Speaker Socket	—	100000Ω or Greater	S	S	O	100000Ω or Greater	O	16000Ω	—
	FREQUENCY MODULATION CHASSIS									
6AC7	R. F. Amp.	—	S	S	S	S	150Ω	15000Ω	S	15000Ω
6SA7	Mod. and Osc.	—	S	S	30000Ω	20000Ω	20000Ω	S	S	S
6AB7	1st I. F. Amp.	—	S	S	S	3Ω	150Ω	15000Ω	S	15000Ω
6AC7	2nd I. F. Amp.	—	S	S	S	500000Ω	150Ω	B	S	30000Ω
6SJ7	Limiter	—	S	S	S	32000Ω	S	15000Ω	S	15000Ω
6H6	Demod. (Discr.)	—	S	S	100000Ω	S	100000Ω	O	S	200000Ω
6SK7	Tun. Ind. Amp.	—	S	S	S	2.2M	S	40000Ω	S	40000Ω
80	Rectifier	—	29000Ω	250Ω	250Ω	29000Ω	—	—	—	—

Symbols used on chart are as follows: Ω—ohms; M—megohms; S—short; O—open

A. 6V6G tube socket nearest to the front of the chassis
B. Radio-Phono switch in "Radio" position .... 24,000 ohms
Radio-Phono switch in "Phono" position .... "open"

Other Tests Not Shown on Chart (Amplitude Modulation Chassis)

- Antenna terminal to chassis base .... 75 ohms
- Ground terminal to chassis base .... "short"
- Audio connector socket to chassis base .... "open"
- Between terminals of A. C. plug:
  - A. C. switch open .... "open"
  - A. C. switch closed .... 5 ohms
- Terminals of A. C. plug to chassis base .... "open"
- R. F. coil tests measured directly across R. F. coil terminals with range switch in standard broadcast position. ("A" Range)

L3—.8 ohm; L4—.8 ohm; L5—.1 ohm; L6—3 ohms; L7—.3 ohm; L8—4 ohms; L9—.1 ohm; L10—"short"; L11—.1 ohm; L12—"short".

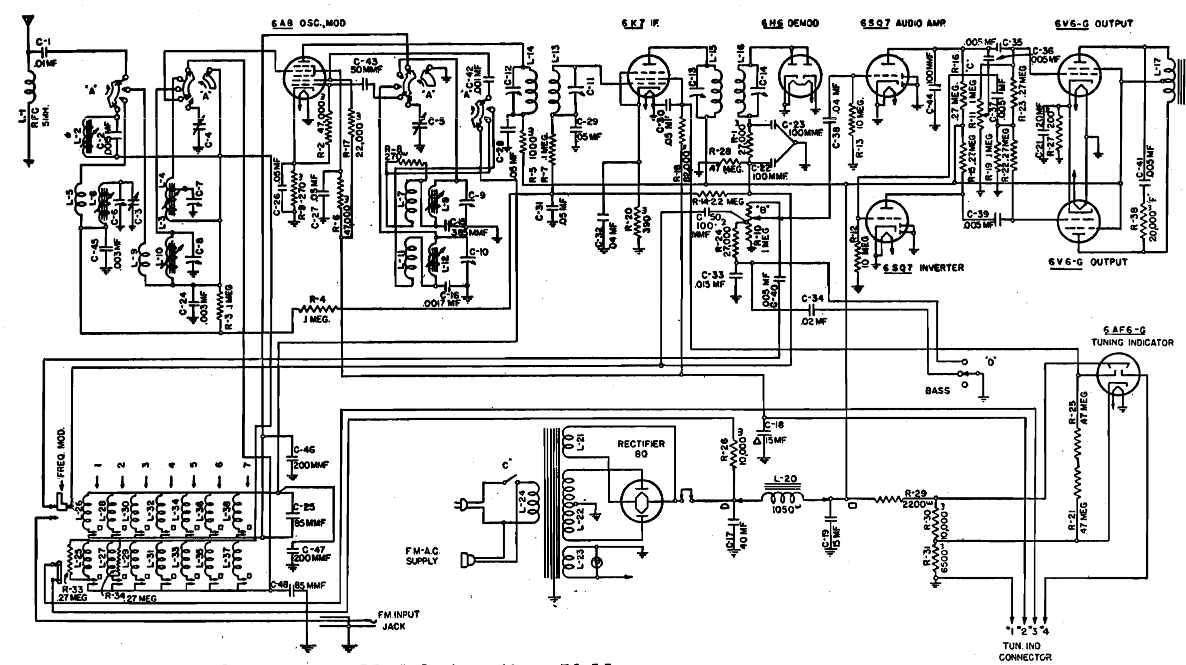
Other Tests Not Shown on Chart (Frequency Modulation Chassis)

- Antenna terminal to chassis base .... "open"
- Ground terminal to chassis base .... "short"
- Phono jack to chassis base .... "open"
- Terminals of A. C. plug to chassis base .... "open"
- Between terminals of A. C. plug .... 9 ohms
- Relay socket to chassis base:
  - Terminal No. 1 .... 40,000 ohms
  - Terminal Nos. 2 and 3 .... "open"
  - Terminal No. 4 .... "short"
- Audio connector plug to chassis base:
  - Prong of plug .... "open"
  - Shield of plug .... "short"
- Between prong of audio connector plug and contact of phono jack:
  - Radio-Phono switch in "Phono" position .... "short"
  - Radio-Phono switch in "Radio" position .... "open"
- R. F. coil tests measured directly across R. F. coil terminals.

L1 — .2 ohm; L2 — "short"; L3 — "short"; L4—"short"; L13—55 ohms.

STROMBERG-CARLSON TEL. MFG. CO.

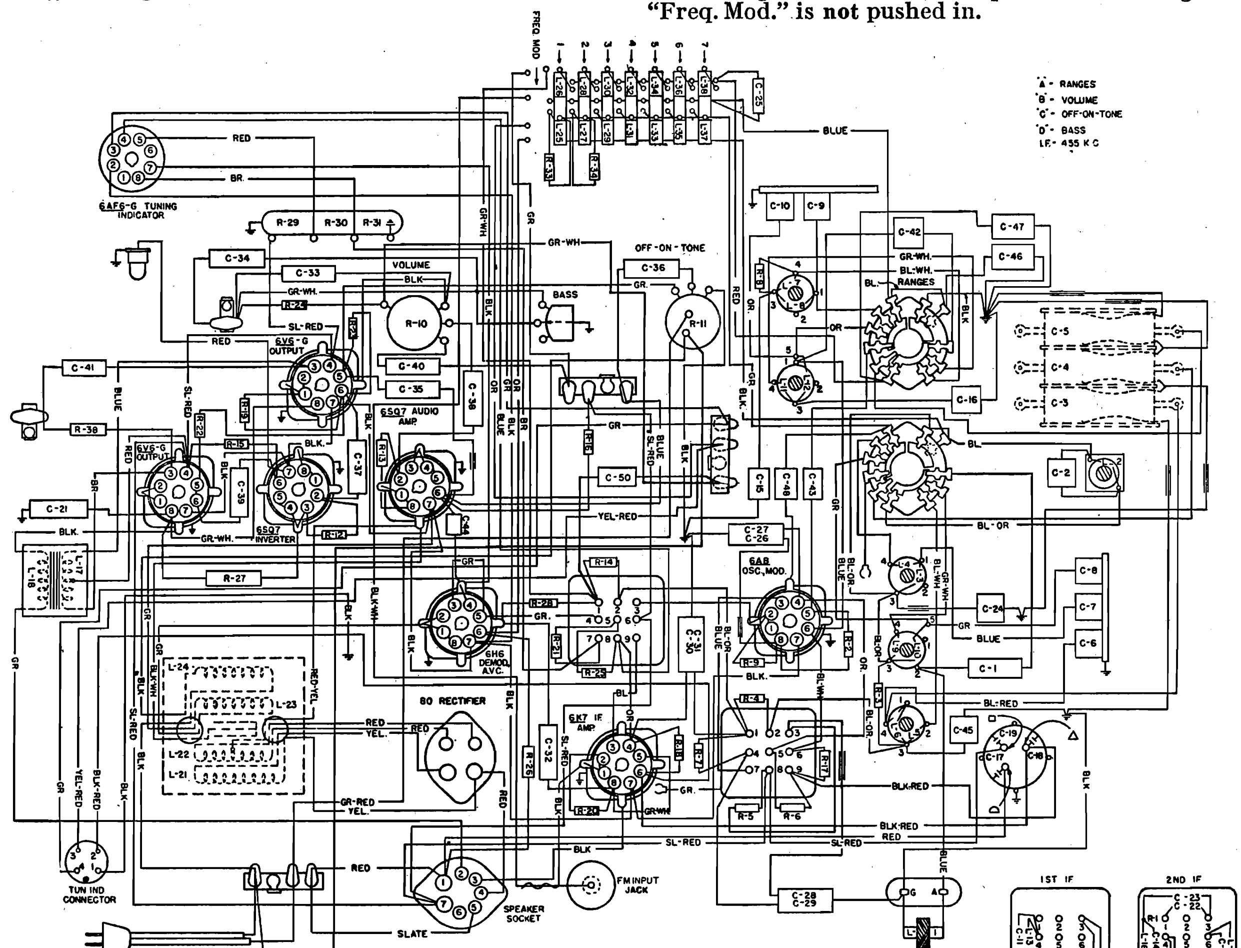
MODEL 515M
Ch. AM



Tuning Ranges --- { Frequency Modulation 42 to 50 Mc. / Short Wave 5.8 to 18 Mc. / Standard Broadcast .54 to 1.7 Mc. }

Voltage Rating ---------------------105 to 125 Volts

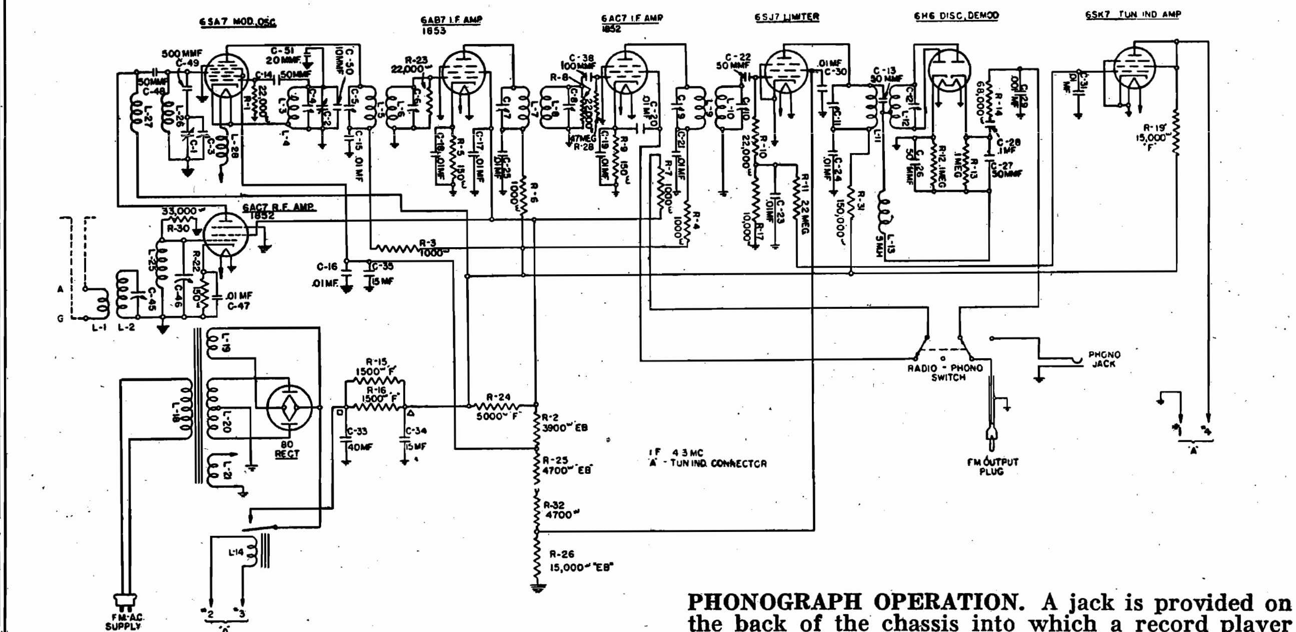
MANUAL TUNING. Important. When tuning stations manually in the Standard Broadcast or Short Wave ranges be sure that the push button designated **"Freq. Mod."** is **not** pushed in.



Wiring and Schematic Diagram
Amplitude Modulation

MODEL 515M
Ch. FM

STROMBERG-CARLSON TEL. MFG. CO.

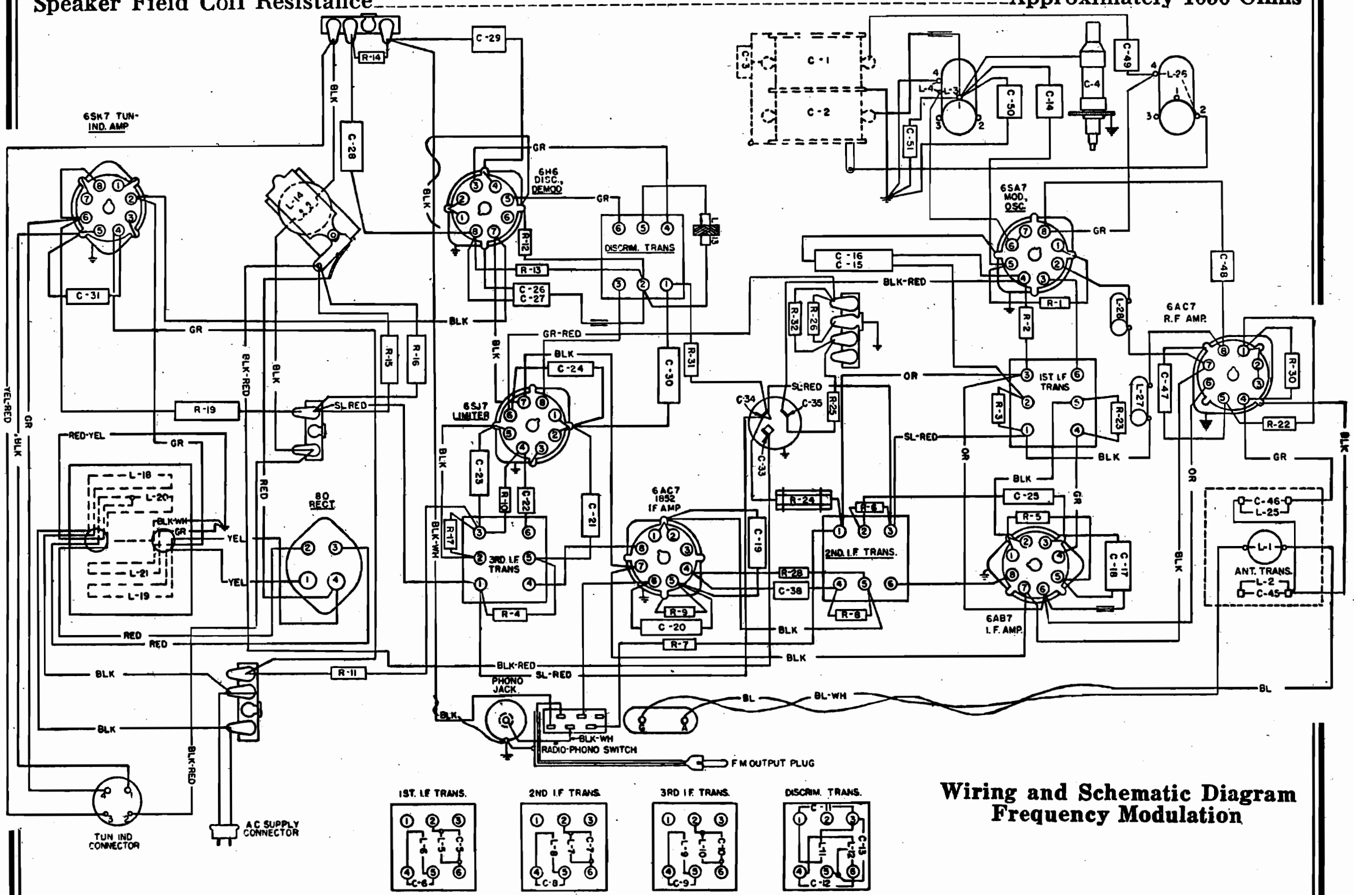


SPECIAL CIRCUITS. A tuning indicator having two apertures is used in this receiver. One aperture will operate when tuning stations in the standard broadcast and short-wave ranges and the other aperture will operate when tuning stations in the frequency modulation range. Stations should be tuned for maximum closing of the tuning indicator.

PHONOGRAPH OPERATION. A jack is provided on the back of the chassis into which a record player may be plugged and a switch is provided next to it for switching from "Radio" to "Phonograph".

TELEVISION. Switching to phonograph also makes the audio amplifier and loud speaker available for use with television receivers designed for this type of sound reproduction.

Input Power Rating	140 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation) 4.3 Megacycles (Frequency Modulation)
Speaker Voice Coil Impedance at 400 Cycles	Approximately 1.5 Ohms
Speaker Field Coil Resistance	Approximately 1050 Ohms



Wiring and Schematic Diagram
Frequency Modulation

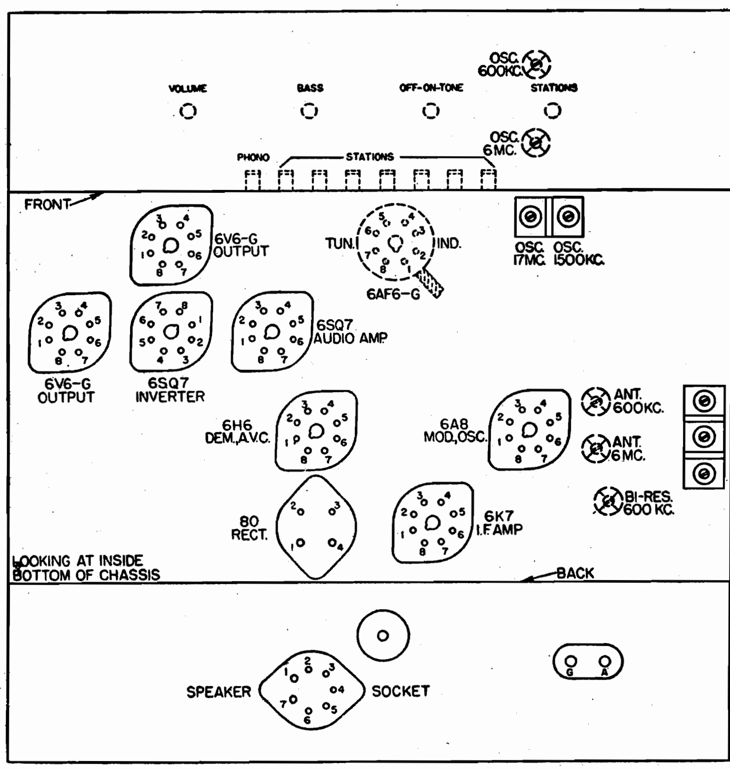
STROMBERG-CARLSON TEL. MFG. CO.

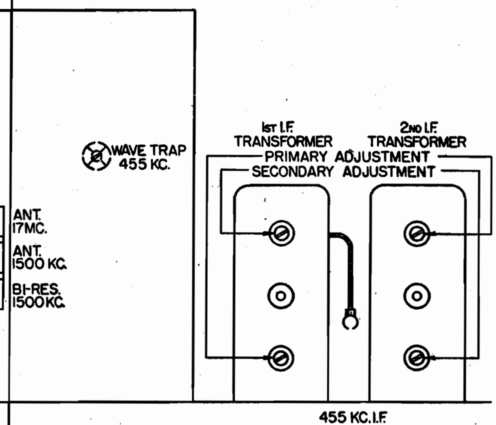
MODEL 515M

This is a seventeen tube, three gang, three range receiver, designed for the reception of both amplitude and frequency modulated stations.

Eight button automatic tuning is provided. The tuning unit is composed of a group of coils which are adjusted by means of iron cores, so that seven favorite stations in the standard broadcast range may be set up. The eighth button is for switching from amplitude to frequency modulation. Tone is adjusted by a variable tone control and the dial is of the slide rule type edge, lighted for clear visability without glare.

Provision is made for a record player to be used with this receiver without additional wiring.

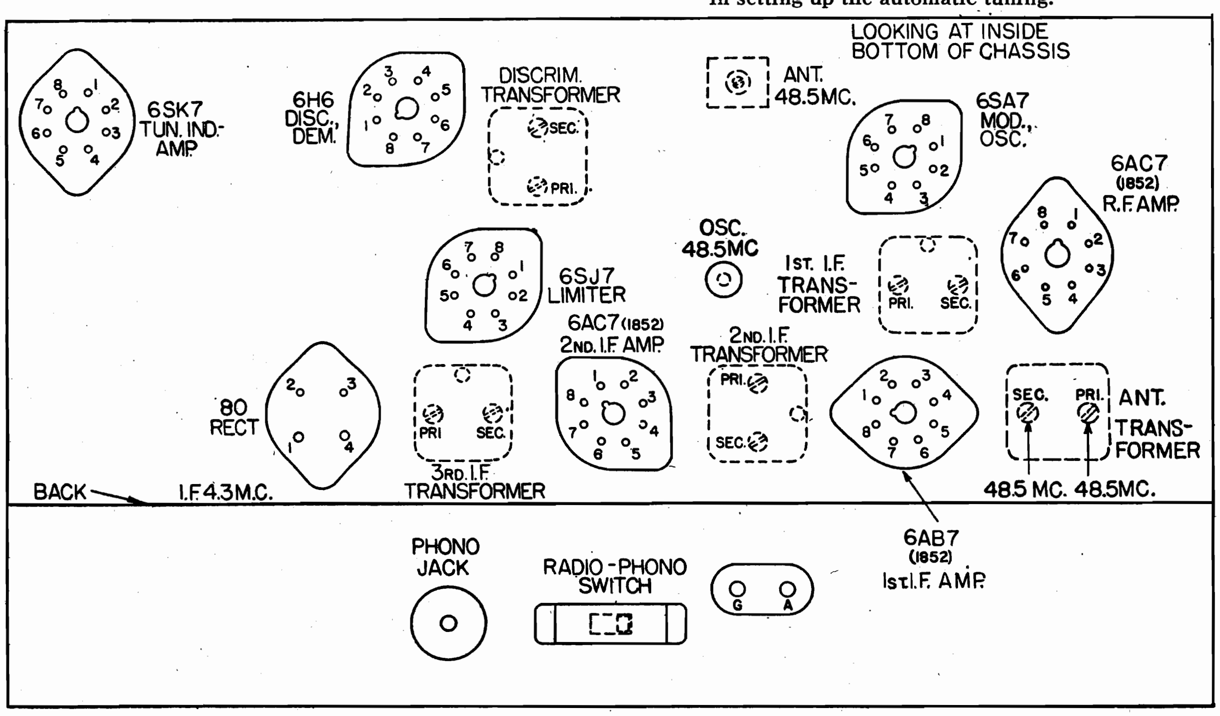




Location Chart (Amplitude Modulation)

Iron core coils are used in the standard broadcast and short-wave ranges to provide greater accuracy of alignment. In addition a thernal drift compensator is included in the circuit. The audio system employs a special inverter push-pull circuit designed to provide excellent fidelity. The power transformer has an electro-static shield to reduce line noises to a minimum and the chassis is thoroughly shielded throughout.

AUTOMATIC TUNING. An adjustable iron core coil type of automatic tuning is employed and the stations may be easily located by properly utilizing the concentric adjusting screws provided. A special tool identified as SD-70 Screwdriver will help materially in setting up the automatic tuning.



Location Chart—(Frequency Modulation)

MODEL 515M
MODEL 505

STROMBERG-CARLSON TEL. MFG. CO.

ACCESSORIES

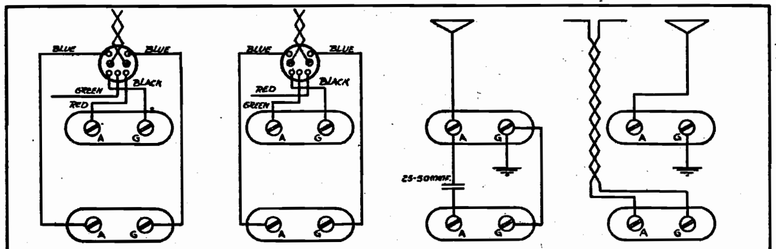
MODEL 515-M

ANTENNA. For best results use a Stromberg-Carlson No. 6 Antenna. This antenna is designed to provide improved pick-up on both the amplitude and frequency modulation bands.

If it is desired, two ordinary antennas may be used, one for amplitude modulation, which should be a straight wire "L" type antenna about 75 feet long, and one for frequency modulation. This latter antenna may be a straight wire about 40 feet in length or of the dipole type with two arms approximately 5½ feet in length. The dipole antenna will exhibit a marked directional effect and should be erected as high as possible above the ground and adjusted so as to receive the desired frequency modulated stations with best results.

For average reception, a single straight wire antenna may be used for both amplitude and frequency modulation.

The various types of antennas should be connected to the No. 515 Receiver as follows:



STROMBERG-CARLSON NO.6 — STROMBERG-CARLSON NO.6 (GREEN LEAD CONNECTED FOR MINIMUM INTERFERENCE BETWEEN STATIONS.) — SINGLE ANTENNA — SEPARATE ANTENNAS

PARTS LIST MODEL 505

Capacitors

Piece No.	Circuit Designation	Part
24402	C-28	.1 mf. Capacitor
24405	C-36	.04 mf. Capacitor
25487	C-29, 37	.001 mf. Capacitor
27305	C-14, 22, 48	50 mmf. Capacitor
27999	C-26, 27	2—50 mmf. Capacitors
28568	C-38	100 mmf. Capacitor
31480	C-15, 16, 17, 18	2—.01 mf. Capacitors
31481	C-19, 20, 21, 23, 24, 25, 30, 31	.01 mf. Capacitor
30399	C-32, 33, 34, 35	Electrolytic Capacitor (1—40 mf., 2—15 mfs., 1—20 mf.)
32669	C-1, 2	Variable Capacitor (2 gang)
30311	C-4	Capacitor (Air Trimmer)
31377	C-51	20 mmf. Capacitor
31457	C-3, 4	Aligning Capacitor
31481	C-47	.01 mf. Capacitor
32806	C-50	10 mmf. Capacitor

Coils, Transformers and Speaker

Piece No.	Circuit Designation	Part
30332	L-13	R. F. Choke Coil
32691	L-1, 2, 25	Antenna Coil
32677	L-26	R. F. Coil
32678	L-3, 4	Oscillator Coil
32679	L-5, 6—C-5, 6	1st. I. F. Transformer
32696	L-7, 8—C-7, 8	2nd I. F. Transformer
32698	L-9, 10—C-9, 10	3rd I. F. Transformer
32681	L-11, 12—C-11, 12	Discriminator I. F. Transformer
31437	L-18, 19, 20, 21	Power Transformer, 50/60 Cycles
31438	L-18, 19, 20, 21	Power Transformer, 25/60 Cycles
31451	L-14, 15, 16, 17	Speaker Complete with Output Transformer
30528	L-16	Cone for Speaker
31453	L-14, 15	Output Transformer
32060	L-27	R. F. Choke Coil
32687	L-28	Heater Choke Coil

Controls and Knobs

Piece No.	Circuit Designation	Part
27811	R-15	Switch Off-On and Tone Control
30136	R-16	Volume Control
29297		Dial Drive Shaft
27668		"C" Washer for Dial Drive Shaft
28843		Knob

Resistors

Piece No.	Circuit Designation	Part
26309	R-19	10 ohm Resistor
26322	R-18	120 ohm Resistor
26323	R-5, 9	150 ohm Resistor
26333	R-3, 4, 6, 7	1000 ohm Resistor
26341	R-32	47,000 ohm Resistor
26349	R-1, 10, 23	22,000 ohm Resistor
26351	R-30	33,000 ohm Resistor
26355	R-14	68,000 ohm Resistor
26357	R-12, 13	.1 megohm Resistor
26359	R-31	.15 megohm Resistor
26362	R-20	.27 megohm Resistor
26365	R-28	.47 megohm Resistor
26369	R-21	1 megohm Resistor
26381	R-27	10 megohm Resistor
28165	R-2	3,900 ohm Resistor
28166	R-25	4,700 ohm Resistor
28172	R-26	15,000 ohm Resistor
28758	R-17	400 ohm, 1 watt Resistor
31479	R-24	5,000 ohm, 1 watt Resistor

Miscellaneous Parts

Piece No.	Circuit Designation	Part
SD-67		Dial Drive Cord
24135		Felt Foot for Cabinet
26122		Antenna and Ground Terminal Strip
28652		Power Supply Cord
28694		Pilot Lamp Socket Assembly
28695		Dial Pointer
29137		Pulley Assembly
29479		Screw for Dial Escutcheon
29628		Spring for Dial Drive Cord
29956		Pilot Lamp
30151		8-Prong Tube Socket
30153		4-Prong Tube Socket
30224		F. M. Sound Output Plug
30225		Guard for F. M. Sound Output Jack
30226		F. M. Sound Output Jack
30388		Dial Escutcheon
32683		Dial
31478		Shielded Cable for Connecting to Amplitude Modulation Receiver

REPLACEMENT PARTS (FREQUENCY MODULATION)

MODEL 515-M

Capacitors

Piece No.	Circuit Designation	Part
24402	C-28	.1 mf. Capacitor
25487	C-29, 37	.001 mf. Capacitor
27305	C-14, 22, 48	50 mmf. Capacitor
27999	C-26, 27	2—50 mmf. Capacitors
28568	C-38	100 mmf. Capacitors
29283	C-32	15 mmf. Capacitor
30311	C-4	Air Trimmer
31377	C-51	20 mmf. Capacitor
31480	C-15, 16, 17, 18	2—.01 mf. Capacitors
31481	C-19, 20, 21, 23, 24, 25, 30, 31, 47	.01 mf. Capacitor
31856	C-32, 33, 34, 35	Electrolytic Capacitor (1—40 mf., 350 V.; 1—15 mf., 300 V.; 1—15 mf., 150 V.)
32669	C-1, 2	Variable Capacitor (2 gang)
31457	C-3, 4	Aligning Capacitor
32806	C-30	10 mmf. Capacitor

Coils and Transformers

Piece No.	Circuit Designation	Part
30332	L-13	R. F. Choke Coil
32691	L-1, 2	Antenna Coil
32677	L-26	R. F. Coil
32678	L-3, 4	Oscillator Coil
32679	L-5, 6	1st I. F. Transformer
32696	L-7, 8	2nd I. F. Transformer
32681	L-11, 12	Discriminator I. F. Transformer
32698	L-9, 10	3rd I. F. Transformer
31850	L-18, 19, 20, 21	Power Transformer, 50/60 Cycles
32060	L-27	R. F. Choke Coil
32687	L-28	Heater Choke Coil

Resistors

Piece No.	Circuit Designation	Part
25526	R-19	15,000 Ohm Resistor, 1 Watt
26323	R-5, 9, 22	150 Ohm Resistor
26333	R-3, 4, 6, 7	1000 Ohm Resistor
26341	R-32	4700 Ohm Resistor
26349	R-1, 8, 10, 23	22,000 Ohm Resistor
26351	R-30	33,000 Ohm Resistor
26353	R-14	47,000 Ohm Resistor
26355	R-14	68,000 Ohm Resistor
26357	R-12, 13	.1 Megohm Resistor
26359	R-31	.15 Megohm Resistor
26365	R-11, 28	.47 Megohm Resistor
26373	R-11	2.2 Megohm Resistor
27049	R-15, 16	1,500 Ohm Resistor, 1 Watt
28165	R-2	3,900 Ohm Resistor
28166	R-25	4,700 Ohm Resistor
28172	R-26	15,000 Ohm Resistor
31479	R-24	5,000 Ohm Resistor, 1 Watt

Miscellaneous Parts

Piece No.	Circuit Designation	Part
26122		Antenna and Ground Terminal Strip
29128		Pulley Assembly
30151		8-Prong Tube Socket
30153		4-Prong Tube Socket
30224		Phono. Plug
30225		Guard
30226		Radio-Phono Jack
31512		A. C. Cord
31861		Radio-Phono Switch

REPLACEMENT PARTS (AMPLITUDE MODULATION)

Capacitors

Piece No.	Circuit Designation	Part
24405	C-32, 38	.04 mf. Capacitor
24559	C-44	100 mmf. Capacitor
24637	C-16	.0017 mf. Capacitor
25149	C-1	.01 mf. Capacitor
25150	C-34	.02 mf. Capacitor
25487	C-42	.001 mf. Capacitor
26151	C-41	.005 mf. Capacitor
27108	C-26, 27, 28, 29, 30, 31	2—.05 mf. Capacitors
27305	C-43	50 mmf. Capacitor
28594	C-33	.015 mf. Capacitor
28568	C-50	100 mmf. Capacitor
30116	C-45	.003 mf. Capacitor
30237	C-15	385 mmf. Capacitor
30322	C-35, 36, 37, 39, 40	.005 mf. Capacitor
30559	C-46, 47	200 mmf. Capacitor
30560	C-48	85 mmf. Capacitor
27685	C-21	Electrolytic Capacitor, 20 mf., 25 V.
30499	C-17, 18, 19	Electrolytic Capacitor (1—40 mf., 450 V.; 1—15 mf., 350 V.; 1—15 mf., 300 V.)
30253	C-6, 7, 8	Aligning Capacitor Assembly (3 unit)
30502	C-9, 10	Aligning Capacitor Assembly (2 unit)
30375	C-3, 4, 5	Tuning Capacitor (3 gang)

Coils, Transformers and Speakers

Piece No.	Circuit Designation	Part
30149	L-3, 4	Bi-resonator Coil
30150	L-7, 8	Oscillator Coil "A" Band
30238	L-2	Wave Trap
30332	L-1	R. F. Choke Coil
30401	L-9, 10	Antenna Coil "C" Band
30402	L-11, 12	Oscillator Coil "C" Band
30500	L-5, 6	Antenna Coil "A" Band
27134	L-17, 18	Output Transformer
30424	L-21, 22, 23, 24	Power Transformer (50/60 Cycles)
30432	L-25, 26, 27, 28, C-25	Push Button Coil and Switch Assembly
30245	L-15, 16, C-13, 14	Second I. F. Transformer
30504	L-13, 14, C-11, 12	First I. F. Transformer
30359		Speaker
30421		Cone for Speaker

Resistors

Piece No.	Circuit Designation	Part
26326	R-8, 9	270 Ohm Resistor
26328	R-20	390 Ohm Resistor
26333	R-5	1000 Ohm Resistor
26336	R-18	82,000 Ohm Resistor
26349	R-17	22,000 Ohm Resistor
26350	R-24	27,000 Ohm Resistor
26353	R-2, 6	47,000 Ohm Resistor
26357	R-7, 9, 34	.1 Megohm Resistor
26362	R-15, 16, 22, 23, 33, 34	.27 Megohm Resistor
26365	R-24, 25, 28	.47 Megohm Resistor
26373	R-14	2.2 Megohm Resistor
26381	R-12, 13	10 Megohm Resistor
26775	R-38	20,000 Ohms, 1 Watt
28956	R-27	200 Ohm Resistor, I. R. C.
30400	R-23, 30, 31	"B" Voltage Divider
30417	R-26	10,000 Ohm Resistor, Type G

Miscellaneous Parts

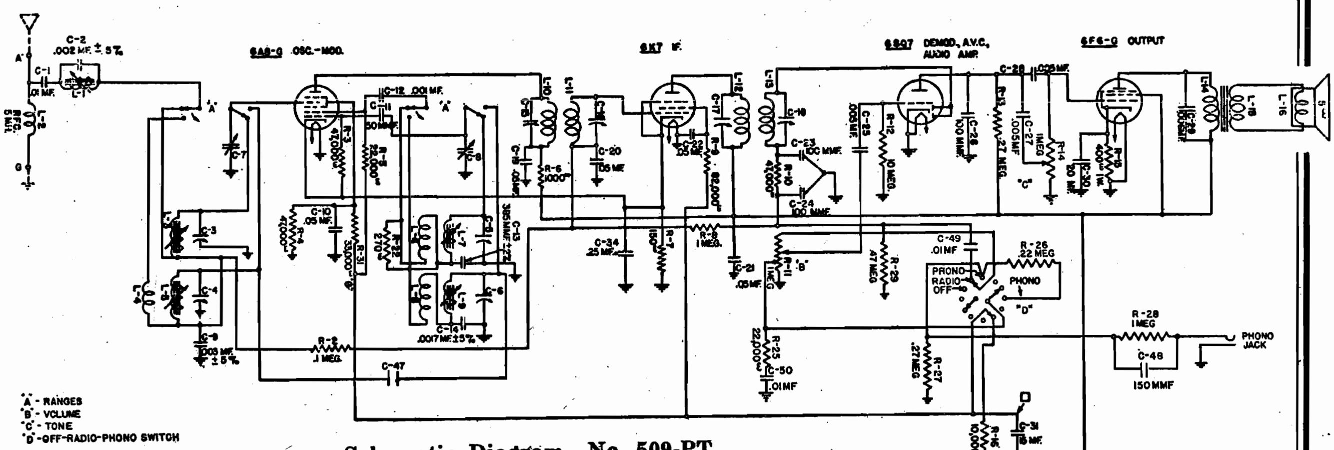
Piece No.	Circuit Designation	Part
SD-233		Dial Drive Cord
26122		Antenna and Ground Terminal Strip
26677		3-Prong Plug
27088		Spring Washer for Mounting Coils
27969		Phono. Cord and Plug
28652		Power Supply Cord
28694		Pilot Lamp Socket
29956		Pilot Lamp
32686		Dial Scale
30269		Corner Rubber for Dial Scale
30151		8-Prong Tube Socket
30152		7-Prong Tube Socket
30153		4-Prong Tube Socket
30169		Station Call Letters
30172		Dial Escutcheon

Controls and Knobs

Piece No.	Circuit Designation	Part
27311	R-11	Off-On Switch and Tone Control
29560	R-10	Volume Control
30501		Range Switch
30250		Bass Control Switch
27802		Large Tuning Knob
28827		Small Knob with Arrow
28843		Small Plain Knob
29084		Large Knob with Arrow
29461		Large Plain Knob
27628		Felt Washer for Knobs

STROMBERG-CARLSON TEL. MFG. CO.

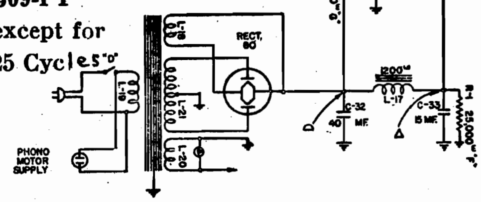
MODELS 509-PF
509-PFB
MODELS 509-PT
509-PTB



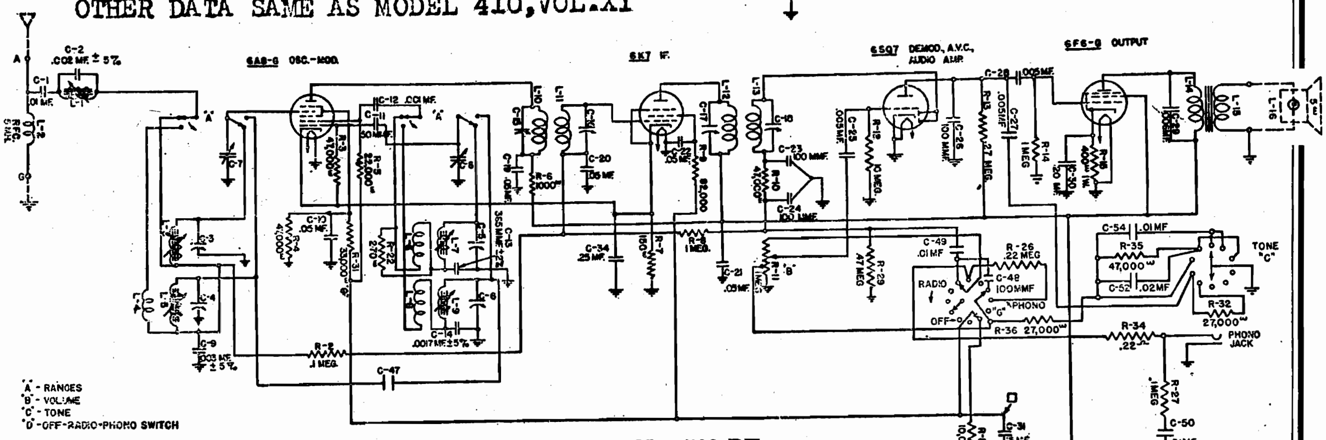
Schematic Diagram—No. 509-PT

The specifications are the same as the No. 410 Receivers except for

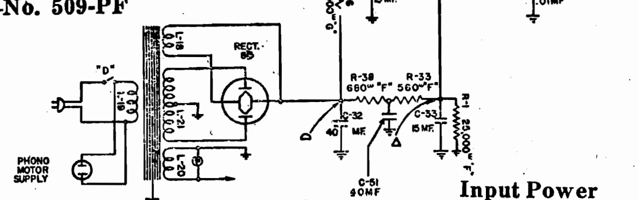
Power Frequency Rating___Std. 60 Cycle, also available 25 Cycles
Input Power Rating, 509-PF________________85 Watts
Input Power Rating, 509-PT________________95 Watts



ALIGNMENT, VOLTAGE, LAYOUT AND ALL OTHER DATA SAME AS MODEL 410, VOL. XI



Schematic Diagram—No. 509-PF



These receivers employ the same circuits as the No. 410 except for improved tone and phonograph compensation circuits which are designed to provide exceptionally good phonograph reproduction.

The No. 509-PT is equipped with a single record phonograph unit using a crystal pick-up. This phonograph unit is designed to play the standard 10 or 12 inch records.

The No. 509-PF Receivers are equipped with an automatic record changer using a crystal pick-up. This record player shifts and plays the standard 10 or 12 inch records.

Model	Input Power Frequency
509-PF	60 Cycles
509-PFB	25 Cycles
509-PT	60 Cycles
509-PTB	25 Cycles

Replacement parts are the same as used on the No. 410 Receivers except for the following:

Piece No.	Circuit Designation	Part
25054	C-48	150 mmf. Capacitor, 509-PT
25150	C-52	.02 mf. Capacitor, 509-PF
26349	R-25	22,000 Ohm Resistor, 509-PT
26350	R-32, 36 . . .	27,000 Ohm Resistor, 509-PF
26353	R-35	47,000 Ohm Resistor, 509-PF
26357	R-27	.1 Megohm Resistor, 509-PF
26361	R-26 (R-37, 509-PF) . . .	.22 Megohm Resistor
26362	R-27	.27 Megohm Resistor, 509-PT
26365	R-29	.47 Megohm Resistor
26369	R-28	1 Megohm Resistor, 509-PT

Piece No.	Circuit Designation	Part
27313	. . . . . .	Tone Control Switch, 509-PF
28568	C-48	100 mmf. Capacitor, 509-PF
29084	. . . . . .	Knob for OFF-ON, Radio Phono. Switch
29560	R-11	Volume Control
30477	C-51	40 mf. 400 Volts, 509-PF
30566	. . . . . .	Tone Control, 509-PT
31481	C-49, 50 (C-54, 509-PF) . . .	.01 mf. Capacitor
32305	. . . . . .	Speaker, 509-PF
32314	. . . . . .	Switch OFF-ON Radio Phono.
32319	R-33	560 Ohm Resistor, 509-PF
32320	R-38	680 Ohm Resistor, 509-PF

MODEL 520

STROMBERG-CARLSON TEL. MFG. CO.

TELEVISION. A foil is provided on the back of the chassis into which a television receiver may be plugged. Switching to phonograph makes the audio amplifier and loud speaker available for use with television receivers designed for this type of sound reproduction.

ALIGNING INFORMATION

Never re-align unless absolutely necessary.

Use a good modulated signal generator (test oscillator with variable output voltage and a sensitive output meter across the voice coil of the speaker.)

Always align using the smallest possible input from the signal generator. A strong signal makes adjustments inaccurate.

Always have the volume control "full on".

ALIGNING PROCEDURE. (Follow this order exactly.)

I. **Dial pointer adjustment.**

With the plates of the gang tuning capacitor fully engaged, check to be sure that the dial pointer is in a vertical position directly on the calibration marks located at the low frequency end of the dial scale. Adjust if necessary.

II. **Intermediate frequency adjustments.**

1. Set range switch to Standard Broadcast position.
2. Turn set to extreme low frequency end of dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 kilocycles to the grid of the 6SA7 Modulator and Oscillator tube (terminal No. 8) using a 0.1 microfarad capacitor in series with the output lead of the signal generator.
5. Adjust the I. F. aligners for maximum output in the following order:
   - A. Secondary of second I. F. Transformer.
   - B. Primary of second I. F. Transformer.
   - C. Secondary of first I. F. Transformer.
   - D. Primary of first I. F. Transformer.

III. **Radio frequency adjustments.**

Short Wave Range (C Band).

1. Remove the output lead of the signal generator and the 0.1 microfarad capacitor from the grid of the 6SA7 tube.
2. Disconnect the output lead from the signal generator and replace with a few turns of wire connected to the signal generator output terminals.
3. Place the signal generator two or three feet from the receiver's loop.
4. Set the range switch to the short-wave range position (C Band).
5. Set the signal generator frequency and the receiver tuning dial to 0.6 megacycles.
6. Adjust the 0.6 megacycle iron core for maximum signal.
7. Adjust the spacing of the short-wave loop leads for maximum signal.
8. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
9. Adjust the oscillator and loop aligning capacitors for maximum signal.
10. Repeat operations 5, 6, and 7.
11. Repeat operations 8 and 9.

Standard Broadcast Range (A Band).

1. Set the range switch to the "Loop" position.
2. Set the signal generator frequency and the receiver tuning dial to 600 kilocycles.
3. Adjust the 600 K. C. oscillator iron core for maximum signal.
4. Set the signal generator frequency and the receiver tuning dial to 1500 kilocycles.
5. Adjust the 1500 K. C. oscillator and loop aligning capacitors for maximum signal.
7. Repeat operations 2 and 3.
8. Repeat operations 4 and 5.

IV. **Wave Trap Adjustment** (520 Table Models only)

1. Tune the receiver to 1000 kc.
2. Set the signal generator frequency to 455 kc., and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligning capacitor for minimum signal.

PHONOGRAPH OPERATION. A jack is provided on the back of the chassis of all receivers not already equipped with phonograph mechanism, into which a record player may be plugged, and a push button is provided on the front of the receiver for switching from "Radio" to "Phonograph".

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times.

Set up stations in the daytime to avoid unnecessary interference.

Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations, in order to determine when the station is exactly in tune.

1. Turn the receiver "On".
2. Push in the "Radio" button.
3. Set the Range Switch as follows:
   - a. If an external antenna is used, set knob so arrow points to designation "ANT.".
   - b. If the built-in loop antenna is used, set knob so arrow points to designation "Loop".
4. Turn volume control about three-quarters of the way on (in a clockwise direction).
5. Pull the six station push buttons off their levers.
6. Remove the call letters of the six selected stations from the call letter sheets, which are in an envelope stapled to the cabinet. Insert the station call letters part way in the slots at the sides of the buttons. Next, insert a transparent tab in each slot in front of the station letters. Then push both the transparent tabs and the call letters all the way into the slot. A pencil eraser may be helpful.
7. Loosen the set screw of the lever to be set up.
8. Push in the lever and manually tune in the desired station, observing the tuning indicator in order to obtain exact resonance.
   IMPORTANT: For accurate set-up, be sure that the lever is pushed in, in the same manner and with the same amount of pressure as will be used when operating the push buttons.
9. Tighten the set screw. Be sure not to disturb the adjustment in any way while tightening the screw.
10. Place the proper button on the lever.
11. Check the accuracy of the adjustment by detuning the station and retuning with the button several times, pushing the button with an even pressure. Readjust if necessary.
12. Set up the other five stations in the same manner.

Tuning Ranges .... A—540 to 1600 Kc., C—5700 to 18000 Kc.
Voltage Rating .... A.C. 105 to 125 Volts
Input Power Rating, 520-H, J, and L .... 78 Watts
Input Power Rating, 520-PF .... 95 Watts
Input Power Rating, 520-PL, and PG .... 110 Watts
Intermediate Frequency .... 455 Kilocycles
Speaker Voice Coil Impedance at 400 Cycles .... Approximately 1.5 Ohm
Speaker Field Coil Resistance .... Approximately 1050 Ohms

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 kc.—No signal.

Use a line voltage of 120 volts or make allowance for the variations.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D.C. readings on the 500 volt scale except when an asterisk appears.

Read from indicated terminals to chassis base.

See location chart on page 2 for position of terminals. A.C. voltages are indicated by italics.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	0	0	0	0	+3*	+115	*6.3*	+200
6SA7	Modulator and Oscillator	0	0	+250	+115	0	0	*6.3*	0
6SK7	I. F. Amplifier	0	0	0	0	+2	+100	*6.3*	+250
6SQ7	Demodulator, A. V. C., Audio	0	0	0	0	0	+95	*6.3*	0
6V6GT	Output	0	0	+300	+250	0	0	*6.3*	+12*
6U5	Tuning Indicator	*6.3*	+90	0	+250	0	0	—	—
5Y3G	Rectifier	0	+400	0	*385*	0	*385*	0	+400
Speaker Socket	—	+310	0	0	+400	+400	0	+400	—

*Read on lowest possible scale of voltmeter

CONTINUITY TEST

CAUTION: Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out. Plug speaker in socket for all other tests.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to the electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart on page 2 for position and numbering of terminals.

		TERMINALS OF SOCKETS							
Tube	*Circuit*	1	2	3	4	5	6	7	8
6SK7	R. F. Amp.	S	S	S	A	B	20000¶	S	7300¶
6SA7	Mod. and Osc.	S	S	2200¶	20000¶	33000¶	C	S	47000¶
6SK7	I. F. Amp.	S	S	S	D	220¶	85000¶	S	2200¶
6SQ7	Demod., A. V. C., Audio Amp.	S	10M	S	E	S	F	S	S
6V6GT	Output	S	S	200¶	2200¶	470000¶	S	S	240¶
6U5	Tuning Indicator	S	100000¶	G	2200¶	S	S		
5Y3G	Rectifier	O	O	O	130¶	O	140¶	O	O
Loop	3 Prong	O	O	S	—	—	—	—	—
Loop	4 Prong	O	S	2200¶	O	—	—	—	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open

A. Push "Radio" button in .... 3.2 Megohms
Push "Phono" button in .... "Open"

B. Range switch in Loop position .... 1700 Ohms
Range switch in external antenna position .... 220 Ohms
Range switch in short-wave position .... 220 Ohms

C. Range switch in Loop position .... 5 Ohms
Range switch in external antenna position .... 5 Ohms
Range switch in short-wave position .... "Short"

D. Push "Radio" button in .... 3.2 Megohms
Push "Phono" button in .... "Open"

E. Push "Radio" button in .... 1 Megohm
Push "Phono" button in .... "Open"

F. Range switch in Loop position .... 240,000 Ohms
Range switch in external antenna position .... 240,000 Ohms
Range switch in short-wave position .... 270,000 Ohms

G. Push "Radio" button in .... 3.3 Megohms
Push "Phono" button in .... 3.3 Megohms

Other tests not shown on chart—

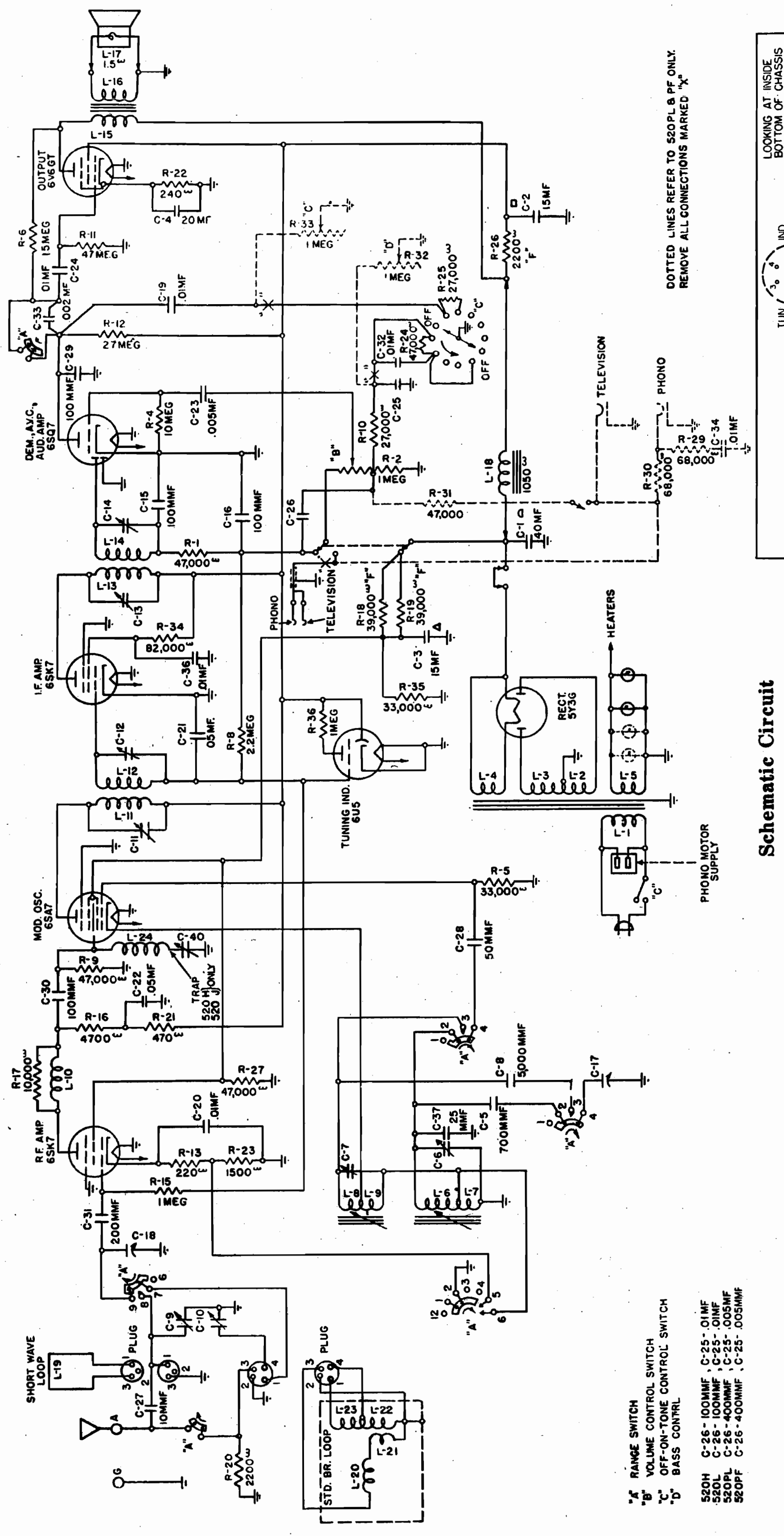
Test from phono jack on back of chassis base:
Push "Radio" button in .... "Open"
Push "Phono" button in .... 1 Megohm

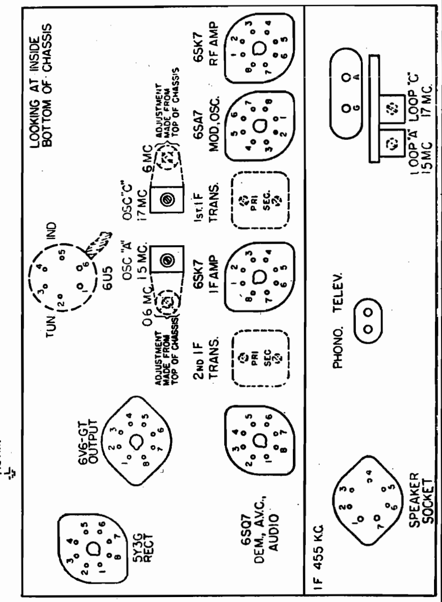
Test from Television jack on back of chassis base:
Push "Radio" button in .... "Open"
Push "Phono" button in .... 1 Megohm

Test between terminals of A.C. plug:
"Off-On" switch in "Off" position .... "Open"
"Off-On" switch in "On" position .... 5 Ohms
Terminals of A.C. plug to chassis base .... "Open"

STROMBERG-CARLSON TEL. MFG. CO.

MODEL 520



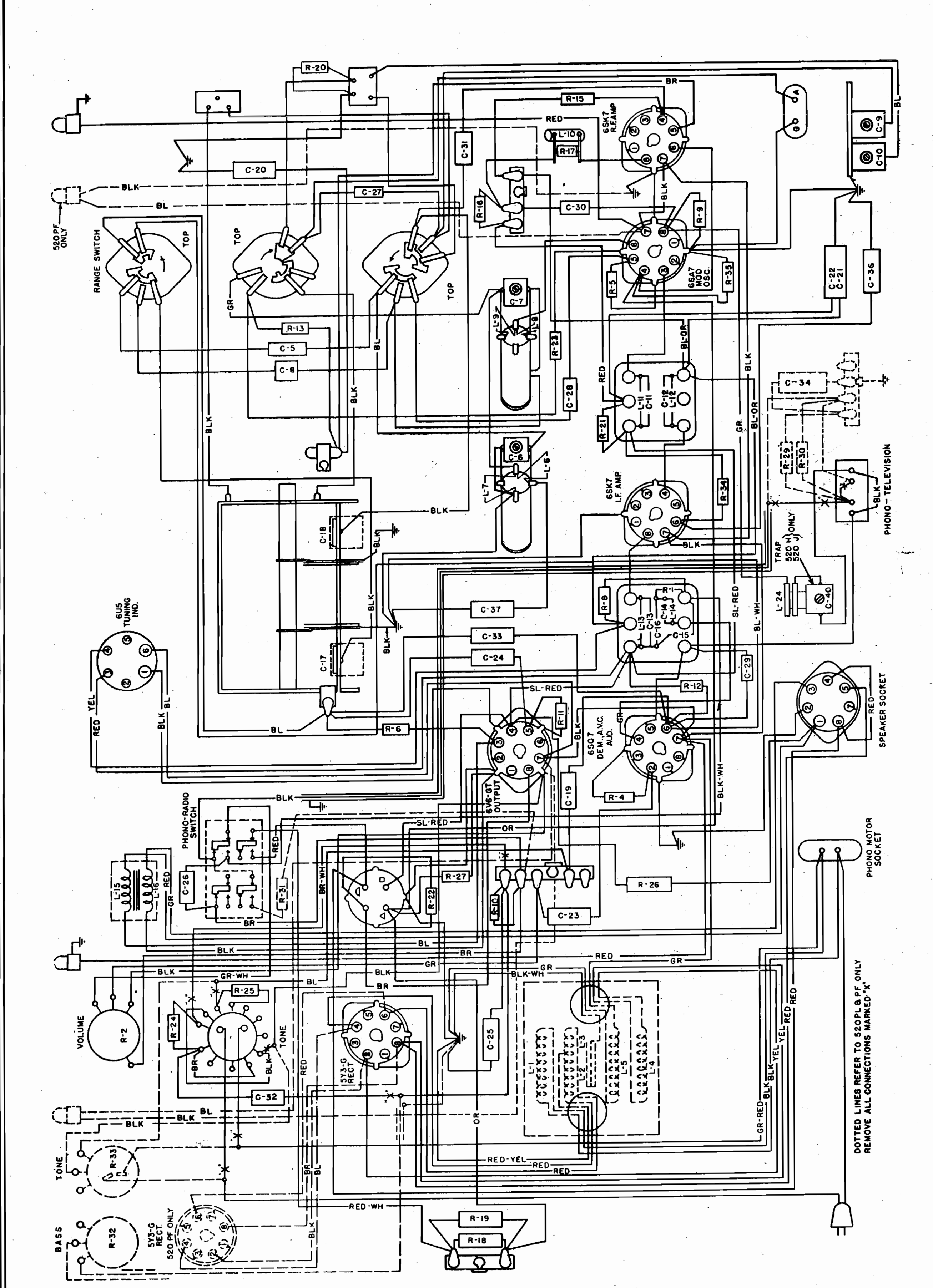


Schematic Circuit

Model	Input Power Frequency	Chassis	Cabinet	Speaker	Phonograph Equipment
520-H	50-60 Cycles	32832	32306	26171	Use No. 16 Record Player
520-HB	25-60 Cycles	32833	32306	26171	Use No. 16 Record Player
520-J	50-60 Cycles	32832	32098	26171	Use No. 16 Record Player
520-JB	25-60 Cycles	32833	32098	26171	Use No. 16 Record Player
520-L	50-60 Cycles	32043	32099	32166	Use No. 16 Record Player
520-LB	25-60 Cycles	32044	32099	32166	Use No. 16 Record Player
520-PF	60 Cycle	32178	32101	32166	32286
520-PFB	25 Cycle	32179	32101	32166	32287
520-PL	60 Cycle	32176	32102	32166	32283
520-PLB	25 Cycle	32177	32102	32166	32284
520-PG	60 Cycle	32986	32988	32989	32822
520-PGB	25 Cycle	32987	32988	32989	32823

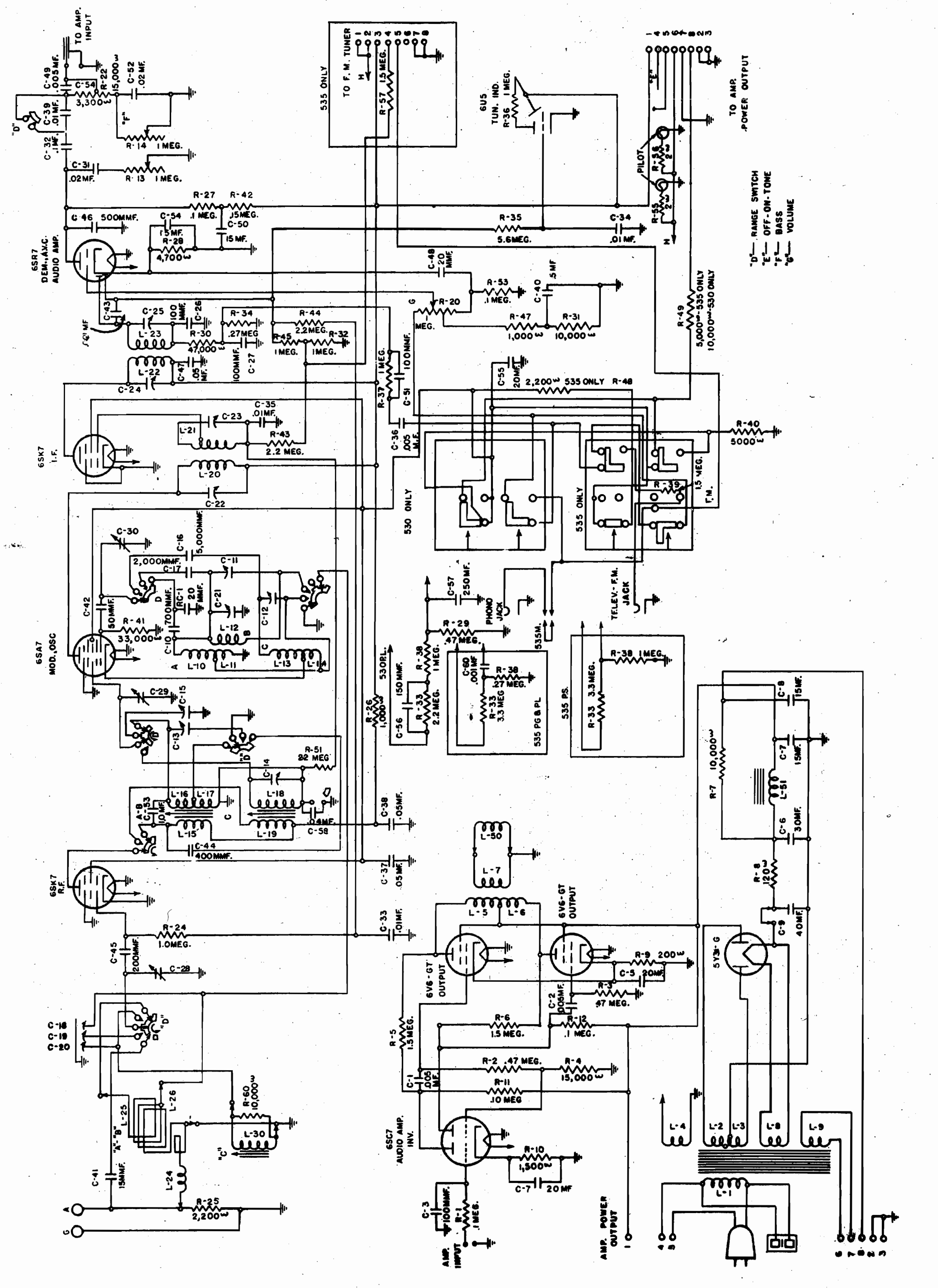
MODEL 520

STROMBERG-CARLSON TEL. MFG. CO.



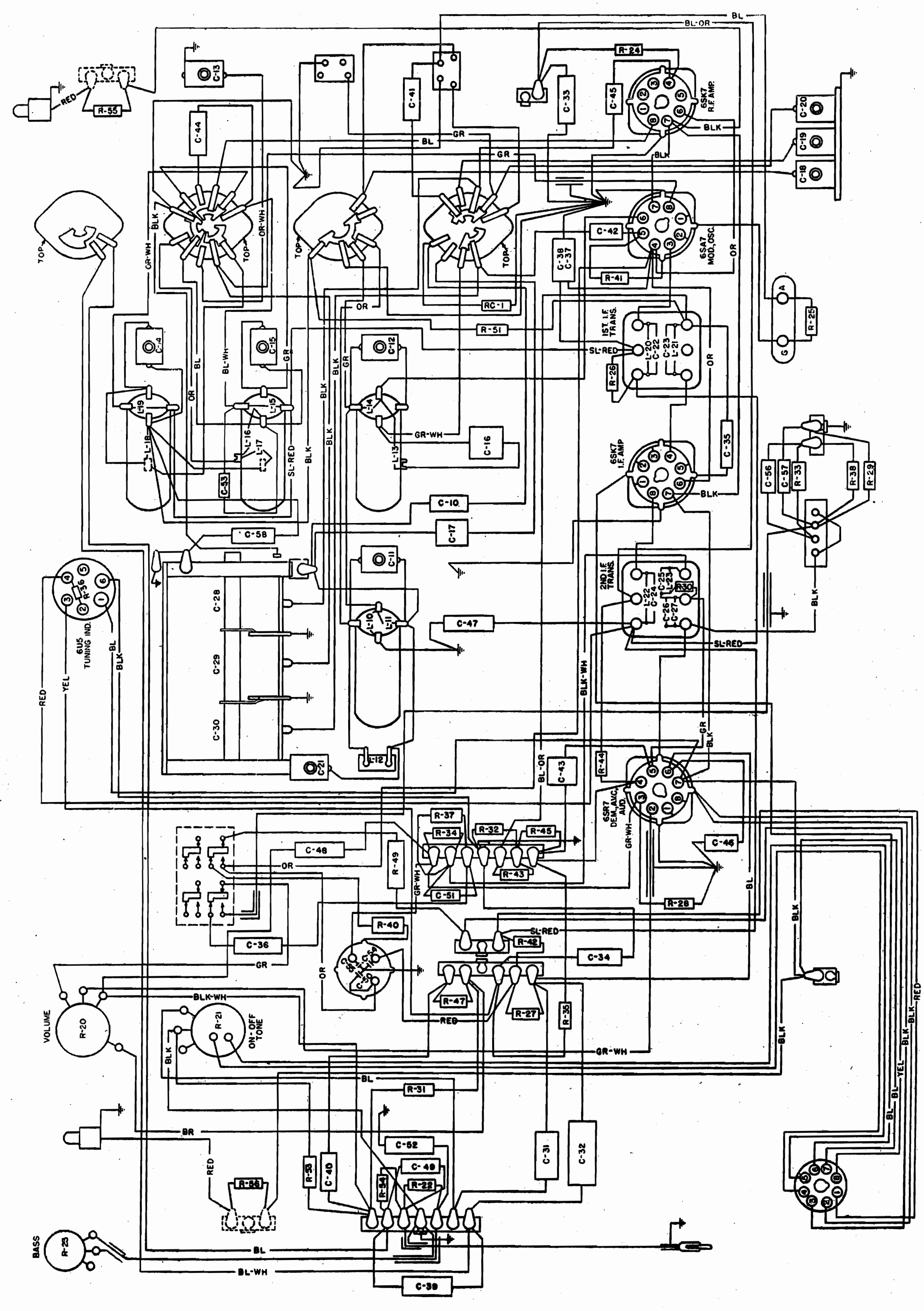
MODELS 530, 535

STROMBERG-CARLSON TEL. MFG. CO.



MODEL 530
Ampl. Mod.

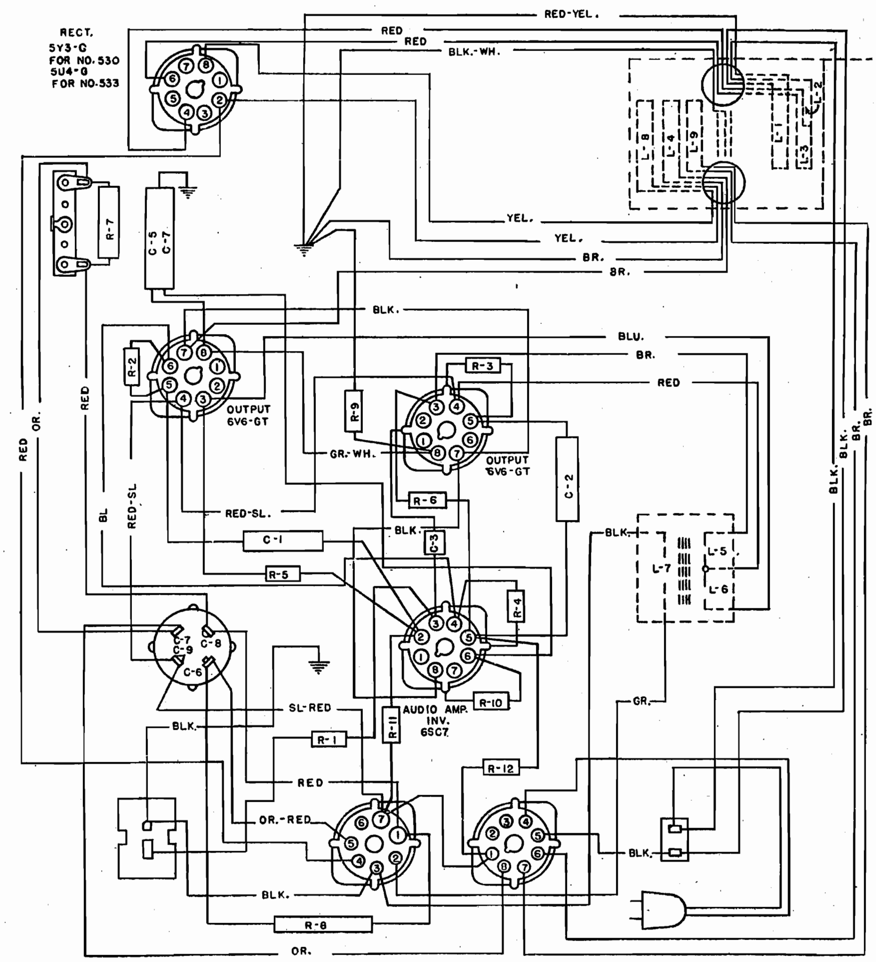
STROMBERG-CARLSON TEL. MFG. CO.



Wiring Diagram (530 Ampl. Mod.)

STROMBERG-CARLSON TEL. MFG. CO.

MODELS 530, 535



Wiring Diagram Power Amplifier (Nos. 530 and 535 Receivers)

GENERAL. The No. 530 Receivers are nine tube, three gang, three range receivers, designed for the reception of Amplitude Modulated stations. The No. 535 Receivers are fifteen tube receivers of the very latest design, providing reception of both Amplitude and Frequency Modulated stations. The "Armstrong Wide-Swing Frequency Modulation System" used in this receiver is outstanding in that substantially static-free reception is obtained, plus a degree of high fidelity which has heretofore been unobtainable in any radio system.

Six button automatic tuning is provided in these receivers, so that six favorite stations may be set up.

Separate continuously variable bass and treble controls are provided in these chassis.

Provision is made for a record player to be used with all models not already equipped with phonograph mechanism without additional wiring.

The No. 530-PL Receiver is equipped with a record player using a crystal pick-up in conjunction with a specially equalized circuit. This record player shifts and plays the standard 10" or 12" records.

The No. 535-PG, PL and PS Receivers are equipped with record players using a one-ounce sapphire pick-up in conjunction with specially equalized circuits. This type of pick-up eliminates the frequent changing of needles and reduces record wear to a minimum. This record player shifts and plays the standard 10" or 12" records. The records may be intermixed on the No. 535-PG and PS Receivers.

A loop antenna is provided in these receivers so that no antenna and ground connection whatsoever is required. However, antenna and ground terminals are provided on the chassis so that an external antenna may be used for improved reception if desired.

PHONOGRAPH OPERATION. A jack is provided on the back of the chassis of all receivers not already equipped with a phonograph mechanism, into which a record player may be plugged, and a push button is provided on the front of the receiver for switching from "Radio" to "Phonograph".

ACCESSORIES

ANTENNA. The built-in loop antenna provided in these receivers will give satisfactory operation in most locations. However, for improved reception, a Stromberg-Carlson All-Wave Antenna is recommended. These antenna are supplied in kits containing all the necessary parts for mounting and installation, and are designed especially for use with all Stromberg-Carlson receivers.

HEADSET ATTACHMENT. Headphones can be very simply attached to this receiver. Ask for Pc-28303 Headset Package Assembly, which comes complete with headphones and installation instructions.

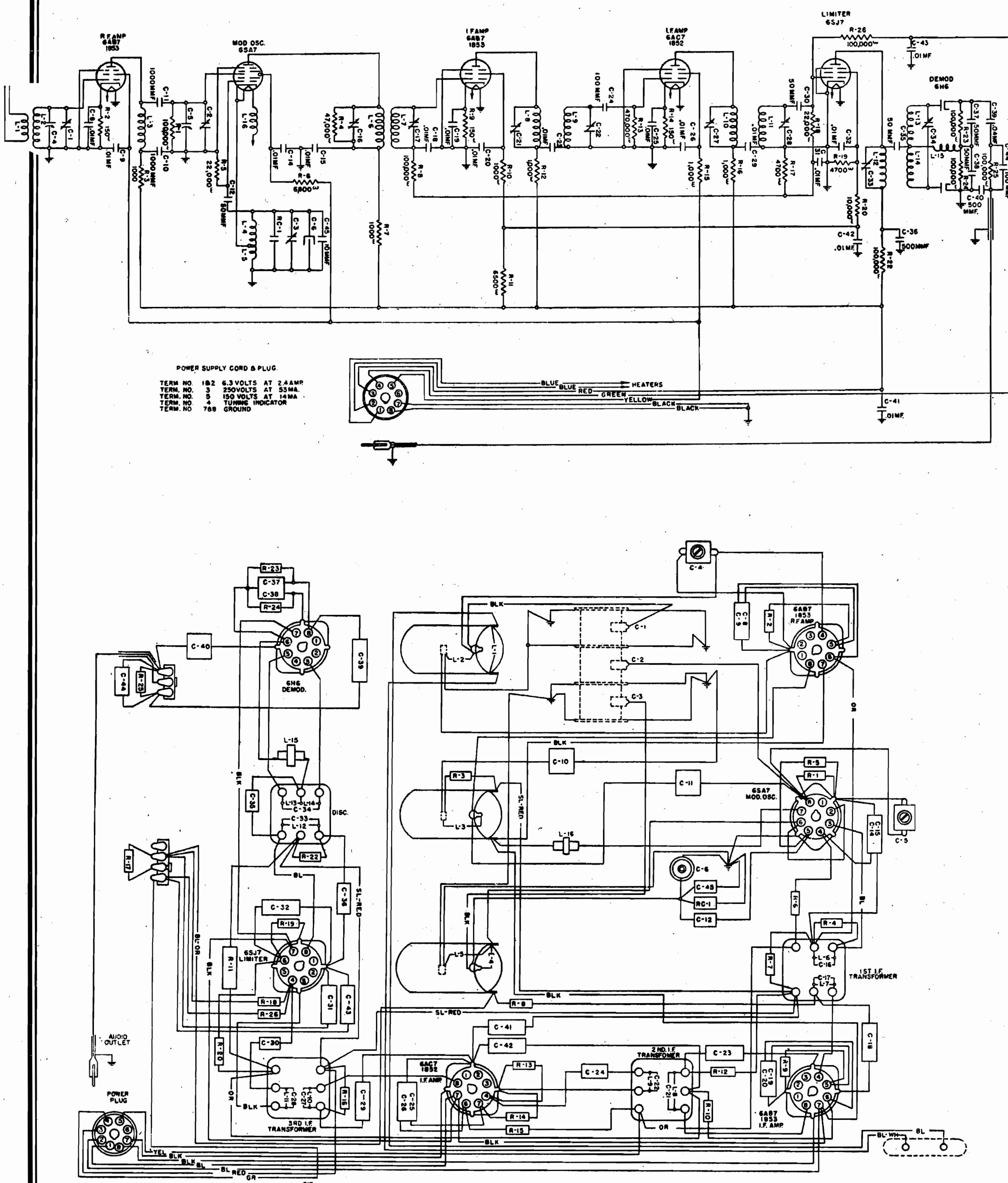
CARE OF THE CABINET. The finish of Stromberg-Carlson cabinets should be protected by using Stromberg-Carlson cabinet polish regularly. It is available in pint cans designated as Pc-28601.

Nicks and scratches of most kinds can be repaired quickly and easily by proper use of the Pc-26962 Touch-up Kit. Complete instructions are provided with each kit.

ADJUSTING THE DIAL LAMP. To obtain the proper illumination of the dial, slide the two dial lamp sockets on their mounting brackets to the position where maximum illumination of the dial is obtained.

MODEL 535
Freq. Mod.

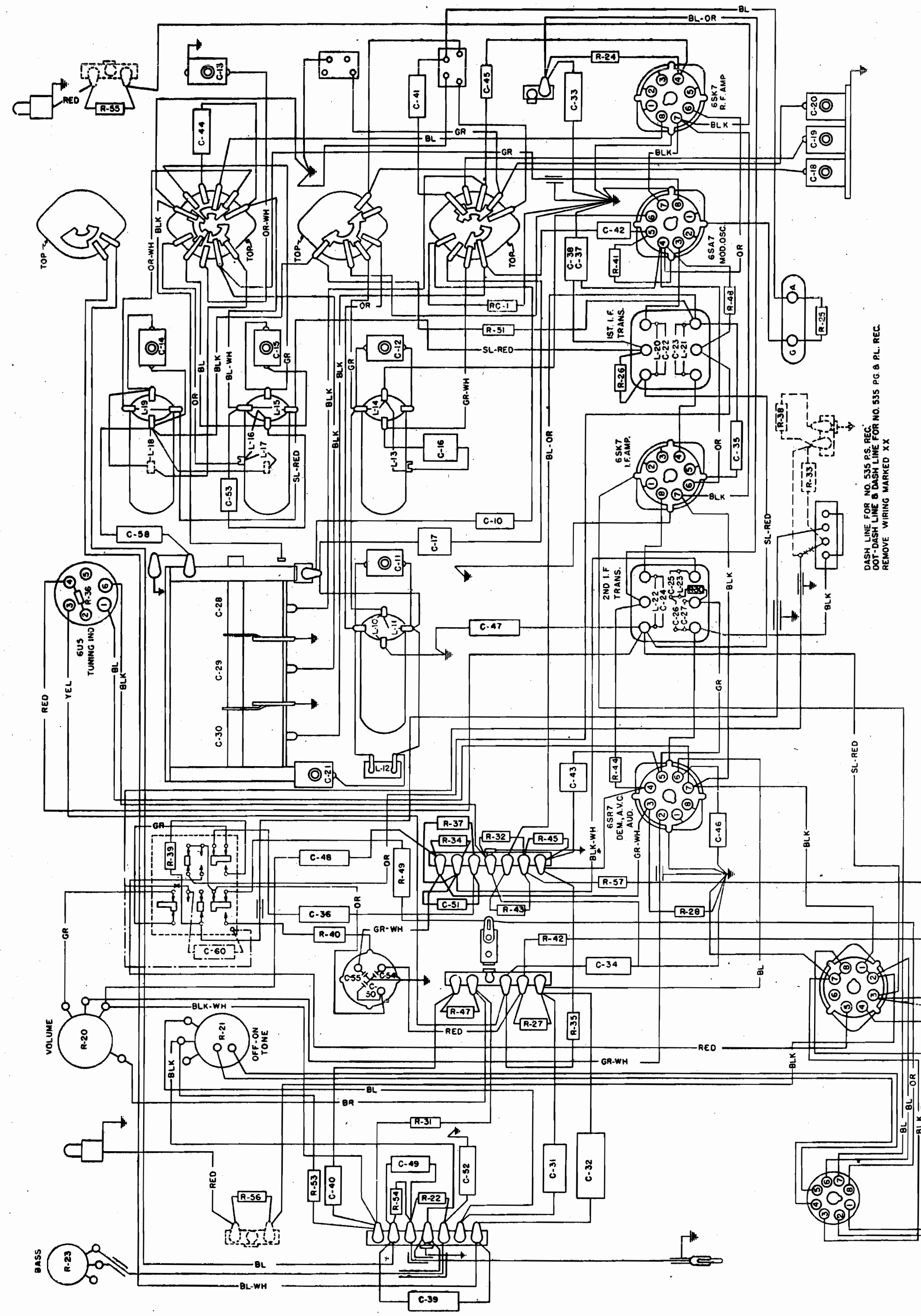
STROMBERG-CARLSON TEL. MFG. CO.



Schematic Circuit and Wiring Diagram (535 Freq. Mod.)

STROMBERG-CARLSON TEL. MFG. CO.

MODEL 535
Ampl. Mod.



Wiring Diagram (535 Ampl. Mod.)

MODELS 530, 535

STROMBERG-CARLSON TEL. MFG. CO.

INSTRUCTIONS FOR SETTING UP PUSH BUTTONS

IMPORTANT: The stations selected should be the local or favorite stations which give good reception at all times. If a Frequency Modulation station is available, it may be set up on one of the push buttons on the No. 535 Receivers.

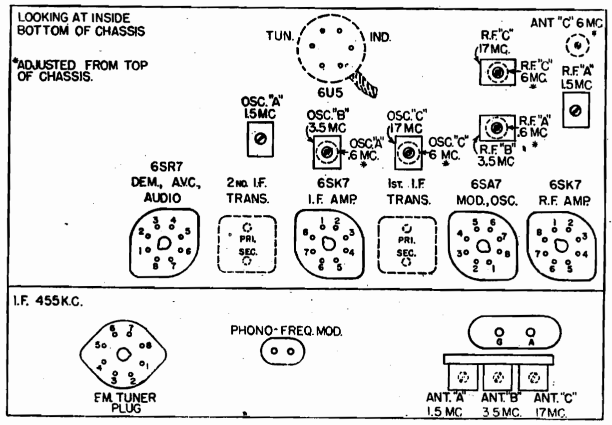
Set up stations in the daytime to avoid unnecessary interference. Allow the set to run for about twenty minutes before setting up stations.

Always use the tuning indicator unit when setting up stations, in order to determine when the station is exactly in tune.

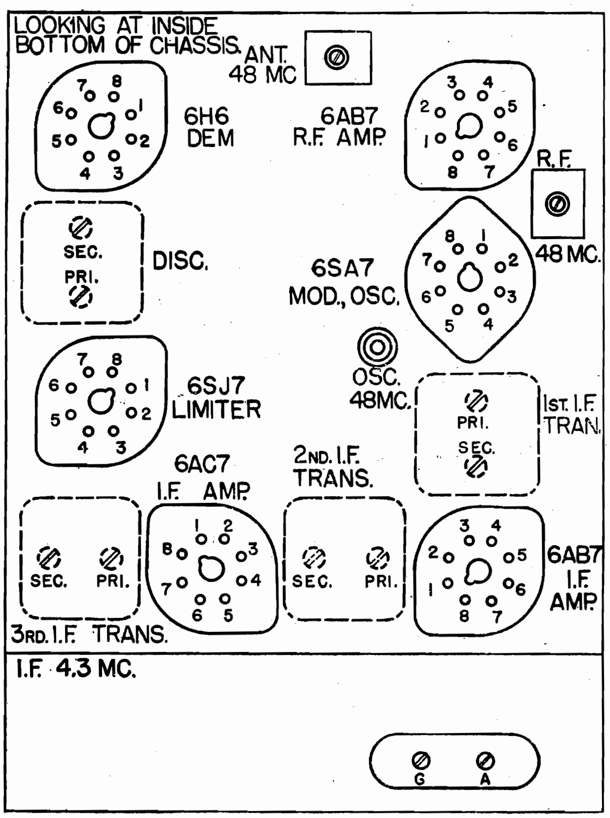
1. Turn the receiver "On".
2. On the No. 530 Receivers, push in the "Radio" button. On the No. 535 Receivers, be sure the "Phono" and "F. M." buttons are in the proper position to receive the desired stations.
3. Set the range switch to the "BC" position.
4. Turn volume control about three-quarters of the way on (in a clockwise direction).
5. Pull the six station push buttons off their levers.
6. Remove the call letters of the six selected stations from the call letter sheets, which are in an envelope stapled to the cabinet. Insert the station call letters part way in the slots at the sides of the buttons. Next, insert a transparent tab in each slot in front of the station letters. Then push both the transparent tabs and the call letters all the way into the slot. (A pencil eraser may be helpful.)
7. Loosen the set screw of the lever to be set up.
8. Push in the lever and manually tune in the desired station, observing the tuning indicator in order to obtain exact resonance.

IMPORTANT: For accurate set-up, be sure that the lever is pushed in, in the same manner and with the same amount of pressure as will be used when operating the push buttons.

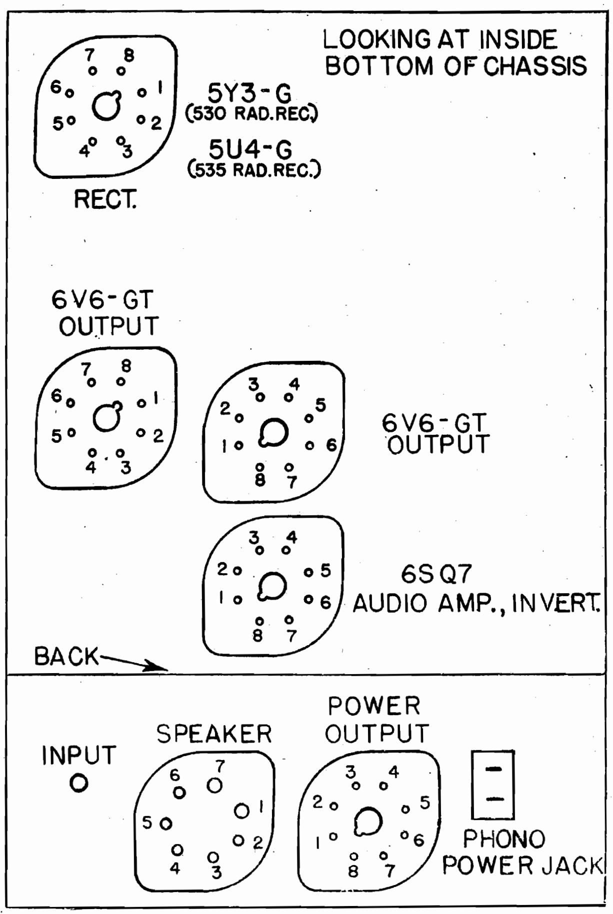
9. Tighten the set screw. Be sure not to disturb the adjustment in any way while tightening the screw.
10. Place the proper button on the lever.
11. Check the accuracy of the adjustment by detuning the station and retuning with the button several times, pushing the button with an even pressure. Readjust if necessary.
12. Set up the other five stations in the same manner.



Location Chart (Ampl. Mod.)



Location Chart (Freq. Mod.)



Location Chart (Power Ampl.)

STROMBERG-CARLSON TEL. MFG. CO.

NORMAL VOLTAGE READINGS

Take all readings with chassis operating and tuned manually to 1000 kc. or 47 megacycles—no signal.

Use a line voltage of 120 volts or make allowance for the variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt.

Take all D. C. readings on the 500 volt scale, except when an asterisk appears.

Read from indicated terminals to chassis base.

See location chart on Page 2 for position of terminals.

A. C. voltages are indicated by italics.

AMPLITUDE MODULATION AND POWER AMPLIFIER CHASSIS, 530 AND 535 RECEIVERS

Tube	Circuit	Receiver No.	*Terminals of Sockets* 1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	530	0	0	0	0	0	+100	*6.3*	+260
		535	0	0	0	0	0	+100	*6.3*	0
6SA7	Modulator and Oscillator	530	0	0	+260	+100	−20*	0	*6.3*	0
		535	0	0	+260	+100	−20*	0	*6.3*	0
6SK7	I. F. Amplifier	530	0	0	0	0	0	+100	*6.3*	+260
		535	0	0	0	0	0	+100	*6.3*	0
6SR7	Demod., A. V. C., Audio Amp.	530	0	0	+3	0	0	+54	*6.3*	0
		535	0	0	+3	0	0	+54	*6.3*	0
6AC7	Audio Inverter	530	0	+165	0	0	+165	+2	0	*6.3*
		535	0	+165	0	0	+165	+2	0	*6.3*
6V6GT	Output	530	0	0	+260	+263	0	—	*6.3*	+14
		535	0	0	+260	+263	0	—	*6.3*	+14
6V6GT	Output	530	0	0	+260	+263	0	—	*6.3*	+14
		535	0	0	+260	+263	0	—	*6.3*	+14
5Y3G	Rectifier	530	—	+400	—	*390*	—	*390*	—	+400
5U4G	Rectifier	535	—	+370	—	*355*	—	*355*	—	+370
—	Speaker Socket	530	+394	0	0	+400	+400	—	+262	—
		535	+360	0	0	+370	+370	—	+265	—
—	Power Socket	530	+263	0	0	*50*	*50*	*6.3*	0	+240
		535	+263	0	0	*50*	*50*	*6.3*	0	+200
	FREQUENCY MODULATION CHASSIS, 535 RECEIVER									
6AB7	R. F. Amplifier	535	0	0	0	0	+1.8	+150	*6.3*	+265
6SA7	Modulator and Oscillator	535	0	0	+265	+100	−2*	0	*6.3*	0
6AB7	I. F. Amplifier	535	0	0	0	0	+2.2	+150	*6.3*	+265
6AC7	I. F. Amplifier	535	0	0	0	0	+2.2	+150	*6.3*	+265
6SJ7	Limiter	535	0	0	0	0	0	+42	*6.3*	+10
6H6	Demodulator	535	0	0	0	0	0	—	*6.3*	0

* Read on 1000 volt scale of voltmeter.
Between terminals 2 and 8 of rectifier socket—5 volts A. C.

CONTINUITY TEST

Remove all tubes and disconnect all plugs from the chassis before checking continuity.

Use a good meter capable of measuring accurately up to several megohms.

The resistances given are often approximate, owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart on Page 2 for position and numbering of terminals.

IMPORTANT: The continuity of each chassis may be checked as a separate unit; however, the power supply of the chassis to be checked should be shorted as follows:

1. A. M. chassis 530 and 535 Receivers: Short terminals 1, 2 and 8 of power supply plug together.
2. Power Amplifier chassis 530 and 535 Receivers: Short terminals 2 and 8 of power socket together.
3. F. M. chassis 535 Receivers: Short terminals 3, 4, 5, 7 and 8 of power supply plug together.

Be sure to remove the shorting wires when continuity is completed.

AMPLITUDE MODULATION CHASSIS, 530 AND 535 RECEIVERS

Tube	Circuit	*Terminals of Sockets* 1	2	3	4	5	6	7	8
6SK7	R. F. Amplifier	S	S	S	4.5M	S	A	S	1000¶
6SA7	Mod. and Osc.	S	S	11¶	A	33000¶	S	S	B
6SK7	I. F. Amplifier	S	S	S	3.2M	S	A	S	13¶
6SR7	Demod., A. V. C., Audio Amp.	S	C	4700¶	2M	320000¶	250000¶	S	S
6U5	Tuning Indicator	S	1M	6.7M	S	S	S	—	—
—	*Power Supply Plug	250000¶	S	S	O	O	S	S	250000¶
—	Power Supply Socket	S	S	S	2.5M	S	O	S	S
	POWER AMPLIFIER CHASSIS, 530 AND 535 RECEIVERS								
6AC7	Audio Inv.	S	150000¶	O	12000¶	150000¶	1500¶	S	S
6V6GT	Output	S	S	50000¶	50000¶	500000¶	12000¶	S	S
6V6GT	Output	S	S	50000¶	50000¶	500000¶	O	S	S
5Y3G or 5U4G	Rectifier	O	O	O	60¶	O	60¶	O	O
—	*Power Output Socket	50000¶	S	S	O	O	O	O	50000¶
—	Speaker Socket	10000¶	S	S	O	10000¶	O	50000¶	—
	FREQUENCY MODULATION CHASSIS, 535 RECEIVERS								
6AB7	R. F. Amplifier	S	S	S	S	150¶	S	O	1000¶
6SA7	Mod. and Osc.	S	S	1000¶	6800¶	22000¶	S	O	O
6AB7	I. F. Amplifier	S	S	S	100000¶	150¶	5700¶	O	1000¶
6AC7	I. F. Amplifier	S	S	S	470000¶	150¶	1000¶	O	1000¶
6SJ7	Limiter	S	S	S	270000¶	S	4700¶	O	100000¶
6H6	Demodulator	S	S	100000¶	S	100000¶	100000¶	O	200000¶
—	*Power Plug	O	O	17000¶	130000¶	O	O	S	S

Symbols shown on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

A. Push Buttons in normal position .... 7200 Ohms
   Phono Button pushed in .... 5 Megohms
   Radio or F. M. button pushed in .... "Open"

B. Range Switch in "A" band .... 3.2 Megohms
   Range Switch in "B" band .... "Short"
   Range Switch in "C" band .... "Short"

C. Operate volume control from most counterclockwise position to extreme clockwise position—should read 50,000 Ohms to 1 Megohm.

* Remove shorting wire before making continuity test of power circuits.

Other Tests Not Shown on Chart:

Amplitude Modulation Chassis:

Between terminals 4 and 5 of the Power Supply Plug should read "Open" with A. C. switch open; "Short" with A. C. switch closed.

Audio output plug: Prong 5 Megohms—Shield "Short".

F. M. Jack: "Open"—A, B and C Bands
   Push in F. M. Button—1 Megohm.

Phono Jack: "Open"—A, B and C Bands
   Push in F. M. Button—1 Megohm.

Power Amplifier Chassis

Audio Input Jack to Chassis Base .... "Open"

Frequency Modulation Chassis

Audio Plug: Prong "Open", Shield "Short".

Antenna Terminal to Chassis Base .... "Open"
Ground Terminal to Chassis Base .... "Open"
Between Antenna and Ground Terminals .... "Short"

MODELS 530, 535 STROMBERG-CARLSON TEL. MFG. CO.

ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY.

GENERAL. All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning Frequency Modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. Standard signal generator with sweep circuit.
2. Wide band sweep signal generator.
3. Oscillograph.
4. Microammeter—0 to 200 microamps.
5. Center "0" microammeter with 100 divisions either side of "0".

See location chart on Page 2 for location of all aligners.

ALIGNING PROCEDURE (AMP. MOD.)

I. Dial Pointer Adjustment. (A. M.)

With the plates of the gang tuning capacitor fully engaged, check to be sure that the dial pointer is in a vertical position directly on the calibration marks located at the low frequency end of the dial scale. Adjust if necessary.

II. Intermediate Frequency Adjustments. (A. M.)

1. Set the range switch to standard broadcast position.
2. Tune set to extreme low frequency end of dial.
3. Connect the ground terminal of the signal generator to the ground terminal of the chassis.
4. Introduce a modulated signal of 455 kilocycles to the grid of the 6SA7 Modulator and Oscillator tube (terminal No. 8), using a 0.1 mmf. capacitor in series with the output lead of the signal generator.
5. Adjust the I. F. aligners for maximum output in the following order:

   a. Secondary of second I. F. transformer.
   b. Primary of second I. F. transformer.
   c. Secondary of first I. F. transformer.
   d. Primary of first I. F. transformer.

III. Radio Frequency Adjustments. (A. M.)

Standard Broadcast Range (A Band)

1. Replace the 0.1 mf. capacitor in series with the output lead of the signal generator with a 200 mmf. capacitor and connect it to the antenna terminal of the chassis.
2. Set the signal generator frequency and the receiver tuning dial to 600 kc.
3. Set the range switch to the Standard Broadcast range (A Band).
4. Adjust the 600 kc. oscillator and R. F. aligners (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 kc.
6. Adjust the 1500 kc. oscillator, R. F. and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six.

Medium Wave Range (B Band)

1. Replace the 0.1 mf. capacitor in series with the output lead from the signal generator with a 400 ohm carbon type resistor and connect it to the antenna terminal of the chassis.
2. Set the range switch to the Medium Wave range (B Band).
3. Set the signal generator frequency and the receiver tuning dial to 3.5 megacycles.
4. Adjust the oscillator R. F. and antenna aligning capacitors for maximum signal.

Short Wave Range (C Band)

1. Leave the signal generator connected in the same manner as when adjusting the Medium Wave Range (B Band).
2. Set the range switch to the Short Wave Range (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycle oscillator, R. F. and antenna aligners (iron cores) for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycle oscillator, R. F. and antenna aligning capacitors for maximum signal.
7. Repeat operations three and four.
8. Repeat operations five and six

Note: After the receiver has been placed in the cabinet, plug the loops into their respective sockets and readjust the Standard Broadcast, Medium Wave and Short Wave antenna high frequency shunt aligners for maximum signal.

ALIGNING PROCEDURE (FREQ. MOD.)

I. Dial Pointer Adjustment.

Before alignment is attempted, be sure that the variable capacitor plates of the F. M. tuner are fully meshed with the variable capacitor plates of the A. M. tuner when turned all the way in.

II. Intermediate Frequency Adjustments (F. M.)

Note: All I. F. adjustments are made using a wide band sweep signal generator with a sweep circuit of plus or minus 300 kilocycles.

1. Push in the F. M. button.
2. Tune the set to the extreme high frequency end of the dial (50 megacycles).
3. Connect the 0-200 microammeter across the R-17 4700-ohm resistor. (This resistor is mounted on the terminal strip located on the side of the base.)
4. Connect the oscillograph between ground and the junction of C-43 .01-mf. capacitor and R-26 100,000-ohm resistor located on the same terminal strip with the R-17 resistor.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6AC7 second I. F. tube socket.
6. Introduce a signal of 4.3 megacycles to the grid of the 6AC7 second I. F. tube socket (terminal No. 4), using a 0.1 capacitor in series with the output lead of the signal generator. Keep the 0 to 200 microammeter at approximately 100 microamps.
7. Adjust the secondary and primary of the third I. F. transformer for maximum reading on the 0 to 200 microammeter.
8. Connect the output lead of the wide band sweep signal generator and the 0.1 microfarad capacitor in series with it to the grid of the 6AB7 first I. F. tube socket (terminal No. 4).
9. Connect the ground lead of the signal generator to the ground terminal of the 6AB7 first I. F. tube socket.
10. Adjust the second I. F. transformer in the same manner.
11. Connect the output lead of the wide band sweep signal generator with the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 Modulator and Oscillator tube (terminal No. 8).
12. Connect the ground terminal of the signal generator to the ground terminal of the 6SA7 tube socket.
13. Adjust the first I. F. transformer in the same manner.

III. Discriminator Adjustment (F. M.)

1. Connect the ground terminal of the standard unmodulated signal generator to the ground terminal of the 6AB7 first I. F. tube socket.
2. Connect the output lead of the unmodulated standard signal generator to the grid of the 6AB7 first I. F. tube (terminal No. 4), using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator, leaving the wide band sweep signal generator connected to the grid of the 6SA7 Modulator and Oscillator tube socket.
3. Adjust the attenuator of the wide band sweep signal generator for a curve on the oscillograph.
4. Set the frequency of the unmodulated standard signal generator to approximately 4.3 megacycles and adjust the attenuator for interference patterns on the oscillograph. Adjust the unmodulated standard signal generator for frequency until interference patterns on each trace come together. (This is done in order to assure that the frequency of the standard signal generator which is used to align the discriminator coincides with the mean frequency of the wide band sweep signal generator.)
5. Remove the wide band sweep signal generator.
6. Connect the center "0" microammeter with a .5 megohm resistor in series across one-half of the discriminator load. (From ground to the junction of the two .1 megohm resistors R-23 and R-24.)
7. Set the attenuator of the standard signal generator for maximum output.
8. Adjust the primary of the discriminator transformer for maximum reading on the center "0" microammeter.
9. Connect the center "0" microammeter and the .5 megohm resistor in series with it across the whole discriminator load. (From ground to the junction of R-23 .1 megohm resistor and C-29 .04 mf. capacitor.)
10. Adjust the secondary of the discriminator transformer for center "0" reading of the microammeter.
11. Vary the frequency of the standard signal generator, making sure that the voltage peaks, which should be of the same magnitude, are the same number of kilocycles off on either side of resonance. Any departure from these conditions may be corrected by a slight readjustment of the primary.

    Note: Connect the wide band sweep signal generator to the grid of the 6SA7 Modulator and Oscillator tube socket and make slight readjustments of the I. F. transformers for proper curve, since there is some interaction between these stages and the discriminator.

IV. Radio Frequency Adjustments. (F. M.)

1. Set the signal generator frequency and the receiver tuning dial to 48.5 megacycles.
2. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to one of the F. M. terminals on the back of the chassis.
3. Connect the ground lead of the signal generator to the other F. M. terminal.
4. Adjust the oscillator aligner (air trimmer) for maximum signal.
5. Adjust the R. F. and antenna aligners for maximum signal on the 0 to 200 microammeter, maintaining the center "0" microammeter at "0" at all times by rotating the receiver dial slightly back and forth.

Model	Input Power Frequency	A. M. Chassis	F. M. Chassis	Power Amplifier Chassis	Cabinet	Speaker	Phonograph Equipment
530-PL	60 Cycles	32113	None	32123	32104	26170	32702
530-PLB	25 Cycles	32113	None	32124	32104	26170	32703
535-PG	60 Cycles	32114	32316	32125	32713	32427	32713
535-PGB	25 Cycles	32114	32316	32126	32714	32427	32714
535-PS	60 Cycles	32114	32316	32125	32103	32427	32822
535-PSB	25 Cycles	32114	32316	32126	32103	32427	32823
535-M	60 Cycles	32121	32317	32125	32107	32427	Use No. 16 Record Player
535-MB	25 Cycles	32121	32317	32126	32107	32427	Use No. 16 Record Player
535-PL	60 Cycles	32114	32316	32125	32106	32427	32713
535-PLB	25 Cycles	32114	32316	32126	32106	32427	32714

Tuning Ranges: Standard Broadcast 540 to 1600 kilocycles; Medium Wave 1.6 to 3.6 megacycles; Short Wave 5.7 to 18 megacycles; Frequency Modulation (535) 42 to 50 megacycles

Voltage Rating .... 105 to 125 Volts

Type of Circuit .... Superheterodyne with Automatic Tuning

Number of Tubes { No. 530—9; No. 535—15

1—6SK7 R. F. Amplifier
1—6SA7 Modulator and Oscillator
1—6SK7 I. F. Amplifier
1—6SR7 Demodulator, A. V. C. and Audio
1—6U5 Tuning Indicator
1—6AC7 Audio Amplifier and Inverter
2—6V6GT Output
1—5Y3G Rectifier (530 Receiver)
1—5U4G Rectifier (535 Receiver)
1—6AB7 R. F. Amplifier (F. M.)
1—6SA7 Modulator and Oscillator (F. M.)
1—6AB7 I. F. Amplifier (F. M.)
1—6AC7 I. F. Amplifier (F. M.)
1—6SJ7 Limiter (F. M.)
1—6H6 Demodulator (F. M.)

Input Power Rating { 530-PL .... 120 Watts; 535-PL, PS, PG .... 155 Watts; 535-M .... 130 Watts

Intermediate Frequency .... { 455 Kilocycles (Amplitude Modulation); 4.3 Megacycles (Frequency Modulation)

Speaker Field Coil Resistance .... 530—1050 ohms; 535—610 ohms

Speaker Voice Coil Impedance .... 530— 1.5 ohms; 535— 11 ohms

MODEL 585M

STROMBERG-CARLSON TEL. MFG. CO.

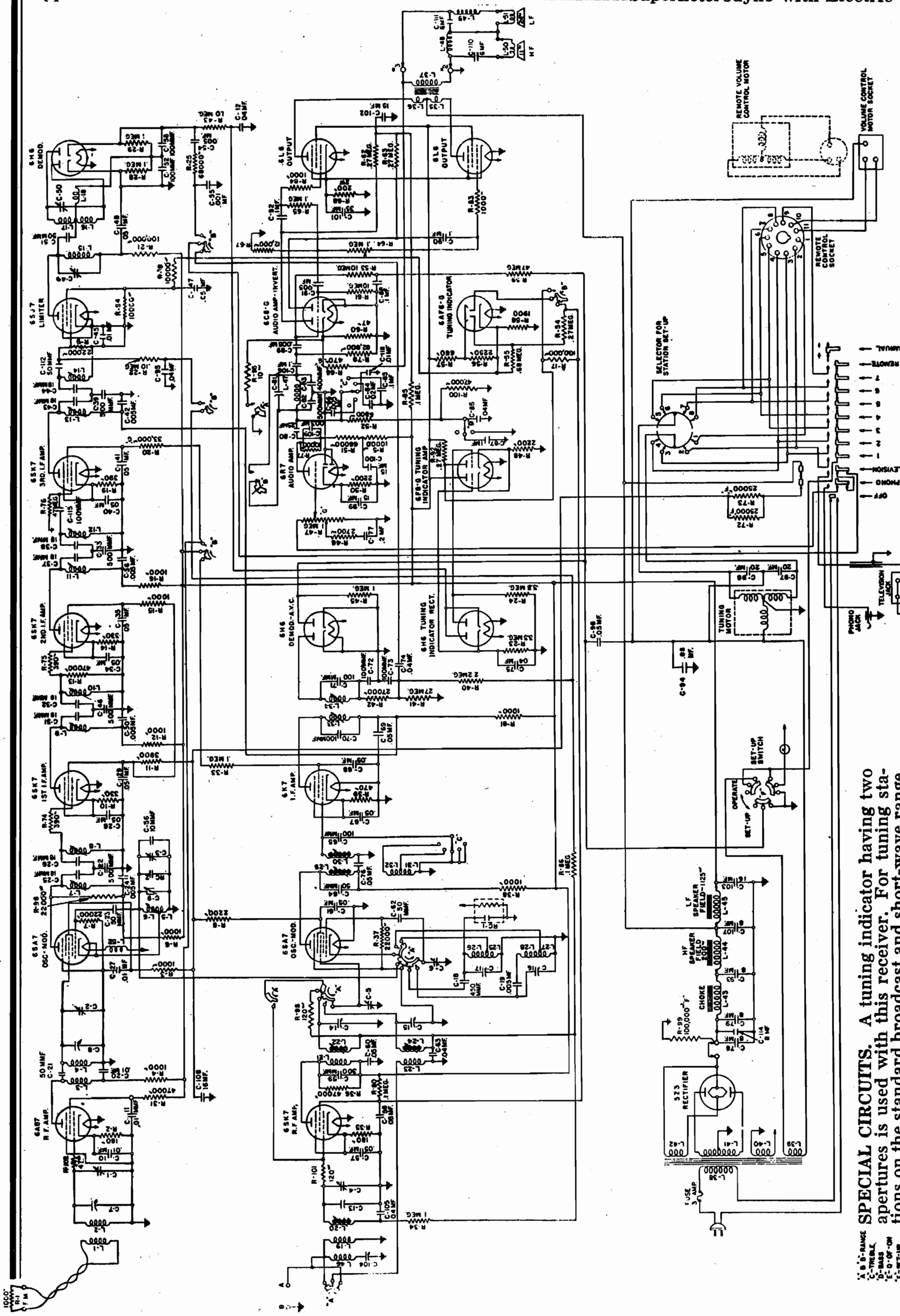
Model	Input Power Frequency	Chassis	Cabinet	Speaker
585-M	50-60 Cycles	32711	31088	31087 (Bass) 31126 (Treble)

SPECIFICATIONS

Tuning Ranges ---------------------------- { Frequency Modulation 42 to 50 Mc. (42,000 to 50,000 Kc.)
Shortwave 5.8 to 18 Mc. (5800 to 18,000 Kc.)
Standard Broadcast .54 to 1.7 Mc. (540 to 1700 Kc.)

Voltage Rating ---105 to 125 Volts

Type of Circuit--------------------------------Superheterodyne with Electric Tuning



'A' 'B'-RANGE
'C'-TREBLE
'D'-BASS
'E'-O-OFF-ON
'F'-SET-UP
'G'-VOLUME

SPECIAL CIRCUITS. A tuning indicator having two apertures is used with this receiver. For tuning stations on the standard broadcast and short-wave range, one aperture is for strong signals and the other for weak signals. One aperture will close with a signal of approximately 100,000 microvolts and the other will not close even with a two volt signal. Stations on the frequency modulation range should be tuned for maximum closing of both apertures.

Iron core coils are used in the broadcast and short-wave ranges to provide greater accuracy of alignment. The audio system employs a special inverter push-pull circuit designed to provide excellent fidelity, and the chassis is thoroughly shielded throughout with an electro-statically shielded power transformer.

FREQUENCY MODULATION: The "Armstrong Wide-Swing Frequency Modulation System" used in this receiver is an outstanding development in radio. It makes possible:

1. Static-Free Reception;
   Both natural and man-made static is virtually eliminated.
2. Noise free reception;
   The tube and set noises present in ordinary amplitude modulation receivers are virtually eliminated.
3. Extreme high fidelity reception;
   Noise free reproduction of an audio range limited only by the capacity of the human ear or the audio system of the receiver is possible without interference.
4. Interference free reception;
   Two stations cannot be received at the same time.

MODEL 585M

STROMBERG-CARLSON TEL. MFG. CO.

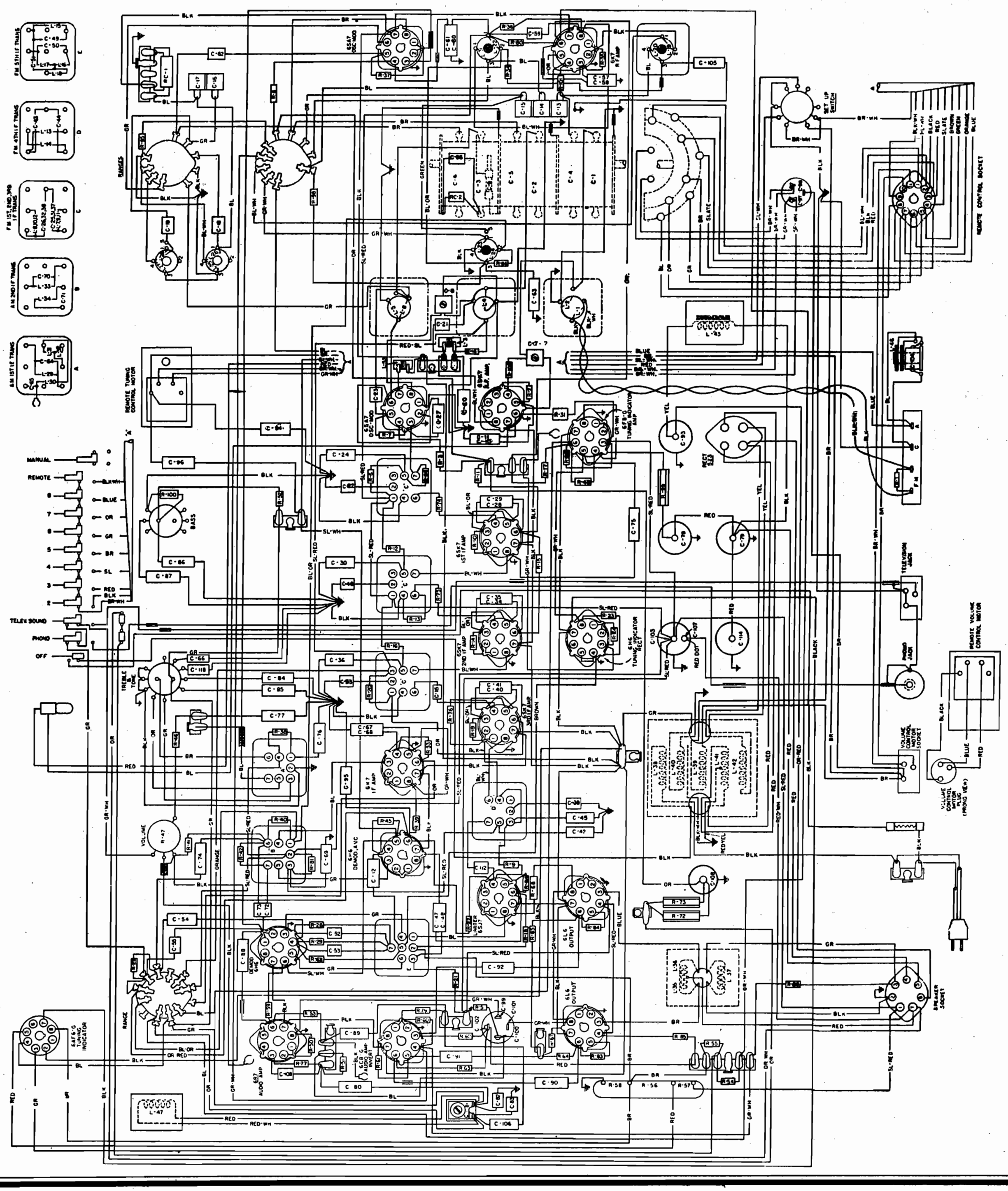
GENERAL. This is a nineteen-tube, three gang, three range receiver designed for the reception of both amplitude and frequency modulated stations and is equipped with a dual coaxial speaker system. It is capable of reproducing without distortion an audio frequency range of at least 10,000 cycles.

The chassis is of the fortified type with bails provided for ease in handling and servicing. Automatic tuning is accomplished by means of a motor drive controlled by a commutator and brush assembly and the dial is of the slide rule type, edge-lighted for clear visibility without glare. Separate treble and bass controls are provided to make accurate adjustment of the tone possible.

A remote control unit is provided with this receiver which enables the user to operate the receiver at a remote point.

The power output of this receiver is excellent and the tone quality and fidelity of reproduction is finer than anything produced commercially to date.

Input Power Rating	225 Watts
Intermediate Frequency	455 Kilocycles (Amplitude Modulation) 4.3 Megacycles (Frequency Modulation)
Speaker Field Coil Resistance—Approximately	1125 Ohms (Bass) 200 Ohms (Treble)
Speaker Voice Coil Impedance at 400 Cycles—Approximately	24 Ohms (Bass) 11 Ohms (Treble)



STROMBERG-CARLSON TEL. MFG. CO.

ADJUSTING DIAL LAMP

The dial on this receiver is edge-lighted, and for proper illumination it is very important that the dial light be adjusted so that the filament is exactly opposite the edge of the glass.

To make this adjustment simply slide the pilot light socket back and forth on its mounting bracket until maximum illumination is obtained.

NORMAL VOLTAGE READINGS

Take all voltage readings with chassis operating and tuned manually to 1000 kilocycles or 48 megacycles—no signal.

The upper figures shown in the table are with the range switch set to the standard broadcast range and tuned to approximately 1000 kilocycles—no signal.

The lower figures shown in the table are with the range switch set to the frequency modulation position and tuned to approximately 48 megacycles—no signal.

Use a line voltage of 125 volts or make allowance for any slight variation.

Use a good high resistance voltmeter having a resistance of at least 1000 ohms per volt. Take all D. C. readings on the 500 volt scale except when an asterisk appears. Read from indicated terminals to chassis base. See location chart on Page 3 for position of terminals.

A. C. voltages are indicated by italics.

Tube	Circuit	Range Switch Set To	Cap	Terminals of Sockets 1	2	3	4	5	6	7	8
6AB7	R. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	+1* +3*	— —	+1* +3*	+68 +135	*6.5* *6.5*	0 +265
6SA7	Mod. and Osc. (F. M.)	A. M. F. M.	— —	0 0	0 0	+290 +280	+70 +120	— —	0 0	*6.5* *6.5*	0 0
6SK7	1st I. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	+2* +4*	— —	+2* +4*	+70 +110	*6.5* *6.5*	+290 +265
6SK7	2nd I. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	+2* +3*	— —	+2* +3*	+55 +90	*6.5* *6.5*	+290 +270
6SK7	3rd I. F. Amp. (F. M.)	A. M. F. M.	— —	0 0	0 0	0 +6*	— —	0 +6*	0 +150	*6.5* *6.5*	+285 +260
6SJ7	Limiter (F. M.)	A. M. F. M.	— —	0 0	0 0	0 0	— —	0 0	+95 +90	*6.5* *6.5*	+95 +95
6H6	Demod. (F. M.)	A. M. F. M.	— —	0 0	0 0	— —	— —	— —	— —	*6.5* *6.5*	0 0
6H6	Tun. Ind. Rect. (F. M.)	A. M. F. M.	— —	0 0	0 0	— —	— —	— —	— —	*6.5* *6.5*	— —
6F8G	Tun. Ind. Amp. (F. M.)	A. M. F. M.	0 0	0 0	0 0	+295 +275	+11** +10**	— —	+200 +185	*6.5* *6.5*	+11** +10**
6SK7	R. F. Amp. (A. M.)	A. M. F. M.	— —	0 0	0 0	+2* +2*	— —	+2* +2*	+90 +80	*6.5* *6.5*	+290 +275
6SA7	Mod. and Osc. (A. M.)	A. M. F. M.	— —	0 0	0 0	+290 +275	+70 +135	— —	0 +100	*6.5* *6.5*	0 0
6K7	I. F. Amp. (A. M.)	A. M. F. M.	0 0	0 0	0 0	+285 +260	+115 0	+4* 0	+290 0	*6.5* *6.5*	+4* 0
6H6	Demod., A. V. C., "Q" (A. M.)	A. M. F. M.	— —	0 0	0 0	— —	0 0	— —	— —	*6.5* *6.5*	0 0
6R7	Audio Amp.	A. M. F. M.	0 0	0 0	0 0	+90 +85	0 0	0 0	— —	*6.5* *6.5*	+3* +3*
6C8G	Audio Inv.	A. M. F. M.	0 0	0 0	0 0	+35 +35	— —	— —	+35 +35	*6.5* *6.5*	0 0
6L6	Output	A. M. F. M.	— —	0 0	0 0	+415 +410	+290 +275	— —	— —	*6.5* *6.5*	+20** +20**
6L6	Output	A. M. F. M.	— —	0 0	0 0	+415 +410	+290 +275	— —	— —	*6.5* *6.5*	+20** +20**
5Z3	Rectifier	A. M. F. M.	— —	+495 +495	*480* *480*	*480* *480*	+495 +495	— —	— —	*5* *5*	— —
6AF6G	Tun. Ind.	A. M. F. M.	— —	— —	0 0	+65 +60	+90 +185	+250 +235	— —	*6.5* *6.5*	+95 +90
	Speaker Socket	A. M. F. M.	— —	+290 +275	0 0	0 0	+495 +495	+495 +495	+486 +486	+425 +420	— —

*Read on lowest possible scale of voltmeter.
**Read on 100 volt scale of voltmeter.

CONTINUITY TEST

Remove all tubes and disconnect the receiver from the power supply before making continuity test.

Test speaker socket with speaker left out.

Leave speaker plug in socket for all other tests. (If a speaker is not available when checking continuity the speaker socket may be shorted by using two pieces of bus wire and shorting together terminals 1, 6 and 7 and terminals 4 and 5 of the speaker socket. (See location chart on Page 3 for position and numbering of terminals.) Caution: Be sure to remove the two shorting wires when the continuity test is completed.

Use a good meter capable of measuring up to several megohms.

The resistances given are often approximate owing to electrolytic capacitors in the circuit. When this is the case, be sure to reverse the test leads and read the highest resistance.

Read from indicated terminals to chassis base unless otherwise specified.

See location chart on Page 3 for position and numbering of terminals.

Tube	Circuit	Cap	Terminals of Sockets 1	2	3	4	5	6	7	8
6AB7	R. F. Amp. (F. M.)	—	S	S	180¶	S	180¶	A	S	O
6SA7	Osc. and Mod. (F. M.)	—	S	S	6000¶	A	22000¶	S	S	S
6SK7	1st I. F. Amp. (F. M.)	—	S	S	330¶	390¶	330¶	B	S	6000¶
6SK7	2nd I. F. Amp. (F. M.)	—	S	S	330¶	390¶	330¶	C	S	6000¶
6SK7	3rd I. F. Amp. (F. M.)	—	S	S	390¶	4700000¶	390¶	D	S	5000¶
6SJ7	Limiter (F. M.)	—	S	S	S	57000¶	S	1900¶	S	1900¶
6H6	Demod. (F. M.)	—	S	S	100000¶	200000¶	100000¶	1M	S	S
6H6	Tun. Ind. Rect. (F. M.)	—	S	S	1M	2.4M	2.4M	O	S	1M
6F8G	Tun. Ind. Amp. (F. M.)	1M	S	S	5000¶	2000¶	1M	150000¶	S	2200¶
6SK7	R. F. Amp. (A. M.)	—	S	S	180¶	F	180¶	90000¶	S	5000¶
6SA7	Osc. and Mod. (A. M.)	—	S	S	6000¶	G	22000¶	H	S	I
6K7	I. F. Amp. (A. M.)	7¶	S	S	5000¶	J	470¶	K	S	470¶
6H6	Demod., A. V. C., "Q" (A. M.)	—	S	S	300000¶	S	900000¶	500000¶	S	S
6R7	Audio Amp.	1M	S	S	100000¶	S	S	1.5M	S	2200¶
6C8G	Audio Inv.	1M	S	S	3500000¶	47¶	10M	350000¶	S	S
6L6	Output	—	S	S	5000¶	5000¶	150000¶	150000¶	S	200¶
6L6	Output	—	S	S	5000¶	5000¶	150000¶	150000¶	S	200¶
5Z3	Rectifier	—	5000¶	30¶	30¶	5000¶	—	—	—	—
6AF6G	Tun. Ind.	—	O	S	200000¶	L	4200¶	O	S	1900¶
—	Speaker Socket	—	5000¶	S	S	O	90000¶	90000¶	300000¶	—

Symbols used on chart are as follows: ¶—ohms; M—megohms; S—short; O—open.

A. Push in any "Pre-set Station" Button .... 18,000 Ohms
Push in "Phono" Button .... 300,000 Ohms
Push in "Television" Button .... 300,000 Ohms

B. Push in any "Pre-set Station" Button .... 20,000 Ohms
Push in "Phono" Button .... 400,000 Ohms
Push in "Television" Button .... 400,000 Ohms

C. Push in any "Pre-set Station" Button .... 30,000 Ohms
Push in "Phono" Button .... 400,000 Ohms
Push in "Television" Button .... 400,000 Ohms

D. Range switch in standard broadcast position .... "Open"
Range switch in short-wave position .... "Open"
Range switch in frequency modulation position .... 38,000 Ohms

E. "Q" Switch "On"
Range switch in standard broadcast position .... "Open"
Range switch in short-wave position .... "Open"
Range switch in frequency modulation position .... 1 Megohm
"Q" Switch "Off"
Range switch in standard broadcast, short-wave and frequency modulation positions .... "Short"
Set up switch in "Set up" position .... "Short"
Set up switch in "Operate" position .... 1 Megohm

F. Range switch in standard broadcast position .... 3 Megohms
Range switch in short-wave position .... 3 Megohms
Range switch in frequency modulation position .... 550,000 Ohms

MODEL 585M

STROMBERG-CARLSON TEL. MFG. CO.

G.	Push in any "Pre-set Station" Button	20,000 Ohms
	Push in "Phono" Button	400,000 Ohms
	Push in "Television" Button	400,000 Ohms
H.	Range switch in standard broadcast position	"Short"
	Range switch in short-wave position	"Short"
	Range switch in frequency modulation position	"Open"
I.	Range switch in standard broadcast position	3.5 Megohms
	Range switch in short-wave position	3.5 Megohms
	Range switch in frequency modulation position	"Open"
J.	Range switch in standard broadcast position	100,000 Ohms
	Range switch in short-wave position	100,000 Ohms
	Range switch in frequency modulation position	"Open"
K.	Range switch in standard broadcast position	5,000 Ohms
	Range switch in short-wave position	5,000 Ohms
	Range switch in frequency modulation position	"Open"

IMPORTANT: Do not go back and touch up any adjustments previously made. If the receiver is not in proper alignment after completing the adjustments outlined above, go back and start over again and follow the instructions through to the finish.

REMOTE CONTROL. Remote selection of stations is accomplished by simply plugging the remote control unit into the socket provided on the back of the chassis. This unit enables the user to select any one of eight favorite stations which have been previously set up on the electric tuning system of the receiver.

L.	Range switch in standard broadcast position	900,000 Ohms
	Range switch in short-wave position	900,000 Ohms
	Range switch in frequency modulation position	1.5 Megohms
	Other tests not shown on chart—	
	Phono jack to chassis base	
	Push in "Phono" button	1 Megohm
	Push in any "Pre-set" Station button	"Open"
	Television jack to chassis base	
	Terminal No. 1 (this is the terminal located nearest to the bottom of the chassis) Push in "Television" button	1 Megohm
	Terminal Nos. 2 and 3	"Short"
	Amplitude Modulation Antenna Terminal to chassis base	"Short"
	Amplitude Modulation Ground Terminal to chassis base	"Short"
	Frequency Modulation Terminals to chassis base	"Open"
	Between Frequency Modulation Terminals	1,000 Ohms
	Terminals of A. C. Plug to chassis base	"Open"
	Between terminals of A. C. Plug—	
	Push in "Off" button	"Open"
	Push in any other button	1.5 Ohms

PHONOGRAPH OPERATION. A jack is provided on the back of the chassis into which a record player may be plugged and a push button is provided on the front of the chassis for switching from "Radio" to "Phonograph".

TELEVISION. A socket is provided on the back of the chassis into which a television receiver may be plugged and a push button is provided on the front of the chassis for switching to television so that the audio amplifier and speaker system employed in this receiver are available for use with television receivers designed for this type of sound reproduction.

ALIGNING INFORMATION

NEVER REALIGN UNLESS ABSOLUTELY NECESSARY

GENERAL. All aligning adjustments are carefully made at the factory with special equipment which is designed for aligning frequency modulation receivers. The limitations of commercial oscillographs and other ordinary test equipment are such that alignment should not be attempted in the field unless absolutely necessary.

If alignment is attempted, it will not be successful unless the instructions which follow are adhered to exactly.

The following equipment will be required:

1. Standard signal generator with sweep circuit.
2. Wide band sweep signal generator.
3. Oscillograph.
4. Microammeter "0" to 200 Microamps.
5. Center "0" Microammeter with 100 divisions each side of "0".

See location chart above for location of all aligning screws.

ALIGNING PROCEDURE (follow this order exactly)

I. **Dial pointer adjustment.** With the plates of the gang tuning capacitor fully engaged, set the dial pointer directly on the two vertical lines located at the extreme low frequency end of the dial scale.

II. **Intermediate frequency adjustments** (Frequency Modulation)

1. Set the range switch to Frequency Modulation position and the volume control to "off" position.
2. Tune the set to the extreme high frequency end of the dial (50 megacycles).
3. Disconnect the ground side of the 10000 ohm resistor R94 and connect the "0" to 200 microammeter in series with it and ground. (This resistor is connected between terminals No. 3 and 4 of the fourth I. F. transformer.)
4. Connect the oscillograph between high side of R94 resistor and ground.
5. Connect the ground terminal of the wide band sweep signal generator to the ground terminal of the 6SK7 third I. F. tube socket.
6. Introduce a signal of 4.3 megacycles to the grid of the 6SK7 third I. F. tube (Terminal No. 4), using a 0.1 microfarad capacitor in series with the output lead of the signal generator. Keep the "0" to 200 microammeter at approximately 100 microamps.
7. Align the secondary and primary of the fourth I. F. transformer for maximum reading on the "0" to 200 microammeter.
8. Slight adjustments of the aligners may be made if necessary to obtain a symmetrical curve on the oscillograph. Try for a good curve rather than the very last bit of output.
9. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 second I. F. tube (Terminal No. 4).
10. Align the third I. F. transformer in the same manner.
11. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SK7 first I. F. tube (Terminal No. 4).
12. Connect the ground lead to the ground terminal of the 6SK7 first I. F. tube socket.
13. Align the second I. F. transformer in the same manner.
14. Connect the output lead and the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 modulator tube (Terminal No. 8).
15. Connect the ground lead to the ground terminal of the 6SA7 modulator tube socket.
16. Align the first I. F. transformer in the same manner.
17. Remove the wide band sweep signal generator.

III. **Discriminator adjustment** (Frequency Modulation)

Note: Be sure the frequency of both signal generators are the same.

1. Connect the ground terminal of the standard signal generator to the ground terminal of the 6SK7 second I. F. tube socket.
2. Introduce an unmodulated signal of 4.3 megacycles to the grid of the 6SK7 second I. F. tube (Terminal No. 4) using a 0.1 microfarad capacitor in series with the output lead of the standard signal generator.
3. Connect the center "0" microammeter with a .5 megohm resistor in series across one-half of the discriminator load. (From ground to the junction of the two .1 megohm resistors R28 and R29).
4. Set the attenuator on the standard signal generator for maximum output.
5. Adjust the primary of the discriminator transformer for maximum reading on the center "0" microammeter.
6. Connect the center "0" microammeter and the .5 megohm resistor in series with it across the whole discriminator load. (Terminal No. 4 of the 6H6 Demodulator tube and ground).
7. Adjust the secondary of the discriminator transformer for center "0" reading of the microammeter.
8. Vary the frequency of the standard signal generator slightly and be sure that the center "0" microammeter reads the same on each side of resonance. If not, go back and realign both primary and secondary.

IV. **Radio frequency adjustments** (Frequency Modulation)

1. Set the signal generator frequency and the receiver tuning dial to 48.5 megacycles).
2. Replace the 0.1 microfarad capacitor in series with the output lead from the signal generator with a 100 ohm resistor and connect it to the F. M. antenna terminal nearest to the end of the antenna and ground terminal strip.
3. Connect the ground lead to the other F. M. terminal on the antenna and ground terminal strip.
4. Adjust the oscillator shunt aligner for maximum signal.
5. Adjust the R. F. and antenna aligners for maximum signal on the "0" to 200 microammeter maintaining the center "0" microammeter at "0" at all times by rotating the receiver dial slightly back and forth.
6. Remove both meters from the circuits and resolder the 10000 ohm resistor R94 in its original position to terminal No. 4 on the fourth I. F. transformer.

V. **Intermediate frequency adjustments** (Amplitude Modulation)

Adjustment of second I. F. transformer.

1. Set the range switch to standard broadcast position.
2. Set the fidelity control in the center or "sharp" position and turn the volume control "full on".
3. Connect the oscillograph to the high side of the volume control R47.
4. Replace the 100 ohm resistor in series with the output lead from the signal generator with a 0.1 microfarad capacitor and connect it to the grid cap of the 6K7 I. F. tube. (Do not remove the grid cap from this tube.)
5. Connect the ground terminal of the signal generator to the ground terminal of the receiver.
6. Introduce a modulated signal of 455 kilocycles to the grid of the 6K7 I. F. tube.
7. Adjust the second I. F. transformer aligners for a symmetrical curve on the oscillograph in the following order:
   a. Secondary of second I. F. transformer.
   b. Primary of second I. F. transformer.
8. Set the fidelity control to the high fidelity (expanded) position and readjust the primary of the second I. F. transformer for symmetrical curve.
9. Set the fidelity control back to the center or "sharp" position.

Adjustment of first I. F. transformer.

1. Connect the output lead from the signal generator with the 0.1 microfarad capacitor in series with it to the grid of the 6SA7 Modulator Tube. (Terminal No. 8.)
2. Adjust the first I. F. transformer aligners for a symmetrical curve on the oscillograph in the following order:
   a. Secondary of first I. F. transformer.
   b. Primary of first I. F. transformer.
3. After the Amplitude Modulation I. F. adjustments have been completed, the fidelity control should be turned to the high fidelity position and a check made on the shape of the curve which should show a slight double peak.
4. Turn the fidelity control back to middle or "sharp" position.
5. Remove the oscillograph from the circuit.

VI. **Radio frequency adjustments** (Amplitude Modulation)

Short Wave Range (C Band)

1. Replace the 0.1 microfarad capacitor in series with the output lead of the signal generator with a 400 ohm resistor and connect it to the Amplitude Modulation antenna terminal on the back of the chassis.
2. Set the range switch to the short-wave range position (C Band).
3. Set the signal generator frequency and the receiver tuning dial to 6 megacycles.
4. Adjust the 6 megacycle "oscillator" and "antenna" iron cores for maximum signal.
5. Set the signal generator and the receiver tuning dial to 17 megacycles.
6. Adjust the 17 megacycles "oscillator" and "antenna" aligning capacitors for maximum signal.
7. Repeat operations 3 and 4.
8. Repeat operations 5 and 6.

Standard Broadcast Range (A Band)

1. Replace the 400 ohm resistor in series with the output lead of the signal generator with a 200 micro-microfarad capacitor.
2. Set the range switch to the standard broadcast range (A Band).
3. Set the signal generator frequency and the receiver tuning dial to 600 kilocycles.
4. Adjust the 600 kilocycle "oscillator", "R. F." and "Antenna" iron cores for maximum signal.
5. Set the signal generator frequency and the receiver tuning dial to 1500 kilocycles.
6. Adjust the 1500 kilocycle "oscillator", "R. F." and "Antenna" aligning capacitors for maximum signal.
7. Repeat operations 3 and 4.
8. Repeat operations 5 and 6.

VII. **Wave trap adjustment.** (Leave the receiver connected in the same manner as when adjusting the standard broadcast range) (A Band).

1. Set the receiver's tuning dial to 1000 kilocycles.
2. Set the signal generator frequency to 455 kilocycles and introduce a fairly strong modulated signal to the receiver.
3. Adjust the wave trap aligner for minimum signal.

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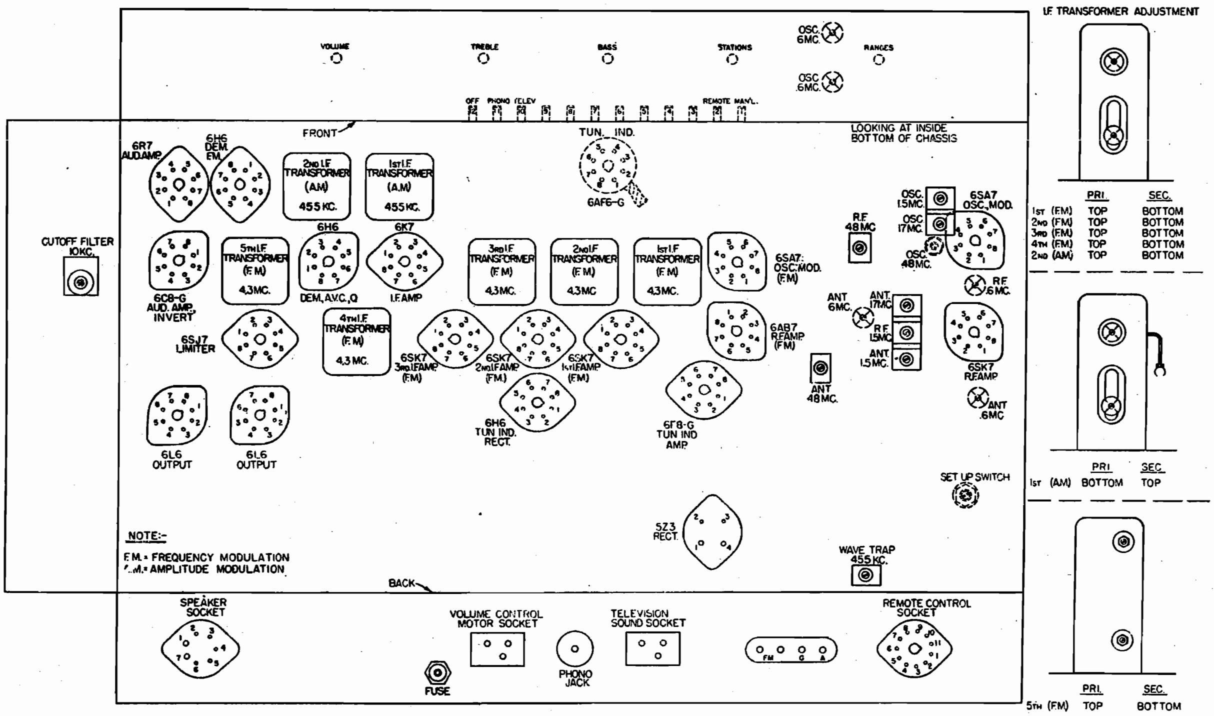
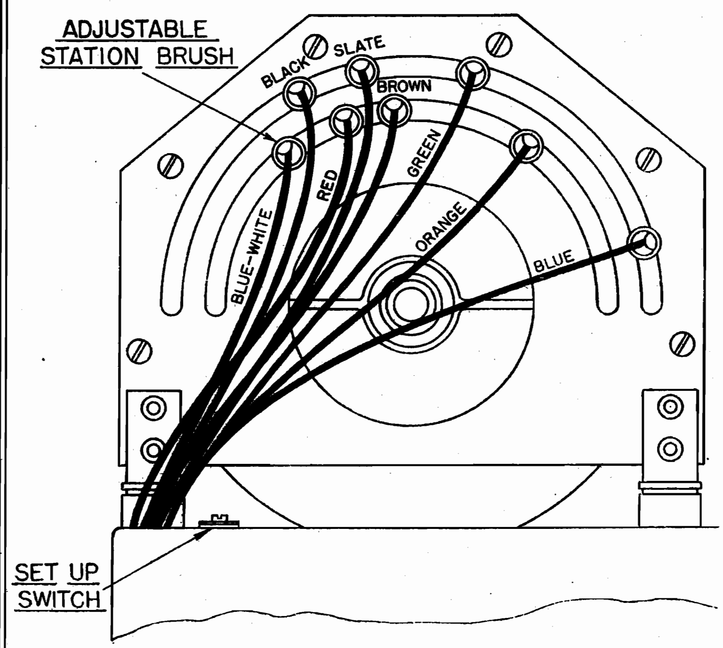
MODEL 585M



Location Chart



Adjustable Station Brushes and Set Up Switch

SETTING UP PUSH BUTTONS

Button No.	Purpose	Color of wire on brush
1	Manual	—
2	Remote	—
3	Highest frequency station	Blue
4	Next lower frequency station	Orange
5	Next lower frequency station	Green
6	Next lower frequency station	Brown
7	Next lower frequency station	Slate
8	Next lower frequency station	Red
9	Lowest frequency station on receiver	Black
10	Telev. button on receiver	Blue White
	Lowest frequency button on remote control unit	
11	Phonograph	See diagram of adjustable brushes and set-up switch
12	Off	

IMPORTANT: The stations selected should be local or favorite stations which give good reception at all times. Frequency Modulated Stations, as well as Amplitude Modulation Stations, may be set up on the push buttons by simply using the appropriate button determined by the position of the Frequency Modulated Station on the dial.

Always use the tuning indicator unit when setting up stations in order to determine when the station is exactly in tune.

Seven stations may be set up for push buttons located on the front of the receiver and eight stations may be set up on the remote control unit. The same seven stations which were set up for the buttons on the front of the receiver must also be used on the remote control unit and the eighth station which is chosen for the remote control unit must be of a lower frequency than any of the other stations which have been set up.

Put the call letters of the selected stations in place above the push buttons. **The stations should be arranged according to frequency with the highest frequency at the right and the lowest frequency at the left, just as on the dial.** (The call letters will be found inside the envelope stapled inside or underneath the cabinet).

Set the "Treble" control in normal position.

Turn the set-up switch (located on the base just back of the brush and commutator assembly) to the set-up position. (The slot in the screw should point toward "set-up").

Push the button of the highest frequency station to be set up (button No. 3) and then tune in that station manually. **Be sure the station is exactly "in tune" by tuning carefully and watching the cathode ray indicator.**

Slide the brush to which the blue wire is connected until it is over the slot in the commutator. Then adjust it very carefully until the pilot light goes out. This indicates exact adjustment.

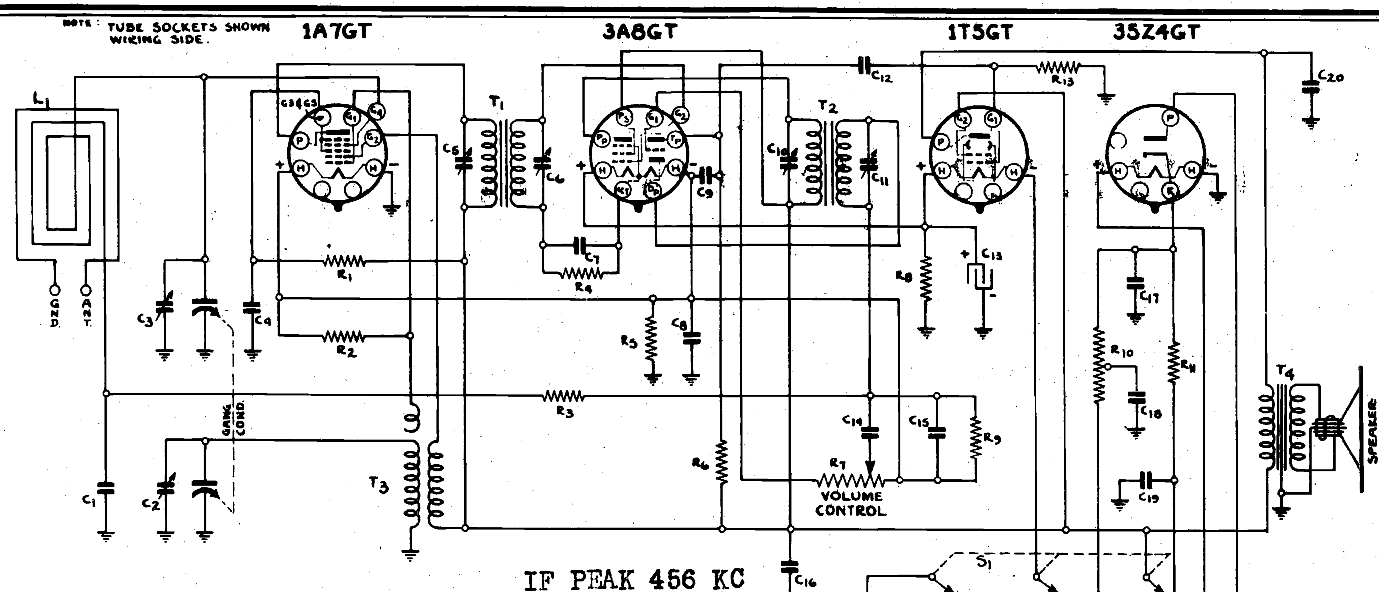
Repeat operations 4 and 5 for each station. Work from right to left or from the higher to the lower frequencies in accordance with the table below:

Turn the set-up switch back to the "Operate" position.

Check the operation of all the push buttons to be sure that each has been accurately set up. If it is necessary to readjust any of the buttons, follow the procedure given above.

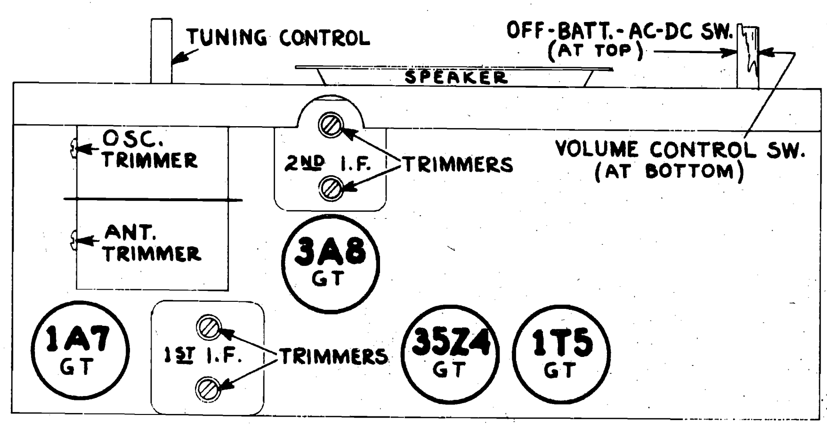
TRAV-LER RADIO & TELEV. CORP.

MODELS B70, B71, B712



IF PEAK 456 KC

R_1	20,000 Ω	C_1	.05 μf.	C_{17}	40 μf.
R_2	200,000 Ω	C_2	TRIMMER (GANG)	C_{18}	40 μf.
R_3	2 MEGOHM	C_3	" "	C_{19}	40 μf.
R_4	6 MEGOHM	C_4	.01 μf.	C_{20}	.001 μf.
R_5	750 Ω	C_5	PLATE TRIMMER-1st. I.F.	C_{21}	.05 μf.
R_6	.5 MEGOHM	C_6	GRID " "		
R_7	1. MEG. V.C.	C_7	.01 μf.		
R_8	500 Ω	C_8	.1 μf.	L_1	LOOP ANT. #15-164
R_9	1. MEGOHM	C_9	.00025 μf.		
R_{10}	2,300 C.T. SW.	C_{10}	PLATE TRIMMER-2nd I.F.	T_1	1st. I.F.
R_{11}	3,000 Ω	C_{11}	GRID " "	T_2	2nd I.F.
R_{12}	550 Ω -	C_{12}	.01 μf.	T_3	OSC. COIL #15-165
"	(PART #34-50)	C_{13}	80 μf. 80 V.	T_4	SPEAKER #43-125
R_{13}	1. MEGOHM	C_{14}	.01 μf.		
		C_{15}	.00025 μf.	S_1	SWITCH #14-73
		C_{16}	.1 μf.		



TRIMMER & TUBE LOCATION

B70 33-110 FLC

FOR ALIGNMENT. SEE NEXT PAGE

INSTRUCTIONS FOR REMOVAL OF CHASSIS. (Model B70 only)

1. Remove batteries after taking off bottom panel.

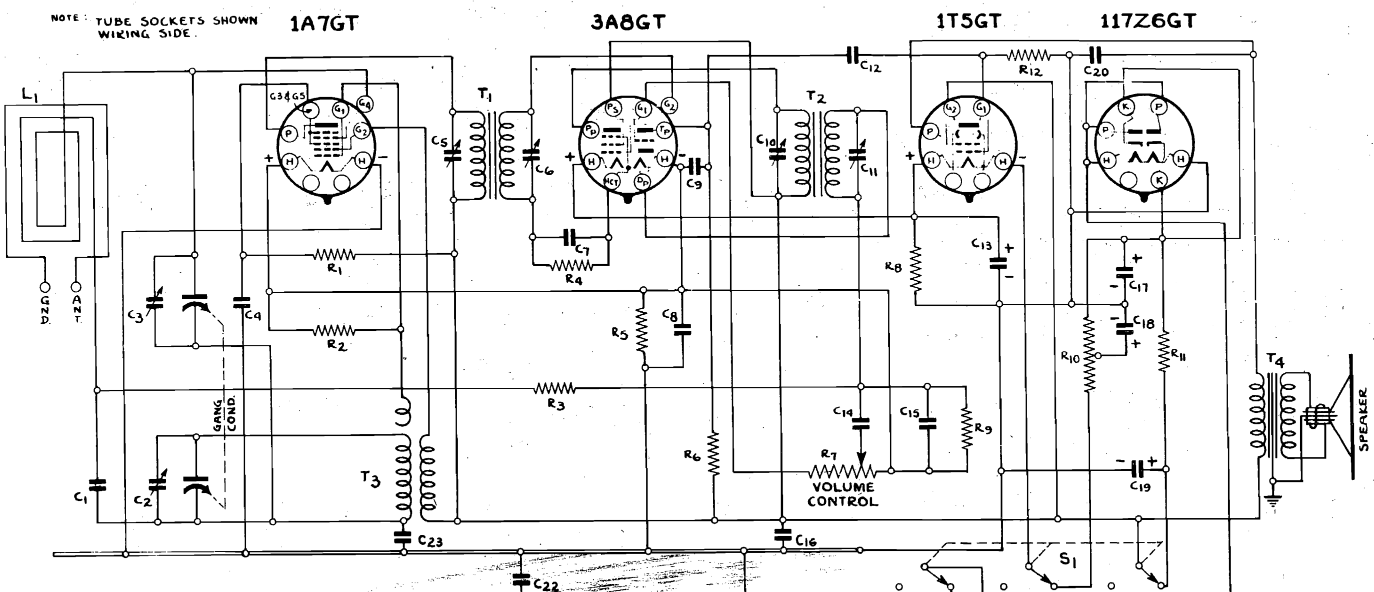
2. Remove two wood screws from loop antenna panel in cover. If loop panel does not come out easily, loosen antenna or ground screws a few turns, and lift one end out by gently pulling on screw with pliers until panel can be removed.

3. Remove two screws in rear on cabinet and one screw in front of cabinet. The chassis can now be removed by pushing it from behind and sliding it out of the cabinet.

4. If the loop antenna is disconnected for any reason, be sure that the lead coming from the gang condenser is connected to the inside turn of the loop antenna coil.

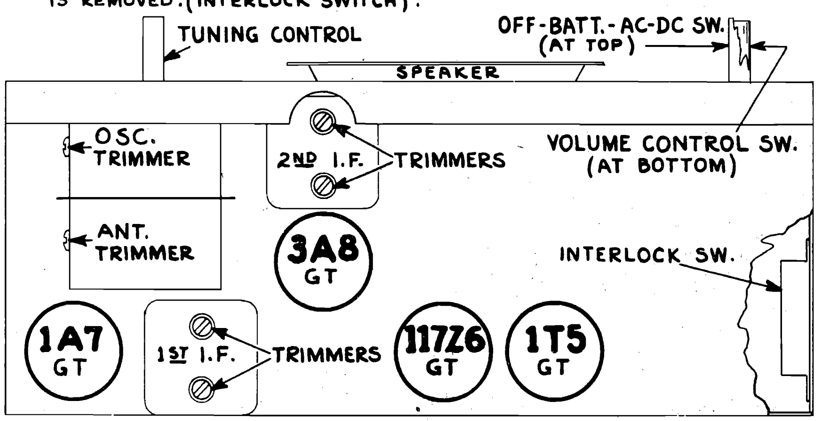
MODEL FB-73
MODELS B70, B71, B712

TRAV-LER RADIO & TELEV. CORP.



R_1 20,000 Ω	C_1 .05 µf.	C_{17} 40 µf.	
R_2 200,000 Ω	C_2 TRIMMER (GANG)	C_{18} 40 µf.	
R_3 2 MEGOHM	C_3 " "	C_{19} 40 µf.	
R_4 6 MEGOHM	C_4 .01 µf.	C_{20} .001 µf.	
R_5 750 Ω	C_5 PLATE TRIMMER-1st. I.F.	C_{21} .05 µf.	
R_6 .5 MEGOHM	C_6 GRID " "	C_{22} .05 µf.	
R_7 1. MEG. V.C.	C_7 .01 µf.	C_{23} .05 µf.	
R_8 500 Ω	C_8 .1 µf.	L_1 LOOP ANT. #15-179	
R_9 1. MEGOHM	C_9 .00025 µf.		
R_{10} 2,300 C.T. SW.	C_{10} PLATE TRIMMER-2nd. I.F.	T_1 1st. I.F.	
R_{11} 3,000 Ω	C_{11} GRID " "	T_2 2nd I.F.	
R_{12} 1. MEGOHM	C_{12} .01 µf.	T_3 OSC. COIL #15-180	
	C_{13} 80 µf. 80 V.	T_4 SPEAKER #43-138	
	C_{14} .01 µf.		
	C_{15} .00025 µf.	S_1 SWITCH #14-78	
	C_{16} .1 µf.		

NOTE: POWER AUTOMATICALLY TURNED "OFF" WHEN CABINET BACK PANEL IS REMOVED. (INTERLOCK SWITCH).



ALIGNMENT --- MODELS B70, FB73 B71, B712

I. F. 456 K.C.

Set receiver dial at 1720 KC, or with tuning condenser open.

Set signal generator at 456 KC with generator coupled to receiver through a .1 mfd. condenser in each lead (ground side to chassis and other lead to 1A7GT grid cap). Allow just enough signal to produce a reading in an output indicating device such as a.c. meter connected to voice leads of speaker. Meter must be able to indicate as low as one or two volts a.c.

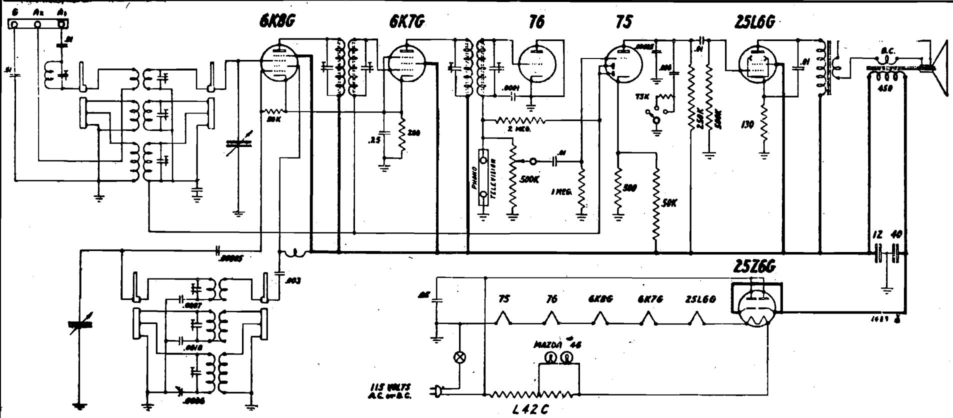
Adjust each I.F. trimmer to maximum output while reducing input signal to a minimum, thus avoiding a.v.c. effects and insuring perfect resonance.

B.C. BAND

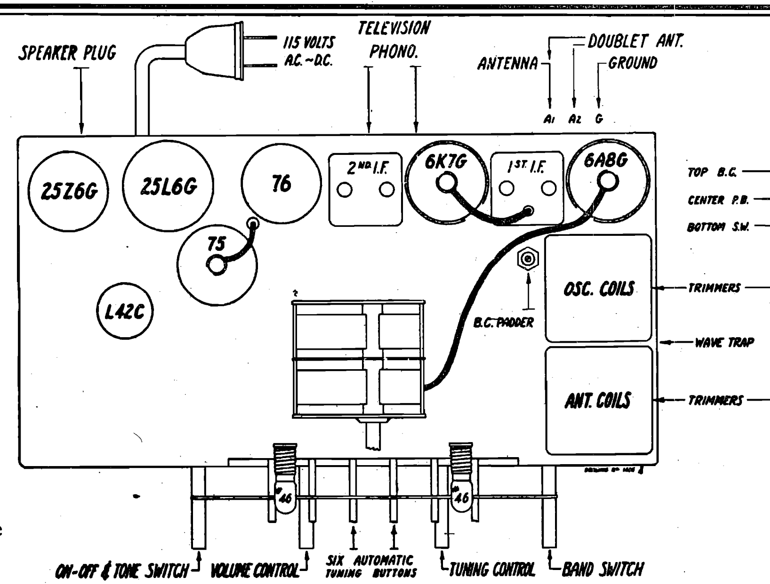
Connect signal generator to a single turn loop of wire five or six inches in diameter facing receiver loop and spaced about eight inches away. This is to simulate actual receiving conditions.

Set receiver dial to 1500 KC and signal generator dial to 1500 KC. Adjust oscillator trimmer until signal is heard. Start this procedure with considerable signal from generator and reduce as previously instructed until signal is set at 1500 KC on receiver. Adjust antenna trimmer at same point and to the greatest output with minimum signal from generator.

TRAV-LER RADIO & TELEV. CORP.



IF PEAK 456 KC



The ranges of the three wave bands are as follows.

Standard Broadcast Band	538	to	1,720 K.C.
Intermediate (Police) Band	1,950	to	6,500 K.C.
Short Wave (Foreign) Band	7,650	to	24,500 K.C.

I. F. ALIGNMENT

From a good signal generator, connect the proper leads, one to the chassis (make sure polarity is the same first), and the other thru a .1 mfd. condenser to the grid cap of the 6K8, with the tube's grid lead still in place. Set the radio dial to 1720 K.C. and the signal generator to 456 K.C. With the set's volume control full on, increase the generator output until the signal is heard in the speaker. Adjust the I.F. trimmers for maximum output, decreasing the generator output as the speaker output increases.

B. C. ALIGNMENT

1. Connect the signal generator lead thru a .0002 mfd. condenser as dummy antenna to the "A1" terminal, with the metal strip connected across A2 and G. Set the signal generator and radio dial to 1720 K.C. and adjust the B.C. oscillator trimmer for maximum output.
2. Set the signal generator and radio dial to 1400 K.C. and adjust the B.C. ANT. trimmer for maximum output.
3. Set the signal generator to 600 K.C. and the radio dial to approximately 600 K.C., and adjust the B.C. oscillator padder for maximum output by adjusting dial and pad together

Check the alignment again at 1400 K.C.

Adjust the wave trap at 456 K.C. for MINIMUM output.

INTERMEDIATE BAND ALIGNMENT

Using a 400 ohm resistor as dummy antenna, adjust the Intermediate Band oscillator trimmer at 6.7 M.C. and the Antenna trimmer at 6 M.C.

Check for alignment at 2.2 M.C.

SHORT WAVE BAND ALIGNMENT

Using a 400 ohm resistor as dummy antenna, adjust S.W. oscillator trimmer at 24.5 M.C., and the Antenna trimmer at 22 M.C.

Check for alignment at 8 M.C.

Each push button may be adjusted to select any station in the broadcast band.

1. Tune in desired station with the Selector knob.
2. Twist the push button you are going to set up for this station one full turn to the left.
3. Push this button in all the way, holding the Selector knob so station will stay tuned in.
4. With button pressed in, twist it to the right until tight and then release it.

Follow this procedure with the remaining buttons, setting each for a different station.

Insert call-letter tabs.

MODEL 621

TRAV-LER RADIO & TELEV. CORP.

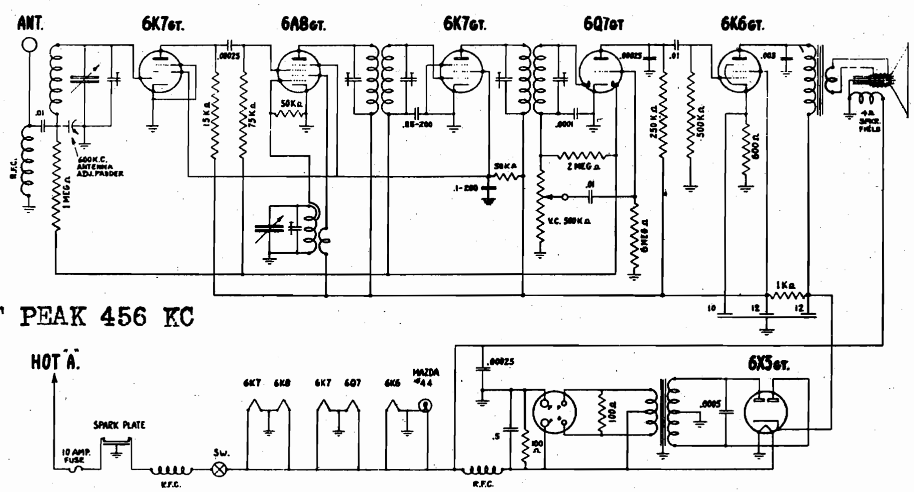
I. F. ALIGNMENT

Set the variable condenser at minimum capacity, (dial pointer at 1550 K.C.). Connect the two leads from a good, modulated signal generator, the ground lead to the radio chassis and the other lead through a .1 mfd. condenser, to the grid cap of the 6A8GT with the tube's grid lead still in place.

Connect the leads from a fully charged 6 volt storage battery to the receiver chassis and battery lead, the polarity being reversible.

With the set in operation and the volume control full on, set the signal generator to 456 K.C. and increase its output until the signal is heard in the set's speaker. Starting with the second I. F., adjust the I. F. trimmers for maximum output, decreasing the signal generator output as the receiver output increases.

The generator output in all the alignment adjustments should be adjusted so the meter will read approximately .4 volts continually.



IF PEAK 456 KC

R. F. ALIGNMENT

With the variable condenser still full open, set the generator to 1550 K.C. Connect the generator lead to the antenna lead through a .0001 mfd. condenser as dummy antenna. Adjust the oscillator trimmer for maximum output. Set the receiver dial and the generator to 1400 K.C. so the signal comes through, and adjust the antenna trimmer for maximum output.

Set the receiver dial and generator to 600 K.C. and adjust the oscillator padder for maximum output by rocking the variable condenser (with the tuning knob) as the padder is adjusted.

Return the dial and generator setting to 1400 K.C. and check for alignment.

PUSH BUTTON ADJUSTMENT

Six push button station selectors are incorporated in this receiver, and each may be set to select any frequency or station within the range of the set.

To adjust each button, follow these instructions.

1. With the set in operation, tune in any station the push button is to be set for, with the right hand tuning knob.

2. Keep a firm grip on the tuning knob so the station will not be detuned, and turn the push button about one turn to the left to loosen the mechanism. Press the button all the way in and turn it to the right until it is tight.

Repeat these operations with the other five buttons, setting each for a different station. Insert the correct call letter tab into the space provided in the panel just above the push buttons.

UNITED MOTORS SERVICE

MODEL R675

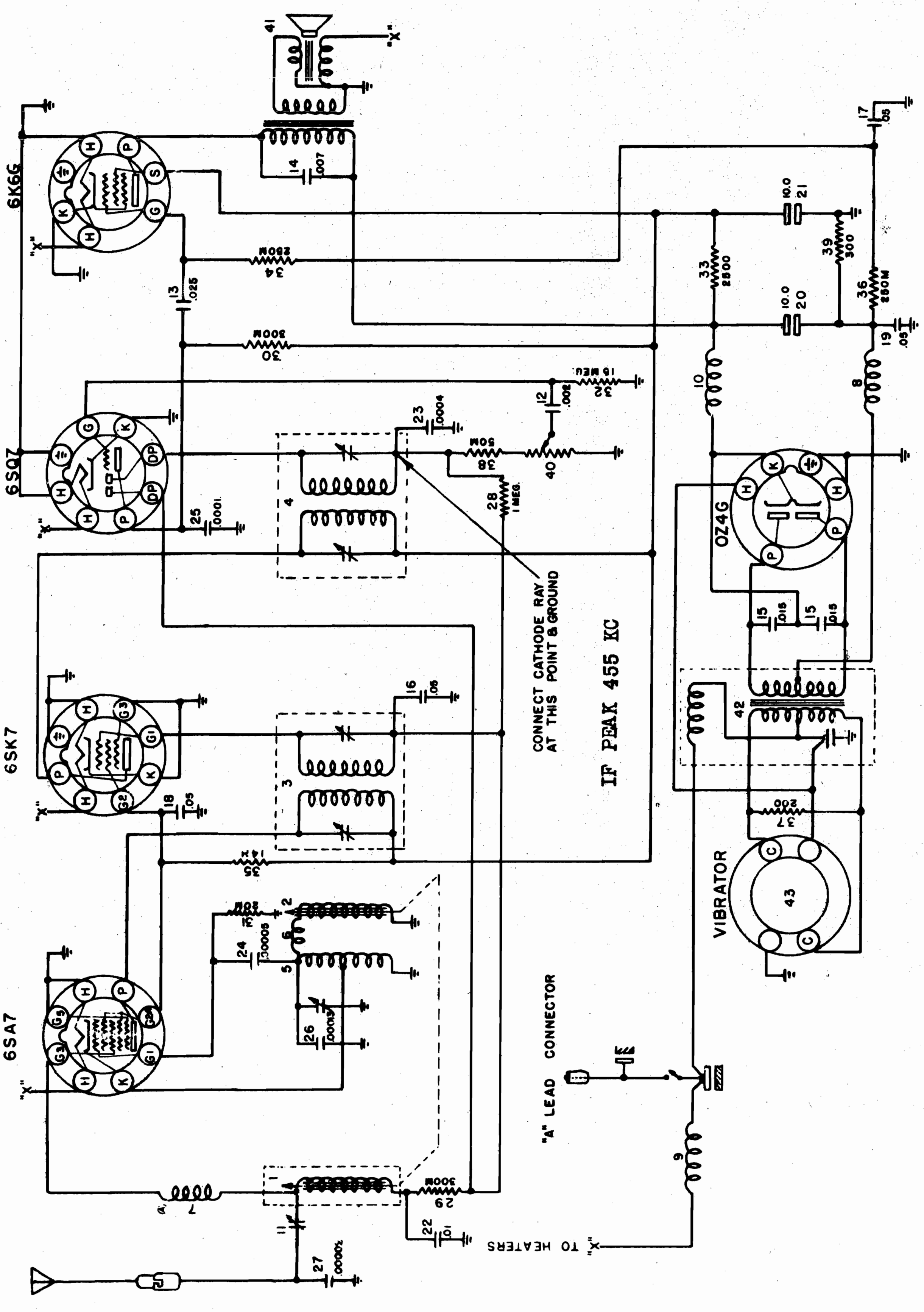


FIG. 2--DELCO MODEL R-675

4-25-39

MODEL R675

UNITED MOTORS SERVICE

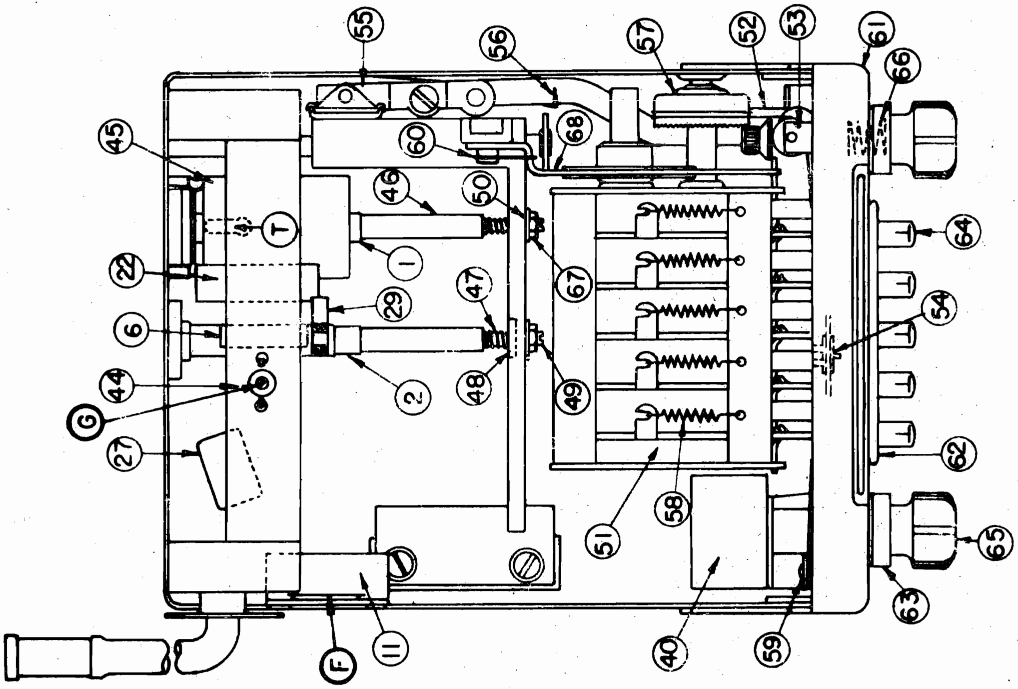


FIG. 5--PARTS LAYOUT--TUNER ASSEMBLY

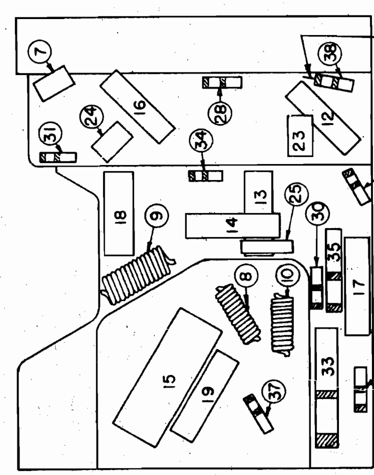


FIG. 4--PARTS LAYOUT--Bottom View

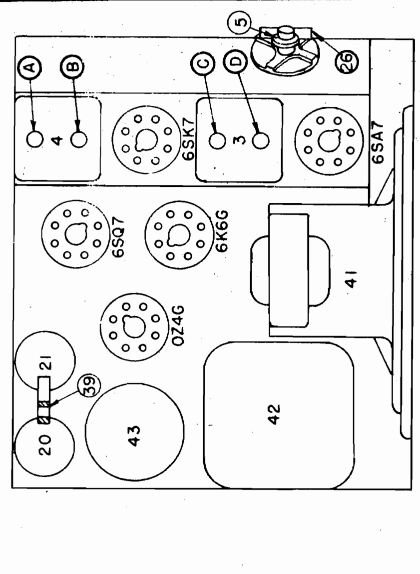
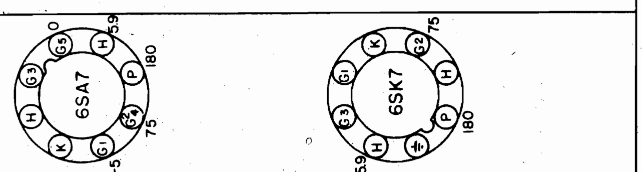
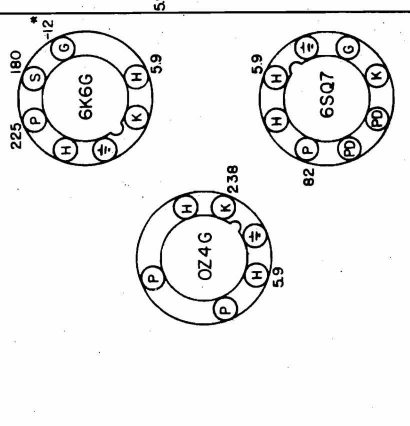


FIG. 3--PARTS LAYOUT--Top View





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

CURRENT DRAIN WITH SPEAKER AND DIAL LIGHT 6.1 AMPS.

"B" SUPPLY DRAIN 44 M.A.

UNITED MOTORS SERVICE

MODEL R675
MODELS R677, R678

Tuning is accomplished with the conventional manual tuning control or by means of five push buttons which mechanically adjust the position of the iron cores in the tuning coils, tuning the radio to preselected stations.

SETTING STATIONS ON PUSH BUTTONS
MODELS 675, 677, 678

1. Remove the push-button trim plate by prying gently with a small screwdriver or knife blade in the slots provided at the bottom of plate.

2. Press the manual station selector knob and tune across the dial. Select the five stations which will give the best all around reception.

3. Stations may be set up in any sequence desired; however, it is best from a speed-of-operation standpoint to set them up on the buttons in the order of their frequencies.

4. Press a button on which a station is to be set-up. Insert screwdriver supplied in receiver package in hole located to the right of the button and loosen set screw. BUTTON MUST BE HELD IN WHEN LOOSENING OR TIGHTENING SET SCREW.

5. Tune set manually (with station button held down FIRMLY) until station desired to be set up is tuned in. In order to secure an accurate set-up, rock manual tuning knob back and forth slightly until station is tuned in clearly and with maximum volume. DO NOT RELEASE PUSH BUTTON.

6. With push button still held down firmly and station accurately tuned in, tighten adjustment screw securely and remove screwdriver before releasing button.

7. Insert station call letter tab in slot provided at top of button.

8. Repeat this same procedure in setting up the remaining buttons and then replace the button snap-on plate.

CIRCUIT ALIGNMENT
MODEL 675

If realignment is found necessary, the circuits can be properly aligned only with the use of a calibrated Test Oscillator or Signal Generator, and an output meter. Extreme care should be exercised in following the alignment instructions in order to obtain the best performance possible. IT WILL BE NECESSARY TO USE AN INSULATED SCREWDRIVER IN ALL ALIGNMENT ADJUSTMENTS.

In order to prevent the A.V.C. from affecting the alignment adjustment, the lowest signal generator output which will give a readable indication on the output meter should be used. Top and bottom covers must be removed in order to properly align the set, however, the chassis should not be removed from the case.

ALIGNMENT PROCEDURE

Two separate alignment procedures are included in these instructions. The first is to be considered the usual alignment procedure, and the second to be used only when a tuning coil has been changed, or when some major change has been made in the tuning apparatus.

CAPACITY ALIGNMENT

1. Aligning I.F. Stages at 455 Kilocycles

   (a) Connect the ground lead of the Signal Generator to chassis frame. Connect the signal lead through an 0.1 mfd. condenser to the terminal "T" (Fig. 5).

   (b) Connect output meter from the plate of the 6K6G tube to ground.

   (c) Set signal to exactly 455 kilocycles and turn volume control on full.

   (d) Tune the set by means of the manual tuning control knob to a position where no squeals or beat notes can be noticed, also so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output.

   (e) Adjust trimmers A-B-C-D (Fig. 3) in the order mentioned until maximum output is obtained.

   (f) Repeat adjustment of I.F. trimmers A-B-C-D with as low an output from the Signal Generator as possible, for more accurate alignment.

2. Alignment at 1560 Kilocycles

   (a) Tune the set by means of the tuning control knob to the extreme high frequency position against stop.

   (b) Connect the signal lead of the Signal Generator to the antenna terminal of the set through a .0001 mfd. condenser.

   (c) Set frequency of the Signal Generator to 1560 kilocycles and adjust the oscillator shunt trimmer "G" for maximum output (Fig. 5).

3. Alignment at 600 Kilocycles

   (a) Leave Signal Generator connected the same as for alignment at 1560 kilocycles.

   (b) Set the Signal Generator to 600 kilocycles.

   (c) Tune the set (manual tuning control) to this signal.

   (d) Adjust the antenna trimmer "F" (Fig. 5) for maximum output.

4. Checking I.F. Band Spread

   (a) A Cathode Ray Oscillograph should be used to check the I.F. band spread after completing the alignment procedure. Slight adjustment of the I.F. stages may be found necessary in order to obtain a symmetrical selectivity curve. Connect Cathode Ray Oscillograph as shown in Fig. 4.

CAPACITY AND INDUCTANCE ALIGNMENT

To be used ONLY when a major change such as changing a tuning coil has been made in the tuning apparatus and there is definite evidence of tuning coils not "tracking."

1. I.F. Alignment.

   Align the I.F. stages the same as outlined under the capacity Alignment Procedure.

2. Mechanical Alignment of R.F. Stage

   (a) Tune the set by means of the tuning control knob to extreme high frequency position, against mechanical stop (cores will be almost withdrawn from coil forms.)

   (b) Adjust the nut on the oscillator core (Illus. #2, Fig. 5) aligning the end of the core (inside coil form) to a position flush with the end of the oscillator coil winding. This may be done by laying a separate core (or an accurate 1-3/8" gauge) alongside the oscillator core making the stud ends flush and making the opposite ends just meet the winding of the oscillator coil.

   (c) Adjust the position of the core of the antenna coil assembly (Illus. #1, Fig. 5) until this core sticks out of its coil form (toward tuner) exactly the same amount that the oscillator core sticks out of its coil form. This should be measured carefully as it gives the antenna core the same mechanical relation to its coil as the oscillator core has to its coil.

3. Alignment at 1560 Kilocycles

   (a) Connect the signal lead of the Signal Generator to the antenna terminal of the set through a .0001 mfd. condenser.

   (b) Set the Signal Generator to 1560 kilocycles and adjust the oscillator shunt trimmer "G" (Fig. 5) for maximum output.

4. Alignment at 600 Kilocycles

   (a) Leave Signal Generator leads connected the same as for alignment at 1560 kilocycles.

   (b) Set the Signal Generator to 600 kilocycles.

   (c) Tune the set (manual tuning control) to this signal.

   (d) Adjust the antenna trimmer "F" (Fig. 5) for maximum output.

5. Alignment at 1400 Kilocycles

   (a) Leave Signal Generator leads connected the same as for alignment at 600 kilocycles.

   (b) Set the Signal Generator to 1400 kilocycles.

   (c) Tune the set to signal and using wrench, part #7238078, adjust the antenna coil (Illus. #1) iron core for maximum output. (Do not attempt to make this adjustment without this wrench.)

SERVICE HINTS

Removing Tuner Assembly

In order to make the parts located under the tuner assembly accessible for service tests, the tuner assembly can be lifted out of the way as follows.

1. Unsolder single "A" lead to switch.
2. Unsolder green lead connected to oscillator trimmer condenser at condenser (Illus. #44, Fig. 5).
3. Remove the four hex head slotted screws (two on each side of case) used for mounting tuner assembly to case.
4. Remove the two screws in antenna lead support bracket.
5. Lift front end of tuner out of case, pivoting at the back end, being careful not to break other leads connected to tuner.

Dial Cord Replacement.

1. Loosen shaft (Illus. #57, Fig. 5) in cord drive gear assembly.
2. Pull spring clip from shaft and disassemble cord drive gear assembly.
3. Thread doubled end of cord through cord drive pulley until the spring lies inside the pulley.
4. Looking in the end of the drive pulley, take the spring counter-clockwise around the shaft from the dial cord hole, placing the hook end in the hole provided in the side of the pulley.
5. Wrap one half the cord clockwise approximately one turn around the outside of the drum and the other half counter-clockwise and hold the cord in place with a piece of scotch tape on the side of the pulley opposite the cord hole.
6. Fasten cord drive gear assembly back into place lightly, not meshing gears until cord is threaded into place.
7. Thread cord around the two pulleys at the manual tuning control end of the dial and across the front and over the single pulley at the volume control end of the dial.
8. Mesh gears carefully by tightening cord drive gear shaft. Too tight a mesh will result in hard push button operation or rough or tight manual tuning drive.
9. Tune set to a station of known frequency or to Signal Generator. Set to a good calibration point (700 K.C.). Set pointer to that frequency on dial and crimp pointer tabs over dial cord.

Lubrication

The mechanical parts of the push button tuner should be carefully lubricated as a part of every service job, using a special lubricant supplied under part #7236515. NOTE: Do not use ordinary oils and greases on the automatic tuner.

Grease the following points:

(a) Dial pulleys and pins
(b) Plunger Guides
(c) All gears
(d) Core bracket guides
(e) Ratchet

Do not allow brake surface to become greasy.

Volume Control Replacement

1. Unsolder all volume control leads at the volume control.
2. Remove volume control nut from front end of chassis.
3. Remove volume control by lifting switch end of volume control up and back.
4. To replace reverse the procedure.

Oscillator Series Coil Replacement

1. This coil (Illus. #6, Fig. 5) is glued to terminal strip in the original assembly. Replacement coils will be furnished with a piece of tape to hold them to the terminal strip.

Oscillator Trimmer Condenser Replacement (Illus. #44, Fig. 5)

1. Unsolder leads from trimmer condenser.
2. Unsolder trimmer ground connection from chassis.
3. Straighten tangs through terminal strip and remove trimmer.
4. To replace reverse the procedure.

Antenna Coil Replacement.

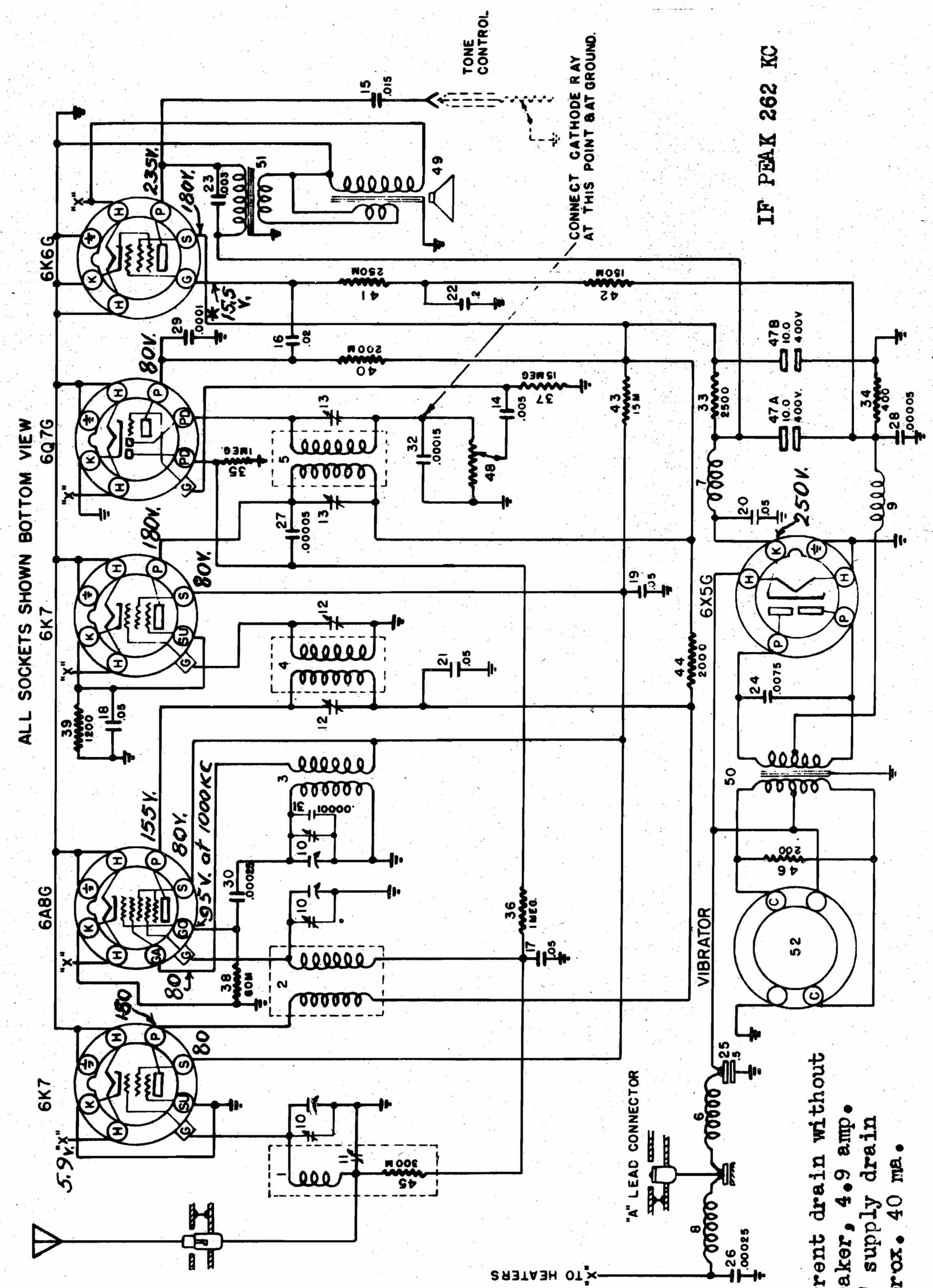
1. Unsolder leads from antenna coil terminals located on terminal strip at rear of tuner.
2. Remove iron core by removing nut, Illus. #67, and washers, Illus. #48 and 50, (Fig. 5). Pull out of coil toward tuner unit. NOTE: Extreme care should be used in handling the iron cores as they are brittle and very easily broken.
3. To remove shield, Illus. #45 (Fig. 5), unsolder from chassis and straighten the three ears.
4. To remove coil, loosen the three screws holding its base to chassis.
5. To replace the antenna coil reverse this procedure.

Oscillator Coil Replacement (Tuning Coil)

1. Remove iron core in same manner as recommended under antenna coil replacement.
2. Remove three nuts holding coil to chassis and unsolder coil leads from terminal strip.
3. To replace reverse procedure.

UNITED MOTORS SERVICE

MODEL R676



IF PEAK 262 KC

* This reading is taken between negative side of 400-ohm resistor (No. 34) and ground.

FIG. 2--DELCO MODEL R-676 CIRCUIT DIAGRAM

Current drain without speaker, 4.9 amp. "B" supply drain approx. 40 ma.

4-14-39

MODEL R676

UNITED MOTORS SERVICE

1. Aligning I-F Stages at 262 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 .1 mfd. condenser, leaving the tubes grid clip in place.

   (c) Connect the output meter from the plate of the 6K6G tube to ground.

   (d) Set the Signal Generator to exactly 262 kilocycles and turn the volume control on full.

   (e) Turn the condenser gang to a position where no squeals or beat notes are heard and so that when the tuning condenser is rotated within narrow limits, there is no appreciable change in output.

   (f) Adjust trimmers A-B-C-D through the cutouts on the side of the chassis opposite the antenna and "A" receptacles (Illus. 12 & 13, Figure 4) for maximum output. Repeat with lowest possible output from the signal generator for more accurate alignment.

2. Aligning at 1530 Kilocycles

   (a) Leave Signal Generator leads connected the same as for I-F adjustments.

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

   (c) Set the Signal Generator to exactly 1530 Kilocycles.

   (d) Adjust the oscillator parallel trimmer "G" on the center section of the gang condenser carefully for maximum output (Figure 3).

3. Aligning at 1400 Kilocycles

   (a) Remove the signal lead of the Signal Generator from the grid cap of the 6A8G and connect to the antenna terminal of the receiver through a .0002 mfd. mica condenser.

   (b) Set the Signal Generator to 1400 kilocycles and tune the receiver to this signal.

   (c) Adjust the parallel trimmers "F" and "H" (Figure 3) on the condenser gang carefully for maximum output.

4. Aligning at 600 Kilocycles

   (a) Set the Signal Generator to approximately 600 kilocycles.

   (b) Turn the rotor plates of the gang condenser until this signal is tuned in with maximum output.

   (c) Adjust trimmer "E" (Illus. #11, Figure 4) while rocking the rotor plates of the gang condenser back and forth through the signal until maximum output is obtained.

   It will be necessary to readjust this condenser to the car antenna upon installation of the set.

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

5. Checking I-F Band Spread

   A Cathode Ray Oscillograph should be used to check the I-F band spread after completing the alignment procedure. Connect the oscillograph from connection "I" (Figure 4) to ground.

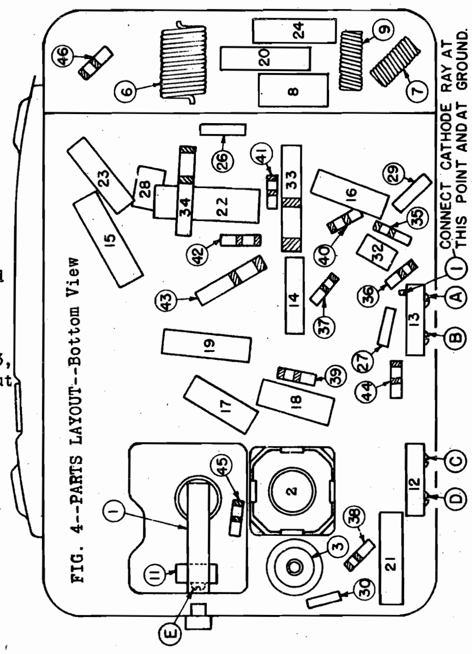


FIG. 4--PARTS LAYOUT--Bottom View

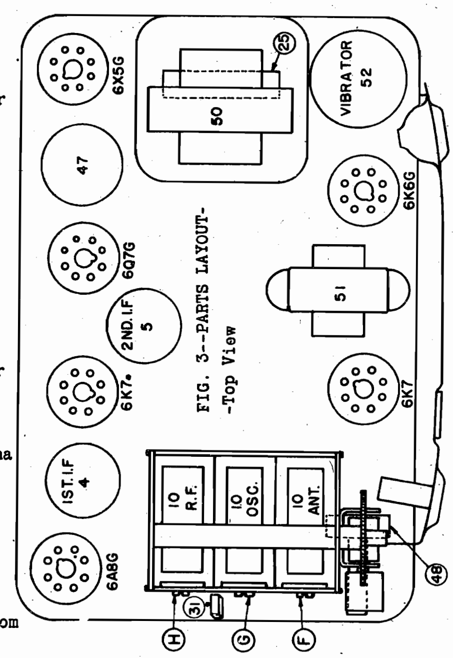


FIG. 3--PARTS LAYOUT--Top View

UNITED MOTORS SERVICE

MODEL R677

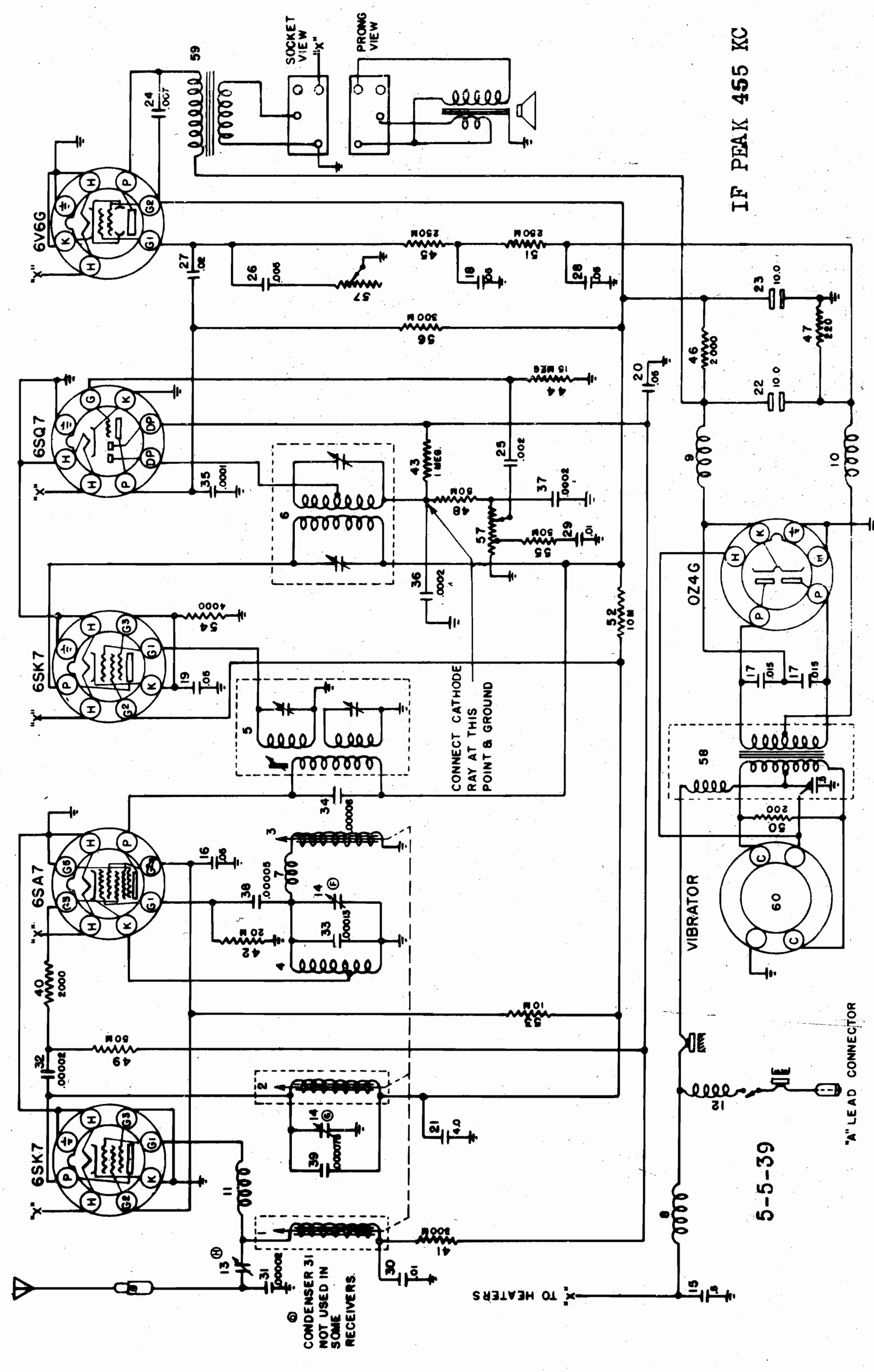


FIG. 2--DELCO MODEL R-677 CIRCUIT DIAGRAM

FOR TUNER SEE INDEX

MODEL R677

UNITED MOTORS SERVICE

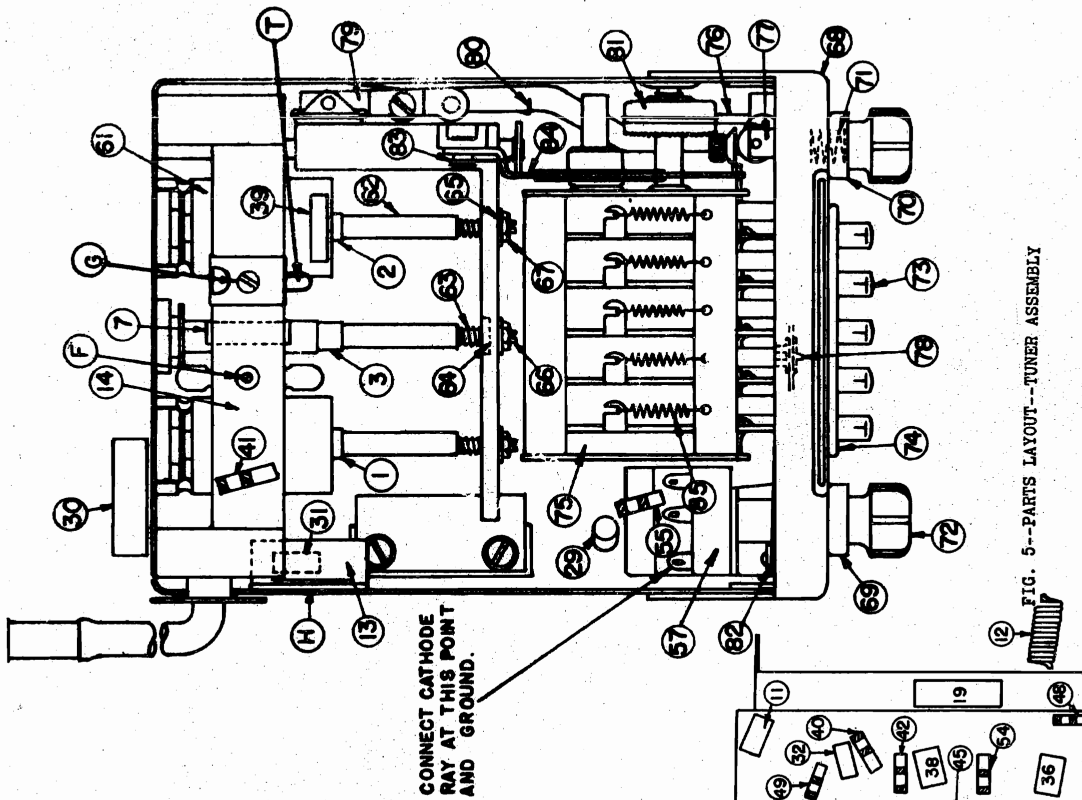


FIG. 5--PARTS LAYOUT--TUNER ASSEMBLY

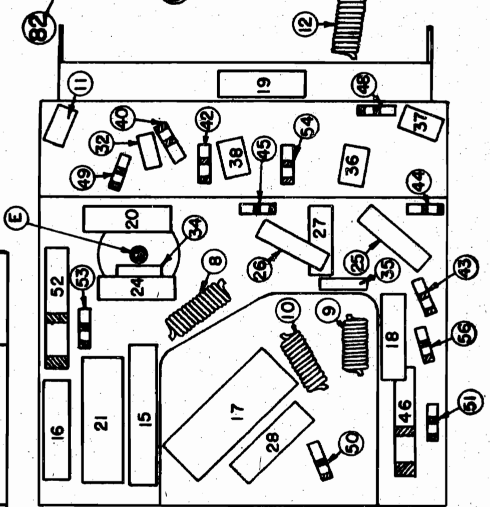
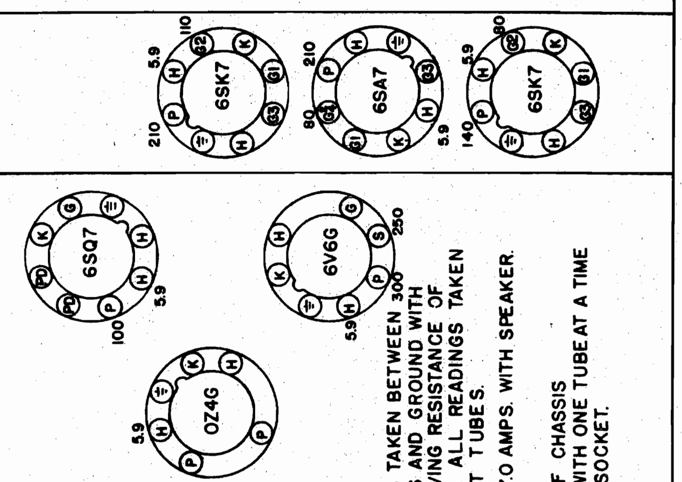


FIG. 4--PARTS LAYOUT--Bottom View



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

CURRENT DRAIN 7.0 AMPS. WITH SPEAKER. "B" DRAIN 53 M.A.

NOTE- TOP VIEW OF CHASSIS READINGS TAKEN WITH ONE TUBE AT A TIME REMOVED FROM SOCKET.

FIG. 1--TUBE SOCKET VOLTAGES

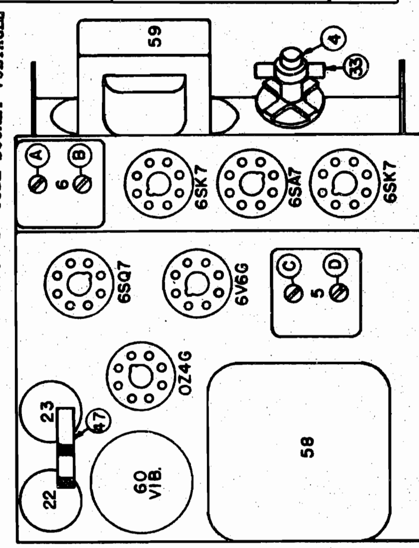


FIG. 3--PARTS LAYOUT--Top View

UNITED MOTORS SERVICE

MODEL R677

In order to prevent the A.V.C. from affecting the alignment adjustment, the lowest signal generator output which will give a readable indication on the output meter should be used. Top and bottom covers must be removed in order to properly align the set, however, the chassis should not be removed from the case.

ALIGNMENT PROCEDURE

Two separate alignment procedures are included in these instructions. The first is to be considered the usual alignment procedure, and the second to be used only when a tuning coil has been changed, or when some major change has been made in the tuning apparatus.

CAPACITY ALIGNMENT

1. Aligning I.F. Stages at 455 Kilocycles

(a) Connect the ground lead of the Signal Generator to chassis frame. Connect the signal lead through an 0.1 mfd. condenser to the terminal "T" (Fig. 5).

(b) Connect output meter from the plate of the 6V6G tube to ground.

(c) Set signal to exactly 455 kilocycles and turn volume control on full.

(d) Tune the set by means of the manual tuning control knob to a position where no squeals or beat notes can be noticed, also so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output.

(e) Adjust trimmers A-B-C-D (Fig. 3) and I.F. core adjustment "E", (Fig. 4) in the sequence named, until maximum output is obtained.

(f) Repeat adjustments with as low an output from the Signal Generator as possible, for more accurate alignment.

2. Alignment at 1560 Kilocycles

(a) Tune the set by means of the manual tuning control knob to the extreme high frequency position against stop.

(b) Connect the signal lead of the Signal Generator to the antenna terminal of the set through a .0001 mfd. condenser.

(c) Set frequency of the Signal Generator to 1560 kilocycles and adjust the oscillator shunt trimmer condenser "F" (Fig. 5) for maximum output.

3. Alignment at 600 Kilocycles

(a) Leave Signal Generator connected the same as for alignment at 1560 kilocycles.

(b) Set the Signal Generator to 600 kilocycles.

(c) Tune the set (manual tuning control) to this signal.

(d) Adjust the R.F. trimmer condenser "G" (Fig. 5) for maximum output.

(e) Adjust the antenna trimmer condenser "H" (Fig. 5) for maximum output. (This trimmer is readjusted at 1400 kilocycles when set is installed in car.)

4. Checking I.F. Band Spread

(a) A Cathode Ray Oscillograph should be used to check the I.F. band spread after completing the alignment procedure. Slight adjustment of the I.F. stages may be found necessary in order to obtain a symmetrical selectivity curve. Connect Cathode Ray Oscillograph as shown in Fig. 5.

CAPACITY AND INDUCTANCE ALIGNMENT

To be used ONLY when a major change such as changing a tuning coil has been made in the tuning apparatus and there is definite evidence of tuning coils not "tracking."

1. I.F. Alignment.

Align the I.F. stages the same as outlined under the capacity Alignment Procedure.

2. Mechanical Alignment of R.F Stages

(a) Tune the set by means of the t ing control knob to extreme high frequency position, against stop (cores will be almost withdrawn from coil forms.)

(b) Adjust the nut on the oscillator core stud aligning the end of the core (inside coil form) to a position flush with the end of the oscillator coil winding. This may be done by laying a separate core Part #7237714 (or an accurate 1-3/8" gauge) alongside the oscillator core making the stud ends flush and making the opposite ends just meet the winding of the oscillator coil.

(c) Adjust the position of the antenna and R. F. coil cores to a position flush with the end of the coil windings, using the separate core for a gauge in the same manner as for the oscillator coil.

3. Alignment at 1560 Kilocycles

(a) Connect the signal lead of the Signal Generator to the antenna terminal of the set through a .0001 mfd. condenser.

(b) Set frequency of the Signal Generator to exactly 1560 kilocycles and adjust the oscillator shunt trimmer condenser "F" (Fig. 5) for maximum output indication on the output meter.

4. Alignment at 600 Kilocycles

(a) Leave the Signal Generator connected the same as for alignment at 1560 kilocycles.

(b) Set the Signal Generator to 600 kilocycles.

(c) Tune the set (manual tuning control) to this signal.

(d) Adjust the R.F. trimmer condenser "G" for maximum output.

(e) Adjust the antenna trimmer condenser "H" for maximum output.

5. Alignment at 1400 Kilocycles

(a) Leave Signal Generator connected the same as for alignment at 600 kilocycles.

(b) Set the Signal Generator to 1400 kilocycles.

(c) Tune the set to signal and using wrench, part #7238078, adjust the position of the iron core in the R. F. coil (Illus. #2, Fig. 5) for maximum output meter indication.

(d) Adjust the position of the iron core in the antenna coil (Illus. #1, Fig. 5) for maximum output. DO NOT TOUCH THE ADJUSTMENT OF THE OSCILLATOR COIL IRON CORE.

(e) Repeat adjustments with a lower output from the signal Generator for more accurate alignment.

SERVICE HINTS

It is to be noted that the voltage chart is given for the tube sockets with the tubes pulled out of the socket. This is because the bases of several tube sockets are not readily accessible.

1. To remove the tuner assembly for servicing parts mounted on the 6SK7 or 6SA7 tube sockets, proceed as follows:

   (a) Unsolder single yellow "A" lead at switch.

   (b) Unsolder blue lead and black lead from either end of trimmer "G" (Fig. 5).

   (c) Unsolder green lead from high side of trimmer "F" (Fig. 5).

   (d) Remove screws holding tuner assembly in case and screws cn antenna lead.

   (e) Fold tuning unit back being careful not to break other leads connected to it.

2. The position of the R.F. coil shunt condenser (Illus. 39, Fig. 5) should not be changed. Changing its position causes this stage of the radio to be detuned.

3. Coil cores (Part #7237714) should not have to be replaced except when broken by mishandling. Since these cores are matched at the factory into sets of matched characteristics, it is recommended that all three cores be replaced at the same time. All Branch stock on #7237714 is matched and may be ordered in the required quantity for service.

MODEL R678

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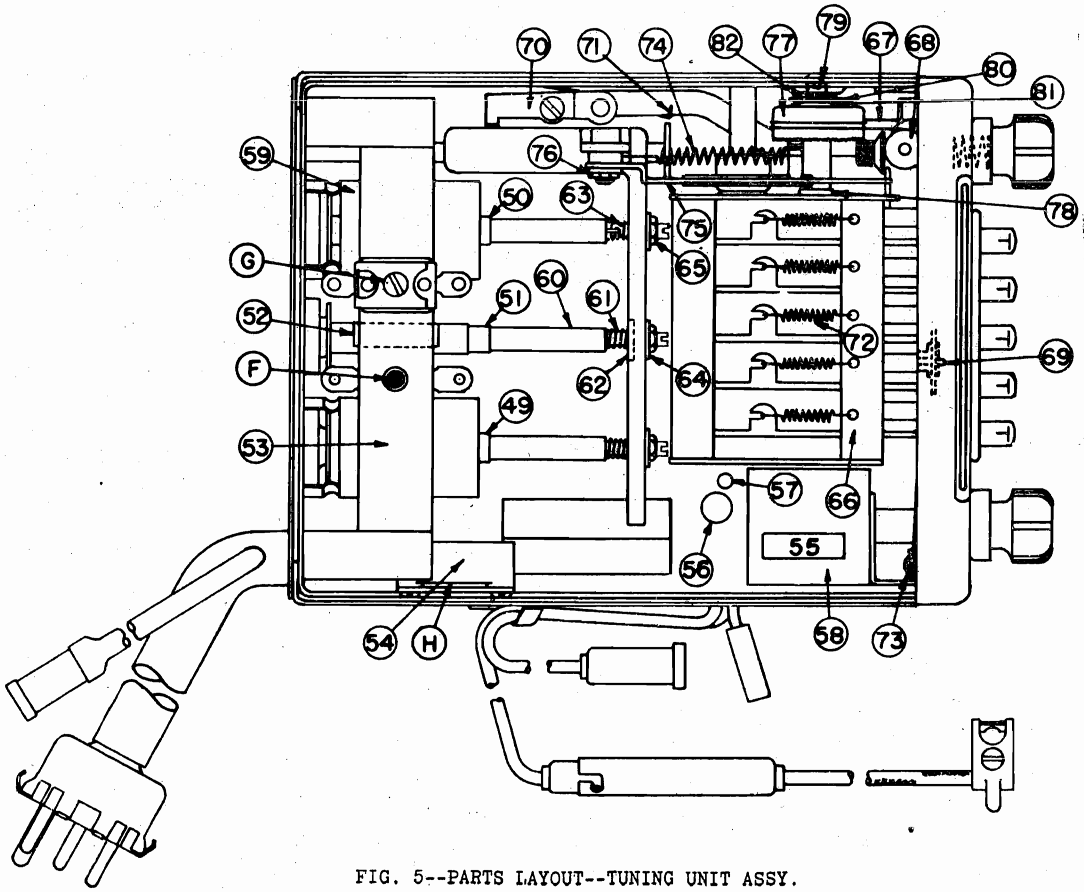

FIG. 5--PARTS LAYOUT--TUNING UNIT ASSY.

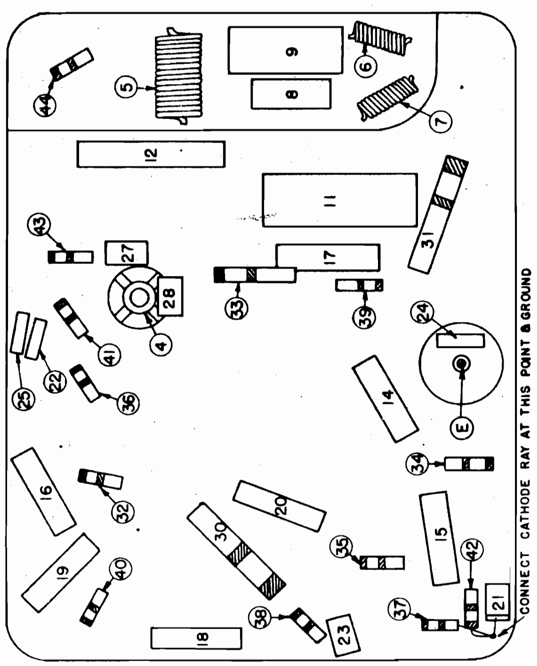

FIG. 4--PARTS LAYOUT--DASH UNIT--Bottom View

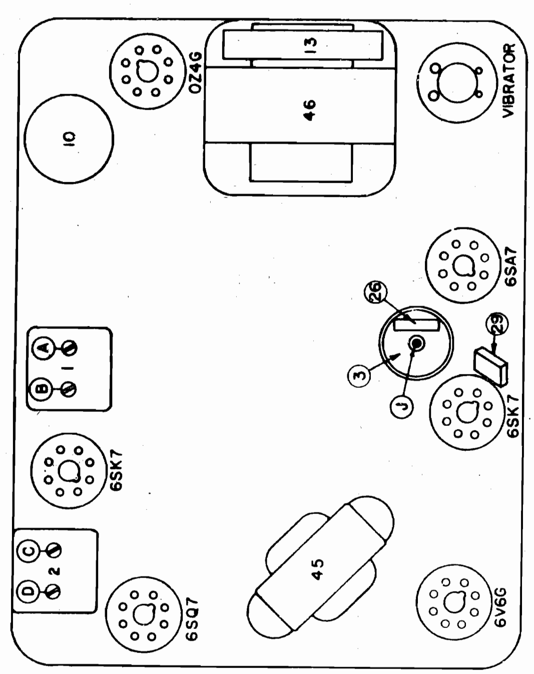

FIG. 3--PARTS LAYOUT--DASH UNIT--Top View

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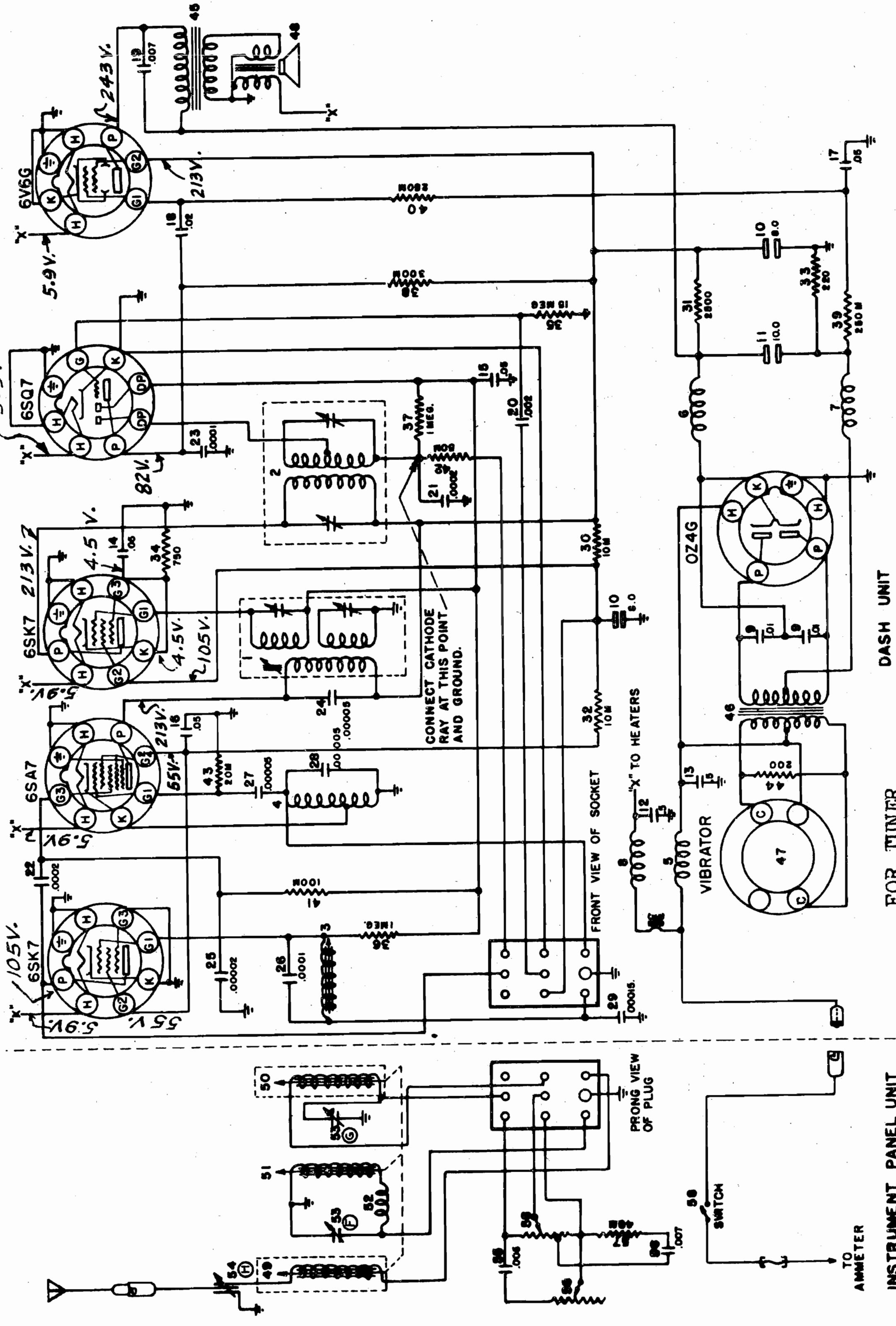
MODEL R678



IF PEAK 455 KC

FOR TUNER
SEE INDEX

FIG. 2--DELCO MODEL R-678 CIRCUIT DIAGRAM

5-9-39

UNITED MOTORS SERVICE

CAPACITY ALIGNMENT

1. Aligning I.F. Stages at 455 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis. Connect the signal lead through a 0.1 mfd. condenser to the bottom right hand connections of the tuner socket as shown in Fig. 2.

   (b) Connect output meter from the plate of the 6V6G tube to ground.

   (c) Set signal generator to exactly 455 kilocycles and turn volume control on full.

   (d) Tune the set by means of the manual tuning control knob to a position where no squeals or beat notes can be noticed; also, so that when the tuning knob is rotated within narrow limits there is no appreciable change in output.

   (e) Adjust trimmers A-B-C-D (Fig. 3) and I.F. core adjustment "E" (Fig. 4) in the sequence named, until maximum output is obtained.

   (f) Repeat adjustments with as low an output from the signal generator as possible, for more accurate alignment.

   (g) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .1 mfd. condenser.

   (h) Adjust the I.F. Trap adjustment "J" for MINIMUM output.

2. Alignmment at 1560 Kilocycles

   (a) Tune the set by means of the manual tuning control knob to the extreme high frequency position, against stop.

   (b) Connect the signal lead of the signal generator to the antenna terminal of the set through a .0001 mfd. condenser.

   (c) Set frequency of the signal generator to exactly 1560 kilocycles and adjust the oscillator shunt trimmer condenser "F" (Fig. 5) for a maximum output.

3. Alignment at 600 Kilocycles

   (a) Leave the signal generator connected the same as for alignment at 1560 kilocycles.

   (b) Set the signal generator to 600 kilocycles.

   (c) Tune the set (manual tuning control) to this signal.

   (d) Adjust the R.F. trimmer condenser "G" (Fig. 5) for maximum output.

   (e) Adjust the antenna trimmer condenser "H" (Fig. 5) for maximum output.

4. Checking I.F. Band Spread

   A Cathode Ray Oscillograph should be used to check the I.F. band spread after completing the alignment procedure. Slight adjustment of the I.F. stages may be found necessary in order to obtain a symmetrical selectivity curve. Connect Cathode Ray Oscillograph as shown in Fig. 4.

CAPACITY AND INDUCTANCE ALIGNMENT

To be used ONLY when a major change such as changing a tuning coil has been made in the tuning apparatus and there is definite evidence of the coils not "tracking."

1. I.F. Alignment

   Align the I.F. stages in the same manner as outlined under the Capacity Alignment Procedure.

2. Mechanical Alignment of R.F. Stages

   (a) Tune the set by means of the tuning control knob to extreme high frequency position against stop. (Cores will be almost withdrawn from coil forms.)

   (b) Adjust the nut on the oscillator (center coil) core stud, aligning the end of the core (inside coil form) to a position flush with the end of the oscillator coil winding. This may be done by laying a separate core, Part #7237714, (or an accurate 1-3/8" gauge) alongside the oscillator core making the stud ends flush and making the opposite ends just meet the winding of the oscillator coil.

   (c) Adjust the position of the antenna and R.F. coil cores (Illus. #49 and 50, Fig. 5) to a position flush with the end of the coil windings, using the separate core for a gauge in the same manner as for the oscillator coil.

3. Alignment at 1560 Kilocycles

   (a) Connect the signal lead of the signal generator to the antenna terminal of the set through a .0001 mfd. condenser.

   (b) Set frequency of the signal generator to exactly 1560 kilocycles and adjust the oscillator shunt trimmer condenser "F" (Fig. 5) for a maximum output indication on the output meter.

4. Alignment at 600 Kilocycles

   (a) Leave the signal generator connected the same as for alignment at 1560 kilocycles.

   (b) Set the signal generator to 600 kilocycles.

   (c) Tune the set (manual tuning control) to this signal.

   (d) Adjust the R.F. trimmer condenser "G" (Fig. 5) for maximum output.

   (e) Adjust the antenna trimmer condenser "H" (Fig. 5) for maximum output.

5. Alignment at 1400 Kilocycles

   (a) Leave signal generator connected the same as for alignment at 600 kilocycles.

   (b) Set the signal generator to 1400 kilocycles.

   (c) Tune radio set to the signal and using wrench, Part No. 7238078, adjust the position of the iron core in the R.F. coil (Illus. #50, Fig. 5) for maximum output meter indication.

   (d) Adjust the position of the iron core in the antenna coil (Illus. #49, Fig. 5) for maximum output. DO NOT TOUCH THE ADJUSTMENT OF THE OSCILLATOR COIL IRON CORE.

   (e) Repeat adjustments with a lower output from the signal generator for more accurate alignment.

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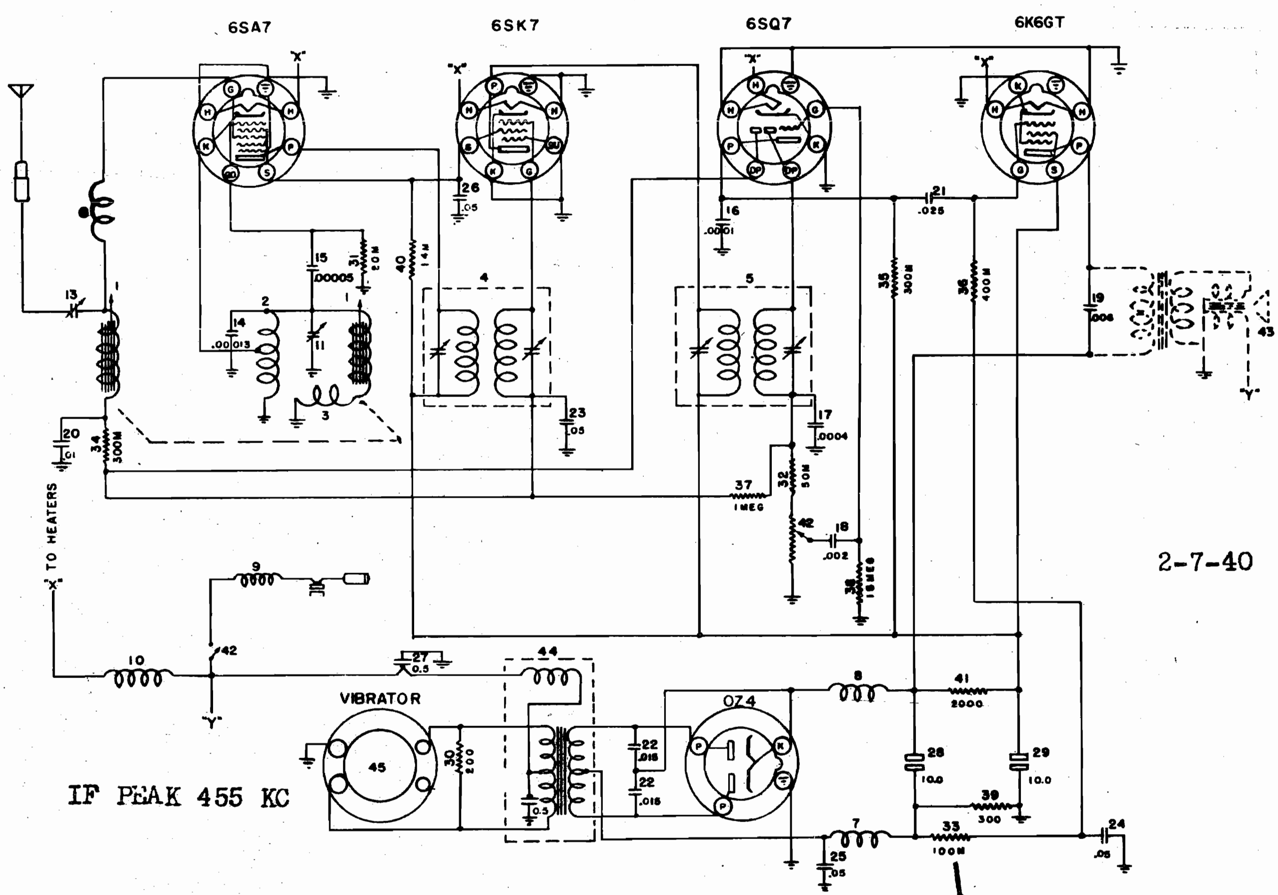
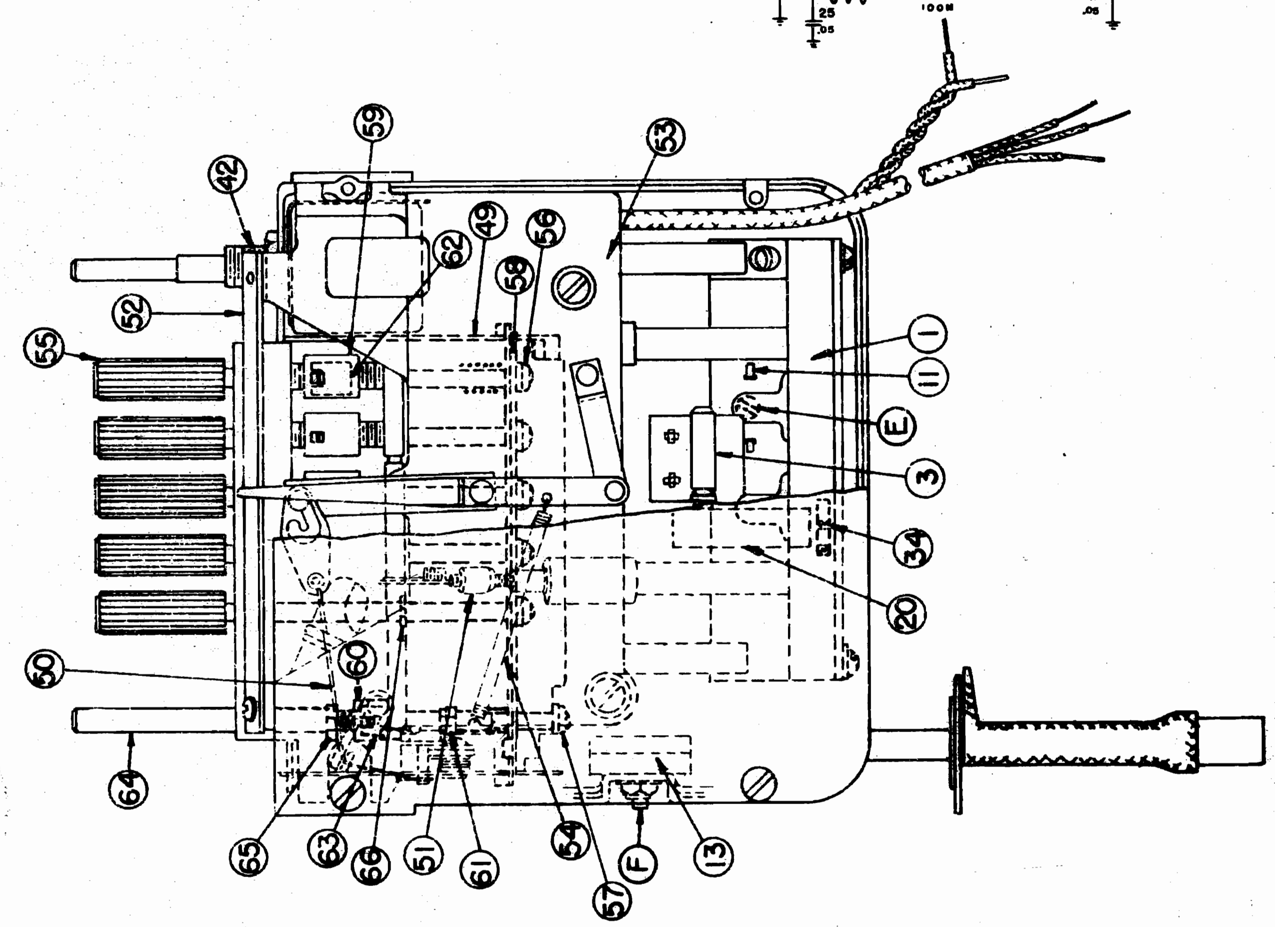
MODEL R685





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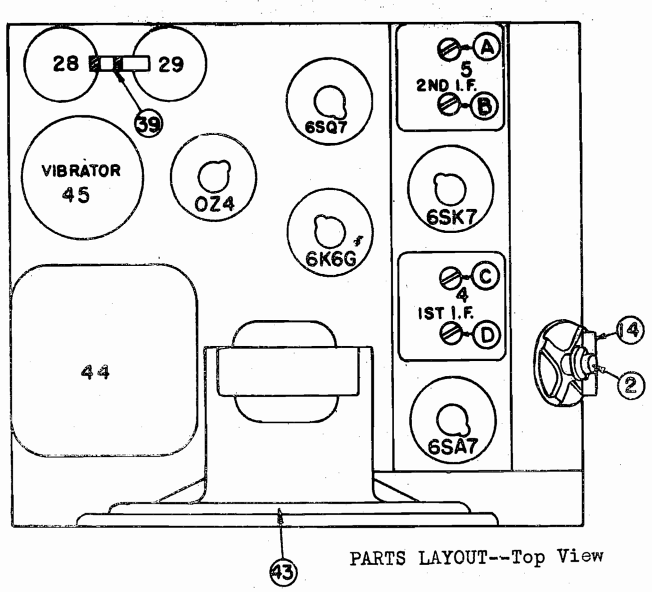
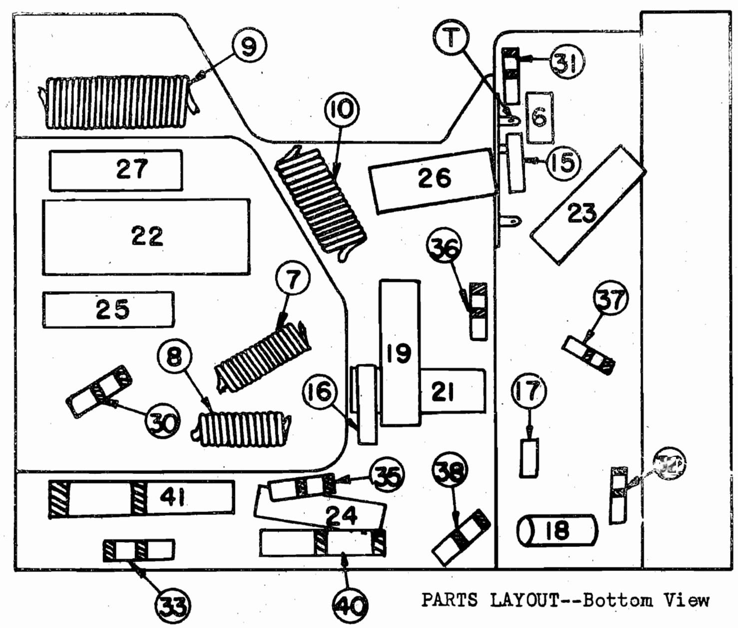


PARTS LAYOUT--Top View



PARTS LAYOUT--Bottom View

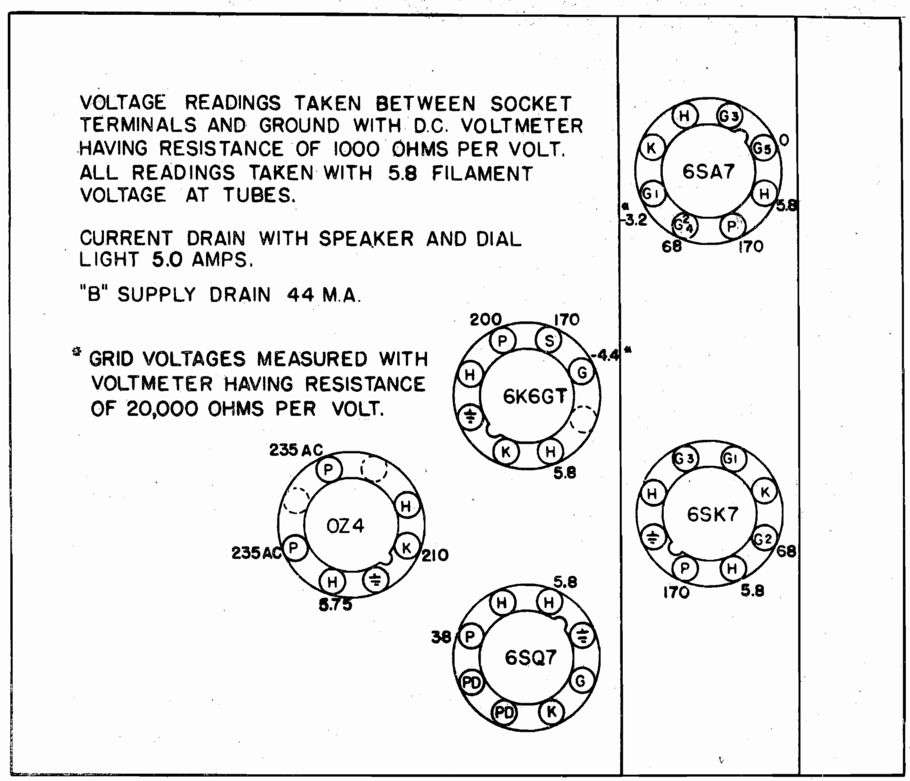


FIG. 1--TUBE SOCKET VOLTAGES

GENERAL: The Delco Model R-685 is a five tube, single unit superhetrodyne receiver with a 5" dynamic speaker, designed for universal mounting on all cars.

TUNING CONTROLS: Tuning is accomplished by means of a manual tuning control or by means of five push-buttons each of which drives the permeability tuning cores to preselected frequencies.

Setting up the push-buttons for any desired station is accomplished by pressing the button into its latched position and rotating it in the manner of a manual tuning control until the desired station is tuned in. No locking device is required to retain this setting.

Note: Do not hold the button in beyond its normal latching position when setting up stations.

The manual tuning control operates by pressing the tuning knob into its latched position and tuning in the conventional manner.

CAPACITY ALIGNMENT

Aligning I-F Stages at 455 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 terminal "T" (Fig. 4) through a .1 mfd. condenser.

(c) Connect the output meter from the plate of the 6K6GT tube to ground.

(d) Set the signal generator to exactly 455 K.C.

(e) Turn the volume control on full and tune the set to a position where no squeals or beat notes are noticed, also so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output.

(f) Adjust the I-F trimmers A, B, C, D (Fig. 3) in the order mentioned until maximum output is obtained.

(g) Repeat these adjustments with as low an output from the signal generator as possible for more accurate alignment.

2. Aligning at 1560 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .0001 mfd. mica condenser.

(b) Tune the set to the extreme high frequency position against the stop.

(c) Set the signal generator to exactly 1560 K.C.

(d) Adjust the oscillator shunt trimmer "E" (Fig. 5) for maximum output.

3. Aligning at 600 Kilocycles

(a) Leave the signal generator connected the same as before.

(b) Set the signal generator to 600 K.C.

(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.

(d) Adjust the antenna trimmer "F" (Fig. 5) for maximum output.

CAPACITY AND INDUCTANCE ALIGNMENT

1. Aligning I-F Stages at 455 Kilocycles

Align the I-F stages as outlined under paragraph 1 under CAPACITY ALIGNMENT.

2. Mechanical Alignment of Cores

(a) Tune the set by means of the manual tuning control to the extreme high frequency end of the dial and against stop. (Cores will be almost withdrawn from coil forms.)

(b) Remove the pointer plate (note insulating washers under left hand screw) without disturbing the tuning mechanism.

(c) Using a spare core (part #7240022) as a gauge, adjust the oscillator core so that with the front surfaces of the spare core and the oscillator core exactly flush, the rear surface of the test core is flush with the front end of the oscillator coil winding. This adjustment may be made using adjustment tool #7240160 inserted through the hole at the rear of the coil mounting bracket. The tool should be fitted into the hole at the rear of the core and rotated without applying any thrust to the core which would move it out of its normal resting position.

(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 fibre mounting bushing.

(e) Adjust the antenna coil core position so that the front surface of the core is flush with the front end of the antenna coil fibre mounting bushing.

(f) Replace the pointer plate assembly.

3. Aligning at 1560 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .0001 mfd. mica condenser.

(b) Tune the set by means of the manual tuning control to the extreme high frequency end of the dial and against stop.

(c) Set the signal generator to exactly 1560 K.C.

(d) Adjust the oscillator shunt trimmer "E" (Fig. 5) for maximum output.

4. Aligning at 600 Kilocycles

(a) Leave the signal generator connected the same as before.

(b) Set the signal generator to 600 K.C.

(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.

(d) Adjust the antenna trimmer "F" (Fig. 5) for maximum output.

5. Aligning at 1400 Kilocycles

(a) Set the signal generator to 1400 K.C.

(b) Tune che set manually until this signal is tuned in with maximum output.

(c) Adjust the core of the antenna coil (using tool #7240160) for maximum output.

(d) Repeat the alignment with as low an output from the signal generator as possible for more accurate alignment.

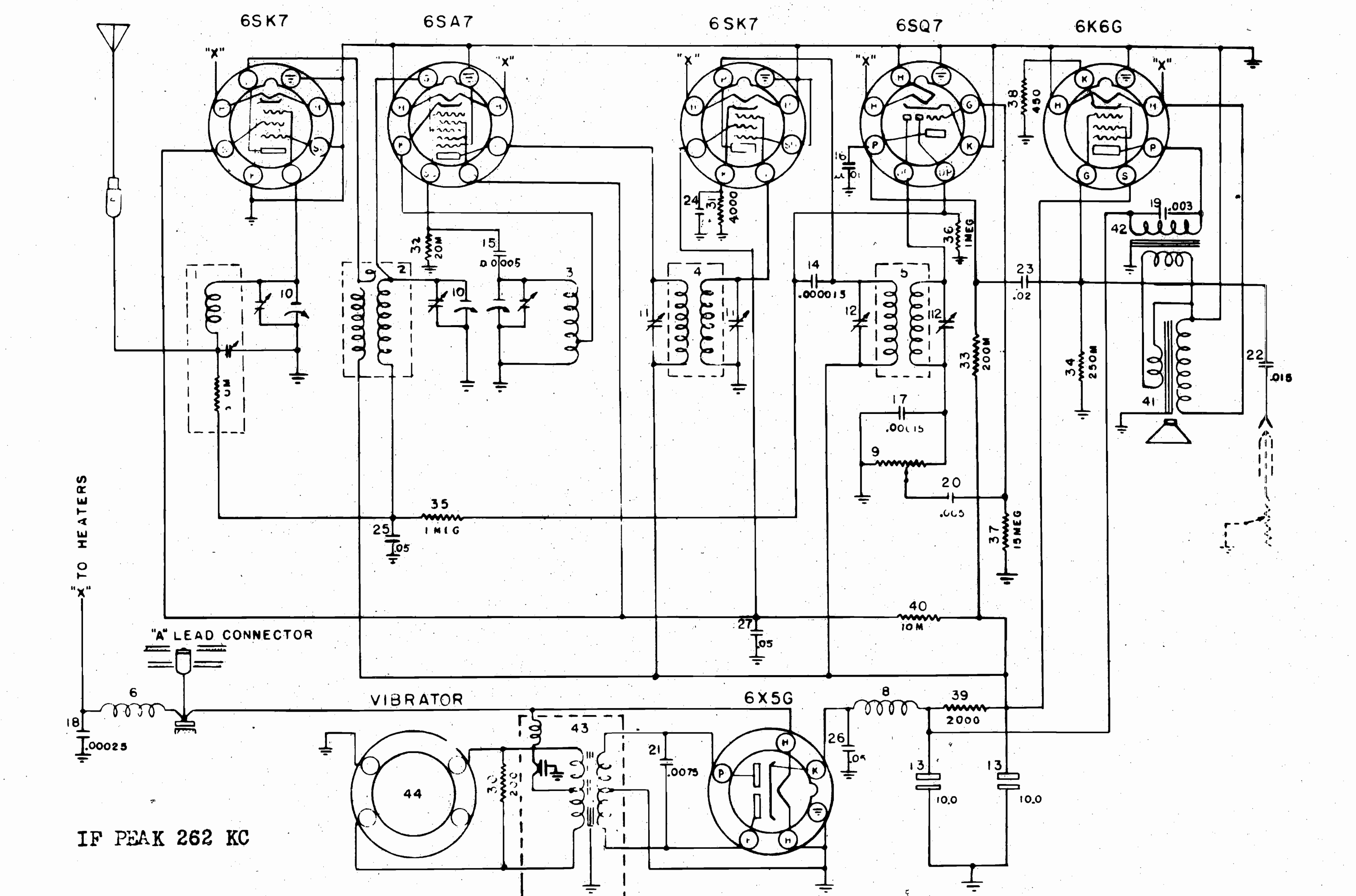
(e) Apply cement to the core screws to prevent their changing adjustments.

6. Adjusting Receiver to Car Antenna

After the receiver is reinstalled in the car, it will be necessary to readjust the antenna trimmer on a weak station at about 600 K.C.

MODEL R686

UNITED MOTORS SERVICE



IF PEAK 262 KC

Note: Condenser #22 was changed from plate to grid of the 6K6G tube starting with serial #865000.

4-12-40

FIG. 2--DELCO MODEL R-686 CIRCUIT DIAGRAM

UNITED MOTORS SERVICE

MODEL R686

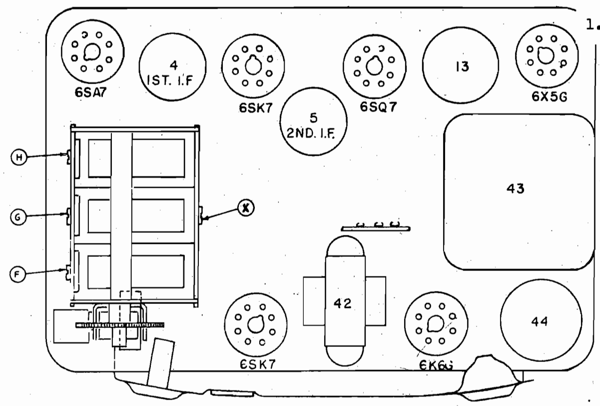


FIG. 3--PARTS LAYOUT--Top View

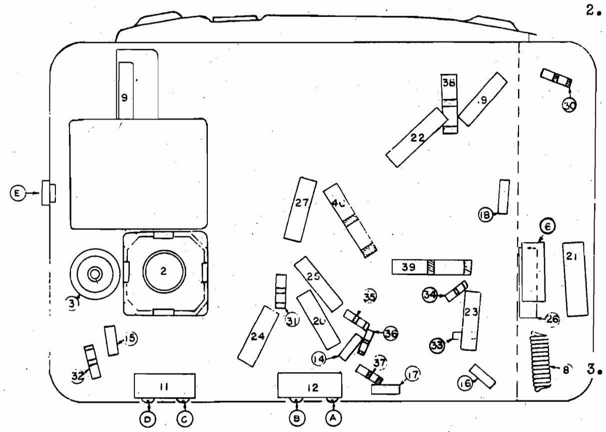


FIG. 4--PARTS LAYOUT--Bottom View

1. Aligning I-F Stages at 262 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 end section (RF) of the gang condenser (adjacent to trimmer "H", Fig. 3) through a .1 mfd. condenser.
   - (c) Connect the output meter from the plate of the 6K6G tube to ground.
   - (d) Set the signal generator to exactly 262 kilocycles and turn the volume control on full.
   - (e) Turn the condenser gang to a position where no squeals or beat notes are heard and so that when the tuning condenser is rotated within narrow limits, there is no appreciable change in output.
   - (f) Adjust trimmers A-B-C-D through the cut-outs on the side of the chassis opposite the antenna and "A" receptacles (Illus. 11 and 12, Fig. 4) for maximum output. Repeat with lowest possible output from the signal generator for more accurate alignment.
2. Aligning at 1530 Kilocycles
   - (a) Leave signal generator leads connected the same as for I-F adjustments.
   - (b) Turn the rotor plates of the gang condenser all the way out of mesh and against the high frequency stop.
   - (c) Set the signal generator to exactly 1530 Kilocycles.
   - (d) Adjust the oscillator parallel trimmer "G" on the center section of the gang condenser carefully for maximum output (Fig. 3).
   - (e) Trimmer "X" (Fig. 3) is adjusted and sealed at the factory and should require no further adjustment.

     In the event that its setting has been changed, back out trimmers "G" and "X" to minimum capacity and readjust simultaneously until maximum output is obtained.
3. Aligning at 1400 Kilocycles
   - (a) Remove the signal lead of the signal generator and connect to the antenna terminal of the receiver through a .0002 mfd. mica condenser.
   - (b) Set the signal generator to 1400 Kilocycles and tune the receiver to this signal.
   - (c) Adjust the parallel trimmers "F" and "H" (Fig. 3) on the condenser gang carefully for maximum output.
4. Aligning at 600 Kilocycles
   - (a) Set the signal generator to approximately 600 Kilocycles.
   - (b) Turn the rotor plates of the gang condenser until this signal is tuned in with maximum output.
   - (c) Adjust trimmer "E" (Fig. 4) while rocking the rotor plates of the gang condenser back and forth through the signal until maximum output is obtained.

     It will be necessary to readjust this condenser to the car antenna upon installation of the set.
   - (d) Repeat adjustments made under "Alignment at 1400 Kilocycles".

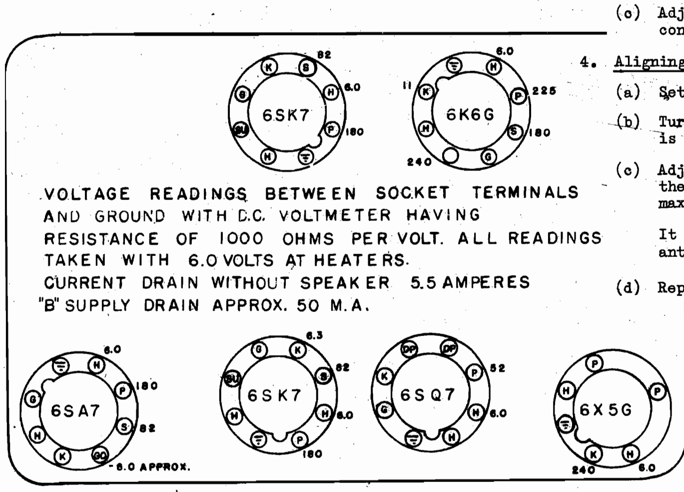


FIG. 1--TUBE SOCKET VOLTAGES

MODEL R687

UNITED MOTORS SERVICE

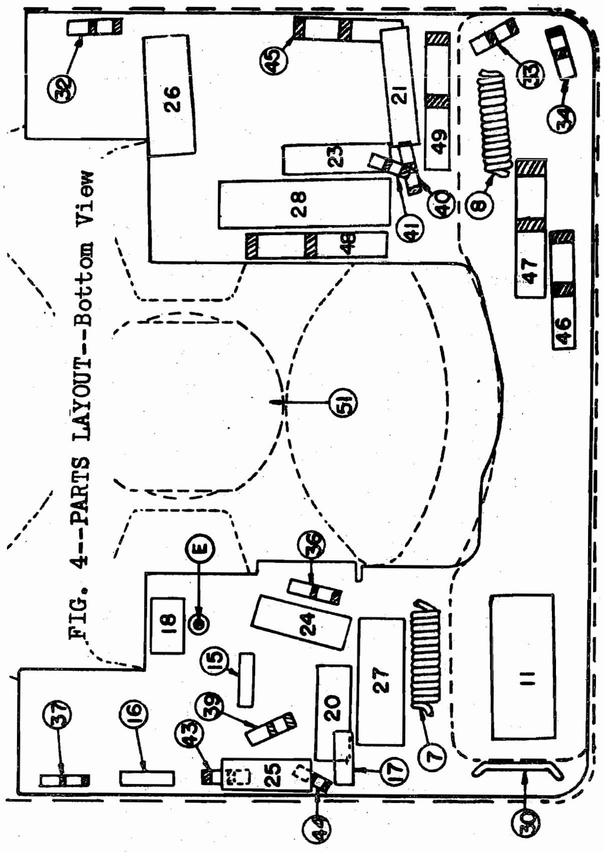


FIG. 4--PARTS LAYOUT--Bottom View

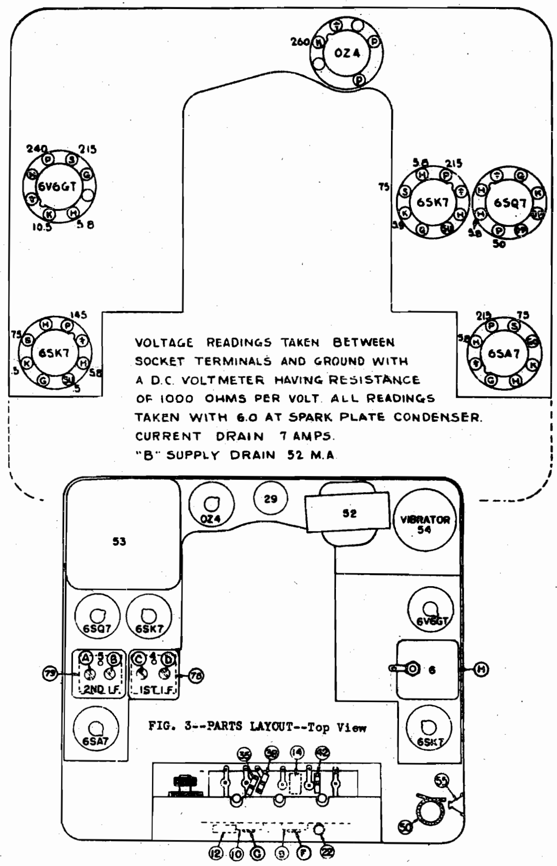


FIG. 3--PARTS LAYOUT--Top View

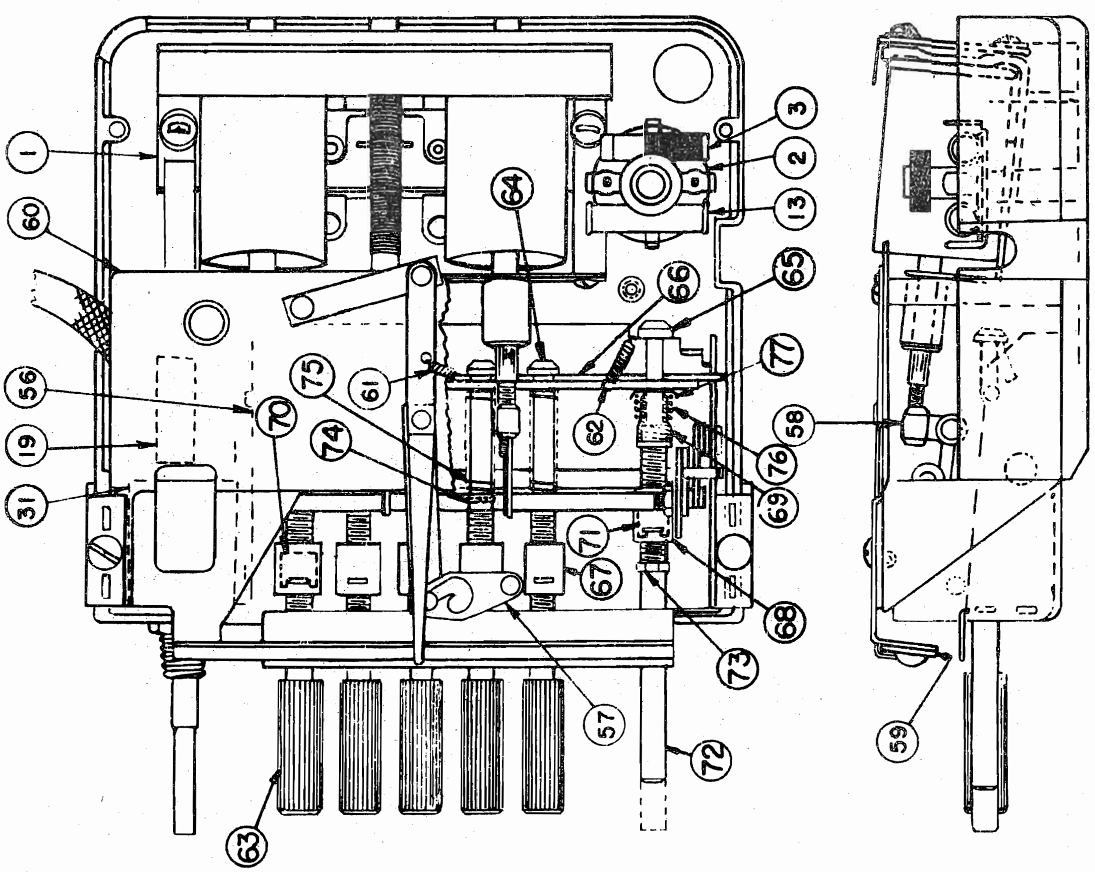
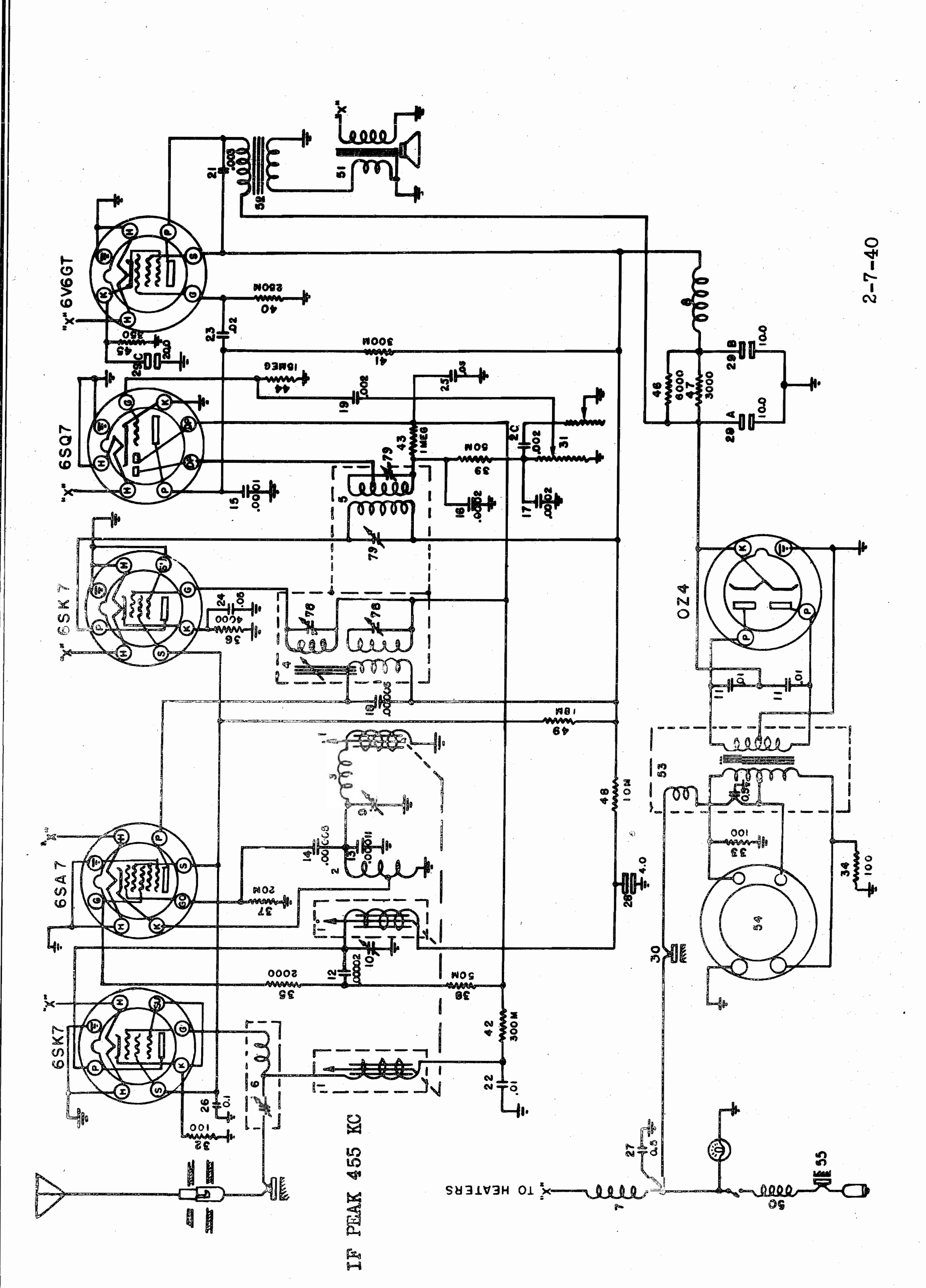


FIG. 5--PARTS LAYOUT--TUNER UNIT

UNITED MOTORS SERVICE

MODEL R687



MODEL R687
MODEL R688

UNITED MOTORS SERVICE

CAPACITY ALIGNMENT

MODELS R687, R688

1. Aligning I-F Stages at 455 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 bottom right hand connection of the tuner socket (Fig. 2) through a .1 mfd. condenser.

(c) Connect the output meter from the plate of the 6V6GT tube to ground.

(d) Set the signal generator to exactly 455 K.C.

(e) Turn the volume control on full and tune the set to a point where no squeals or beat notes are noticed, also so that when the tuning control knob is rotated within narrow limits, there is no appreciable change in output.

(f) Adjust the I-F trimmers "A, B, C, D" (Fig. 3) and the I-F core adjustment "E" (Fig. 4) 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 lead of the signal generator to the antenna terminal of the receiver through a .1 mfd. condenser.

(i) Adjust the I-F wave trap "J" (Fig. 3) for minimum output.

*** Disregard items (h) and (i) for Model R687**

2. Aligning at 1560 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .0001 mfd. mica condenser.

(b) Tune the set to the extreme high frequency position against the stop.

(c) Set the signal generator to exactly 1560 K.C.

(d) Adjust the oscillator shunt trimmer "F" (Fig. 5) for maximum output.

3. Aligning at 600 Kilocycles

(a) Leave the signal generator connected the same as before.

(b) Set the signal generator to 600 K.C.

(c) Tune the set by means of the manual tuning control until this signal is tuned in with maximum output.

(d) Adjust the R. F. trimmer "G" (Fig. 3) for maximum output.

(e) Adjust the antenna trimmer "H" (Fig. 3) for maximum output.

**** Disregard item (d) for Model R688**

CAPACITY AND INDUCTANCE ALIGNMENT

1. Aligning I. F. Stages at 455 Kilocycles

Align the I. F. stages as outlined under paragraph 1 under CAPACITY ALIGNMENT.

2. Mechanical Alignment of Cores

(a) Tune the set by means of the manual tuning control to the extreme high frequency end of the dial and against stop. (Coils will be almost withdrawn from coil forms.)

(b) Remove the pointer plate (note insulating washers under left hand screw) without disturbing the tuning mechanism.

(c) Using a spare core (Part #7240022) as a gauge adjust the oscillator core (middle core) so that with the front surfaces of the spare core and the oscillator core exactly flush, the rear surface of the test core is exactly flush with the front end of the oscillator coil winding. This adjustment may be made using adjustment tool #7240160 inserted through the hole at the rear of the coil mounting bracket.

The tool should be fitted into the hole at the rear of the core and rotated without applying any thrust to the core which would move it out of its normal resting position.

(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 fibre mounting bushing.

(e) Adjust the antenna and R. F. cores so that the front surfaces of the cores are flush with the front ends of the coil fibre mounting bushing.

(f) Replace the pointer plate assembly.

3. Aligning at 1560 Kilocycles

Follow procedure No.2 under "Capacity Alignment".

4. Aligning at 600 Kilocycles

(a) Leave the signal generator connected the same as before.

(b) Set the signal generator to 600 K.C.

(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.

(d) Adjust the R. F. trimmer "G" (Fig. 3) for maximum output.

(e) Adjust the antenna trimmer "H" (Fig. 3) for maximum output.

5. Aligning at 1400 Kilocycles

(a) Set the signal generator to 1400 K.C.

(b) Tune the set manually until this signal is tuned in with maximum output.

(c) Adjust the antenna and R. F. cores for maximum output.

(d) Repeat the alignment with as low an output from the signal generator as possible for more accurate alignment.

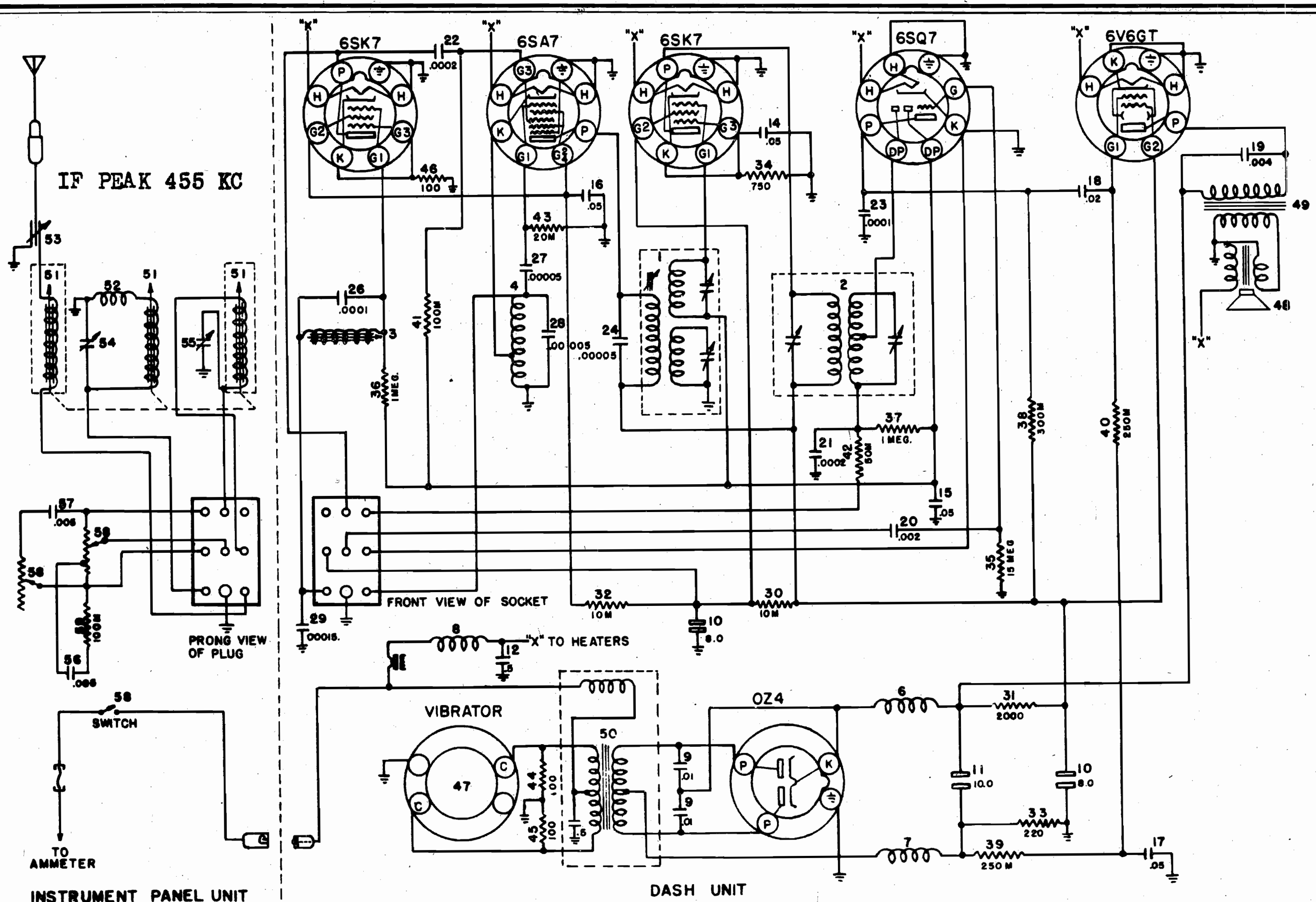
(e) Apply cement to the core screws to prevent their changing alignment.

6. Adjusting Receiver to Car Antenna

After the receiver is reinstalled in the car, it will be necessary to readjust the antenna trimmer on a weak station at about 600 K.C.

UNITED MOTORS SERVICE

MODEL R688



Setting up the push-buttons for any desired station is accomplished by pressing the button into its latched position and rotating it in the manner of a manual tuning control until the desired station is tuned in. No locking device is required to retain this setting.

Note: Do not hold the button in beyond its normal latched position when setting up stations.

2-7-40

MODEL R688

UNITED MOTORS SERVICE

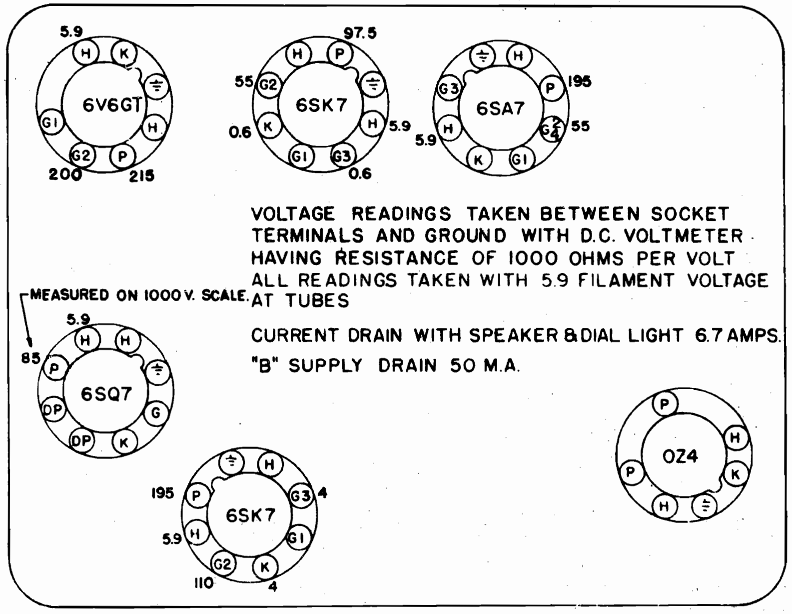


FIG. 1--TUBE SOCKET VOLTAGES

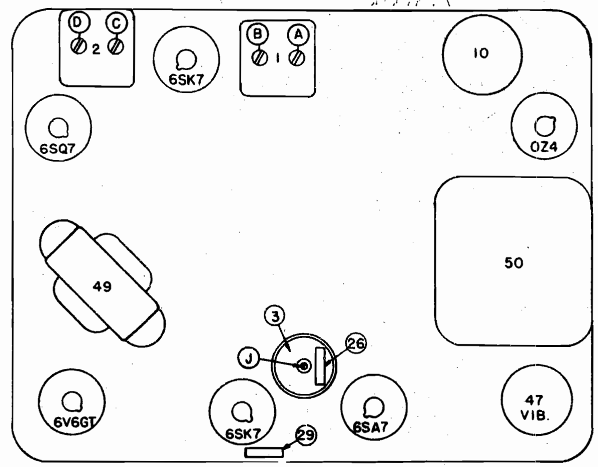


FIG. 3--PARTS LAYOUT--DASH UNIT--Top View

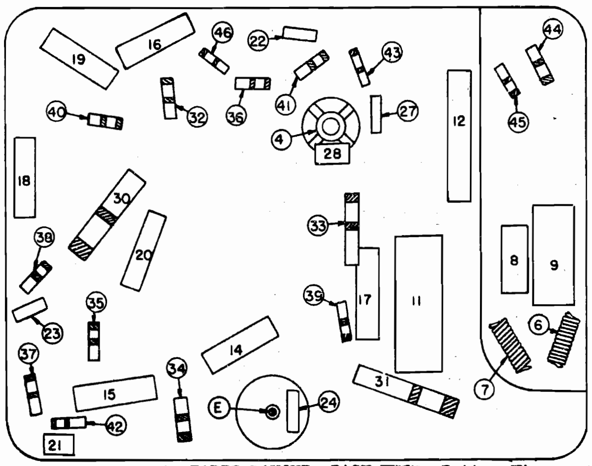


FIG. 4--PARTS LAYOUT--DASH UNIT--Bottom View

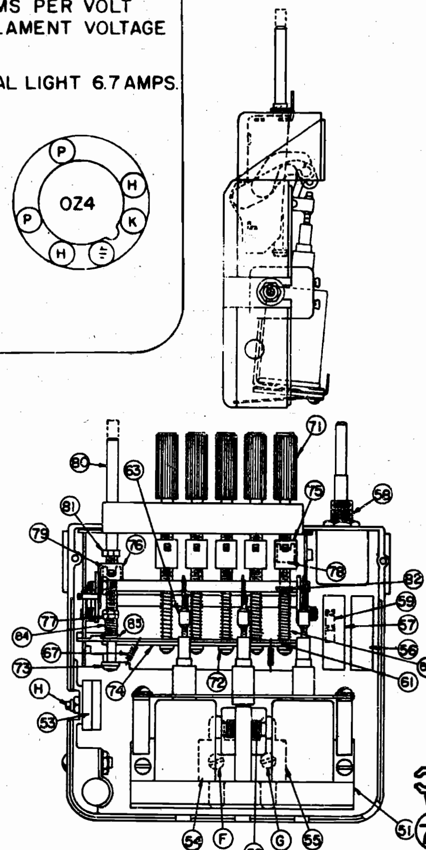


FIG. 5--PARTS LAYOUT--I. P. UNIT

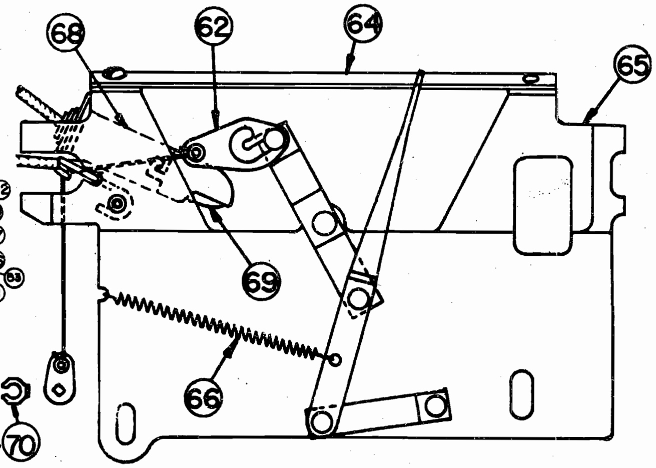
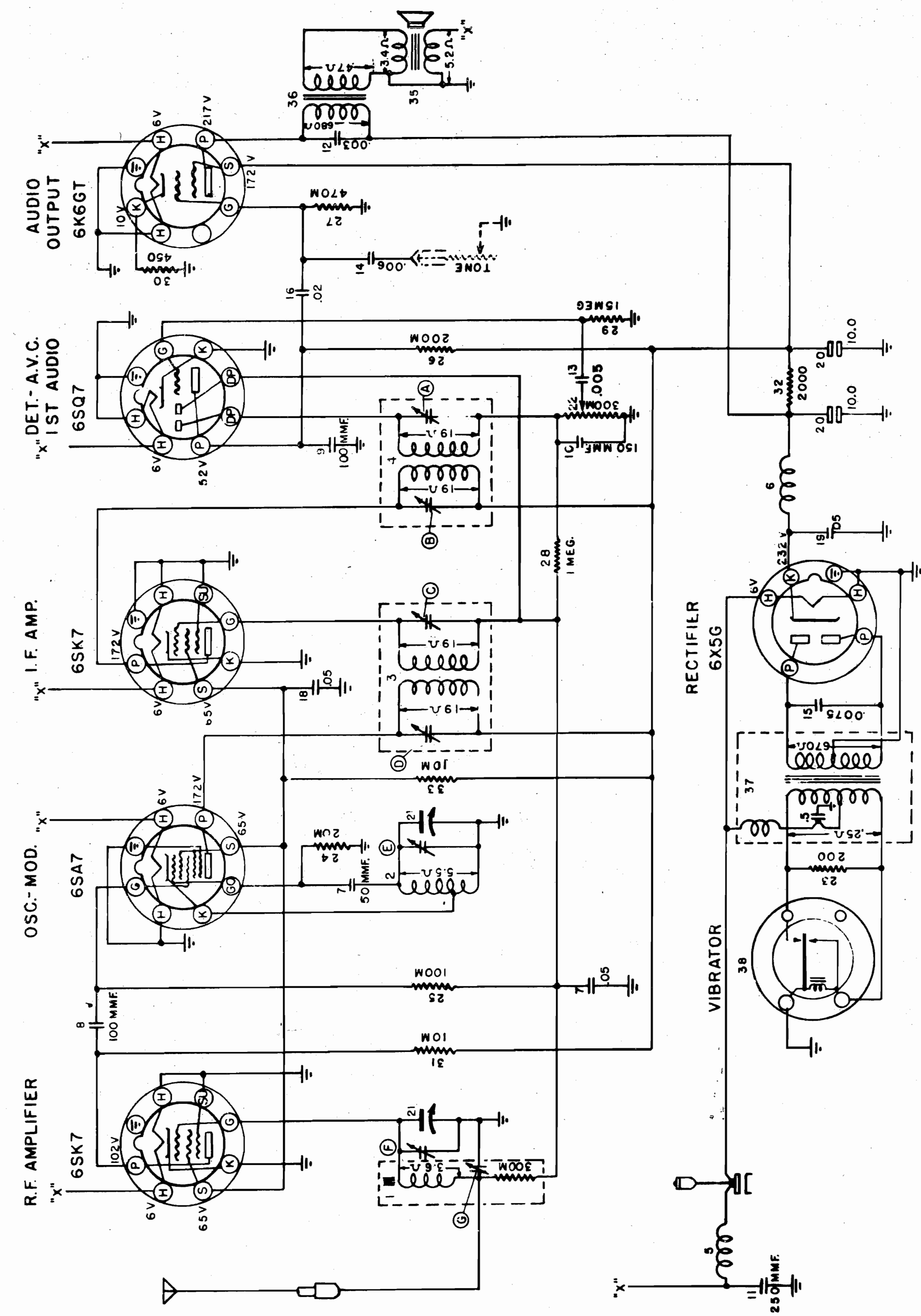


FIG. 6--PARTS LAYOUT POINTEL PLATE ASSEMBLY

UNITED MOTORS SERVICE

MODEL R695



IF PEAK 455 KC

FIG. 2--DELCO MODEL R-695 CIRCUIT DIAGRAM

Date: 1-16-41

MODEL R695

UNITED MOTORS SERVICE

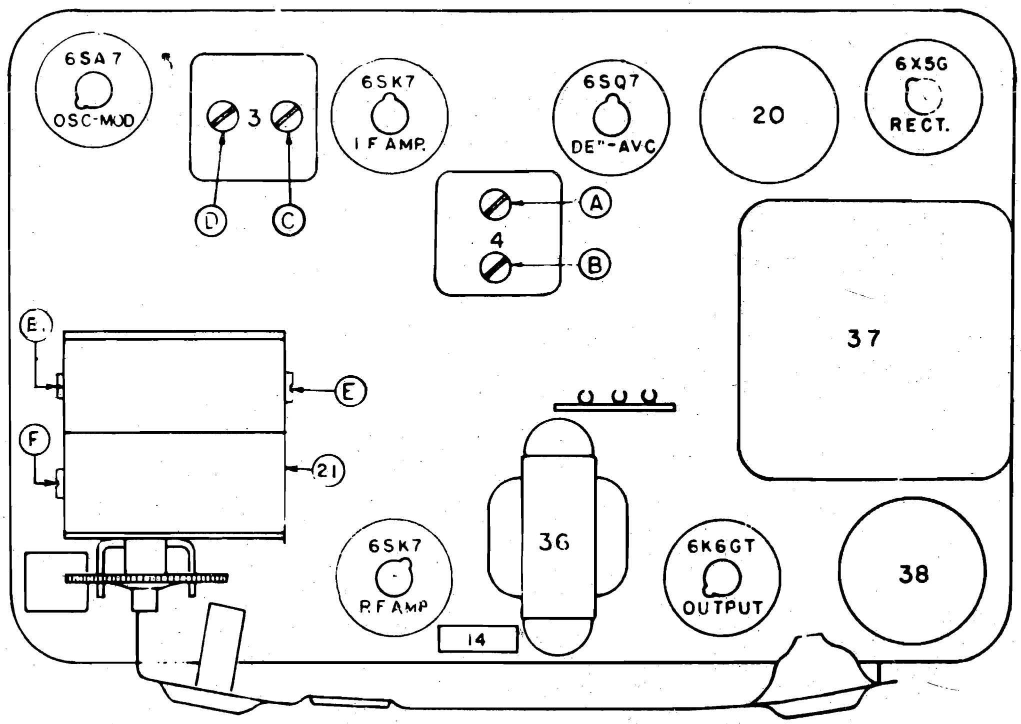


FIG. 3--PARTS LAYOUT--Top View

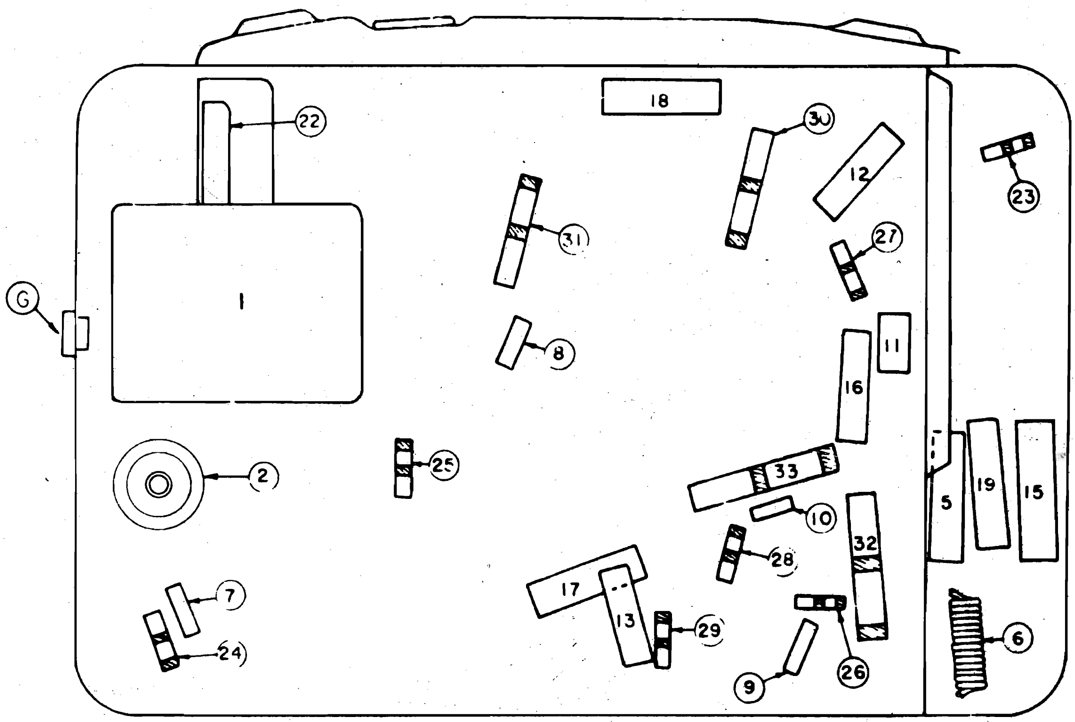


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE

SUBJECT--SERVICE INSTRUCTIONS--DELCO MODEL R-695 AUTO RADIO

GENERAL: The Delco Model R-695 is a six tube, single unit, superheterodyne receiver with a 5" dynamic speaker, designed for universal mounting on all cars.

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly aligned only with the use of a calibrated test oscillator or signal generator and an output meter.

1. Aligning I-F Stages at 455 Kilocycles

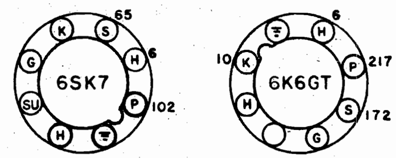
(a) Connect the ground lead of the signal generator to the chassis frame.
(b) Connect the signal lead of the signal generator to the grid end of condenser (Illus. 8, Fig. 4) through a .1 mfd. condenser.
(c) Connect the output meter from the plate of the 6K6GT tube to ground through a .1 mfd. condenser.
(d) Set the signal generator to exactly 455 Kilocycles.
(e) Turn the volume control on full and tune the set to a position where no squeals or beat notes are noticed, also so that when the tuning control knob is rotated within narrow limits, there is no appreciable change in output.
(f) Adjust the I-F trimmers (Illus. A, B, C, D, Fig. 3) in the order mentioned until maximum output is obtained.
(g) Repeat these adjustments with as low an output from the signal generator as possible for more accurate alignment.

2. Aligning at 1530 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .000070 mfd. mica condenser.
(b) Tune the set to the extreme high frequency position against the stop.
(c) Set the signal generator to exactly 1530 Kilocycles.
(d) Adjust the oscillator shunt trimmer (Illus. E, Fig. 3) for maximum output.

3. Aligning at 1400 Kilocycles

(a) Leave the signal lead of the signal generator connected the same as before.
(b) Set the signal generator to 1400 Kilocycles.
(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.
(d) Adjust the trimmer (Illus. F, Fig. 3) for maximum output.



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 6.6 AMPERES. "B" SUPPLY DRAIN 51 M.A. TOLERANCE ON VOLTAGES 10%.

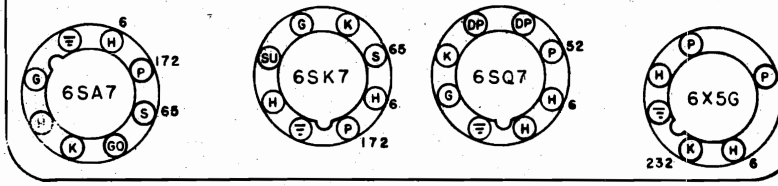


FIG. 1--TUBE SOCKET VOLTAGES

4. Aligning at 600 Kilocycles

(a) Leave the signal lead of the signal generator connected the same as before.
(b) Set the signal generator to 600 Kilocycles.
(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.
(d) Adjust the trimmer (Illus. G, Fig. 4) for maximum output.
(e) Repeat adjustment made under 3 and 4.

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 low frequency end of the dial (approximately 600 Kilocycles.)
(b) Adjust the antenna trimmer (Illus. G, Fig. 4) for maximum volume.

MODEL R695

UNITED MOTORS SERVICE

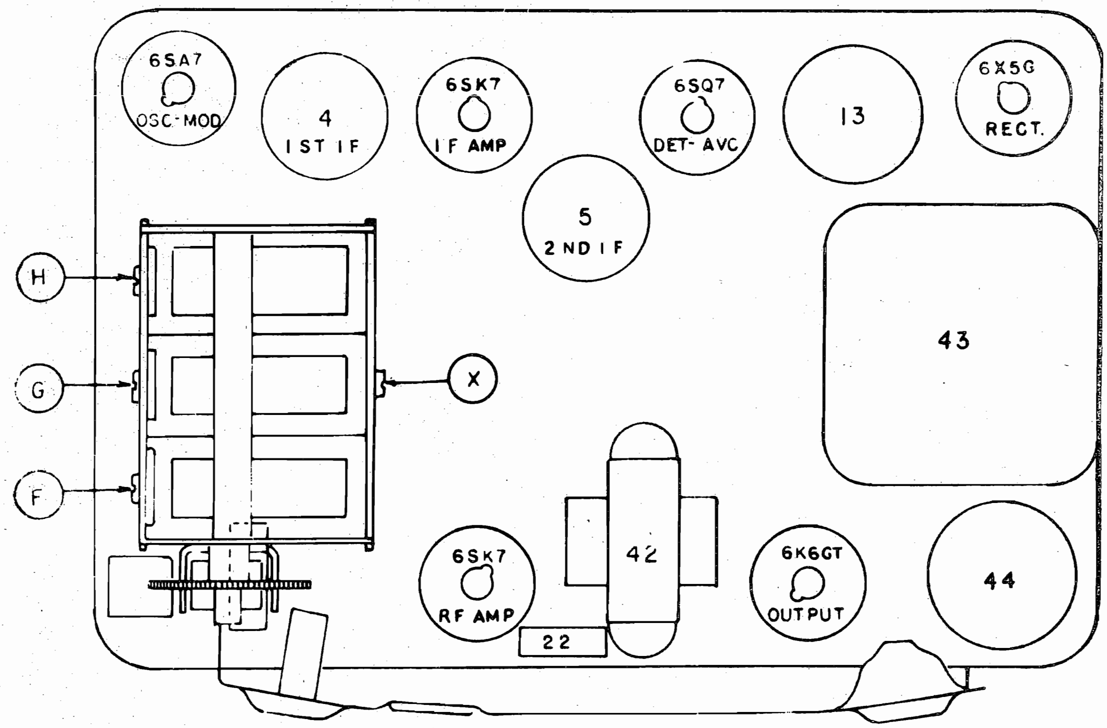


FIG. 3--PARTS LAYOUT--Top View

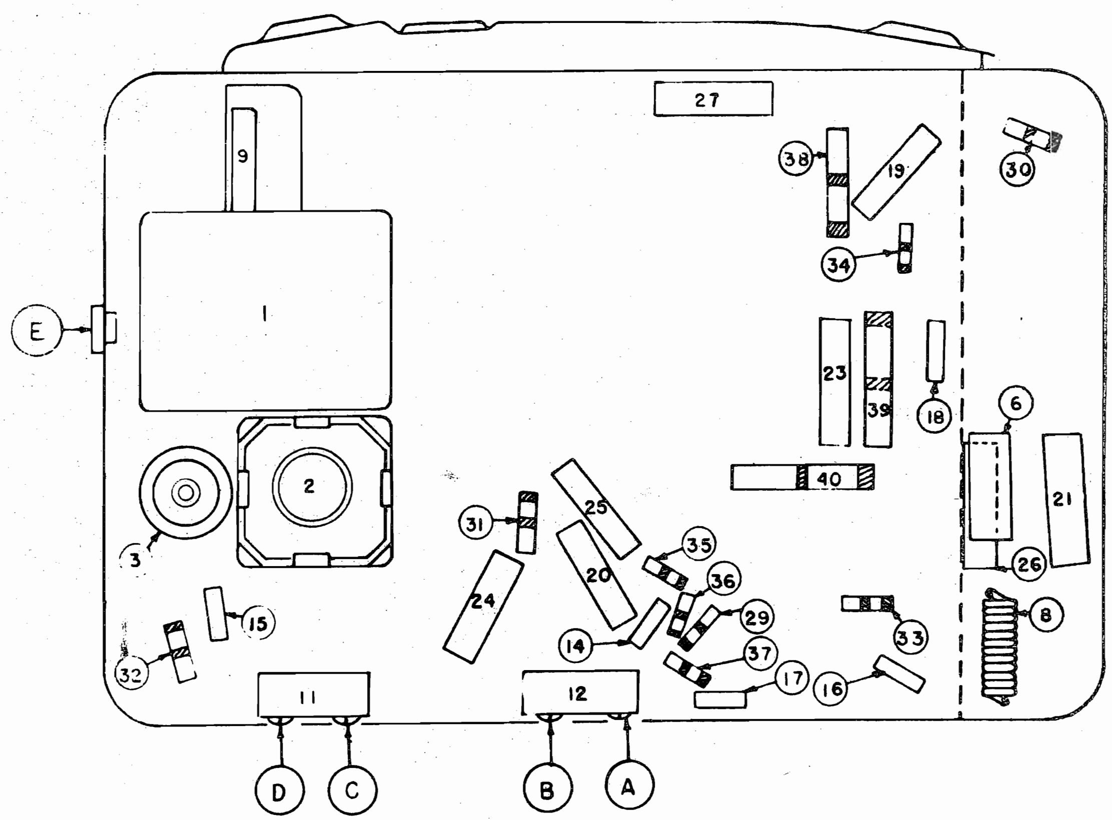
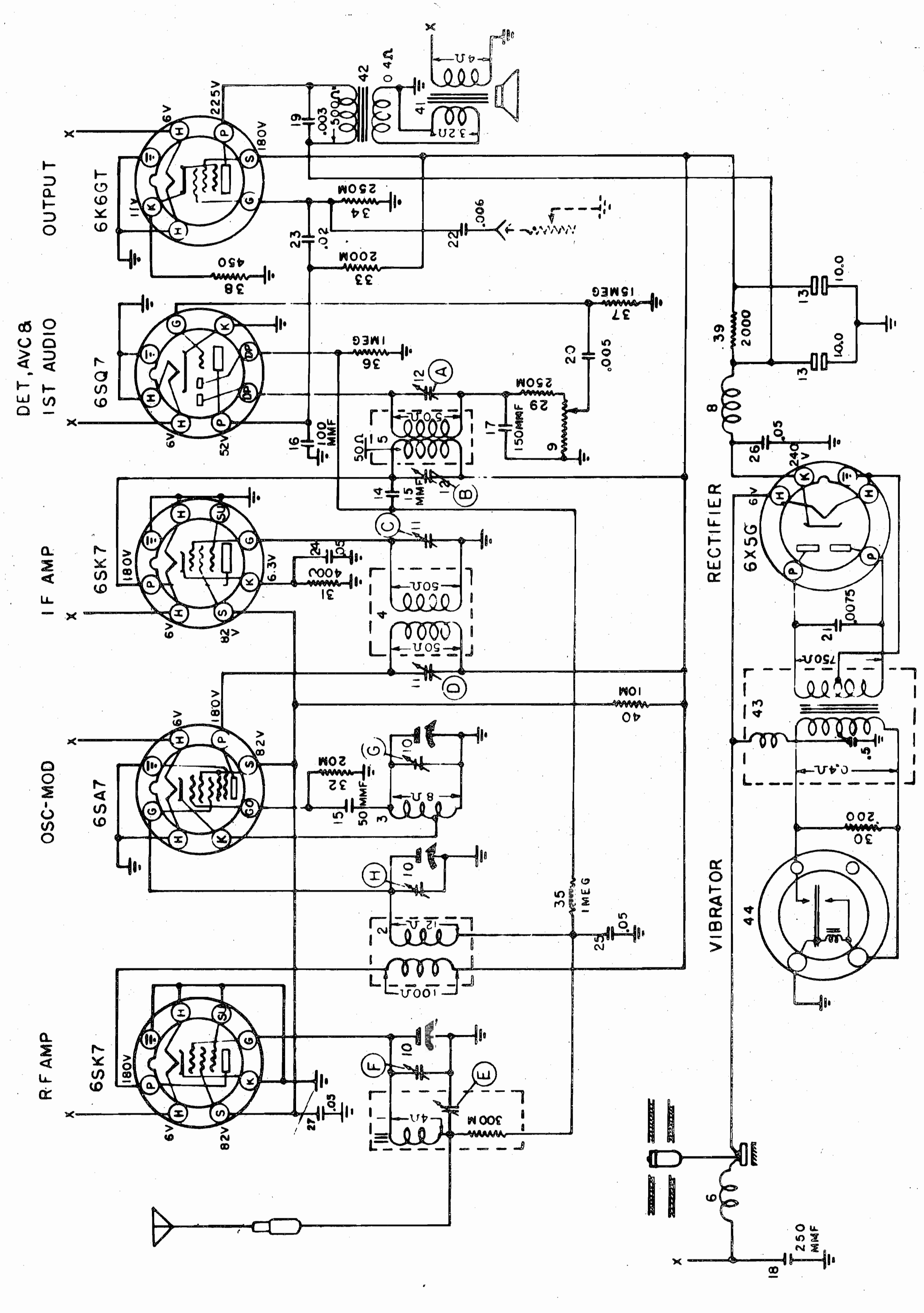


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE

MODEL R696



IF PEAK 260 KC

FIG. 2--DELCO MODEL R-696 CIRCUIT DIAGRAM

Date: 1-15-41

SUBJECT--SERVICE INSTRUCTIONS--DELCO MODEL R-696 AUTO RADIO

GENERAL: The Delco Model R-696 is a six tube, single unit Auto Radio with a 6" dynamic speaker, variable tone control, non-synchronous vibrator and type 6K6GT power tube.

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly aligned only with the use of a calibrated test oscillator or signal generator and an output meter.

In order to prevent the A.V.C. circuit from affecting the alignment adjustment, the lowest signal generator output should be used, which will give a readable indication on the output meter. Do not remove the bottom half of the case during alignment.

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 terminal of trimmer (Illus. H, Fig. 3) through a .1 mfd. condenser.
(c) Connect the output meter from the plate of the 6K6GT tube to ground through a .1 mfd. condenser.
(d) Set the signal generator to 260 Kilocycles.
(e) Turn the volume control on full and turn the gang condenser to a position where no squeals or beat notes are heard and so that when the tuning condenser is rotated within narrow limits, there is no appreciable change in output.
(f) Adjust the trimmers (Illus. A,B,C,D, Fig. 4) for maximum output. Repeat with lowest possible output from the signal generator for more accurate alignment.

2. Aligning at 1530 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .00007 mfd. mica condenser.
(b) Tune the set to the extreme high frequency position against the stop.
(c) Set the signal generator to 1530 Kilocycles.
(d) Adjust the oscillator shunt trimmer (Illus. G, Fig. 3) for maximum output.

3. Aligning at 1400 Kilocycles

(a) Leave the signal generator connected the same as before.
(b) Set the signal generator to 1400 Kilocycles.

3. Aligning at 1400 Kilocycles--

(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.
(d) Adjust the trimmers (Illus. F, H, Fig. 3) for maximum output.

4. Aligning at 600 Kilocycles

(a) Leave the signal generator connected the same as before.
(b) Set the signal generator to 600 kilocycles.
(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.
(d) Adjust the trimmer (Illus. E, Fig. 4) for maximum output.
(e) Repeat alignment under 3.

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 low frequency end of the dial (approximately 600 kilocycles.)
(b) Adjust the trimmer (Illus. E, Fig. 4) for maximum volume.

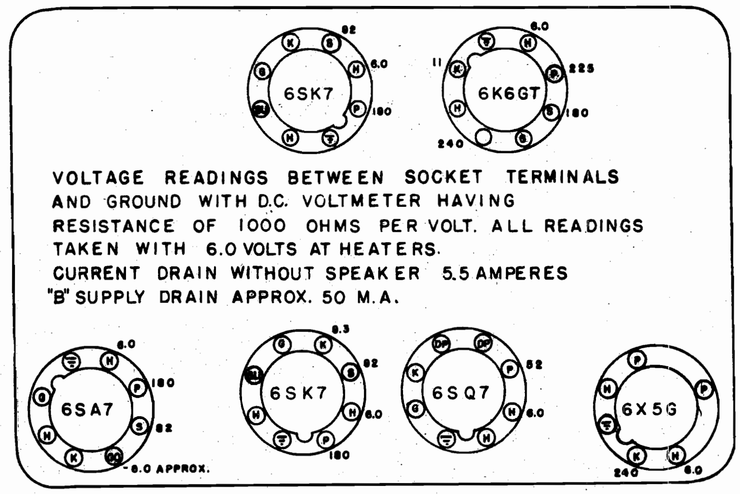


FIG. 1--TUBE SOCKET VOLTAGES

UNITED MOTORS SERVICE

MODEL R697

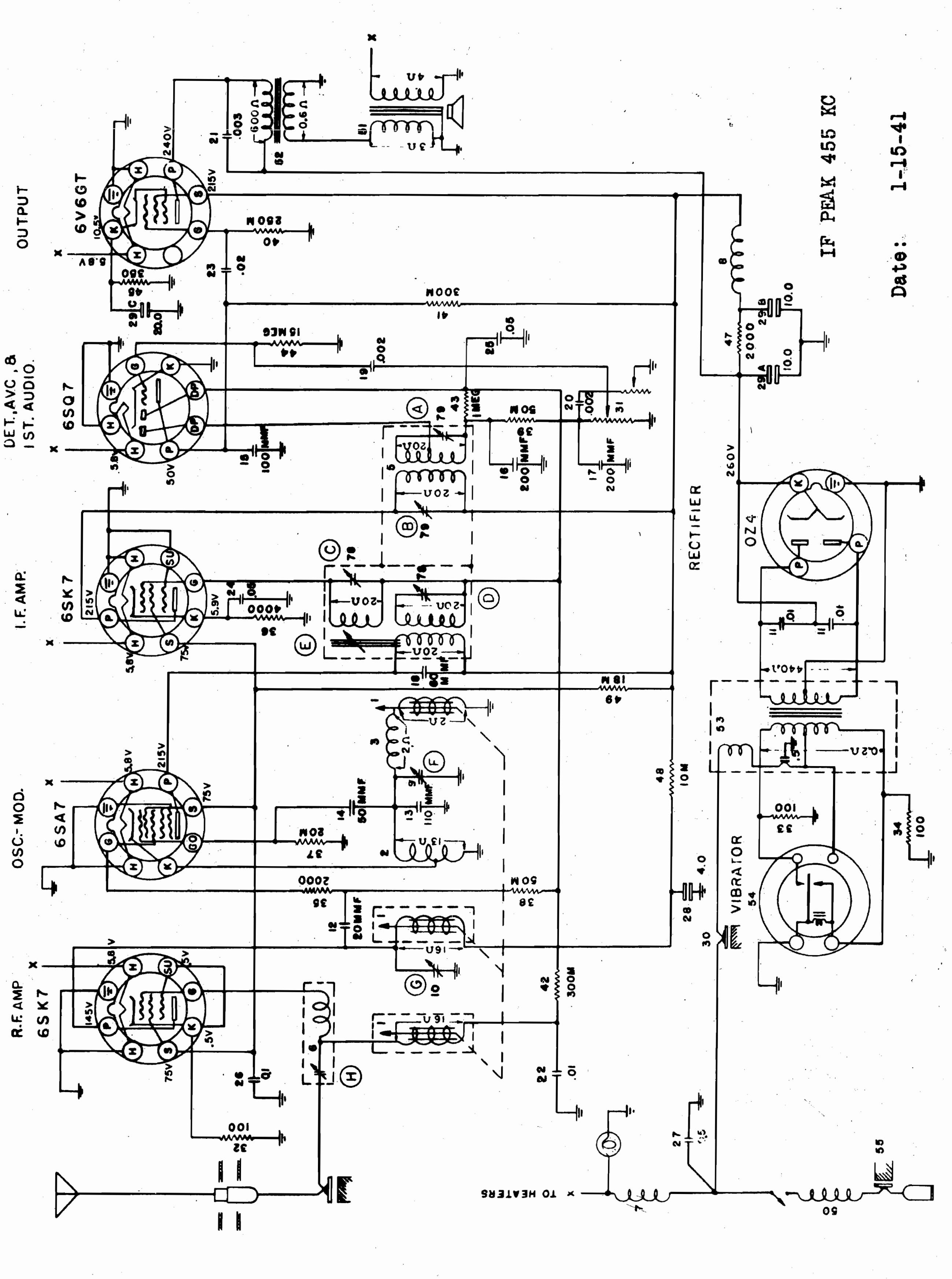


FIG. 2--DELCO MODEL R-697 CIRCUIT DIAGRAM

MODEL R697

UNITED MOTORS SERVICE

GENERAL: The Delco Model R-697 is a six tube single unit Superheterodyne receiver with an 7'' dynamic speaker and is designed specifically for instrument panel mounting on 1941-1940 General Motors cars.

TUNING CONTROLS : Tuning is accomplished by means of a manual tuning control or by means of five push buttons each of which drives the permeability tuning cores to preselected frequencies.

SETTING UP THE PUSH BUTTONS for any desired station is accomplished by pressing the button into its latched position and rotating in the manner of a manual tuning control until the desired station is tuned in. No looking device is required to obtain this setting.

NOTE : Do not hold the button in beyond its normal latching position when setting up stations.

The manual tuning control operates by pressing the tuning knob into its latched position and tuning in the conventional manner.

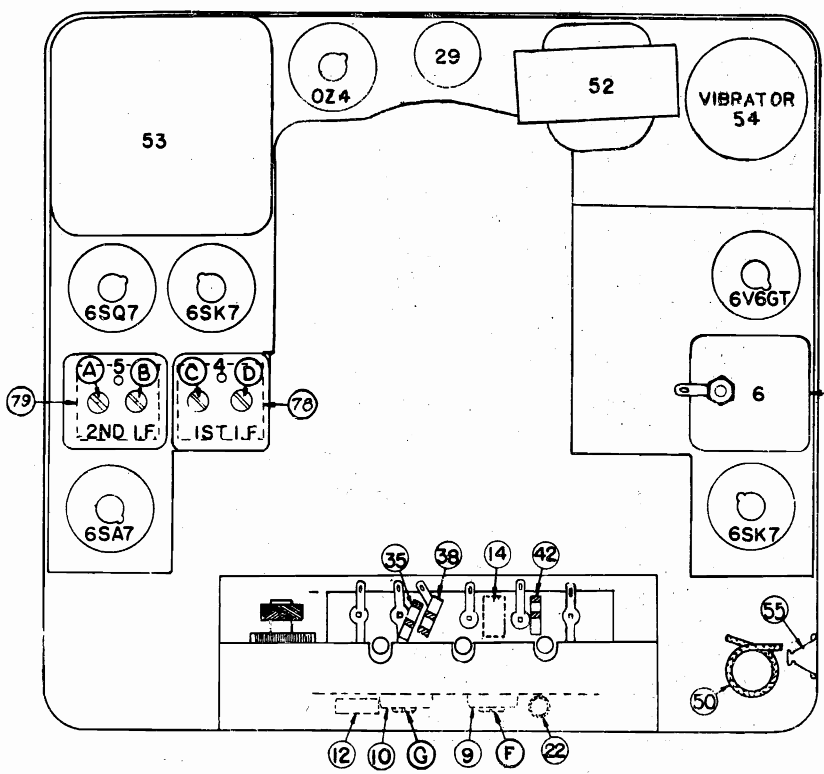


FIG. 3--PARTS LAYOUT--Top View

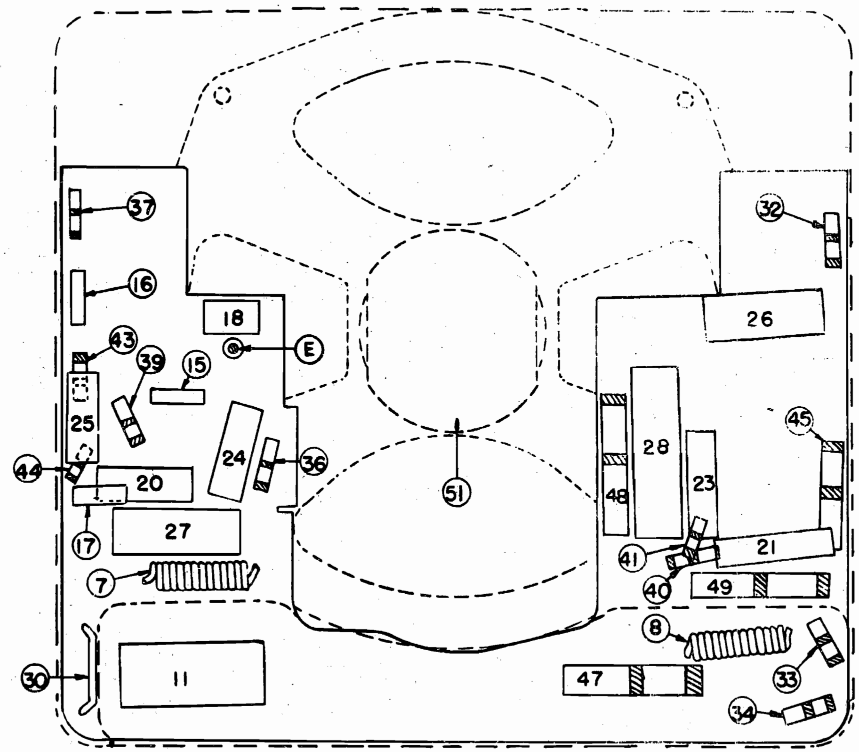


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE

MODEL R697

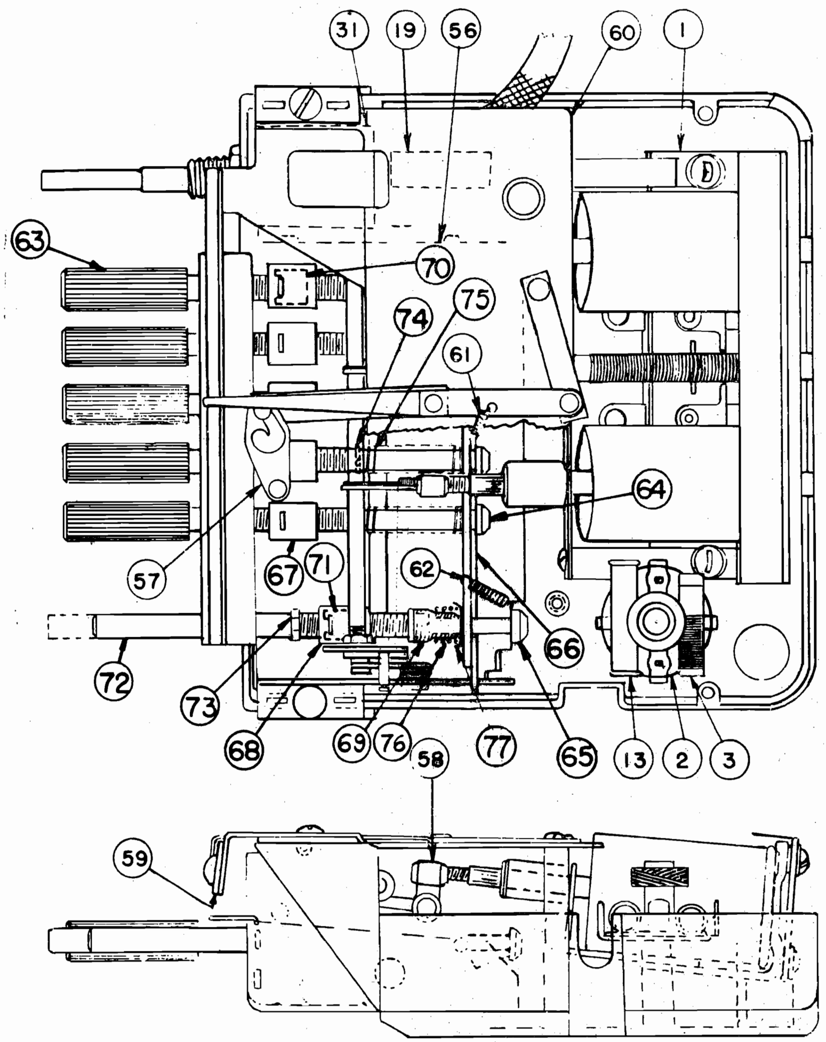


FIG. 5--PARTS LAYOUT--TUNER

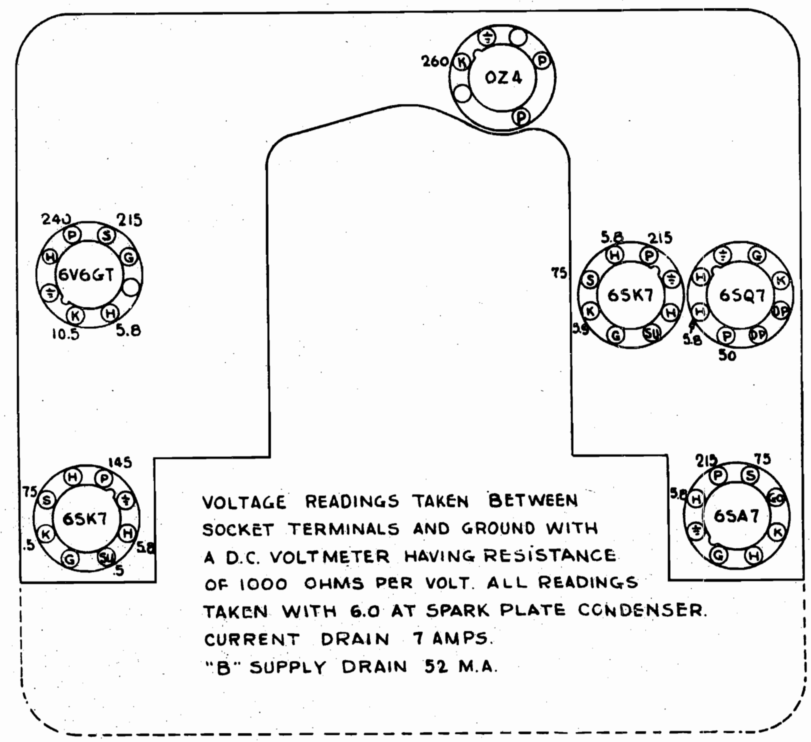


FIG. 1--TUBE SOCKET VOLTAGES

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly aligned only with the use of a calibrated test oscillator or signal generator and an output meter. Extreme care should be exercised in following the alignment instructions in order to obtain the best performance possible. It will be necessary to use an insulated screw driver in making alignment adjustments.

ALIGNMENT PROCEDURE

Two seaprate alignment procedures are included in these instructions. The first, or CAPACITY ALIGNMENT, is to be considered as the usual alignment procedure and the second OR CAPACITY AND INDUCTANCE ALIGNMENT is to be used only when a tuning coil has been replaced or a major change has been made in the tuning circuits.

CAPACITY ALIGNMENT

1. Aligning I-F Stages at 455 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 of the 6SA7 tube (grid side of resistor #35, Fig. 3) through a .1 mfd. condenser.
(c) Connect the output meter from the plate of the 6V6GT tube to ground through a .1 mfd. condenser.

1. Aligning I-F Stages at 455 Kilocycles-

(d) Set the signal generator to 455 kilocycles.
(e) Turn the volume control on full and tune the set to a point where no squeals or beat notes are noticed, also so that when the tuning control knob is rotated within narrow limits there is no appreciable change in output.
(f) Adjust the I-F trimmers (Illus. A,B,C,D, Fig. 3) and the I.F. core adjustment (Illus. E, Fig. 4) until maximum output is obtained.
(g) Repeat these adjustments with as low an output from the signal generator as possible for more accurate alignment.

2. Aligning at 1560 kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .00007 mfd. mica condenser.
(b) Tune the set to the extreme high frequency position against the stop.
(c) Set the signal generator to 1560 kilocycles.
(d) Adjust the oscillator shunt trimmer (Illus. F, Fig. 3) for maximum output.

3. Aligning at 600 kilocycles

(a) Leave the signal generator connected the same as before.
(b) Set the signal generator to 600 kilocycles.
(c) Tune the set by means of the manual tuning control until this signal is tuned in with maximum output.
(d) Adjust the trimmers (Illus. G, H, Fig. 3) for maximum output.

CAPACITY AND INDUCTANCE ALIGNMENT

1. Aligning I-F stages at 455 kilocycles

Align the I-F stages as outlined under paragraph 1, under CAPACITY ALIGNMENT.

2. Mechanical Alignment of Cores

(a) Tune the set by means of the manual tuning control to the extreme high frequency end of the dial and against stop. (Coils will be almost withdrawn from coil forms.)
(b) Remove the pointer plate (note insulating washers under left hand screw) without disturbing the tuning mechanism.
(c) Using a spare core (Part #7240022) as a gauge, adjust the oscillator core (middle core) so that with the front surfaces of the spare core and the oscillator core exactly flush, the rear surface of the test core is exactly flush with the front end of the oscillator coil winding. This adjustment may be made using adjustment tool (part #7240160) inserted through the hole at the rear of the coil mounting bracket.

2. Mechanical Alignment of Cores

The tool should be fitted into the hole at the rear of the core and rotated without applying any thrust to the core which would move it out of its normal resting position.
(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 fibre mounting bushing.
(e) Adjust the antenna and R.F. cores so that the front surfaces of the cores are flush with the front ends of the coil fibre mounting bushing.
(f) Replace the pointer plate assembly.

3. Aligning at 1560 kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver through a .000070 mfd. mica condenser.
(b) tune the set by means of the manual tuning control to the extreme high frequency end of the dial and against the stop.
(c) Set the signal generator to 1560 kilocycles.
(d) Adjust the oscillator shunt trimmer (Illus. F, Fig. 3) for maximum output.

4. Aligning at 600 kilocycles

(a) Leave the signal generator connected the same as before.
(b) Set the signal generator to 600 kilocycles.
(c) Tune the set by means of the manual control until this signal is tuned in with maximum output.
(d) Adjust the trimmers (Illus. F,H, Fig. 3) for maximum output.

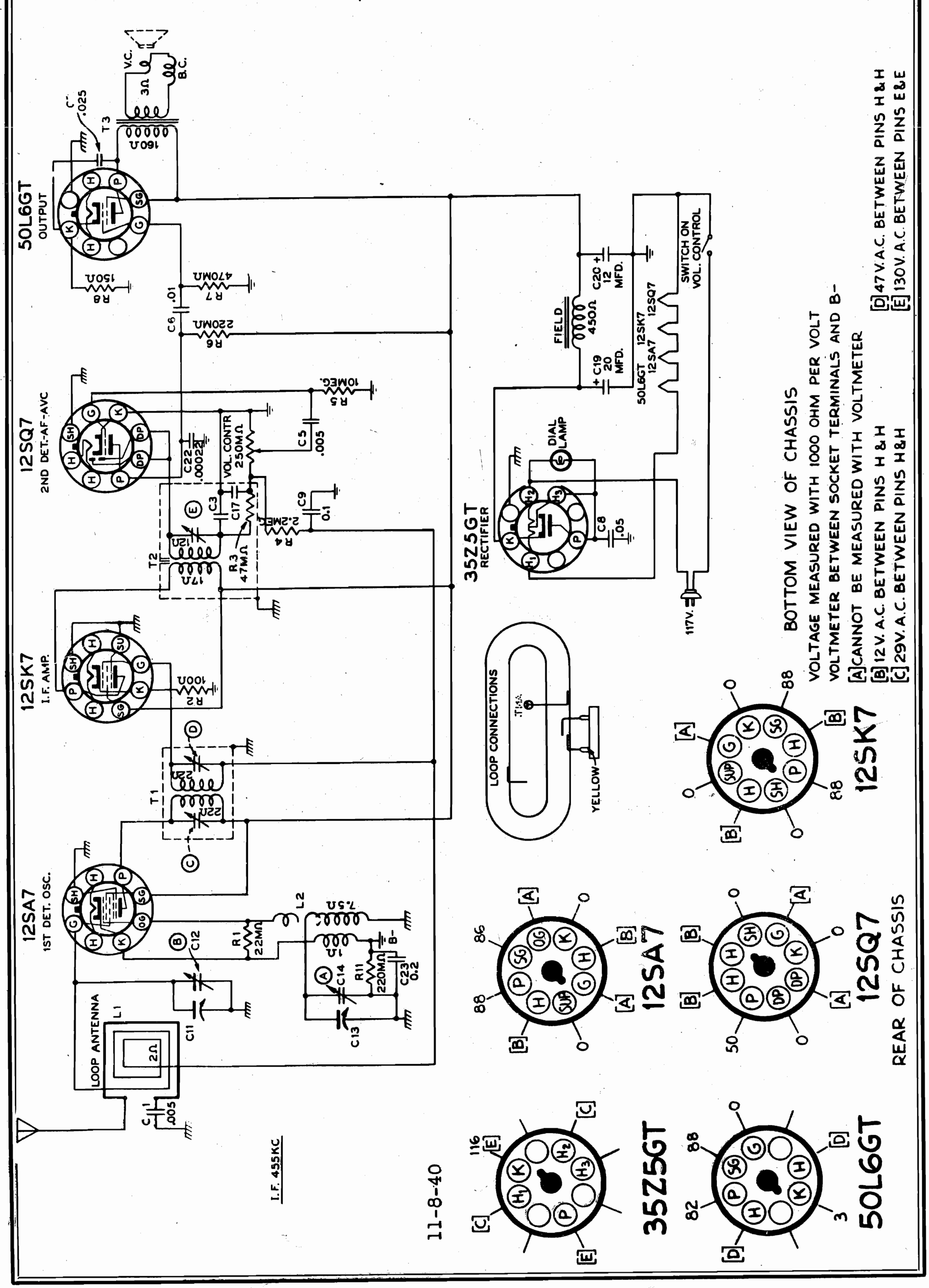
5. Aligning at 1400 kilocycles

(a) Set the signal generator to 1400 kilocycles.
(b) Tune the set manually until this signal is tuned in with maximum output.
(c) Adjust the antenna and R.F. cores for maximum output.
(d) Repeat the alignment with as low an output from the signal generator as possible for more accurate alignment.
(c) Apply cement to the core screws to prevent their changing alignment.

6. Adjusting receiver to car antenna

After the receiver is reinstalled in the car, it will be necessary to readjust the antenna trimmer (Illus. H, Fig. 3), on a weak station at or near 600 kilocycles. for maximum output.

UNITED MOTORS SERVICE MODEL R1170 Delco



MODEL R1170 Delco

UNITED MOTORS SERVICE

If realignment if found necessary, the circuits can be properly adjusted only with the use of a calibrator test oscillated or signal generator and an output meter.

1. Aligning I-F Stages at 455 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis through a .01 mfd. condenser.

   (b) Connect the signal lead of the signal generator to the grid terminal of the 12SK7 tube through a .01 mfd. condenser.

   (c) Connect the output meter across the primary of the output transformer.

   (d) Set the signal generator to exactly 455 K.C.

   (e) Tune the receiver to quiet point at 1600 K.C. end of dial, set Volume Control full on, adjust the trimmer on the second I-F transformer (Illus. E, Fig. 3) for maximum output.

   (f) Connect the signal lead of the signal generator to the grid of the 12SA7 tube.

   (g) Adjust the trimmers on the first I-F transformer (Illus. C, D, Fig. 3) for maximum output.

2. Aligning at 1720 Kilocycles

   (a) Connect the signal lead of the signal generator to the antenna terminal of the loop through .0001 mfd. condenser.

   (b) Set signal generator to exactly 1720 K.C.

   (c) Tune receiver to 1720 K.C., condenser plates full clockwise (out of mesh).

   (d) Adjust oscillator trimmer condenser (Illus. A, Fig. 3) for maximum output.

3. Aligning at 1500 Kilocycles

   (a) Leave the signal lead of the signal generator connected as above.

   (b) Set the signal generator to 1500 K.C.

   (c) Rotate the tuning control knob until this signal is tuned in with maximum output.

   (d) Adjust the antenna trimmer (Illus. B. Fig. 3) for maximum output.

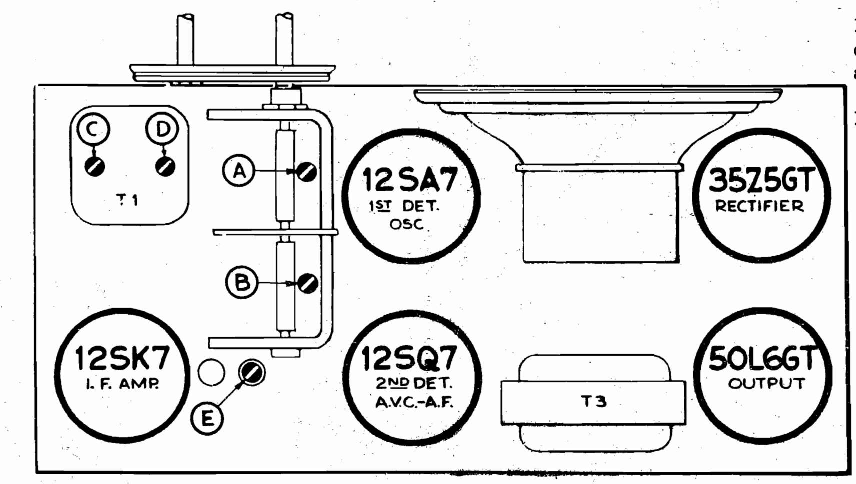


FIG. 3--PARTS LAYOUT--Top View

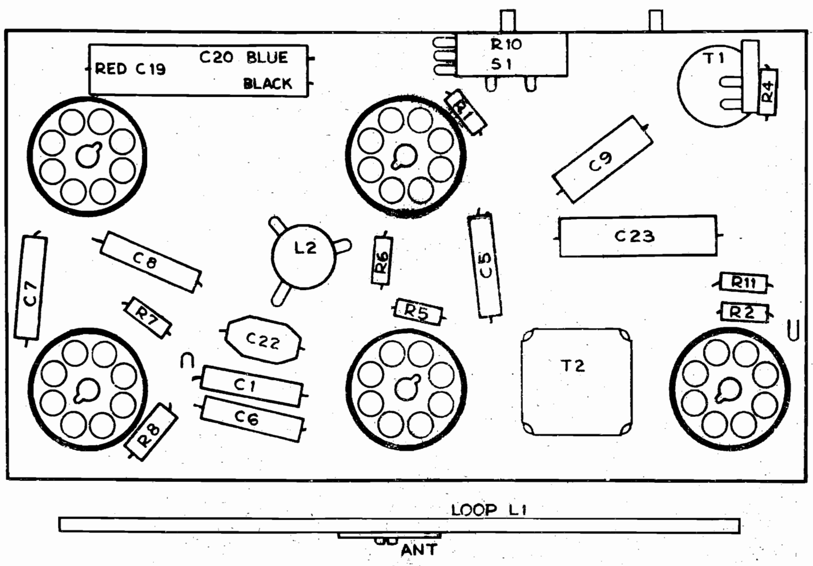
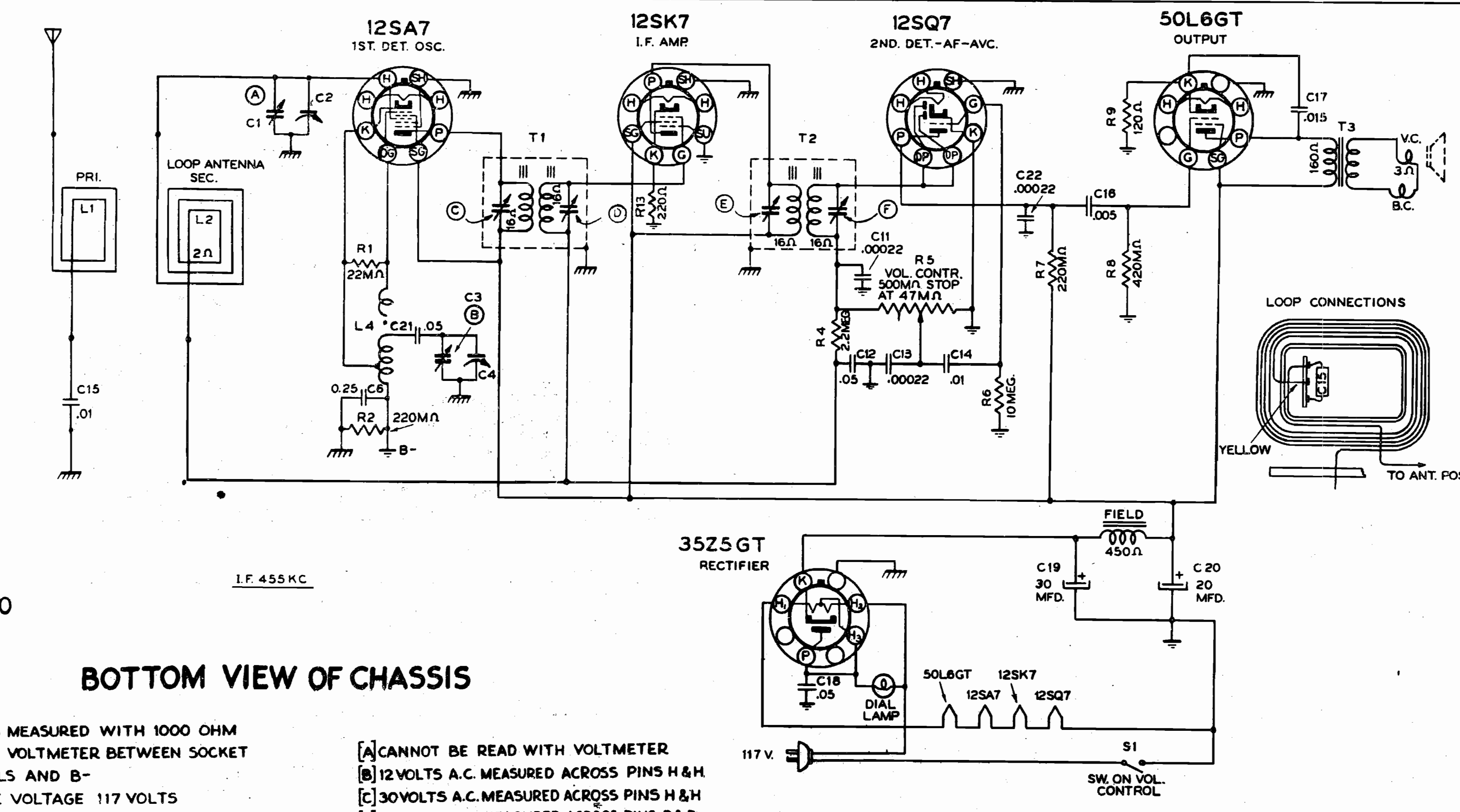


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE

MODELS R1171,R1172
R1173 Delco



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BOTTOM VIEW OF CHASSIS

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

A.C. LINE VOLTAGE 117 VOLTS

POWER CONSUMPTION 30 WATTS

VOLUME CONTROL AT MINIMUM VOLUME.

[A] CANNOT BE READ WITH VOLTMETER

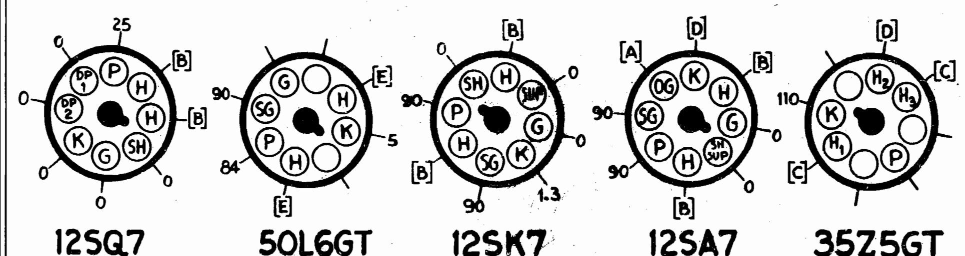
[B] 12 VOLTS A.C. MEASURED ACROSS PINS H & H

[C] 30 VOLTS A.C. MEASURED ACROSS PINS H & H

[D] 117 VOLTS A.C. MEASURED ACROSS PINS D & D

[E] 45 VOLTS A.C. MEASURED ACROSS PINS H & H

FIG. 2--DELCO MODELS R-1171, R-1172, R-1173



REAR OF CHASSIS

MODELS R1171, R1172
R1173 Delco

UNITED MOTORS SERVICE

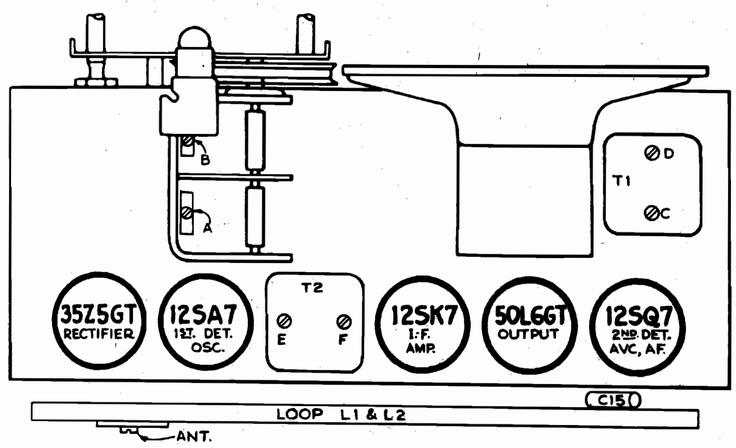


FIG. 3--PARTS LAYOUT--Top View

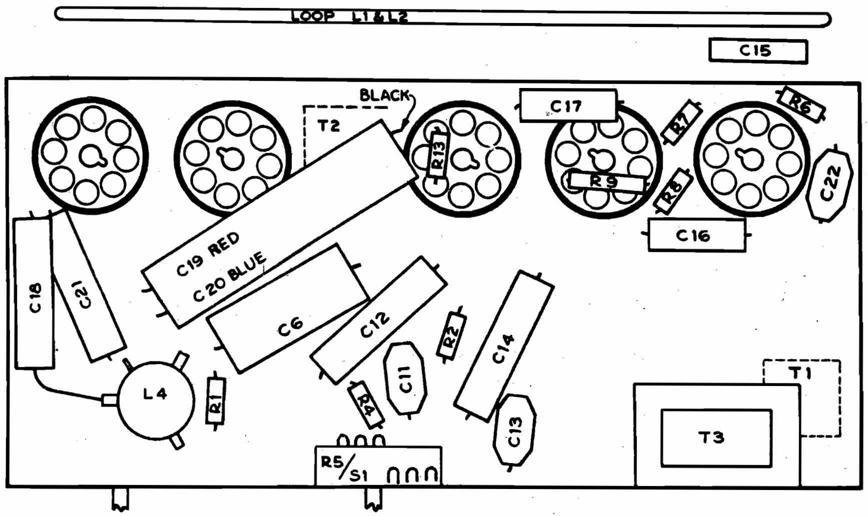


FIG. 4--PARTS LAYOUT--Bottom View

1. Aligning I-F Stages at 455 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis through a .01 mfd. capacitor.

   (b) Connect the signal lead of the signal generator to the grid terminal of the 12SK7 tube through a .01 mfd. condenser.

   (c) Connect the output meter across the primary of the output transformer.

   (d) Set the signal generator to exactly 455 KC.

   (e) Tune receiver to quiet point at 1,600 KC end of dial, set volume control full on, adjust the trimmers on the second I-F transformer (Illus. E & F Fig. 3) for maxinum output.

   (f) Connect the signal lead of the signal generator to the grid of the 12SA7 tube.

   (g) Adjust the trimmers on the first I-F transformer (Illus. C & D Fig. 3) for maximum output.

2. Aligning at 1600 Kilocycles

   (a) Connect the signal lead of the signal generator to the antenna terminal of the loop through 100 mmfd. capacitor.

   (b) Set signal generator to exactly 1600 KC.

   (c) Tune receiver to 1600 KC., condenser plates full clockwise (out of mesh).

   (d) Adjust oscillator trimmer condenser (Illus. B, Fig. #3) for maximum output.

3. Aligning at 1400 Kilocycles

   (a) Leave the signal lead of the signal generator connected as above.

   (b) Set the signal generator to 1400 KC.

   (c) Rotate the tuning control knob until this signal is tuned in with maximum output.

   (d) Adjust the antenna trimmer (Illus. A, Fig. #3) for maximum output.

UNITED MOTORS SERVICE

MODEL R1174 Delco

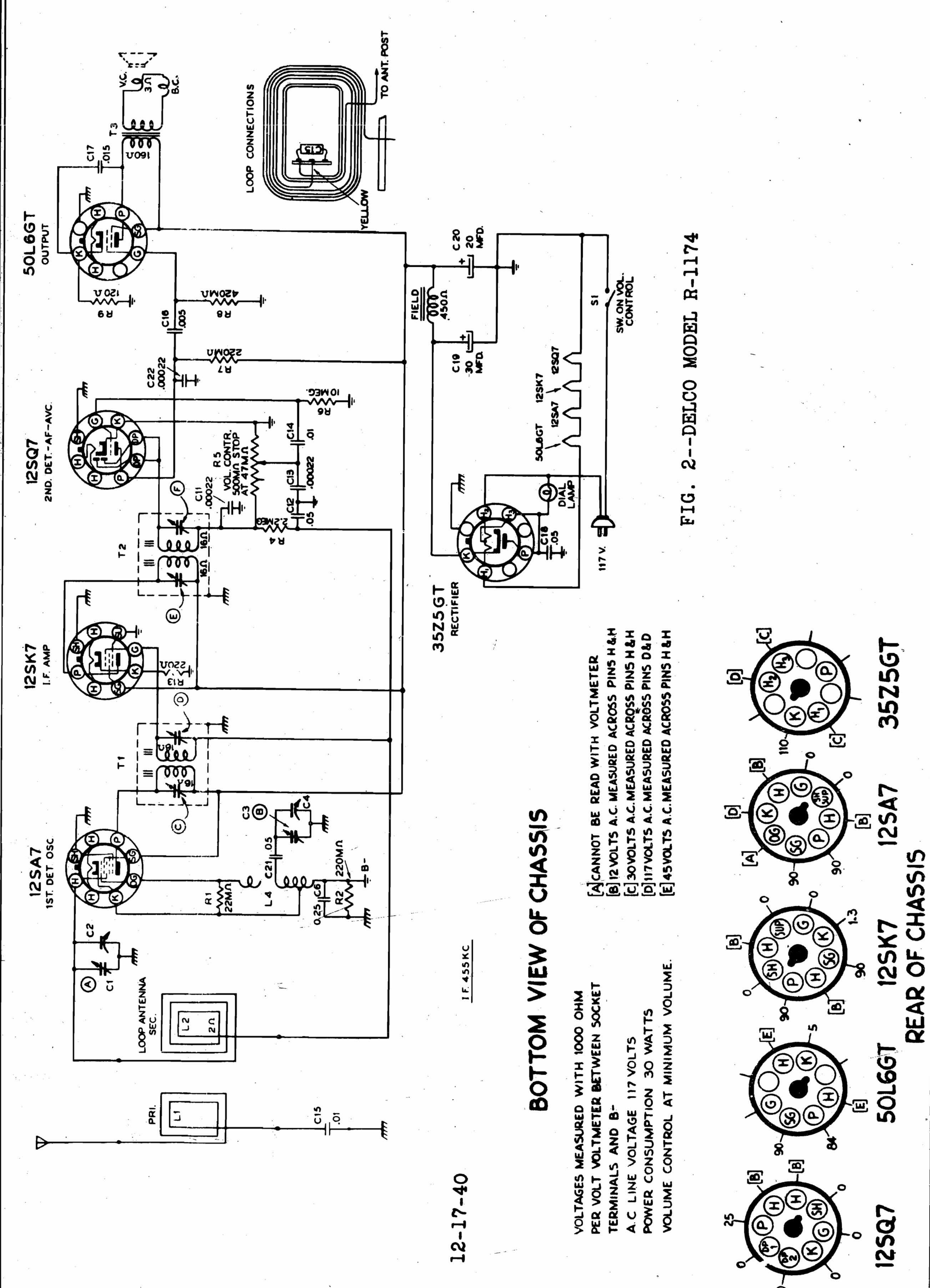


FIG. 2--DELCO MODEL R-1174

MODEL R1174 Delco

UNITED MOTORS SERVICE

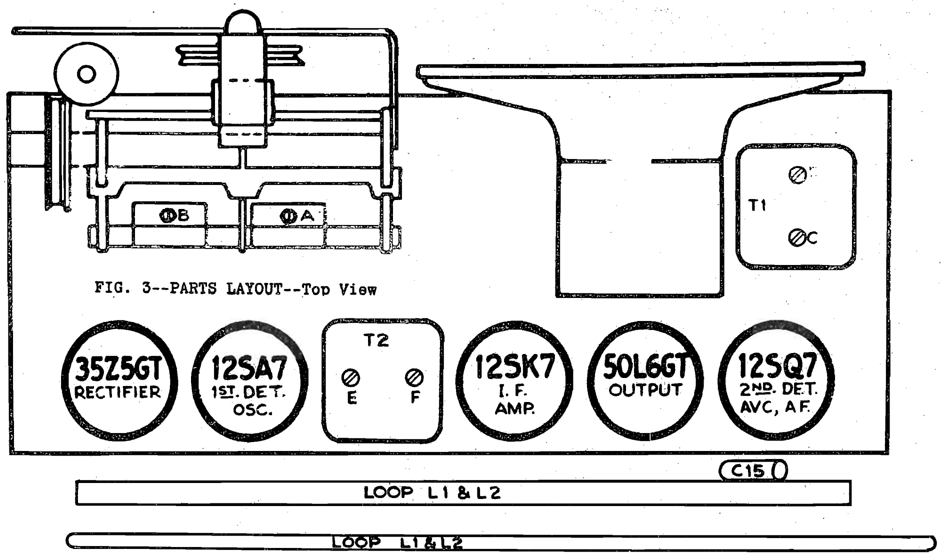


FIG. 3--PARTS LAYOUT--Top View

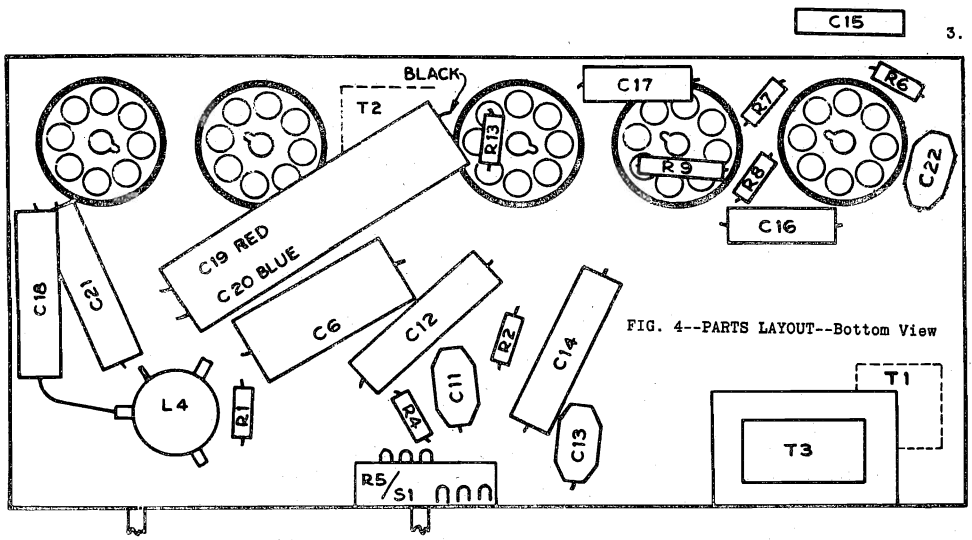


FIG. 4--PARTS LAYOUT--Bottom View

1. Aligning I-F Stages at 455 Kilocycles

   (a) Connect the ground lead of the signal generator to the chassis through a .01 mfd. capacitor.
   (b) Connect the signal lead of the signal generator to the grid terminal of the 12SK7 tube through a .01 mfd. condenser.
   (c) Connect the output meter across the primary of the output transformer.
   (d) Set the signal generator to exactly 455 KC.
   (e) Tune receiver to quiet point at 1,600 KC end of dial, set volume control full on, adjust the trimmers on the second I-F transformer (Illus. E & F, Fig. 3) for maximum output.
   (f) Connect the signal lead of the signal generator to the grid of the 12SA7 tube.
   (g) Adjust the trimmers on the first I.F. transformer (Illus. C & D., Fig. 3) for maximum output.

2. Aligning at 1600 Kilocycles

   (a) Connect the signal lead of the signal generator to the antenna terminal of the loop through 100 mmfd. capacitor.
   (b) Set signal generator to exactly 1600 KC.
   (c) Tune receiver to 1600 KC, condenser plates full clockwise (out of mesh).
   (d) Adjust oscillator trimmer condenser (Illus. B, Fig. #3) for maximum output.

3. Aligning at 1400 Kilocycles

   (a) Leave the signal lead of the signal generator connected as above.
   (b) Set the signal generator to 1400 KC.
   (c) Rotate the tuning control knob until this signal is tuned in with maximum output.
   (d) Adjust the antenna trimmer (Illus. A, Fig. #3) for maximum output.

GENERAL: The Delco Model R-1174 is a five-tube, AC-DC superheterodyne receiver with 5" electrodynamic speaker.

ANTENNA: A loop antenna is built inside the back cover of this radio and attached to the chassis. This type of antenna is somewhat directional therefore, the radio should be tried in different positions to determine the position which will produce the best reception. An antenna terminal is provided for coupling an outside antenna to the receiver.

UNITED MOTORS SERVICE — MODEL R1175 Delco

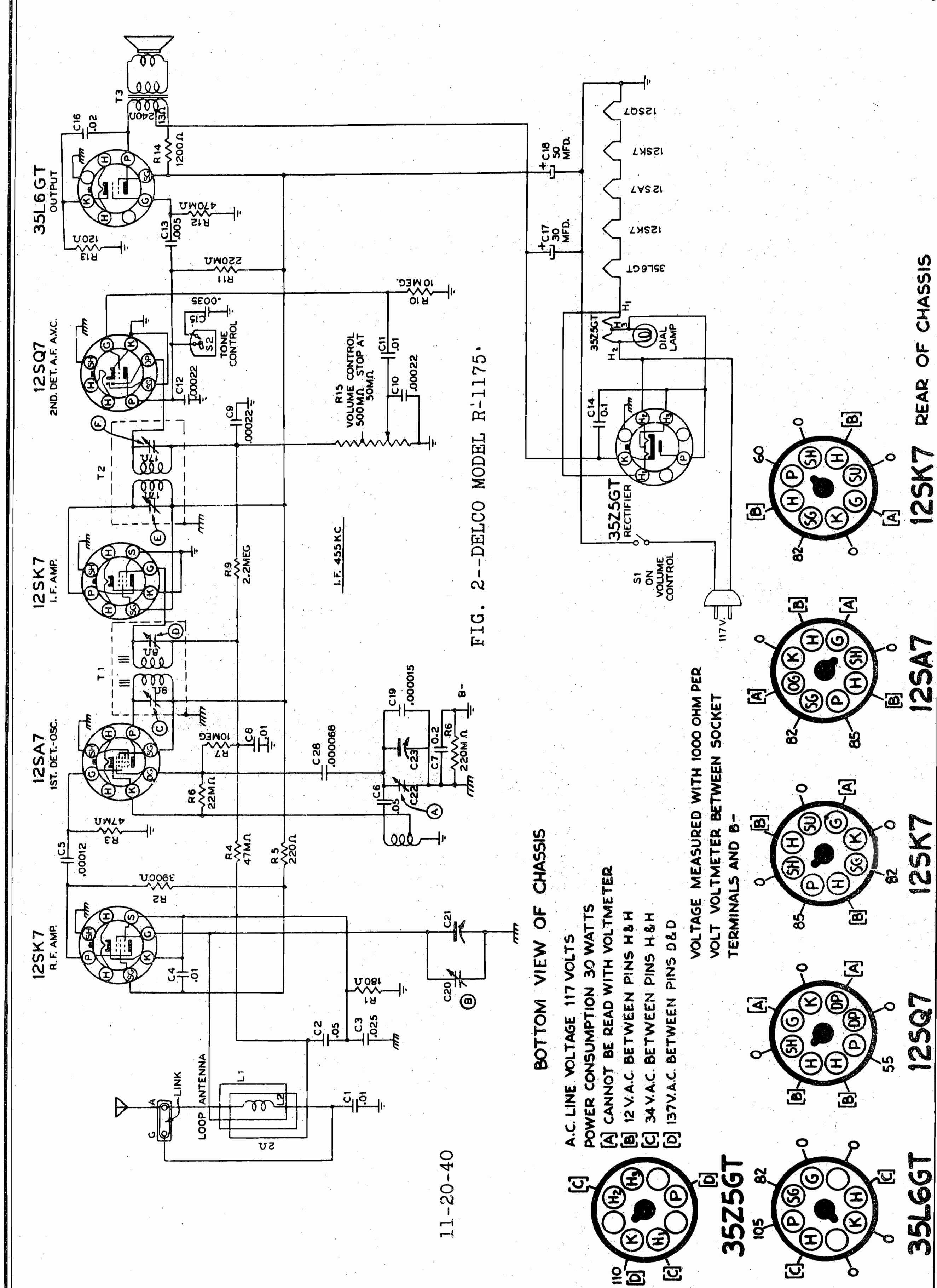


FIG. 2--DELCO MODEL R-1175.

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MODEL R1175 Delco

UNITED MOTORS SERVICE

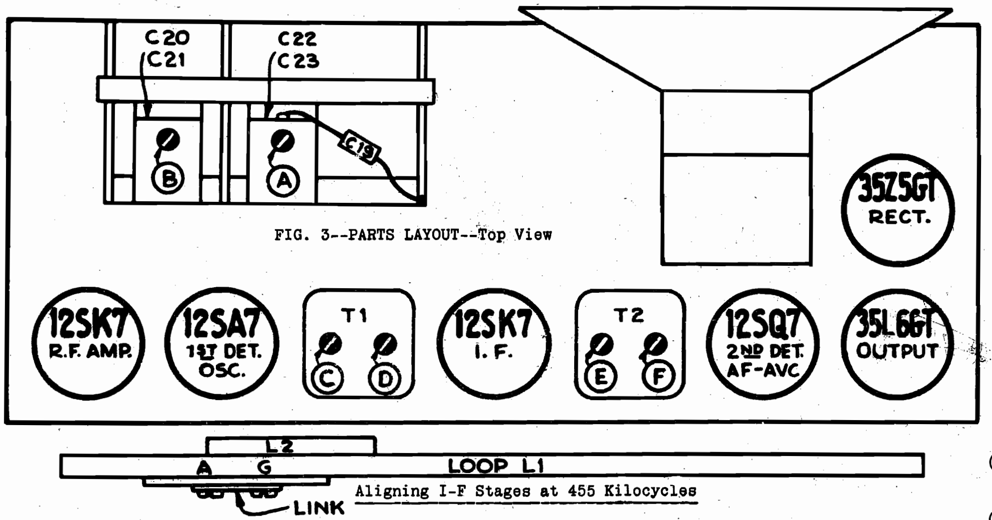

FIG. 3--PARTS LAYOUT--Top View

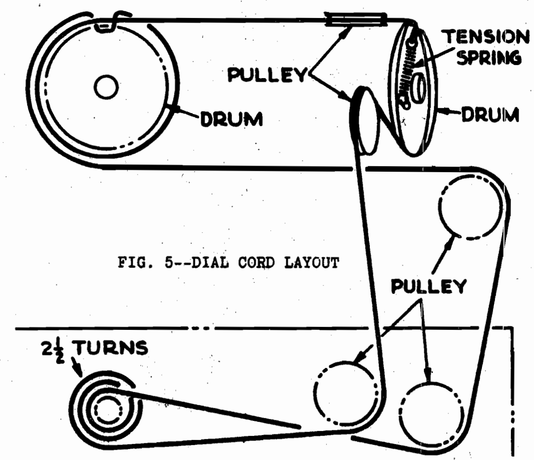

FIG. 5--DIAL CORD LAYOUT

Aligning I-F Stages at 455 Kilocycles

(a) Connect the ground lead of the signal generator to the chassis through a .01 mfd. condenser.

(b) Connect the signal lead of the signal generator to the grid terminal of the 12SK7 tube through a .01 mfd. condenser.

(c) Connect the output meter across the primary of the output transformer.

(d) Set the signal generator to exactly 455 KC.

(e) Tune the receiver to quiet point at 1600 KC end of dial, set Volume Control full on, adjust the trimmers on the second I-F transformer (Illus. E, F, Fig. #3) for maximum output.

(f) Connect the signal lead of the signal generator to the grid of the 12SA7 tube.

(g) Adjust the trimmer on the first I-F transformer (Illus. C, D, Fig. #3) for maximum output.

Aligning at 1600 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the loop through .0001 mfd. condenser.

(b) Set the signal generator to exactly 1600 KC.

(c) Tune receiver to 1600 KC. condenser plates full clockwise (out of mesh)

(d) Adjust oscillator trimmer condenser (Illus. A, Fig. 3) for maximum output.

Aligning at 1400 Kilocycles

(a) Leave the signal lead of the signal generator connected as above.

(b) Set the signal generator to 1400 KC.

(c) Rotate the tuning control knob until this signal is tuned in with maximum output.

(d) Adjust the antenna trimmer (Illus. B, Fig.3) for maximum output.

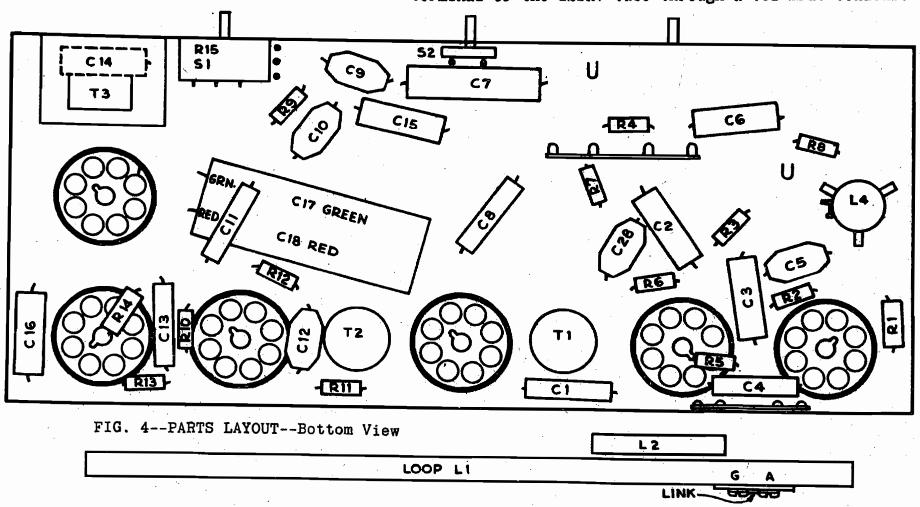

FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE

MODELS R1176,R1181
Delco

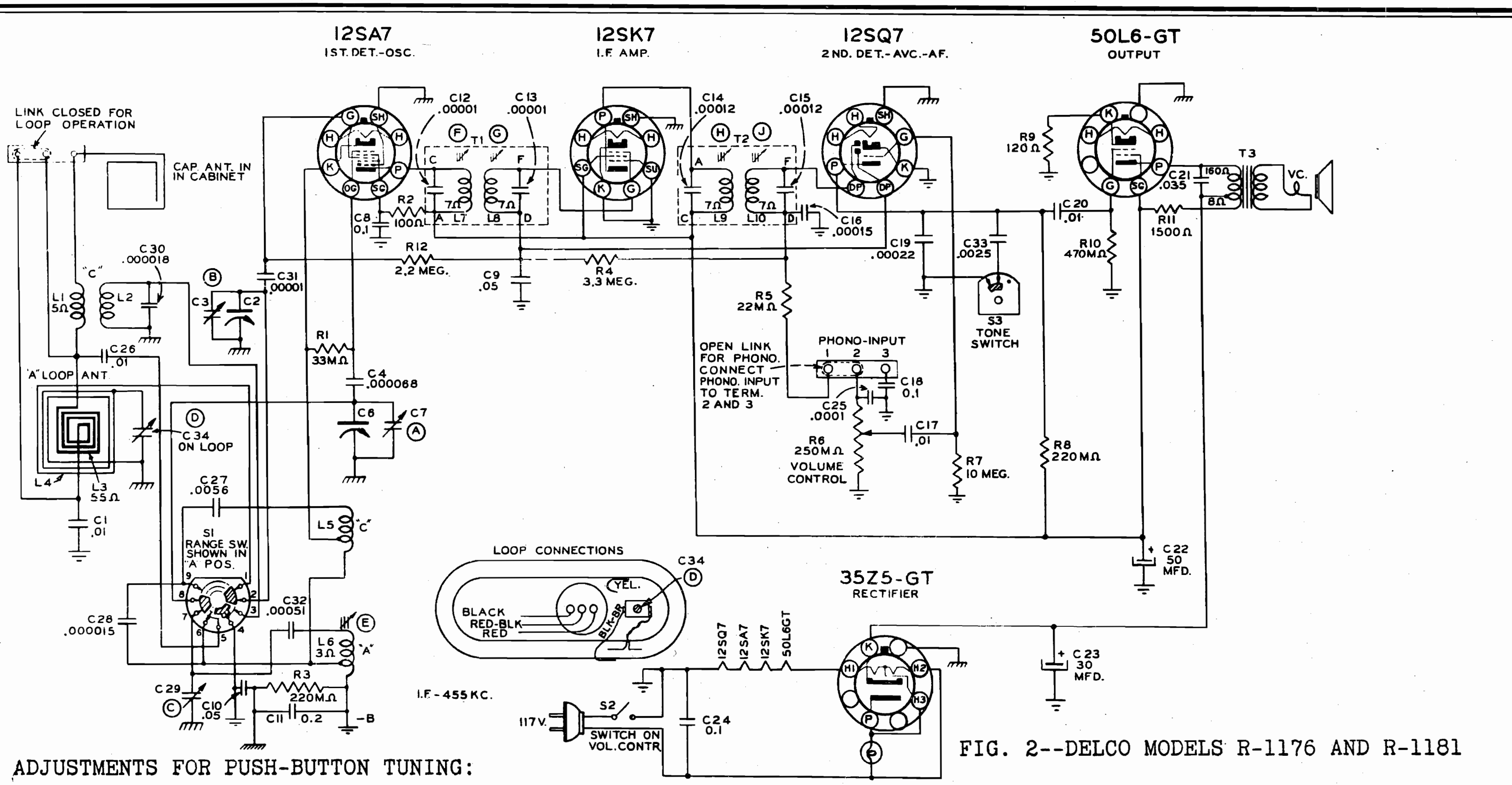

FIG. 2--DELCO MODELS R-1176 AND R-1181

ADJUSTMENTS FOR PUSH-BUTTON TUNING:

TUNER DATA ALSO FOR MODEL R1177

1. Press down on the first push button and hold it down. The screw in back of the push button is now accessible and should be loosened one or two turns with a screwdriver.
2. While still holding down the push button, tune in the station with the tuning knob. When the station is heard at its best, tighten up the screw in back of the push button. Now let go of the push button, turn the tuning knob in order to detune and again press down the button and let go. To check, repeat action.
3. Proceed to set up the other five push buttons in a similar manner.

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MODELS R1176, R1181
Delco

UNITED MOTORS SERVICE

BOTTOM VIEW OF CHASSIS

A.C. LINE VOLTAGE 117 VOLTS
VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B-
VOLUME CONTROL AT MINIMUM VOLUME

POWER CONSUMPTION 30 WATTS
[A] CANNOT BE READ WITH VOLTMETER
[B] 12 VOLTS A.C. MEASURED ACROSS PINS H&H
[C] 33 VOLTS A.C. MEASURED ACROSS PINS H&H
[D] 117 VOLTS A.C. MEASURED ACROSS PINS D&D
[E] 47 VOLTS A.C. MEASURED ACROSS PINS H&H

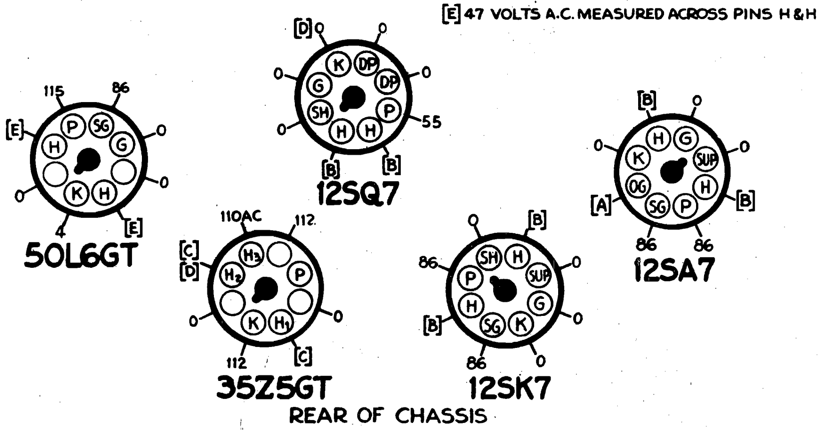

FIG. 1--TUBE SOCKET VOLTAGES

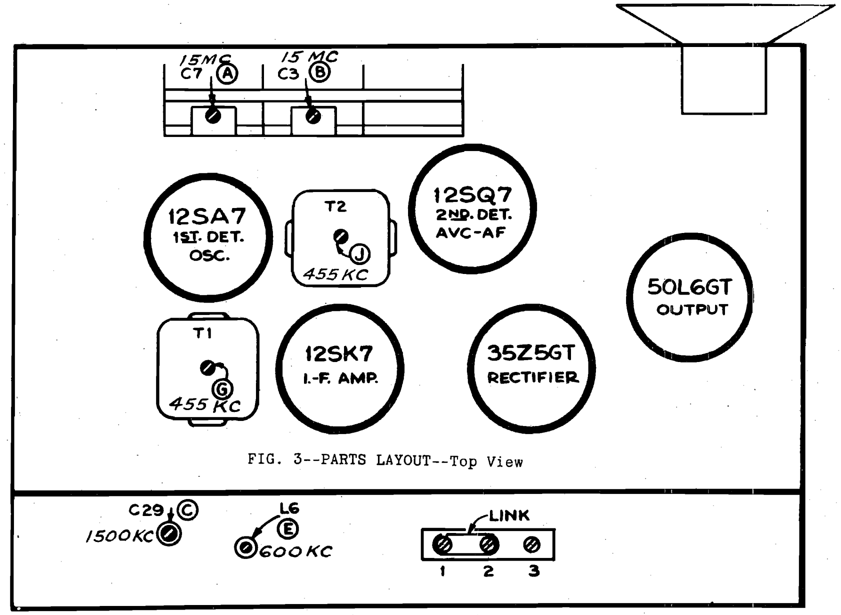

FIG. 3--PARTS LAYOUT--Top View

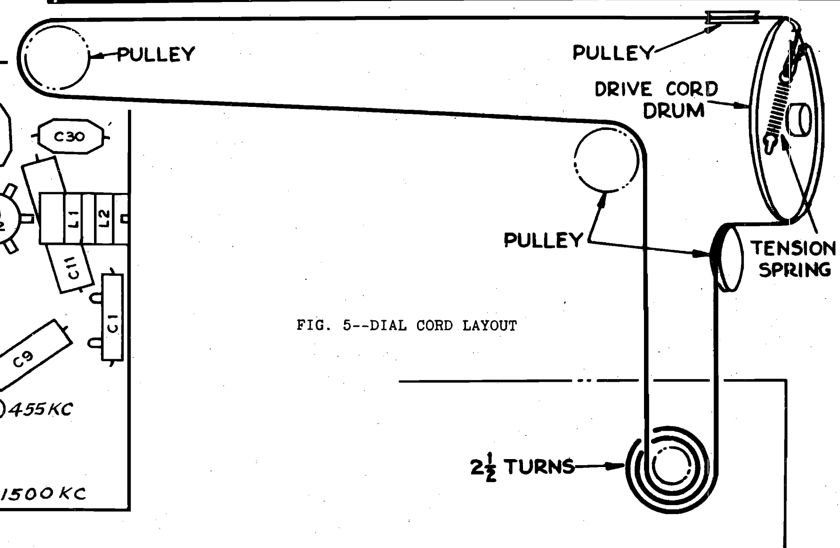

FIG. 5--DIAL CORD LAYOUT

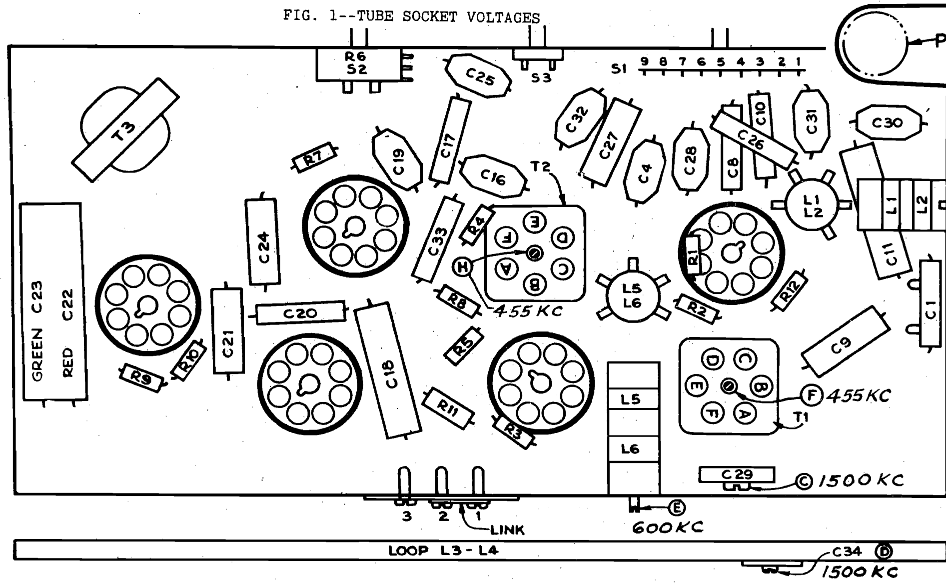

FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE

MODEL R1177 Delco

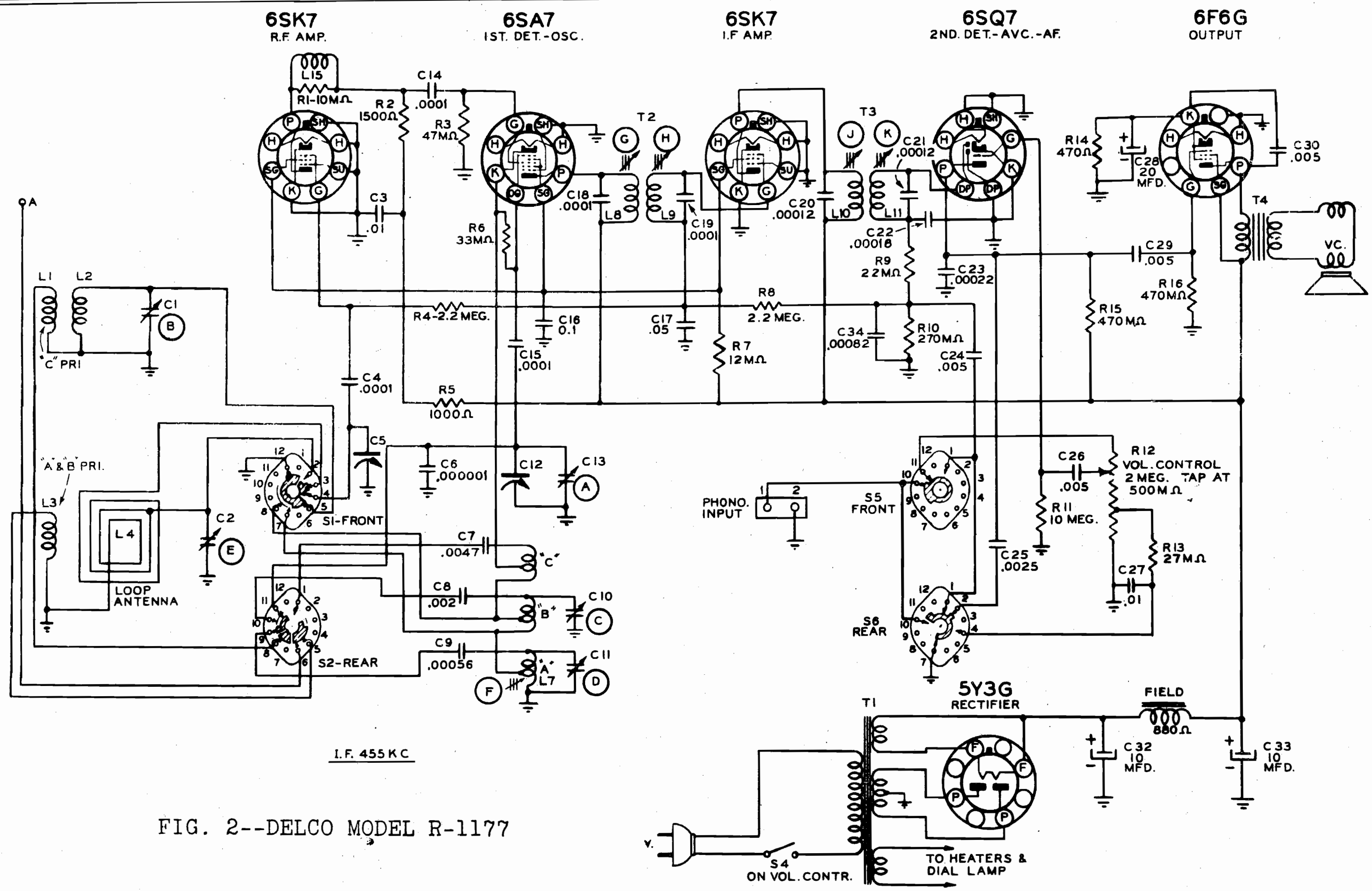

FIG. 2--DELCO MODEL R-1177

ANTENNA: A loop antenna is built inside the back of the radio. This type of antenna is somewhat directional, therefore, the radio should be tried in different positions to determine the position which will produce the best reception.

Terminals are provided for connecting an outside antenna and ground where required.

FOR TUNER
SEE INDEX

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MODEL R1177 Delco

UNITED MOTORS SERVICE

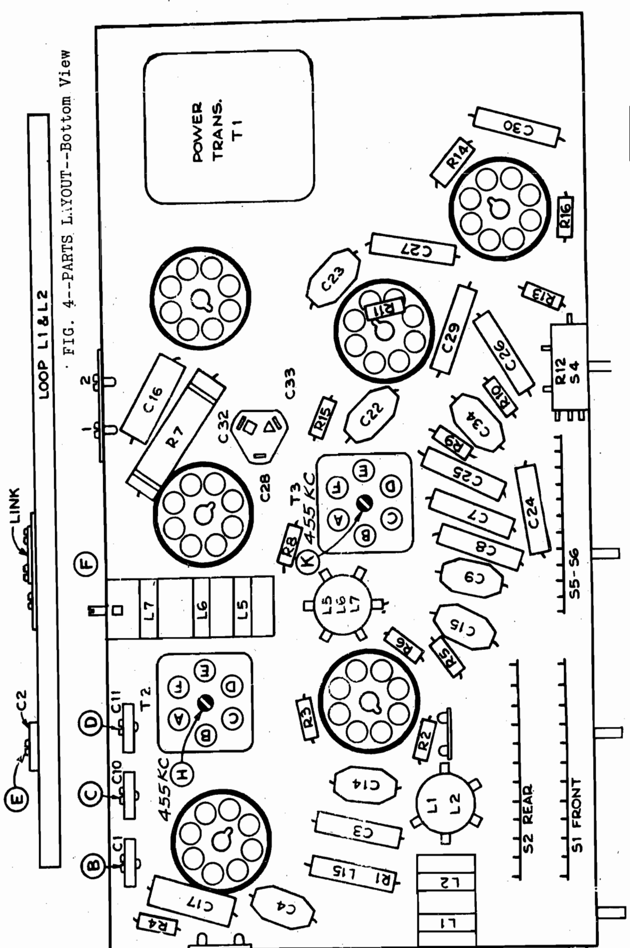


FIG. 4--PARTS LAYOUT--Bottom View

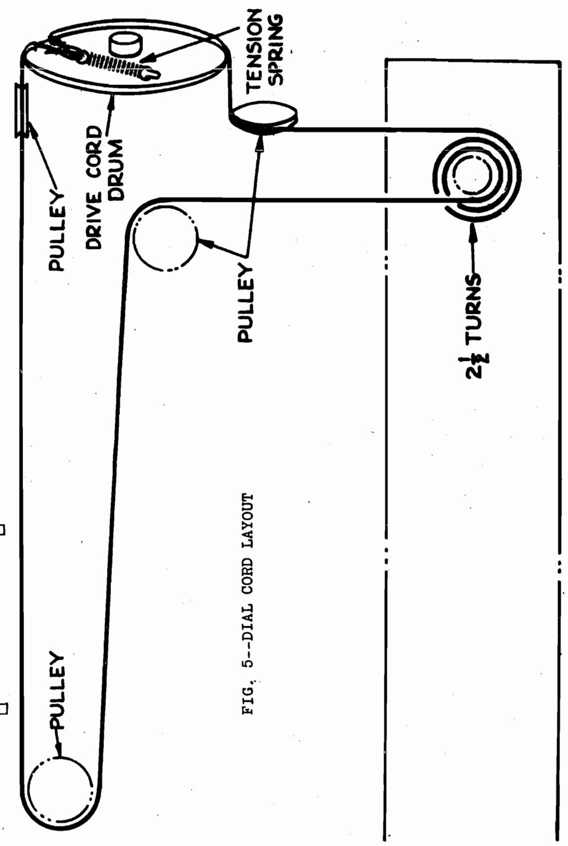
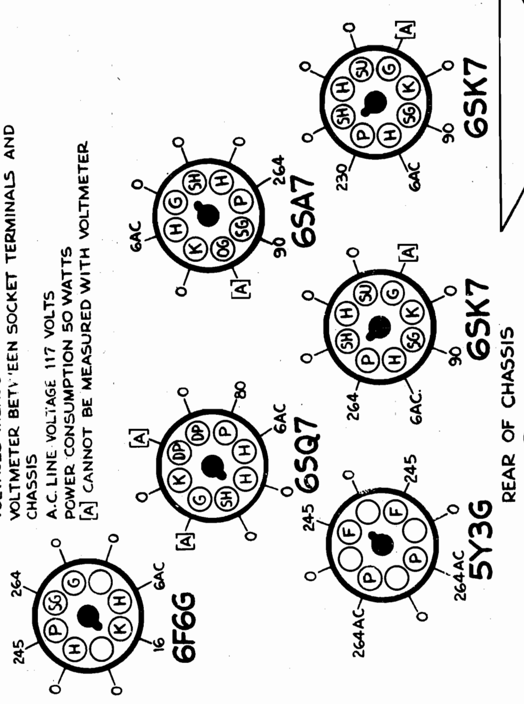


FIG. 5--DIAL CORD LAYOUT

BOTTOM VIEW OF CHASSIS

VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS
A.C. LINE VOLTAGE 117 VOLTS
POWER CONSUMPTION 50 WATTS
[A] CANNOT BE MEASURED WITH VOLTMETER



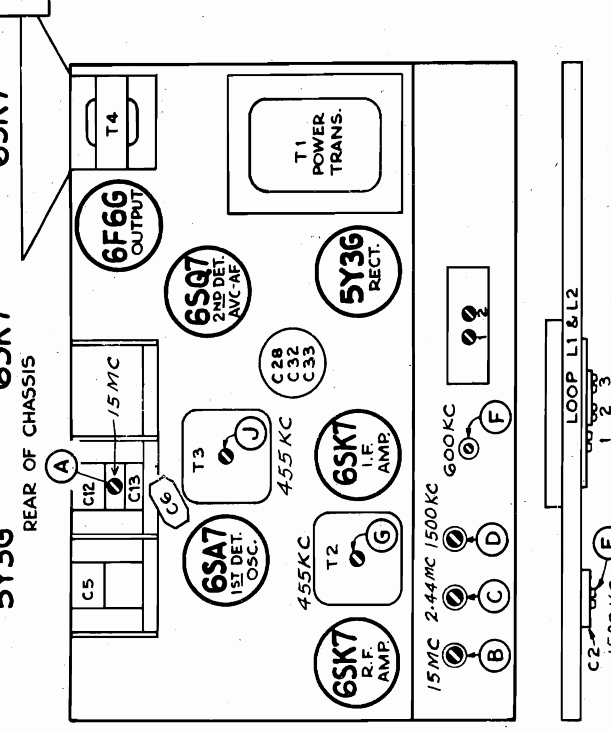


FIG. 3--PARTS LAYOUT--Top View

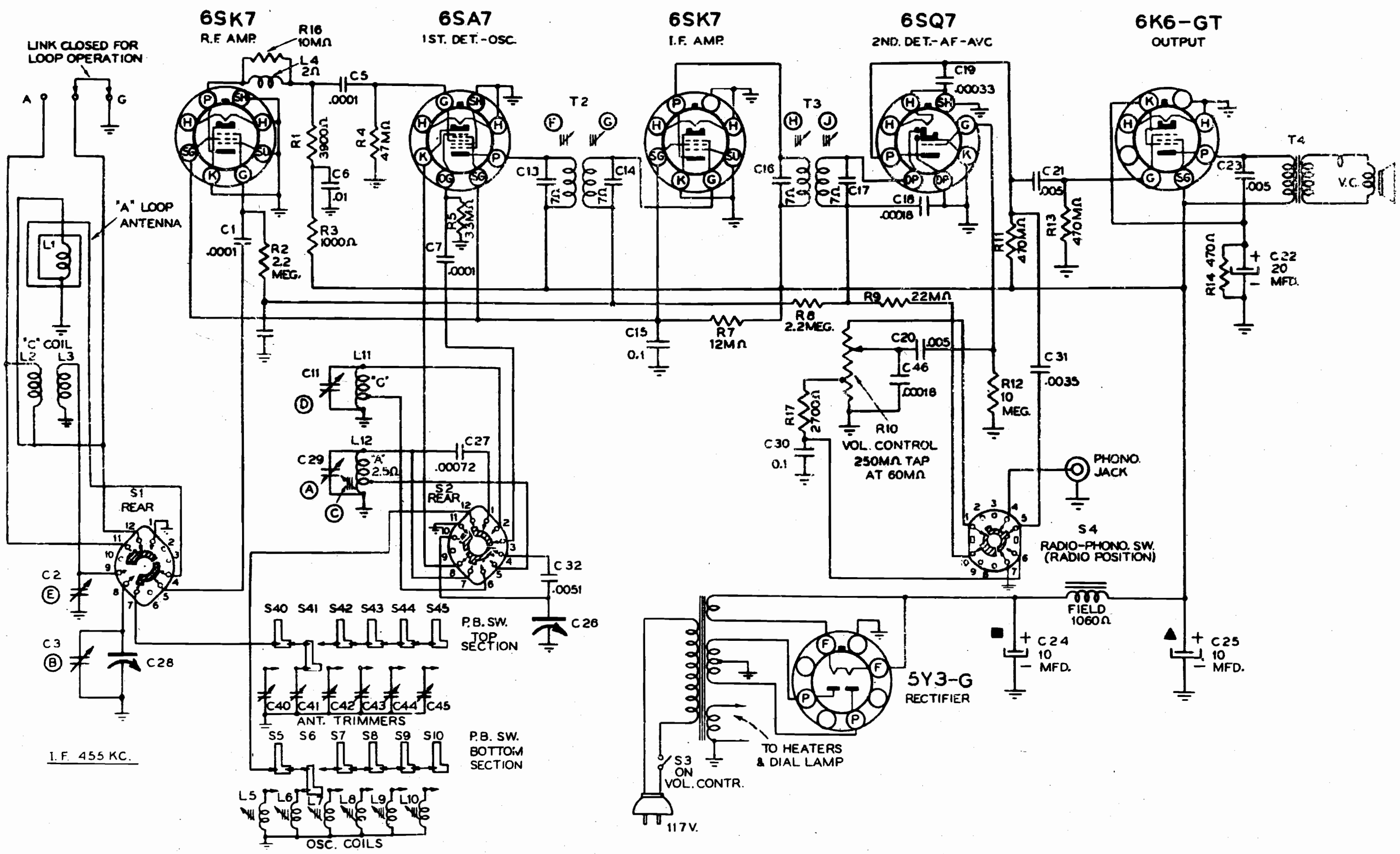


FIG. 2--DELCO MODEL R-1178 CIRCUIT DIAGRAM

PRECAUTIONARY LEAD DRESS

1. Dress 2nd I.F. leads close to chassis.
2. Dress leads from volume control and tone switch away from filaments, diode and power leads.

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MODEL R1178 Delco

UNITED MOTORS SERVICE

TUNING CONTROLS: Tuning is accomplished by means of a manual control or by means of six push buttons for electric tuning. The buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screw-driver or alignment tool. Allow at least five minutes warm-up period before making adjustments. The procedure is as follows:

1. Turn Range Control knob to "A" position, and manually tune in the station. Turn the Loop Antenna to give minimum pickup of signal, no outside antenna should be used and link on antenna board should be closed.

2. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.

3. Adjust No. 1 antenna trimmer for maximum output on this station. Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particluar station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores. Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

4. Adjust for each station in the same manner.

5. After all six stations are tunedin on the buttons, turn the loop Antenna to a position giving the best signal pickup and make a final careful adjustment of all core rods until best reception is obtained for each Outdoor antenna should now be reconnected if used.

During alignment the chassis must be removed from the cabinet along with the loop antenna. Keep the signal generator and signal generator leads as far from the loop as possible, also keep the output as low as possible to avoid a.v.c. action.

CALIBRATION SCALE ON INDICATOR-DRIVE-CORD DRUM: The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in Fig. 5.

As the first step in R-F alignment, check the position of the drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

POINTER FOR CALIBRATION SCALE: Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "O" mark on the calibration scale when the plates are fully meshed.

DIAL-INDICATOR ADJUSTMENT: After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 KC mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

1. Aligning I-F Stages at 455 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 terminal of the 6SK7 tube through a .01 mfd. condenser.
(c) Connect the output meter across the primary of the output transformer.
(d) Set the signal generator to exactly 455 KC.
(e) Tune receiver to quiet point at 1500 KC end of dial, set volume control full on, range switch to broadcast position, and adjust the trimmers on the second I.F. transformer (Illus. H. J., Fig. 3 & 4) for maximum output.
(f) Connect the signal lead of the signal generator to the grid of the 6SA7 tube.
(g) Adjust the trimmers, on the first I-F transformer (Illus. F. G., Fig. 3 & 4) for maximum output.

2. Aligning Broadcast Band at 1500 Kilocycles

(a) Connect signal lead of signal generator to antenna "A" terminal on loop, link open, through .0002 condenser. Connect a 25,000 ohm load resister across secondary of 1st I-F transformer.
(b) Set signal generator to 1500 KC.
(c) Rotate the tuning condenser to 150° on drum calibration scale.
(d) Adjust the broadcast oscillator trimmer (Illus. A., Fig. 4) to maximum output.
(e) Adjust the broadcast antenna trimmer (Illus. B., Fig. 3) to maximum output

3. Aligning Broadcast Band at 600 Kilocycles

(a) Set signal generator to 600.
(b) Rotate the tuning condenser to 30.5° on drum calibration scale.
(c) Adjust the broadcast oscillator trimmer (Illus. C., Fig. 3) while rocking the condenser-gang back and forth until maximum output is obtained.

4. Repeat steps 2 and 3 above for maximum output.

5. Aligning Shortwave Band at 15 M.C.

(a) Connect signal lead of signal generator to antenna "A" terminal on loop, link open, through .00005 mfd. condenser.
(b) Remove 25,000 ohm load resistor.
(c) Set signal generator to 15 M.C.
(d) Rotate tuning condenser to 147° on drum calibration scale.
(e) Adjust the short wave oscillator trimmer (Illus. D., Fig. 4) for maximum output. Use MINIMUM capacity peak if two peaks can be obtained.
(f) Adjust the short wave antenna trimmer (Illus. E., Fig. 4) for maximum output.

UNITED MOTORS SERVICE

MODEL R1178 Delco

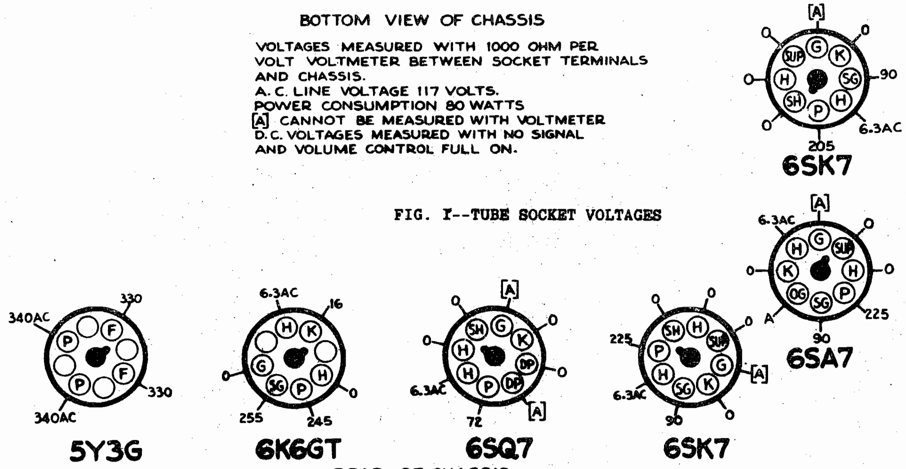

FIG. 1--TUBE SOCKET VOLTAGES

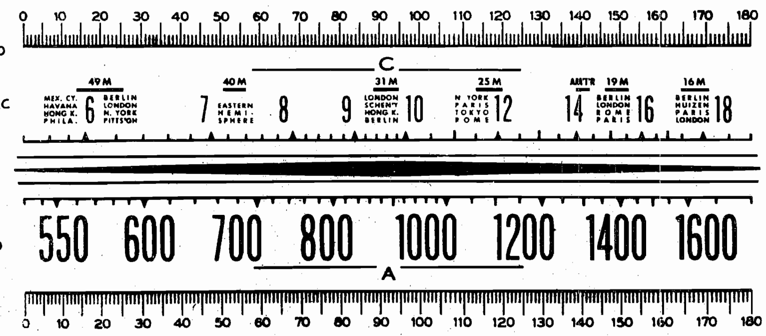

FIG. 5--DIAL CALIBRATION

REAR OF CHASSIS

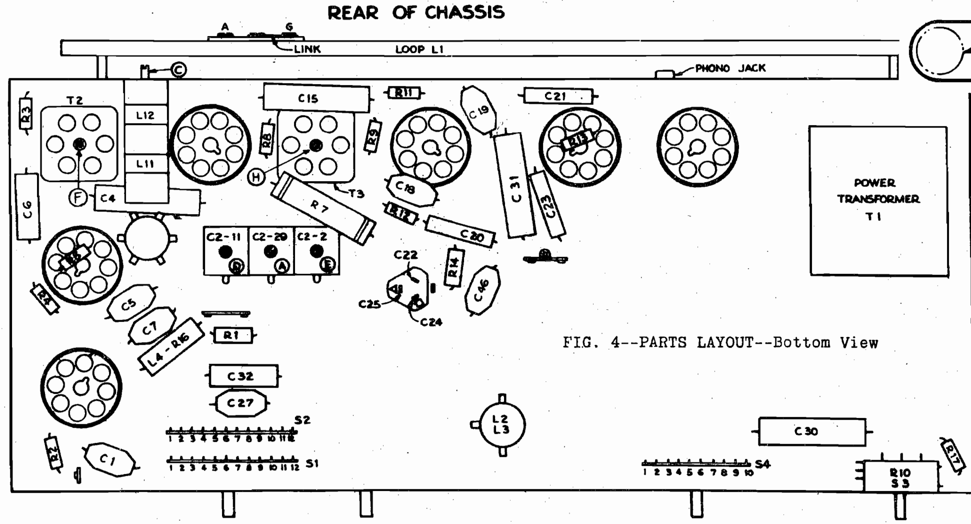

FIG. 4--PARTS LAYOUT--Bottom View

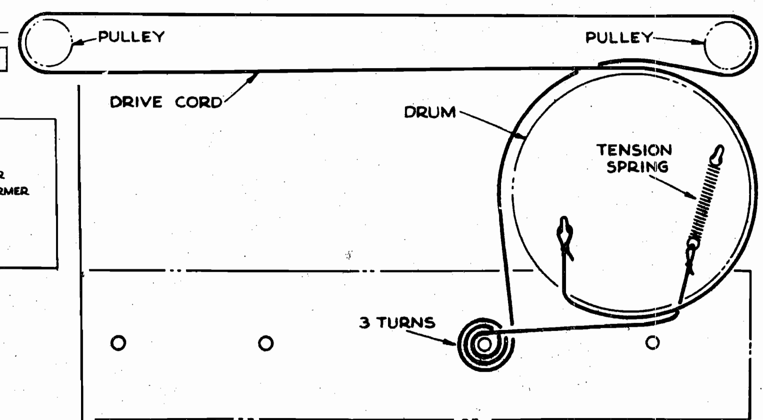

FIG. 6--DIAL CORD LAYOUT

MODEL R1178 Delco

UNITED MOTORS SERVICE

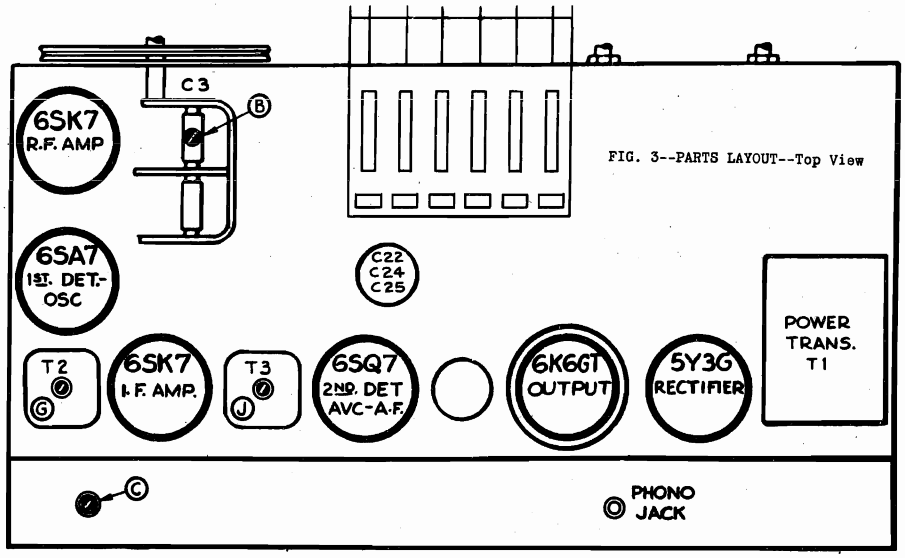

FIG. 3--PARTS LAYOUT--Top View

Illus. No.	Service Part No.	Description
L1	1214671	Antenna loop
L2	1214662	Antenna "C" band
L3	"	Antenna "C" band
L4	Incl. in R16	
L5	1214673	Oscillator "PB"
L6	"	Oscillator "PB"
L7	"	Oscillator "PB"
L8	"	Oscillator "PB"
L9	"	Oscillator "PB"
L10	1214785	Oscillator "PB" low frequency
L11	1214670	Oscillator
L12	"	Oscillator
C1	1210275	.0001 mfd. molded
C2	1214670	Trimmer
C11	"	Trimmer
C29	"	Trimmer
C3	1214677	Variable tuning
C26	"	Variable tuning
C28	"	Variable tuning
C4	7230592	.05 mfd. 600 V. tubular
C5	1210275	.0001 mfd. molded
C6	1208600	.01 mfd. 600 V. tubular
C7	1210275	.0001 mfd. molded
C13	Incl. in T2	.0001 mfd. molded
C14	Incl. in T2	.0001 mfd. molded
C15	1207908	.1 mfd. 400 V. tubular
C16	Incl. in T3	.00012 mfd. molded
C17	Incl. in T3	.00012 mfd. molded
C18	1215294	.00018 mfd. molded
C19	7232957	.00033 mfd. molded
C20	7230912	.005 mfd. 800 V. tubular
C21	7230912	.005 mfd. 800 V. tubular
C22	1214676	20 mfd. 25 V. elect.
C24	"	10 mfd. 450 V. elect.
C25	"	10 mfd. 450 V. elect.
C23	7230912	.005 mfd. 800 V. tubular
C27	1215297	.00072 mfd. silvered mica
C30	1207908	.1 mfd. 400 V. tubular
C31	7232954	.0035 mfd. 700 V. tubular
C32	1215298	.0051 500 V. tubular
C40	1214674	Trimmer
C41	"	Trimmer
C42	"	Trimmer

Illus. No.	Service Part No.	Description	
C43	"	Trimmer	
C44	"	Trimmer	
C45	"	Trimmer	
C46	1215294	.00018 mfd. molded	
R1	1214546	3,900 ohms 1/2 watt ins.	
R2	1211164	2 megohms 1/2 watt ins.	
R3	1211035	1,000 ohms 1/2 watt ins.	
R4	1210116	50,000 ohms 1/2 watt ins.	
R5	1213845	33,000 ohms 1/2 watt ins.	
R7	1214659	12,000 ohms 3 watt ins.	
R8	1211164	2 megohms 1/2 watt ins.	
R9	1210882	20,000 ohms 1/2 watt ins.	
R10	1214667	Volume	
S3	"	110 V. power	
R11	1210470	500,000 ohms 1/2 watt ins.	
R12	1214761	10 megohm 1/2 watt ins.	
R13	1210470	500,000 ohms 1/2 watt ins.	
R14	1211021	500 ohms 1 watt ins.	
R16	1214660	10,00 ohms 1/2 watt ins. (incl. L4)	
R17	1211049	2700 ohms 1/2 watt ins.	
S1	1214669	Switch	Band change
S2	"	Switch	Band change
S4	1214668	Switch	Tone control
S5	1214675	Switch	Push button
S6	"	Switch	Push button
S7	"	Switch	Push button
S8	"	Switch	Push button
S9	"	Switch	Push button
S10	"	Switch	Push button
S40	1214675	Switch	Push button
S41	"	Switch	Push button
S42	"	Switch	Push button
S43	"	Switch	Push button
S44	"	Switch	Push button
S45	"	Switch	Push button
T1	1214786	Transformer	25 cycle 110 V. power
T1	1214666	Transformer	50-60 cycle 110 V. power
T2	1214629	Coil assy.	1st I.F.
T3	1214630	Coil assy.	2nd I.F.
T4	1214678	Transformer	Output
	1214514	Speaker	12" dynamic

CHASSIS MISCELLANEOUS PARTS

Part No.	Item	Description
7241702	Cord	Dial drive (60" length)
1214672	Core	Adjustable core and stud for P.B. oscillator coils
1214663	Core	Adjustable core and stud for oscillator coil
1214664	Drum	Dial drive
1214683	Indicator	Dial pointer
51	Lamp	6-8 volt (Mazda #51)

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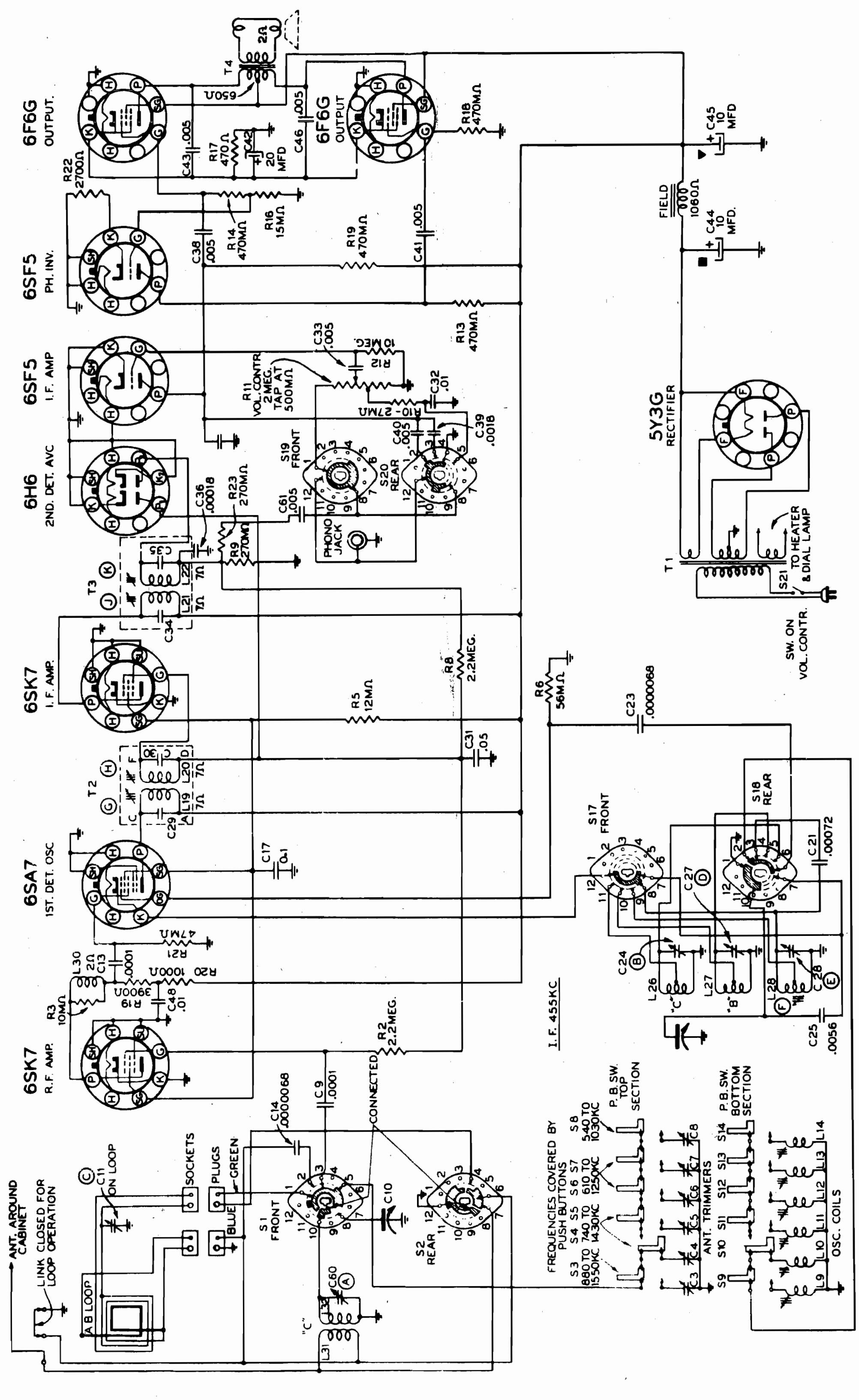
MODEL R1179 Delco



IF PEAK 455 KC

PRECAUTIONARY LEAD DRESS

1. Dress 2nd I. F. leads close to chassis.
2. Dress leads from volume control and tone switch away from filaments, diode and power leads.
3. Dress .005 mfd. (C33) volume control condenser away from electrolytic.

12-16-40

MODEL R1179 Delco

UNITED MOTORS SERVICE

As the first step in R-F alignment, check the position of the drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

POINTER FOR CALIBRATION SCALE: Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

DIAL-INDICATOR ADJUSTMENT: After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 KC mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

1. Aligning I-F Stages at 455 Kilocycles

(a) Connect the ground lead of the signal generator to the chassis.
(b) Connect the output meter from plate to plate of the 6F6G output tubes.
(c) Connect the signal lead of the signal generator to the control grid of the 6SA7 tube through a .01 mfd. condenser.
(d) Turn the band switch to the broadcast position, the tone control on high and the volume control on full.
(e) Set the signal generator to exactly 455 kilocycles.
(f) Adjust the trimmers on the I-F coils (Illus. G,H,J,K, Figs. 3 & 4) for maximum output.

2. Aligning short wave band at 16 M.C.

(a) Connect signal lead of signal generator to antenna terminal "A" on rear of chassis through a .00005 mfd. condenser. Leave ground lead connected to receiver chassis.
(b) Change the band switch to the short wave (C) position.
(c) Set the signal generator to 16 M.C.
(d) Rotate the tuning condenser plates to 155° on drum calibration scale.
(e) Adjust the short wave oscillator trimmer (Illus. B., Fig. 4) for maximum output.
(f) Adjust the short wave antenna trimmer (Illus. A, Fig. 4) for maximum output. Use minimum capacity peak if two peaks can be obtained.

3. Aligning Middle wave Band at 2.44 Megacycles

(a) Connect signal lead of signal generator to antenna section of gang condenser through 300 ohm resistor. Leave ground lead connected to receiver chassis.
(b) Change the band switch to the middle wave position (B).
(c) Set the signal generator to 2.44 megacycles.
(d) Rotate the tuning condenser plate to 97° on drum calibration scale.
(e) Adjust the middle wave oscillator trimmer (Illus. D, Fig. 4) for maximum output. Use minimum capacity peak if two peaks can be obtained.

4. Aligning Broadcast Band at 1,500 Kilocycles

(a) Set Band switch to the broadcast position.
(b) Rotate the tuning condenser plates to 160° on drum calibration scale.
(c) Adjust the broadcast oscillator trimmer (Illus. E., Fig. 4) for maximum output. Use minimum capacity peak if two peaks can be obtained.

5. Aligning Broadcast Band at 600 Kilocycles

(a) Set signal generator to 600 kilocycles.
(b) Rotate the tuning condenser plates to 30° on drum calibration scale.
(c) Adjust the broadcast oscillator trimmer (Illus. F, Fig. 3) (rocking gang) until maximum output is obtained.

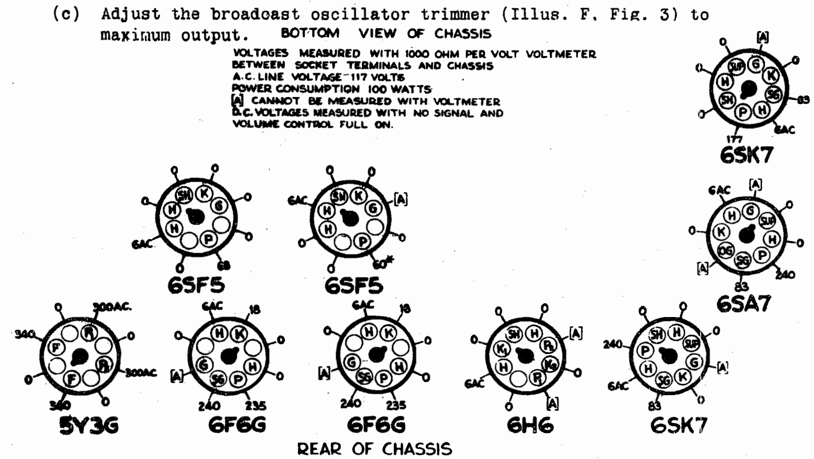
Note: Fasten chassis in cabinet. Connect loop, see that link is closed on the antenna board, attach dial indicator to drive cord, with indicator at 540 KC mark and gang at maximum capacity.

6. Aligning Broadcast Band at 1,500 Kilocycles

(a) Connect a radiation loop to signal generator consisting of two turns of wire 18 inches in diameter and locate the generator and loop 4 to 6 ft. from receiver.
(b) Set signal generator to 1,500 KC.
(c) Rotate the tuning condenser plates to 160° on drum calibration scale.
(d) Adjust the broadcast antenna trimmer on loop to maximum output.

7. Aligning Broadcast Band at 600 Kilocycles

(a) Set signal generator to 600 KC.
(b) Rotate the tuning condenser plates to 30° on drum calibration scale.
(c) Adjust the broadcast oscillator trimmer (Illus. F. Fig. 3) to maximum output.



UNITED MOTORS SERVICE

MODEL R1179 Delco

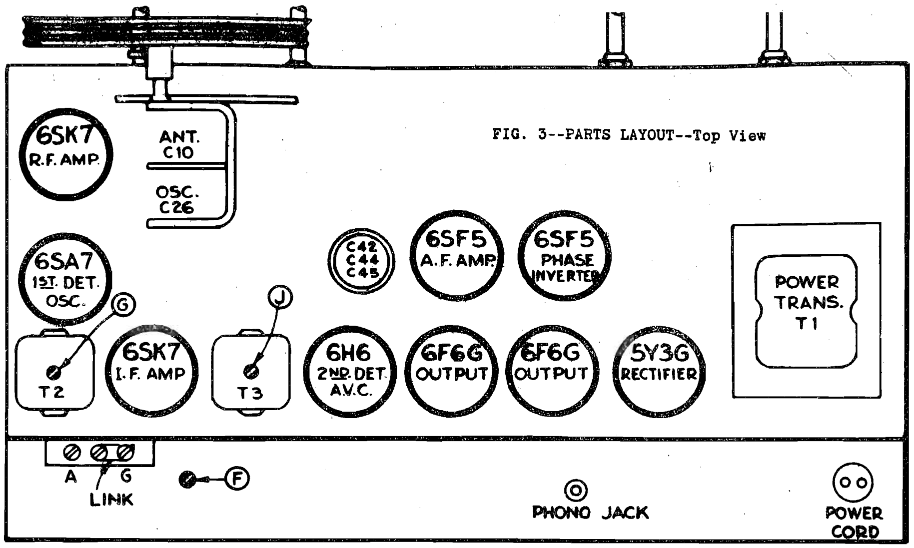


FIG. 3--PARTS LAYOUT--Top View

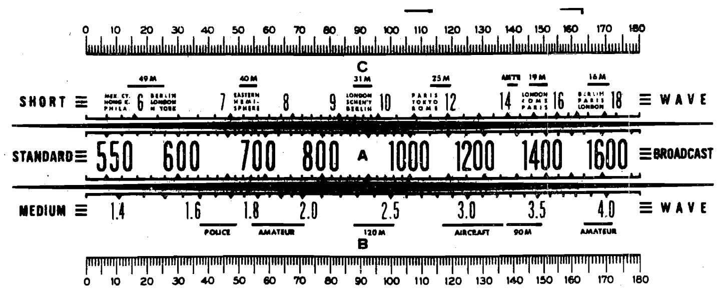


FIG. 5--DIAL CALIBRATION

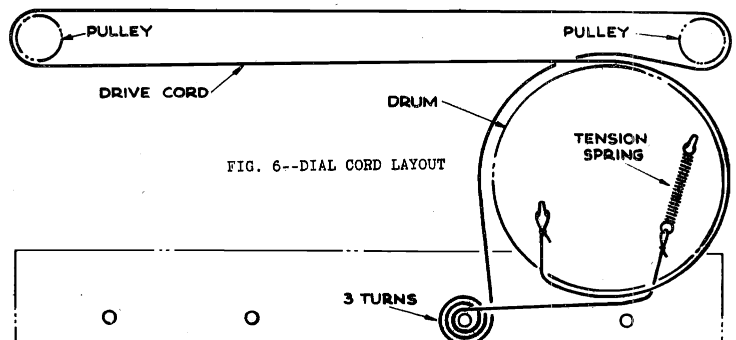


FIG. 6--DIAL CORD LAYOUT

CALIBRATION SCALE ON INDICATOR-DRIVE-CORD DRUM: The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in Fig. 5.

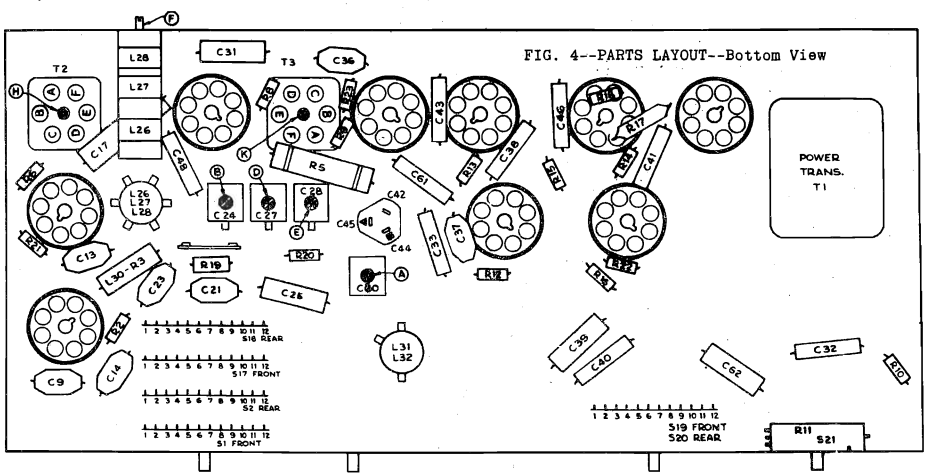


FIG. 4--PARTS LAYOUT--Bottom View

1. Turn Range Control knob to "A" position, and manually tune in the station. Turn the Loop Antenna to give minimum pickup of signal, no outside antenna should be used and link on antenna board should be closed.

2. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.

3. Adjust No. 1 antenna trimmer for maximum output on this station. Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores. Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

4. Adjust for each station in the same manner.

5. After all six stations are tuned-in on the buttons, turn the Loop Antenna to a position giving the best signal pickup and make a final careful adjustment of all core rods until best reception is obtained for each. Outdoor antenna should now be reconnected if used.

MODEL R1180 Delco

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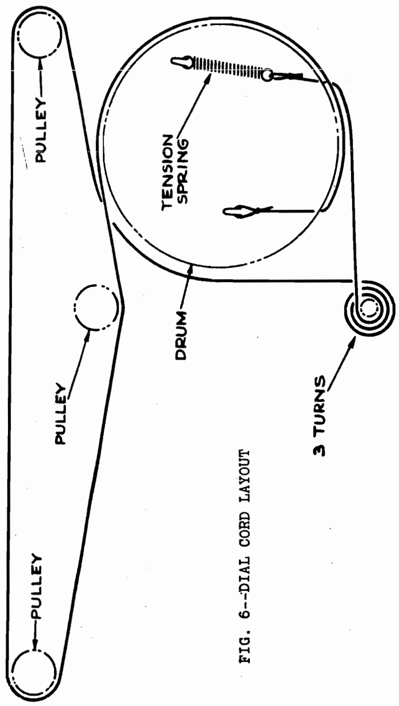


FIG. 6--DIAL CORD LAYOUT

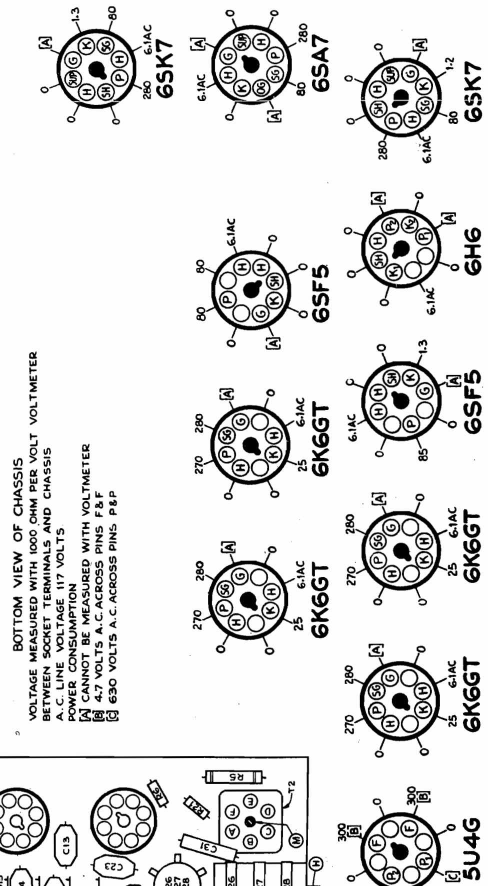


FIG. 1--TUBE SOCKET VOLTAGES

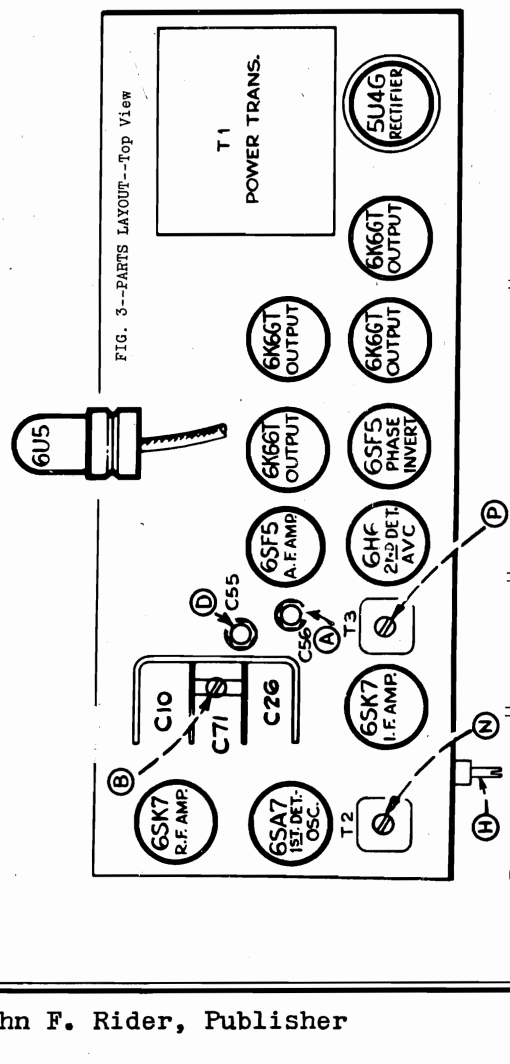


FIG. 3--PARTS LAYOUT--Top View

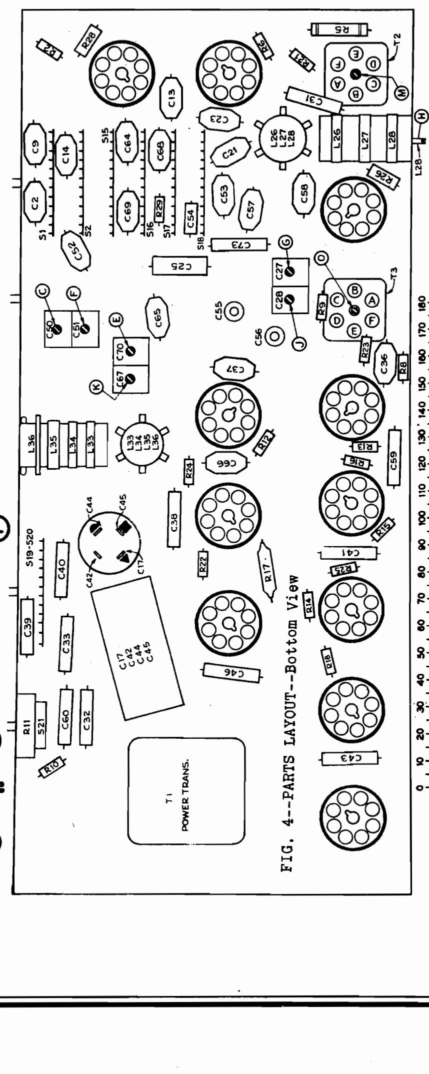


FIG. 4--PARTS LAYOUT--Bottom View

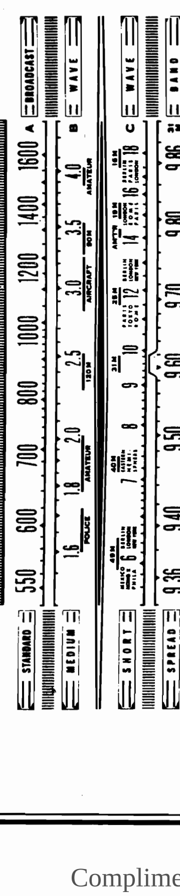
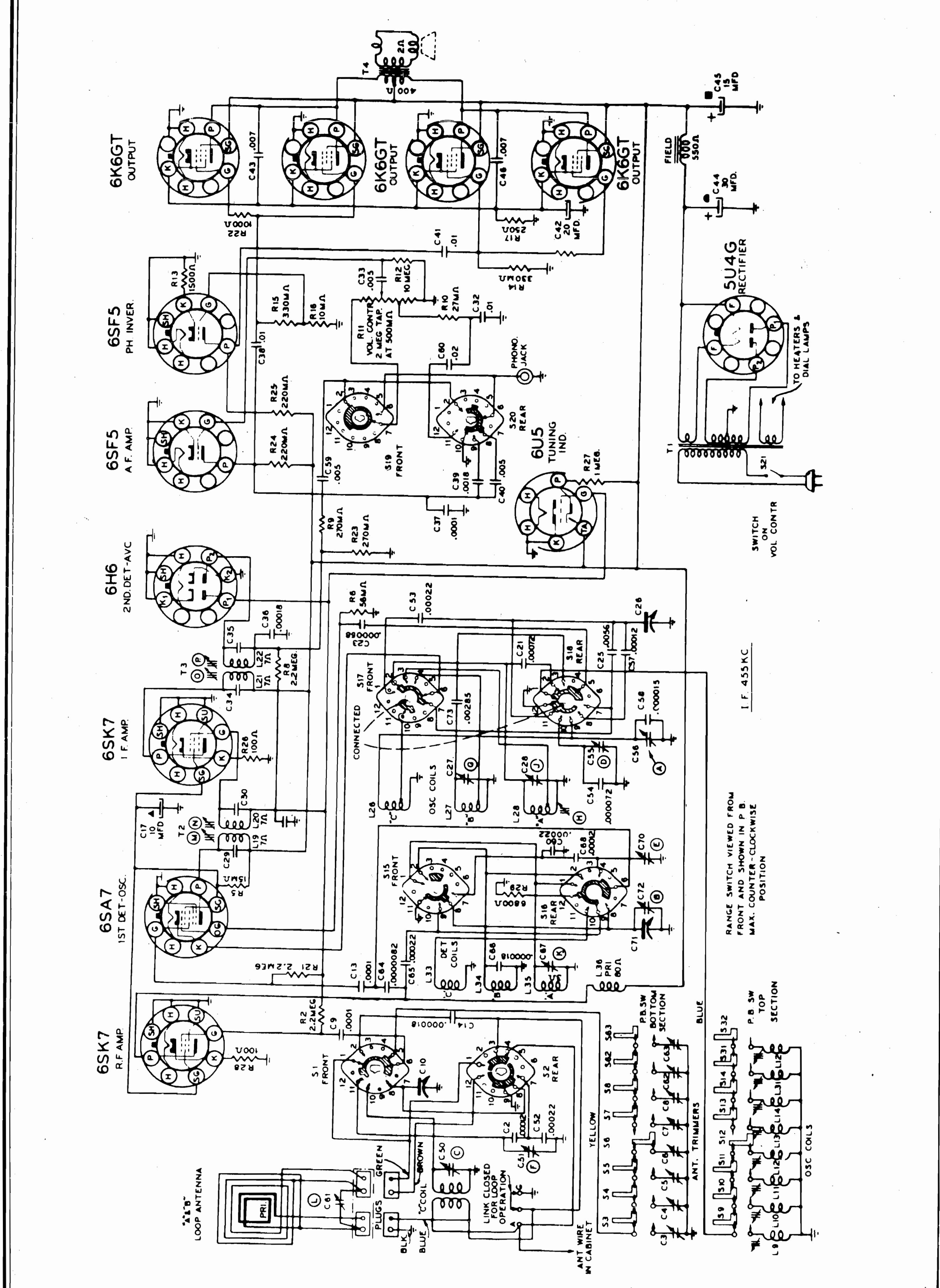


FIG. 5--DIAL CALIBRATION

UNITED MOTORS SERVICE

MODEL R1180 Delco



MODEL R1180 Delco

UNITED MOTORS SERVICE

TUNING CONTROLS: Tuning is accomplished by means of a manual control or by means of six push buttons for electric tuning. The buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screw-driver or alignment tool. Allow at least five minutes warm-up period before making adjustments. The procedure is as follows:

1. Turn Range Control knob to "A" position, and manually tune in the station. Turn the Loop Antenna to give minimum pickup of signal, no outside antenna should be used and link on antenna board should be closed.

2. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.

3. Adjust No. 1 antenna trimmer for maximum output on this station. Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores. Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

4. Adjust for each station in the same manner.

5. After all six stations are tuned-in on the buttons, turn the Loop Antenna to a position giving the best signal pickup and make a final careful adjustment of all core rods until best reception is obtained for each. Outdoor antenna should now be reconnected if used.

During alignment the chassis must be removed from the cabinet but the loop may be left in cabinet and must be connected to the receiver. Keep the signal generator and signal generator leads as far from the loop as possible, also keep the output as low as possible to avoid A.V.C. action.

CALIBRATION SCALE ON DRIVE-CORD DRUM: The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore, a calibration scale is attached to the drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment procedure.

As the first step in R-F alignment check the position of the drive drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

To determine the corresponding frequency for any setting of the calibration scales, refer to Fig. 5 which shows the dial with 0-180° calibration scales drawn at top and bottom.

POINTER FOR CALIBRATION SCALE: Improvise a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

DIAL-INDICATOR ADJUSTMENT: After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 KC mark, and the gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

SPREAD-BAND ALIGNMENT: Make final adjustment of "D", "E" and "F" "31-meter" trimmers during actual reception of a station of known frequency near 9.5 megacycles.

1. Aligning I-F Stages at 455 Kilocycles

(a) Connect the ground lead of the signal generator to the chassis.
(b) Connect the output meter across the primary of the output transformer.
(c) Connect the signal lead of the signal generator to the grid of the 6SK7 I-F tube through a 0.1 mfd. condenser.
(d) Set the signal generator to exactly 455 KC.
(e) With the band switch in the "C" band position, the volume control on full and the radio tuned to a quiet point at 18 M.C. end of dial, adjust the trimmers on the second I-F coils (Illus. O, P Fig. 3 & 4) for maximum output.
(f) Connect the signal lead of the signal generator to the grid of the 6SA7 tube.
(g) Adjust the trimmers on first I-F coil (Illus. M, N Fig. 3 & 4) for maximum output.

2. Aligning at 15 M.C.

(a) Connect the signal lead of the signal generator to the antenna terminal of the receiver (link on terminal closed) in series with a .00005 mfd. condenser.
(b) Connect the ground lead of the signal generator to the ground terminal of the receiver.
(c) Set the signal generator to 15 M.C.
(d) With the band switch in the "C" position, rotate the tuning condenser plates to 145° on drum calibration scale.
(e) Adjust "C" band oscillator trimmer (Illus. A, Fig. 3) for maximum output. Use MINIMUM capacity peak if two peaks can be obtained.
(f) Adjust "C" band detector trimmer (Illus. B, Fig. 3) for MAXIMUM output. Use MAXIMUM capacity peak if two peaks can be obtained.
(g) Adjust "C" band antenna trimmer (Illus. C, Fig. 4) for maximum output. Use MAXIMUM capacity peak if two peaks can be obtained.

3. Aligning "31" Meter Band at 9.5 M.C.

(a) Connect signal lead of signal generator as above.
(b) Change the band switch to "31" meter band position.
(c) Set generator to 9.5 M.C.
(d) Rotate the tuning condenser plates to 64° on drum calibration scale.
(e) Adjust "31-meter" oscillator trimmer (Illus. D, Fig. 3) to maximum output. Use MINIMUM capacity peak if two peaks can be obtained.
(f) Adjust "31-meter" detector trimmer (Illus. E, Fig. 4) to maximum output.
(g) Adjust "31-meter" Antenna trimmer (Illus. F, Fig. 4) to maximum output. Rock in trimmers E and F.

4. Aligning at 2.44 M.C.

(a) Conect signal lead of signal generator to GREEN lead of loop antenna plug in series with 300 ohm resistor.
(b) Change Band switch to "B" position.
(c) Set signal generator to 2.44 M.C.
(d) Rotate the tuning condenser plates to 90° on drum calibration scale.
(e) Adjust "B" band oscillator trimmer (Illus. G, Fig. 4) to maximum output.

5. Aligning at 600 KC.

(a) Connect signal lead of signal generator as above.
(b) Change band switch to broadcast "A" position.
(c) Set signal generator to 600 KC.
(d) Rotate the tuning condenser plates to 30° on drum calibration scale.
(e) Adjust the broadcast oscillator trimmer (Illus. H, Fig. 3 & 4) while rocking the condenser gang back and forth until maximum output is obtained.

6. Aligning at 1500 KC.

(a) Connect signal lead of signal generator as above.
(b) Set signal generator to 1500 KC.
(c) Rotate the tuning condenser plates to 159° on drum calibration scale.
(d) Adjust broadcast oscillator trimmer (Illus. J, Fig 4) to maximum output.
(e) Adjust broadcast detector trimmer (Illus. K, Fig 4) to maximum output.

7. Repeat Operations 4 and 5

NOTE: Fasten chassis in cabinet, close antenna link, adjust indicator to dial scale.

8. Aligning at 1500 KC.

(a) Connect a radiation loop to signal generator consisting of two turns of wire 18 inches in diameter and locate the generator and loop 4 to 6 feet from receiver.
(b) Set signal generator to 1500 KC.
(c) Rotate the tuning condenser plates to 159° on drum calibration scale.
(d) Adjust the broadcast antenna trimmer "L" (on loop) to maximum output.

9. Aligning at 600 KC.

(a) Set signal generator to 600 KC. connection as above.
(b) Rotate the tuning condenser plates to 30° on drum calibration scale.
(c) Adjust the broadcast oscillator trimmer (Illus. H, Fig. 3 & 4) to maximum output.

10. Repeat operations 8 and 9

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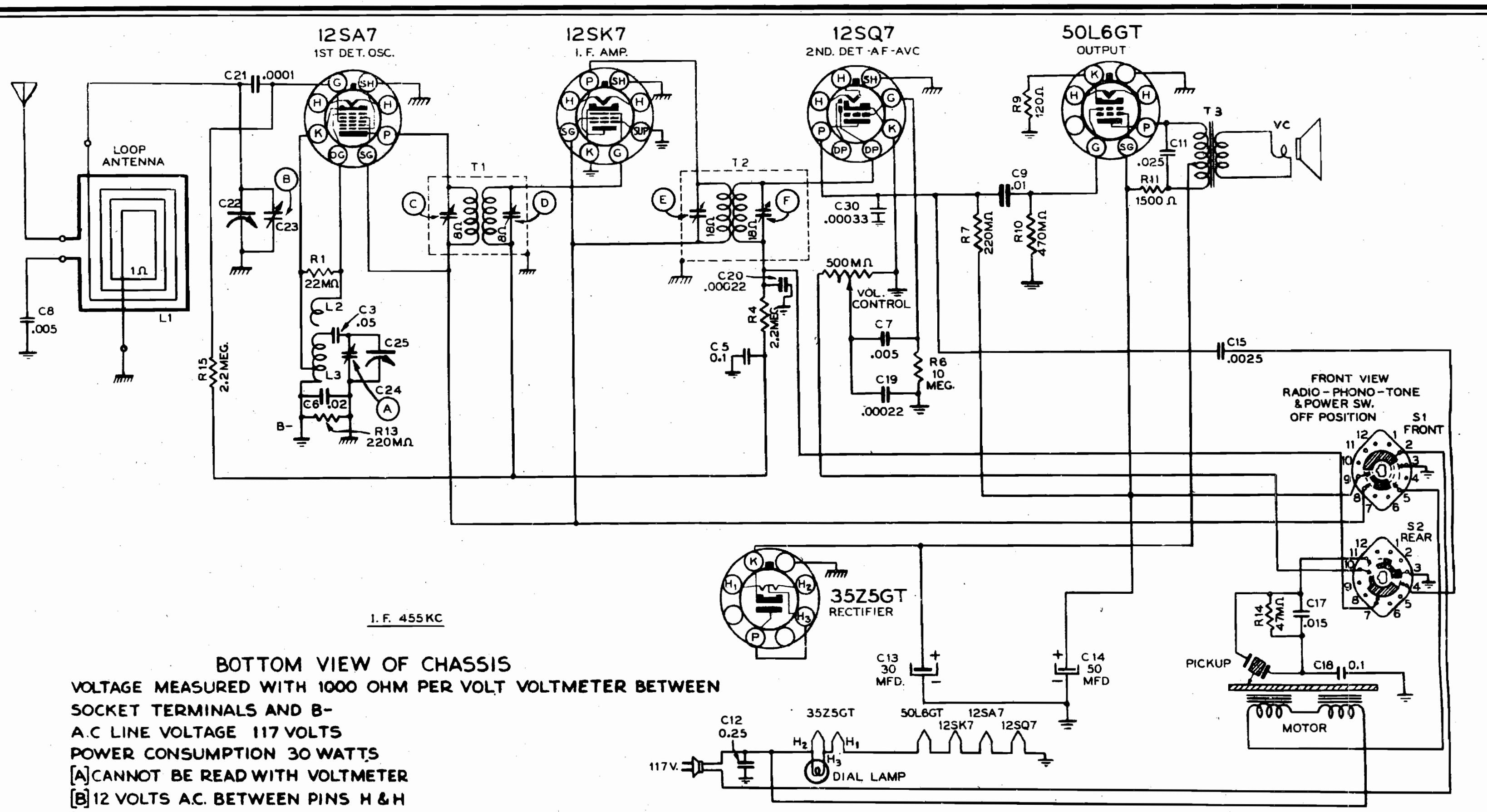
MODEL R1185 Delco



BOTTOM VIEW OF CHASSIS

VOLTAGE MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND B-

A.C LINE VOLTAGE 117 VOLTS

POWER CONSUMPTION 30 WATTS

[A] CANNOT BE READ WITH VOLTMETER

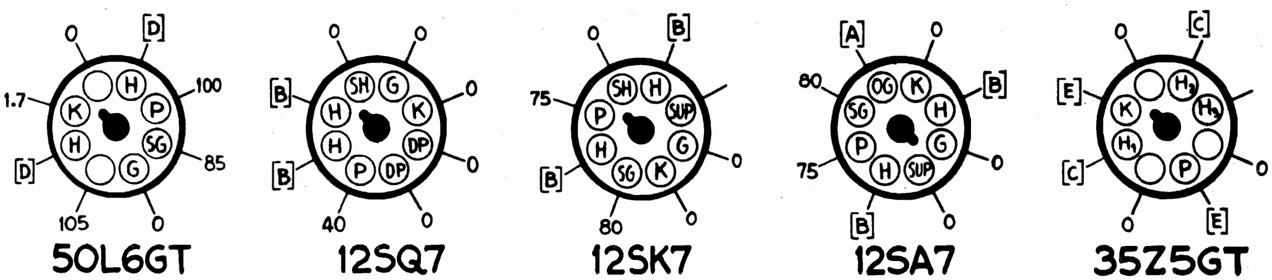
[B] 12 VOLTS A.C. BETWEEN PINS H & H

[C] 29 VOLTS A.C. BETWEEN PINS H & H

[D] 45 VOLTS A.C. BETWEEN PINS H & H

[E] 125 VOLTS A.C. BETWEEN PINS E & E

12-5-40



REAR OF CHASSIS

UNITED MOTORS SERVICE

PHONOGRAPH MOTOR: The phonograph motor is of the self starting synchronous type and operates the turntable through friction drive between the motor drive spindle and the rubber tired idler on the rim of the turntable.

The motor should be lubricated once or twice a year by placing a few drops of S.A.E. 20 oil on the turntable spindle and saturating the felt oil retaining pads on the motor shaft.

CAUTION: The motor drive spindle and the rubber tire on the idler must be kept clean and entirely free from oil and grease at all times.

POWER SUPPLY: Although this model employs an AC-DC chassis, it is not suitable for use on DC., as this would damage the motor.

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly adjusted only with the use of a test oscillator or signal generator and an output meter.

1. Aligning I-F Stages at 455 Kilocycles

(a) Connect the ground lead of the signal generator to the chassis through a .01 mfd. condenser, and keep the output as low as possible.
(b) Connect the signal lead of the signal generator to the grid terminal of the 12SK7 tube through a .01 mfd. condenser.
(c) Connect the output meter across the primary of the output transformer.

(d) Set the signal generator to exactly 455 KC.
(e) Tune the receiver to quiet point at 1600 KC end of dial, set Volume Control full on, adjust the trimmers on the second I-F transformer (Illus. E, F, Fig. 3) for maximum output.
(f) Connect the signal lead of the signal generator to the grid of the 12SA7 tube.
(g) Adjust the trimmers on the first I-F transformer (Illus. C, D, Fig. 3) for maximum output.

2. Aligning at 1560 Kilocycles

(a) Connect the signal lead of the signal generator to the antenna terminal of the loop through .0001 mfd. condenser.
(b) Set signal generator to exactly 1560 KC.
(c) Tune receiver to 1560 KC., adjust oscillator trimmer condenser (Illus. A, Fig. 3) for maximum output.

3. Aligning at 1300 Kilocycles

(a) Leave the signal lead of the signal generator connected as above.
(b) Set the signal generator to 1300 KC.
(c) Rotate the tuning control knob until this signal is tuned in with maximum output.

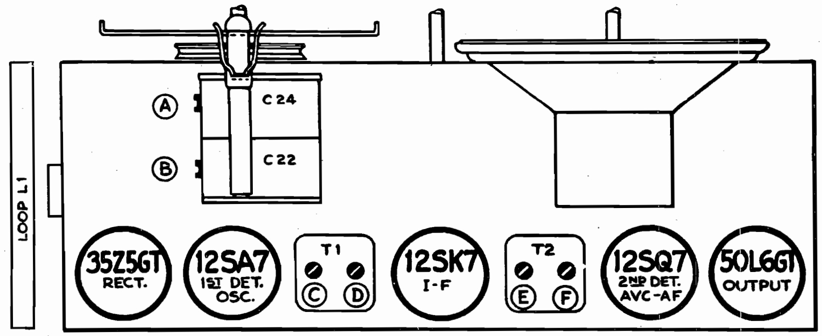


FIG. 3--PARTS LAYOUT--Top View

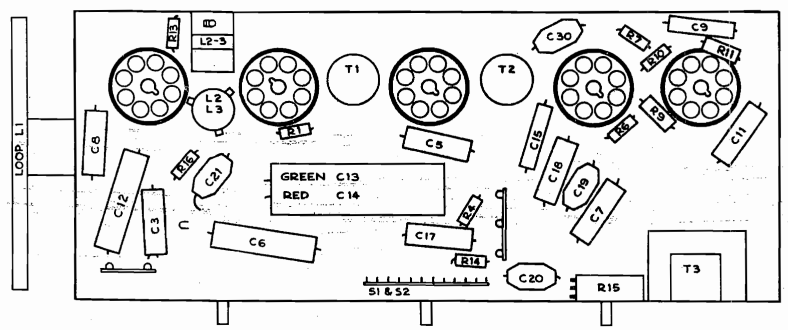


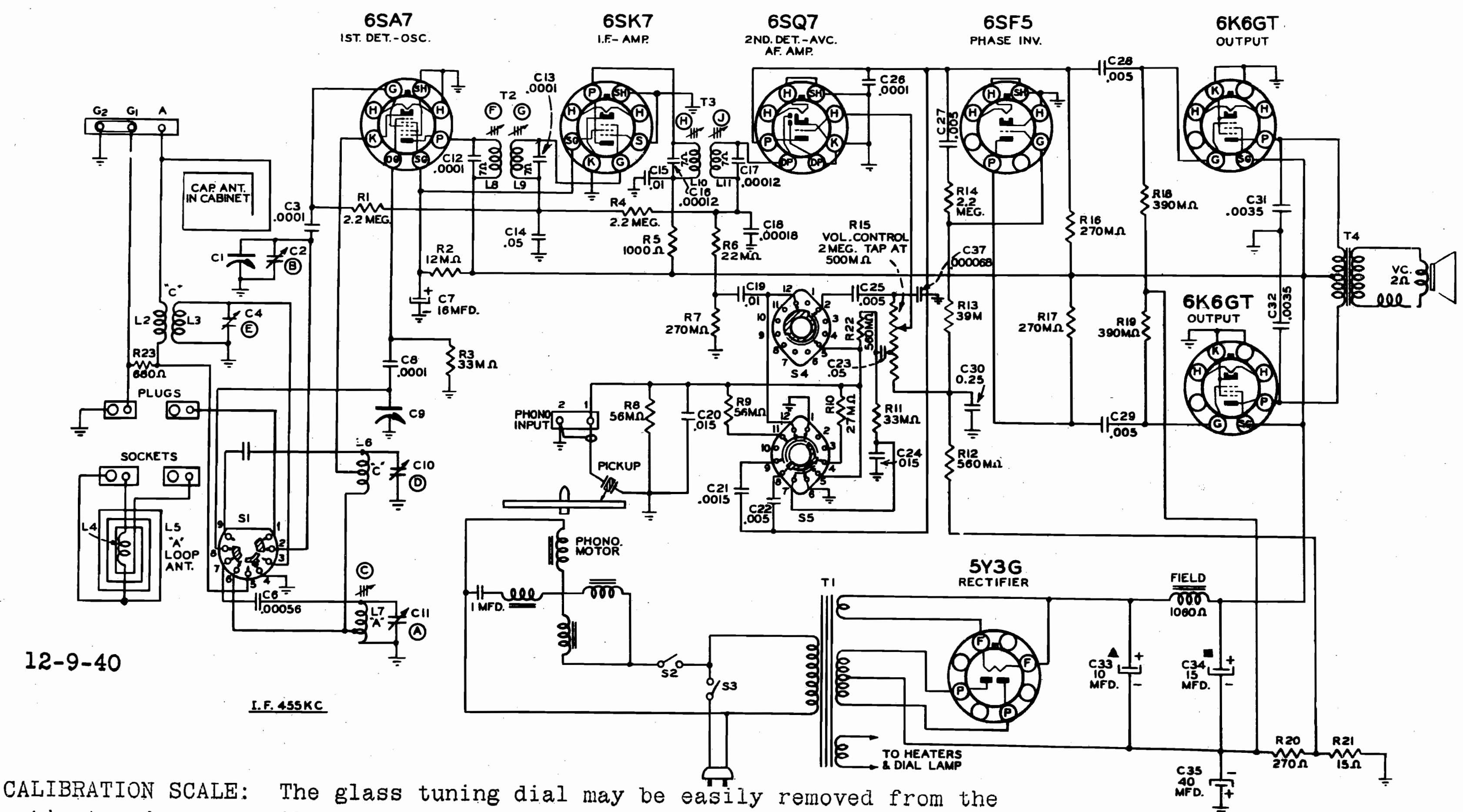
FIG. 4--PARTS LAYOUT--Bottom View

(d) Adjust the antenna trimmer (Illus. B, Fig. 3) for maximum output.

4. Repeat Operations 2 and 3 for maximum output.

UNITED MOTORS SERVICE

MODELS R1186,R1188
Delco



12-9-40

CALIBRATION SCALE: The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment.

CIRCUIT ALIGNMENT: If realignment is found necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

During alignment the chassis may be removed from the cabinet along with the loop antenna. Keep the signal generator and signal generator leads as far from the loop as possible, also keep the output as low as possible to avoid a.v.c. action.

MODELS R1186, R1188
Delco

UNITED MOTORS SERVICE

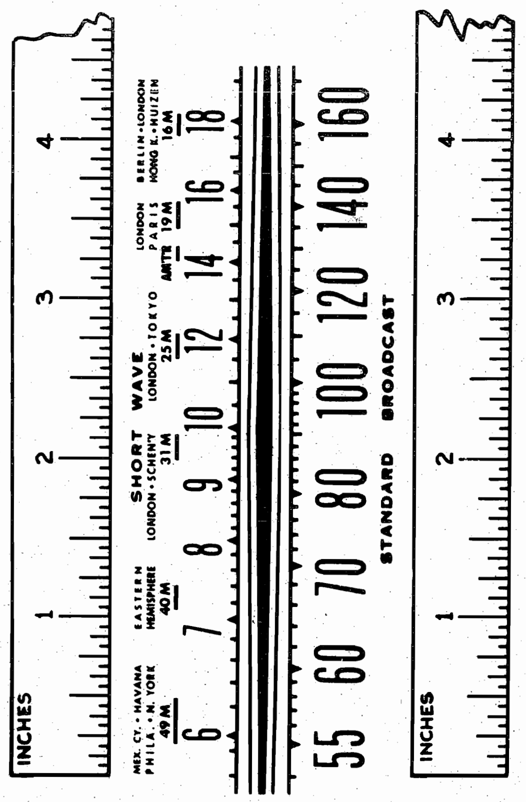
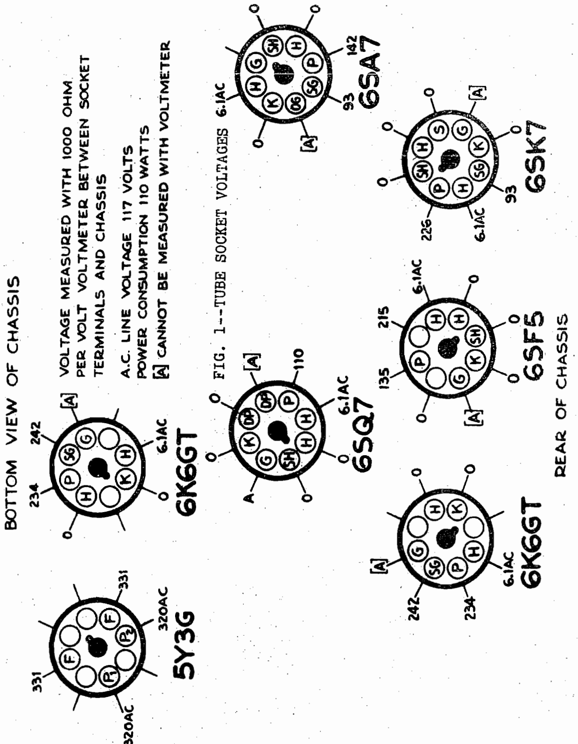


FIG. 5--DIAL CALIBRATION

BOTTOM VIEW OF CHASSIS

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

A.C. LINE VOLTAGE 117 VOLTS
POWER CONSUMPTION 110 WATTS
[A] CANNOT BE MEASURED WITH VOLTMETER



REAR OF CHASSIS

FIG. 1--TUBE SOCKET VOLTAGES

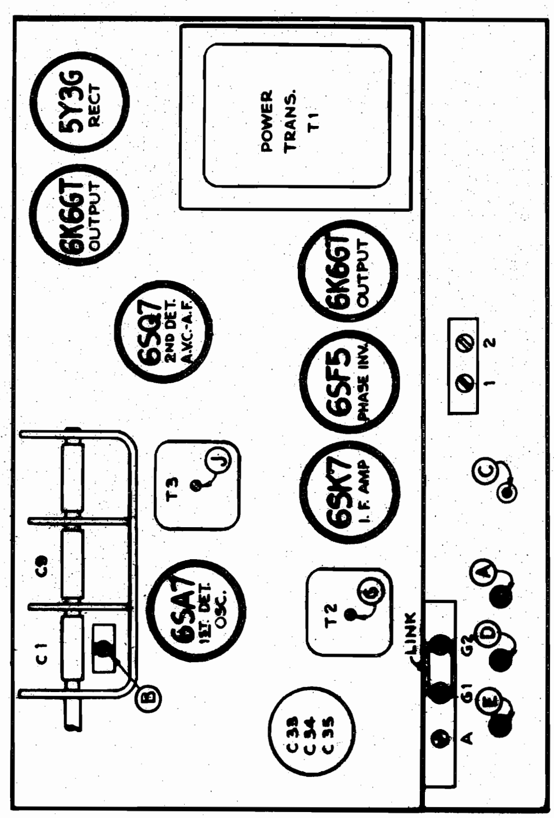


FIG. 3--PARTS LAYOUT--Top View

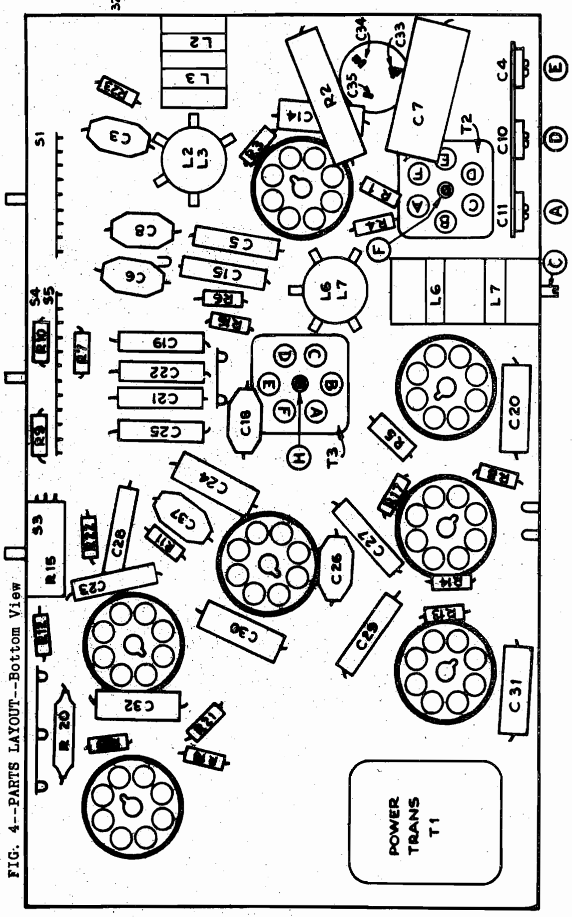


FIG. 4--PARTS LAYOUT--Bottom View

UNITED MOTORS SERVICE — MODELS R1186, R1188 Delco

1. Aligning I-F Stages at 455 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 terminal of the 6SK7 tube through a .01 mfd. condenser.
(c) Connect the output meter across the primary of the output transformer.
(d) Set the signal generator to exactly 455 KC.
(e) Tune receiver to quiet point at 1500 KC end of dial, set volume control full on, range switch to broadcast position, and adjust the trimmers on the second I-F transformer (Illus. H. J., Fig. 3 & 4) for maximum output.
(f) Connect the signal lead of the signal generator to the grid of the 6SA7 tube.
(g) Adjust the trimmers, on the first I-F transformer (Illus. F. G., Fig. 3 & 4) for maximum output.

2. Aligning Broadcast Band at 1500 Kilocycles

(a) Connect signal lead of signal generator to antenna "A" terminal on the chassis, link open, through .0002 condenser.
(b) Connect the ground lead of the signal generator to the "G2" terminal of the chassis.
(c) Set signal generator to 1500 KC.
(d) With band switch in broadcast position, tune receiver to the 1500 KC position.
(e) Adjust Broadcast Oscillator Trimmer (Illus. A, Fig. 3 & 4) for maximum output.
(f) Adjust Broadcast Antenna Trimmer (Illus. B, Fig. 3) for maximum output.

3. Aligning Broadcast Band at 600 Kilocycles

(a) Set signal generator to 600 KC.
(b) Tune radio to 600 KC position.
(c) Adjust Broadcast Oscillator Trimmer (Illus. C., Fig. 3 & 4) while rocking gang condenser back and forth through the signal until maximum output is obtained.

4. Repeat operations 2 and 3 for maximum output

5. Aligning Shortwave Band at 15 M.C.

(a) Connect the signal lead of the signal generator to the "A" terminal in series with .00005 mfd. condenser.
(b) Set the signal generator to exactly 15 M.C.
(c) With the band switch in the short wave position, tune the receiver to the 15 M.C. position.
(d) Adjust the short wave oscillator trimmer (Illus. D., Fig. 3 & 4) for maximum output. If two peaks are obtained use high frequency (minimum capacity) peak.
(e) Adjust short wave antenna trimmer (Illus. E., Fig. 3 & 4) while rocking gang condenser back and forth through the signal until maximum output is obtained. If two peaks can be obtained use low frequency (maximum capacity) peak.

MODEL R1186X
Record Changer

UNITED MOTORS SERVICE

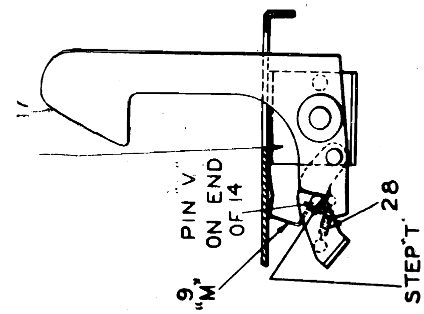


FIG. 3--RECORD DISCRIMINATOR

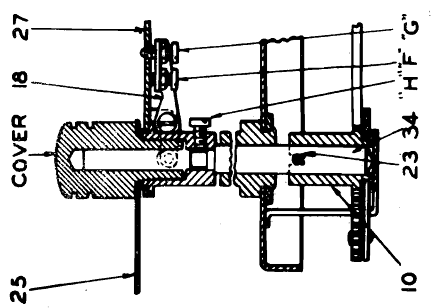


FIG. 2--SEPARATING KNIFE, SUPPORT SHELF AND POST

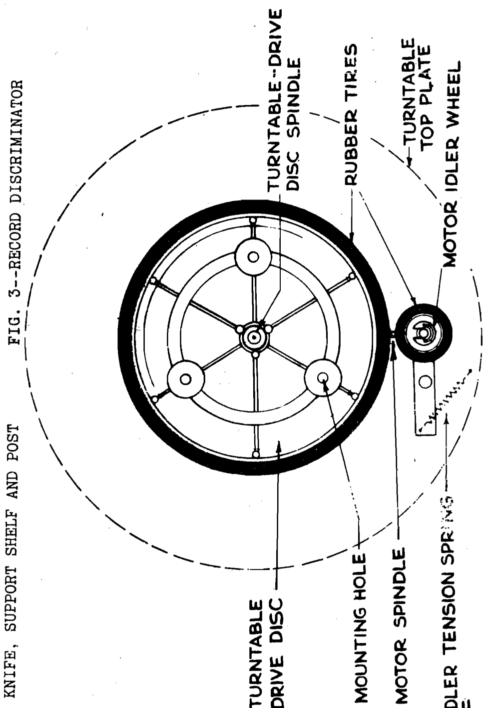


FIG. 4--TURN TABLE DRIVE--Top View

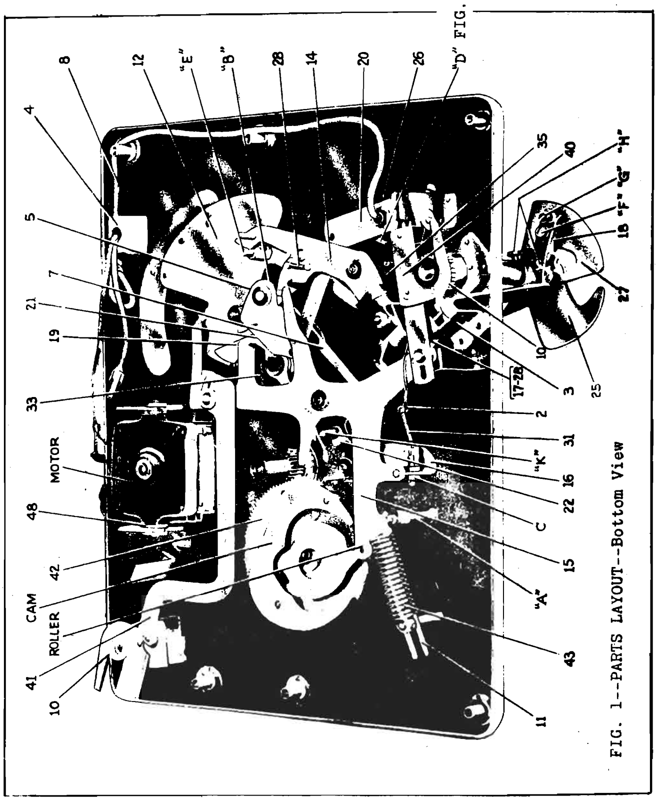


FIG. 1--PARTS LAYOUT--Bottom View

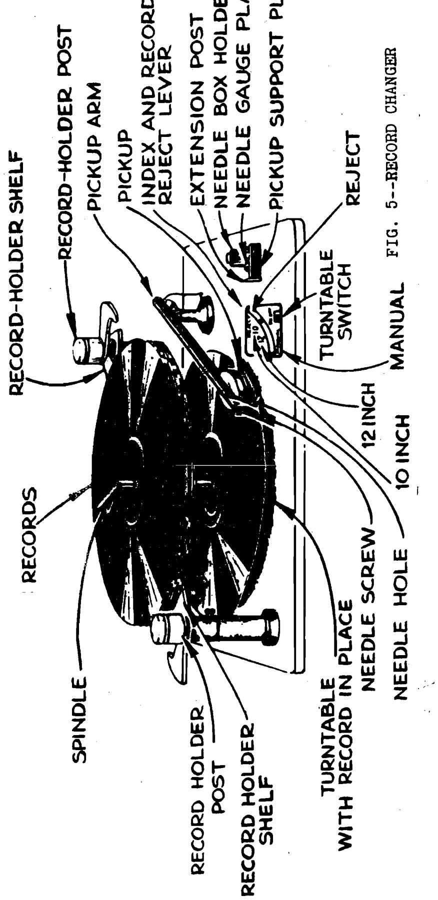


FIG. 5--RECORD CHANGER

UNITED MOTORS SERVICE

MODEL R1186X
Record Changer

SUBJECT--SERVICE INSTRUCTIONS--DELCO AUTOMATIC RECORD CHANGER

GENERAL: The R-1186X Record Changer is a mechanical device for playing Victrola records in sequence. It has a capacity of seven 12 in. records or eight 10 in. records. If the mechanism is set for 10" records, it will play both 10" and 12" records in mixed sequence, BUT it is strongly recommended that only one size be used at a loading.

The motor employed is self starting sychronous available only in 50 or 60 cycles 110 V. AC.

SERVICE: It is important that the drive motor spindle, and rubber tires on main driving disc and idler pulley be kept clean and free from oil, grease, dirt, or any foreign matter at all times. 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 rubber-tired drive disc is not removable from the spindle. The turntable is fastened to the driving disc by three bolts. If necessary to remove these parts the spindle drive gear set screw should first be removed. The driving disc, turntable and spindle assembly can now be lifted upward from the motorboard. If this is done, great care should be taken not to bend the spindle.

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.

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.

The 10" and 12" records must be absolutely flat for smooth operation.

A pickup shorting switch, located under the motorboard, operates when the pickup is moved outward to the pickup rest.

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; oil, grease, dirt, or other foreign matter on motor spindle, main driving disc or idler pulley rubber tire. Clean with any quick drying naphtha.
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. 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".

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. Rotate the turntable until the changer is out-of-cycle; and check rubber bumper bracket (A). The roller should clear the nose of the cam plate by approximately 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 record discriminating 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 5/8 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 5/8 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 motorboard, 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 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 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 "27" so that the curved inner edges of the shelves are uniformly spaced approximately 1/16 inch from the record edge. Some backlash will be present in the rotation of these shelves. They should be adjusted so that the backlash permits them to move away from the record but not closer than the approximate 1/16 inch specified above. Tighten the blunt tipped screw "H", run mechanism through cycle several times to check action, then tighten cone tipped 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 motorboard. 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 and pulleys on underside of motorboard.

Do not allow oil or grease to come in contact with rubber bumper or rubber parts of the mechanism.

MOTOR SERVICE DATA

On the drive motor a 0.014 inch feeler gauge is recommended for centering the rotor in the field bore.

The field coils can be disassembled and reassembled if care is used in reassembling the field lamination block in a manner so that the dovetail joint will not be sprung.

When disassembling the rotor or rotor shaft bearing only, the field stacking should be held in a clamp to prevent the field springing when the bolts which hold the assembly together are loosened.

MODEL R1405 Delco

UNITED MOTORS SERVICE

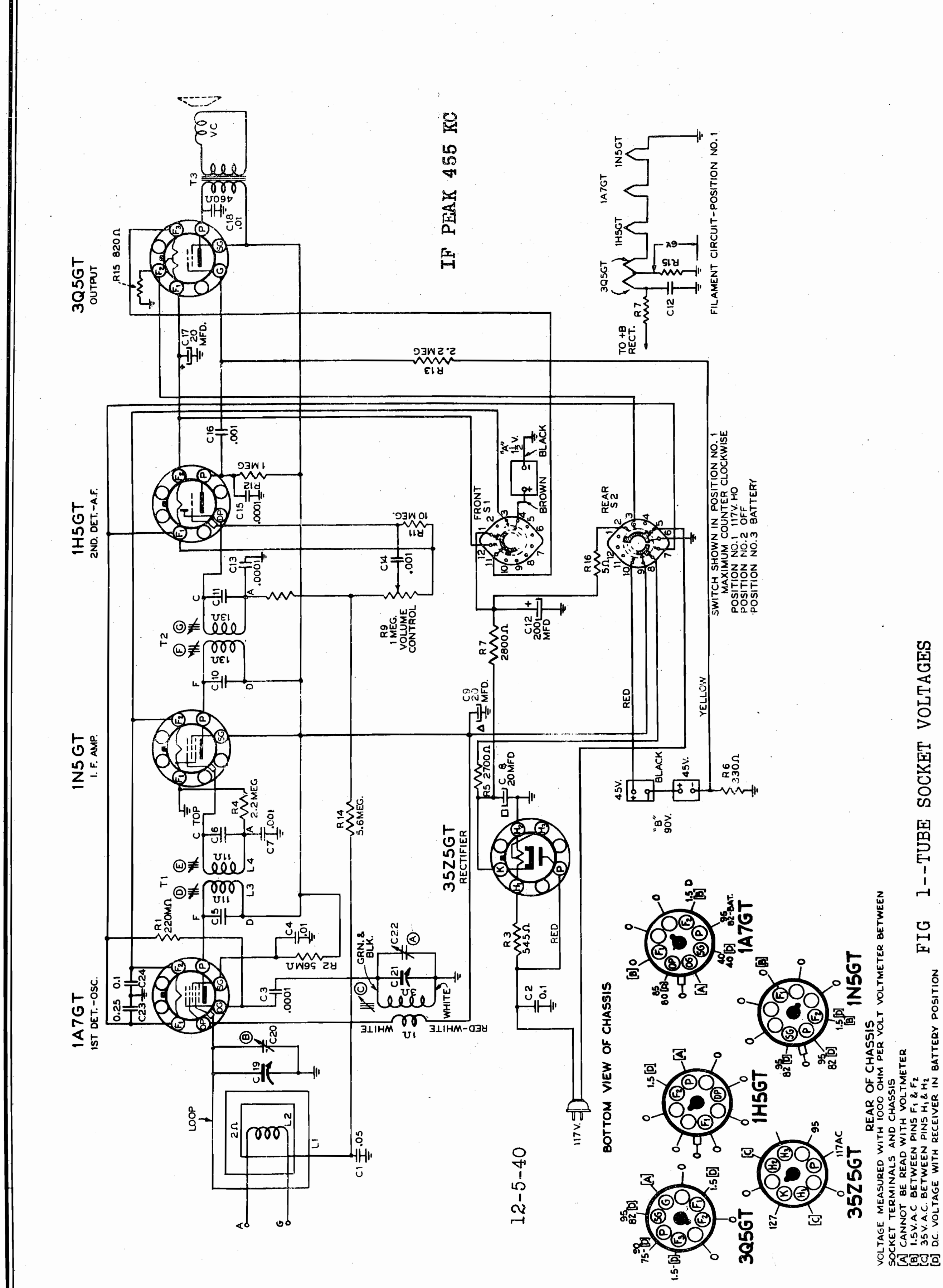


FIG 1--TUBE SOCKET VOLTAGES

UNITED MOTORS SERVICE

MODEL R1405 Delco

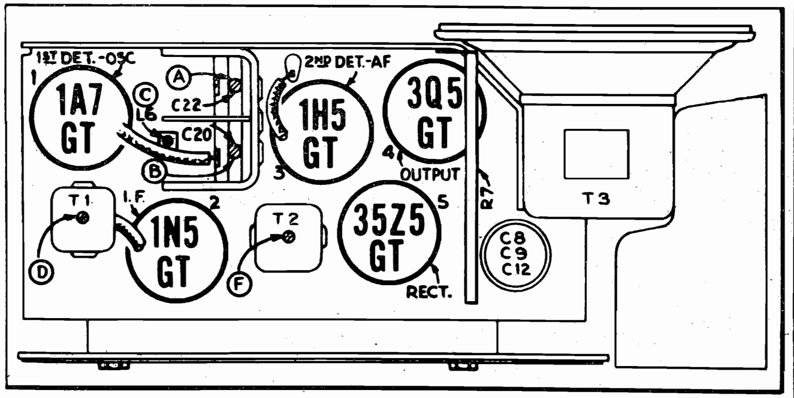


FIG. 3--PARTS LAYOUT--Top View

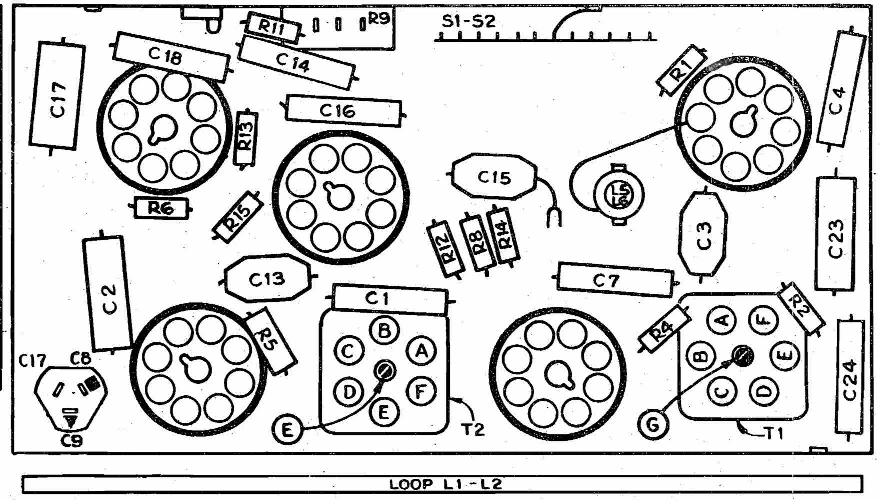


FIG. 4--PARTS LAYOUT--Bottom View

CIRCUIT ALIGNMENT

If realignment is found necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

1. Aligning I-F Stages at 455 Kilocycles
   - (a) Connect the ground lead of the signal generator to the chassis through a .01 mfd. condenser.
   - (b) Connect the signal lead of the signal generator to the grid cap of the 1N5GT tube through a .01 mfd. condenser.
   - (c) Connect the output meter across the primary of the output transformer.
   - (d) Set the signal generator to exactly 455 KC.
   - (e) Tune the receiver to quiet point at 1600 KC end of dial, set Volume Control full on, adjust the trimmers on the second I-F transformer (Illus. F, G, Fig. 3 & 4) for maximum output.
   - (f) Connect the signal lead of the signal generator to the grid cap of the 1A7GT tube.
   - (g) Adjust the trimmers on the first I-F transformer (Illus. D, E, Fig. 3 & 4) for maximum output.
2. Aligning at 1720 Kilocycles.
   - (a) Connect the signal lead of the signal generator to the antenna lead of the loop through a .0001 mfd. condenser.
   - (b) Set signal generator to exactly 1720 KC.
   - (c) Tune receiver to 1720 KC, condenser plates full clockwise (out of mesh).
   - (d) Abjust oscillator trimmer condenser (Illus. A, Fig. 3) for maximum output.
3. Aligning at 1400 Kilocycles
   - (a) Leave the signal lead of the signal generator connected as above.
   - (b) Set the signal generator to 1400 KC.
   - (c) Rotate the tuning control knob until this signal is tuned in with maximum output.
   - (d) Adjust the antenna trimmer (Illus. B, Fig. 3) for maximum output.
4. Aligning at 600 Kilocycles
   - (a) Set signal generator to 600 KC.
   - (b) Rotate the tuning control knob until this signal is tuned in with maximum output.
   - (c) Adjust oscillator trimmer (Illus. C, Fig. 3) while rocking group condenser back and forth through the signal until maximum output is obtained.

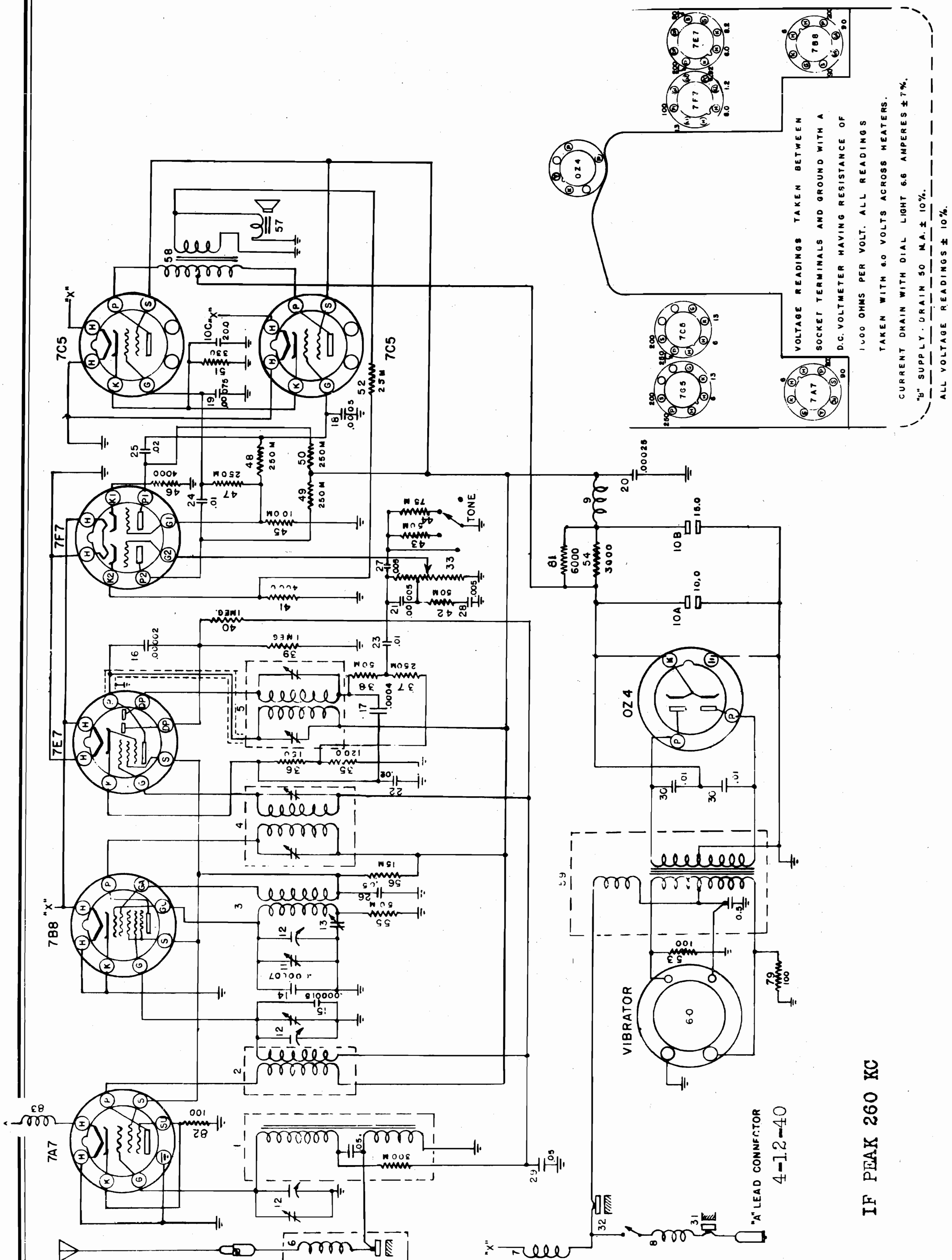
NOTE: Repeat operations 2, 3, and 4.

Current Consumption:

"A" 0.25 amperes	Battery operation	105-125 volt 50-60 cycle	35 Watts
"B" 11.5 milliamperes		105-125 volt D.C.	

MODEL 983679
Pontiac

UNITED MOTORS SERVICE



UNITED MOTORS SERVICE

MODEL 983679
Pontiac

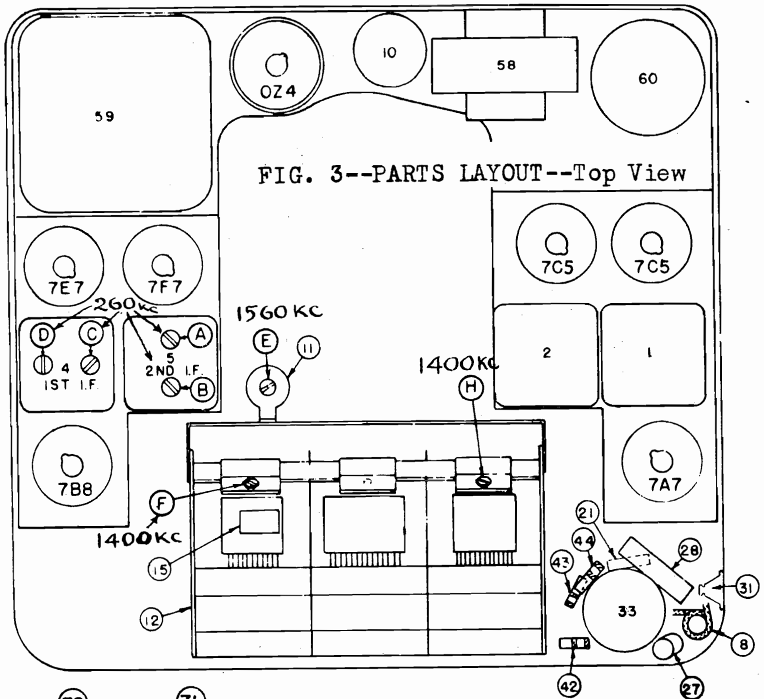


FIG. 3--PARTS LAYOUT--Top View

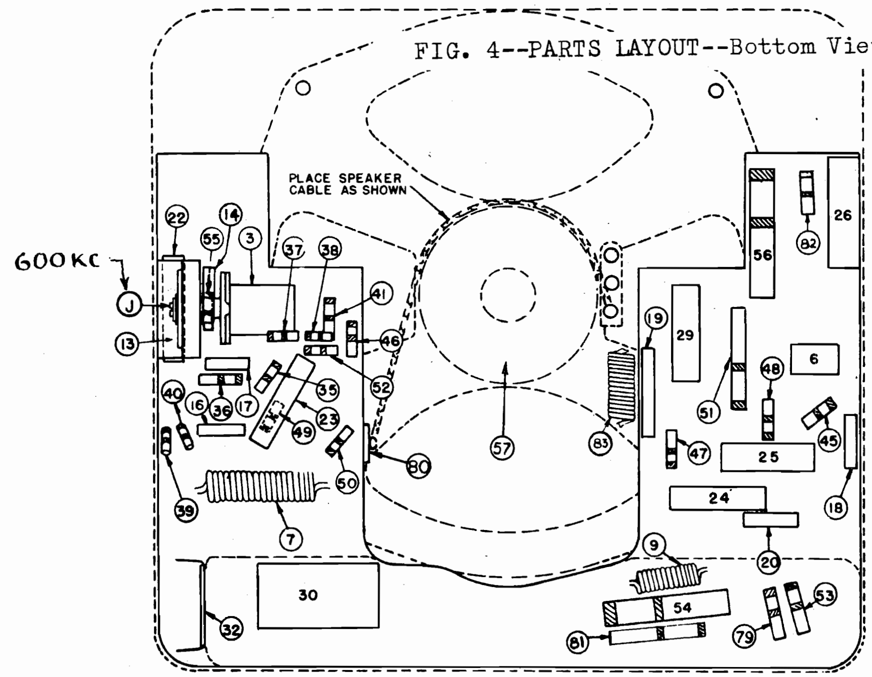


FIG. 4--PARTS LAYOUT--Bottom View

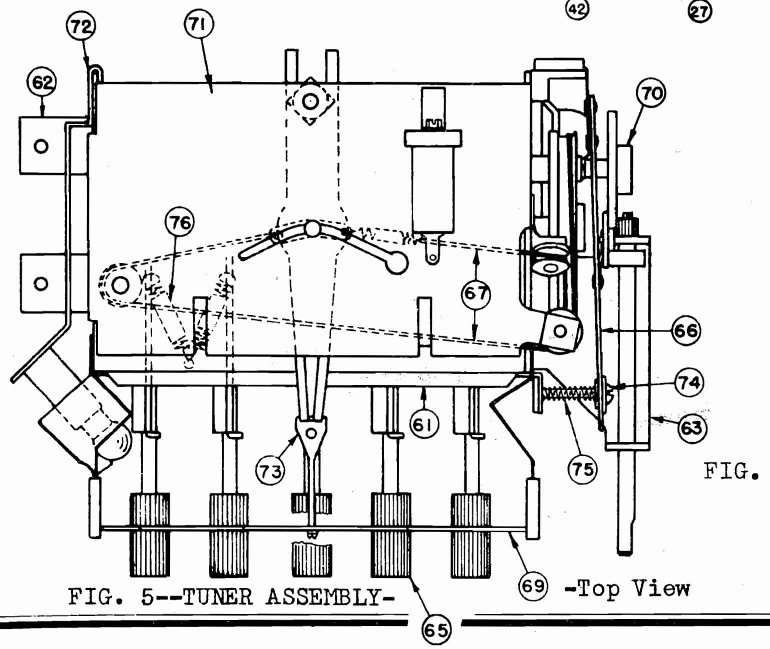


FIG. 5--TUNER ASSEMBLY- -Top View

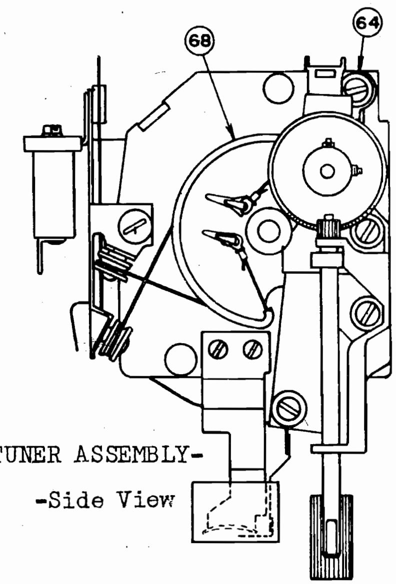


FIG. 6--TUNER ASSEMBLY- -Side View

TUNER:

Mechanical tuning is accomplished by five push buttons which rotate the tuning condenser to pre-selected frequencies.

1. Rotate the button to be set in a counter-clockwise direction until it turns freely.
2. Push the button in as far as it will go and hold it in this position while tuning in the desired station by means of the manual knob.
3. When the station has been carefully tuned in, release the button and turn it in a clockwise direction until it becomes tight. Tighten with the fingers, do NOT use any kind of tool.

MODEL 983679
Pontiac

UNITED MOTORS SERVICE

Adjusting receiver to car antenna

When the receiver leaves the factory the antenna circuit is closely aligned to match the capacity of the car antenna. However, due to variations in antenna capacity it may be necessary to adjust the antenna trimmer to match the car antenna. This should be done as follows:

(a) Turn set on and tune in a very weak station between 120 and 150 (near 150) on the dial. Adjust the antenna trimmer (F) for maximum volume.

Do not disturb the oscillator or the R.F. trimmers in making this adjustment.

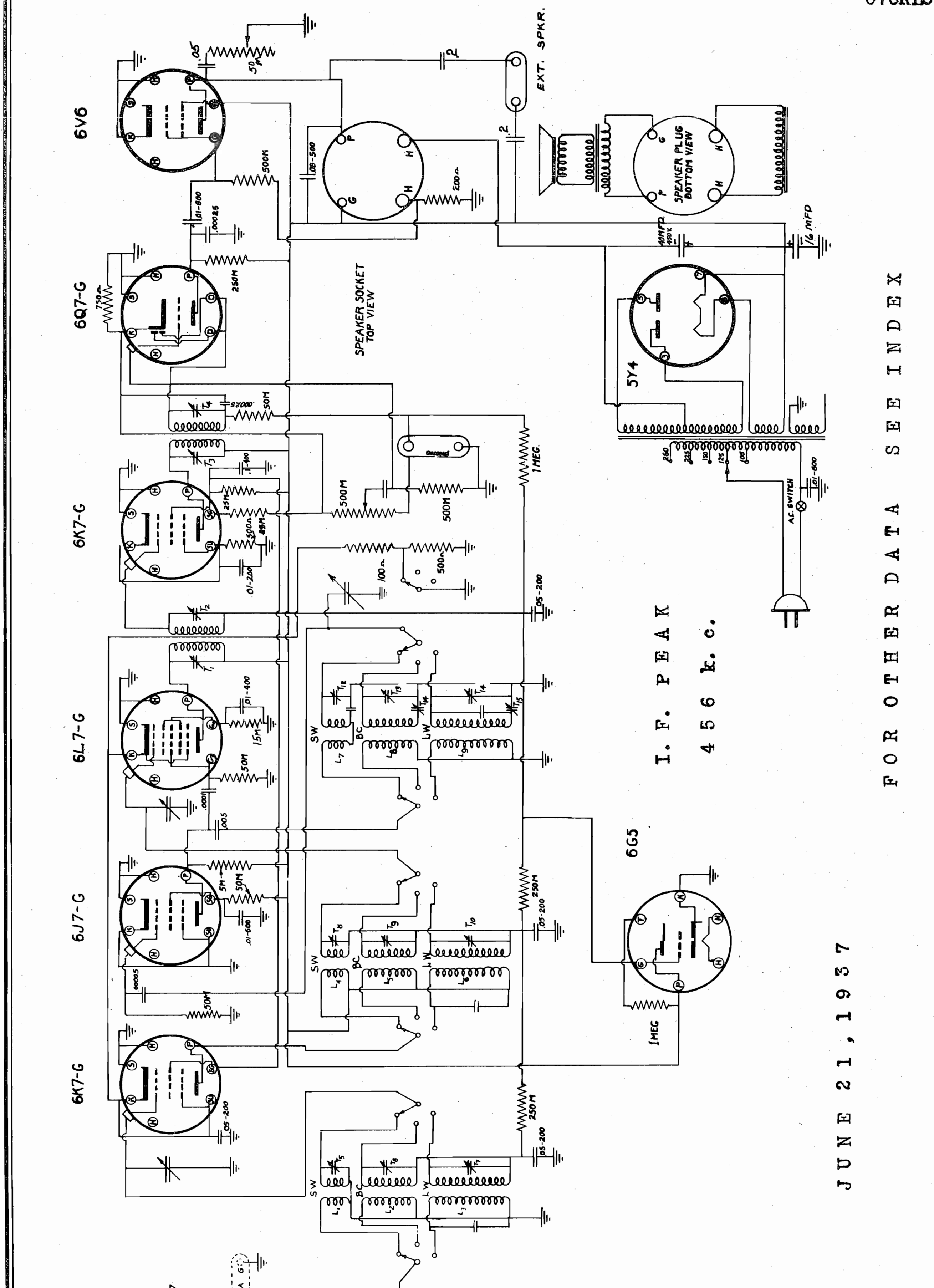
SERVICE HINTS

Dial cord (or pointer) replacement:

1. Unhook the cord eyelets from drive pulley.
2. Move pointer by hand toward the 150 end of the dial until the pointer pivot pin drops through the enlarged end of the pointer guide slot.
3. Lift the pointer and pointer cord out of the tuner from the dial side.
4. File off the lower tip of the pointer guide pin, releasing the retaining washer and the cord pivot arms.
5. With the pointer upside down and pointing away from the operator, put the longer cord pivot arm on the left. Cord side up.
6. Place the short pivot arm (spring assembly) on the right. Cord side up.
7. Replace the retaining washer and solder it to the guide pin.
8. Replace the pointer. Place pivot pin in the enlarged end of the guide slot and then slide the rear end of the pointer into the rear support bearing.
9. Place the long cord behind the pointer and over pulleys (Fig. 5 & 6). Hook the cord eyelet over the drive pulley hook nearest the back of the tuner and push the cord into position around the pulley rim.
10. Put the spring loaded cord over pulley and between the longer string and the tuner frame before hooking the cord eyelet to the drive pulley.

WALGREEN CO.

MODELS 78RLS
C78RLS



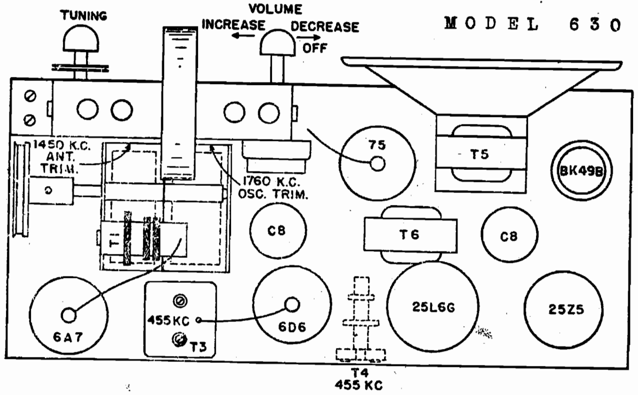
MODELS 78RLS, C78RLS
MODELS 99RLS, C99RLS
MODEL 630

WALGREEN CO.

ALIGNMENT FOR MODELS 78RLS C78RLS 99RLS C99RLS

LOCATION OF PARTS ON TOP OF CHASSIS

MODEL 630



MODEL 630

Follow the procedure outlined below, in order to adjust the push-buttons properly:

1. By means of the Station Selector Knob tune in WITH THE RIGHT HAND AS ACCURATELY AS POSSIBLE the station having the lowest frequency—that is, your selected station which is tuned in nearest the right-hand side of the dial.

2. After the station has been tuned in accurately with the right hand, continue to hold it in its exact position firmly, and with the left hand loosen the Push-Button to be set up for that station by unscrewing the Push-Button about one turn to the left (counter-clockwise).

3. Continuing to hold the Station Selector Knob in its exact position. PUSH THE PUSH-BUTTON IN ALL THE WAY with the left hand.

4. After the Push-Button has been depressed all the way, tighten it gently toward the right (clockwise). Release Push-Button slowly and when in normal position grip button and tighten firmly.

The Push-Button tuning system is now correctly set up for your first selected station of lowest frequency and the Call Letter Tab for this station should be at the extreme right of the Call Letter Holder.
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.

Follow through with this same procedure, setting up the other 3 stations

Carefully check each Push-Button for the accuracy of the 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 four selected stations for automatic operation, merely push in ALL THE WAY the Button set up for that station.

Intermediate Alignment

Attach the output meter to the receiver. Set the signal generator to 456 KC and attach the output of the generator to the control grid cap of the 6K7G I.F. amplifier tube. Adjust the trimmers on the 2nd I.F. transformer for max. gain. Keep the volume control of the receiver at max. and the attenuator of the signal generator as low as possible.

Transfer the output connection of the signal generator from the 6K7G I.F. tube to the control grid of the 6L7 tube and adjust the trimmers on the 1st I.F. transformer. Now go back over the adjustments of both I.F. transformers.

Tuning Circuit Alignment

Long Wave---Set signal generator at 160KC. Attach output of generator to ant. of receiver using a 250 MMFD dummy. Throw band switch to the extreme left, counter clockwise, to band 3. Make sure dial pointer is set properly and then tune dial to approx. 160KC. Adjust long wave padder for max. gain while "rocking" the gang back and forth with each adjustment. The long wave padder is near-est the front edge of chassis.

Set signal generator to 350KC, tune dial to 350 KC and adjust osc. trimmer. Adjust ant. and R.F. stage trimmers for max. output.

B roadcast Band.-- Set signal generator to 600 KC, adjust band switch to broadcast position. Tune dial to 600 KC and adjust the other padder condenser for max. gain while "rocking" the gang back and forth with each adjustment.

Set signal generator to 1500 KC and tune dial to 1500 KC. Adjust osc. trimmer to bring in signal and adjust ant. and R.F. trimmers for max. gain.

Short Wave Band.--Change dummy ant. to 400 ohm resistor. Set signal generator to 15 M.C. Turn band switch to short wave band and tune dial to 15 M.C. Adjust osc. trimmer to bring in signal and adjust ant. and R.F. trimmers for max. gain.

Make the usual tests for image. Take care not to peak set on image when adjusting the short wave band.

The positions of the various trimmers are as follows:

On the trimmer strip nearest the front edge of the chassis are the three antenna trimmers. The one nearest the band switch is band 2 trimmer, the next trimmer is for band 1 and the trimmer out towards the side of chassis on this same strip is for band 3.

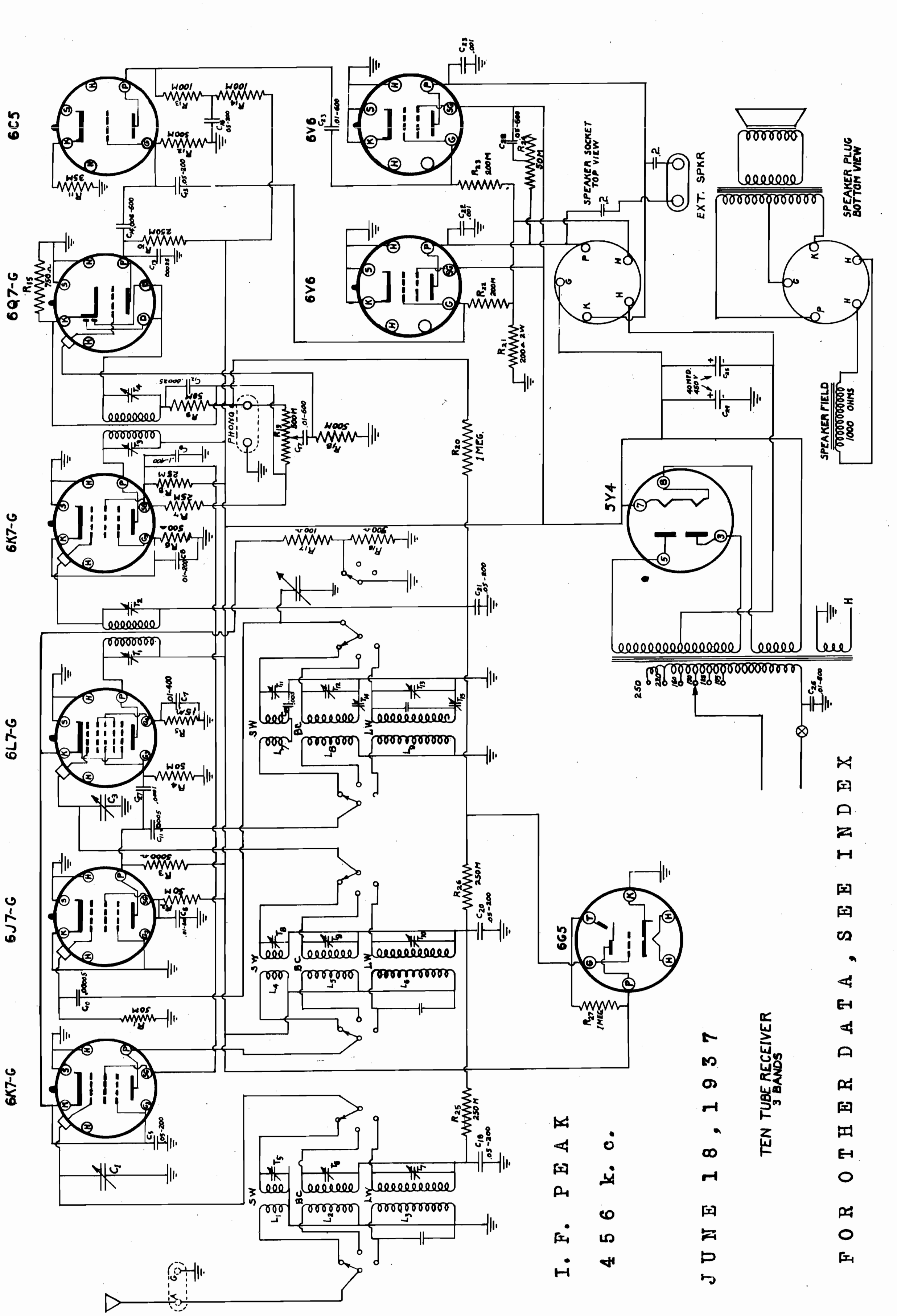
The center trimmer strip of 3 trimmers is for osc. adjustments.

The trimmer strip of 3 trimmers just back of the band switch is for R.F. interstage adjustments.

The trimmers for each band are in the same respective positions on all three trimmer strips.

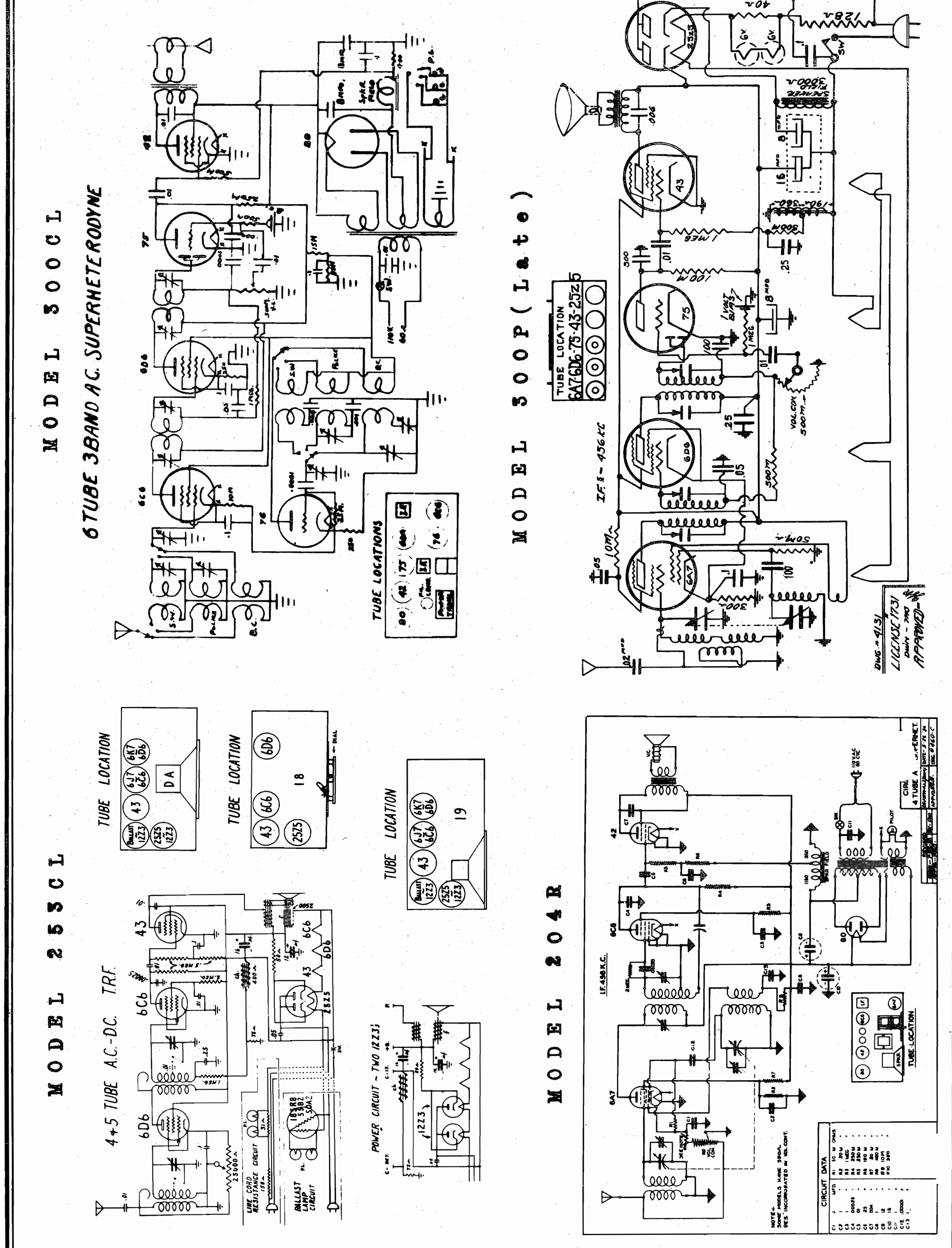
WALGREEN CO.

MODELS 99RLS, C99RLS



MODEL 300CL
MODEL 300P
MODEL 204R
MODEL 253CL

WALGREEN CO.



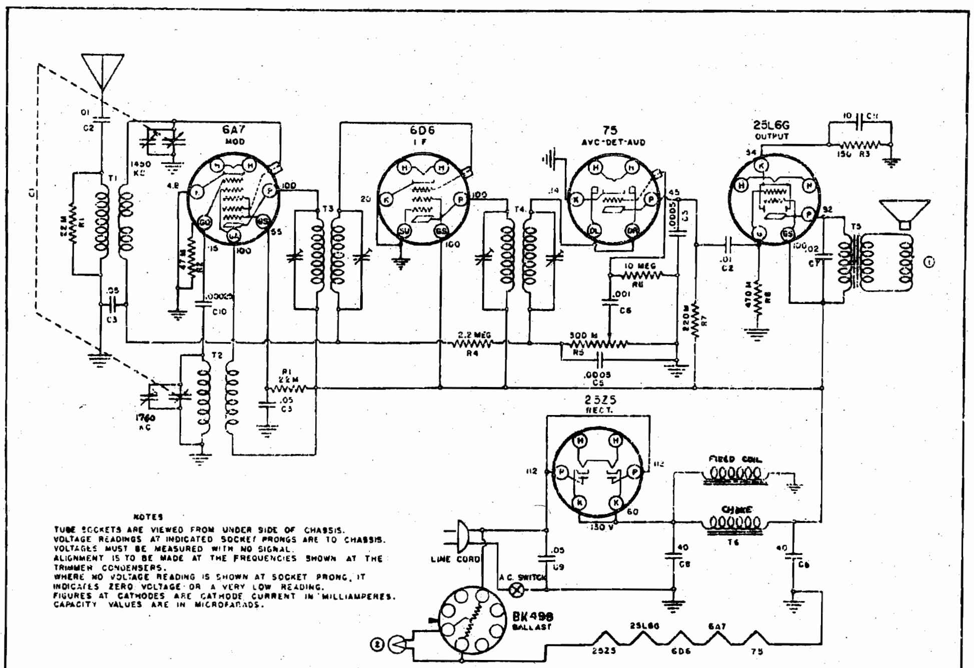
WALGREEN CO.

MODELS 604,606,653
MODEL 630

AETNA MODEL 630

I. F. PEAK 455 K.C.

FOR OTHER DATA SEE INDEX

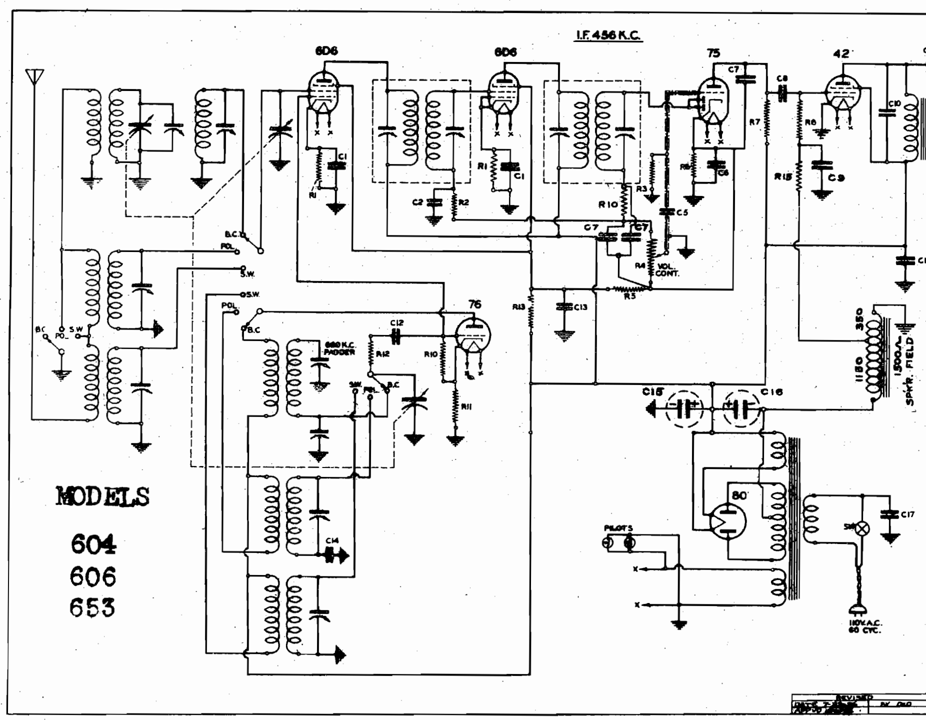


MODEL 630

CODE	PART NO	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO	DESCRIPTION
R1	60-185	22 M OHM RESISTOR	C1	19-132	VARIABLE CONDENSER	T1	10-239	ANTENNA TRANSFORMER
R2	60-177	47 M OHM RESISTOR	C2	16-121	.01 MFD. 200 V CONDENSER	T2	10-240	OSCILLATOR "
R3	60-184	150 OHM " ±10%	C3	1622	.05 MFD. " "	T3	10-241	1ST I.F. TRANSFORMER
R4	60-179	2.2 MEGOHM RESISTOR				T4	10-242	2ND I.F. "
R5	24-124	500 M OHM VOLUME CONTROL	C5	15-112	.0005 MF MICA CONDENSER	T5		OUTPUT "
R6	60-193	10 MEGOHM RESISTOR	C6	16-124	.001 MF 400 V CONDENSER			
R7	60-180	220 M OHM "	C7	1605	.02 MF " " "	1	79-233	SPEAKER
R8	60-178	470 M OHM "	C8	16-232	40 MFD. 150 W.V. ELECTROLYTIC	2	8901	PILOT LIGHT #40
			C9	1607	.05 MF 400 V CONDENSER			
			C10	1504	.00025 MF MICA CONDENSER	T6	33-214	CHOKE
			C11	16-235	5. MFD. 25 V. CONDENSER			

This receiver is made to cover from 1750 KC. to 535 KC., which covers the standard broadcast band and the first police band.

The receiver will operate on either alternating or direct current, from a power supply of 105 to 125 volts. Do not connect it to any other source.



CIRCUIT DATA

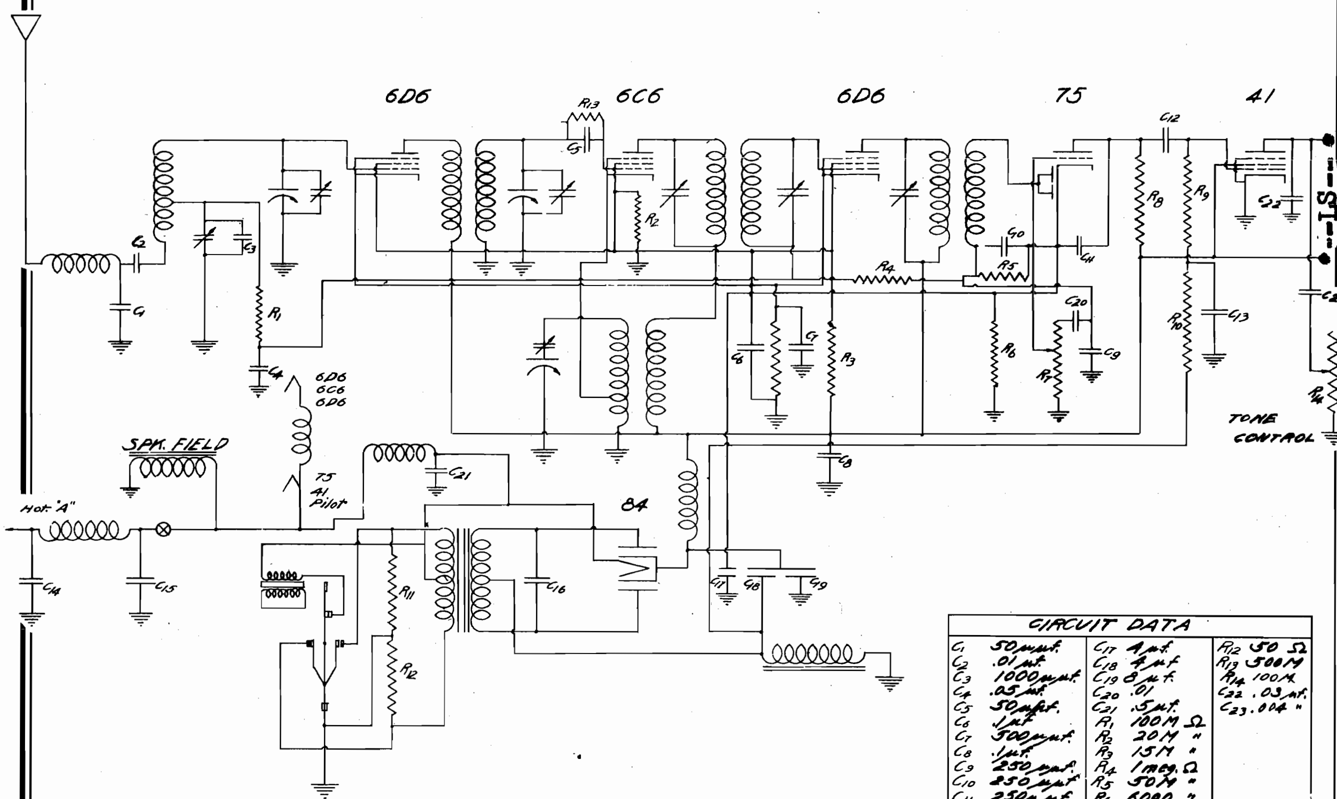
C1	.1	MFD.	R1	400	OHMS
C2	.05	"	R2	1. MEG	"
C3	.05	"	R3	500 M	"
C4	.00025	"	R4	500 M	"
C5	.01	"	R5	20 M	"
C6	.05	"	R6	250	"
C7	.00025	"	R7	250 M	"
C8	.05	"	R8	500 M	"
C9	.25	"	R9	500	"
C10	.004	"	R10	50 M	"
C11	.1	"	R11	250	"
C12	.0001	"	R12	50	"
C13	.1	"	R13	15 M	"
C14	.002	"	R14	50 M	
C15	8.	"	R15	100 M	
C16	8.	"			
C17	.05	"			

CIRCUIT DIAGRAM
6 TUBE A.C. SUPERHET 456 KC

DRAWN - W. J. Jabert | DATE - 5-27-36
APPVD. | DRG. #604-653-606

MODEL 660 (early)

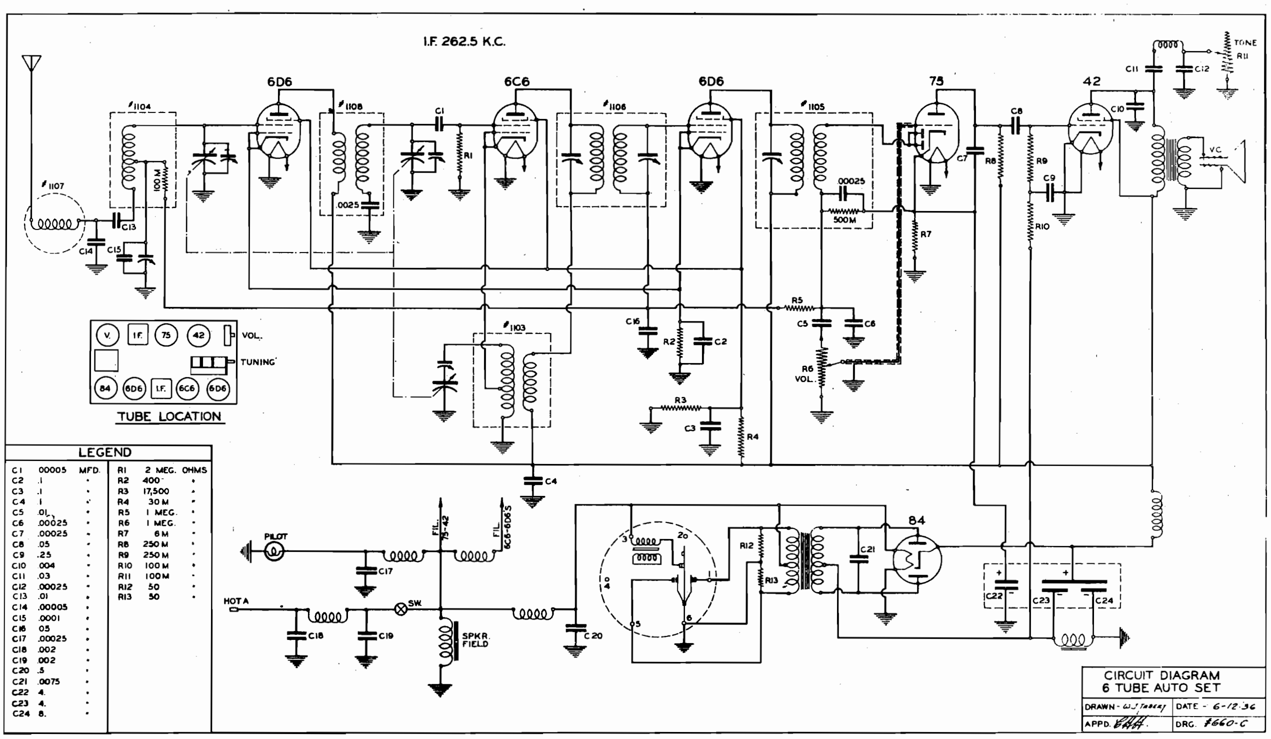
WALGREEN CO.



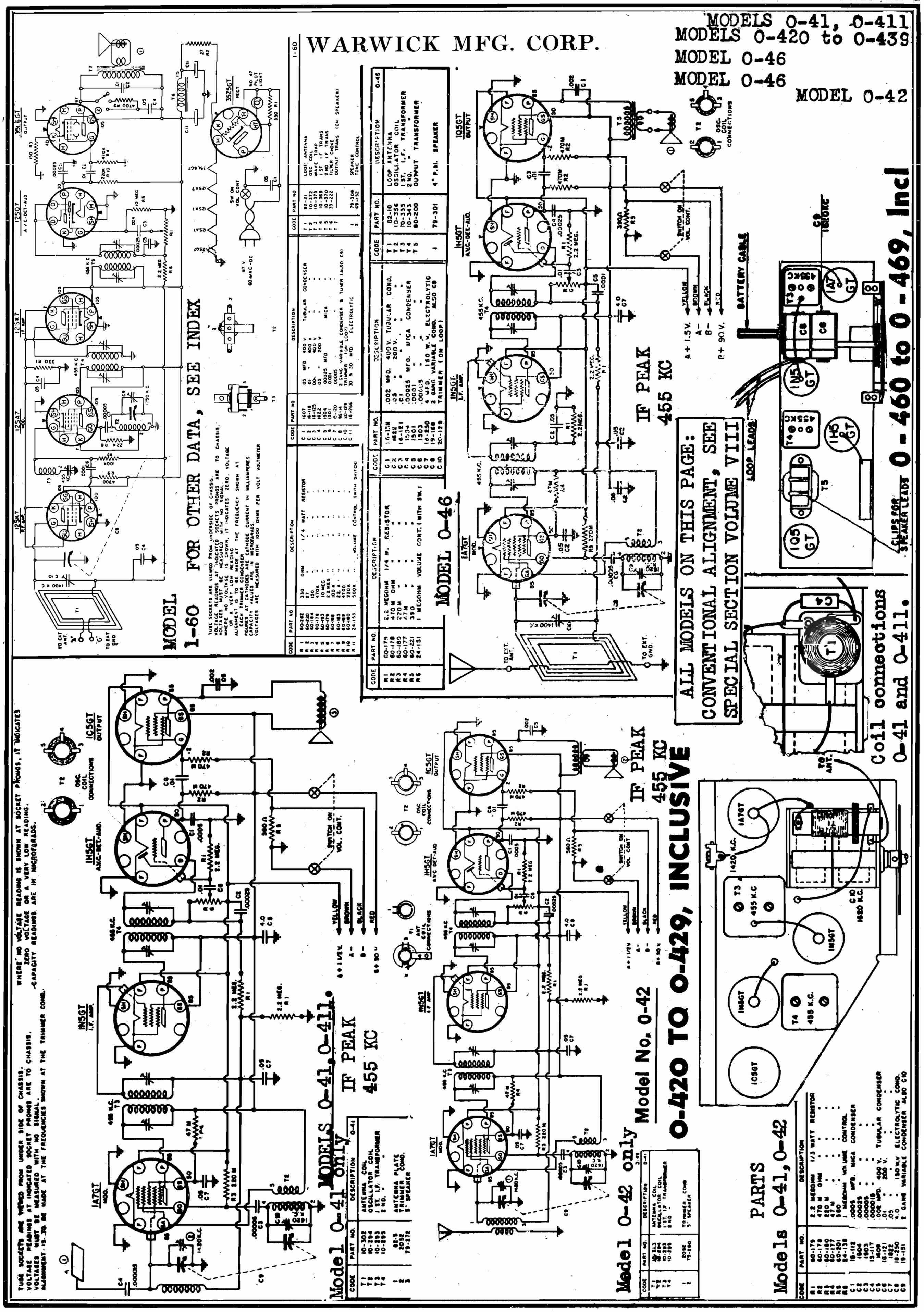
CIRCUIT DATA					
C_1	50 mmf.	C_{17}	4 mf.	R_{12}	50 Ω
C_2	.01 mf.	C_{18}	4 mf	R_{13}	500M
C_3	1000 mmf.	C_{19}	8 mf.	R_{14}	100M
C_4	.05 mf.	C_{20}	.01	C_{22}	.03 mf.
C_5	50 mmf.	C_{21}	.5 mf.	C_{23}	.004 "
C_6	.1 mf.	R_1	100M Ω		
C_7	500 mmf.	R_2	20M "		
C_8	.1 mf.	R_3	15M "		
C_9	250 mmf.	R_4	1 meg. Ω		
C_{10}	250 mmf.	R_5	50M "		
C_{11}	250 mmf.	R_6	6000 "		
C_{12}	.01	R_7	500M		
C_{13}	25 mmf.	R_8	250M "		
C_{14}	.002 mf.	R_9	200M "		
C_{15}	.002 mf.	R_{10}	100M "		
C_{16}	.0075 mf.	R_{11}	50 "		

6 TUBE AUTO RADIO
MODEL 660

BOTH ARE EARLY TYPES OF MODEL 660



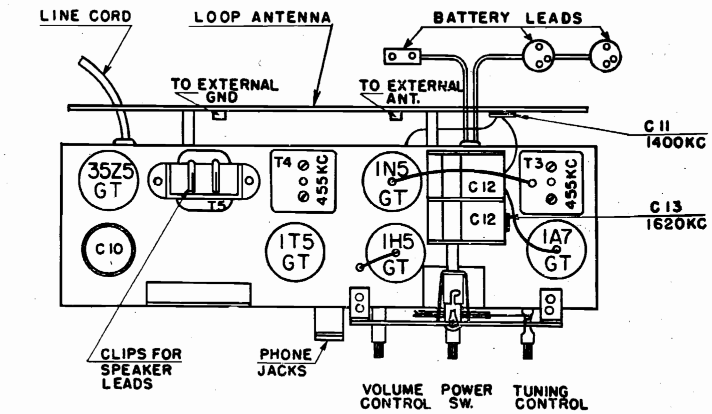
LEGEND					
C1	00005	MFD.	R1	2 MEG.	OHMS
C2	.1	"	R2	400	"
C3	.1	"	R3	17,500	"
C4	.1	"	R4	30 M	"
C5	.01	"	R5	1 MEG.	"
C6	.00025	"	R6	1 MEG.	"
C7	.00025	"	R7	6 M	"
C8	.05	"	R8	250 M	"
C9	.25	"	R9	250 M	"
C10	.004	"	R10	100 M	"
C11	.03	"	R11	100 M	"
C12	.00025	"	R12	50	"
C13	.01	"	R13	50	"
C14	.00005	"			
C15	.0001	"			
C16	05	"			
C17	.00025	"			
C18	.002	"			
C19	.002	"			
C20	.5	"			
C21	.0075	"			
C22	4.	"			
C23	4.	"			
C24	8.	"			

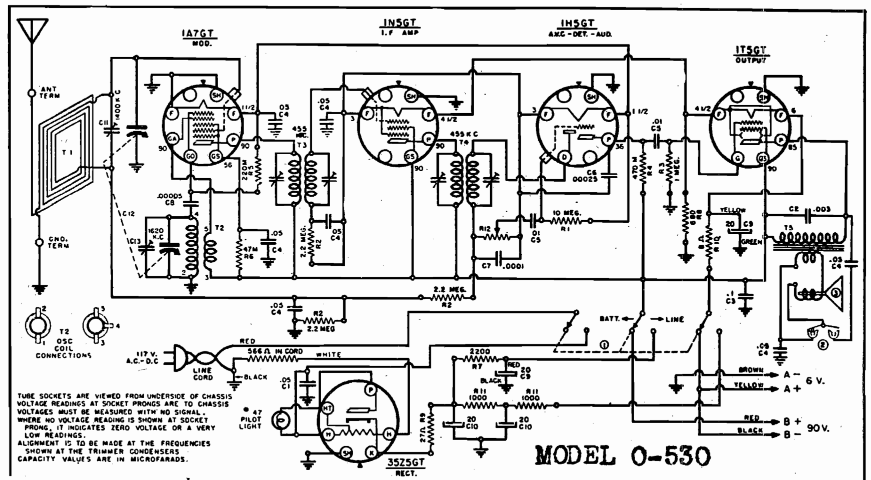

MODELS 0-41, 0-411
MODELS 0-420 to 0-439
MODEL 0-46
MODEL 0-46
MODEL 0-42
WARWICK MFG. CORP.
MODEL 1-60
FOR OTHER DATA, SEE INDEX
MODEL 0-46
IF PEAK 455 KC
ALL MODELS ON THIS PAGE: CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOLUME VIII
0-460 to 0-469, Incl
Coil connections 0-41 and 0-411.
MODELS 0-41, 0-411
IF PEAK 455 KC
Model 0-41 only
Model No. 0-42
0-420 TO 0-429, INCLUSIVE
IF PEAK 455 KC
Model 0-42 only
PARTS Models 0-41, 0-42

MODEL 0-84
MODEL 0-530

WARWICK MFG. CO.

MODEL 0-530





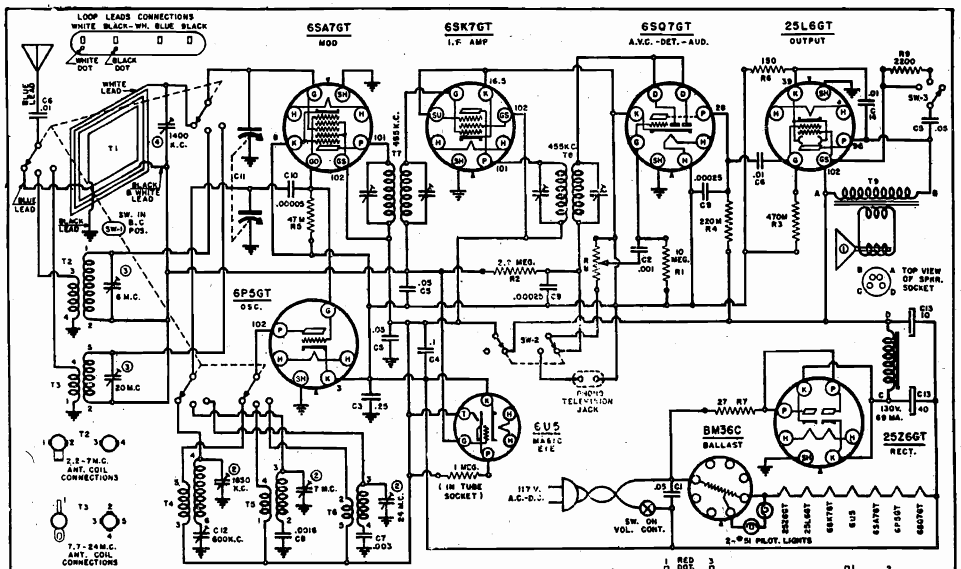
MODEL 0-530

CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD. 400 V. TUBULAR COND
C 2	16 139	003 " " " "
C 3	16 115	.1 " 200 V. " "
C 4	1622	05 " " " "
C 5	16-121	01 " " " "
C 6	1504	.00025 MFD. MICA CONDENSER
C 7	1501	.0001 " " "
C 8	1503	.00005 " " "
C 9	18-263	20 X 20 " 150 W.V. ELECTROLYTIC
C 10	18-262	20 X 20 " 150 W.V. "
C 11	20-129	TRIMMER ON LOOP
C 12	19-167	2 GANG VARIABLE COND. ALSO C 13

CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 " " "
R 3	60-195	1 " " "
R 4	60-178	470 M OHM " "
R 5	60-180	220 M " " "
R 6	60-177	47 M " " "
R 7	60-383	2200 " " "
R 8	60-379	680 " " "
R 9	60-220	27 " " "
R 10	60-128	8 " 1/2 W. "
R 11	60-644	1000 " 3 W. "
R 12	24-150	1 MEGOHM VOLUME CONTROL

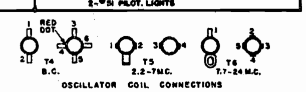
CODE	PART NO.	DESCRIPTION 0-53
T 1	82-17	LOOP ANTENNA
T 2	10-310	OSCILLATOR COIL
T 3	10-355	1 ST. I.F. TRANSFORMER
T 4	10-343	2 ND. "
T 5	80-196	OUTPUT TRANSFORMER
1	69-151	POWER SWITCH
2	12-3	PHONE JACK
3	79-299	5" P.M. SPEAKER

MODEL 0-84



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO COMMON GND.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
VOLTAGES ARE MEASURED WITH 1000 OHM PER VOLT VOLTMETER.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES

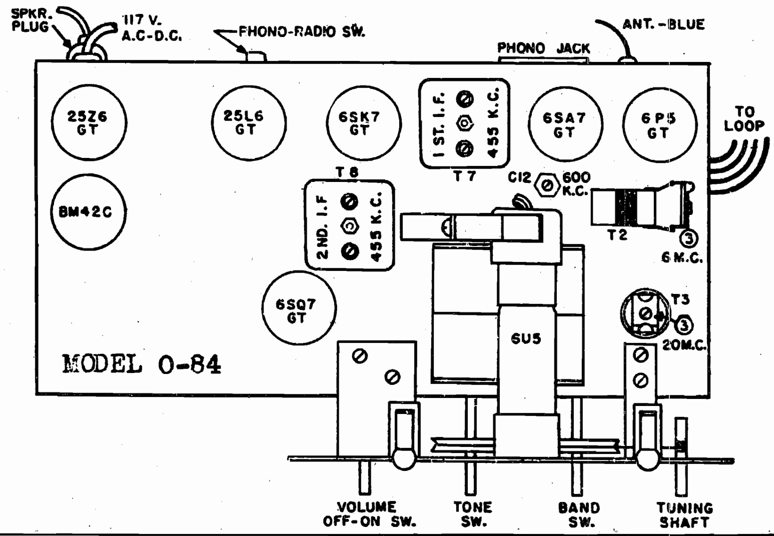
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCY SHOWN AT EACH TRIMMER CONDENSER.
CAPACITY VALUES ARE IN MICROFARADS



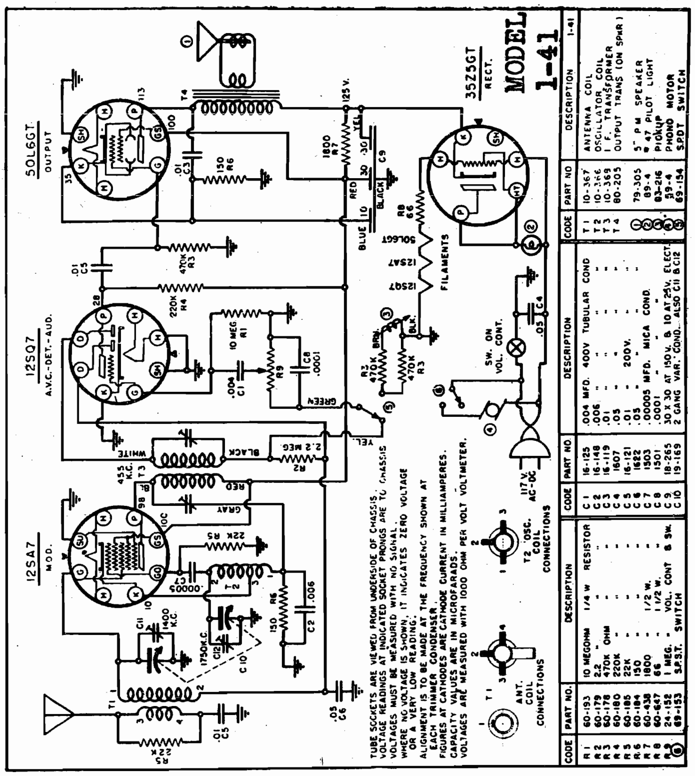
CODE	PART NO.	DESCRIPTION
C 1	1607	.05 MFD 400V. TUBULAR CONDENSER
C 2	16-124	.001 "
C 3	16-120	25 200 V
C 4	16-115	1 "
C 5	1622	.05
C 6	16-121	.01 "
C 7	15-118	.003 MFD MICA CONDENSER
C 8	15-119	.0016 " "
C 9	1504	.00025
C 10	1503	.00005 "
C 11	19-156	2 GANG VARIABLE CONDENSER
C 12	20-128	PADDING CONDENSER
C 13	18-255	40 X 10 MFD. 150 W.V. ELECTROLYTIC
C 14	16-119	.01 MFD. 400V. TUBULAR CONDENSER

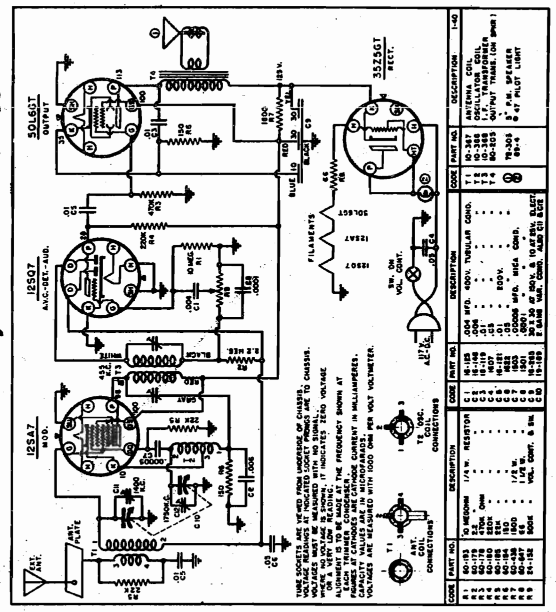
CODE	PART NO.	DESCRIPTION
R 1	60-193	10 MEGOHM 1/4 W. RESISTOR
R 2	60-179	2.2 "
R 3	60-178	470M OHM
R 4	60-180	220M
R 5	60-177	47M "
R 6	60-184	150 "
R 7	60-220	27 " "
R 8	24-144	500M VOLUME CONTROL
R 9	60-253	2200 1/4 W. RESISTOR
SW 1	69-142	BAND SWITCH
SW 2	69-140	PHONO "
SW 3	69-143	TONE

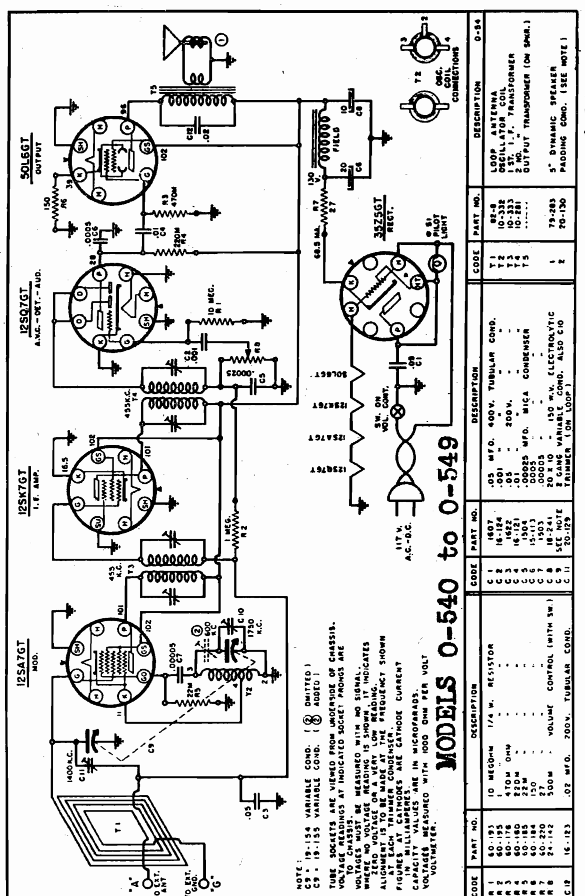
CODE	PART NO.	DESCRIPTION 0-84
T 1	82-13	LOOP ANTENNA
T 2	10-324	ANTENNA COIL (2.2-7 M.C.)
T 3	10-322	ANTENNA COIL (7.7-24 M.C.)
T 4	10-316	OSCILLATOR COIL (B.C.)
T 5	10-327	OSCILLATOR COIL (2.2-7 M.C.)
T 6	10-329	OSCILLATOR COIL (7.7-24 M.C.)
T 7	10-317	1ST. I.F. TRANSFORMER
T 8	10-312	2ND. "
T 9	------	OUTPUT TRANSFORMER (ON SPKR.)
1	79-277	6 1/2" DYNAMIC SPEAKER
2	20-121	TRIMMER BLOCK
3	2052	2 PLATE TRIMMER
4	20-129	TRIMMER (ON LOOP)

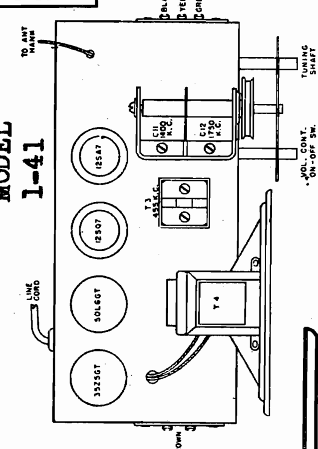


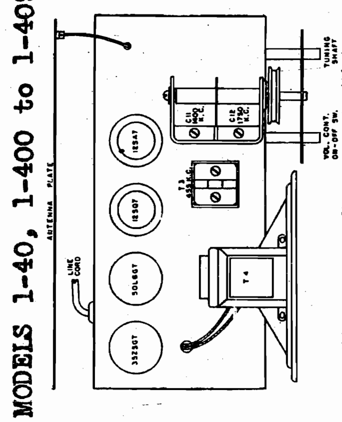
WARWICK MFG. CO. MODELS 1-40, 1-400 to 1-409
MODEL 1-41
MODELS 0-540 to 0-549

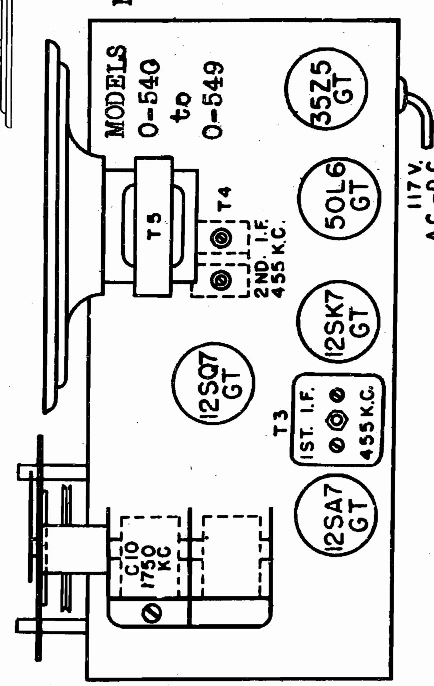












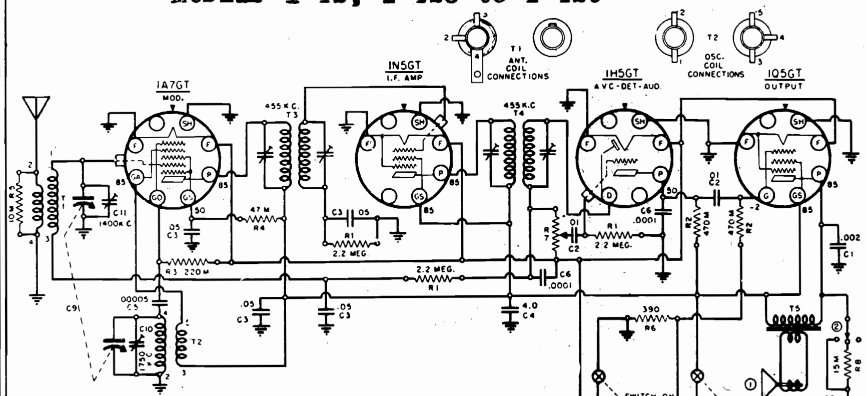
ALL MODELS:
THESE RECEIVERS COVER A FREQUENCY RANGE FROM 540 KC TO 1750 KC.

CONVENTIONAL ALIGNMENT

MODELS 1-42, 1-420 to 1-429
MODELS 1-50, 1-500 to 1-509
MODEL 1-52

WARWICK MFG. CO.

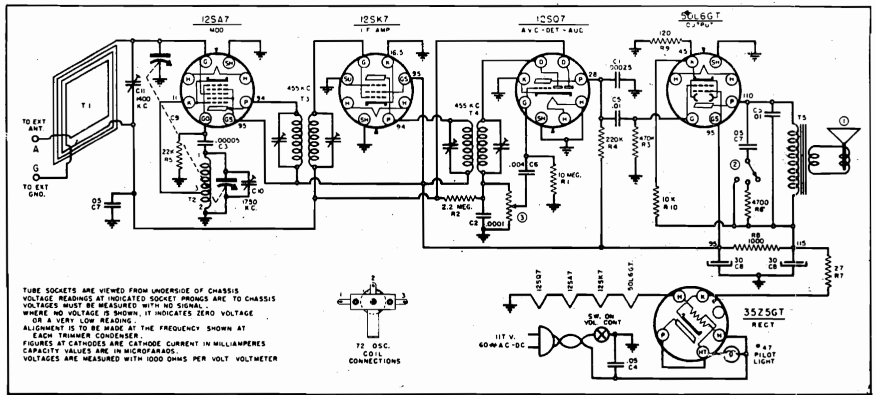
MODELS 1-42, 1-420 to 1-429



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 PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 1-42
R 1	60-179	2.2 MEGOHM 1/4 W RESISTOR	C 1	16-138	.002 MFD. 400V TUBULAR COND.	T 1	10-344	ANTENNA TRANSFORMER
R 2	60-178	470M OHM	C 2	16-121	.01 " 200V " "	T 2	10-341	OSCILLATOR "
R 3	60-180	220M " "	C 3	1622	.05 " " " "	T 3	10-342	1ST I F "
R 4	60-177	47M " "	C 4	18-250	4.0 " 150W V ELECTROLYTICS	T 4	10-343	2ND I F "
R 5	60-215	10M " " "	C 5	15-120	.00005 MFD. MICA CONDENSER	T 5		OUTPUT TRANS' (ON SPKR)
R 6	60-221	390 " " "	C 6	1501	.0001 " "			
R 7	24-154	1 MEGOHM VOLUME CONTROL	C 9	19-165	2 GANG VAR COND. ALSO C10 & C11	1	79-297	5" P M SPEAKER
R 8	60-202	16M OHM 1/4 W RESISTER	C 10	1605	.02 MFD 400V TUBULAR COND	2	69-152	TONE CONTROL SWITCH

MODELS 1-50, 1-500 to 1-509



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS
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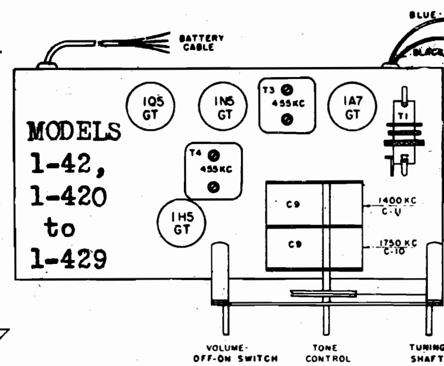
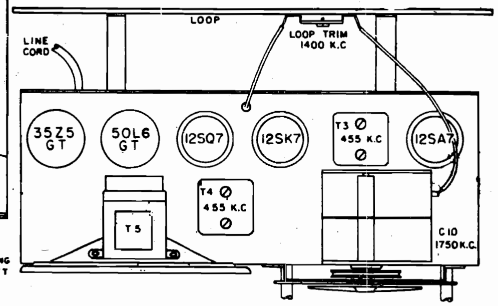
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES
CAPACITY VALUES ARE IN MICROFARADS.
VOLTAGES ARE MEASURED WITH 1000 OHMS PER VOLT VOLTMETER

CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 1-50
R 1	60-193	10 MEGOHM 1/4 WATT RESISTOR	C 1	1504	.00025 MFD MICA CONDENSER	T 1	82-21	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	1607	.05 MFD. 400 V TUBULAR CONDENSER	T 4	10-370	2ND I.F. TRANSFORMER
R 5	60-185	22 K " " "	C 5	16-119	.01 " " " "	T 5	80-205	OUTPUT TRANSFORMER (ON SPKR)
R 6	60-189	4700 " " "	C 6	16-125	.004 " " " "			
R 7	60-220	27 " " "	C 7	1622	.05 " 200 V. "	1	79-306	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)			

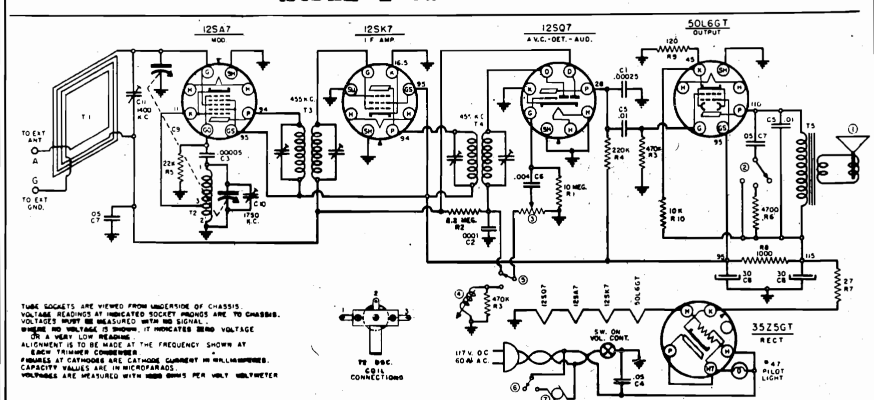
MODELS 1-42, 1-420 to 1-429



MODELS 1-50, 1-500 to 1-509



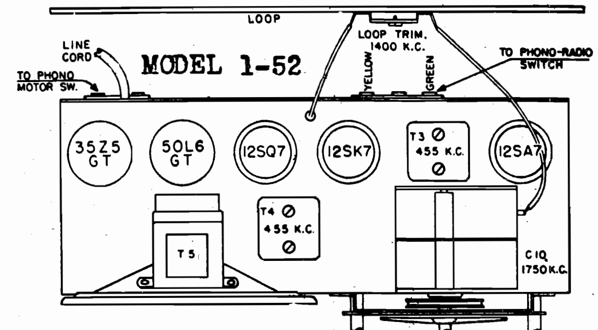
MODEL 1-52



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

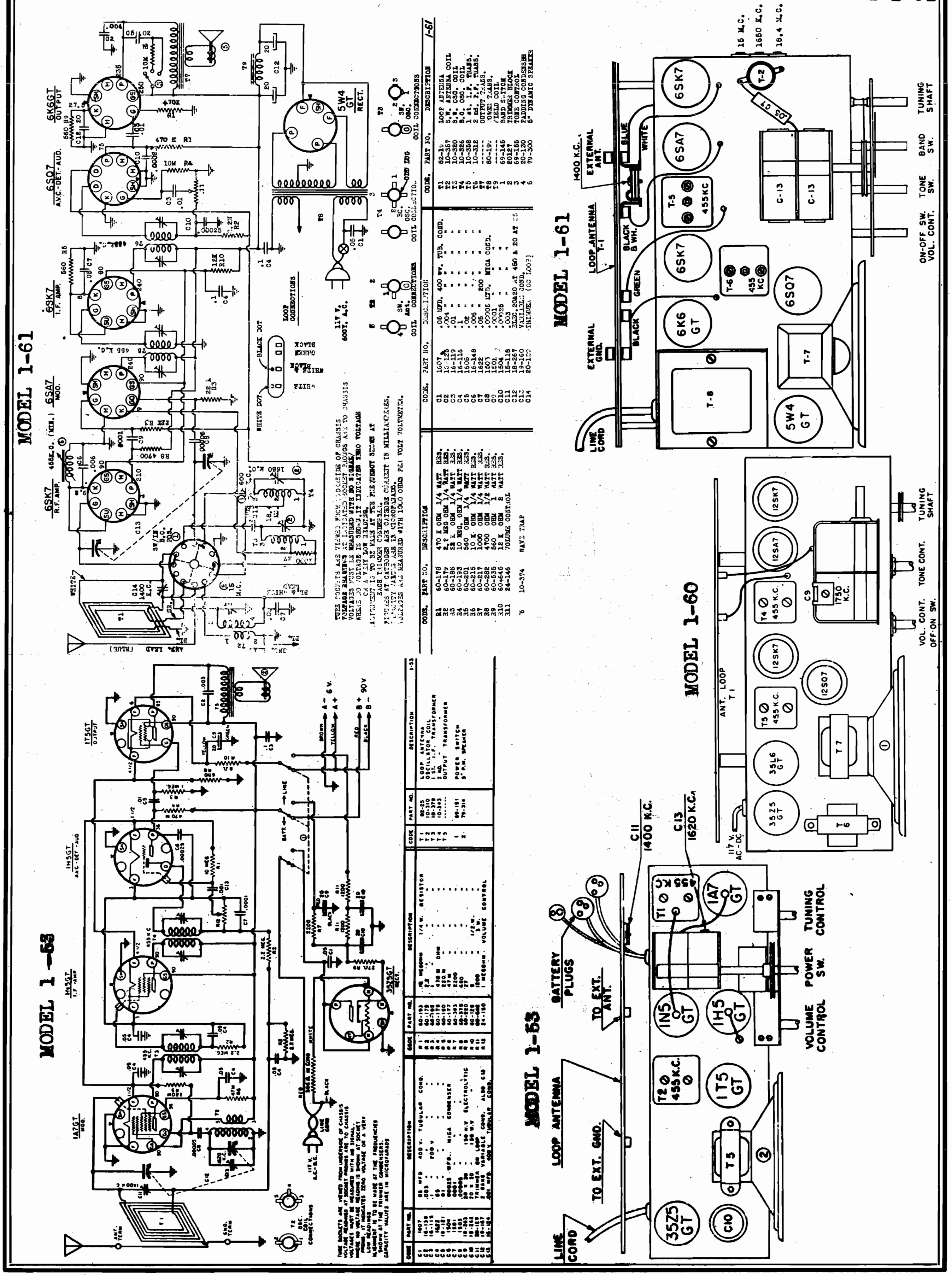
CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION	CODE	PART NO.	DESCRIPTION 1-52
R 1	60-193	10 MEGOHM 1/4 WATT RESISTOR	C 1	1504	.00025 MFD. MICA CONDENSER	T 1	82-23	LOOP ANTENNA
R 2	60-179	2.2 " " "	C 2	1501	.0001 " " "	T 2	10-371	OSCILLATOR COIL
R 3	60-178	470K OHM " "	C 3	1503	.00005 " "	T 3	10-369	1ST. I.F. TRANSFORMER
R 4	60-180	220K " "	C 4	1607	.05 MFD. 400 V. TUBULAR CONDENSER	T 4	10-370	2ND I.F. TRANSFORMER
R 5	60-185	22 K " " "	C 5	16-119	.01 " " " "	T 5	80-205	OUTPUT TRANSFORMER (ON SPKR)
R 6	60-189	4700 " " "	C 6	16-125	.004 " " " "			
R 7	60-220	27 " " "	C 7	1622	.05 " 200 V. "	1	79-30	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)	4	83-216	PICKUP
7	59-4	PHONO MOTOR	6	69-153	S.P.S.T. SWITCH	5	69-154	S.P.D.T. SWITCH

MODEL 1-52



WARWICK MFG. CO.

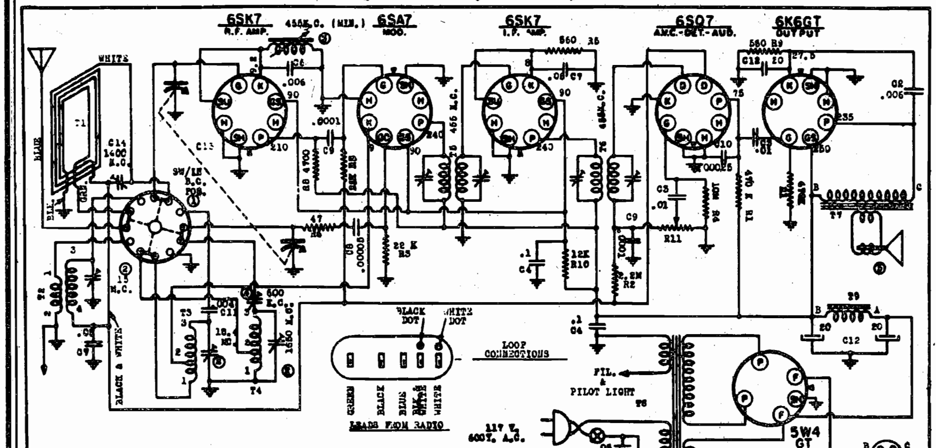
MODEL 1-53
MODEL 1-60
MODEL 1-61



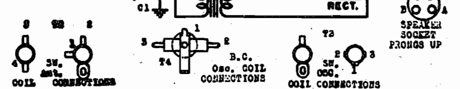
MODELS 1-43, 1-430 to 1-439
MODELS 1-621, 1-622, 9-62, 910

WARWICK MFG. CO.

MODELS 1-621, 1-622, 9-62, 910



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 PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

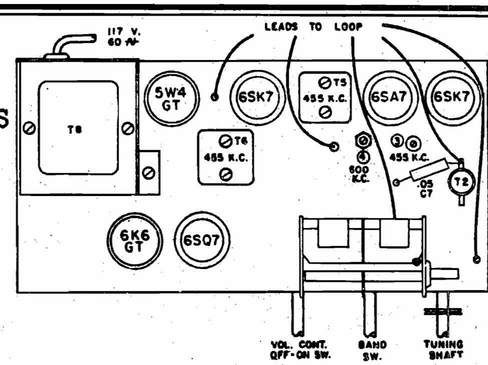


CODE.	PART NO.	DESCRIPTION
R1	60-170	470 K OHM 1/4 WATT RES.
R2	60-179	2.2 MEG OHM 1/4 WATT RES.
R3	60-185	22 K OHM 1/4 WATT RES.
R4	60-193	10 MEG. OHM 1/4 WATT RES.
R5	60-201	560 OHM 1/4 WATT RES.
R6	60-258	47 OHM 1/4 WATT RES.
R7		
R8	60-282	4700 OHM 1/2 WATT RES.
R9	60-335	560 OHM 1 WATT RES.
R10	60-445	12 K OHM 2 WATT RES.
R11	24-155	VOLUME CONTROL

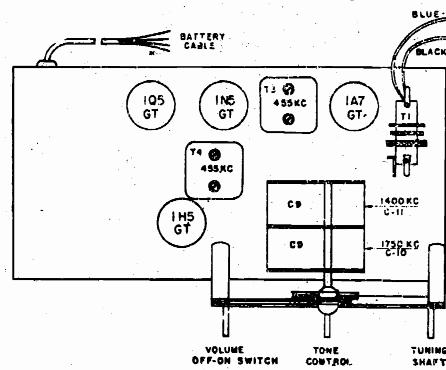
CODE.	PART NO.	DESCRIPTION
C1	1607	.05 MFD. 400 WV. TUB. COND.
C2	16-128	.006 " " " " "
C3	16-119	.02 " " " " "
C4	16-116	.1 " " " " "
C5		
C6	16-148	.006 " " " " "
C7	1622	.05 " 200 " " "
C8	1503	.00005 MFD. MICA COND.
C9	1501	.0001 " " "
C10	1504	.00025 " " "
C11	15-170	.004 " " "
C12	18-267	ELEC. 20&20 AT 450 & 20 AT 25
C13	95-15	VARIABLE COND.
C14	20-129	TRIMMER (ON LOOP)

CODE.	PART NO.	DESCRIPTION 1-62
T1	82-24	LOOP ANTENNA
T2	10-387	S.W. ANTENNA COIL
T3	10-376	S.W. OSC. COIL
T4	10-375	B.C. OSC. COIL
T5	10-358	1 st. I.F. TRANS.
T6	10-312	2 nd. I.F. TRANS.
T7	------	OUTPUT TRANS.
T8	80-189	POWER TRANS.
T9	------	FIELD COIL
1	69-157	BAND SWITCH
2	20127	TRIMMER BLOCK
3	10-374	Wave Trap
4	20-130	PADDING CONDENSER
5	79-286	6" DYNAMIC SPEAKER

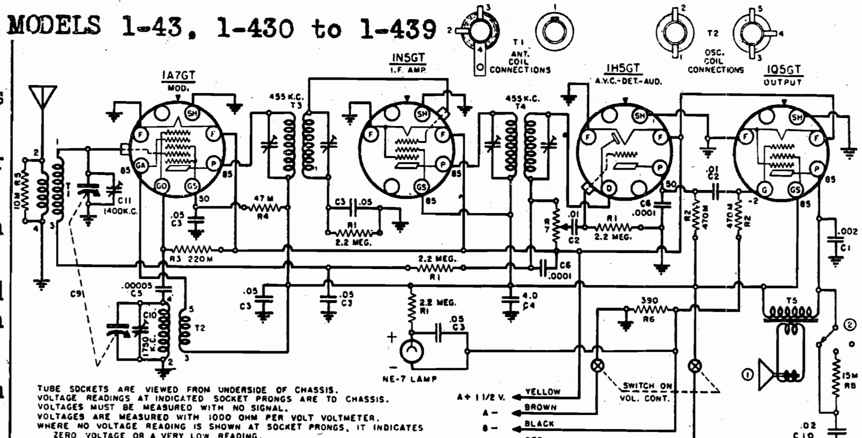
MODELS
1-621
1-622
9-62
910



MODELS
1-43
1-430
to
1-439



MODELS 1-43, 1-430 to 1-439



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 PRONGS, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
ALIGNMENT IS MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDS.
CAPACITY VALUES ARE IN MICROFARADS.

CODE	PART NO.	DESCRIPTION
R1	60-179	2.2 MEGOHM 1/4 W. RESISTOR
R2	60-178	470M OHM " "
R3	60-180	220M " " "
R4	60-177	47M " " "
R5	60-215	10M " " "
R6	60-221	390 " " "
R7	24-148	1 MEGOHM VOLUME CONTROL
R8	60-202	15M OHM 1/4W RESISTOR

CODE	PART NO.	DESCRIPTION
C1	16-138	.002 MFD. 400V. TUBULAR COND.
C2	16-121	.01 " 200V. " "
C3	1622	.05 " " " "
C4	18-250	4.0 " 150 W.V. ELECTROLYTICS
C5	15-120	.00005 MFD. MICA CONDENSER
C6	1501	.0001 " " "
C9	19-163	2 GANG VAR. COND. ALSO C10 & C11
C10	1605	.02 MFD. 200 V TUBULAR COND.

CODE	PART NO.	DESCRIPTION 1-43
T1	10-344	ANTENNA TRANSFORMER
T2	10-341	OSCILLATOR "
T3	10-342	1 ST. I.F "
T4	10-343	2 ND. I.F. "
T5	------	OUTPUT TRANS. (ON SPKR.)
1	79-310	8" P.M. SPEAKER
2	69-156	TONE CONTROL SW.

MODELS 1-621, 1-622, 9-62, 910

Follow the procedure outlined below in order to adjust the push buttons properly:

1. By means of the tuning knob, tune in as accurately as possible your first desired station.

2. Lift up the button for that station and with a small screw-driver loosen set screw about two turns (counter-clockwise).

3. Push the set screw in as far as it can go with the screw-driver, and while holding the set screw in this position, make sure that your desired station is tuned in properly. It may be necessary to re-tune your station.

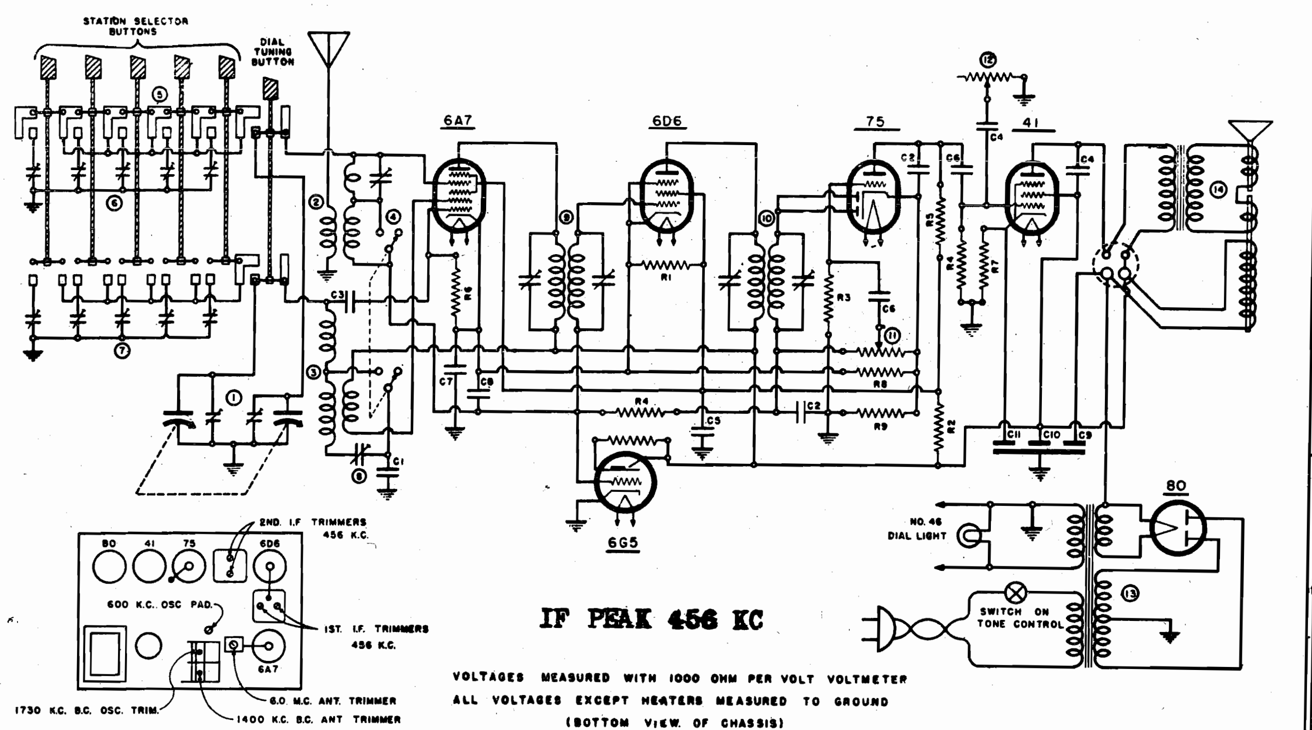
4. While holding set screw in as far as possible, and after your station is adjusted properly, tighten set screw firmly.

The push-button tuning system is now correctly set up for your first selected station.

Follow through with this same procedure in setting up the other three stations.

WARWICK MFG. CO.

MODEL WS-645



PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION 645
R1	6117	25,000 OHM 1/2 W CARBON RES.	C1	15-101	00148 MFD. MICA CONDENSER ±5%	1	19-113	2 GANG CONDENSER
R2	6105	10,000 " " " "	C2	1504	.00025 " " " "	2	10-196	ANTENNA COIL
R3	6017	1 MEG. " 1/3 W " "	C3	1501	0001 " " " "	3	10-147	OSCILLATOR COIL
R4	6018	500,000 " " " "	C4	1651	004 " 600 V. TUBULAR COND.	4	69-108	WAVE SWITCH
R5	6056	200,000 " " " "	C5	1607	05 " 400 V. " "	5	69-115	6 BUTTON PUSH-BUTTON SWITCH
R6	6028	40,000 " " " "	C6	1603	01 " " " "	6	20-106	ANT. TRIMMER STRIP
R7	6052	800 " " " "	C7	1614	25 " 200 V. " "	7	20-107	OSC. " "
R8	60-151	160 " " " " ±10%	C8	1622	05 " " " "	8	20-100	BC OSC. PADDING TRIMMER
R9	60-150	51 " " " " ±10%	C9	18-102	8 " 250 V. WET ELECTROLYTIC	9	10-194	1ST. I.F. TRANSFORMER
			C10	"	4 " " " "	10	10-195	2 ND. I.F. " "
			C11	"	4 " 25 V. " "	11	24-105	VOLUME CONTROL
						12	26-106	TONE CONTROL WITH SWITCH
						13	80-104	POWER TRANSFORMER
						14		SPEAKER

FOR TUNER. SEE INDEX

All alignments must be made with the volume control turned full on and with the signal input from the generator reduced to as low a value as possible while still giving a sufficient output to be easily read on the output meter.

Connect the output meter, through a .5 M.F. condenser and a resistance of such a value as to make the total meter resistance approximately 7000 ohms, to the two small pins of the speaker plug. The output meter remains connected during the entire alignment procedure.

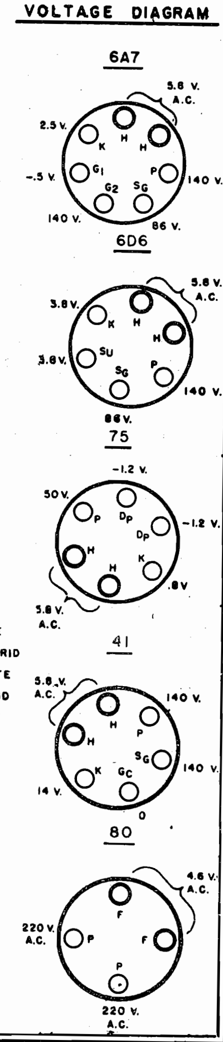
Connect the signal generator to the grid cap of the 6A7 tube through a .1 M.F. condenser. Connect the ground of the generator to the ground lead of the receiver. With the wave switch on broadcast position and the dial set to about 1000 K.C., feed in a 456 K.C. signal. Adjust the trimmers on top of the first and second I.F. transformers until the maximum output is obtained. This aligns the I.F.

Leaving the wave switch on broadcast position turn the dial to the extreme high frequency end. Feed a 1730 K.C. signal to the receiver antenna lead through a .00025 M.F. mica condenser. Adjust the 1730 K.C. broadcast oscillator trimmer until maximum output is shown. Set the generator to 1400 K.C. and tune in this signal on the receiver. Then adjust the 1400 K.C. broadcast antenna trimmer to maximum output. Set the generator to 600 K.C. and adjust the 600 K.C. broadcast oscillator pad to maximum output **while tuning the receiver back and forth across the signal** from the generator. This completes the alignment of the broadcast band.

The short wave band is aligned while feeding a 6.0 M.C. signal to the receiver antenna lead through a .00025 M.F. mica condenser. Turn the wave switch to short wave position and tune in the 6.0 M.C. signal. Adjust the 6.0 M.C. short wave trimmer to maximum output.

F - FILAMENT
H - HEATER
P - PLATE
K - CATHODE
G1 - OSC. GRID
G2 - OSC. PLATE
Gc - CONTROL GRID
Dp - DIODE PLATE
Sg - SCREEN GRID
Su - SUPPRESSOR

VOLTAGE DIAGRAM



INSTAMATIC
PUSH-BUTTON
TUNING

WARWICK MFG. CO.

INSTAMATIC TUNING

The purpose of **Instamatic** tuning is to give the user instant, automatic tuning of any one of a selection of favorite broadcast stations. The control buttons are conveniently located just below the tuning dial. Pushing in any button will release any other button which happens to be already in. After the **Instamatic** tuning feature has been properly adjusted, this will instantly and automatically tune in the station selected by this button.

Before attempting to adjust or use **Instamatic** tuning, the "Installation" and "Operation" instructions must be carefully followed. When the receiver is operating satisfactorily using the tuning dial with the "Dial Tuning" button pressed in, the **Instamatic** feature may be easily adjusted by carefully following these instructions.

Located on the back of the chassis is a row of five pair of small bakelite adjustment knobs. Each pair of these knobs controls the tuning of the station for the **Instamatic** button which is in the same relative position.

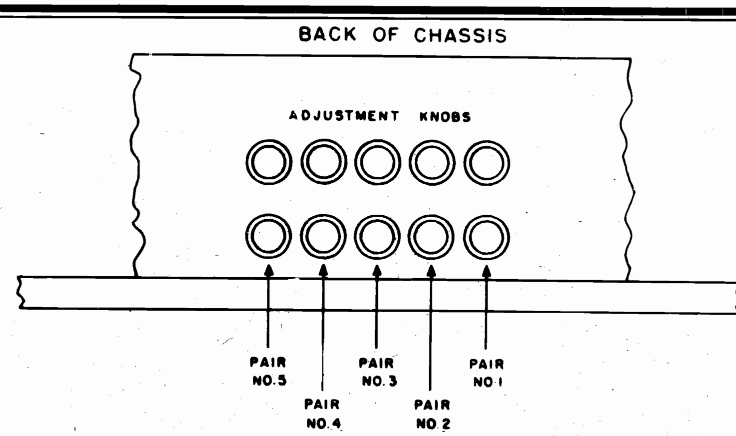
With the receiver operating with the "Dial Tuning" button in and the wave switch on broadcast position, turn the tuning knob to the left until the 540 KC end of the band has been reached. Then turn the tuning knob to the right until a station, for which it it desired to have **Instamatic** tuning, is heard. Press in the Button No. 1. This is the button at the left hand end of the row. Reach around to the back of the receiver and turn upper knob of the Pair No. 1 until the same program is heard. Unless the wrong knob is being turned, several different stations will be heard during this procedure. If necessary to check that the same program is now tuned in, the "Dial Tuning" button may again be pressed. In this way it can be determined that the same station is tuned in with the **Instamatic** button as when the "Dial Tuning" button is in. If it is not the same station the adjustment knob should be turned again and these operations repeated until the same program is heard when either of these two buttons is pressed.

The bottom adjustment knob of the first pair is now turned until the station is heard the best. Both top and bottom knobs may then be adjusted to exact tuning by watching the magic eye and adjusting until the two edges of the green section are as close together as it is possible to get them.

The first **Instamatic** button is now properly adjusted for the station which was tuned in on the dial and the station's call letters may be pushed out of the station list, moistened on the back, and pressed into the hollow end of the button.

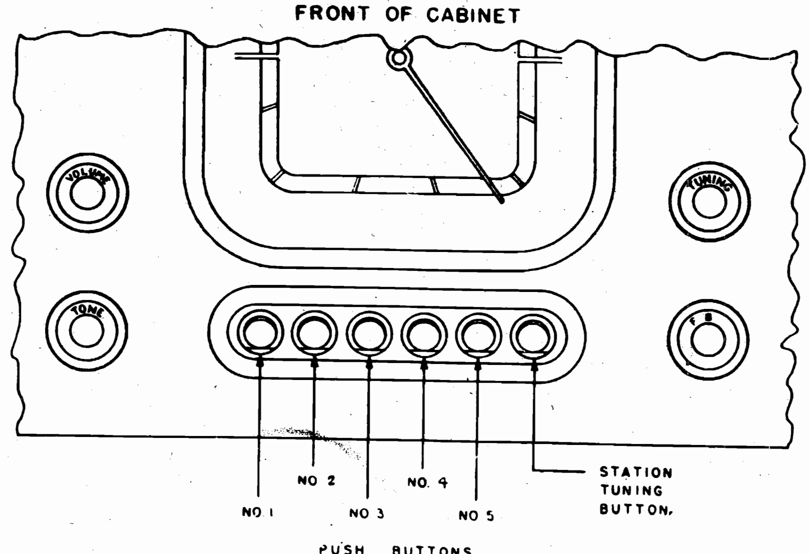
With the "Dial Tuning" button pressed in, the tuning knob is again turned to the right until the next station for which **Instamatic** tuning is wanted, is tuned in. The adjustment process for this station is the same as before, except that Button No. 2 and Pair No. 2 adjustment knobs are used. Proceeding in this way all five of the buttons may be properly adjusted for the stations desired.

It must be remembered that the "Dial Tuning" button must be pressed in whenever it is desired to tune in stations with the tuning knob, regardless of which wave band is in use. It must also be remembered that the wave switch must be in the broadcast position when **Instamatic** tuning is being used.



The approximate frequency coverage of each of the "**Instamatic**" control buttons is as follows:

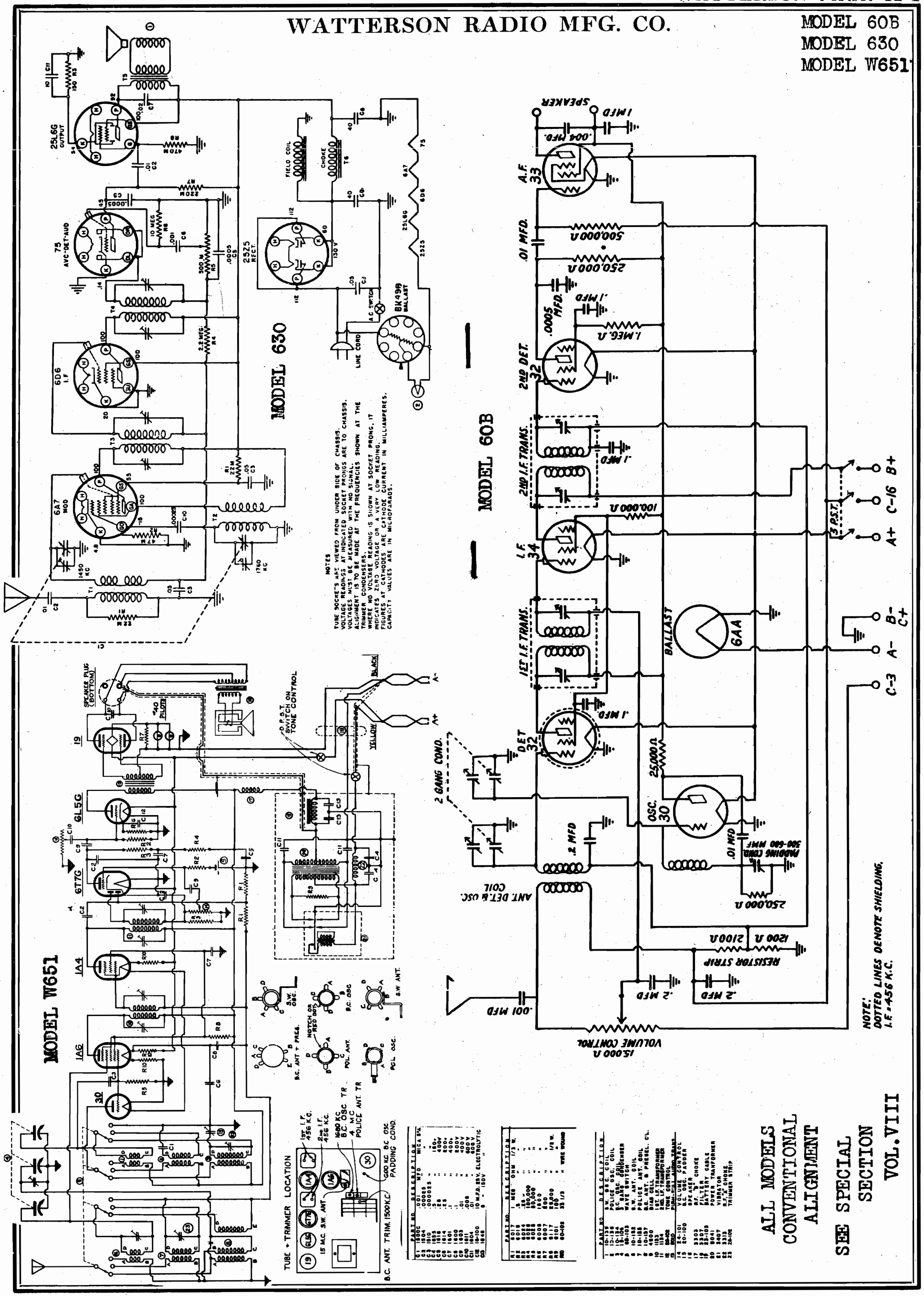
1—Stations between 540 and 1000 KC
2 Stations between 540 and 1000 KC
3 Stations between 750 and 1200 KC
4 Stations between 750 and 1200 KC
5 Stations between 1000 and 1500 KC



If desired the tuning dial may be left set to a station which is not set up on one of the buttons. The "Dial Tuning" button will then tune in this station when it is pressed. This will give an extra **Instamatic** tuned station, making a total of six different stations which can be instantly tuned in by simply pressing a button.

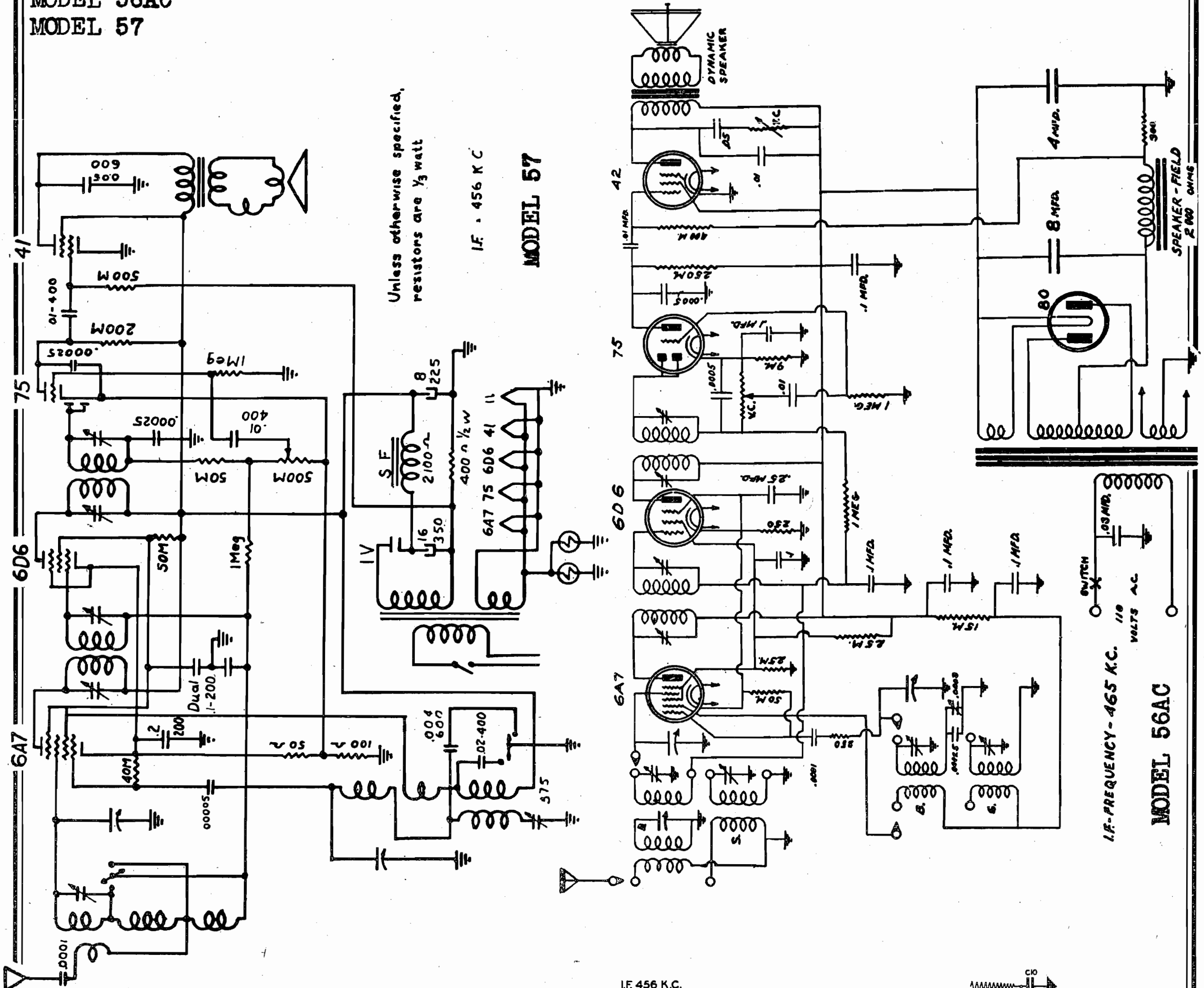
WATTERSON RADIO MFG. CO.

MODEL 60B
MODEL 630
MODEL W651



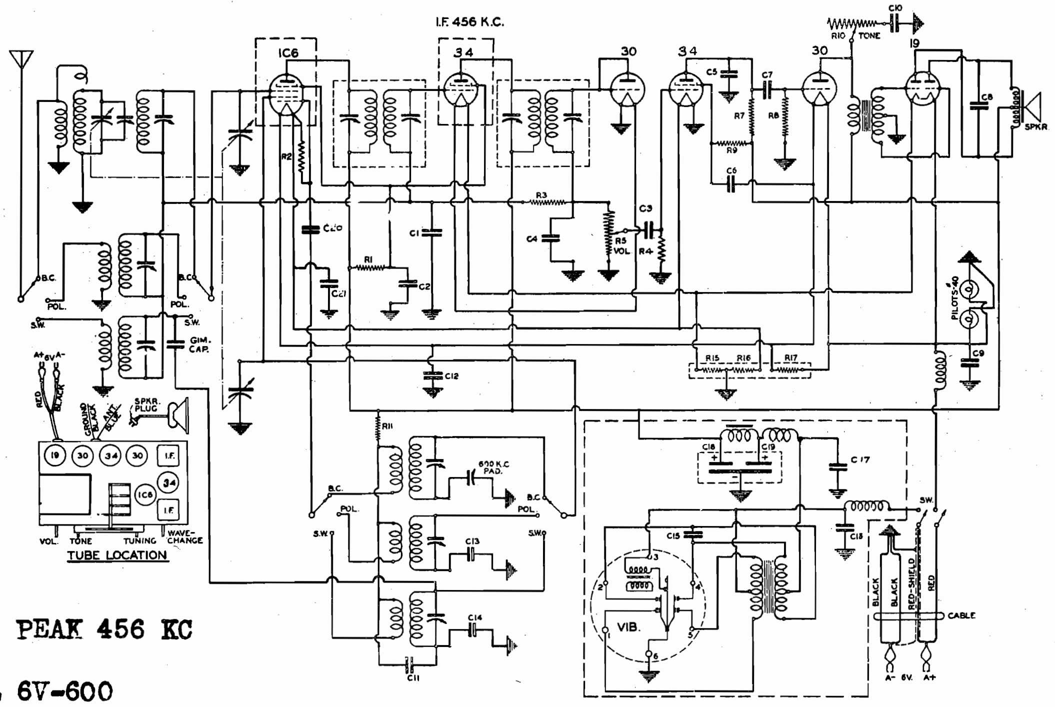
MODEL 6V-600W
MODEL 56AC
MODEL 57

WATTERSON RADIO MFG. CO.



ALL MODELS
CONVENTIONAL
ALIGNMENT

SEE
SPECIAL
SECTION
VOL.VIII



LEGEND					
R1	25M	OHMS	C1	.1	MFD.
R2	50M	"	C2	.1	"
R3	1 MEG.	"	C3	.01	"
R4	1 MEG.	"	C4	.00025	"
R5	500 M	"	C5	.0005	"
			C6	.1	"
R7	100 M	"	C7	.05	"
R8	500 M	"	C8	.006	"
R9	1 MEG.		C9	.1	"
R10	50 M	"	C10	.03	"
R11	5 M	"	C11	.001	"
			C12	.1	"
			C13	.0015	"
			C14	.0027	"
R15	20	"	C15	.01	"
R16	33.3	"	C16	.5	"
R17	33.3	"	C17	.01	"
			C18	8.	
			C19	8.	
			C20	.0001	
			C21	.1	

I.F. PEAK 456 KC

MODEL 6V-600

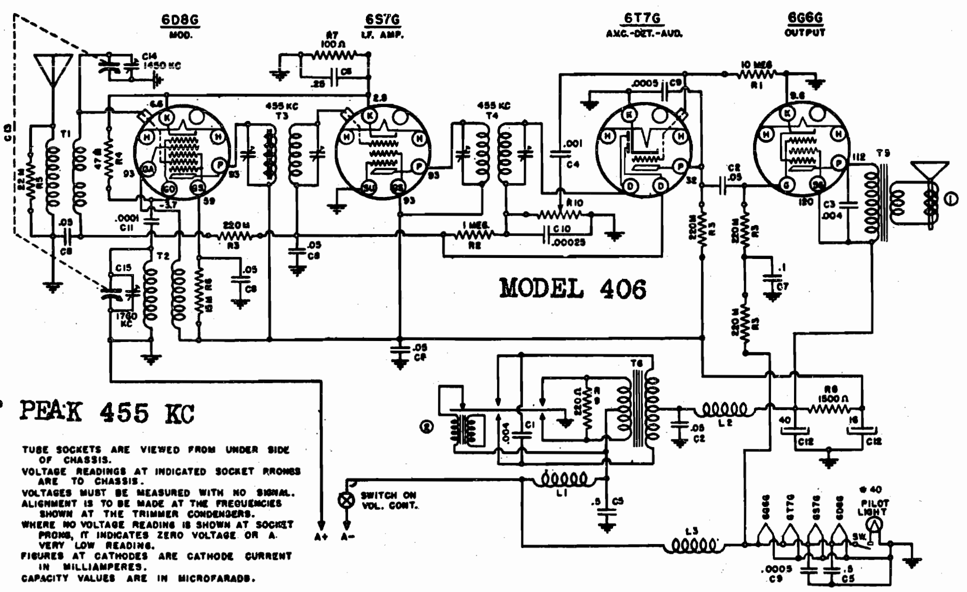
WATTERSON RADIO MFG. CO.

MODEL 79
MODEL 406
MODEL 669

CODE	PART NO.	DESCRIPTION
C1	16-127	.004 MFD. 1000 V. BUFFER COND
C2	1607	.05 " 400 V TUB. CONDENSER
C3	16-125	.004 " " " "
C4	16-124	.001 " " " "
C5	16-112	.5 " 200 V. " "
C6	16-120	.25 " " " "
C7	16-115	.1 " " " "
C8	1622	.05 " " " "
C9	15-112	.0005 " MICA CONDENSER
C10	1504	.00025 " " "
C11	1501	.0001 " " "
C12	18-236	40 X 16 MFD ELECTROLYTIC
C13	19-132	2 GANG VARIABLE CONDENSER C14 & C15

CODE	PART NO.	DESCRIPTION
R1	60-193	10 MEGOHM 1/3 W RESISTOR
R2	60-195	1 " " "
R3	60-180	220 M OHM " "
R4	60-177	47 M " " "
R5	60-185	22 M " " "
R6	60-202	15 M " " "
R7	60-197	100 " " "
R8	60-203	1500 " 1/2 W "
R9	60-199	220 " " "
R10	24-124	VOLUME CONTROL 500M Ω

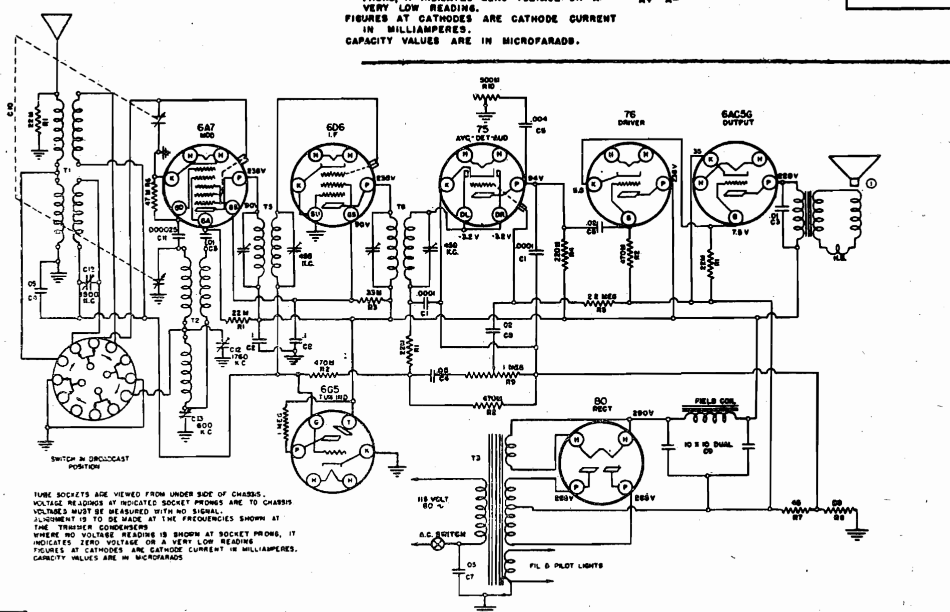
CODE	PART NO.	DESCRIPTION 406
T1	10-239	ANTENNA TRANSFORMER
T2	10-240	OSCILLATOR "
T3	10-253	1ST. I.F. "
T4	10-252	2 ND. I.F. "
T5		OUTPUT TRANS. (ON SPKR.)
T6	80-160	VIBRATOR TRANSFORMER
L1	33-217	VIBRATOR CHOKE
L2	10-245	R.F. "S" "
L3	33-218	FILAMENT "
1	79-256	SPEAKER 5" P.M.
2	34-103	VIBRATOR



MODEL 406

IF PEAK 455 KC

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS.
VOLTAGES MUST BE MEASURED WITH NO SIGNAL.
ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMER CONDENSERS.
WHERE NO VOLTAGE READING IS SHOWN AT SOCKET PRONG, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING.
FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS.



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FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.
CAPACITY VALUES ARE IN MICROFARADS

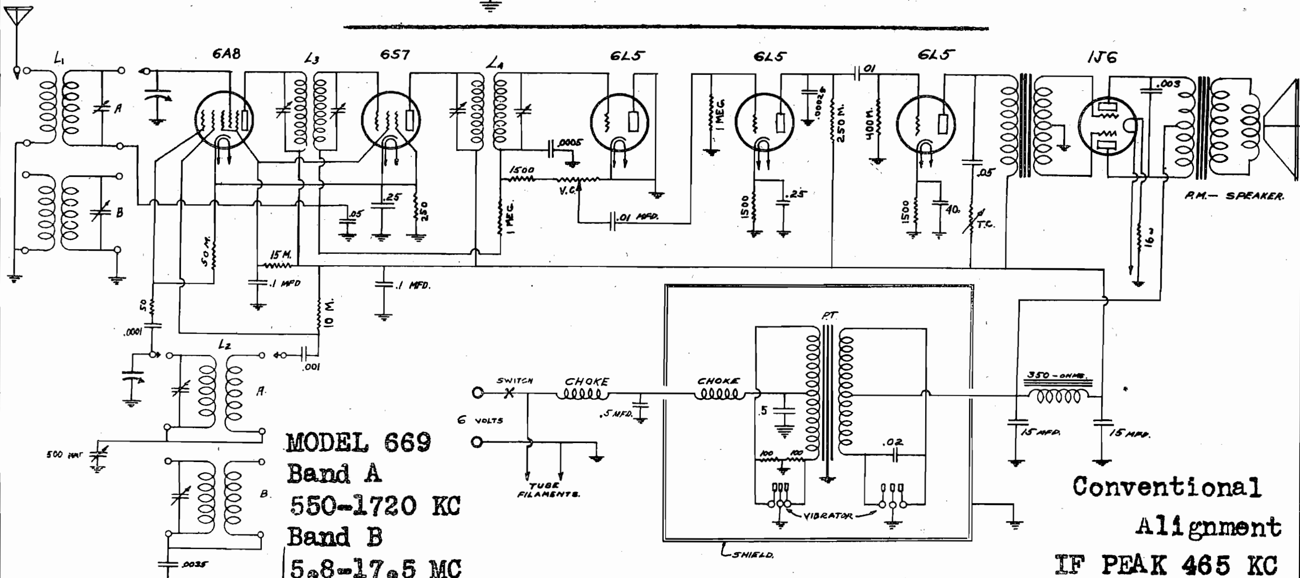
CODE	PART NO	DESCRIPTION
R1	60-185	22 M OHM 1/3 WATT RESISTOR
R2	60-178	470M " " " "
R3	60-188	33M " " " "
R4	60-190	220M " " " "
R5	60-179	2.2 MEGOHM 1/3 WATT RESISTOR
R6	60-177	47 M OHM 1/3 WATT RESISTOR
R7	60-187	45 " 1/2 " " ±10
R8	60-191	90 " " " " ±10 %
R9	24-123	1 MEGOHM VOLUME CONTROL & SW
R10	26-118	500M OHM TONE CONTROL

CODE	PART NO	DESCRIPTION
C1	1501	100 MMF MICA CONDENSER
C2	16-116	1 MFD 400 V TUBULAR CONDENSER
C3	1604	01 MFD 600 V " "
C4	1622	05 " 200 V " "
C5	1651	004 MFD 600 V " "
C6	16-108	02 " " " "
C7	1607	05 " 400 V " "
C8	16-123	02 " 200 V " "
C9	18-226	10 X 10 MFD 400 W V ELECTROLYTIC CONDENSER
C10	19-133	2 GANG VARIABLE CONDENSER

CODE	PART NO	DESCRIPTION
C11	1510	25 MMF MICA CONDENSER
C12	2052	TRIMMERS 3-30 MFD
C13	20-117	PADDING CONDENSER 300-600 MMFD
T1	10-237	ANTENNA COIL
T2	10-238	OSCILLATOR COIL
T3	[illegible]-159	POWER TRANSFORMER
T5	10-227	1ST I F "
T6	10-228	2ND I F "
1	79-245	SPEAKER

MODEL 79

IF PEAK 455 KC

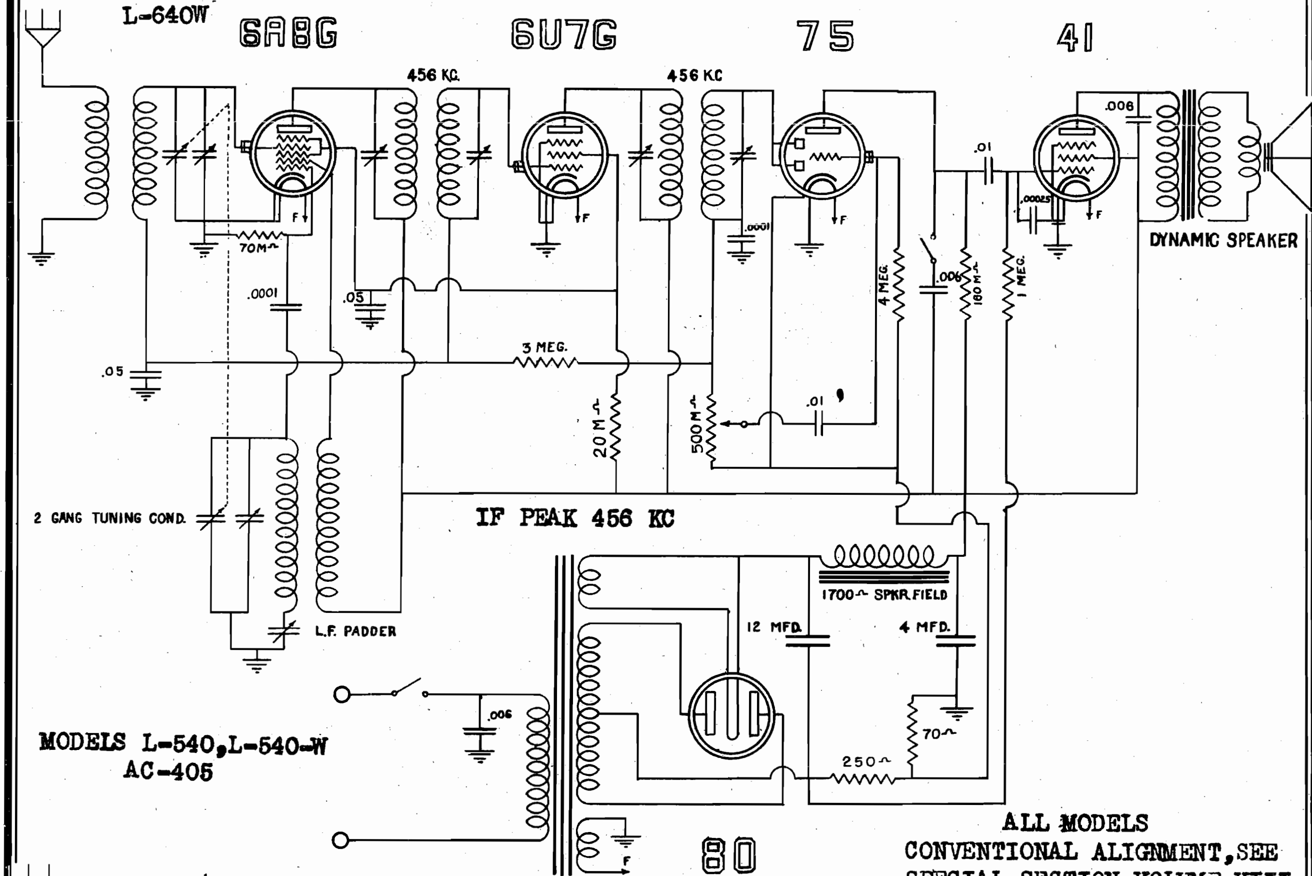


MODEL 669
Band A
550-1720 KC
Band B
5.8-17.5 MC

Conventional Alignment
IF PEAK 465 KC

MODELS AC-405,
L-540, L-540-W
MODELS AC-406, L-640-W
L-640W

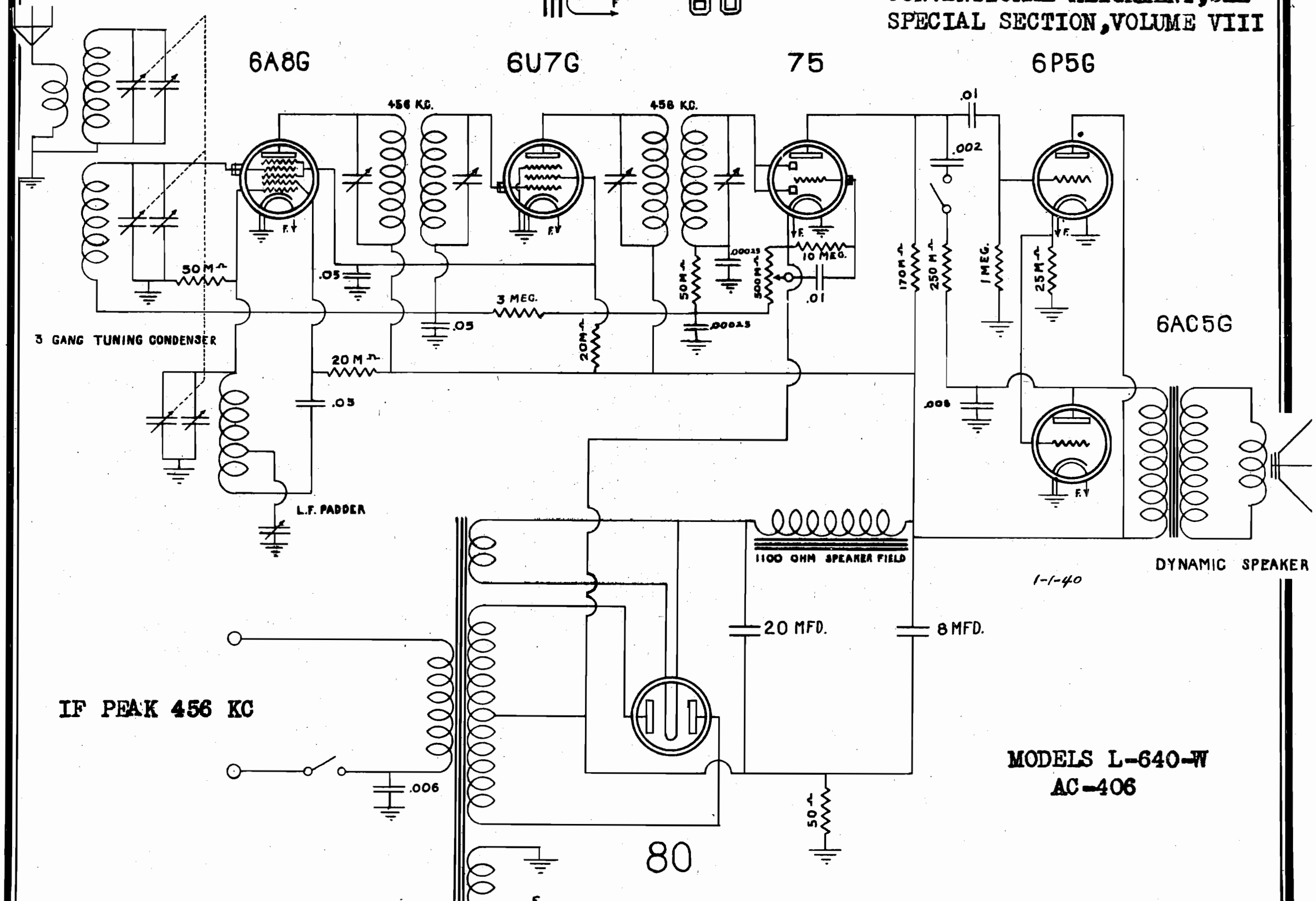
WATTERSON RADIO MFG. CO.



MODELS L-540, L-540-W
AC-405

IF PEAK 456 KC

ALL MODELS
CONVENTIONAL ALIGNMENT, SEE
SPECIAL SECTION, VOLUME VIII

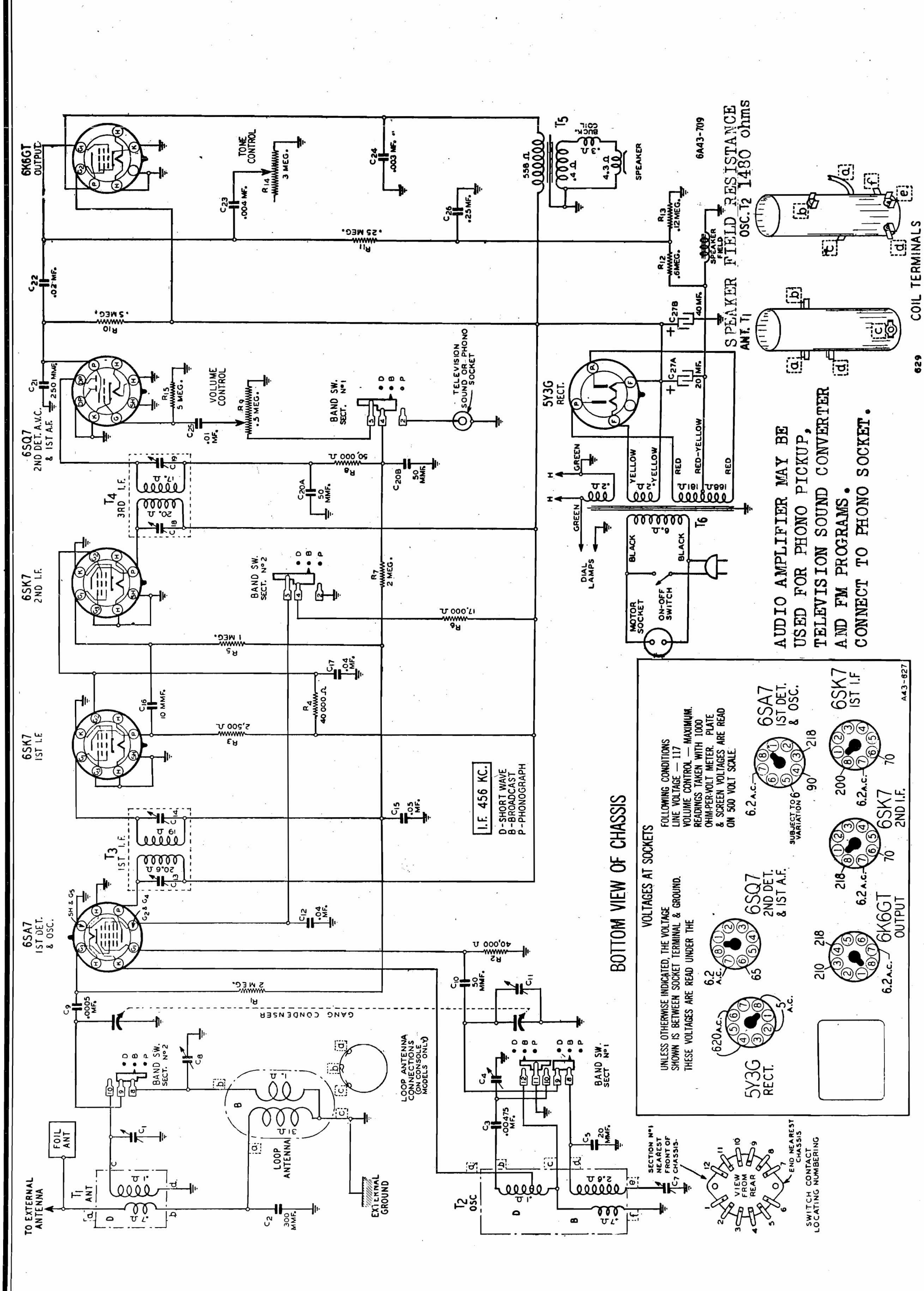


IF PEAK 456 KC

MODELS L-640-W
AC-406

WELLS-GARDNER & CO.

MODEL 6A43



MODEL 6A43

WELLS-GARDNER & CO.

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 ....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

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.

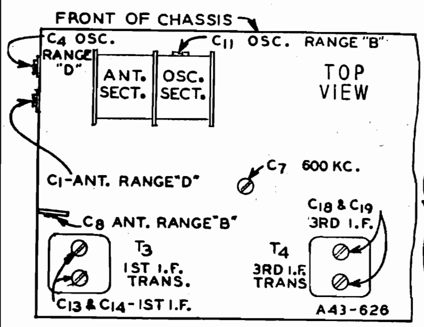
The following equipment is required for aligning:

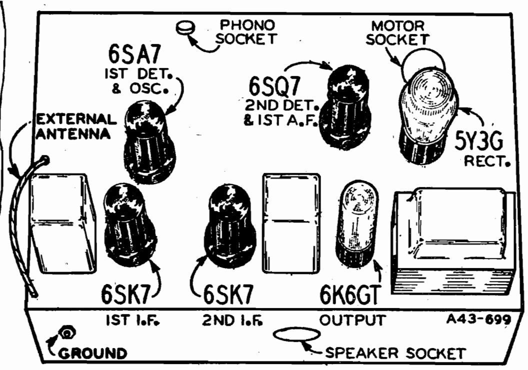
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

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.

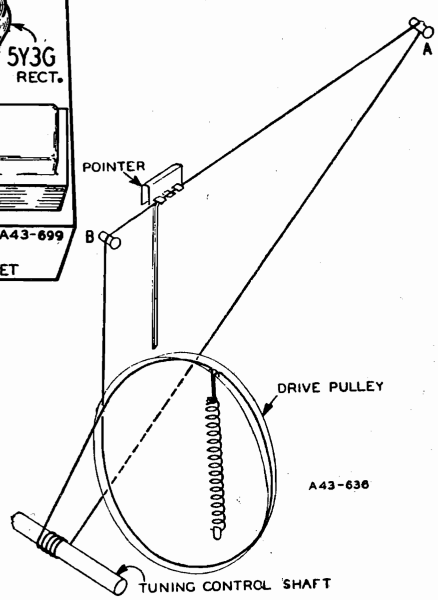
NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Tune in a 1400 KC signal. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

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 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.

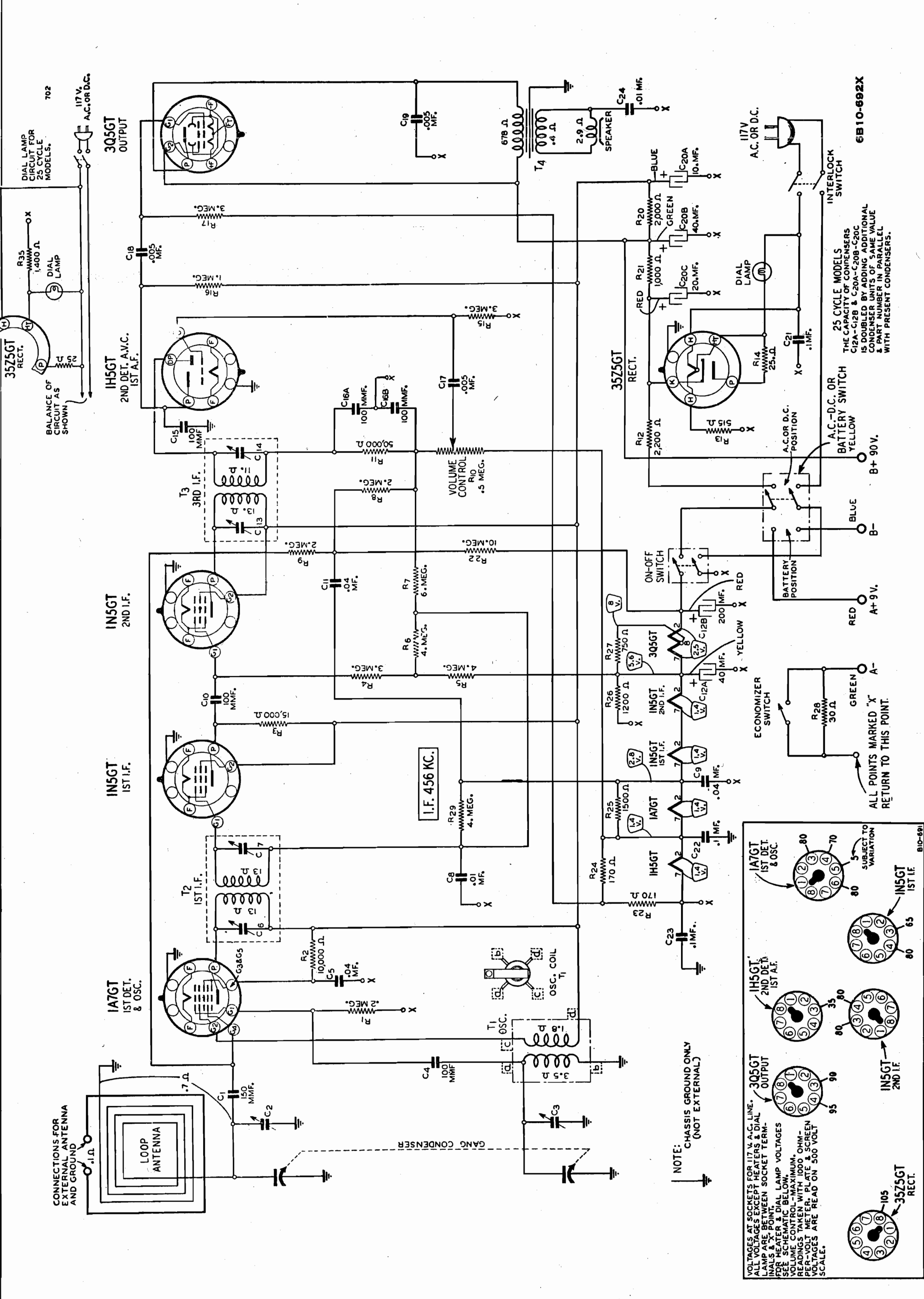


CHANGES 7/26/40

On later models, two resistors were added to the phono circuit. One, a 1.5 Megohm resistor, was connected in series with No. 2 terminal on the band switch (Section No. 1) and the ungrounded terminal of the phono socket. The other resistor, .5 Megohm, was connected between the ungrounded terminal of the phono socket and ground.

WELLS-GARDNER & CO.

MODEL 6B10



MODEL 6B10

WELLS-GARDNER & 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

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

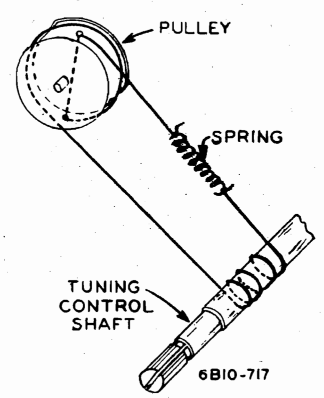
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

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.

DRIVE CORD REPLACEMENT

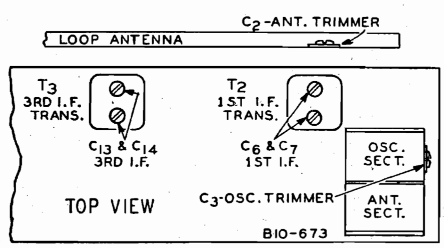


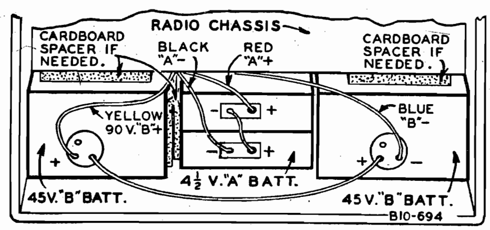
GANG CONDENSER IN CLOSED POSITION

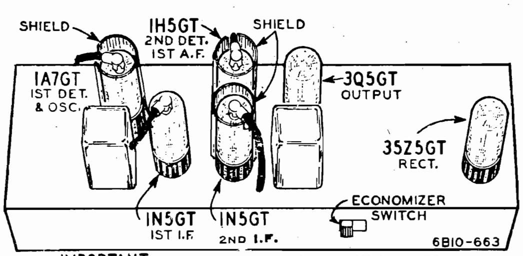
CALIBRATION—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen pointer set screw and set the pointer at the 800 KC mark. Retighten set screw.

CAUTION

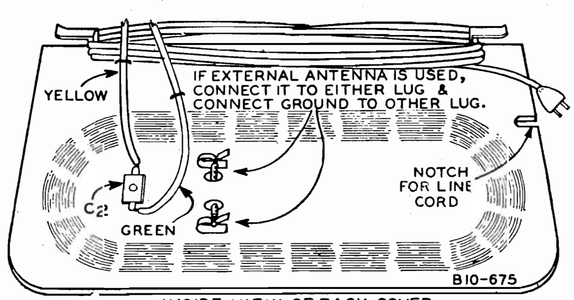
The metal chassis is connected to one side of the line through .20 mfd. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this capacity is grounded and the metal chassis comes in contact with an external ground, this capacity will be connected across the line and there will be an increase in hum.







IMPORTANT — METAL BASE TUBES MUST BE USED IN THOSE SOCKETS AT WHICH SHIELDS ARE SHOWN.



INSIDE VIEW OF BACK COVER

WELLS-GARDNER & CO.

MODEL 6C13

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

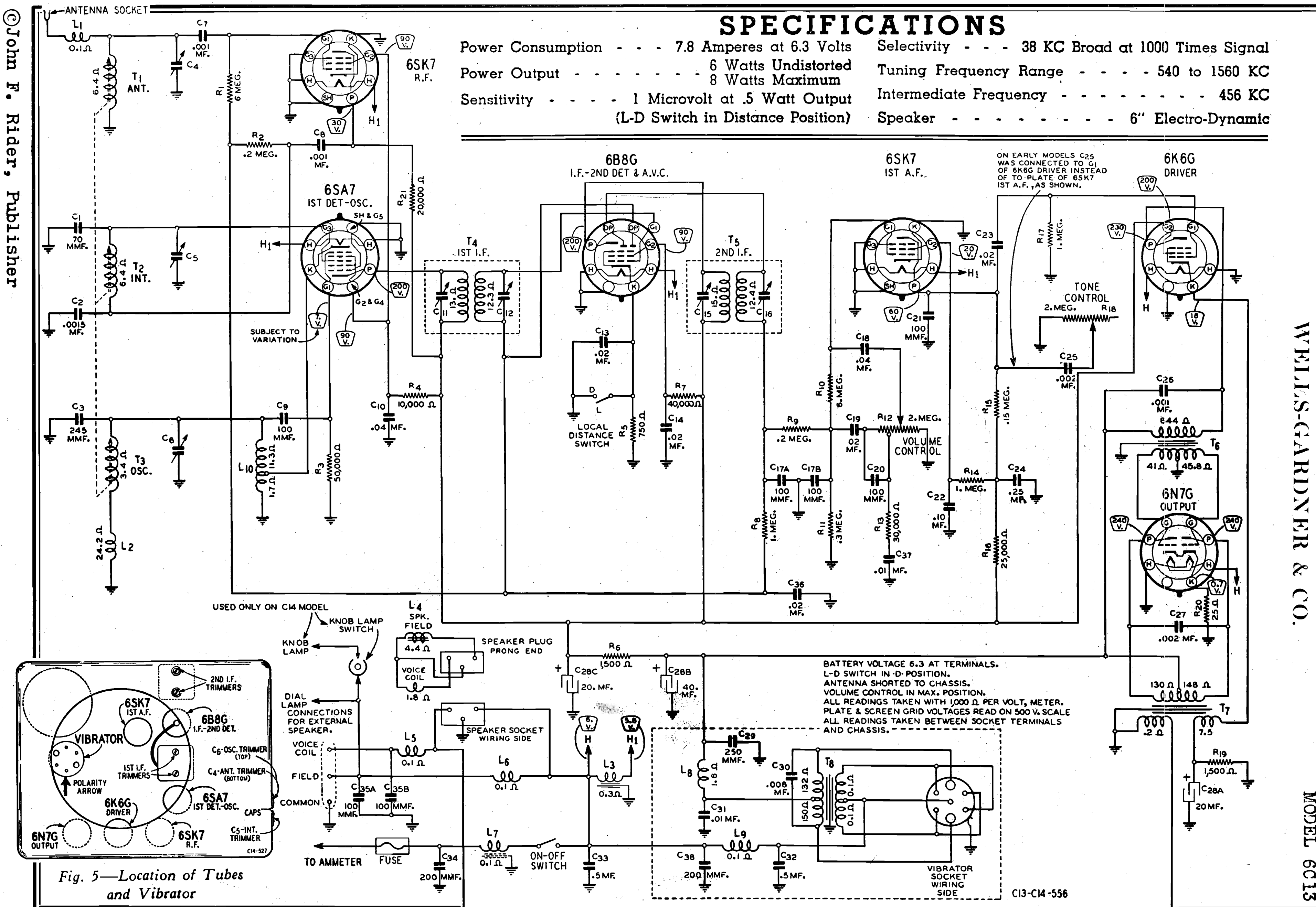


Fig. 5—Location of Tubes and Vibrator

MODEL 6C13

WELLS-GARDNER & CO.

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.

A 36 inch shielded antenna cable (30 mmf. capacity) with bayonet connector plug is furnished. Whenever possible, this cable should be used rather than the one which may be supplied with the antenna.

The plug on the antenna cable is inserted in the socket at the side of the chassis case as shown in Fig. 3. The wire at the other end of the cable is connected to the antenna.

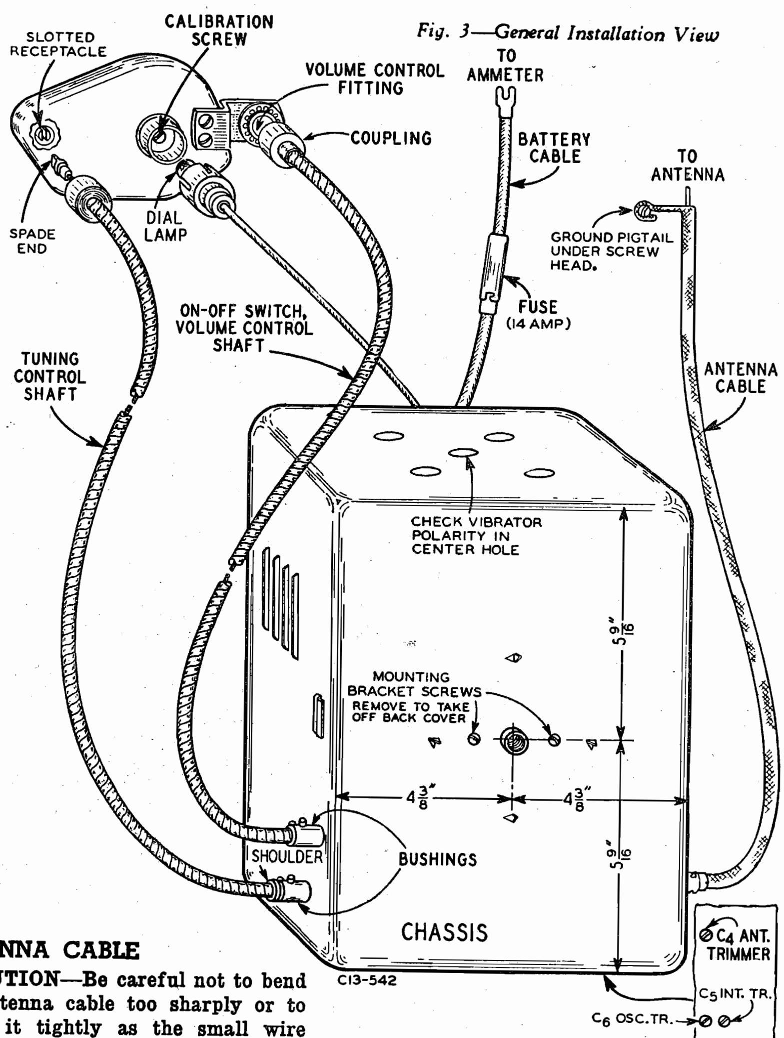
LOW CAPACITY ANTENNA

This radio is designed for a low capacity car antenna. The total capacity of antenna and shielded cable should be 35 to 60 mmf.

HIGH CAPACITY ANTENNA

If this radio is to be installed with a high capacity car antenna (70 to 500 mmf. total capacity of antenna and shielded cable), a 24 inch shielded adapter extension cable is necessary. The adapter is inserted in the socket at the side of the chassis case. Then the antenna cable plug is inserted in the socket at the other end of the adapter.

Fig. 3—General Installation View



ANTENNA CABLE

CAUTION—Be careful not to bend the antenna cable too sharply or to clamp it tightly as the small wire inside the cable may be broken.

WELLS-GARDNER & CO.

MODEL 7A40

Power Consumption 55 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 - - - - - - 10" P.M. Dynamic

Tuning Frequency Range

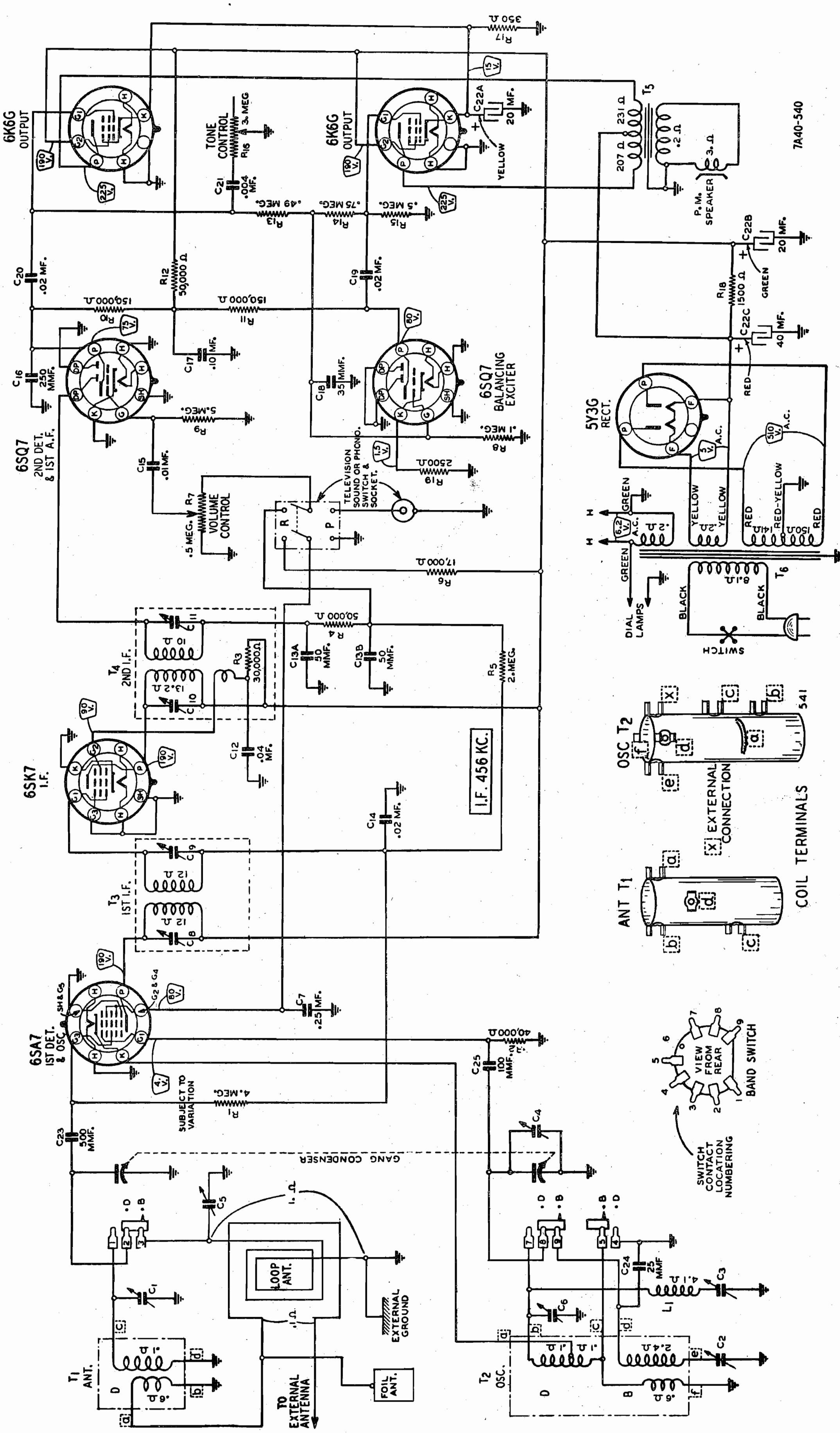
B Range .... 528 to 1550 KC

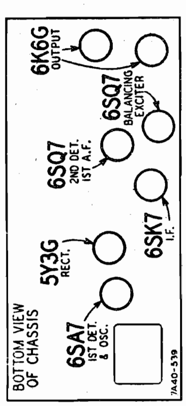
D Range .... 5750 to 18300 KC

Sensitivity—External Antenna—(For 0.5 Watt output)

B Range .... 25 Microvolts Average

D Range .... 45 Microvolts Average





MODEL 7A40
MODEL 7A41

WELLS-GARDNER & CO.

ALIGNMENT PROCEDURE MODEL 7A40

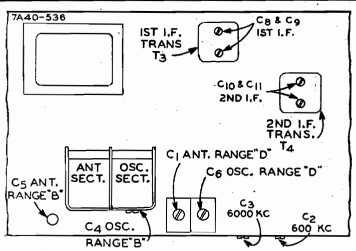
Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

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

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter—Non-Metallic Screwdriver.
Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH 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. (C8) & (C9) 2nd I.F. (C10) & (C11)
RANGE B					
1550 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C4)
1400 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C5)
600 KC	Antenna Lead	200 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
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C3) 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)



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—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.

Television Sound or Phonograph Connections

On the back panel of the chassis base is a switch and a socket for a single shielded pin tip at which connections are made. The connector on the cable from a television receiver or from a phono pickup can be inserted in the socket.

(The cable connector must be a single shielded pin tip type, Part No. 6A224.)

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." Phonograph records may also be played through the radio.

When phonograph or television sound reproduction is desired, the knob should be moved to the "Television Sound or Phonograph" position. For radio reception, the knob should be in the "Radio" position.

Procedure for Setting the Station Buttons

MODELS 7A40, 7A41

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 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 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 means of the manual tuning knob.

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 button No. 1.

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.

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.

Drive Cord Replacement

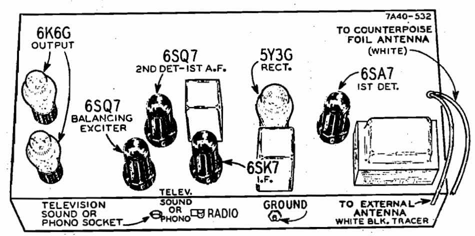
Tie one end of the new drive cord (approximately 70 inches in length) to tension spring. Turn gang condenser to full open position. Thread free end of drive cord up through hole in rim of condenser drive pulley and pull spring flush against pulley rim.

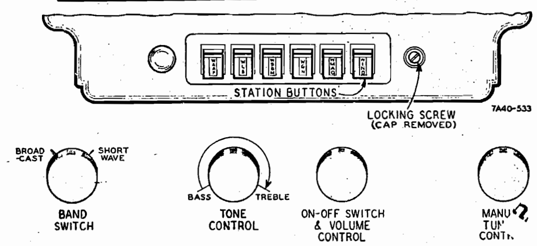
Wind one turn counter-clockwise (from condenser drive pulley side of chassis) around drive pulley. This turn should progress to the left (from front of chassis). Pass cord in back of guide arm—see illustration. Then wind drive cord 3½ turns counter-clockwise (from front of chassis) around tuning control shaft. Turns should progress away from the chassis.

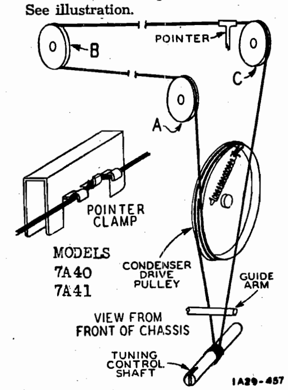
Pass cord around pulleys C, B, and A as shown in illustration. Then wind cord ¾ turn counter-clockwise (from condenser drive pulley side of chassis) around drive pulley. The turn should be at right side (from front of chassis) of pulley groove.

Thread cord through hole in pulley groove and knot securely 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.







WELLS-GARDNER & CO.

MODEL 7A41-704

FOR OTHER DATA
SEE INDEX

Power Consumption 55 Watts (At 117 volts 60 cycles)

Phonograph Operating { Seeburg Unit—71 Watts; RCA Unit—67 Watts

Power Output - - - - - - - 3.0 Watts Undistorted; 4.5 Watts Maximum

Selectivity - - 38 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - - 456 KC

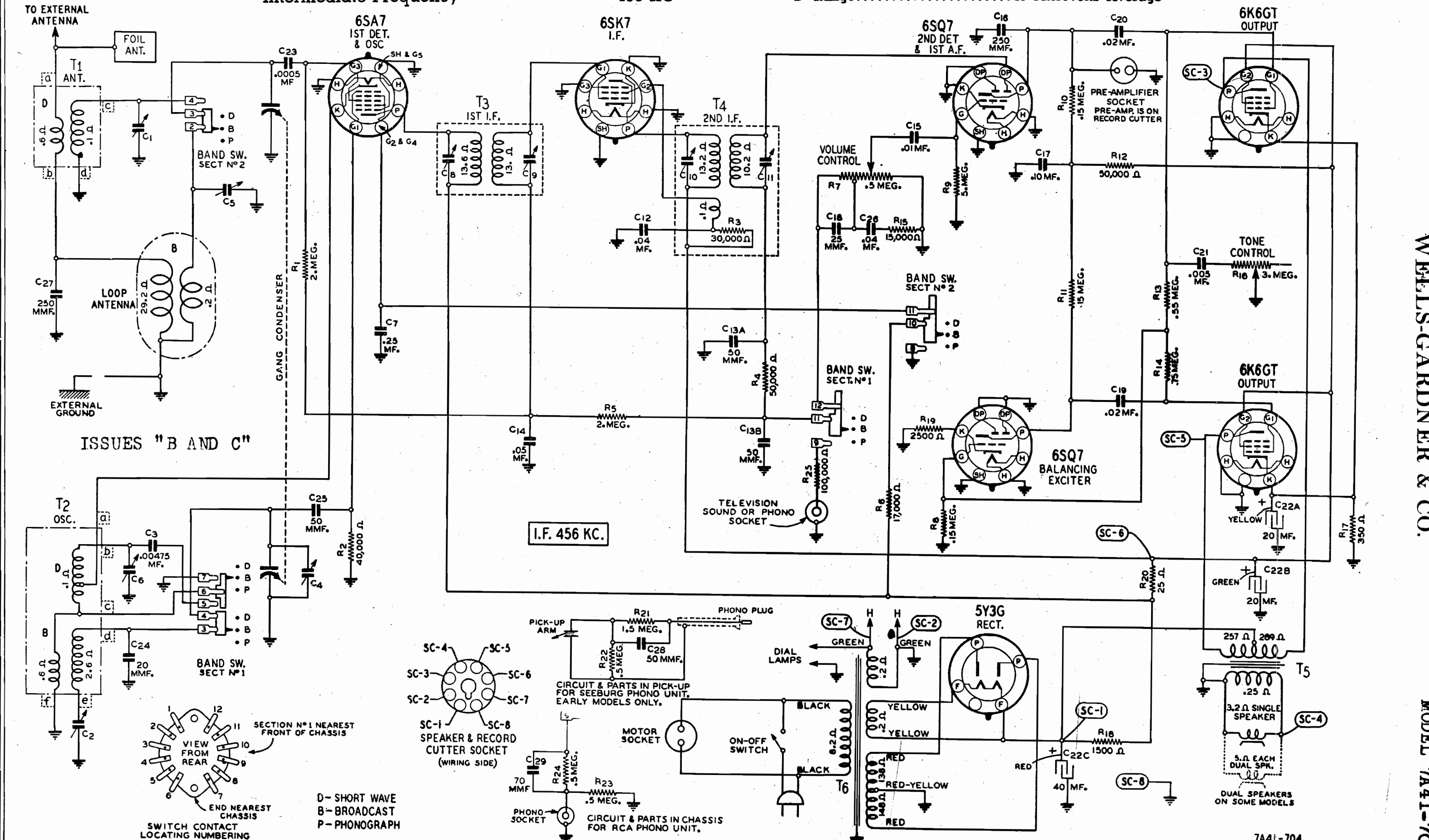
Speaker - - - - - - - - - - - 10" P.M. Dynamic

Tuning Frequency Range

B Range........................... 528 to 1600 KC
D Range...........................5750 to 18300 KC

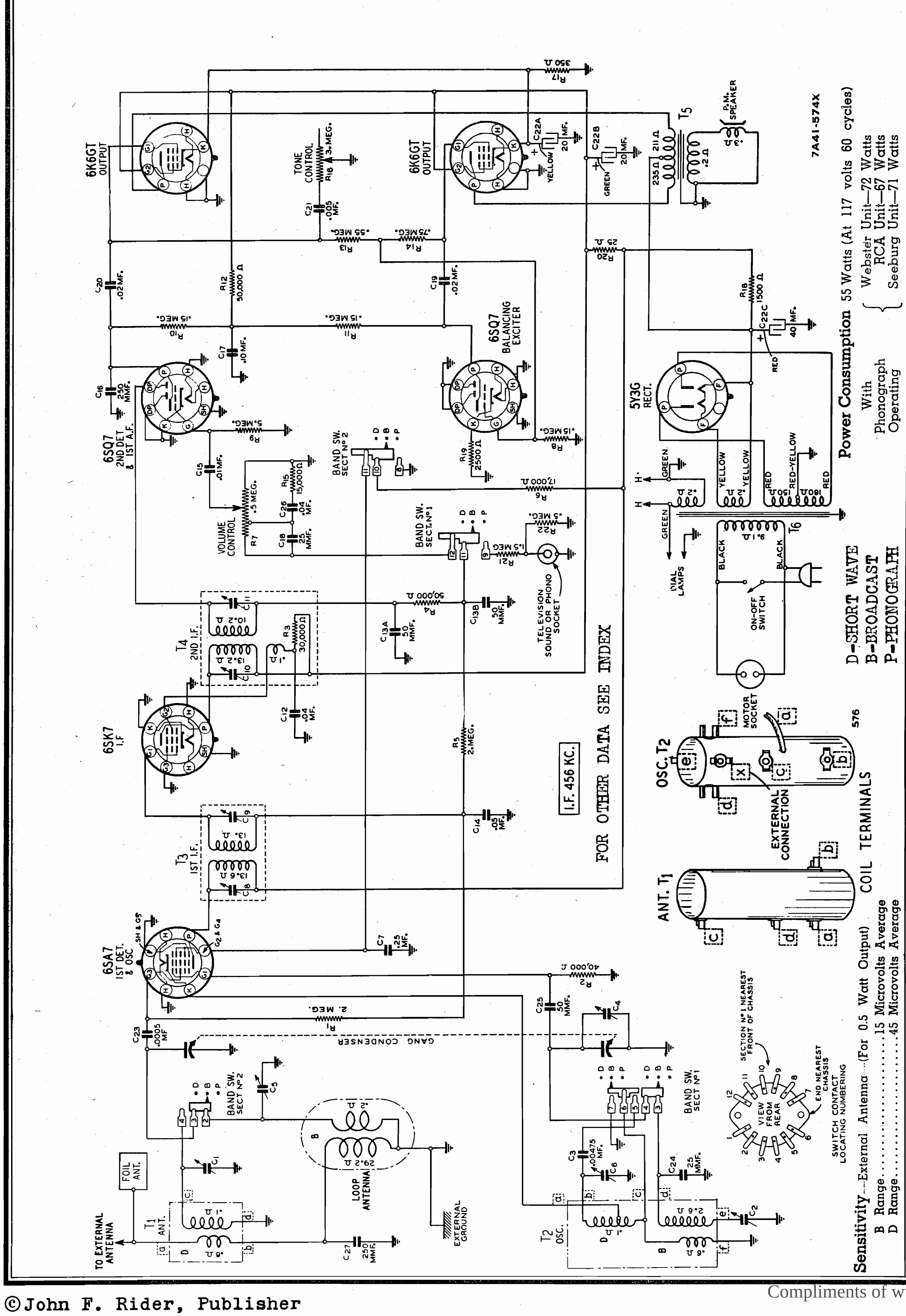
Sensitivity—External Antenna—(For 0.5 Watt Output)

B Range.......................15 Microvolts Average
D Range.......................45 Microvolts Average



MODEL 7A41-574X

WELLS-GARDNER & CO.



WELLS-GARDNER & CO.

MODEL 7A41

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.

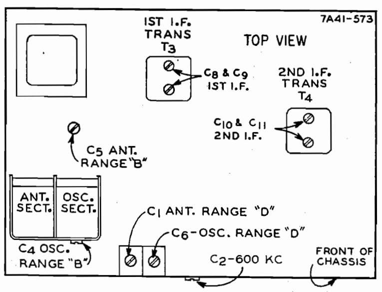
The following equipment is required for aligning:

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	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)



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—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.

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 put the record changer in operation.

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. (See illustration—Page 2.) 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 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.

Television-Frequency Modulation -Home Recorder

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."

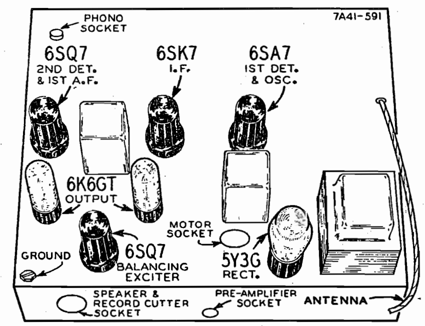
When Frequency Modulated programs are desired, the Phonograph-Radio knob should be turned to the Phonograph (P) position. For radio reception, the knob should be in one of the two Radio positions.

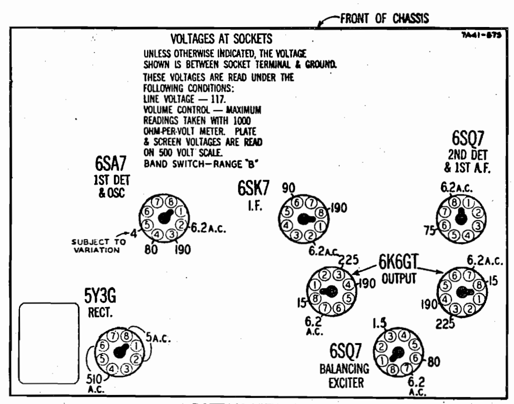
Home Recorder

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.

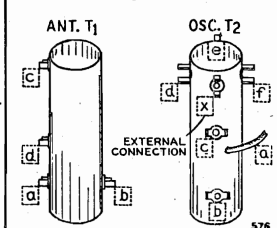
Your favorite radio programs, comedy, dance or symphony may be permanently recorded. By means of a microphone attachment, voice or music of your own production may be recorded.

For detailed information regarding this record cutter unit, get in touch with the dealer from whom the radio was purchased.





BOTTOM VIEW OF CHASSIS



COIL TERMINALS

WELLS-GARDNER & CO.

Battery Cable and Fuse

The battery connection is made at the ammeter. The end of the battery cable with the connecting lug is secured to one of the posts at the back of the ammeter in the instrument panel. The other end of the cable with the fuse receptacle connects to the battery cable from the radio after the fuse has been inserted. A 14 ampere fuse is used.

Dial Lamp Cable

Insert the dial lamp assembly in the hole at the top of the lamp housing as indicated in Fig. 3. The dial lamp used in this unit is a 6-8 volt automobile type lamp (Bulb No. 51).

Suppression of Motor Noise

The following procedure has been found to be effective in reducing motor noise to a satisfactory level in most cars. Follow the steps in the order given. Additional procedure, which may be required in exceptional cases of motor noise, is not covered here and will be found by referring to current literature on this subject.

GENERATOR CONDENSER—A generator condenser is required in all cases. Connect the condenser lead to the battery terminal of the generator. The case and mounting strap connect the other side of the condenser to ground. This unit must, therefore, be well grounded at its mounting.

CAUTION—In cars with automatic regulators, it is important not to connect the condenser across the field terminal. Most manufacturers at the present time have a recommendation for the proper post at which to connect the condenser.

DISTRIBUTOR SUPPRESSOR—A distributor suppressor will be required in most cases. Remove the high tension lead to the distributor. Insert a distributor suppressor and connect the wire to the other end of the suppressor (See Fig. 7). If this is not practical, cut the high tension lead *close to the distributor* and use a wood screw end type distributor suppressor in this line.

Withdraw Antenna Cable Plug

Turn on the radio and start the motor.

If motor noise is heard, proceed as follows:

BONDING CABLES—Try grounding to the fire wall all cables and tubing which pass through it such as oil lines, gas lines, etc. By means of a file, contact can be established between any of the lines and the fire wall in order to determine whether such a ground will reduce the noise. To bond the cables to the fire wall, clean the point of contact, wrap a length of braided shielding around the cable, and solder the connection. Then solder the end of the shielding to the fire wall or ground it under a screw head if one is convenient.

Sufficient play should be left in the bonding shielding so that movement of the cables or tubing will not loosen this shielding from the fire wall.

BONDING STEERING COLUMN, ETC.—It is possible for the steering column, foot pedals, and brake lever to carry interference to the back of the fire wall at which point it may affect the radio. See if each of these items is well grounded to the frame of the car. By means of a file or a braided shielding jumper, contact can be established between any of these items and the frame in order to determine whether or not such a ground will reduce the noise. A piece of one inch braided shielding should be used if such a ground is necessary and this shielding may be grounded under a screw head, nut, or may be soldered in position.

Then Reinsert Antenna Cable Plug

If motor noise is heard when the antenna cable is reconnected, proceed as follows until the noise is satisfactorily reduced:

DOME LIGHT LEAD—Noise due to radiation from the dome light lead is generally experienced only when a roof antenna is being used. Disconnect the dome light lead connection at the back of the instrument panel and ground this wire. If this is found to reduce the noise noticeably, interference is being radiated by the dome light lead. Reconnect the dome light lead and then connect a .5 mfd. bypass condenser between the point at which this lead leaves the pillar post and ground.

BYPASS CONDENSERS—Try a .5 mfd. bypass condenser from the ammeter to ground and see if interference is reduced. Install this condenser permanently if there is an improvement.

In like manner, try a .5 mfd. condenser from car fuse to ground, switch to ground, tail light and stop light connections to ground, windshield wiper and various other 6 volt connections to ground, noting what effect these condensers have on the noise pick-up.

Try a .5 mfd. condenser from the "Hot" side of the coil primary to ground.

The electric gauges used for oil, water, and gas are often a source of interference and bypass condensers should be tried.

HIGH AND LOW TENSION LEADS—In some cases, the high and low tension leads between the coil and distributor are run close together. In some cars, they are in the same conduit. If this is the case, remove the low tension lead from this conduit. In any event, keep the high and low tension leads as far apart from each other as possible. If separating the two leads is not sufficient, shield and ground the shield of the low tension lead.

GROUNDING MOTOR AND OTHER PARTS—The motor must, in every case, be well grounded to the frame of the car. If it is not, use a very heavy braided lead for this purpose, similar to a storage battery ground lead. In like manner, it may be necessary to check the grounding of the metal fire wall, instrument panel, transmission, radiator, hood, and muffler to the frame of the automobile. To obtain a good electrical connection, scrape off the paint, if necessary, at the point where ground contact is made.

PEENING ROTOR ARM—In extreme cases of motor noise, it is advisable to peen the distributor rotor arm, that is, increase the length of the arm by using a small machinist's hammer. This will lessen the gap between the rotor arm and the stationary contacts thus reducing the spark. Be sure, after peening the arm, that it does not strike the stationary contacts.

SPARK PLUG SUPPRESSORS—If motor noise persists, spark plug suppressors must be installed. One suppressor is put on each plug. These are not regularly supplied with the radio and must be purchased extra. Ninety-five percent of all cars will not require spark plug suppressors.

Care should be taken that a good mechanical and electrical connection is made between the spark plugs, suppressors, and plug wires.

WHEEL OR BRAKE STATIC—Noise from this source is generally experienced only when an under car antenna is being used. To determine if noise is being caused from this source, set the car in motion; then with the motor shut off and the clutch disengaged, apply the brakes. If the noise stops, the source of the static is in the wheels. The use of a front or rear wheel static eliminator will generally end the trouble.

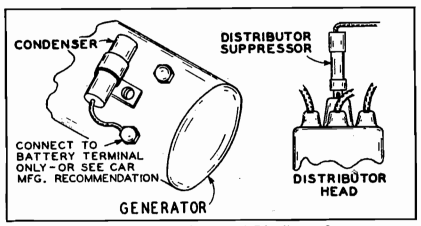


Fig. 7—Generator Condenser and Distributor Suppressor

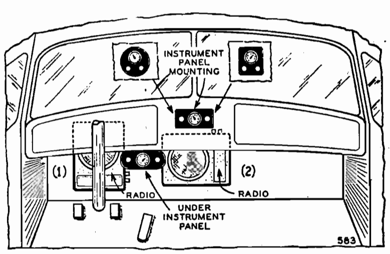


Fig. 1—Control Assembly and Chassis Mountings

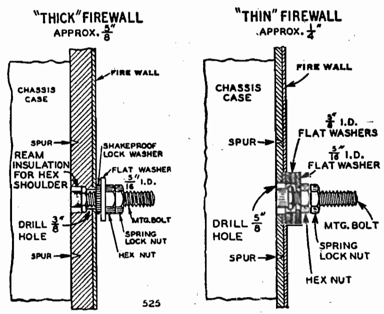


Fig. 2—Details of Chassis Mounting

Procedure for Setting the Stations

There are 6 positions of the Automatic Station Mechanism. Five of these are Automatic Station positions and one is the Manual Tuning position. A sixth station may be tuned in with the Manual Tuning Knob. If the position of this knob is not disturbed, the sixth station will be automatically tuned in when the Automatic Station Mechanism is in the Manual Tuning position.

The different positions are reached by pushing the Automatic Station Knob firmly and gently all the way in and releasing this knob so that it snaps all the way back. Pushing in the knob once in this manner will advance the mechanism to the next position, twice will move it to the second position, etc.

When the radio is in the Manual Tuning position, the dial is illuminated. When it is in any of the 5 station setting positions, one of the numbers on the Automatic Station Knob is illuminated.

Five stations may be set for Automatic Tuning. A sixth station may also be automatically tuned in at the Manual Tuning position as explained above.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the stations in frequency order.

Any station setting position may be used for any station you can receive although it is better to put the stations on your list in frequency order.

In the Chicago area, for example, the following stations *might* be listed:

Position	Station	Frequency	From Manual Tuning Position
No. 1	WMAQ	670 KC	1 Push
No. 2	WGN	720 KC	2 Pushes
No. 3	WBBM	770 KC	3 "
No. 4	WLS	870 KC	4 "
No. 5	WCFL	970 KC	5 "
No. 6	MANUAL TUNING		6 "

First get the mechanism in the Manual Tuning position. If the dial is illuminated, it is already in this position. If one of the numbers on the Automatic Station Knob is illuminated, depress this knob one or more times until every number is dark.

Select the first station from the list you have made and carefully tune in this station by rotating the Manual Tuning Knob. Determine what program is being broadcast.

Then advance the mechanism to position No. 1 by depressing the Automatic Station Knob once. As shown in Fig. 3, there are 5 small holes in the chassis case through which the station setting screws are reached.

Insert a small bladed screwdriver in the opening for setting screw No. 1 and turn this screw in or out until the desired station (the one previously tuned in) is heard. Turning the screw in (clockwise) will tune in stations with lower kilocycle numbers while turning the screw out (counter-clockwise) will tune in stations with higher kilocycle numbers.

There is a card supplied with the radio on which is a frequency scale. Using the screwdriver as a guide, this scale will show the approximate frequency (kilocycle number) at which the setting screw is set.

Be sure not to tune in some other station broadcasting the same program. Turn the screw slowly back and forth until this station is carefully tuned in to the clearest and loudest point. The final motion of the setting screw should be to the right (clockwise). The station is now set for position No. 1.

Next advance the mechanism to position No. 2 by depressing the Automatic Station Knob once more. Tune in the second station on your list by adjusting setting screw No. 2 as explained above.

If you have difficulty in knowing when this station is tuned in, push the Automatic Tuning Knob 4 times to reach the Manual Tuning position. Then tune in this station with the Manual Tuning Knob, noting the program that is being broadcast. Push in the Automatic Station Knob twice to get the mechanism back into position No. 2 and again tune in this station by carefully adjusting setting screw No. 2 until the station is clearest and loudest.

Proceed in like manner to set any remaining stations on your list.

WELLS-GARDNER & CO.

MODEL 7C15

SPECIFICATIONS

Power Consumption - - - 8.1 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

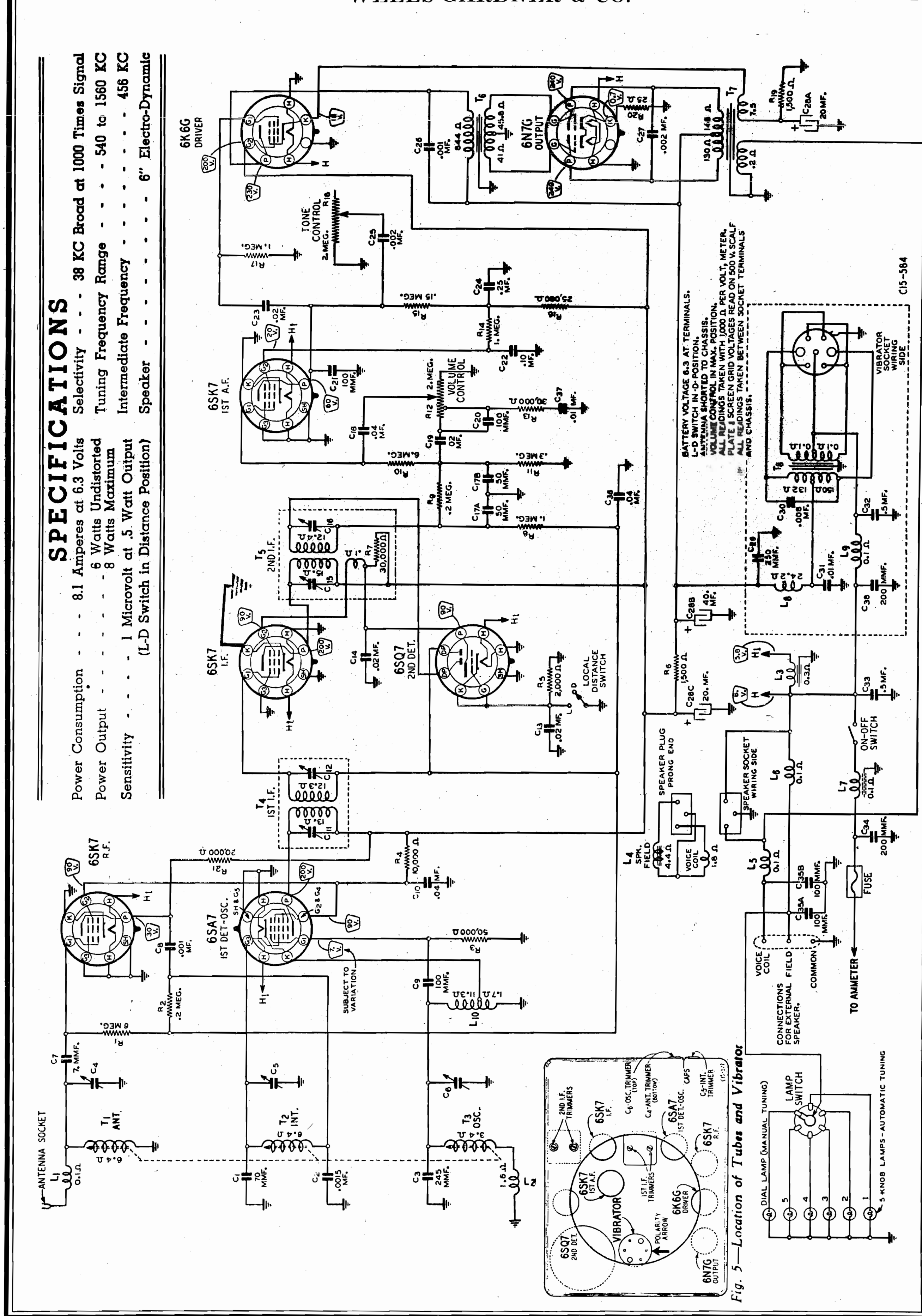


Fig. 5—Location of Tubes and Vibrator

WELLS-GARDNER & CO.

Antenna

Practically all car antennas at the present time are supplied with a shielded lead-in cable. The total capacity of the antenna and shielded lead-in should be 35 to 60 mmf. It is recommended that the antenna and lead-in be a type approved by the factory.

The plug on the antenna cable is inserted in the socket at the side of the chassis case as shown in Fig. 3. 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—"Fishpole" type, such as door hinge and cowl; over-the-roof types which are short and are mounted quite a distance from the metal roof of the car.

Mount the antenna on the same side of the car as the radio.

HIGH CAPACITY ANTENNA

If this radio is to be installed with a high capacity car antenna (70 to 500 mmf. total capacity of antenna and shielded cable), one of two procedures must be followed. If a short length antenna cable is being used, a 24 inch shielded adapter extension cable may be obtained. If a long antenna cable such as a 60 inch antenna cable is being used with the high capacity antenna a small adapter only need be purchased. Either of these two procedures will adapt the high capacity antenna circuit to the low capacity antenna input circuit. In both cases the correct adapter should be inserted in the socket at the side of the chassis case. Then the antenna cable plug should be inserted in the adapter.

Types of High Capacity Antennas—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). Under car antennas (These are usually high capacity) are not recommended for this radio.

ANTENNA CABLE

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 "fishpole" and over-the-roof type antenna, the lead must be shielded the entire distance from the radio to the point where the lead goes through the car body to the outside. 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.

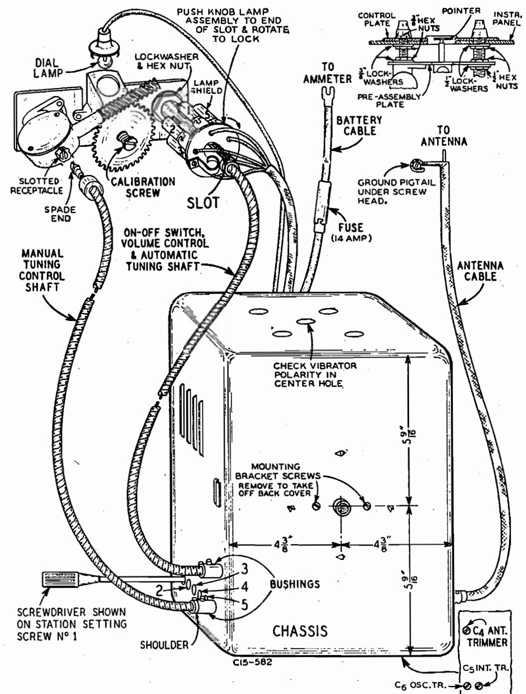
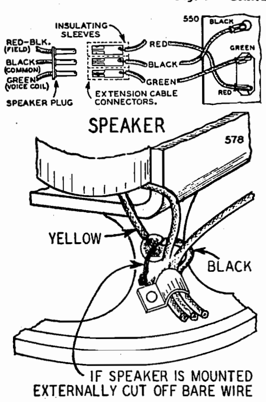


Fig. 3—General Installation View



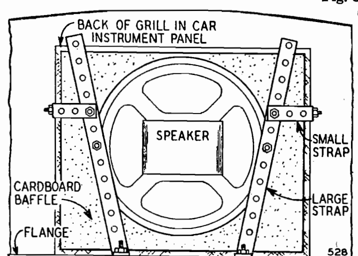


Fig. 4—External Speaker Connections, One Method of Mounting, and Cutting Off Bare Ground Wire When Speaker is Mounted Externally.

Inserting Vibrator Unit

IMPORTANT—The vibrator unit can be inserted in two ways. The proper method of insertion will depend on which terminal of the car battery is grounded. If the POSITIVE (+) terminal of the car battery is grounded, line up the + mark on the top of the vibrator with the arrow on the chassis base. If the NEGATIVE (—) terminal of the car battery is grounded, line up the — mark on the top of the vibrator with the arrow on the chassis base.

On one side of the chassis case is a hole (See Fig. 3) through which may be seen the vibrator. If a red stripe is seen on the side of the vibrator, the vibrator is inserted for cars on which the positive terminal of the battery is grounded. If no paint mark is visible, the vibrator is inserted for cars with the negative terminal of the battery grounded.

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 (C4) up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

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 pointer disc shaft is the calibration screw. Turn this screw with the fingers until the pointer on the dial scale is at the frequency of the station being received.

Calibration

(For Later type control with no stop on pointer shaft).

Tune to a station of known frequency (about 850 KC). Turn the knurled calibration screw at the back end of the pointer disc shaft one complete turn (360 degrees) in a clockwise direction (from back of instrument panel). Then continue to turn the screw in a clockwise direction until the pointer is at the frequency of the station being received.

Mounting Speaker in Back of Instrument Panel Grille

Some automobiles have a grille in the instrument panel, in back of which a speaker may be mounted. The speaker may be taken out of the case should it be desired to mount it in back of such a grille.

Remove the grille plate and speaker from the case (see article "Replacing Tubes and Vibrator"). Pull out the speaker plug. Replace the grille, putting the round cardboard gasket under the grille. Cut off the bare ground wire on the speaker as shown in Fig. 4.

At one side of the speaker grille is a rectangular cover. Unscrew the screw at each end and remove this cover. Three clips, each a different color, will be seen. Using the 24 inch, 3 wire cable supplied with the radio, match the color of each wire with a clip and insert the solid pin tips in the clips—See Fig. 4. Pass the cable through the same hole in the cover provided for the other wires. Push each of the connectors at the other end of the cable over the proper prong of the speaker plug, matching the color as shown in Fig. 4. Be sure the insulating sleeves cover the connectors completely. Tape over the speaker plug and connectors. Replace the cover.

Two perforated straps are provided which may be used as mounting brackets to secure the speaker in back of the grille. The method of mounting will vary in different cars. If the spring clamps on the back of the speaker frame interfere with the mounting, they may be cut off.

In the mounting shown in Fig. 4, the long and short straps have each been cut in two pieces and attached as indicated. The speaker should be supported at two points on the rim 180 degrees apart.

Secure the straps under any nearby screw head or nut which is convenient. Frequently it will be advisable, as shown in Fig. 4, to bend the straps under the flange at the bottom of the instrument panel and then drill two holes in the flange through which to extend the mounting bolts.

A piece of cardboard is provided for use as a baffle. This is cut for a 5¼ inch speaker which may be purchased if it is required. The outline of the hole necessary for a 6 inch speaker (speaker in radio) is shown on the cardboard. Cut the cardboard to size so that it covers all of the grille opening that is not covered by the speaker.

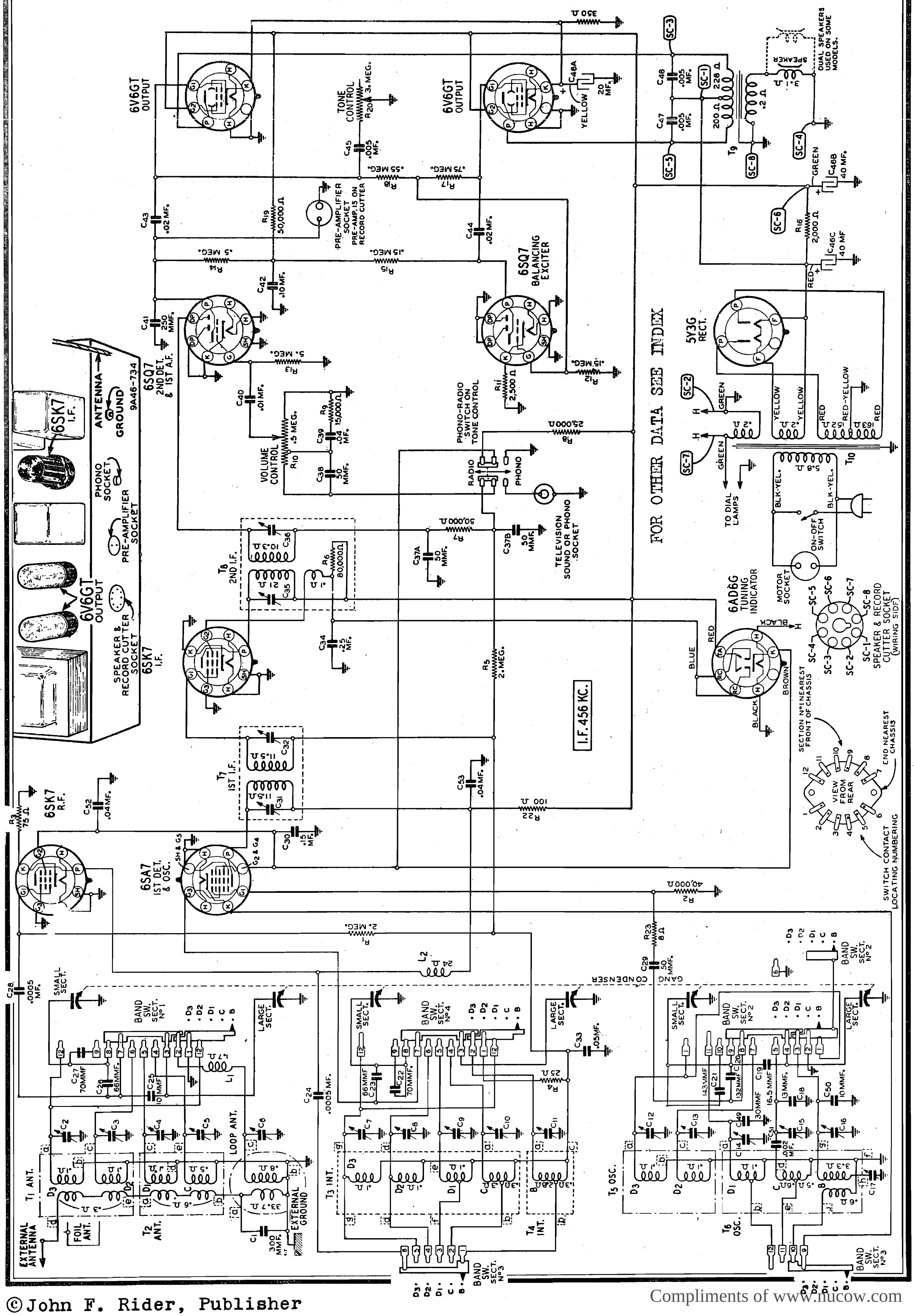
Several pieces of felt are also provided to be used around the rim of the speaker in those cars in which the grille is curved or bent.

Replacing Tubes and Vibrator

To replace the tubes or vibrator, remove the screw on the grille plate. Take off grille plate and pull the speaker out of the case. The speaker is held in place by 2 spring clamps. The tubes and vibrator are now accessible for replacement.

WELLS-GARDNER & CO.

MODEL 9A46



MODEL 9A46

WELLS-GARDNER & CO.

Series 9A46

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 from cabinet—Reconnect loop antenna plugs.					
I. F. 456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C31) & (C32) 2nd I.F. (C35) & (C36)
RANGE B 1730 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C16)
1500 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Ant. Range B (C6) Int. Range B (C11)
600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C17) Rock Rotor—See Note B.
RANGE C 7400 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C15)
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Ant. Range C (C5) Int. Range C (C10) Rock Rotor—See Note B
RANGE D_1 12,300 KC	Antenna Lead	400 Ohm	D_1 Range	Turn Rotor to Full Open	Oscillator Range D_1 (C14)
11,900 KC	Antenna Lead	400 Ohm	D_1 Range	Turn Rotor to Max. Output	Ant. Range D_1 (C4) Int. Range D_1 (C9) Rock Rotor—See Note B
RANGE D_2 15,450 KC	Antenna Lead	400 Ohm	D_2 Range	Turn Rotor to Full Open	Oscillator Range D_2 (C13)
15,250 KC	Antenna Lead	400 Ohm	D_2 Range	Turn Rotor to Max. Output	Ant. Range D_2 (C3) Int. Range D_2 (C8) Rock Rotor—See Note B
RANGE D_3 21,800 KC	Antenna Lead	400 Ohm	D_3 Range	Turn Rotor to Full Open	Oscillator Range D_3 (C12)
21,500 KC	Antenna Lead	400 Ohm	D_3 Range	Turn Rotor to Max. Output	Ant. Range D_3 (C2) Int. Range D_3 (C7) Rock Rotor—See Note B
LOOP RANGE B 1500 KC	Antenna Lead See Note C	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C6)

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

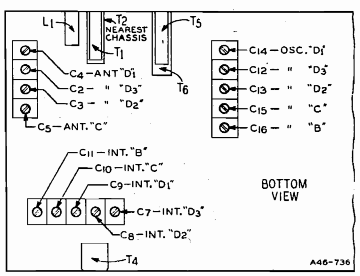
After each range is completed, repeat the procedure as a final check.

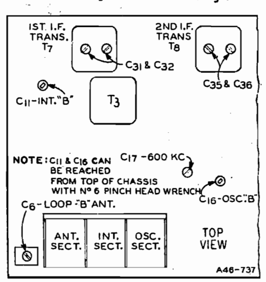
NOTE A—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

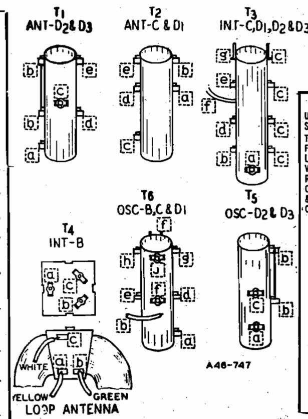
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

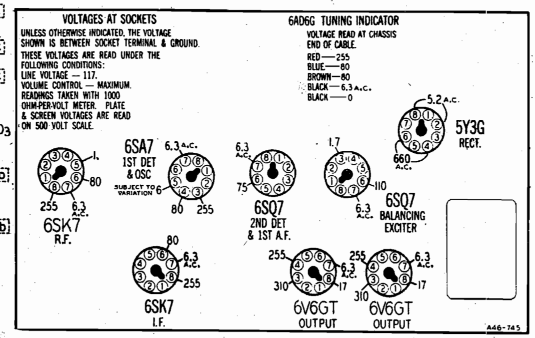
NOTE C—Re-assemble chassis in cabinet.

CAUTION—When aligning the short wave 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.









PROCEDURE FOR SETTING THE STATION BUTTONS

SELECTING THE STATIONS TO BE SET

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

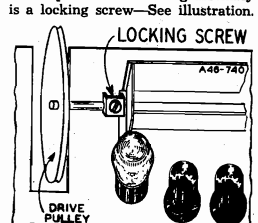
Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the 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 increase from left to right.

SETTING A STATION BUTTON

Unlock the push button tuning mechanism from the back of the radio. On the drive pulley shaft and at the left side (from back of radio) of the push button tuning assembly is a locking screw—See illustration.



VIEW FROM BACK OF CABINET

Turn the manual tuning knob until the locking screw can be easily reached with a screwdriver.

Using a small handled screwdriver, unlock the mechanism by turning this screw several turns in a counter-clockwise direction.

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 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 in*. It is better to start with the left hand button.

Hold *this* button all the way in. 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 in.*

Slowly release the button 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.

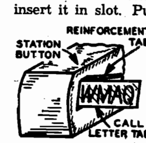
After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning knob until the locking screw can be easily reached with a screwdriver. Then, with the SMALL HANDLED screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads.

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.

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.

In Models With Transparent Buttons—Insert a celluloid reinforcement tab half way in the slot at the front of the first station button.

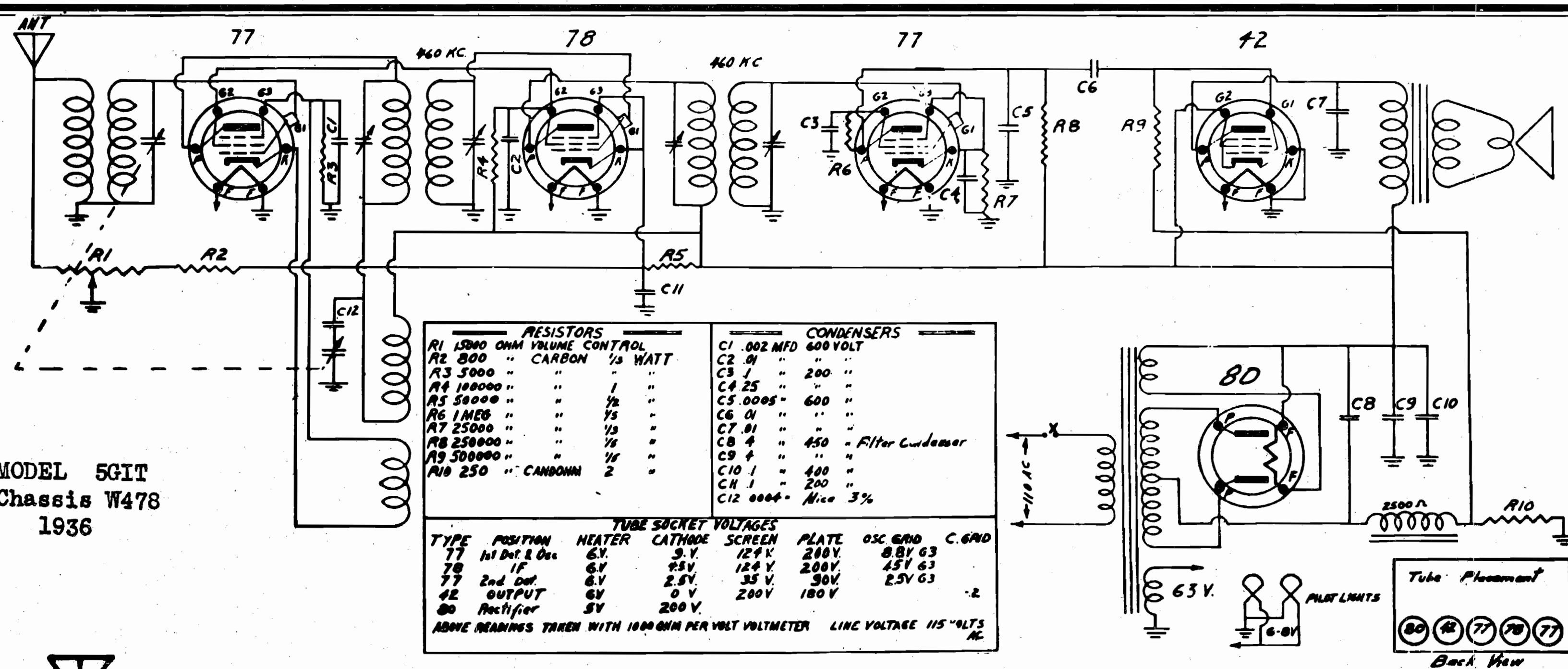
Place the call letter tab in front of the celluloid reinforcement tab and insert it in slot. Push both tabs all the way in. the button slot. Follow the same procedure for inserting the station call letter tabs in any other buttons.



In Models With Brown Opaque Buttons—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.

WESTERN AIR PATROL

MODEL 5G1T, Ch. W478
MODELS 15A, TR14,
TR40, TR44, Ch. W417



RESISTORS				
R1	15000 OHM	VOLUME CONTROL		
R2	800 "	CARBON	1/3	WATT
R3	5000 "	"	"	"
R4	100000 "	"	1	"
R5	50000 "	"	1/2	"
R6	1 MEG "	"	1/5	"
R7	25000 "	"	1/3	"
R8	250000 "	"	1/6	"
R9	500000 "	"	1/6	"
R10	250 "	CARBOHM	2	"

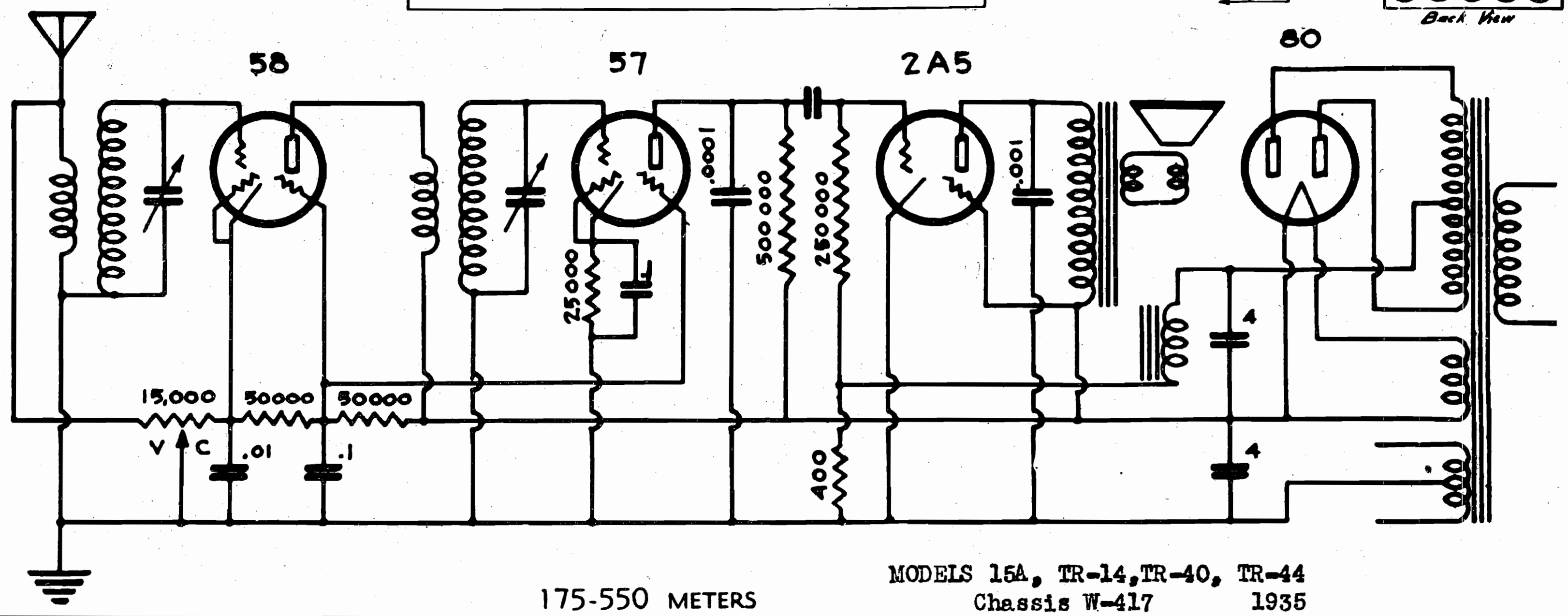
CONDENSERS				
C1	.002 MFD	600 VOLT		
C2	.01 "	"	"	
C3	.1 "	200	"	
C4	25 "	"	"	
C5	.0005 "	600	"	
C6	.01 "	"	"	
C7	.01 "	"	"	
C8	4 "	450	"	Filter Condenser
C9	4 "	"	"	
C10	.1 "	400	"	
C11	.1 "	200	"	
C12	.0004 "	Mica	3%	

TUBE SOCKET VOLTAGES

TYPE	POSITION	HEATER	CATHODE	SCREEN	PLATE	OSC. GRID	C. GRID
77	1st Det. & Osc.	6.V.	9.V.	124 V.	200 V.	8.8 V G3	
78	IF	6.V	4.5 V.	124 V.	200 V.	45 V G3	
77	2nd Det.	6.V	2.5 V.	35 V.	90 V.	2.5 V G3	
42	OUTPUT	6V	0 V	200 V	180 V		-.2
80	Rectifier	5V	200 V.				

ABOVE READINGS TAKEN WITH 1000 OHM PER VOLT VOLTMETER   LINE VOLTAGE 115 VOLTS AC.

MODEL 5GIT
Chassis W478
1936

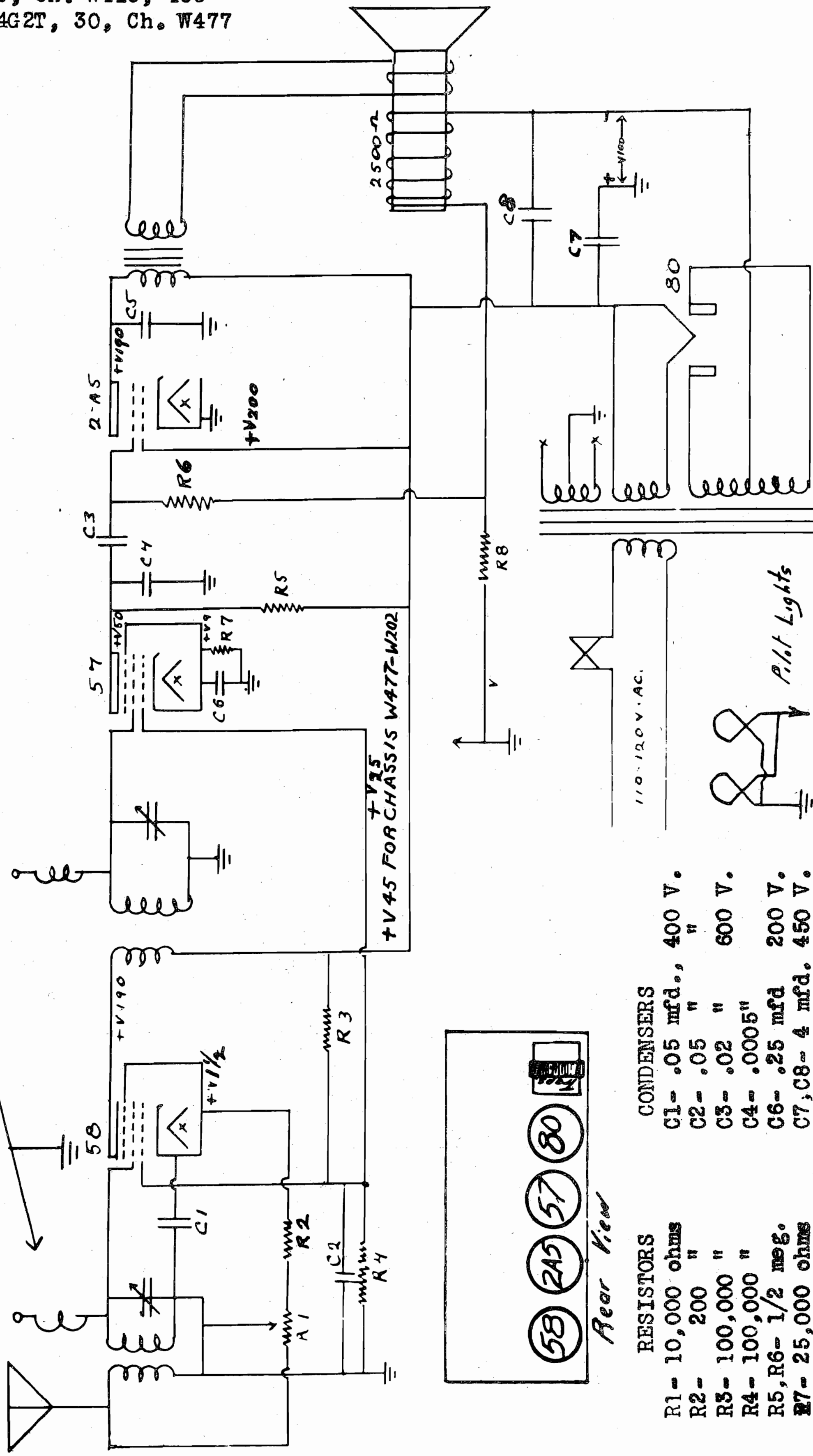


175-550 METERS

MODELS 15A, TR-14, TR-40, TR-44
Chassis W-417   1935

MODEL 17, Ch. W405
MODEL 18, Ch. W418, 488
MODELS 4G2T, 30, Ch. W477

WESTERN AIR PATROL

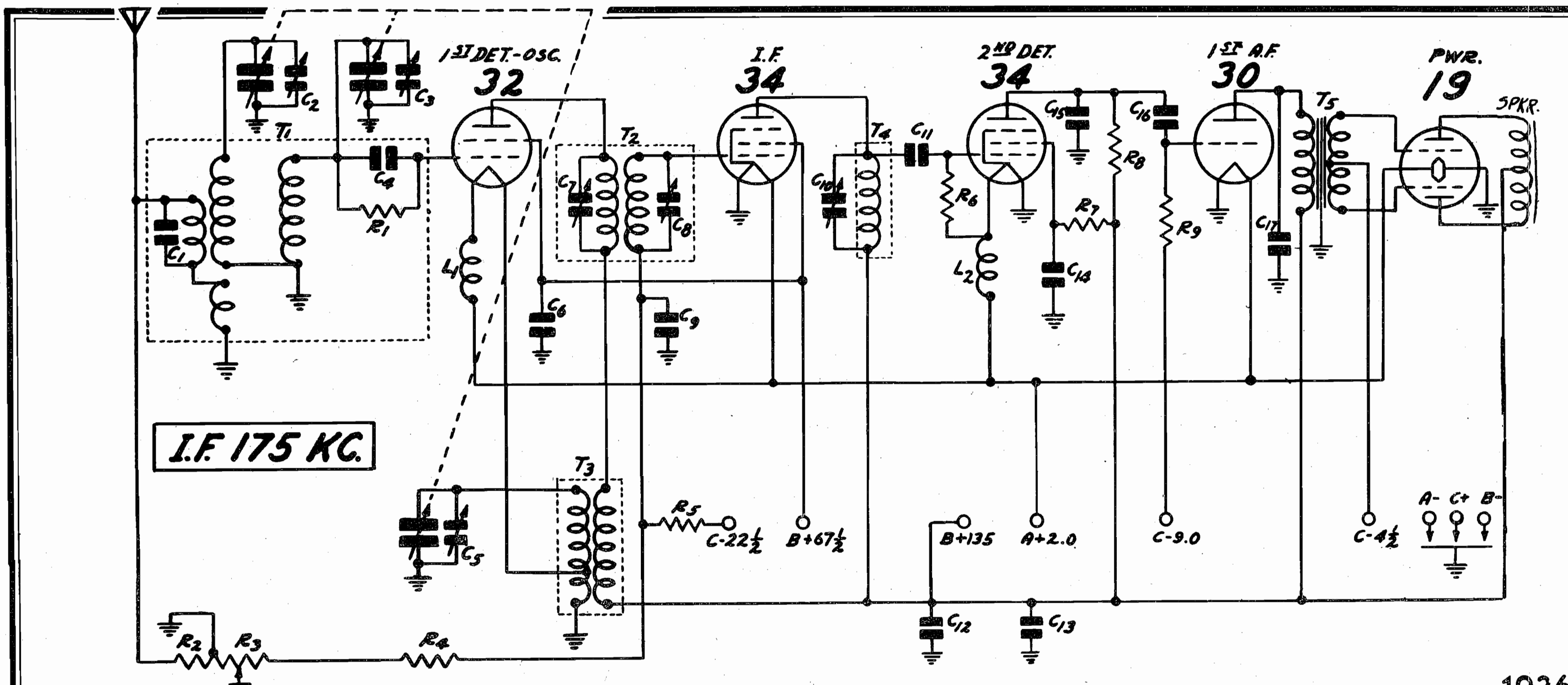


RESISTORS	
R1-	10,000 ohms
R2-	200 "
R3-	100,000 "
R4-	100,000 "
R5,R6-	1/2 meg.
R7-	25,000 ohms
R8-	400 "

CONDENSERS		
C1-	.05 mfd.,	400 V.
C2-	.05 "	"
C3-	.02 "	600 V.
C4-	.0005"	
C6-	.25 mfd	200 V.
C7,C8-	4 mfd.	450 V.

WESTERN AIR PATROL

MODEL 25G, Ch. W419



1936

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C_1	150 MMF MOULDED
C_2	GANG TRIMMER
C_3	GANG TRIMMER
C_4	35 MMF MOULDED
C_5	GANG TRIMMER
C_6	.25 MF 180 V.
C_7	40-100 MMF } DUAL (P-17A37)
C_8	20-70 MMF } DUAL (P-17A37)
C_9	.05 MF 180 V.
C_{10}	40-100 MMF (P-17A38)
C_{11}	50 MMF MOULDED
C_{12}	.10 MF 180 V.
C_{13}	4.0 MF 150 V. ELECTROLYTIC (P-45X28)
C_{14}	.10 MF 180 V.
C_{15}	.002 MF 300 V.
C_{16}	.006 MF 300 V.
C_{17}	.002 MF 300 V.

R_1	1.0 MEGOHM .2 W.
R_2	10 000 OHM } VOLUME CONTROL (P-36X201)
R_3	60 000 OHM } VOLUME CONTROL (P-36X201)
R_4	900 OHM .2 W.
R_5	6 500 OHM .2 W.
R_6	2.0 MEGOHM .2 W.
R_7	100 000 OHM .5 W.
R_8	40 000 OHM .5 W.
R_9	1.0 MEGOHM .2 W.
L_1	SINGLE FILAMENT REACTOR (P-9A281)
L_2	SINGLE FILAMENT REACTOR (P-9A281)
T_1	DOUBLE TUNED ANTENNA COIL (P-9A381)
T_2	1ST I.F. COIL (P-9A383)
T_3	OSC. COIL (P-9A382)
T_4	2ND I.F. COIL (P-9A384)
T_5	AUDIO INPUT TRANS. (P-50XH)

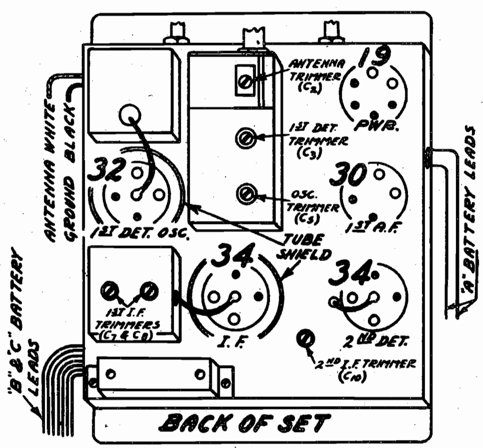


Fig. 8—Tube Arrangement

WESTERN AIR PATROL

"A" Battery and Regulator

This receiver is designed to operate with a 2 volt storage cell, but may be operated with a 3 volt dry "A" battery if used with a voltage regulator. The receiver may also be used with an air cell "A" battery provided a series resistor is used.

3 Volt "A" Battery—The voltage regulator required with this type of battery as illustrated in Fig. 4 is not supplied with the receiver unless specified. This device consists of a rheostat which controls the voltage, a voltmeter for measuring its value as supplied to the receiver and a small push button switch for cutting the voltmeter in and out of the circuit. It has two prongs at the bottom which plug into the socket in the platform at the rear left corner of the chassis. The circuit diagram of the regulator is shown in Fig. 5.

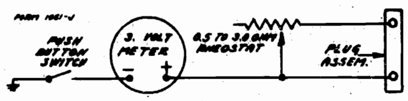


Fig. 5—Schematic Diagram of Voltage Regulator

The receiver is shipped from the factory with a jumper between the two socket connections and a fibre strip over the socket. This strip must be removed and the jumper taken out as illustrated in Figs. 6 and 7 before the regulator can be inserted as shown in Fig. 4. The jumper is in the "A+" line.

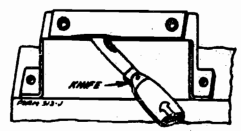


Fig. 6—Prying off Fiber Cover

When a new 3 volt "A" battery is inserted, the adjusting knob must be turned to the left hand position and then turned up until the voltmeter indicates 1.9 to 2 volts. The push button must be held in until the adjustment is completed. Caution the user never to operate the receiver with the adjustment beyond 2 volts.

Air Cell "A" Battery—If an air cell "A" battery is used, a series resistor will be required to reduce the voltage to the proper level of 2 volts for the tube filaments. Although the voltage regulator mentioned above can be used, the series resistor is cheaper and is satisfactory as the voltage of one of these batteries drops very little during the useful life of the battery

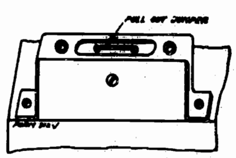


Fig. 7—Removing Jumper Wire

Replacing Drive Cord

Remove chassis from cabinet.

Take off the pointer by removing the screw at the center of the dial.

Remove the dial by taking out the six rivets from the dial assembly.

Remove the on-off indicator dial by pulling it forward.

With the condenser plates in a completely open position, slip the new drive cord thru hole "A" (from the front) in the drive drum. See Fig. 9.

Pull the cord thru this hole far enough to tie a knot near the end. Make this knot large enough so that it will not pull back thru the hole.

Slip the opposite end of the drive cord thru hole "B" of the drive drum.

Now slip the piece of fine tubing (about ¾" long) over the drive cord and insert about half of this tubing into hole "B" as shown in the illustration. This is important to prevent the cord from being cut.

Bring the drive cord down to the drive shaft and wrap the cord in a clockwise direction about two and one-half times around this shaft, progressing toward the front.

Bring the cord up from the drive shaft and wrap it around the drive drum approximately one and one-half times in a clockwise direction, progressing toward the front until the cord is up to the turned-in portion of the flange "C". See Fig. 9.

Pull the cord tight and tie the end of the cord to the tension spring as shown in the illustration. The knot should be at the bend in the flange so that the spring will be under sufficient tension to prevent the drive cord from slipping.

Now, by applying a little tension on the spring, hook the other end of the spring into hole "D" on the opposite side of the drum. Hook the spring from the inside (in later models hole "D" is replaced by a hook on the inside of the drive drum).

Turn the drive shaft back and forth several times to take out the slack and see if the drive is operating properly. *If the cord slips on the drive shaft, remove the spring from the drive drum and add an additional knot in the cord at the spring in order to put greater tension on the spring.*

Replace the on-off indicator dial, care being taken that the indicator is so placed that it will properly show the on and off positions.

Re-assemble the pointer and dial to the drive assembly. If the rivets are broken use No. 2 by ¼" long round head machine screws and nuts.

Testing Batteries

If the receiver does not operate satisfactorily test the batteries under load. A high resistance meter is required for the "B" and "C" voltages. If any of the batteries are considerably below their rated voltage, new ones should be used. When the "B" batteries are replaced the "C" batteries should also be replaced. The reason for this is that the "C" drain is such that the "C" batteries are run down in about the same time as the "B" batteries.

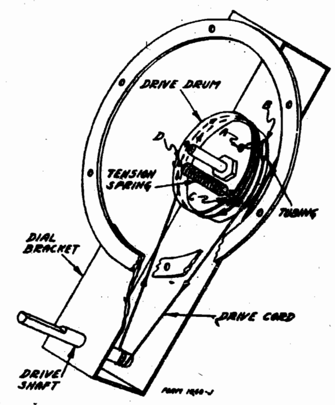


Fig. 9—Replacing Drive Cord

VOLTAGES AT SOCKETS
Volume Control at Maximum—Antenna Shorted to Ground. B+135 Volts
.Voltages to Chassis

Type of Tube	Function	Across Filament	Plate to Gnd.	Screen to Gnd.	Grid to Gnd.	Normal Plate M. A.
32	1st Det. & Osc.	2.0	135	67.5	7.5 (1) (2)	2.5
34	I. F.	2.0	135	67.5	2.5 (3)	2.8
34	2nd Det.	2.0	50	40 (1)	0	1.8
30	1st Audio	2.0	135		9 (4)	3.0
19	Output	2.0	135		4.5	3.2 Total

(1) With 250,000 ohm meter. (2) Subject to variation. (3) With 25,000 ohm meter. (4) Read at "C" battery.

Alignment Procedure and Dial Calibration

Misalignment or mistracking of condensers generally manifests itself as broad tuning and lack of volume at portions or all of the standard wave band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment.

A signal generator that will provide accurately calibrated signals over the standard wave band and at the intermediate frequency and an output meter are required for indicating the effect of adjustments.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I. F. Adjustment

Set the signal generator for a signal of 175 KC.

Connect the antenna lead of the signal generator thru a .1 MF condenser to the coil end of the grid leak resistor R1. There is a lead which runs from the center tuning condenser stator to a lug at the bottom of the R. F. coil assembly. This connection can be made at the lug on the coil to which this lead is connected.

Connect the ground lead of the receiver to the ground post of the signal generator.

Turn the volume control to the maximum position.

Then adjust the three I. F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 8.

As stated above, use a non-metallic screwdriver to make the adjustment.

1750 KC Adjustment

Set the signal generator for 1750 KC.

Turn the rotor of the tuning condenser to the full open position.

Connect the antenna lead of the receiver thru a 250 mmf. condenser to the output of the signal generator.

Keep the volume control at the maximum position.

Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained. The location of this trimmer is shown in Fig. 8.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the 1st detector and antenna trimmers for maximum output.

Do not change the setting of the oscillator trimmer.

Dial Calibration

To obtain dial scale calibration tune in an 800 KC signal and set the dial pointer at that mark on the dial scale. When calibrated in this manner, the setting will be approximately correct at both ends of the scale.

SPECIFICATIONS

Input Voltages
- "A" Battery . . . . . . 2 Volts (.5 Amperes)
- "B" Batteries . . . . . . 67½ and 135 Volts
- "C" Batteries . . . . . . 4½, 9 and 22½ Volts

Power Output . . . . 1 Watt (Undistorted)

Sensitivity . . . . 15 Microvolts Absolute
Tuning Range . . . . . . 530 to 1750 KC
Intermediate Frequency . . . . . 175 KC
Speaker . . . . 6" Magnetic

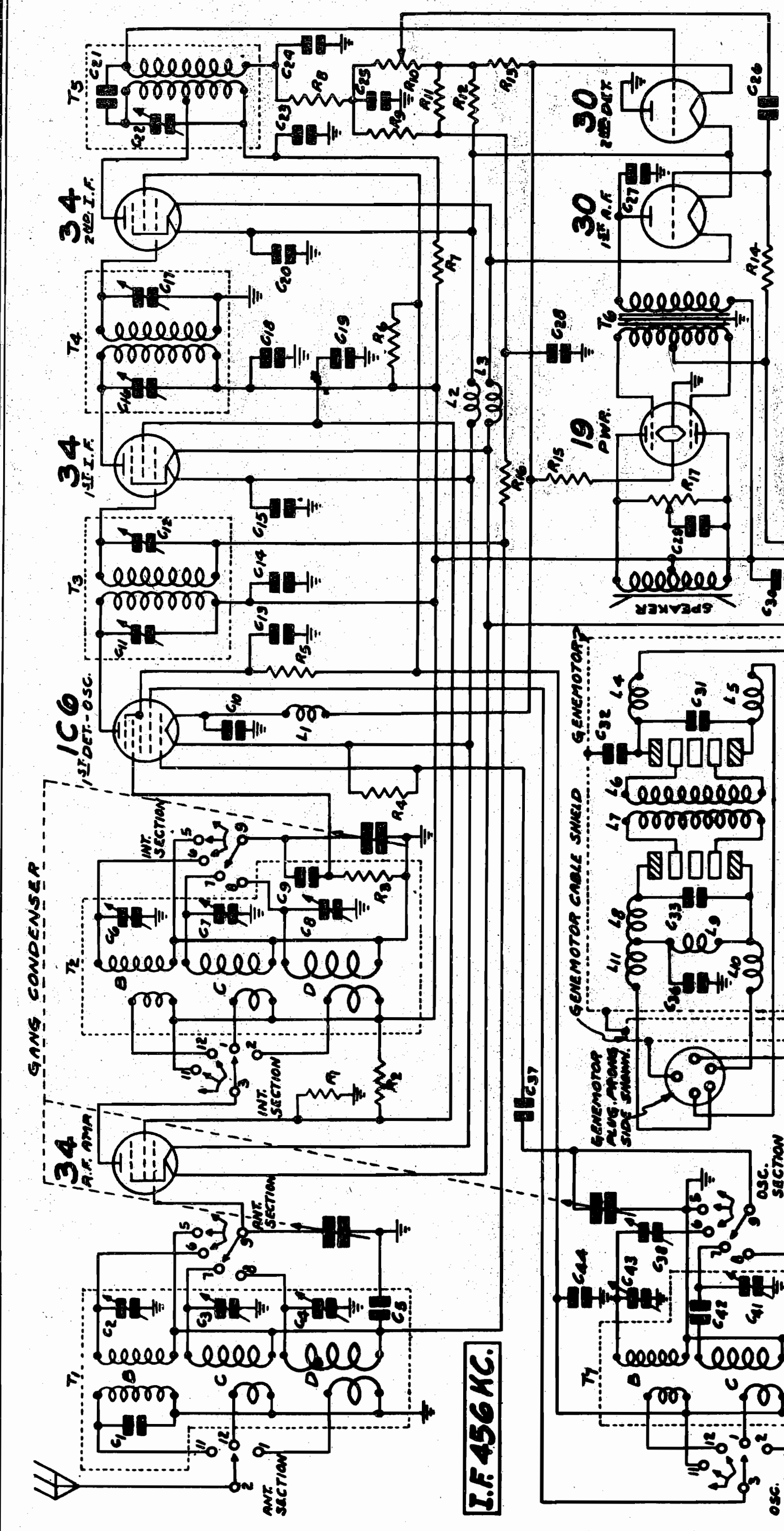
MODEL 27E, Ch. W420

WESTERN AIR PATROL

Power Consumption - 1.8 Amperes at 6.3 Volts

Power Output - - - - - - 1 Watt Undistorted

Tuning Frequency Range
B Range - - - - - - - - - - - 535 to 1730 KC.
C Range - - - - - - - - - - - 1680 to 4800 KC.
D Range - - - - - - - - - - - 5650 to 16000 KC.



ARROWS INDICATE CONNECTIONS PRESENT IN BAND SWITCH WHEN IN POSITION SHOWN.
CONTACT LOCATIONS 4 AND 10 IN OSC. AND INT. SECTIONS AND 3, 4 AND 10 IN ANT. SECTION ARE BLANK.

	POSITION 1 STANDARD WAVE (B)	POSITION 2 SHORT WAVE (C)	POSITION 3 SHORT WAVE (D)
OSC. & INT. SECTION	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3	5 6 7 8 9 11 12 1 2 3
ANT. SECTION	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2	5 6 7 8 9 11 12 1 2

GROUPS OF CIRCUIT ELEMENTS ENCLOSED IN DOTTED RECTANGLES COMPRISE DISTINCT MECHANICAL ASSEMBLIES.

C 1 250 mmf.
C 2 2-25 mmf.
C 3 2-25 mmf.
C 4 2-25 mmf.
C 5 .05 mf. 180 V.
C 6 2-25 mmf.
C 7 2-25 mmf.
C 8 2-25 mmf.
C 9 35 mmf.
C10 .25 mf. 180 V.
C11 70-150 mmf. } ONE
C12 70-150 mmf. } UNIT
C13 .05 mf. 180 V.

C14 20.0 mf. 150 V. Electrolytic
C15 .25 mf. 180 V.
C16 70-150 mmf. } ONE
C17 70-150 mmf. } UNIT
C18 .50 mf. 180 V.
C19 .85 mf. 180 V.
C20 .05 mf. 180 V.
C21 50 mmf.
C22 40-100 mmf.
C23 .05 mf. 180 V.
C24 100 mmf.
C25 50 mmf.
C26 .002 mf. 600 V.

C27 250 mmf.
C28 .01 mf. 180 V.
C29 .05 mf. 240 V.
C30 20.0 mf. 150 V. Electrolytic
C31 .25 mf. 180 V.
C32 .05 mf. 180 V.
C33 .25 mf. 180 V.
C34 .25 mf. 180 V.
C35 .25 mf. 180 V.
C36 .50 mf. 180 V.
C37 35 mmf.
C38 300-600 mmf. } ONE
C39 40-100 mmf. } UNIT

C40 2-25 mmf.
C41 2-25 mmf.
C42 1400 mmf.
C43 2-25 mmf.
C44 .25 mf. 18 V.

R 1 100,000 ohm .2 W.
R 2 60,000 ohm .2 W.
R 3 1 megohm .2 W.
R 4 100,000 ohm .2 W.
R 5 5,000 ohm .2 W.
R 6 10,000 ohm .5 W.
R 7 1,000 ohm .2 W.
R 8 60,000 ohm .2 W.

R 9 3 megohm .2 W.
R10 1 megohm Vol. Control
R11 1 megohm .2 W.
R14 3 megohm .2 W.
R16 500,000 ohm .2 W.
R17 150,000 ohm Tone Control
R12 12.5 ohm 1.0 W. }
R13 12.5 ohm 1.0 W. } ARMORED
R15 .70 ohm .50 W. } WIRE-WOUND
R18 150 ohm 2.0 W. } RESISTOR

T 1 Ant. R. F. Trans.
T 2 Interstage R. F. Trans.
T 3 1st I. F. Trans.
T 4 2nd I. F. Trans.
T 5 3rd I. F. Trans.
T 6 Push Pull Input Trans.
T 7 Osc. Inductors

L 1 Single Filament Reactor
L 2 } Double Filament
L 3 } Reactor
L 4 "B" Choke
L 5 "B" Choke
L6, L7, L8 & L9 Genemotor Windings
L10 "A" Choke
L11 "A" Choke
L12 Osc. Tracking Coil

Nov., 1935

MODEL 27E, Ch: W420

WESTERN AIR PATROL

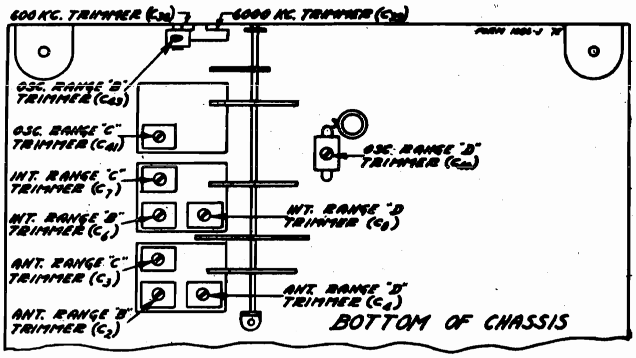


Fig. 3—Arrangement of Trimmers

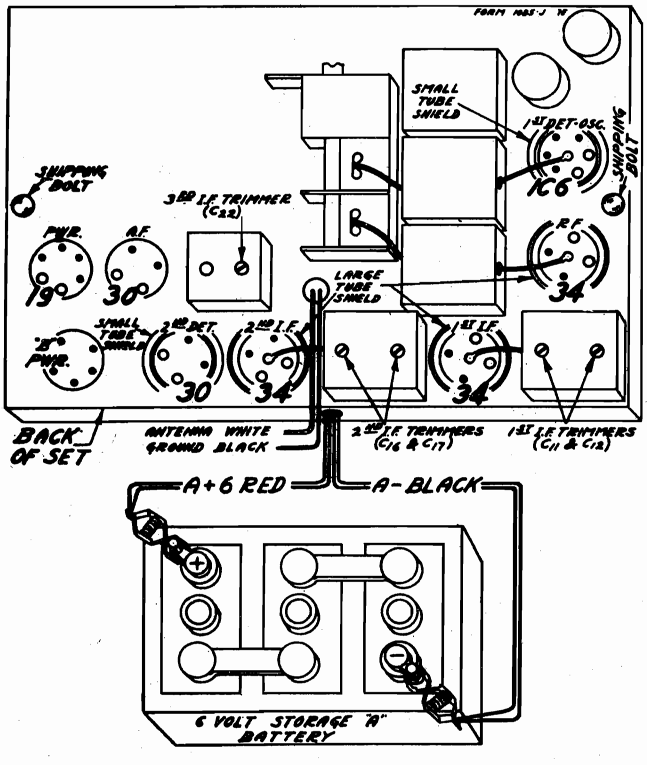


Fig. 4—Tube Arrangement and Battery Connections

VOLTAGES AT SOCKETS
Antenna Shorted to Ground—Battery 6 Volts under load
Volume Control at Maximum

Type of Tube	Function	Across Fila-ment	Plate to Ground	Screen to Ground	Bias Voltage (see Notes)	Normal Plate M. A.
34	R. F.	2.0	135	45	1.5[1]	1.7
1C6	1st Det.	2.0	135 80[2]	70	2.0[3]	3.2 1.7[2]
34	1st I. F.	2.0	135	45	1.5[1]	1.7
34	2nd I. F.	2.0	135	80	4.0[3]	3.2
30	2nd Det.	2.0				
30	1st A. F.	2.0	135		8.0[4]	2.3
19	Power	2.0	135		3.9[5]	2.3 (per plate)

(1) As read from negative filament leg to low potential end of resistor R12.
(2) Anode Grid
(3) As read from negative filament leg to ground.
(4) Total voltage drop from negative filament leg to ground and across R18.
(5) As read across R18.

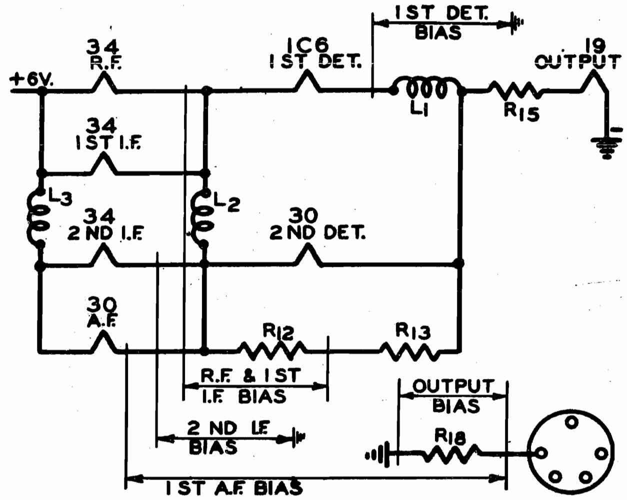


Fig. 6—Abridged Wiring Diagram showing Filament Wiring System and Points at which No-Signal Bias Voltages are obtained.

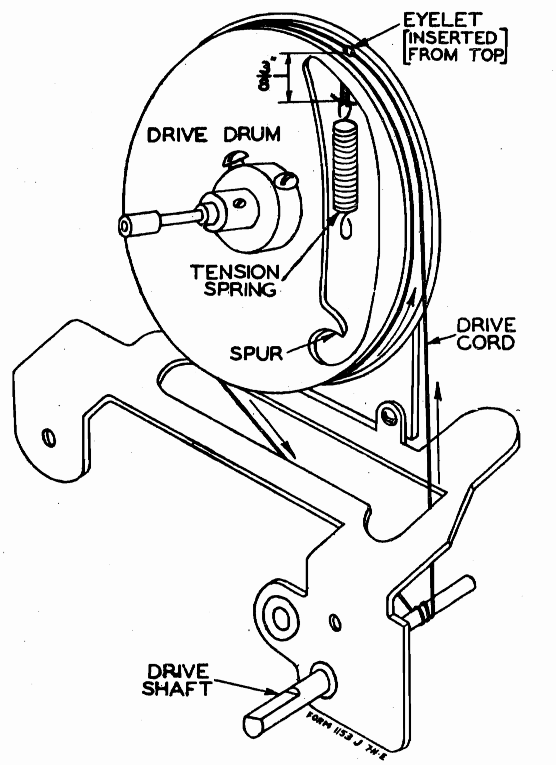


Fig. 7—Drive Cord Replacement

Battery Connections—CAUTION

CAUTION: Do not turn the switch on unless ALL the tubes are in the sockets.

CAUTION: Be sure that the battery clips are properly connected to the battery. If the connections are reversed, the receiver may be damaged.

WESTERN AIR PATROL

A signal generator that will provide an accurately calibrated signal at 456, 1730, 1500, 600, 4800, 4200, 16,000, 15,000 and 6000 KC and an output indicating meter are required. It will be practically impossible to align the receiver if unsatisfactory apparatus is used.

Use a non-metallic screwdriver for the adjustments. The complete procedure is as follows:

I.F. Adjustment

Set the signal generator for a signal of 456 KC.

Connect the output of the signal generator through a 0.1 mf. condenser to the switch end of condenser C9--see Fig. 2. There is a lead which goes to the lug on the top of the center stator section of the tuning condenser--see Fig. 4. The connection can be made at this lug.

Connect the ground lead of the receiver to the ground post of the signal generator

Turn the band selector to the Range B position (standard wave band--purple dial color).

Turn the volume control to the maximum position.

Attenuate the signal from the signal generator to prevent the levelling-off action of the A.V.C.

Then adjust the five I.F. trimmers until maximum output is obtained. The adjusting screws for these condensers are reached from the top of the chassis, and the location is shown in Fig. 4.

RANGE B ALIGNMENT

1730 KC Adjustment

Set the signal generator for 1730 KC.

Turn the rotor of the tuning condenser to the full open position.

Keep the band selector in the standard wave position.

Connect the antenna lead of the receiver through a 200 mmf. condenser to the output of the signal generator.

For this and all subsequent adjustments keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range B trimmer (C43) until maximum output is obtained. The location of this trimmer is shown in Fig. 3.

1500 KC Adjustment

Set the signal generator for 1500 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Loosen the pointer set screw and set the large pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

Adjust the interstage Range B trimmer (C6) and antenna Range B trimmer (C2) to maximum.

Do not change the setting of the oscillator Range B trimmer.

600 KC Adjustment

Set the signal generator for 600 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 600 KC trimmer until the peak of the greatest intensity is obtained. See Fig. 3 for location of this trimmer.

Be sure to use a non-metallic screwdriver for this adjustment.

RANGE C ALIGNMENT

4800 KC Adjustment

Set the signal generator for 4800 KC.

Connect the antenna lead of the receiver through a 400-ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range C position (1st short wave band -- green dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range C trimmer (C41) until maximum output is obtained. See Fig. 3 for location of this trimmer.

4200 KC Adjustment

Set the signal generator for 4200 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range C trimmer (C7) and antenna Range C trimmer (C3) to maximum.

Do not change the setting of the oscillator Range C trimmer.

RANGE D ALIGNMENT

16,000 KC Adjustment

Set the signal generator for 16,000 KC.

Keep the antenna lead of the receiver connected through the 400-ohm resistor to the output of the signal generator.

Turn the rotor of the tuning condenser to the full open position.

Turn the band selector to the Range D position (2nd short wave band--red dial color).

As mentioned above, keep the volume control at the maximum position and attenuate the signal from the signal generator to prevent A.V.C. action.

Adjust the oscillator Range D trimmer (C40) until maximum output is obtained. See Fig. 3 for location of this trimmer.

15,000 KC Adjustment

Set the signal generator for 15,000 KC.

Turn the rotor of the tuning condenser carefully until maximum output is obtained.

Adjust the interstage Range D trimmer (C8) and antenna Range D trimmer (C4) to maximum.

When adjusting the interstage Range D trimmer, it will be necessary at the same time to turn the tuning condenser rotor slowly back and forth until the peak of the greatest intensity is obtained.

Then go back and repeat the procedure as given for the 16,000 KC adjustment. If it is found necessary to make any appreciable change in the settings of the oscillator Range D trimmer, the 15,000 KC adjustment must be repeated.

Do not make any further change in the setting of the oscillator Range D trimmer.

6000 KC Adjustment

Set the signal generator for 6000 KC.

Turn the tuning condenser rotor until maximum output is obtained.

Turn the rotor slowly back and forth at the same time adjusting the 6000 KC trimmer until the peak of greatest intensity is obtained. See Fig. 3 for location of this trimmer.

REPLACING DRIVE CORD

Remove the chassis from the cabinet. Take off the station pointer by removing the screw at the center of dial. Loosen the two set screws in the collar on the band selector switch shaft. Loosen the dial assembly by taking out the two screws which secure the bottom of this assembly to the chassis and one screw at the top which secures this assembly to the bracket. Pull the dial assembly forward until the collar is free of the band selector shaft; and lay the assembly face downward in front of the chassis.

Turn the dial drum until the opening in this drum is approximately vertical and with the hole at the top. Remove the tension spring and the old drive cord. When replacing this drive cord a 30 pound test cord as regularly supplied by the factory should be used.

See that the eyelet is in the hole in the drive drum. Insert one end of the new drive cord from the outside through the hole in the eyelet in the drive drum. Tie the end of the cord, which has been inserted through the hole, to one end of the tension spring. Now wrap the cord in a counter clock-wise direction (facing the front of the chassis) around the drive drum for approximately one and one half turns, progressing towards the front. Then tilt the chassis up on its back panel and bring the cord mentioned in the previous paragraph down to the drive shaft. Wrap it two and onehalf times around this shaft, progressing toward the back of the chassis. Wrap the cord on directly in line with the drive drum above. Then bring this cord up to the drive drum until it is up to the eyelet in the drive drum.

Now insert the free end of the cord through the hole in the eyelet and tie it to the end of the tension spring. The end of the spring when hanging free and with the slack taken out of the drive cord should be three eights or less from the flang of the drum. Cut off the surplus length of the cord after it has been knotted.

Now secure the other end of the tension spring over the spur on the drive drum. Turn the drive shaft back and forth several times.

Replace the dial assembly and pointer.

Replace the chassis in the cabinet.

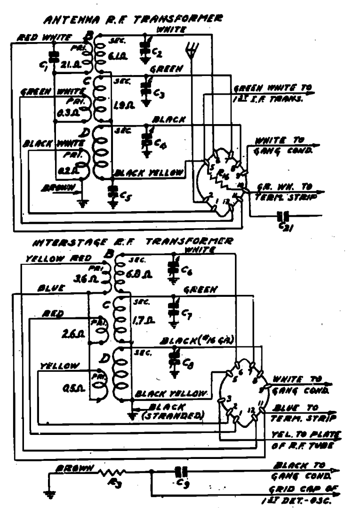
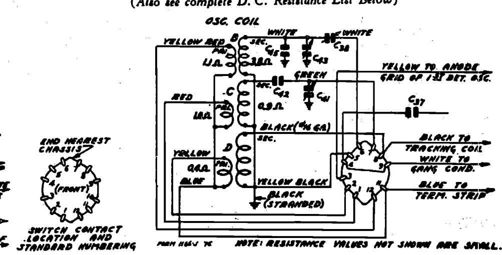
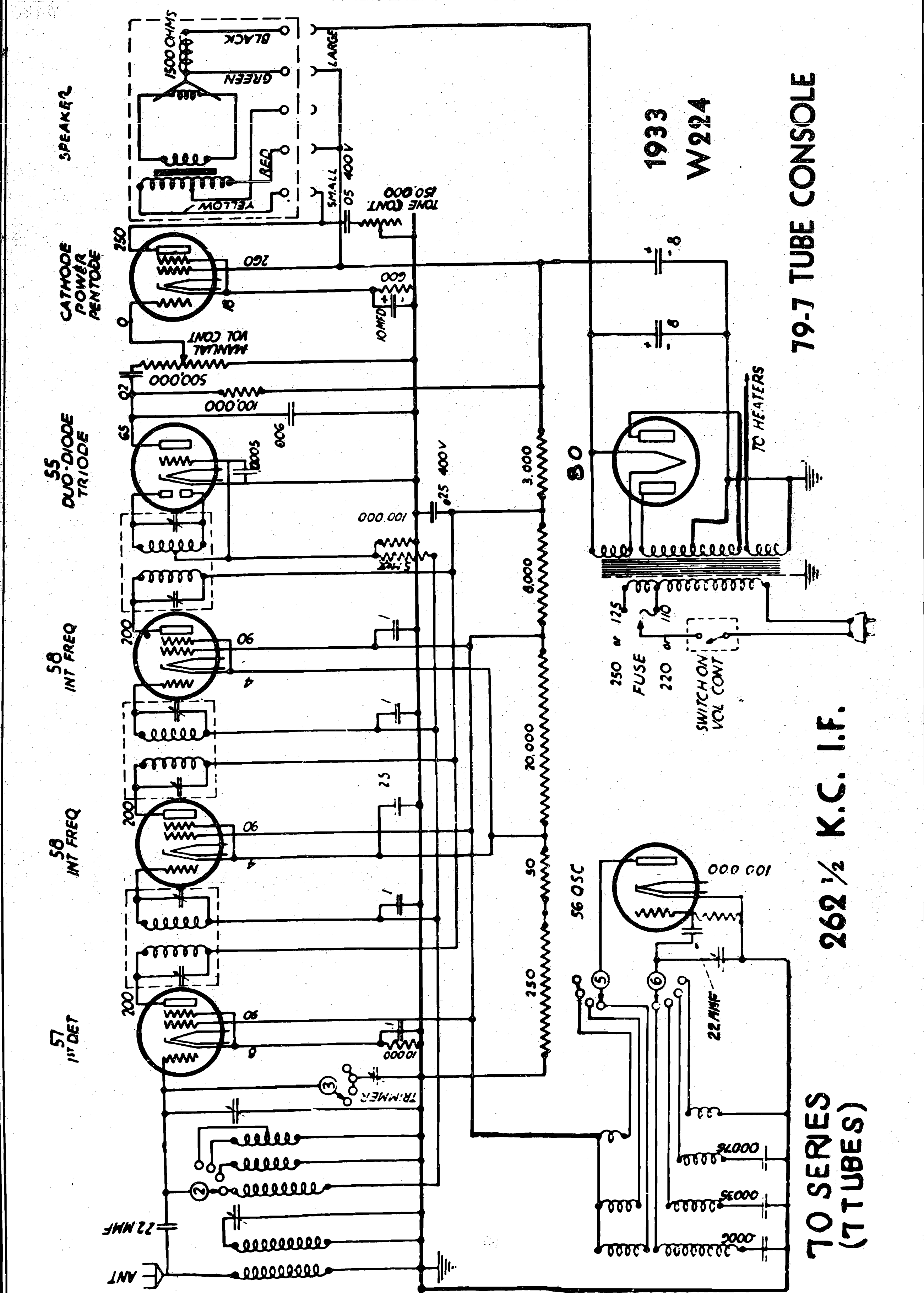


Fig. 5—Color Coding of Coil Wires and D. C. Resistance of Windings. (Also see complete D. C. Resistance List Below)



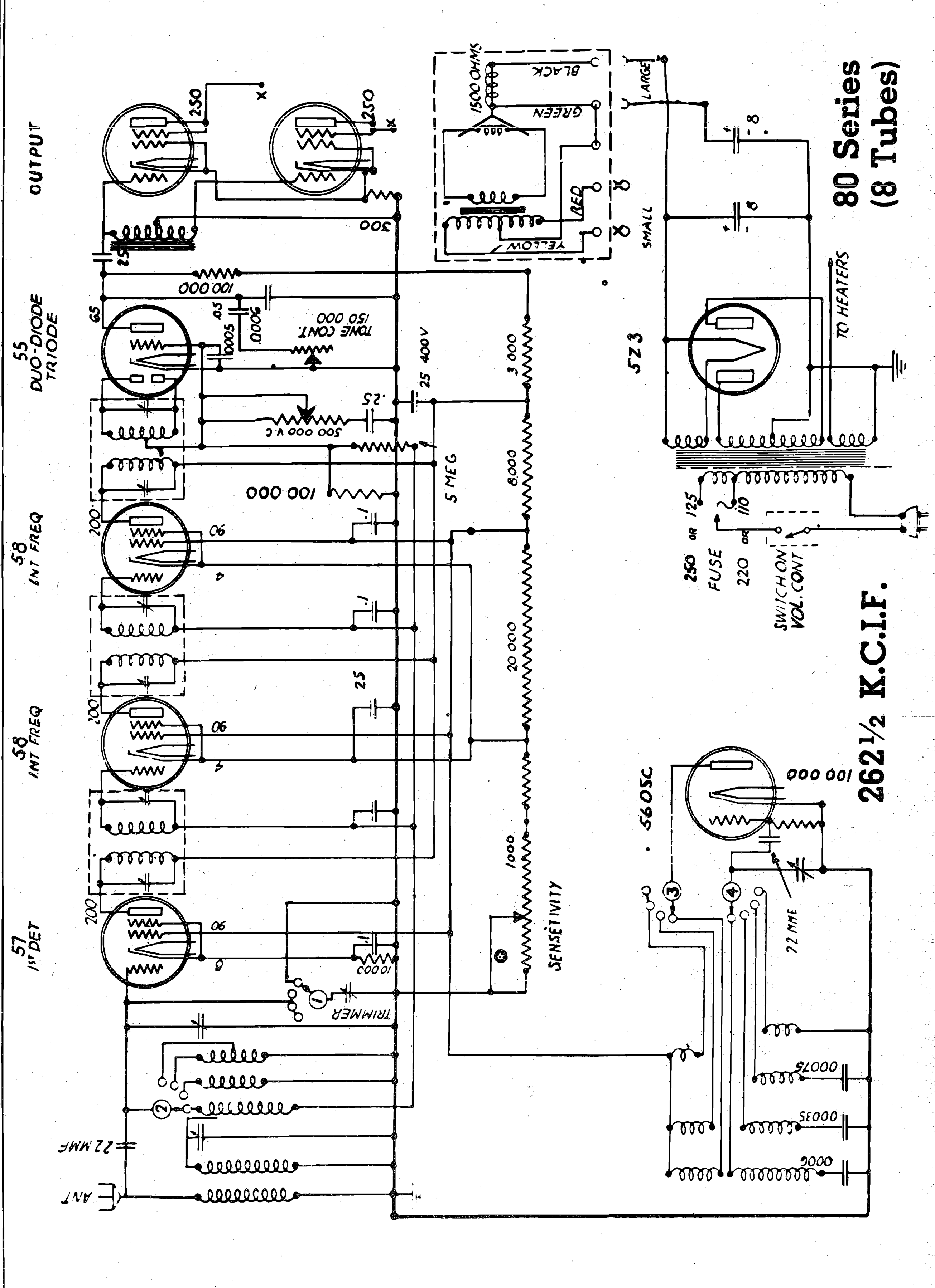
MODEL 79-7, Ch. W224

WESTERN AIR PATROL



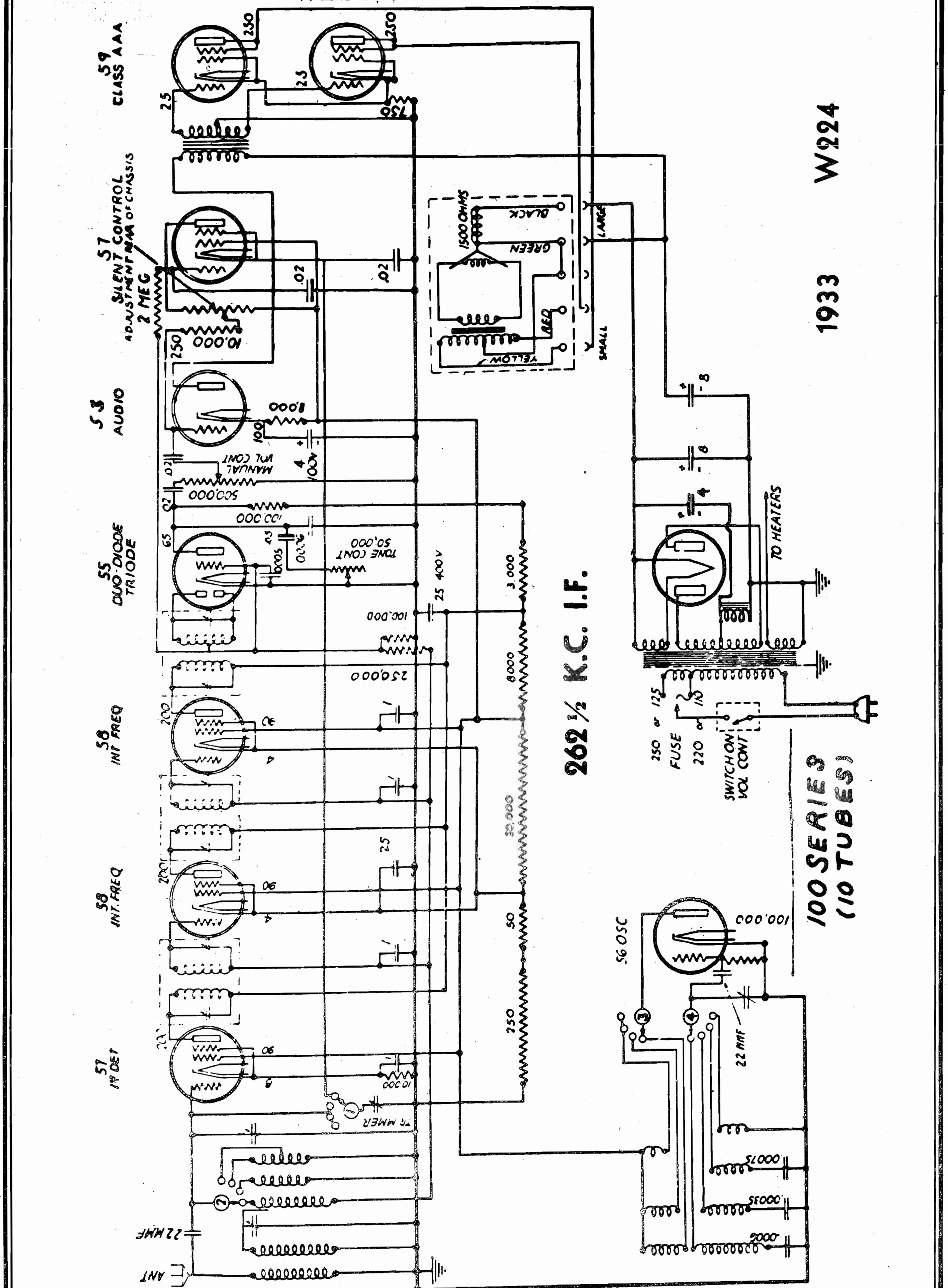
WESTERN AIR PATROL

MODEL 79-8, Ch. W224



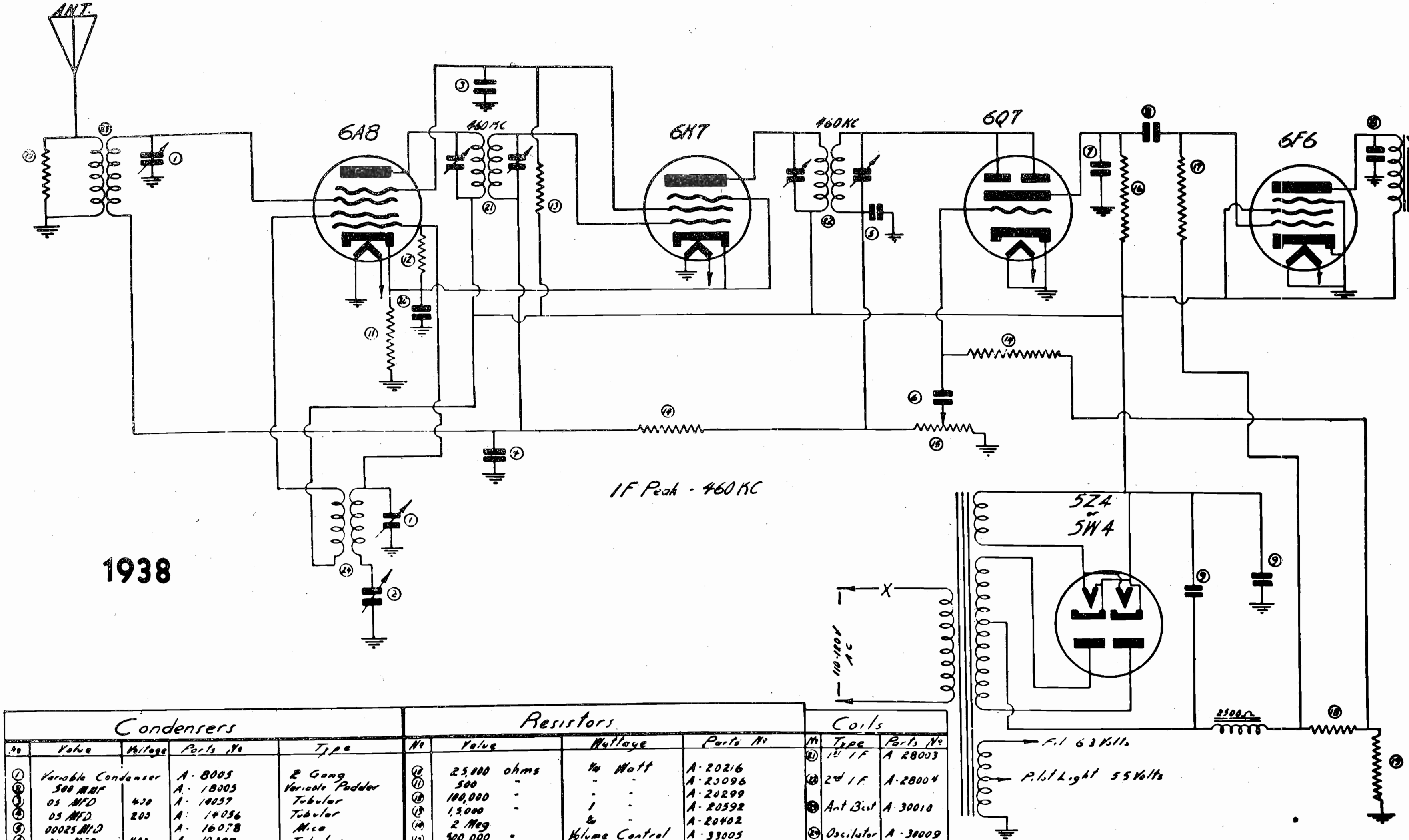
MODEL 79-10, Ch. W224

WESTERN AIR PATROL



WESTERN AIR PATROL

MODEL 157, Ch. W827



Condensers

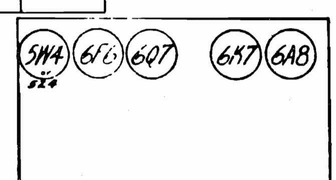
No	Value	Voltage	Parts No	Type
1	Variable Condenser		A-8005	2 Gang
2	500 MMF		A-18005	Variable Padder
3	.05 MFD	400	A-14057	Tubular
4	.05 MFD	200	A-14056	Tubular
5	.00025 MFD		A-16078	Mica
6	.01 MFD	400	A-14027	Tubular
7	.001 MFD	600	A-14078	Tubular
8	.01 MFD	600	A-14028	Tubular
9	8 x 8 MFD	450	A-13005	Electrolytic Cond
10	1 MFD	200	A-14001	Tubular

Resistors

No	Value	Wattage	Parts No
10	25,000 ohms	1/4 Watt	A-20216
11	500 -	- -	A-20096
12	100,000 -	- -	A-20299
13	15,000 -	1 -	A-20592
14	2 Meg	1/4 -	A-20402
15	500,000 -	Volume Control	A-33005
16	250,000 -	1/4 Watt	A-20337
17	1 Meg	- -	A-20361
18	350 -		A-20479
19	30 -	Insulated	A-20012-I

Coils

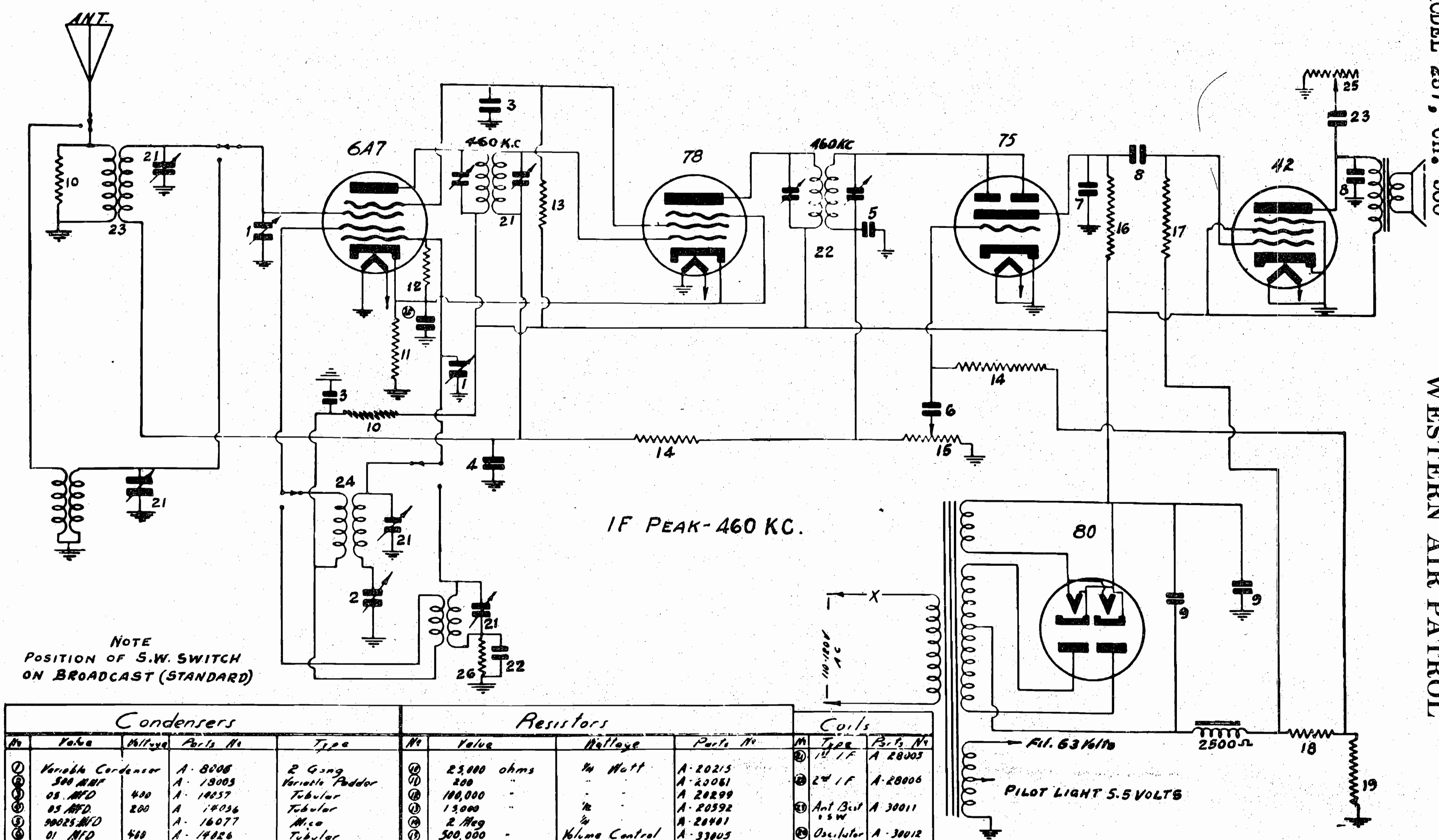
No	Type	Parts No
21	1st IF	A 28003
22	2nd IF	A-28004
23	Ant Coil	A-30010
24	Oscilator	A-30009



Tube Placement

MODEL 257, Ch. 500

WESTERN AIR PATROL



NOTE
POSITION OF S.W. SWITCH
ON BROADCAST (STANDARD)

Condensers

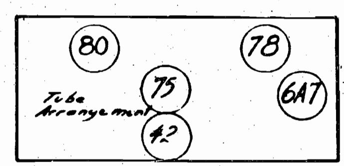
No	Value	Voltage	Parts No	Type
1	Variable Condenser		A-8006	2 Gang
2	500 MMF		A-18003	Variable Padder
3	.05 MFD	400	A-14057	Tubular
4	.05 MFD	200	A-14036	Tubular
5	.00025 MFD		A-16077	Mica
6	.01 MFD	400	A-14026	Tubular
7	.001 MFD	600	A-14078	Tubular
8	.01 MFD	600	A-14028	Tubular
9	8 x 8 MFD	450	A-10005	Electrolytic Cond
[illegible]	.1 MFD	200	A-14001	Tubular
[illegible]	3-30 MMF			Trimmer - SW
[illegible]	.006 MFD	600	A-14119	Tubular
[illegible]	.03 MFD	400	A-14039	Tubular

Resistors

No	Value	Wattage	Parts No
10	25,000 ohms	1/4 Watt	A-20215
11	200 "	"	A-20061
12	100,000 "	" "	A-20299
13	15,000 "	1/2 "	A-20592
14	2 Meg	1/4	A-20401
15	500,000 "	Volume Control	A-33005
16	250,000 "	1/4 Watt	A-20336
17	1 Meg	" "	A-20360
18	350 "		A-20479
19	30 "	Insulated	A-20012-I
20	30,000 "	1/4 Watt	A-20224
25	50,000 "	Tone Control	A-34002

Coils

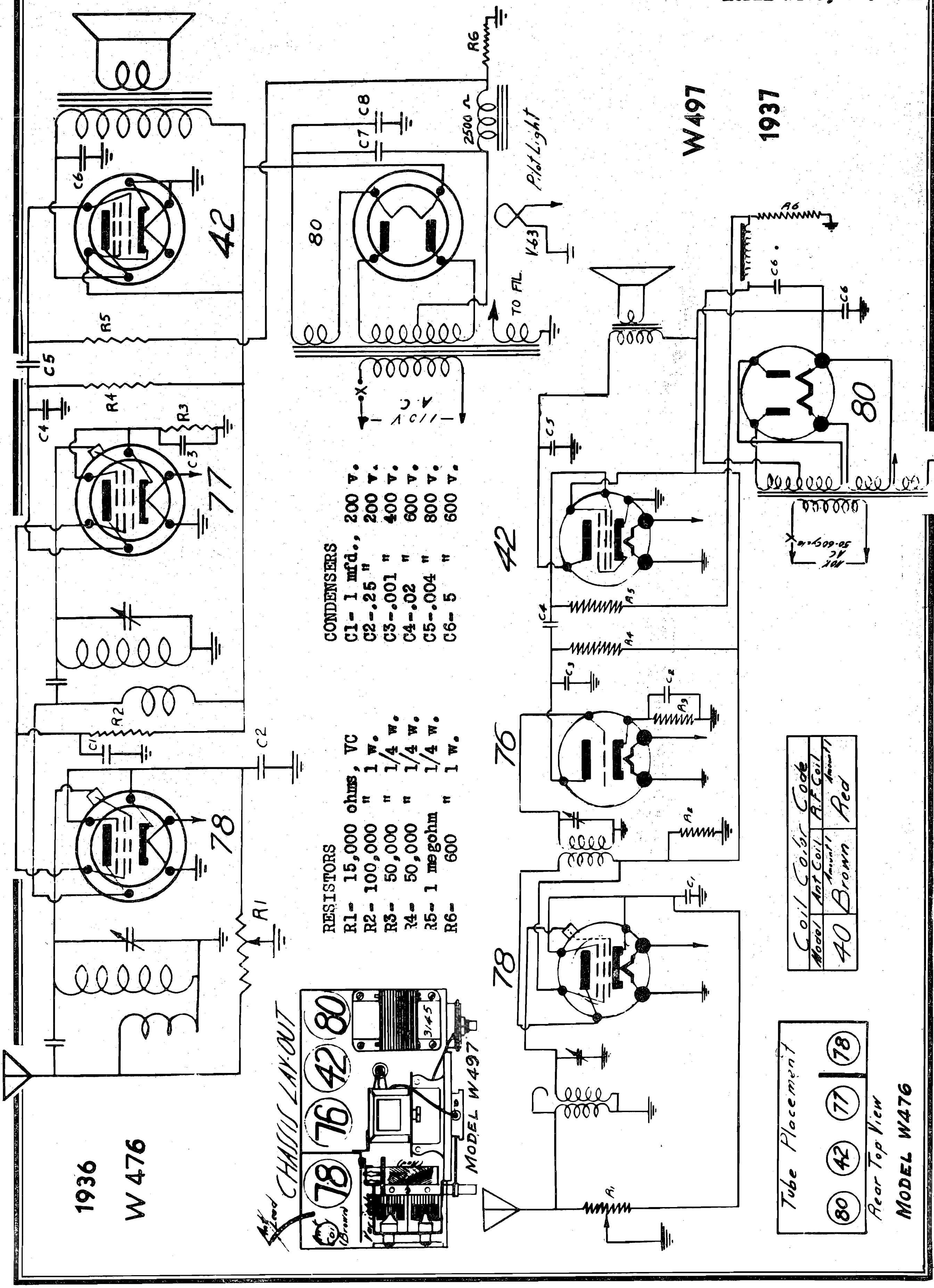
No	Type	Parts No
21	1st IF	A-28005
22	2nd IF	A-28006
23	Ant Coil, SW	A-30011
24	Oscillator, SW	A-30012



1938

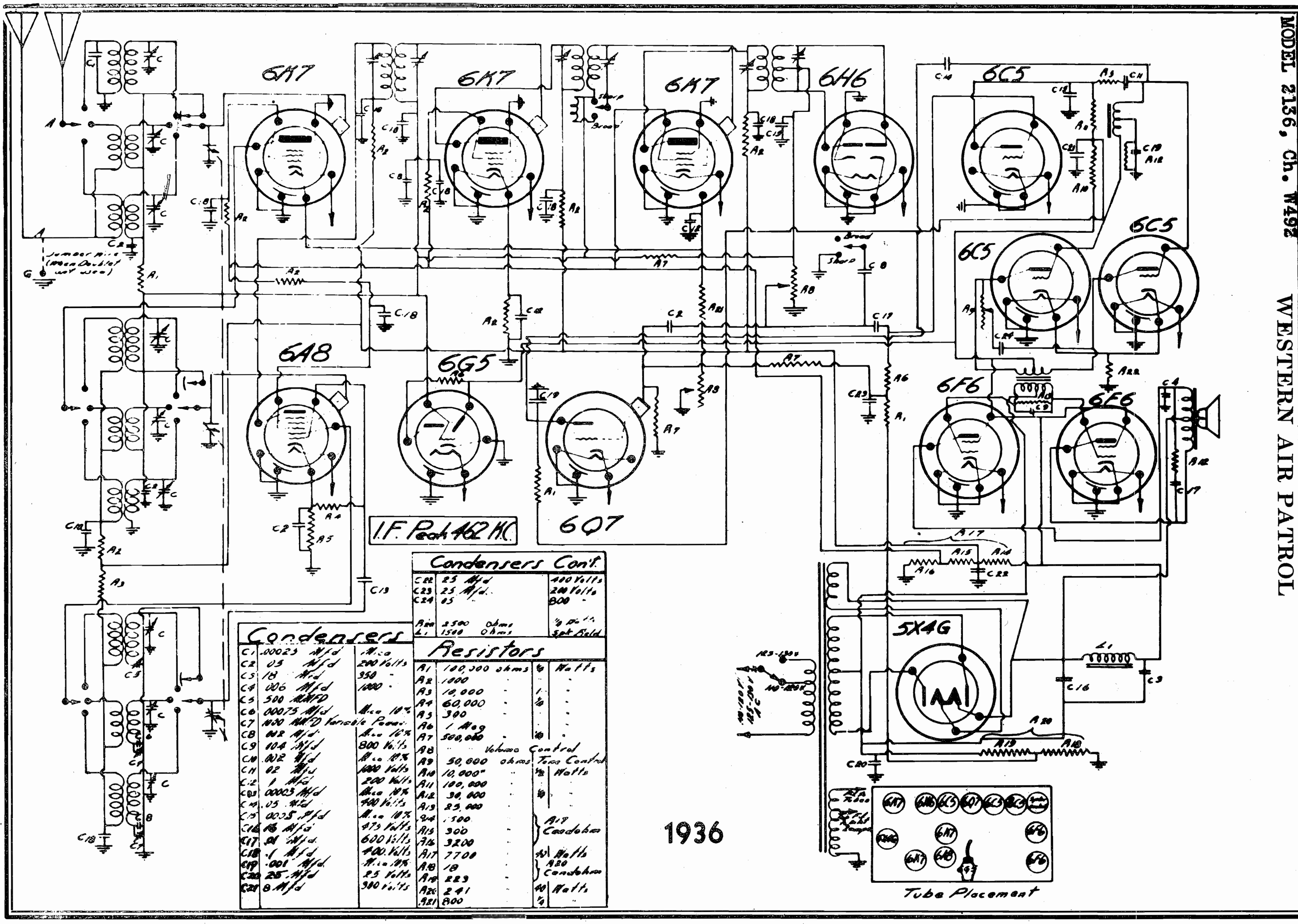
WESTERN AIR PATROL

MODEL 16, Ch. W497
MODEL W476, Ch. 4G1T



MODEL 2136, Ch. W492

WESTERN AIR PATROL



Condensers

C1	.00025 Mfd	Mica
C2	.05 Mfd	200 Volts
C3	18 Mfd	350 "
C4	.006 Mfd	1000 "
C5	500 MMFD	
C6	.00075 Mfd	Mica 10%
C7	1030 MMFD Variable Padder	
C8	.002 Mfd	Mica 10%
C9	.004 Mfd	800 Volts
C10	.002 Mfd	Mica 10%
C11	.02 Mfd	1000 Volts
C12	1 Mfd	200 Volts
C13	.00003 Mfd	Mica 10%
C14	.05 Mfd	400 Volts
C15	.0025 Mfd	Mica 10%
C16	16 Mfd	475 Volts
C17	.01 Mfd	600 Volts
C18	.1 Mfd	400 Volts
C19	.001 Mfd	Mica 10%
C20	25 Mfd	25 Volts
C21	8 Mfd	380 Volts

Condensers Con't.

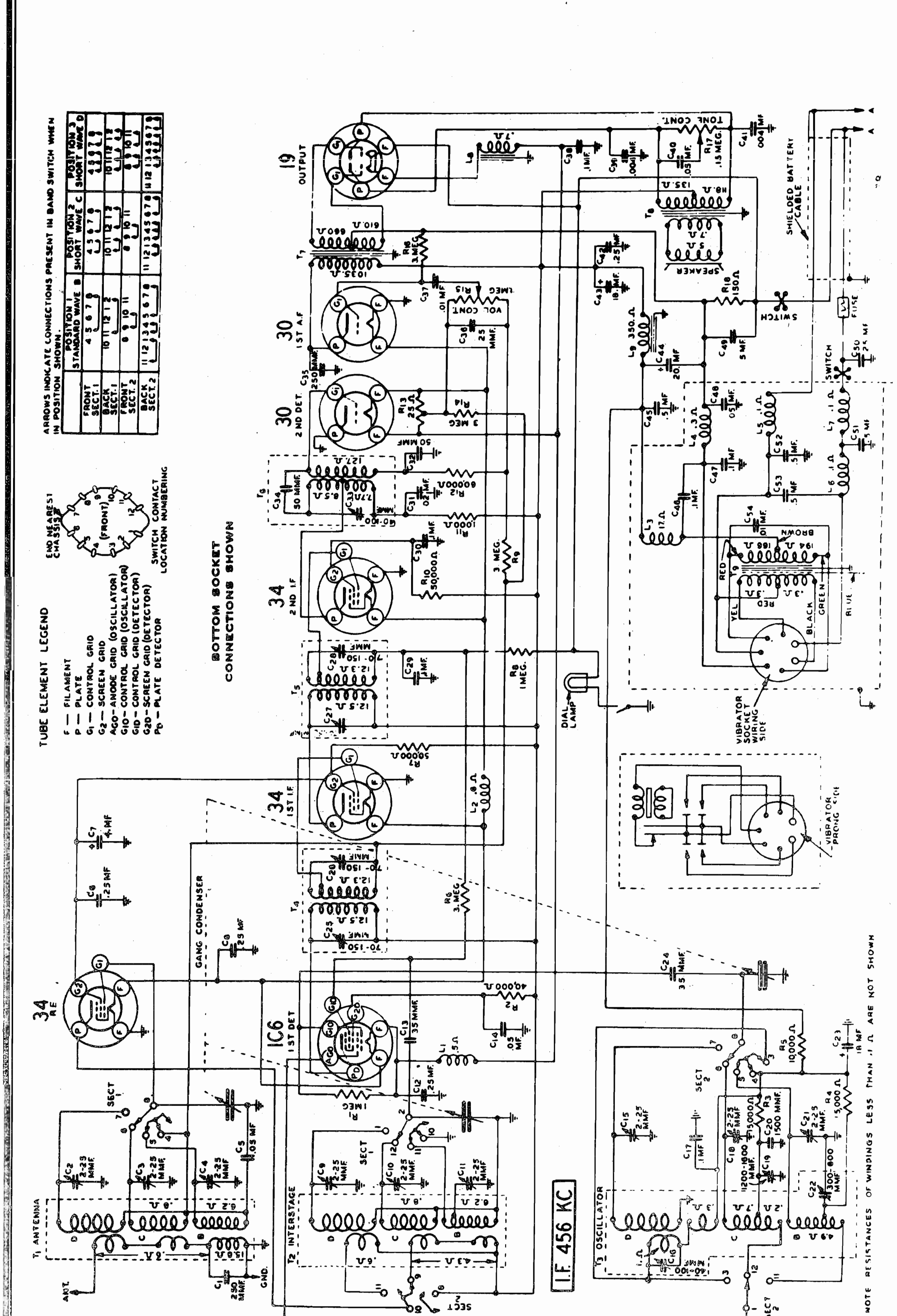
C22	25 Mfd	400 Volts
C23	25 Mfd	200 Volts
C24	.05 "	800 "
R20	2500 ohms	1/2 Watt
L1	1500 ohms	Spk Field

Resistors

R1	100,000 ohms	1/2	Watts
R2	1000 "	"	"
R3	10,000 "	1	"
R4	60,000 "	1/2	"
R5	300 "	"	"
R6	1 Meg	"	"
R7	500,000 "	1/2	"
R8	" " Volume Control		
R9	50,000 ohms Tone Control		
R10	10,000 "	1/2	Watts
R11	100,000 "	"	"
R12	30,000 "	1/2	"
R13	25,000 "		"
R14	1500	R19 Candohm	
R15	300 "		
R16	3200 "		
R17	7700 "	1/2	Watts
R18	18 "	R20 Candohm	
R19	223 "		
R20	241 "	10	Watts
R21	800	1/2	"

WESTERN AIR PATROL

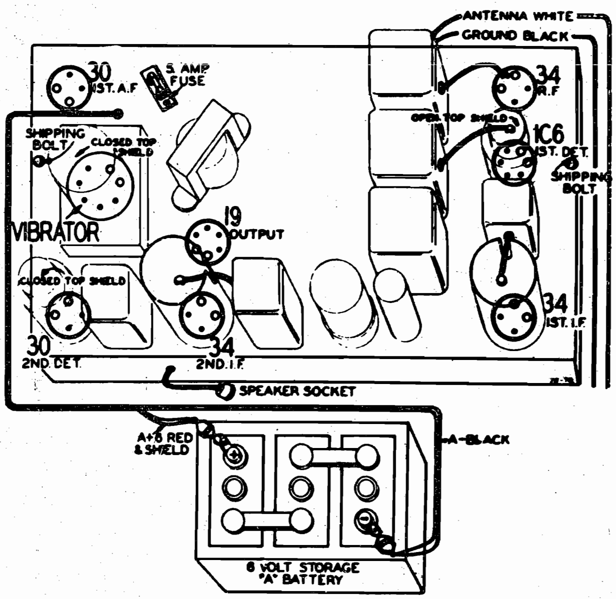
MODEL 27T, Ch. W496



FOR OTHER DATA SEE INDEX

MODEL 27T, Ch. W496

WESTERN AIR PATROL



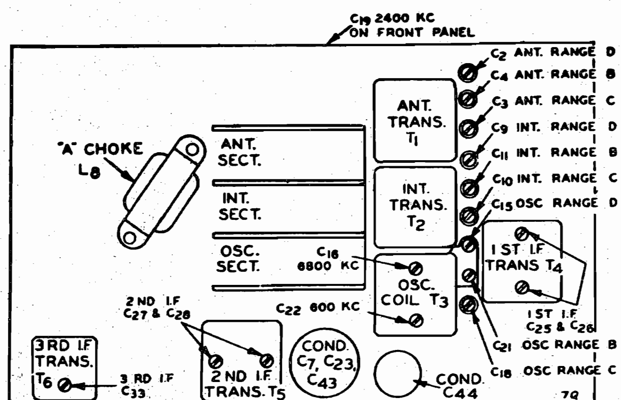
VOLTAGES AT SOCKETS

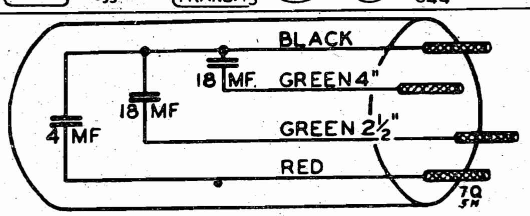
Volume Control at Maximum — Antenna Shorted to Ground

Battery - 6 Volts — Band Switch in Standard Wave Position

Type of Tube	Function	Across Filament	Plate to Ground	Screen to Ground	Bias Voltage See Notes
34	R.F.	2.0	145	55	1.0(1)
1C6	1st Det.-Osc.	2.0	145 90(2)	60	2 (3)
34	1st I.F.	2.0	145	55	1.0(1)
34	2nd I.F.	2.0	140	90	4.0(3)
30	2nd Det.	2.0			
30	1st A.F.	2.0	140		9 (4)
19	Power	2.0	140		5 (5)

(1) As read from negative filament leg to tap of resistor R13.
(2) Anode grid to ground.
(3) As read from negative filament leg to A—.
(4) Total voltage drop from negative filament leg to low potential end of resistor R18.
(5) As read across resistor R18.





Electrolytic Condenser Internal Connections

ALIGNMENT

Peak I.F. trimmers at 456 KC.
Range B-
Peak osc. trimmer (C21) at 1730 KC. Peak C11 and C4 at 1500 KC. Pad C22 at 600 KC.
Range C-
Peak C18 at 6700 KC.
Peak C3 and C10 at 6000 KC.
Pad C19 at 2400 KC.
Range D-
Peak C15 at 18,400 KC.
Peak C9 and C2 at 15,000 KC.
Pad C16 at 6800 KC.

NOTE

When adjusting interstage and antenna trimmers, rock gang condenser rotor until peak is obtained.

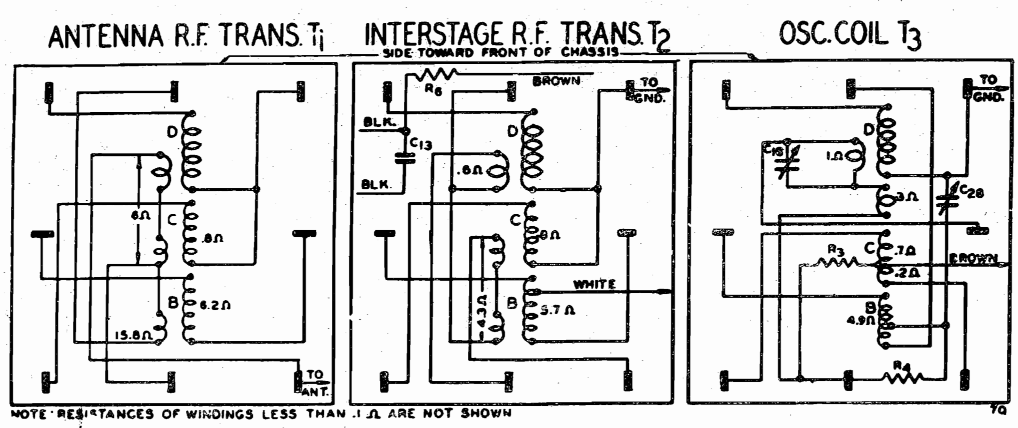
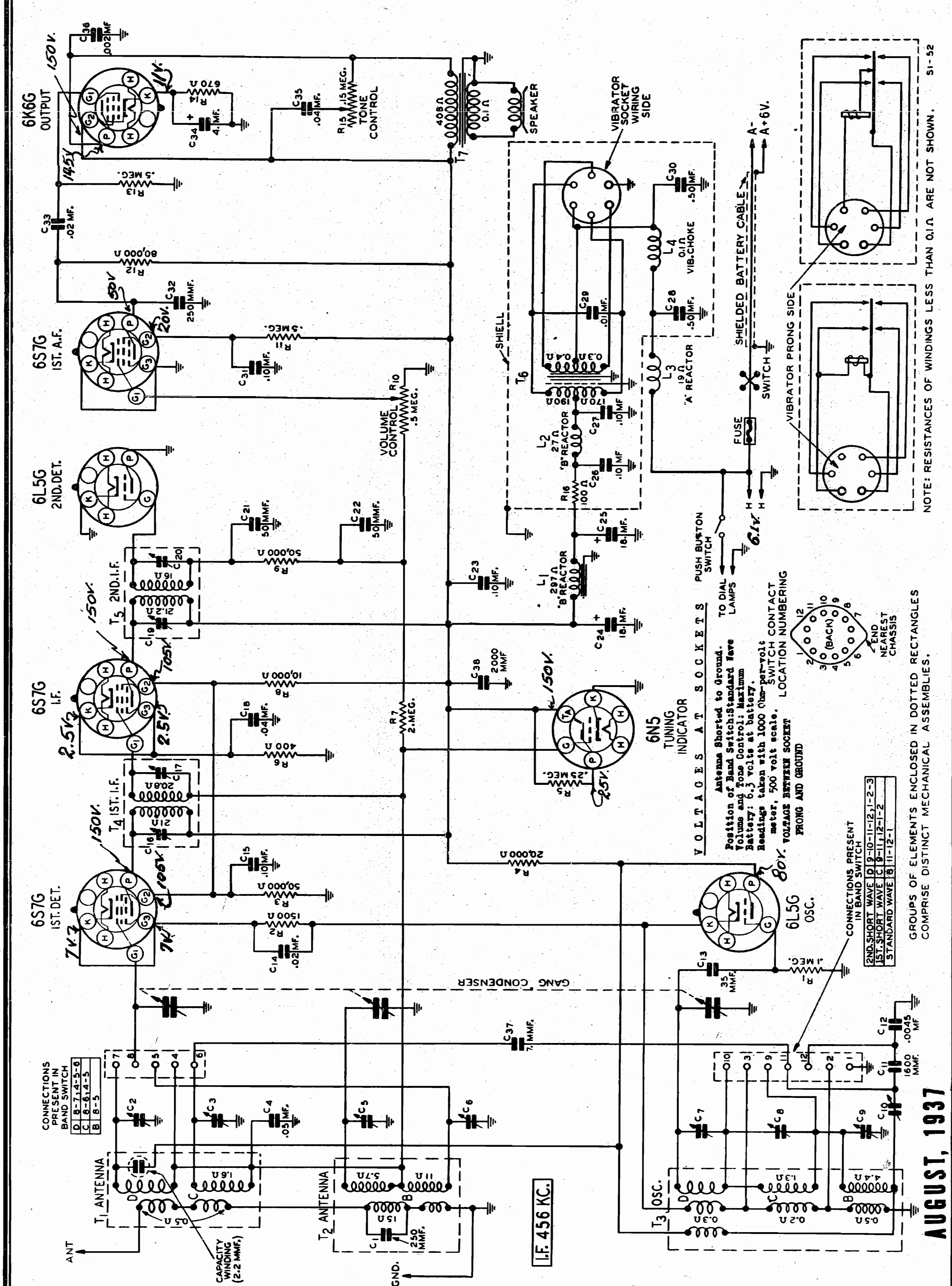


Fig. 7 R.F. and Oscillator Coil Base Terminal Arrangement and D. C. Resistance of Windings

MODEL 708, Ch. W832

WESTERN AIR PATROL



MODEL 708, Ch.832
MODEL 56, Ch. W485

WESTERN AIR PATROL

MOD. 708 **ALIGNMENT PROCEDURE** W832

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

Allow Chassis and Signal Generator to "Heat Up" for Several Minutes.

The following equipment is required for aligning:
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.
Output Indicating Meter — Non-Metallic Screwdriver.
Dummy Antennas — .1 mf., 200 mmf., and 400 ohms.

STEP (Follow Order as Given)	BAND SWITCH SETTING	DUMMY ANTENNA	SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	TRIMMERS ADJUSTED See Illustration	PROCEDURE INITIAL STEPS	PROCEDURE ADJUSTMENT
I. F.							
2nd I.F. Adj.	Range B	.1 mf.	456 KC	Grid of I.F. Tube	2nd I.F. (C19) & (C20)	Turn Rotor to Full Open	Adjust to Maximum Output
1st I.F. Adj.	Range B	.1 mf.	456 KC	Grid of 1st Det.	1st I.F. (C16) & (C17)	Turn Rotor to Full Open	Adjust to Maximum Output
RANGE D							
22,000 KC	Range D	400 Ohm	22,000 KC	Antenna Lead	Oscillator Range D (C7)	Turn Rotor to Full Open	Adjust to Maximum Output
20,000 KC	Range D	400 Ohm	20,000 KC	Antenna Lead	Antenna Range D (C2)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B
RANGE C							
6350 KC	Range C	400 Ohm	6350 KC	Antenna Lead	Oscillator Range C (C8)	Turn Rotor to Full Open	Adjust to Maximum Output
6000 KC	Range C	400 Ohm	6000 KC	Antenna Lead	Antenna Range C (C3)	Turn Rotor to Max. Output	Adjust to Maximum Output
RANGE B							
1830 KC	Range B	200 mmf.	1830 KC	Antenna Lead	Oscillator Range B (C9)	Turn Rotor to Full Open	Adjust to Maximum Output
1500 KC	Range B	200 mmf.	1500 KC	Antenna Lead	1st Ant. Range B (C5) 2nd Ant. Range B (C6)	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	Adjust to Maximum Output
600 KC	Range B	200 mmf.	600 KC	Antenna Lead	600 KC (C10)	Turn Rotor to Max. Output	Adjust to Maximum Output Rock Rotor — See Note B

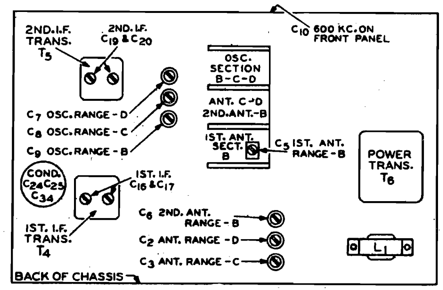
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

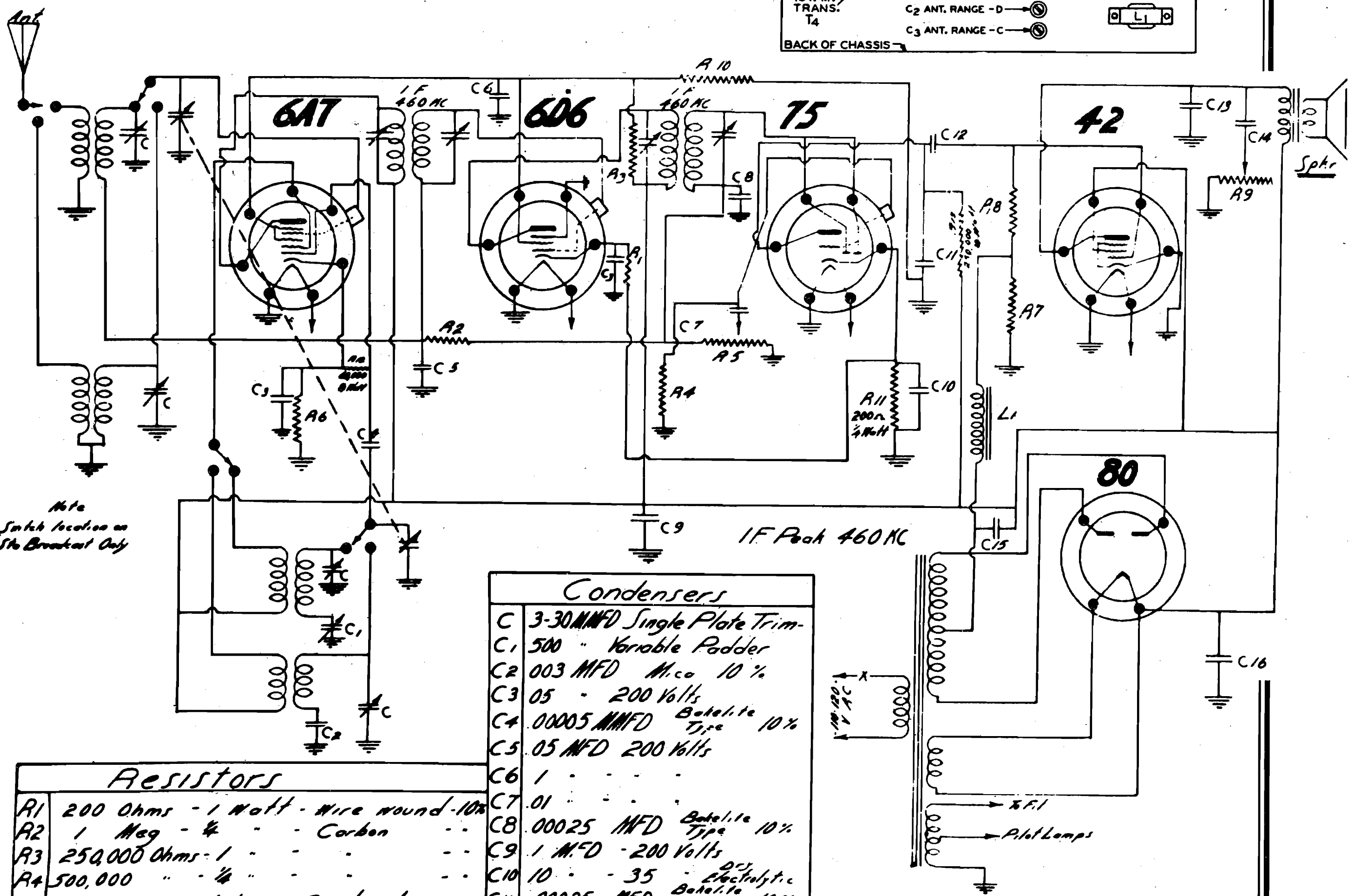
After each range is completed, repeat the procedure as a final check.

NOTE A—Loosen the pointer set screw and set the pointer at the 1500 KC mark on the standard wave band scale. Retighten the set screw.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 5000 KC. The signal will then be heard at 5000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 5000 less 912 KC, or 4088 KC on the dial. It may be necessary to increase the input signal to hear the image.





Condensers

C	3-30 MMFD Single Plate Trim-
C1	500 " Variable Padder
C2	003 MFD Mica 10%
C3	05 " 200 Volts
C4	.00005 MMFD Bakelite Type 10%
C5	.05 MFD 200 Volts
C6	1 " " " "
C7	.01 " " " "
C8	.00025 MFD Bakelite Type 10%
C9	.1 MFD - 200 Volts
C10	10 " - 35 " Dry Electrolytic
C11	.00025 MFD Bakelite Type 10%
C12	.02 MFD - 400 Volts
C13	.006 " - 800 "
C14	.02 " - 600 "
C15	5 " " " " Filter
C16	" " " " "

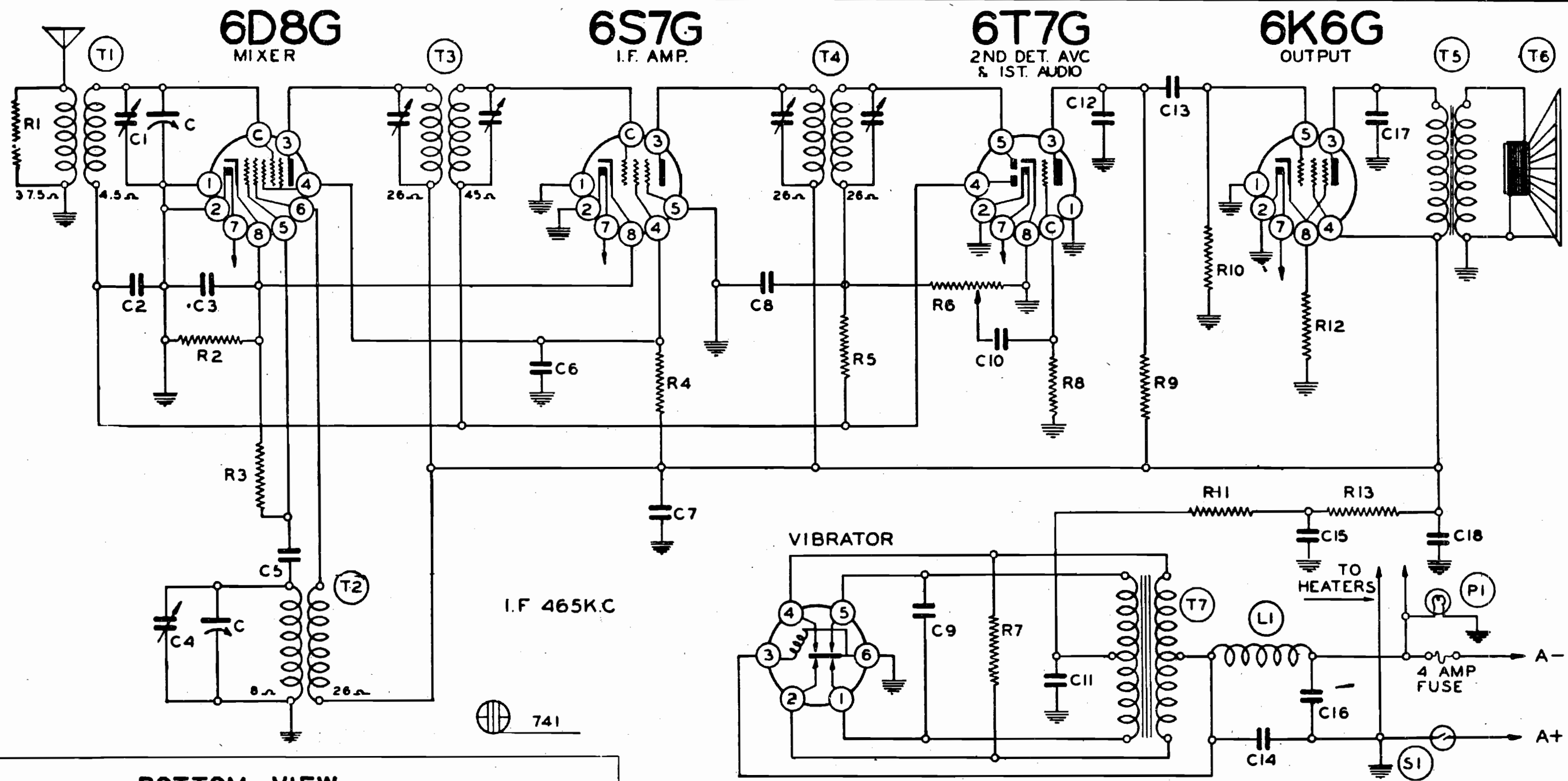
Resistors

R1	200 Ohms - 1 Watt - Wire wound - 10%
R2	1 Meg - ¼ " - Carbon " "
R3	250,000 Ohms - 1 " " " " "
R4	500,000 " - ¼ " " " " "
R5	500,000 " Volume Control
R6	500 " - ¼ Watt - Carbon " "
R7	300 " - 1 " " " " "
R8	500,000 " - ¼ " " " " "
R9	50,000 " Tone Control
R10	100,000 " - ½ Watt - Carbon " "

MOD. 56
W485
1937

WESTERN AUTO SUPPLY CO.

MODEL D723

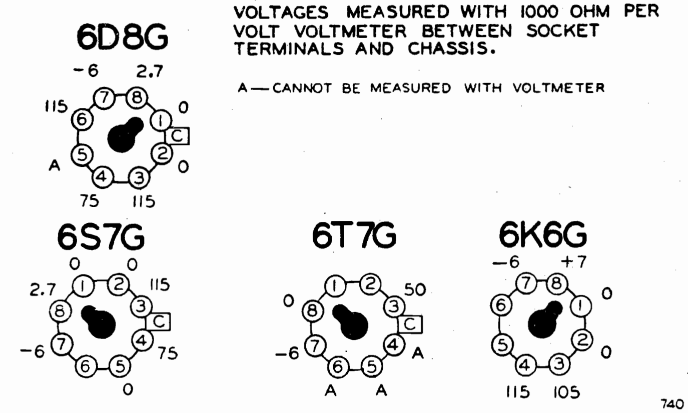


Broadcast Band 6-Volt Storage Battery Operated
Superheterodyne Receiver
WITH FOUR BUTTON AUTO-TUNER
Frequency Range—535 - 1735 Kilocycles

BOTTOM VIEW OF CHASSIS

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

A—CANNOT BE MEASURED WITH VOLTMETER



Nov. 1938

REAR OF CHASSIS

740

Fig 3

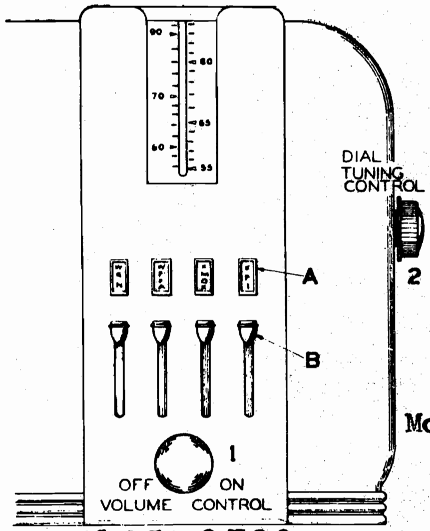
Circuit Diagram Reference	Part No.	Description
		RESISTORS
R1	13017	10M ohm—⅓ w.
R2	130239	250 ohm—⅓ w.
R3	13012	50M ohm—⅓ w.
R4	130263	12M ohm—⅓ w.
R5	1304	3 megohm—⅓ w.
R6	101108	1 megohm—volume control
R7	13084	200 ohm—⅓ w.
R8	130225	15 megohm—⅓ w.
R9	13011	250M ohm—⅓ w.
R10	13019	1 megohm—⅓ w.
R11	130231	75 ohm—⅓ w.
R12	13070	500 ohm—⅓ w.
R13	130199	1500 ohm—1 watt
		CONDENSERS
C	10271B	2 gang variable condenser
C1		Antenna Trimmer
C2	1009	.05 x 200 v.
C3	10020	.1 x 200 v.
C4		Oscillator Trimmer
C5	12912	.00025 mica
C6	10020	.1 x 200 v.

Circuit Diagram Reference	Part No.	Description
C7	10020	.1 x 200 v.
C8	1295	.0001 mica
C9	10068	.003 x 1400 v.
C10	10019	.006 x 600 v.
C11	10020	.1 x 200 v.
C12	1292	.0005 mica
C13	10011	.01 x 400 v.
C14	10040	.5 x 120 v.
C15	11959C	30 mfd.—150 w. v. lytic
C16	10040	.5 x 120 v.
C17	10019	.006 x 600 v.
C18	11959C	10 mfd. 150 w. v. lytic
		PARTS
T1	11185B	Antenna Coil
T2	110103	Oscillator Coil
T3	10896E	Input I. F.—465 kc.
T4	10895E	Output I. F.—465 kc.
T5	10582	Output Transformer
T6	114142	5" P. M. Speaker
T7	104137C	Power Transformer
L1	10568	"A" Choke
P1	10789	6-8 v. pilot light
S1		Off-on switch on volume control

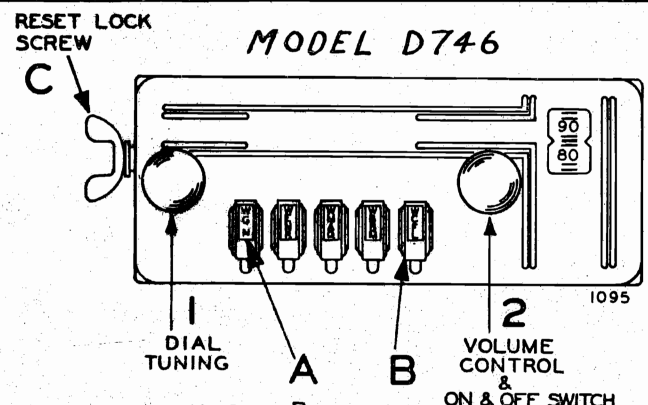
MODEL D723

MODEL D746

WESTERN AUTO SUPPLY CO.



MODEL D723
FIG. 2—FRONT VIEW



MODEL D746

Model D-723

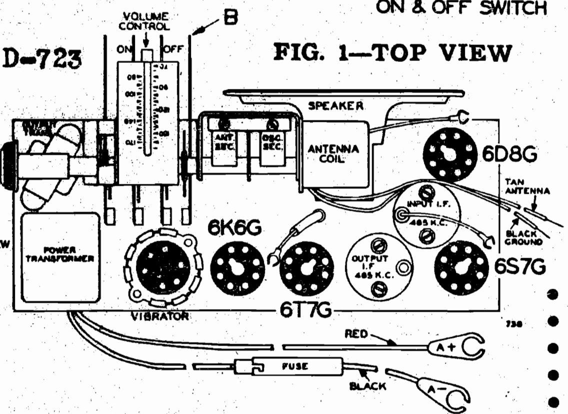


FIG. 1—TOP VIEW

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

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

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

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

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

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

Model D-723 ALIGNMENT PROCEDURE

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

- 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.

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6S7G I. F. Tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6D8G	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROADCAST BAND	1735 Kc.	200 mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Top of rear section of gang (See Fig. 1)	Broadcast Oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Set dial at 1400 Kc.	Trimmer—Top of front section of gang (See Fig. 1)	Antenna Broadcast	Adjust to maximum output

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

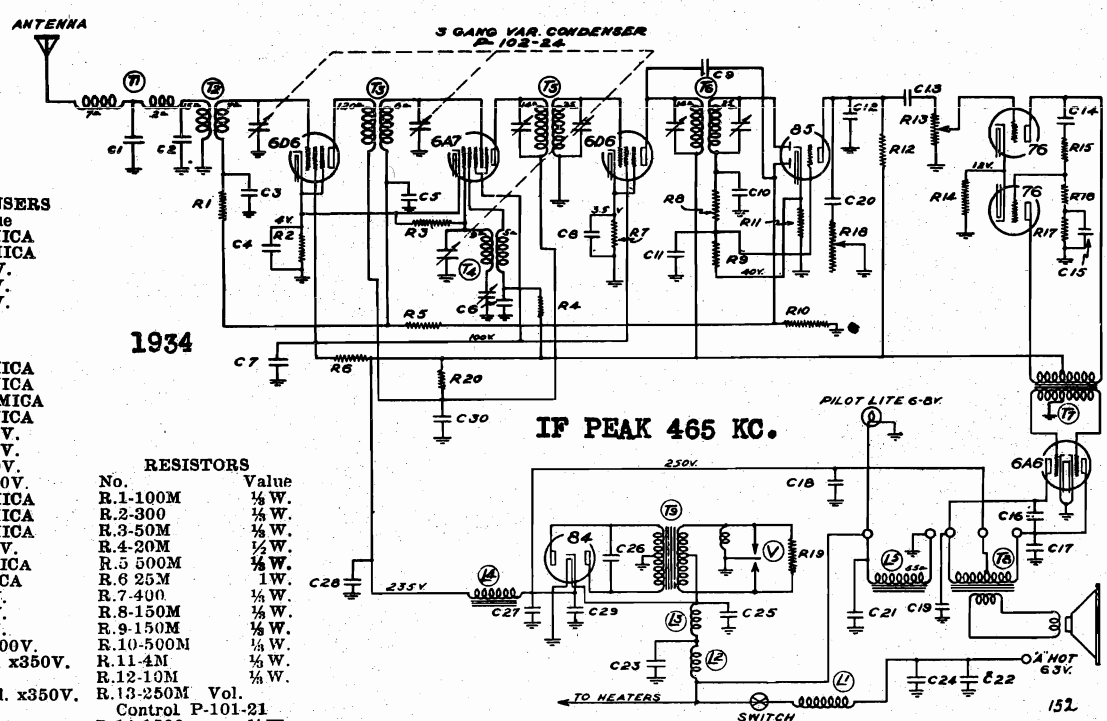
After each band is completed, repeat the procedure as a final check.

FREQUENCY RANGE
535 to 1735KC.

Power Consumption........2.1 Amperes at 6.3 Volts
Power Output........350 Milliwatts Undistorted, 800 Milliwatts Maximum
Intermediate Frequency........465 KC.

WESTERN AUTO SUPPLY CO.

MODEL S-741



1934

CONDENSERS

No.	Value
C.1	.00009 MICA
C.2	.00002 MICA
C.3	.01x400V.
C.4	.25x200V.
C.5	.05x200V.
C.6	.1x200V.
C.7	.1x200V.
C.8	.1x200V.
C.9	.00002 MICA
C.10	.0001 MICA
C.11	.00005 MICA
C.12	.0001 MICA
C.13	.02x400V.
C.14	.02x400V.
C.15	.01x400V.
C.16	.006x600V.
C.17	.0005 MICA
C.18	.0005 MICA
C.19	.0005 MICA
C.20	.05x400V.
C.21	.0005 MICA
C.22	.002 MICA
C.23	.5x120V.
C.24	.5x120V.
C.25	.5x120V.
C.26	.015x1400V.
C.27	8.0 mfd. x350V. P-119-16
C.28	12.0 mfd. x350V. P-119-16
C.29	.01x400V.
C.30	.1x400V.

117-2 Dash Mounting Bracket
117-1 Bracket Steering Column
Dash Mounting Assembly

RESISTORS

No.	Value	
R.1	100M	½ W.
R.2	300	⅓ W.
R.3	50M	⅓ W.
R.4	20M	½ W.
R.5	500M	⅓ W.
R.6	25M	1W.
R.7	400	⅓ W.
R.8	150M	⅓ W.
R.9	150M	⅓ W.
R.10	500M	⅓ W.
R.11	4M	⅓ W.
R.12	10M	⅓ W.
R.13	250M Vol. Control P-101-21	
R.14	1500	⅓ W.
R.15	1 meg	⅓ W.
R.16	91M	⅓ W.
R.17	75M	⅓ W.
R.18	100M Tone Control P-101-39	
R.19	200	⅓ W.
R.20	1500	⅓ W.

PARTS

No.	Part No.
T1-Antenna Filter	P-111-43
T2-Antenna Coil	P-111-42
T3-R.F. Coil	P-109-20
T4-Oscillator Coil	P-110-34
T5-Input I.F. Coil	P-108-56
T6-Output I.F. Coil	P-108-57
T7-Audio Trans.	P-105-13
T8-Output Trans.	
T9-Power Trans.	P-104-21
L1-"A" Choke	P-105-18
L2-"A" Choke	P-105-18
L3-"A" Choke	P-105-19
L4-Filter Choke	P-105-11
L5-Speaker Field	
V-Vibrator	

142-4

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the two plates of the type 6A6 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT: Series A & B

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 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.
   (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

I.F. ALIGNMENT: Series 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 the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-56) and output (108-57) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).

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.

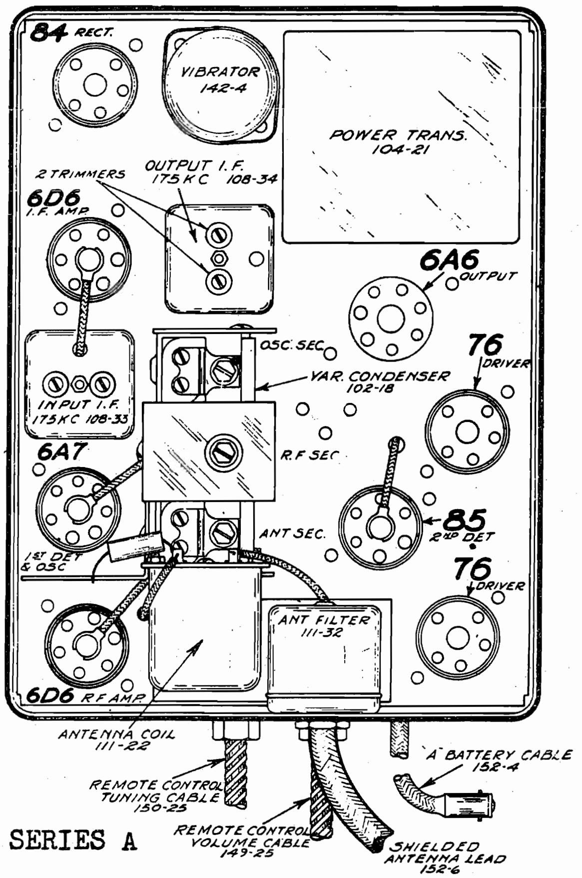
In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

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.

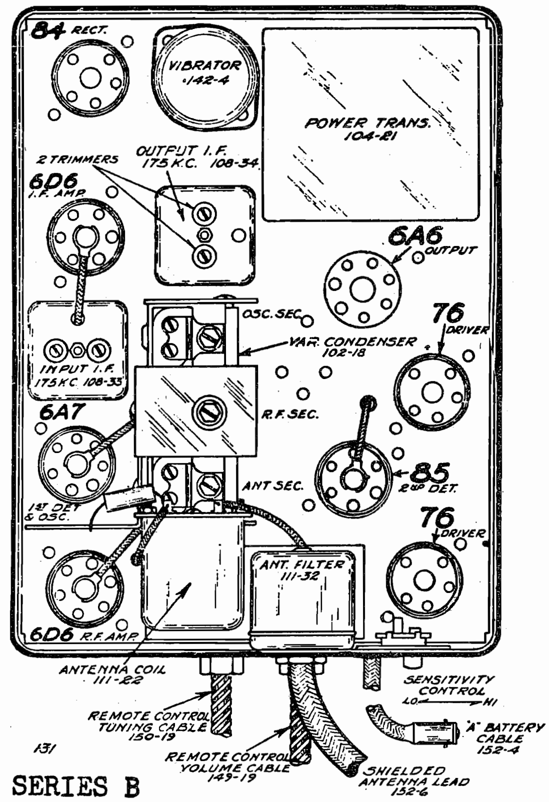
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.
4. Re-set external oscillator to 600 K.C. and adjust series pad to resonance, rotate condenser and move dial pointer to 600 K.C. by gently rocking condenser to and fro. Pick up oscillator signal while adjusting series pad to resonance. This adjustment is accessible from the bottom of the chassis.
   (a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

MODEL S-741
Series A, B, C

WESTERN AUTO SUPPLY CO.



SERIES A



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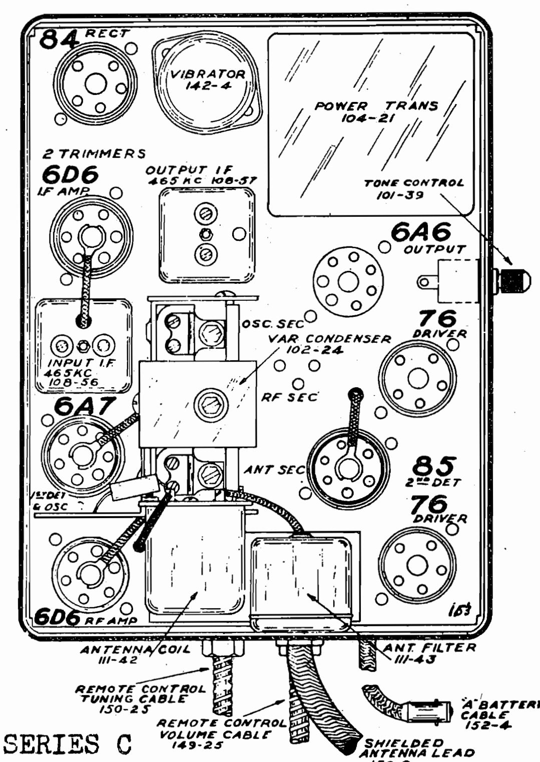
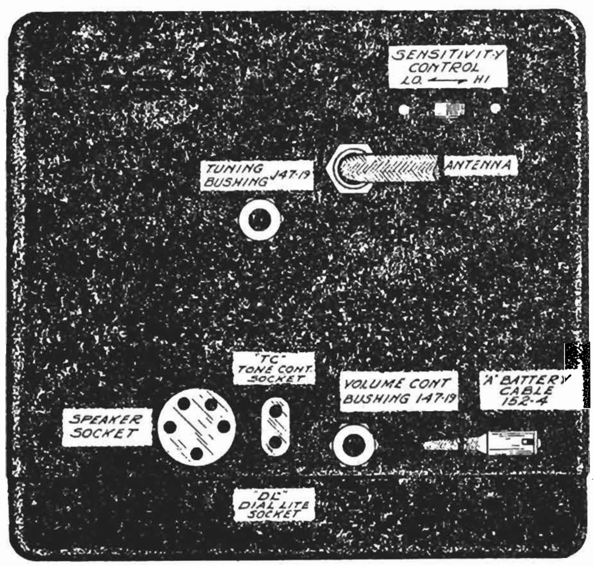


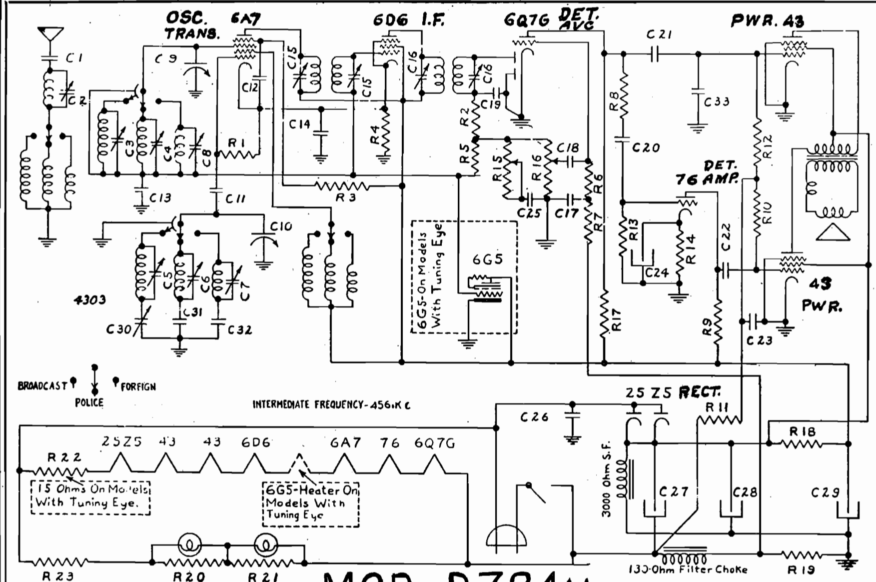
SERIES C



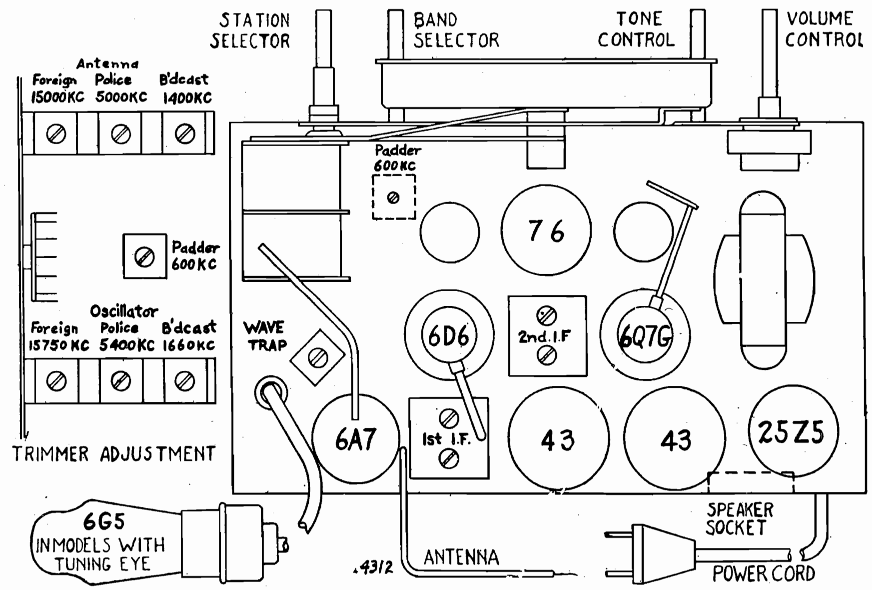
Arrangemnet of Series A & C is similar to Series B, except that Series A & C have no Sensitivity Control Switch

WESTERN AUTO SUPPLY CO.

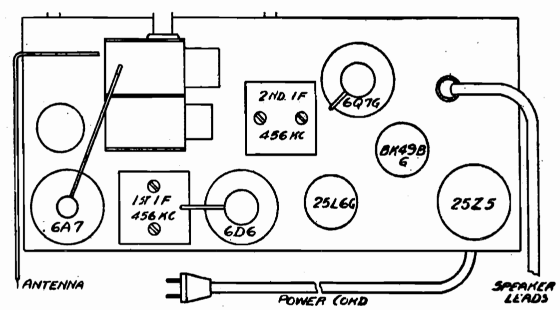
MODEL D724U
MODEL D905



MOD. D724U



MODEL D-724U



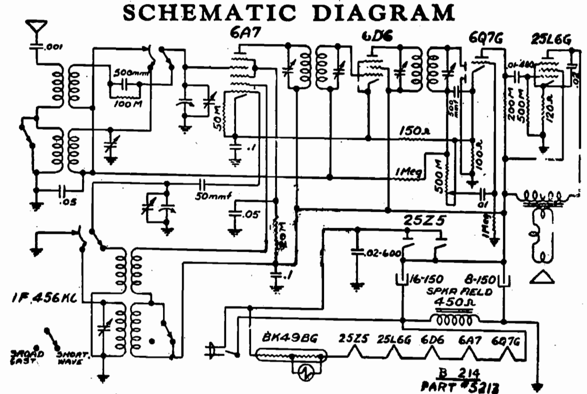
MODEL D-905

6A7—Oscillator Translator
6D6—IF Amplifier
6Q7G—Detector-AVC-1st Audio

25L6G—Power Output
25Z5—Rectifier
BK49BG—Ballast

FOR CONVENTIONAL ALIGNMENT, SEE SPECIAL SECTION VOLUME VIII

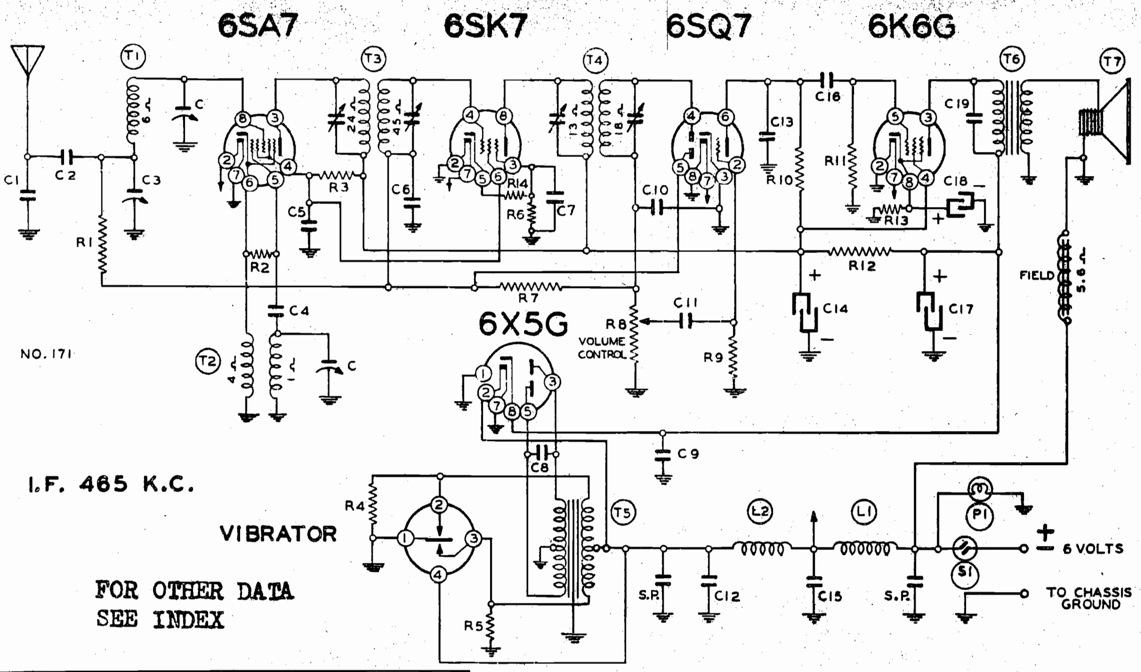
SCHEMATIC DIAGRAM



Symbol	Part No.	Description
Symbol	Part No.	Description
C-1	3137	.001-400 V.
C-2	2559	180 MMF Trimmer
C-3, 4, 5, 6, 7	2597	1-10 MMF Trimmer
C-8	1611	3-35 MMF Trimmer
C-9, 10	2871	350 MMF Variable
C-11, 33	2780	50 MMF Mica
C-12, 13	580	.05-200 V.
C-14, 17	572	.1-200 V.
C-15, 16	2445	IF Trimmer
C-18, 20, 21, 22	576	.02-400 V.
C-19	1286	250 MMF Mica
C-23	566	.5-200 V.
C-25	581	.005-600 V.
C-26	2600	.02-600 V.
C-27	4297	20 MF-150 V.
C-24	4298	4 MF-18 V.
C-28	4298	30 MF-150 V.
C-29	4298	10 MF-150 V.
C-30	2560	220-550 MMF Padder
C-31	2741	1330 MMF 5%
C-32	2740	3850 MMF 5%
R-1, 2	631	50 M-⅓ W.
R-3, 14	4302	20 M-⅓ W. 10%
R-4	2689	100 OHM-⅓ W.
R-5, 6, 7	624	1 Meg.-⅓ W.
R-8	2599	1 Meg.-⅓ W.-10%
R-9	4300	250 M-⅓ W.-10%
R-10, 12	2731	500 M-⅓ W.-10%
R-11	2568	300 M-⅓ W.-10%
R-13	2880	100 M-⅓ W.-10%
R-15	2737	2 Meg. Tone Control
R-16	2726	500M Volume Control
R-17	2730	200 M-⅓ W.-10%
R-18	2886	500 OHM-1 W.-10%
R-19	3580	100 OHM-.5 W.
R-20, 21	4296	32 OHM 3 W.
R-22	4304	15 OHM—On Eye Models
R-22	4301	35 OHM—4W—Wire Wound
R-23	802	300 OHM Line Cord
	2755	Antenna Coil
	2724	Band Switch
	2857	Oscillator Coil
	2860	1st IF Transformer
	2859	2nd IF Transformer
	4295	Filter Choke
	1489	5 Prong Socket
	789	6 Prong Socket
	2165	7 Prong Socket
	2557	7 Prong Octal Socket
	530	Pilot Lamp
	2378	Pointer
	1408	Pointer Screw
	2981	Tuning Eye Cable
	4307	Speaker—10"
	4306	Speaker—8"

MODEL D746

WESTERN AUTO SUPPLY CO.



FOR OTHER DATA
SEE INDEX

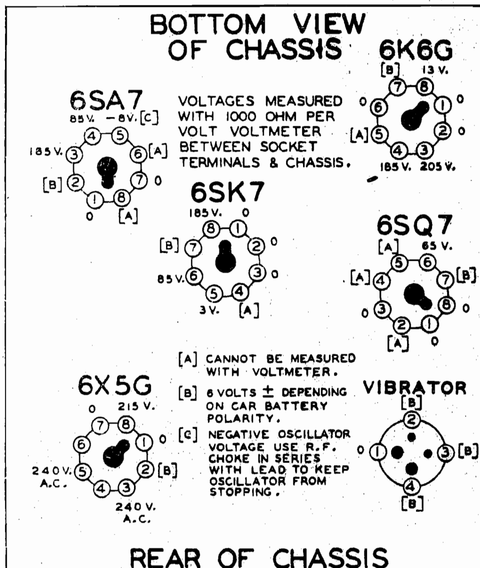


FIG. 4

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13011	250M ohm—⅓ w.
R2	130236	30M ohm—⅓ w.
R3	130307	15M ohm—1 watt
R4	13060	100 ohm—⅓ w.
R5	13060	100 ohm—⅓ w.
R6	13070	500 ohm—⅓ w.
R7	1304	3 megohm—⅓ w.
R8	101110	1 megohm volume control
R9	130257	5 megohm—⅓ w.
R10	13011	250M ohm—⅓ w.
R11	1303	500M ohm—⅓ w.
R12	130199	1500 ohm—1 watt
R13	130308	750 ohm—1 watt
R14	130174	50 ohm—⅓ w.
		CONDENSERS
C	10269	2 gang variable condenser
C1	1293	.00002 mica
C2	10055	.01 x 400 volts
C3	12434	Adj. Antenna Trimmer
C4	12921	.0002 mica
C5	100115	.05 x 400 v.
C6	1009	.05 x 200 v.
C7	10020	.1 x 200 v.
C8	10034	.005 x 1200 v.

Circuit Diagram Ref. No.	Part No.	Description
C9	12912	.00025 mica
C10	1295	.0001 mica
C11	10025	.002 x 600 v.
C12	10031	.5 x 120 v.
C13	1292	.0005 mica
C14	119105	15 ufd. lytic x 350 w. v.
C15	10031	.5 x 120 v.
C16	10078	.01 x 200 v.
C17	119105	15 ufd. lytic x 350 w. v.
C18	119105	20 ufd. lytic x 25 w. v.
C19	10087	.01 x 600 v.
		C14, C17 and C18 in same unit
		PARTS
T1	11195B	Antenna Coil
T2	110146	Oscillator Coil
T3	108139	Input I. F. Coil—465 kc.
T4	108121B	Output I. F. Coil—465 kc.
T5	104131	Power Transformer
T6	10567	Output Transformer
T7	114114-R	5" Dynamic Speaker (5.6 ohm field)
L1	10568	"A" Choke
L2	10566	"A" Choke
S1		Switch on volume control
P1	10797	Pilot light (T51) 6-8 volts
S.P.	11749	(2) Spark Plates

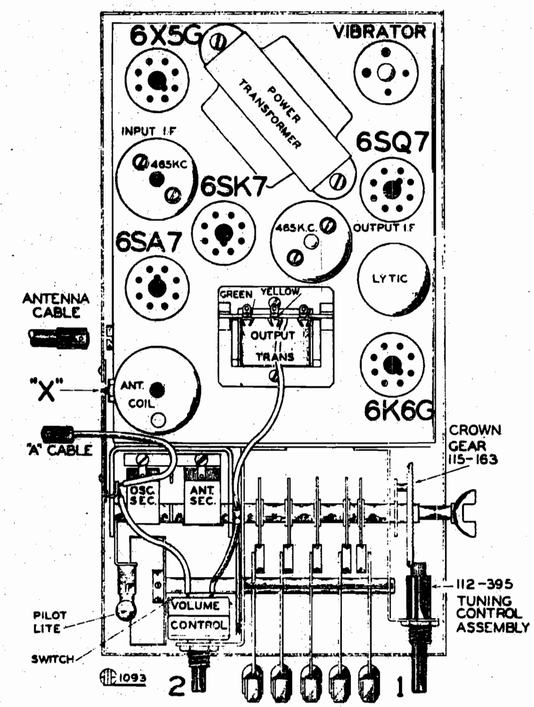


FIG. 3—TOP VIEW

TUBE COMPLEMENT

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

1—Type No. 6SA7—Mixer first detector and oscillator.

1—Type No. 6SK7—Remote Cut-off Pentode as an I.F. Amplifier.

1—Type No. 6SQ7—Duplex Diode Triode Second Detector, A.V.C. and First Audio.

1—Type No. 6K6G—Pentode Output Amplifier.

1—Type No. 6X5G—High Vacuum Rectifier.

JANUARY, 1940

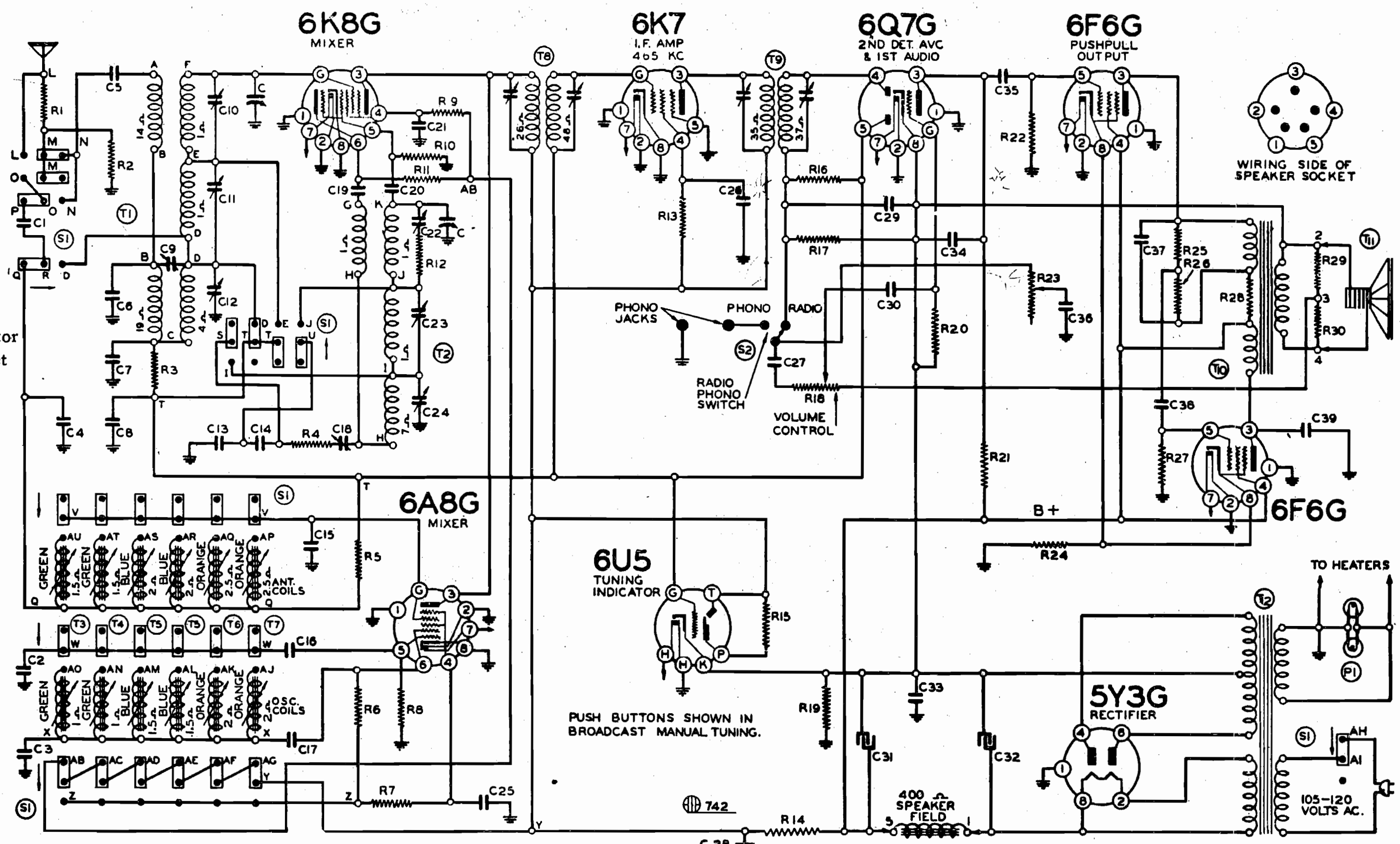
WESTERN AUTO SUPPLY CO.

MODEL D-920B

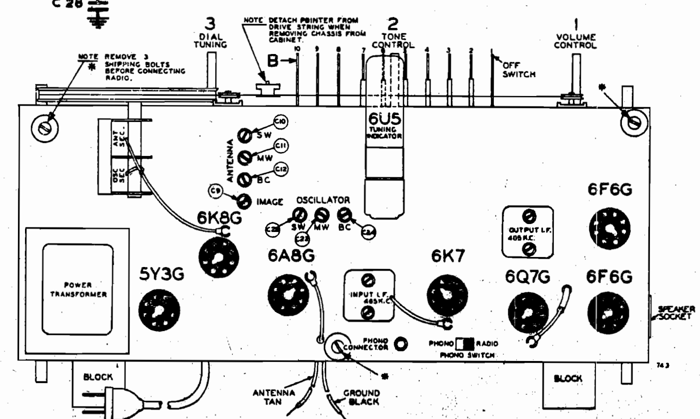
Cir. Dia. Ref. No.	Part No.	Description
		RESISTORS
R1	13041	800 ohm—1/3 w.
R2	13017	10M ohm—1/3 w.
R3	130103	100M ohm—1/3 w.
R4	130231	75 ohm—1/3 w.
R5	1309	200M ohm—1/3 w.
R6	130149	15M ohm—1/3 w.
R7	13012	50M ohm—1/3 w.
R8	13012	50M ohm—1/3 w.
R9	13012	50M ohm—1/3 w.
R10	13012	50M ohm—1/3 w.
R11	13065	30M ohm—1 watt
R12	130174	50 ohm—1/3 w.
R13	130103	100M ohm—1/3 w.
R14	130260	3500 ohm—1 watt
R15	130110	1 megohm—in tuning indicator socket
R16	1304	3 megohm—1/3 w.
R17	1303	500M ohm—1/3 w.
R18	101133	1 megohm volume control
R19	130197	20 ohm—1/3 w.
R20	130225	15 megohm—1/3 w.
R21	1309	200M ohm—1/3 w.
R22	1303	500M ohm—1/3 w.
R23	101134	300M ohm tone control
R24	130261	220 ohm— 2 watt
R25	1303	500M ohm—1/3 w.
R26	130193	3000 ohm—1/3 w.
R27	1303	500M ohm—1/3 w.
R28	130262	450 ohm—1 watt
R29	130215	25 ohm—1/3 w.
R30	130168	100 ohm—1/3 w.
		CONDENSERS
C	10283	2 gang variable
C1	10025	.002 x 600 v.
C2	129119	.000329 mica (0-Temp Coeff
C3	129123	.0008 mica (0-Temp Coeff
C4	12971	.002 mica
C5	12987	.000105 mica
C6	129126	.00007 mica
C7	10077	.00304 x 600 v.
C8	10093	.05 x 200 v.
C9	12459	Image rejection trimmer
C10	12459	S. W. Antenna trimmer
C11	12459	M. W. Antenna trimmer
C12	12459	B. C. Antenna trimmer
C13	129125	.00422 compression type mica
C14	129124	.00125 compression type mica
C15	129111	.000484 mica (0-Temperature Coefficient)
C16	12912	.00025 mica
C17	10025	.002 x 600 v.
C18	12444	Series Pad
C19	10025	.002 x 600 v.
C20	12939	.00005 mica
C21	10094	.05 x 600 v.
C22	12458	S. W. Oscillator trimmer
C23	12458	M. W. Oscillator trimmer
C24	12458	B. C. Oscillator trimmer
C25	10094	.05 x 600 v.
C26	10094	.05 x 600 v.
C27	10026	.02 x 400 v.
C28	10045	.1 x 600 v.
C29	12921	.0002 mica
C30	10071	.004 x 600 v.
C31	10316	30 mfd. lytic—350 v.
C32	10317	30 mfd. lytic—450 v.
C33	10020	.1 x 200 v.
C34	1292	.0005 mica
C35	10097	.02 x 600 v.
C36	10012	.003 x 600 v.
C37	10012	.003 x 600 v.
C38	10097	.02 x 600 v.
C39	10012	.003 x 600 v.

PARTS

T1	111109	Antenna Coils
T2	11094	Oscillator Coil
T3	110100	High Frequency P. B. Coil
T4	110100B	High Frequency P. B. Coil
T5	110101	Medium Frequency P. B. Coil
T6	110102	Low Frequency P. B. Coil
T7	110102B	Low Frequency P. B. Coil
T8	108105K	Input I. F.—465 kc.
T9	108106K	Output I. F.—465 kc.
T10	10577	Output Transformer
T11	114144	10" Dynamic Speaker (600 ohm Field)
T12	104151	Power Transformer
S1	12565	Push Button Switch
S2	12561	Radio—Phono Switch
P1	10794	2—6-8 v. pilot lights



IF PEAK 465 KC



1938, 1939

MODEL D920B
MODEL D921

WESTERN AUTO SUPPLY CO.

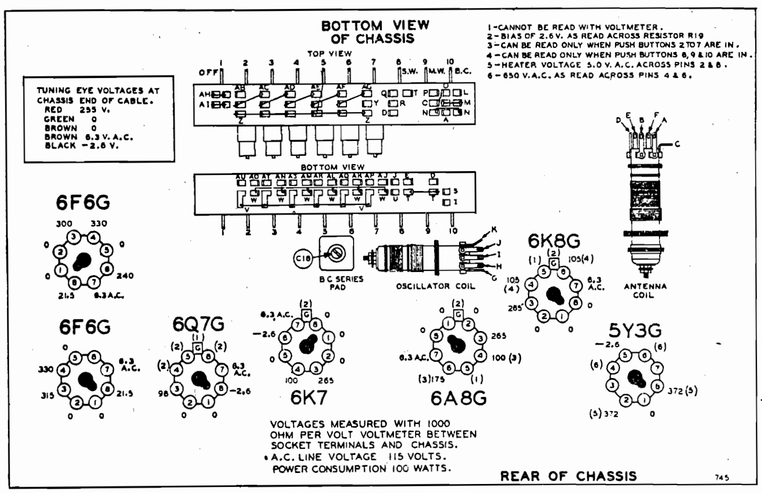
BAND	Signal Generator Frequency Setting	Signal Generator Dummy Antenna	Connection to Radio	Pushbutton Indicated Below Pushed "In"	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7 I.F Tube	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave	Set dial at 17 MC	Trimmer (C22) (See Fig. 1)	Short wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave	Set dial at 17 MC	Trimmer (C10) (See Fig. 1)	Short wave antenna	Adjust to maximum output
MEDIUM WAVE BAND	5 Mc.	400 ohms	Antenna lead	Med. Wave	Set dial at 5 MC	Trimmer (C23) (See Fig. 1)	Medium wave oscillator	Adjust to maximum output
	5 Mc.	400 ohms	Antenna lead	Med. Wave	Dial set at 5 MC	Trimmer (C11) (See Fig. 1)	Medium wave antenna	Adjust to maximum output
BAND BROAD-CAST	1600 Kc.	200 mmf.	Antenna lead	Broadcast	Rotor full open (Plates out of mesh)	Trimmer (C24) (See Fig. 1)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast	Set dial at 1400 Kc.	Trimmer (C12) (See Fig. 1)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast	Set dial at 600 Kc.	Trimmer (C18) (See Fig. 4)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
IMAGE REJECTION ADJUST-MENTS	1930 Kc.	200 mmf.	Antenna lead	Broadcast	Pick up signal at 1000 Kc. on dial	Trimmer (C9) (See Fig. 1)	Image rejection	Adjust for minimum output (See note "B")

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

NOTE "B". 1930 Kc. is the image frequency of 1000 Kc. Adjust Trimmer (C9) until a minimum output is obtained.

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

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

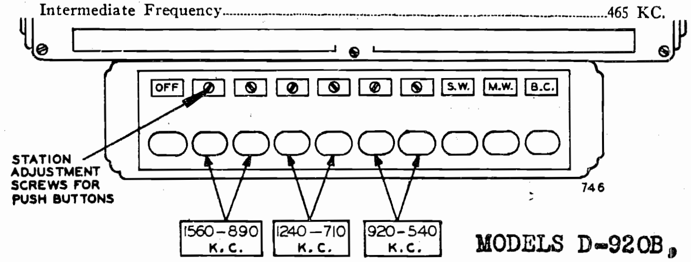


7 Tube Including Cathode-Ray Tuning Indicator

2-Band A. C. Superheterodyne Receiver

BAND	FREQUENCY RANGE
Broadcast	535 to 1600 Kc.
Medium Wave	1.58 to 5.5 MC.
Short Wave	5.0 to 18.3 MC.

Power Consumption .... 130 Watts (At 115 volts 50-60 cycles)
Power Output .... 8 Watts Undistorted. 12 Watts Maximum
Intermediate Frequency .... 465 KC.



MODELS D-920B, D-921

FIG. 3—Showing Station Adjustment Screws.

PROCEDURE FOR SETTING THE AUTOMATIC STATION PUSHBUTTONS:

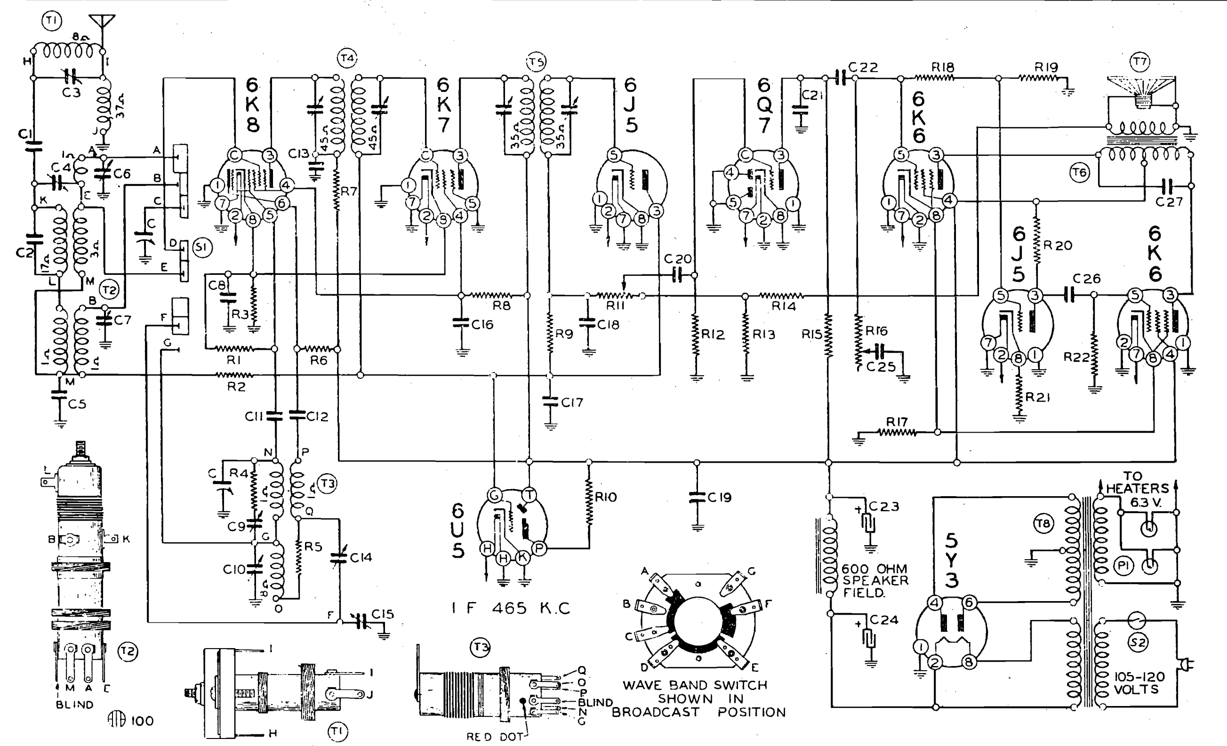
Only a single adjustment for each station is required in setting up your favorite stations for automatic pushbutton operation. These adjustments are located at the front of the chassis shown in Fig. 3 and are accessible through the station call letter tab holes. The only equipment needed is a small screw driver to make the adjustments.

After you have made up your list of stations, press button marked "Broadcast" and tune set manually until station selected having the highest frequency is tuned in and the program noted. Press button covering frequency range in which station is located (See Fig. 3). Adjust screw through station tab opening above button pressed until the same station is heard clearly and tuning indicator indicates that it is correctly tuned.

WESTERN AUTO SUPPLY CO.

MODEL D921

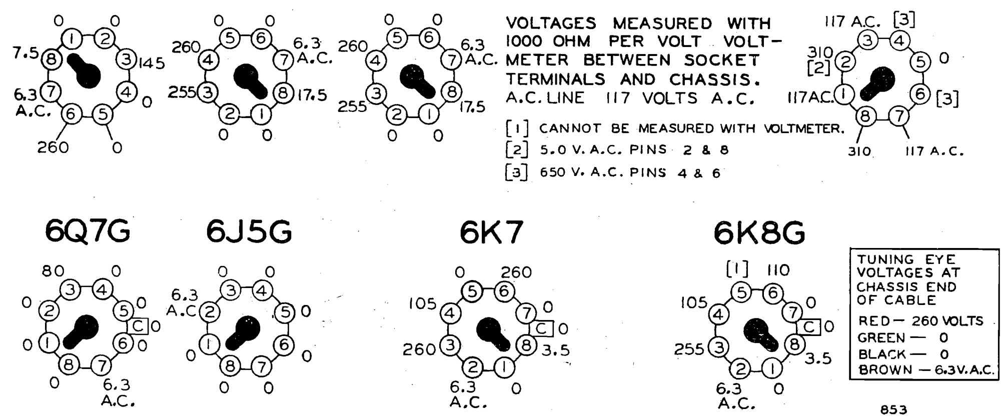
ISSUE A
March 1939
Serial No. 9C628200 up



FOR TUNER SEE INDEX

BOTTOM VIEW OF CHASSIS

I. F. FREQUENCY 465 KC.



VOLTAGES MEASURED WITH 1000 OHM PER VOLT VOLTMETER BETWEEN SOCKET TERMINALS AND CHASSIS. A.C. LINE 117 VOLTS A.C.

[1] CANNOT BE MEASURED WITH VOLTMETER.
[2] 5.0 V.A.C. PINS 2 & 8
[3] 650 V.A.C. PINS 4 & 6

TUNING EYE VOLTAGES AT CHASSIS END OF CABLE
RED — 260 VOLTS
GREEN — 0
BLACK — 0
BROWN — 6.3V.A.C.

853

REAR OF CHASSIS

MARCH, 1939

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13094	50M ohm—1/3 w.
R2	13011	250M ohm—1/3 w.
R3	13097	200 ohm—1/3 w.
R4	130174	50 ohm—1/3 w.
R5	130174	50 ohm—1/3 w.
R6	130281	35M ohm—1 watt
R7	130192	2M ohm—1/3 w.
R8	130196	30M ohm—1 watt
R9	1304	3 megohm—1/3 w.
R10	130110	1 megohm—1/10 in tuning ind. socket
R11	101159	1 megohm volume control
R12	130225	15 megohm—1/3 w.
R13	130215	25 ohm—1/3 w.
R14	130168	100 ohm—1/3 w.
R15	1309	200M ohm—1/3 w.
R16	101165	1 megohm tone control
R17	130220	300 ohm—1 watt
R18	130163	400M ohm—1/3 w.
R19	130103	100M ohm—1/3 w.
R20	13094	50M ohm—1/3 w.
R21	130218	5M ohm—1/3 w.
R22	1303	500M ohm—1/3 w.
		CONDENSERS
C	102101	2 gang variable condenser
C1	10011	.01 x 400 v.
C2	129132	.000125 mica
C3	12467	Wave Trap Trimmer
C4	12482	Image Trimmer
C5	129131	.002775 mica
C6	12475	B.C. Antenna Trimmer
C7	12475	S.W. Ant. Trimmer
C8	100104	.5 x 100 v.
C9	12476	S.W. Osc. Trimmer
C10	12476	B.C. Osc. Trimmer
C11	12939	.00005 Mica
C12	10025	.002 x 600 v.
C13	10013	.05 x 400 v.
C14	12444	.000422 B. C. Series Pad
C15	129138	.0015 S. W. Series Pad. Comp. Type
C16	1001	.1 x 400 v.
C17	10020	.1 x 200 v.
C18	1295	.0001 mica
C19	1001	.1 x 400 v.
C20	10019	.006 x 600 v.
C21	1292	.0005 Mica
C22	10026	.02 x 400 v.
C23	11969	16 mfd. 350 w.v. lytic
C24	11973B	16 mfd. 400 w.v. lytic
C25	1009	.05 x 200 v.
C26	10076	.02 x 400 v.
C27	10012	.003 x 600 v.
		PARTS
T1	108144	Wave Trap
T2	111119	B.C. & S.W. Antenna Coils
T3	110111	B.C. & S.W. Osc. Coils
T4	108122C	Input I.F. Coil
T5	108106P	Output I.F. Coil
T6	10554C	Output Transformer
T7	114159	10" Dynamic Speaker
T8	104160	Power Transformer
S1	12572	Wave Band Switch
S2		Off-On Switch on Tone Control
P1	10794	2 - 6-8 v. Pilot lights

MODEL D921

WESTERN AUTO SUPPLY CO.

BAND	DIAL SCALE	FREQUENCY RANGE
Broadcast	Upper	540 to 1750 KC. (Kilocycles)
Short Wave	Lower	5.5 to 18.3 MC. (Megacycles)

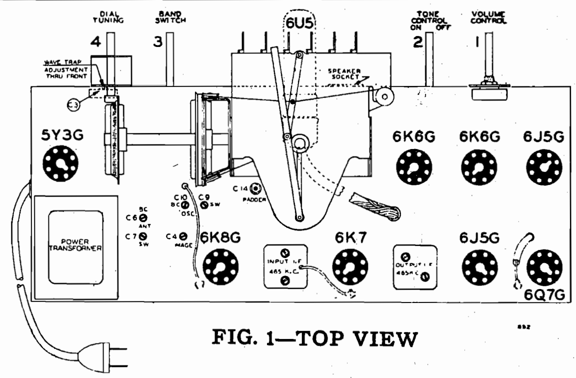


FIG. 1—TOP VIEW

TUBES:

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 6K8G Converter (Oscillator and First Detector).
1—Type 6K7 Remote Cut-Off Pentode, I. F. Amplifier.
1—Type 6J5G Second Detector and A. V. C.
1—Type 6Q7G First Audio Amplifier.
1—Type 6J5G Phase Inverter
2—Type 6K6G Pentode Push-Pull Output Amplifiers.
1—Type 5Y3G High Vacuum Rectifier.
1—Type 6U5 Cathode-Ray Tuning Indicator.

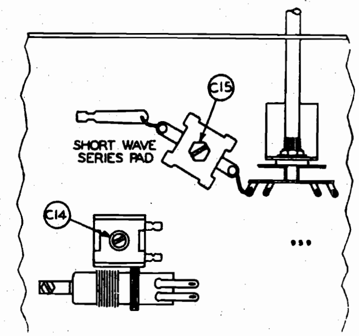


FIG. 4

ALIGNMENT PROCEDURE

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

The following equipment is required for aligning:

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

BAND	SIGNAL GENERATOR Frequency Setting	SIGNAL GENERATOR Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8G	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST BAND	1750 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C10) (See Fig. 1)	Broadcast oscillator	Adjust to maximum output
	1500 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 1500 Kc.	Trimmer (C6) (See Fig. 1)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C14) (See Fig. 1)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set Dial at 600 Kc.	Trimmer (C3) (See Fig. 1)	I. F. Wave Trap	Adjust for minimum output
IMAGE REJECTION ADJUST-MENTS	2430 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Pick up signal at 1500 Kc. on dial	Trimmer (C4) (See Fig. 1)	Image rejection	Adjust for minimum output (See note "B")
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 17 MC.	Trimmer (C9) Top of Chassis (See Fig. 1)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 MC.	Trimmer (C7) (See Fig. 1)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set Dial at 6 MC.	Trimmer (C15) (See Fig. 4)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")

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

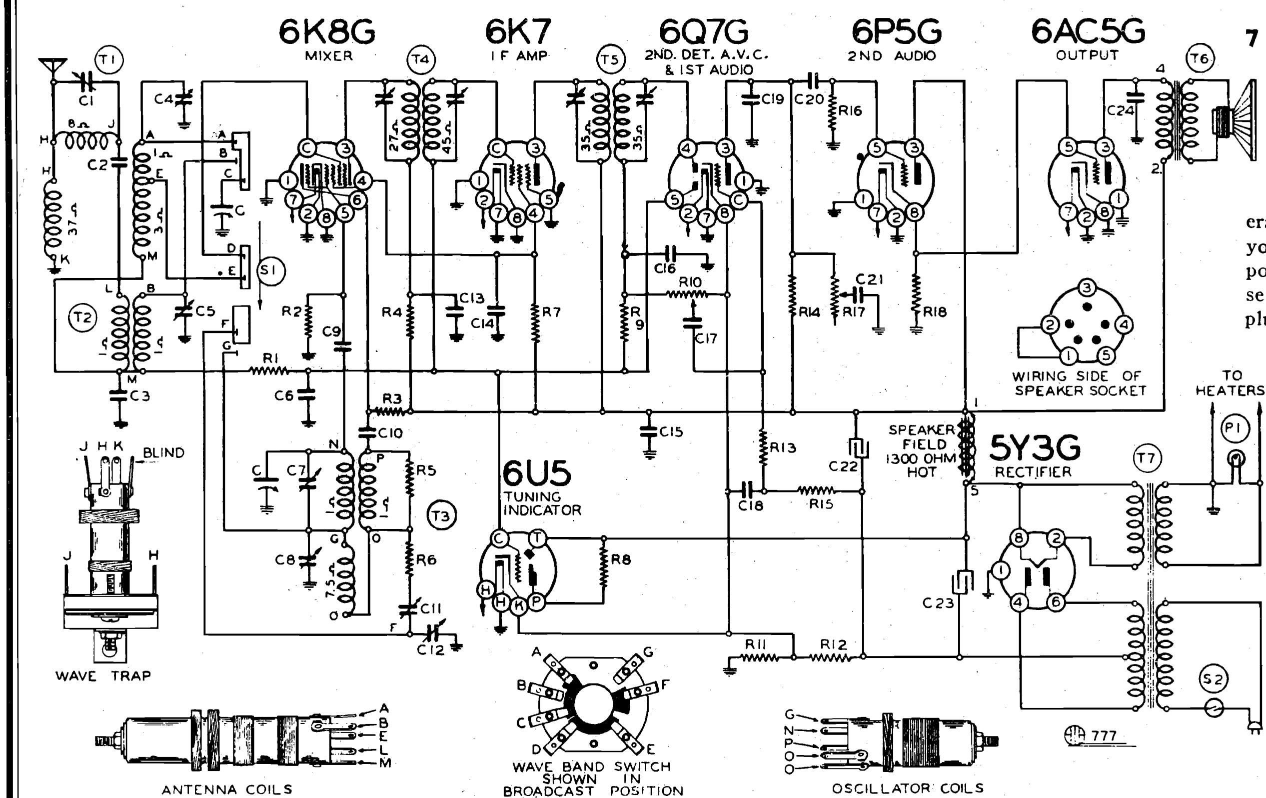
NOTE "B." 2430 Kc. is the image frequency of 1500 Kc. Adjust Trimmer (C4) until a minimum output is obtained.

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

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

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme right rotation	Short Wave	5.5 to 18.3 MC.
Extreme left rotation	Broadcast	540 to 1750 KC.

Power Consumption.........85 Watts (At 115 volts 50-60 cycles)
Power Output.........5 Watts Undistorted, 7 Watts Maximum
INTERMEDIATE FREQUENCY.........465 KC.



7 Tube Including Cathode-Ray Tuning Indicator

2-Band A. C. Superheterodyne Receiver

POWER SUPPLY:

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

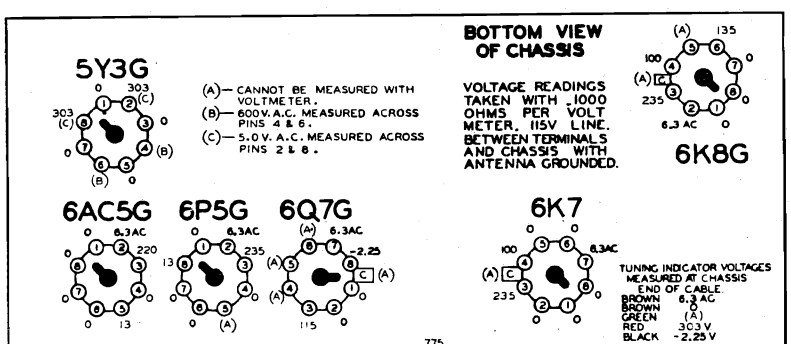
TUBES:

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 6K8G Triode Hexode, First Detector-oscillator.
1—Type 6K7 Remote Cut-Off Pentode, I. F. Amplifier (465 K. C.).
1—Type 6Q7G Duplex Diode Triode Second Detector, A. V. C. and First Audio.
1—Type 6P5G Driver Stage.
1—Type 6AC5G Positive Grid Triode Output Amplifier.
1—Type 5Y3G High Vacuum Rectifier.
1—Type 6U5 Cathode-Ray Tuning Eye.

I. F. FREQUENCY 465 KC.



REAR OF CHASSIS

FIG. 3

Circuit Diagram Ref. No.	Part No.	Description
		RESISTORS
R1	13011	250M ohm—⅓ w.
R2	13012	50M ohm—⅓ w.
R3	1301	25M ohm—⅓ w.
R4	13023	2000 ohm—⅓ w.
R5	130235	1500 ohm—⅓ w.
R6	130240	30 ohm—⅓ w.
R7	13076	30M ohm—⅓ w.
R8	130110	1 megohm—in tuning indicator socket
R9	1304	3 megohm—⅓ w.
R10	101137	1 megohm volume control
R11	130203	40 ohm—⅓ w.
R12	130203	40 ohm—⅓ w.
R13	13019	1 megohm—⅓ w.
R14	1309	200M ohm—⅓ w.
R15	1303	500M ohm—⅓ w.
R16	13019	1 megohm—⅓ w.
R17	101157	250M ohm tone control
R18	1301	25M ohm—⅓ w.
		CONDENSERS
C	10285	2 gang variable condenser
C1	12451	Wave Trap adjustable trimmer
C2	10011	.01 x 400 v.
C3	129129	.0025 mica
C4	12473	B.C. Antenna Trimmer
C5	12473	S.W. Antenna Trimmer
C6	1009	.05 x 200 v.
C7	12472	S.W. Oscillator Trimmer
C8	12472	B.C. Oscillator Trimmer
C9	12939	.00005 mica
C10	10025	.002 x 600 v.
C11	12466	B. C. Oscillator Series Pad
C12	12466	S.W. Oscillator Series Pad
C13	10026	.02 x 400 v.
C14	1001	.1 x 400 v.
C15	10013	.05 x 400 v.
C16	1295	.0001 mica
C17	10019	.006 x 600 v.
C18	10020	.1 x 200 v.
C19	1292	.0005 mica
C20	10011	.01 x 400 v.
C21	10019	.006 x 600 v.
C22	11980	12 mfd. lytic—450 w. v.
C23	11980	12 mfd. lytic—450 w. v.
C24	10019	.006 x 600 v.
		PARTS
T1	108124	Wave Trap
T2	111115	Antenna Coils
T3	110104	Oscillator Coils
T4	108122	Input I. F.—465 kc.
T5	108106J	Output I. F.—465 kc.
T6	114148	10 in. Dynamic Speaker (Field Resis. 1300 ohms)
T7	104139B	Power Transformer
S1	12569	Wave Band Switch
S2		Off-on switch on tone control
P1	10794	6-8 v. pilot light

1939

MODEL D929

ALIGNMENT PROCEDURE

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

The following equipment is required for aligning:

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

BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted (in Order Shown)	Trimmer Function	Adjustment
I. F.	465 Kc.	.1 MFD.	Grid of 6K7	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	465 Kc.	.1 MFD.	Grid of 6K8	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE BAND	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set dial at 17 MC.	Trimmer (C7) Top of Chassis (See Fig. 1)	Short Wave oscillator	Adjust to maximum output
	17 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Dial Set at 17 MC.	Trimmer (C5) (See Fig. 1)	Short Wave antenna	Adjust to maximum output
	6 Mc.	400 ohms	Antenna lead	Short Wave (Extreme right rotation)	Set dial at 6 MC.	Trimmer (C12) (See Fig. 1)	Short Wave oscillator series pad	Adjust to maximum rock dial. (See note "A")
BROAD-CAST BAND	1735 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Rotor full open (Plates out of mesh)	Trimmer (C8) (See Fig. 1)	Broadcast oscillator	Adjust to maximum output
	1400 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 1400 Kc.	Trimmer (C4) (See Fig. 1)	Broadcast antenna	Adjust to maximum output
	600 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 600 Kc.	Trimmer (C11) (See Fig. 1)	Broadcast oscillator series pad	Adjust to maximum rock dial. (See note "A")
	465 Kc.	200 mmf.	Antenna lead	Broadcast (Extreme left rotation)	Set dial at 600 Kc.	Trimmer (C1) (See Fig. 1)	I. F. Wave Trap	Adjust for **minimum** output

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

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

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

BAND SWITCH	BAND	FREQUENCY RANGE
Extreme right rotation	Short Wave	5.6 to 18.3 MC.
Extreme left rotation	Broadcast	540 to 1735 KC.

Power Consumption .... 70 Watts (At 115 volts 50-60 cycles)
Power Output .... 3 Watts Undistorted, 5 Watts Maximum
INTERMEDIATE FREQUENCY .... 465 KC.

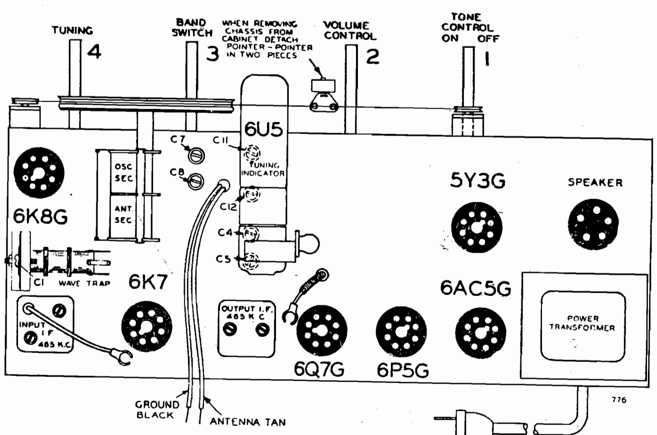


FIG. 1—TOP VIEW

SERVICE NOTES:

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

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

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

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

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

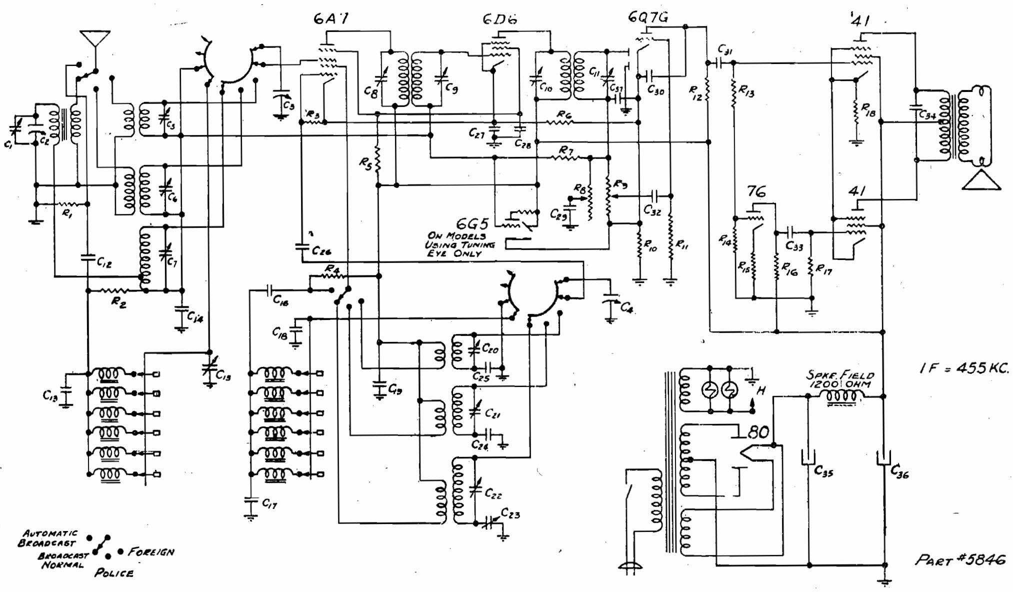
BAND	FREQUENCY RANGE
Broadcast	**540 to 1735 KC. (Kilocycles)**
Short Wave	**5.6 to 18.3 MC. (Megacycles)**

Receivers of this model which are to be used on voltages or frequencies other than 105-115 volts, 50-60 cycles are so marked. The power consumption of this receiver is 70 watts.

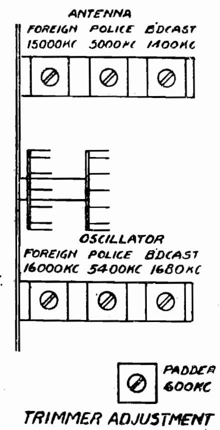
NOTE:—On the back of the string dial drum a calibrated scale is provided for aligning this chassis to the frequencies listed in the alignment procedure. Attach a pointer so that it will indicate proper dial setting in respect to the position of the variable condenser.

WESTERN AUTO SUPPLY CO.

MODELS D930, D711



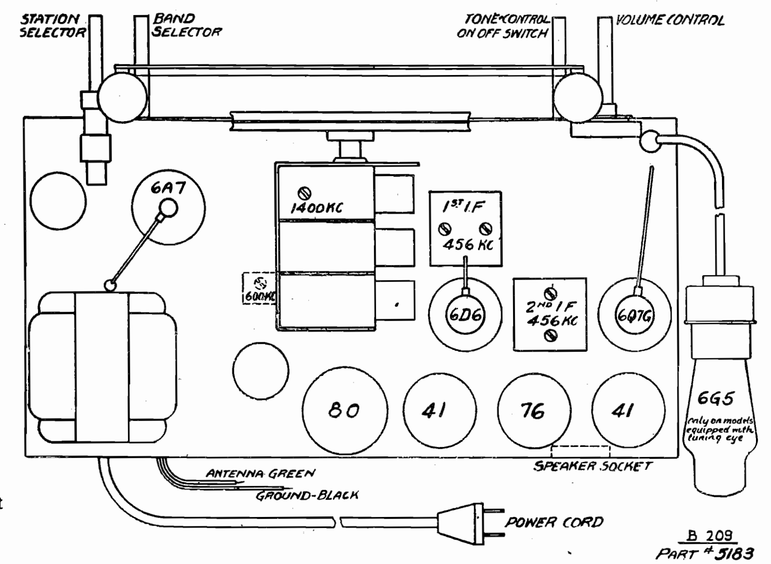
SETTING UP THE PUSH BUTTON STATION SELECTOR



Call station nearest 1600 KC end of dial the No. 1 station and number five other stations consecutively as they are tuned in on the dial, tuning from left to right. Set band selector at "B", or second position from left, and tune in station No. 1. Observe program. Turn band selector knob to extreme left position. Push No. 1 button in as far as it will go. Insert screwdriver thru opening directly above No. 1 button and turn screwdriver until same station is heard. If station is not heard reverse direction of rotation.

Tubes required are:

1—6A7 Oscillator-translator
1—6D6 Intermediate Frequency Amplifier
1—6Q7G Detector AVC—First Audio Amplifier
1—76 Driver—Phase Inverter
2—41 Power Output
1—80 Rectifier
1—6G5 Cathode Ray Tuning Tube (on models equipped with "eye" tuning indicator)

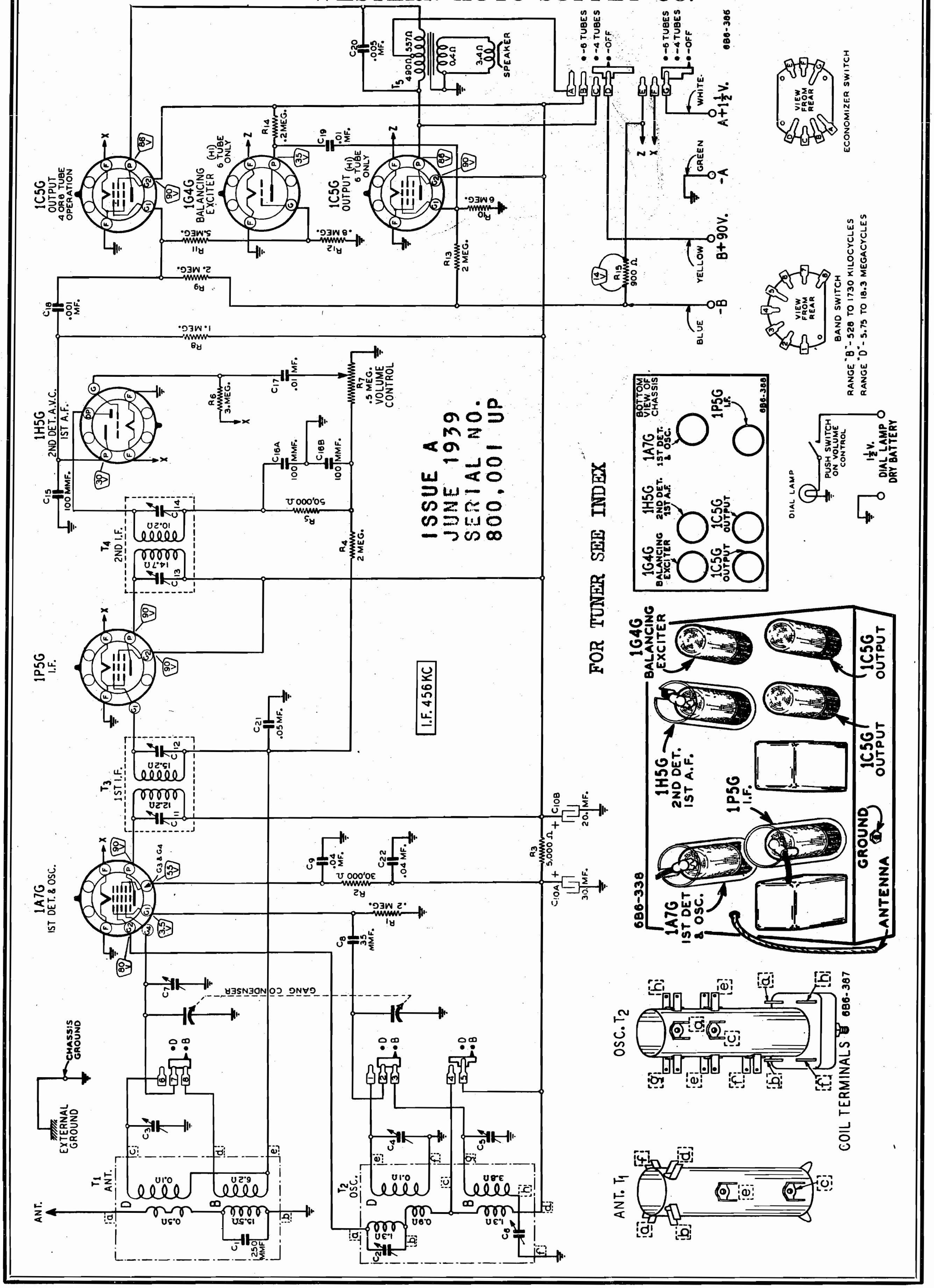


Symbol	Part No.	Description
C1		Trimmer on variable
C2, 3, 4	5092	3-gang 362 mmfd. variable
C5, 20, 22	1611	3-35 mmfd. trimmer
C6, 7, 21	2597	1-10 mmfd. trimmer
C8, 9, 10, 11		I.F. Trimmers
C12, 30, 37	4810	.0005 400 V.
C13	5193	.002 Special 5%
C14, 28	572	.1 200 V.
C15	3272	30-140 mmf. trimmer
C16, 31, 33	576	.02 400 V.
C17, 18		370 mmf. Special 3%
C19	563	.05 400 V.
C23	2560	350 mmfd. Var. Padder
C24	2741	1330 mmfd. Padder
C25	2793	.006 600 V.
C26	2780	50 mmfd. Mica
C27	2792	.2 200 V.
C29	2695	.003 600 V.
C32	568	.01 400 V.
C34	824	.002 600 V.
C35	3285	16 mfd. 350 W.V. Elect.
C36	5101	16 mfd. 225 W.V. Reg. Elect.
R1	617	20M 1/3 W.
R2, 7, 11	624	1 Meg. 1/3 W.
R3, 16	631	50M 1/3 W.

Symbol	Part No.	Description
R4	4529	10M 1/3 W.
R5	636	40M 1/3 W.
R6	2605	200 ohms 1/3 W.
R8	5099	2 meg. tone control
R9	5100	500M Volume Control
R10	2689	100 ohm 1/3 W.
	2647	50 ohm 1/3 W. on models using tuning eye
R12	2730	200M 1/3 W.
R13	2881	400M 1/3 W. 10%
R14	2880	100M 1/3 W. 10%
R15	2883	5M 1/3 W. 10%
R17	2731	500M 1/3 W.
R18	5184	310 ohm 5% Flexohm
	5091	Power Transformer
	3463-5	1st I.F. Transformer
	3463-6	2nd I.F. Transformer
	5096	Oscillator Coils
	5095	Antenna Coils
	2845	B.C. Antenna Coil
	2163	Drive Cable
	5185	Speaker 8"
	5832	Push Button Tuning Assembly Complete. (Replacement of individual component parts not recommended.)
	5810	Glass Indicator

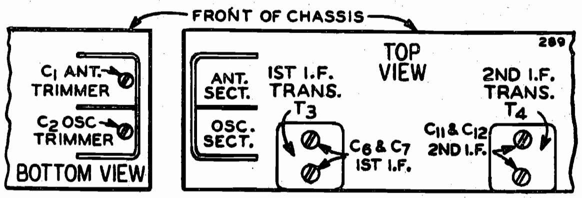
MODEL D934

WESTERN AUTO SUPPLY CO.



WESTERN AUTO SUPPLY CO.

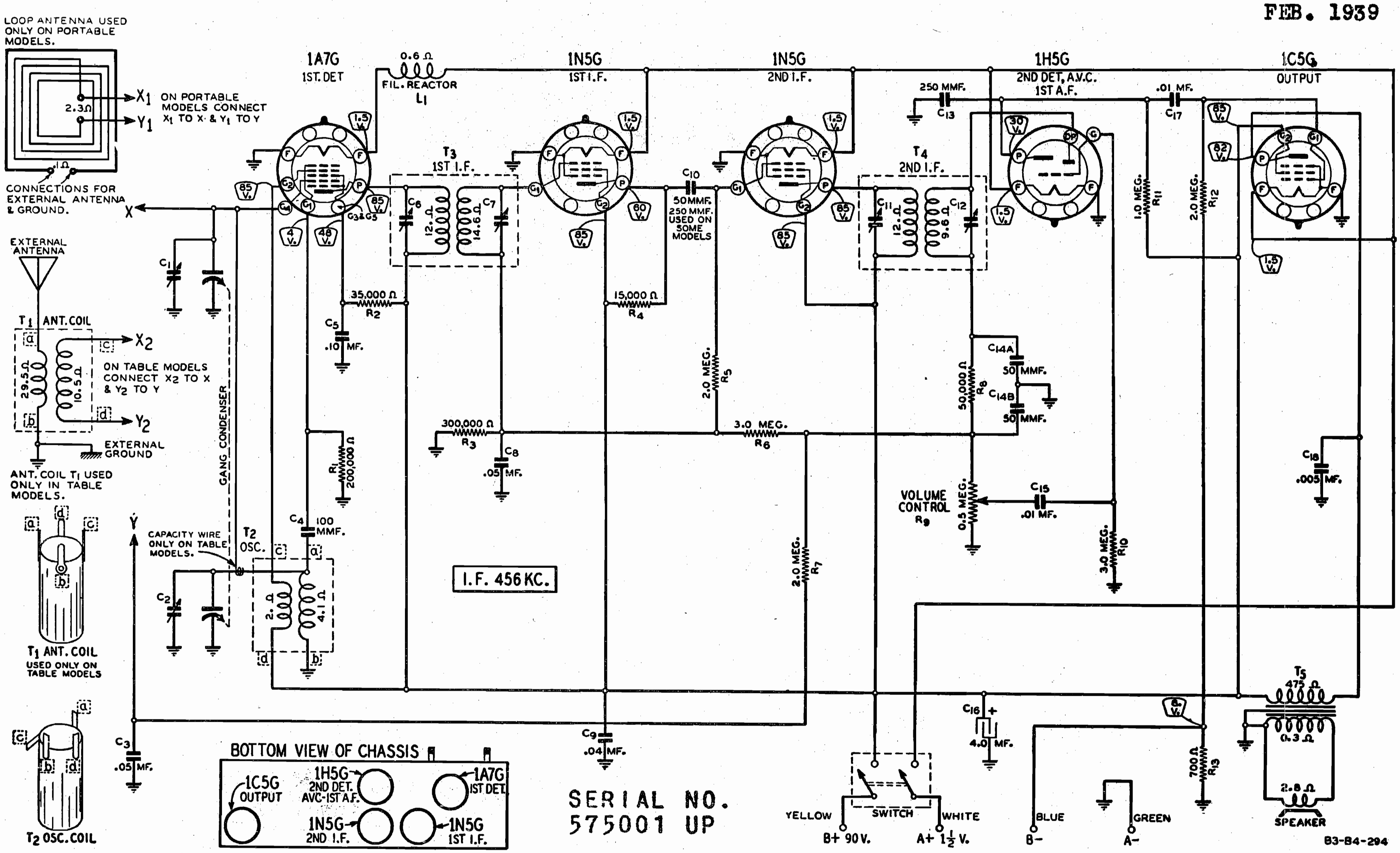
MODEL D937
Issue B



Caution

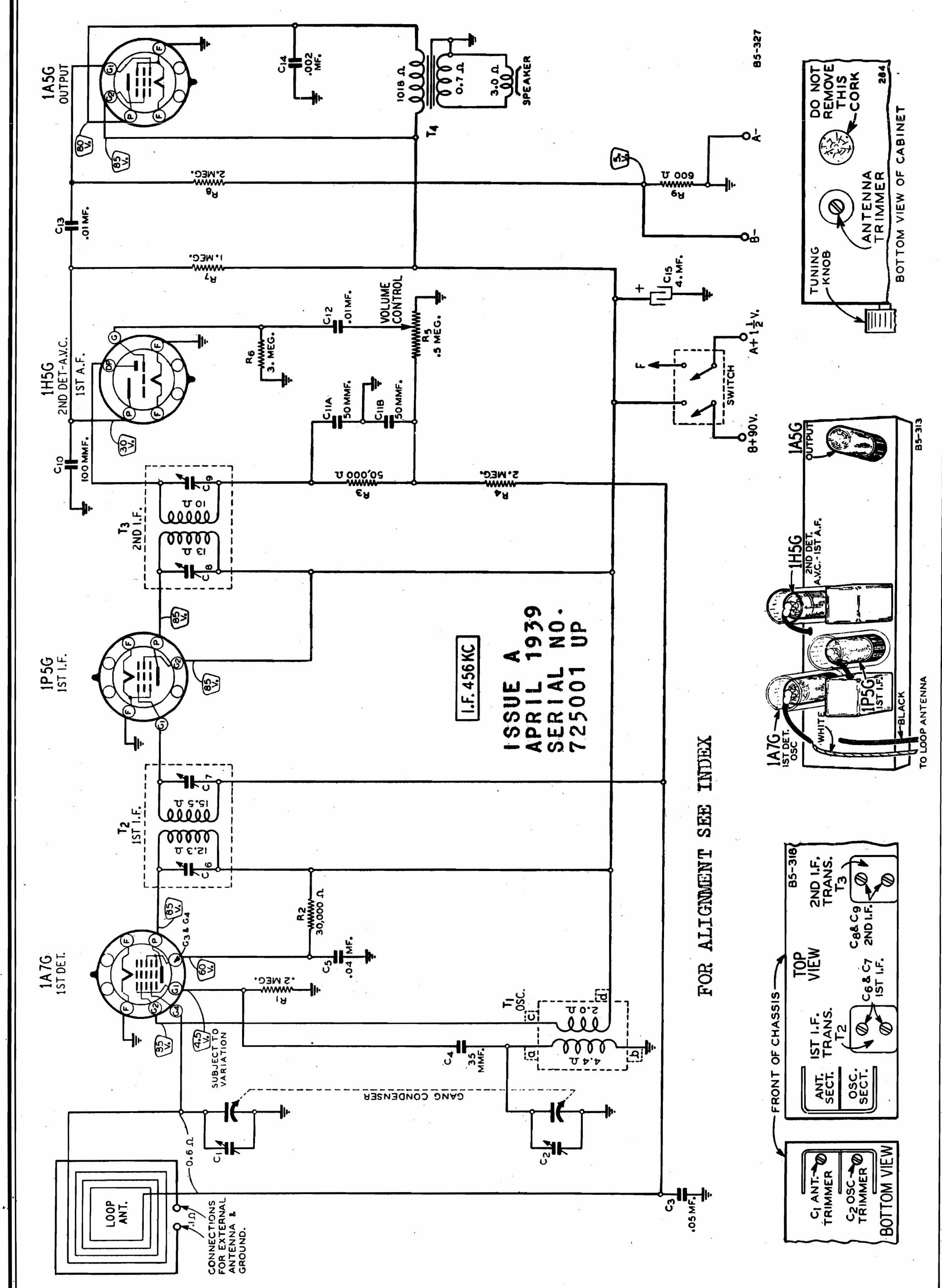
On models having an On-Off indicator disk behind the front of the cabinet, it is necessary to take the following precautions, when removing the chassis: Pull the chassis away from the front of the cabinet until the control shafts are clear of the cabinet. Then tilt the rear of the chassis upward. At the same time, keep the front of the chassis base clear of the bottom of the cabinet to prevent breaking the On-Off indicator disk on the volume control shaft. Now carefully pull the chassis out of the cabinet.

FEB. 1939



MODEL D938

WESTERN AUTO SUPPLY CO.



WESTERN AUTO SUPPLY CO.

MODEL D1042
Early and Issue A

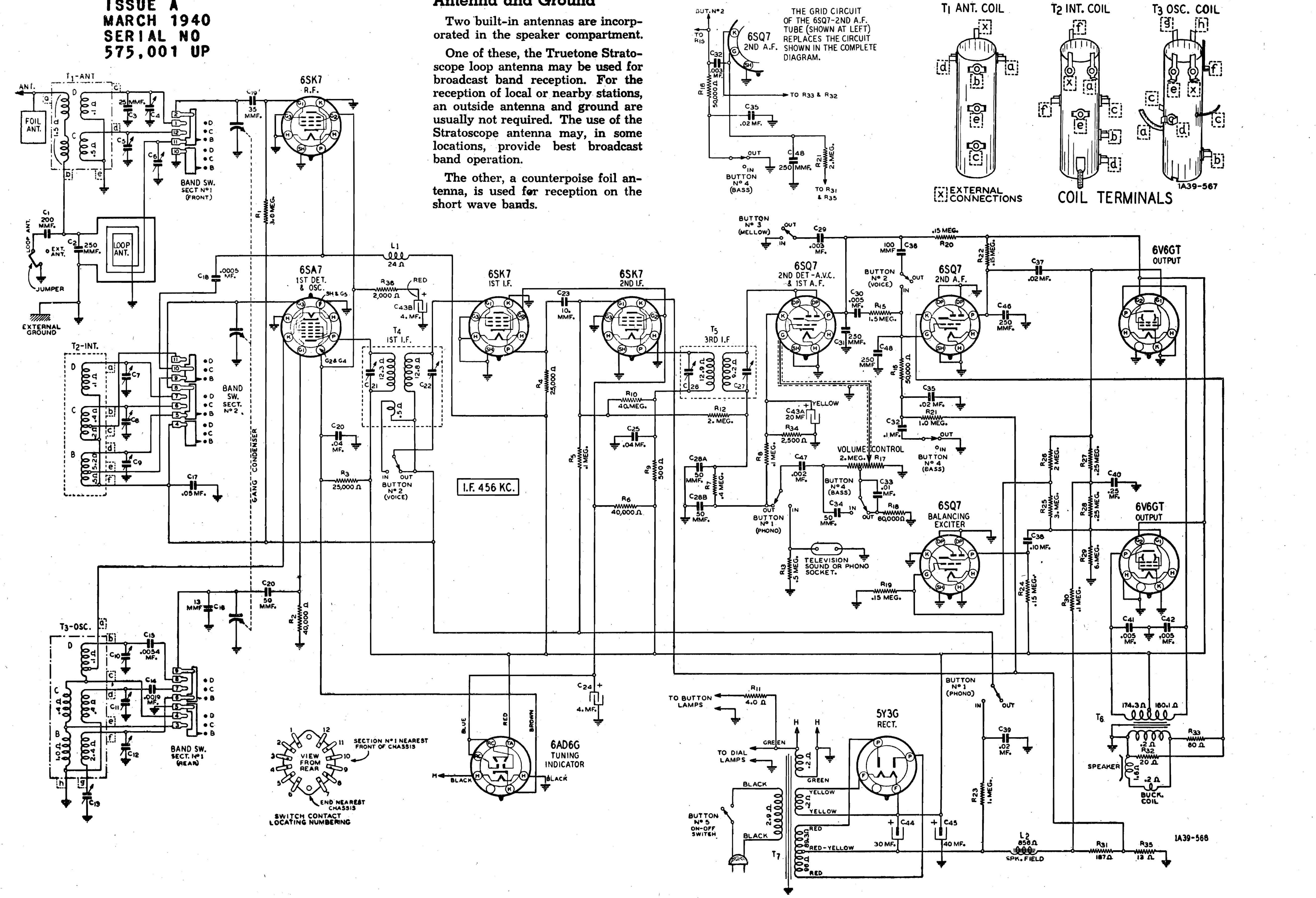
ISSUE A
MARCH 1940
SERIAL NO
575,001 UP

Antenna and Ground

Two built-in antennas are incorporated in the speaker compartment.

One of these, the Truetone Stratoscope loop antenna may be used for broadcast band reception. For the reception of local or nearby stations, an outside antenna and ground are usually not required. The use of the Stratoscope antenna may, in some locations, provide best broadcast band operation.

The other, a counterpoise foil antenna, is used for reception on the short wave bands.



WESTERN AUTO SUPPLY CO.

MODEL D1042
Early and Issue A

SPECIFICATIONS

Power Consumption - 103 Watts (At 117 volts 60 cycles)

Power Output - - - - - - 8 Watts Undistorted, 9 Watts Maximum

Selectivity - 29.5 KC Broad at 1000 times Signal (Sharp)

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - 12" Electro-Dynamic

Tuning Frequency Range

B Range	528	to	1730 KC
C Range	2200	to	7000 KC
D Range	7000	to	22000 KC

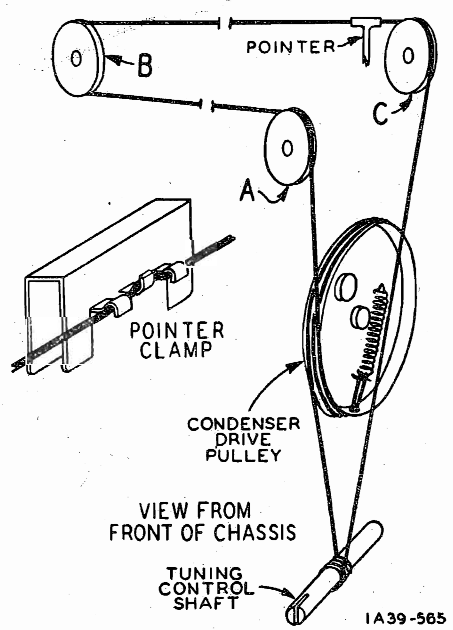
Sensitivity —External Antenna—(For 0.5 Watt output)

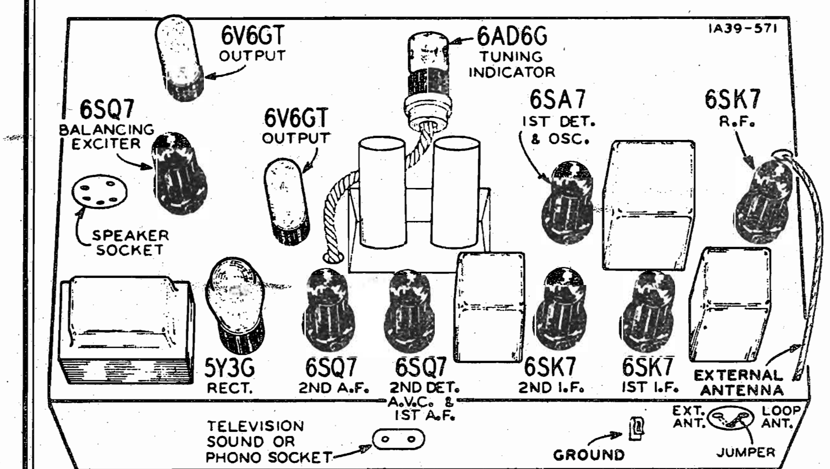
B Range	1.0 Microvolt	Average
C Range	1.0 Microvolt	Average
D Range	3.0 Microvolts	Average

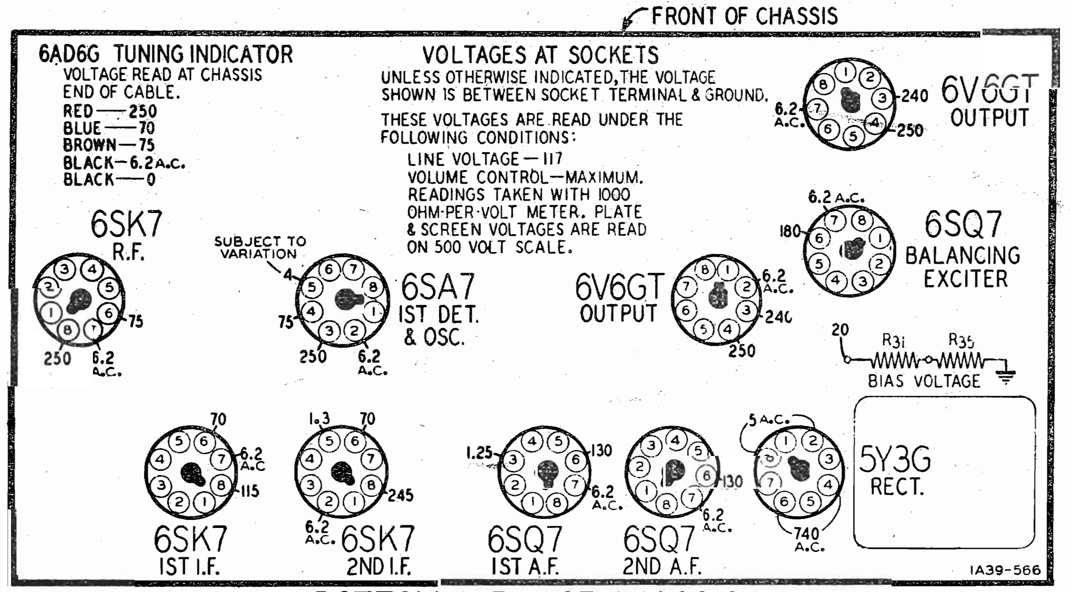
ISSUE A
MARCH 1940
SERIAL NO
575,001 UP

6 STATION BUTTONS
11 TUBES
3 BANDS

TRUETONE
CHROMATIC
CONTROL







BOTTOM VIEW OF CHASSIS

MODEL D1042
Early and Issue A

WESTERN AUTO SUPPLY CO.

Procedure for Setting the Station Buttons

Selecting the Stations to be Set

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the highest kilocycle number first, the station with the next lower kilocycle number next, and so on.

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

Pull the chromatic control button No. 2 out to the sharp tuning position—

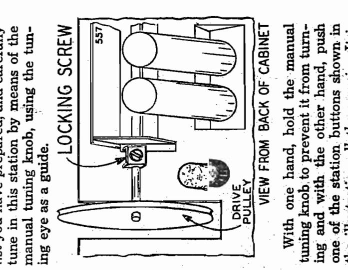
Now unlock the push button tuning mechanism from the back of the radio. On the drive pulley shaft and at the left side (from back of radio) of the push button tuning assembly is a locking screw—See illustration.

Turn the manual tuning knob until the locking screw can be easily reached with a screwdriver.

Using a small handled screwdriver, unlock the mechanism by turning this screw several turns in a counter-clockwise direction.

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 means of the manual tuning knob, using the tuning eye as a guide.



VIEW FROM BACK OF CABINET

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 left hand button.

Hold *this* button all the way in.

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 in.*

Slowly release the button after the station is tuned in.

CAUTION—Do not touch this button again while the mechanism is unlocked as the setting may be altered.

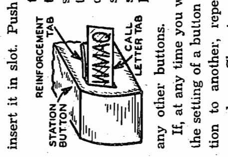
Carefully tune in the second station on your list. Then hold the tuning knob and push the second button slowly and firmly all the way in. Check for accurate tuning.

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 until the locking screw can be easily reached with a screwdriver. Then, with the 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.

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.

Removing Button Escutcheon and Lower Row of Buttons

Pull off volume control knob. Take out the 5 screws on the push button escutcheon and raise this escutcheon as far as possible.

Each button of the lower row of buttons is held on its plunger shaft with a spring which fits into a slot on the shaft.

Insert a screwdriver under the bottom of the escutcheon and push the spring off the bottom of the button. Then slip the screwdriver between the spring and the button and rotate the spring until it slips out of the button slot. Then pull the button off. After the 5 buttons of the lower row are removed, the escutcheon plate may be taken off the cabinet.

To replace the lower row of push buttons on the plunger shafts, first put the push button escutcheon back in place. Then replace the spring in the slot on each button and push each button back on the shaft (with the flat portion of the spring at the top of the plunger) until the spring drops in the slot on the shaft.

Drive Cord Replacement

Use a drive cord approximately 74 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 1/4 turn in a clockwise direction (from right side of chassis) around condenser drive pulley. Wind cord over pulleys A, B, and C as shown in illustration. Wind 4 1/2 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 1 1/4 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.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Button No. 2 (Voice)—pulled out 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. and 400 ohms.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
All adjustments with the exception of the Loop Range B adjustment are made with the loop disconnected and the chassis out of the cabinet.				Wire jumper in Antenna Selector Socket on BACK of chassis may be in either position for all adjustments with the exception of the Loop Range B adjustment—See Note D.	
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C21) & (C22) 3rd I.F. (C26) & (C27)
RANGE B					
1730 KC	R. F. Grid	.1 mf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1500 KC	R. F. Grid	.1 mf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Int. Range B (C9)
600 KC	R. F. Grid	.1 mf.	B Range	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note B
RANGE C—See Note C					
7000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Full Open	Oscillator Range C (C11)
6000 KC	Antenna Lead	400 Ohm	C Range	Turn Rotor to Max. Output	Antenna Range C (C5) Int. Range C (C8)
RANGE D—See Note C					
22,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
21,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Antenna Range D (C4) Int. Range D (C7) Rock Rotor—See Note B
LOOP RANGE B					
1500 KC See Note D	None—See Note D		B Range	Turn Rotor to Max. Output	See Note E Loop Trimmer (C6)

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

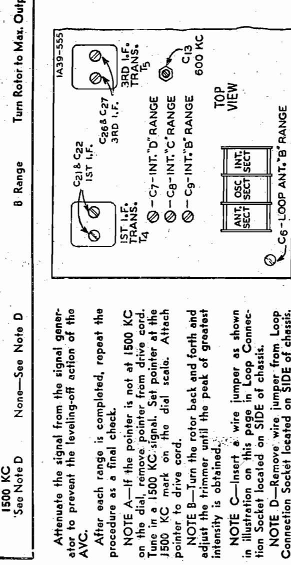
After each range is completed, repeat the procedure as a final check.

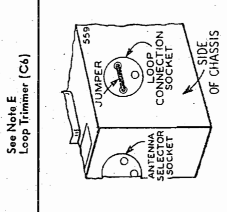
NOTE A—If the pointer is not at 1500 KC on the dial, remove pointer from drive cord. Tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale. Attach pointer to drive cord.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

NOTE C—Insert a wire jumper as shown in illustration on this page in Loop Connection Socket located on SIDE of chassis.

NOTE D—Remove wire jumper from Loop Connection Socket located on SIDE of chassis. Wire jumper in Antenna Selector Socket on BACK of chassis should be inserted in LOOP position—see illustration on page 1. Re-install set in cabinet and reconnect loop. 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 Stratoscope loop in cabinet.





NOTE E—Turn knob of Stratoscope 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.

Television Sound or Phonograph Connections

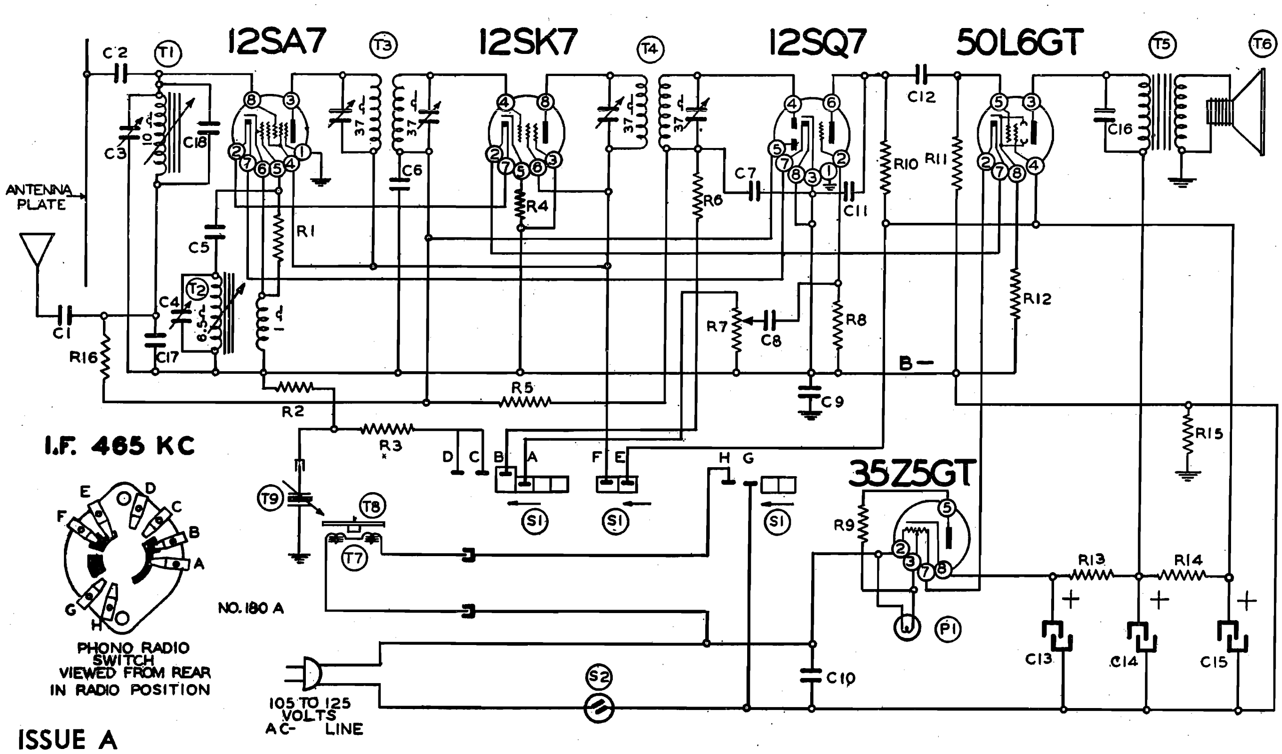
Should Television programs become available in your community, the excellent audio amplifier and speaker system of this radio may be used to reproduce Television sound in conjunction with any "Television Picture Receiver and Sound Converter."

On the back panel of the chassis base is a 2 hole socket at which connections are made. The leads from a television receiver or from a phono pickup can be inserted in the socket.

When phonograph or television sound reproduction is desired, button No. 1—See illustration on page 2 — should be pushed in to the "Television Sound or Phono" position. For radio reception, the button should be pulled out to the "Radio" position.

WESTERN AUTO SUPPLY CO.

MODEL D1C70



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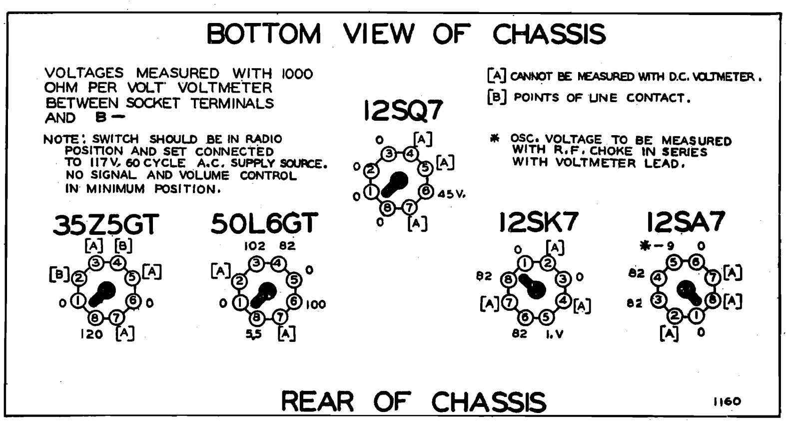
April 1940 Serial No. OC371605B



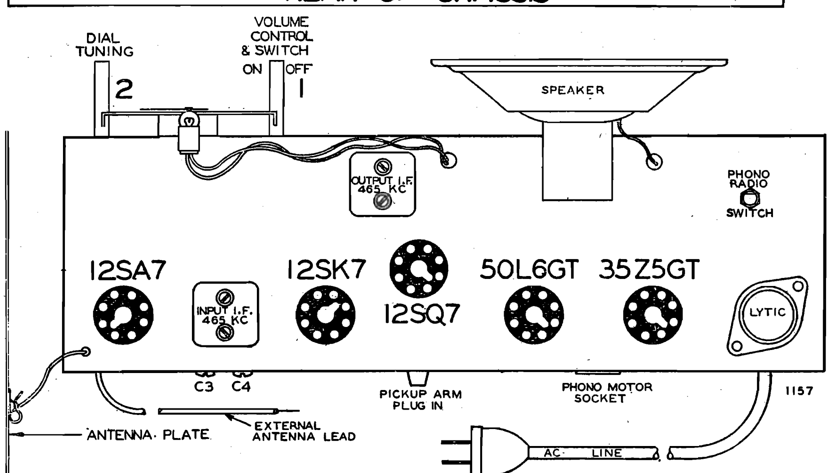


FIG. 1—TOP VIEW

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

MODEL D1070

WESTERN AUTO SUPPLY CO.

ALIGNMENT PROCEDURE

IMPORTANT: See Aligning Instructions on Page 4

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

The following equipment is required for aligning:

- An all wave signal generator which will provide an accurately calibrated signal at the test frequencies as listed.
- Output indicating meter.
- Non-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. 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 "A" (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	1690 Kc.	.1 MFD.	Connect to Terminal "A" (See Fig. 4)	Iron Cores All the way out	Trimmer (C4) (See Fig. 4)	Oscillator	Adjust to maximum output
	1690 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 4)	Iron Cores All the way out	Trimmer (C3) (See Fig. 4)	Antenna	Adjust to maximum output
	1400 Kc.	200 MMF.	Connect to Terminal "B" (See Fig. 4)	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. 4)	Turn Dial to 1690 Kc.	Adjust trimmer (C3) (See Fig. 4)	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.

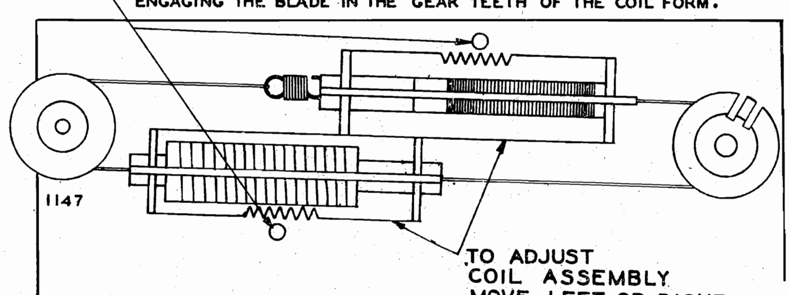


FIG. 3.—TUNING ASSEMBLY

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

FREQUENCY RANGE
535 to 1690 K.C.

Power Consumption..........Radio Only 30 Watts
Power Output..........900 Milliwatts Undistorted, 1.7 Watts Maximum
Intermediate Frequency..........465 K.C.

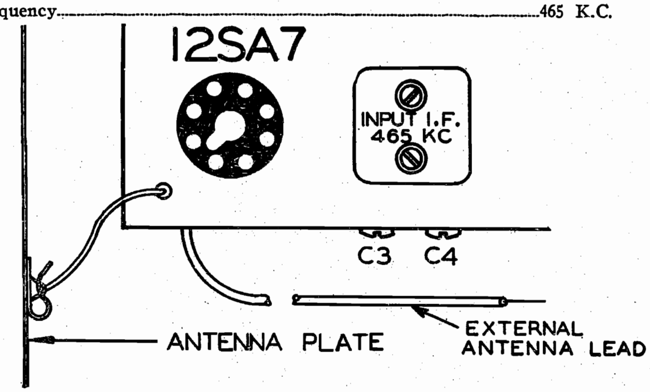


FIG. 4.—TRIMMERS

TUBES:

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 12SA7 Mixer, First Detector-oscillator.
1—Type 12SK7 I. F. Amplifier.
1—Type 12SQ7 Second Detector, A.V.C. and First Audio.
1—Type 50L6GT Beam Output Amplifier.
1—Type 35Z5GT Rectifier.

WESTERN AUTO SUPPLY CO.

MODELS D-937, D-938
MODEL D-934

SPECIFICATIONS – MOD. D-934

Input Voltages and Currents
"A" Battery (LO Operation)............1.5 volts—250 Ma.
"B" Battery (LO Operation)............ 90 volts—10.5 to 12 Ma.
"A" Battery (HI Operation)..............1.5 volts—400 Ma.
"B" Battery (HI Operation)............. 90 volts—13.5 to 17.5 Ma.
Dial Lamp Battery
(HI & LO Operation)..........................1.5 volts—1 Amp.

Power Output
(LO Operation).................................... 70 Milliwatts Undistorted
(LO Operation)....................................200 Milliwatts Maximum
(HI Operation).....................................250 Milliwatts Undistorted
(HI Operation).....................................270 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 1730 KC
D Range..5750 to 18300 KC
Sensitivity (For .05 Watt Output)
B Range...25 Microvolts Average
D Range...80 Microvolts Average

From an inspection of the circuit diagram it will be noted the LO operation is that of a 4 tube radio—one output tube and the phase inverter having their filaments open circuited. The HI position permits normal operation with all 6 tubes operating, and with push-pull output.

Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

ALIGNMENT PROCEDURE

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	2nd I.F. (C13) & (C14) 1st I.F. (C11) & (C12)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C5)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC—See Note A	Ant. Range B (C7)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C6) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C3) Rock Rotor—See Note B
6000 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	6000 KC (C2) Rock Rotor—See Note B

Volume Control—Maximum All Adjustments.
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

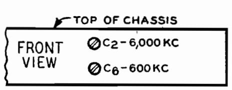
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

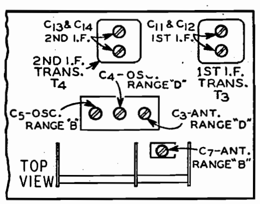
NOTE A—If the pointer is not at 1500 KC on the dial, slip the drive cord out from under one of the end clamps on the pointer head. Move pointer to 1500 KC on the dial and replace drive cord under end clamp.

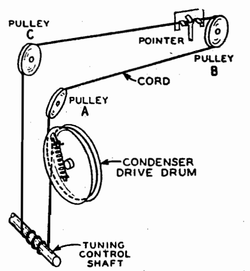
NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave bands, be sure NOT to adjust at the image



frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 KC on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.





Drive Cord Replacement

Tie one end of the new drive cord to the tension spring.

Turn the gang condenser to the full open position. Secure the free end of the spring over the hook on the condenser drive drum—See illustration. Pass the cord through the hole in the drum rim and over pulleys A, B, and C as shown. Wind 3½ turns in a clockwise direction (from front of chassis) around the tuning control shaft, progressing toward the chassis. Pull drive cord taut. Then wind one complete turn in a clockwise direction (from right side of chassis) around condenser drive drum. This turn must be wound on the left side (from front of chassis) of the drive drum groove. Pass cord through hole in drum rim and tie to tension spring as shown.

Dial Pointer Attachment—Tune in a station of known frequency. Set the pointer at this frequency on the dial scale and secure pointer to cord—See illustration.

Procedure for Setting the Station Buttons – MOD. D-934

Setting a Station Button

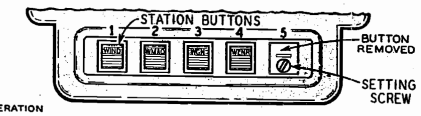
Pull the button at the left (No. 1) off the shaft. When this is done, the locking screw under the shaft will be exposed.

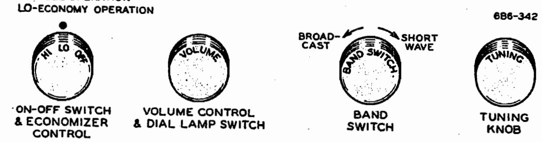
Loosen this screw with a small screwdriver by turning several turns in a counter-clockwise direction. Continue to press in firmly on the screwdriver, thus holding the station button shaft depressed. Select the first station from the list you have prepared and carefully tune in this station by means of the manual tuning knob.

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 as outlined above. 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 the others.

Continue to press in firmly on the screwdriver and lock the mechanism by turning the locking screw in a clockwise direction until it is tight. The station is now set on this button.

Proceed in the same manner to set stations on any of the remaining buttons.





SPECIFICATIONS MOD. D-937

Input Voltages and Currents
"A" Battery....................................1.5 Volts—.30 Amperes
"B" Battery....................................90 Volts—12 to 15 Ma
Power Output - - - 140 Milliwatts Undistorted
Selectivity - - 41 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC.
Speaker - - - - - - - - - 6" P.M. Dynamic
Tuning Frequency Range - - - 540 to 1600 KC.
Sensitivity (For .05 Watt Output)
Portable Model............20 Microvolts Per Meter Average

ALIGNMENT PROCEDURE – MOD. D-937 & D-938

Volume Control—Maximum All Adjustments. Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	1st I.F. (C6) & (C7) 2nd I.F. (C11) & (C12)
1600 KC	Grid of 1st Det.	.1 mf.	Turn rotor to full open	Oscillator (C2)
1500 KC	None—See Note		Turn rotor to max. output	Antenna (C1)

TRIMMERS C8+C9 FOR MODEL 938

The following equipment 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 Antenna—.1 mf.

NOTE—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Secure the back in place on the cabinet. Connections for the output meter may be made through the opening for the outside antenna and ground connecting posts. This opening is at the bottom of the cabinet near the back. Place radio approximately 3 feet from loop so as to pick up signal. Radio should not be in proximity to any metal (metal bench, etc.).

CALIBRATION (For model with pointer in back of celluloid dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. IF THE POINTER IS AT A HIGHER KC MARK THAN 800 KC, grasp the drive cord below the tension spring. Hold the tuning control shaft motionless and slowly pull the drive cord down until the pointer is at the 800 KC mark. IF THE POINTER IS AT A LOWER KC MARK THAN 800 KC, grasp the drive cord above the tension spring. Hold the tuning control shaft motionless and slowly pull the drive cord up until the pointer is at the 800 KC mark.

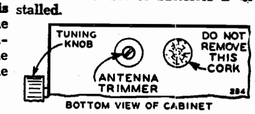
CALIBRATION (For models with pointer in front of dial scale)—To obtain dial scale calibration, tune in an 800 KC signal. The pointer should be at the 800 KC mark on the dial. If it is not, loosen the pointer screw, set the pointer at the 800 KC mark and retighten the pointer screw.

Adjusting Antenna Trimmer

After the batteries are installed and the back of the cabinet is in place, adjust the antenna trimmer.

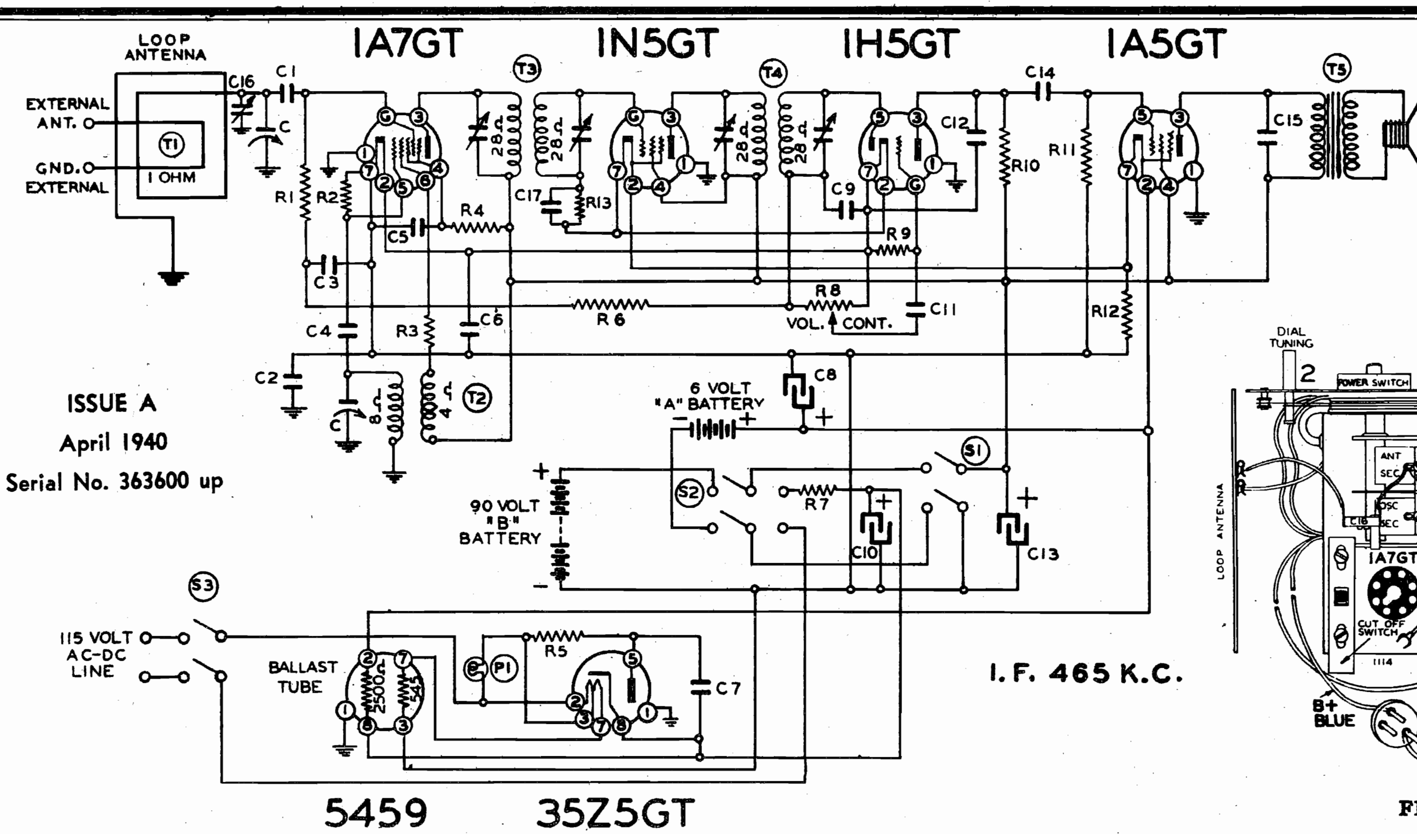
Accurately tune in a weak station signal between 1400 and 1500 KC on the dial. With a screwdriver turn the adjusting screw of the antenna trimmer up or down until maximum output is obtained. This trimmer is reached through an opening in the bottom of the cabinet—see illustration. CAUTION: Do not remove the cork from the other opening at the bottom of the cabinet.

Readjust the antenna trimmer when a new set of batteries is installed.



MODEL D1080

WESTERN AUTO SUPPLY CO.



ALIGNMENT FREQUENCIES:
IF - 465 KC
B-C Osc. - 1550 KC
B-C Ant (C-16) - 1400 KC

ISSUE A
April 1940
Serial No. 363600 up

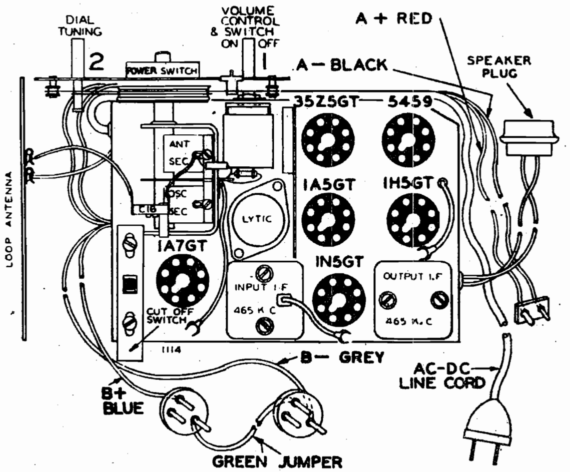
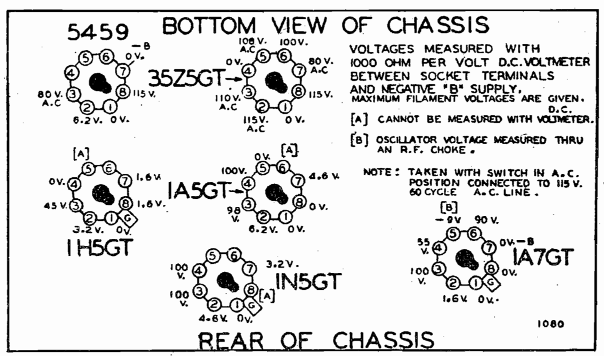


FIG. 2—TOP VIEW



RESISTORS

Circuit Diagram Ref. No.	Part No.	
R1	13038	2 megohm—⅓ w.
R2	130266	200M ohm—⅓ w.
R3	13018	4M ohm—⅓ w.
R4	130208	40M ohm—⅓ w.
R5	130215	25 ohm—½ w.
R6	130170	3 megohm—⅓ w.
R7	130129	2500 ohm—⅓ w.
R8	101210	1 megohm volume control
R9	130257	5 megohm—⅓ w.
R10	1303	500M ohm—⅓ w.
R11	13038	2 megohm—⅓ w.
R12	13092	1M ohm—⅓ w.
R13	130100	150M Ohm—⅓ w.

CONDENSERS

Circuit Diagram Ref. No.	Part No.	
C	102125	2 gang variable condenser
C1	12912	.00025
C2	100110	.2 mfd. x 400 v.
C3	1009	.05 x 200 v.
C4	12912	.00025
C5	1009	.05 x 200 v.
C6	10020	.1 x 200 v.
C7	10011	.01 x 400 v.
C8	119104	Lytic 200 mfd. x 6 w. v.
C9	1295	.0001 mfd.
C10	119104	Lytic 40 mfd. x 150 w. v.
C11	10025	.002 x 600 v.
C12	1292	.0005 mfd.
C13	119104	Lytic 20 mfd. x 150 w. v.
C14	10011	.01 x 400 v.
C15	10025	.002 x 600 v.
C16	124116	Adjustable antenna trimmer
C17	10026	.02 x 400 v.

C8, C10 and C13 in same unit

PARTS

Circuit Diagram Ref. No.	Part No.	
T1	111171	Loop Antenna
T2	110144	Oscillator Coil
T3	108171B	Input I. F. Coil—465 kc.
T4	108172	Output I. F. Coil—465 kc.
T5	114189	Speaker with output transformer
S1	101210	Switch on volume control
S2	125106	Power Switch
S3	125107	Cut-off switch in line cord
P1	107249	Pilot light T47

TUBES—

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

The type and function of each tube is as follows:

1A7GT Mixer, First Detector-oscillator.

1N5GT Remote Cut-Off Pentode, 1st I. F. Amplifier (465 K. C.).

1H5GT Second Detector, A.V.C. 1st Audio.

1A5GT Output Amplifier.

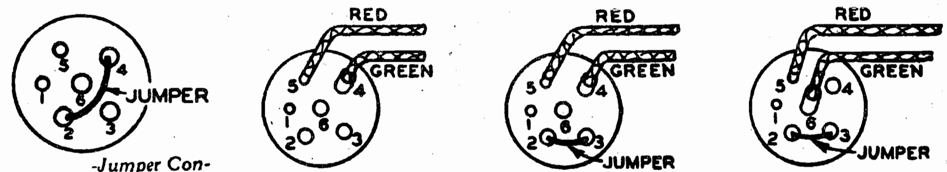
35Z5GT Rectifier.

5459 Ballast Resistor.

MODEL D-745

WESTERN AUTO SUPPLY CO.

Roof Speaker and Dual Speaker Connections



-Jumper Connection for Chassis Speaker only

Single 5¼ Inch Roof Speaker

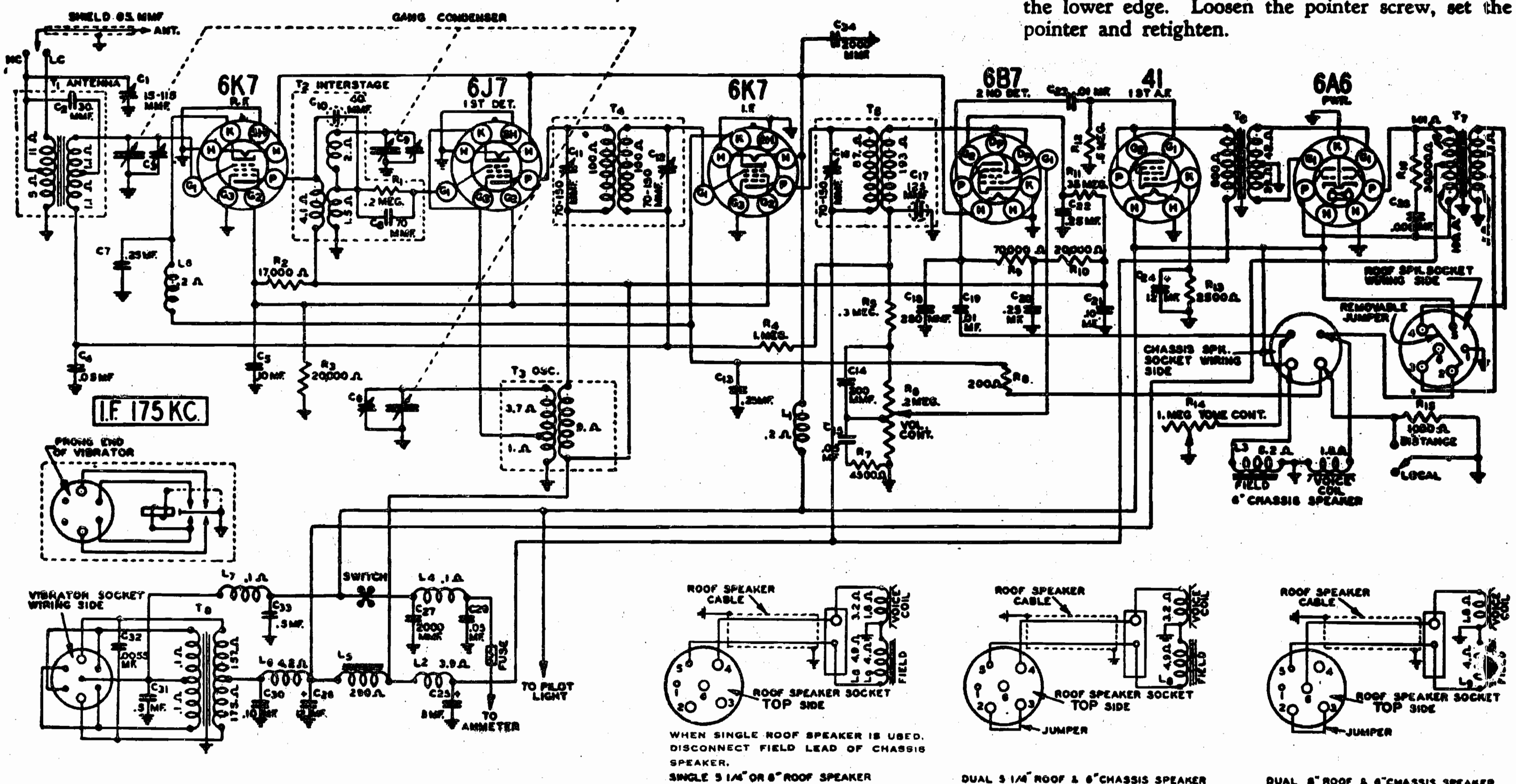
Dual 5¼ In. Roof & 6 In. Chassis Speakers

Dual 8 Inch Roof and 6 Inch Chassis Speakers.

Calibrating the Radio

To calibrate the radio, tune in a station of known frequency. At the back of the control head is the calibration screw—see Fig. 10. Remove the pilot lamp assembly. Insert a fine blade screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received. The knob must be held during this adjustment.

If the control head is inaccessible it may be calibrated by setting the pointer from the front. Remove the crystal by inserting a knife blade under the lower edge. Loosen the pointer screw, set the pointer and retighten.



Inserting Vibrator Unit

Note that the vibrator unit can be inserted in two ways. The proper method of insertion will depend on which side of the car battery is grounded. Complete information is shown on the label on the vibrator.

WESTERN AUTO SUPPLY CO.

CHANGES IN LATER MODELS

June, 1937

Later models of the Series have changes incorporated in them which are explained below. The models which have these changes may be identified by the issue letter which is a large letter stamped on top of the chassis base. The tube arrangement label on the chassis case cover also shows this issue letter.

When ordering parts, it is important that the issue letter be noted and the correct part number, as shown in the parts list, be specified.

The "D" issue Series is different from the "B" and "C. The gang condenser used in the "D" issue radios does not have the cut plate oscillator section. A padding condenser (600 KC) was added in series with the oscillator section of this gang condenser and the oscillator coil. The padding condenser is a part of the 2nd I. F. trimmer unit and is mounted in the 2nd I. F. coil can.

The capacity (C17) shown within a dotted circle in the 2nd I.F. coil assembly on the schematic has been changed to an actual part as shown in the supplementary parts list

The antenna, R.F. Interstage, oscillator, and 2nd I.F. coil assemblies have been changed and have been given new part numbers as shown in the supplementary parts list.

SUPPLEMENTARY REPLACEMENT PARTS

The PARTS of the Series are used on the Series "D" issue Radio with the following EXCEPTIONS:
PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE

THE FOLLOWING NEW PARTS ARE USED:

No.	Code	Description	List Price
9A859	T1	Antenna Transformer and Can Assembly.......	$1.65
9A861	T2	R. F. Interstage Transformer and Can Assembly..	1.75
9A862	T3	Oscillator Coil and Can Assembly....	.95
9A858	T5	2nd I. F. Transformer and Can Assembly.....	2.35
47X57	C17	100 mmf. Molded Condenser............ . ..	.10
17A79	(C16 (	30-100 mmf. 2nd I.F. Trimmer) 900-1300 mmf. Oscillator 600 KC Padder)...	.45
14A77		3 Section Gang Condenser Complete with Drive Gears..............................	5.05

THE FOLLOWING PARTS OF THE SERIES ARE NOT USED ON THE SERIES "D" ISSUE RADIO:

No.	Code	Description	List Price
9A740) or 9A771)	T1	Antenna Transformer and Can Assembly.......	$1.65
9A741) or 9A765)	T2	R.F. Interstage Transformer and Can Assembly....................................	1.70
9A742) or 9A772)	T3	Oscillator Coil and Can Assembly...........	.85
9A744	T5	2nd I.F. Coil and Can Assembly.............	1.60
17A65	C16	30-100 mmf. 2nd I.F. Trimmer..............	.20
14A65		3 Section Gang Condenser Complete with Drive Gears..............................	5.85

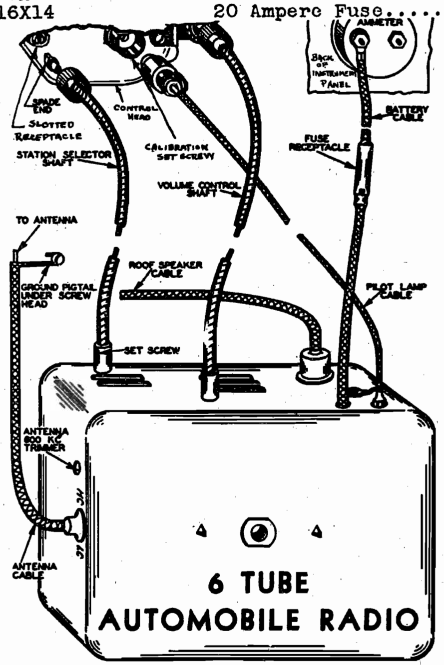
The Following Changes apply to all Issues of the Series 6J:

THE FOLLOWING NEW PARTS ARE USED:

46X213	C29	.5 mf. 180 volt	Tubular Condenser........	$0.30
16X16		15 Ampere Fuse............................		.10

THE FOLLOWING PARTS ARE NOT USED:

46X207	C29	.5 mf. 180 volt	Tubular Condenser........	$0.30
16X14		20 Ampere Fuse............................		.10



General Installation View

Alignment Procedure

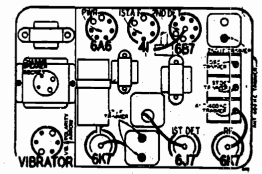
Set the signal generator for 175 KC and connect the output of the signal generator through a .05 mf. condenser to the stator of the 1st detector section of the tuning condenser. Set the volume control at the maximum position and attenuate the signal from the signal generator to prevent the levelling off action of the AVC. Then adjust the three IF trimmers until maximum output is obtained

Set the signal generator for 1581 KC. Turn the rotor of the tuning condenser to the full open position. Insert the antenna plug with the mark on the high capacity (HC) side. Connect the shielded antenna lead from the chassis through a 120 mmf. condenser to the antenna post of the signal generator. Adjust the trimmer of the oscillator section of the three gang condenser until maximum output is obtained.

Set the signal generator for 1400 KC. Turn the rotor of the tuning condenser carefully until maximum output is obtained. Adjust the 1st detector and antenna 1400 KC trimmers for maximum output. Do not change the setting of the oscillator trimmer.

Then set the signal generator for 600 KC and adjust the 600 KC antenna trimmer to maximum (see Fig. 10 for location of this trimmer).

After the alignment procedure is completed, the antenna plug may be withdrawn and reinserted on the LC side if a low capacity (70 mmf.) car antenna is used.



Location of Tubes and Vibrator

Adjusting Antenna 600 KC Trimmer

Tune in a weak signal at approximately 600 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna 600 KC trimmer up or down until maximum output is obtained. See Fig. 9 for location of this trimmer.

Antenna

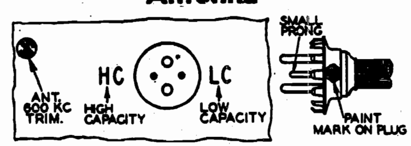


Fig. 9—Antenna Plug Insertion

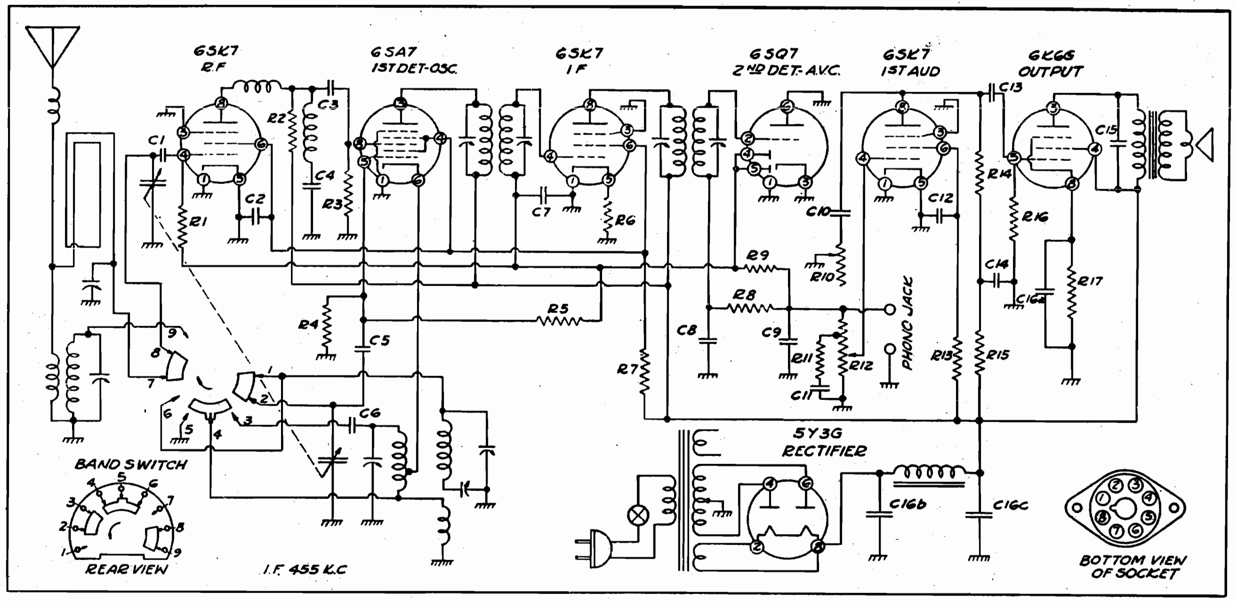
IMPORTANT—The antenna plug can be inserted in two ways depending on whether the antenna is of high or low capacity.

If the total capacity of the antenna and shielded lead is approximately 200 mmf., which would be the case in a running board or ordinary roof antenna (not metal roof), insert the antenna plug with the mark on the HC side—See Fig. 9.

If the total capacity of the antenna and shielded lead is approximately 70 mmf., such as is the case if a "fish pole" antenna is used, insert the antenna plug with the mark on the LC side.

MODEL D-1003

WESTERN AUTO SUPPLY CO.



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

SERVICE NOTES

Voltages taken from the different points of the circuit to chassis are measured with volume control in maximum position, all tubes in their sockets and with a volt meter having a resistance of 1000 ohms per volt, on the 300 volt scale. These voltages are clearly indicated on the voltage chart.

All voltages should be measured with 117 volts A.C. input to receiver. Resistance and actual connections of coils and transformers, electrolytic condenser information and speaker data are given under Service Information.

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.

SERVICE INFORMATION

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, 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

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.

	Volts
6SK7 (RF) TUBE	
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

MODEL D-1003

WESTERN AUTO SUPPLY CO.

ISSUE A
MAY 1940

Serial No.
D-69,751 & Up

SEVEN TUBE AC SUPERHETERODYNE RECEIVER

Broadcast and Short Wave Bands

Frequency Range 535-1630 Kilocycles and 5,700-18,100 Kilocycles

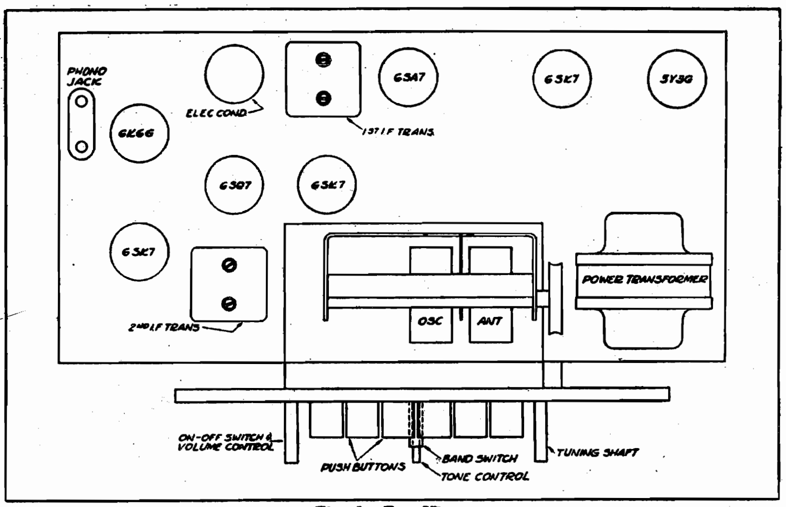


Fig. 1—Top View

TUBE COMPLEMENT

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

1—Type 6SK7—Remote cut-off Pentode as RF Amplifier.

1—Type 6SA7—Pentagrid Converter as First Detector and Oscillator.

1—Type 6SK7—Remote cut-off Pentode as an IF amplifier (455 KC).

1—Type 6SQ7—Duplex Diode Triode Second Detector and A.V.C.

1—Type 6SK7—Remote cut-off Pentode as First Audio.

1—Type 6K6G—Power Amplifier.

1—Type 5Y3G—Rectifier.

PROCEDURE FOR SETTING UP PUSH BUTTONS

There are six push buttons by means of which six stations may be selected. Make a list of six stations tuned in regularly. 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 six 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.

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 mfd., 200 mmf., 400 ohms.

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.	.1 Mfd.	Grid of 6SK7 I.F. tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	455 KC.	.1 Mfd.	Grid of 6SA7 tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
BROAD-CAST	1,630 KC.	200 Mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Upper left, front of chassis	Oscillator	Adjust to maximum output
	1,400 KC.	200 Mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Lower right, front of chassis	Broadcast Antenna	Adjust to maximum output
	600 KC.	200 Mmf.	Antenna lead	Set dial at 600 KC.	Trimmer—Underside of chassis, center	Oscillator Series Pad.	Adjust to maximum rock dial See Note 'A'
SHORT WAVE	18,100 KC.	400 ohms	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Lower left, front of chassis	Short Wave Oscillator	Adjust to receive signal
	16,000 KC.	400 ohms	Antenna lead	Tune signal	Trimmer—Upper right, front of chassis	Short Wave Antenna	Adjust to maximum output

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

Attenuate the signal from the signal generator to prevent the leveling-off action of the A.V.C.

Do not bend variable condenser to correct tracking.

Frequency Range — 535 to 1630 and 5,700 to 18,100 K.C.
Power output 2.6 watts undistorted — 4.1 watts maximum.
Intermediate Frequency 455 K.C.
Power Consumption—60 watts.

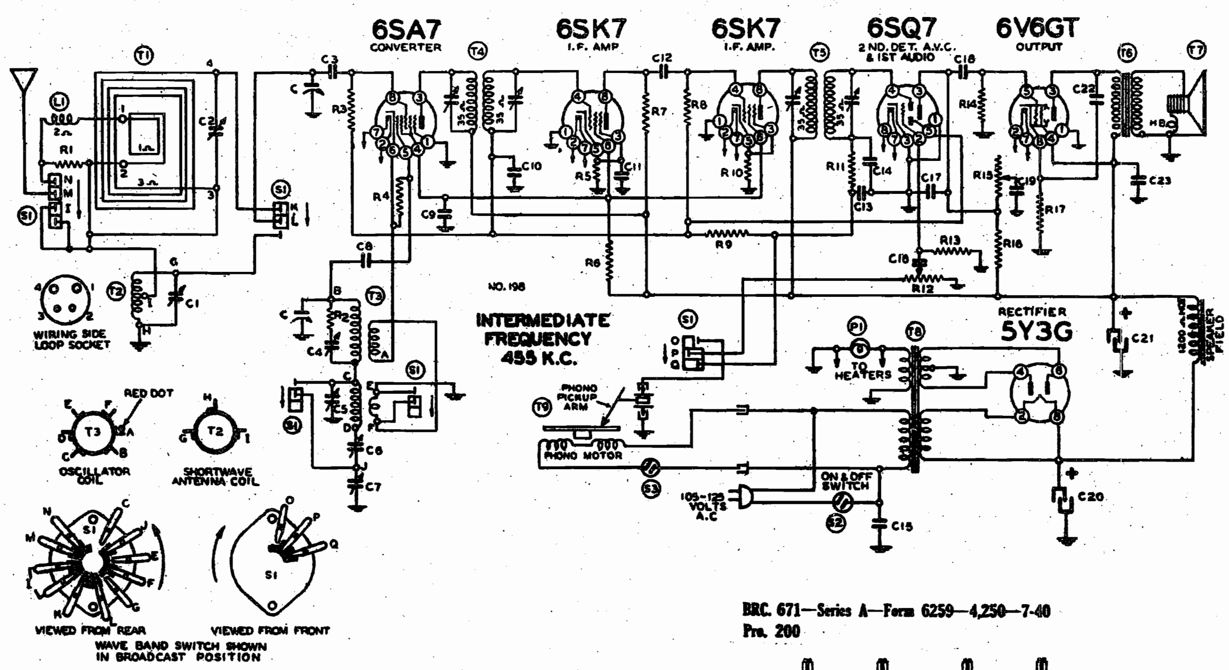
MODEL D-1076

WESTERN AUTO SUPPLY CO.

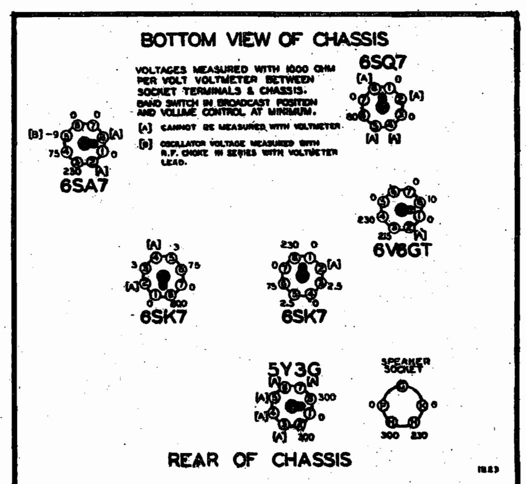
Code No.	Part No.	Description
		RESISTORS
R1	13071	4000 ohm—1/3 w.
R2	130128	20 ohm—1/3 w.
R3	13019	1 megohm—1/3 w.
R4	130236	30M ohm—1/3 w.
R5	130283	750 ohm—1/3 w.
R6	130324	18M ohm—1 watt
R7	130218	5M ohm—1/3 w.
R8	13020	100M ohm—1/3 w.
R9	130170	3 megohm—1/3 w.
R10	130222	350 ohm—1/3 w.
R11	13012	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.

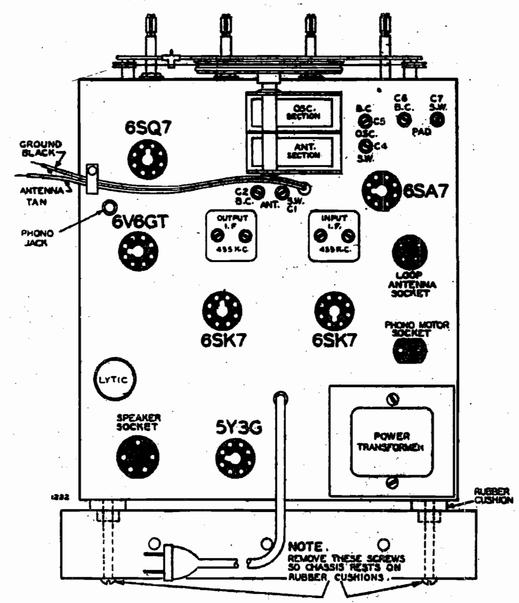
C1 and C2 are in same unit C4 and C5 in same unit
C6 and C7 are in same unit C13 and C14 in same unit
C20 and C21 are in same unit

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



BRC. 671—Series A—Form 6259—4,250—7-40
Pro. 200



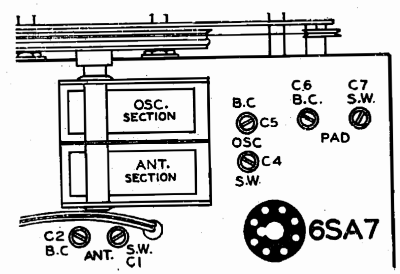


MODEL D-1076

WESTERN AUTO SUPPLY CO.

TECHNICAL DATA

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

MANUAL ISSUE A
AUG. 1940
Serial No. 634,400 up

6 TUBE A. C.

2 BAND

BUILT-IN AERIAL

RECORD CHANGER

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 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.

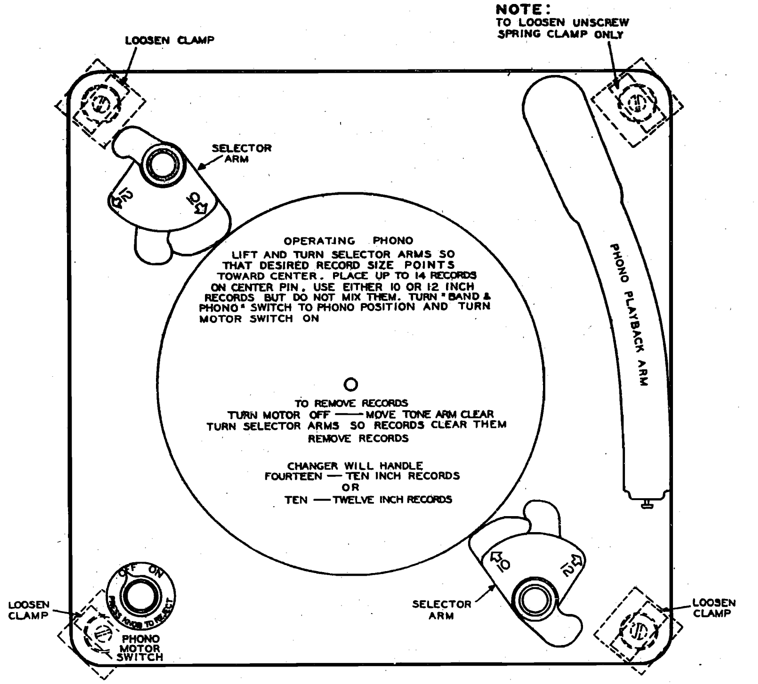
Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

WESTERN AUTO SUPPLY CO.

MODEL D-1076

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.

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.**

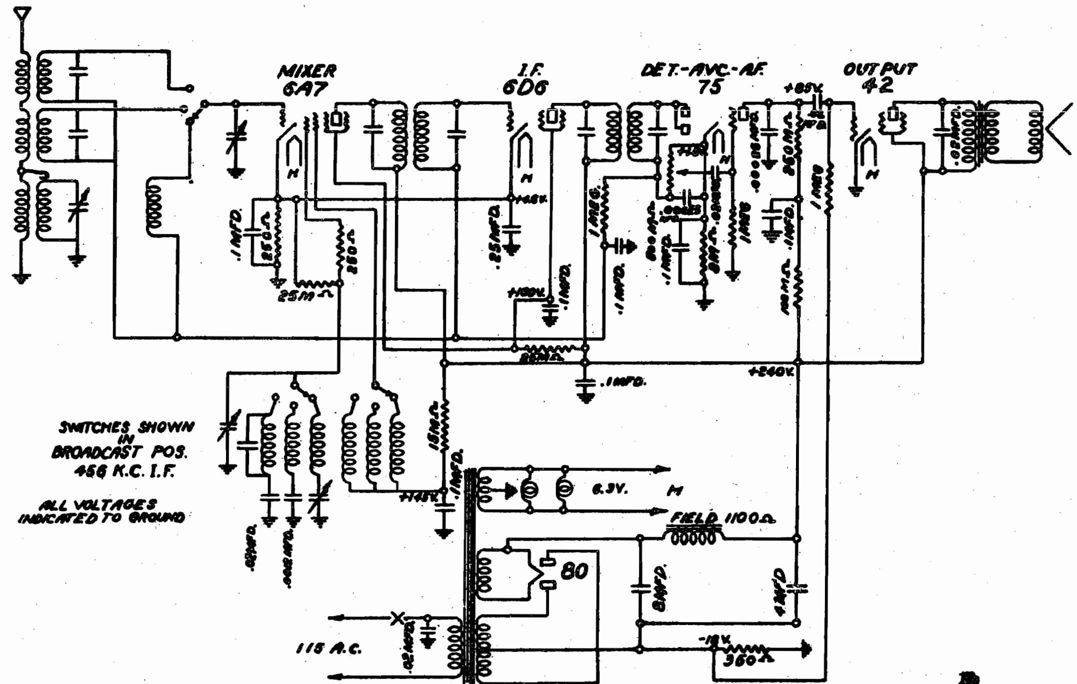
For convenience, the tone arm on your changer may be raised to a nearly vertical position, so that the needle may be easily inserted; the needle screw should be tightened firmly.

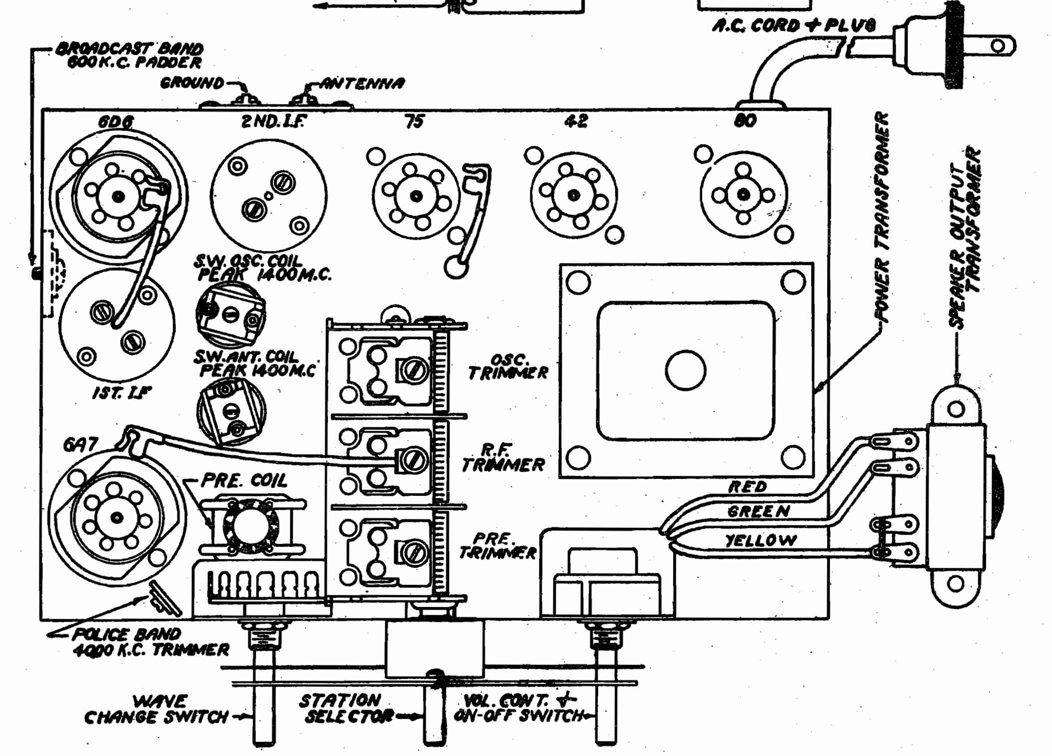
Care of Records

To insure long life for your records requires only slight effort. Do not expose them to heat from the sun, nor to heat from nearby stoves or radiators. Store them preferably in albums, but in any case keep them always in a cool, dry place, resting vertically or horizontally. Remove dust and dirt, using soft cloth and light circular motion. If fluids are used for lubricating record surfaces, keep in mind that these often tend to attract dust, and extra effort is necessary to clean it off. Even a fine film of dust very often contains abrasive particles which, when grounded against the record surface by the steel needle, can cause very rapid wear of the recorded music.

MODEL D-728

WESTERN AUTO SUPPLY CO.





CONVENTIONAL ALIGNMENT - SEE THE SPECIAL SECTION VOL. VIII

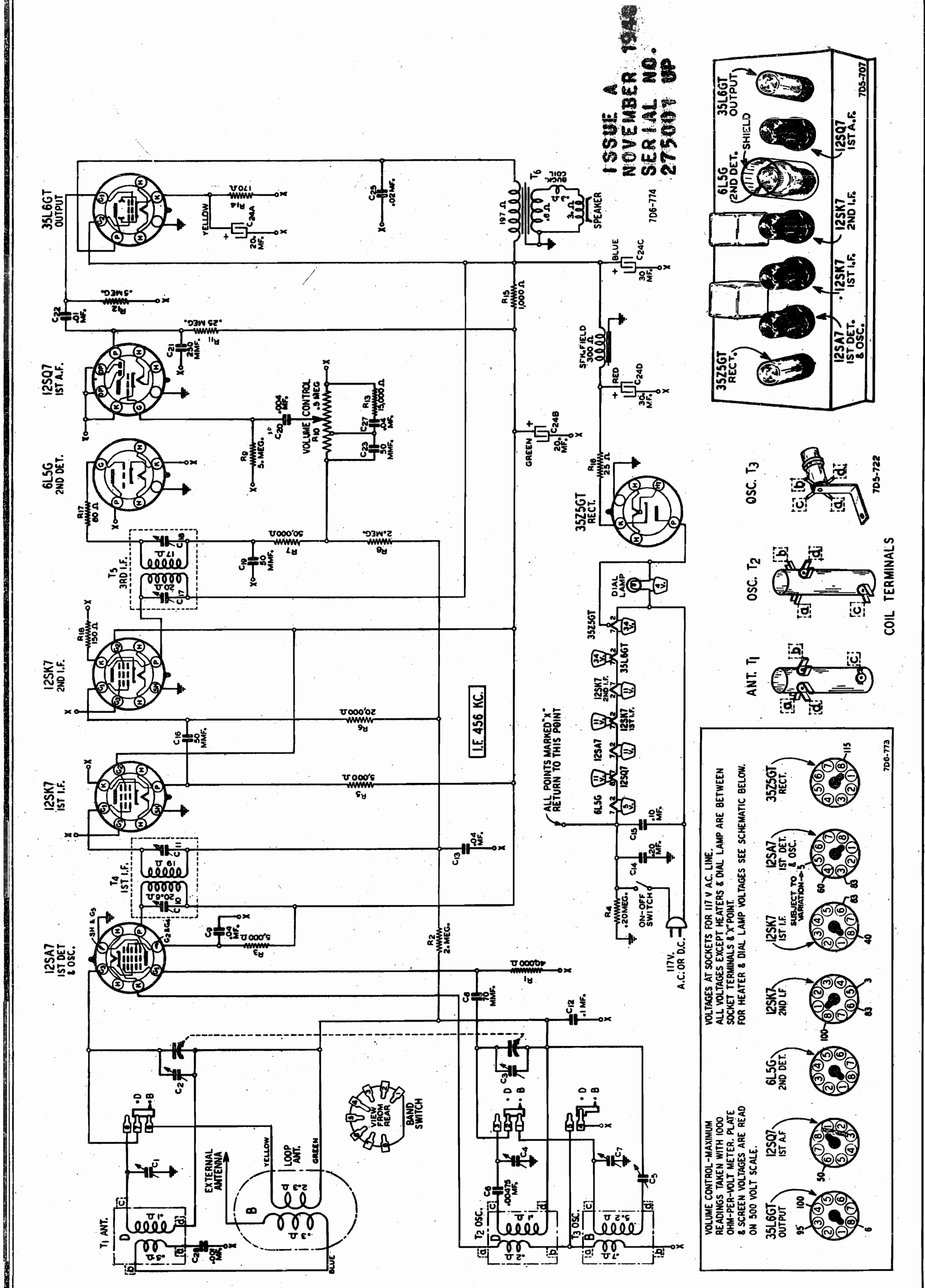
FREQUENCY RANGES - BROADCAST - 540 to 1700 KC - Adjust the OSC, RF and ANT trimmers to a maximum peak of 1400 KC, then pad the Oscillator circuit at 600 KC while rocking gang condenser.

SHORTWAVE - 5800 to 15200 KC - Adjust the OSC and ANT trimmers to a maximum peak of 14000 KC. No padding required.

POLICE - 1700 to 5000 KC - Adjust the ANT coil trimmer to a maximum peak of 4000 KC. No other adjustments required.

WESTERN AUTO SUPPLY CO.

MODEL D-1117



MODEL D-1117

WESTERN AUTO SUPPLY CO.

SPECIFICATIONS

Power Consumption....28 Watts (At 117 volts AC Supply)

Power Output...75 Watt Undistorted
1.3 Watts Maximum

Selectivity.................49 KC Broad at 1000 times Signal

Intermediate Frequency...456 KC

Speaker ....5" Electro-Dynamic

Tuning Frequency Range

B Range .... 528 to 1600 KC
D Range ....5750 to 18,300 KC

Sensitivity (For .05 watt output)—External Antenna

B Range .... 5 Microvolts Average
D Range ....40 Microvolts Average

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 test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 200 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. (C10) & (C11) 3rd I.F. (C17) & (C18)
RANGE B						
1600 KC	Signal Grid of 1st Det.	Point "X"	.1 mf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C3) See Note A
1400 KC	External Antenna Lead	Point "X"	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note B	Antenna Range B (C2)
600 KC	External Antenna Lead	Point "X"	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note C
RANGE D						
18,300 KC	External Antenna Lead	Point "X"	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C4)
17,000 KC	External Antenna Lead	Point "X"	400 Ohm	D Range	Turn Rotor to Max. Output	Ant. Range D (C1)

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

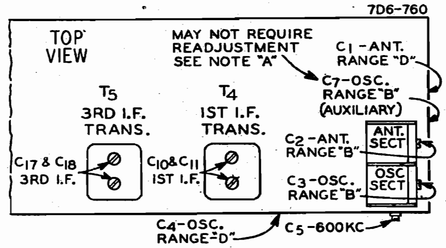
After each range is completed, repeat the procedure as a final check.

NOTE A—Adjust Oscillator Range B (C3) trimmer on gang condenser. Oscillator Range B (C7) auxiliary trimmer on side of chassis is adjusted at factory and ordinarily need not be readjusted in the field.

NOTE B—If the pointer is not at 1400 KC on the dial, set pointer at this mark on the dial scale.

NOTE C—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

CAUTION—When aligning the short wave band, be sure NOT to adjust at the image frequency. This can be checked as follows: Let us say the signal generator is set for 15,000 KC. The signal will then be heard at 15,000 on the dial of the radio. The image signal, which is much weaker, will be heard at 15,000 less 912 KC, or 14,088 KC on the dial. It may be necessary to increase the input signal to hear the image.



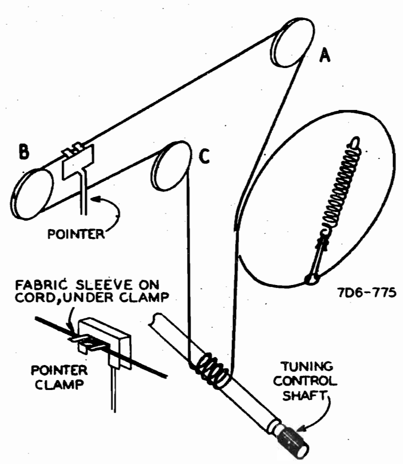
DRIVE CORD REPLACEMENT

Turn gang condenser to completely closed position—see illustration.

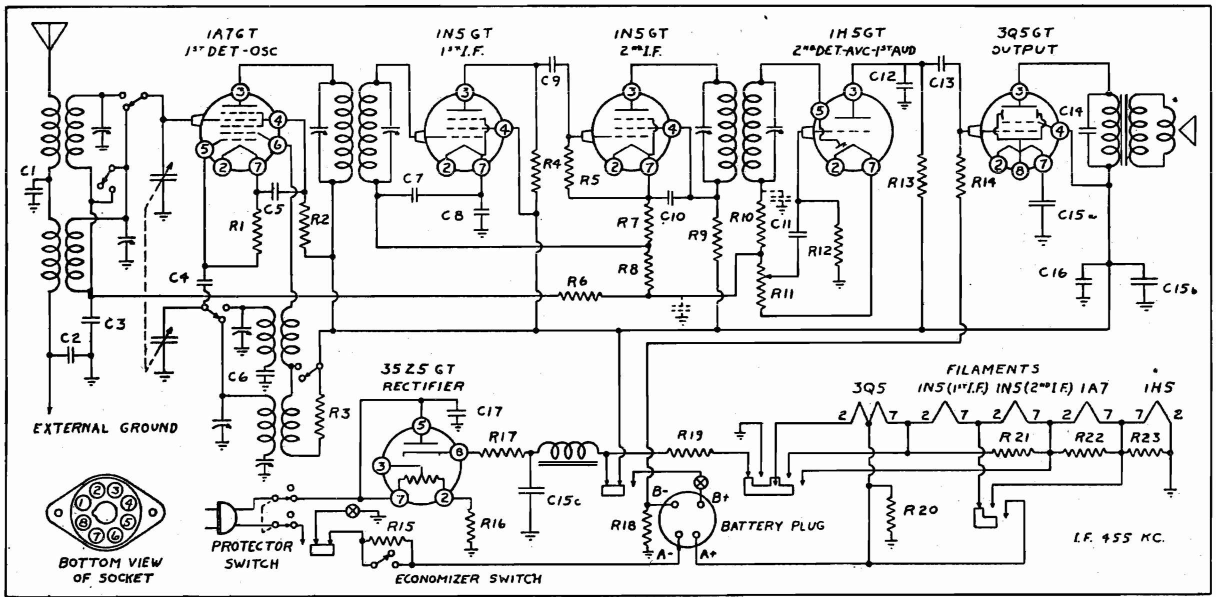
Using a new drive cord approximately 50 inches in length, tie one end to tension spring. Pass other end of cord down through hole in groove of drive pulley. Pull spring flush against inside of pulley rim. Wind cord 1/4 turn clockwise (from front of chassis) around drive pulley. Then pass over idler pulleys A, B, and C as shown.

Wind cord 4½ turns counter-clockwise (from front of chassis) around tuning control shaft. These turns should progress away from the chassis. Then wind cord 3/4 turn clockwise (from front of chassis) around drive pulley. This turn should be on the left side (from gang condenser side of chassis) of pulley groove. Pass cord through hole in pulley groove. Tie cord to tension spring. Stretch tension spring and secure free end to hook on pulley.

Dial Pointer Attachment—Tune in a signal of known frequency. Set pointer at this frequency mark on dial scale. Fasten pointer to cord—See illustration.



WESTERN AUTO SUPPLY CO.



Band switch shown in broadcast position.

AC-DC-Battery switch shown in AC-DC position.

RESISTORS

No.	Ohms	Watts	No.	Ohms	Watts
R1	70,000	½	R13	1,000,000	½
R2	30,000	½	R14	2,000,000	½
R3	150	½	R15	0.5	½
R4	20,000	½	R16	550	15
R5	1,000,000	½	R17	30	½
R6	2,000,000	½	R18	400	½
R7	5,000,000	½	R19	1,950	5
R8	5,000,000	½	R20	3,000	½
R9	5,000	½	R21	500	½
R10	70,000	½	R22	200	½
R11	1,000,000	V.C.	R23	110	½
R12	10,000,000	½			

CONDENSERS

No.	Capacity (Mfd.)	Volts	No.	Capacity (Mfd.)	Volts
C1	.0001	Mica	C11	.01	400
C2	.01	400	C12	.0001	Mica
C3	.05	200	C13	.01	400
C4	.0001	Mica	C14	.002	600
C5	.01	400	C15a	40.	25
C6	.004	Mica	C15b	30.	150
C7	.01	400	C15c	30.	150
C8	.25	200	C16	.05	400
C9	.0001	Mica	C17	.05	400
C10	.01	400			

SERVICE INFORMATION

When removing the chassis it is first necessary to remove the "Protector Switch" located on the left side of the cabinet. When checking the chassis on AC or DC it is necessary to insert a piece of metal, similar to the one on the cardboard back, into the "Protector Switch" to close the line circuit.

Speaker (Part No. P-4572) 6" PM Type.

D.C. voice coil resistance........7.3 ohms
Voice coil impedance at 400 cycles........8.0 ohms

B.C. and S.W. Antenna Coil (Part No. P4582)

Starting with the lug that is connected to ground lead in a clockwise direction, the terminals are: No. 1, ground; No. 2, cond; 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

B.C. and S.W. Oscillator Coil (Part No. P-4566)

In a clockwise direction starting at the mounting lug on same side as single lug on other end, the connections are: No. 1, plate; No. 2, grid; No. 3, S.W. pad; No. 4, B.C. pad; No. 5, grid, No. 6, switch; other end, No. 7, B+.

S.W. Primary—No. 1 and No. 6—Resistance........ .8 ohm
B.C. Primary—No. 7 and No. 6—Resistance........ 3.8 ohms
S.W. Secondary—No. 2 and No. 3—Resistance........ .05 ohm
B.C. Secondary—No. 5 and No. 4—Resistance........ 4.5 ohms

First I.F. Transformer (Part No. P-4569)
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. P-4420)
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 the 150 volt scale (except AC readings). Line voltage 117 volts AC. Volume control maximum and no signal tuned in.

1A7GT TUBE

	Volts
Plate (3) to ground	98
Screen (4) to ground	60
Grid (6) to ground	99

1N5GT (1st I.F.) TUBE

	Volts
Plate (3) to ground	76
Screen (4) to ground	100

1N5GT (2nd I.F.) TUBE

	Volts
Plate (3) to ground	91
Screen (4) to ground	93

3Q5GT TUBE

	Volts
Plate (3) to ground	97
Screen (4) to ground	100

35Z5GT TUBE

	Volts
Plate (5) to ground	117 (AC)
Cathode (8) to ground	120

MODEL D-1123

WESTERN AUTO SUPPLY CO.

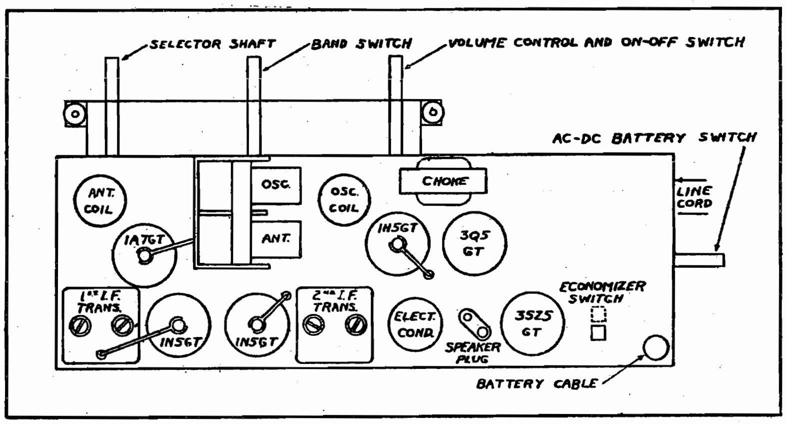


Fig. 1—Top View

TUBE COMPLEMENT

The tube complement of this receiver consists of the following tubes:

1—Type 1A7GT—Pentagrid Converter (Composite first detector and oscillator).

1—Type 1N5GT—Sharp cut-off Pentode as 1st IF Amplifier (455 KC).

1—Type 1N5GT—Sharp cut-off Pentode as 2nd IF Amplifier (455 KC).

1—Type 1H5GT—Duplex Diode Triode Second Detector, AVC and First Audio.

1—Type 3Q5GT—Beam Power Amplifier.

1—Type 35Z5—Rectifier.

SERVICE NOTES

Voltages taken from the different points of the circuit to chassis are measured with volume control in maximum position, all tubes in their sockets and 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 the signal from acting upon the AVC and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages should be measured with 117 volts AC input to receiver. Resistance and actual connections of coils and transformers and speaker data are given under Service Information.

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.

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 signal generator as well as an output meter, must be used.

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 mfd., 200 mmfd., 400 ohms.

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 1N5GT I.F. tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Output I. F.	Adjust to maximum output
	455 KC.	.1 Mfd.	Grid of 1A7GT tube	Rotor full open (Plates out of mesh)	Two trimmers on top (See Fig. 1)	Input I. F.	Adjust to maximum output
SHORT WAVE	18,100 KC.	400 ohms	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Upper left, front of chassis	Short Wave Oscillator	Adjust to receive signal
	16,100 KC.	400 ohms	Antenna lead	Tune Signal	Trimmer—Center, front of chassis	Short Wave Antenna	Adjust to maximum output
BROADCAST	1730 KC.	200 Mmf.	Antenna lead	Rotor full open (Plates out of mesh)	Trimmer—Lower left, front of chassis	Broadcast Oscillator	Adjust to maximum output
	1400 KC.	200 Mmf.	Antenna lead	Set dial at 1400 KC.	Trimmer—Right, front of chassis	Broadcast Antenna	Adjust to maximum output
	600 KC.	200 Mmf.	Antenna lead	Set dial at 600 KC.	Trimmer—Top of chassis (See Fig. 1)	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 intensity is obtained.

Attenuate the signal from the signal generator to prevent the leveling-off action of the A.V.C.

Do not bend variable condenser to correct tracking.

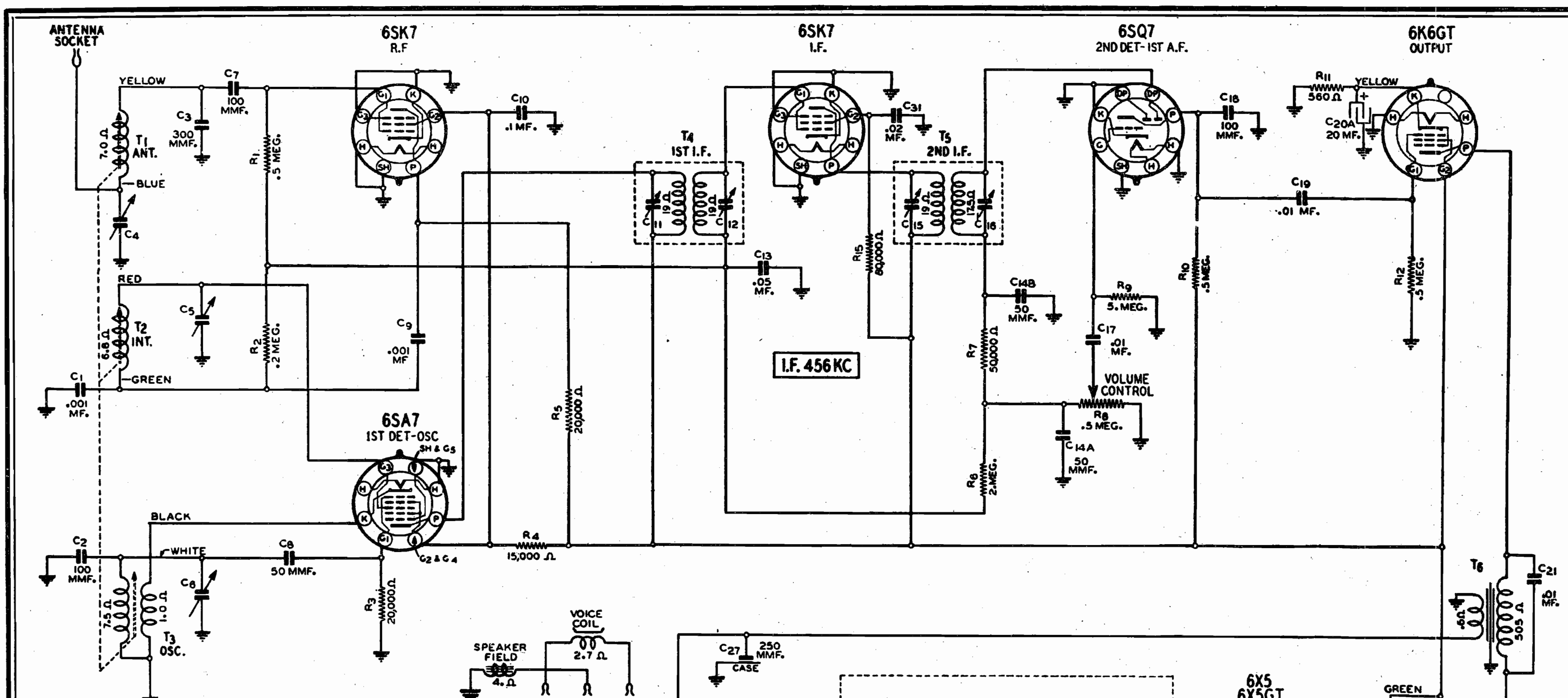
Frequency Range—535 to 1730 and 5,750 to 18,100 K.C.

Power output .27 watt undistorted—.35 watt maximum.

Intermediate Frequency 455 K.C.

MODEL D-1190

WESTERN AUTO SUPPLY CO.



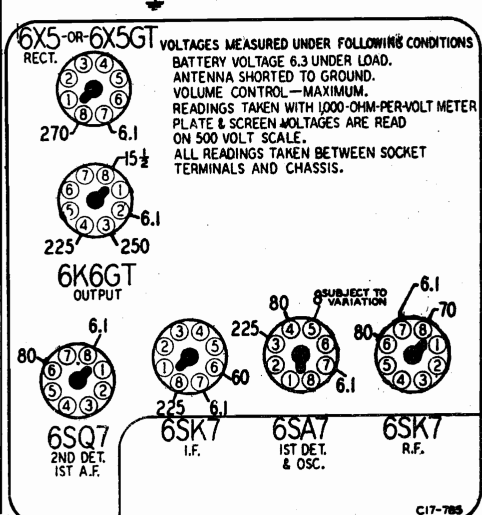


Fig. 6—Schematic Circuit Diagram

ISSUE A
DECEMBER 1940
SERIAL NO.
225,001 UP

SPECIFICATIONS

Power Consumption - - 8.2 Amperes at 6.6 Volts
Power Output (6.6 Volts) - - 3.0 Watts Undistorted, 5.5 Watts Maximum
Sensitivity - - - - 1 Microvolt at .5 Watt Output
Selectivity - - 38 KC Broad at 1000 Times Signal
Tuning Frequency Range - - - - 540 to 1600 KC
Intermediate Frequency - - - - - - - 456 KC
Speaker - - - - - - - - - 6" Electro-Dynamic

MODEL D-1190

WESTERN AUTO SUPPLY CO.

Adjusting Antenna Trimmer

After the antenna is connected, tune in a weak signal at approximately 1400 KC with the volume control about three-fourths on. Turn the adjusting screw of the antenna trimmer (C4) up or down until maximum output is obtained. See Fig. 3 for location of this trimmer.

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. 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.

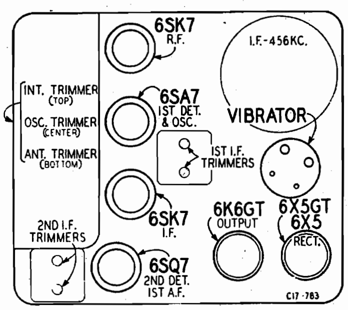


Fig. 4—Location of Tubes and Vibrator

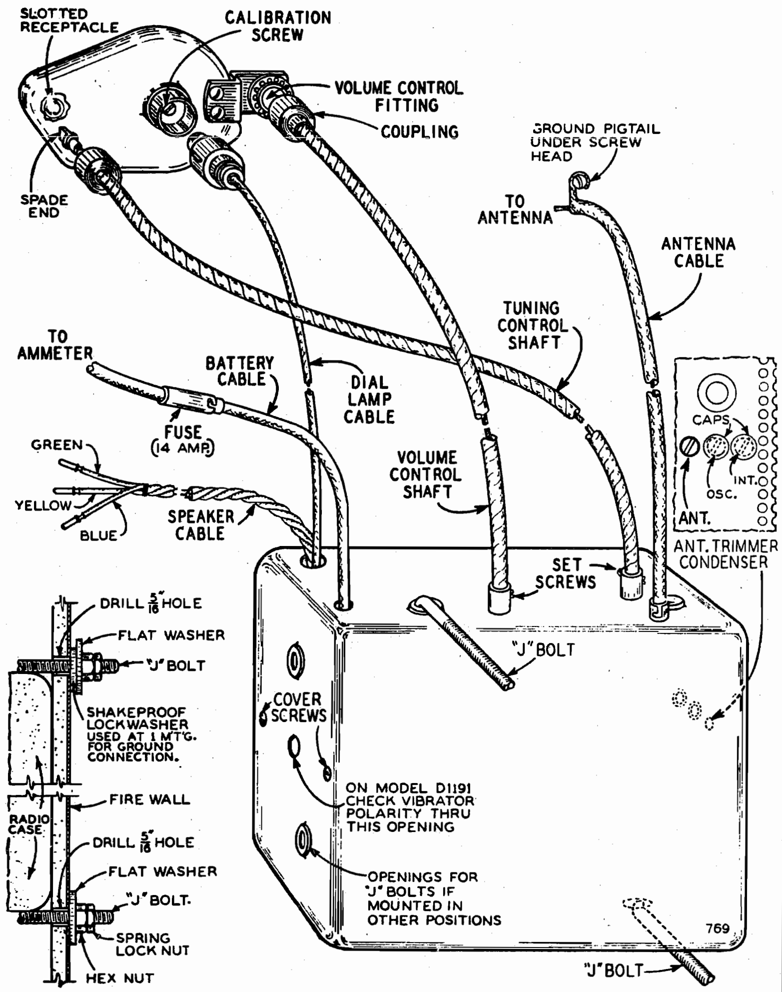


Fig. 3—General Installation View

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 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 4)
I.F.				
456 KC	Control Grid (prong No. 8) 6SA7 1st Det. Tube	.05 mf.	Extreme Position out of Coil	1st I.F. (C11) & (C12) 2nd I.F. (C15) & (C16)
OSCILLATOR				
1600 KC	Antenna Cable See Note A	See Note A	Extreme Position out of Coil	Oscillator (C6)
1400 KC ADJUSTMENT				
1400 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 1400 KC—Readjust Antenna Trimmer C4 for maximum output.

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

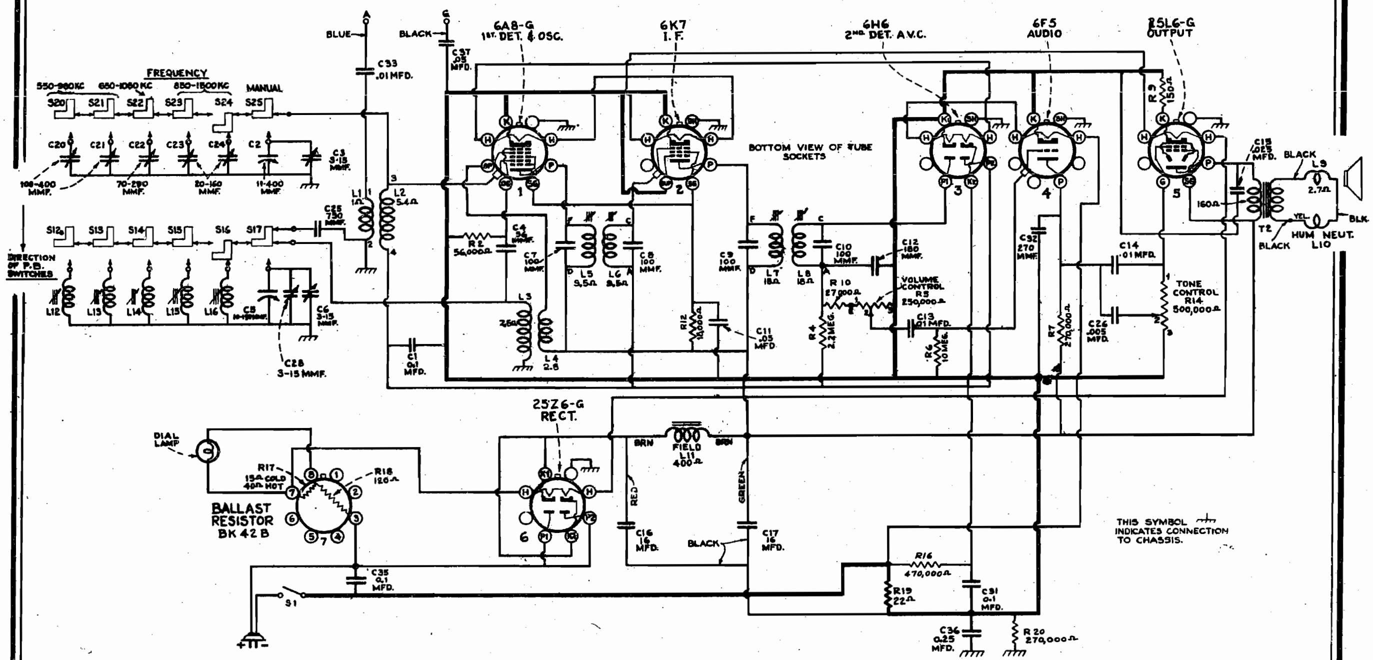
After each range is completed, repeat the procedure as a final check.

NOTE A—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.

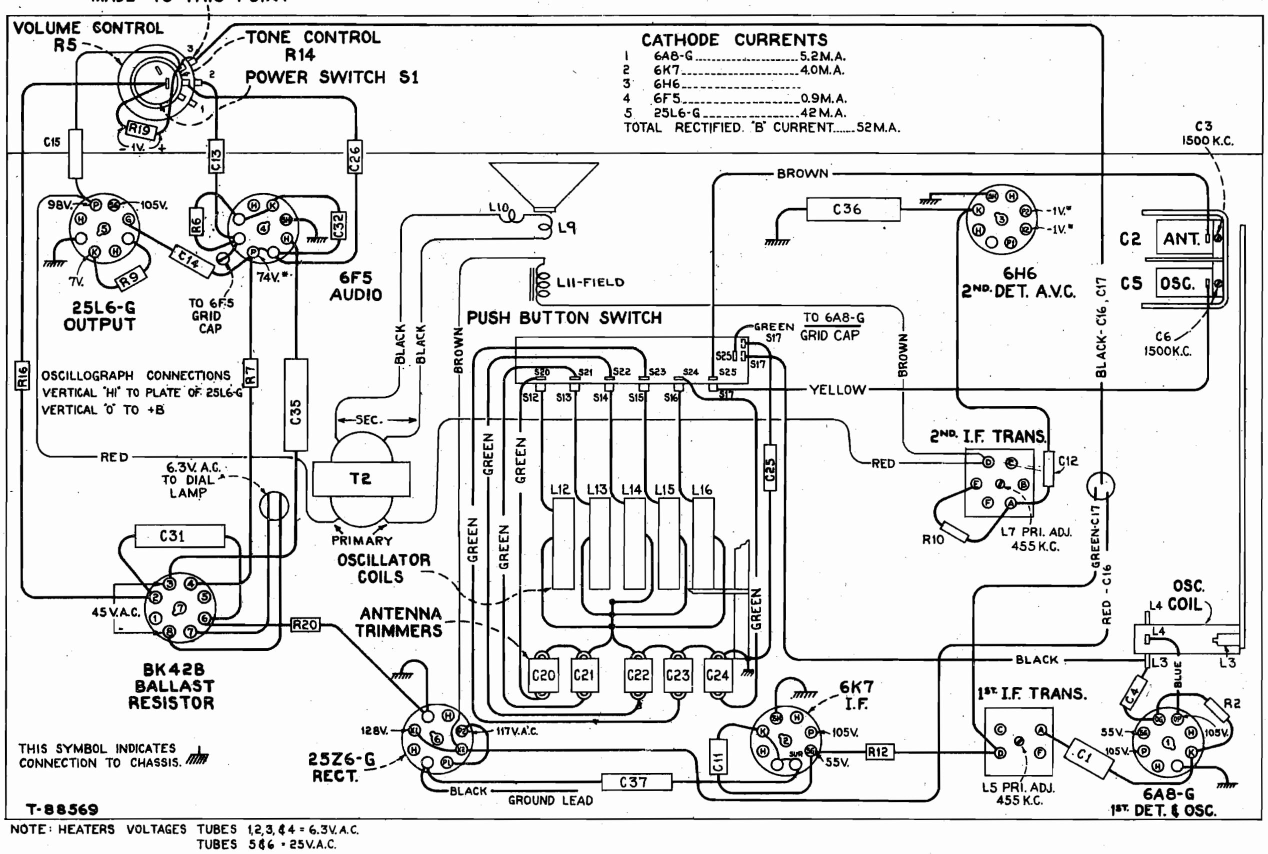
CALIBRATION—To calibrate the radio, tune in a station of known frequency. At the back of the control unit is the calibration screw. Remove the dial lamp assembly. Insert a fine bladed screwdriver and turn this screw until the pointer on the dial scale is at the frequency of the station being received.

WESTINGHOUSE ELEC. SUPPLY CO.INC.

MODEL WR-158



VOLTAGE MEASUREMENTS MADE TO THIS POINT



Bottom View of Chassis Showing Socket Voltages, Parts Location, and R-F Wiring

*** NOTE:** Values with star (*) are operating voltages in circuits with high series-resistance. These voltages will be lower when measured with a voltmeter drawing current through the circuit. Exact voltage may be measured with a vacuum-tube voltmeter if desired. The other values will not be affected by measuring with an ordinary high-resistance voltmeter.

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately ±20% with 117-volt a-c supply.

MODEL WR-158

WESTINGHOUSE ELEC. SUPPLY CO. INC.

ALIGNMENT PROCEDURE

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the black lead and keep the output as low as possible to avoid a-v-c action.

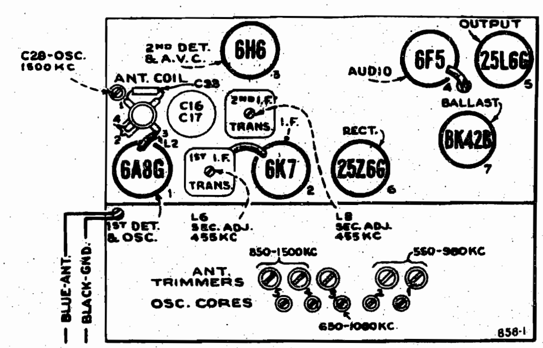
Calibration Marks. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

Drum and Dial Indicator Adjustment.—As the first step in r-f alignment, check the position of the drum on the front shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing directly down as shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand line as shown. The indicator is held to the drive cord by means of spring clips.

After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw (which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

After completion of alignment, seal the i-f core-adjustment screws with household cement.

The dial tuning (right hand) push-button must be pushed in for steps 1 to 3, inclusive.

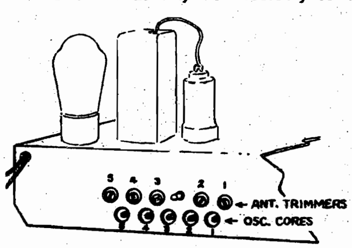


Tube and Trimmer Locations

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark	C6 (osc.)* C3 (ant.)
4	Follow "Adjustments for Electric Tuning"			

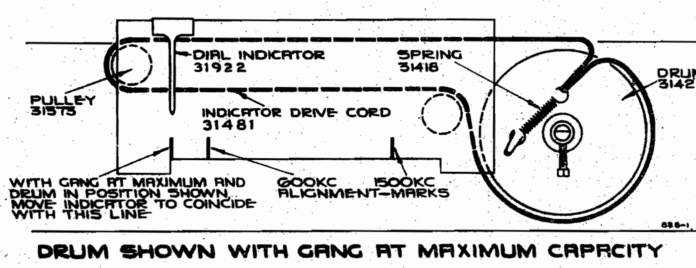
* Use minimum capacity peak if two peaks can be obtained.

The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.



Push-Button Adjustments

Nos. 1, 2—Approximately 550-980 kc.
No. 3—Approximately 650-1,080 kc.
Nos. 4, 5—Approximately 850-1,500 kc.



Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

Adjustments for Electric Tuning

These models have six push-buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations in the standard-broadcast range. The station buttons connect to separate magnetically-tuned oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool. Allow at least five minutes warm-up period before making adjustments. Use a regular antenna for the preliminary adjustments.

The procedure is as follows:

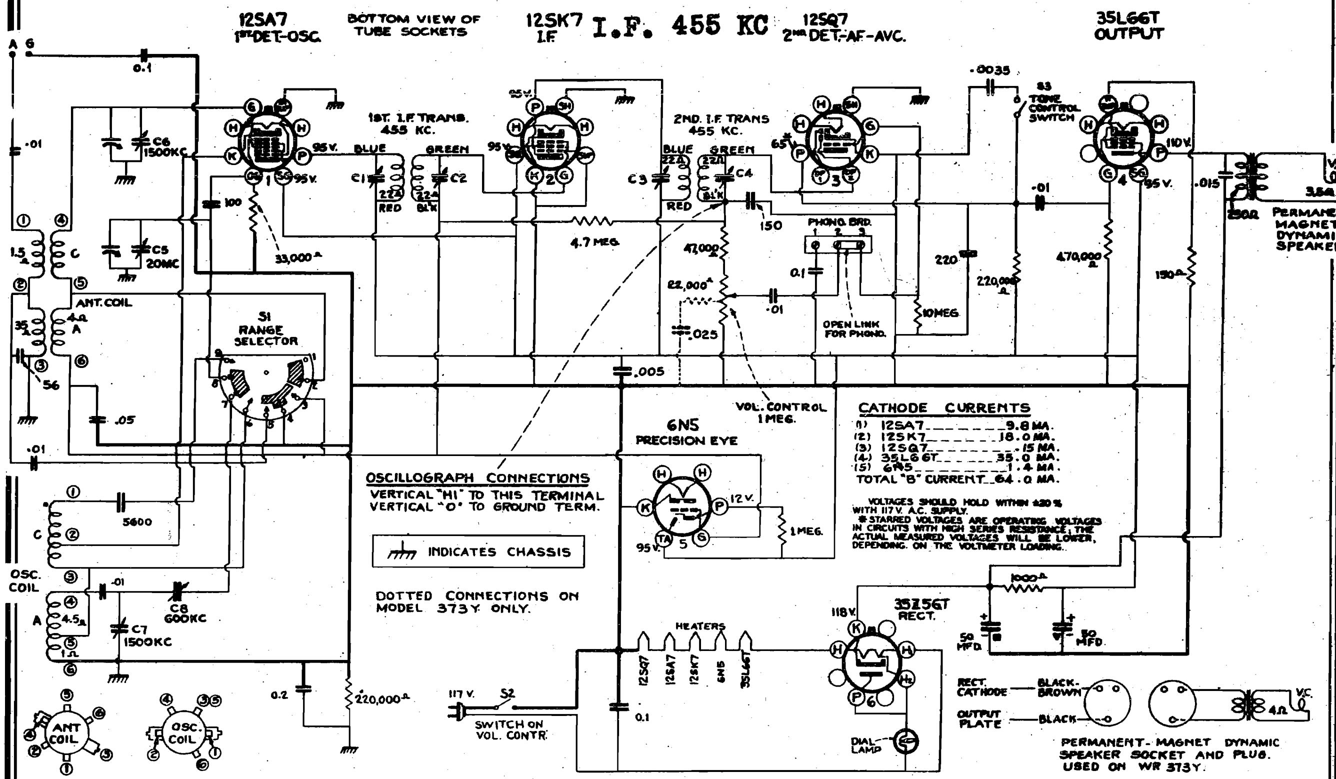
1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning (right-hand) button, and manually tune in the first station on the list.
3. Push in station-button No. 1 (left-hand) and adjust No. 1 oscillator core (L12) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station it received.
4. Adjust No. 1 antenna trimmer (C20) for maximum output on this station.
5. Adjust for each of the remaining four stations in the same manner.

(Clockwise adjustment of oscillator cores and antenna trimmers tunes the circuits to lower frequencies.)

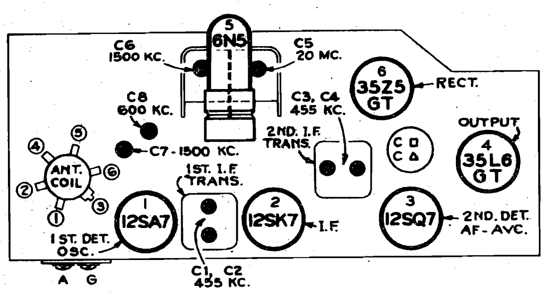
6. Make a final careful adjustment of the oscillator cores and antenna trimmers, using one or two feet of wire as an antenna to ensure sharp peaking.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

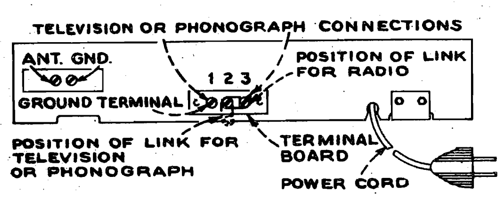
MODELS WR-172, WR-373Y



Schematic Circuit Diagram



Tube and Trimmer Locations



Back of Chassis

FOR FURTHER DATA SEE INDEX

WR-172 is a table model with a six inch speaker; WR-373Y is a console model with a twelve inch speaker. Both models have six tubes, are AC-DC operated, have six push buttons for tuning, a horizontal Slide Rule dial, and a Precision Eye for precise manual tuning.

Power Output (125 volts, 60 cycle supply)

Undistorted .... 0.8 watts
Maximum .... 1.4 watts

Power Supply Ratings

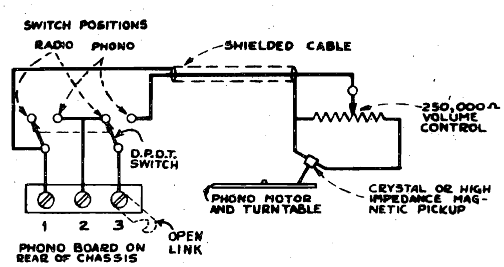
A-C Rating .... 105-125 volts, 50-60 cycles, 35 watts
D-C Rating .... 105-125 volts, direct current, 35 watts

Loudspeaker

Type .... Permanent Magnet Dynamic

	Model WR-172	Model WR-373Y
Diameter	6-inch	12-inch
Voice Coil Impedance at 400 cycles	3.5 ohms	4 ohms

Phonograph Terminal Board.—A 3-terminal board is located on the rear of the chassis for connecting a phonograph pickup, or Record Player, into the audio amplifier of the receiver. The accompanying schematic shows connections for a high-impedance pickup with a switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch.



Record Player Connections, Using a Double-Pole, Double-Throw Toggle Switch

MODELS WR-172, WR-272,
WR-372, WR-373, WR-373Y,
WR-473, WR-474
MODELS WR-175, WR-176
MODELS WR-272, WR-372

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODELS WR-172,WR-272,WR-372,WR-373,WR-373Y,WR-473,WR-474

Alignment Procedure

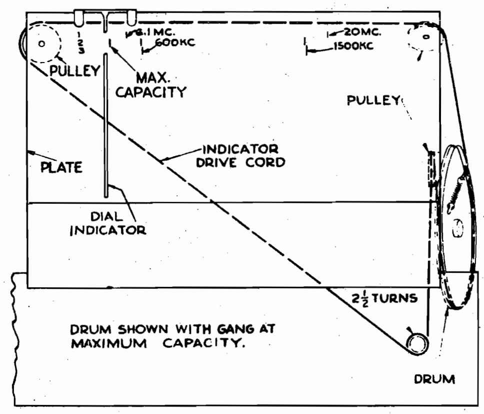
Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground binding post, and keep the output as low as possible to avoid A.V.C. action.

Calibration Marks.—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc, 1,500 kc, 6.1 mc, and 20 mc have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point 1/16 inch to the left of the mark at the extreme left (low frequency) end of the dial scale.



Dial-Indicator and Drive Mechanism
Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

Steps	Connect the high side of the test osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Antenna terminal	455 kc	"A" Band Quiet point between 550-750 kc	C3 and C4 (2nd I-F trans.)
2				C1 and C2 (1st I-F trans.)
3	Antenna terminal in series with 300 ohms	20 mc	"C" Band 20 mc calibration mark	C5 (osc.)*
4	Antenna terminal in series with 200 mmf.	1,500 kc	"A" Band 1,500 kc calibration mark	C7 (osc.) C6 (ant.)
5		600 kc	"A" Band 600 kc calibration mark	C8 (osc.) Rock gang
6	Repeat step 4			

* Use **minimum** peak if two can be obtained. Check to determine that C5 has been adjusted properly by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

Note: Oscillator tracks **above** signal on both bands.

Alignment Procedure

WR-175 and WR-176

Output Meter Alignment.—Connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—Connect the low side of the test-oscillator to the receiver chassis, through a .01 mfd capacitor, and keep the output as low as possible.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (osc.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	C1, C2, C3, C4 (1st and 2nd I-F transformers)
2	Antenna term. of ant. loop in series with 100 mmfd.	1,600 kc	Full clockwise (out of mesh)	C5 (oscillator)
3		1,500 kc	Resonance on 1,500 kc signal	C6 (antenna)

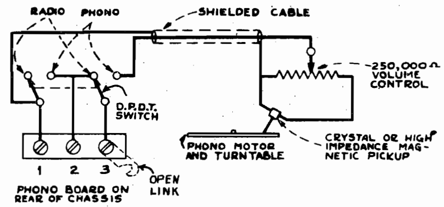
RECORD PLAYER CONNECTIONS, WR-272,WR-372

Phonograph or Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a record player or television attachment into the audio-amplifying circuit.

On Models WR-272 and WR-372 the cable from the attachment should be connected to terminals 1 and 3. The shielded or ground lead going to terminal 1. When using the attachment the connection link is disconnected and volume is controlled by the control on the phonograph or television attachment.

The accompanying schematic shows connections for a high-impedance pickup with switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch.

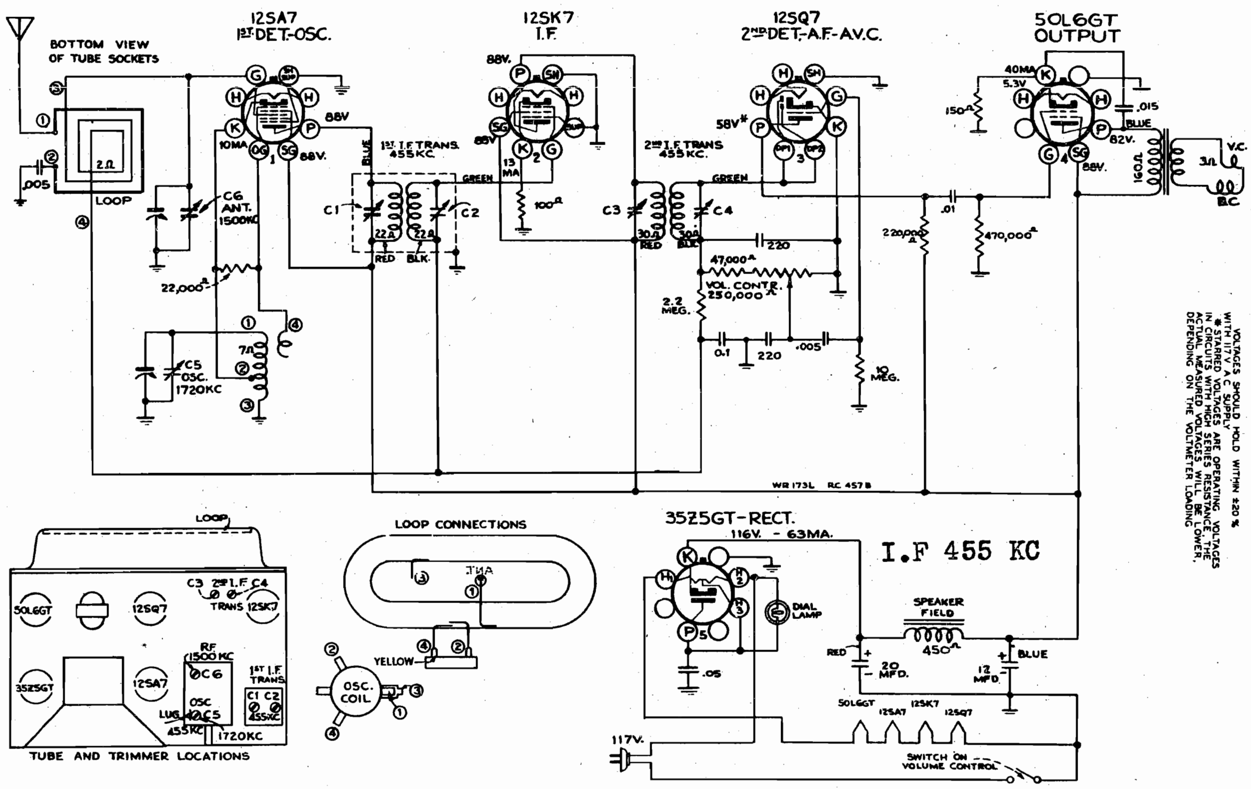
The Model WR-373 has the Radio-Phono-Television switch built into the chassis, allowing switching to be accomplished thru the "Tone-Radio-Phono-Television" Control on the front of cabinet.



Record Player Connections, Using a Double-Pole Double-Throw Toggle Switch Models WR-272 and WR-372

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-173L
MODEL WR-174L

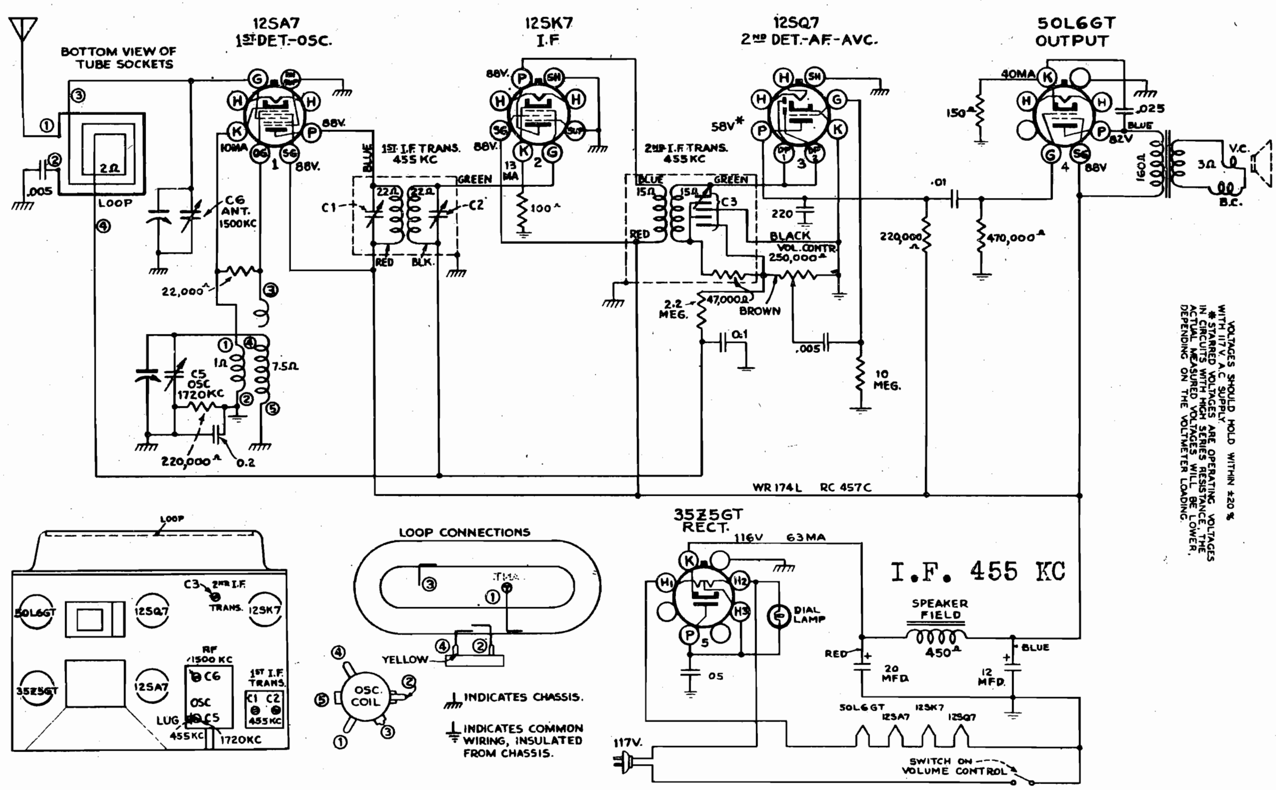


Schematic Circuit Diagram Model WR-173L

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress electrolytic capacitor against rear apron.

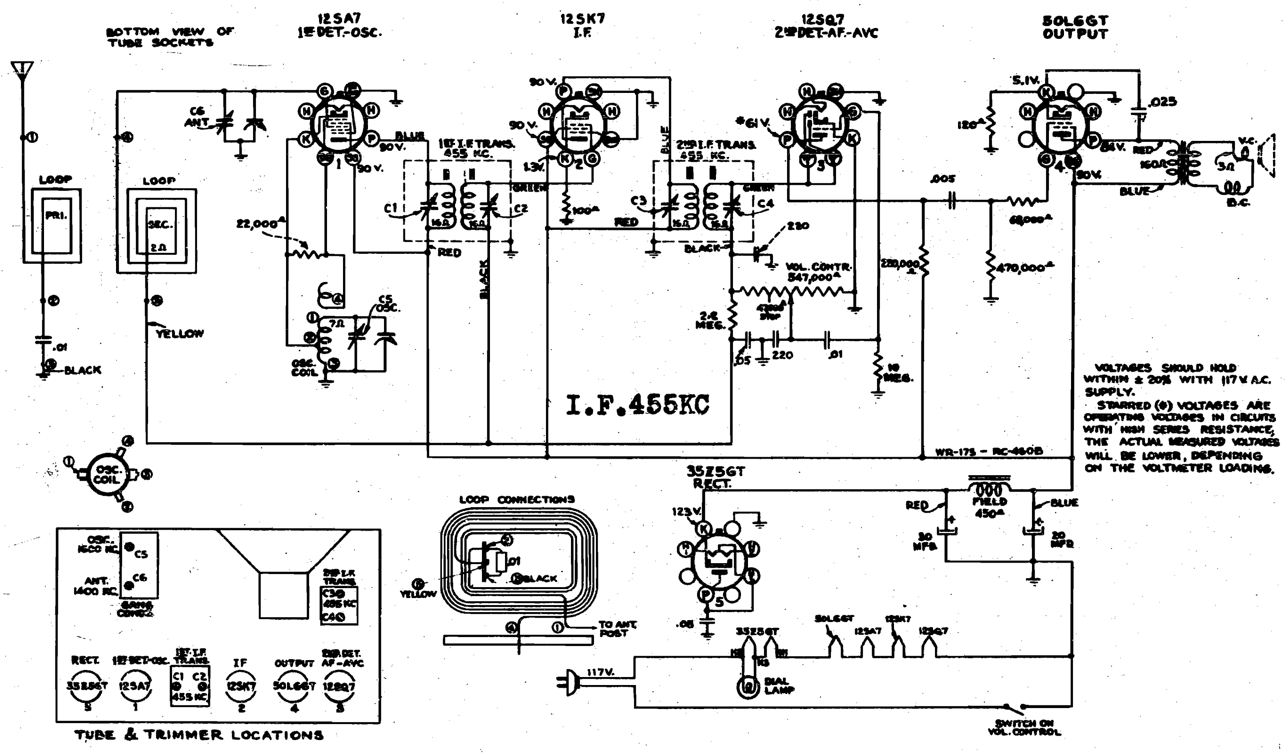
TRIM OSC 1720 KC
TRIM ANT 1500 KC



Schematic Circuit Diagram Model WR-174L

MODEL WR-175
MODEL WR-176

WESTINGHOUSE ELEC. SUPPLY CO. INC.



Schematic Circuit Diagram Model WR-175

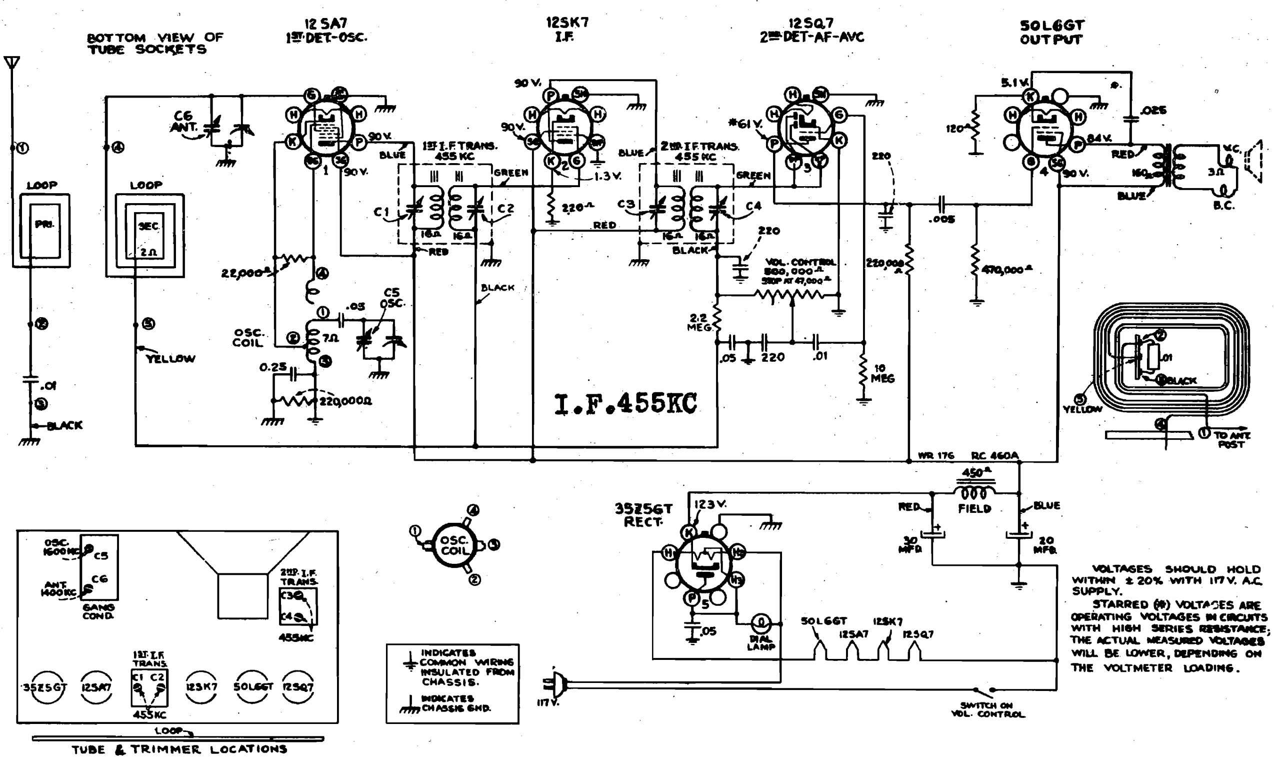
Power Supply Ratings

105-125 volts, 50-60 cycles, 30 watts
105-125 volts, direct current, 30 watts

Precautionary Lead Dress

1. Dress 1st I-F plate and grid leads against chassis and away from each other. Dress plate lead from 12SK7 close to chassis.
2. Dress leads from terminal board on loop support away from loop.

FOR OTHER DATA SEE INDEX

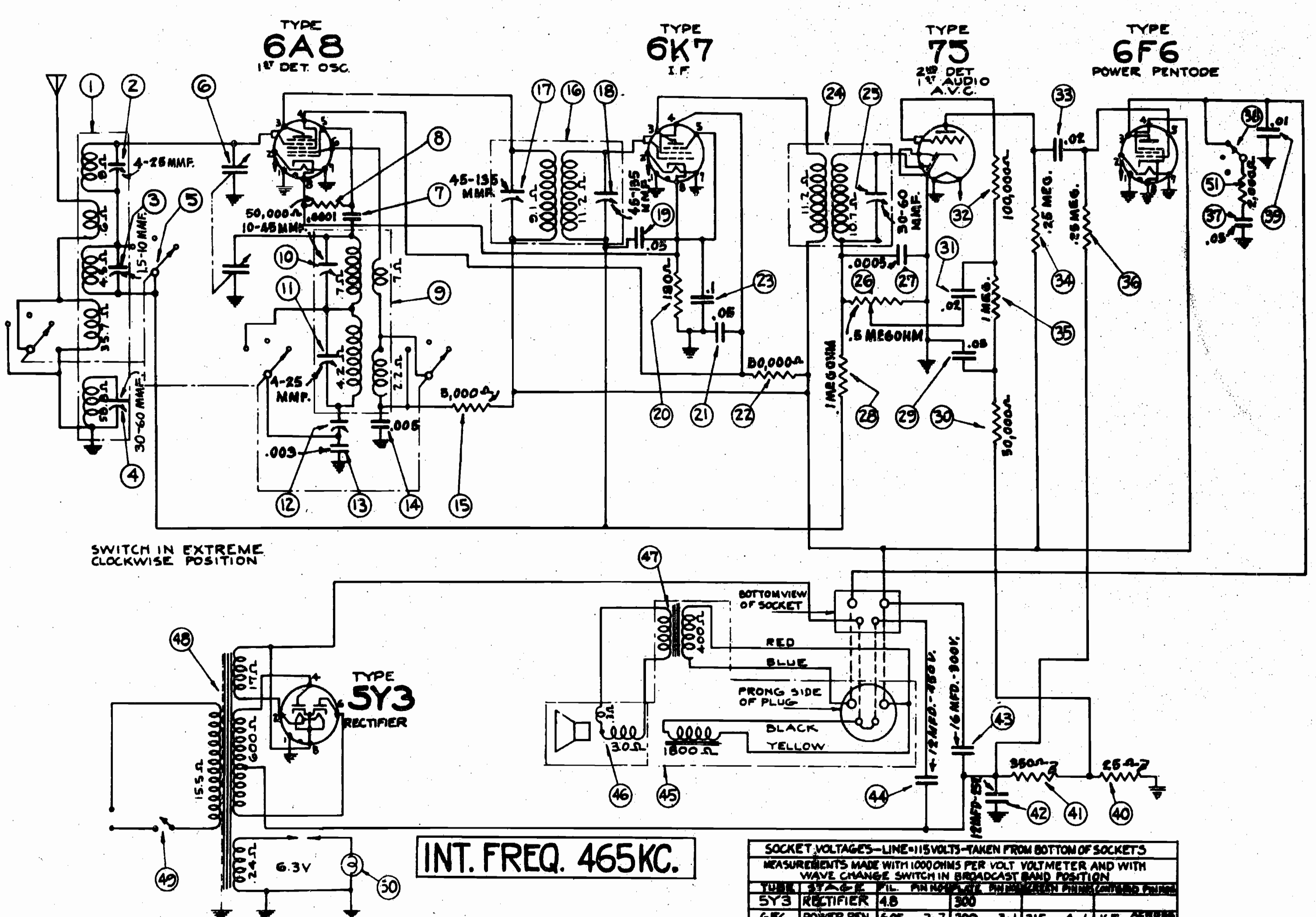


Schematic Circuit Diagram Model WR-176

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODELS WR-210, WR-310

WESTINGHOUSE RADIO MODELS WR-210 AND WR-310



INT. FREQ. 465KC.

SOCKET VOLTAGES—LINE=115 VOLTS—TAKEN FROM BOTTOM OF SOCKETS									
MEASUREMENTS MADE WITH 1000 OHMS PER VOLT VOLTMETER AND WITH WAVE CHANGE SWITCH IN BROADCAST BAND POSITION									
TUBE	STAGE	FIL.	PIN NOS.	PLATE	PIN NOS.	SCREEN	PIN NOS.	CONTROL GRID	PIN NOS.
5Y3	RECTIFIER	4.8		300					
6F6	POWER PEN.	6.05	2-7	200	3-1	215	4-1	-16.5	ACROSS 40 & 41
75	2ND DET-AUDIO	6.05		100				-1.08	ACROSS 28
6K7	I F.	6.05	2-7	215	3-1	75	4-1	-2.25	8-1
6A8	DET.-OSC.	6.05	2-7	215 DET. 130 OSC.	3-1 6-1	75	4-1	-2.25	8-1

MODELS WR-210, WR-310 **WESTINGHOUSE ELEC. SUPPLY CO. INC.**

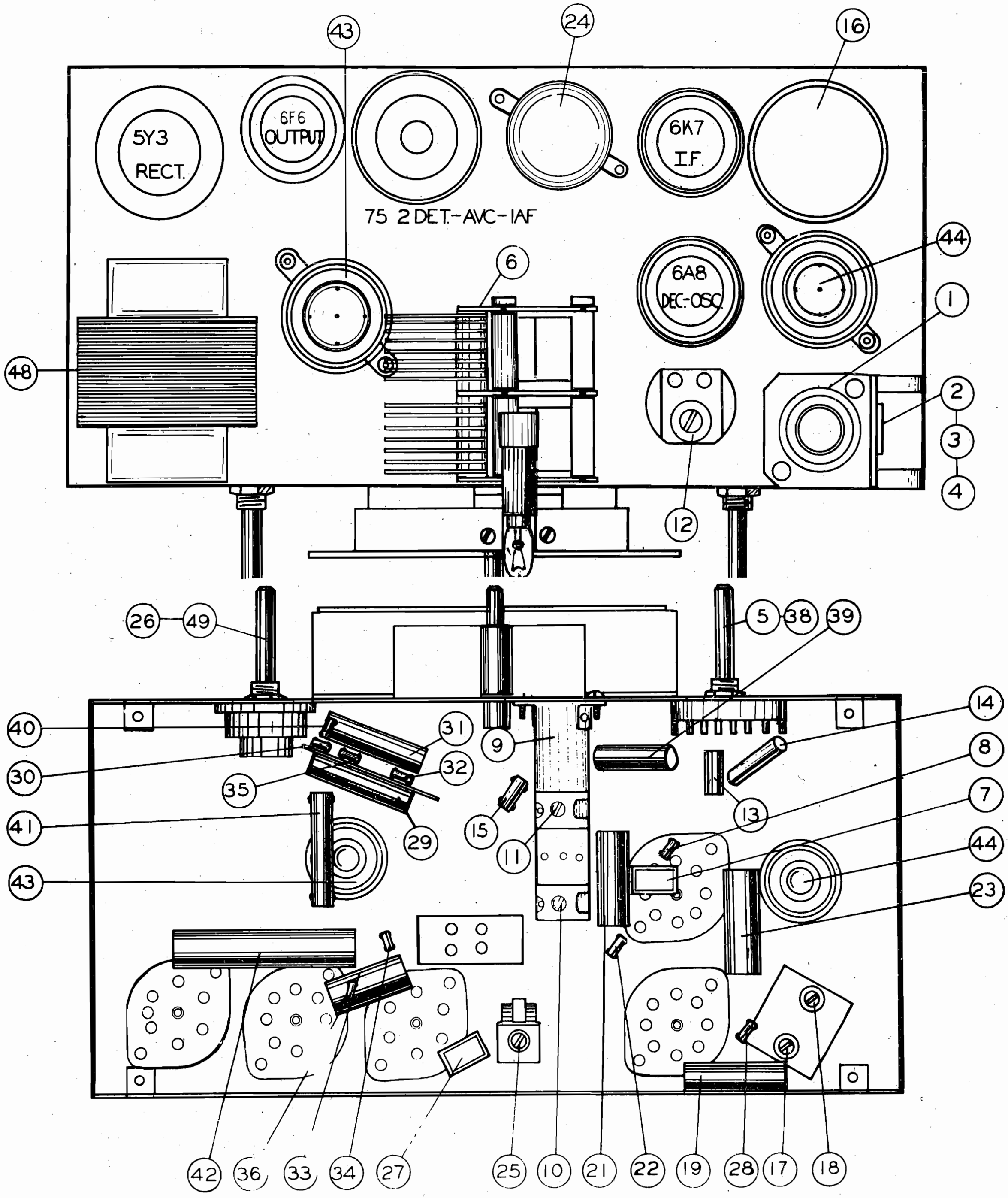


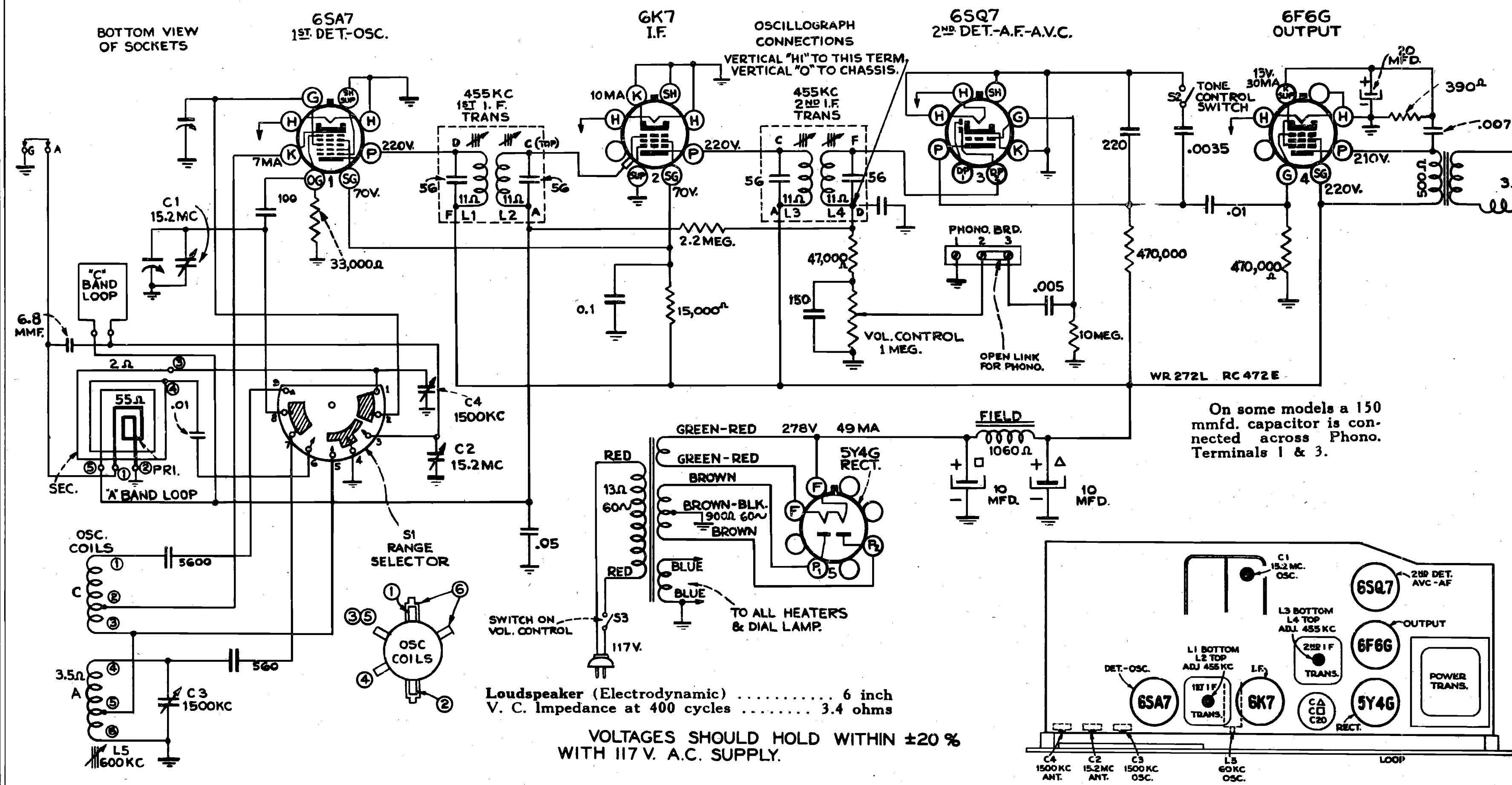
Figure No. 2

I-F ALIGNMENT: Volume control, maximum.Tone control treble.Wave switch,broadcast.Dial set 600 kc.Apply 465 kc to grid of 6K7 i-f tube. Adjust trimmer 25 for maximum output.Apply 465 kc to grid of 6A8 and adjust trimmers 17 and 18 for maximum output.

BROADCAST BAND ALIGNMENT: Apply 465 kc to antenna lead;adjust wavetrap trimmer 4 for minimum output. Apply 1700 kc through .0002 mf dummy; adjust trimmer 11 until signal is received.Adjust trimmer 3 (middle). Set dial and generator to 600 kc;adjust trimmer 12.

S-W BAND ALIGNMENT: Wave switch to s-w position. Set dial and generator to 6000 kc;adjust trimmer 10 until signal is received. Adjust trimmer 2 (top) for maximum output.

WESTINGHOUSE ELEC. SUPPLY CO. INC. MODEL WR-272L



On some models a 150 mmfd. capacitor is connected across Phono. Terminals 1 & 3.

Loudspeaker (Electrodynamic) .... 6 inch
V. C. Impedance at 400 cycles .... 3.4 ohms

VOLTAGES SHOULD HOLD WITHIN ±20 % WITH 117 V. A.C. SUPPLY.

Tube and Trimmer Location

Frequency Range
Standard Broadcast (A) .... 540-1,560 kc
Short Wave (C) .... 5.8-18 mc

Intermediate Frequency .... 455 kc

Power Supply Rating
Rating A .... 105-125 volts, 50-60 cycles, 60 watts
Rating B .... 105-125 volts, 25-60 cycles, 60 watts

Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push buttons by turning counter-clockwise about one turn from their tight position so they turn freely.

2. Check to be sure the link connection on back of chassis is in "Radio" position (connected between terminals 2 and 3).

3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than 1/4 turn after the screw begins to grip or damage to the mechanism may result.

4. Proceed in a similar manner for the remainder of the push-buttons.

5. Insert the station marker tabs in the recesses above the push-buttons.

MODEL 272L

WESTINGHOUSE ELEC. SUPPLY CO. INC.

Alignment Procedure

Before proceeding with alignment the following lead dress should be carefully checked.

1. Dress loop lead (3) away from tap lead (4) and chassis.
2. Dress AC power leads away from sockets.
3. Dress leads from band switch to trimmers away from each other and away from chassis.
4. Dress blue lead and two green leads from terminal board away from chassis and away from each other.
5. Dress green lead from volume control to rear terminal away from all parts and against chassis.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic drawing.

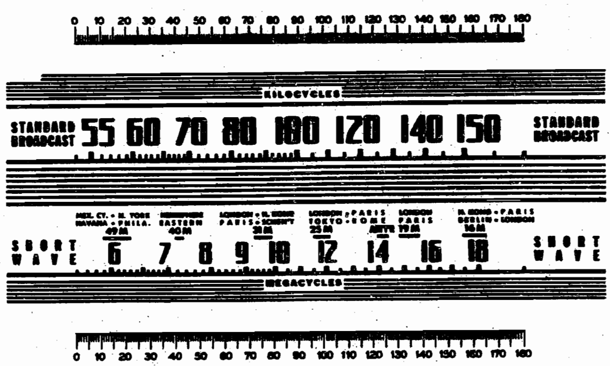
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

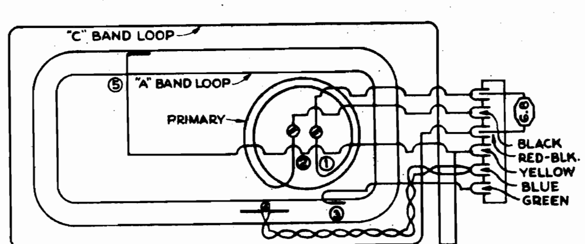
Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator 1/16 inch to the left of the mark at the extreme left (540 kc) end of the dial scale, with gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.



Receiver Dial Scales, and Corresponding 0-180° Calibration Scales

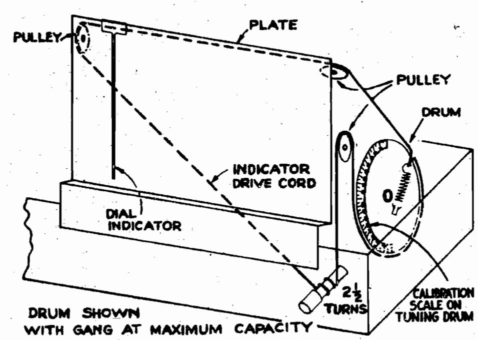
The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 24° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."



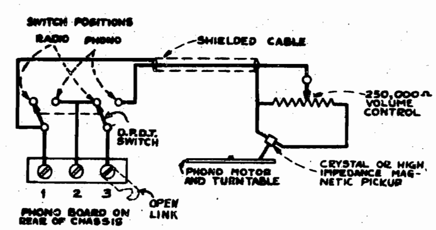
Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	I-F grid through 0.1 mfd. capacitor and ground	455 kc	Quiet point between 550-750 kc	L-3 and L-4 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd. capacitor and ground	455 kc		L-1 and L-2 (1st I-F trans.)
3	Antenna terminal (open link between "A" and "G") in series with 300 ohms	15.2 mc	15.2 mc (134°) "C" band	C-1 oscillator*
4		15.2 mc	Rock at 15.2 mc (134°)	C-2 antenna† while rocking
5	Antenna terminal (open link between "A" and "G") in series with 200 mmfd.	1,500 kc	1,500 kc (156°) "A" band	C-3 oscillator C-4 antenna
6		600 kc	Rock at 600 kc (24°) "A" band	L-5 oscillator while rocking
7		1,500 kc	1,500 kc (156°) "A" band	C-3 oscillator C-4 antenna

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.



Dial-Indicator and Drive Mechanism



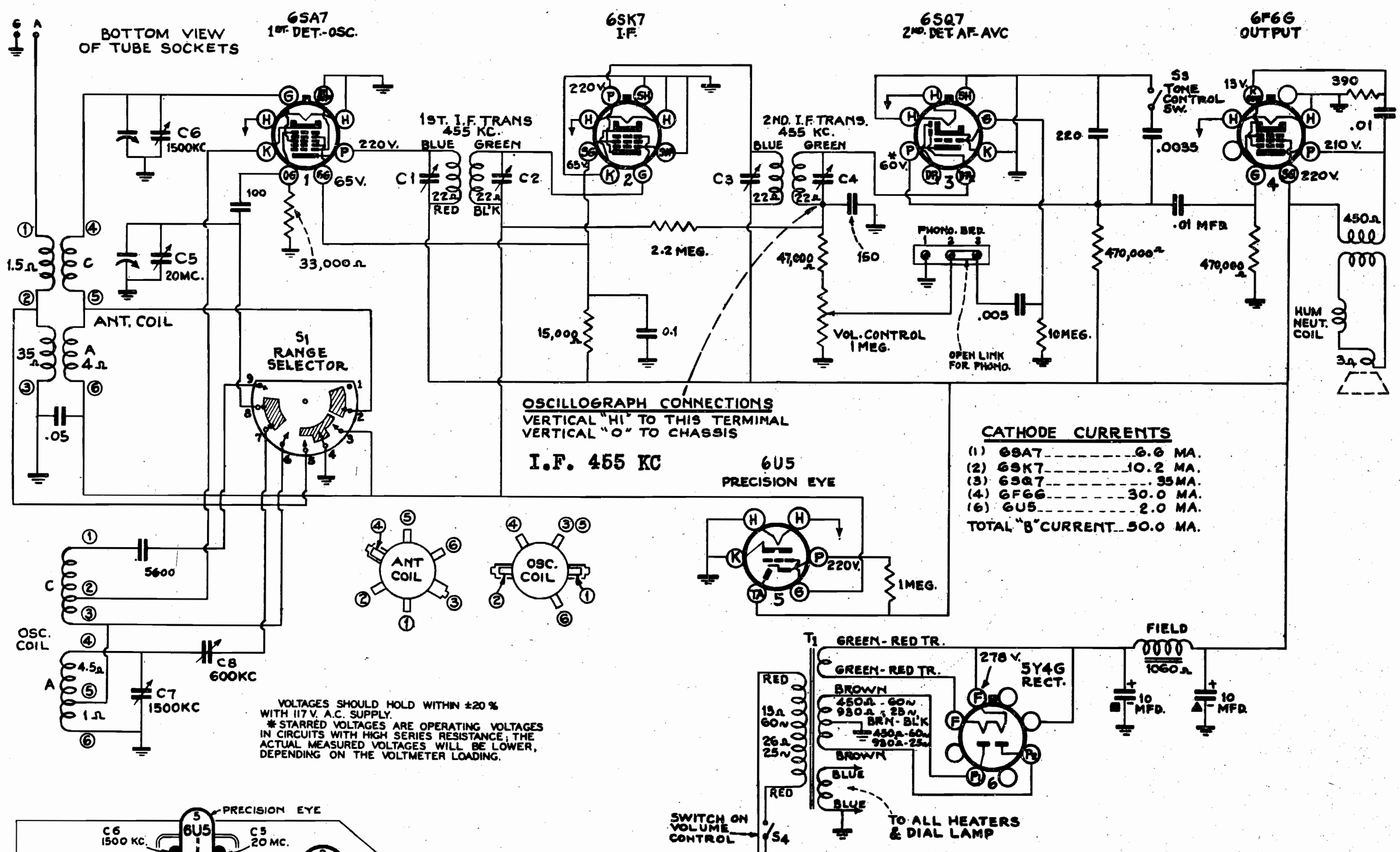
Record Player Connections, Using a Double-Pole Double-Throw Toggle Switch

The accompanying schematic shows connections for a high-impedance pickup with switch for changing from radio to records. For low-impedance pickups, a suitable step-up transformer should be used to provide proper impedance matching, and should be connected between the pickup and radio-phono switch.

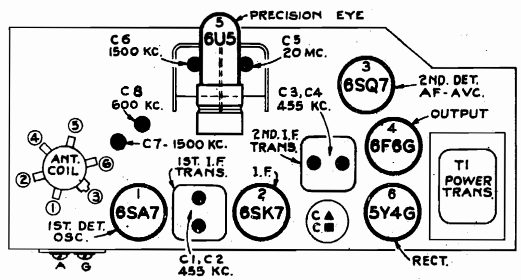
Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws, holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-272



Model WR-272 Schematic Circuit Diagram



Model WR-272, Tube and Trimmer Locations

FOR OTHER DATA SEE INDEX

TUBE COMPLEMENT

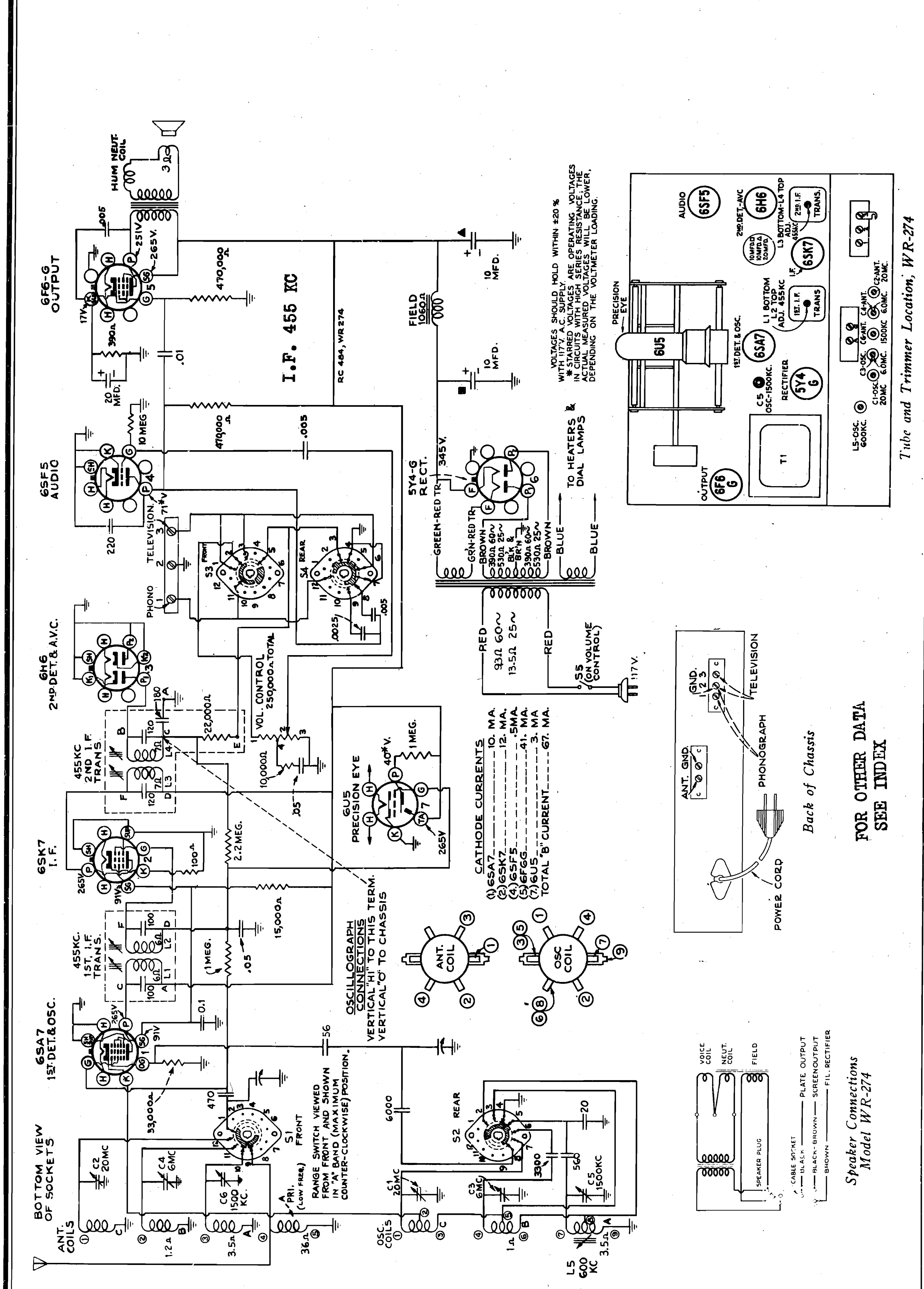
Model WR-272

(1) RCA-6SA7 .... First Detector-Oscillator
(2) RCA-6SK7 .... I-F Amplifier
(3) RCA-6SQ7 .... Second Det., A.V.C. and A-F Amplifier
(4) RCA-6F6G .... Power Output
(5) RCA-6U5 .... Precision Eye
(6) RCA-5Y4G .... Full Wave Rectifier

DIAL LAMP .... Mazda 51, 7.5 volts, 0.2 amp.

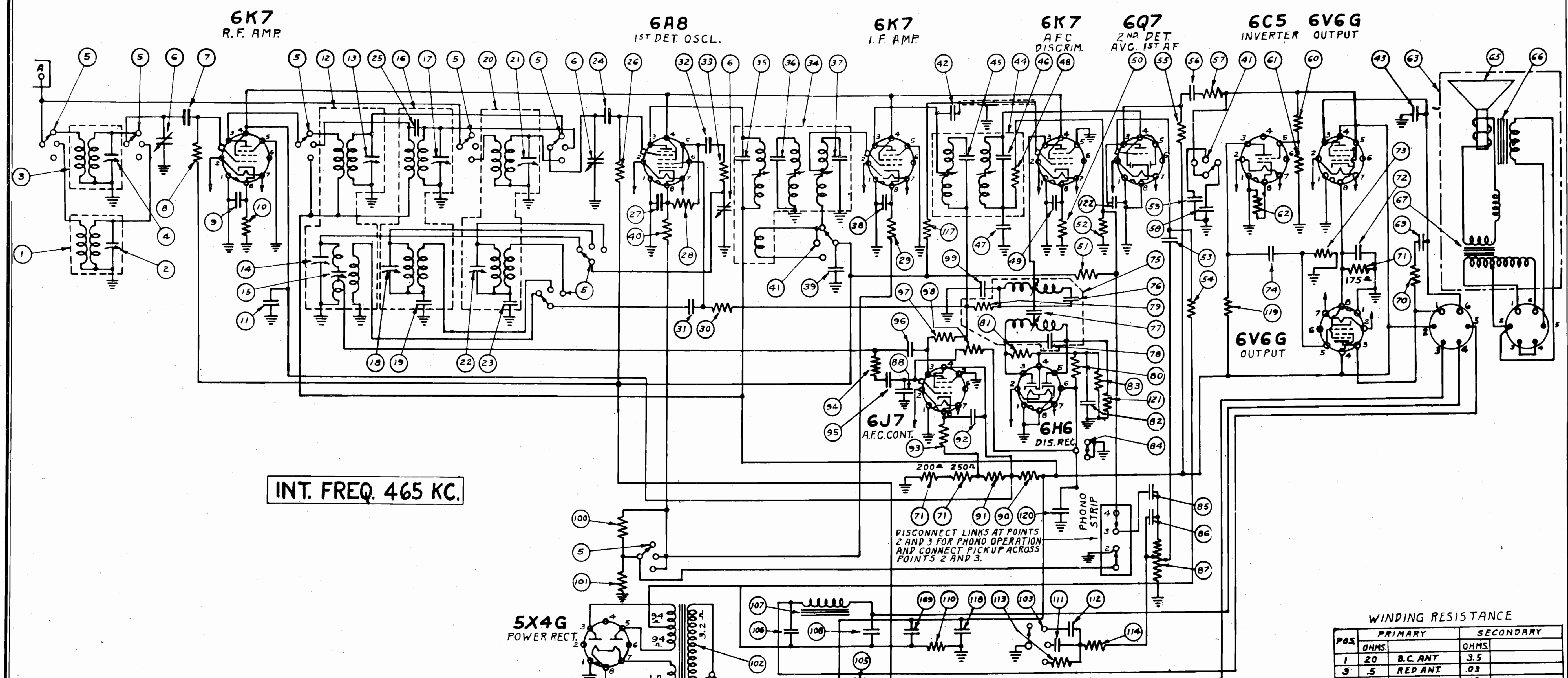
MODEL WR-274

WESTINGHOUSE ELEC. SUPPLY CO. INC.



MODEL WR-334

WESTINGHOUSE ELEC. SUPPLY CO. INC.



SOCKET VOLTAGES

TUBE	STAGE	FIL	PIN NO.	PLATE	PIN NO.	SCREEN	PIN NO.	BIAS.	CATH	OSCL. PL. VOL.
6K7	R.F. AMP.	6.3	2 TO 7	255	1 TO 3	107	1 TO 4	—	3.2	
6A8	1ST DET. OSC.	"	"	"	"	"	"	—	5-BRO. 3 P-S.W.	220
6K7	I.F. AMP.	"	"	"	"	"	"	—	4.5 BRO. 3 P-S.W.	
6Q7	2ND DET.	"	"	120	"	—	—	-1.8	—	
6C5	INVERTER	"	"	180	"	—	—	—	4	
6V6G	OUTPOT	"	"	250	"	255	1 TO 4	—	13.5	
6V6G	" "	"	"	"	"	"	"	—	"	
6H6	DISC. REC.	"	"	—	—	—	—	—	—	
6J7	A.F.C. CONT.	"	"	180	1 TO 3	107	1 TO 4	—	4.4	
5X4G	POW. REC.	5	7 TO 8	—	—	—	—	—	390	
6U5	EYE	6.3	1 TO 6	255	—	—	—	—	175	

WINDING RESISTANCE

POS.	PRIMARY		SECONDARY	
	OHMS.		OHMS.	
1	20	B.C. ANT	3.5	
3	.5	RED ANT.	.03	
12	1.5	B.C. R.F.	13	
12	1.3	B.C. OSCL.	.5 2	HIGH END TO TAP LOW END TO TAP
16	2	POLICE R.F.	.03	
16	.5	RED OSCL.	.03	
20	1.5	POLICE ANT.	.6	
20	.5	" OSCL.	1.2	
34	9	1ST I.F.	4.5 TO TAP	LINK 9 OHMS
44	5 TO TAP	DIODE TRANS.	10	
75	5 TO TAP	DISCRIM. "	10	
107	92	CHOKE		
68	2	VOICE COIL		
67	225 TO TAP	OUTPUT TR.	.05	
66	400	SPK. FIELD		

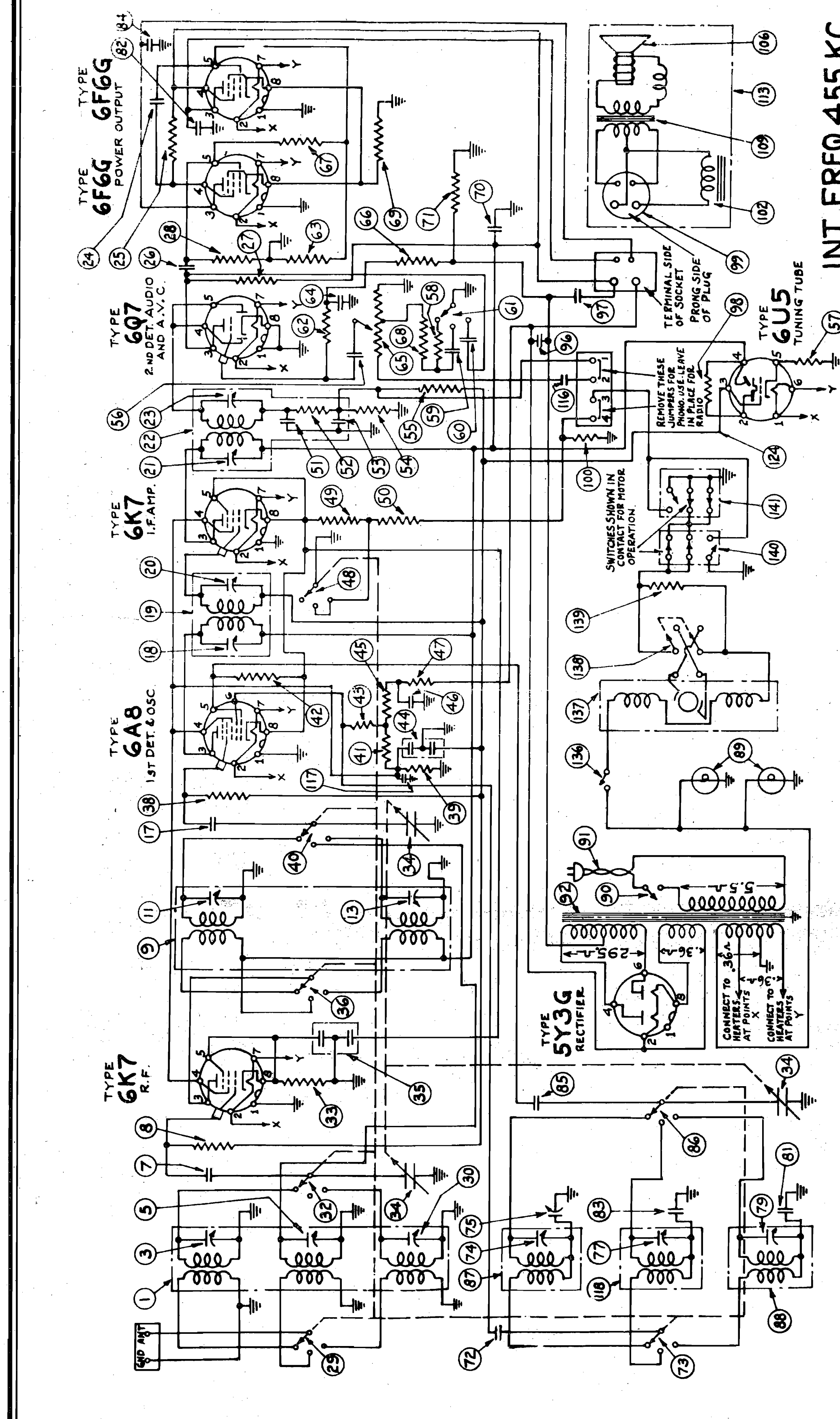
ELECTRICAL SPECIFICATIONS

Power Consumption -------------------- 115 Watts
Maximum Output -------------------- 14 Watts
Maximum Undistorted Output -------------------- 10 Watts
Tuning Ranges -------------------- (Brown Band 535 - 1800 KC.
(Green Band 1700 - 6000 KC.
(Red Band 5800 - 18500 KC.
Line-Up Frequencies ------------- I.F. 465 KC., 1500 KC., 600 KC., 5000 KC., 16,000 KC.

FOR OTHER DATA, SEE INDEX

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-342



INT. FREQ. 455 KC

FOR OTHER DATA, SEE INDEX

WINDING RESISTANCES

POS	PRIMARY OHMS	PRIMARY	SECONDARY OHMS	SECONDARY	POS	PRIMARY OHMS	PRIMARY	SECONDARY OHMS	SECONDARY
1	21.	B-C.	4.2	B-C	87	1.6	B-C	7.5	B-C
	0.4	POLICE	1.2	POLICE	88	0.9	S-W	0.3	S-W
	0.7	S-W	0.3	S-W	102	1000	FIELD		
9	1.9	B-C	11	B-C	106	1.8	VOICE COIL		
	1.4	S-W	0.3	S-W	109	500	OUTPUT TR	1.5	OUTPUT TR
19	8.8		8.8		118	0.8	POLICE	1.2	POLICE
22	8.8		8.8						

SOCKET VOLTAGES

TUBE	STAGE	FIL.	PIN NO	PLATE	PIN NO	SCREEN	PIN NO	BIAS	CATH
6K7	R.F.	6.0	2 TO 7	252	1 TO 3	108.	1 TO 4		3.5
6A8	1ST DET. & OSC.	6.0	2 TO 7	252	1 TO 3	108.	1 TO 4		5.8
6K7	I.F. AMP.	6.0	2 TO 7	252	1 TO 3	108.	1 TO 4		5.8
6Q7	2ND DET. AVC	6.0	2 TO 7	100	1 TO 3			-1.7	
6F6G	PWR OUTPUT	6.0	2 TO 7	228	1 TO 3	234.	1 TO 4		18.
6F6G	PWR OUTPUT	6.0	2 TO 7	226	1 TO 3	255.	1 TO 4		18.
5Y3G	RECTIFIER	4.6	2 TO 8						355.

MODEL WR-334
MODEL WR-342

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-334

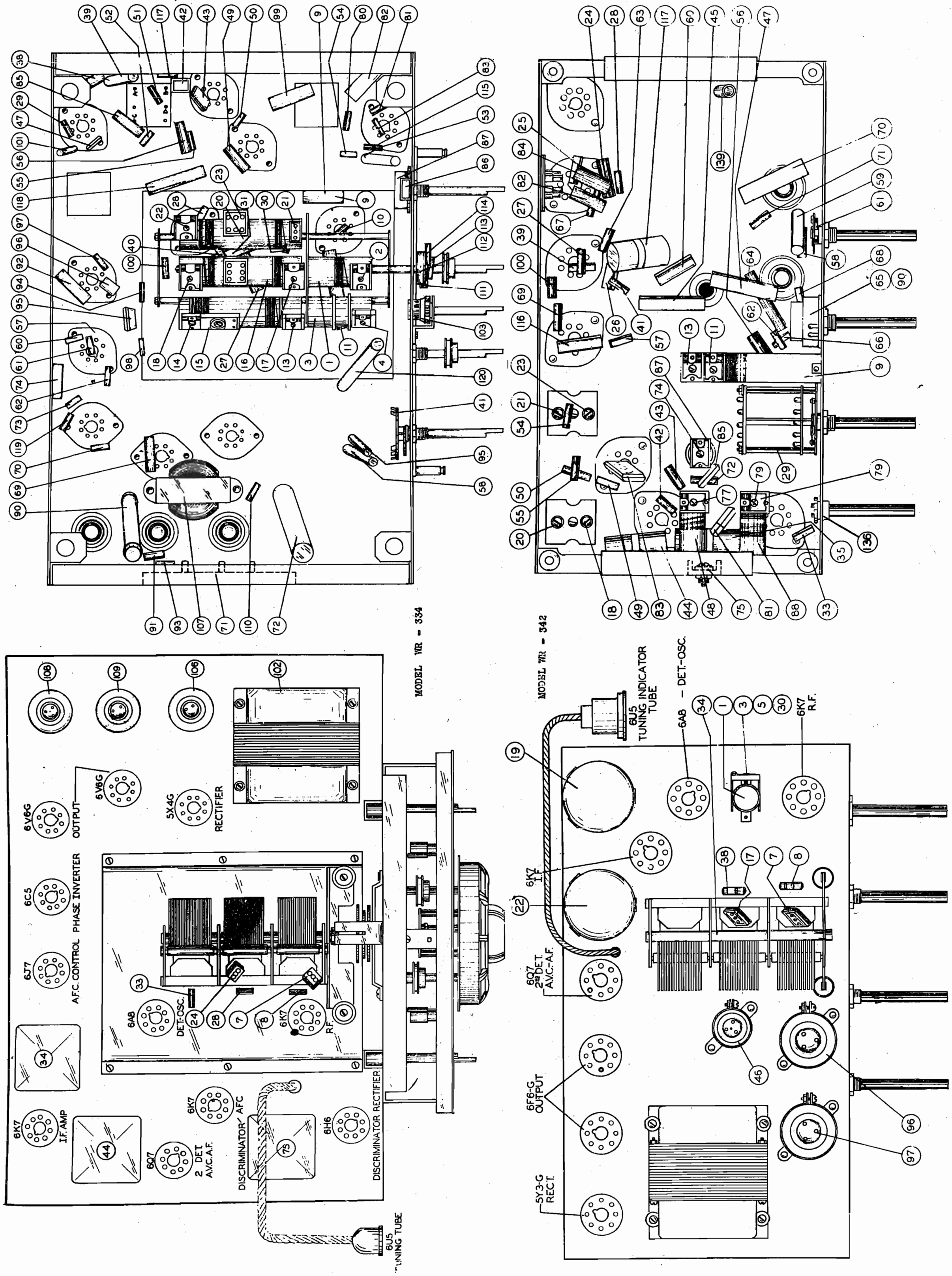
Dia. #	Part #	Description of Parts
1	RC 95312	Short-wave antenna coil
2		4-35 mmf. trimmer - part of RC 95312
3	RC 95311	Broadcast antenna coil
4		4-35 mmf. trimmer - part of RC 95311
5	SW 9586	Wave change switch
6	CG 9566	Variable gang condenser
7	CM 9519	500 mmf. mica condenser .
8	RE 1043	100,000 ohm, 1/2 W. resistor
9	CW 2-05	.05 mfd., 200 V. condenser
10	RE 3313	330 ohm, 1/2 W. resistor
11	CW 4-10	.1 mfd., 400 V. condenser
12	RC 95313	Broadcast composite coil
13		4-35 mmf. trimmer - part of RC 95313
14		5-25 mmf. trimmer - part of RC 95313
15		300-600 mmf. oscillator lag cond. -
16	RC 95315	Short-wave composite coil
17-18		4-35 mmf. trimmer - part of RC 95315
19		.0034 mfd. oscillator lag condenser -
20	RC 95314	Police composite coil
21		10 mmf. trimmer - part of RC 95314
22		4-35 mmf. trimmer - part of RC 95314
23		.001 mfd. oscillator lag condenser -
24	CM 9519	500 mmf. mica condenser
25		10 mmf. mica condenser - part of RC 95315
26	RE 1043	100,000 ohm, 1/2 W. resistor
27	CW 2-05	.05 mfd., 200 V. condenser
28	RE 4733	47,000 ohm, 1/2 W. resistor
29	RE 2713	270 ohm, 1/2 W. resistor
30	RE 562412	5600 ohm, 1 W. resistor
31	CW 4-01	.01 mfd., 400 V. condenser
32	CM 9513	100 mmf. mica condenser
33	RE 1213	120 ohm, 1/2 W. resistor
34	IC 95117	1st I.F. transformer
35		100 mmf. trimmer - part of IC 95117
36-37		107 mmf. trimmer - part of IC 95117
38	CW 2-05	.05 mfd., 200 V. condenser
39	CW 4-05	.05 mfd., 400 V. condenser
40	RE 2213	220 ohm, 1/2 W. resistor
41	SW 9588	Treble control switch
42	CM 9546	5 mmf. mica condenser
43	CM 955	50 mmf. mica condenser
44	IC 95115	I.F. diode coil
45-46		107 mmf. trimmers - part of IC 95115
47	CM 9513	100 mmf. mica condenser
48	RE 4733	47,000 ohm, 1/2 W. resistor
49	CW 2-05	.05 mfd., 200 V. condenser
50	RE 3313	330 ohm, 1/2 W. resistor
51	RE 4743	470,000 ohm, 1/2 W. resistor
52	RE 4743	470,000 ohm, 1/2 W. resistor
53	CW 4-02	.02 mfd., 400 V. condenser
54	RE 4743	470,000 ohm, 1/2 W. resistor
55	RE 2243	220,000 ohm, 1/2 W. resistor
56	CW 4-02	.02 mfd., 400 V. condenser
57	RE 4733	47,000 ohm, 1/2 W. resistor
58	CW 6-003	.003 mfd., 600 V. condenser
59	CW 6-001	.001 mfd., 600 V. condenser
60	RE 3943	390,000 ohm, 1/2 W. resistor
61	RE 6833	68,000 ohm, 1/2 W. resistor
62	RE 5613	560 ohm, 1/2 W. resistor
63	SK 9584	Speaker
65	DM 9528	Speaker diaphragm assembly
66	CL 9570	Speaker field coil
67	TR 95151	Speaker output transformer
69	CW 6-001	.001 mfd., 600 V. condenser
70	RE 225412	22,000 ohm, 1 W. resistor
71	RE 95141	200-250 ohm - voltage divider resistor
72	CE 9569	12 mfd., 50 V. electrolytic condenser
73	RE 4743	470,000 ohm, 1/2 W. resistor
74	CW 4-02	.02 mfd., 400 V. condenser
75	IC 95116	Descriminator coil
76-78		107 mmf. trimmers - part of IC 95116
77		100 mmf. trimmers - part of IC 95116
79	RE 2222	2200 ohm, 1/2 W. resistor
80	RE 1053	1 meg., 1/2 W. resistor
81	RE 4743	470,000 ohm, 1/2 W. resistor
82	CW 4-05	.05 mfd., 400 V. condenser
83	RE 1053	1 meg., 1/2 W. resistor
84	SW 9589	A.F.C. switch
85	CW 4-02	.02 mfd., 400 V. condenser
86	CM 953	50 mmf. mica condenser
87	VR 9555	2 meg. mid-tapped volume control
88	CM 9516	25 mmf. mica condenser
90	RE 1036	10,000 ohm, 1/2 W. resistor
91	RE 1534	15,000 ohm, 1/2 W. resistor
92	CW 4-05	.05 mfd., 400 V. condenser
93	RE 3313	330 ohm, 1/2 W. resistor
94	RE 4733	47,000 ohm, 1/2 W. resistor
95	CM 953	50 mmf. mica condenser
96	CM 9519	500 mmf. mica condenser
97	RE 4733	47,000 ohm, 1/2 W. resistor
98	RE 4743	47,000 ohm, 1/2 W. resistor
99	CW 4-05	.05 mfd., 400 V. condenser
100	RE 1013	100 ohm, 1/2 W. resistor
101	RE 2233	22,000 ohm, 1/2 W. resistor
102	TR 95125	Power transformer 105-125 V., 50-60 cy
103	SW 9587	On-Off and bass switch
104	CB 9512	Line cable
105		1 meg. resistor - part of CB 95151
106	CE 9554	18 mfd., 450 V. electrolytic condenser
107	TR 9573	Choke
108	CE 9570	18 mfd., 450 V. electrolytic condenser
109	CE 9562	18 mfd., 300 V. electrolytic condenser
110	RE 1203	12 ohm, 1/2 W. resistor
111	CW 6-005	.005 mfd., 600 V. condenser
112	CW 6-002	.002 mfd., 200 V. condenser
113	RE 1043	100,000 ohm, 1/2 W. resistor
114	RE 1043	100,000 ohm, 1/2 W. resistor
115	RE 3313	330 ohm, 1/2 W. resistor
116	LP 9510	Dial lamp 6.3 V., .25 amp.
117	RE 4743	470,000 ohm, 1/2 W. resistor
118	CW 4-10	.1 mfd., 400 V. condenser
119	RE 1033	10,000 ohm, 1/2 W. resistor
120	CW 4-10	.1 mfd., 400 V. condenser
121	RE 4743	470,000 ohm, 1/2 W. resistor
122	CW 6-001	.001 mfd., 600 V. condenser

MODEL WR-342

Dia. #	Part #	Description
1	RC 95306	Antenna composite coil
3,5		4-35 mmf. trimmer condenser
7	CM 9519	.0005 mfd. mica condenser
8	RE 2743	270,000 ohm, 1/2 W. resistor
9	RC 95307	R.F. composite coil
11,13		4-35 mmf. trimmer condenser
17	CM 9519	.0005 mfd. mica condenser
18		80-200 mmf. trimmer condenser
19	IC 95119	1st I.F. coil assembly
20		80-200 mmf. trimmer condenser
21		80-200 mmf. trimmer condenser
22	IC 95120	2nd I.F. coil assembly
23		80-200 mmf. trimmer condenser
24	CW 4-01	.01 mfd., 400 V. condenser
25	RE 1023	1,000 ohm, 1/2 W. resistor
26	CW 4-02	.02 mfd., 400 V. condenser
27	RE 1043	100,000 ohm, 1/2 W. resistor
28	RE 1843	180,000 ohm, 1/2 W. resistor
29	SW 95103	Wave-change switch
30		4-35 mmf. trimmer condenser
33	RE 3913	390 ohm, 1/2 W. resistor
34	CG 9576	Gang condenser
35	CW 9535	.1-.1 mfd., 400 V. dual condenser.
38	RE 2743	270,000 ohm, 1/2 W. resistor
39	RE 6833	68,000 ohm, 1/2 W. resistor
41	RE 1033	10,000 ohm, 1/2 W. resistor
42	RE 4733	47,000 ohm, 1/2 W. resistor
43	RE 472412	4700 ohm, 1 W. resistor
44	CW 9535	.1-.1 mfd., 400 V. dual condenser
45	RE 103522	10,000 ohm, 2 W. resistor
46	CE 9568	8 mfd., 450 V. electrolytic condenser
47	RE 682522	6800 ohm, 2 W. resistor
49	RE 1513	150 ohm, 1/2 W. resistor
50	RE 1513	150 ohm, 1/2 W. resistor
51	CM 9513	.0001 mfd. mica condenser
52	RE 4733	47,000 ohm, 1/2 W. resistor
53	CM 9513	.0001 mfd. mica condenser -
54	RE 4743	470,000 ohm, 1/2 W. resistor
55	RE 4743	470,000 ohm, 1/2 W. resistor
56	CW 2-02	.02 mfd., 200 V. condenser
57	RE 2713	270 ohm, 1/2 W. resistor
58	RE 1043	100,000 ohm, 1/2 W. resistor
59	CW 6-002	.002 mfd., 600 V. condenser
60	CW 4-02	.02 mfd., 400 V. condenser
61	SW 95102	Tone control switch
62	RE 2253	2.2 meg., 1/2 W. resistor
63	RE 4743	470,000 ohm, 1/2 W. resistor
64	CW 2-10	.1 mfd., 200 V. condenser
65	VR 9561	Volume control - 2 meg. mid-tapped
66	RE 4743	470,000 ohm, 1/2 W. resistor
67	RE 3343	330,000 ohm, 1/2 W. resistor
68	RE 1043	100,000 ohm, 1/2 W. resistor
69	RE 271412	270 ohm, 1 W. resistor
70	CW 4-10	.1 mfd., 400 V. condenser
71	RE 1803	18 ohm, 1/2 W. resistor
72	CW 6-005	.005 mfd., 600 V. condenser
74		4-35 mmf. trimmer condenser - part of RC 95308
75	CS 9585	225-700 mmf. oscillator series (lag) condenser
77		4-35 mmf. trimmer condenser - part of RC 95309
79		4-35 mmf. trimmer condenser - part of RC 95310
80	CM 9545	4,050 mmf. mica condenser
82	CW 6-002	.002 mfd., 600 V. condenser
83	CM 9544	1375 mmf. mica condenser ...
84	CW 6-002	.002 mfd., 600 V. condenser
85	CM 9513	.0001 mfd. mica condenser
87	RC 95308	Broadcast oscillator coil
88	RC 95310	Short-wave oscillator coil
89	LP 9510	Dial lamp - 6.3 Volt, .25 Amp
90		Switch - part of VR 9561
91	CB 9512	Line cable and plug assembly
92	TR 95162	Power transformer - 105-125 V., 50-60 Cycle
96	CE 9554	18 mfd., 450 V. electrolytic condenser
97	CE 9562	18 mfd., 300 V. electrolytic condenser
98		1 meg., 1/4 W. resistor - part of CB 95151
99		Speaker plug - part of speaker
100	RE 1033	10,000 ohm, 1/2 W. resistor
102	CL 9572	Speaker field coil
106	DM 9528	Speaker diaphragm
109	TR 95150	Speaker output transformer
113	SK 9585	Speaker
116	CW 2-02	.02 mfd., 200 V. condenser
117	CW 9547	.5 mfd., 400 V. condenser
118	RC 95309	Police oscillator coil
124	CB 95151	Tuning tube cable and plug assembly
136	SW 95101	Switch
137	MO 951	Motor
138	SW 9582	Motor reversing switch
139	RE 95144	1.5 ohm resistor
140	SW 9584	Switch
141	SW 9599	Switch

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-334
MODEL WR-342



MODEL WR-334
MODEL WR-342

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR - 334

To properly align the circuits of the receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied when the individual circuits are brought into alignment. A conventional output meter should be connected across the speaker voice coil terminals to indicate proper alignment. The sensitivity of the output meter must be sufficient to give a satisfactory reading with a low input signal.

A zero center micro-ammeter with an approximate 0-30 scale is absolutely essential for the proper alignment of the discriminator circuit.

Before attempting to align the receiver, the circuit, position of alignment adjustments and chassis layout should be familiarized. The top and bottom views of the chassis are shown in figures #1 and #2.

ADJUSTMENT OF THE I.F. DIODE COIL 465 KC.

1. Refer to bottom view of chassis and connect a 20,000 ohm resistor between points "C" and "D" under 2nd I.F. coil #44.
2. Turn the receiver "ON" and to the position immediately after set is turned on. Set volume control on full. Set A.F.C. switch in "OFF" position. Set high fidelity control in a left hand or MINIMUM position. Set wave change switch to broadcast position.

3. Connect the output meter across the speaker voice coil.

4. Set the test oscillator to 465 KC. and adjust the output to give a readable deflection of the output meter when the signal is applied to the grid of the 6K7 I.F. tube through a .5 mfd. blocking condenser.

5. Adjust the bottom adjustment screw on coil #44 for maximum output.

6. Remove the 20,000 ohm resistor from points "C" and "D" and connect between points "A" and "B".

7. Adjust the top adjustment screw on coil #44 for maximum output.

8. Remove the 20,000 ohm resistor.

ALIGNMENT OF DISCRIMINATOR COIL

1. Connect the micro-ammeter between the #4 terminal of the 6H6 discriminator rectifier tube and ground.

2. With test signal still applied to the I.F. tube increase the signal output of the oscillator.

3. Adjust the bottom screw on the discriminator coil #75 for maximum deflection of the micro-ammeter (either direction).

4. Adjust the top screw on the discriminator coil until a zero reading on the micro-ammeter is reached. To check this alignment, vary the I.F. signal slightly to each side of the 465 setting and the micro-ammeter should show a deflection first on one side then the other of the zero point.

ADJUSTMENT OF 1ST I.F. COIL 465 KC.

1. Apply the test signal to the grid of the 6A8 detector-oscillator tube through a .5 mfd. blocking condenser.

2. Adjust first the bottom, second the middle and third the top alignment screws on I.F. coil #34 for maximum output.

ADJUSTMENT OF THE BROADCAST BAND

1. With the gang condenser completely in mesh, check the position of the dial pointer which should be at the end horizontal line of the scale.

2. Set the test oscillator and dial pointer to 1500 KC.

3. Adjust the oscillator trimmer #14.

4. Connect the test oscillator to the antenna terminal of the receiver through a .0002 mfd. condenser.

5. Adjust the R.F. and antenna trimmers #13 and #4 for maximum output.

6. Set the test oscillator and dial pointer to 600 KC.

7. Adjust the oscillator series (lag) condenser #15 at the same time turning the gang condenser slightly back and forth until a maximum is reached.

8. Return the test oscillator and dial pointer to the 1500 KC. setting and recheck trimmers #14, #13 and #4.

9. Check sensitivity and calibration over the scale.

NOTE: In adjusting the two remaining bands, a .0002 mfd. condenser and a 400 ohm resistor connected in series should be inserted between the test oscillator and the antenna terminal of the receiver. This combination is the approximate equivalent of a short wave antenna.

ADJUSTMENT OF THE GREEN BAND

1. Turn the wave change switch to the green band position.

2. Set the test oscillator and dial pointer at 5000 KC.

3. Adjust the oscillator trimmer #22.

4. Check sensitivity and calibration over the scale.

ADJUSTMENT OF THE RED BAND

1. Turn the wave change switch to the red band position.

2. Set the test oscillator and dial pointer at 16,000 KC.

3. Adjust the oscillator trimmer #18. Two positions may be found at which the signal can be heard. Use the one with the least capacity or with the trimmer farther out.

4. Adjust the R.F. and antenna trimmers #17 and #2 for maximum output.

5. Check calibration and sensitivity over the scale.

MODEL WR - 342

This model is an eight-tube, alternating-current, three-band, superheterodyne receiver, designed to operate over the standard broadcast band, extending from 535 to 1800 KC. The first short-wave band includes frequencies between 1730 and 6000 KC., and the second short-wave band includes frequencies between 5700 and 18,500 KC.

LINE-UP CAPACITOR ADJUSTMENTS

To properly align the circuits of this receiver, it is essential to use a high grade modulated test oscillator, the output of which can be continuously varied and reduced sufficiently to prevent overload as the individual circuits of the receiver are brought into alignment. A conventional output meter should be connected across the terminals of the speaker voice coil to indicate when the individual circuits are correctly aligned. The sensitivity of the meter must be sufficient to give satisfactory readings with low input signals.

ALIGNMENT OF I.F. (455 KC.)

1. Set the volume control to maximum position, the wave-change switch to the standard broadcast band and the dial pointer to approximately 600 KC.

2. Connect the output meter across the voice coil terminals of the speaker.

3. Set the test oscillator to 455 KC., and adjust its output to produce a measurable reading on the output meter when the test signal is applied to the grid of the first detector-oscillator tube through a 0.5 mfd. blocking condenser.

4. Adjust the four I.F. trimmer condensers #18, #20, #21 and #23 to maximum output.

ALIGNMENT OF BROADCAST BAND

1. Check the pointer setting to be sure that it is exactly horizontal when the tuning condenser is completely closed.

2. Set the oscillator and dial indicator at 1500 KC., and adjust the broadcast oscillator trimmer #74.
3. Set the test oscillator and dial pointer to 600 KC.

4. Adjust the oscillator lag condenser #75 for maximum output, at the same time rocking the gang condenser.

5. Reset test oscillator and gang condenser to 1500 KC., and recheck operation #2.

6. Connect the test oscillator to the antenna terminal through a .0002 mfd. condenser and adjust the R.F. and antenna trimmers #11 and #3.

7. Check sensitivity and calibration over the scale.

NOTE: In adjusting the two short-wave bands, a .0002 mfd. condenser and a 400 ohm resistor in series should be inserted between the antenna terminal and the high side of the test oscillator. This combination is the approximate equivalent of a short-wave antenna.

ALIGNMENT OF FIRST SHORT-WAVE BAND

1. Turn the wave-change switch to the first short-wave position (1730-6000 KC. scale).

2. Set the test oscillator and dial pointer to 5200 KC., and adjust the oscillator and antenna trimmers #77 and #5.

3. Check sensitivity and calibration over the scale.

ALIGNMENT OF SECOND SHORT-WAVE BAND

1. Turn the wave-change switch to the second short-wave position (5700-18,500 KC. scale).

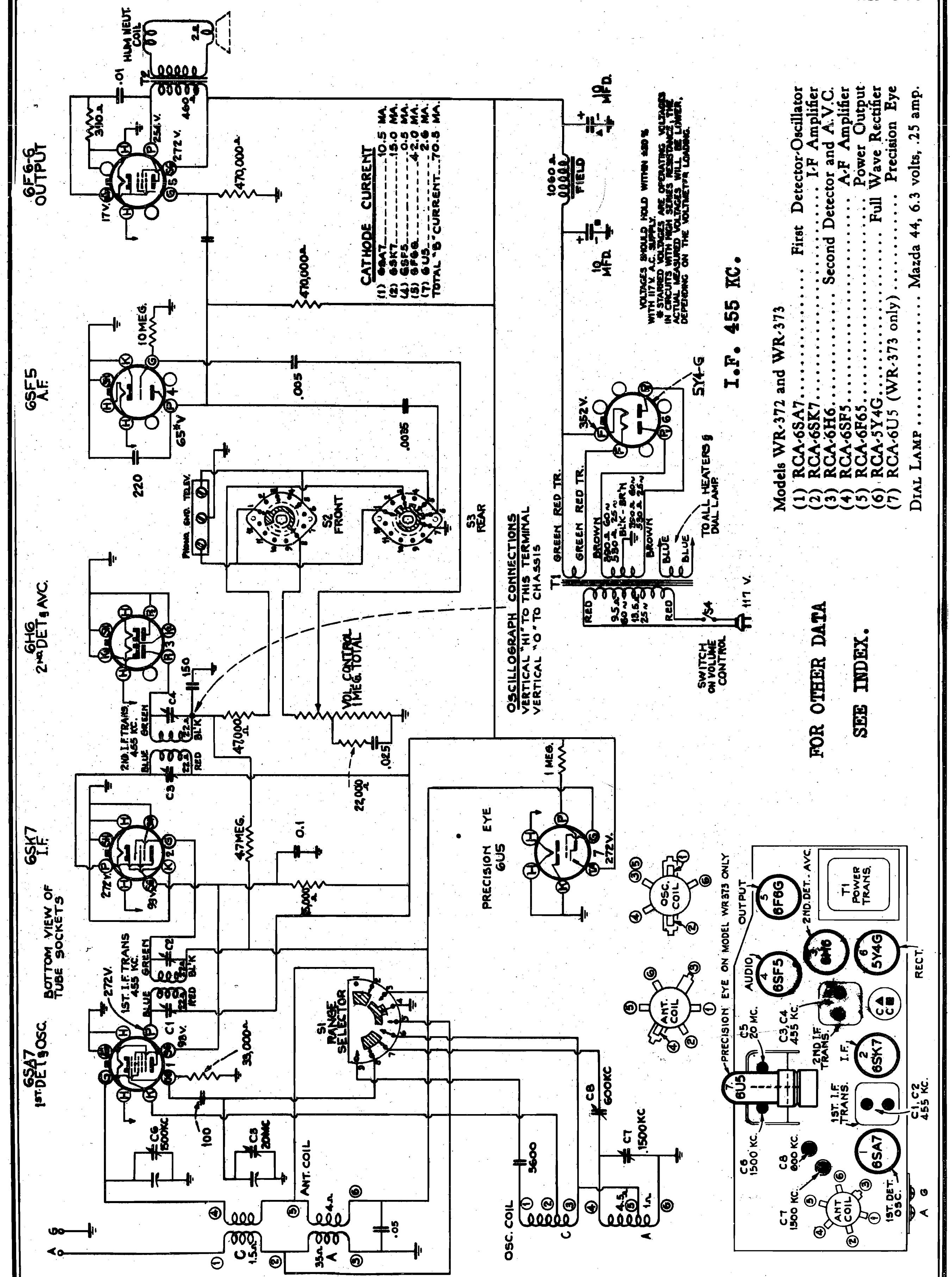
2. Set the test oscillator and dial pointer to 16,500 KC., and adjust the oscillator trimmer #79. Two positions may be found. Use the one with the least capacity, that is, with the trimmer screw farthest out.

3. Adjust the antenna trimmer #30.

4. Check sensitivity and calibration over the scale.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODELS WR-372, WR-373



CATHODE CURRENT

(1)	6SA7	10.5 MA.
(2)	6SK7	15.0 MA.
(4)	6SF5	0.5 MA.
(5)	6F6G	42.0 MA.
(7)	6U5	2.6 MA.
	TOTAL "B" CURRENT	70.5 MA.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. A.C. SUPPLY. ※ STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

I.F. 455 KC.

Models WR-372 and WR-373

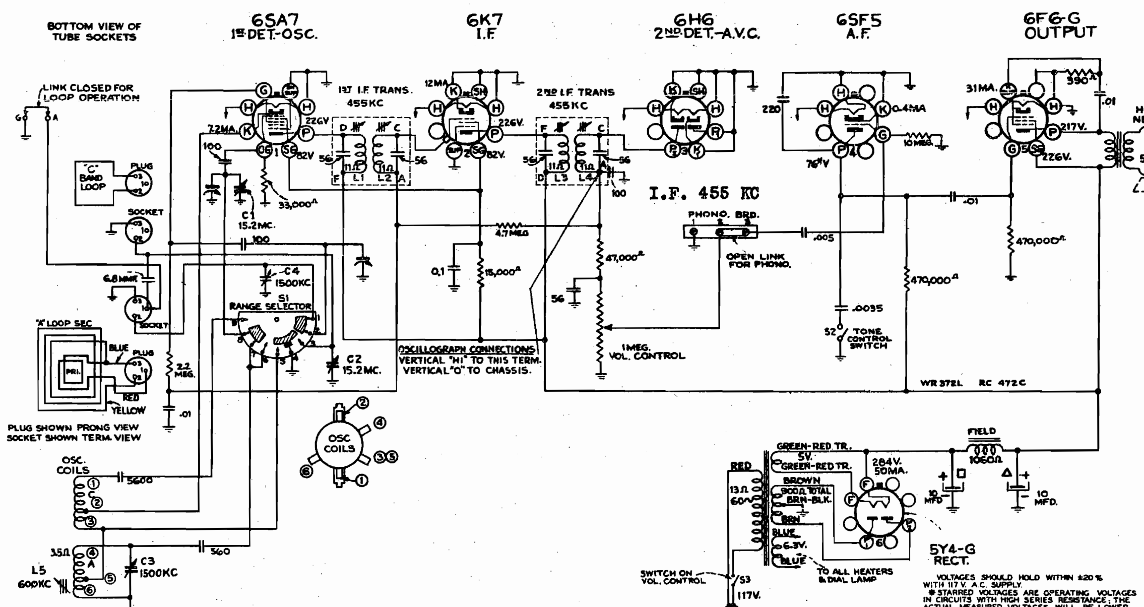
(1) RCA-6SA7 .... First Detector-Oscillator
(2) RCA-6SK7 .... I-F Amplifier
(3) RCA-6H6 .... Second Detector and A.V.C.
(4) RCA-6SF5 .... A-F Amplifier
(5) RCA-6F6G .... Power Output
(6) RCA-5Y4G .... Full Wave Rectifier
(7) RCA-6U5 (WR-373 only) .... Precision Eye

Dial Lamp .... Mazda 44, 6.3 volts, .25 amp.

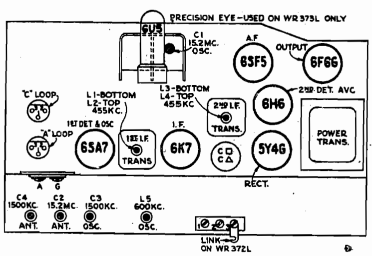
FOR OTHER DATA SEE INDEX.

MODEL WR-372L
MODEL WR-373L

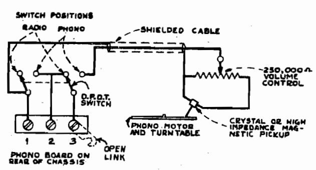
WESTINGHOUSE ELEC. SUPPLY CO. INC.



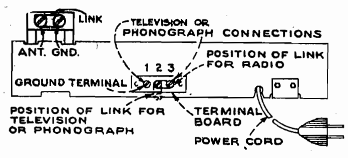
MODEL WR-372L



Tube and Trimmer Locations



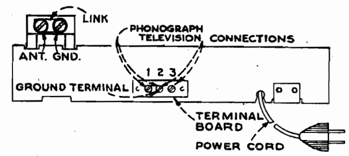
Record Player Connections, Using a Double-Pole Double-Throw Toggle Switch (Model WR-372L)



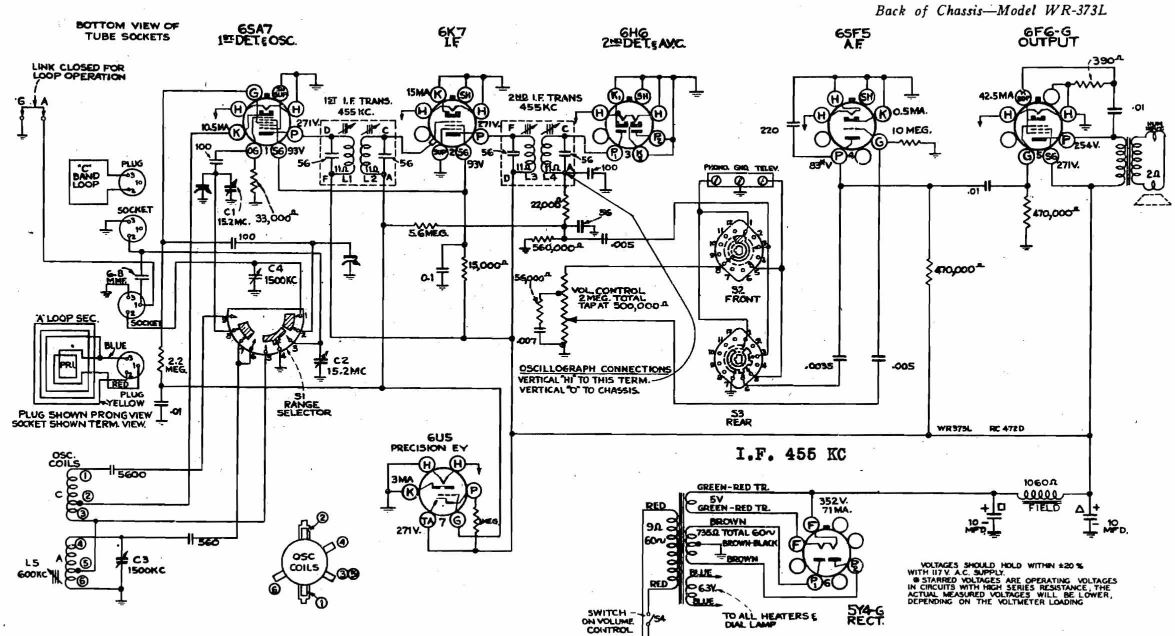
Back of Chassis—Model WR-372L

FOR OTHER DATA

SEE INDEX



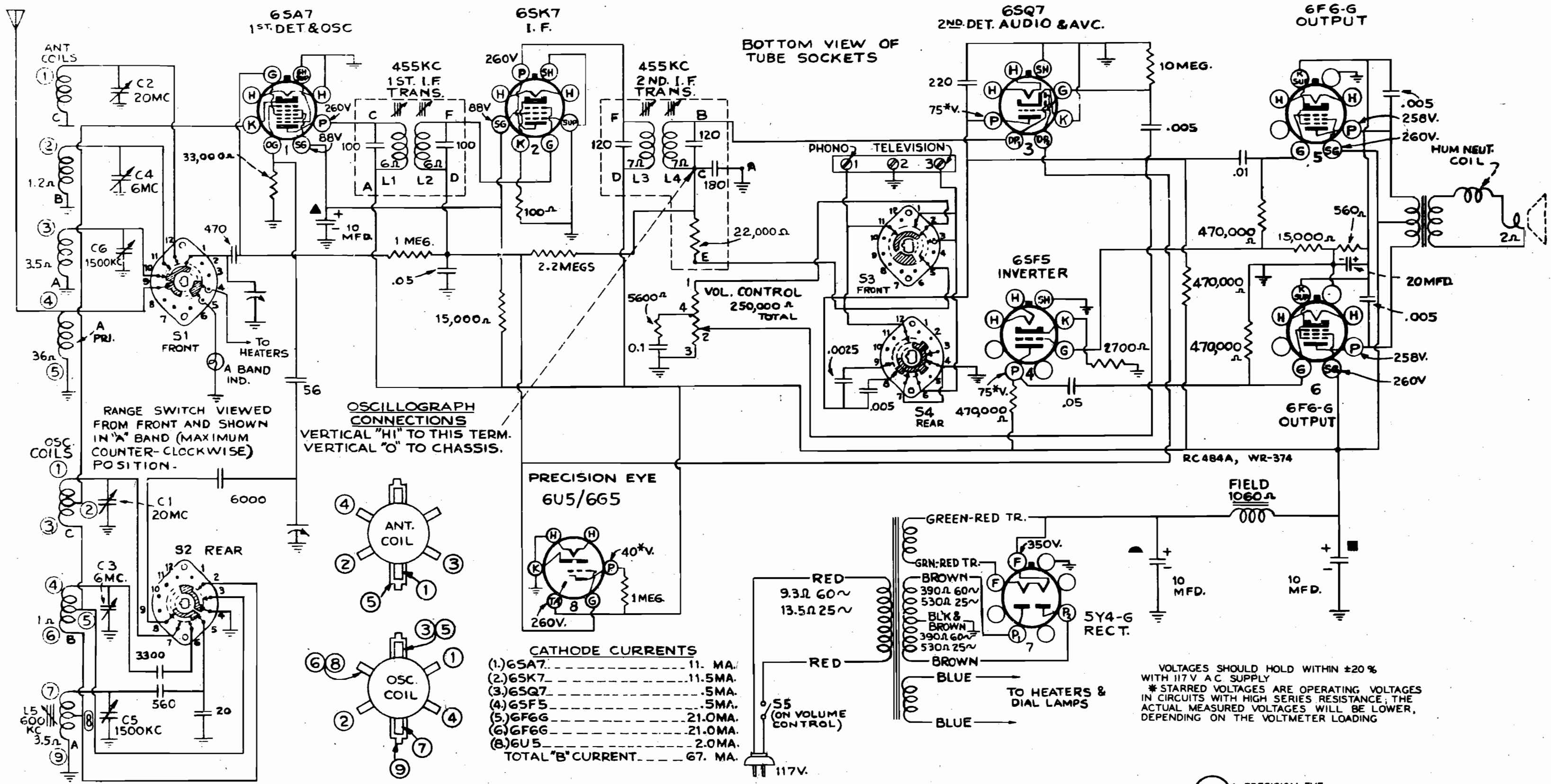
Back of Chassis—Model WR-373L



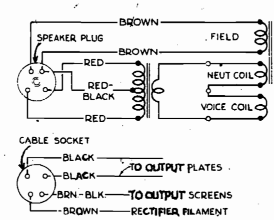
MODEL WR- 373L

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-374

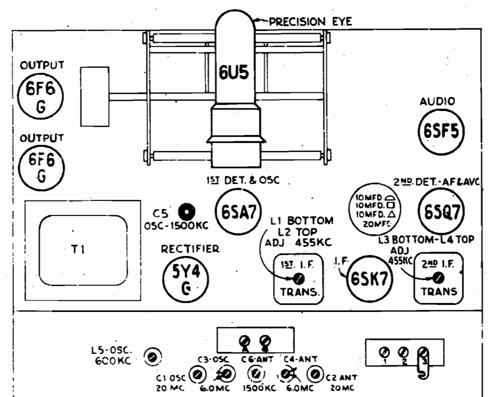


	Model WR-274	Model WR-374
DIAL LAMP .... Mazda 44, 6.3 volts, .25 amp.		
POWER SUPPLY RATINGS		
Rating A—105-125 volts, 50-60 cycles..	65 watts	75 watts
Rating B—105-125 volts, 25-60 cycles..	65 watts	75 watts
Rating C—100-130, 140-160, 195-250 volts, 50-60 cycles.......	65 watts	75 watts
POWER OUTPUT (125 volts, 60 cycle supply)		
Undistorted	2.5 watts	5.0 watts
Maximum	4.5 watts	5.5 watts
LOUDSPEAKER (Electrodynamic).........	6-inch	12-inch
V.C. Impedance at 400 cycles..........	3.4 ohms	2.2 ohms



Speaker Connections Model WR-374

FOR ALIGNMENT, PUSH-BUTTON DATA, DRIVE CABLE, SEE INDEX.



Tube and Trimmer Location, WR-374

MODELS WR-274, WR-374 WESTINGHOUSE ELEC. SUPPLY CO. INC.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L3 and L4 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L1 and L2 (1st I-F trans.)
3	Ant. terminal in series with 300 ohms	20 mc	20 mc (200°) "C" band	C1 (osc.)* C2 (ant.)
4		6 mc	6 mc (187.5°) "B" band	C3 (osc.)** C4 (ant.)
5	Ant. terminal in series with 200 mmfd.	1,500 kc	1,500 kc (198.25°) "A" band	C5 (osc.) C6 (ant.)
6		600 kc	600 kc (39.75°) "A" band	L5 (osc.) Rock gang
7	Repeat step 5.			

* Use **minimum** capacity peak if two can be obtained. Check to determine that C1 has been adjusted to correct peak by tuning receiver to approximately 19.09 mc where a weaker signal should be received.

** Use **minimum** capacity peak if two can be obtained. Check to determine that C3 has been adjusted to correct peak by tuning receiver to approximately 5.09 mc where a weaker signal should be received.

Note.—Oscillator tracks **above** signal on all bands.

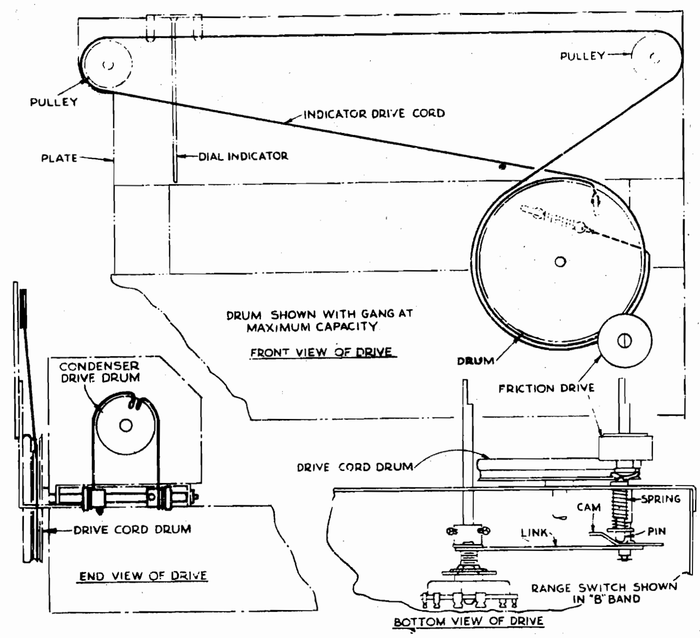
Loudspeaker.—To center the loudspeaker voice coil, first remove the front dust cover, then loosen the screws holding the spider assembly. Insert three narrow feelers into the air gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Phonograph or Television Attachment.—A terminal board is provided on the rear of the chassis for connecting a record player or Television attachment into the audio-amplifying circuit. The cable from the record player should be connected to terminals 1 and 2, the cable from the Television attachment going to terminals 2 and 3. Terminal 2 is chassis ground and the shield or ground lead from either of the attachments should be connected to this terminal.

Precautionary Lead Dress.—

On Model WR-274, the lead from 6SF5 plate to 6F6G should be dressed close to chassis.

Power cord should be dressed away from power transformer.



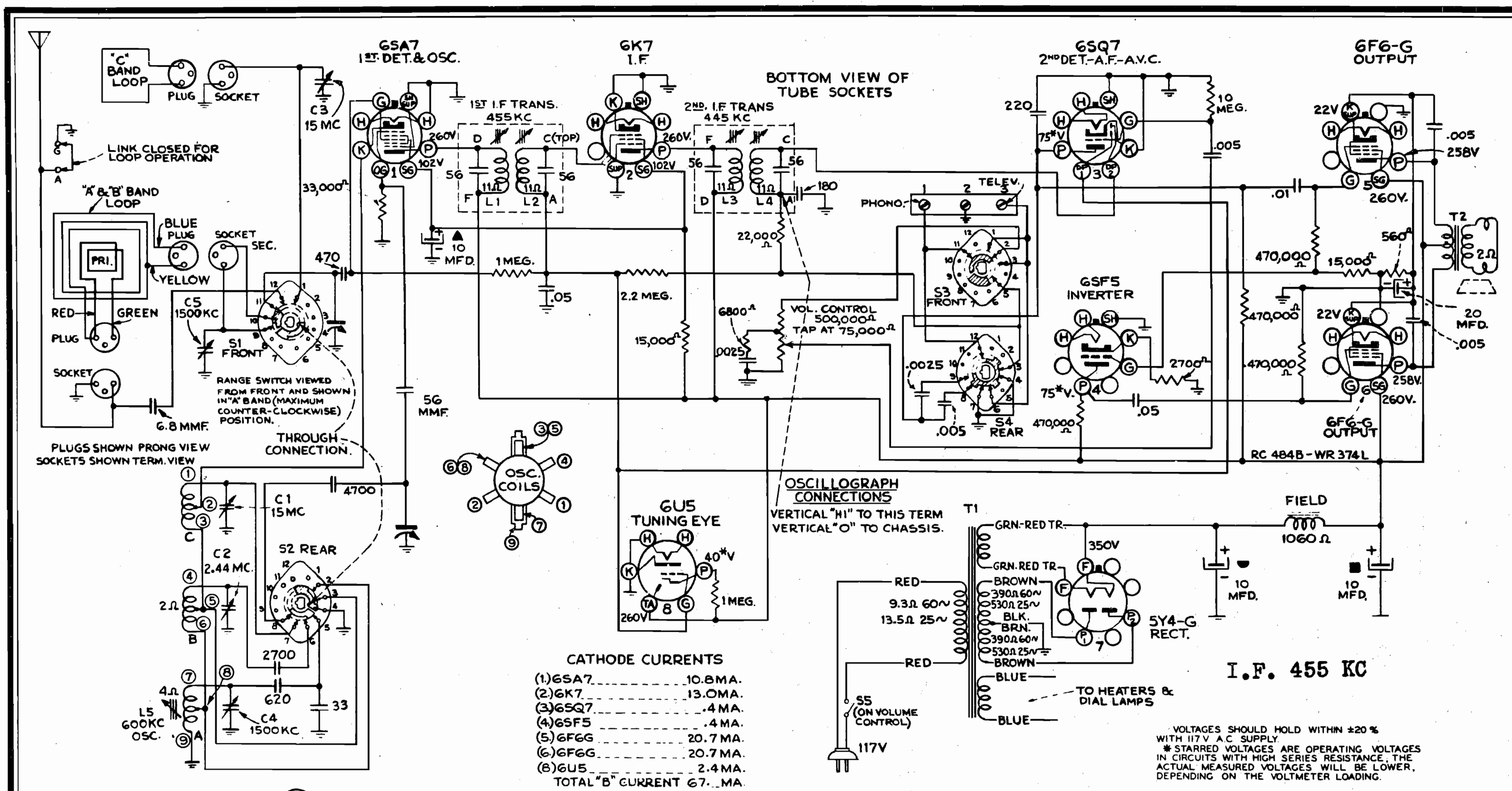
Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-buttons by turning counter-clockwise about one turn from their tight position so they turn freely.
2. Check to be sure the Phono-Radio switch is in "Radio" position.
3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than 1/4 turn after the screw begins to grip or damage to the mechanism may result.
4. Proceed in a similar manner for the remainder of the push-buttons.
5. Insert the station marker tabs in the recesses above the push-buttons.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-374L



I.F. 455 KC

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. A.C. SUPPLY.
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

CATHODE CURRENTS

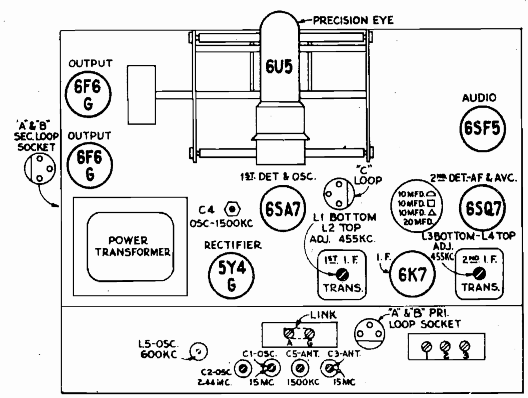
(1) 6SA7	10.8 MA.
(2) 6K7	13.0 MA.
(3) 6SQ7	.4 MA.
(4) 6SF5	.4 MA.
(5) 6F6G	20.7 MA.
(6) 6F6G	20.7 MA.
(8) 6U5	2.4 MA.
TOTAL "B" CURRENT	67. MA.

POWER SUPPLY RATINGS

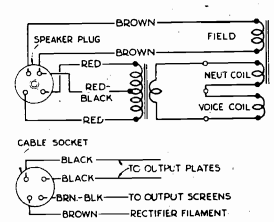
Rating A............ 105-125 volts, 50-60 cycles, 75 watts
Rating B............ 105-125 volts, 25-60 cycles, 75 watts
Rating C............ 100-130, 140-160, 195-250 volts, 50-60 cycles, 75 watts

LOUDSPEAKER

Electrodynamic.............................. 12-inch
V.C. Impedance at 400 cycles.................. 2.2 ohms

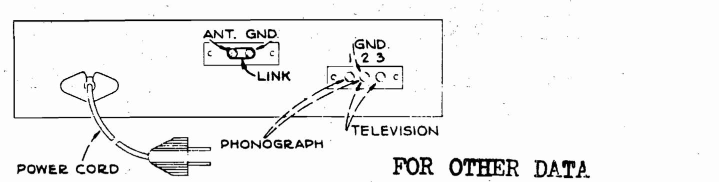


Tube and Trimmer Location



Speaker Connections

POWER OUTPUT (125 volts, 60 cycle supply)
Undistorted.......................... 5.0 w
Maximum.............................. 5.5 w

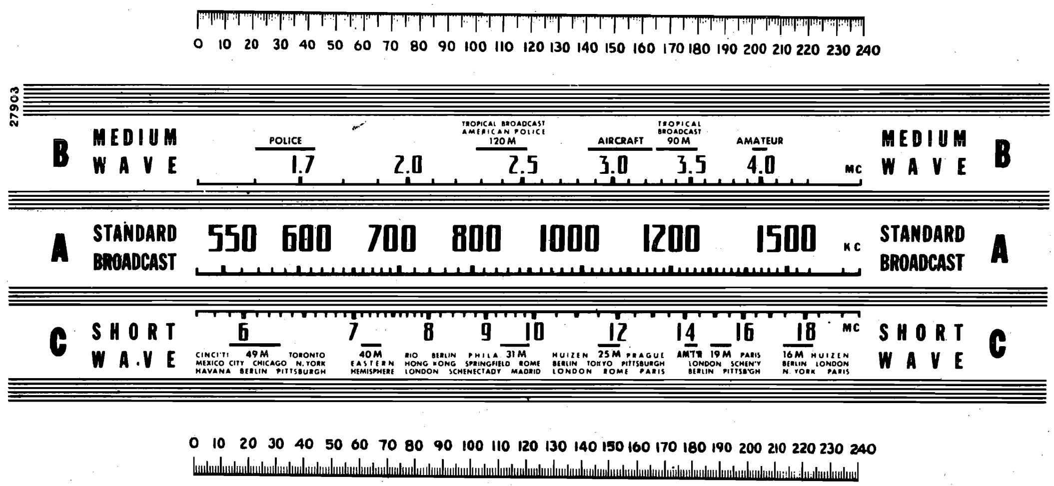


Back of Chassis

FOR OTHER DATA SEE INDEX

MODEL WR-374L
MODELS WR-476

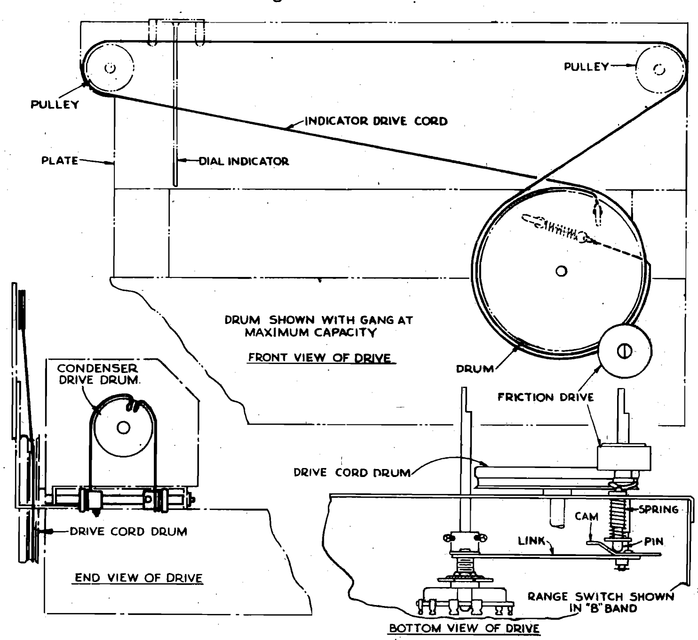
WESTINGHOUSE ELEC. SUPPLY CO.INC.



Receiver Dial Scales, and Corresponding 0-240° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 37.5° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."

Note: In the Dial Indicator Drive Cord Assembly drawing at the right the mechanism is shown with the range switch in the "B" band position. In the "A" band position the trip arm on the range shaft must be adjusted so that when the push-buttons are operated, the drive cord drum will turn freely without rubbing or binding against the drive roller.



Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-buttons by turning counter-clockwise about one turn from their tight position so they turn freely.

2. Check to be sure the Phono-Radio switch is in "Radio" position.

3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than 1/4 turn after the screw begins to grip or damage to the mechanism may result.

4. Proceed in a similar manner for the remainder of the push-buttons.

5. Insert the station marker tabs in the recesses above the push-buttons.

Alignment Procedure

Before proceeding with alignment the following lead dress should be carefully checked:

1. Dress AC switch leads away from tube sockets.
2. Do not twist loop leads together or around each other. Spacing between leads from "C" band loop to chassis is important—see alignment step "7" below.
3. "High side" leads from loop sockets, range switch, oscillator coil, and trimmers must be dressed away from chassis and each other.
4. Dress the 470 mmf. and 56 mmf. condensers going to the grid and osc. grid of the 6SA7 tube away from each other.

Calibration Scale on Indicator-Drive-Cord Drum. — The tuning dial is fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the tuning drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 120° mark on the drum scale must be vertical and directly under the center of the shaft of the tuning drum when the plates are fully meshed. The drum is held to the shaft by means of two set-screws, which must be tightened securely when the drum is in the correct position.

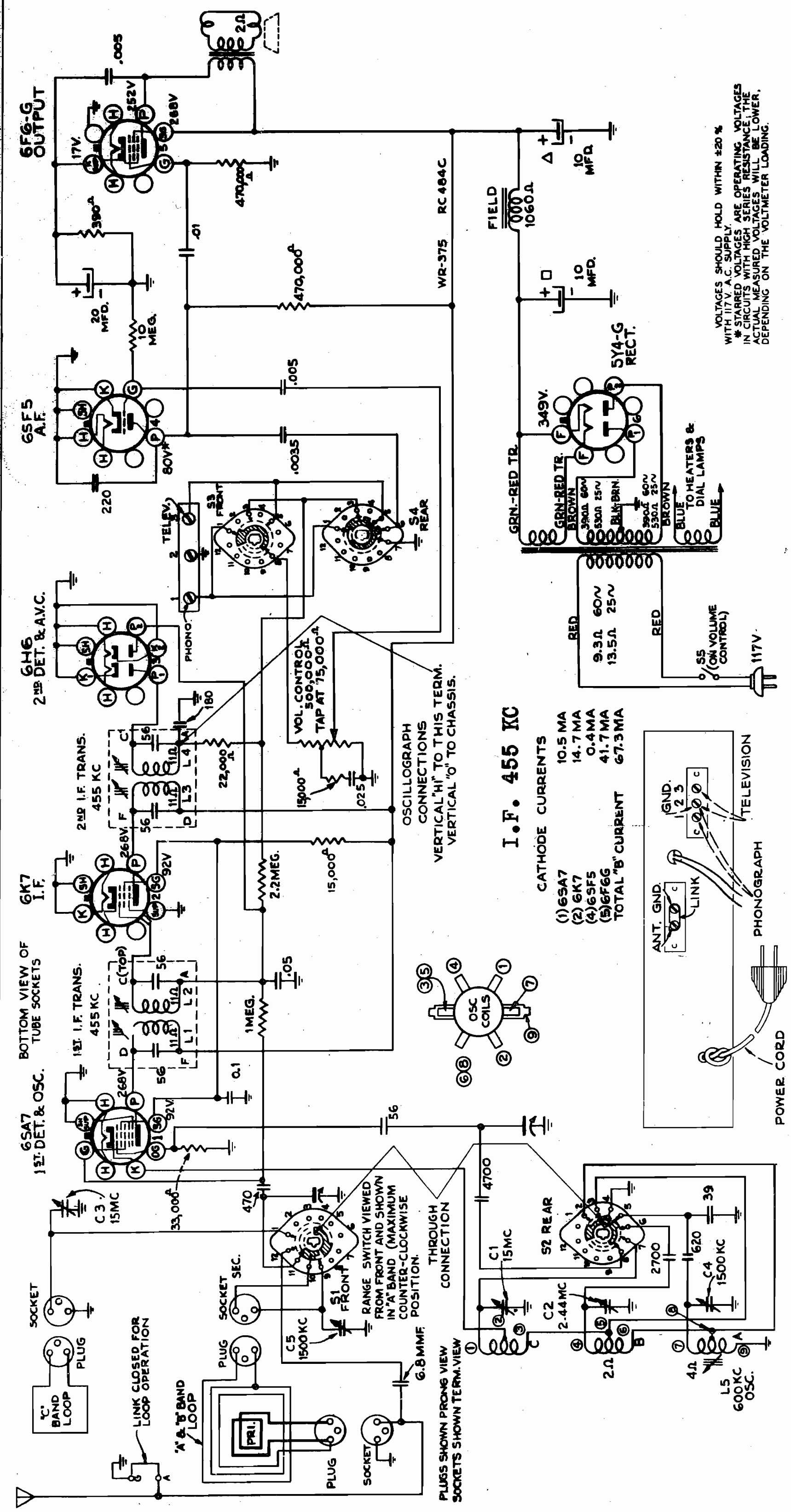
On the inner side of the tuning drum are two projections which serve as stops to prevent extreme rotation of the gang condenser. The tuning drum should be set so that the stop limiting clockwise movement of the drum takes effect just as the gang condenser plates are becoming fully meshed, thus preventing stress on the gang due to extreme rotation.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0° mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator set 1/8 inch to the left of the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-375



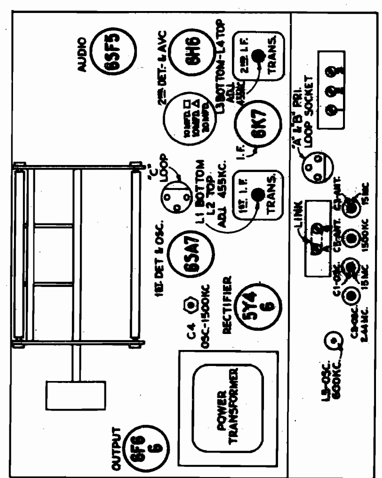
I.F. 455 KC

CATHODE CURRENTS

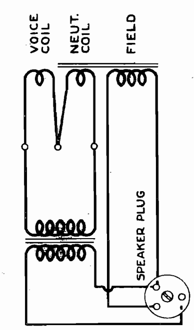
(1) 6SA7	10.5 MA
(2) 6K7	14.7 MA
(4) 6SF5	0.4 MA
(5) 6F6G	41.7 MA
TOTAL "B" CURRENT	67.3 MA

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117V. A.C. SUPPLY. * STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE, THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING.

Schematic Circuit Diagram



Tube and Trimmer Location



Speaker Connections

Power Supply Ratings

Rating A .... 105-125 volts, 50-60 cycles, 75 watts
Rating B .... 105-125 volts, 25-60 cycles 75 watts
Rating C ...... 100-130, 140-160, 200-250 volts, 50-60 cycles, 75 watts

Loudspeaker

Electrodynamic 12-inch
V.C. Impedance at 400 cycles .... 2.2 ohms

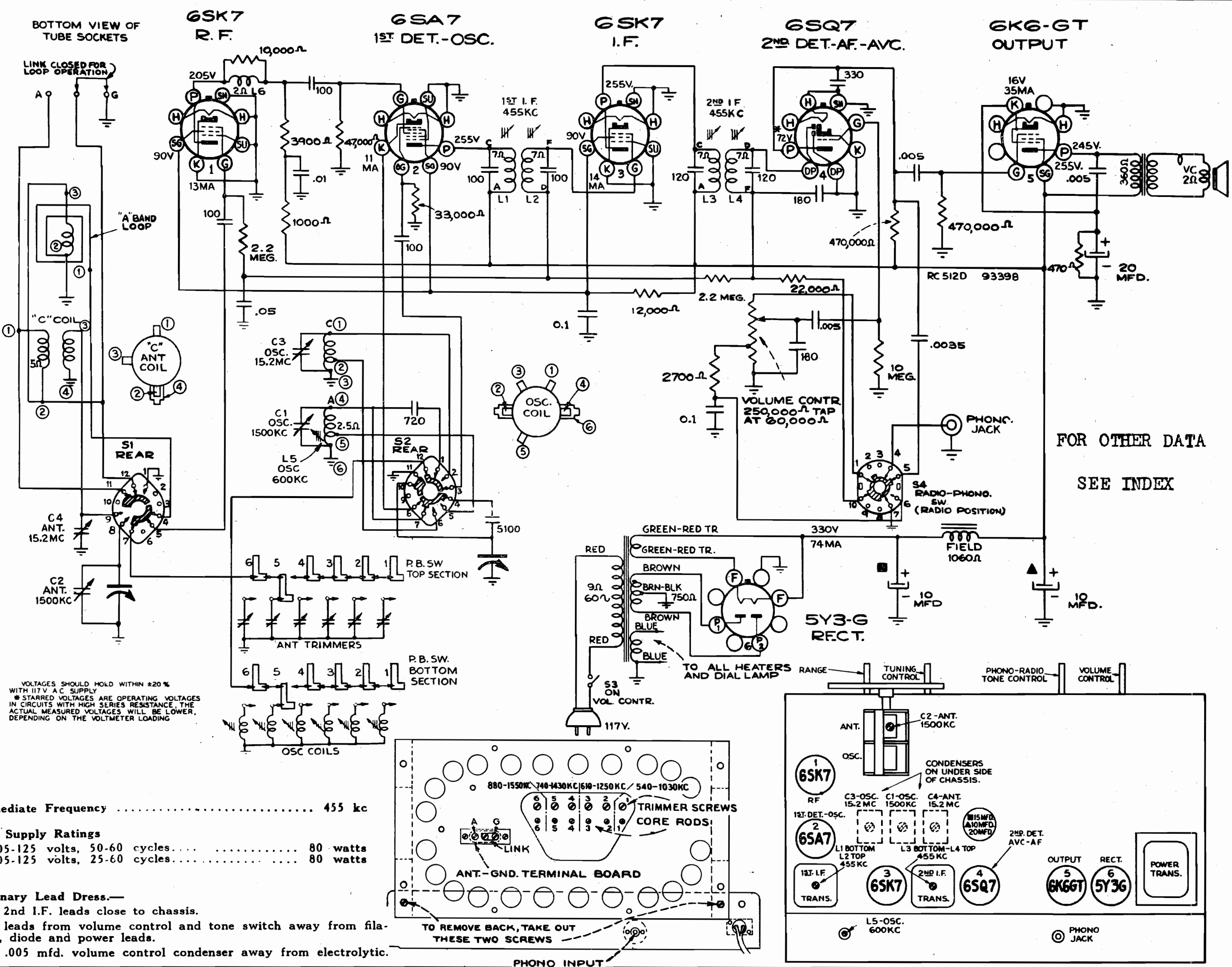
Power Output

Undistorted .... 2.5 watts
Maximum .... 4.5 watts

FOR OTHER DATA SEE INDEX

MODEL WR-386

WESTINGHOUSE ELEC. SUPPLY CO. INC.



Intermediate Frequency .... 455 kc

Power Supply Ratings

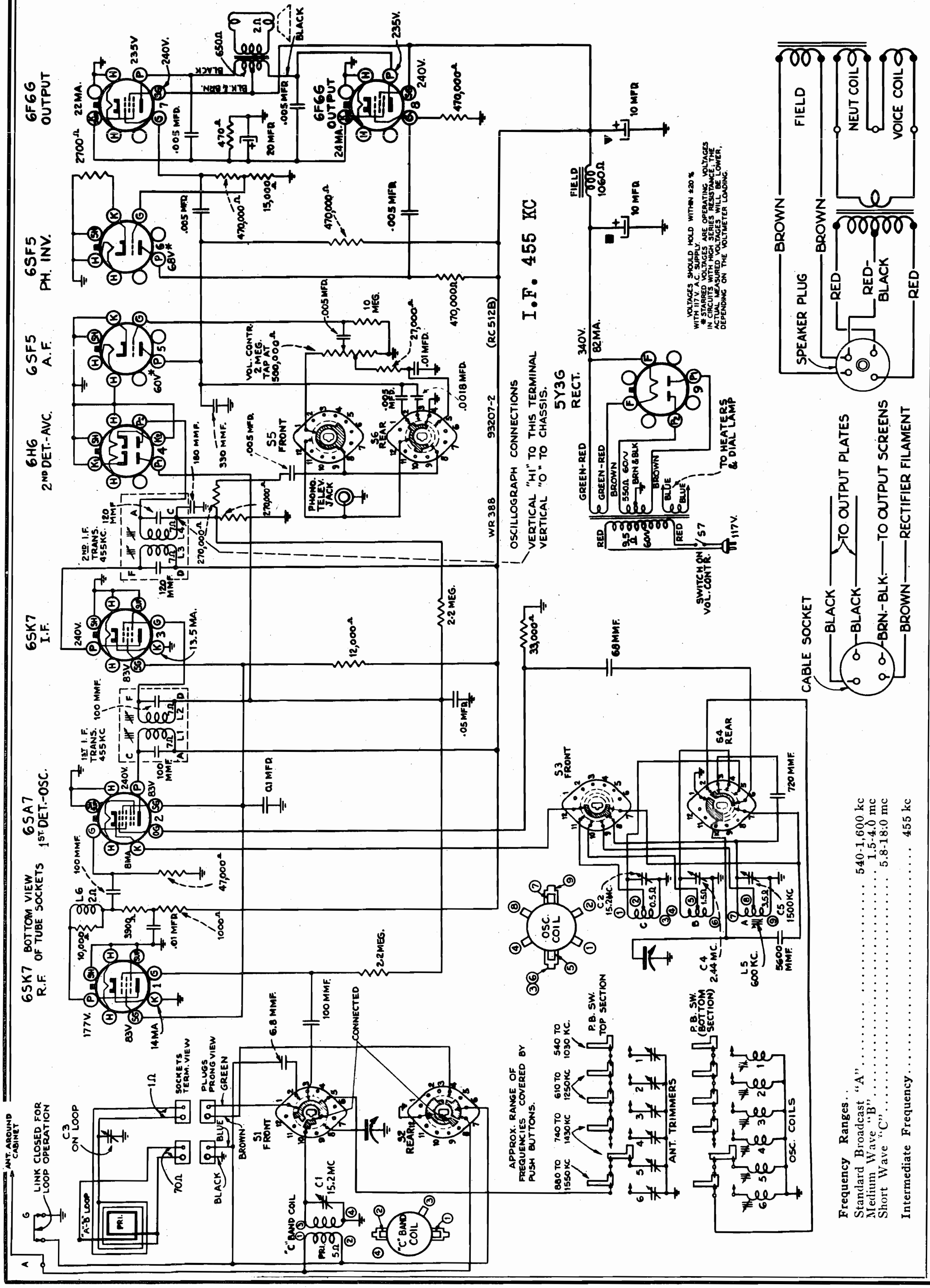
105-125 volts, 50-60 cycles.... .... 80 watts
105-125 volts, 25-60 cycles............... .... 80 watts

Precautionary Lead Dress.—

1. Dress 2nd I.F. leads close to chassis.
2. Dress leads from volume control and tone switch away from filaments, diode and power leads.
3. Dress .005 mfd. volume control condenser away from electrolytic.

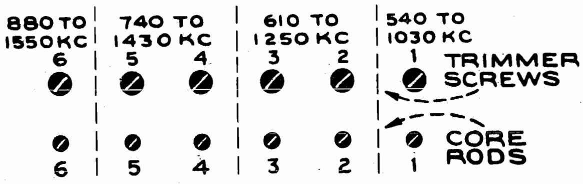
WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-388

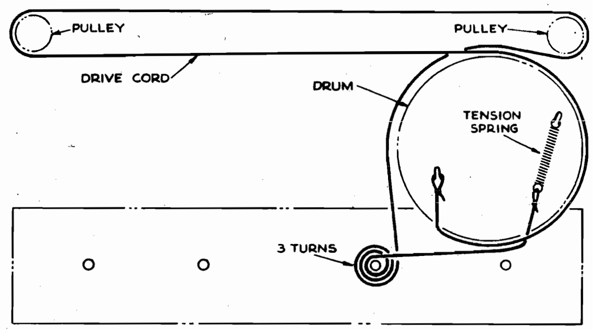


MODEL WR-388

WESTINGHOUSE ELEC. SUPPLY CO. INC.



Push Button Adjustments



Arrangement of Drive Cord for Condenser and Dial Indicator

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial is fastened in the cabinet and cannot be used for reference during alignment, therefore a calibration scale is attached to the indicator-drive-cord drum which is mounted on the shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The "90°" mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

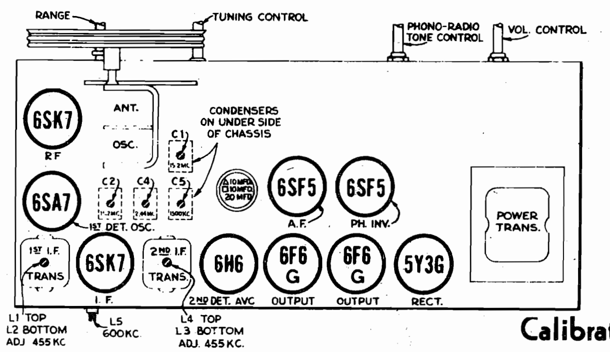
To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 540 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

Precautionary Lead Dress.—

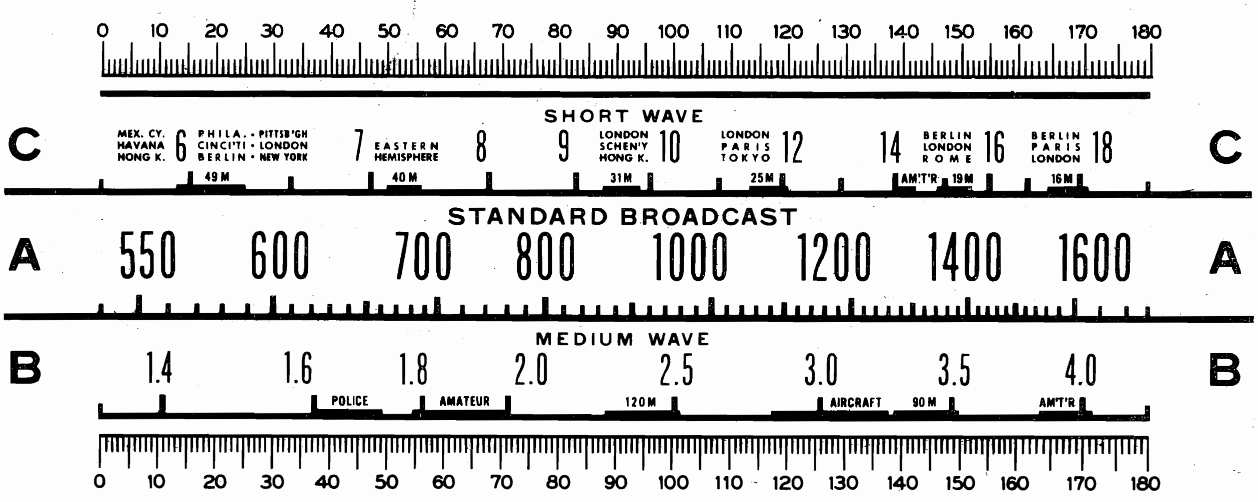
1. Dress 2nd I.F leads close to chassis.
2. Dress leads from volume control and tone switch away from filaments, diode and power leads.
3. Dress .005 mfd. volume control condenser away from electrolytic.



Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid in series with .01 mfd.	455 kc	"A"	Quiet Point near 180°	L3 and L4 (2nd I-F Trans.)
2	6SA7 1st Detector in series with .01 mfd.				L1 and L2 (1st I-F Trans.)
3	Ant. terminal "A" in series with 47 mmf.	15.2 mc	"C"	148.5°	C1 (ant.) C2 (osc.)*
4	Ant. section of gang condenser in series with 300 ohms	2.44 mc	"B"	97°	C4 (osc.)*
5		1,500 kc	"A"	160°	C5 (osc.)*
6		600 kc		30°	L5 (osc.) (Rock gang)
7	Fasten chassis in cabinet. Connect loop, see that link is closed on the antenna board, attach dial indicator to drive cord, with indicator at 540 kc mark and gang at maximum capacity.				
8	Radiation loop consisting of two turns of wire 18 in. in diameter located 4 to 6 feet from receiver	1,500 kc	"A"	1,500 kc	C3 (ant.) (on loop)
9		600 kc		600 kc	L5 (osc.) (Rock gang)
10		Repeat steps 8 and 9			

*Use minimum capacity peak if two peaks can be obtained.
Note: Oscillator tracks above signal on all bands.

Calibration Scale

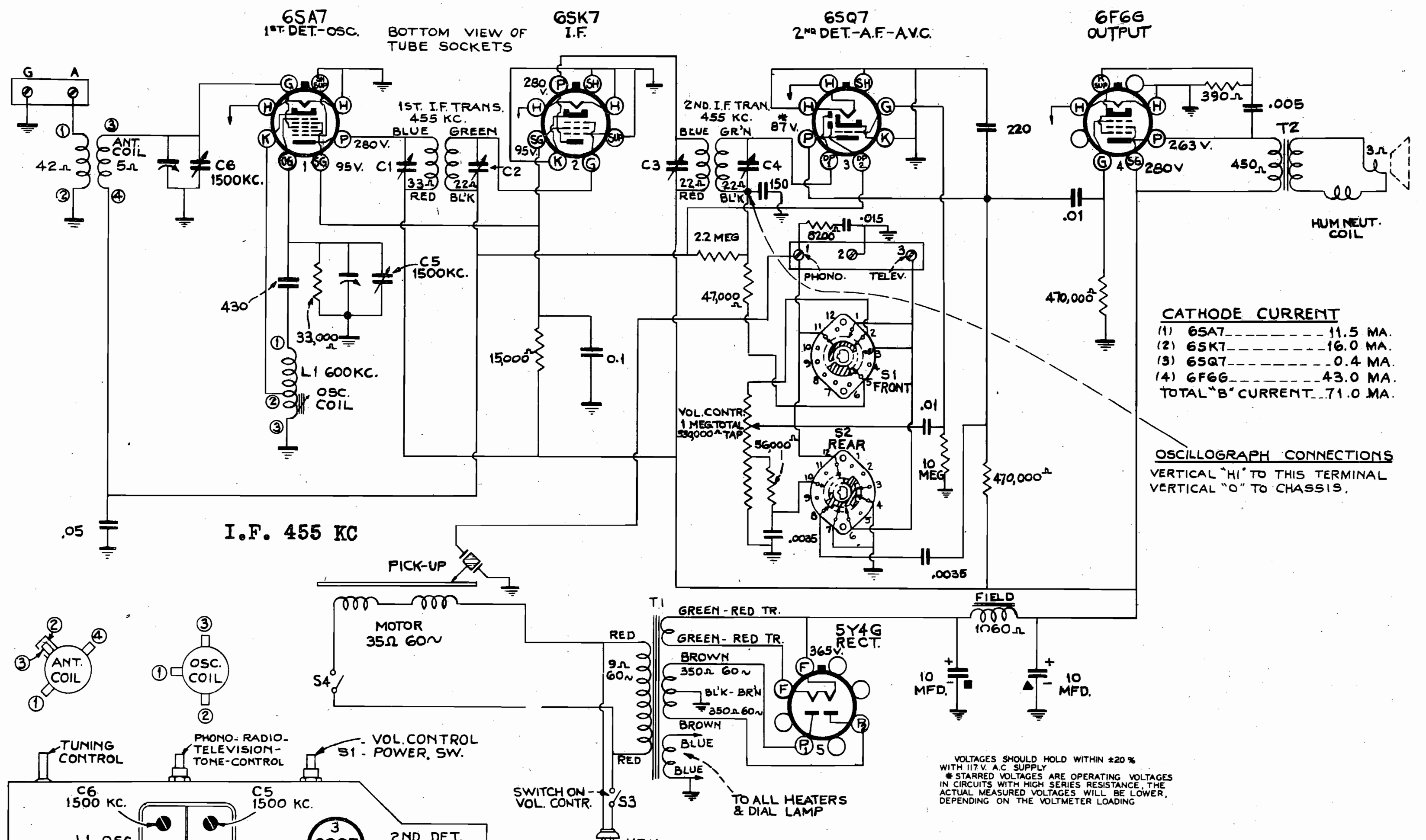


Receiver Dial Scales, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 30° on the calibration scale corresponds to 600 kc on "A" band. Read instructions under "Alignment Procedure."

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-470



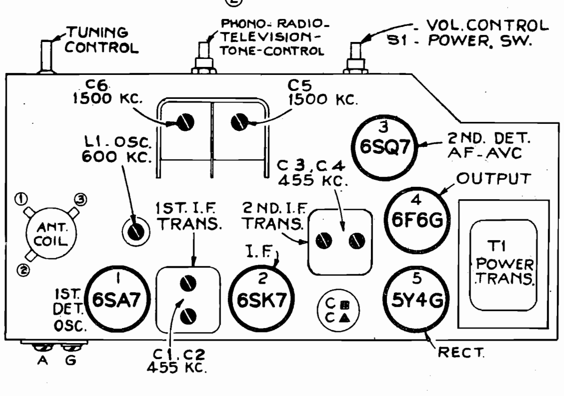
CATHODE CURRENT

(1)	6SA7	11.5 MA.
(2)	6SK7	16.0 MA.
(3)	6SQ7	0.4 MA.
(4)	6F6G	43.0 MA.
	TOTAL "B" CURRENT	71.0 MA.

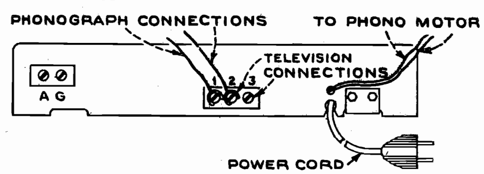
OSCILLOGRAPH CONNECTIONS

VERTICAL "HI" TO THIS TERMINAL
VERTICAL "O" TO CHASSIS.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. A.C. SUPPLY
* STARRED VOLTAGES ARE OPERATING VOLTAGES IN CIRCUITS WITH HIGH SERIES RESISTANCE. THE ACTUAL MEASURED VOLTAGES WILL BE LOWER, DEPENDING ON THE VOLTMETER LOADING



Tube and Trimmer Locations



Back of Chassis

FOR FURTHER DATA SEE INDEX

PRECAUTIONARY LEAD DRESS.—

1. Power cord leads must be dressed away from 6SQ7 socket, and toward end of chassis.
2. Green lead 2nd I.F. to 6SQ7 must be dressed against base.
3. Blue lead 2nd I.F. to 6SK7 must be dressed close to base.
4. Green and blue leads from 1st I.F. transformer must be dressed close to base.
5. Green lead from gang to 6SA7 socket must be dressed toward side apron way from other parts.

Voice Coil Impedance............ 3.4 ohms at 400 cycles

MODELS WR-473
WR-474
WR-474L

WESTINGHOUSE ELEC. SUPPLY CO. INC.

AUTOMATIC RECORD CHANGER

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.

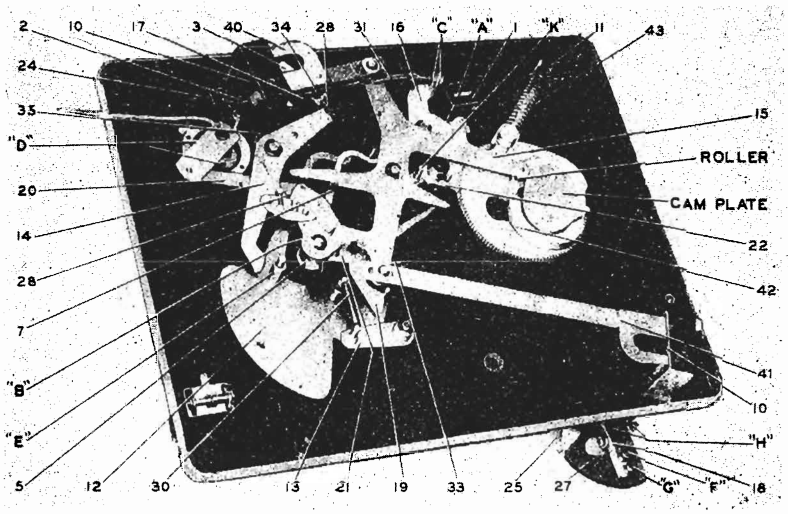
The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes.

A shorting switch, located in the pickup head, operates due to pressure when the pickup is placed on the pickup rest.

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.

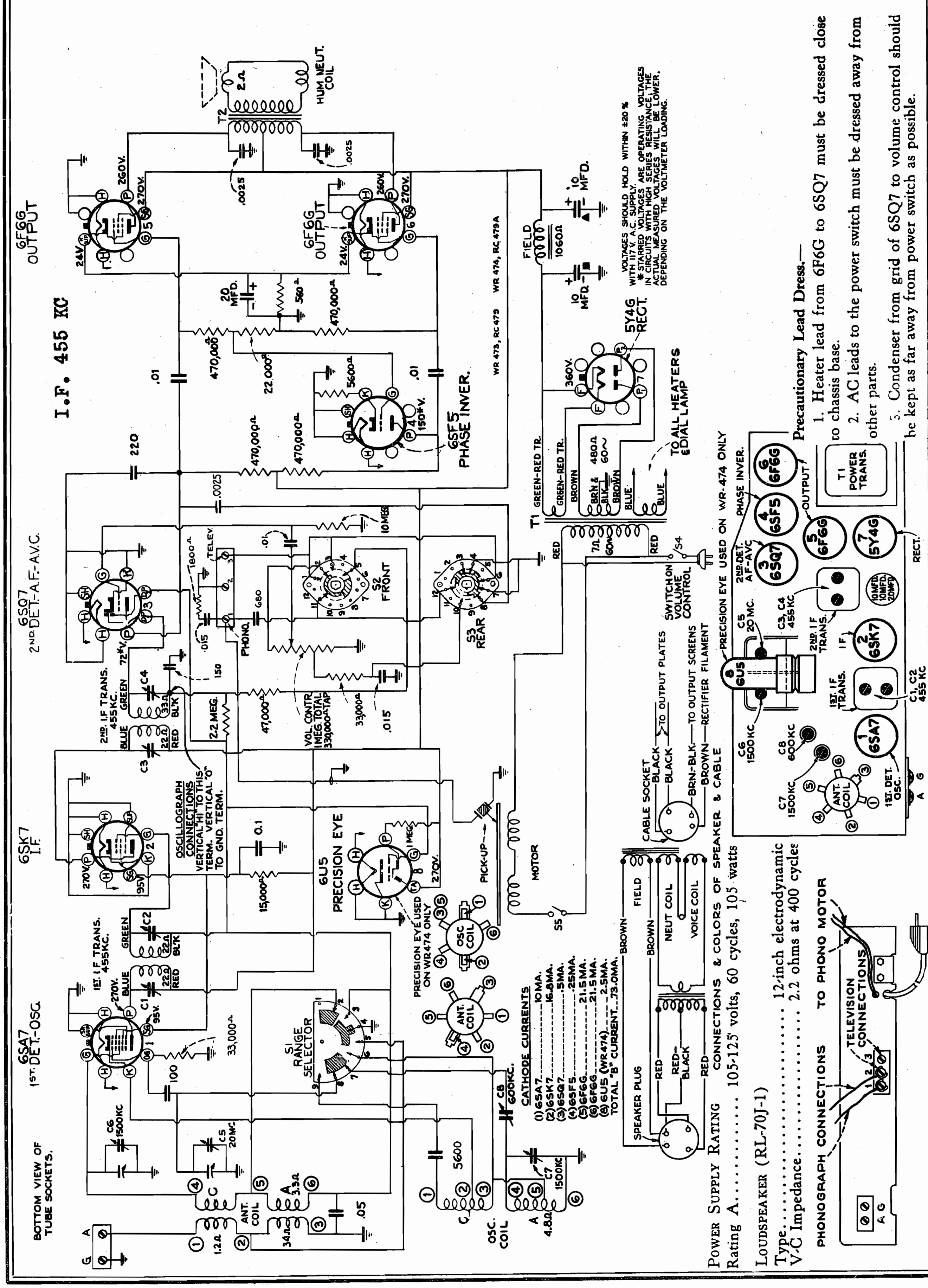
MISCELLANEOUS SERVICE HINTS

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."

WESTINGHOUSE ELEC. SUPPLY CO.INC.

MODELS WR-473, WR-474



Precautionary Lead Dress.—

1. Heater lead from 6F6G to 6SQ7 must be dressed close to chassis base.
2. AC leads to the power switch must be dressed away from other parts.
3. Condenser from grid of 6SQ7 to volume control should be kept as far away from power switch as possible.

POWER SUPPLY RATING

Rating A............ 105-125 volts, 60 cycles, 105 watts

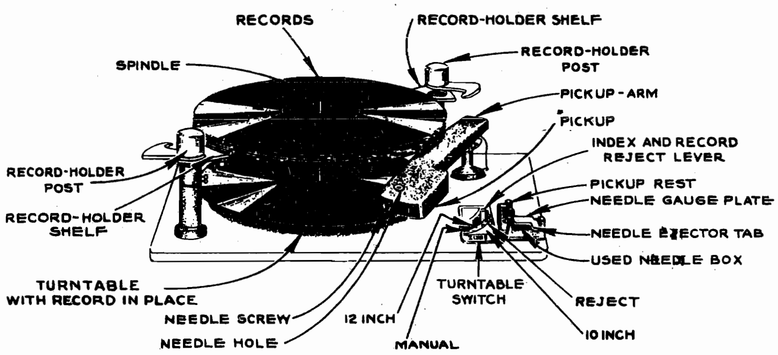
LOUDSPEAKER (RL-70J-1)

Type.................. 12-inch electrodynamic
V-C Impedance......... 2.2 ohms at 400 cycles

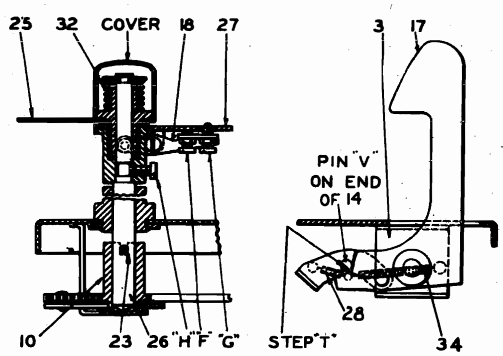
MODELS WR-473, WR-474
MODELS WR-172, WR-470, WR-373Y,

WESTINGHOUSE ELEC. SUPPLY CO. INC.

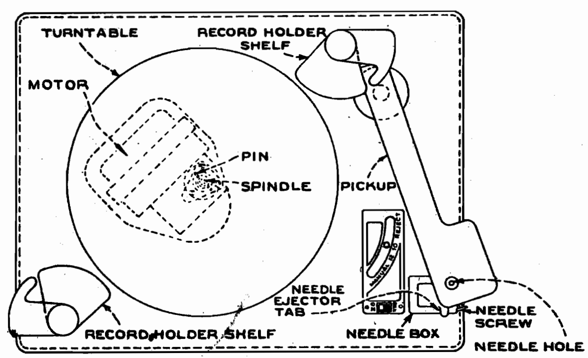
Automatic Record Changer



Top View of Automatic Record Changer



Details of Record Shelf Posts, and Locating Lever Assemblies



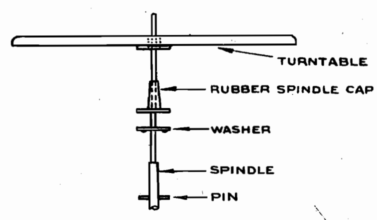
Motorboard and Controls WR-474

The crystal pickup is sealed in a metal case as protection against extreme changes of climate. If failure occurs, do not attempt to repair the unit, but install a new crystal unit.

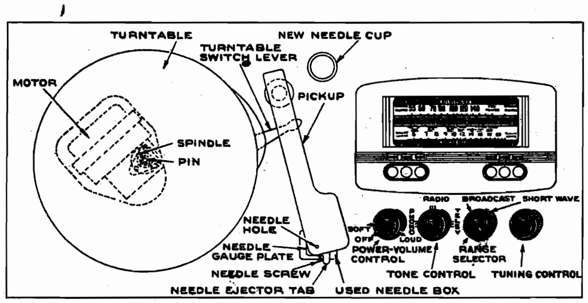
The phonograph motor is a self-starting constant-speed induction type.

Motor Lubrication.—Apply a few drops of light machine oil to the spindle bearing and oil hole every six months. The oil hole is located in the motor casting, adjacent to the spindle bearing, and on Model WR-474 is covered with a screw plug.

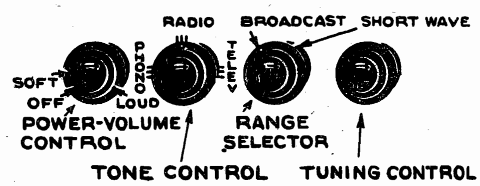
The automatic stop (Model WR-473) should be adjusted so that the lever will snap to the "off" position when the pickup needle is 1⅞ inches from the center line of the spindle.



Turntable Assembly (All Models)



Controls, WR-473



Controls, WR-474

Adjustments for Push-Button Tuning

MODELS WR-172, WR-373Y, WR-470, WR-473, WR-474

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Loosen the push-buttons by turning counter-clockwise about one turn from their tight position so they turn freely.

2. Check to be sure the Phono-Radio switch is in "Radio" position.

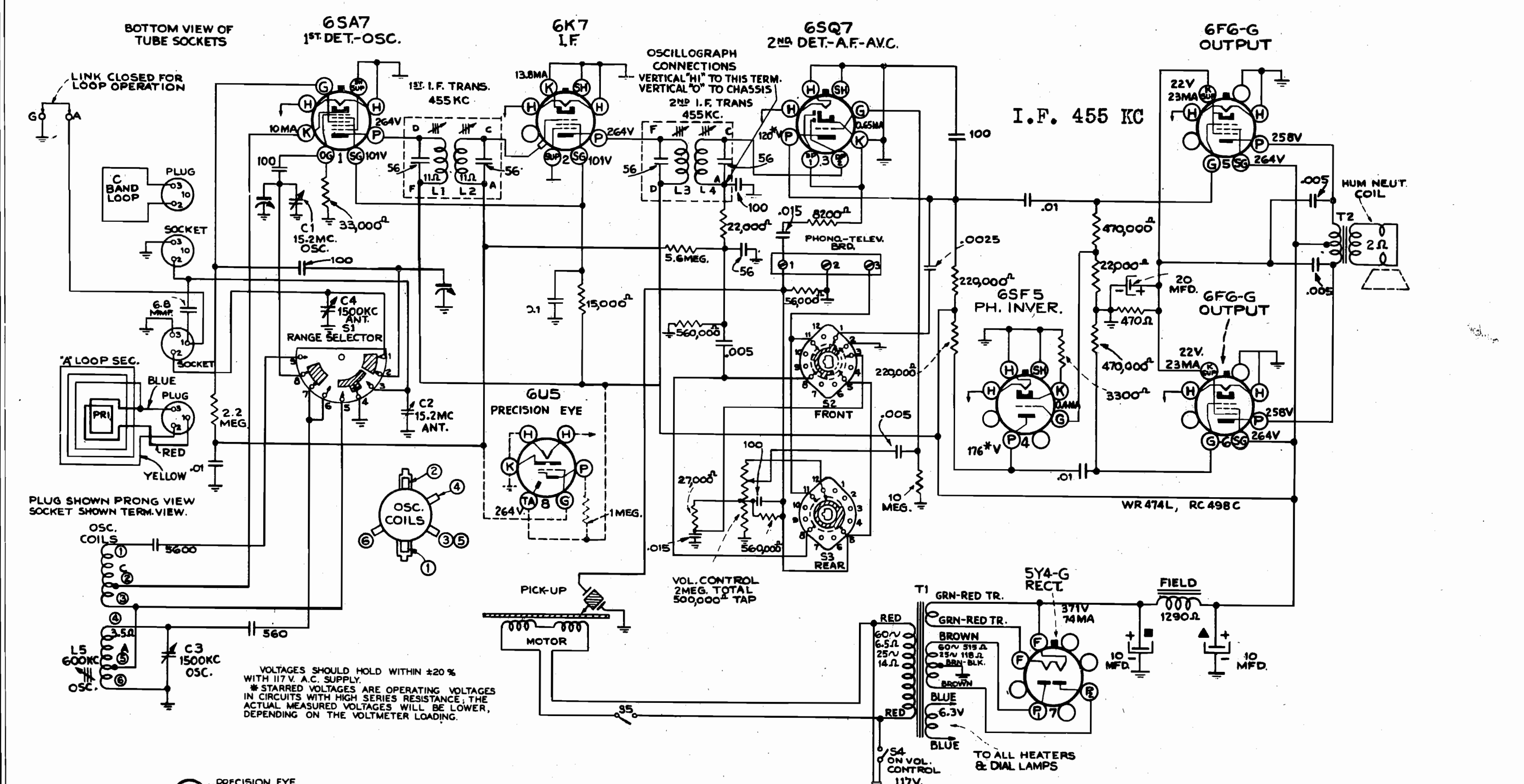
3. Press in push-button No. 1 (left) as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the button. Do not tighten more than ¼ turn after the screw begins to grip or damage to the mechanism may result.

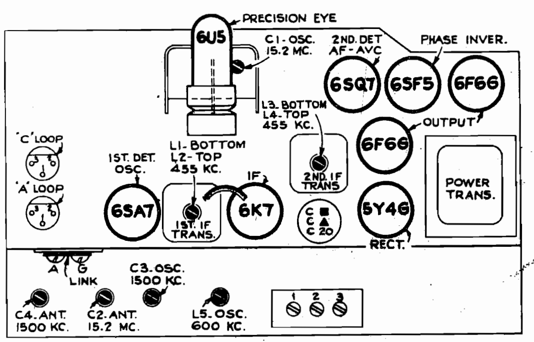
4. Proceed in a similar manner for the remainder of the push-buttons.

5. Insert the station marker tabs in the recesses above the push-buttons.

MODEL WR-474L

WESTINGHOUSE ELEC. SUPPLY CO. INC.





Tube and Trimmer Locations

Frequency Range

Standard Broadcast (A) .... 540-1,560 kc

Short-Wave (C) .... 5.8-18 mc

Intermediate Frequency .... 455 kc

Power Supply Rating

Rating A.............. 105-125 volts, 60 cycle, 105 watts

Power Output

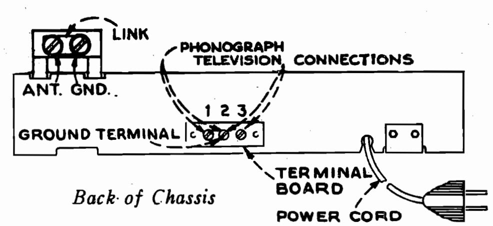
Undistorted .... 5 watts

Maximum .... 6 watts

Loudspeaker (RL-70K4).......... 12-inch electrodynamic

V.C. Impedance.................. 2.2 ohms at 400 cycles

FOR OTHER DATA, SEE INDEX



Back of Chassis

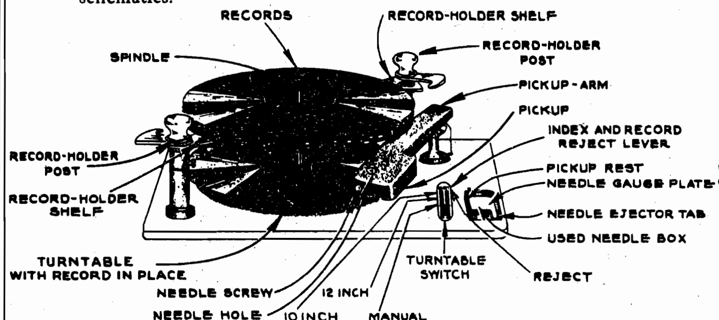
MODELS WR-474L, WR-476 WESTINGHOUSE ELEC. SUPPLY CO. INC.

Alignment Procedure

Before proceeding with alignment the following lead dress should be carefully checked.

1. Dress AC switch leads away from 6SQ7 tube socket.
2. Do not twist loop leads together or around each other. Spacing between leads from "C" band loop to chassis is important—see alignment step "5" below.
3. "High side" leads from loop sockets, range switch, oscillator coil, and trimmers must be dressed away from chassis and each other.
4. Dress the two 100 mmf. condensers going to the grid and osc. grid of the 6SA7 tube away from each other.
5. Dress the .01 mfd. 6F6-G grid condenser away from power switch.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown on the chassis schematics.



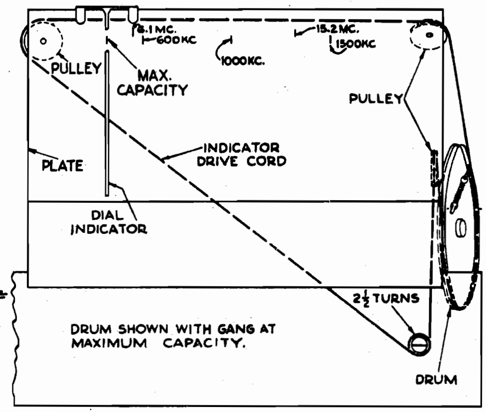
Top View of Automatic Record Changer

Output Meter Alignment.—If this method is used, connect the output meter across the voice coil, and turn the receiver volume control to maximum.

Test Oscillator.—For all alignment operations, keep the oscillator output as low as possible to avoid a-v-c action.

Calibration Marks. — The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore, calibration marks have been stamped in the plate on the front of the chassis as shown in the accompanying drawing. These marks are used for reference during alignment.

Dial Indicator Adjustment.—With the gang condenser in full mesh, the indicator should point to the extreme left (low frequency) mark on the dial scale.



Dial-Indicator and Drive Mechanism

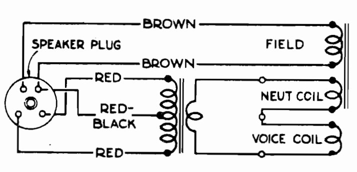
Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing.

Steps	Connect test-osc. output to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	I-F grid through 0.1 mfd. capacitor and ground	455 kc	"C" band Quiet point	L-3 and L-4 (2nd I-F trans.)
2	1st det. grid through 0.1 mfd. capacitor and ground			L-1 and L-2 (1st I-F trans.)
3		15.2 mc	15.2 mc	C-1 oscillator*
4	Radiation loop consisting of two turns of wire 18 inches in diameter located 4 to 6 feet from receiver	15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
5		6.1 mc	6.1 mc	Spacing between leads from "C" band loop to chassis
6		15.2 mc	Rock at 15.2 mc	C-2 antenna† while rocking
7		1,500 kc	1,500 kc	C-4 antenna C-3 oscillator
8		600 kc	Rock at 600 kc	L-5 oscillator while rocking
9		1,500 kc	1,500 kc	C-4 antenna C-3 oscillator

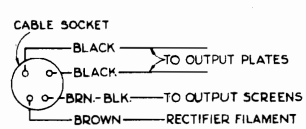
When making adjustments 4 to 9 inclusive the chassis must be in the cabinet, both loops connected, and all leads in their normal positions. When mounting chassis in cabinet if calibration marks on dial plate do not line up with dial scale mounted on cabinet move pointer to agree with dial scale on cabinet.

* Oscillator should track on high frequency side of signal. If two peaks are obtained use high frequency (minimum capacity) peak.

† If two peaks can be obtained use low frequency (maximum capacity) peak.

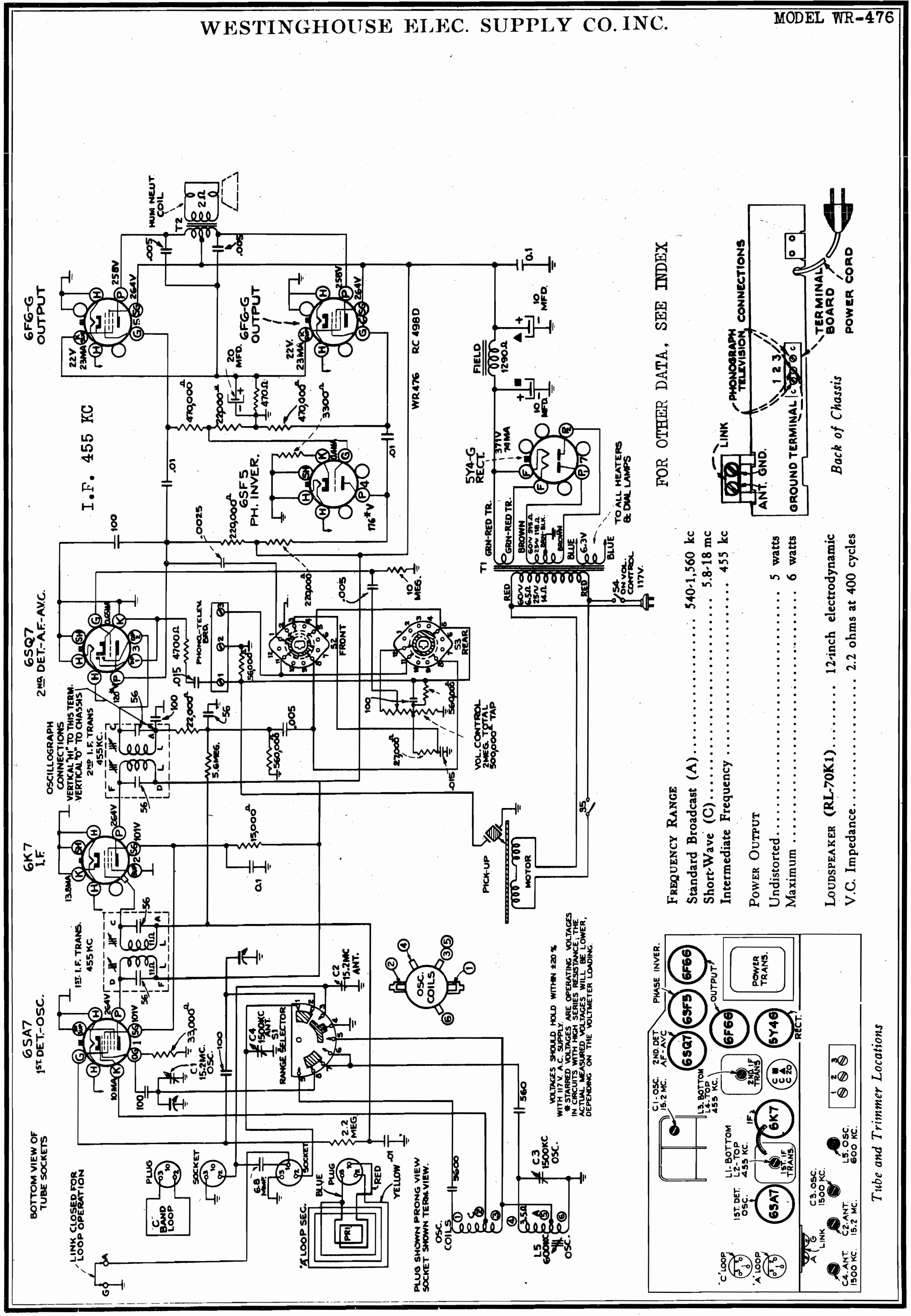


Speaker and Cable Connections



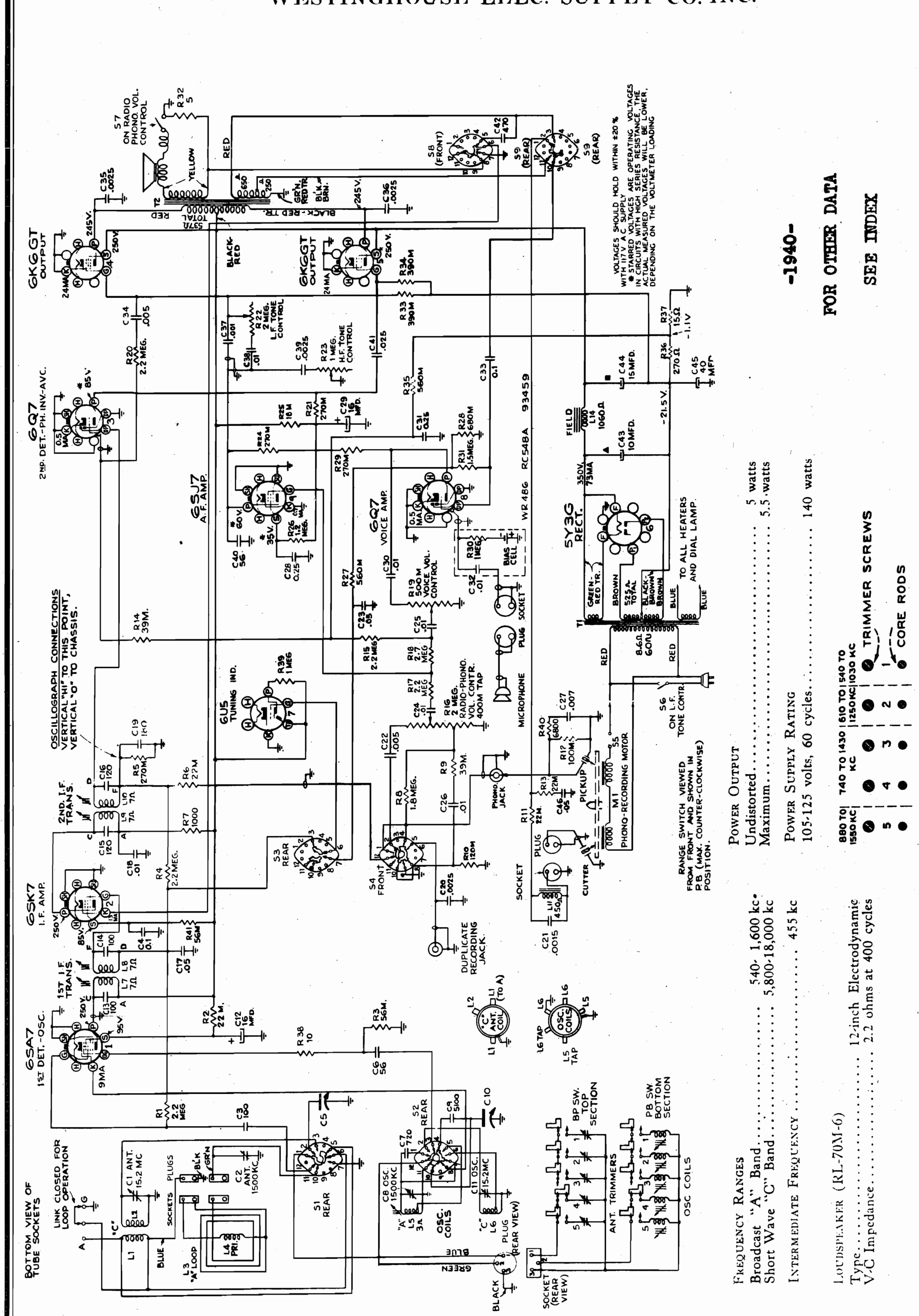
WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-476



MODEL WR-486

WESTINGHOUSE ELEC. SUPPLY CO. INC.



Frequency Ranges
Broadcast "A" Band .... 540- 1,600 kc
Short Wave "C" Band .... 5,800-18,000 kc

Intermediate Frequency .... 455 kc

Loudspeaker (RL-70M-6)
Type .... 12-inch Electrodynamic
V-C Impedance .... 2.2 ohms at 400 cycles

Power Output
Undistorted .... 5 watts
Maximum .... 5.5 watts

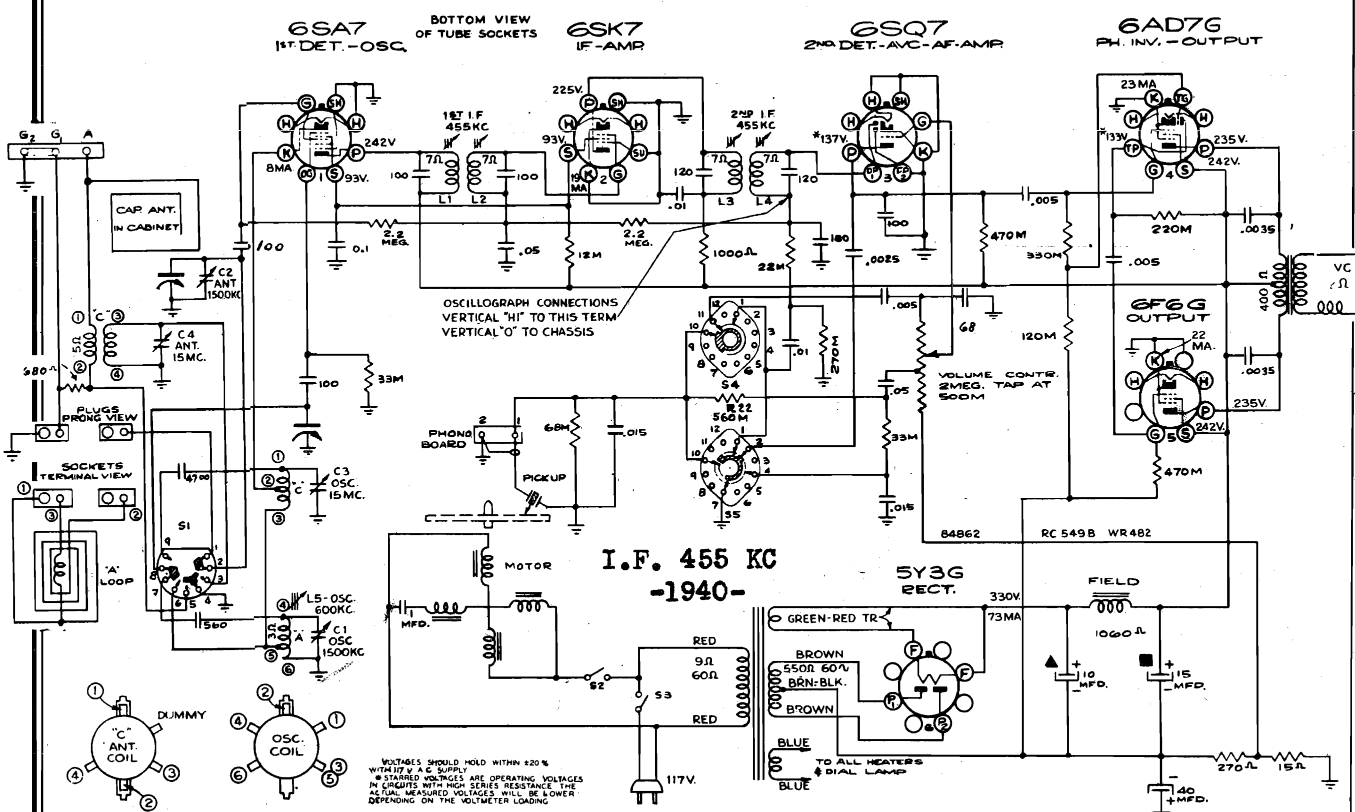
Power Supply Rating
105-125 volts, 60 cycles .... 140 watts

-1940-

FOR OTHER DATA
SEE INDEX

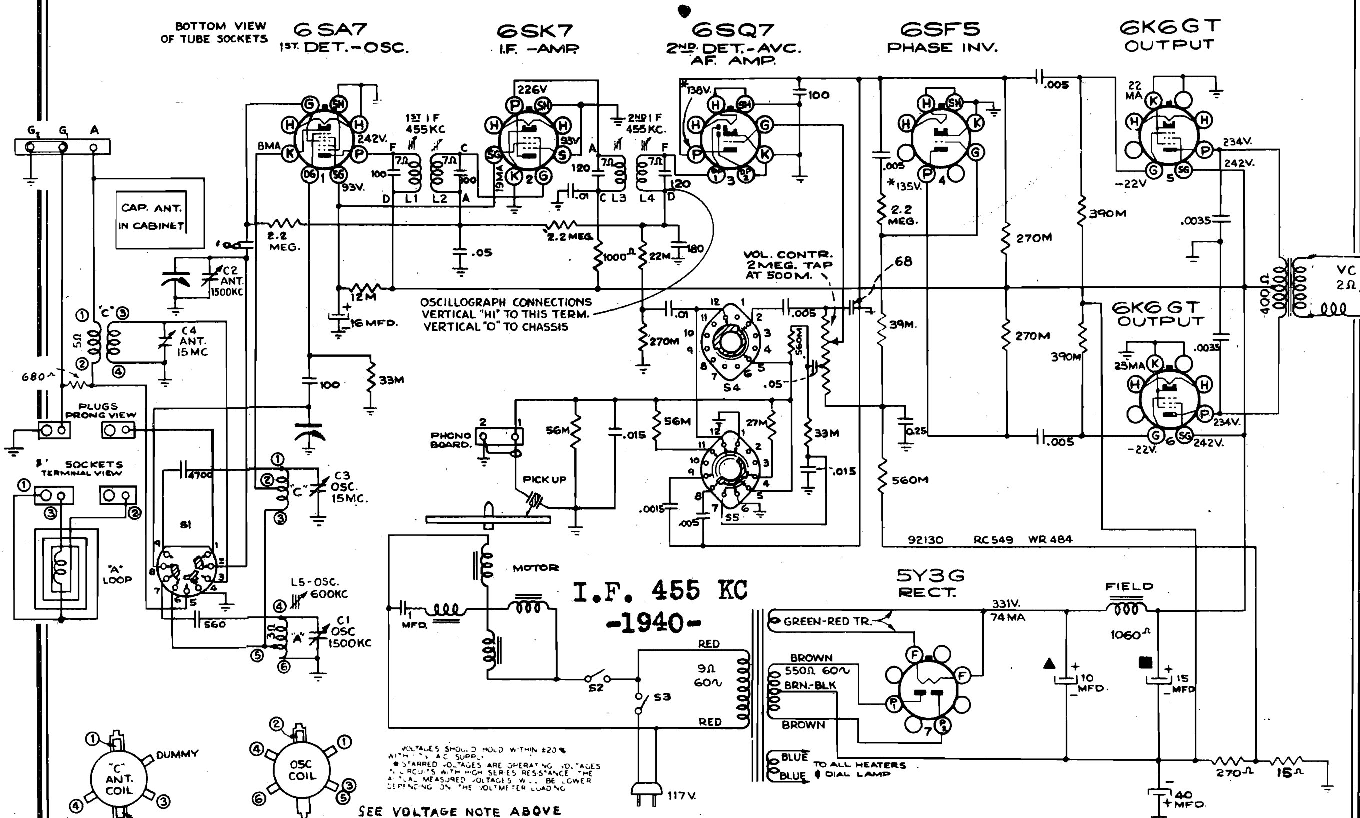
WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-482
MODEL WR-484



POWER CONSUMPTION 110 WATTS **FOR OTHER DATA SEE INDEX**

Schematic Circuit Diagram—Model WR-482



POWER CONSUMPTION 110 WATTS **FOR OTHER DATA SEE INDEX**

Schematic Circuit Diagram—Model WR-484

MODEL WR-482
MODEL WR-484

WESTINGHOUSE ELEC. SUPPLY CO. INC.

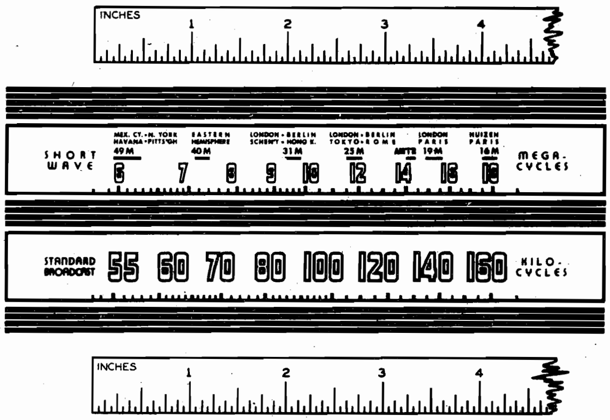
Alignment Procedure

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the schematic diagram.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration Scale.—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment. In the event that only the chassis is returned for service, and the cabinet with its tuning dial is left in the customer's home, the calibration scale printed in this service note can be used in conjunction with an ordinary 12-inch ruler as an accurate and convenient substitute for the regular dial.



Calibration Scale

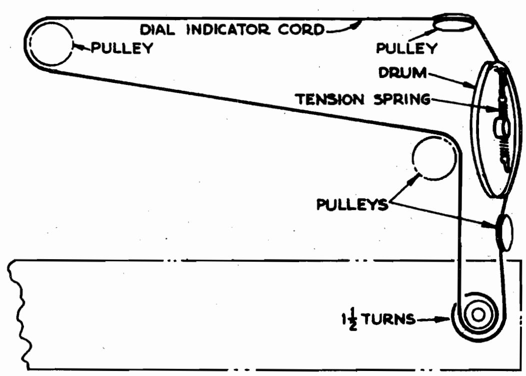
Each method is described below.

Using Tuning Dial.—

1. Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
2. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
3. Place the glass dial under the pointer so that the extreme left scale graduations coincide with the pointer. Use scotch tape to hold the glass dial in this position.

Using Calibration Scale.—

1. With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
2. Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

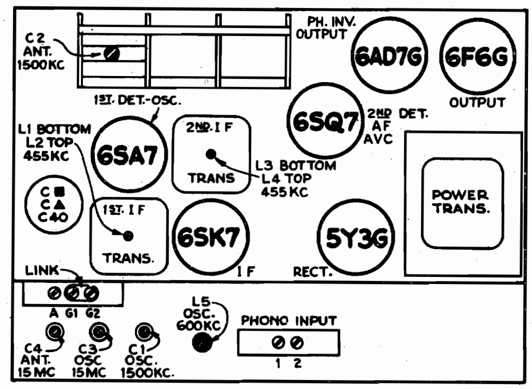


Dial Indicator and Drive Mechanism

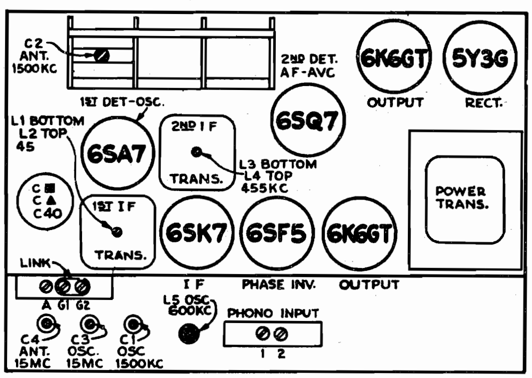
Dial-Pointer adjustment.—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 grid in series with .01 mfd.	455 kc	"A" band Quiet point between 550-750 kc	L3 and L4 (2nd I-F trans.)
2	6SA7 grid in series with .01 mfd.			L1 and L2 (1st I-F trans.)
3	Ant. terminal (open link) in series with 200 mmfd.	1,500 kc	1,500 kc "A" band	C1 (osc.) C2 (ant.)
4		600 kc	600 kc "A" band	L5 (osc.) Rock gang
5	Ant. terminal (open link) in series with 47 mmfd.	15 mc	15 mc "C" band	C3 (osc.)* C4 (ant.) Rock gang

* Use minimum capacity peak if two peaks can be obtained.
The oscillator tracks above the signal frequency on all bands.
Note: C2 omitted on some production—adjust grid lead (6SA7) for resonance.



Tube and Trimmer Locations—Model WR-482



Tube and Trimmer Locations—Model WR-484

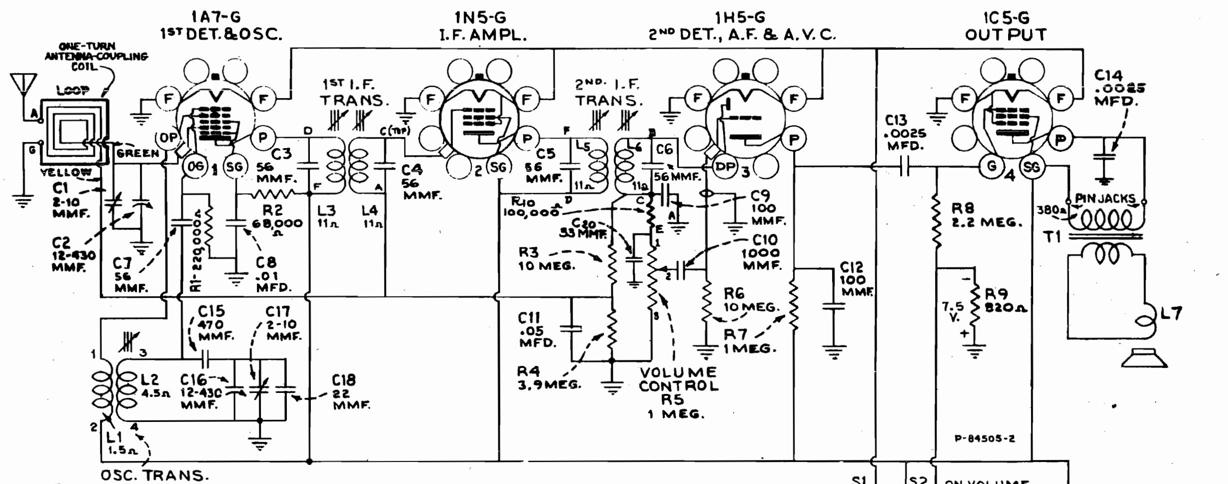
Adjustments for Push-Button Tuning

The push-buttons should be adjusted for six favorite stations after the receiver has been operating for a brief warm-up period. Each button may be set up to any standard broadcast station. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:

1. Pull off the push-buttons and loosen the push-button screw with a small screwdriver.
2. Set the radio-phono switch to "radio" position and the range switch to "Broadcast" position, now accurately tune in the station for which the first button is to be set.
3. Press in push-button rod No. 1 as far as it will go without undue pressure, hold in, retune station with manual control if necessary for best reception, and then carefully tighten up the screw. Do not tighten more than ¼ turn after the screw begins to grip or damage to the mechanism may result.
4. Replace the push-button on its shaft.
5. Proceed in a similar manner for the remainder of the push-buttons.
6. Moisten and insert the station marker tabs in the recesses in the push-buttons.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-674



Power Output

Undistorted .... 0.10 watt
Maximum .... 0.21 watt

Loudspeaker

Type .... 5-inch permanent-magnet dynamic
Voice-coil Impedance .... 2.2 ohms at 400 cycles

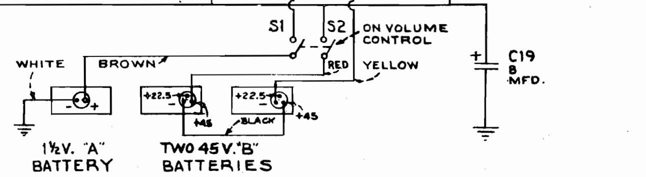
Batteries Required

"A," one 1.5 volt dry plug-type "A," 2½-in. x 2½-in. x 4-in. (Eveready No. 742 or equivalent)
"B," two 45 volt dry plug-type "B," 2½-in. x 4-in. x 5¾-in. (Eveready No. 732 or equivalent)

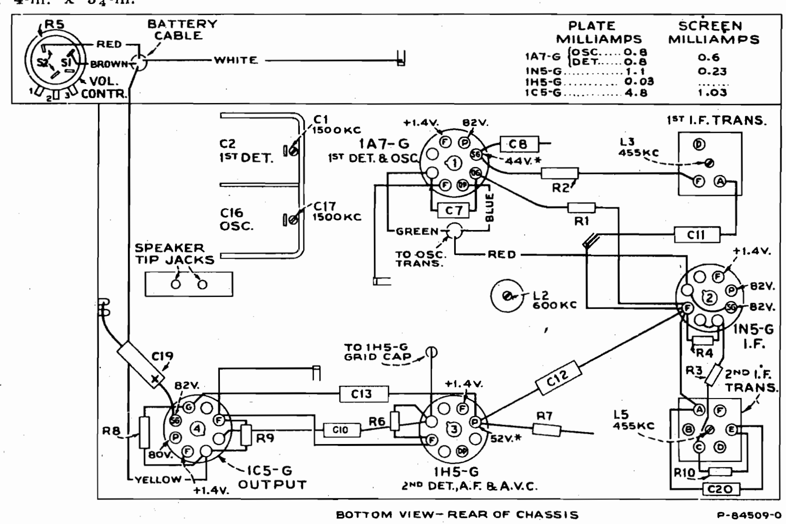
Current Consumption

"A" 0.24 ampere—"B," 9.0 milliamperes

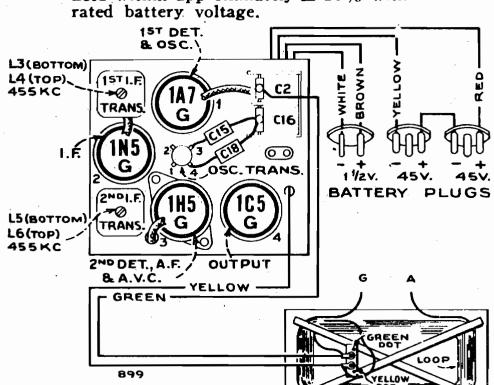
Note: Values with star (*) are operating voltages. Values not starred are actual measured voltages. Measurements are made to chassis unless otherwise indicated, with set tuned to quiet point. Values should hold within approximately ± 20% with rated battery voltage.



Frequency Range .... 540-1,560 kc
Intermediate Frequency .... 455 kc



R-F Wiring Diagram and Socket Voltages



Tube Location

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Pre-setting Dial.—With gang condenser in full mesh, the pointer should be horizontal.

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	1N5-G grid cap, in series with .001 mfd.	455 kc	Quiet point between 550-750 kc	L5 and L6 (2nd I-F transformer)
2	1A7-G grid cap, in series with .001 mfd.	455 kc		L3 and L4 (1st I-F transformer)
3	Assemble chassis and batteries in correct position in cabinet, and fasten rear cover (loop) in place while making the following adjustments, which are accessible through holes in the bottom of the cabinet.			
4	Antenna terminal, in series with 200 mfd. Connect low side of test-osc. to "G" term.	1500 kc	1500 kc*	C17 (osc.) C1 (ant.)
5		600 kc	600 kc*	L2 (osc.) Rock in
6	Repeat steps 4 and 5.			

* Use bottom of "1" in "1500" for 1500 kc calibration point, and use center of the last "0" in "600" for 600 kc calibration point.

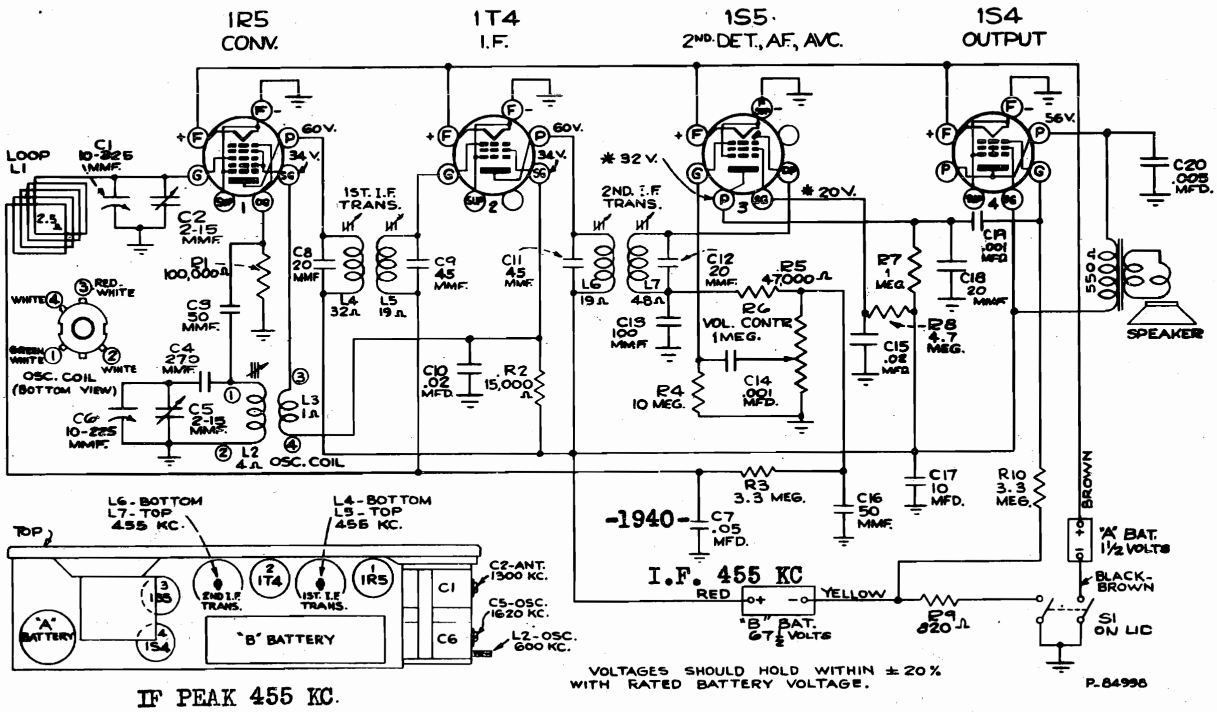
Precautionary Lead Dress.—

1. Dress speaker leads down to chassis.
2. The green lead from the loop to the antenna section of the gang should be dressed between the output and detector tube shields and pulled toward the far corner of the loop by means of the rubber band.
3. The spiral shield on the 1st-A.F. grid lead should be brought as close as possible to the grid cap.
4. Leads to the high side and tap of the volume control should be dressed down to the chassis and away from the output tube plate lead.

Antenna.—An antenna and ground may be connected to "A" and "G" at bottom of cabinet. If total length of antenna and lead-in is more than 150 feet, connect a 300 mmf capacitor in series with lead-in.

MODELS WR-682, WR-682A

WESTINGHOUSE ELEC. SUPPLY CO. INC.



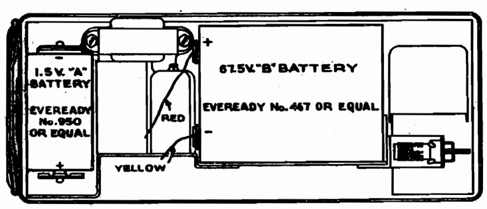
Schematic Circuit Diagram

Alignment Procedure

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, keep the output as low as possible to avoid a-v-c action.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	Tuning condenser stator (ant.) in series with .01 mfd.	455 kc	Quiet point at 1,600 kc end of dial	L7, L6, L5, L4 (2nd and 1st I-F transformers)
2	Radiated signal 1,620 kc	1,620 kc	Full clockwise (out of mesh)	C5 (oscillator)
3	Radiated signal 1,300 kc	1,300 kc	1,300 kc signal	C2 (antenna)
4	Radiated signal 600 kc	600 kc	600 kc	L2 (osc.)
5	Repeat steps 2, 3 and 4.			



Back View—Cover removed

Replacing Lid or Front Panel:

When the molded lid (which contains the loop antenna), or the chrome front panel requires replacement, it is not necessary to replace the complete assembly of lid and front panel, as either one may be replaced separately in a few minutes by taking out the hinge pins as described below.

The following parts are available for this purpose:

PART No.	
37808	Lid and antenna (type without lid support)
37812	Chrome front panel (type without lid support)
37809	Lid and antenna (type with lid support)
37813	Front chrome panel, (type with lid support)
37857	Two hinge pins and two hinge springs

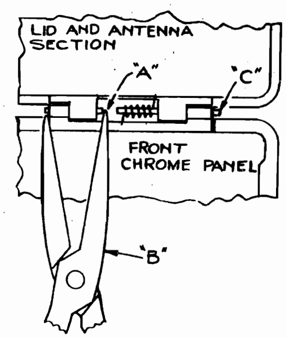
Installation Instructions:

First remove the three self-tapping screws that hold the chassis in the center case, and remove the case. Unsolder the leads from the loop lugs.

(a) With lid closed, cut hinge pins at point "A" with sharp cutters.

(b) Start removal of pin sections as shown, using long-nose pliers.

(c) Grasp end of pin section with long-nose pliers and pull out of hinge.



Replacing Lid or Chrome Panel

(d) Install new lid, or new front panel, using the replacement hinge pins and springs that are provided with replacement lids and panels. Arrange springs as shown. Apply a small amount of "Thermoplastic Cement" (G.E. ZV 5057) near outer end of each pin to insure tight and permanent fit.

Loose Control Knobs:

If for any reason either the tuning or volume control knob should become loose on its shaft, it may be rigidly mounted in the following manner:

(a) Remove the loose control knob from its shaft and scrape off the old cement from both shaft and control knob.

(b) Apply a generous even coating of a good cement to the shaft region which is to engage the knob. G.E. Thermoplastic cement, ZV-5057, is excellent for this purpose; it is a green fluid, easily thinned with acetone if necessary.

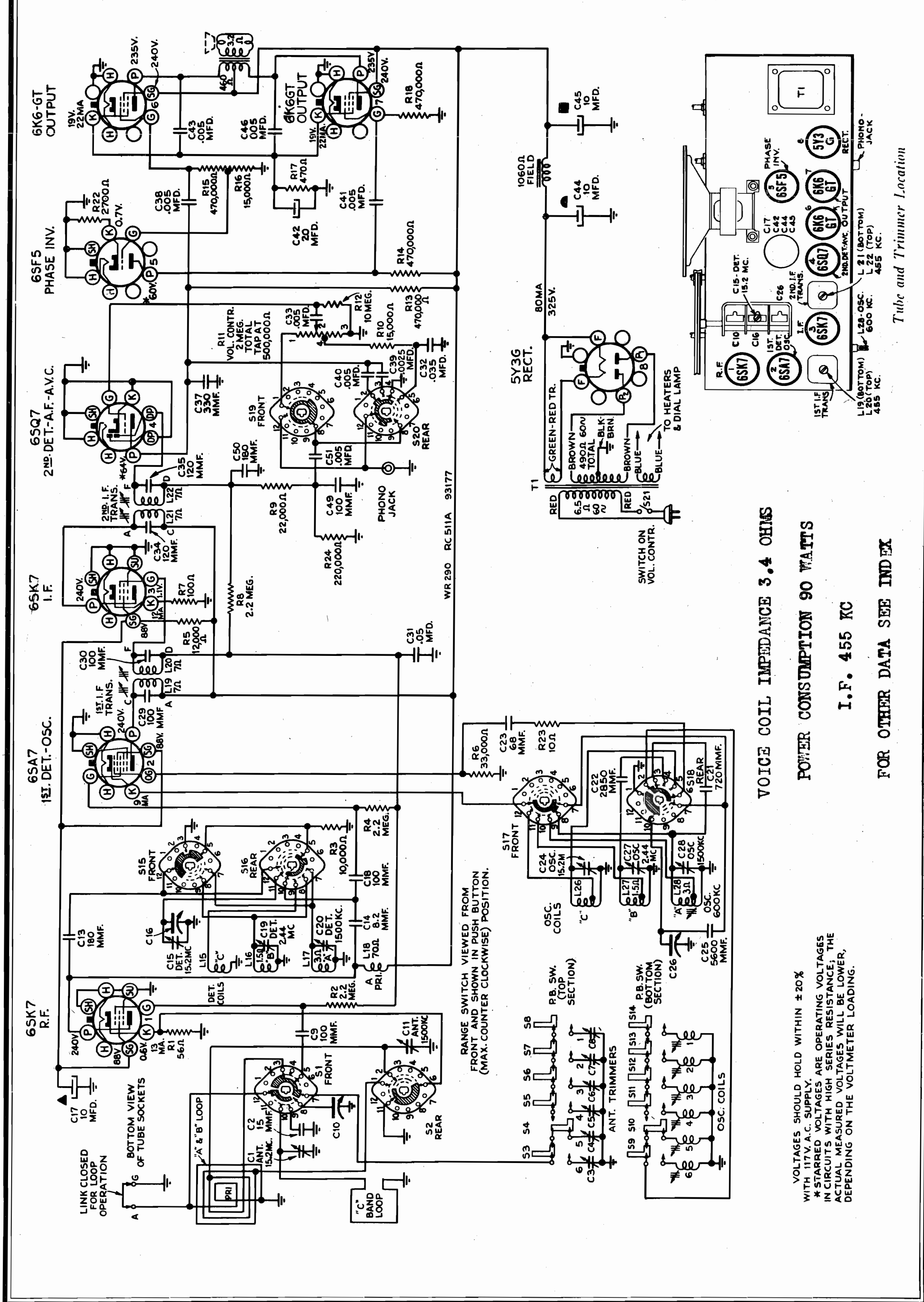
(c) Allow the cement on the shaft to air-dry, to evaporate any acetone present.

(d) Apply a small amount of heat to the shaft, sufficient to soften the cement.

(e) Mount knob on shaft while cement is still soft, and allow a few minutes for drying.

WESTINGHOUSE ELEC. SUPPLY CO. INC.

MODEL WR-290



MODEL WR-290

WESTINGHOUSE ELEC. SUPPLY CO. INC.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid a-v-c action.

Calibration for Alignment.—The proper dial calibration for alignment purposes can be set up in two ways:

1. The dial may be removed from the cabinet by sliding out the two spring pieces which clamp it in its mounting position. The condenser plates should then be turned into full mesh, the pointer adjusted to the scratch at the left end of the dial backing plate, and the dial slipped under the pointer so that its extreme left calibration mark coincides with the pointer. The dial may be held in place with scotch tape. In this manner the actual receiver dial is used for alignment. When alignment is finished, the scale should be replaced including the fibre light shields which are folded under the ends of the glass scale.
2. A calibration scale is attached to the tuning drum. The correct setting of the gang, in degrees, for each alignment frequency is given in the alignment table. Check the position of the drum, making sure that the 0 degree scale mark is horizontal with the gang in full mesh.

Pointer for Calibration Scale.—If method (2) is used, improvise a pointer for the calibration scale by fastening a piece of wire to the chassis, and bend the wire so that it points to the 0 degree mark on the calibration scale when the plates are fully meshed.

* Use minimum capacity peak if two can be obtained. Check to determine that C-24 has been adjusted to correct peak by tuning receiver to approximately 14.29 mc where a weaker signal should be received.

Note.—Oscillator tracks **above** signal on all bands

To reduce sensitivity during RF Alignment connect a 15,000 ohm, ½ watt resistor across secondary of 1st IF transformer.

Push Button Adjustment

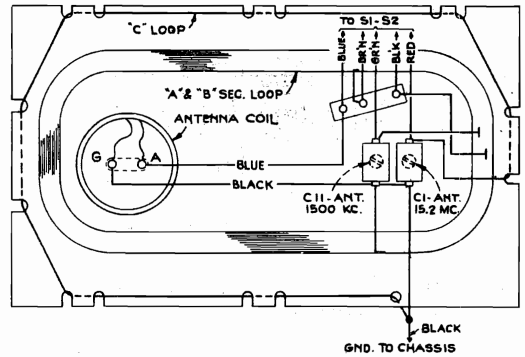
The push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool. Allow at least five minutes warm-up period before making adjustments.

In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across "A" and "G" terminals on back of set. In either case the procedure is as follows:

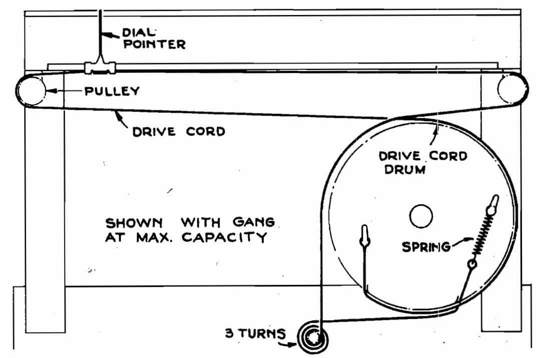
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn Range Control knob to "PB" and press push button No. 1 and adjust No. 1 oscillator core to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer for maximum output on this station.
   Owing to the relatively high R-F gain, it may be found that there are several settings of each push-button magnetite core that will bring in any particular station. In such cases it is advisable to unscrew the push button antenna trimmers to minimum capacity before adjusting the oscillator cores.
   Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.
5. Adjust for each of the remaining stations in the same manner.
6. After all stations are tuned-in on the buttons, make a final careful adjustment of all core rods until best reception is obtained for each. Outdoor antenna should not be reconnected if used.

Alignment Procedure

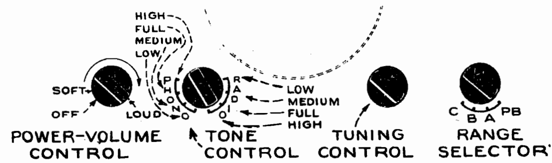
Steps	Connect high side of test oscillator to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	6SK7 I-F grid in series with 0.01 mfd.	455 kc	"A" band Quiet Point between 550 and 750 kc	L-21 and L-22 (2nd I-F Trans.)
2	6SA7 grid in series with 0.01 mfd.			L-19 and L-20 (1st I-F Trans.)
3	Antenna terminal in series with 300 ohms ("A" antenna trimmer C-11, should be ½ turn out)	15.2 mc	15.2 mc (149°) "C" band	C-24 (Osc.)* C-15 (Det.) Rock gang C-1 (R-F) Rock gang
4	Antenna terminal in series with 200 mmf.	2.44 mc	2.44 mc (91.5°) "B" band	C-27 (Osc.) C-19 (Det.)
5	Antenna terminal in series with 200 mmf. (Preset "A" osc. trimmer C-28 ½ turn out)	600 kc	600 kc (30.5°) "A" band	L-28 Rock gang
6	Antenna terminal in series with 200 mmf.	1,500 kc	1,500 kc (160°) "A" band	C-28 (Osc.) C-20 (Det.) C-11 (R-F)
7	Repeat step 5, then 6			
8	Antenna terminal in series with 300 ohms	15.2 mc	15.2 mc (149°) "C" band	C-1 (R-F) Rock gang



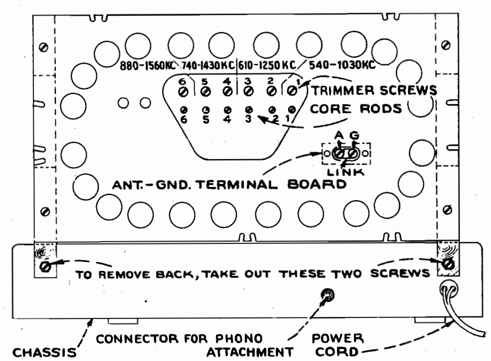
Loop Connections and Trimmers



Dial-Indicator and Drive Mechanism



Location of Controls



Back of Chassis

Frequency Ranges
Broadcast .... 540-1,600 kc
Medium Wave .... 1.56-4.0 mc
Short Wave .... 5.8-18.0 mc

Intermediate Frequency .... 455 kc

Power Output Rating
Undistorted .... 5.0 watts
Maximum .... 5.5 watts

Loudspeaker (RL-79-A5)
Type .... 6-inch Electrodynamic
V.C. Impedance .... 3.4 ohms at 400 cycles

Power Supply Ratings
105-125 volts, 50-60 cycles, 90 watts
105-125 volts, 25-60 cycles, 90 watts

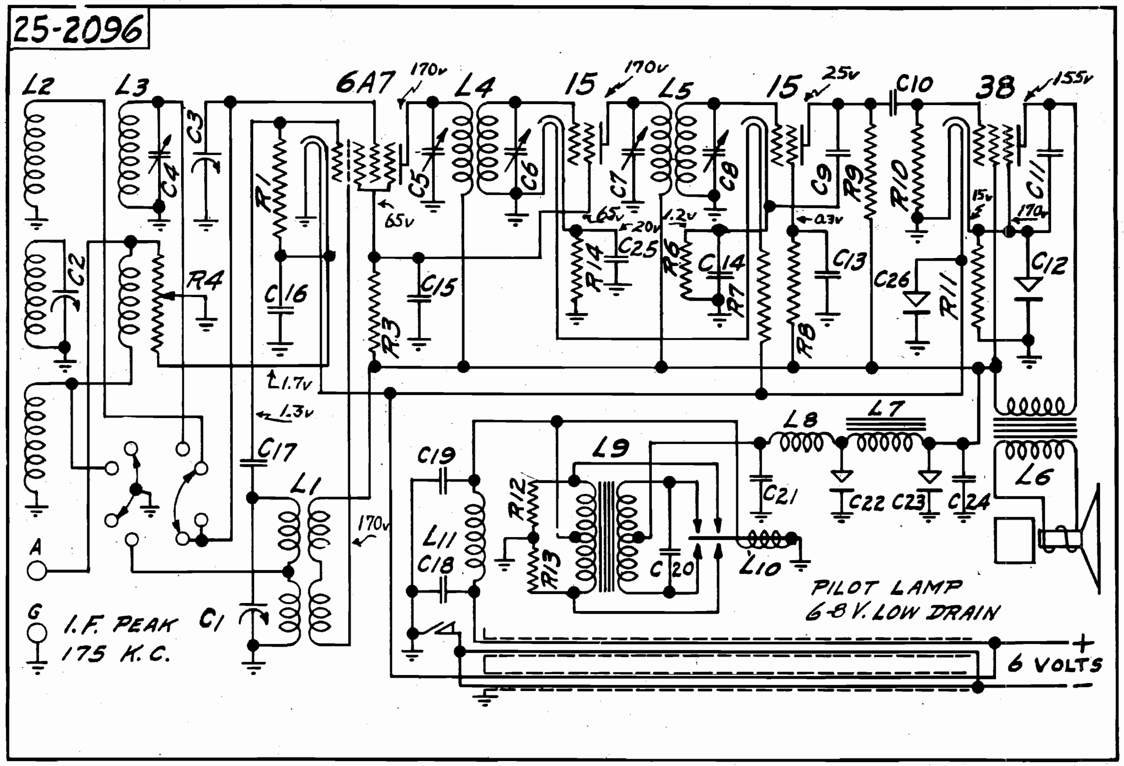
WILCOX-GAY CORP.

MODEL 6J4

VOLTAGES MEASURED WITH A 1000 ohms-per-volt METER

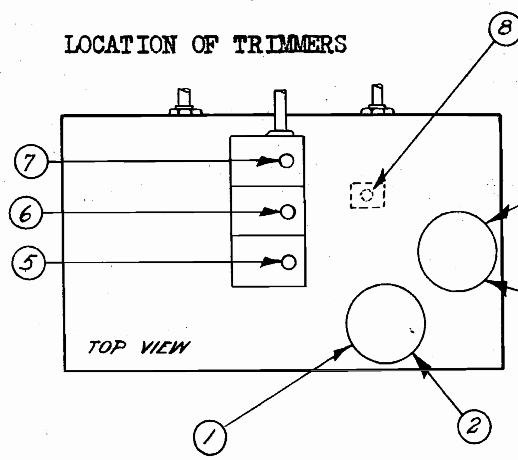
B+ VOLTAGE 170 BATTERY 6.2 volts

CODE	PART NO.	RESISTORS
R1	53-898	50,000 Ohm Oscillator Grid Resistor
R3	53-898	50,000 Ohm Osc. & I.F. Screen Resistor
R4	19-1296	10,000 Ohm Volume Control & Off-On Switch
R6	53-898	50,000 Ohm Second Det. Cathode Resistor
R7	53-2012	9.09 Ohm I.F. & Second Det. Filament Res.
R8	53-2008	10 Meg Ohm Second Detector Screen Resistor
R9	53-926	1 Meg Ohm Second Detector Plate Resistor
R10	53-925	500,000 Ohm Output Grid Resistor
R11	53-1065	1,000 Ohm Output Cathode Resistor
R12	53-1061	150 Ohm B Primary Regulator Resistor
R13	53-1061	150 Ohm B Primary Regulator Resistor
R14	53-1063	500 Ohm I.F. Cathode Resistor
		CONDENSERS
C1	77-833	16-328 MMFD. Osc. Section of 3 Gang Cond.
C2	77-833	16-366 MMFD. Pres. Section of 3 Gang Cond.
C3	77-833	16-366 MMFD. Pres. Section of 3 Gang Cond.
C4	78-2010	3-30 MMFD. Police Band Pres. Trimmer Cond.
C5	78-2011	First I.F. Primary Trimmer Condenser
C6	78-2008	First I.F. Secondary Trimmer Condenser
C7	78-2011	Second I.F. Primary Trimmer Condenser
C8	78-2008	Second I.F. Secondary Trimmer Condenser
C9	76-265	.001 Mfd. Mica Second Det. Plate Filter Cond.
C10	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C11	75-2001	.002 Mfd. 600 V. Paper Output Plate Filter Cond.
C12	18-928	25 Mfd. 25 V. Dry Electrolytic Output Cathode Cond.
C13	75-2005	.1 Mfd. 200 V. Paper Second Det. Screen By-Pass
C14	75-2005	.1 Mfd. 200 V. Paper Second Det. Cathode By-Pass
C15	75-2005	.1 Mfd. 200 V. Paper Osc. & I.F. Screen By-Pass
C16	75-2005	.1 Mfd. 200 V. Paper Osc. Cathode By-Pass
C17	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C18	75-2011	.5 Mfd. 200 V. Paper B Unit Supply Filter Cond.
C19	75-2011	.5 Mfd. 200 V. Paper B Unit Supply Filter Cond.
C20	75-1325	.015 Mfd. 1000 V. Oil B Secondary Wave Form Cond.
C21	75-2007	.1 Mfd. 400 V. Paper B Supply Filter Condenser
C22	18-2006	16 Mfd. 250 W.V. Wet Electrolytic B Filter Cond.
C23	18-2006	16 Mfd. 250 W.V. Wet Electrolytic B Filter Cond.
C24	75-2013	1. Mfd. 400 V. Paper B Supply By-Pass Condenser
C25	75-2005	.1 Mfd. 200 V. I.F. Cathode By-Pass Condenser
C26	18-928	25 Mfd. 25 W.V. Dry Electrolytic Condenser
		INDUCTANCES
L1	17-2101	Oscillator Coil Assembly
L2	17-2109	Broadcast Preselector Coil Assembly
L3	17-2103	Police Band Preselector Coil Assembly
L4	68-2031	First I.F. Transformer Assembly
L5	68-2031	Second I.F. Transformer Assembly
L6	64-2037	Permanent Magnet Dynamic Speaker With Output Transformer for #38 Tube
L7	14-940	20 Henry B Filter Choke
L8	17-2114	5500 Microhenry R.F. Choke
L9	80-2020	B Supply Transformer Assembly
L10	72-2001	Replaceable Plug-In Synchronous Vibrator
L11	17-1434	B Unit Supply Filter Choke



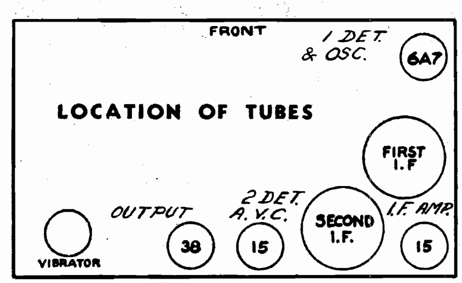
FOR ALIGNMENT, SEE INDEX

LOCATION OF TRIMMERS



CHASSIS MODEL 6J4

FOR USE ONLY WITH **6 VOLTS D.C.**
PILOT LIGHTS 6-8 V. -.15 A.
I. F. PEAK 175 K. C.



MODELS 6J4,6M6,6P4, 6S12,7C6,7CB6,7D6

WILCOX-GAY CORP.

ALIGNMENT MODEL 6J4

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT[1] SIGNAL
Remove Grid Clip from 6A7					
Control Grid of 6A7	175 K.C.	1400 K.C.	Broadcast (Left)	1	Max.
" " "	" "	" "	" "	2	Max.
" " "	" "	" "	" "	3	Max.
" " "	" "	" "	" "	4	Max.
Connect Grid Clip to 6A7					
*Ant. & Ground Posts	1400 K.C.	1400 K.C.	" "	5	Max.
" " "	" "	" "	" "	6	Max.
" " "	" "	" "	" "	7	Max.
" " "	4.0 M.C.	4.0 M.C.	Police (Right)	8	Max.

Volume Control in "Full-On" position at all times.
(*) Connect a standard dummy antenna between signal generator and receiver.
Note 1: Signal across primary of output transformer to be maintained at approximately 10 volts by adjusting signal generator.

ALIGNMENT MODEL 6P4

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT[1] SIGNAL
Remove Grid Clip from 1C6					
Control Grid of 1C6	175 K.C.	1400 K.C.		1	Max.
" " "	" "	" "		2	Max.
" " "	" "	" "		3	Max.
" " "	" "	" "		4	Max.
" " "	1400 K.C.	" "		5	Max.
" " "	" "	" "		6	Max.
" " "	" "	" "		7	Max.
" " "	1000 K.C.	1000 K.C.		5^2	Max.
" " "	" "	" "		6^2	Max.
" " "	" "	" "		7^2	Max.
" " "	600 K.C.	600 K.C.		5^2	Max.
" " "	" "	" "		6^2	Max.
" " "	" "	" "		7^2	Max.

Volume Control in "Full-On" position at all times.
(*) Connect a standard dummy antenna between signal generator and ground.
Note 1: Signal across primary of the output transformer at no time to exceed 50 volts.
Note 2: Due to formed oscillator plates, set should track. If not, bend slotted plates at this point and recheck at 1400 K.C.

ALIGNMENT MODELS 7C6 - 7CB6 - 7D6

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT[1] SIGNAL
Remove Grid Clip from 6A7					
Control Grid of 6A7	175 K.C.	1400 K.C.	Broadcast (Left)	1	Max.
" " "	" "	" "	" "	2	Max.
" " "	" "	" "	" "	3	Max.
" " "	" "	" "	" "	4	Max.
Connect Grid Clip to 6A7					
*Ant. & Ground Posts	1400 K.C.	1400 K.C.	" "	5	Max.
" " "	" "	" "	" "	6	Max.
" " "	" "	" "	" "	7	Max.
" " "	600 K.C.	600 K.C.	" "	5^2	Max.
" " "	" "	" "	" "	6^2	Max.
" " "	" "	" "	" "	7^2	Max.
" " "	4.0 M.C.	4.0 M.C.	Police (Center)	8	Max.
" " "	14.0 M.C.	14.0 M.C.	Foreign (Right)	9	Max.

Volume Control in "Full-On" position at all times.
(*) Connect a standard dummy antenna between signal generator and receiver.
Note 1: Signal across primary of output transformer to be maintained at approximately 25 volts by adjusting signal generator.
Note 2: Due to formed oscillator plates, set should track. If not, bend slotted plates at this point and recheck at 1400 K.C.

ALIGNMENT MODEL 6M6

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT[1] SIGNAL
Remove Grid Clip from 6A7					
Control Grid of 6A7	115 K.C.	214.3 Meters	Broadcast (Center)	1	Max.
" " "	" "	" "	" "	2	Max.
" " "	" "	" "	" "	3	Max.
" " "	" "	" "	" "	4^2	Max.
Connect Grid Clip to 6A7					
*Ant. & Chassis (Wht.Lead)	1400 K.C.	" "	" "	5	Max.
" "	600 K.C.	500 "	" "	5^3	Max.
" "	1400 "	214.3 "	" "	5	Max.
" "	" "	" "	" "	6	Max.
" "	" "	" "	" "	7	Max.
" "	15.0 M.C.	20 "	Foreign (Right)	8	Max.
" "	6.0 "	50 "	" "	8^4	Max.
" "	353 K.C.	850 "	Long Wave (Left)	9	Max.
" "	150 "	2000 "	" " "	10	Max.
" "	353 "	850 "	" " "	9	Max.
" "	" "	" "	" " "	11	Max.
" "	" "	" "	" " "	12	Max.

Volume Control in "Full-On" position at all times.
(*) Connect a standard dummy antenna between signal generator and receiver.
Note 1: Signal across primary of the output transformer at no time to exceed 50 volts.
Note 2: Repeat above procedure and critically trim each adjustment to absolute resonance to insure perfect alignment.
Note 3: Check ganging and if necessary bend plates and recheck at 1400 K.C.
Note 4: Check ganging at this point.

ALIGNMENT MODEL 6S12

SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	OUTPUT SIGNAL
Remove Grid Clip from 6A8					
Control Grid of 6A8	456 K.C.	1400 K.C.	Broadcast (Right)	1^1	Max.
" " "	" "	" "	" "	2	Max.
" " "	" "	" "	" "	3	Max.
" " "	" "	" "	" "	4	Max.
" " "	" "	" "	" "	5	Max.
" " "	" "	" "	" "	6^2	Max.
Connect Grid Clip to 6A8					
*Ant. & Ground Posts	1400 K.C.	1400 K.C.	" "	7	Max.
" " "	" "	" "	" "	8	Max.
" " "	" "	" "	" "	9	Max.
" " "	600 K.C.	600 K.C.	" "	10	Max.
" " "	1400 K.C.	1400 K.C.	" "	7^3	Max.
" " "	1000 K.C.	1000 K.C.	" "	7^4	Max.
" " "	" "	" "	" "	8^4	Max.
" " "	" "	" "	" "	9^4	Max.
" " "	4.0 M.C.	4.0 M.C.	Police (Center)	11	Max.
" " "	" "	" "	" "	12	Max.
" " "	" "	" "	" "	13	Max.
" " "	1700 K.C.	1700 K.C.	" "	14	Max.
" " "	4.0 M.C.	4.0 M.C.	" "	11	Max.
" " "	14.0 M.C.	14.0 M.C.	Foreign (Left)	15	Max.
" " "	" "	" "	" "	16	Max.
" " "	456 K.C.	1400 K.C.	Broadcast (Right)	17	Min.

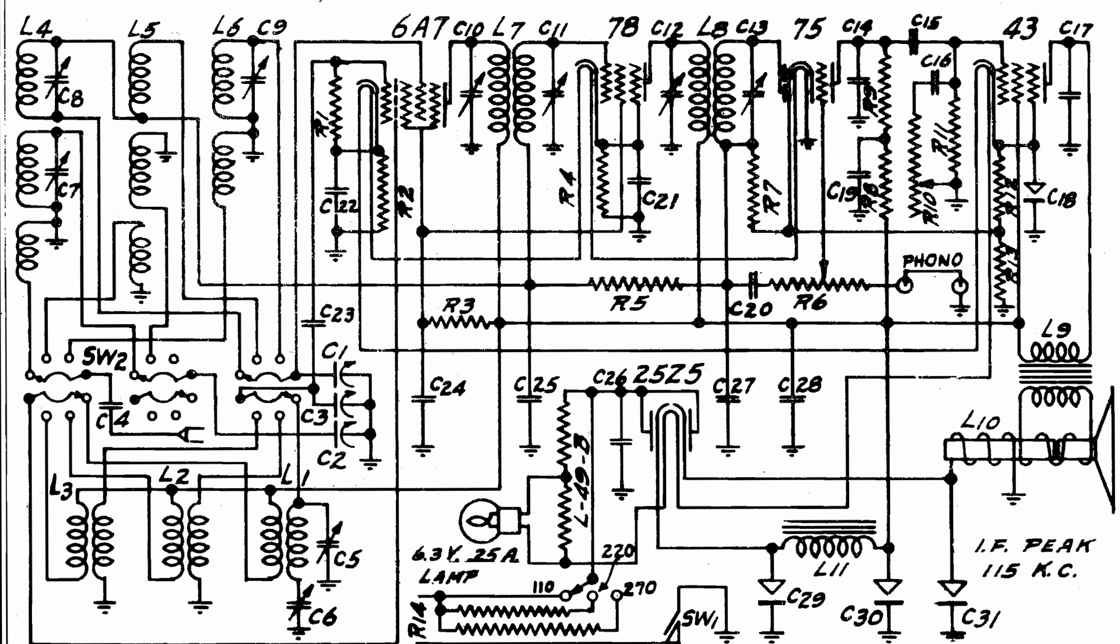
Volume Control in "Full-On" position at all times.
(*) Connect a standard dummy antenna between signal generator and receiver.
Note 1: Tone control must be turned partially toward its bass position, or off the high fidelity position.
Note 2: Repeat above procedure and critically trim each adjustment to absolute resonance to insure perfect alignment. The I.F. sensitivity should be from 2 to 4 microvolts.
Note 3: Repeat above procedure and critically trim each adjustment to absolute resonance.
Note 4: Investigate scale tracking and sensitivity at this point and bend slotted rotor plates if necessary.

WILCOX-GAY CORP.

MODEL 6M6

25-2084

FOR ALIGNMENT, SEE INDEX



CODE	PART NO.	RESISTORS
R1	53-898	50,000 Ohm Oscillator Grid Resistor
R2	53-1062	250 Ohm Oscillator Cathode Resistor
R3	53-1042	25,000 Ohm 6A7 & 78 Screen Resistor
R4	53-1063	500 Ohm 78 Cathode Resistor
R5	53-926	1 Meg Ohm A.V.C. Network Resistor
R6	19-1315	500,000 Ohm Volume Control
R7	53-925	500,000 Ohm Diode Resistor
R8	53-898	50,000 Ohm 75 Plate Hum Resistor
R9	53-924	250,000 Ohm 75 Plate Resistor
R10	19-1317	250,000 Ohm Tone Control
R11	53-925	500,000 Ohm 43 Grid Resistor
R12	53-1062	500 Ohm 43 Cathode Resistor
R13	53-1122	40 Ohm 75 Cathode Resistor
R14	20-2004	Line Power Cord Assembly

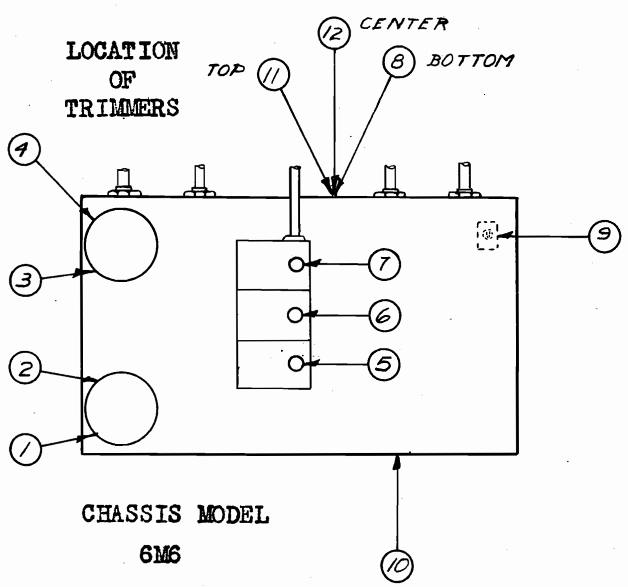
CONDENSERS

C1	77-833	366 MMFD. Preselector Section of 3 Gang
C2	77-833	366 MMFD. Preselector Section of 3 Gang
C3	77-833	328 MMFD. Oscillator Section of 3 Gang
C4	75-2003	.01 Mfd. 400 V. Paper Antenna Series Cond.
C5	78-2010	3-30 MMFD. Long Wave Osc. Parallel Trimmer
C6	78-2006	Long Wave Oscillator Series Trimmer
C7	78-1588	3-30 MMFD. Long Wave Preselector Trimmer
C8	78-1588	3-30 MMFD. Long Wave Preselector Trimmer
C9	78-1588	3-30 MMFD. Foreign Band Preselector Trimmer
C10	78-993	First I. F. Primary Trimmer
C11	78-1228	First I. F. Secondary Trimmer
C12	78-993	Second I. F. Primary Trimmer
C13	78-2015	Second I. F. Secondary Trimmer
C14	76-265	.001 Mfd. Mica 75 Plate Filter Condenser
C15	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C16	75-2003	.01 Mfd. 400 V. Paper Tone Control Cond.
C17	75-2002	.004 Mfd. 600 V. Paper 43 Plate Filter Cond.
C18	18-[illegible]	25 Mfd. 25 V. Elect. 43 Cathode By-Pass Cond.
C19	75-2005	.1 Mfd. 200 V. Paper 75 Plate Hum Filter Cond.
C20	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C21	75-2005	.1 Mfd. 200 V. Paper 78 Cathode By-Pass Cond.
C22	75-2005	.1 Mfd. 200 V. Paper 6A7 Cathode By-Pass Cond.
C23	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C24	75-2005	.1 Mfd. 200 V. Paper 6A7 & 78 Screen By-Pass Cond.
C25	75-2005	.1 Mfd. 200 V. Paper A.V.C. By-Pass Condenser
C26	75-2005	.1 Mfd. 200 V. Paper Line By-Pass Condenser
C27	76-307	.0005 Mfd. Mica Diode Filter Condenser
C28	75-2011	.5 Mfd. 200 V. Paper B Supply By-Pass Condenser
C29	18-2003	11 Mfd. 150 W.V. Dry Electrolytic Condenser
C30	18-2003	4 Mfd. 150 W.V. Dry Electrolytic Condenser
C31	18-2003	4 Mfd. 150 W.V. Dry Electrolytic Condenser

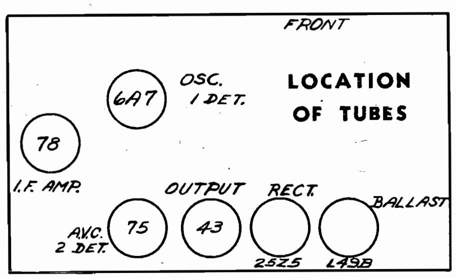
INDUCTANCES

L1	17-2013	Long Wave Oscillator Coil Assembly
L2	17-2013	Broadcast Oscillator Coil Assembly
L3	17-2095	Foreign Band Oscillator Coil Assembly
L4	17-2093	Long Wave Preselector Coil Assembly
L5	17-2093	Broadcast Preselector Coil Assembly
L6	17-2096	Foreign Band Preselector Coil Assembly
L7	68-2022	First I. F. Transformer Assembly
L8	68-2029	Second I. F. Transformer Assembly
L9	64-1653	43 Output Transformer on L10
L10	64-1653	6½" Speaker 3000 Ohm Field
L11	14-940	20 Henry Filter Choke
SW1	66-2010	Line Power Switch
SW2	66-2009	Wave Band Change Switch

LOCATION OF TRIMMERS



CHASSIS MODEL 6M6



VOLTAGE TABLE

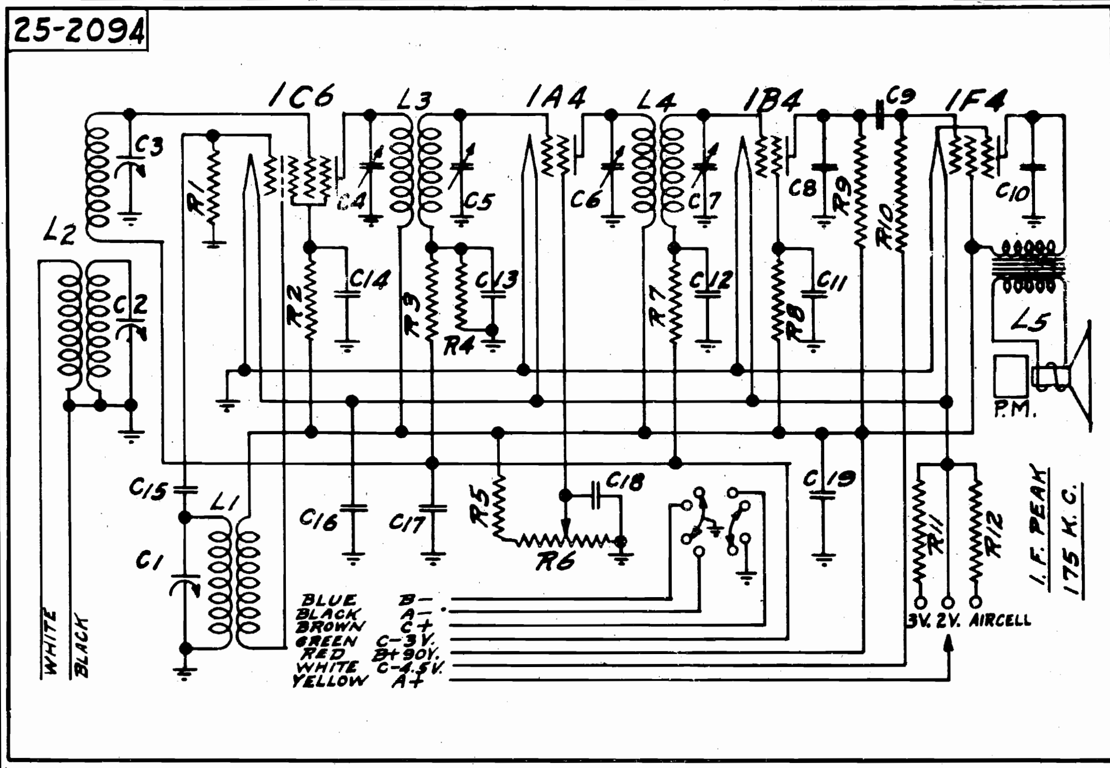
TUBE	PL.	SC.	K	2 PL.	2 GR.
6A7	125	55	1.3	125	- 2.7
78	125	55	2.2		
75	42		1.5		
43	115	125	20		

B+ VOLTAGE ———— 125
SPEAKER FIELD VOLTAGE ———— 125
LINE VOLTAGE WAS 220 V. 60 CYCLE
METER 1000 OHMS - PER-VOLT

MODEL 6P4

WILCOX-GAY CORP.

25-2094



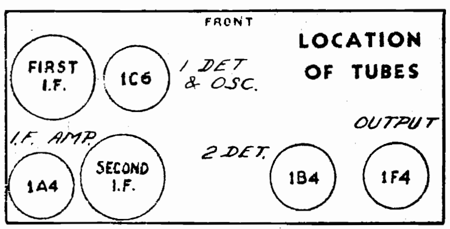
CODE	PART NO.	RESISTORS
R1	53-898	50,000 Ohm Oscillator Grid Resistor
R2	53-920	10,000 Ohm 1C6 Screen Resistor
R3	53-923	100,000 Ohm 1A4 Grid Isolation Resistor
R4	53-898	50,000 Ohm 1A4 Grid Resistor
R5	53-1042	25,000 Ohm 1A4 Screen Resistor
R6	19-1315	500,000 Ohm Volume Control
R7	53-923	100,000 Ohm 1B4 Grid Isolation Resistor
R8	53-925	500,000 Ohm 1B4 Screen Resistor
R9	53-924	250,000 Ohm 1B4 Plate Resistor
R10	53-925	500,000 Ohm 1F4 Grid Resistor
R11	53-2010	2.5 Ohm Filament Series Resistor
R12	53-2009	1.0 Ohm Filament Series Resistor

		CONDENSERS
C1	77-833	Oscillator Section of 3 Gang Condenser
C2	77-833	First Preselector Section of 3 Gang Condenser
C3	77-833	Second Preselector Section of 3 Gang Condenser
C4	78-2008	First I.F. Primary Trimmer Condenser
C5	78-2011	First I.F. Secondary Trimmer Condenser
C6	78-2008	Second I.F. Primary Trimmer Condenser
C7	78-2011	Second I.F. Secondary Trimmer Condenser
C8	76-662	.002 Mfd. Mica Second Det. Plate Filter Cond.
C9	75-2003	.01 Mfd. 400 V. Paper Audio Feed Condenser
C10	75-2001	.002 Mfd. 600 V. Paper Output Plate Filter Cond.
C11	75-2005	.1 Mfd. 200 V. Paper Second Detector Screen By-Pass
C12	75-2006	.1 Mfd. 200 V. Paper 1B4 Grid Isolation By-Pass
C13	75-2005	.1 Mfd. 200 V. Paper 1A4 Grid Isolation By-Pass
C14	75-2005	.1 Mfd. 200 V. Paper 1C6 Screen By-Pass Condenser
C15	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C16	75-2013	1. Mfd. 400 V. Paper Filament By-Pass Condenser
C17	75-2006	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C18	75-2005	.1 Mfd. 200 V. Paper 1A4 Screen By-Pass Cond.
C19	75-2011	.5 Mfd. 200 V. Paper B+ By-Pass Condenser

		INDUCTANCES
L1	17-2111	Oscillator Coil Assembly
L2	17-2100	Preselector Coil Assembly
L3	68-2012	First I.F. Transformer Assembly
L4	68-2030	Second I.F. Transformer Assembly
L5	64-2036	Permanent Magnet Dynamic Speaker - Output Trans. 1F4 Tube

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	GRID TO GROUND	2 PL. TO GROUND	2 GRID TO GROUND
1C6	1ST DET. & OSC.	90	60	- 3 V.	90	- 7
1A4	I.F. AMPLIFIER	90	NOTE	- .3		
1B4	2ND DETECTOR	30	25	- .3		
1F4	POWER OUTPUT	85	90			

NOTE FOR 1A4
SCREEN WITH VOLUME CONTROL OFF IS 0 VOLTS
SCREEN WITH VOLUME CONTROL ON IS 50 VOLTS



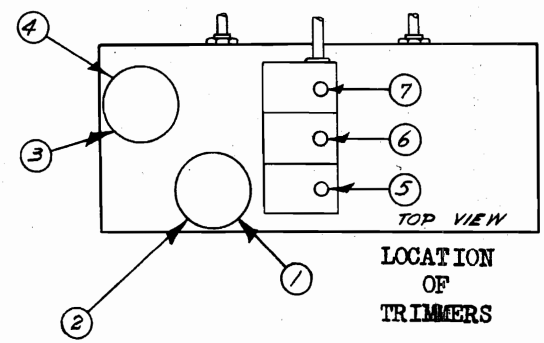
FOR USE ONLY WITH
"B" 90-135 V. D.C.
"A" 2-3 V. D.C.

I. F. PEAK 175 K.C.

CHASSIS MODEL
6P4

BLUE	B-
BLACK	A-
BROWN	C-
GREEN	C- 3 V.
RED	B+ 90 V.
YELLOW	A+ 2 V.
WHITE	C- 4.5 V.

FOR ALIGNMENT, SEE INDEX

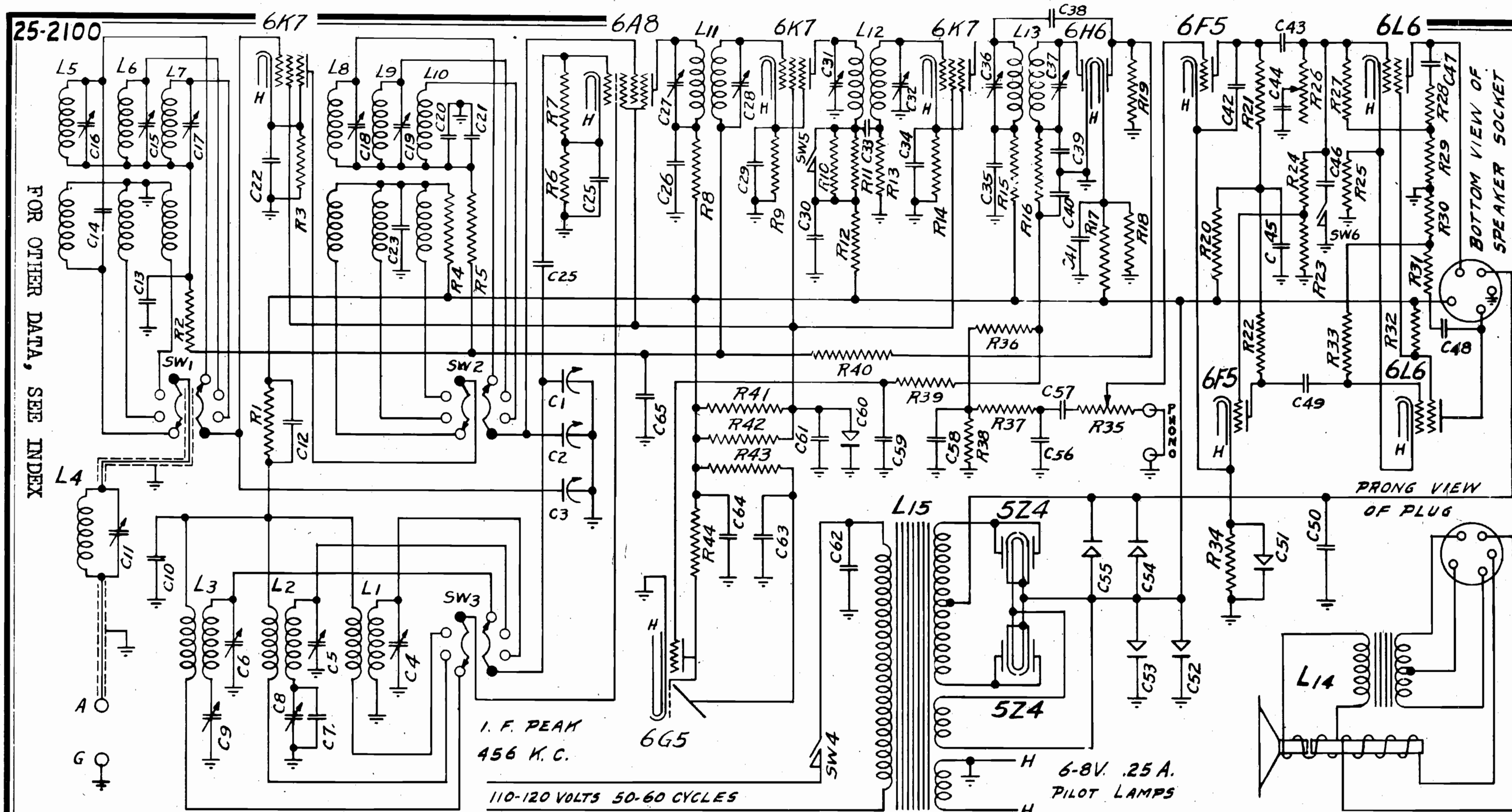


LOCATION
OF
TRIMMERS

WILCOX-GAY CORP.

MODEL 6S12

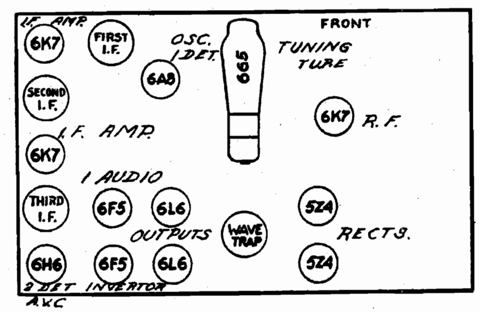
25-2100



FOR OTHER DATA, SEE INDEX

VOLTAGE TABLE

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2ND PLATE TO GROUND	2ND GRID TO GROUND
6K7	R.F. AMPLIFIER	265	90	3.4		
6A8	OSC. & 1ST DETECTOR	320	90	3.4	212	- 18
6K7	I.F. AMPLIFIER	260	90	3.4		
6K7	I.F. AMPLIFIER	265	90	3.0		
6H6	2ND DETECTOR & AVC			50 - AVC CATHODE		
6F5	1ST AUDIO AMPLIFIER	100		1.8		
6F5	INVERTER	100				
6L6	OUTPUT	390	275	18		
6L6	OUTPUT	390	275	18		
6G5	TUNING	20			TARGET 265	



PILOT LIGHTS 6-8 V.
I. F. PEAK 456 K. C.

FOR USE ONLY WITH
110-120 V . 50-60 CYCLE

MODEL 6S12

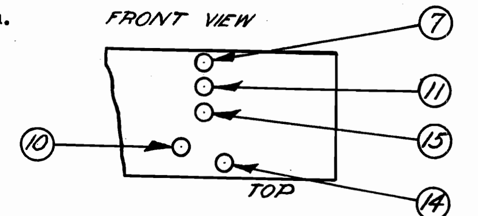
WILCOX-GAY CORP.

CODE	PART NO. RESISTOR	NAME
R1	53-195	25,000 Ohm Type J Osc. Plate Resistor
R2	53-923	100,000 Ohm Type M A.V.C. Network Resistor
R3	53-1063	500 Ohm R.F. Amp. Cathode Resistor
R4	53-195	25,000 Ohm Type J R.F. Amp. Plate Resistor
R5	53-923	100,000 Ohm Type M A.V.C. Network Resistor
R6	53-1062	250 Ohm 6A8 Cathode Resistor
R7	53-941	20,000 Ohm Type M Osc. Grid Resistor
R8	53-195	25,000 Ohm Type J 6A8 Plate Isolation Resistor
R9	53-1063	500 Ohm First I.F. Cathode Resistor
R10	53-922	75,000 Ohm First I.F. Plate Isolation Resistor
R11	53-898	50,000 Ohm First I.F. Plate Isolation Resistor
R12	53-195	25,000 Ohm Type J First I.F. Plate Isolation Resistor
R13	53-919	5,000 Ohm Type M High Fidelity Coupling Resistor
R14	53-1063	500 Ohm Second I.F. Cathode Resistor
R15	53-195	25,000 Ohm Type J Second I.F. Plate Isolation Resistor
R16	53-898	50,000 Ohm Detector Diode Filter Resistor
R17	53-924	250,000 Ohm A.V.C. Cathode Resistor
R18	53-898	50,000 Ohm A.V.C. Cathode Resistor
R19	53-926	500,000 Ohm A.V.C. Diode Load Resistor
R20	53-923	100,000 Ohm 6F5's Plate Hum Resistor
R21	53-924	250,000 Ohm First Audio Plate Resistor
R22	53-924	250,000 Ohm Invertor Plate Resistor
R23	53-941	20,000 Ohm Invertor Grid Resistor
R24	53-926	1 Meg Ohm Invertor Network Resistor
R25	53-1061	150 Ohm 6L6's Cathode Resistor
R26	19-2004	250,000 Ohm Tone Control
R27	53-926	1 Meg Ohm 6L6 Grid Resistor
R28	53-925	500,000 Ohm Audio Degeneration Network Resistor
R29	53-921	40,000 Ohm Audio Degeneration Network Resistor
R30	53-921	40,000 Ohm Audio Degeneration Network Resistor
R31	53-925	500,000 Ohm Audio Degeneration Network Resistor
R32	53-278	20,000 Ohm Type J 6L6 Screen Resistor
R33	53-925	500,000 Ohm 6L6 Grid Resistor
R34	53-2003	2,000 Ohm 6F5's Cathode Resistor
R35	19-2005	500,000 Ohm Volume Control & Line Switch
R36	53-925	500,000 Ohm Detector Diode Load Resistor
R37	53-920	10,000 Ohm Audio Filter Network Resistor
R38	53-923	100,000 Ohm Detector Diode Load Resistor
R39	53-926	1 Meg Ohm 6G5 Grid Resistor
R40	53-925	500,000 Ohm A.V.C. Network Resistor
R41	53-922	75,000 Ohm R.F. & I.F. Screen Resistor
R42	53-922	75,000 Ohm R.F. & I.F. Screen Resistor
R43	53-923	100,000 Ohm 6G5 Plate Resistor
R44	53-926	1 Meg Ohm 6G5 Triode Plate Resistor
	CONDENSERS	
C1	77-1581	Oscillator Section of 3 Gang Condenser
C2	77-1581	Second Preselector Section of 3 Gang Cond.
C3	77-1581	First Preselector Section of 3 Gang Cond.
C4	78-1588	3-30 MMFD. Foreign Band Oscillator Trimmer
C5	78-1588	3-30 MMFD. Police Band Osc. Parallel Trimmer
C6	78-1588	3-30 MMFD. Broadcast Band Osc. Parallel Trimmer
C7	76-265	.001 Mfd. Mica Police Band Osc. Series Cond.
C8	78-1572	1600 MMFD. Police Band Osc. Series Trimmer
C9	78-1572	600 MMFD. Broadcast Oscillator Series Trimmer
C10	75-2003	.01 Mfd. 400 V. Paper Osc. Plate Isolation Cond.
C11	78-2016	Wave Trap Trimmer Condenser
C12	76-662	.002 Mfd. Mica Osc. Plate Filter Condenser
C13	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C14		Broadcast Antenna Coil Coupling Capacitor
C15	78-2010	3-30 MMFD. Police Band Antenna Trimmer Cond.
C16	78-1588	3-30 MMFD. Broadcast Antenna Trimmer Cond.
C17	78-1588	3-30 MMFD. Foreign Band Antenna Trimmer Cond.
C18	78-1588	3-30 MMFD. Broadcast R.F. Trimmer Condenser
C19	78-2010	3-30 MMFD. Police Band R.F. Trimmer Condenser
C20	76-662	.002 Mfd. Mica A.V.C. Network R.F. Filter Cond.
C21	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C22	75-2005	.1 Mfd. 200 V. Paper R.F. Amp. Cathode By-Pass Cond.
C23	75-2003	.01 Mfd. 400 V. Paper R.F. Amp. Plate Isolation Cond.
C24	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C25	75-2005	.1 Mfd. 200 V. Paper 6A8 Cathode Condenser
C26	75-2003	.01 Mfd. 400 V. Paper 6A8 Plate Isolation Cond.
C27	78-2016	50-150 MMFD. First I.F. Primary Trimmer Cond.
C28	78-2016	50-150 MMFD. First I.F. Secondary Trimmer Cond.
C29	75-2005	.1 Mfd. 200 V. Paper First I.F. Cathode By-Pass Cond.
C30	75-2003	.01 Mfd. 400 V. Paper First I.F. Plate Isolation Cond.

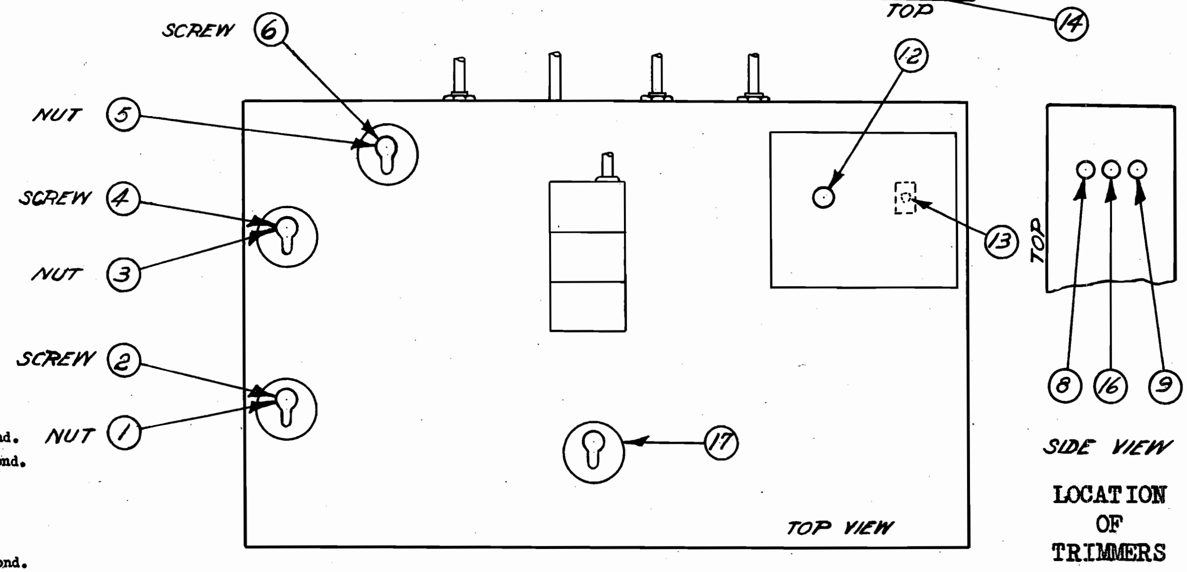
SCHEMATIC DIAGRAM CODE	PART NO. COND. (Cont.)	NAME
C31	78-2016	50-150 MMFD. Second I.F. Primary Trimmer Condenser
C32	78-2016	50-150 MMFD. Second I.F. Secondary Trimmer Cond.
C33	75-2003	.01 Mfd. 400 V. Paper High Fidelity Coupling Cond.
C34	75-2005	.1 Mfd. 200 V. Paper Cathode By-Pass Cond.
C35	75-2003	.01 Mfd. 400 V. Paper Plate Isolation Cond.
C36	78-2016	50-150 MMFD. Third I.F. Primary Trimmer Cond.
C37	78-2016	50-150 MMFD. Third I.F. Secondary Trimmer Cond.
C38	76-2001	.0001 Mfd. Mica A.V.C. Coupling Condenser
C39	76-2001	.0001 Mfd. Mica Diode Filter Condenser
C40	76-2001	.0001 Mfd. Mica Diode Filter Condenser
C41	75-2005	.1 Mfd. 200 V. Paper A.V.C. Cathode By-Pass Cond.
C42	76-307	.0005 Mfd. Mica First Audio Plate Filter Cond.
C43	75-2007	.1 Mfd. 400 V. Paper Audio Feed Condenser
C44	75-2003	.01 Mfd. 400 V. Paper Tone Control Cond.
C45	75-2012	.5 Mfd. 400 V. Paper 6F5's Plate Hum Filter Cond.
C46	76-662	.002 Mfd. Mica High Fidelity Condenser
C47	75-2007	.1 Mfd. 400 V. Paper Audio Degeneration Network Cond.
C48	75-2007	.1 Mfd. 400 V. Paper Audio Degeneration Network Cond.
C49	75-2007	.1 Mfd. 400 V. Paper Audio Feed Condenser
C50	75-2008	.2 Mfd. 200 V. Paper Field By-Pass Cond.
C51	18-928	25 Mfd. 25 V. Dry Electrolytic 6F5's Cathode
C52	18-721	8 Mfd. 450 V. Dry Electrolytic Filter Cond.
C53	18-721	8 Mfd. 450 V. Dry Electrolytic Filter Cond.
C54	18-721	8 Mfd. 450 V. Dry Electrolytic Filter Cond.
C55	18-721	8 Mfd. 450 V. Dry Electrolytic Filter Cond.
C56	76-268	.00025 Mfd. Mica Audio Filter Cond.
C57	75-2005	.1 Mfd. 200 V. Paper Audio Feed Cond.
C58	76-2001	.0001 Mfd. Mica Audio Filter Cond.
C59	75-2005	.1 Mfd. 200 V. Paper 6G5 Grid By-Pass Cond.
C60	18-2004	4 Mfd. 450 V. Dry Elect. R.F. & I.F. Screen Cond.
C61	75-2007	.1 Mfd. 400 V. Paper R.F. & I.F. Screen By-Pass Cond.
C62	75-2003	.01 Mfd. 400 V. Paper Line By-Pass Cond.
C63	75-2003	.01 Mfd. 400 V. Paper 6G5 Plate By-Pass Cond.
C64	75-2013	1. Mfd. 400 V. Paper B Supply By-Pass Cond.
C65	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.

	INDUCTANCES	
L1	17-2095	Foreign Band Oscillator Coil Assembly
L2	17-2119	Police Band Oscillator Coil Assembly
L3	17-2118	Broadcast Oscillator Coil Assembly
L4	37-2003	Wave Trap Assembly
L5	17-2123	Broadcast Antenna Coil Assembly
L6	17-2120	Police Band Antenna Coil Assembly
L7	17-2125	Foreign Band Antenna Coil Assembly
L8	17-2124	Broadcast R.F. Coil Assembly
L9	17-2121	Police Band R.F. Coil Assembly
L10	17-2126	Foreign Band R.F. Coil Assembly
L11	68-2033	First I.F. Transformer Assembly
L12	68-2036	Second I.F. Transformer Assembly
L13	68-2032	Third I.F. Transformer Assembly
L14	64-2033	12" Speaker, 500 Ohm Field, PP 6L6 Output Trans.
L15	80-2016	Power Transformer
SW1	66-2009	Rear Panel of Wave Band Switch
SW2	66-2009	Center Panel of Wave Band Switch
SW3	66-2009	Front Panel of Wave Band Switch
SW4		"Off-On" Switch on Volume Control
SW5		High Fidelity Switch on Tone Control
SW6		High Fidelity Switch on Tone Control

CHASSIS MODEL 6S12



FOR ALIGNMENT, SEE INDEX



LOCATION OF TRIMMERS

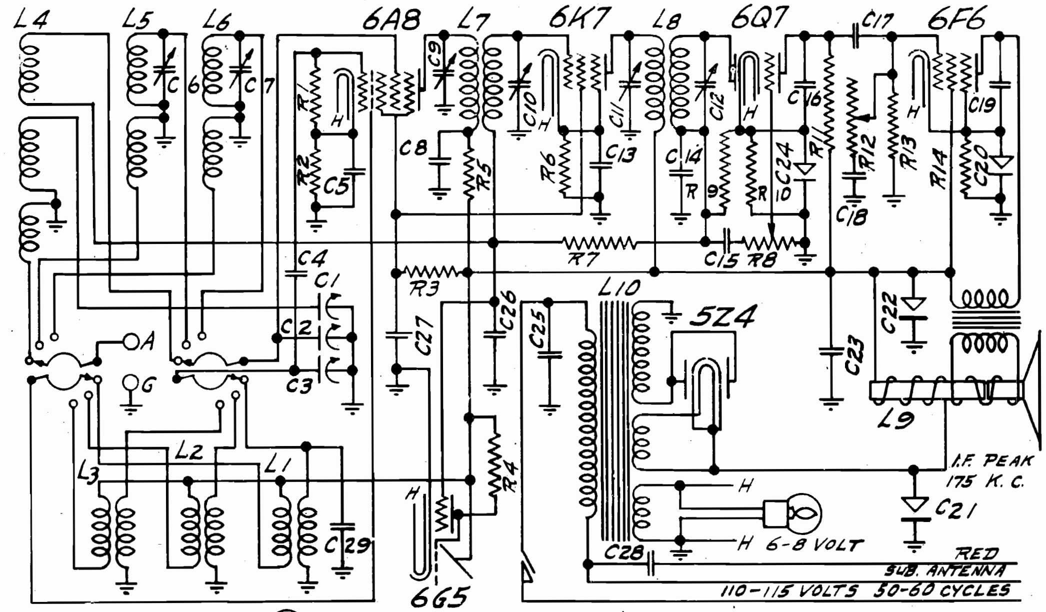
WILCOX-GAY CORP.

MODELS 7C6,7CB6

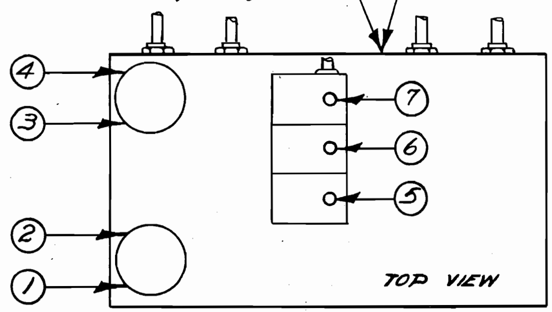
25-2118

CODE	PART NO.	RESISTORS
R1	53-941	20,000 Ohm Oscillator Grid Resistor
R2	53-1062	250 Ohm Oscillator Cathode Resistor
R3	53-898	50,000 Ohm R.F. & I.F. Screen Resistor
R4	53-926	1 Meg Ohm 6G5 Triode Plate Resistor
R5	53-919	5,000 Ohm 6A8 Plate Isolation Resistor
R6	53-1063	500 Ohm I.F. Cathode Resistor
R7	53-926	1 Meg Ohm A.V.C. Network Resistor
R8	19-1315	500,000 Ohm Volume Control 19-2006 on 7CB6
R9	53-925	500,000 Ohm Diode Load Resistor
R10	53-919	5,000 Ohm 6Q7 Cathode Resistor
R11	53-924	250,000 Ohm 6Q7 Plate Resistor
R12	19-1317	250,000 Ohm Tone Control
R13	53-925	500,000 Ohm 6F6 Grid Resistor
R14	53-1063	500 Ohm 6F6 Cathode Resistor
		INDUCTANCES
L1	17-2111	Broadcast Oscillator Coil Assembly
L2	17-2105	Police Band Oscillator Coil Assembly
L3	17-2127	Foreign Band Oscillator Coil Assembly
L4	17-2100	Broadcast Preselector Coil Assembly
L5	17-2104	Police Band Preselector Coil Assembly
L6	17-2096	Foreign Band Preselector Coil Assembly
L7	68-2026	First I.F. Transformer Assembly
L8	68-2024	Second I.F. Transformer Assembly
L9	64-2030	12" Speaker 1500 Ohm Field 6F6 Trans. for 7C6
L10	80-2017	Power Transformer
L9	64-2022	8" Speaker 1500 Ohm Field 6F6 Trans. for 7CB6
		CONDENSERS
C1	77-833	366 MMFD. Preselector Section of 3 Gang
C2	77-833	366 MMFD. Preselector Section of 3 Gang
C3	77-833	328 MMFD. Oscillator Section of 3 Gang
C4	76-2002	.00005 Mfd. Mica Oscillator Grid Condenser
C5	75-2005	.1 Mfd. 200 Volt Paper 6A8 Cathode Condenser
C6	78-1587	3-30 MMFD. Police Band Preselector Trimmer Cond.
C7	78-1587	3-30 MMFD. Foreign Band Preselector Trimmer Cond.
C8	75-2003	.01 Mfd. 400 V. Paper 6A8 Plate Isolation By-Pass
C9	78-2008	First I.F. Primary Trimmer Condenser
C10	78-2011	First I.F. Secondary Trimmer Condenser
C11	78-2008	Second I.F. Primary Trimmer Condenser
C12	78-2013	Second I.F. Secondary Trimmer Condenser
C13	75-2005	.1 Mfd. 200 V. Paper 6K7 Cathode Condenser
C14	76-307	.0005 Mfd. Diode Filter Condenser
C15	75-2005	.1 Mfd. 200 V. Paper Audio Feed Condenser
C16	76-265	.001 Mfd. Mica 6Q7 Plate Filter Condenser
C17	75-2005	.1 Mfd. 200 Volt Paper Audio Feed Condenser
C18	75-2003	.01 Mfd. 400 V. Tone Control Condenser
C19	75-2001	.002 Mfd. 600 V. Paper 6F6 Plate Filter Cond.
C20	18-928	25 Mfd. 25 V. Dry Electrolytic Condenser
C21	18-2005	12 Mfd. 325 W.V. Electrolytic Condenser
C22	18-2006	16 Mfd. 250 W.V.Electrolytic Condenser
C23	75-2012	.5 Mfd. 400 V; Paper B Supply By-Pass Condenser
C24	18-928	25 Mfd. 25 V. Electrolytic 6Q7 Cathode By-Pass
C25	75-2003	.01 Mfd. 400 V. Paper Line By-Pass Condenser
C26	75-2005	.1 Mfd. 200 V. Paper A.V.C. Network By-Pass Cond.
C27	75-2005	.1 Mfd. 200 V. Paper R.F. & I.F. Screen By-Pass
C28	75-2003	.01 Mfd. 400 V. Paper Sub. Antenna Condenser
C29	76-2003	.00001 Mfd. Mica Condenser

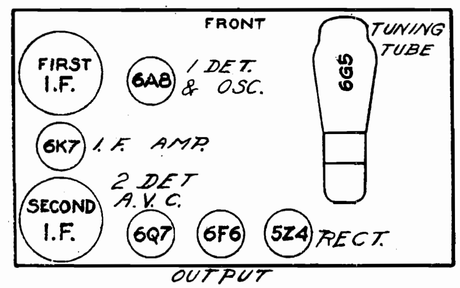
FOR ALIGNMENT SEE INDEX



LOCATION OF TRIMMERS
FOR
MODELS 7C6,7CB6,7D6



LOCATION OF TUBES



FOR USE ONLY WITH
CHASSIS MODELS 110-120 V . 50-60 CYCLE
7C6 7CB6
PILOT LIGHTS 6-8 V.
I. F. PEAK 175 K. C.

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2 PL. TO GROUND	2 GRID TO GROUND
6A8	1st DET. & OSC.	230	70	3.4	235	- 25
6K7	I.F. AMPLIFIER	235	70	4		
6Q7	2nd DET. & AVC	75		1.5		
6F6	POWER OUTPUT	225	235		TARGET	
6G5	TUNING	20			230	

B+ VOLTAGE ______ 235

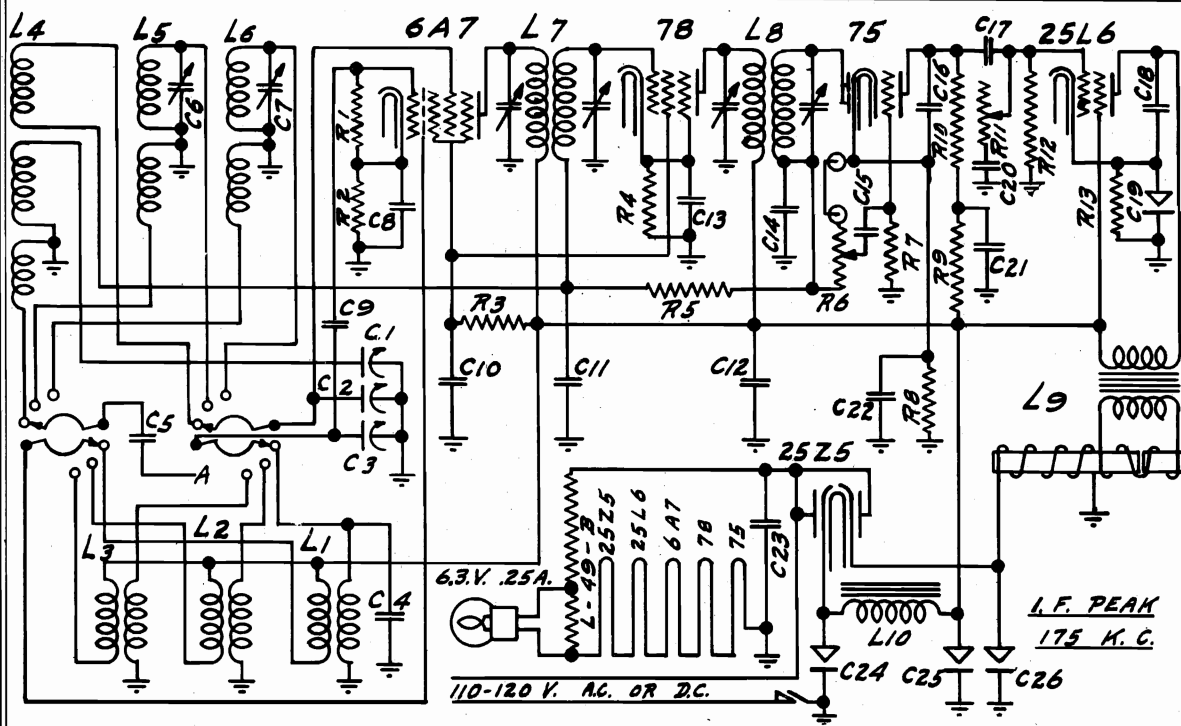
SPEAKER FIELD VOLTAGE ______ 95

METER 1000 OHMS PER VOLT

MODEL 7D6

WILCOX-GAY CORP.

25-2122



CONDENSERS

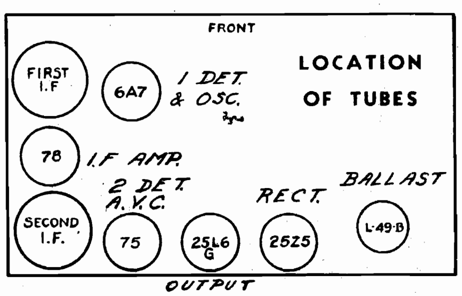
C1	77-833	366 MMFD. Pres. Sect. of Variable Cond.
C2	77-833	366 MMFD. Pres. Sect. of Variable Cond.
C3	77-833	326 MMFD. Osc. Sect. of Variable Cond.
C4	76-2003	.00001 Mfd. Mica Condenser
C5	75-2003	.01 Mfd. 400 Volt Paper Condenser
C6	78-1587	3-30 MMFD. Trimmer Condenser
C7	78-1587	3-30 MMFD. Trimmer Condenser
C8	75-2005	.1 Mfd. 200 Volt Paper Condenser
C9	76-2002	.00005 Mfd. Mica Condenser
C10	75-2005	.1 Mfd. 200 Volt Paper Condenser
C11	75-2005	.1 Mfd. 200 Volt Paper Condenser
C12	75-2011	.5 Mfd. 200 Volt Paper Condenser
C13	75-2005	.1 Mfd. 200 Volt Paper Condenser
C14	76-307	.0005 Mfd. Mica Condenser
C15	75-2003	.01 Mfd. 400 Volt Paper Condenser
C16	76-265	.001 Mfd. Mica Condenser
C17	75-2003	.01 Mfd. 400 Volt Paper Condenser
C18	75-2002	.004 Mfd. 600 Volt Paper Condenser
C19	18-928	25 Mfd. 25 Volt Electrolytic Cond.
C20	75-2003	.01 Mfd. 400 Volt Paper Condenser
C21	75-2005	.1 Mfd. 200 Volt Paper Condenser
C22	75-2005	.1 Mfd. 200 Volt Paper Condenser
C23	75-2005	.1 Mfd. 200 Volt Paper Condenser
C24	18-2003	11 Mfd. 150 W.V. Electrolytic Cond.
C25	18-2003	4 Mfd. 150 W.V. Electrolytic Cond.
C26	18-2003	4 Mfd. 150 W.V. Electrolytic Cond.

INDUCTANCES

L1	17-2106	Broadcast Oscillator Coil Assembly
L2	17-2105	Police Band Oscillator Coil Assembly
L3	17-2127	Foreign Band Oscillator Coil Assembly
L4	17-2100	Broadcast Preselector Coil Assembly
L5	17-2104	Police Band Preselector Coil Assembly
L6	17-2096	Foreign Band Preselector Coil Assembly
L7	68-2012	First I.F. Transformer Assembly
L8	68-2024	Second I.F. Transformer Assembly
L9	64-2044	6½" Speaker 3000 Ohm Field 25L6 Trans.
L10	14-940	20 Henry Filter Choke

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND	2 PLATE TO GROUND	2 GRID TO GROUND
6A7	1st DET. & OSC.	110	45	1.3	110	- 2.7
78	I.F. AMPLIFIER	110	45	1.6		
75	2nd DET. & AVC	35		0.7		
25L6G	POWER OUTPUT	105	110	10		

CODE	PART NO.	RESISTORS
R1	53-941	20,000 Ohm Type M Resistor
R2	53-1062	250 Ohm Wirewound Resistor
R3	53-1042	25,000 Ohm Type M Resistor
R4	53-1063	500 Ohm Wirewound Resistor
R5	53-926	1 Meg Ohm Type M Resistor
R6	19-1315	500,000 Ohm Volume Control
R7	53-925	500,000 Ohm Type M Resistor
R8	53-919	5,000 Ohm Type M Resistor
R9	53-898	50,000 Ohm Type M Resistor
R10	53-924	250,000 Ohm Type M Resistor
R11	19-1317	250,000 Ohm Tone Control
R12	53-925	500,000 Ohm Type M Resistor
R13	53-2014	200 Ohm Type M Resistor



FOR USE ONLY WITH
110-120 V. 50-60 CYCLE
OR
110-120 V. D. C.

I. F. PEAK 175 K. C.
PILOT LIGHTS 6-8 V.

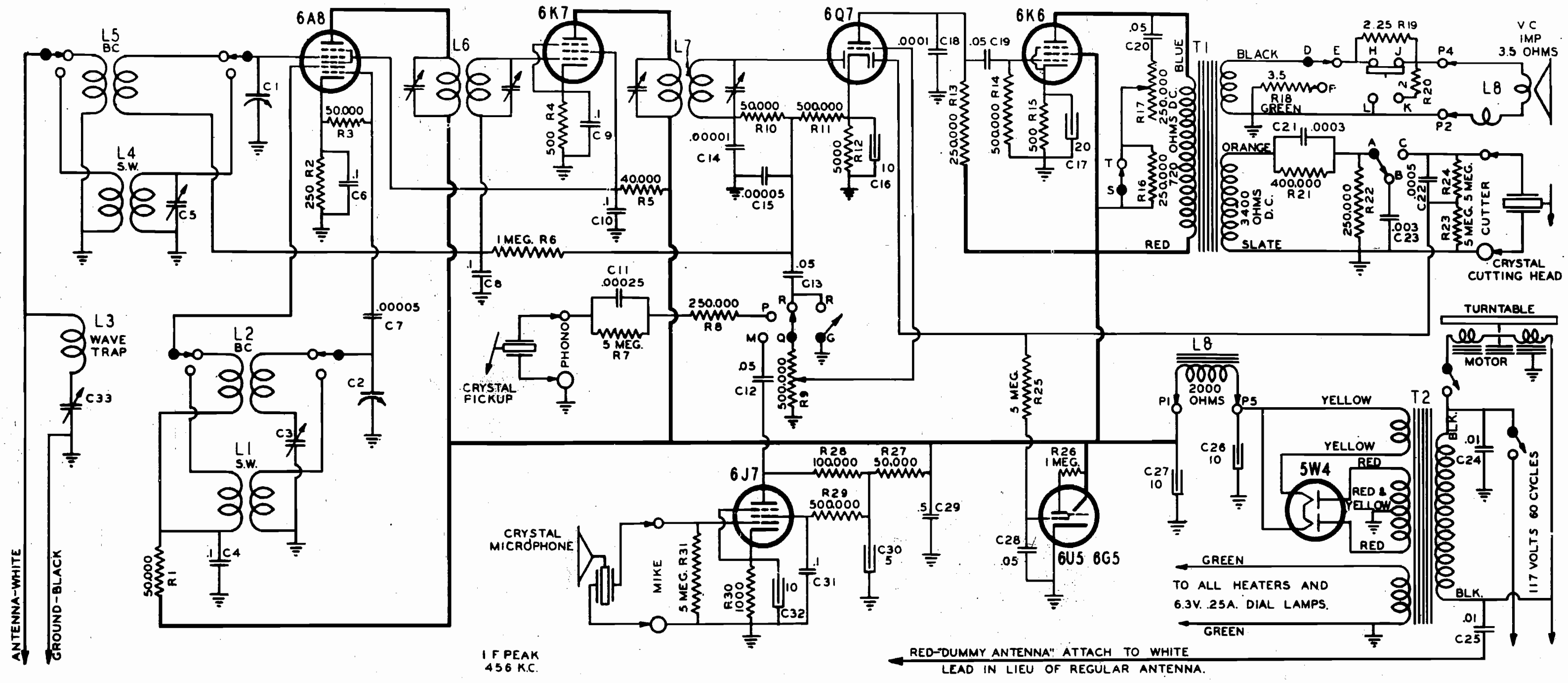
CHASSIS MODEL
7D6

B+ VOLTAGE 110
SPEAKER FIELD VOLTAGE 120
METER 1000 OHMS PER VOLT

FOR OTHER DATA
SEE INDEX

WILCOX-GAY CORP.

MODELS A-85,A-87, A-88,A-90

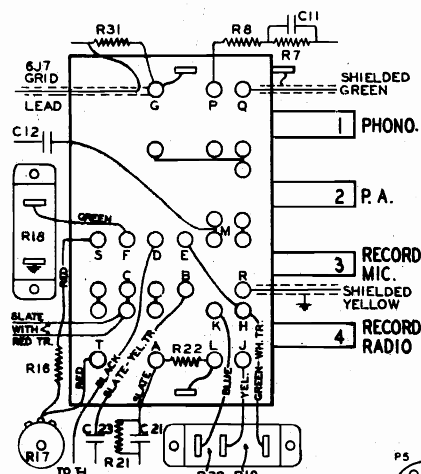


I F PEAK 456 K.C.

CODE OF SCHEMATIC

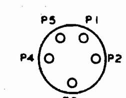
PART NO.	CODE	DESCRIPTION
77-2021	C1	DETECTOR SECTION } 2 GANG COND.
	C2	OSCILLATOR SECTION } 2 GANG COND.
76-2010	C3	L.F. PADDING COND.
75-2005	C4	.1 MFD. 200 V. PAPER COND.
76-2010	C5	S.W. DETECTOR TRIMMER
75-2005	C6	.1 MFD. 200 V. PAPER COND.
76-2011	C7	.00005 MFD. MICA COND.
75-2005	C8	.1 MFD. 200 V. PAPER COND.
75-2005	C9	.1 MFD. 200 V. PAPER COND.
75-2005	C10	.1 MFD. 200 V. PAPER COND.
76-2013	C11	.00025 MFD. MICA COND.
75-2004	C12	.05 MFD. 400 V. PAPER COND.
75-2004	C13	.05 MFD. 400 V. PAPER COND.
76-2010	C14	.00001 MFD. MICA COND.
76-2011	C15	.00005 MFD. MICA COND.
18-2012	C16	10 MFD. 25 V. TUBULAR ELECT.
18-2017	C17	20 MFD. 25 V. } ELECT. COND. IN CAN.
	C26	10 MFD. 450 V. } ELECT. COND. IN CAN.
	C27	10 MFD. 450 V. } ELECT. COND. IN CAN.
	C30	5 MFD. 300 V. } ELECT. COND. IN CAN.
	C18	.0001 MFD. MICA COND.
75-2004	C19	.05 MFD. 400 V. PAPER COND.
75-2004	C20	.05 MFD. 400 V. PAPER COND.
76-2016	C21	.0003 MFD. MICA COND.
76-2014	C22	.0005 MFD. MICA COND.
76-2016	C23	.003 MFD. MICA COND.
75-2017	C24	.01 MFD. 110 V. AC METAL CLAD.
75-2017	C25	.01 MFD. 110 V. AC METAL CLAD.
75-2004	C28	.05 MFD. 400 V. PAPER COND.
75-2012	C29	.5 MFD. 400 V. PAPER COND.
75-2005	C31	.1 MFD. 200 V. PAPER COND.
18-2012	C32	10 MFD. 25 V. TUBULAR ELECT.
	C33	See L3

53-898	R1	50,000 OHM 1/4 WATT RESISTOR
53-2011	R2	250 OHM 1/2 WATT RESISTOR
53-898	R3	50,000 OHM 1/4 WATT RESISTOR
53-1065	R4	500 OHM 1/2 WATT RESISTOR
53-2032	R5	40,000 OHM 1 WATT RESISTOR
53-926	R6	1 MEGOHM 1/4 WATT RESISTOR
53-2020	R7	5 MEGOHM 1/4 WATT RESISTOR
53-924	R8	250,000 OHM 1/4 WATT RESISTOR
19-2014	R9	500,000 OHM VOL. CON. & LINE SW.
53-898	R10	50,000 OHM 1/4 WATT RESISTOR
53-925	R11	500,000 OHM 1/4 WATT RESISTOR
53-919	R12	5,000 OHM 1/4 WATT RESISTOR
53-924	R13	250,000 OHM 1/4 WATT RESISTOR
53-925	R14	500,000 OHM 1/4 WATT RESISTOR
53-2031	R15	500 OHM 1 WATT RESISTOR
53-924	R16	250,000 OHM 1/4 WATT RESISTOR
19-2009	R17	250,000 OHM TONE CONTROL
53-2037	R18	3.5 OHM 10 WATT CANDOHM RESISTOR
53-2038	R19	2.25 OHMS } CANDOHM RESISTOR
	R20	2 OHMS } CANDOHM RESISTOR
53-2039	R21	400,000 OHM 1/4 WATT RESISTOR
53-924	R22	250,000 OHM 1/4 WATT RESISTOR
53-2020	R23	5.0 MEGOHM 1/4 WATT RESISTOR
53-2020	R24	5.0 MEGOHM 1/4 WATT RESISTOR
53-2020	R25	5.0 MEGOHM 1/4 WATT RESISTOR
53-898	R27	50,000 OHM 1/4 WATT RESISTOR
53-923	R28	100,000 OHM 1/4 WATT RESISTOR
53-925	R29	500,000 OHM 1/4 WATT RESISTOR
53-2023	R30	1,000 OHM 1/4 WATT RESISTOR
53-2020	R31	5.0 MEGOHM 1/4 WATT RESISTOR
17-2149	L1	SHORT WAVE OSC. COIL ASSEMBLY
17-2254	L2	BROADCAST OSC. COIL ASSEMBLY
37-2004	L3	WAVE TRAP (INCLUDES C33)
17-2242	L4	SHORT WAVE DETECTOR COIL ASSEM.
17-2255	L5	BROADCAST DETECTOR COIL ASSEM.
68-2061	L6	1st. I.F. TRANSFORMER ASSEM.
68-2056	L7	2nd. I.F. TRANSFORMER ASSEM.
64-2075	L8	6½" SPEAKER-2000 OHM FIELD
81-2009	T1	OUTPUT TRANSFORMER
80-2035	T2	POWER TRANSFORMER
64-2076	L8	8" SPEAKER--FOR MODEL A-90 ONLY



PUSH-BUTTON SWITCH TERMINAL CONNECTIONS

PUSH BUTTON CIRCUIT FUNCTIONS	
NORMAL "UP" POSITION OF PUSH BUTTON SWITCHES INDICATED IN SCHEMATIC DIAGRAM	
1	OPENS Q-R, CLOSES Q-P, R-G
2	OPENS Q-R, CLOSES Q-M
3	OPENS Q-R, D-E, A-B, T-S CLOSES Q-M, D-F, A-C
4	FIRST POS. OPENS A-B, T-S, CLOSES A-C
4	SECOND POS. OPENS H-J, CLOSES K-L A-C REMAINS CLOSED, T-S REMAINS OPEN



BOTTOM VIEW OF SPEAKER SOCKET OR PRONG VIEW OF PLUG.

MODEL No. A-85, A-87, A-88, A-90.

DATE 6-26-40

MODELS A-85, A-87, A-88, A-90

WILCOX-GAY CORP.

GANGING INSTRUCTIONS

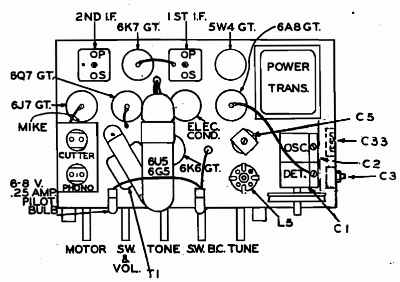
An OUTPUT METER or other indicating device should be used for accuracy in making ganging adjustments.

If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:

(a) Depress push-button No. 4 "To Record Radio"

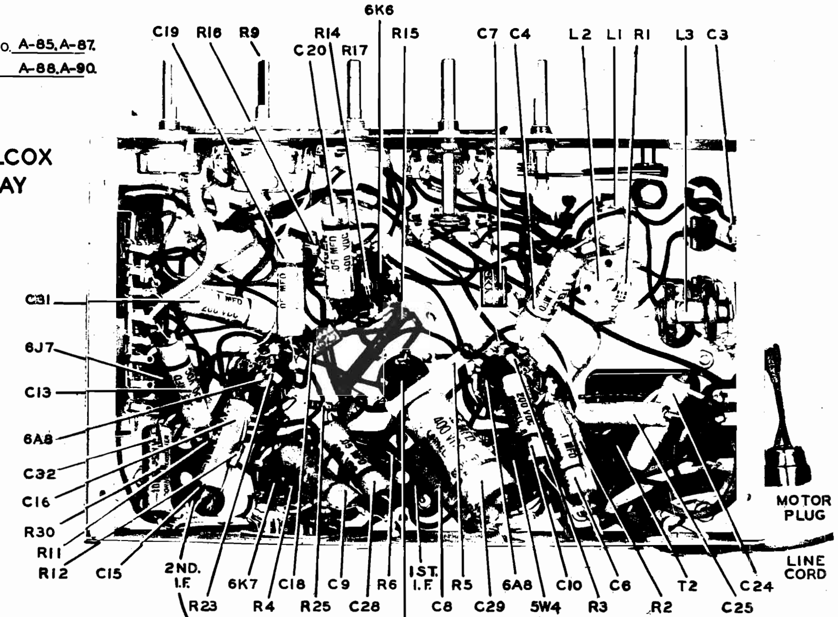
(b) Disconnect cutting-head from chassis.

(c) Adjust volume control to near maximum.



MODEL No. A-85, A-87, A-88, A-90
DATE 6-26-40

WILCOX GAY



Connect signal generator to control grid of the 6A8 tube.

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd. I.F.--S
" "	" "	"	" " P
" "	" "	"	1st. I.F.--S
" "	" "	"	" " P
" "	550 K.C.	"	C-33 °

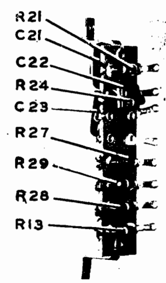
Connect signal generator to ANT. and GND. leads.
Turn condenser gang to full maximum capacity and check position of dial pointer with reference line on the scale, which is the last graduation below the 550 K.C. calibration.

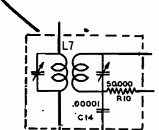
600 K.C.	600 K.C.	Broadcast	L.F.Pad (C-3)
1400 K.C.	1400 K.C.	"	Osc.(C-2)
" "	" "	"	Det.(C-1)
Not used °°	15-16 M.C.	Short Wave	Ant.(C-5)

The entire alignment procedure should be repeated to obtain greatest accuracy in the adjustment of the trimming condensers.

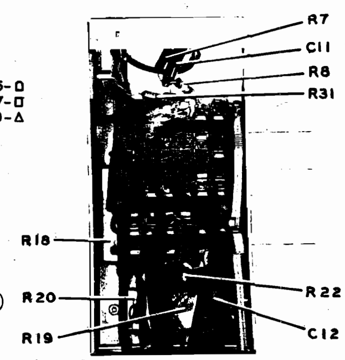
° Adjust C-33 trimmer for MINIMUM signal.

°° Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer for greatest noise.





C17
C26-□
C27-□
C30-Δ



Aerial disconnected.
All voltage measurements made against ground (chassis) except as noted.

VOLTAGE

Tube	Position	Plate	Screen	Cathode
6A8	1st. Det. Osc.	230	75	2.2
6K7	I.F.	230	75	3.0
6Q7	2nd. Det.	90*		1.5
6J7	Mike Amp.	45 to 65*	30*	.8
6K6	Output	215	235	13.5

Line Voltage------------118
P5 or C26 to GND.--------350
P1 or C27 to GND.--------240
P5 to P1 (sp'kr field)--110
C30 to GND.-------------150

NOTE: This is a typical voltage analysis made by use of standard 1000 ohm per volt voltmeter, using the 300 volt scale for plate and screen voltage readings.

* Not actual voltages due to large values of resistance in circuit between supply voltage and point of measurement. These voltage values may vary considerably, depending upon the resistance of voltmeter used.

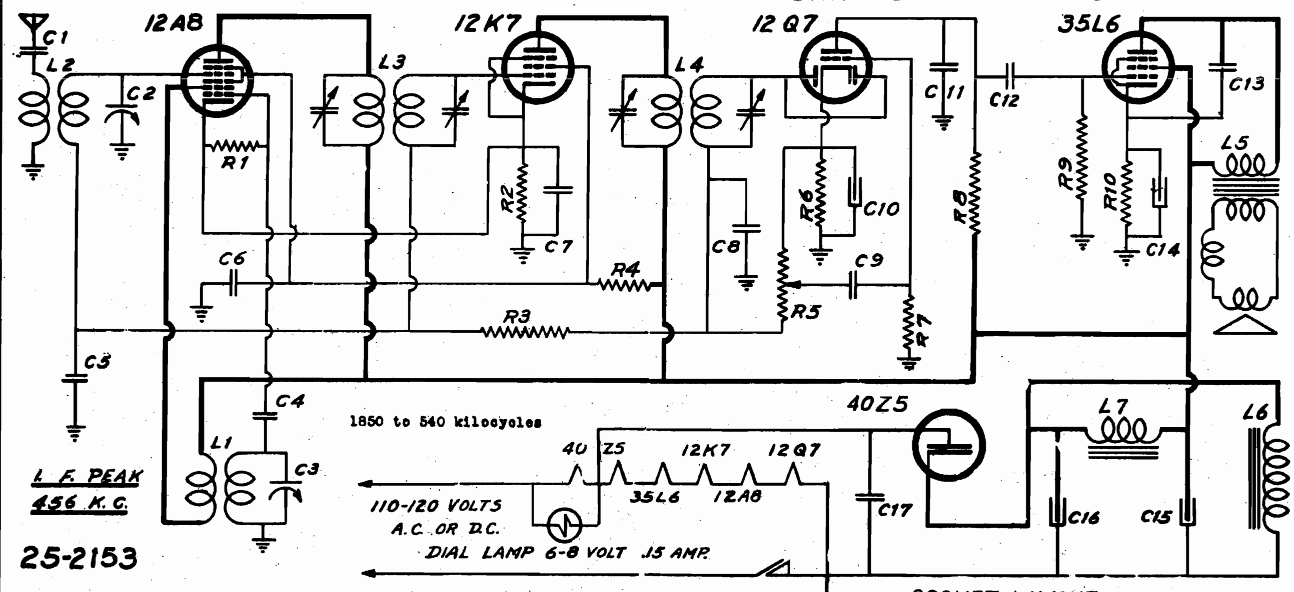
The above voltages should be considered as being approximate, as difference in line voltage, type of testing equipment used, normal tolerance limits of component parts in the chassis, all have an effect upon these readings. A tolerance of 10% is usually considered permissible.

MODEL A-53 (1939) "Thin Man"

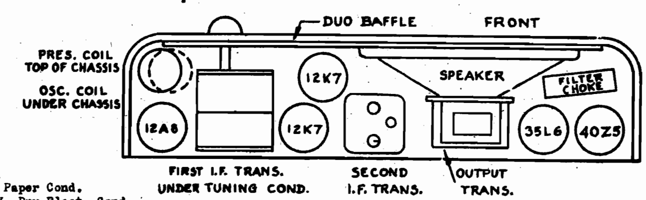
WILCOX-GAY CORP.

MODELS 8K2, A-56, A-60 Record-Player

SCHEMATIC DIAGRAM CHASSIS MODEL 9C5



SOCKET LAYOUT



MODEL A-53 "THIN MAN" 1939

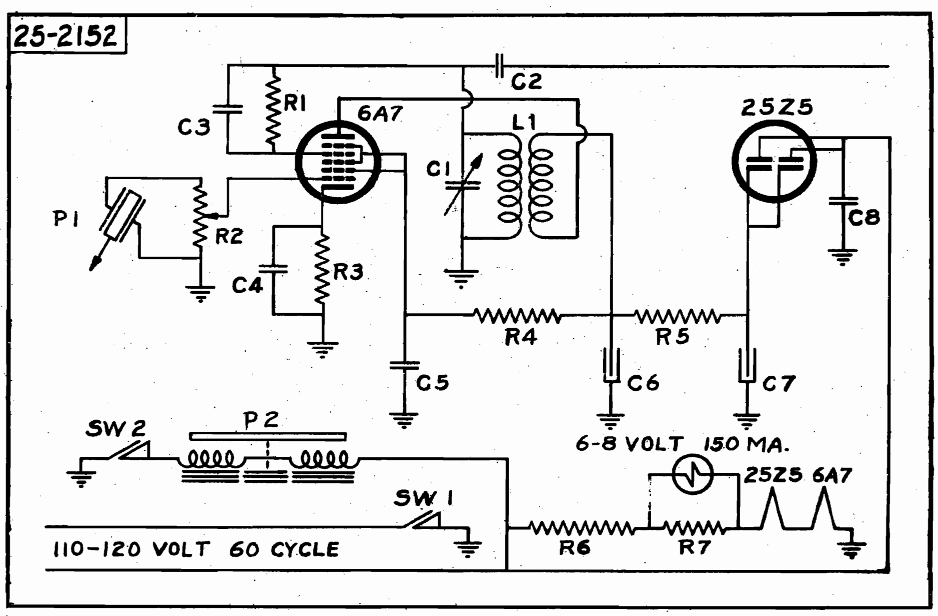
R1	53-898	50,000 Ohm 1/4 Watt Resistor
R2	53-1062	250 Ohm 1/2 Watt Resistor
R3	53-926	1 Meg Ohm 1/4 Watt Resistor
R4	53-1042	25,000 Ohm 1/4 Watt Resistor
R5	19-2012	500,000 Ohm Volume Cont. & Switch
R6	53-919	5,000 Ohm 1/4 Watt Resistor
R7	53-925	500,000 Ohm 1/4 Watt Resistor
R8	53-924	250,000 Ohm 1/4 Watt Resistor
R9	53-925	500,000 Ohm 1/4 Watt Resistor
R10	53-2014	200 Ohm 1/4 Watt Resistor

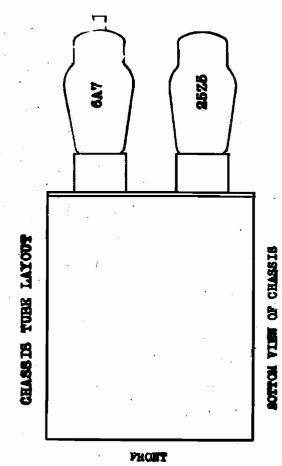
C1	75-2003	.01 Mfd 400 V. Paper Cond.
C2, C3	77-2015	Two Gang Variable Condenser
C4	76-2002	.00005 Mfd Mica Condenser
C5	75-2005	.1 Mfd 200 V. Paper Cond.
C6	75-2005	.1 Mfd 200 V. Paper Cond.
C7	75-2005	.1 Mfd 200 V. Paper Cond.
C8	76-307	.0005 Mfd Mica Condenser

C9	75-2003	.01 Mfd 400 V. Paper Cond.
C10	18-2012	10 Mfd 25 W. V. Dry Elect. Cond.
C11	75-2014	.001 Mfd 600 V. Paper Cond.
C12	75-2003	.01 Mfd 400 V. Paper Cond.
C13	75-2001	.002 Mfd 600 V. Paper Cond.
C14	18-2012	10 Mfd 25 W.V. Dry Elect. Cond.
C15	18-2011	8 Mfd 150 W.V. Dry Elect. Cond.
C16	18-2010	16 Mfd 150 W.V. Dry Elect. Cond.
C17	75-2005	.1 Mfd 200 V. Paper Condenser

L1	17-2232	Oscillator Coil Assembly
L2	17-2230	Preselector Coil Assembly
L3	68-2055	First I.F. Trans. Assembly
L4	68-2052	Second I.F. Trans. Assembly
L5	64-2043	5" Speaker, Output Trans. for 35L6 Tube
L6	64-2043	3000 Ohm Field on L5
L7	14-2002	18 Henry Filter Choke

86-2207





MODELS A-56, A-60 & 8K2

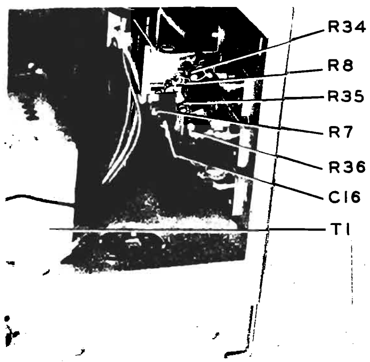
CODE	PART NO.	NAME
L1	17-2223	Coil Assembly, Oscillator
C1	78-2034	Condenser, Trimmer, 40-240 Mmfd.
C2	76-2003	Condenser, Mica, .00001 Mfd.
C3	76-2002	Condenser, Mica, .00005 Mfd.
C4	75-2005	Condenser, Paper, .1 Mfd. 200 Volt
C5	75-2005	Condenser, Paper, .1 Mfd. 200 Volt
C6	18-2011	Condenser, Electrolytic, 8 Mfd. 150 W.V.
C7	18-2010	Condenser, Electrolytic, 16 Mfd. 150 W.V.
C8	75-2005	Condenser, Paper, .1 Mfd. 200 Volt

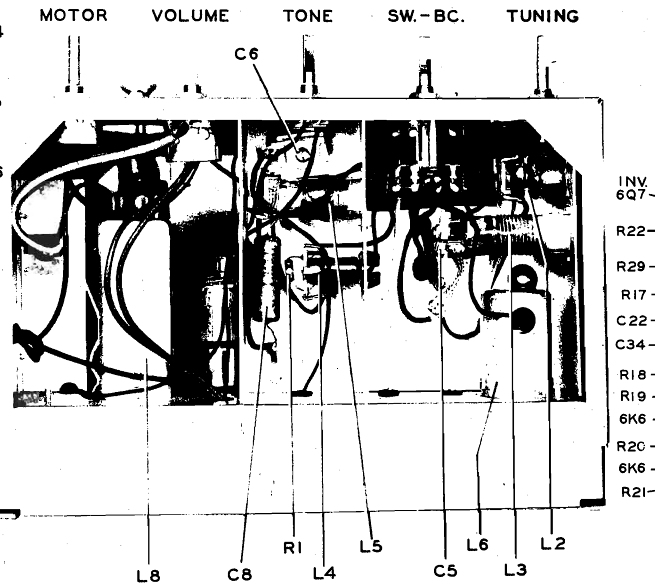
P1	52-2080	Phono Pick-up Arm Assembly
P2	52-2081	Phono Motor Assembly, 60 Cycle AC 110-120 Volt with 9" Turn Table
	45-349	Lamp, Pilot Mazda
R1	53-920	Resistor, 10,000 Ohm 1/4 Watt
R2	19-2013	Volume Control
R3	53-2023	Resistor, 1,000 Ohm 1/4 Watt
R4	53-919	Resistor, 5,000 Ohm 1/4 Watt
R5	53-919	Resistor, 5,000 Ohm 1/4 Watt
R6	53-2021	Resistor, 278 Ohm 25 Watt
R7	53-2021	Resistor, 26 Ohm 2.34 Watt
SW1		Switch, Line "Off-On" (On R2)
SW2	66-2023	Switch, Motor "Off-On"

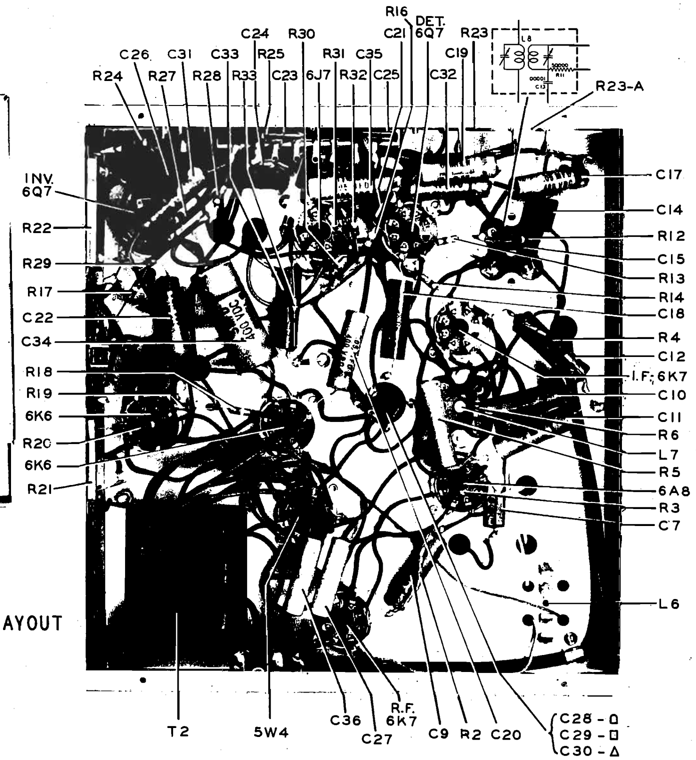
86-2204

MODELS A-89,A-91,A-92,
A-93,A-94,A-101

WILCOX-GAY CORP.







MODEL No. A89, A91, A92, A93, A94
DATE 11-27-40.

PARTS LAYOUT

VOLTAGE DATA
Line Voltage----115
C28 to GND.-----360
C29 to GND.-----250
C30 to GND.-----175
Speaker Field---110

Aerial disconnected.
Volume control at minimum.
All voltage measurements made against ground (chassis) except as noted.

Tube	Position	Plate	Screen	Cathode
6K7	R.F.	250	83	2.8
6A8	1st. Det. Osc.	250 112	83	2.8
6K7	I.F.	250	83	3.3
6Q7	2nd. Det.	80*	--	1.5
6Q7	Inverter	85*	--	1.5
6J7	Mike Amp.	40 to 65*	35*	1.1
6K6	Output	245	250	17.0

NOTE: This is a typical voltage analysis made by use of standard 1000 ohm per volt voltmeter, using the 300 volt scale for plate and screen voltage readings.

* Not actual voltages due to large values of resistance in circuit between supply voltage and point of measurement. These voltage values may vary considerably, depending upon the resistance of voltmeter used.

The above voltages should be considered as being approximate, as difference in line voltage, type of testing equipment used, normal tolerance limits of component parts in the chassis, all have an effect upon these readings. A tolerance of 10% is usually considered permissible.

MODELS A-89, A-91, A-92, A-93, A-94, A-101.

CORRECTION FOR HIGH HUM LEVEL

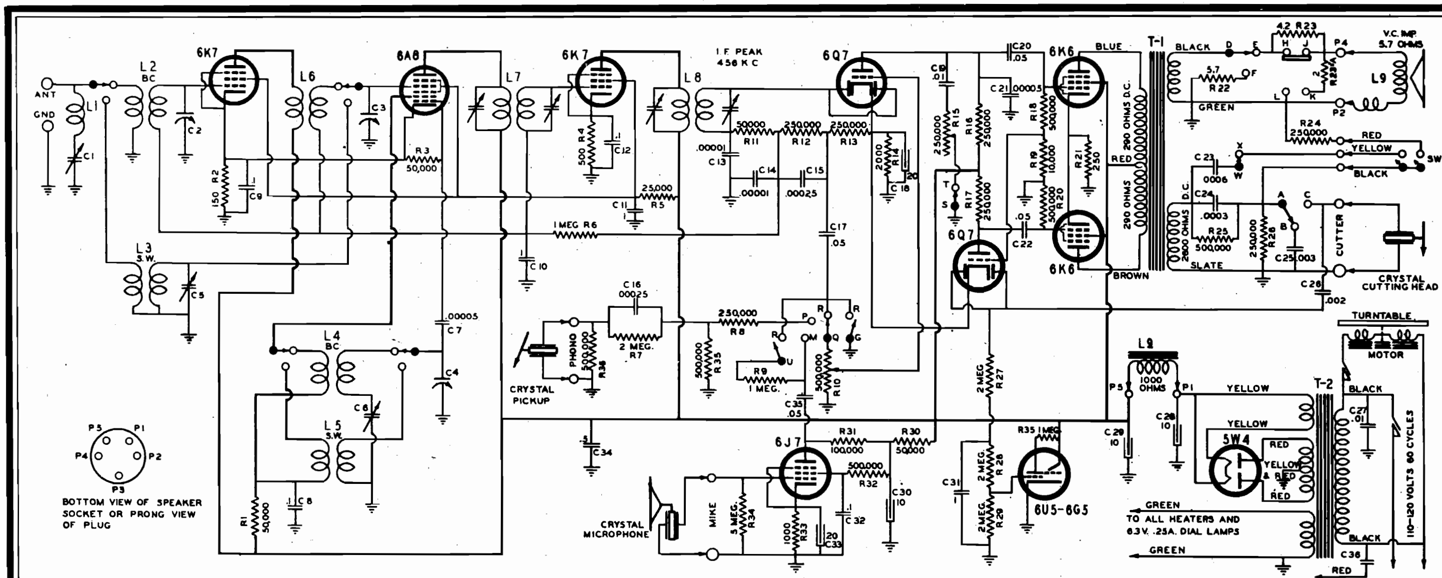
In the operation of Recordio Models A-89, A-91, A-92, A-93, A-94 and A-101, bearing serial numbers prior to No. 624060, if the residual hum, noted with the volume control turned to minimum position, appears to be abnormally high or objectionable, a correction may be effected by a rearrangement of the ground connections to the volume control and cathode by-pass condenser C18.

These connections should be changed as follows:

1. Disconnect the spiral shield covering of the volume control leads, from the volume control terminal and solder the shielding directly to the volume control switch cover.
2. Remove the wire placed through the rubber grommet in the vertical shield fin, which connects the ground terminal of the volume control to chassis.
3. Run a wire from the ground terminal of the volume control through the fibre grommet in the chassis base directly below the volume control, to the ground lug located near the electrolytic condenser in the approximate center of the underside of the chassis. (Note: R33 and C33 are already connected to this lug.) Do not permit the volume control ground terminal to contact the chassis through any other medium.
4. Move the ground connection of the 6Q7 cathode by-pass condenser, C18, from its present location on the assembly lug of the electrolytic condenser, to the chassis ground lug to which the volume control has been grounded.

WILCOX-GAY CORP.

MODELS A-51, 8C4
MODELS A-89, A-91, A-92
A-93, A-94



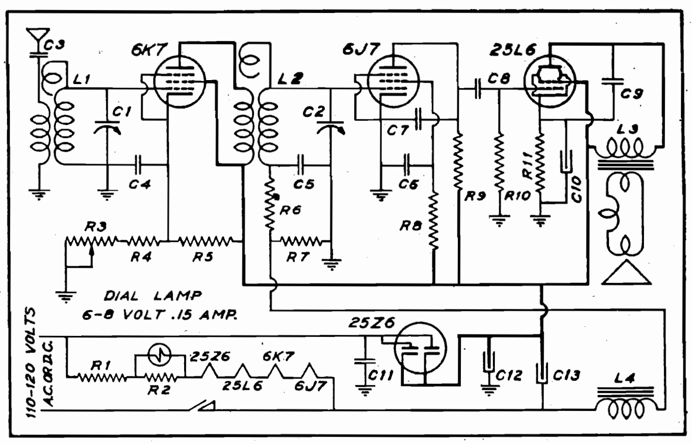
SCHEMATIC DIAGRAM
MODEL No. A-89 A-91 A-92 A-93 A-94
DATE 10-22-40

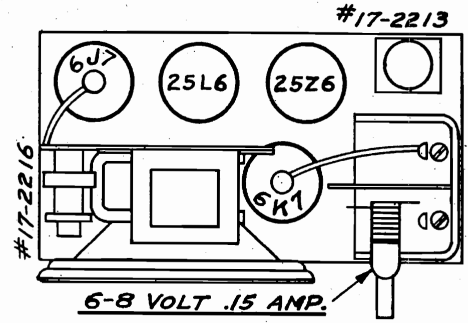
EQUALIZER SWITCH POSITIONS

REFER TO "SW" IN DIAGRAM

SPEED SHIFT LEVER	EQUALIZER SWITCH
SLOW	CLOSED
FAST	OPEN

This receiver is designed for operation on 110-120 volts AC or DC





#17-2213

#17-2216

6-8 VOLT .15 AMP.

Code	Part No.	Description
R1	20-2010	175 Ohm Resis. in Power Cord
R2	53-2018	26 Ohm 2.34 Watt Resistor
R3	19-2011	15,000 Ohm Vol. Cont. & Switch
R4	53-2014	200 Ohm ¼ Watt Resistor
R5	53-1042	25,000 Ohm ¼ Watt Resistor
R6	53-926	1 Meg Ohm ¼ Watt Resistor
R7	53-2017	20 Ohm ½ Watt Resistor
R8	53-2020	5 Meg Ohm ¼ Watt Resistor
R9	53-925	500,000 Ohm ¼ Watt Resistor
R10	53-925	500,000 Ohm ¼ Watt Resistor
R11	53-1061	150 Ohm ½ Watt Resistor
C1, C2	77-2013	Two Gang Variable Cond.
C3	75-2001	.002 Mfd. 600 V. Paper Cond.
C4	75-2005	.1 Mfd. 200 V. Paper Cond.
C5	75-2005	.1 Mfd. 200 V. Paper Cond.
C6	75-2003	.01 Mfd. 400 V. Paper Cond.
C7	75-2014	.001 Mfd. 600 V. Paper Cond.
C8	75-2003	.01 Mfd. 400 V. Paper Cond.
C9	75-2001	.002 Mfd. 600 V. Paper Cond.
C10	18-2012	10 Mfd. 25 W.V. Elect. Cond.
C11	75-2005	.1 Mfd. 200 V. Paper Cond.
C12	18-2011	8 Mfd. 150 W.V. Elect. Cond.
C13	18-2010	16 Mfd. 150 W.V. Elect. Cond.
L1	17-2213	Antenna Coil Assembly
L2	17-2216	Detector Coil Assembly
L3	81-2004	Output Trans. for 25L6 Tube
L4	64-2056	4" Speaker 450 Ohm Field

Model

8C4 A51

R. F. Amplifier	1	#6K7
Detector Tube	1	#6J7
Output Tube	1	#25L6
Rectifier Tube	1	#25Z6

TUBE	CIRCUIT	PLATE TO GROUND	SCREEN TO GROUND	CATHODE TO GROUND
6K7	R. F. Amplifier	108	108	2.8
6J7	**Detector**	24	.2	0
25L6	Power Output	100	108	6.2

Speaker Field Drop 22

B + Voltage 108

Line Voltage Was 120 V. 60 cycle

Meter 1000 ohms per volt

MODELS A-89, A-91, A-92
A-93, A-94

WILCOX-GAY CORP.

MODEL No. A89-A91
DATE 8-22-40. A92, A93, A94

GANGING INSTRUCTIONS

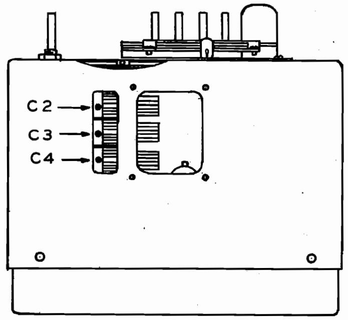


FIG. 11

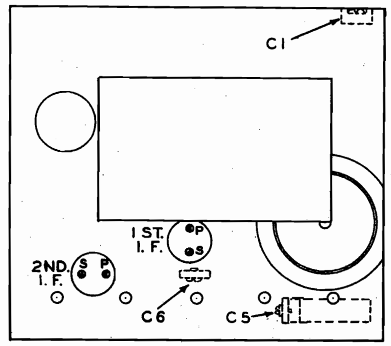
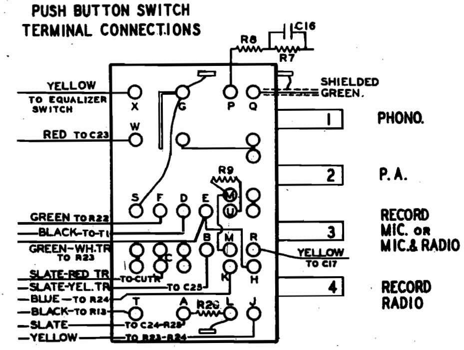


FIG. 12

PUSH BUTTON SWITCH
TERMINAL CONNECTIONS



PUSH BUTTON CIRCUIT FUNCTIONS	
NORMAL "UP" POSITION OF PUSH BUTTON SWITCHES INDICATED IN SCHEMATIC DIAGRAM	
1	OPENS Q-R, W-X, CLOSES Q-P, R-G
2	OPENS Q-R, CLOSES Q-M
3	FIRST POS. OPENS A-B, T-S, CLOSES U-R SECOND POS. OPENS Q-R, A-B, D-E, T-S CLOSES Q-M, A-C, D-F
4	FIRST POS. OPENS A-B, T-S, CLOSES A-C SECOND POS. OPENS A-B, T-S, H-J CLOSES A-C, K-L
NOTE - ALL OTHER CONTACT POSITIONS INDICATED IN DIAGRAM	

An OUTPUT METER or other indicating device should be used for accuracy in making ganging adjustments. If an output meter is not available, the magic eye (6U5) may be used as an output indicator as follows:
(a) Depress push-button No. 4 "To Record Radio".
(b) Disconnect cutting head from chassis.
(c) Adjust volume control to near maximum.
Connect signal generator to control grid of 6A8 tube. Make connection to side of middle section, (C3) of condenser gang. (FIG. 11)

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	WAVE BAND SWITCH POSITION	TRIMMER NUMBER	FIGURE NUMBER
456 K.C.	1500 K.C.	Broadcast	2nd I.F.-S	12
" "	" "	"	" " -P	12
" "	" "	"	1st I.F.-S	12
" "	" "	"	" " -P	12
Connect signal generator to ANT. and GND. terminals.				
456 K.C.	550 K.C.	Broadcast	Wave Trap (C-1)*	12
600 K.C.	600 K.C.	"	L.F. Pad. (C-6)**	12
1400 K.C.	1400 K.C.	"	Osc. (C-4)	11
1400 K.C.	1400 K.C.	"	Det. (C-3)	11
1400 K.C.	1400 K.C.	"	R.F. (C-2)	11
Not Used***	15-16 M.C.	Short Wave	Pre-Sel. (C-5)	12

As resonance is approached by adjustment of the trimmers, the signal generator attenuator should be adjusted for a minimum signal that will provide a low reading on the output indicator.

It is advisable to repeat the entire alignment procedure to correct the slight effect one adjustment may have upon the other.

* Adjust C-1 for MINIMUM signal.

** First note the position of the dial pointer with the condenser gang turned to full maximum capacity. The left edge of the pointer should be slightly to the right of the last dial graduation.

In adjusting the L.F. Pad. (C-6) rock the condenser gang back and forth across the 600 K.C. signal and note that maximum output meter reading coincides with the 600 K.C. dial graduation. If the dial reading is other than 600 K.C., reset the dial pointer on the dial cord, to read 600 K.C. at maximum output meter indication.

*** Connect antenna to receiver, and adjust dial so that no station is received. Advance volume control until a fair volume of noise is received. Adjust trimmer C-5 for greatest noise.

MODEL No. A93-A94

TURNTABLE SPEED VARIATION

In order to satisfactorily correct any variation in the speed of the turntable, which is usually evidenced by "wow" or a waver in the pitch of musical tones during the playing of records or home recordings, it is first necessary to determine the kind of speed variation encountered.

As the various types of turntable speed variation usually fall under two distinct classifications--INTERMITTENT VARIATION and VARIATION SYNCHRONIZED WITH TURNTABLE ROTATION, the matter of diagnosis in any particular case of trouble is simplified.

Intermittent Variation

It is important that the rubber rimmed intermediate drive wheels be kept clean and free from oil, to avoid slipping or irregular operation of the wheels. The drive wheel bearings are of Oilite Bronze and require no oiling to prevent wear, however, ONE drop of light lubricating oil may be applied to each drive wheel bearing if desired to "quiet" their operation.

All record shavings and other dirt particles that may have gotten under the turntable should be removed, as such foreign material may seriously interfere with the smooth operation of the mechanism.

If the drive wheels appear to slip, although the rubber rims and the turntable rim are free from oil, the tension of the drive wheel tension spring should be increased.

The round movable disc on which the dual drive wheel assembly is mounted, should be adjusted to a degree of tightness that affords minimum looseness of the assembly, at the same time maintaining entire freedom of movement. If the drive wheel assembly is allowed to tip while in motion, resulting in the drive wheels rotating out of the horizontal plane, the rim of the top wheel may ride high and intermittently touch the underneath side of the turntable.

The wire leads connected to the cutting head inside the recording arm should not be permitted to drag on the record or turntable, as this produces an intermittent braking effect causing the turntable to be slowed down, or to rotate with varying speed. Intermittent variation in turntable speed may also be due to a binding of the lateral feed screw bearing. An adjustment is provided on the gear housing of the feed screw assembly, to take up end play in the feed screw. When this adjustment is correctly made, only a very slight amount of end play should be perceptible, however, it should be determined that this end play exists throughout the complete rotation of the feed screw.

CONTINUED ON NEXT PAGE

WILCOX-GAY CORP.

MODEL A-93,A-94

Variation Synchronized With Turntable Rotation

If "wow" resulting from variation in the speed of the turntable is evidenced to be in the order of four times per turntable revolution, this would indicate a defect in the rubber rimmed drive wheel. The wheel may be out of round, or warped, or may have a flat spot or bump on the rubber rim.

If the "wow" is noticed to be once per turntable revolution, however, this would indicate some irregularity in the rim of the turntable. In handling, avoid bumping or dropping the turntable, as any pronounced dent in the rim of the table to throw it out of round will result in a very noticeable variation in turntable speed.

Running the finger tips lightly over the inside surface of the turntable rim will show up any irregularity sufficiently pronounced to produce "wow" in the recording or record reproduction. The bearing surface of the turntable rim does not necessarily have to be perfectly smooth, as the effect of minute irregularities of the surface are absorbed by the rubber rim of the drive wheel.

A badly warped record, either a home recording or commercial record, or one in which the center hole is worn or oversize, will tend to produce "wow" during its reproduction, and it is suggested that this be taken into consideration in investigating a complaint pertaining to waver or "wow" in record reproduction.

Ordinarily, recordings made on record blanks which are only slightly warped, will prove to be satisfactory. However, "wows" may be out into the recording if the cutting head damper is incorrectly adjusted so that the felt damper bears against the cutting head with too much pressure.

To correctly adjust the Cutting Head Damper, proceed as follows:

1. Turn the adjusting screw to the RIGHT so that no pressure is exerted on the cutting head by the felt damper.
2. Raise the recording arm to a near vertical position so that the stylus screw is midway in the slot in the front end of the arm. Observe that when the stylus screw is moved to one end of the slot and released, it will move back and forth a few times, before coming to rest in the center of the slot.
3. Turn the damper adjusting screw to the LEFT until, when the stylus screw is moved to one end of the slot and released, it will return to a midway position and stop. The tendency to continue moving back and forth has been eliminated.

In order to determine if "wow" is actually "out" into a home recording, or if a variation in turntable speed exists during all functions of the turntable, first play an especially selected regular phonograph record, known to be entirely free from "wow". If the record plays satisfactorily, but "wow" is noticed in playing home recordings made on the same instrument, this gives evidence of the existence of some mechanical fault in the recording mechanism. As previously pointed out, the cutting head leads may be dragging on the record or turntable, during recording, or the rubber rimmed drive wheel may slip at the point of contact with the motor pulley or the turntable rim. Although the drive wheel tension may be sufficient to provide unvarying speed of the turntable during the playing of records, the greater power demand placed upon the power source during recording, due to the work involved in cutting the record groove, may cause the drive wheel to slip.

MOTORS

Dynamic Balance

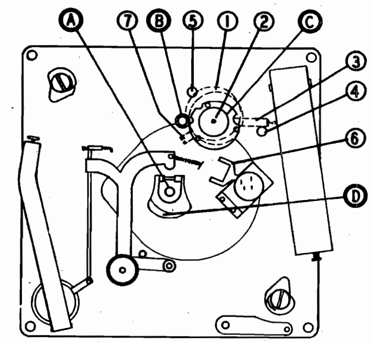
All Recordio motors employed in dual-speed models are now dynamically balanced by the motor manufacturer, and such motors have an identifying red dot on the bottom of the motor rotor. Thorough investigation indicates that the use of dynamically balanced motors eliminates all possibility of recorded flutter due to motor vibration. Prior to the use of dynamically balanced motors, all motors were passed through a very rigid vibration test to insure satisfactory performance from this standpoint.

Motor Shaft Sticks

In some of the early production units, sufficient vertical end play in the motor shaft existed to allow the lower end of the shaft to enter the motor bearing if the unit were subjected to rough handling during transportation. This sometimes caused the shaft to stick in the bearing, resulting in failure of the motor to operate when turned on. In the event a tight shaft is encountered, it may be freed in the bearing by lightly tapping the end of the motor shaft.

In motors of more recent production, a fibre washer is placed on the motor shaft to take up a sufficient amount of end play so that the shaft cannot become stuck in the bearing.

Oiling



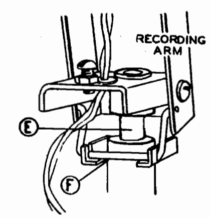
When the RECORDIO leaves the factory, the equipment is properly lubricated and requires no immediate attention.

Frequent oiling of the recording mechanism is not required, although the use of a small amount of oil judiciously applied about once a year, in accord with the following directions, will suffice to maintain the equipment in good order.

Remove the turntable by applying upward pressure at the rim of the table, at the same time lightly tapping the top of the turntable spindle with a small tool.

Lift the dual drive wheel assembly from its mounting.

Lubricate the oiling positions indicated in the accompanying drawings, using only two or three drops of electric motor oil at each position, unless otherwise specified.



A. Turntable shaft bearing.

B. Upper motor bearing.

C. Between drive wheel mounting disc and bed plate.

D. Place a coating of petroleum jelly on the lip of the master cam.

E. Recording arm pivot post.

F. Pivot post straddle plate slot.

Carefully apply one or two drops of oil to each drive wheel bearing, so that the oil will not run out on to the rubber rims of the wheels.

The lower motor bearing may be lubricated by application of oil to the felt wick surrounding the lower end of the motor shaft.

Replace dual drive wheel and turntable as follows:

Place the dual drive wheel assembly (1) on the pin in the center of the movable mounting plate (2). The shift lever (3) of the wheel assembly should be positioned against the stop pin (4) as shown in the drawing. Likewise, the switch arm (6) should be positioned as shown so that the switch actuating finger (7) will engage in the wide slot of the switch arm (6) as the shift lever (3) is moved between the stop pins (4) and (5).

Place the shift lever (3) against stop pin (5) so that the switch arm (6) is moved to the position opposite that shown in the drawing.

Carefully lower the turntable on the spindle. It will be observed that one of the rubber rimmed drive wheels protrudes beyond the rim of the turntable. With the finger tips, press the drive wheel into position so that the rubber rim of the wheel bears against the inside surface of the turntable rim.

Rotate the turntable by hand, permitting the key pin of the turntable spindle to engage the key slot in the turntable hub.

WILCOX-GAY CORP.

AUTOMATIC RECORD CHANGER ADJUSTMENTS

MODEL No. A93,A94,A96.

DESCRIPTION OF TRIP MECHANISM

(1) In order to automatically change records, the record changer mechanism must first be put in motion. The trigger which accomplishes this purpose is the trip mechanism. The trip mechanism is actuated by the trip grooves at the end of the music grooves in all standard records.

(2) All commercial records manufactured in recent years have either an eccentric (oscillating), or spiral (run-in) type of trip groove.

(3) This record changer will trip on any standard eccentric trip groove. It will also trip on any spiral trip groove provided that the spiral does not terminate at a larger diameter than that for which the trip mechanism is adjusted.

(4) To observe the operation of the trip mechanism, it is necessary to first remove the turntable and then move lever (A) to either the 10 or 12 inch position.

(5) To follow the action of the trip mechanism on eccentric trip groove records, it will be seen that as the pickup arm (M) swings inwardly, the trip rod (K) moves toward the pickup base until the serrations on the trip rod seen at (K) are in contact with the knife edge of the trip latch (X). If the pickup arm (M) is now moved outwardly, the serrations at (K) will engage with the trip latch (X) permitting the trip cam lift lever (C) to be released so that it will drop in and engage the trip cam (P).

(6) To observe the action of the trip mechanism on spiral trip groove records, swing the pickup arm (M) inwardly until the trip dog (G) comes in contact with the trip latch (X) and releases trip cam lift lever (C).

(7) The reject button (R) it will be noted also operates to trip the mechanism by imparting motion to latch (X).

(8) After trip cam lift lever (C) has been released so that it can engage trip cam (P) the forces required to operate the balance of the trip mechanism are derived from the motor.

(9) As trip cam (P) engages trip cam lift lever (C), cam (P) is hinged upwards so that it engages the change mechanism drive wheel control lever (I) and forces the drive wheel (L) into positive frictional engagement with the inside of the turntable rim.

(10) To keep wheel (L) in engagement with the turntable rim after lever (I) carries past cam (P), lever (I) is engaged by latch (Y) and the tripping operation is complete.

DESCRIPTION OF SPEED REDUCER AND CAM SHAFT

(11) Driven by the wheel (L) through a double worm and gear reduction, the cam shaft (S) carries cams which control the pickup arm movements, the dropping of records, and at the conclusion of the change cycle, the release of latch (Y).

(12) Cam (T) which is mounted on the lower end of cam shaft (S) raises and lowers the pickup arm (M) through a rocker arm and push rod.

(13) The positioning of the pickup arm (M) for 10 or 12 inch records is controlled by two cams just above the lower cam shaft bearing. The lower of these cams (with short throw) positions the pickup for 12 inch records and the upper cam (with long throw) positions the pickup for 10 inch records.

(14) An examination of the pickup positioning cams will reveal spring fingers at the termination of the cam rise. These spring fingers are provided to urge the pickup needle into the starting groove on records which do not have lead in grooves.

(15) When lever (A) is set in the 10 or 12 inch position, the pickup positioning cam follower is shifted up or down so as to engage the proper cam. The pickup positioning cam follower can easily be distinguished by the coil spring mounted thereon and linking the cam follower to its extension. This coil spring will extend, preventing damage, if for any reason the pickup arm (M) becomes obstructed while the pickup positioning cam is forcing the pickup arm (M) inwardly.

(16) Just above the pickup positioning cams is the pickup removal cam which has the function of swinging the pickup arm (M) outwardly when the mechanism has been tripped.

(17) The last and uppermost cam operates through cam follower (Z) to release the wheel latch (Y) thus disengaging wheel (L) from the turntable rim at the completion of the change cycle.

(18) On the upper side of the latch control cam is mounted a roller which engages lever (Q) and actuates the record handling fingers (D) through the connecting links provided.

ADJUSTMENT OF SPIRAL TRIP MECHANISM

(19) To adjust the spiral trip to operate farther from the center of the record, loosen the set screw holding dog (G) and move the dog (G) away from the end of the trip rod (K). (Read paragraph 20 before making adjustment.)

(20) Dog (G) is set at the factory to trip when the pickup needle is 1 3/4" from the edge of the hole in the record center. This standard setting is correct for all late recordings and all but a very few of the older ones. To facilitate the location of dog (G) it is best to hold a scale with the end touching the turntable pin (E) and in such a manner that the pickup needle will swing directly above the scale graduations. As noted above, the trip should release when the pickup needle reaches the 1 3/4" graduation. NOTE: If for any reason the position of the pickup arm (M) with relation to the pickup base becomes changed, the trip dog (G) may require resetting. For this reason always check to see that the pickup is being lowered correctly onto the edge of the record before adjusting dog (G). (This pickup adjustment is covered in paragraph 34.)

MECHANISM FAILS TO TRIP

(21) If the mechanism fails to trip always examine the trip grooves on the record first before attempting to make any adjustments. The record grooves may be worn or scratched in such a manner as to cause the pickup needle to jump the grooves. Also try a new pickup needle as the needle may have been damaged.

(22) The trip rod (K) is held in contact with the trip latch (X) by the trip rod tension spring (F). If the eccentric trip fails to operate, it may be necessary to increase the pressure of spring (F) against trip rod (K) but before changing the adjustment, observe the following:

(1) Make sure that the trip rod does not bind in the bearing where it is linked to the pickup base.

(2) Be sure that the trip rod floats freely.

(3) Examine the serrations at (K) to be certain that the sharp edges have not been damaged.

(4) Remove any dirt which may be embedded in the serrations and which would prevent the trip latch (X) from being engaged.

(5) Examine the knife edge of trip latch (X) to see if it has become damaged.

NOTE: Do not increase the pressure of spring (F) against trip rod (K) any more than is necessary to insure operation of the eccentric trip because excessive spring pressure will cause:

(1) Jumping of the pickup needle out of spiral trip grooves at the tripping point.

(2) The eccentric tripping action will require more power and the needle may jump the grooves and fail to trip altogether.

(23) If the trip mechanism still works in a faulty manner after the foregoing precautions have been taken, next check the trip latch (X) and the trip cam lift lever (C) to make sure that they work freely and do not bind on the studs on which they are mounted. If either of these levers are scraping on the base plate, make sure that the studs which carry them have not worked loose.

(24) If the lever (C) moves freely when it clears the trip latch (X) but does not swing into the path of the trip cam (P) then the spring which connects to lever (C) is either stretched or missing. If lever (C) makes a loud click when it drops in, the rubber bumper, against which it should strike, has worked up and should be pressed back into place.

WILCOX-GAY CORP.

MODELS A-93, A-94, A-96

CHANGE MECHANISM DRIVE WHEEL FAILS TO ENGAGE

(25) If the trip mechanism functions in a satisfactory manner and wheel (L) is latched in position to engage the turntable rim but does not contact the turntable rim with sufficient pressure to insure operation, loosen screws at (H) and move the wheel control lever extension outwardly a distance which will bring wheel (L) into positive contact with the turntable rim. CAUTION: This adjustment is very critical and should be carefully made. If wheel (L) is forced too tightly against the turntable rim, the latch (Y) will stick at the completion of the change cycle and prevent the wheel from becoming disengaged from the turntable rim. As an aid in making this adjustment, it is well to scribe a line on the wheel control lever at the end of the wheel control lever extension, so that it can be seen how far the extension is being moved each time. Before making any adjustment, it is also advisable to check the set screw in wheel (L) to make sure that wheel (L) is tight and not turning on the shaft which carries it.

(26) If latch (Y) fails to hold wheel (L) in position:

(1) Lever (I) may not be following through completely on cam (P), due to either lever (C) being bent down, or lever (I) bent up too far.

(2) At the end of lever (I) in vicinity of wheel (L) is noted a dog (W) which is meant to engage in latch (Y). This dog may have been bent outward so that it does not completely enter latch (Y), when lever (I) has completed its travel on cam (P).

(3) The adjustment of fingers on latch lever (Y) is such that the clearance for the dog (W) should be approximately .010". This can be determined by moving lever (I) outward from the center so that the dog (W) will move into latch (Y) and a feeler gauge inserted between the dog and finger to establish this clearance. To adjust for proper clearance, the finger on latch (Y) may be bent in or out.

(4) Check the spring on lever (Z) to make sure that the spring is not defective or missing.

MECHANISM REPEATS

(27) If the mechanism repeats (continues to change records without playing them), the wheel (L) may not be disengaging from the turntable rim. This failure to disengage may be due to the following:

(1) Faulty action of the latch (Y). (See "Caution" in paragraph 25.)

(2) A defective or missing return spring on wheel control lever (I).

(3) A defective or missing spring on lever (Z).

(4) Lever (Z) may be bent so that it is not contacting the wheel release cam. (See paragraph 17.)

(28) If wheel (L) disengages at the completion of the change cycle and immediately re-engages, the trip mechanism is at fault and it is suggested that the following be checked:

(1) Reject button (R) may be sticking in the depressed position.

(2) The trip cam (P) may be sticking in the raised position.

(3) The reset spring on trip latch (X) may be defective or missing.

(4) The stud on which wheel control lever (I) is mounted may have worked loose and should be tightened.

MECHANISM TRIPS DURING PLAYING CYCLE

(29) If the mechanism trips during the playing of a record and before the pickup arm has swung inwardly to the point where the trip is adjusted to operate on spiral trip groove records, the following conditions should be checked:

(1) Weak or missing reset spring on latch (X). Tension of spring may be increased by turning the spring anchor lug.

(2) Defective shoulder or trip latch (X) or rounded corner on cam lift lever (C), permitting lever (C) to slip off of the shoulder on trip latch (X).

(3) Rubber bumper (B), against which wheel control lever (I) strikes, may have worked up away from the base plate, permitting lever (I) to over-travel and lock trip rod (K) against trip latch (X). NOTE: Where over-travel of lever (I) due to lever (I) not striking bumper (B) causes tripping during the playing cycle, it is possible that either a weak reset spring on latch (X) or a damaged shoulder on latch (X) is a contributing factor.

PICKUP ARM STICKS OR JAMS

(30) If during normal operation of the unit the pickup arm acts as though it were jammed in any manner, the following procedure should be followed:

First, stop the motor, next remove the turntable, and trip the mechanism. The pickup arm (M) should now be capable of free motion between the normal limits of its travel. (From edge of base plate into within approximately 1" of the center pin (E) depending on the adjustment of trip dog (G).

If trip dog (G) will not slip by the lug against which it strikes on trip latch (X), or the serrations at (K) on trip rod (K) hang up on trip latch (X) and prevent trip rod (K) from sliding by trip latch (X) then investigate the following:

(1) Rubber bumper (B) pushed upwards away from base plate and permitting lever (I) to over-travel.

(2) Excessive pressure exerted against trip rod (K) by spring (F).

(3) Trip rod (K) bent.

(4) An extension on trip latch (X), which extends rearwardly along trip rod (K), may be bent or broken. The function of this extension is to swing trip rod (K) clear of trip latch (X) as soon as tripping takes place.

RECORD SUPPORT ADJUSTMENT

(31) An examination of the unit will disclose the rear record support (front support on A-96) has fixed positions determined by dedents which are located by lever (A). The opposite record support (O) however, is adjustable by means of an overlapping connecting link between the two support bases, underneath the changer unit.

The record support posts should be equidistant from the center of the turntable, so that the opposite sides of the record will be released at nearly the same instant, and so that only one record at a time will be dropped to the turntable. The correct adjustment may best be determined by placing a 10 inch record on the supports, with the support posts in the 10 inch position, and making the adjustment by loosening the screws shown at (V) and moving the record support post (O) to a position so that the entering edges of both separating fingers (N) are equidistant from the edge of the record. (NOTE: The record selected for making this adjustment must be flat and the center hole must fit the center post (E) without excessive looseness.) CAUTION: Before making this adjustment always make sure that lever (A) is firmly located in the proper dedent, and the three feed screw assembly mounting screws are tight. (Vertical alignment of the record centering pin (E) is dependent upon correct feed screw mounting.)

After the adjustment has been made, and the two screws tightened, turn on the motor and observe that the record is released from both support fingers at nearly the same instant. Then place a full stack of records on the supports and observe the dropping of each record. It will be noticed that the combined weight of ten or twelve records resting on the supports, will cause the support posts to spring outward slightly as the change mechanism goes through cycle; and the degree to which the posts swing outward is lessened with a decrease of total record weight. It will also be observed that one post may spring out more than the other during the change cycle, and this should be taken into consideration in making an adjustment of the support posts, so that the degree of unevenness with which the records are released from the support fingers will be "averaged" for the entire stack of records.

RECORD SUPPORT AND SEPARATING FINGERS

(32) As there is a difference in thickness between 10 inch and 12 inch records, and the equipment is designed to accommodate both sizes, the separating fingers (N) must be in correct adjustment so that they will slide in between the two lower records of the stack, and have no tendency to strike the edge of either record. The record supports (D) and the record

MODELS A-93, A-94, A-96

WILCOX-GAY CORP.

separating fingers (N) are so designed that, when in proper alignment, no chipping of standard records will take place. If, however, the separating finger should strike the edge of a record, due to a warped record, or one having chipped edges, fingers (N) may be sprung out of alignment. For proper operation, the fingers (N) must be perfectly flat. As the fingers are usually found to be bent upwards, rather than downwards, when out of correct alignment, it is necessary to remove the fingers from the support posts to straighten them. A heavy screw driver will be required to loosen the large screw at the top of the post, and the order of placement of the fingers and spacers should be noted in removing these parts so that they may be replaced in correct order. Ordinarily, straightening can be accomplished by holding the main part of the finger (N) through which the clamping screw passes, with one hand, and then taking hold of the sickle shaped part of (N) with the fingers of the other hand, bending the sickle shaped part until it is lined up with the main body. DO NOT USE PLIERS NOR ATTEMPT TO STRAIGHTEN THE FINGER (N) IN A VISE. After bending, lay the finger (N) on a flat surface to make sure the straightening has been properly done.

PICKUP ARM LIFT ADJUSTMENT

(33) The height to which pickup arm (M) is lifted during the change cycle may be adjusted by the screw (U). In making this adjustment, make sure that the pickup arm will not lift high enough to strike the bottom record on the record supports. Also make sure that the pickup needle drops low enough to rest properly on one record on the turntable. (Recommended needle length 5/8") If the timing of the pickup lift is not correct, loosen the set screw holding lift cam (T) on shaft (S) and relocate the cam. (The relative position of the remaining cams is fixed.)

ADJUSTMENT OF PICKUP LOWERING POINT

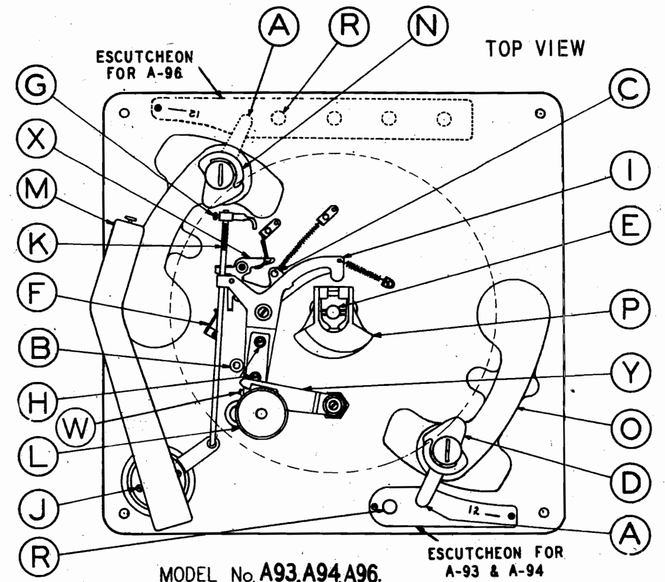
(34) To adjust the pickup arm (M) so that it will be lowered to the correct point on the outside of the record, first shift the lever (A) to the 10" position, and then stop the mechanism with the pickup positioning cam follower at the point of maximum rise of the pickup positioning cam. (See paragraphs 13, 14, and 15.) Now raise the pickup arm to the vertical position and loosen screws at (J) so that the arm (M) can be moved with relation to the pickup base but not too freely. Next holding the pickup base so that it will not turn, force the pickup arm (M) toward the record centering pin (E). Next, carefully pull the pickup arm (M) outwardly until the pickup needle is 4-45/64" from the pin (E). Raise the pickup arm (M) and tighten the locking screws at (J) being careful not to move arm (M) outwardly past the correct setting before tightening the screws. This adjustment will automatically take care of 12" records as well as 10" as will be seen by moving lever (A) to the 12" position and running the unit through its cycle. If the pickup arm (M) always lowers in the 12" position regardless of the position of the lever (A) the pickup positioning cam follower is sticking in the down position.

CONCERNING RECORDED "WOW" IN MODELS A-93 AND A-94 INCORPORATING #55-2020 AUTOMATIC RECORD CHANGER AND RECORDER UNIT

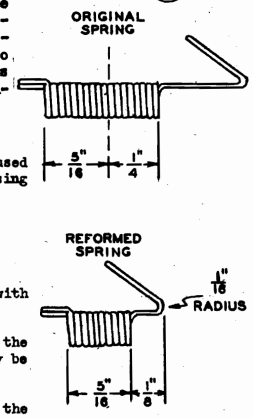
If recorded "wow" is encountered in dual-speed recorder units of the automatic record changer type used in equipment bearing serial numbers prior to 624010, a correction may usually be effected by increasing the tension of the intermediate drive wheel spring.

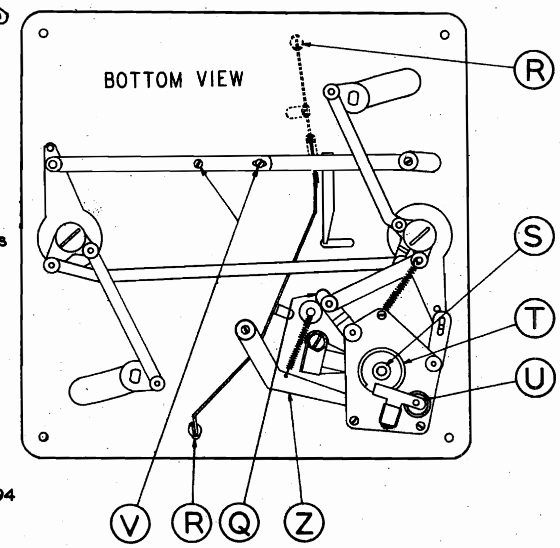
To accomplish this, proceed as follows:

1. Remove turntable and intermediate drive wheel assembly. (See Operating Instructions.)
2. Remove recorder-changer unit by removing the four mounting screws, and disconnecting cables with plugs, from Recordio chassis.
3. Place recorder-changer unit on the work bench, tilted to a position that provides easy access to the under side of the unit. DO NOT PLACE UNIT IN AN UPSIDE-DOWN POSITION, as the record spindle may be sprung or bent.
4. Remove the intermediate drive wheel spring, and make alterations to the spring in accord with the specifications given below.
5. Remove twelve turns at the hook end of the spring. Straighten out three turns of the coiled spring, and--
6. form a new hook so that the bend in the hook is only 1/8" from the coiled spring. DO NOT MAKE A SHARP BEND IN FORMING THE HOOK. Instead, form a 1/16" radius as shown in the drawing.
7. Before replacing the spring in the unit, remove the burred or ragged edge of the hole in the base plate, through which the pin protrudes for attachment of the loop end of the spring.
8. After the spring has been installed, and the unit restored to the cabinet, the intermediate drive wheel assembly and turntable should be replaced in accord with the directions given on Page 6 of the Operating Instructions.



MODEL No. A93, A94, A96.
DATE 12-11-40

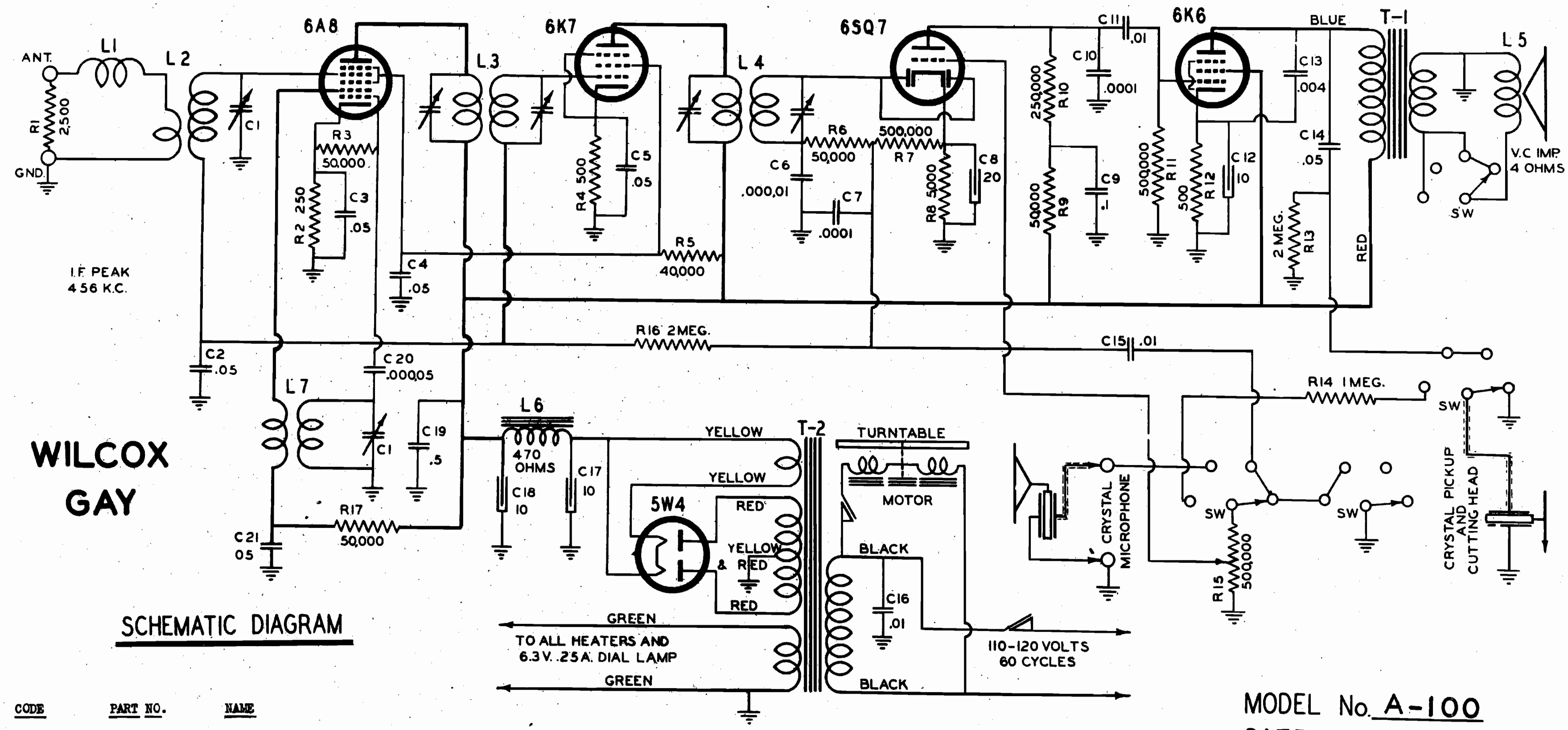




MODEL No. A-93, A-94
DATE 2-7-41

WILCOX-GAY CORP.

MODEL A-100



SCHEMATIC DIAGRAM

MODEL No. A-100
DATE 12-24-40

SWITCH POSITIONS
1—PHONOGRAPH
2—RECORD MICROPHONE
3—RECORD RADIO
4—RADIO
SWITCHES ARE SHOWN IN NUMBER 4 POSITION

CODE	PART NO.	NAME
C1-A, C1-B	77-2023	{ ANT. SECTION, OSC. SECTION } VARIABLE COND.
C2	75-2004	.05 MFD. 400 V. PAPER COND.
C3	75-2004	.05 MFD. 400 V. PAPER COND.
C4	75-2004	.05 MFD. 400 V. PAPER COND.
C5	75-2004	.05 MFD. 400 V. PAPER COND.
C6	76-2010	.00001 MFD. MICA COND.
C7	76-2012	.0001 MFD. MICA COND.
C8	18-2021	20 MFD. 25 W.V. ELECT. COND.
C9	75-2007	.1 MFD. 400 V. PAPER COND.
C10	76-2012	.0001 MFD. MICA COND.
C11	75-2003	.01 MFD. 400 V. PAPER COND.
C12, C17, C18	18-2020	{ 10 MFD. 350 V., 10 MFD. 450 V., 10 MFD. 450 V. } ELECT. COND. IN CAN
C13	75-2002	.004 MFD. 600 V. PAPER COND.
C14	75-2004	.05 MFD. 400 V. PAPER COND.
C15	75-2003	.01 MFD. 400 V. PAPER COND.
C16	75-2003	.01 MFD. 400 V. PAPER COND.
C19	75-2012	.5 MFD. 400 V. PAPER COND.
C20	76-2011	.00005 MFD. MICA COND.
C21	75-2004	.05 MFD. 400 V. PAPER COND.
R1	53-2002	2,500 OHM 1/4 WATT RESISTOR
R2	53-1062	250 OHM WIREWOUND RESISTOR
R3	53-898	50,000 OHM 1/4 WATT RESISTOR
R4	53-1063	500 OHM WIREWOUND RESISTOR

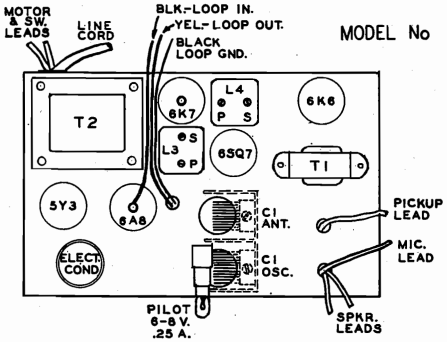
CODE	PART NO.	NAME
R5	53-2032	40,000 OHM 1 WATT RESISTOR
R6	53-898	50,000 OHM 1/4 WATT RESISTOR
R7	53-925	500,000 OHM 1/4 WATT RESISTOR
R8	53-919	5,000 OHM 1/4 WATT RESISTOR
R9	53-898	50,000 OHM 1/4 WATT RESISTOR
R10	53-924	250,000 OHM 1/4 WATT RESISTOR
R11	53-925	500,000 OHM 1/4 WATT RESISTOR
R12	53-2031	500 OHM 1 WATT RESISTOR
R13	53-2024	2 MEGOHM 1/4 WATT RESISTOR
R14	53-926	1 MEGOHM 1/4 WATT RESISTOR
R15	19-2018	500,000 OHM VOL. CONTROL & SWITCH
R16	53-2024	2 MEGOHM 1/4 WATT RESISTOR
R17	53-898	50,000 OHM 1/4 WATT RESISTOR
L1	17-2269	ANTENNA LOADING COIL
L2	17-2272	LOOP ANTENNA ASSEM. (INCLUDES L1)
L3	68-2061	1ST. I.F. TRANSFORMER
L4	68-2056	2ND. I.F. TRANSFORMER (INCLUDES C6 AND R6)
L5	64-2079	SPEAKER, 4" P.M. DYNAMIC
L6	14-2002	FILTER CHOKE
L7	17-2271	OSCILLATOR COIL

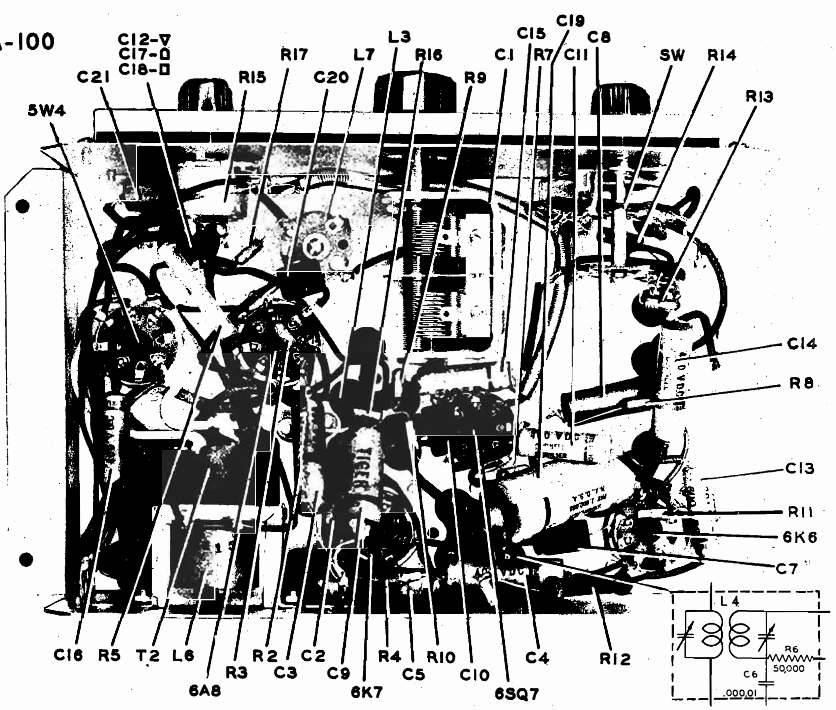
CODE	PART NO.	NAME
SW	66-2043	SWITCH, 4 POLE 4 POS.
T1	81-2011	OUTPUT TRANSFORMER
T2	80-2039	POWER TRANSFORMER

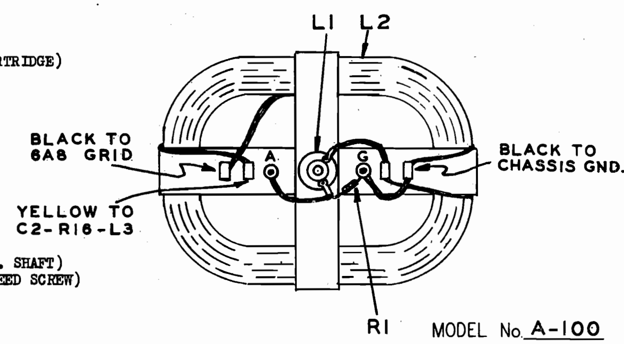
MODEL A-100

WILCOX-GAY CORP.

MODEL No A-100







MODEL No. A-100
DATE 1-10-41
12-30-40
12-24-40

GANGING INSTRUCTIONS

An OUTPUT METER, connected to the speaker voice coil terminals, should be used for accuracy in making ganging adjustments.

The voice coil terminals, as well as the I.F. trimmers, may be made accessible by removing the screws by which the motor panel is mounted in the cabinet. Before lifting off the phono-recorder unit, MOVE THE PHONO. ARM TO THE CENTER OF THE TURNTABLE, and permit the arm to maintain this position until after the unit has been restored to the cabinet. In this way, the follower arm which engages the lateral feed screw will be protected against damage.

The R.F. trimmers may be reached through the opening provided in the bottom of the cabinet.

Connect signal generator to control grid of 6A8 tube.*

SIGNAL GENERATOR FREQUENCY	DIAL POSITION	TRIMMER
456 K.C.	1700 K.C.	L3-S**
" "	" "	L3-P**
" "	" "	L4-S**
" "	" "	L4-P**

Connect signal generator to ANT. and GND. terminals.

1400 K.C.	1400 K.C.	C1-OSC.
" "	" "	C1-ANT.

* Check the alignment of pointer with reference line below 550 K.C. on the scale. The pointer may be slipped on the shaft to correct for misalignment.

** In ganging the I.F. amplifier, use a low signal input to avoid setting up of oscillation in the amplifier.

NOTE: In the event of loop antenna replacement, the R.F. alignment should be checked at 600 K.C., and if necessary, inductance of the loop may be adjusted to bring about correct alignment of the dial at 600 K.C., by dressing the end of the inside loop turn to provide more or less inductance as required.

An adjustment of loop inductance should be followed by re-alignment of the R.F. trimmers at 1400 K.C.

VOLTAGE DATA

Line Voltage---117
C17 to GND.----270
C18 to GND.----250
C21 to GND.----115

All voltage measurements made against ground (chassis) by use of a 1000 ohm per volt voltmeter.

Tube	Position	Plate	Screen	Cathode
6A8	1st. Det.	250	80	2.5
	Osc.	115		
6K7	I.F.	250	80	3.7
6SQ7	2nd. Det.	80*	--	1.3
6K6	Output	225	250	17.0

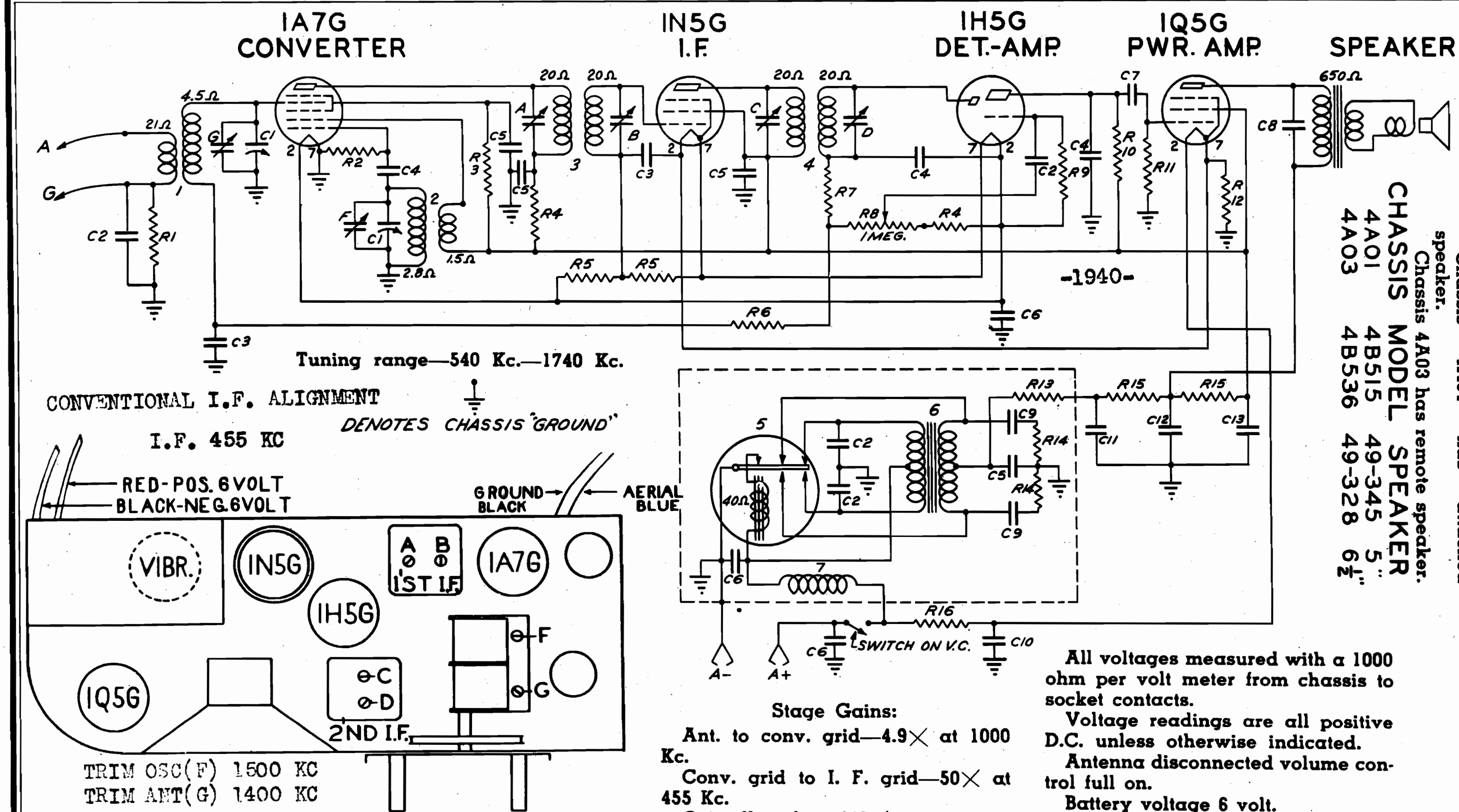
* Not actual voltage due to large value of resistance in circuit between supply voltage and point of measurement.

MODEL A-100
RECORDIO JR. PARTS LIST

55-2027	RECORDER UNIT--COMPLETE
2-2041	RECORDER PICKUP ARM ASSEM. (WITH CARTRIDGE)
2-2040	ARM CHANNEL ONLY
16-2002	CORD RETAINER CLIP
23-2035	CRYSTAL CARTRIDGE (L-26)
51-2117	CARTRIDGE CLAMP PLATE
57-2083	CARTRIDGE MTG. SCREW
57-2119	CONE POINT PIVOT SCREW
48-2016	CONE POINT SCREW LOCKNUT
2-2043	FOLLOWER ARM ASSEMBLY
5-2376	FOLLOWER ARM STOP BRACKET
79-2010	INTERMEDIATE DRIVE WHEEL
16-2005	DRIVE WHEEL STUD CLIP
57-2118	LATERAL FEED SCREW ASSEM. (WITH T.T. SHAFT)
47-2029	MOTOR & PLATE ASSEM. (LESS T.T. & FEED SCREW)
66-2042	MOTOR SWITCH
40-2053	MOTOR SWITCH KNOB
57-2100	MOTOR MTG. SCREWS
52-2165	NEEDLE RECEPTACLE
57-2056	NEEDLE SCREW
58-2043	PIVOT POST SHAFT ASSEMBLY
5-2374	PIVOT POST LOCK SPRING ASSEMBLY
6-2029	PIVOT POST BUSHING
73-2066	PIVOT POST BUSHING MTG WASHER 2 1/32" DIA. ST. BRONZE
73-2067	PIVOT POST BUSHING MTG WASHER 2 1/32" DIA. PLAIN
73-2036	PIVOT POST BUSHING MTG LOCKWASHER
48-2009	PIVOT POST BUSHING MTG NUT
5-2371	PICKUP ARM REST
70-2022	TURNTABLE (WITH PIN MOUNTED)
52-2133	TURNTABLE DRAG PIN
67-2050	TURNTABLE DRAG PIN SPRING
57-1669	TURNTABLE DRAG PIN SPRING MTG. SCREW
73-1642	TURNTABLE DRAG PIN SPRING MTG. LOCKWASHER

ZENITH RADIO CORP.

MODEL 4B515, Ch. 4A01
MODEL 4B536, Ch. 4A03



NOTE

Chassis 4A01 has attached speaker.

Chassis 4A03 has remote speaker.

CHASSIS	MODEL	SPEAKER	
4A01	4B515	49-345	5"
4A03	4B536	49-328	6½"

Tuning range—540 Kc.—1740 Kc.

CONVENTIONAL I.F. ALIGNMENT

I.F. 455 KC

⏚ DENOTES CHASSIS "GROUND"

TRIM OSC(F) 1500 KC
TRIM ANT(G) 1400 KC

Stage Gains:

Ant. to conv. grid—4.9× at 1000 Kc.

Conv. grid to I. F. grid—50× at 455 Kc.

Overall audio—448× at .050 watt —400 cycles.

All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts.

Voltage readings are all positive D.C. unless otherwise indicated.

Antenna disconnected volume control full on.

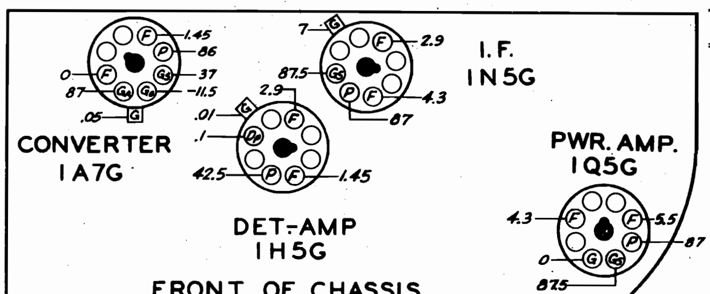
Battery voltage 6 volt.

Battery consumption—.4 ampere.

Power Output—370 milliwatts.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-695	TWO GANG VARIABLE	
C2	22-826	.01 MFD.	200V.
C3	22-829	.05 MFD.	200V.
C4	22-162	.0001 MFD.	600V.
C5	22-828	.05 MFD.	400V.
C6	22-199	.5 MFD.	200V.
C7	22-243	.01 MFD.	400V.
C8	22-448	.004 MFD.	600V.
C9	22-966	.04 MFD.	600V.
C10	22-961	500 MFD. ELECTROLYTIC	15V.
C11	22-742	15 MFD. ELECTROLYTIC	250V.
C12	22-742	15 MFD. ELECTROLYTIC	250V.
C13	22-742	10 MFD. ELECTROLYTIC	250V.
R1	63-597	470M OHM	¼W.

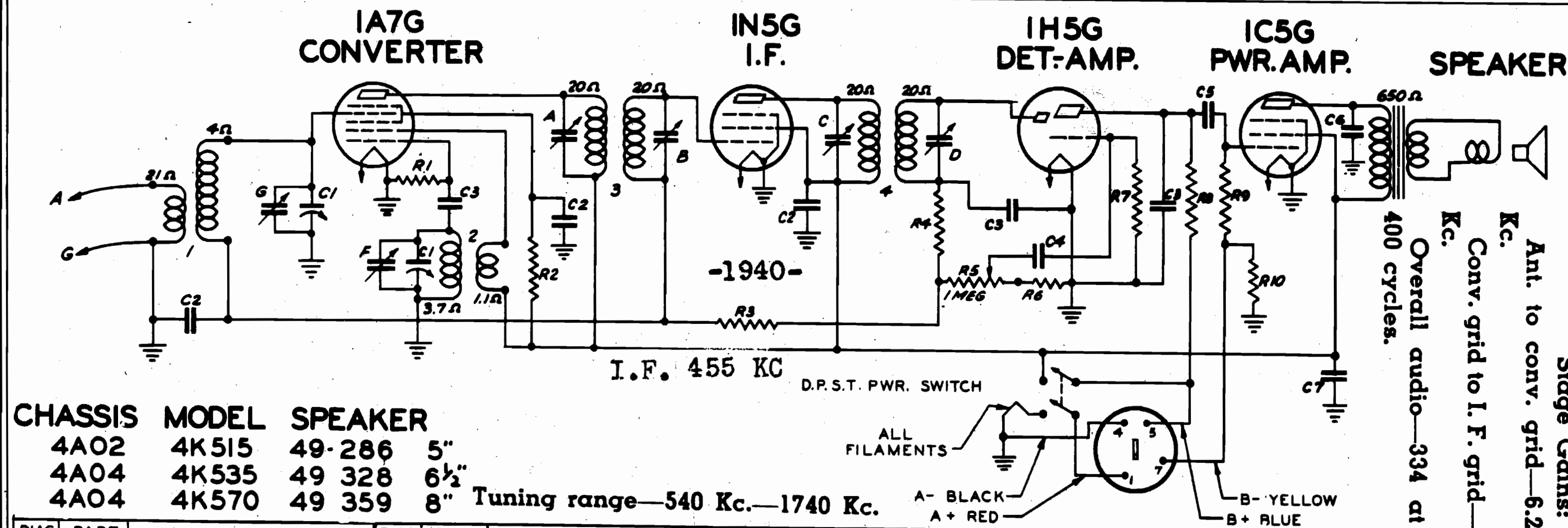
DIAG. Nº	PART Nº	DESCRIPTION	
R2	63-595	100M OHM	¼W.
R3	63-594	68M OHM	¼W.
R4	63-583	1000 OHM	¼W.
R5	63-296	220M OHM	¼W.
R6	63-669	3.9 MEGOHM	¼W.
R7	63-593	47M OHM	¼W.
R8	63-1079	VOLUME CONTROL	
R9	63-976	15 MEGOHM	¼W.
R10	63-271	1 MEGOHM	¼W.
R11	63-600	2.2 MEGOHM	¼W.
R12	63-1060	90 OHM WIREWOUND	1W.
R13	63-577	100 OHM	¼W.
R14	63-697	100 OHM	¼W.
R15	63-605	1000 OHM	½W.
R16	63-1061	7 OHM	½W.



DIAG. Nº	PART Nº	DESCRIPTION
1	20-208	ANTENNA COIL
2	S6381	OSCILLATOR COIL ASSEM.
3	95-589	1ST I.F. TRANS.
4	95-590	2ND I.F. TRANS.
5	190-17	VIBRATOR
6	95-635	POWER TRANSFORMER
7	S5043	CHOKE ASSEMBLY
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
F		B'DCAST OSC. (ON GANG)
G		ANT. B'DCAST (ON GANG)

MODEL 4K515, Ch. 4A02
MODELS 4K535, 4K570,
Ch. 4A04

ZENITH RADIO CORP.



Stage Gains:
Ant. to conv. grid—6.2× at 1000 Kc.
Conv. grid to I. F. grid—56× at 455 Kc.
Overall audio—334 at .050 watt, 400 cycles.

CHASSIS	MODEL	SPEAKER	
4A02	4K515	49-286	5"
4A04	4K535	49 328	6½"
4A04	4K570	49 359	8"

Tuning range—540 Kc.—1740 Kc.

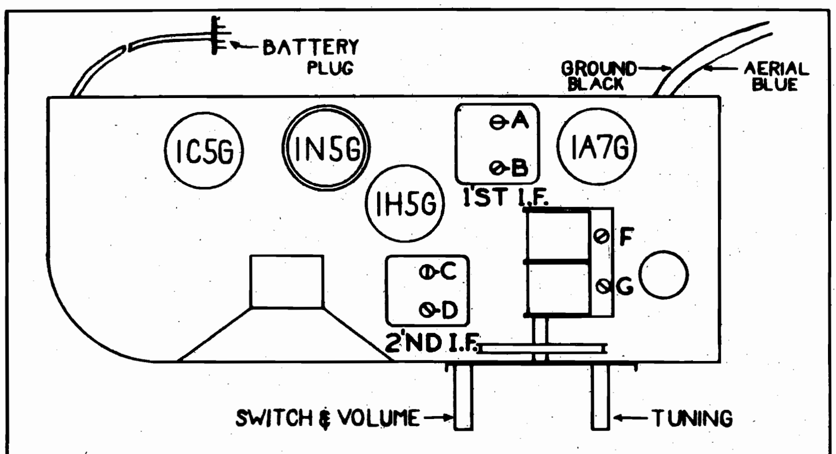
DIAG. No	PART No	DESCRIPTION		DIAG. No	PART No	DESCRIPTION		DIAG. No	PART No	DESCRIPTION
C1	22-695	TWO GANG VARIABLE		R4	63-593	47M OHM	¼ W.	4	95-590	2ND I.F. TRANS. ASSEM.
C2	22-829	.05 MFD.	200 V.	R5	63-1072	VOLUME CONTROL		A		1ST I.F. TRANS. PRI.
C3	22-162	.0001 MFD.	600 V.	R6	63-587	4700 OHM	¼ W.	B		1ST I.F. TRANS. SEC.
C4	22-826	.01 MFD.	200 V.	R7	63-976	15 MEGOHM	¼ W.	C		2ND I.F. TRANS. PRI.
C5	22-243	.01 MFD.	400 V.	R8	63-271	1 MEGOHM	¼ W.	D		2ND I.F. TRANS. SEC.
C6	22-448	.004 MFD.	600 V.	R9	63-600	2.2 MEGOHM	¼ W.	F		B'DCAST OSC. (ON GANG)
C7	22-684	8 MFD. ELECTROLYTIC	150 V.	R10	63-238	1000 OHM	¼ W.	G		ANT. B'DCAST (ON GANG)
R1	63-654	180M OHM	¼ W.	1	20-208	ANTENNA COIL				
R2	63-594	68M OHM	¼ W.	2	S-7815	OSCILLATOR COIL ASSEM.				
R3	63-669	3.9 MEGOHM	¼ W.	3	95-589	1ST I.F. TRANS. ASSEM.				

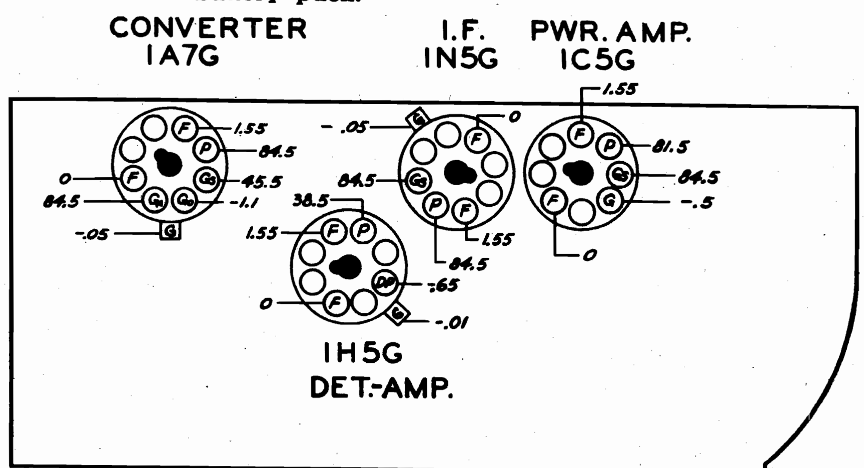
NOTE
Chassis 4A02—attached speaker.
Chassis 4A04—remote speaker.

All voltages measured with a 1000 ohm per volt meter from chassis to socket contacts using a fresh Z28 battery pack.

I.F. ALIGNMENT CONVENTIONAL

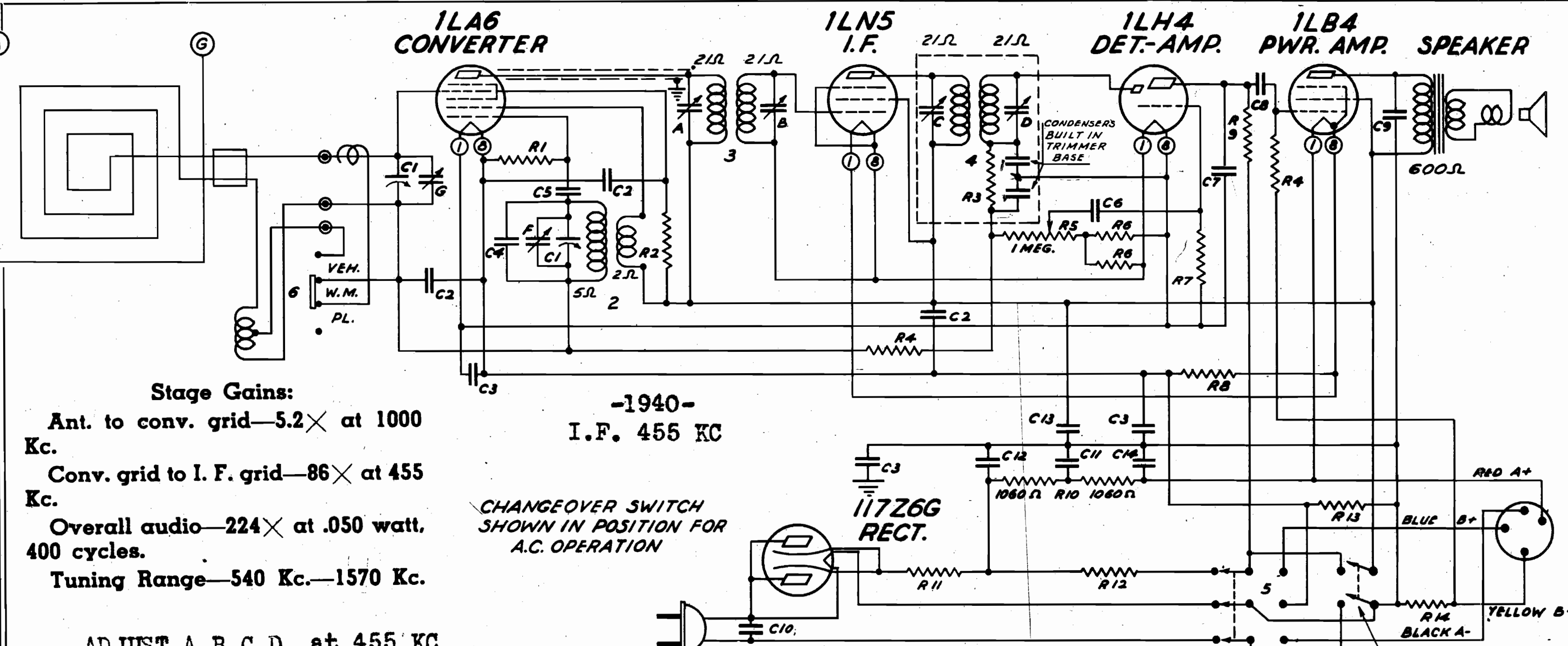
TRIM OSC(F)1500 KC
TRIM ANT(G)1400 KC





ZENITH RADIO CORP.

MODELS 5G500, 5G500L
Ch. 5A01



Stage Gains:

Ant. to conv. grid—5.2× at 1000 Kc.

Conv. grid to I. F. grid—86× at 455 Kc.

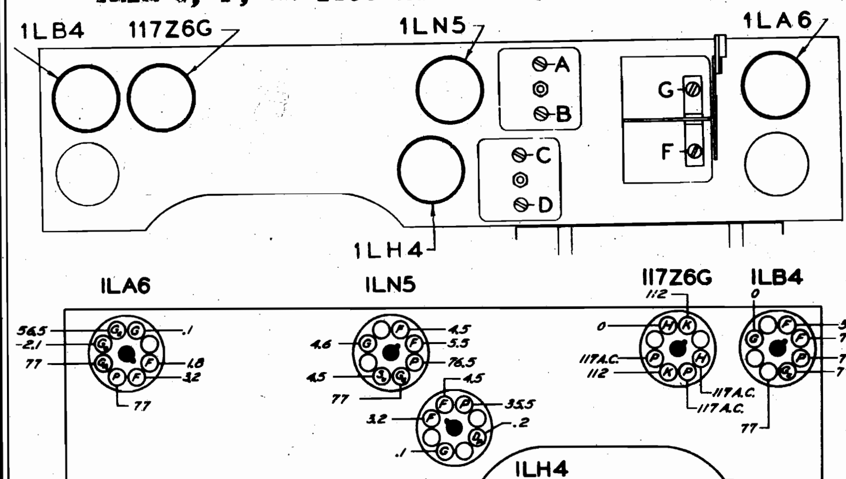
Overall audio—224× at .050 watt, 400 cycles.

Tuning Range—540 Kc.—1570 Kc.

-1940-
I.F. 455 KC

CHANGEOVER SWITCH SHOWN IN POSITION FOR A.C. OPERATION

ADJUST A,B,C,D, at 455 KC
TRIM G, F, at 1400 KC RF signal loosely coupled to loop



VOLTAGES MEASURED FROM SOCKET TERMINALS TO A.C. LINE AT CHANGEOVER SWITCH.

DIAG. NO	PART NO	DESCRIPTION		DIAG. NO	PART NO	DESCRIPTION	
C1	22-1024	TWO GANG VARIABLE		R1	63-773	180 M OHM	¼ W.
C2	22-829	.05 MFD.	200 V.	R2	63-590	15 M OHM	¼ W.
C3	22-827	.1 MFD.	200 V.	R3	63-713	47 M OHM	¼ W.
C4	22-988	20 MMFD.	600 V.	R4	63-722	2.2 MEGOHM	¼ W.
C5	22-162	.0001 MFD.	600 V.	R5	63-1121	VOLUME CONTROL	
C6	22-492	.002 MFD.	600 V.	R6	63-587	4700 OHM	¼ W.
C7	22-470	.00015 MFD.	600 V.	R7	63-1093	15 MEGOHM	¼ W.
C8	22-243	.01 MFD.	400 V.	R8	63-1097	870 OHM WIREWOUND	1 W.
C9	22-448	.004 MFD.	600 V.	R9	63-271	1 MEGOHM	¼ W.
C10	22-869	.05 MFD.	400 V.	R10	63-1120	2-SECTION CANDOHM	
C11	22-1026	20 MFD. ELECTROLYTIC	150 V.	R11	63-1096	140 OHM WIREWOUND	2 W.
C12		40 MFD. "	150 V.	R12	63-439	2700 OHM	¼ W.
C13	22-1027	20 MFD. "	150 V.	R13	63-1099	33 OHM WIREWOUND	½ W.
C14		20 MFD. "	25 V.	R14	63-742	180 OHM	¼ W.

All voltages measured from point indicated to Neg. B. using 20000 ohm per volt meter.

Line voltage—117 v. A.C.

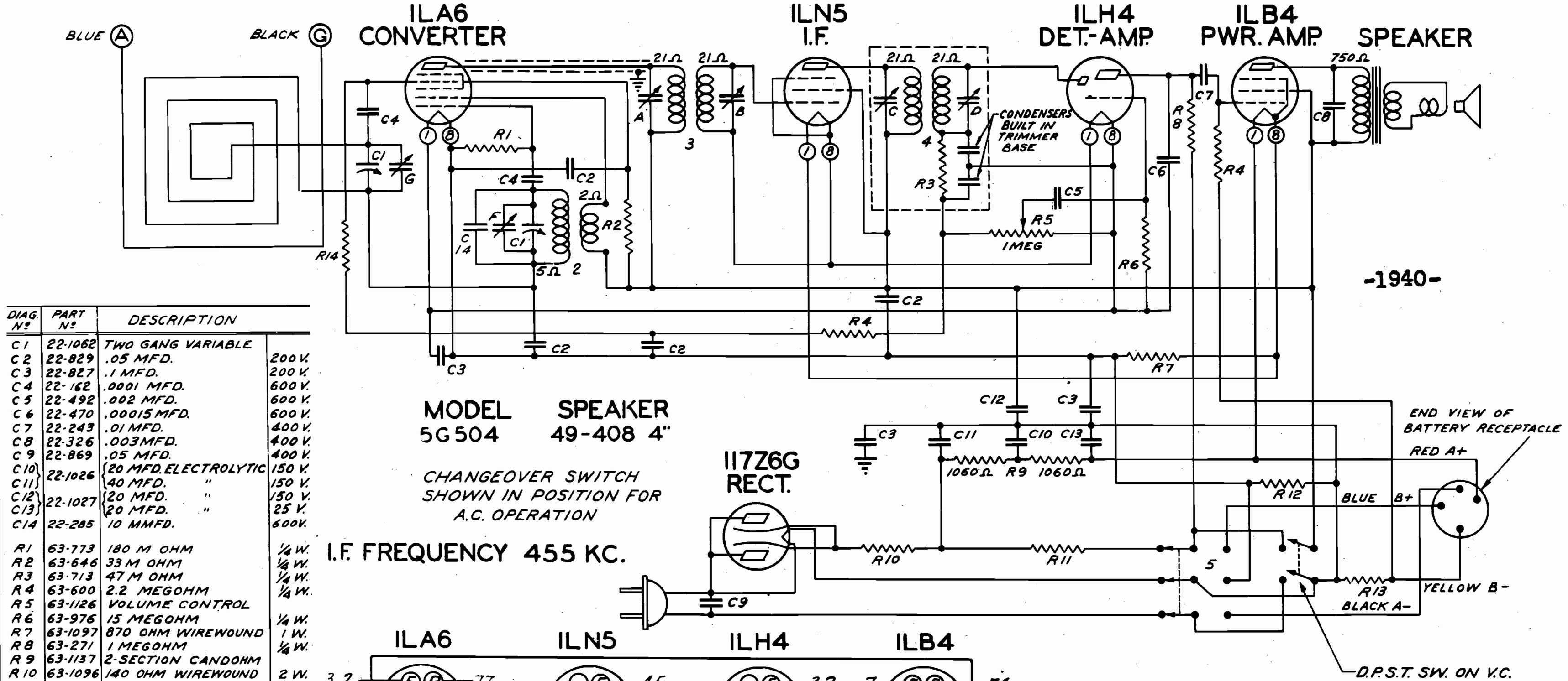
Power consumption—117 v.—20 watts.

Power consumption, battery—1.02 watts.

MODEL	SPEAKER
5G500	49-386 5½"
5G500L	49-386 5½"

MODEL 5G504
Ch. 5A03

ZENITH RADIO CORP.

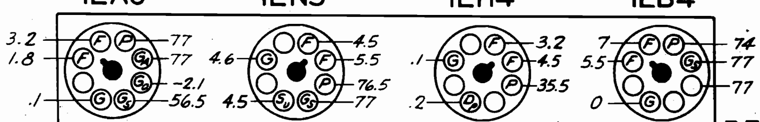


DIAG. No	PART No	DESCRIPTION	
C1	22-1062	TWO GANG VARIABLE	
C2	22-829	.05 MFD.	200 V.
C3	22-827	.1 MFD.	200 V.
C4	22-162	.0001 MFD.	600 V.
C5	22-492	.002 MFD.	600 V.
C6	22-470	.00015 MFD.	600 V.
C7	22-243	.01 MFD.	400 V.
C8	22-326	.003 MFD.	400 V.
C9	22-869	.05 MFD.	400 V.
C10	22-1026	20 MFD. ELECTROLYTIC	150 V.
C11		40 MFD. "	150 V.
C12	22-1027	20 MFD. "	150 V.
C13		20 MFD. "	25 V.
C14	22-285	10 MMFD.	600 V.
R1	63-773	180 M OHM	1/4 W.
R2	63-646	33 M OHM	1/4 W.
R3	63-713	47 M OHM	1/4 W.
R4	63-600	2.2 MEGOHM	1/4 W.
R5	63-1126	VOLUME CONTROL	
R6	63-976	15 MEGOHM	1/4 W.
R7	63-1097	870 OHM WIREWOUND	1 W.
R8	63-271	1 MEGOHM	1/4 W.
R9	63-1137	2-SECTION CANDOHM	
R10	63-1096	140 OHM WIREWOUND	2 W.
R11	63-439	2700 OHM	1/4 W.
R12	63-1099	33 OHM WIREWOUND	1/2 W.
R13	63-742	180 OHM	1/4 W.
R14	63-296	220 M OHM	1/4 W.
1	S8742	WAVEMAGNET ASSEMBLY	
2	S8730	OSC. COIL ASSEMBLY	
3	95-720	1ST I.F. TRANSFORMER	
4	95-721	2ND I.F. TRANSFORMER	
5	85-242	CHANGEOVER SWITCH	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. " SEC.	
C		2ND I.F. " PRI.	
D		2ND I.F. " SEC.	
F		BROADCAST OSC. (ON GANG)	
G		BROADCAST ANT. (ON GANG)	

MODEL 5G504 SPEAKER 49-408 4"

CHANGEOVER SWITCH SHOWN IN POSITION FOR A.C. OPERATION

I.F. FREQUENCY 455 KC.

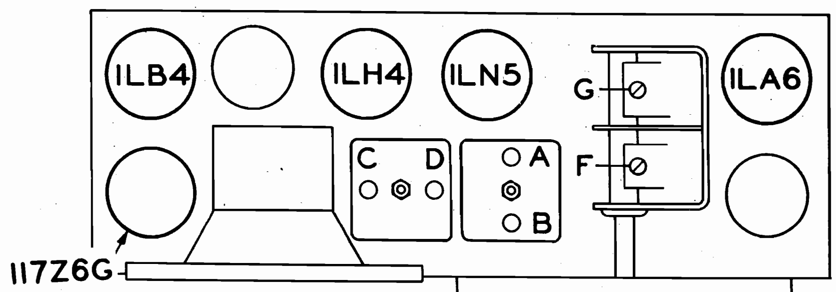


All voltages measured from point indicated to Neg. B. using 20000 ohm per volt meter.
Line voltage—117 v. A.C.

Power consumption—117 v.—20 watts.
Power consumption, battery—1.02 watts.
Power output—170 milliwatts.

Stage Gains:

Ant. to conv. grid—4.9× at 1000 Kc.
Conv. grid to I. F. grid—53× at 455 Kc.
Overall audio—280× at .050 watt, 400 cycles.
Tuning Range—540 Kc.—1600 Kc.

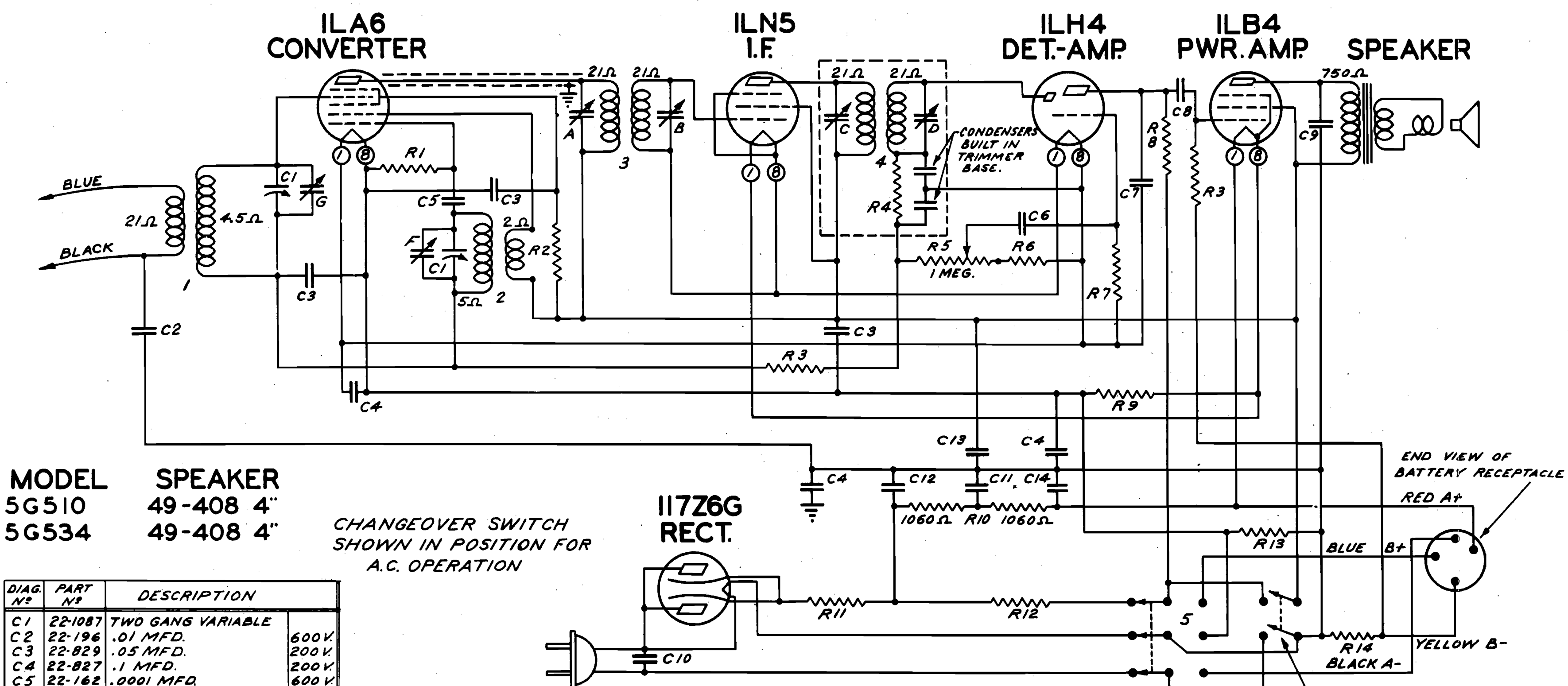


I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII

I.F. TRIMMERS A,B,C,D
For R.F. Alignment
Couple test oscillator
thru single turn loop
to Wavemagnet
TRIM OSC,ANT (F,G) 1400 KC

ZENITH RADIO CORP.

MODELS 5G510, 5G534
Ch. 5A10



MODEL	SPEAKER
5G510	49-408 4"
5G534	49-408 4"

CHANGEOVER SWITCH SHOWN IN POSITION FOR A.C. OPERATION

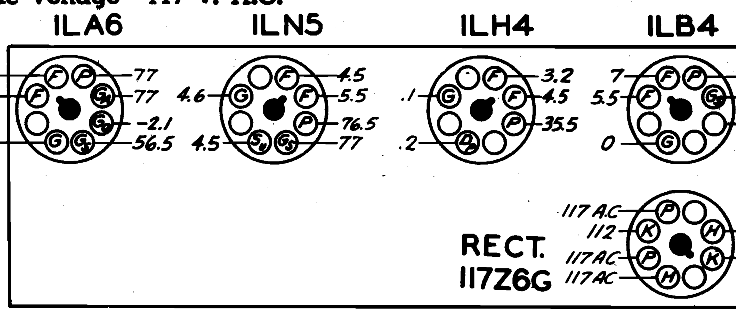
DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1087	TWO GANG VARIABLE	
C2	22-196	.01 MFD.	600 V.
C3	22-829	.05 MFD.	200 V.
C4	22-827	.1 MFD.	200 V.
C5	22-162	.0001 MFD.	600 V.
C6	22-492	.002 MFD.	600 V.
C7	22-470	.00015 MFD.	600 V.
C8	22-243	.01 MFD.	400 V.
C9	22-448	.004 MFD.	600 V.
C10	22-869	.05 MFD.	400 V.
C11	22-1026	20 MFD. ELECTROLYTIC	150 V.
C12		40 MFD. "	150 V.
C13	22-1027	20 MFD. "	150 V.
C14		20 MFD. "	25 V.
R1	63-654	180 M OHM	¼ W.
R2	63-646	33 M OHM	¼ W.
R3	63-600	2.2 MEGOHM	¼ W.
R4	63-713	47 M OHM	¼ W.
R5	63-1144	VOLUME CONTROL	
R6	63-587	4700 OHM	¼ W.
R7	63-1093	15 MEGOHM	¼ W.
R8	63-271	1 MEGOHM	¼ W.
R9	63-1097	870 OHM WIREWOUND	1 W.
R10	63-1137	2 SECTION CANDOHM	
R11	63-1096	140 OHM WIREWOUND	2 W.
R12	63-439	2700 OHM	¼ W.
R13	63-1099	33 OHM WIREWOUND	½ W.
R14	63-627	180 OHM	¼ W.

All voltages measured from point indicated to Neg. B. using 20000 ohm per volt meter.

Antenna disconnected — volume control at minimum and condenser plates in full mesh.

Line voltage—117 v. A.C.

CONVENTIONAL I.F.
ALIGNMENT-SEE SPECIAL
SECTION VOL. VIII
I.F. 455 KC
TRIM ANT-OSC 1400 KC



Power consumption—117 v.—18.5 watts.

Power consumption, battery—1.02 watts.

Power output—160 milliwatts.

Stage Gains:

Ant. to conv. grid—3.8× at 1000 Kc.

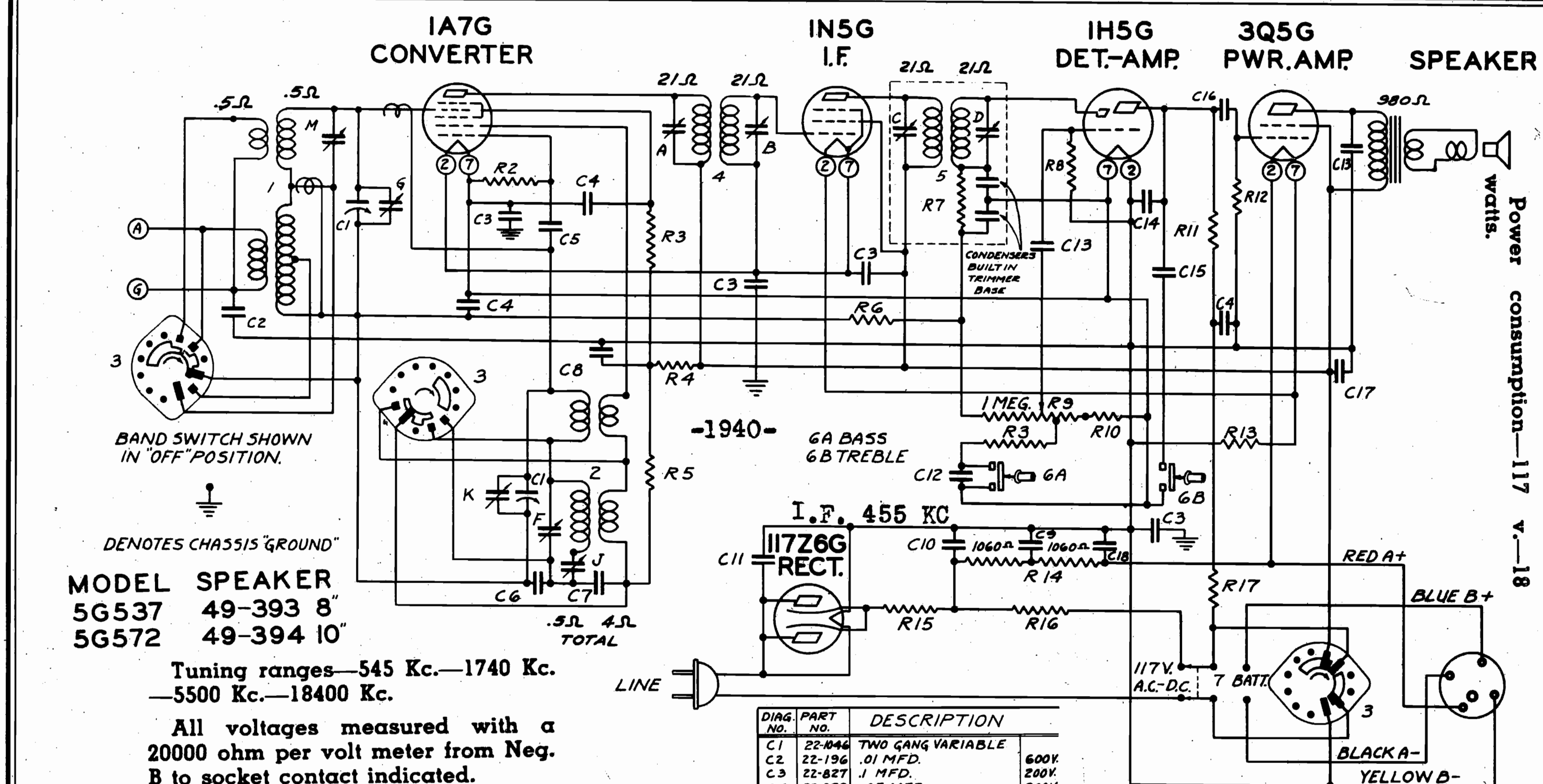
Conv. grid to I. F. grid—65× at 455 Kc.

Overall audio—260× at .050 watt, 400 cycles.

Tuning Range—540 Kc.—1600 Kc.

MODELS 5G537, 5G572
Ch. 5A02

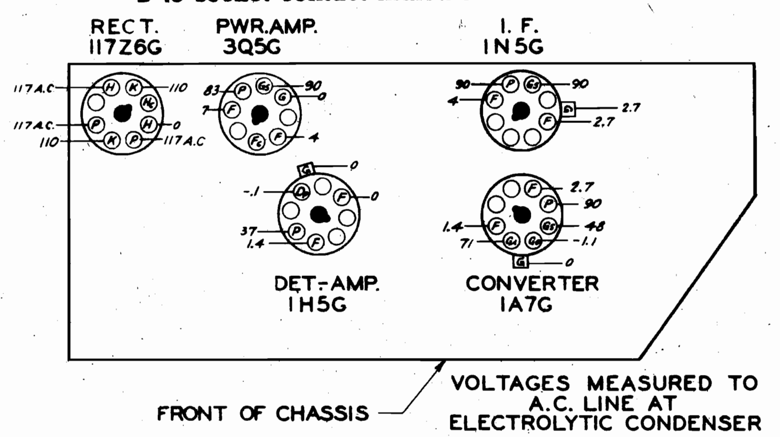
ZENITH RADIO CORP.



MODEL	SPEAKER
5G537	49-393 8"
5G572	49-394 10"

Tuning ranges—545 Kc.—1740 Kc.
—5500 Kc.—18400 Kc.

All voltages measured with a 20000 ohm per volt meter from Neg. B to socket contact indicated.



DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-1046	TWO GANG VARIABLE	
C2	22-196	.01 MFD.	600V.
C3	22-827	.1 MFD.	200V.
C4	22-829	.05 MFD.	200V.
C5	22-289	50 MMFD.	600V.
C6	22-1022	.005 MFD.	600V.
C7	22-182	.00025 MFD.	600V.
C8	22-1047	10 MFD. ELECTROLYTIC	150V.
C9	22-1047	20 MFD. ELECTROLYTIC	150V.
C10	22-1047	30 MFD. ELECTROLYTIC	150V.
C11	22-869	.05 MFD.	400V.
C12	22-826	.01 MFD.	200V.
C13	22-492	.002 MFD.	600V.
C14	22-470	.00015 MFD.	600V.
C15	22-887	.001 MFD.	600V.
C16	22-243	.01 MFD.	400V.
C17	22-1027	20 MFD. ELECTROLYTIC	150V.
C18	22-1027	20 MFD. ELECTROLYTIC	25V.
R2	63-654	180M OHM	1/4 W.
R3	63-593	47M OHM	1/4 W.
R4	63-635	3300 OHM	1/4 W.
R5	63-640	8200 OHM	1/4 W.
R6	63-669	39 MEGOHM	1/4 W.
R7	63-713	47M OHM	1/4 W.
R8	63-976	15 MEGOHM	1/4 W.
R9	63-1124	VOLUME CONTROL	
R10	63-587	4700 OHM	1/4 W.
R11	63-271	1 MEGOHM	1/4 W.

DIAG. NO.	PART NO.	DESCRIPTION	
R12	63-600	2.2 MEGOHM	1/4 W.
R13	63-1097	870 OHM WIREWOUND	1 W.
R14	63-1120	2-SECTION CANDOHM	
R15	63-1096	140 OHM WIREWOUND	2 W.
R16	63-605	1000 OHM	1/2 W.
R17	63-597	470M OHM	1/4 W.
1	5-8509	ANT. COIL ASSEMBLY	
2	5-8510	OSC. COIL ASSEMBLY	
3	85-232	BAND SELECTOR SWITCH	
4	95-711	1ST I.F. TRANSFORMER	
5	95-712	2ND I.F. TRANSFORMER	
6	5-8531	TONE CONTROL SWITCH ASSEM.	
7	85-171	POWER SWITCH	

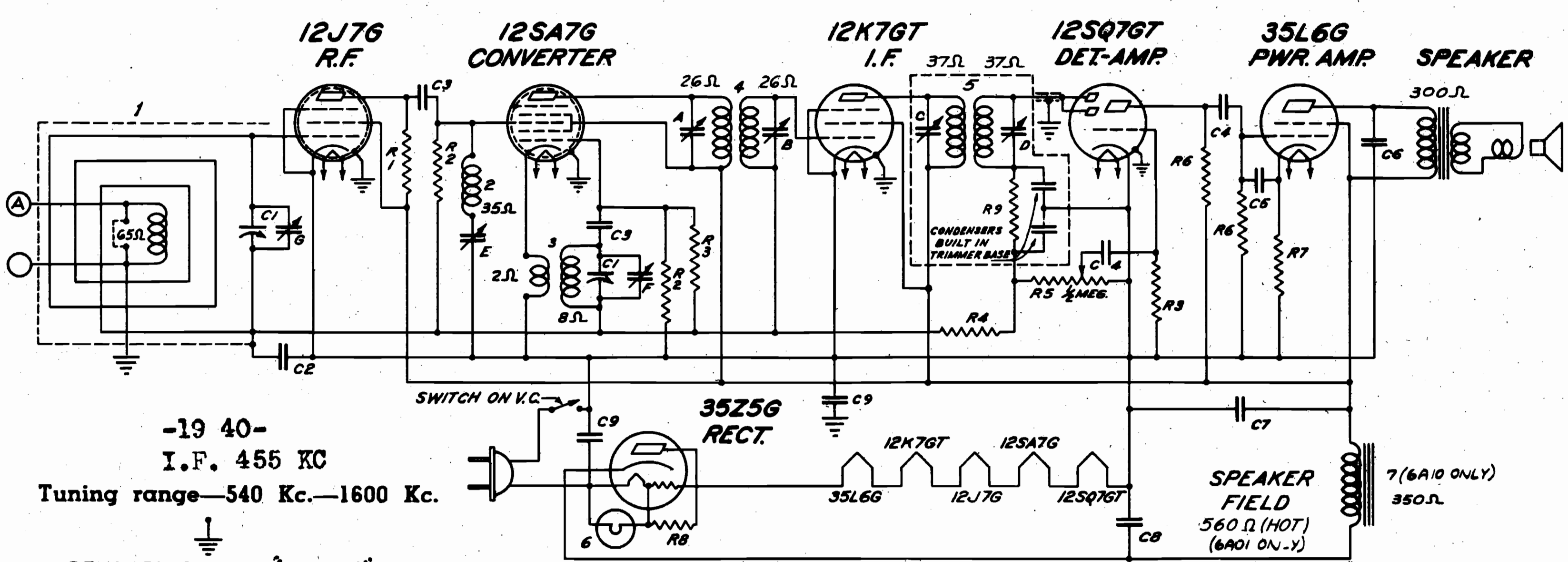
FOR ALIGNMENT SEE INDEX

Stage Gains:

Ant. to conv. grid—4× at 1000 Kc.
Conv. grid to I. F. grid—129× at 455 Kc.
Overall audio—476× at .050 watt. 400 cycles.

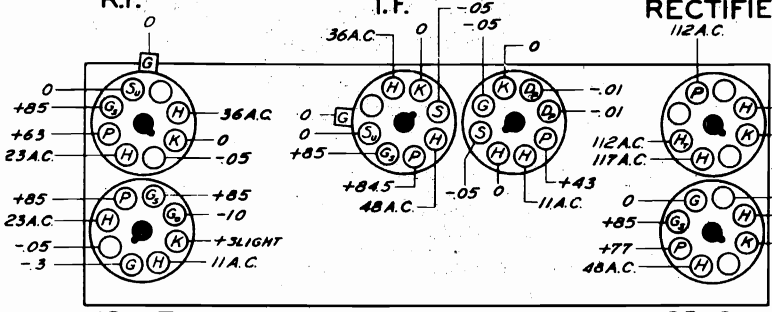
MODEL 6D510, Ch. 6A01
MODELS 6D525, 6D526,
Ch. 6A10

ZENITH RADIO CORP.



-19 40-
I.F. 455 KC
Tuning range—540 Kc.—1600 Kc.

DENOTES CHASSIS "GROUND"



DIAG. No.	PART No.	DESCRIPTION	
C1	22-1006	TWO-GANG VARIABLE	
C2	22-829	.05 MFD.	200V.
C3	22-162	.0001 MFD.	600V.
C4	22-243	.01 MFD.	400V.
C5	22-854	.0005 MFD.	600V.
C6	22-1049	.03 MFD.	400V.
C7	22-1014	20 MFD. ELECTROLYTIC	150V.
C8	22-1014	20 MFD. ELECTROLYTIC	150V.
C9	22-1017	.05 MFD.	200V.
R1	63-589	10M OHM	½ W.
R2	63-591	22M OHM	½ W.
R3	63-1093	15 MEGOHM	½ W.
R4	63-600	2.2 MEGOHM	½ W.
R5	63-1112	VOLUME CONTROL	
R6	63-597	470M OHM	½ W.
R7	63-686	150 OHM WIREWOUND	½ W.
R8	63-1023	22 OHM WIREWOUND	½ W.
R9	63-713	47 M OHM	½ W.

DIAG. No.	PART No.	DESCRIPTION
1		WAVEMAGNET ASSEMBLY
2	S8326	WAVE TRAP COIL ASSEMBLY
3	S8336	OSC. COIL ASSEMBLY
4	95-696	1ST I.F. TRANS.
5	95-697	2ND I.F. TRANS.
6	100-67	PILOT LIGHT 6.3V .15A.
7	95-713	FILTER CHOKE (300 Ω RES.)
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
E	22-1015	WAVE TRAP
F		BROADCAST OSC. (ON GANG)
G		BROADCAST ANT. (ON GANG)

CHASSIS	MODEL	SPKR.
6A01	6D510	49-385 4"
6A10	6D525	49-403 4"
6A10	6D526	49-403 4"

All voltages measured with a 20,000 ohm per volt meter from Neg. B to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control on full.

Line voltage 117 v. A.C.

Stage Gains:

Ant. to R.F. grid—5.5× at 1000 Kc.

R.F. grid to conv. grid—6.2× at 1000 Kc.

Conv. grid to I.F. grid—51× at 455 Kc.

Overall audio—289× at .25 watt, 400 cycles.

FOR OTHER DATA SEE INDEX

6A01 uses dynamic speaker.

6A08 has phono connections

6A08 and 6A10 use P.M. speaker with choke to replace field winding.

Power consumption—6A01-6A10—25.5 watts.

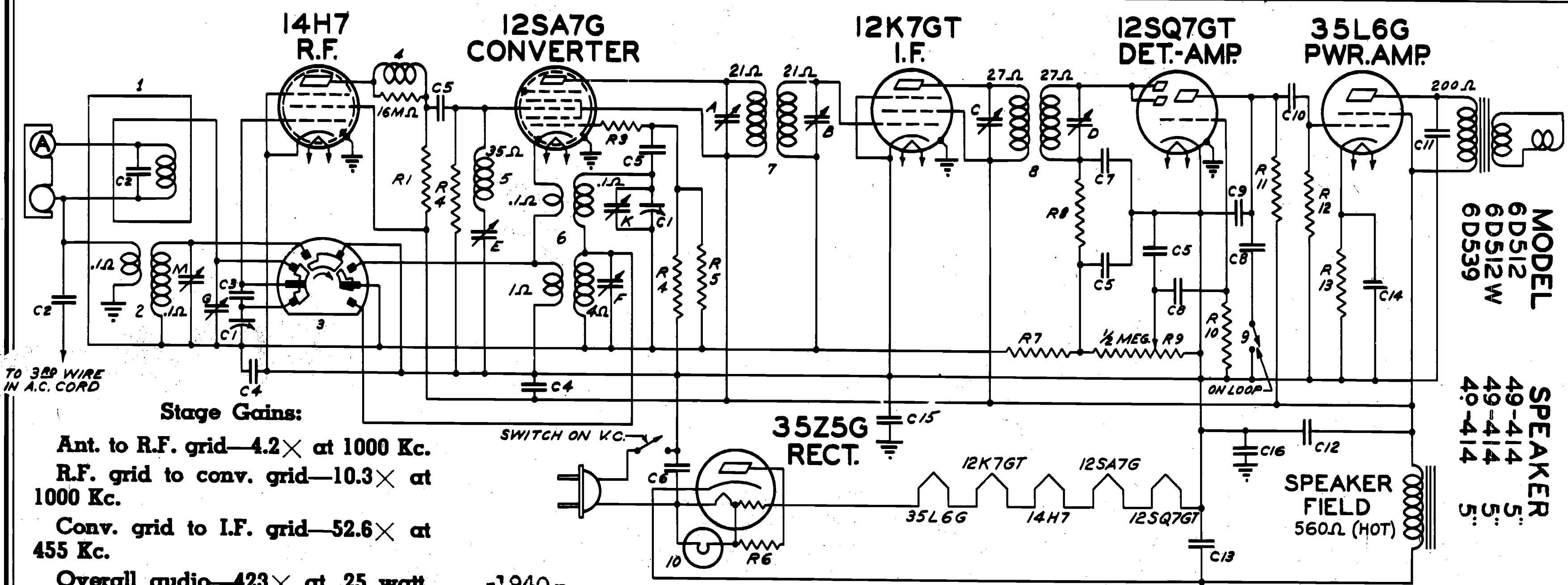
Power consumption—6A08—40.5 watts.

Power output—1. watt.

MODELS 6D512, 6D512W, 6D539, Ch. 6A16

ZENITH RADIO CORP.

MODEL	SPEAKER	
6D512	49-414	5"
6D512W	49-414	5"
6D539	49-414	5"



Stage Gains:

Ant. to R.F. grid—4.2× at 1000 Kc.

R.F. grid to conv. grid—10.3× at 1000 Kc.

Conv. grid to I.F. grid—52.6× at 455 Kc.

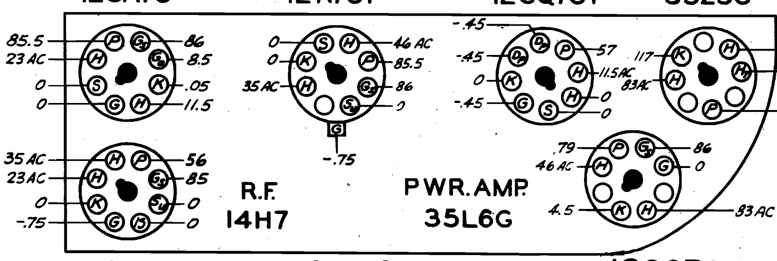
Overall audio—423× at .25 watt, 400 cycles.

-1940-

I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII
I.F. TRIMMERS A,B,C,D, ALIGN AT 455 KC. ADJUST WAVETRAP E FOR MIN. SIGNAL AT 455 KC, SIG. FED TO 14H7 GRID. TRIM SW (F,G) 15 MC TRIM BC OSC 1500 KC (H)

8-22-40 C16 ADDED # 22-1157 WAS 22-467
8-16-40 C15 ADDED
8-14-40 C5 AT VC. ADDED

DIAG. No	PART No	DESCRIPTION	
C1	22-1071	TWO-GANG VARIABLE	
C2	22-289	50 MMFD.	600V.
C3	22-1098	.00083 MFD.	600V.
C4	22-829	.05 MFD.	200V.
C5	22-162	.0001 MFD.	600V.
C6	22-1017	.05 MFD.	200V.
C7	22-182	.00025 MFD.	600V.
C8	22-492	.002 MFD.	600V.
C9	22-716	.0005 MFD.	600V.
C10	22-243	.01 MFD.	400V.
C11	22-1100	.06 MFD.	400V.
C12	22-1073	15 MFD. ELECTROLYTIC	150V.
C13	22-1073	30 MFD. ELECTROLYTIC	150V.
C14	22-1073	20 MFD. ELECTROLYTIC	25V.
C15	22-1157	.03 MFD.	200V.
C16	22-1158	.05 MFD.	200V.
R1	63-587	4700 OHM	1/4 W.
R3	63-576	68 OHM	1/4 W.
R4	63-591	22M OHM	1/4 W.
R5	63-1093	15 MEGOHM	1/4 W.
R6	63-1083	22 OHM WIREWOUND	1/2 W.
R7	63-599	1.5 MEGOHM	1/4 W.
R8	63-593	47M OHM	1/4 W.
R9	63-1130	VOLUME CONTROL	
R10	63-976	15 MEGOHM	1/4 W.
R11	63-296	220M OHM	1/4 W.
R12	63-597	470M OHM	1/4 W.
R13	63-686	150 OHM WIREWOUND	1/2 W.



All voltages measured with a 20000 ohm per volt meter from Neg. B to socket contact indicated.

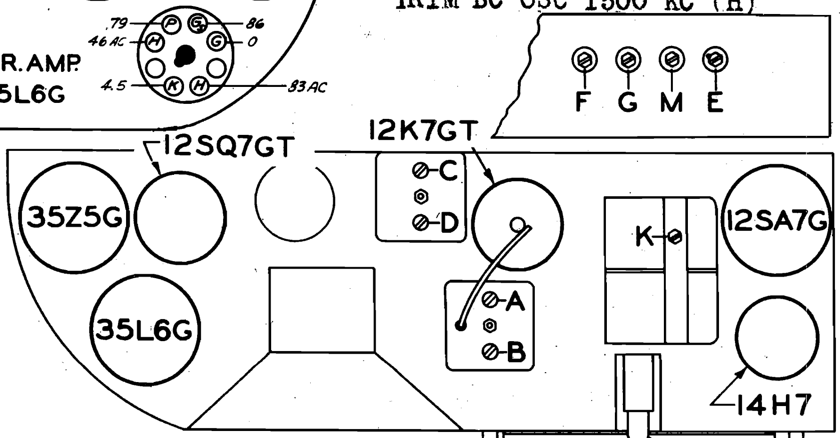
All voltages are positive D.C. unless marked otherwise.

Volume control on full.

Line voltage 117 v. A.C.

Power consumption—27 watts.

Tuning Range—540 Kc.—1600 Kc. 5600 Kc.—16000 Kc.



ZENITH RADIO CORP.

Ch. 5A03
Ch. 6A01, 6A10
Ch. 6A02, 6A04
Ch. 7A02, 7A04
Ch. 12A3

SERVICE NOTES

All chassis

Weak short wave—Open R.F. choke in plate circuit of 1232 tube. *Noisy*—Dial rubbing against escutcheon. Stator lugs on braid of gang condenser rubbing against side of opening in chassis. Make sure all loktal type tubes are firmly seated in sockets.

Cannct be aligned—Check for open or rosin connection on primary winding of wavemagnet.

Overloads—Usually due to open resistor in A.V.C. circuit of first detector.

Phono Models

Distortion—Check for broken crystal in pickup.

Low Volume—Check for poor contact in phono switch and plug contacts—check shield on lead from crystal for poor ground.

6A02-6A04

Noisy—right hand pilot light wiring may be pinched by automatic bracket.

Check for poor contact on manual push button.

Check for loose or poor contacts on pilot lights.

Oscillation on short wave band—Push black lead of automatic away from automatic adjustments. Keep white and green leads of automatic away from 7L7-7H7 socket.

7A02-7A04

Dead—480 mmfd. condenser on automatic may be grounded against automatic frame or latch bar.

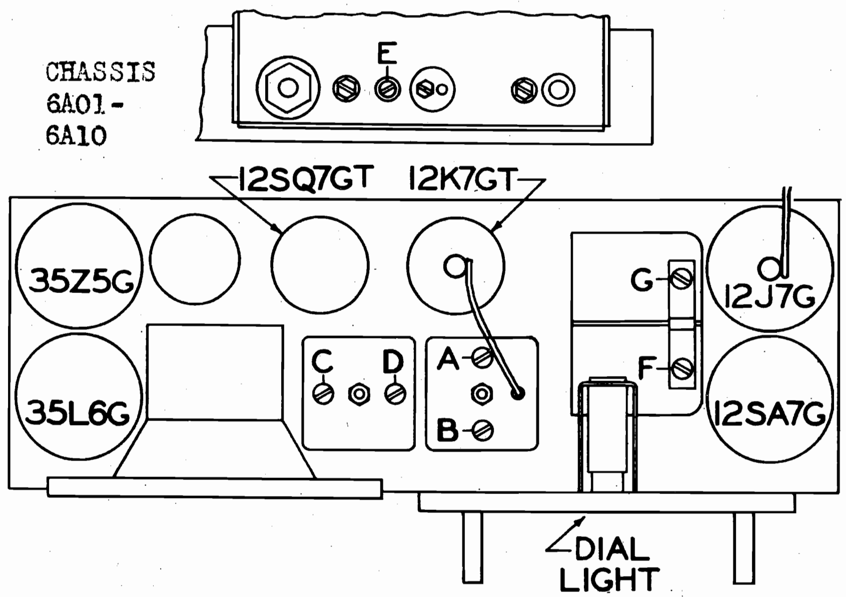
Oscillation—Push leads of wave trap close to chassis keeping them away from antenna coil.

12A3

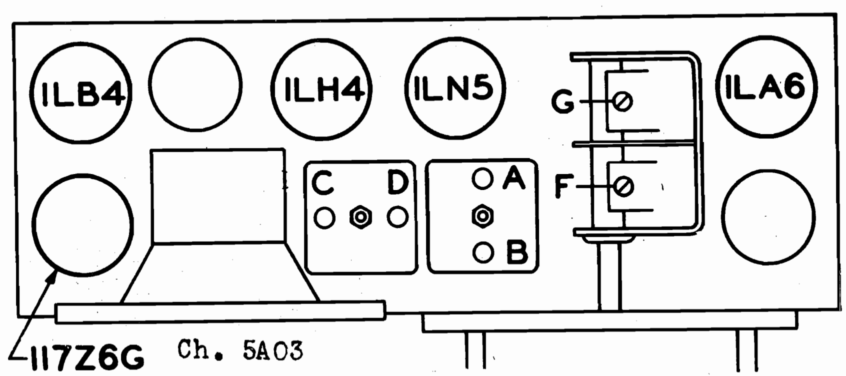
Hum—Change 6J5 in first audio socket.

ALIGNMENT-CHASSIS 6A01-6A10
PEAK I.F. TRIMMERS A B C D
AT 455 KC. FEED 455-KC SIGNAL
TO R-F GRID AND ADJUST WAVE-
TRAP TRIMMER E FOR MINIMUM
RESPONSE.
TRIM F AT 1600 KC
TRIM G AT 1400 KC

CHASSIS
6A01-
6A10



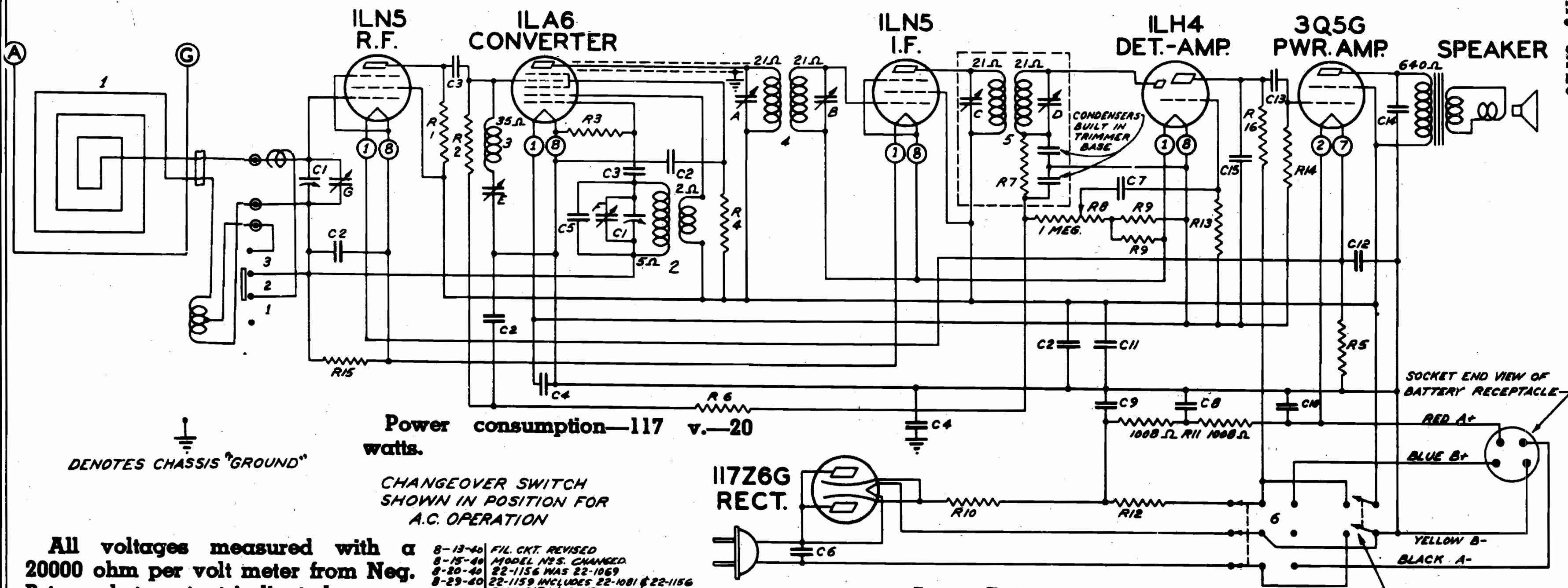
ALIGNMENT-CHASSIS 5A03
PEAK I.F. TRIMMERS A B C D
AT 455 KC. COUPLE TEST OSC-
ILLATOR VIA SINGLE TURN
LOOP LOOSELY TO WAVEMAGNET
AND TRIM F AND G AT 1400 KC



Ch. 5A03

MODELS 6G501F, 6G501M,
6G501L, 6G505,
Ch. 6A19

ZENITH RADIO CORP.

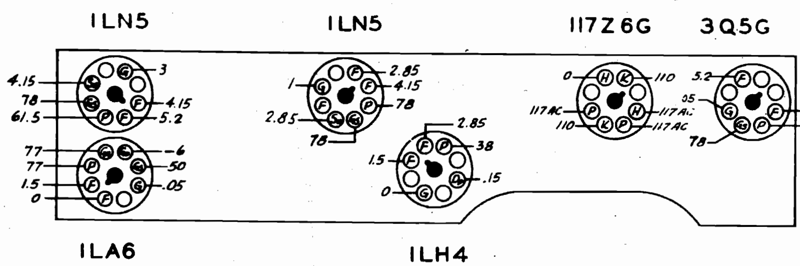


Power consumption—117 v.—20 watts.

CHANGEOVER SWITCH SHOWN IN POSITION FOR A.C. OPERATION

All voltages measured with a 20000 ohm per volt meter from Neg. B to socket contact indicated.

8-13-40 FIL. CKT. REVISED
8-15-40 MODEL NOS. CHANGED
8-20-40 22-1156 WAS 22-1069
8-29-40 22-1159 INCLUDES 22-1081 & 22-1156
DIAG. C15 WAS C12
9-11-40 22-196 WAS 22-243



Stage Gains:

Ant. to R.F. grid—5× at 1000 Kc.

R.F. grid to conv. grid.—6.5× at 1000 Kc.

Conv. grid to I.F. grid—49.1× at 455 Kc.

Overall audio—322× at .05 watt, 400 cycles.

Tuning Range—540 Kc. to 1570 Kc.

MODEL	SPEAKER
6G501F	49-420 5½
6G501M	49-420 5½
6G501L	49-420 5½
6G505	49-420 5½

DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION
C1	22-1024	TWO GANG VARIABLE		R2	63-595	100M OHM	¼W.	2	S8374	OSCILLATOR ASSEMBLY
C2	22-829	.05 MFD.	200V.	R3	63-773	180M OHM	¼W.	3	S8326	WAVE TRAP ASSEMBLY
C3	22-162	.0001 MFD.	600V.	R4	63-592	33M OHM	¼W.	4	95-739	1ST I.F. TRANSFORMER
C4	22-827	.1 MFD.	200V.	R5	63-1097	870 OHM WIREWOUND	1 W.	5	95-740	2ND I.F. TRANSFORMER
C5	22-988	20 MMFD.	600V.	R6	63-600	2.2 MEGOHM	¼W.	6	85-224	CHANGEOVER SWITCH
C6	22-869	.05 MFD.	400V.	R7	63-713	47M OHM	¼W.	7	85-225	WAVEMAGNET SWITCH
C7	22-492	.002 MFD.	600V.	R8	63-1121	VOLUME CONTROL				
C8	22-1026	20 MFD. ELECTROLYTIC	150V.	R9	63-587	4700 OHM	¼W.			
C9	22-1026	40 MFD. ELECTROLYTIC	150V.	R10	63-1096	140 OHM WIREWOUND	2W.			
C10	22-1159	20 MFD. ELECTROLYTIC	25V.	R11	63-1132	2-SECTION CANDOHM		A		1ST I.F. TRANS. PRI.
C11	22-1159	40 MFD. ELECTROLYTIC	150V.	R12	63-1156	1800 OHM	½W.	B		1ST I.F. TRANS. SEC.
C12	22-1159	40 MFD. ELECTROLYTIC	25V.	R13	63-1093	15 MEGOHM	¼W.	C		2ND I.F. TRANS. PRI.
C13	22-196	.01 MFD.	600V.	R14	63-722	2.2 MEGOHM	¼W.	D		2ND I.F. TRANS. SEC.
C14	22-448	.004 MFD.	600V.	R15	63-325	150M OHM	¼W.	E	22-1086	WAVE TRAP
C15	22-470	.00015 MFD.	600V.	R16	63-271	1 MEGOHM	¼W.	F		BROADCAST OSC. (ON GANG)
								G		BROADCAST ANT. (ON GANG)
R1	63-590	15M OHM	¼W.	1	S8984	WAVEMAGNET ASSEM.				

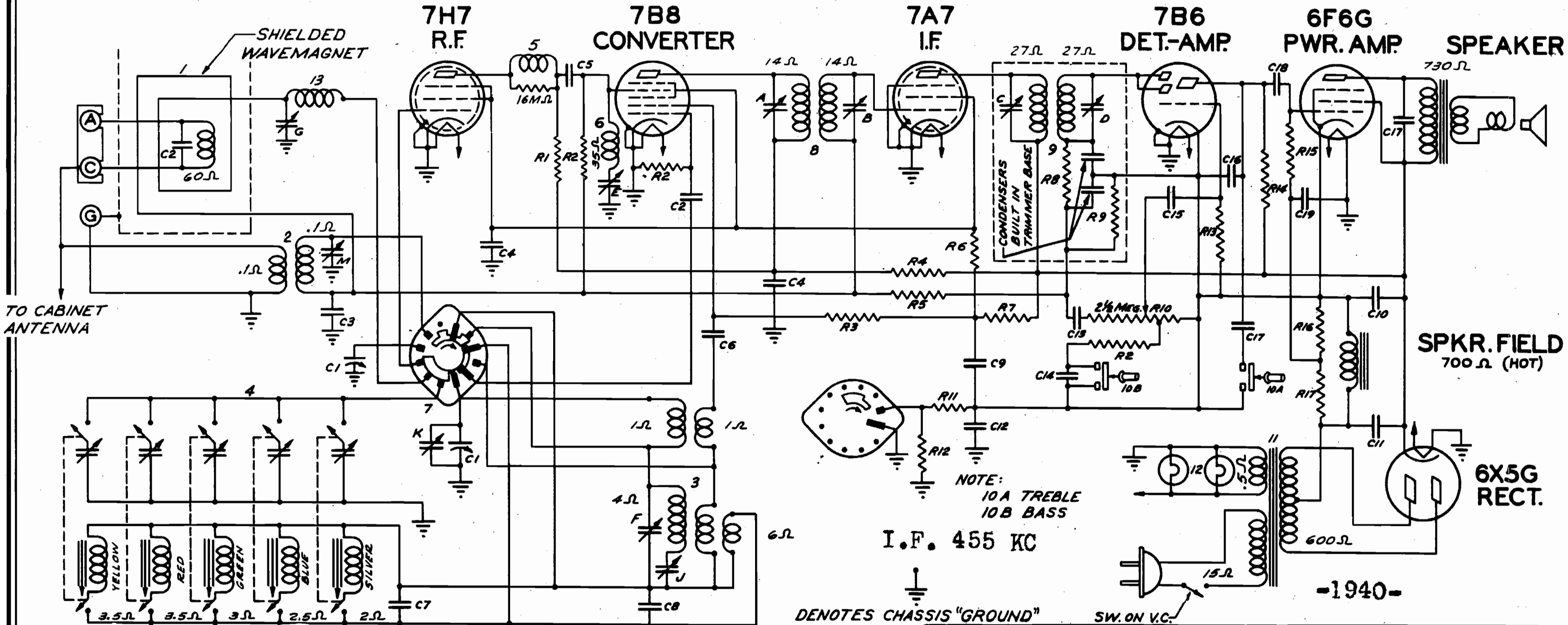
ALIGNMENT

I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII
WAVETRAP (E)
ADJUST FOR MINIMUM RESPONSE
FEEDING 455 KC SIGNAL TO
MIXER GRID
TRIM OSC-ANT AT 1400 KC

110V. A.C.-D.C.-BATTERY PACK
UNIVERSAL PORTABLE
I.F. FREQUENCY 455KC.

ZENITH RADIO CORP.

MODELS 6S546, 6S556
Ch. 6A05



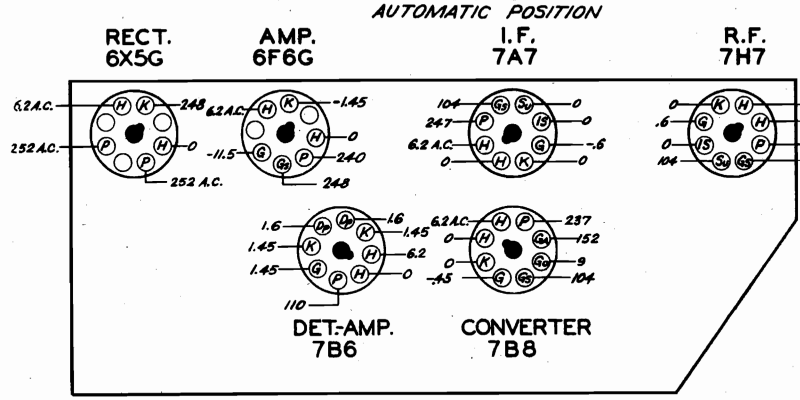
I.F. 455 KC

-1940-

DENOTES CHASSIS "GROUND"

FOR OTHER DATA SEE INDEX

BAND SWITCH SHOWN IN AUTOMATIC POSITION



Power consumption—60 watts.
Power output—6 watts.

DIAG. No	PART No	DESCRIPTION		DIAG. No	PART No	DESCRIPTION	
C1	22-1044	TWO GANG VARIABLE		C19	22-138	.2 MFD.	200 V.
C2	22-289	50 MMFD.	600 V.				
C3	22-829	.05 MFD.	200 V.				
C4	22-828	.05 MFD.	400 V.				
C5	22-162	.0001 MFD.	600 V.	R1	63-637	4700 OHM	¼ W.
C6	22-182	.00025 MFD.	600 V.	R2	63-593	47M OHM	¼ W.
C7	22-868	COMPENSATING COND.		R3	63-150	10M OHM	½ W.
C8	22-1022	.005 MFD.	600 V.	R4	63-583	1000 OHM	¼ W.
C9	22-1034	5 MFD. ELECTROLYTIC	450 V.	R5	63-599	1.5 MEGOHM	¼ W.
C10	22-1034	15 MFD. "	350 V.	R6	63-1102	15M OHM	½ W.
C11	22-1036	14 MFD. "	450 V.	R7	63-1101	8200 OHM	2 W.
C12	22-827	.1 MFD.	200 V.	R8	63-713	47M OHM	¼ W.
C13	22-188	.02 MFD.	400 V.	R9	63-719	470M OHM	¼ W.
C14	22-229	.005 MFD.	600 V.	R10	63-1123	VOLUME CONTROL	
C15	22-492	.002 MFD.	600 V.	R11	63-1098	42 OHM WIREWOUND	½ W.
C16	22-854	.0005 MFD.	600 V.	R12	63-624	68 OHM	¼ W.
C17	22-448	.004 MFD.	600 V.	R13	63-976	15 MEGOHM	¼ W.
C18	22-830	.02 MFD.	600 V.	R14	63-296	220M OHM	¼ W.
R15	63-597	470M OHM	¼ W.	13	S8474	LOOP LOADING COIL	
R16	63-654	180M OHM	¼ W.	A		1ST I.F. TRANS. PRI.	
R17	63-656	270M OHM	¼ W.	B		1ST I.F. " SEC.	
				C		2ND I.F. " PRI.	
1		WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.	
2	S8507	ANTENNA COIL ASSEMBLY		E	22-1015	WAVE TRAP	
3	S8508	OSCILLATOR COIL ASSEMBLY		F	22-1042	BROADCAST OSCILLATOR	
4	S8457	AUTOMATIC TUNING UNIT		G	22-1042	BROADCAST ANTENNA	
5	S8359	R.F. CHOKE & RES. ASSEMBLY		J	22-1023	BROADCAST PADDER	
6	S8326	WAVE TRAP ASSEMBLY		K		SHORT WAVE OSC. (ON GANG)	
7	85-233	BAND SELECTOR SWITCH		M	22-1042	SHORT WAVE ANTENNA	
8	95-708	1ST I.F. TRANSFORMER					
9	95-709	2ND I.F. TRANSFORMER					
10	S8531	TONE CONTROL SWITCH					
11	95-710	POWER TRANS. 50-60 ~ 117 V.					
12	100-36	PILOT LIGHT 6.3 V. .25 A.					

MODEL	SPEAKER
6S546	49-388 6"
6S556	49-390 10"

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

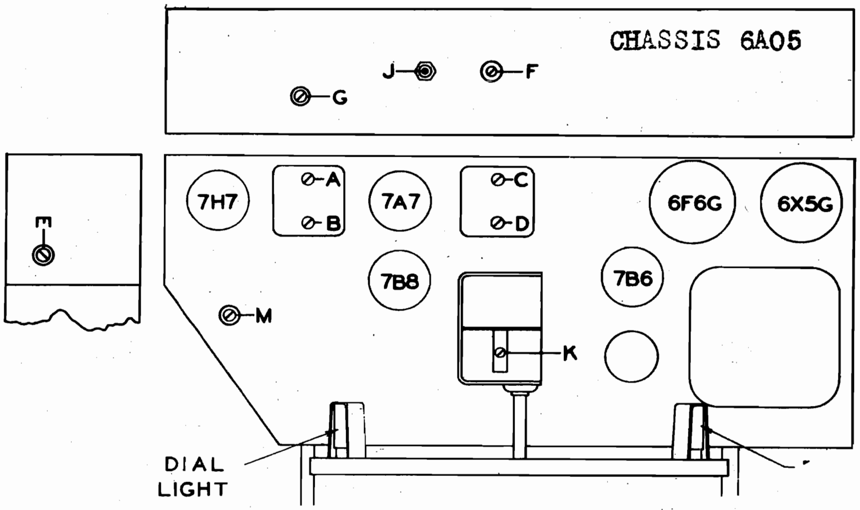
All voltages are positive D.C. unless marked otherwise.

Volume control full on.

Line voltage 117 A.C.

Ch. 6A05
Ch. 10A3

ZENITH RADIO CORP.



ALIGNMENT

CHASSIS 6A05
I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL VIII
I.F. TRIMMERS A B C D
PEAK AT 455 KC
WITH 455-KC SIGNAL AT R-F
GRID, ADJUST E FOR MINIMUM
RESPONSE.
TRIM K AT 18 MC
TRIM M at 16 MC
TRIM F, G AT 1500 KC
PAD J AT 600 KC

CHASSIS 6A05
Stage Gains

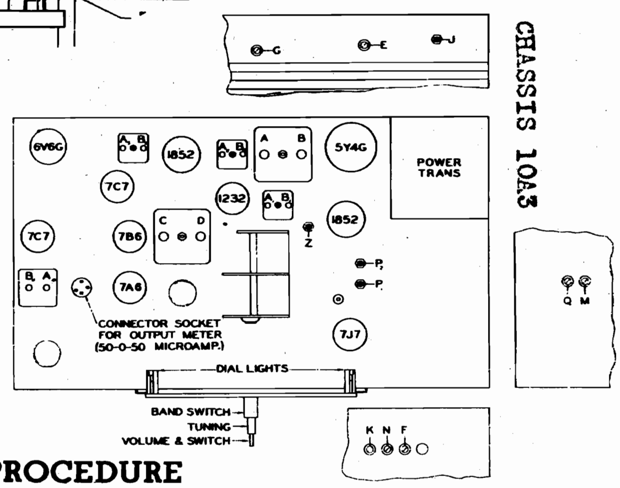
Ant. to R.F. grid—3.8× at 1000 Kc.

R.F. grid to conv. grid—7× at 1000 Kc.

Conv. grid to I.F. grid—92× at 455 Kc.

Overall audio—778× at 1 watt 400 cycles.

Tuning ranges— 545 Kc.— 1570 Kc.
5700 Kc.—18300 Kc.



ALIGNMENT PROCEDURE

CHASSIS 10A3

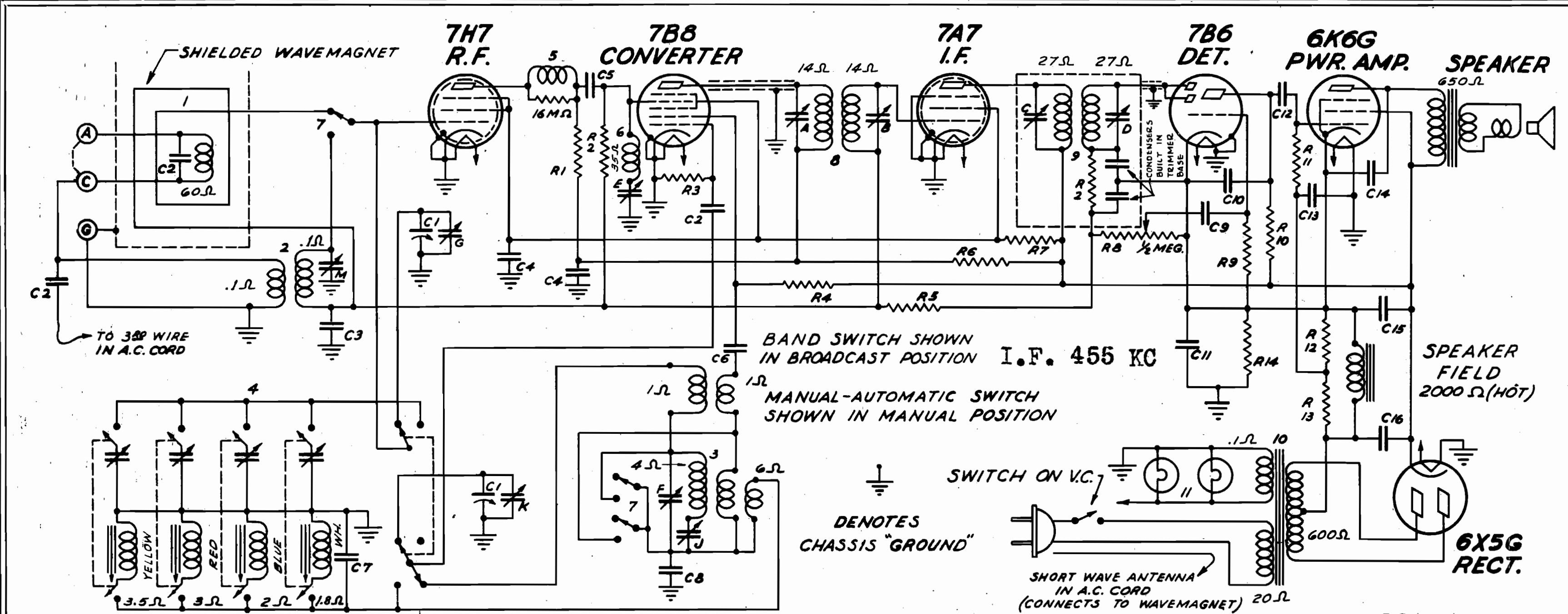
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Connect Output Meter to	Trimmers	Purpose
1	Con. Grid	0.5 Mfd.	455 Kc.	B.C.	600 Kc.	6V6G Output	A B C D	Align I.F.
2	R.F. Grid	0.5 Mfd.	455 Kc.	B.C.	600 Kc.	6V6G Output	E	I.F. Trap Adjust for Minimum
3	Ant. terminals marked Z and G	400 Ohms	18 Mc.	S.W.	18 Mc.	"	K	Set to Scale
4	"	"	16 Mc.	S.W.	16 Mc.	"	M	Align Ant.
5	"	"	5.0 Mc.	Med.	5.0 Mc.	"	N	Set to Scale
6	"	"	4.5 Mc.	Med.	4.5 Mc.	"	Q	Align Ant.
7	Single turn Loop Loosely coupled to loop		1400 Kc.	B.C.	1400 Kc.	"	F	Set Osc. to Scale
8	"		1400	B.C.	1400 Kc.	"	G	Align Ant.
9	"	"	600 Kc.	B.C.	600 Kc.	"	J (Rock Gang)	Broadcast Padder
10	1852 Grid	0.5 Mfd.	4.3 Mc.	Manual F.M.	4.3 Mc.	F.M. Output Meter Across Full Disc. Load	B4	Align for Zero Deflection
11	"	"	"	"	"	F.M. Output Meter Across Half Disc. Load	A4	Align for Max. Deflection
12	"	"	"	"	"	"	A3B3	"
13	767-1232 Grid	"	"	"	"	"	A2B2	"
14	7J7 Grid	"	"	"	"	"	A B	"
15	F.M. Ant. Terminals	100 Ohms	46.0 Mc.	"	46.0 Mc.	"	Adjust cam on gang shaft for scale	"
16	"	"	42.5 Mc.	"	42.5 Mc.	"	P	"
17	"	"	49 Mc.	"	49 Mc.	"	P2	"
18	"	"	46 Mc.	"	46 Mc.	"	Z	"

During F.M. Alignment keep input low, to obtain max. sensitivity for alignment. This is necessary because with large inputs the limiting action of the limiters masks alignment operations.

NOTE A 10M ohm per volt or higher voltmeter may be used as an F.M. output meter.

MODEL 6S511, Ch. 6A13
MODELS 6S527, 6S528, Ch. 6A02
MODEL 6S580, Ch. 6A04

ZENITH RADIO CORP.



DIAG. No.	PART No.	DESCRIPTION	
C1	22-1007	TWO GANG VARIABLE	
C2	22-289	50 MMFD.	600 V.
C3	22-829	.05 MFD.	200 V.
C4	22-828	.05 MFD.	400 V.
C5	22-162	.0001 MFD.	600 V.
C6	22-182	.00025 MFD.	600 V.
C7	22-868	COMPENSATING COND.	
C8	22-1022	.005 MFD.	600 V.
C9	22-492	.002 MFD.	600 V.
C10	22-716	.0005 MFD.	600 V.
C11	22-827	.1 MFD.	200 V.
C12	22-830	.02 MFD.	600 V.
C13	22-219	.03 MFD.	200 V.
C14	22-448	.004 MFD.	600 V.
C15	22-1029	10 MFD. ELECTROLYTIC	250 V.
C16	22-1029	15 MFD. "	350 V.

DIAG. No.	PART No.	DESCRIPTION	
R1	63-757	4700 OHM	¼ W.
R2	63-713	47 M OHM	¼ W.
R3	63-593	47 M OHM	¼ W.
R4	63-1054	10 M OHM	¼ W.
R5	63-599	1.5 MEGOHM	¼ W.
R6	63-703	1000 OHM	¼ W.
R7	63-151	15 M OHM	1 W.
R8	63-1118	VOLUME CONTROL	
R9	63-976	15 MEGOHM	¼ W.
R10	63-296	220 M OHM	¼ W.
R11	63-597	470 M OHM	¼ W.
R12	63-260	100 M OHM	¼ W.

DIAG. No.	PART No.	DESCRIPTION	
R13	63-659	470 M OHM	¼ W.
R14	63-1098	42 OHM WIREWOUND	½ W.
1	S8376	WAVEMAGNET ASSEMBLY	
2	S8347	ANTENNA COIL ASSEM.	
3	S8348	OSCILLATOR COIL ASSEM.	
4	S8384	AUTOMATIC TUNING ASSEM.	
5	S8359	R.F. CHOKE & RES. ASSEM.	
6	S8326	WAVETRAP COIL ASSEM.	
7	85-223	BAND SELECTOR SWITCH	
8	95-698	1ST I.F. TRANSFORMER	
9	95-699	2ND I.F. TRANSFORMER	
10	95-700	PWR. TRANS. 50-60~ 117 V.	
11	100-67	PILOT LIGHT 6.3 V. .15 A.	

DIAG. No.	PART No.	DESCRIPTION
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
E	22-1015	WAVETRAP
F	22-1011	BROADCAST OSC.
G		B'DCAST ANT. (ON GANG)
J	22-1023	B'DCAST PADDER
K		SHORT WAVE OSC. (ON GANG)
M	22-1011	SHORT WAVE ANTENNA

-1940-

MODEL	SPEAKER	
6S511	49-384	5"
6S527	49-384	5"
6S528	49-384	5"

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

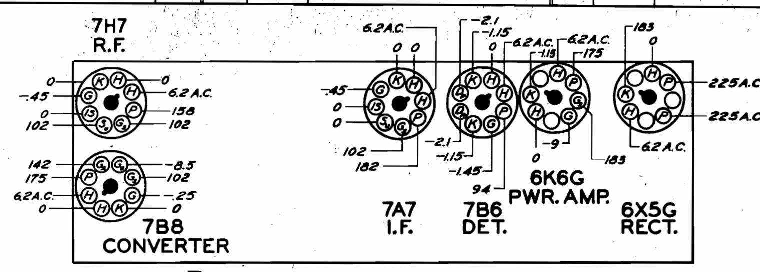
Volume control full on.

Line voltage 117 A.C.

Power consumption 6A02-6A13-6A14—40 watts.

Power consumption 6A04 — 55 watts.

Power output—2.6 watts.



Tuning ranges—545 Kc.—1570 Kc. —5400 Kc.—18500 Kc.

FOR ALIGNMENT, TRIMMERS, P.B. DATA SEE INDEX

Stage Gains:

Ant. to R.F. grid—3.8× at 1000 Kc.

R.F. grid to conv. grid—10× at 1000 Kc.

Conv. grid to I.F. grid—71× at 455 Kc.

Overall audio—594× at .25 watt, 400 cycles.

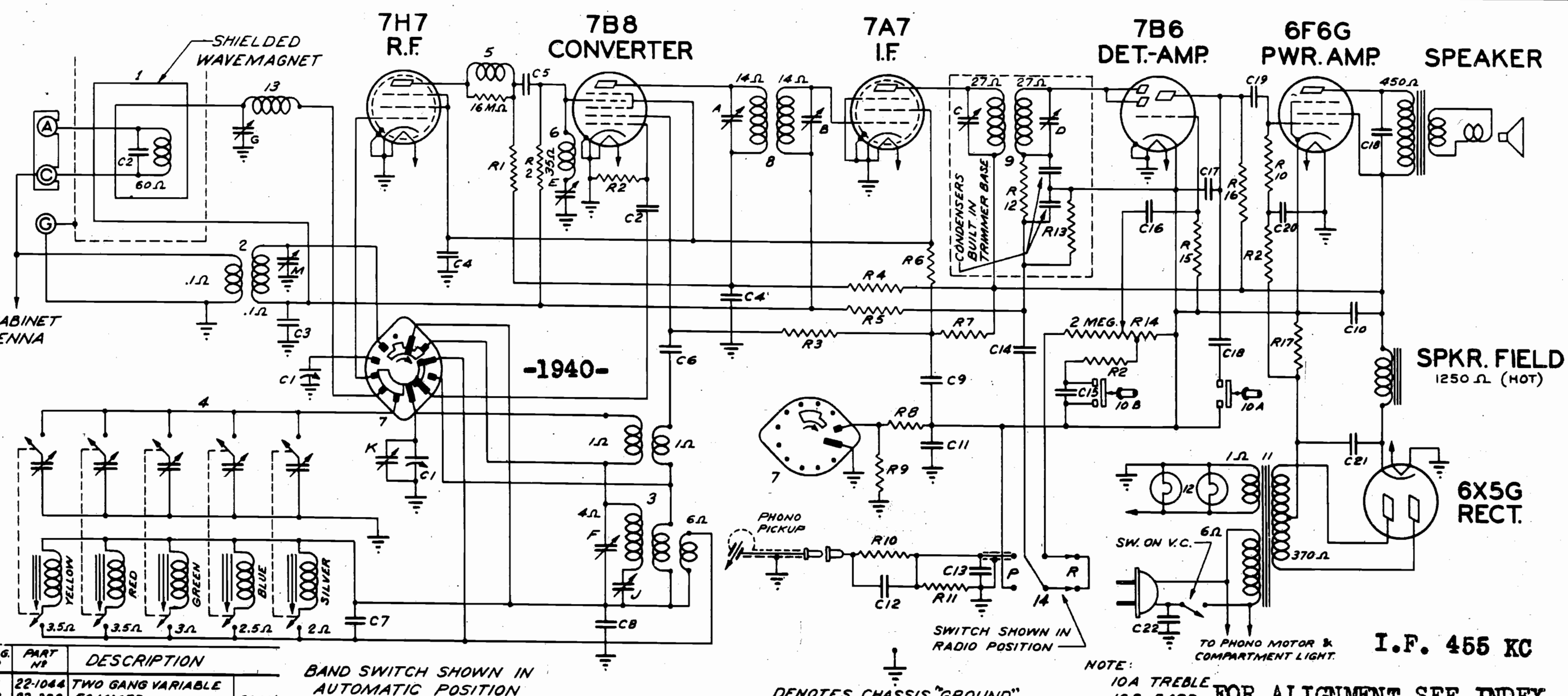
NOTE

Chassis 6A04 has phono connections added

Chassis 6A13 and 6A14 are identical with 6A02 except for color of automatic knobs.

MODELS 6S596, 6S597
Ch. 6A20

ZENITH RADIO CORP.



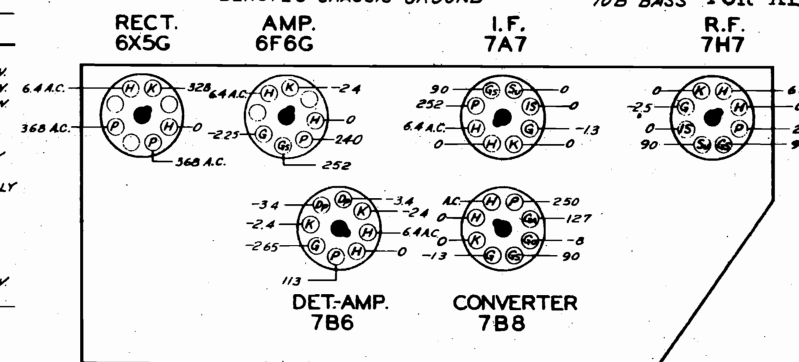
I.F. 455 KC

FOR ALIGNMENT SEE INDEX

DIAG. No.	PART No.	DESCRIPTION	
C1	22-1044	TWO GANG VARIABLE	
C2	22-289	50 MMFD.	600V.
C3	22-829	.05 MFD.	200V.
C4	22-828	.05 MFD.	400V.
C5	22-162	.0001 MFD.	600V.
C6	22-182	.00025 MFD.	600V.
C7	22-868	COMPENSATING COND.	
C8	22-1022	.005 MFD.	600V.
C9	22-1034	5 MFD. ELECTROLYTIC	450V.
C10		15 MFD. "	350V.
C11	22-827	.1 MFD.	200V.
C12	22-470	.00015 MFD.	600V.
C13	22-147	.0005 MFD.	600V.
C14	22-188	.02 MFD.	400V.
C15	22-229	.005 MFD.	600V.
C16	22-492	.002 MFD.	600V.
C17	22-854	.0005 MFD.	600V.
C18	22-448	.004 MFD.	600V.
C19	22-830	.02 MFD.	600V.
C20	22-219	.03 MFD.	200V.
C21	22-1036	14 MFD. ELECTROLYTIC	450V.
C22	22-1041	.005 MFD.	600V.
R1	63-637	4700 OHM	¼ W.
R2	63-593	47 M OHM	¼ W.
R3	63-150	10 M OHM	½ W.
R4	63-583	1000 OHM	¼ W.
R5	63-599	1.5 MEGOHM	¼ W.
R6	63-1102	15 M OHM	½ W.
R7	63-1101	8200 OHM	2 W.
R8	63-1098	42 OHM WIREWOUND	½ W.
R9	63-624	68 OHM	¼ W.
R10	63-597	470 M OHM	¼ W.
R11	63-596	330 M OHM	¼ W.
R12	63-713	47 M OHM	¼ W.
R13	63-719	470 M OHM	¼ W.

BAND SWITCH SHOWN IN AUTOMATIC POSITION

DIAG. No.	PART No.	DESCRIPTION	
R14	63-1123	VOLUME CONTROL	
R15	63-976	15 MEGOHM	¼ W.
R16	63-296	220 M OHM	¼ W.
R17	63-1056	280 OHM WIREWOUND	1½ W.
1		WAVEMAGNET ASSEMBLY	
2	S8507	ANTENNA COIL ASSEMBLY	
3	S8508	OSCILLATOR COIL ASSEMBLY	
4	S8457	AUTOMATIC TUNING UNIT	
5	S8359	R.F. CHOKE & RES. ASSEMBLY	
6	S8326	WAVE TRAP ASSEMBLY	
7	85-255	BAND SELECTOR SWITCH	
8	95-708	1ST I.F. TRANSFORMER	
9	95-709	2ND I.F. TRANSFORMER	
10	S8531	TONE CONTROL SWITCH	
11	95-705	POWER TRANS. 50-60~ 117 V.	
12	100-36	PILOT LIGHT 6.3 V. .25 A.	
13	S8474	LOOP LOADING COIL	
14	85-171	PHONO-RADIO SWITCH	
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. " SEC.	
C		2ND I.F. " PRI.	
D		2ND I.F. " SEC.	
E	22-1015	WAVE TRAP	
F	22-1042	BROADCAST OSCILLATOR	
G	22-1042	BROADCAST ANTENNA	
J	22-1023	BROADCAST PADDER	
K		SHORT WAVE OSC. (ON GANG)	
M	22-1042	SHORT WAVE ANTENNA.	



Stage Gains:

Ant. to R.F. grid—5.2× at 1000 Kc.

R.F. grid to conv. grid—5.9× at 1000 Kc.

Conv. grid to I.F. grid—57.5× at 455 Kc.

Overall audio—735× at 1 watt, 400 cycles.

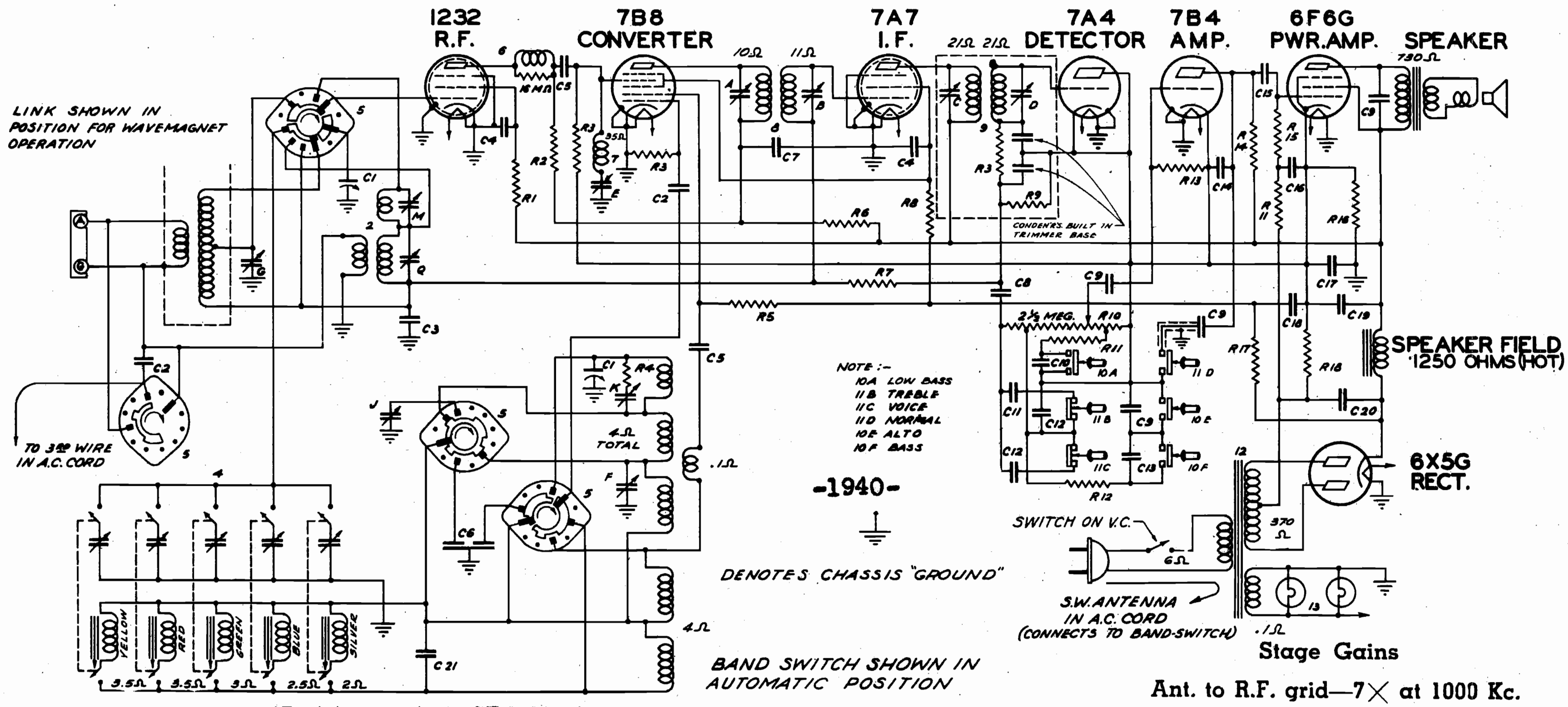
All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.
Volume control on full.
Line voltage 117 v. A.C.

MODEL	SPEAKER
6S596	49-396 10"
6S597	49-380 10"

Power consumption—55 watts.
Power output—6 watts.

MODELS 7S529, 7S530, 7S547, 7S557, 7S558, 7S559, Ch. 7A02

ZENITH RADIO CORP.



FOR OTHER DATA SEE INDEX

DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION		DIAG. NO.	PART NO.	DESCRIPTION
C1	22-1080	TWO GANG VARIABLE		C21	22-888	COMPENSATING COND.		R17	63-972	15 M OHM	1 W	A		1ST I.F. TRANS PRI.
C2	22-289	50 MMFD.	600 V.					R18	63-1056	280 OHM WIREWOUND	1½ W	B		1ST I.F. " SEC.
C3	22-829	.05 MFD.	200 V.									C		2ND I.F. " PRI.
C4	22-828	.05 MFD.	400 V.									D		2ND I.F. " SEC.
C5	22-182	.00025 MFD.	600 V.	R1	63-260	100 M OHM	¼ W.					E	22-1015	WAVETRAP
C6	22-1037	DUAL PADDER	800 V.	R2	63-587	4700 OHM	¼ W.	1		WAVEMAGNET ASSEMBLY		F		BROADCAST OSC. (NOTE 1)
C7	22-825	.1 MFD.	400 V.	R3	63-713	47 M OHM	¼ W.	2	S8404	ANTENNA COIL ASSEMBLY		G		" ANT (NOTE 2)
C8	22-327	.02 MFD.	200 V.	R4	63-621	39 OHM	¼ W.	3	S8403	OSCILLATOR COIL ASSEM.		J		" PADDER (NOTE 2)
C9	22-448	.004 MFD.	600 V.	R5	63-589	10 M OHM	¼ W.	4	S8457	AUTOMATIC TUNING ASSEM.		K		SHORT WAVE OSC. (NOTE 1)
C10	22-229	.005 MFD.	600 V.	R6	63-605	1000 OHM	½ W.	5	85-226	BAND SELECTOR SWITCH		M		" " ANT. (NOTE 2)
C11	22-954	.00035 MFD.	600 V.	R7	63-599	1.5 MEGOHM	¼ W.	6	S8359	R.F. CHOKE & RES. ASSEM.		Q		POLICE BAND ANT. (NOTE 2)
C12	22-470	.00015 MFD.	600 V.	R8	63-960	68 M OHM	½ W.	7	S8326	WAVE TRAP COIL ASSEM.				
C13	22-492	.002 MFD.	600 V.	R9	63-719	470 M OHM	¼ W.	8	95-703	1ST I.F. TRANSFORMER				NOTES:
C14	22-854	.0005 MFD.	600 V.	R10	63-1122	VOLUME CONTROL		9	95-704	2ND I.F. TRANSFORMER				(1) TRIMMERS F & K ARE
C15	22-830	.02 MFD.	600 V.	R11	63-593	47 M OHM	¼ W.	10	S8449	TONE CONTROL ASSEM. (LEFT)				MOUNTED ON STRIP #22-1033
C16	22-219	.03 MFD.	200 V.	R12	63-594	68 M OHM	¼ W.	11	S8449	TONE CONTROL ASSEM. (RIGHT)				(2) TRIMMERS G, J, M & Q ARE
C17	22-827	.1 MFD.	200 V.	R13	63-976	15 MEGOHM	¼ W.	12	95-705	PWR. TRANS. 50-60~ 117 V.				MOUNTED ON STRIP #22-1031
C18	22-1034	5 MFD. ELECTROLYTIC	450 V.	R14	63-296	220 M OHM	¼ W.	13	100-36	PILOT LIGHT 6.3 V. .25 A.				
C19		15 MFD. "	350 V.	R15	63-597	470 M OHM	¼ W.							
C20	22-1036	14 MFD. "	450 V.	R16	63-975	82 OHM WIREWOUND	½ W.							

Stage Gains

Ant. to R.F. grid—7× at 1000 Kc.

R.F. grid to conv. grid—10.7× at 1000 Kc.

Conv. grid to I.F. grid—66× at 455 Kc.

Overall audio—923× at 1 watt 400 cycles.

I.F. FREQUENCY 455 KC.

Power consumption—7A02—60 watts.

Power consumption—7A04—80 watts.

Power output—6.5 watts.

Ch. 7A02, 7A04
Ch. 8A02, 8A03
Ch. 12A3, 12A4

ZENITH RADIO CORP.

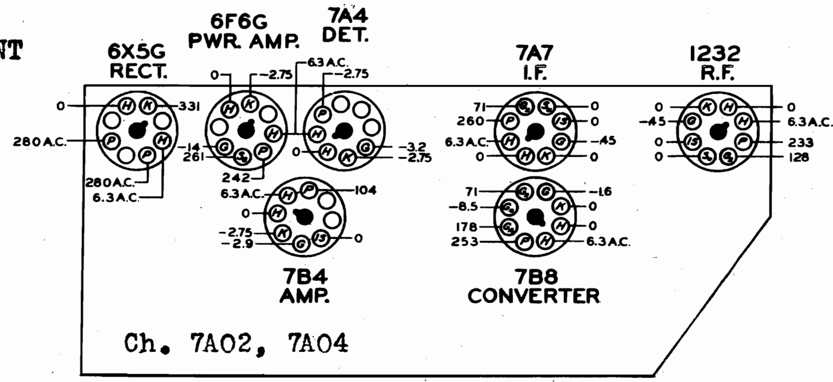
SOCKET VOLTAGES AND ALIGNMENT CHASSIS 7A02-7A04

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

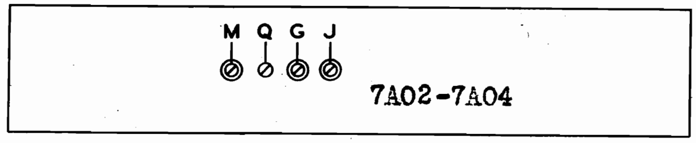
All voltages are positive D.C. unless marked otherwise.

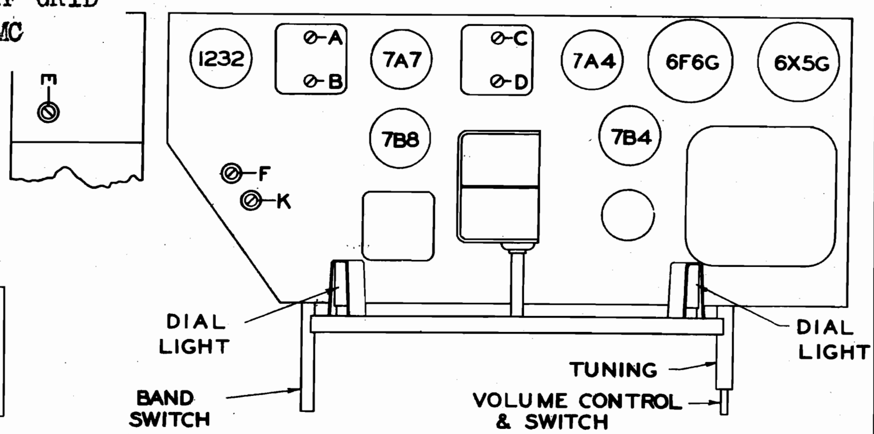
Volume control full on.

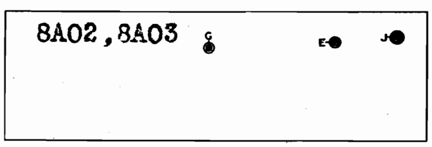
Line voltage 117 A.C.

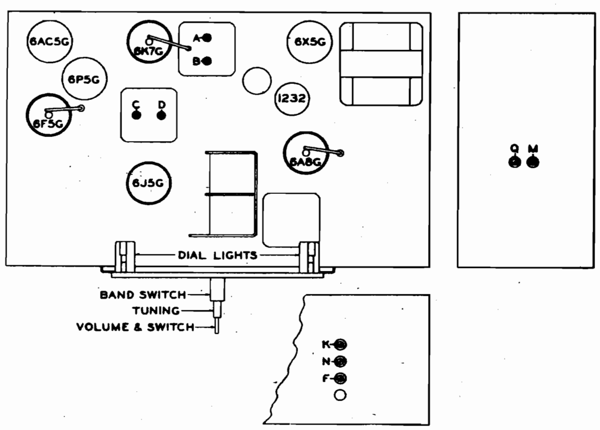


I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII
I.F. 455 KC. ADJUST A B C D
ADJUST WAVETRAP E FOR MIN. SIGNAL
AT 455 KC; SIGNAL FED TO RF GRID
TRIM K AT 18 MC; M AT 16 MC
TRIM Q AT 4.5 MC
TRIM F AT 15))
TRIM F AT 1500 KC
TRIM G AT 1400 KC
PAD J AT 600 KC









ALIGNMENT-CHASSIS 8A02,8A03
I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL. VIII
I.F. 455 KC -ADJUST A B C D
WAVETRAP E-ADJUST FOR MINIMUM SIGNAL at 455 KC
TRIM K AT 18 MC
TRIM M AT 16 MC
TRIM N,Q AT 4.5 MC
TRIM F AT 1500 KC
TRIM G AT 1400 KC
PAD J AT 600 KC

Models 12S550-12S568-12S569-12S595

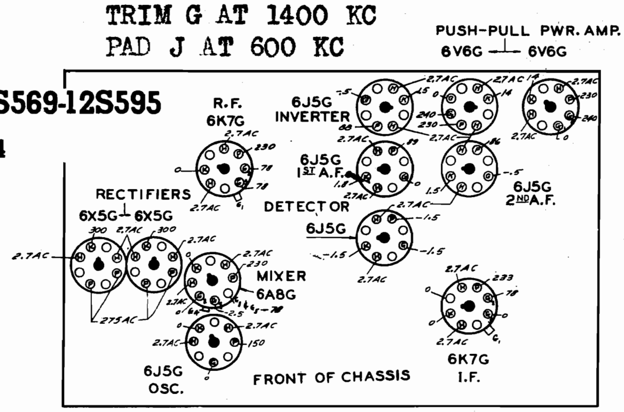
Chassis 12A3-12A4

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

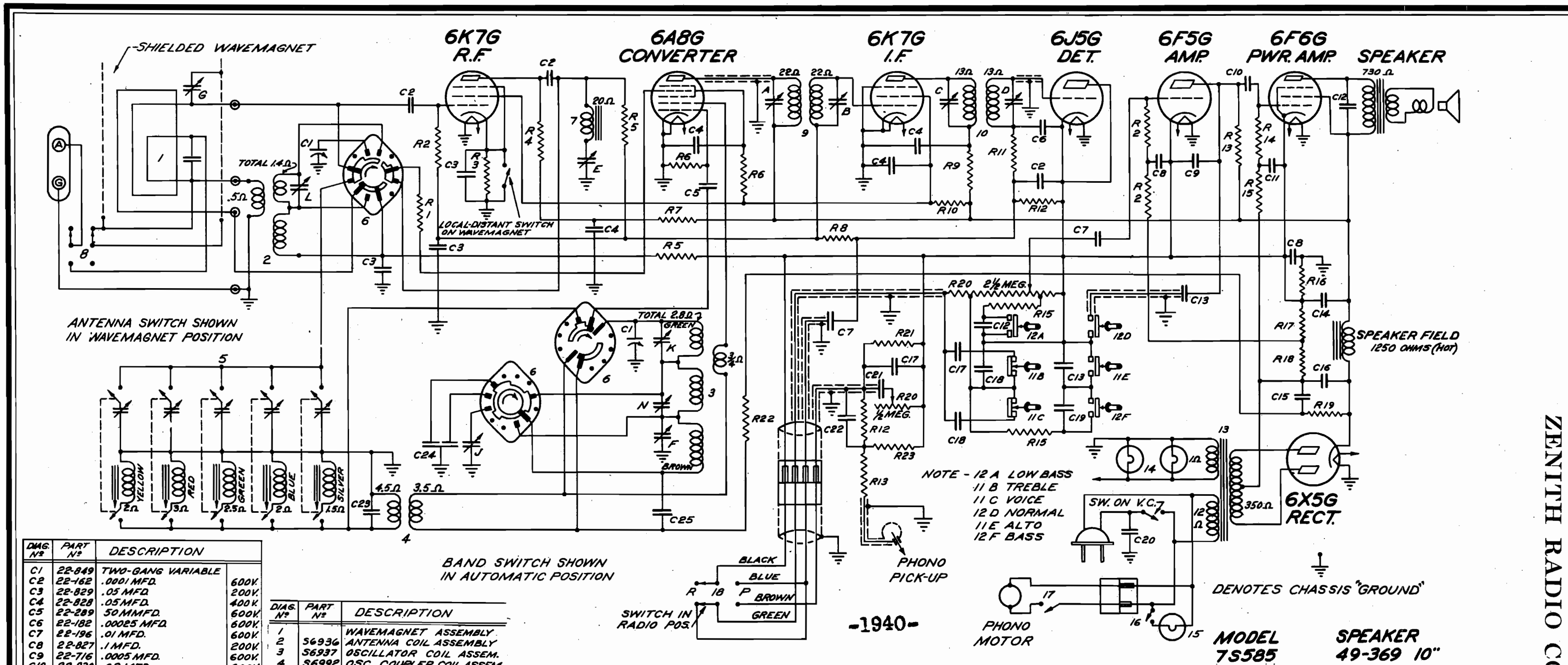
Volume control full on.

Line voltage 117 v.



ZENITH RADIO CORP.

MODEL 7S585
Ch. 7A01



DIAG. No	PART No	DESCRIPTION	
C1	22-849	TWO-GANG VARIABLE	
C2	22-162	.0001 MFD.	600V.
C3	22-829	.05 MFD.	200V.
C4	22-828	.05 MFD.	400V.
C5	22-289	50 MMFD.	600V.
C6	22-182	.00025 MFD.	600V.
C7	22-196	.01 MFD.	600V.
C8	22-827	.1 MFD.	200V.
C9	22-716	.0005 MFD.	600V.
C10	22-830	.02 MFD.	600V.
C11	22-219	.03 MFD.	200V.
C12	22-229	.005 MFD.	600V.
C13	22-448	.004 MFD.	600V.
C14	22-719	16 MFD. ELECTROLYTIC	350V.
C15	22-941	5 MFD. "	450V.
C16	22-941	15 MFD. "	450V.
C17	22-954	.00035 MFD.	600V.
C18	22-470	.00015 MFD.	600V.
C19	22-492	.002 MFD.	600V.
C20	22-525	.005 MFD.	1000V.
C21	22-326	.003 MFD.	400V.
C22	22-953	.0002 MFD.	600V.
C23	22-868	COMPENSATING COND.	
C24	22-853	DUAL OSC. PADDER	
C25	22-358	.002 MFD.	600V.
R1	63-577	100 OHM	1/4 W.
R2	63-271	1 MEGOHM	1/4 W.
R3	63-588	6800 OHM	1/4 W.
R4	63-607	15M OHM	1/4 W.
R5	63-595	100M OHM	1/4 W.
R6	63-592	33M OHM	1/4 W.
R7	63-705	2200 OHM	1/4 W.
R8	63-599	1.5 MEGOHM	1/4 W.
R9	63-583	1000 OHM	1/4 W.
R10	63-676	27M OHM	1 W.
R11	63-713	47M OHM	1/4 W.
R12	63-719	470M OHM	1/4 W.
R13	63-296	220M OHM	1/4 W.
R14	63-597	470M OHM	1/4 W.
R15	63-593	47M OHM	1/4 W.
R16	63-1057	47 OHM WIREWOUND	1/2 W.
R17	63-1066	18 OHM "	1/2 W.
R18	63-1056	280 OHM "	1 1/2 W.
R19	63-1055	22M OHM	1 W.
R20	63-1115	VOLUME CONTROL	
R21	63-464	1 MEGOHM	1/4 W.
R22	63-1054	10M OHM	1/2 W.
R23	63-717	220M OHM	1/4 W.

DIAG. No	PART No	DESCRIPTION
1		WAVEMAGNET ASSEMBLY
2	S6936	ANTENNA COIL ASSEMBLY
3	S6937	OSCILLATOR COIL ASSEM.
4	S6992	OSC. COUPLER COIL ASSEM.
5	S7044	AUTOMATIC TUNING ASSEM.
6	85-205	BAND SELECTOR SWITCH
7	S7500	WAVE TRAP COIL ASSEM.
8	85-171	WAVEMAGNET SWITCH
9	95-600	1ST I.F. TRANSFORMER
10	95-695	2ND I.F. TRANSFORMER
11	S8132	TONE CONTROL ASSEM.(LEFT)
12	S7422	TONE CONTROL ASSEM.(RIGHT)
13	95-634	PWR. TRANS. 117 V. 50-60~
14	100-36	PILOT LIGHT 6.3 V. .25 A.
15	100-80	PHONO LIGHT 110V. 7W.
16	85-204	DOOR SWITCH
17	85-191	MOTOR SWITCH
18	85-192	PHONO SWITCH
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
E	22-940	WAVE TRAP
F		BROADCAST OSC. (SEE NOTE)
G		BROADCAST ANT.
J		B'DCAST PADDER (" ")
K		SHORT WAVE OSC. (" ")
L	22-788	SHORT WAVE DET.
N		POLICE BAND OSC. (" ")

NOTE—
TRIMMERS F, J, K & N ARE MOUNTED ON STRIP #22-881.

Power consumption—80 watts.

Power output—4.5 watts.

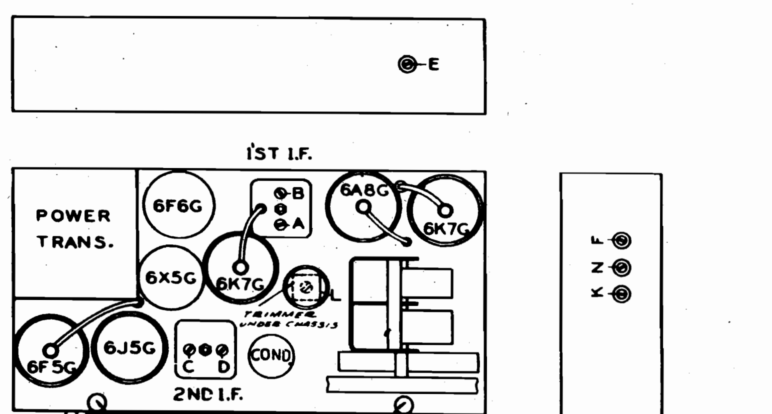
Tuning ranges— 545 Kc.— 1570 Kc.
1520 Kc.— 5000 Kc.
5600 Kc.—18300 Kc.

FOR VOLTAGES, P.B. DATA SEE INDEX

I.F. 455 KC

I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL.VIII

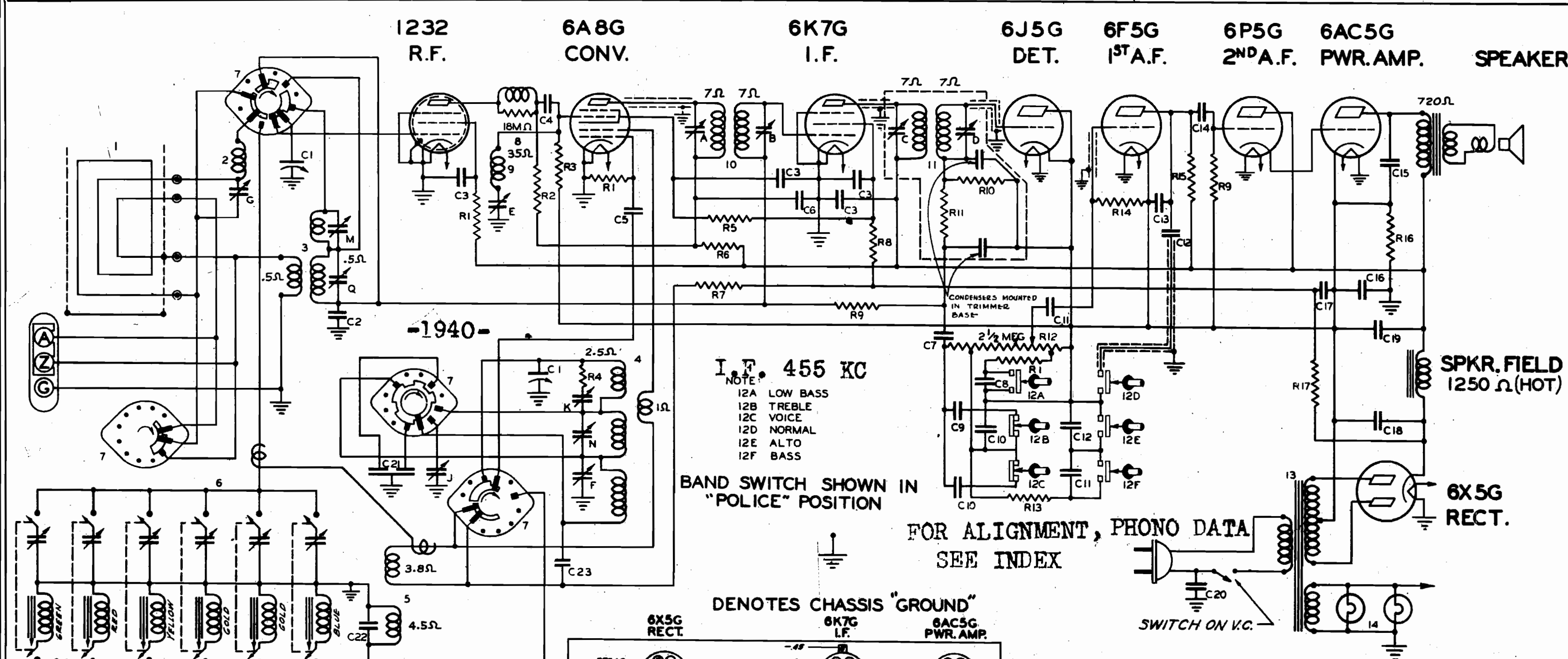
I.F. TRIMMERS A,B,C,D.
TRIM SW OSC (K) 18 MC
TRIM SW ANT (L) 16 MC
TRIM POLICE (N) 4500 KC
TRIM BC ANT (G) 1400 KC
TRIM BC OSC (F) 1500 KC

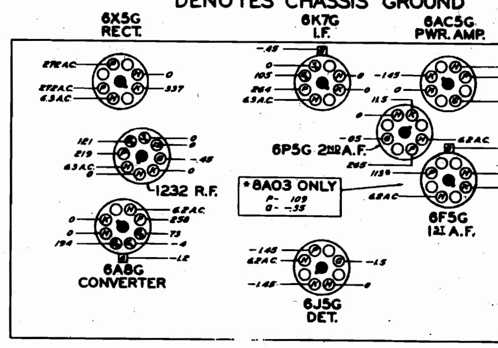


MODELS 8S531, 8S548, 8S563, Ch. 8A02

ZENITH RADIO CORP.

MODELS 8S587, 8S588, Ch. 8A03





C1	22-927	2-GANG VARIABLE	
C2	22-829	.05 MFD.	200 V.
C3	22-828	.05 MFD.	400 V.
C4	22-147	.0005 MFD.	600 V.
C5	22-127	25 MMFD.	600 V.
C6	22-825	.1 MFD.	400 V.
C7	22-327	.02 MFD.	200 V.
C8	22-229	.005 MFD.	600 V.
C9	22-954	.00035 MFD.	600 V.
C10	22-470	.00015 MFD.	600 V.
C11	22-492	.002 MFD.	600 V.
C12	22-448	.004 MFD.	600 V.
C13	22-854	.0005 MFD.	600 V.
C14	22-830	.02 MFD.	600 V.
C15	22-1016	.005 MFD.	1000 V.
C16	22-827	.1 MFD.	200 V.
C17	22-1035	5 MFD. ELECTROLYTIC	450 V.
C18		15 MFD. ELECTROLYTIC	450 V.
C19		15 MFD. ELECTROLYTIC	350 V.
C20	22-1041	.005 MFD.	600 V.
C21	22-1039	DUAL OSC. PADDER	
C22	22-868	COMPENSATING COND.	
C23	22-358	.002 MFD.	600 V.
R1	63-593	4/M OHM	1/4 W
R2	63-587	4700 OHM	1/4 W
R3	63-590	15M OHM	1/4 W
R4	63-576	68 OHM	1/4 W
R5	63-643	18M OHM	1/4 W
R6	63-605	1000 OHM	1/2 W
R7	63-796	10M OHM	1/2 W
R8	63-677	33M OHM	1 W
R9	63-271	1 MEGOHM	1/4 W
R10	63-717	220M OHM	1/4 W
R11	63-711	22M OHM	1/4 W
R12	63-1075	VOLUME CONTROL	
R13	63-594	68M OHM	1/4 W
R14	63-976	15 MEGOHM	1/4 W
R15	63-296	220M OHM	1/4 W
R16	63-1100	52 OHMS WIREW'ND.	1/2 W
R17	63-151	15M OHM	1 W

1		WAVEMAGNET ASSEMBLY
2	S-8142	LOOP LOADING COIL ASSEM.
3	S-8430	ANTENNA COIL ASSEM.
4	S-7505	OSCILLATOR COIL ASSEM.
5	S-8466	OSC. COUPLER COIL ASSEM.
6		AUTOMATIC TUN. ASSEM.
7	85-229	BAND SELECTOR SWITCH
8	S-8496	R.F. CHOKE & RES. ASSEM.
9	S-8326	WAVE TRAP ASSEM.
10	95-625	1ST I. F. TRANS.
11	95-663	2ND I. F. TRANS.
12	S-8491	TONE CONTROL
13	95-627	PWR. TRANS. 60~ 117 V.
14	100-36	PILOT LIGHT 6.3 V. .25 A.
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
E	22-1015	WAVE TRAP
F		BROADCAST OSC. (SEE NOTE 1)
G	22-1042	BROADCAST ANTENNA
J	22-688	BROADCAST PADDER
K		SHORT WAVE OSC. (SEE NOTE 1)
M		SHORT WAVE ANT. (SEE NOTE 2)
N		POLICE BAND OSC. (SEE NOTE 1)
Q		POLICE BAND ANT. (SEE NOTE 2)

NOTES—
(1) TRIMMERS F, K & N ARE MOUNTED ON STRIP 22-850
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP 22-1045

MODEL	SPEAKER
8S 531	49-377 8"
8S 548	49-377 8"
8S 563	49-367 10"

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.

Line voltage 117 v.

Stage Gains

Ant. to R.F. grid—4.9× at 1000 Kc.

R.F. grid to conv. grid—12× at 1000 Kc.

Conv. grid to I.F. grid—66× at 455 Kc.

Overall audio—743× at 1 watt 400 cycles.

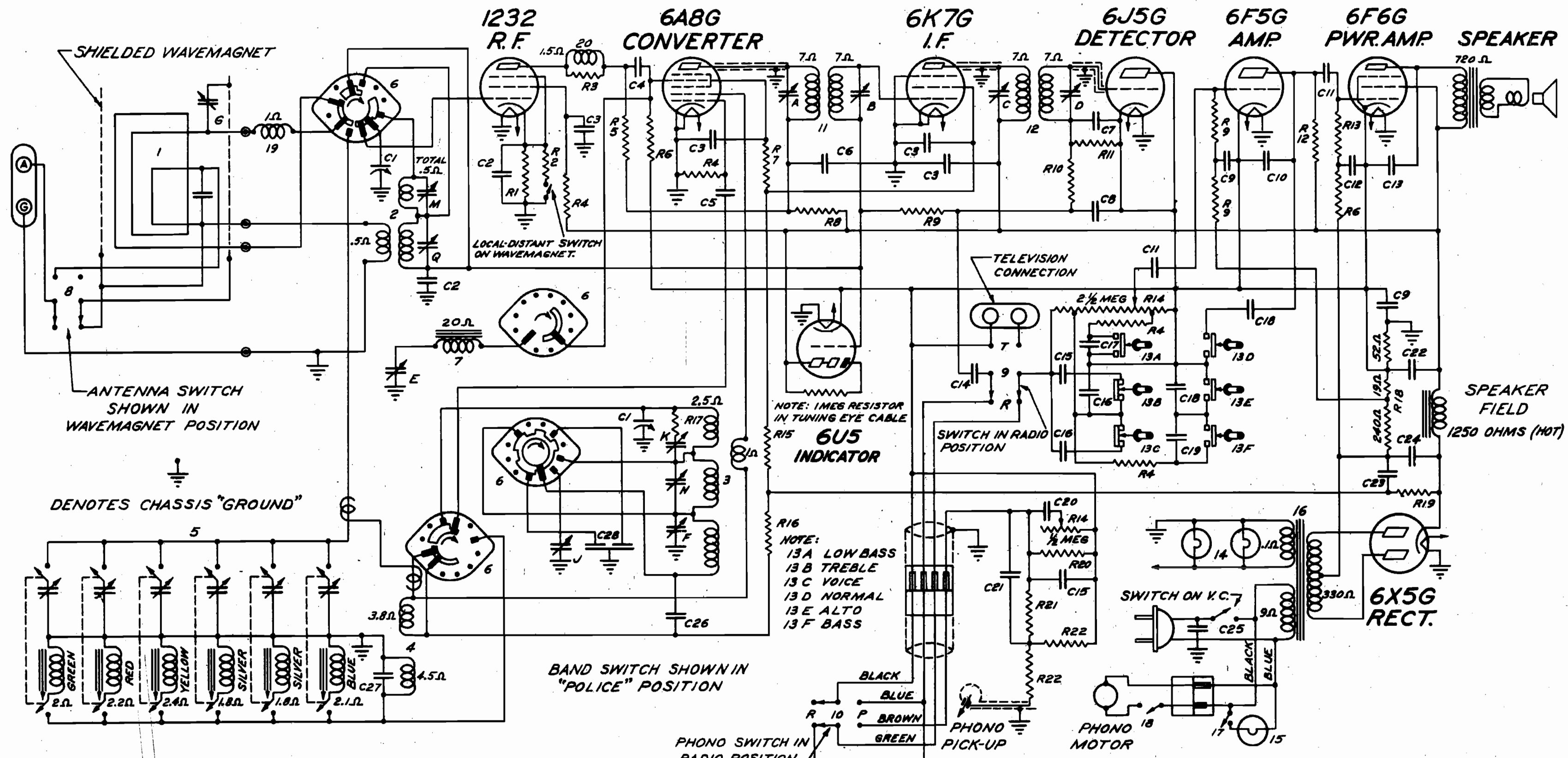
Chassis 8A03 has phono connections added (see page 31).

Tuning ranges— 540 Kc.— 1600 Kc.
1500 Kc.— 5200 Kc.
5700 Kc.—18300 Kc.

Power consumption—8A02—65 watts. —8A03—85 watts.

ZENITH RADIO CORP.

MODEL 8S586
Ch. 8A01



FOR OTHER DATA SEE INDEX

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MODEL 8S586

SPEAKER 49-366 12"

I.F. FREQUENCY 455 KC.
8 TUBE SUPERHETERODYNE
CHASSIS Nº 8A01 3BAND PHONO

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-927	TWO-GANG VARIABLE	
C2	22-829	.05 MFD.	200V.
C3	22-828	.05 MFD.	400V.
C4	22-716	.0005 MFD.	600V.
C5	22-127	25 MMFD.	600V.
C6	22-825	.1 MFD.	400V.
C7	22-182	.00025 MFD.	600V.
C8	22-162	.0001 MFD.	600V.
C9	22-827	.1 MFD.	200V.
C10	22-854	.0005 MFD.	600V.
C11	22-830	.02 MFD.	600V.
C12	22-219	.03 MFD.	200V.
C13	22-1016	.005 MFD.	1000V.
C14	22-327	.02 MFD.	200V.
C15	22-954	.00035 MFD.	600V.
C16	22-470	.00015 MFD.	600V.
C17	22-229	.005 MFD.	600V.
C18	22-448	.004 MFD.	600V.
C19	22-492	.002 MFD.	600V.
C20	22-326	.003 MFD.	400V.
C21	22-953	.0002 MFD.	600V.
C22	22-719	16 MFD. ELECTROLYTIC	350V.
C23	22-933	6 MFD. "	450V.
C24	22-933	16 MFD. "	450V.

DIAG. Nº	PART Nº	DESCRIPTION	
C25	22-525	.005 MFD.	1000V.
C26	22-358	.002 MFD.	600V.
C27	22-868	COMPENSATING COND.	
C28	22-930	DUAL OSC. PADDER	
R1	63-589	10M OHM	¼ W.
R2	63-574	33 OHM	¼ W.
R3	63-1077	18M OHM	1 W.
R4	63-593	47M OHM	¼ W.
R5	63-587	4700 OHM	¼ W.
R6	63-595	100M OHM	¼ W.
R7	63-643	18M OHM	¼ W.
R8	63-605	1000 OHM	½ W.
R9	63-271	1 MEGOHM	¼ W.
R10	63-711	22M OHM	¼ W.
R11	63-717	220M OHM	¼ W.
R12	63-296	220M OHM	¼ W.
R13	63-597	470M OHM	¼ W.
R14	63-1117	VOLUME CONTROL	
R15	63-677	33M OHM	1 W.
R16	63-796	10M OHM	½ W.
R17	63-576	68 OHM	¼ W.

DIAG. Nº	PART Nº	DESCRIPTION	
R18	63-992	3-SECTION CANDOHM	
R19	63-151	15M OHM	1 W.
R20	63-464	1 MEGOHM	¼ W.
R21	63-719	470M OHM	¼ W.
R22	63-717	220M OHM	¼ W.
1		WAVEMAGNET ASSEMBLY	
2	S7504	ANTENNA COIL ASSEMBLY	
3	S7505	OSCILLATOR COIL ASSEM.	
4	S7507	OSC. COUPLER COIL ASSEM.	
5	S7649	AUTOMATIC TUNING ASSEM.	
6	85-202	BAND SELECTOR SWITCH	
7	S7559	WAVE TRAP COIL ASSEM.	
8	85-171	WAVEMAGNET SWITCH	
9	85-171	TELEVISION SWITCH	
10	85-192	PHONO SWITCH	
11	95-625	1ST I.F. TRANS.	
12	95-663	2ND I.F. TRANS.	
13	S7642	TONE CONTROL SW. ASSEM.	
14	100-36	PILOT LIGHT 6.3V. .25A.	
15	100-80	PHONO-LIGHT 110V. 7W.	
16	95-627	POWER TRANS. 50-60~ 117V.	

DIAG. Nº	PART Nº	DESCRIPTION
17	85-203	DOOR SWITCH
18	85-191	MOTOR SWITCH
19	S8142	LOOP LOADING COIL ASSEM.
20	S7526	R.F. CHOKE
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
E	22-958	WAVE TRAP
F		BROADCAST OSC. (SEE NOTE 1)
G		BROADCAST ANTENNA
J	22-463	BROADCAST PADDER
K		SHORT WAVE OSC. (SEE NOTE 1)
M		SHORT WAVE ANT. (SEE NOTE 2)
N		POLICE BAND OSC. (SEE NOTE 1)
Q		POLICE BAND ANT. (SEE NOTE 2)

NOTES—
(1) TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP #22-982

MODEL 7S585, Ch. 7A01
MODEL 8S586, Ch. 8A01

ZENITH RADIO CORP.

Model 8S586
Chassis 8A01

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Sensitivity switch in distance position.

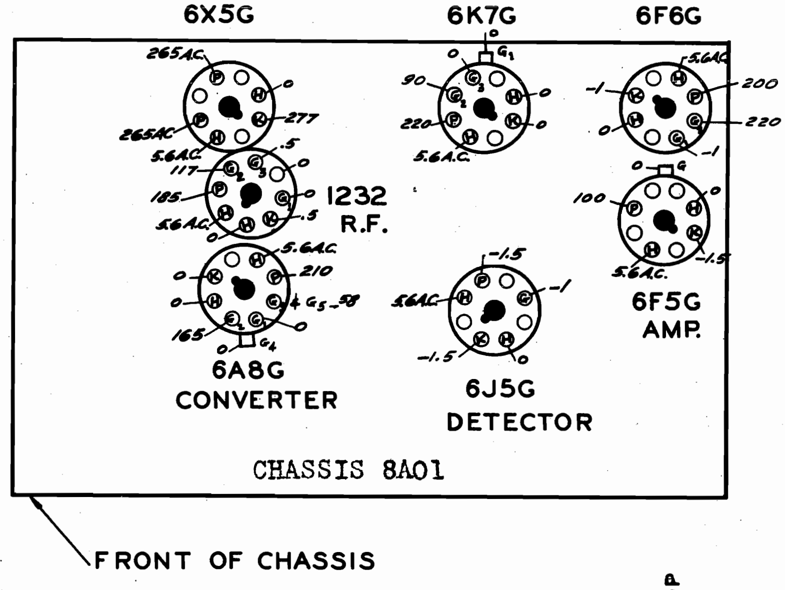
Volume control full on.

Line voltage 112 A.C.

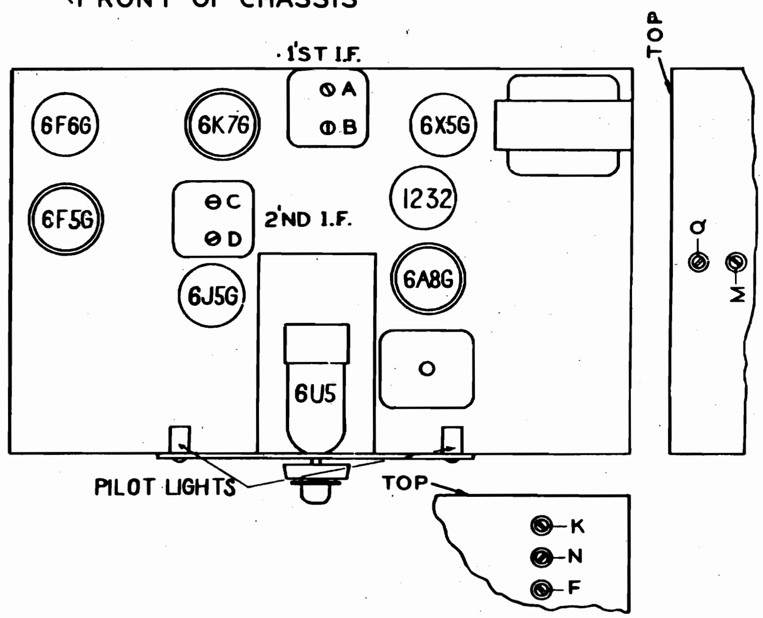
Power consumption—85 watts.

Power output—6 watts.

Tuning ranges— 540 Kc.— 1600 Kc.
1505 Kc.— 5200 Kc.
5600 Kc.—18500 Kc.



ALIGNMENT-CHASSIS 8A01
I.F. 455 KC-PEAK A,B,C,D
SW- TRIM K 18 MC
TRIM M 16 MC
POLICE-
TRIM N,Q 4.5 MC
BROADCAST
TRIM F 1400 KC
TRIM G (on loop)
AT 1400 KC WITH
WAVEMAGNET SWITCH
FOR LOOP OPERATION



MODEL 7S585

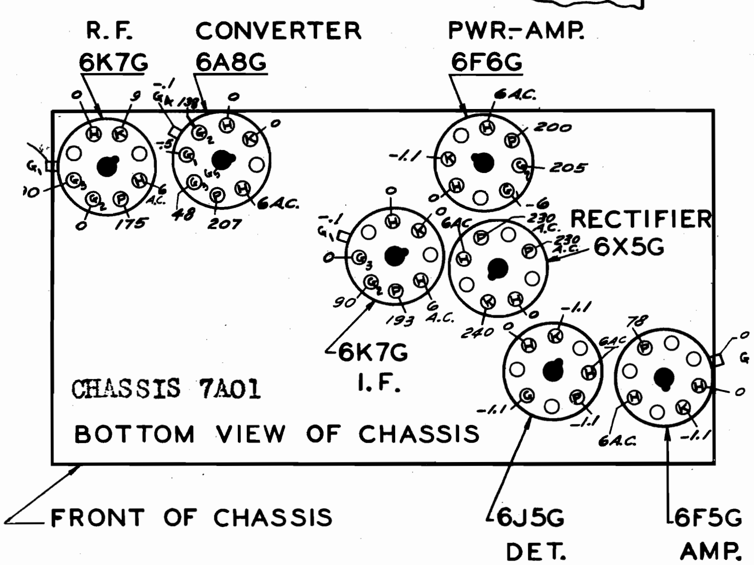
SOCKET LAYOUT
VOLTAGE DATA
CHASSIS 7A01

All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

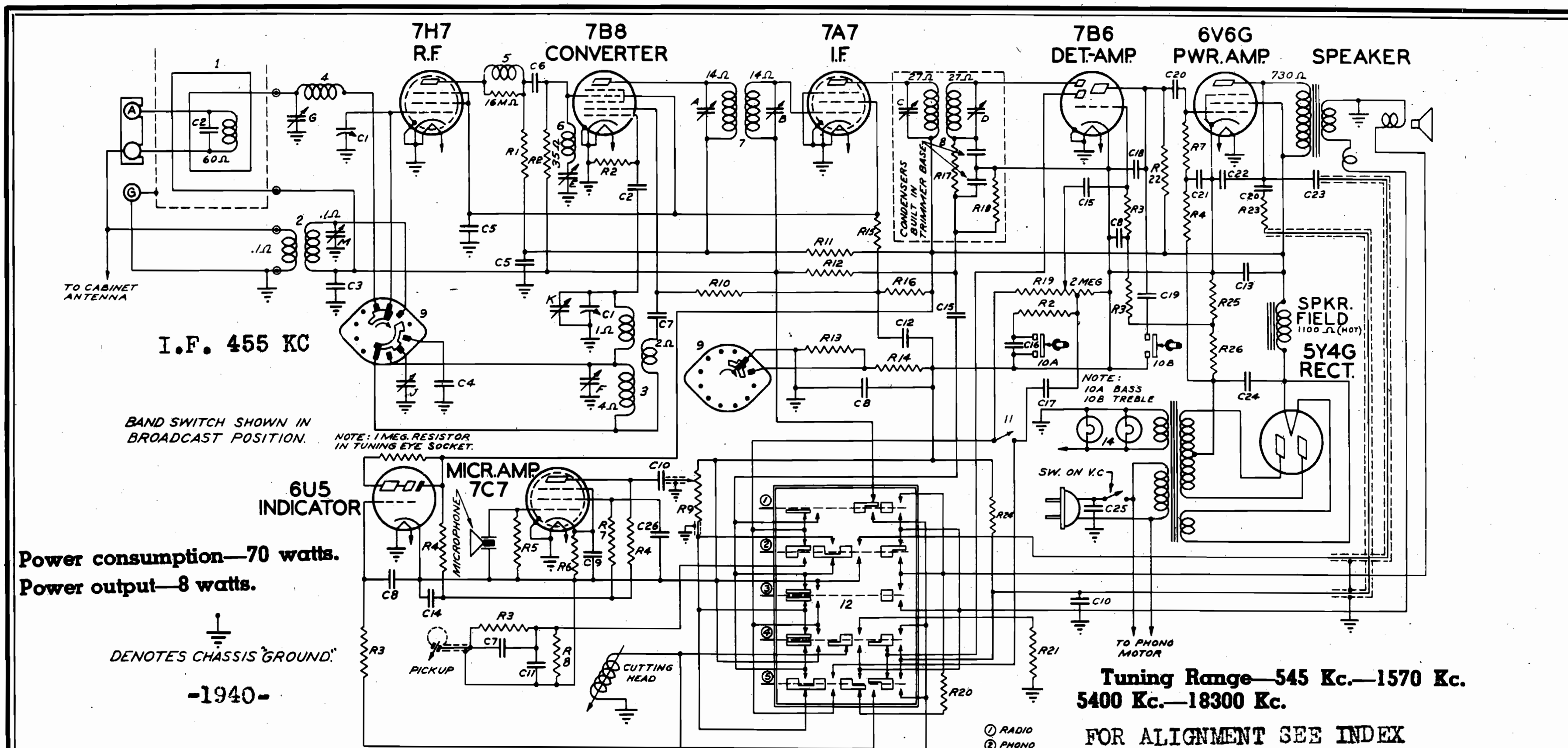
Volume control full on.

Line voltage 112 A.C.



ZENITH RADIO CORP.

MODELS 8S593, 8S594
Ch. 8A04



Power consumption—70 watts.
Power output—8 watts.

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**Tuning Range—545 Kc.—1570 Kc.
5400 Kc.—18300 Kc.**

FOR ALIGNMENT SEE INDEX

① RADIO
② PHONO
③ P.A.
④ RECORD MICR.
⑤ RECORD RADIO

Stage Gains:

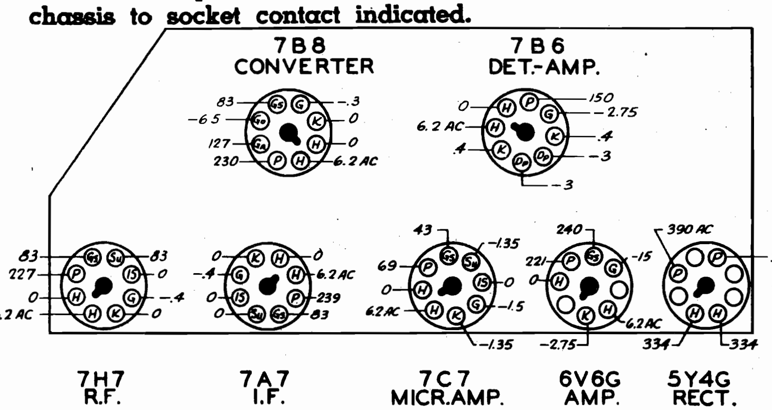
Ant. to R.F. grid—5× at 1000 Kc.

R.F. grid to conv. grid—4.2× at 1000 Kc.

Conv. grid to I.F. grid—76.6× at 455 Kc.

Overall audio—865× at 1 watt, 400 cycles.

All voltages measured with a 20000 ohm per volt meter from chassis to socket contact indicated.



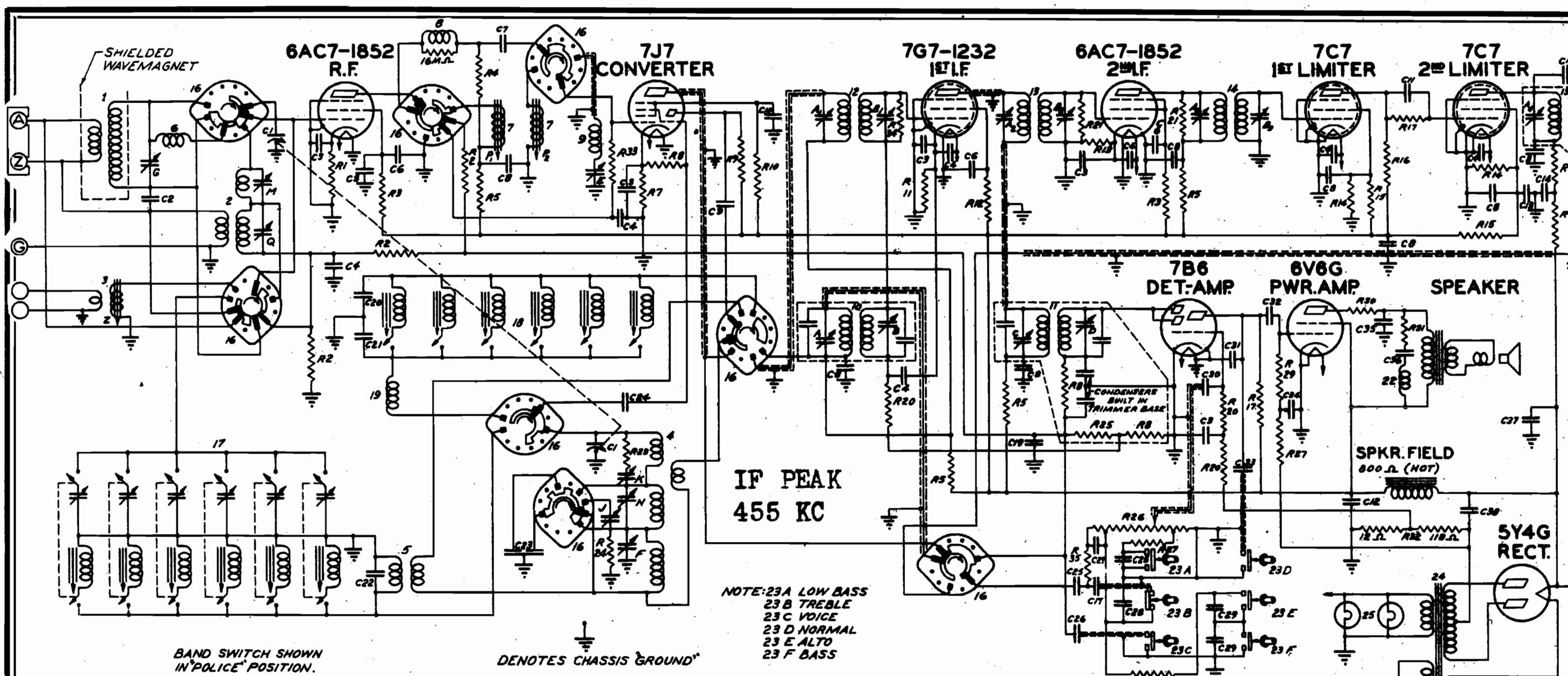
NOTE:
ALL BUTTONS SHOWN IN NON-OPERATED POSITION.

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1044	TWO GANG VARIABLE	
C2	22-289	50MMFD.	600V.
C3	22-829	.05 MFD.	200V.
C4	22-1022	.005 MFD.	600V.
C5	22-828	.05 MFD.	400V.
C6	22-162	.0001 MFD.	600V.
C7	22-182	.00025 MFD.	600V.
C8	22-827	.1 MFD.	200V.
C9	22-1069	20 MFD. ELECTROLYTIC	25V.
C10	22-492	.002 MFD.	600V.
C11	22-887	.001 MFD.	600V.
C12	22-1099	5 MFD. ELECTROLYTIC	450V.
C13	22-1099	20 MFD. "	450V.
C14	22-1099	5 MFD. "	250V.
C15	22-188	.02 MFD.	400V.
C16	22-1118	.005 MFD.	600V.
C17	22-954	.00035 MFD.	600V.
C18	22-854	.0005 MFD.	600V.
C19	22-448	.004 MFD.	600V.
C20	22-830	.02 MFD.	600V.
C21	22-327	.02 MFD.	200V.
C22	22-790	.004 MFD.	1000V.
C23	22-1119	.005 MFD.	1000V.
C24	22-1036	14 MFD. ELECTROLYTIC	450V.
C25	22-1041	.005 MFD.	600V.
C26	22-825	.1 MFD.	400V.

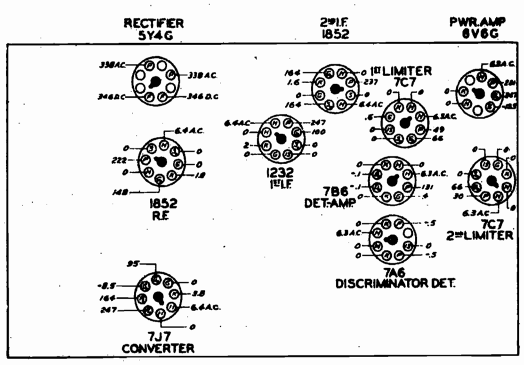
DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-637	4700 OHM	1/4 W.
R2	63-593	47M OHM	1/4 W.
R3	63-271	1 MEGOHM	1/4 W.
R4	63-595	100M OHM	1/4 W.
R5	63-602	4.7 MEGOHM	1/4 W.
R6	63-238	1000 OHM	1/4 W.
R7	63-597	470M OHM	1/4 W.
R8	63-650	68M OHM	1/4 W.
R9	63-1146	VOLUME CONTROL	
R10	63-150	10M OHM	1/2 W.
R11	63-583	1000 OHM	1/4 W.
R12	63-599	1.5 MEGOHM	1/4 W.
R13	63-624	68 OHM	1/4 W.
R14	63-1098	42 OHM WIREWOUND	1/2 W.
R15	63-1102	15M OHM	1/2 W.
R16	63-1101	8200 OHM	2 W.
R17	63-713	47M OHM	1/4 W.
R18	63-719	470M OHM	1/4 W.
R19	63-1123	VOLUME CONTROL	
R20	63-1108	6 OHM WIREWOUND	2 W.
R21	63-1139	8 OHM "	5 W.
R22	63-296	220M OHM	1/4 W.
R23	63-778	470M OHM	1/4 W.
R24	63-790	4.7 MEGOHM	1/4 W.
R25	63-1066	18 OHM WIREWOUND	1/2 W.
R26	63-1063	140 OHM	1 W.

MODELS 10H551, 10H571
Ch. 10A3

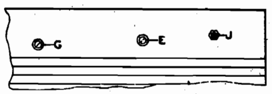
ZENITH RADIO CORP.

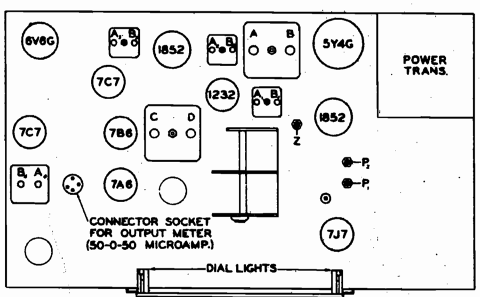


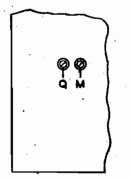
Power consumption—90 watts.
Power output—6.5 watts.
Tuning Range—540 Kc.—1600 Kc. 1.5 Mc.—5.2 Mc. 5.7 Mc.—18.5 Mc. 41.5 Mc.—50.5 Mc.

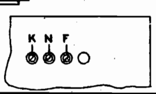


NOTE:
(1) TRIMMERS F, K & N ARE MOUNTED ON STRIP # 22-850
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP # 22-1045









Models 10H551-10H571

Chassis No. 10A3

MODEL	SPEAKER
10H551	49-424 12"
10H571	49-424 12"

AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 4.3 MC.
10 TUBE SUPERHETERODYNE
CHASSIS No 10A3-A.C.-4 BAND
ZENITH RADIO CORPORATION
CHICAGO, ILL.

Stage Gains:

Bc. and 455 Kc.—I.F.

Ant. to R.F. grid—6.5× at 1000 Kc.
R.F. grid to conv. grid—28.1× at 1000 Kc.
Conv. grid. to I.F. grid—31.3× at 455 Kc.
Overall audio—1640× at 1 watt, 400 cycles.

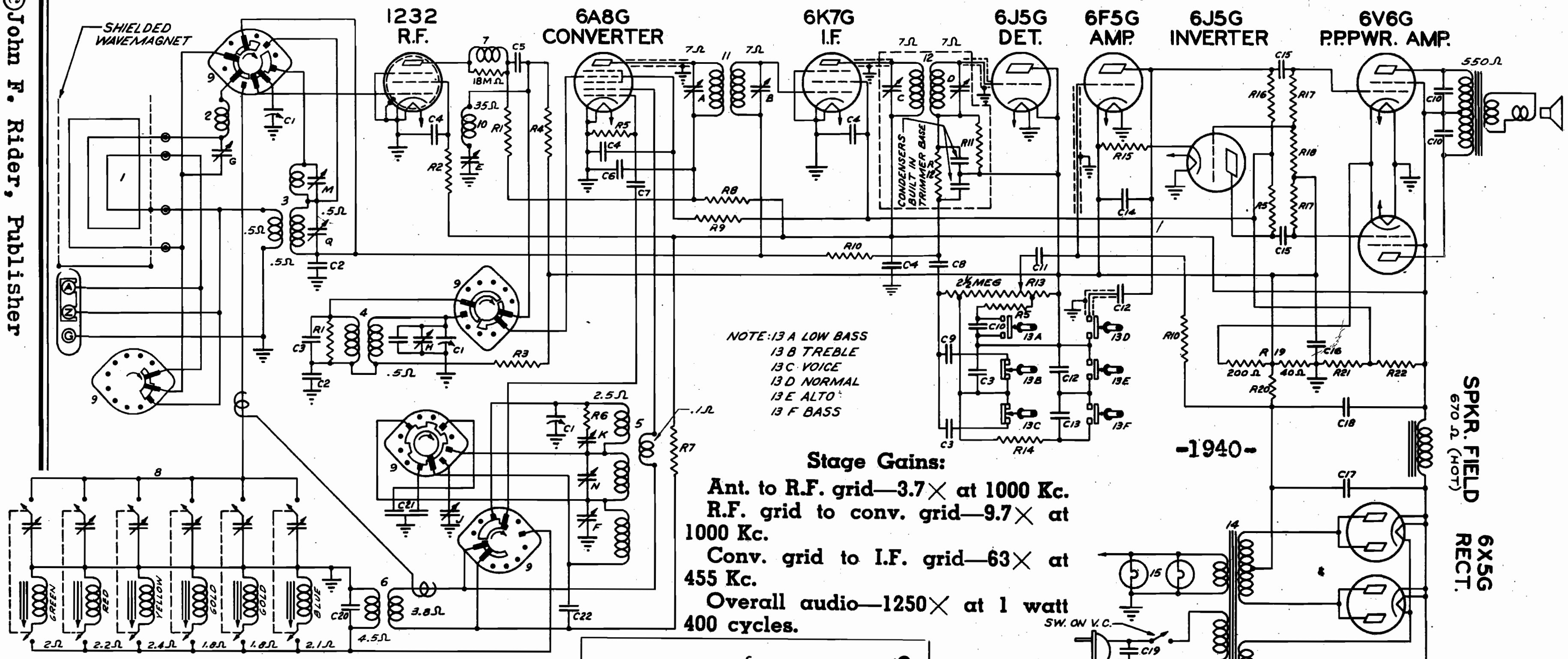
F.M. and 4.3 Mc.—I.F.

Ant. to R.F. grid—1.8× at 46 Mc.
R.F. grid to conv. grid—7.9× at 46 Mc.
Conv. grid to 1st I.F. grid—2.7× at 4.3 Mc.
1st I.F. grid to 2nd I.F. grid—80× at 4.3 Mc.
2nd I.F. grid to LIMITER grid—25× at 4.3 Mc.

DIAG. No	PART No	DESCRIPTION	
C1	22-1121	TWO GANG VARIABLE	
C2	22-319	.005 MFD.	200V.
C3	22-827	.1 MFD	200V.
C4	22-829	.05 MFD.	200V.
C5	22-1123	5 MFD. ELECTROLYTIC	300V.
C6	22-243	.01 MFD.	400V.
C7	22-162	.0001 MFD.	600V.
C8	22-825	.1 MFD.	400V.
C9	22-358	.002 MFD.	600V.
C10	22-828	.05 MFD.	400V.
C11	22-127	25 MMFD.	600V.
C12	22-1125	15 MFD. ELECTROLYTIC	450V.
C13	22-1125	5 MFD. ELECTROLYTIC	300V.
C14	22-1125	15 MFD. ELECTROLYTIC	250V.
C15	22-956	.0005 MFD.	600V.
C16	22-1143	25 MMFD.	600V.
C17	22-289	50 MMFD.	600V.
C18	22-1138	.0005 MFD.	600V.
C19	22-348	.001 MFD.	600V.
C20	22-1146	50 MMFD. COMP.	600V.
C21	22-1139	50 MMFD. COMP.	600V.
C22	22-868	COMPENSATING COND.	
C23	22-1039	DUAL PADDER	
C24	22-1140	50 MMFD.	600V.
C25	22-1127	.02 MFD.	400V.
C26	22-1135	.005 MFD.	600V.
C27	22-1130	15 MMFD.	600V.
C28	22-1137	.00015 MFD.	600V.
C29	22-1126	.01 MFD.	400V.
C30	22-188	.02 MFD.	400V.
C31	22-1136	.00025 MFD.	600V.
C32	22-830	.02 MFD.	600V.
C33	22-448	.004 MFD.	600V.
C34	22-219	.03 MFD.	200V.
C35	22-1134	.002 MFD.	1000V.
C36	22-1120	.02 MFD.	600V.
C37	22-1129	.0005 MFD.	1000V.
C38	22-1124	30 MFD. ELECTROLYTIC	450V.
C39	22-1041	.005 MFD.	600V.
R1	63-741	150 OHM	½W.
R2	63-600	2.2 MEGOHM	½W.
R3	63-1159	39M OHM	1W.
R4	63-1163	2200 OHM	½W.
R5	63-605	1000 OHM	½W.
R6	63-595	100 M OHM	½W.
R7	63-1164	300 OHM	½W.
R8	63-713	47M OHM	½W.
R9	63-608	15M OHM	1W.
R10	63-1160	56M OHM	1W.
R11	63-1161	270 OHM	½W.
R12	63-1109	75M OHM	1W.
R13	63-246	150 OHM	½W.
R14	63-607	15M OHM	½W.
R15	63-1162	33M OHM	1W.
R16	63-961	47M OHM	1W.
R17	63-296	220 M OHM	½W.
R18	63-583	1000 OHM	½W.
R19	63-679	82 M OHM	½W.
R20	63-271	1 MEGOHM	½W.
R21	63-652	120M OHM	½W.
R22	63-160	100 M OHM	½W.
R23	63-576	68 OHM	½W.
R24	63-572	15 OHM	½W.
R25	63-773	180 M OHM	½W.
R26	63-1074	VOLUME CONTROL	
R27	63-593	47M OHM	½W.
R28	63-594	68M OHM	½W.
R29	63-597	470 M OHM	½W.
R30	63-1158	100 OHM	½W.
R31	63-156	10M OHM	1W.
R32	63-1142	2 SECTION CANDOHM	
R33	63-715	100M OHM	½W.
R34	63-589	10M OHM	½W.
R35	63-701	470 OHM	¼W.
1		WAVEMAGNET ASSEMBLY	
2	S9075	ANTENNA COIL -	(S.W.)
3	S9065	ANTENNA COIL -	(F.M.)
4	S9074	OSCILLATOR COIL -	
5	S8466	OSCILLATOR COUPLING COIL	
6	S9044	LOOP LOADING COIL	
7	S9066	DETECTOR COIL ASSEM.	(F.M.)
8	S8359	COIL & RES. ASSEMBLY	
9	S8326	WAVETRAP "	
10	95-763	1st I.F. TRANSFORMER	(A.M.)
11	95-766	2nd I.F. TRANSFORMER	(A.M.)
12	95-767	1st I.F. "	(F.M.)
13	95-768	2nd I.F. "	(F.M.)
14	95-769	3rd I.F. "	(F.M.)
15	95-772	4th I.F. "	(F.M.)
16	85-234	BAND SELECTOR SWITCH	
17		AUTOMATIC TUNING UNIT	(BC.)
18		AUTOMATIC TUNING UNIT	(F.M.)
19	S9350	PEAKING COIL	
20	S8998	F.M. I.F. WAVETRAP	
22	20-230	SPEAKER COMP. FILTER	
23	S8490	TONE CONTROL SW. ASSEM.	
24	95-771	POWER TRANS. 50-60~	
24	95-773	POWER TRANS. 25~	
25	100-36	PILOT LIGHT 6.3V. .25A.	
A		1st I.F. TRANS. PRI.	(A.M.)
B		1st I.F. " SEC.	(A.M.)
C		2nd I.F. " PRI.	(A.M.)
D		2nd I.F. " SEC.	(A.M.)
A1		1st I.F. " PRI.	(F.M.)
B1		1st I.F. " SEC.	(F.M.)
A2		2nd I.F. " PRI.	(F.M.)
B2		2nd I.F. " SEC.	(F.M.)
A3		3rd I.F. " PRI.	(F.M.)
B3		3rd I.F. " SEC.	(F.M.)
A4		4th I.F. TRANS. PRI.	(F.M.)
B4		4th I.F. " SEC.	(F.M.)
E	22-1015	WAVE TRAP	
F		BROADCAST OSC. NOTE 1	
G	22-1043	BROADCAST ANTENNA	
J	22-688	BROADCAST PADDER	
K		SHORTWAVE OSC. NOTE 1	
M		SHORTWAVE ANT. NOTE 2	
N		POLICE BAND OSC. NOTE 1	
P		ULTRA HIGH FREQ. DET. (PLATE)	
P1		ULTRA HIGH FREQ. DET. (GRID)	
Q		POLICE BAND ANT. NOTE 2	
Z		ULTRA HIGH FREQ. ANTENNA	

ZENITH RADIO CORP.

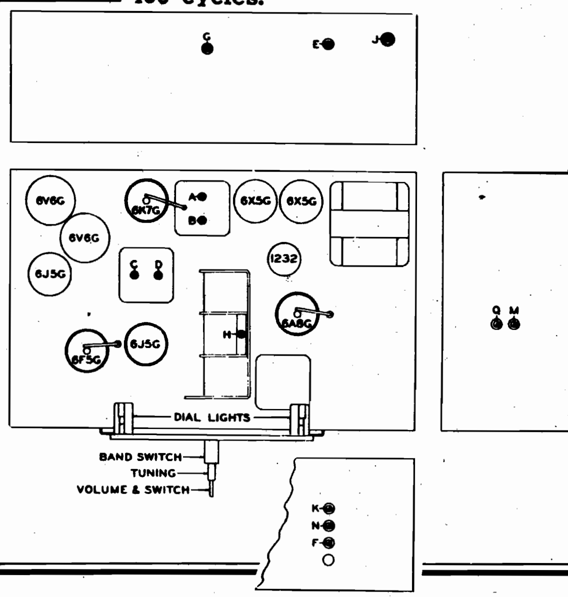
MODELS 10S531, 10S549, 10S566, Ch. 10A1
MODELS 10S589, 10S590, Ch. 10A2



Stage Gains:
Ant. to R.F. grid—3.7× at 1000 Kc.
R.F. grid to conv. grid—9.7× at 1000 Kc.
Conv. grid to I.F. grid—63× at 455 Kc.
Overall audio—1250× at 1 watt 400 cycles.

BAND SWITCH SHOWN IN "POLICE" POSITION

Power consumption—10A1—95 watts.
Power consumption—10A2—120 watts.



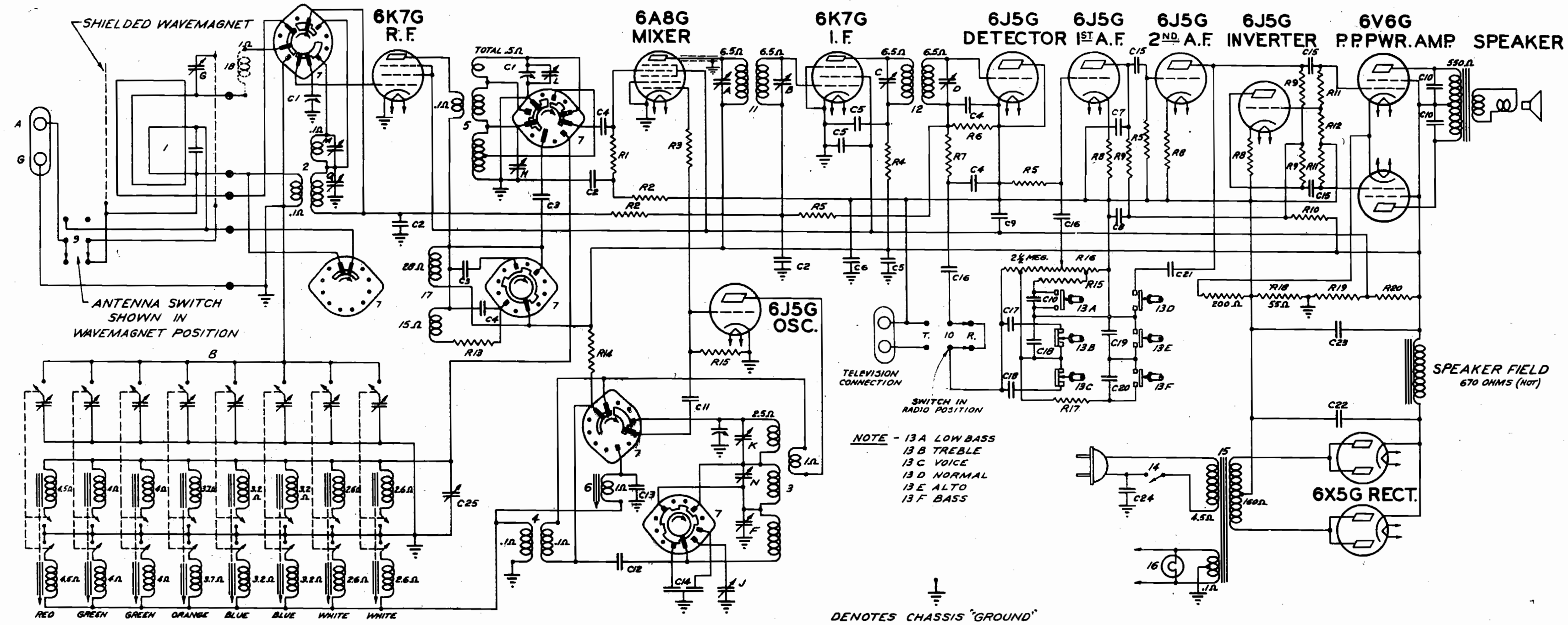
FOR VOLTAGES SEE INDEX
I.F. 455 KC
I.F. ALIGNMENT CONVENTIONAL
SEE SPECIAL SECTION VOL VIII
I.F. TRIMMERS A,B,C,D
WAVETRAP E, ADJUST FOR MINIMUM SIGNAL RESPONSE WITH SIGNAL FED TO ANT. 455 KC
SW OSC (K) TRIM AT 18 MC
SW ANT (M) TRIM AT 16 MC
POL. (Q) TRIM AT 4.5 MC
BC OSC (F) TRIM AT 1500 KC
BC (G-H) TRIM AT 1400 KC
BC (J) PAD At 600 KC

DIAG. No.	PART No.	DESCRIPTION	
C 1	22-1043	THREE GANG VARIABLE	
C 2	22-829	.05 MFD.	200 V.
C 3	22-470	.00015 MFD.	600 V.
C 4	22-828	.05 MFD.	400 V.
C 5	22-147	.0005 MFD.	600 V.
C 6	22-825	.1 MFD.	400 V.
C 7	22-127	25 MMFD.	600 V.
C 8	22-327	.02 MFD.	200 V.
C 9	22-954	.00035 MFD.	600 V.
C 10	22-229	.005 MFD.	600 V.
C 11	22-830	.02 MFD.	600 V.
C 12	22-448	.004 MFD.	600 V.
C 13	22-492	.002 MFD.	600 V.
C 14	22-854	.0005 MFD.	600 V.
C 15	22-171	.05 MFD.	600 V.
C 16	22-827	.1 MFD.	200 V.
C 17	22-934	20 MFD. ELECTROLYTIC	450 V.
C 18	22-934	20 MFD. ELECTROLYTIC	350 V.
C 19	22-1041	.005 MFD.	600 V.
C 20	22-868	COMPENSATING COND.	
C 21	22-1039	DUAL OSCILLATOR PADDER	
C 22	22-358	.002 MFD.	600 V.

DIAG. No.	PART No.	DESCRIPTION	
R 1	63-587	4700 OHM	1/4 W.
R 2	63-595	100 M OHM	1/4 W.
R 3	63-589	10 M OHM	1/4 W.
R 4	63-590	15 M OHM	1/4 W.
R 5	63-593	47 M OHM	1/4 W.
R 6	63-576	68 OHM	1/4 W.
R 7	63-151	15 M OHM	1 W.
R 8	63-605	1000 OHM	1/2 W.
R 9	63-643	18 M OHM	1/4 W.
R 10	63-271	1 MEGOHM	1/4 W.
R 11	63-717	220 M OHM	1/4 W.
R 12	63-711	22 M OHM	1/4 W.
R 13	63-1074	VOLUME CONTROL	
R 14	63-594	68 M OHM	1/4 W.
R 15	63-585	2200 OHM	1/4 W.
R 16	63-296	220 M OHM	1/4 W.
R 17	63-657	330 M OHM	1/4 W.
R 18	63-648	47 M OHM	1/4 W.
R 19	63-1048	TWO SECTION CANDOHM	
R 20	63-1061	7 OHM WIREWOUND	1/2 W.
R 21	63-676	27 M OHM	1 W.
R 22	63-1058	22 M OHM	2 W.

MODELS 12S550, 12S568, 12S569, 12S595, Ch. 12A3

ZENITH RADIO CORP.



BAND SWITCH SHOWN IN "POLICE" POSITION

DIAG. NO.	PART NO.	DESCRIPTION	
C1	22-951	THREE GANG VARIABLE	
C2	22-829	.05 MFD.	200V.
C3	22-289	50 MMFD.	600V.
C4	22-162	.0001 MFD.	600V.
C5	22-828	.05 MFD.	400V.
C6	22-827	.1 MFD.	200V.
C7	22-854	.0005 MFD.	600V.
C8	22-991	16 MFD. ELECTROLYTIC	350V.
C9	22-991	16 MFD. ELECTROLYTIC	200V.
C10	22-229	.005 MFD.	600V.
C11	22-127	25 MMFD.	600V.
C12	22-358	.002 MFD.	600V.
C13	22-944	COMPENSATING COND.	
C14	22-930	DUAL OSC. PADDER	
C15	22-171	.05 MFD.	600V.
C16	22-327	.02 MFD.	200V.
C17	22-954	.00035 MFD.	600V.
C18	22-470	.00015 MFD.	600V.
C19	22-448	.004 MFD.	600V.
C20	22-492	.002 MFD.	600V.
C21	22-196	.01 MFD.	600V.
C22	22-970	20 MFD. ELECTROLYTIC	450V.
C23	22-970	20 MFD. ELECTROLYTIC	350V.
C24	22-992	.02 MFD.	600V.
C25		TRIMMER COND. (SEE NOTE 1)	
R1	63-597	470 M OHM	1/4 W.
R2	63-595	100 M OHM	1/4 W.
R3	63-581	470 OHM	1/4 W.
R4	63-605	1000 OHM	1/2 W.
R5	63-271	1 MEGOHM	1/4 W.
R6	63-655	220 M OHM	1/4 W.
R7	63-591	22 M OHM	1/4 W.
R8	63-282	2200 OHM	1/4 W.
R9	63-648	47 M OHM	1/4 W.
R10	63-680	10 M OHM	1 W.
R11	63-657	330 M OHM	1/4 W.
R12	63-647	39 M OHM	1/4 W.
R13	63-586	3300 OHM	1/4 W.
R14	63-1065	15 M OHM	1 W.
R15	63-593	47 M OHM	1/4 W.
R16	63-1078	VOLUME CONTROL	
R17	63-594	68 M OHM	1/4 W.
R18	63-1052	2 SECTION CANDOHM	
R19	63-676	27 M OHM	1 W.
R20	63-1058	22 M OHM	2 W.

DIAG. NO.	PART NO.	DESCRIPTION
7	85-209	BAND SELECTOR SWITCH
8		AUTOMATIC TUNING UNIT
9	85-171	WAVEMAGNET SWITCH
10	85-171	TELEVISION SWITCH
11	95-637	1ST I.F. TRANSFORMER
12	95-638	2ND I.F. TRANSFORMER
13	S8595	TONE CONTROL SW. ASSEM.
14	85-148	A.C. SWITCH
15	95-639	POWER TRANS. 60~ 117V.
16	100-36	PILOT LIGHT 6.3V. .25A
17	20-216	PLATE CHOKE COIL
18	S8142	LOOP LOADING COIL ASSEM. (NOTE: USED ON SOME MODELS)
A		1ST I.F. TRANS. PRI.
B		1ST I.F. " SEC.
C		2ND I.F. " PRI.
D		2ND I.F. " SEC.
F		BROADCAST OSC. (SEE NOTE)
G		ANTENNA BROADCAST
H	22-959	DETECTOR BROADCAST
K		SHORT WAVE OSC. (SEE NOTE)
L		SHORT WAVE DET. (ON GANG)
M		SHORT WAVE ANTENNA
N		POLICE BAND OSC. (SEE NOTE)
Q		POLICE BAND ANTENNA
J	22-463	BROADCAST PADDER

NOTE:
(1) TRIMMERS F, K, N & C25 ARE MOUNTED ON STRIP #22-881
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP #22-982

I.F. FREQUENCY 455 KC.
12 TUBE SUPERHETERODYNE
CHASSIS No. 12A3 3 BAND A.C.

Stage Gains

Ant. to R.F. grid—2.08× at 1000 Kc.

R.F. grid to conv. grid—7.5× at 1000 Kc.

Conv. grid to I.F. grid—43× at 455 Kc.

Overall audio—2127× at 1 watt 400 cycles.

NOTE

Chassis 12A4 has phono connections added

Tuning ranges— 540 Kc.— 1600 Kc.
1500 Kc.— 5200 Kc.
5700 Kc.—18300 Kc.

Power consumption—12A3—95 watts.

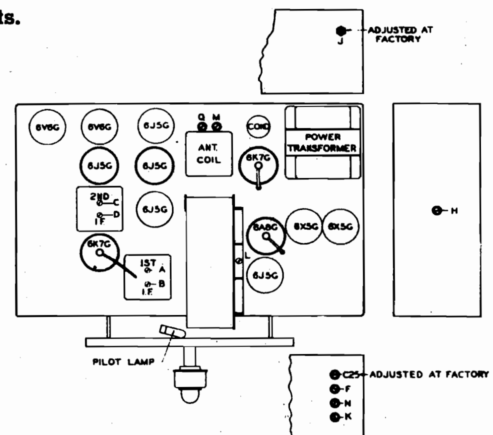
Power consumption—12A4—120 watts.

Power output—15 watts.

MODEL	SPEAKER	
12S550	49-351	10"
12S568	49-351	10"
12S569	49-404	15"

CONVENTIONAL
I.F. ALIGNMENT
SEE SPECIAL
SECTION VOL. VIII

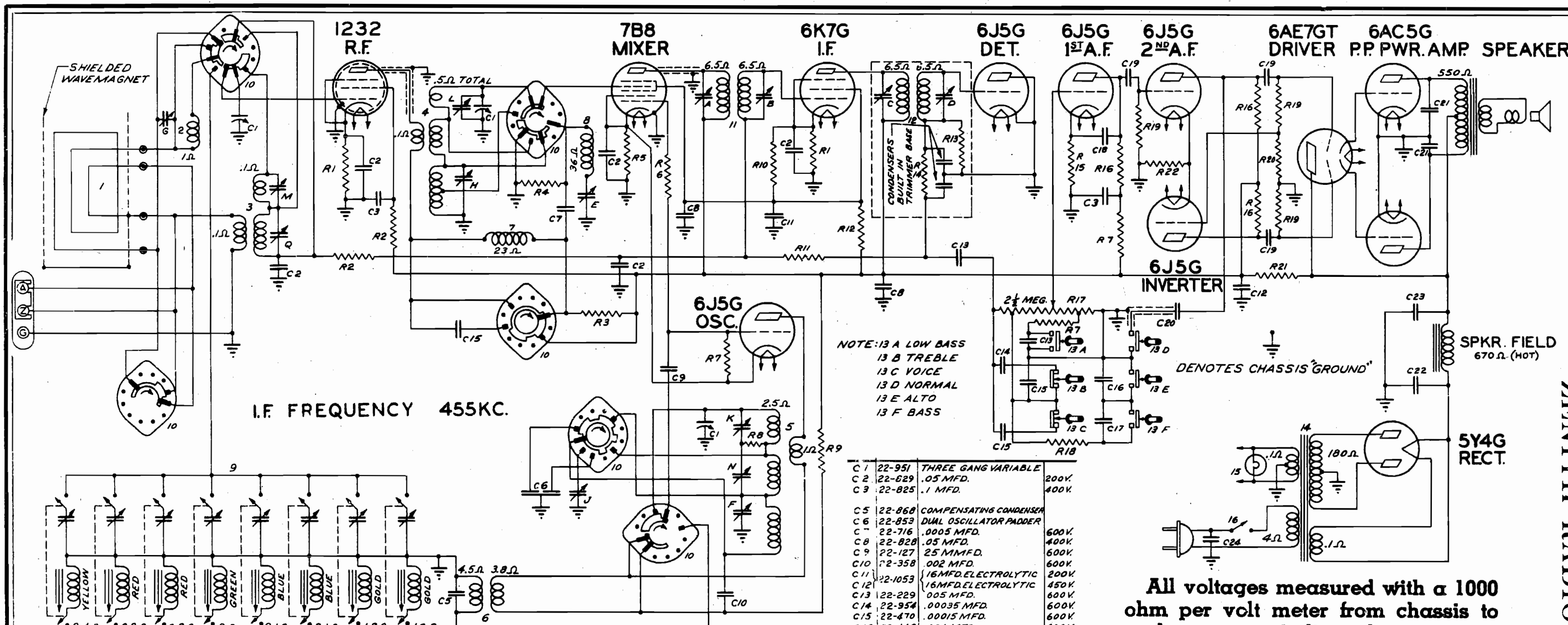
SHORT WAVE
TRIM (K) 18000KC
TRIM L-M 16000KC
POLICE
TRIM N-Q 4500KC
BROADCAST
TRIM F-H-G 1400KC
PAD J 600KC



FOR VOLTAGES, P.B. DATA, SEE INDEX

ZENITH RADIO CORP.

MODELS 12S550Z, 12S568E, 12S568Z, 12S569E, 12S569Z
12S595Z, Ch. 12A1



C 1	22-951	THREE GANG VARIABLE	
C 2	22-829	.05 MFD.	200V.
C 3	22-825	.1 MFD.	400V.
C 5	22-868	COMPENSATING CONDENSER	
C 6	22-853	DUAL OSCILLATOR PADDER	
C 7	22-716	.0005 MFD.	600V.
C 8	22-828	.05 MFD.	400V.
C 9	22-127	25 MMFD.	600V.
C10	22-358	.002 MFD.	600V.
C11	22-1053	16MFD. ELECTROLYTIC	200V.
C12		16MFD. ELECTROLYTIC	450V.
C13	22-229	.005 MFD.	600V.
C14	22-954	.00035 MFD.	600V.
C15	22-470	.00015 MFD.	600V.
C16	22-448	.004 MFD.	600V.
C17	22-492	.002 MFD.	600V.
C18	22-854	.0005 MFD.	600V.
C19	22-830	.02 MFD.	600V.
C20	22-[illegible]	.01 MFD.	600V.
C21	22-[illegible]	.005 MFD.	1000V.
C22	22-1108	20MFD. ELECTROLYTIC	450V.
C23		20MFD. ELECTROLYTIC	450V.
	22-992	.02 MFD	600V.
R 1	63-627	180 OHM	¼ W.
R 2	63-595	100M OHM	¼ W.
R 3	63-587	4700 OHM	¼ W.
R 4	63-591	22M OHM	¼ W.
R 5	63-580	330 OHM	¼ W.
R 6	63-701	470 OHM	¼ W.
R 7	63-593	47M OHM	¼ W.
R 8	63-621	39 OHM	¼ W.
R 9	63-1055	22M OHM	1 W.
R10	63-676	27M OHM	1 W.
R11	63-271	1 MEGOHM	¼ W.
R12	63-1058	22M OHM	2 W.
R13	63-717	220M OHM	¼ W.
R14	63-711	22M OHM	¼ W.
R15	63-439	2700 OHM	¼ W.
R16	63-592	33M OHM	¼ W.
R17	63-1078	VOLUME CONTROL	
R18	63-594	68M OHM	¼ W.
R19	63-657	330M OHM	¼ W.
R20	63-645	27M OHM	¼ W.
R21	63-1105	1000 OHM	2 W.
R22	63-584	1500 OHM	¼ W.
A		1ST I.F. TRANS. PRI.	
B		1ST I.F. TRANS. SEC.	
C		2ND I.F. TRANS. PRI.	
D		2ND I.F. TRANS. SEC.	
E	22-1015	WAVE TRAP	
F		BROADCAST OSC. (NOTE 1)	
G	22-1042	BROADCAST ANTENNA	
H		BROADCAST DET. (NOTE 1)	
J	22-688	BROADCAST PADDER	
K		SHORTWAVE OSC. (NOTE 1)	
L		SHORTWAVE DET. (ON GANG)	
M		SHORTWAVE ANT. (NOTE 2)	
N		POLICE OSC (NOTE 1)	
Q		POLICE ANT. (NOTE 2)	

1		WAVEMAGNET ASSEMBLY
2	S8142	LOOP LOADING COIL ASSEMBLY
3	S8749	ANTENNA COIL ASSEMBLY
4	S8751	DETECTOR COIL ASSEMBLY
5	S8750	OSCILLATOR COIL ASSEMBLY
6	S8466	OSCILLATOR CPLG. COIL ASSEM.
7	S9389	R.F. COIL ASSEMBLY
8	S8326	WAVE TRAP COIL ASSEMBLY
9		AUTOMATIC TUNING UNIT
10	85-235	BAND SELECTOR SWITCH
11	95-637	1ST I.F. TRANSFORMER
12	95-715	2ND I.F. TRANSFORMER
13	S8593	TONE CONTROL SW. ASSEMBLY
14	95-714	PWR. TRANS. 60~ 117 V.
15	100-36	PILOT LIGHT 6.3 V. .25 A.
16	85-148	A.C. SWITCH

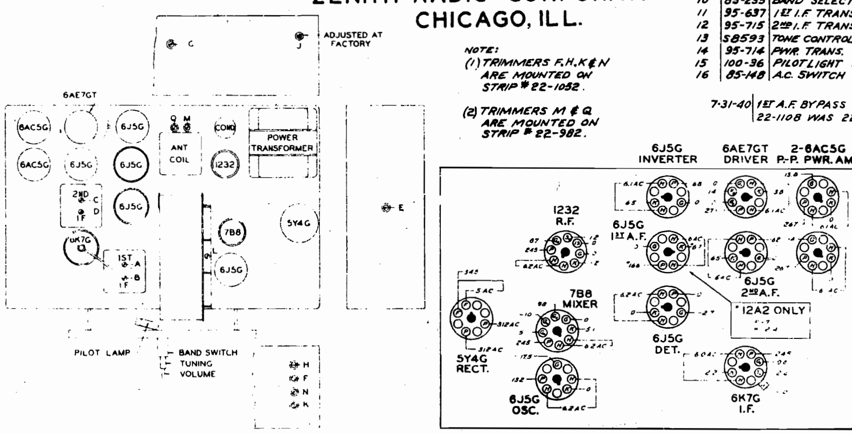
7-31-40 | 1ST A.F. BYPASS CHANGED 22-1108 WAS 22-970

MODEL	SPEAKER	
12S550Z	49-351	10"
12S568Z	49-351	10"
12S569Z	49-404	15"
12S568E	49-416	14"

BAND SWITCH SHOWN IN "POLICE" POSITION

12 TUBE SUPERHETERODYNE
CHASSIS No 12A1 3 BAND A.C.
ZENITH RADIO CORPORATION
CHICAGO, ILL.

NOTE:
(1) TRIMMERS F, H, K & N ARE MOUNTED ON STRIP # 22-1052.
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP # 22-982.



All voltages measured with a 1000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positve D.C. unless marked otherwise.

Volume control on full.

Line voltage 117 v.

Power consumption—100 watts.

Power output—14 watts.

Stage Gains:

Ant. to R.F. grid—10.7× at 1000 Kc.

R.F. grid to conv. grid—6.75× at 1000 Kc.

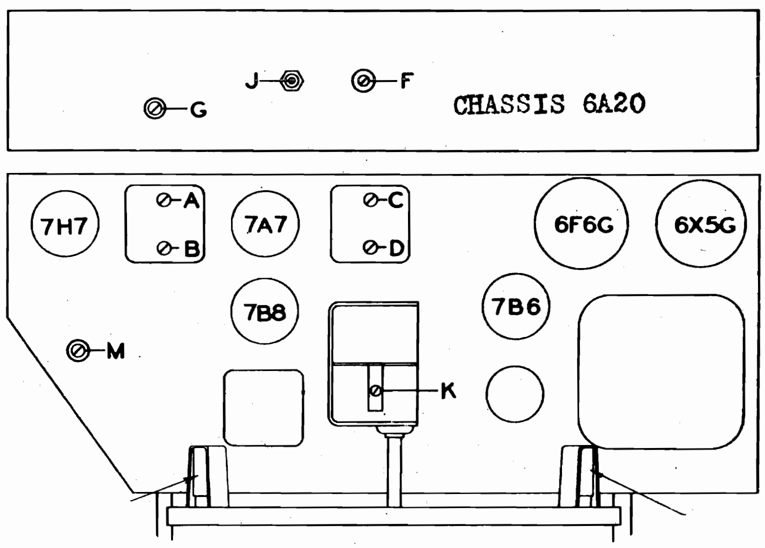
Conv. grid to I.F. grid—31-3× at 455 Kc.

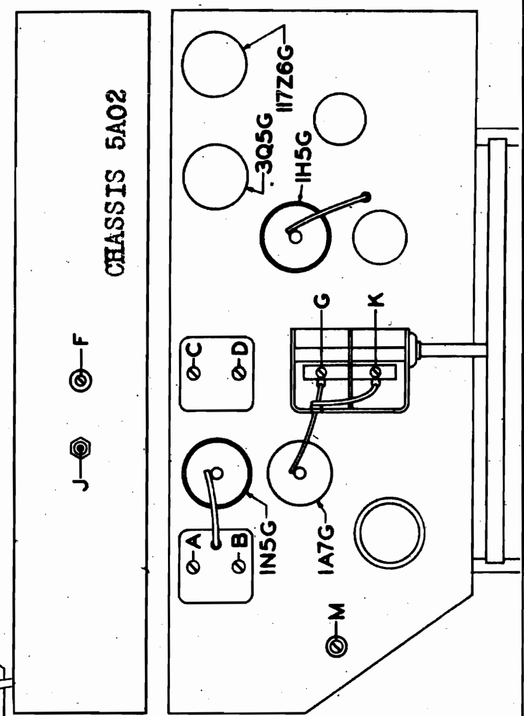
Overall audio—1640× at 1 watt, 400 cycles.

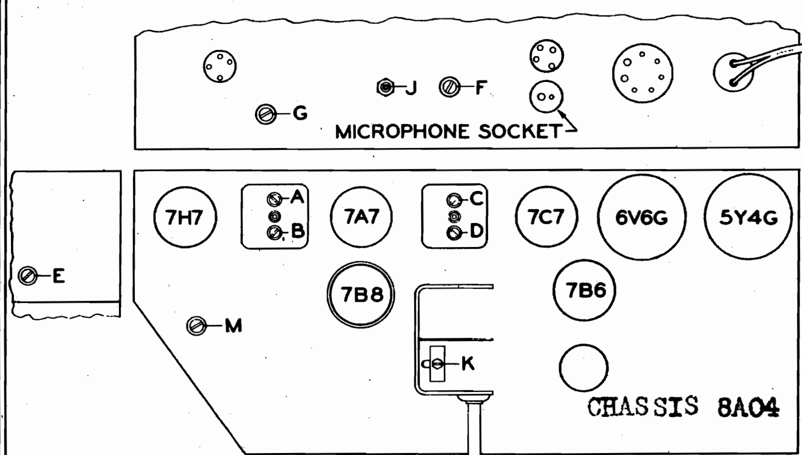
NOTE—The letter E after model number designates the use of a 14 inch speaker.

Ch. 5A02
Ch. 6A20
Ch. 8A04
Ch. 10A1, 10A2

ZENITH RADIO CORP.





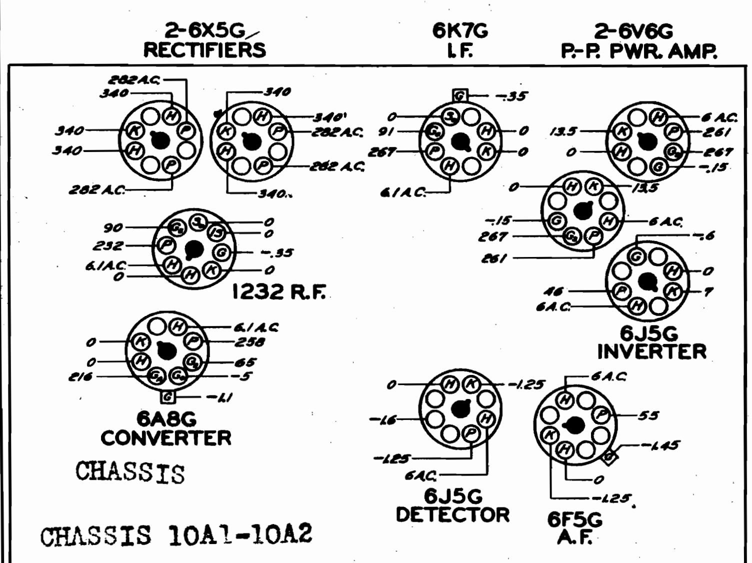


ALIGNMENT-CHASSIS 5A02
I.F. ALIGNMENT CONVENTIONAL
ADJUST TRIMMERS A B C D-455 KC
TRIM K 18 MC
TRIM F,G 1700 KC
PAD J AT 600 KC
TRIM M AT 18 MC

ALIGNMENT-CHASSIS 6A20
I.F. SAME AS CHASSIS 5A02
TRIM K AT 18 MC
TRIM M AT 16 MC
TRIM F,G AT 1500 KC
PAD J AT 600 KC
WITH 455-KC SIGNAL
FED TO RF GRID, ADJUST
WAVETRAP E FOR MINIMUM
RESPONSE.

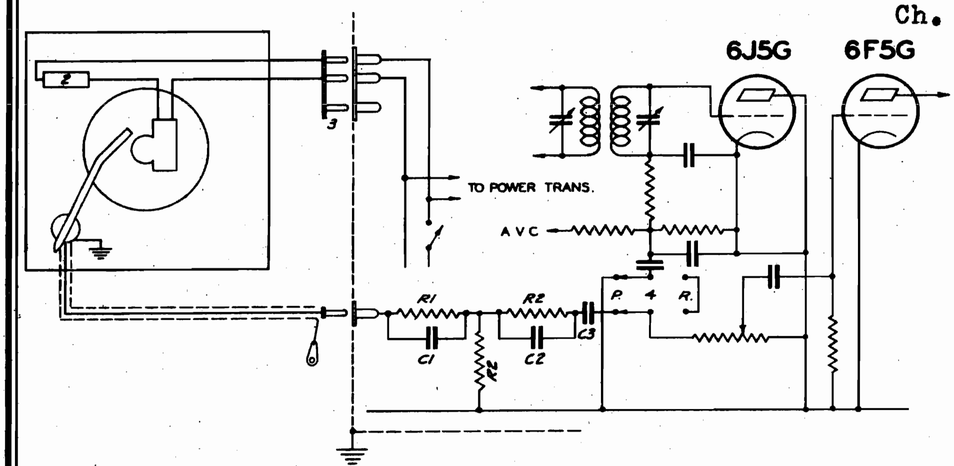
ALIGNMENT -CHASSIS 8A04
SAME AS FOR CHASSIS 6A20

VOLTAGE DATA
CHASSIS 10A1-10A2
ALL VOLTAGES MEASURED WITH
20,000 OHMS-PER-VOLT METER
FROM CHASSIS TO POINT INDIC
-ATED



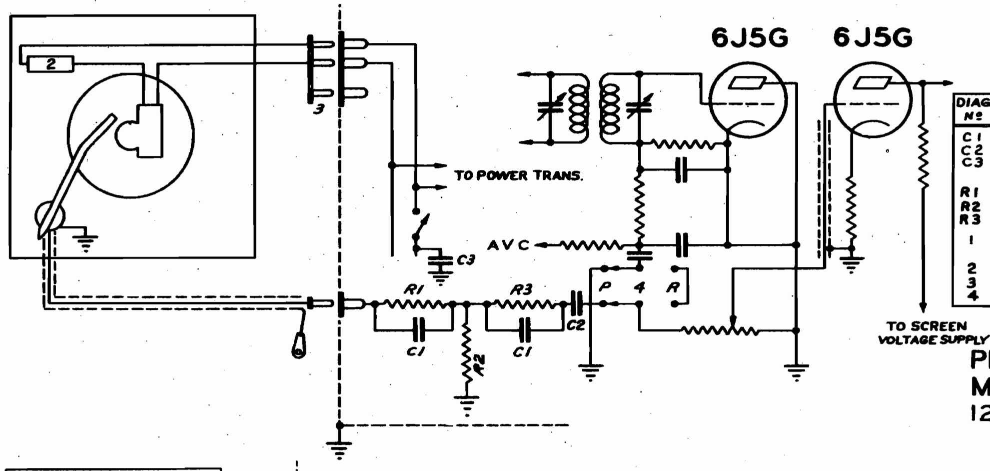
ZENITH RADIO CORP.

Ch. 6A02, 6A04, 6A13, 6A14
Ch. 10A2
Ch. 12A2
Ch. 12A4



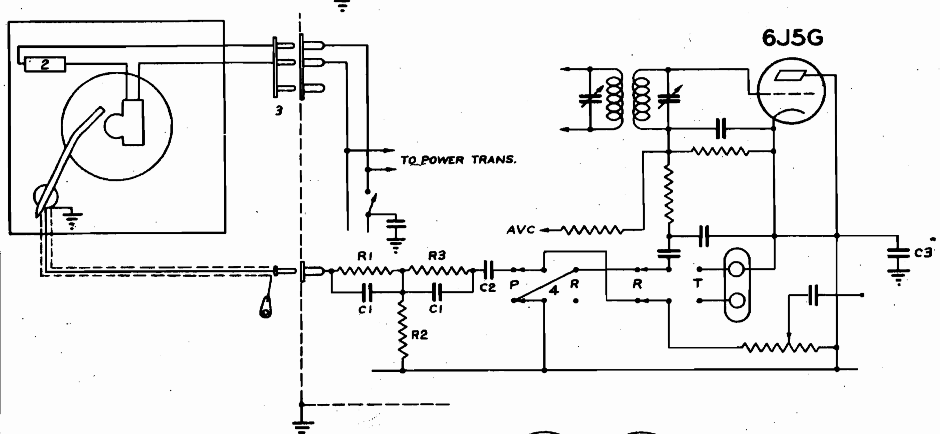
DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1048	.00085 MFD.	600 V.
C2	22-954	.00035 MFD.	600 V.
C3	22-887	.001 MFD.	600 V.
R1	63-597	470 M OHM	1/4 W.
R2	63-271	1 MEGOHM	1/4 W.
1	169-42	WEBSTER AUTOMATIC RECORD PLAYER	
2	85-191	A.C. SWITCH	
3	58-85	A.C. PLUG	
4	85-228	PHONO-RADIO SW.	

PHONO CIRCUIT DATA
MODEL SPEAKER
10S589 49-400 15"
10S590 49-402 12"
CHASSIS Nº 10 A2



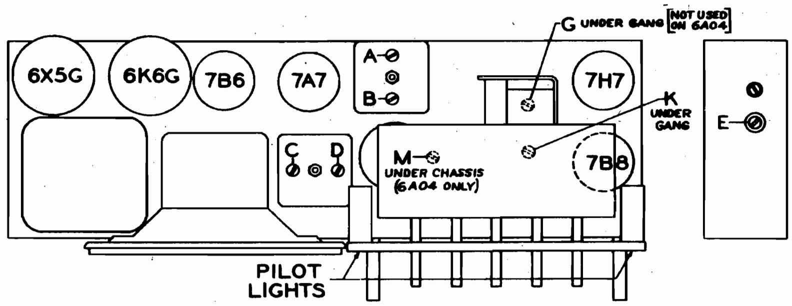
DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-954	.00035 MFD.	600 V.
C2	22-887	.001 MFD.	600 V.
C3	22-1065	.0025 MFD.	600 V.
R1	63-597	470 M OHM	1/4 W.
R2	63-657	330 M OHM	1/4 W.
R3	63-271	1 MEGOHM	1/4 W.
1	169-42	WEBSTER AUTOMATIC RECORD PLAYER	
2	85-191	A.C. SWITCH	
3	58-85	A.C. PLUG	
4	85-228	PHONO-RADIO SW.	

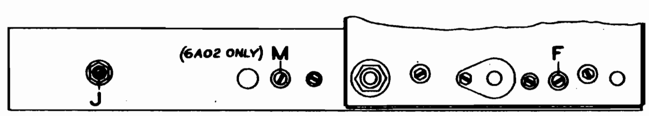
PHONO CIRCUIT DATA
MODEL SPEAKER
12S595Z 49-401 15"
CHASSIS Nº 12A2



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-954	.00035 MFD.	600 V.
C2	22-887	.001 MFD.	600 V.
C3	22-684	8 MFD. ELECTROLYTIC	150 V.
R1	63-597	470M OHM	1/4 W.
R2	63-596	330M OHM	1/4 W.
R3	63-271	1 MEGOHM	1/4 W.
1	169-42	WEBSTER AUTOMATIC RECORD PLAYER	
2	85-191	A.C. SWITCH	
3	58-85	A.C. PLUG	
4	85-228	PHONO RADIO SWITCH	

PHONO CIRCUIT DATA
MODEL SPEAKER
12S595 49-401 15"
CHASSIS Nº 12A4



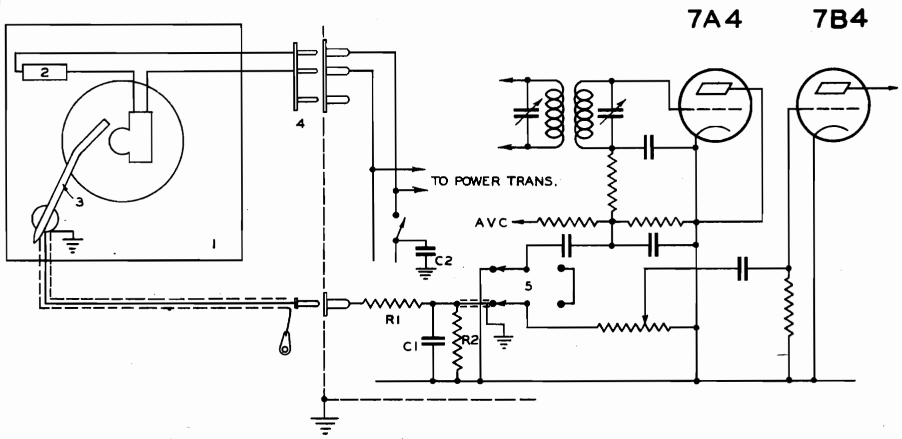


ALIGNMENT

CHASSIS 6A02, 6A04, 6A13, 6A14
I.F. TRIMMERS A B C D
PEAK AT 455 KC
WAVETRAP E-ADJUST FOR
MIN. SIGNAL RESPONSE
AT 455 KC SIGNAL AT
R-F GRID.
TRIM K 18 MC
TRIM F.G 1500 KC
PAD J 600 KC
TRIM M 16 MC

Ch. 7A04
Ch. 6A04
Ch. 8A03
Ch. 12A2

ZENITH RADIO CORP.



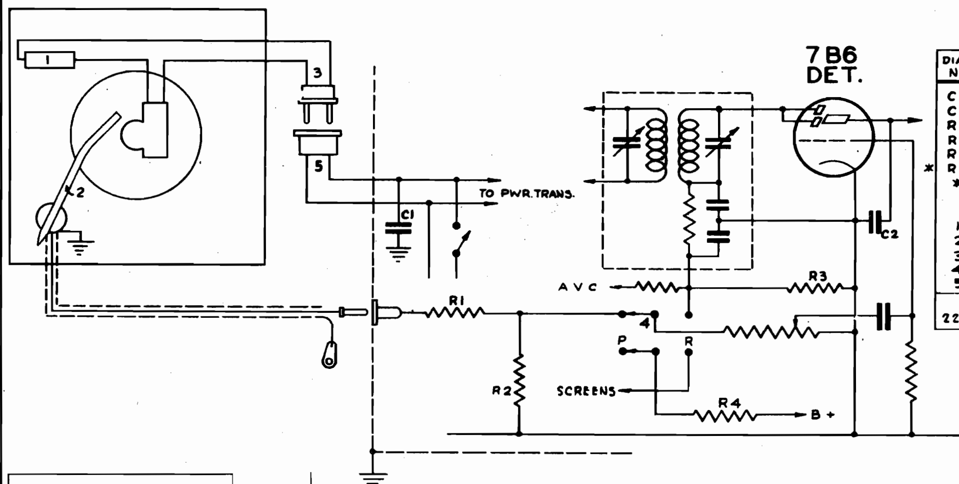
DIAG Nº	PART Nº		DESCRIPTION	
C1	22-887		.001 MFD.	600 V.
C2	22-1041		.005 MFD.	600 V.
R1	63-597		470M OHM	¼ W.
R2	63-655		220M OHM	¼ W
	MODEL 7S582.	MODEL 7S581		
1	169-42		WEBSTER AUTOMATIC RECORD PLAYER	
2	85-191		A.C. SWITCH	
3		142-28	PICK-UP	
4	58-85	58-85	A.C. PLUG	
5	85-171	85-171	PHONO-RADIO SW.	

NOTE-BANDSWITCH ON THIS CHASSIS IS PART NO. 85-227.

PHONO CIRCUIT DATA

MODEL	SPEAKER
7S 582	49-369 10"
7S 581	49-396 10"
7S 584	49-397 12"

CHASSIS NO. 7A04



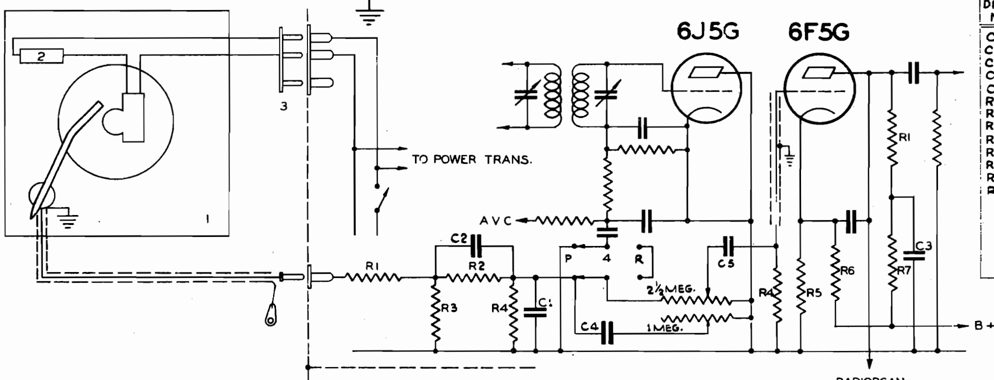
DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1040	.02 MFD.	200 V.
C2	22-82	.001 MFD.	600 V.
R1	63-597	470M OHM	¼ W.
R2	63-595	100M OHM	¼ W.
R3	63-604	10 MEGOHM	¼ W.
* R4	63-151	15M OHM	1 W.
* R4 SAME AS R7 ON 6A02 DIAGRAM			
1	85-181	AUTOMATIC STOP-SWITCH	
2	142-26	PHONO PICK-UP	
3	58-86	A.C. PLUG	
4	85-230	PHONO-RADIO SWITCH	
5	52-188	CABLE & PLUG	

ON THIS CHASSIS, TRIMMER "M" IS PART Nº 22-305 & TRIMMER "G" IS NOT USED

PHONO CIRCUIT DATA

MODEL	SPEAKER
6S 580	49-387 5"

CHASSIS Nº 6A04

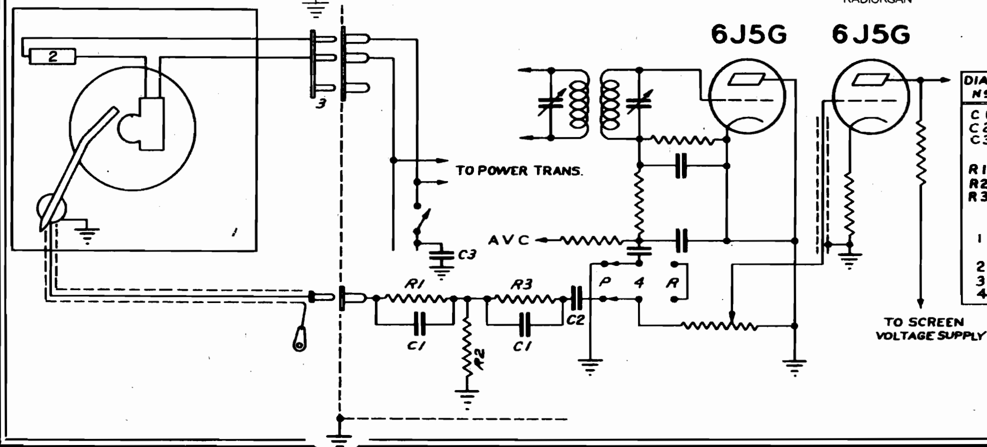


DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-182	.00025 MFD.	600 V.
C2	22-954	.00035 MFD.	600 V.
C3	22-825	.1 MFD.	400 V.
C4	22-326	.003 MFD.	400 V.
C5	22-830	.02 MFD.	600 V.
R1	63-296	220 M OHM	¼ W.
R2	63-597	470 M OHM	¼ W.
R3	63-596	330 M OHM	¼ W.
R4	63-271	1 MEG.	¼ W.
R5	63-1103	390 OHM WIREWND.	½ W.
R6	63-121	100 M OHM	1 W.
R7	63-593	47 M OHM	¼ W.
R8	63-1117	VOLUME CONTROL	
1	169-42	WEBSTER AUTOMATIC RECORD PLAYER	
2	85-191	A.C. SWITCH	
3	58-85	A.C. PLUG	
4	85-228	PHONO.-RADIO SW.	

PHONO CIRCUIT DATA

MODEL	SPEAKER
8S 587	49-397 12"
8S 588	49-397 12"

CHASSIS NO. 8A03



DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-954	.00035 MFD.	600 V.
C2	22-887	.001 MFD.	600 V.
C3	22-1065	.0025 MFD.	600 V.
R1	63-597	470 M OHM	¼ W.
R2	63-657	330 M OHM	¼ W.
R3	63-271	1 MEGOHM	¼ W.
1	169-42	WEBSTER AUTOMATIC RECORD PLAYER	
2	85-191	A.C. SWITCH	
3	58-85	A.C. PLUG	
4	85-228	PHONO-RADIO SW.	

PHONO CIRCUIT DATA

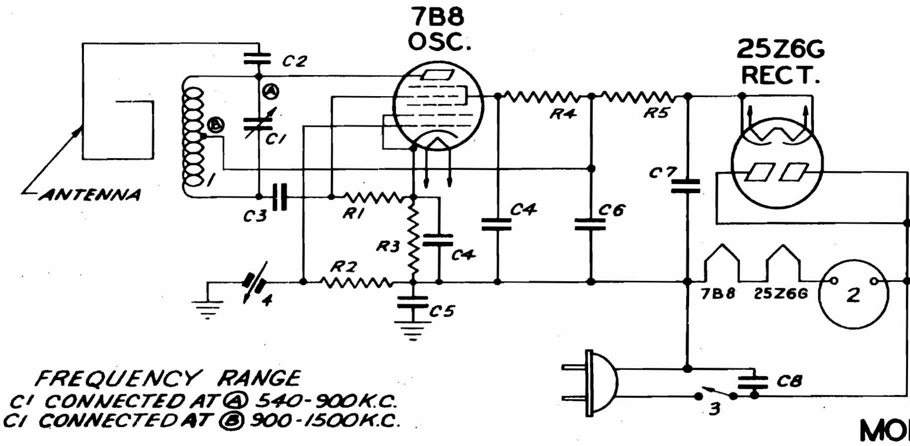
MODEL	SPEAKER
12S595Z	49-401 15"

CHASSIS Nº 12A2

ZENITH RADIO CORP.

MODEL S8500Z
MODEL S9000

C2 WAS 22-162 | 8-3-40

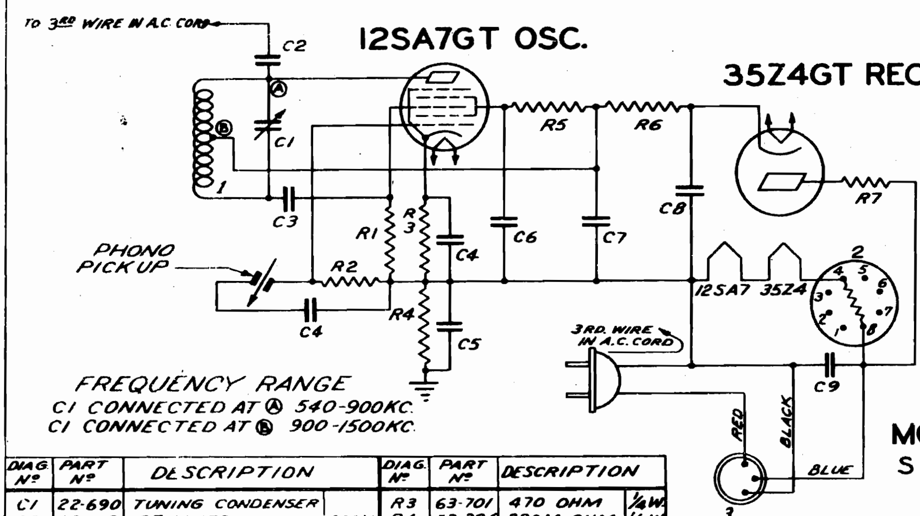


FREQUENCY RANGE
C1 CONNECTED AT Ⓐ 540-900K.C.
C1 CONNECTED AT Ⓑ 900-1500K.C.

MODELS
S8500Z

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-690	TUNING CONDENSER		R2	63-464	1 MEGOHM	¼W.
C2	22-127	25 MMFD.	600V.	R3	63-581	470 OHM	¼W.
C3	22-182	.00025 MFD.	600V.	R4	63-964	4700 OHM	½W.
C4	22-829	.05 MFD.	200V.	R5	63-707	4700 OHM	¼W.
C5	22-827	.1 MFD.	200V.				
C6	22-1061	8 MFD. ELECTROLYTIC	150V.				
C7	22-1061	16 MFD. "	150V.	1	S8611	OSC. COIL ASSEM.	
C8	22-869	.05 MFD.	400V.	2	141-85	MOTOR (60~)	
				3	85-191	A.C. SWITCH	
				4	142-30	PICKUP	
R1	63-593	47M OHM	¼W.				

PHONOGRAPH OSCILLATOR
ZENITH RADIO CORPORATION
CHICAGO ILL.



FREQUENCY RANGE
C1 CONNECTED AT Ⓐ 540-900KC.
C1 CONNECTED AT Ⓑ 900-1500KC.

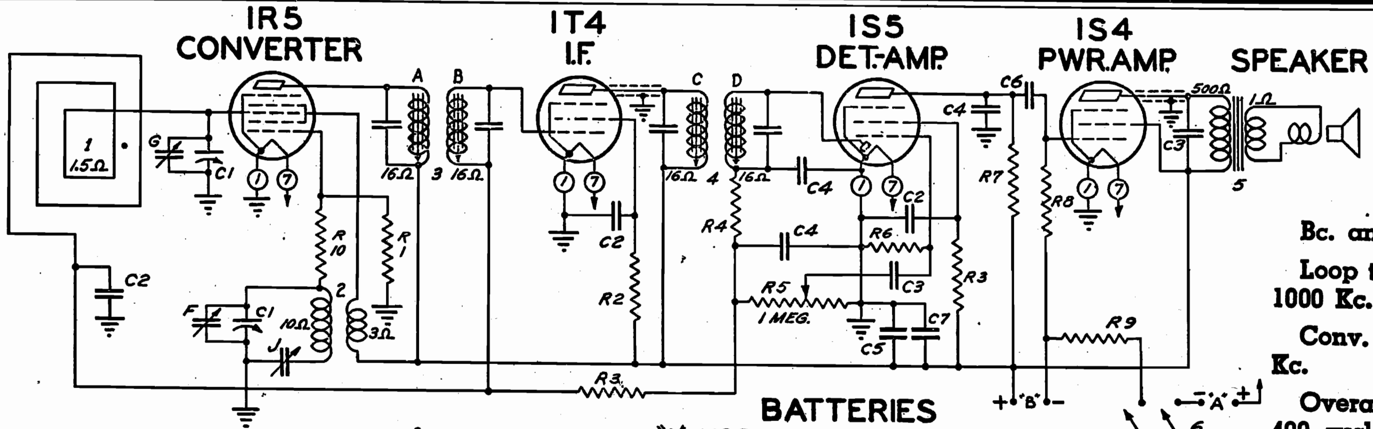
MODEL
S9000

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-690	TUNING CONDENSER		R3	63-701	470 OHM	¼W.
C2	22-127	25 MMFD.	600V.	R4	63-296	220M OHM	¼W.
C3	22-182	.00025 MFD.	600V.	R5	63-964	4700 OHM	½W.
C4	22-829	.05 MFD.	200V	R6	63-803	2200 OHM	½W.
C5	22-827	.1 MFD.	200V.	R7	63-575	47 OHM	¼W.
C6	22-243	.01 MFD.	400V.				
C7	22-876	8 MFD. ELECTROLYTIC	150V.				
C8	22-876	40 MFD. "	150V.	1	S8611	OSC. COIL ASSEM.	
C9	22-828	.05 MFD.	400V.	2	100-76	BALLAST TUBE	
				3	52-208	3 PRONG RECEPTACLE	
R1	63-591	22 M OHM	¼W.				
R2	63-271	1 MEGOHM	¼W.				

PHONOGRAPH OSCILLATOR
ZENITH RADIO CORPORATION
CHICAGO. ILL.

MODEL 4K600, Chassis 4B01

ZENITH RADIO CORP.



Stage Gains:

Bc. and 455 Kc. I.F.

Loop to Conv. grid down 1/3× at 1000 Kc.

Conv. grid to I.F. grid 49× at 455 Kc.

Overall audio 317× at .05 watt, 400 cycles.

Tuning Ranges 540 Kc. to 1620 Kc.

DENOTES CHASSIS "GROUND"

BATTERIES

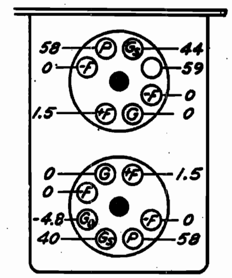
"A"-Nº2 FLASH LIGHT CELLS

"B" {EVEREADY Nº467 / BURGESS NºXX46

MODEL 4K600 — SPEAKER 49-433 3½"

I.F. FREQUENCY 455 KC.
4 TUBE SUPERHETERODYNE
1½V.-BATTERY-PORTABLE
CHASSIS Nº 4B01

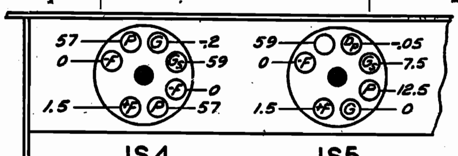
12/9/40



1-29-41 | R10 ADDED

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1167	TWO GANG VARIABLE		R3	63-724	4.7 MEGOHM	1/4W.	4	95-781	2ND I.F. TRANS.
C2	22-1174	.01 MFD.	125V.	R4	63-713	47M OHM	1/4W.	5	95-779	SPKR. TRANS.
C3	22-1169	.001 MFD.	600V.	R5	63-1176	VOLUME CONTROL		6	85-267	PWR. SWITCH
C4	22-162	.0001 MFD.	600V.	R6	63-1093	15 MEGOHM	1/4W.			
C5	22-1176	5 MFD. ELECTROLYTIC	68V.	R7	63-464	1 MEGOHM	1/4W.			
C6	22-1175	.005 MFD.	600V.	R8	63-723	3.3 MEGOHM	1/4W.			
C7	22-1188	.05 MFD.	200V.	R9	63-749	680 OHM	1/4W.	A		1ST I.F.T. PRI.
				R10	63-1234	680 OHM	1/4W.	B		1ST I.F.T. SEC.
								C		2ND I.F.T. PRI.
								D		2ND I.F.T. SEC.
				1	S9385	WAVEMAGNET ASSEMBLY		F		B'DCAST OSCILLATOR
R1	63-715	100M OHM	1/4W.	2	S9354	OSC. COIL ASSEMBLY		G		B'DCAST ANTENNA
R2	63-765	33M OHM	1/4W.	3	95-780	1ST I.F. TRANS.		J	22-1166	B'DCAST PADDER

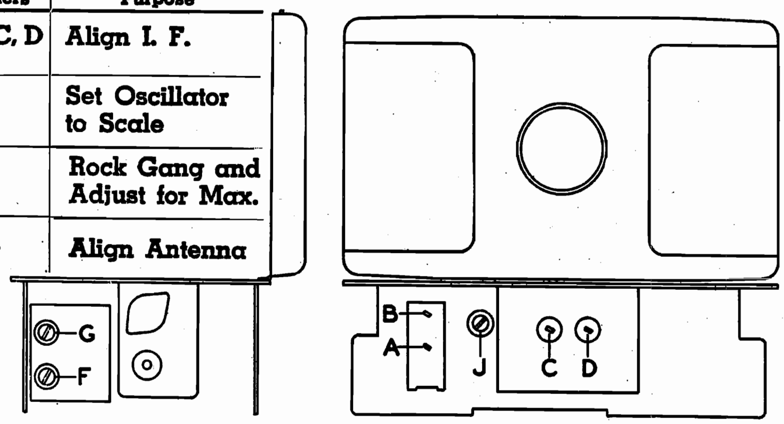
Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.1 mfd.	455 Kc.	—	1600 Kc.	A, B, C, D	Align I. F.
2	1 Turn Loop Made from Generator Leads. Diameter Approx. 10" See Note!	—	1600 Kc.	—	1600 Kc.	F	Set Oscillator to Scale
3		—	600 Kc.	—	600 Kc.	J	Rock Gang and Adjust for Max.
4		—	1400 Kc.	—	1400 Kc.	G	Align Antenna



All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

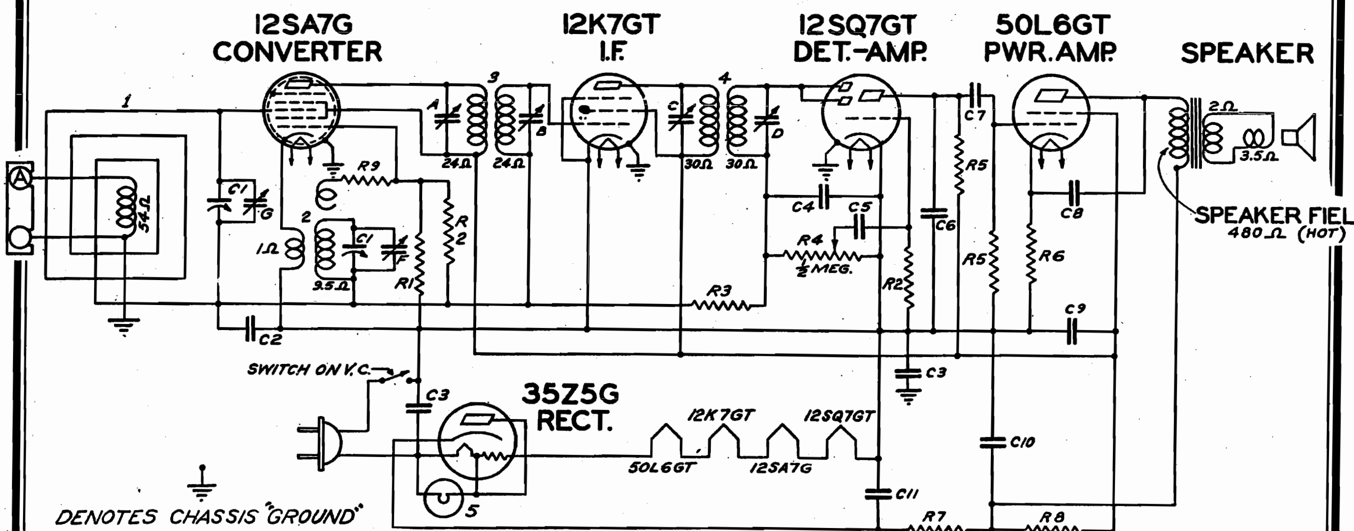
Volume control full on.



TRIMMER LOCATIONS

MODELS 5D610, 5D610W 5D625, Chassis 5B01

ZENITH RADIO CORP.



Power output 1.3 watts.

Tuning Ranges 540 Kc to 1620 Kc.

MODEL	SPEAKER
5 D 610	49-439 4"
5 D 625	49-439 4"

I.F. FREQUENCY 455 KC.
5 TUBE SUPERHETERODYNE
CHASSIS № 5B01 A.C.-D.C.

1-8-41 R9 ADDED

DIAG. №	PART №	DESCRIPTION		DIAG. №	PART №	DESCRIPTION		DIAG. №	PART №	DESCRIPTION
C1	22-1185	TWO-GANG VARIABLE						2	S9450	OSC. COIL ASSEMBLY
C2	22-829	.05 MFD.	200 V.	R1	63-589	10 M OHM	1/4 W.	3	95-696	1ST I.F. TRANS.
C3	22-1017	.05 MFD.	200 V.	R2	63-976	15 MEGOHM	1/4 W.	4	95-794	2ND I.F. TRANS.
C4	22-953	.0002 MFD.	600 V.	R3	63-600	2.2 MEGOHM	1/4 W.	5	100-67	PILOT LIGHT 6.3V. .15A.
C5	22-492	.002 MFD.	600 V.	R4	63-1112	VOLUME CONTROL				
C6	22-854	.0005 MFD.	600 V.	R5	63-597	470M OHM	1/4 W.			
C7	22-243	.01 MFD.	400 V.	R6	63-1171	75 OHM WIREWOUND	1/2 W.	A		1ST I.F. TRANS. PRI.
C8	22-1182	.01 MFD.	400 V.	R7	63-1172	100 OHM WIREWOUND	1/2 W.	B		1ST I.F. TRANS. SEC.
C9		20 MFD. ELECTROLYTIC	150 V.	R8	63-1173	1500 OHM	1 W.	C		2ND I.F. TRANS. PRI.
C10	22-1186	20 MFD. ELECTROLYTIC	150 V.	R9	63-579	220 OHM	1/4 W.	D		2ND I.F. TRANS. SEC.
C11		30 MFD. ELECTROLYTIC	150 V.					F		BROADCAST OSC. (ON GANG)
								G		BROADCAST ANT. (ON GANG)
					S 9452	WAVEMAGNET ASSEMBLY				

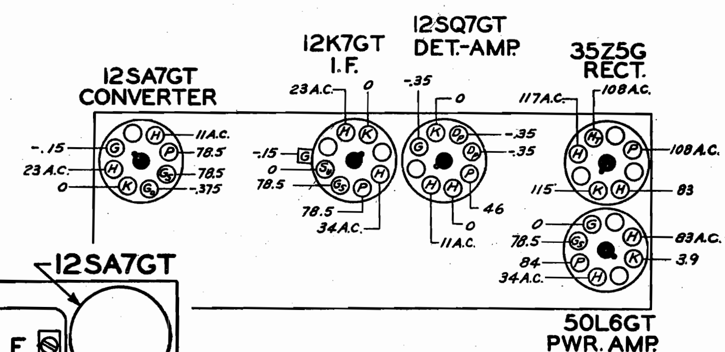
Stage Gains:

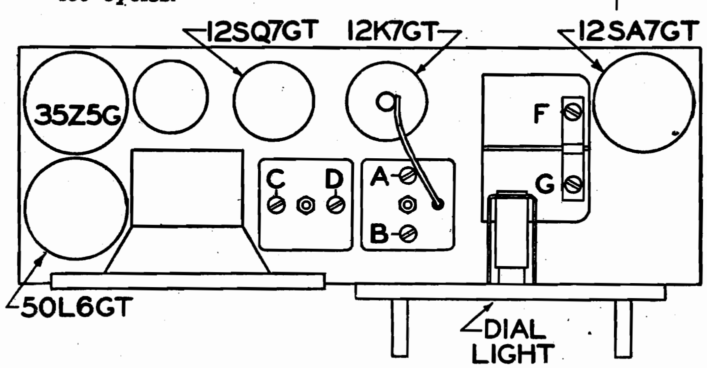
Bc. and 455 Kc. I.F.

Ant. to Conv. grid 7× at 1000 Kc.

Conv. grid to I.F. grid 74× at 455 Kc.

Overall audio 225× at .05 watt, 400 cycles.





TRIMMER LOCATIONS

SOCKET VOLTAGES

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.

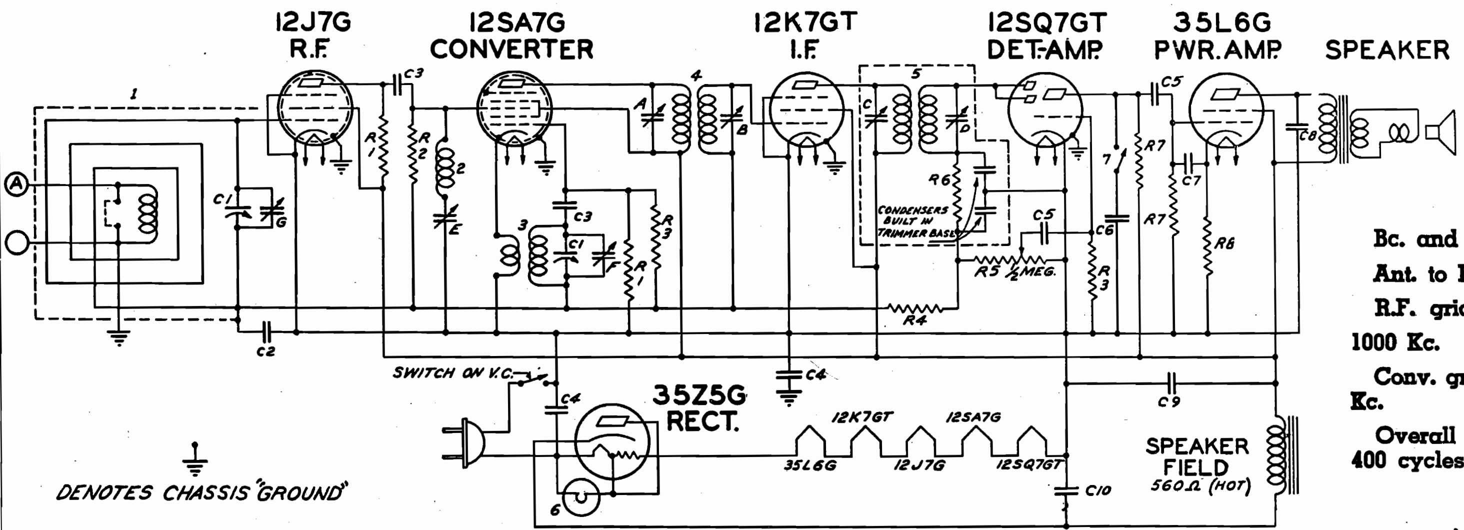
Line voltage 117 A.C.

Power consumption 29 watts.

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.1 mfd.	455 Kc.	—	600 Kc.	A, B, C, D	Align I. F.
2	1 Turn Loop Made from Generator	—	1500 Kc.	—	1500 Kc.	F	Set Oscillator to Scale
3	Leads. See Note!	—	1500 Kc.	—	1500 Kc.	G	Adjust for Maximum

MODEL 6D516, Chassis 6A24

ZENITH RADIO CORP.



Stage Gains:

Bc. and 455 Kc. I.F.

Ant. to R.F. grid 5.5× at 1000 Kc.

R.F. grid to conv. grid 6.2× at 1000 Kc.

Conv. grid to I.F. grid 51× at 455 Kc.

Overall audio 289× at .25 watt, 400 cycles.

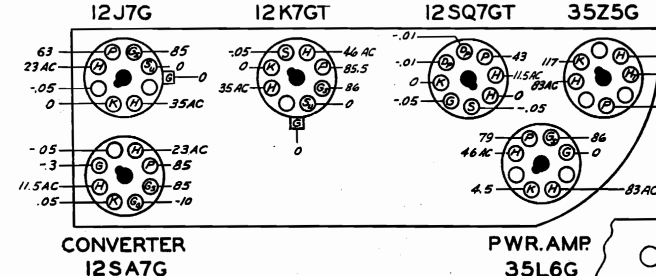
I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS № 6A24 A.C.-D.C.

MODEL 6 D 516 **SPEAKER 49-436 5"**

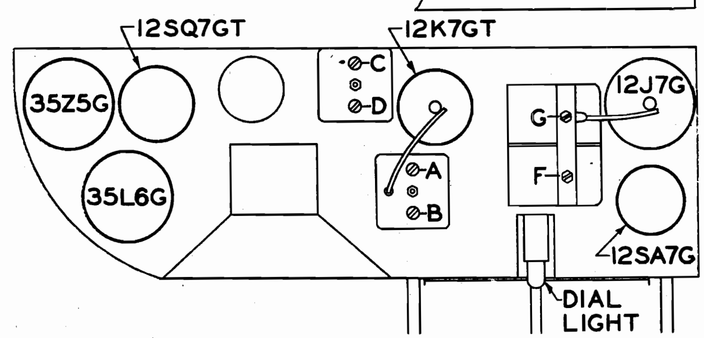
DIAG. №	PART №	DESCRIPTION	
C1	22-1184	TWO-GANG VARIABLE	
C2	22-829	.05 MFD.	200V.
C3	22-162	.0001 MFD.	600V.
C4	22-1017	.05 MFD.	200V.
C5	22-243	.01 MFD.	400V.
C6	22-492	.002 MFD.	600V.
C7	22-854	.0005 MFD.	600V.
C8	22-1049	.03 MFD.	400V.
C9	22-1014	20 MFD. ELECTROLYTIC	150V.
C10	22-1014	20 MFD. ELECTROLYTIC	150V.
R1	63-589	10M OHM	¼W.

DIAG. №	PART №	DESCRIPTION	
R2	63-591	22 M OHM	¼W.
R3	63-976	15 MEGOHM	¼W.
R4	63-600	2.2 MEGOHM	¼W.
R5	63-1130	VOLUME CONTROL	
R6	63-713	47 M OHM	¼W.
R7	63-597	470 M OHM	¼W.
R8	63-686	150 OHM WIREWOUND	½W.
1	S9465	WAVEMAGNET ASSEMBLY	
2	S8326	WAVE TRAP COIL ASSEMBLY	
3	S9437	OSC. COIL ASSEMBLY	

DIAG. №	PART №	DESCRIPTION
4	95-760	1ST I.F. TRANS.
5	95-790	2ND I.F. TRANS.
6	100-67	PILOT LIGHT 6.3V. .15A.
7	85-270	TONE CONTROL SWITCH
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
E	22-1015	WAVE TRAP
F		BROADCAST OSC. (ON GANG)
G		BROADCAST ANT. (ON GANG)



SOCKET VOLTAGES



All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.

Line voltage 117 A.C.

Power consumption 25.5 watts.

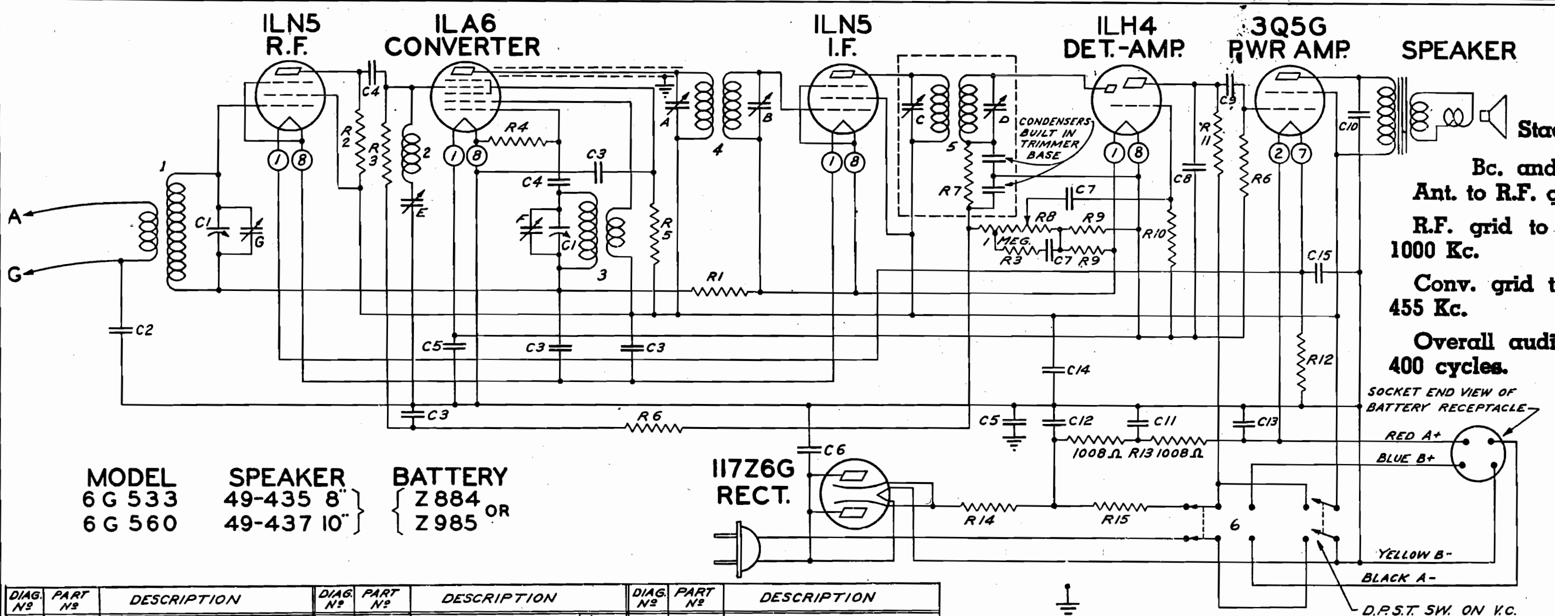
Power output 1. watt.

Tuning Ranges 540 Kc. to 1600 Kc.

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I. F.
2	R. F. Grid	.5 mfd.	455 Kc.	"	600 Kc.	E	Adj. Wave Trap for Minimum
3	1 Turn Loop Made from Generator Leads	——	1600 Kc.	"	1600 Kc.	F	Set Oscillator to Scale
4	See Note!	——	1400 Kc.	"	1400 Kc.	G	Align Antenna

ZENITH RADIO CORP.

MODELS 6G533, 6G560, Chas. 6A25



Stage Gains:

Bc. and 455 Kc. I.F.

Ant. to R.F. grid 5× at 1000 Kc.

R.F. grid to conv. grid 6.5× at 1000 Kc.

Conv. grid to I.F. grid 49.1× at 455 Kc.

Overall audio 322× at .05 watt. 400 cycles.

MODEL	SPEAKER	BATTERY
6G533	49-435 8"	Z884 OR
6G560	49-437 10"	Z985

DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION		DIAG. Nº	PART Nº	DESCRIPTION
C1	22-1181	TWO GANG VARIABLE		R1	63-325	150M OHM	¼ W.	1	20-227	ANTENNA COIL
C2	22-1183	.01 MFD.	400 V.	R2	63-590	15M OHM	¼ W.	2	S 8326	WAVE TRAP COIL ASSEMBLY
C3	22-829	.05 MFD.	200 V.	R3	63-595	100M OHM	¼ W.	3	S 9446	OSCILLATOR COIL ASSEMBLY
C4	22-162	100 MMFD.	600 V.	R4	63-654	180M OHM	¼ W.	4	95-792	1ST I.F. TRANSFORMER
C5	22-827	.1 MFD.	200 V.	R5	63-592	33M OHM	¼ W.	5	95-793	2ND I.F. TRANSFORMER
C6	22-1017	.05 MFD.	200 V.	R6	63-600	2.2 MEGOHM	¼ W.	6	85-171	CHANGEOVER SWITCH
C7	22-492	.002 MFD.	600 V.	R7	63-713	47M OHM	¼ W.			
C8	22-470	.00015 MFD.	600 V.	R8	63-1178	VOLUME CONTROL				
C9	22-196	.01 MFD.	600 V.	R9	63-585	2200 OHM	¼ W.			
C10	22-448	.004 MFD.	600 V.	R10	63-976	15 MEGOHM	¼ W.	A		1ST I.F. TRANS. PRI.
C11	22-1026	20 MFD. ELECTROLYTIC	150 V.	R11	63-271	1 MEGOHM	¼ W.	B		1ST I.F. TRANS. SEC.
C12		40 MFD. ELECTROLYTIC	150 V.	R12	63-1097	870 OHM WIREWOUND	1 W.	C		2ND I.F. TRANS. PRI.
C13	22-1159	20 MFD. ELECTROLYTIC	25 V.	R13	63-1132	2-SECTION CANDOHM		D		2ND I.F. TRANS. SEC.
C14		40 MFD. ELECTROLYTIC	150 V.	R14	63-1096	140 OHM WIREWOUND	2 W.	E	22-1015	WAVE TRAP
C15		40 MFD. ELECTROLYTIC	25 V.	R15	63-1156	1800 OHM	½ W.	F		BROADCAST OSC. (ON GANG)
								G		BROADCAST ANT. (ON GANG)

I.F. FREQUENCY 455KC.
6 TUBE SUPERHETERODYNE
CHASSIS Nº 6A25
110 VOLT A.C.-D.C.-BATTERY PACK

Power output .360 watts.

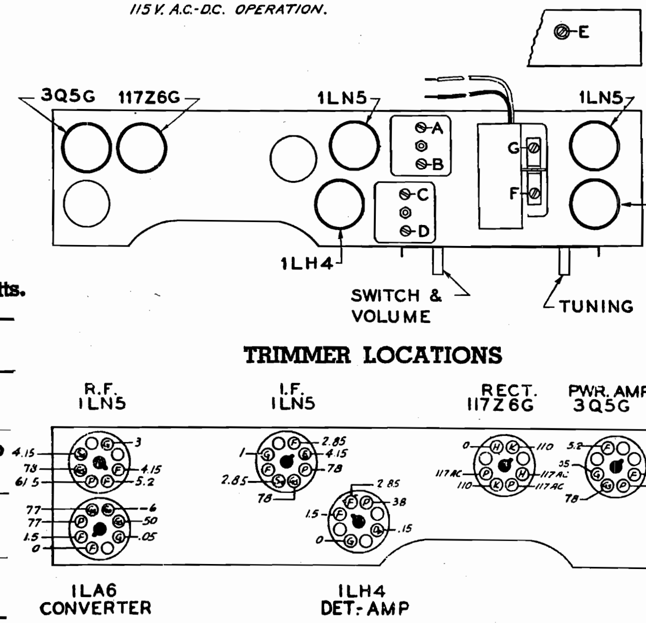
Tuning Ranges 540 Kc. to 1620 Kc.

Volume control full on.

Line voltage 117 A.C.

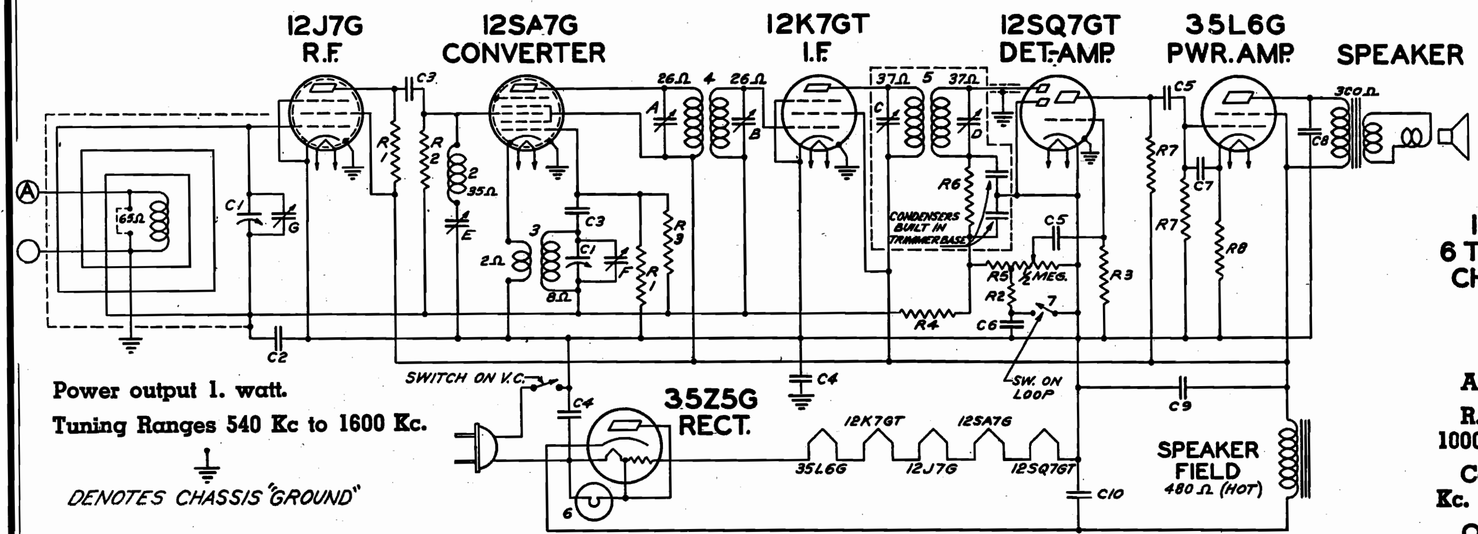
Power consumption 20 watts.

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I. F.
2	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	E	Adj. Wave Trap for Minimum
3	Ant.—Gnd.	200 mmf.	1620 Kc.	BC	1620 Kc.	F	Set Oscillator to Scale
4	Ant.—Gnd.	200 mmf.	1400 Kc.	BC	1400 Kc.	G	Align Antenna



MODELS 6D520, 6D520W
6D538, Chassis 6A26

ZENITH RADIO CORP.



Power output 1. watt.

Tuning Ranges 540 Kc to 1600 Kc.

DENOTES CHASSIS "GROUND"

MODEL	SPEAKER
6D520	49-385 4"
6D538	49-385 4

Volume control full on.

Line voltage 117 A.C.

Power consumption 25.5 watts.

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS № 6A26 A.C.-D.C.

Stage Gains:

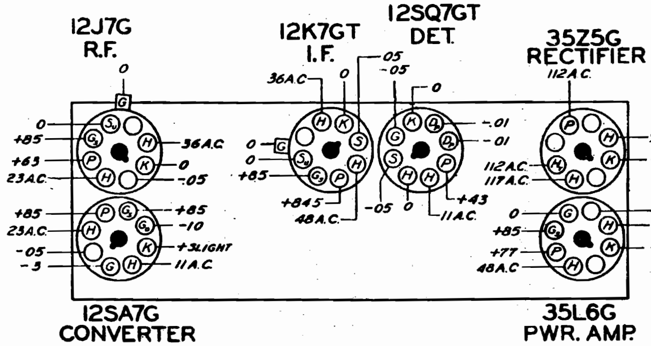
Bc. and 455 Kc. I.F.

Ant. to R.F. grid 5.5× at 1000 Kc.

R.F. grid to conv. grid 6.2× at 1000 Kc.

Conv. grid. to I.F. grid 51× at 455 Kc.

Overall audio 289× at .25 watt. 400 cycles.



SOCKET VOLTAGES

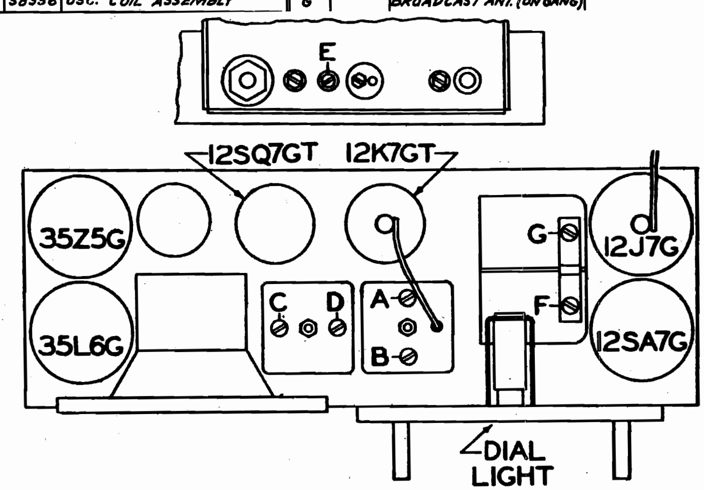
DIAG. №	PART №	DESCRIPTION	
C1	22-1006	TWO-GANG VARIABLE	
C2	22-829	.05 MFD.	200V.
C3	22-162	.0001 MFD.	600V.
C4	22-1017	.05 MFD.	200V.
C5	22-243	.01 MFD.	400V.
C6	22-826	.01 MFD.	200V.
C7	22-854	.0005 MFD.	600V.
C8	22-1182	.01 MFD.	400V.
C9	22-1014	20 MFD. ELECTROLYTIC	150V.
C10		20 MFD. ELECTROLYTIC	150V.
R1	63-589	10M OHM	1/4W.

DIAG. №	PART №	DESCRIPTION	
R2	63-591	22 M OHM	1/4W.
R3	63-1093	15 MEGOHM	1/4W.
R4	63-600	2.2 MEGOHM	1/4W.
R5	63-1149	VOLUME CONTROL	
R6	63-713	47 M OHM	1/4W.
R7	63-597	470 M OHM	1/4W.
R8	63-686	150 OHM WIREWOUND	2W.
		1-23-41 R2 AT V.C. ADDED	
		2-6-41 T.C. CIRCUIT CHANGED	
		2-13-41 DIODE PLATE TO CATH.	
1	S8356	WAVEMAGNET ASSEMBLY	
2	S8326	WAVE TRAP COIL ASSEMBLY	
3	S8336	OSC. COIL ASSEMBLY	

DIAG. №	PART №	DESCRIPTION
4	95-696	1ST I.F. TRANS.
5	95-697	2ND I.F. TRANS.
6	100-67	PILOT LIGHT 6.3V. .15A
7	85-257	TONE CONTROL SWITCH
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
E	22-1015	WAVE TRAP
F		BROADCAST OSC. (ON GANG)
G		BROADCAST ANT. (ON GANG)

All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.



Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I. F.
2	R. F. Grid	.5 mfd.	455 Kc.	BC	600 Kc.	E	Adj. Wave Trap for Minimum
3	1 Turn Loop Made from Generator Leads. See Note!	——	1600 Kc.	BC	1600 Kc.	F	Set Oscillator to Scale
4		——	1400 Kc.	BC	1400 Kc.	G	Align Antenna

ZENITH RADIO CORP.

MODELS 6S546, 6S556
6S532
MODELS 10H571R, 10H573

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I. F.
2	R. F. Grid	.5 mfd.	455 Kc.	BC	600 Kc.	E	Adj. Wave Trap for Minimum
3		—	18 Mc.	SW	18 Mc.	K	Set Oscillator to Scale
4	1 Turn Loop Made	—	1500 Kc.	BC	1500 Kc.	F	Set Oscillator to Scale
5	from Generator Leads.	—	1500 Kc.	BC	1500	G	Align Atenna
6	See Note!	—	600 Kc.	BC	600 Kc.	J	Rock Gang and Adjust for Max.
7		—	16 Mc.	SW	16 Mc.	M	Align Antenna

ALIGNMENT AND TRIMMER LOCATIONS FOR MODELS 6A05 6A05R

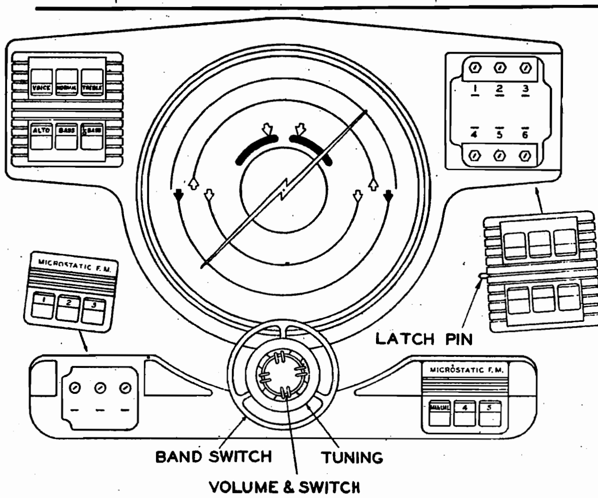
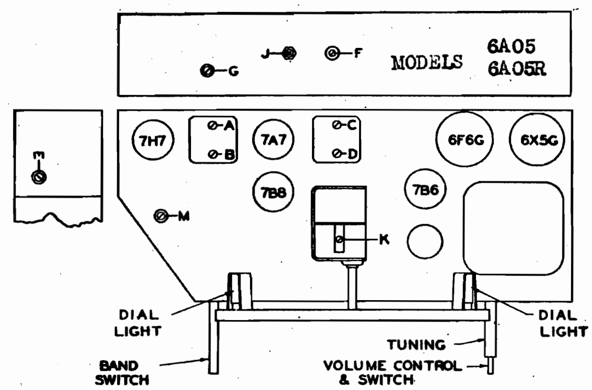


Fig. 2



TRIMMER LOCATIONS

MODELS 10H571R, 10H573

AUTOMATIC

It will be necessary to first set the automatic tuning adjustments to six preselected stations before the automatic tuning can be used.

Each button and its associated tuning adjustment will tune over a portion of the broadcast band, and any station within its tuning range may be selected for automatic tuning on that button.

The tuning ranges are as follows: (See Fig. 2)

No. 1 button—upper left .....545 K.C. to 940 K.C. *No. 4 button—lower left .....740 K.C. to 1300 K.C.*

No. 2 button—upper center ..600 K.C. to 1050 K.C. *No. 5 button—lower center ..880 K.C. to 1550 K.C.*

No. 3 button—upper right ....660 K.C. to 1150 K.C. *No. 6 button—lower right ....880 K.C. to 1550 K.C.*

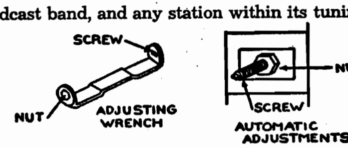


Fig. 4.

To adjust the automatic tuning proceed as follows:

A. Remove the automatic cover plate by pressing on latch pin and lifting away from escutcheon.

B. Select a station within the range of the No. 1 button.

C. Turn the band switch to Broadcast and then tune in the selected station on the dial—then turn band switch to Automatic position.

D. Press the No. 1 button and tune in the same station on the adjacent automatic adjustments by using the special wrench furnished with the receiver. (See Fig. 4.) First, adjust the screw and then the hexagonal nut to the setting which gives the loudest and clearest reception on the desired station. Repeat the operation for greatest accuracy.

AUTOMATIC-FREQUENCY MODULATION BAND

The six push buttons across the lower part of the control panel (See Figure 2) provide means of tuning F.M. stations either manually or automatically. Five of these push buttons may be preset for five F.M. stations as follows:

(1) Select station within range of No. 1 button.

(2) Remove covers from adjusting screws by pulling latch pin and lifting covers.

(3) Turn band switch to F.M., press No. 1 button and tune in desired station on adjacent adjustment, using adjustment wrench.

(4) Follow the same procedure on remaining 4 buttons.

(5) Replace covers.

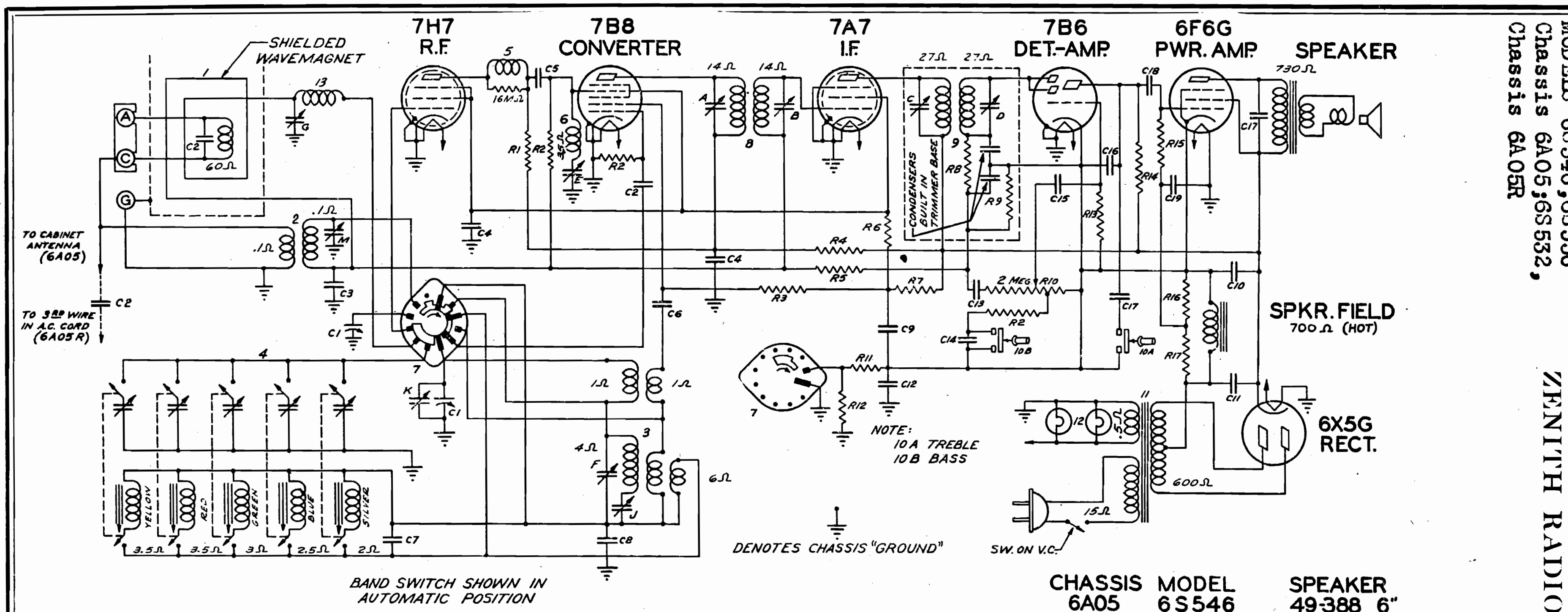
The tuning range covered by each adjusting screw is as follows:

No. 1 Button — 45.5 M.C. to 50.5 M.C. No. 2 Button — 45 M.C. to 50.5 M.C.
No. 3 Button — 43 M.C. to 49 M.C.

Manual Tuning:
No. 4 Button — 41.5 M.C. to 49.5 M.C. No. 5 Button — 41.5 M.C. to 48 M.C.

MODELS 6S546, 6S556
Chassis 6A05; 6S532,
Chassis 6A05R

ZENITH RADIO CORP.



BAND SWITCH SHOWN IN AUTOMATIC POSITION

DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION			DIAG. No.	PART No.	DESCRIPTION		DIAG. No.	PART No.	DESCRIPTION
C1	22-1044	TWO GANG VARIABLE		C19	22-138	.2 MFD.	6A05	200 V.	R15	63-597	470 M OHM	1/4 W.	13	S8474	LOOP LOADING COIL
C2	22-289	50 MMFD.	600 V.	C19	22-827	.1 MFD.	6A05R	200 V.	R16	63-654	180 M OHM	1/4 W.			
C3	22-829	.05 MFD.	200 V.						R17	63-656	270 M OHM	1/4 W.			
C4	22-828	.05 MFD.	400 V.										A		1ST I.F. TRANS. PRI.
C5	22-162	.0001 MFD.	600 V.	R1	63-637	4700 OHM		1/4 W.					B		1ST I.F. " SEC.
C6	22-182	.00025 MFD.	600 V.	R2	63-593	47 M OHM		1/4 W.					C		2ND I.F. " PRI.
C7	22-868	COMPENSATING COND.		R3	63-150	10 M OHM		1/2 W.	1		WAVEMAGNET ASSEMBLY		D		2ND I.F. " SEC.
C8	22-1022	.005 MFD.	600 V.	R4	63-583	1000 OHM		1/4 W.	2	S8507	ANTENNA COIL ASSEMBLY		E	22-1015	WAVE TRAP
C9	22-1034	5 MFD. ELECTROLYTIC	450 V.	R5	63-599	1.5 MEGOHM		1/4 W.	3	S8508	OSCILLATOR COIL ASSEMBLY		F	22-1042	BROADCAST OSCILLATOR
C10	22-1034	15 MFD. "	350 V.	R6	63-1102	15 M OHM		1/2 W.	4		AUTOMATIC TUNING UNIT		G	22-1042	BROADCAST ANTENNA
C11	22-1036	14 MFD. "	450 V.	R7	63-1101	8200 OHM		2 W.	5	S8359	R.F. CHOKE & RES. ASSEMBLY		J	22-1023	BROADCAST PADDER
C12	22-827	.1 MFD.	200 V.	R8	63-713	47 M OHM		1/4 W.	6	S8326	WAVE TRAP ASSEMBLY		K		SHORT WAVE OSC. (ON GANG)
C13	22-188	.02 MFD.	400 V.	R9	63-719	470 M OHM		1/4 W.	7	85-233	BAND SELECTOR SWITCH		M	22-1042	SHORT WAVE ANTENNA
C14	22-229	.005 MFD.	600 V.	R10	63-1123	VOLUME CONTROL			8	95-708	1ST I.F. TRANSFORMER				
C15	22-492	.002 MFD.	600 V.	R11	63-1098	42 OHM WIREWOUND		1/2 W.	9	95-709	2ND I.F. TRANSFORMER				
C16	22-854	.0005 MFD.	600 V.	R12	63-624	68 OHM		1/4 W.	10	S8531	TONE CONTROL SWITCH				
C17	22-448	.004 MFD.	600 V.	R13	63-976	15 MEGOHM		1/4 W.	11	95-710	POWER TRANS. 50-60 ~ 117 V.				
C18	22-830	.02 MFD.	600 V.	R14	63-296	220 M OHM		1/4 W.	12	100-36	PILOT LIGHT 6.3 V. .25 A.				

CHASSIS	MODEL	SPEAKER
6A05	6S546	49-388 6"
6A05	6S556	49-390 10"
6A05R	6S532	49-438 6"

Power output 6. watts.

Tuning Ranges 545 Kc. to 1570 Kc. 5.7 Mc. to 18.3 Mc.

I.F. FREQUENCY 455 KC.
6 TUBE SUPERHETERODYNE
CHASSIS No. 6A05 & 6A05R 2 BAND A.C.

Stage Gains:

Bc. and 455 Kc. I.F.

Ant. to R.F. grid 3.8× at 1000 Kc.

R.F. grid to conv. grid 7× at 1000 Kc.

Conv. grid to I.F. grid 92× at 455 Kc.

Overall audio 778× at 1 watt, 400 cycles.

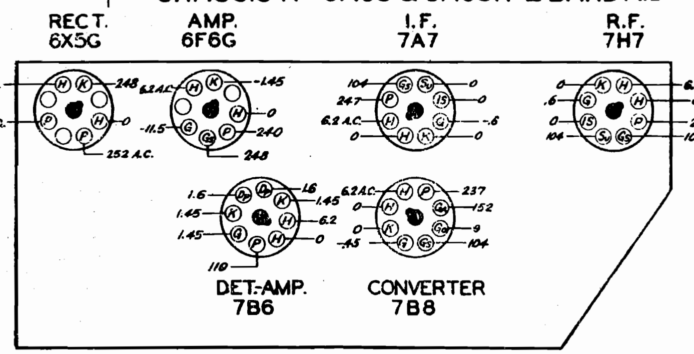
All voltages measured with a 20,000 ohm per volt meter from chassis to socket contact indicated.

All voltages are positive D.C. unless marked otherwise.

Volume control full on.

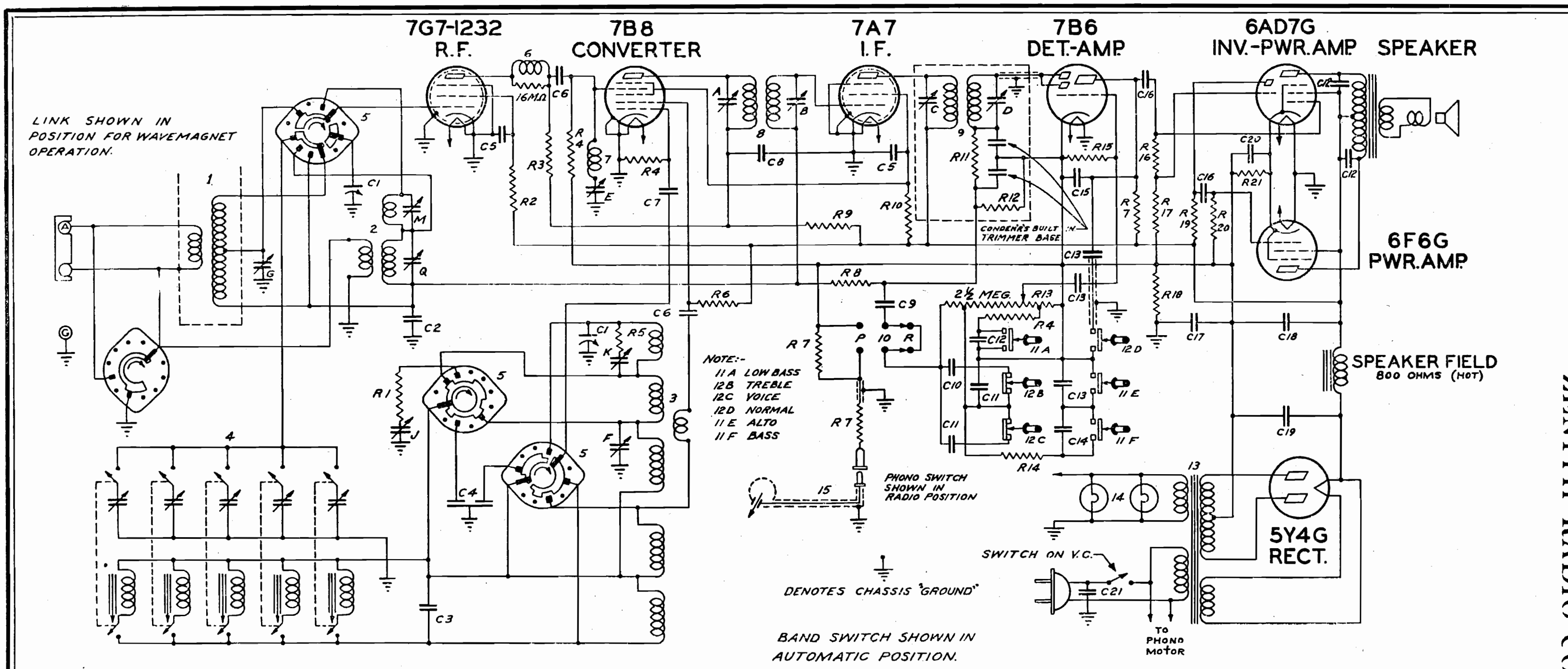
Line voltage 117 A.C.

Power consumption 60 watts.



ZENITH RADIO CORP

MODEL 7S598, Chassis 7A11



I.F. FREQUENCY 455 KC.
7 TUBE SUPERHETERODYNE
CHASSIS Nº 7A11-3 BAND A.C.-PHONO

MODEL
7S598

SPEAKER
49-441 10"

DIAG. Nº	PART Nº	DESCRIPTION	
C1	22-1030	TWO GANG VARIABLE	
C2	22-829	.05 MFD.	200V
C3	22-868	COMPENSATING COND	
C4	22-1037	DUAL PADDER	
C5	22-828	.05 MFD.	400V.
C6	22-182	.00025 MFD.	600V.
C7	22-289	50 MMFD.	600V
C8	22-825	.1 MFD	400V.
C9	22-327	.02 MFD.	200V.
C10	22-954	.00035 MFD.	600V.
C11	22-470	.00015 MFD.	600V.
C12	22-229	.005 MFD.	600V.
C13	22-448	.004 MFD.	600V.
C14	22-492	.002 MFD.	600V.
C15	22-854	.0005 MFD.	600V.
C16	22-196	.01 MFD.	600V.
C17	22-827	.1 MFD.	200V.
C18	22-1187	20 MFD. ELECTROLYTIC	450V.
C19	22-1187	20 MFD. ELECTROLYTIC	450V.
C20	22-1187	40 MFD. ELECTROLYTIC	35V.
C21	22-1041	.005 MFD.	600V.

DIAG. Nº	PART Nº	DESCRIPTION	
R1	63-694	33 OHM	1/4 W.
R2	63-260	100M OHM	1/4 W
R3	63-587	4700 OHM	1/4 W.
R4	63-593	47M OHM	1/4 W.
R5	63-621	39 OHM	1/4 W.
R6	63-589	10M OHM	1/4 W
R7	63-296	220M OHM	1/4 W.
R8	63-599	1.5 MEGOHM	1/4 W
R9	63-605	1000 OHM	1/2 W.
R10	63-960	68M OHM	1/2 W.
R11	63-713	47M OHM	1/4 W.
R12	63-719	470M OHM	1/4 W.
R13	63-1122	VOLUME CONTROL	
R14	63-594	68M OHM	1/4 W.
R15	63-976	15 MEGOHM	1/4 W
R16	63-657	330M OHM	1/4 W.
R17	63-652	120M OHM	1/4 W.
R18	63-975	82 OHM WIREWOUND	1/2 W
R19	63-772	150M OHM	1/4 W.
R20	63-659	470M OHM	1/4 W

DIAG. Nº	PART Nº	DESCRIPTION	
R21	63-1174	420 OHM WIREWOUND	1½ W.
1		WAVEMAGNET ASSEMBLY	
2	S8404	ANTENNA COIL ASSEMBLY	
3	S8403	OSCILLATOR COIL ASSEM.	
4		AUTOMATIC TUNING ASSEM.	
5	85-247	BAND SELECTOR SWITCH	
6	S8359	R.F. CHOKE & RES. ASSEM.	
7	S8326	WAVE TRAP COIL ASSEM.	
8	95-703	1ST I.F. TRANSFORMER	
9	95-761	2ND I.F. TRANSFORMER	
10	85-171	PHONO-RADIO SWITCH	
11	S8449	TONE CONTROL ASSEM. (LEFT)	
12	S8449	TONE CONTROL ASSEM. (RIGHT)	
13	95-756	PWR. TRANS. 50-60~ 117 V.	
14	100-36	PILOT LIGHT 6.3V. .25A.	
15		PICK-UP	

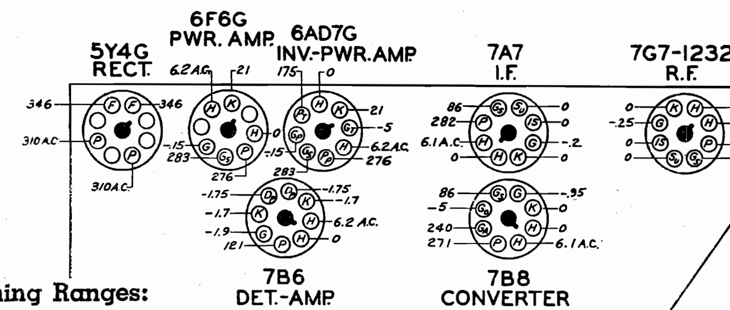
DIAG. Nº	PART Nº	DESCRIPTION
A		1ST I.F. TRANS. PRI.
B		1ST I.F. TRANS. SEC.
C		2ND I.F. TRANS. PRI.
D		2ND I.F. TRANS. SEC.
E	22-1015	WAVETRAP
F		BROADCAST OSC. (NOTE 1)
G		BROADCAST ANT. (NOTE 2)
J		BROADCAST PADDER (NOTE 2)
K		SHORT WAVE OSC. (NOTE 1)
M		SHORT WAVE ANT. (NOTE 2)
Q		POLICE BAND ANT. (NOTE 2)

NOTES
(1) TRIMMERS F & K ARE MOUNTED ON STRIP #22-1033
(2) TRIMMERS G, J, M & Q ARE MOUNTED ON STRIP #22-1031

2 7 41 | C20 WAS 20MFD. C22 OMITTED

Volume control full on.
Line voltage 117 A.C.
Power consumption 77 watts.
Power output 8.4 watts.

Tuning Ranges:
540 Kc. to 1570 Kc.
1.55 Mc. to 4.8 Mc.
5.8 Mc. to 18.3 Mc.



SOCKET VOLTAGES

MODEL 7S598
MODELS 10H571R, 10H573

ZENITH RADIO CORP.

ALIGNMENT PROCEDURE

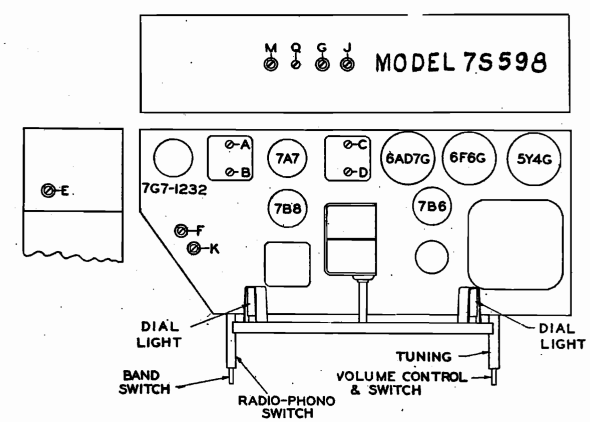
Model 7S598

Chassis No. 7A11

Operation	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D	Align I. F.
2	R. F. Grid	.5 mfd.	455 Kc.	BC	600 Kc.	E	Adj. Wave Trap for Minimum
3	1 Turn Loop Made with Generator Leads to 10" dia. See Note!	—	18 Mc.	SW	18 Mc.	K	Set Oscillator to Scale
4		—	16 Mc.	SW	16 Mc.	M	Align Antenna
5		—	4.5 Mc.	Med.	4.5 Mc.	Q	Rock Gang and Adjust for Max.
6		—	1500 Kc.	BC	1500 Kc.	F	Set Oscillator to Scale
7		—	1400 Kc.	BC	1400 Kc.	G	Align Antenna
8			600 Kc.	BC	600 Kc.	J	Rock Gang and Adjust for Max.
9	Repeat operations 6 - 7 and 3 - 4						

Stage Gains:

Bc. and 455 Kc. I.F.
Ant. to R.F. grid 3.2× at 1000 Kc.
R.F. grid to conv. grid 8.1× at 1000 Kc.
Conv. grid to I.F. grid 65× at 455 Kc.
Overall audio 1411× at 1 watt, 400 cycles.



TRIMMER LOCATIONS

Models 10H571R, 10H573

Chassis No. 10A3R

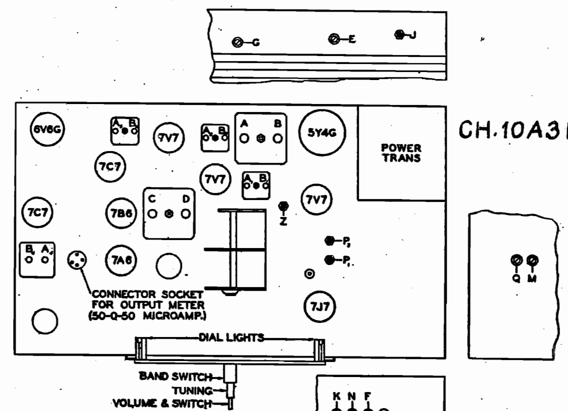
Note: Adjust FM I.F. frequency to value designated on I.F. transformer.

ALIGNMENT PROCEDURE

Opr.	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
1	Converter Grid	.5 mfd.	455 Kc.	BC	600 Kc.	A, B, C, D,	Align I. F.
2	R. F. Grid	"	455 Kc.	BC	600 Kc.	E	Adj. Wave Trap for Minimum
3	Antenna Z and G	400 ohms	18 Mc.	SW	18 Mc.	K	Set Oscillator to Scale
4	"	"	16 Mc.	SW	16 Mc.	M	Align Antenna
5	"	"	5.0 Mc.	Med.	5.0 Mc.	N	Set Oscillator to Scale
6	"	"	4.5 Mc.	Med.	4.5 Mc.	Q	Align Antenna
7	1 Turn Loop Made with Generator Leads to 10" dia. See Note!	—	1400 Kc.	BC	1400 Kc.	F	Set Oscillator to Scale
8		—	1400 Kc.	BC	1400 Kc.	G	Align Antenna
9		—	600 Kc.	BC	600 Kc.	J	Rock Gang to Track BC Padder

F. M. ALIGNMENT — See Pages 126-127
X = FM output meter across full discriminator load.
Y = FM output meter across half discriminator load.

Opr.	Connect Test Oscillator to	Dummy Antenna	Input Signal Frequency	Band	Set Dial At	Trimmers	Purpose
10	7V7 2nd I.F. Grid	.5 mfd.	8.6 Mc.	Manual FM	8.6 Mc.	A 4	Align for Maximum deflection—Y
11	"	"	8.6 Mc.	"	8.6 Mc.	B 4	Align for Zero deflection—X
12	"	"	8.6 Mc.	"	8.6 Mc.	A 3 - B 3	Align for Maximum deflection—Y
13	7V7 1st I. F. Grid	"	8.6 Mc.	"	8.6 Mc.	A 2 - B 2	" — Y
14	Converter Grid	"	8.6 Mc.	"	8.6 Mc.	A 1 - B 1	" — Y
15	FM Ant. Terminals	100 ohms	46. Mc.	"	46. Mc.	Adj. Cam on Gang Shaft to Scale Osc.	Align for Zero deflection—X
16	"	"	42.5 Mc.	"	42.5 Mc.	P1	Align for Maximum deflection—Y
17	"	"	49. Mc.	"	49. Mc.	P 2	" — Y
18	"	"	46. Mc.	"	46. Mc.	Z	" — Y

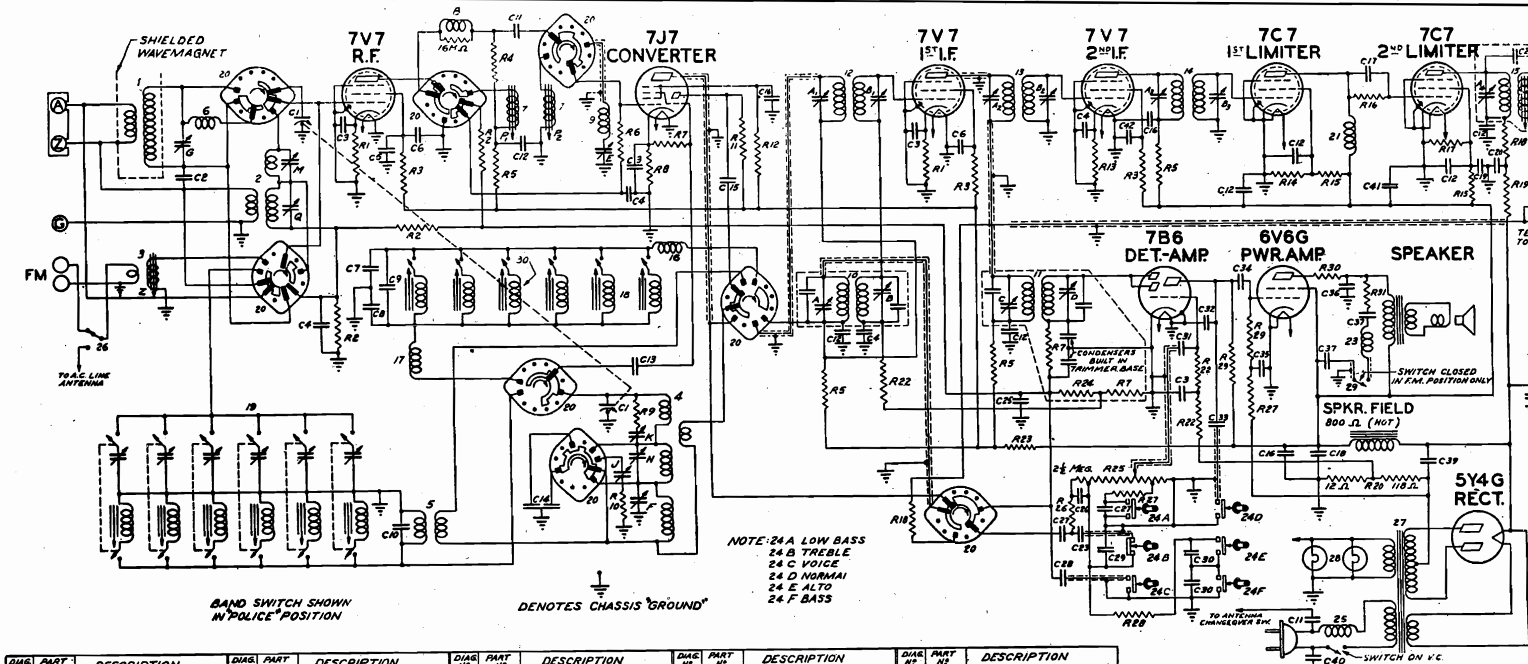


CH.10A3R

TRIMMER LOCATIONS

ZENITH RADIO CORP.

MODELS 10H571R, 10H573
Chassis 10A3R



Tuning Ranges

540 Kc. to 1600 Kc.
1.5 Mc. to 5.2 Mc.
5.7 Mc. to 18.5 Mc.
41.5 Mc. to 50.5 Mc.

MODEL	SPEAKER
10H571R	49-424 12"
10H573	49-424 12"

AMP. MOD. I.F. FREQUENCY 455 KC.
FREQ. MOD. I.F. FREQUENCY 8.6 MC.
10 TUBE SUPERHETERODYNE
CHASSIS No 10A3R-A.C.-4 BAND

DIAG. No	PART No	DESCRIPTION	
C1	22-1121	TWO GANG VARIABLE	
C2	22-319	.005 MFD.	200 V.
C3	22-827	.1 MFD.	200 V.
C4	22-829	.05 MFD.	200 V.
C5	22-1123	5 MFD. ELECTROLYTIC	300 V.
C6	22-243	.01 MFD.	400 V.
C7	22-1146	50 MMFD. COMP.	
C8	22-1139	50 MMFD. COMP.	
C9	22-1193	15 MMFD. CERAMIC	
C10	22-868	COMPENSATING COND.	
C11	22-162	.0001 MFD.	600 V.
C12	22-825	.1 MFD.	400 V.
C13	22-1140	50 MMFD.	600 V.
C14	22-1039	DUAL PADDER	
C15	22-358	.002 MFD.	600 V.
C16	22-828	.05 MFD.	400 V.
C17	22-127	25 MMFD.	600 V.
C18		30 MFD. ELECTROLYTIC	450 V.
C19	22-1178	5 MFD. "	300 V.
C20		15 MFD. "	250 V.
C21	22-1196	.0005 MFD.	600 V.
C22	22-1143	25 MMFD.	600 V.
C23	22-289	50 MMFD.	600 V.
C24	22-1138	.0005 MFD.	600 V.
C25	22-348	.001 MFD.	600 V.
C26	22-1130	15 MMFD.	600 V.
C27	22-1127	.02 MFD.	400 V.
C28	22-1135	.005 MFD.	600 V.

DIAG. No	PART No	DESCRIPTION	
C29	22-1137	.00015 MFD.	600 V.
C30	22-1126	.01 MFD.	400 V.
C31	22-188	.02 MFD.	400 V.
C32	22-1136	.00025 MFD.	600 V.
C33	22-448	.004 MFD.	600 V.
C34	22-830	.02 MFD.	600 V.
C35	22-1202	.04 MFD.	200 V.
C36	22-1134	.002 MFD.	1000 V.
C37	22-366	.04 MFD.	600 V.
C38	22-1129	.0005 MFD.	1000 V.
C39	22-1124	30 MFD. ELECTROLYTIC	450 V.
C40	22-1041	.005 MFD.	600 V.
C41	22-229	.005 MFD.	600 V.
C42	22-492	.002 MFD.	600 V.
R1	63-741	150 OHM	¼ W.
R2	63-600	2.2 MEGOHM	¼ W.
R3	63-1159	39M OHM	1 W.
R4	63-1163	2200 OHM	½ W.
R5	63-605	1000 OHM	½ W.
R6	63-715	100M OHM	¼ W.
R7	63-713	47M OHM	¼ W.
R8	63-1164	300 OHM	½ W.
R9	63-576	68 OHM	¼ W.
R10	63-572	15 OHM	¼ W.
R11	63-943	4700 OHM	1 W.
R12	63-1160	56M OHM	1 W.
R13	63-246	150 OHM	¼ W.

DIAG. No	PART No	DESCRIPTION	
R14	63-1180	15M OHM	½ W.
R15	63-1162	33M OHM	1 W.
R16	63-597	470M OHM	¼ W.
R17	63-607	15M OHM	½ W.
R18	63-583	1000 OHM	¼ W.
R19	63-679	82M OHM	1 W.
R20	63-1150	2 SECTION CANDOHM	
R21	63-160	100M OHM	½ W.
R22	63-271	1 MEGOHM	¼ W.
R23	63-1179	1000 OHM	1 W.
R24	63-773	180M OHM	¼ W.
R25	63-1074	VOLUME CONTROL	
R26	63-701	470 OHM	¼ W.
R27	63-593	47M OHM	¼ W.
R28	63-594	68M OHM	¼ W.
R29	63-296	220M OHM	¼ W.
R30	63-1158	100 OHM	½ W.
R31	63-156	10M OHM	1 W.
1		WAVEMAGNET ASSEMBLY	
2	S 9075	ANTENNA COIL " (S.W.)	
3	S 9065	ANTENNA COIL " (F.M.)	
4	S 9074	OSCILLATOR COIL "	
5	S 8466	OSCILLATOR COUPLING COIL	
6	S 9044	LOOP LOADING COIL	
7	S 9066	DETECTOR COIL ASSEM. (F.M.)	

DIAG. No	PART No	DESCRIPTION
8	S 8359	COIL & RES. ASSEMBLY
9	S 8326	WAVETRAP "
10	95-765	1ST I.F. TRANSFORMER (A.M.)
11	95-766	2ND I.F. " (A.M.)
12	95-785	1ST I.F. " (F.M.)
13	95-786	2ND I.F. " (F.M.)
14	95-787	3RD I.F. " (F.M.)
15	95-788	DISCRIMINATOR I.F. TRANS. (F.M.)
16	S 9535	PLATE PEAKING COIL
17	S 9350	GRID " "
18		AUTOMATIC TUNING UNIT (F.M.)
19		AUTOMATIC TUNING UNIT (BC.)
20	85-234	BAND SELECTOR SWITCH
21	S 9483	PLATE CHOKE
22	S 9503	F.M. I.F. WAVETRAP
23	20-230	SPEAKER COMP. FILTER
24	S 8490	TONE CONTROL SW. ASSEM.
25	S 9504	LINE CHOKE
26	85-238	ANTENNA CHANGEOVER SW.
27	95-771 / 95-773	POWER TRANS. 50-60~ / 25~
28	100-36	PILOT LIGHT 6.3V. .25A.
29	85-273	AUDIO FILTER SWITCH
30	S 9562	MANUAL F.M. OSC. COIL
A		1ST I.F. TRANS. PRI. (A.M.)
B		1ST I.F. " SEC. (A.M.)
C		2ND I.F. " PRI. (A.M.)
D		2ND I.F. " SEC. (A.M.)

DIAG. No	PART No	DESCRIPTION
A1		1ST I.F. TRANS. PRI. (F.M.)
B1		1ST I.F. " SEC. (F.M.)
A2		2ND I.F. " PRI. (F.M.)
B2		2ND I.F. " SEC. (F.M.)
A3		3RD I.F. " PRI. (F.M.)
B3		3RD I.F. " SEC. (F.M.)
A4		DISCRIMINATOR I.F. TRANS. PRI.
B4		DISCRIMINATOR I.F. " SEC.
E	22-1015	WAVETRAP
F		BROADCAST OSC. NOTE 1
G	22-1042	BROADCAST ANTENNA
J	22-688	BROADCAST PADDER
K		SHORT WAVE OSC. NOTE 1
M		SHORT WAVE ANT. NOTE 2
N		POLICE BAND OSC. NOTE 1
P1		ULTRA HIGH FREQ. DET. (PLATE)
P2		ULTRA HIGH FREQ. DET. (GRID)
Q		POLICE BAND ANT. NOTE 2
Z		ULTRA HIGH FREQ. ANTENNA

NOTE:
(1) TRIMMERS F, K & N ARE MOUNTED ON STRIP #22-850
(2) TRIMMERS M & Q ARE MOUNTED ON STRIP #22-1045

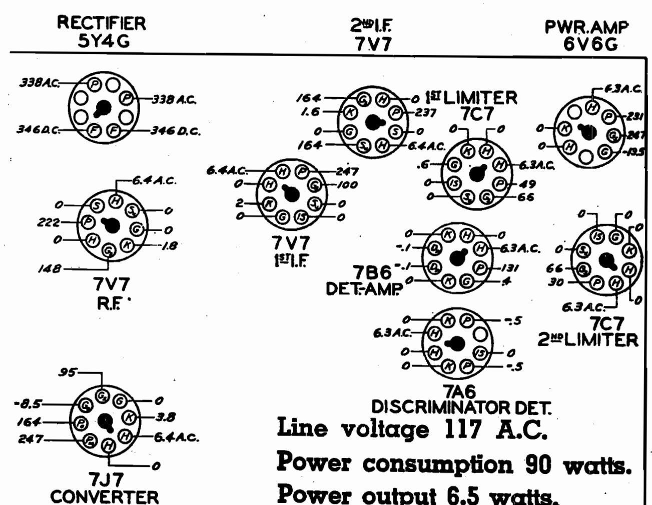
Stage Gains:

Bc. and 455 Kc. I.F.

Ant. to R.F. 6.5× at 1000 Kc.
R.F. grid to conv. grid 28.1× at 1000 Kc.
Conv. grid to I.F. grid 31.3× at 455 Kc.
Overall audio 800× at 1 watt, 400 cycles.

Fm. and 8.6 Mc. I.F.

Ant. to R.F. grid — 1.8× at 46. Mc.
R.F. grid to conv. grid — 7.9× at 46. Mc.
Conv. grid to 1st I.F. grid — 2.7× at 8.6 Mc.
1st I.F. grid to 2nd I.F. grid — 80× at 8.6 Mc.
2nd I.F. grid to Limiter grid — 25× at 8.6 Mc.



Line voltage 117 A.C.
Power consumption 90 watts.
Power output 6.5 watts.

SOCKET VOLTAGES

MODELS 10H571R, 10H573

ZENITH RADIO CORP.

FREQUENCY MODULATION

Broadcasting by the Frequency Modulation method has already proved to be the most satisfactory means of "Local" radio transmission with reduced noise and high fidelity. It is not generally understood that these two features of FM are due in a great measure to the wide frequency band which this method of modulation employs. The FM receiver must be accurately aligned because much of the FM system's noise reducing ability is lost if the FM IF and discriminator circuits are misaligned.

The alignment of FM receivers differs from the familiar AM receiver alignment procedure where a modulated signal from the generator is used and the output is measured with an A.C. voltmeter across the voice coil.

The signal generator for FM alignment must be capable of supplying an unmodulated signal of at least .5 volt at the IF frequencies (4 to 9 Mc.) and a moderate unmodulated signal at the FM RF frequencies (41.5 to 50.5 Mc.) A 50-0-50 microammeter, such as Triplett #321 or #521, makes an excellent output meter when used with our #S9614 four prong plug and cable assembly and a S.P.D.T. switch. (see fig. 1)

The output meter is connected across HALF the diode load resistor for gain alignment and is connected across the FULL diode load resistor for frequency settings. A polarized socket is provided (near the 7A6 tube) which accommodates the output meter plug to facilitate switching the meter across either FULL or HALF the diode load resistor.

IMPORTANT—The FM IF and discriminator alignment must be followed in a stage-by-stage sequence, beginning at the discriminator and working forward to the converter stage. This differs from the conventional AM IF alignment procedure where the signal is applied to the converter grid and all the IFs are aligned simultaneously.

The signal from the generator must be kept just below the point where the limiter action of the receiver begins. To explain further we should consider the purpose of the limiter. It does what its name implies; it limits the amount of signal applied to the discriminator circuit. When the input signal is strong the limiter cuts off, allowing only a portion of the signal to pass, while at low signal levels the limiter acts as an IF amplifier. Therefore, it is easy to understand why the signal input to the receiver and IFs must be held below the limiter operating range during alignment. The most practical way of determining the proper amount of input signal is to watch the output meter (connected across HALF the diode load) while the signal from the generator is increased. The meter will indicate the increase in signal until limiting action begins, from which point on no appreciable increase can be noted on the meter even though the generator signal has been increased considerably. The desired signal input level (from the generator) is just below the limiting point which may be determined by increasing the generator output while watching the output meter, then reducing the generator output slightly when the limiting point is reached.

IF AND DISCRIMINATOR ALIGNMENT

Holes have been placed at the top of all the FM IF transformer shields so that a signal generator may be connected across the transformer secondaries to facilitate alignment. (see fig. 2) A vey high input signal will be necessary to get an output indication for the discriminator alignment. Should the generator be unable to supply sufficient signal, the Discriminator input stage may be aligned first in order that its gain may be utilized to raise the input signal to the discriminator.

1. Connect the output meter across the FULL discriminator load. (fig. 1)
2. Feed an unmodulated signal, at the IF frequency, through the dummy antenna (fig. 2) to the 3rd IF transformer secondary. (The IF frequency is stamped on the IF transformer shields.) Adjust the slug B4 for resonance. Rotating the slug B4 through the resonance point will cause the output meter to swing through zero from positive to negative or vice versa. A zero reading on the meter indicates the desired resonance point.
3. Switch the output meter to HALF discriminator load (fig. 1). Adjust trimmer A4 for maximum output, keeping the signal input below the point of limiting action.
4. (Meter at HALF load) Connect the generator to the 2nd IF transformer secondary and adjust the 3rd IF trimmers A3 and B3 for maximum output.
5. (Meter at HALF load) Connect the generator across the 1st IF transformer secondary and adjust the 2nd IF transformer trimmers A2 B2 for maximum output.
6. (Meter at HALF load) Connect the generator to the converter grid. A small socket is provided near the converter tube which will accommodate the side pin of the ±S9615 Dummy Antenna assembly (fig. 2) to facilitate this generator connection. Adjust the 1st IF transformer trimmers A1 B1 for maximum output.

FM OSCILLATOR AND RF ALIGNMENT

7a. (Meter at FULL load) Connect the generator, through a 100 ohm dummy antenna, to the FM antenna terminals. Set the generator at 50 Mc. and tune in the signal on the receiver. As the pointer passes the 50 Mc. calibration the output meter will swing from negative through zero to a positive reading or vice versa. The resonance point is again at the zero setting. Should the pointer be off calibration more than plus or minus .5 Mc., which is tolerable, the oscillator may be set by adjusting the two flexible green leads between the manual tuning oscillator coil and the band switch. If the pointer is below 50 Mc. it can be raised by bringing the two green leads together and in the same manner the pointer can be lowered by separating the leads.

7b. (Meter still at FULL load) Set the generator at 46 Mc. and check the dial calibration (zero on meter). 46 Mc. should be on scale unless the cam on the condenser shaft has been loosened. If the cam has to be adjusted to scale the oscillator at 46 Mc., the 50 Mc. oscillator adjustment must be repeated. The converter stage is aligned after the receiver has been adjusted to scale within the .5 Mc. limits.

8a. (Meter at FULL load) With generator connected to the FM antenna terminals through 100 ohm dummy, set the generator at 49 Mc. and tune in signal on receiver to get a zero output meter reading. Switch the meter to HALF load and adjust the generator to give an output just below the limiter action point. Adjust slug P1 for maximum output.

8b. (Meter at FULL load) Set generator at 46 Mc. and tune in on receiver. Switch meter to HALF load and adjust "Z" for maximum output.

8c. (Meter at FULL load) Set generator at 42.5 Mc. and tune in on receiver. Switch meter to HALF load and adjust P2 for maximum output.

There are no RF adjustments for the FM push buttons when the push buttons are used on automatic. Button #1 is checked at 50 Mc., buttons #2 and #3 checked at 49 Mc., buttons #5 and #6 checked at 42.5 Mc., and button #4 is the manual switch.

In conclusion we again wish to emphasize the importance of keeping the signal from the generator below the point where limiter action begins, that the output meter is connected across the FULL diode load resistor for frequency and calibration operations, and that the output meter is connected across HALF the diode load resistor for gain checks.

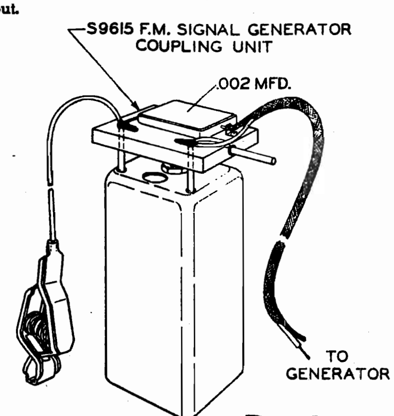


FIG. 2

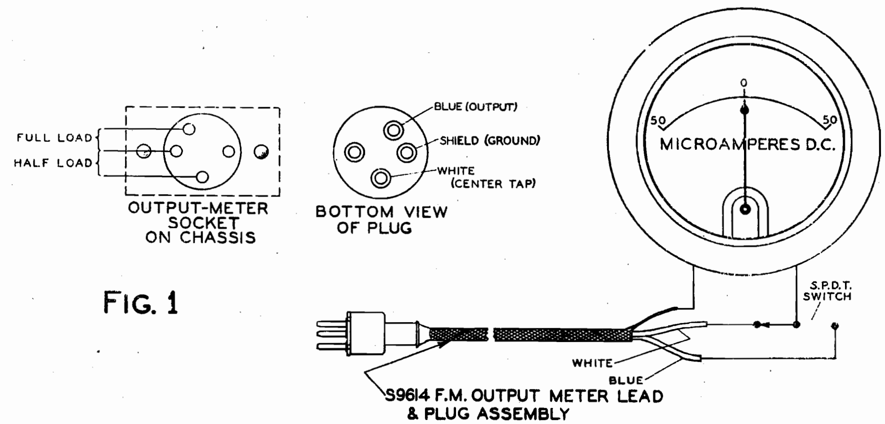
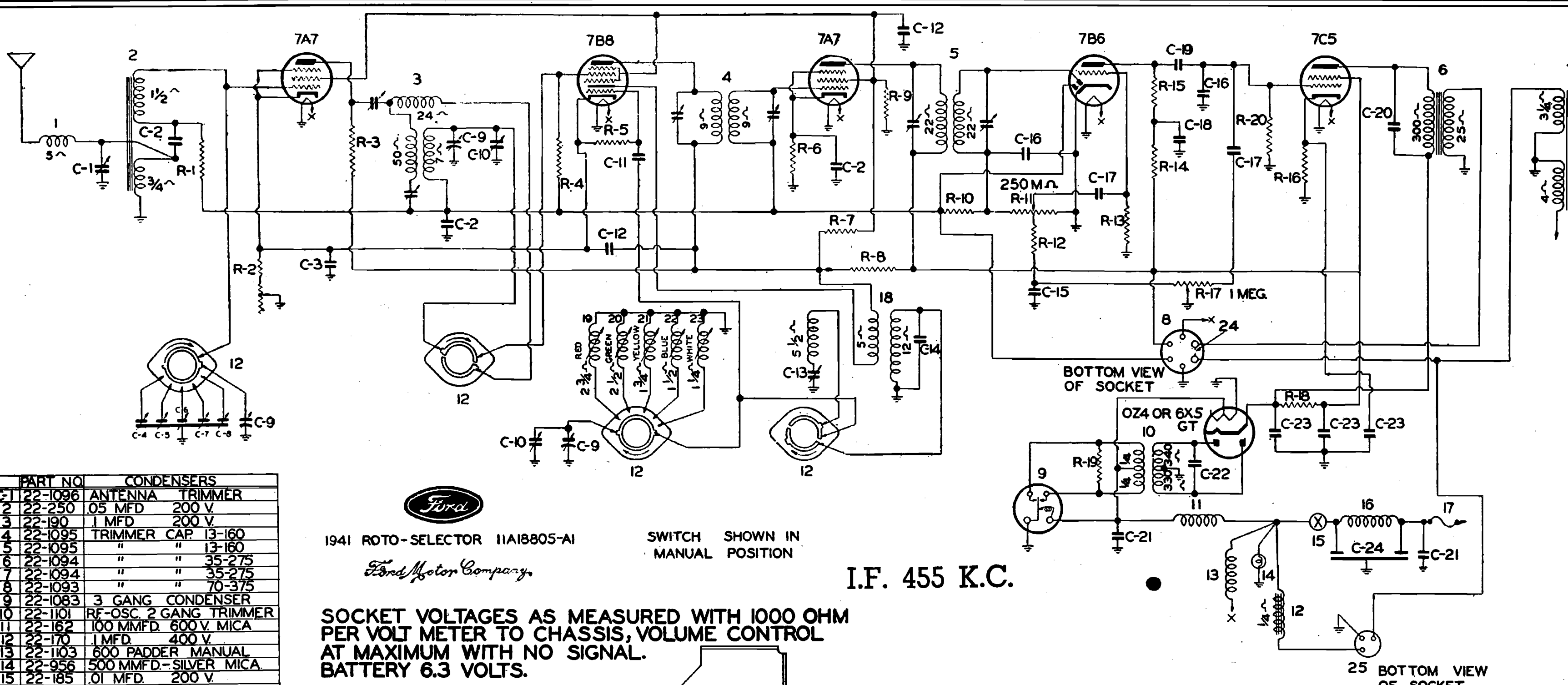


FIG. 1

ZENITH RADIO CORP.

MODELS 6MF590, 6MF591
Chassis 6A21 Ford



I.F. 455 K.C.

SOCKET VOLTAGES AS MEASURED WITH 1000 OHM PER VOLT METER TO CHASSIS, VOLUME CONTROL AT MAXIMUM WITH NO SIGNAL. BATTERY 6.3 VOLTS.

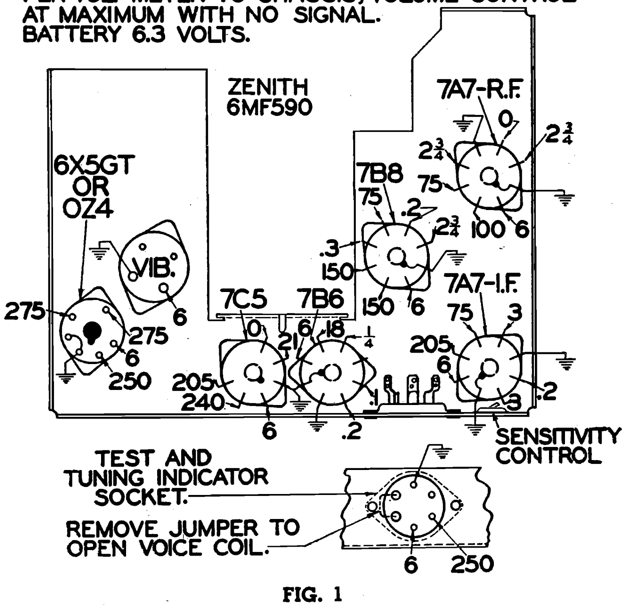


FIG. 1

PART NO.		CONDENSERS
C-1	22-1096	ANTENNA TRIMMER
2	22-250	.05 MFD 200 V.
3	22-190	.1 MFD 200 V.
4	22-1095	TRIMMER CAP 13-160
5	22-1095	" " 13-160
6	22-1094	" " 35-275
7	22-1094	" " 35-275
8	22-1093	" " 70-375
9	22-1083	3 GANG CONDENSER
10	22-1101	RF-OSC. 2 GANG TRIMMER
11	22-162	100 MMFD. 600 V. MICA
12	22-170	.1 MFD. 400 V.
13	22-1103	600 PADDER MANUAL
14	22-956	500 MMFD.-SILVER MICA
15	22-185	.01 MFD. 200 V.
16	22-182	250 MFD -600 V. MICA
17	22-906	.005 MFD. 200 V.
18	22-212	.05 MFD 400 V.
19	22-435	.02 MFD 600 V.
20	22-638	.005 MFD. 600 V.
21	22-908	.5 MFD. 120 V.
22	22-1079	.006 MFD 1600 V.
23	22-955	10-10-20 MFD 400-350-25 V.
24	22-1076	250 MMFD DUAL MICA

PART NO.		RESISTORS
R-1	63-593	470 M OHMS 1/4 W
2	63-1131	200 TO 800 OHM SEN. CONT.
3	63-311	15 M. OHMS 1/4 W
4	63-596	330 M OHMS 1/4 W
5	63-593	47 M OHMS 1/4 W
6	63-634	820 OHMS 1/4 W
7	63-1065	15 M OHMS 1 W
8	63-1135	3900 OHMS 2 W
9	63-592	33 M OHMS 1/4 W
10	63-271	1 MEG OHM 1/4 W
11	63-1133	VOL. CONT. & SWITCH
12	63-589	10 M OHMS 1/4 W
13	63-604	10 MEG. OHM 1/4 W
14	63-595	100 M OHMS 1/4 W
15	63-296	220 M OHMS 1/4 W
16	63-948	330 OHMS 1 W
17	63-1197	TONE CONTROL
18	63-968	1800 OHMS 2 W
19	63-971	220 OHMS 1/2 W
20	63-719	470 M OHMS 1/4 W

PART NO.		MISCELLANEOUS
1	S-8819	ANT. MOTOR NOISE CHOKE
2	S-8927	ANTENNA COIL
3	S-8988	R.F. TRANSFORMER
4	95-742	1st I.F. "
5	95-743	2nd I.F. "
6	95-744	OUTPUT "
7	49-421	SPEAKER
8	78-284	TUNING EYE SOCKET
9	190-15	NON SYNCHRON VIBRATOR
10	95-745	POWER TRANSFORMER
11	20-213	VIBRATOR HASH CHOKE
12	85-253	AUTO. SELECTOR SWITCH
13	20-228	HEATER LINE CHOKE
14	100-36	DIAL LIGHT MAZDA NO. 51
15	63-1133	"A" LINE SWITCH ON VOL. CONT.
16	20-229	"A" LINE CHOKE
17	136-12	FUSE
18	S-8928	OSCILLATOR COIL
19	S-8971	OSCILLATOR COIL (AUTOMATIC
20	S-8972	" " "
21	S-8973	" " "
22	S-8974	" " "
23	S-8975	" " "
24	58-92	VOICE COIL JUMPER
25	78-406	SOCKET

Sensitivity—7 Micro-volts at one watt output.

Power Output—4.5 watts measured at the voice coil.

Tuning Range 540-1600 K.C.

Tube Complement—7A7 R.F.; 7B8 Oscillator and Modulator; 7A7 I.F.; 7B6 second detector and A.V.C.; 6X5GT or 0Z4 Rectifier. 7C5 Beam power output;

Current Consumption—7 amp.

ZENITH RADIO CORP.

ALIGNMENT:

The alignment of a receiver is one of the most important functions that a service man performs, and the instructions must be carefully followed.

CAUTION:

Care should be taken while making all adjustments on the receiver to have the volume control turned full on. The intensity of the signal should be reduced only at the signal generator.

The signal for the entire alignment procedure, both I.F. and R.F. is fed through a special Zenith dummy which can be purchased from your Zenith distributor, Part No. S9187. The capacities in the Zenith dummy antenna as shown in Fig. 2 are identical with the Ford antenna.

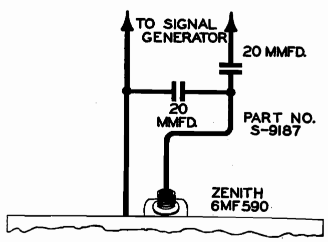


FIG. 2

NOTE:

This receiver is equipped with an adjustable sensitivity control located on the bottom of the chassis as shown in Fig. I. The control is set at the factory to a position which gives sensitivity of 7 microvolts at 1 watt output. It is found advisable to hold the receiver at this level as any higher sensitivity may result in excessive background noise and unless laboratory equipment is available for measuring sensitivity it is not advisable to change the setting

I.F.—

1. The receiver must be in one of the automatic positions.
2. The signal generator is set at 455 K.C. and fed through the special Zenith dummy to the receiver.
3. The R.F. and code trap adjustment screw A (see Fig. 3) is adjusted for maximum response.

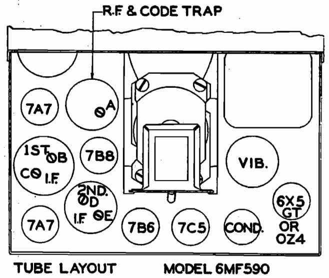


FIG. 3

4. The adjustment screws B, C, D and E (see Fig. 3) are then adjusted in order for maximum response.
5. The code trap A is then adjusted for minimum response.

R.F.—

1. The receiver is returned to manual tuning.
2. The tuning control is rotated until the condenser plates are out of mesh (1600 K.C.)
3. The signal generator is set to 1600 K.C.
4. Adjust the 1600 K.C. oscillator trimmer F (see Fig. 4) for maximum response.
5. Set signal generator to 1400 K.C. and rotate the tuning control until a signal is heard.
6. Adjust the R.F. trimmer G (see Fig. 4) and the antenna trimmer H (see Fig. 5) for maximum response.
7. Set the signal generator to 600 K.C. and rotate the tuning control until signal is heard.
8. The condenser gang is then rocked slightly while adjusting the 600 K.C. padder I (see Fig. 4).

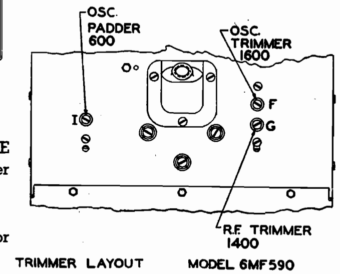


FIG. 4

SETTING THE ROTO-SELECTOR:

First turn the receiver on, and allow it to operate for approximately half an hour. This is necessary in order that the operating temperature may reach normal, and thereby assure accurate adjustment. After the set has been on for the necessary length of time, remove the plastic escutcheon over the tuning control by first pulling off the three knobs and removing the lock nuts on the tuning and volume control shafts. With the escutcheon removed, the automatic adjusting screws become accessible as shown in Fig. 5. The adjustments are made by means of a special wrench held in position by a clip as shown in Fig. 5 and using this wrench, the adjustments are made as follows:

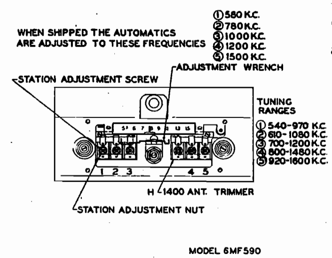


FIG. 5

1. Select a station within the range of adjustment No. 1 (Fig. 5). The range of the adjustments is shown in Fig. 5.
2. Set Roto-Selector in position No. 1.
3. Adjust the No. 1 screw (see Fig. 5) with wrench provided until the desired station is tuned to the loudest point.
4. Adjust No. 1 nut (see Fig. 5) for maximum signal.
5. Repeat the last two above operations to make sure the adjustments are accurate.
6. The same procedure is followed in setting the remaining four adjustments selecting a station within the tuning range of each adjusting screw and placing the selector switch in the corresponding position for each adjusting screw.

The station adjusting eye can be used to great advantage in setting the stations. This eye will enable you to get an accurate setting regardless of signal strength.

The eye may also be used when aligning the receiver instead of an output meter. The eye with a special cable and plug is available at your Zenith distributor.

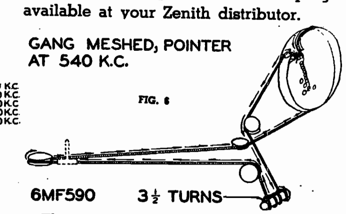


FIG. 6

The stringing of the dial cord is very important for unless properly strung the cord will jump off the pulleys. Figure 6 shows the proper way to string the cord.

The jumper shown on the test socket in Fig. 1 is provided so that an output meter may be connected to the voice coil side of the output transformer.

If you have the type of output meter which is usually connected to the plate of the output tube, it may be adapted for this type of connection by following the instructions shown in Fig. 7.

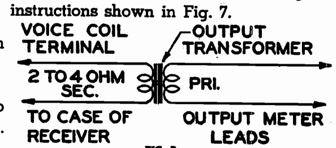
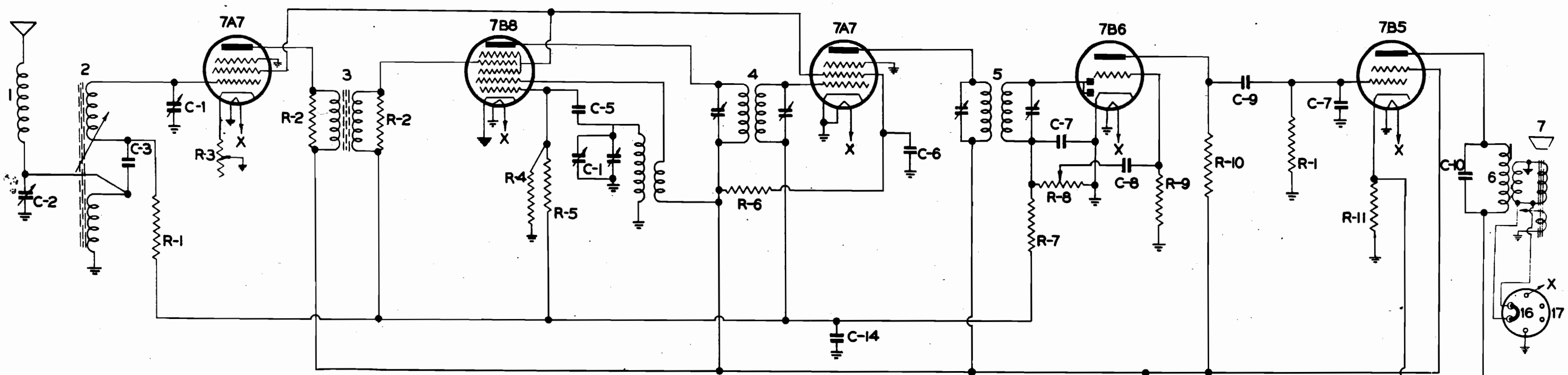


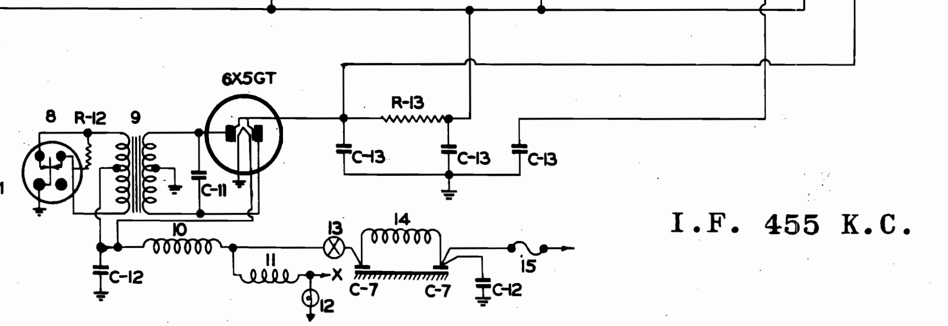
FIG. 7

ZENITH RADIO CORP.

MODEL 6MF593, Chas. 6A23



SOCKET VOLTAGES AS MEASURED WITH 1000 OHM PER VOLT METER TO CHASSIS, VOLUME CONTROL AT MAXIMUM WITH NO SIGNAL.
BATTERY 6.3 VOLTS.



1941 SPECIAL 11A-18805-C1

Ford Motor Company

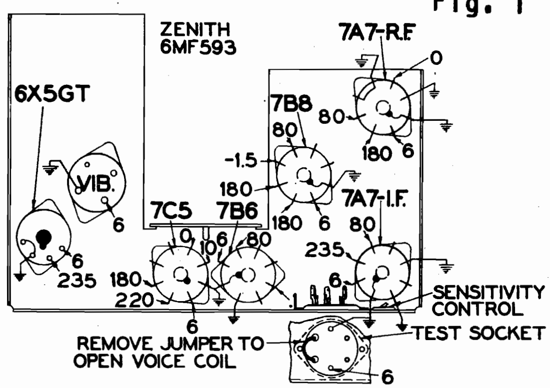


Fig. 1

I.F. 455 K.C.

CURRENT CONSUMPTION - 6 amp. **TUNING RANGE 540** - 1600 K.C.

	PART NO.	CONDENSERS			PART NO	RESISTORS			PART NO	DESCRIPTION
C-1	22-1172	2 GANG VARIABLE COND.		R-1	63-597	470 M. OHMS	1/4W	1	S-8819	ANT. MOTOR NOISE CHOKE
C-2	22-1177	ANTENNA TRIMMER		R-2	63-588	6800 OHMS	1/4W	2	S-9371	ANTENNA COIL
C-3	22-250	.05 MFD	400 V.	R-3	63-1148	SENSITIVITY CONTROL		3	S-9391	R.F. COIL
C-4				R-4	63-595	100 M. OHMS	1/4W	4	95-789	1st I.F. TRANSFOMER
C-5	22-289	50 MMFD MICA		R-5	63-673	8.2 MEG. OHM	1/4W	5	95-784	2nd I.F. "
C-6	22-170	.1 MFD	400 V.	R-6	63-958	22 M OHMS	1W	6	49-434	OUTPUT "
C-7	22-1076	250-250 DUAL MICA		R-7	63-271	1 MEG OHM	1/4W	7	49-434	SPEAKER
C-8	22-906	.005 MFD	200 V	R-8	63-1177	250 M OHMS VOL. CONT.		8	190-15	VIBRATOR
C-9	22-435	.02 MFD	600 V.	R-9	63-604	10 MEG OHM	1/4W	9	95-782	POWER TRANSFORMER
C-10	22-1170	.01 MFD	600 V	R-10	63-296	220 M OHMS	1/4W	10	20-213	HASH CHOKE
C-11	22-1171	.012 MFD	1600 V	R-11	63-941	390 OHMS	1W	11	20-233	HEATER LINE CHOKE
C-12	22-908	.5 MFD	120 V	R-12	63-971	220 OHMS	1/2W	12	100-32	DIAL LIGHT
C-13	22-1179	10-10-20 MMFD	350-300-25 V	R-13	63-1170	1500 OHMS	2W	13	63-1177	SWITCH ON VOL CONTROL
C-14	22-1115	.05 MFD	200 V					14	20-229	MOTOR NOISE CHOKE
								15	136-11	FUSE
								16	58-92	VOICE COIL JUMPER
								17	78-248	TEST SOCKET

TUBE COMPLEMENT

7A7 R.F.

7B8 Oscillator and Modulator;

7A7 I.F.;

7B6 Second Detector and A.V.C.;

7B5 Pentode power output;

6X5GT Rectifier.

SENSITIVITY - 9 microvolts at one watt output.

POWER OUTPUT - 3 watts measured at the voice coil.

ZENITH RADIO CORP.

ALIGNMENT:

The alignment of a receiver is one of the most important functions that a service man performs, and the instructions must be carefully followed.

CAUTION:

Care should be taken while making all adjustments on the receiver to have the volume control turned full on. The intensity of the signal should be reduced only at the signal generator.

The signal for the entire alignment procedure, both I.F. and R.F. is fed through a special Zenith dummy which can be purchased from your Zenith distributor, Part NO. S9187. The capacities in the Zenith dummy antenna as shown in Fig. 2 are identical with the Ford antenna.

NOTE:

This receiver is equipped with an adjustable sensitivity control located on the bottom of the chassis as shown in Fig. 1. The control is set at the factory to a position which gives sensitivity of 9 microvolts at 1 watt output. It is found advisable to hold the receiver at this level as any higher sensitivity may result in excessive background noise and unless laboratory equipment is available for measuring sensitivity it is not advisable to change the setting.

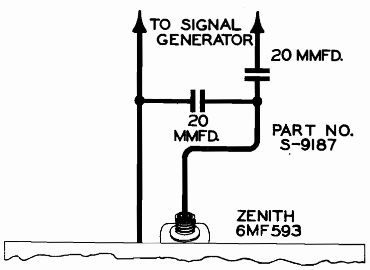
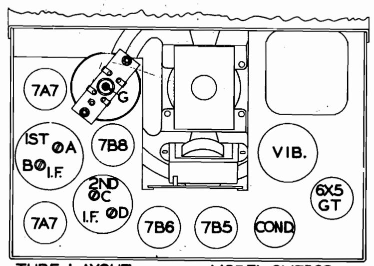


Fig. 2

I.F. —

1. The tuning control is rotated until the condenser plates are fully meshed. (540 K.C.)



TUBE LAYOUT MODEL 6MF593

Fig. 3

2. The signal generator is set at 455 K.C. and fed through the special Zenith dummy to the receiver.

3. The adjustment screws A, B, C and D (see Fig. 3) are then adjusted in order for maximum response.

R.F. —

1. The tuning control is rotated until the condenser plates are out of mesh. (1600 K.C.)

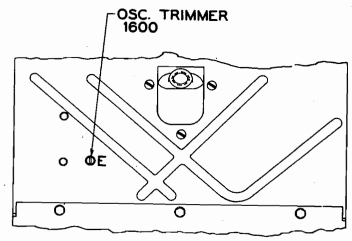
2. The signal generator is set to 1600 K.C.

3. Adjust the 1600 K.C. oscillator trimmer E (see Fig. 4) for maximum response

4. Set signal generator to 1400 K.C. and rotate the tuning control until a signal is heard.

5. Adjust the 1400 antenna trimmer F (see Fig. 5) for maximum response.

6. Set the signal generator to 600 K.C. and rotate the tuning control until the signal is heard.



TRIMMER LAYOUT MODEL 6MF593

Fig. 4

7. The condenser gang is then rocked slightly while adjusting the 600 K.C. core G (see Fig. 3)

8. Repeat operations 4 and 5.

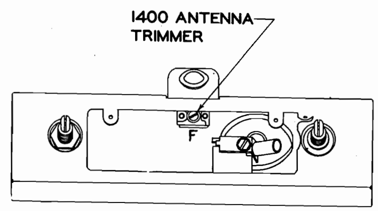
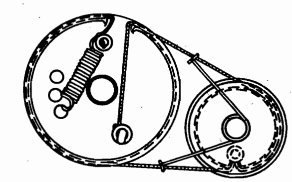


Fig. 5

The stringing of the cord is very important. Figure 6 shows the proper way to string the dial cord.

GANG MESHED, DIAL AT 540 K.C.



6MF593

Fig. 6

The Zenith Radio Corporation furnishes the antenna for 1941 Ford and Mercury only.

Parts for this antenna will be available at your Zenith distributor.

The jumper shown on the test socket in Fig. 1 is provided so that an output meter may be connected to the voice coil side of the output transformer.

If you have the type of output meter which is usually connected to the plate of the output tube, it may be adapted for this type of connection by following the instructions shown in Fig. 7.

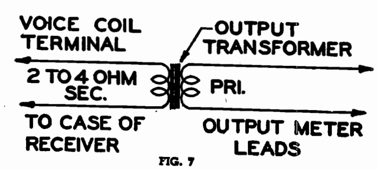
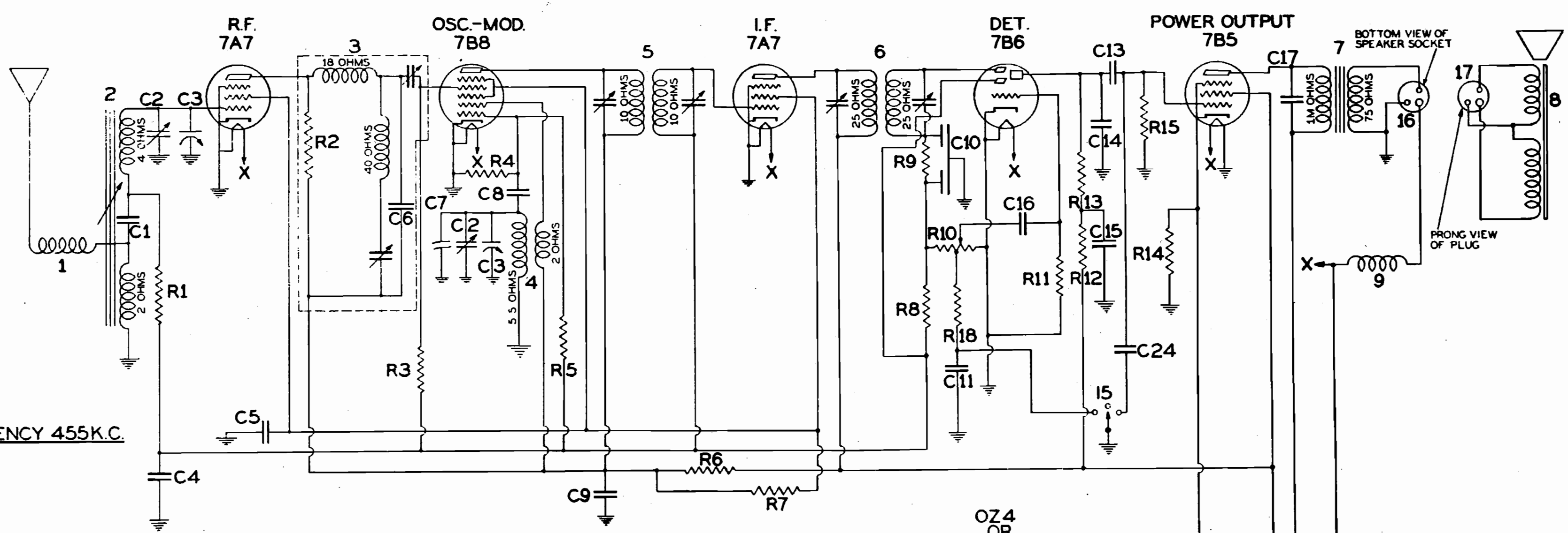


FIG. 7

ZENITH RADIO CORP.

MODEL 6MN595, Chassis 6A17 Nash

NASH AC6011 SPECIAL ZENITH MODEL 6MN595



DIAG NO.	PART NO.	CONDENSERS
C1	22-1080	.006MFD.-200V.
2	22-1082	2 PLATE TRIMMER
3	22 1067	2 CANG CONDENSER
4	22-250	.05MFD.-200V.
5	22-170	.1MFD.-400V.
6	22-988	.000020MFD.-600V.
7	22-1074	COMPENSATOR
8	22-162	.0001MFD.-600V. MICA
9	22-170	.1MFD.-400V.
10	22-1076	.00025MFD. DUAL MICA
11	22-185	.01MFD.-200V.
12	22-1076	.00025MFD. DUAL MICA
13	22-435	.02MFD.-600V.
14	22-182	.00025MFD.-600V. MICA
15	22-212	.05MFD.-400V.
16	22-906	.005MFD.-200V.
17	22-838	.005MFD.-600V.
18		20MFD.-25V.
19	22-904	10MFD.-350V.
20		10MFD.-400V.
21	22-905	25MFD.-200V.
22	22-1079	.006MFD.-1600V.
23	22-908	.5MFD.-120V.
24	22-906	.005MFD.-200V.

DIAG NO.	PART NO.	RESISTORS
R1	63-597	470M OHMS - 1/4W.
2	63-640	8200 OHMS - 1/4W.
3	63-596	330M OHMS - 1/4W.
4	63-593	47M OHMS - 1/4W.
5	63-604	10 MEGOHMS - 1/4W.
6	63-1135	3900 OHMS - 2W.
7	63-1065	15M OHMS - 1W.
8	63-271	1 MEGOHM - 1/4W.
9	63-592	33M OHMS - 1/4W.
10	63-1128	1/4 MEGOHM VOL. CONT.
11	63-604	10MEGOHMS - 1/4W.
12	63-595	100M OHMS - 1/4W.
13	63-296	220M OHMS - 1/4W.
14	63-941	390 OHMS - 1W.
15	63-597	470M OHMS - 1/4W.
16	63-968	1800 OHMS - 2W.
17	63-967	82 OHMS - 1/2W.
18	63-589	10M OHMS - 1/4W.

DIAG NO.	PART NO.	MISC.
1	S-8819	ANT. MOTOR NOISE CHOKE
2	S-8884	ANTENNA COIL
3	95-736	UNTUNED COIL ASSEMBLY
4	S-8887	OSCILLATOR COIL
5	95-737	1ST. I.F. TRANSFORMER
6	95-738	2ND. I.F. TRANSFORMER
7	95-734	OUTPUT TRANSFORMER
8	49-412	SPEAKER
9	20-225	SPEAKER FIELD CHOKE
10	95-733	POWER TRANSFORMER
11	190-15	VIBRATOR
12	20-213	VIBRATOR HASH CHOKE
13	20-229	"A" LINE CHOKE
14	20-226	HEATER LINE CHOKE
15	85-249	THREE POS. TONE CONTROL

DIAG NO.	PART NO.	MISC. CONT'D.
16	78-208	SPEAKER S'KET.
17	52-196	" CAB. & PLUG
18	136-11	FUSE - 14 AMPS
19	100-32	DIAL LIGHT #51

MADE ESPECIALLY FOR
NASH MOTORS

ZENITH RADIO

NASH-A.C.6011-SPECIAL
ZENITH MODEL 6MN595

MODEL 6MN595
MODEL 7MN596

ZENITH RADIO CORP.

Zenith Model 6MN595 — Nash A.C. 6011 Special
Zenith Model 7MN596 — Nash A.C. 6001 De Luxe

Tuning Range: 540 to 1600 K.C.

Sensitivity: 8 microvolts at 1 watt output.

The cover on both receivers may be removed to check tubes and vibrator without removing the set from the car.

SOCKET VOLTAGES

Figs. 1 and 2 show approximate voltages at the socket terminals.

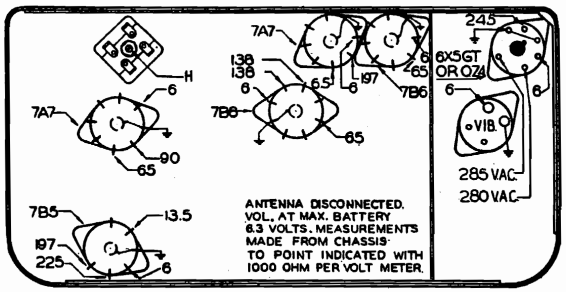


Fig. 1.

NASH AC 6011 SPECIAL
ZENITH 6MN 595

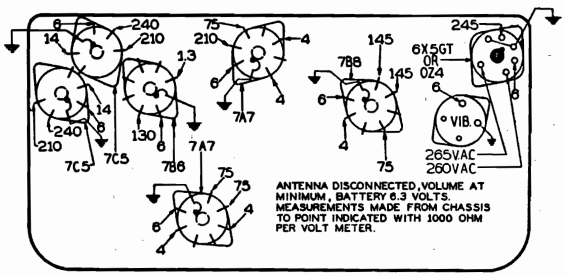


Fig. 2.

NASH AC 6001 DELUXE
ZENITH 7MN 596

SETTING THE SUPER-MATIC TUNING — MODEL 6MN595

Adjustment should not be made until receiver has warmed up 15 minutes.

(A) Select a desired station at right side of dial scale.

(B) Loosen screw on right hand push button bar. (See Fig. 4)

(C) Push Super-Matic button bar in as far as possible and tighten screw while bar is in this position.

(D) Repeat the above for remaining bars, choosing three other desired stations.

(E) Insert push buttons on push button bars.

I.F.: The tuning condenser is fully meshed (540 K.C.) The signal generator is set at 455 K.C. and fed through the special Zenith antenna dummy to the receiver. The wave trap adjustment screw A, (see Fig. 3) is adjusted for maximum response. The adjusting screws B, C, D and E (see Fig. 3) are then adjusted in order for maximum response on the output meter. The wave trap A is then adjusted for minimum response.

R.F.: The tuning control is rotated until the condenser plates are completely out of mesh (1600 K.C.) Set the signal generator to 1600 K.C. Adjust the 1600 K.C. osc. trimmer F shown in Fig. 3 for maximum response.

Set the signal generator to 1400 K.C. Rotate the tuning control until the signal is heard and adjust the 1400 antenna trimmer G (See Fig. 3) for maximum response.

Reset the signal generator to 600 K.C. and rotate the tuning control until a signal is heard, and adjust the core H (See Fig. 1) in the antenna coil for maximum response.

If core H is found to be off a great deal, the 1400 antenna trimmer G should be readjusted.

6MN595 AC 6011 SPECIAL

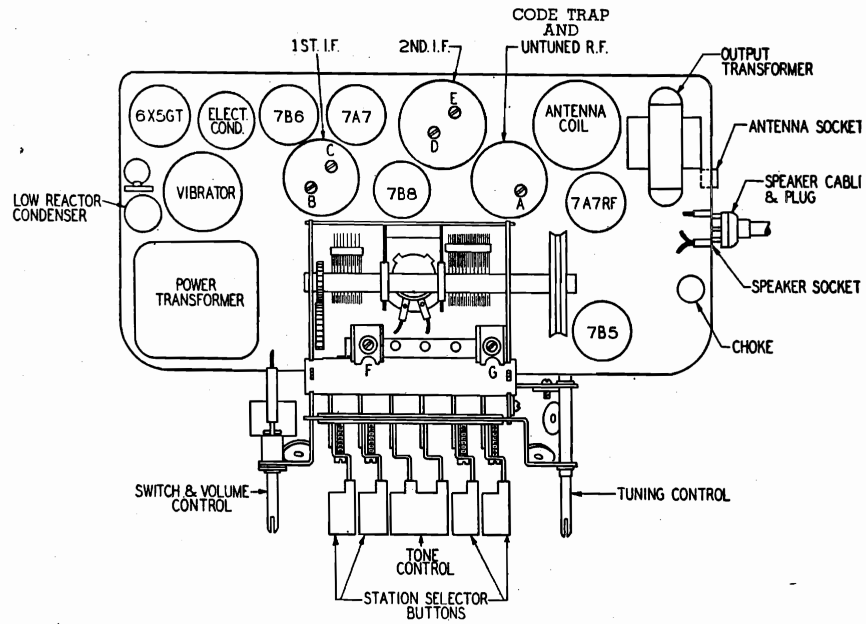
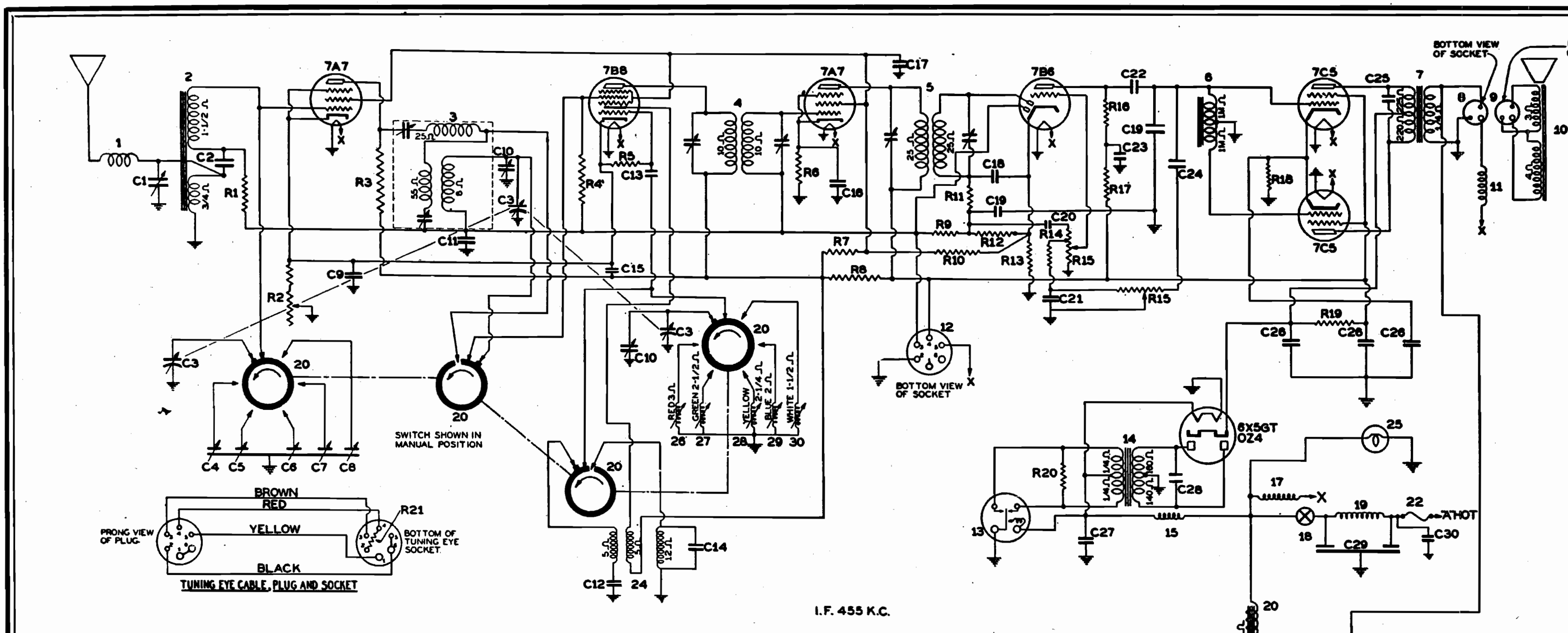


Fig. 3.

NASH AC 6011 SPECIAL
ZENITH 6MN 595

ZENITH RADIO CORP.

MODEL 7MN596, Chassis 7A08 Nash



I.F. 455 K.C.

DIAG. NO.	PART NO.	CONDENSERS
C 1	22-1114	ANTENNA TRIMMER
2	22-1115	.05 MFD. - 200V.
3	22-1085	3 GANG CONDENSER
4	22-1093	TRIMMER CAP. 70-375
5	22-1094	" " 35-275
6	22-1094	" " 35-275
7	22-1095	" " 13-160
8	22-1095	" " 13-160
9	22-190	.1 MFD - 200V.
10	22-1102	R.F. & OSC. 2 GANG TRIMMER
11	22-250	.05 MFD. - 200V.
12	22-1077	600 PADDER - MANUAL
13	22-162	100MMFD. - 600V. MICA
14	22-956	500MMFD. SILVER MICA
15	22-170	.1 MFD. - 400V.
16	22-250	.05 MFD. - 200V.
17	22-170	.1 MFD. - 400V.
18	22-182	250MMFD - 600V. MICA
19	22-1076	250MMFD. DUAL MICA
20	22-185	.01 MFD. - 200V.
21	22-906	.005MFD. - 200V.
22	22-435	.02 MFD. - 600V.
23	22-212	.05 MFD. - 400V.
24	22-1075	.007MFD. - 200V.
25	22-838	.005MFD - 600V.
26	22-917	20-10-20MFD. - 450-400-25V.
27	22-908	.5 MFD. - 120V.
28	22-1116	.007MFD. - 1600V.
29	22-1076	250MMFD. DUAL MICA
30	22-905	.25MFD. - 200V.

DIAG. NO.	PART NO.	RESISTORS
R 1	63-719	470M OHMS 1/4W.
2	63-1131	200 TO 800 OHMS SEN. CONT.
3	63-311	15M OHMS 1/4W.
4	63-596	330M OHMS 1/4W.
5	63-713	47M OHMS 1/4W.
6	63-634	820 OHMS 1/4W.
7	63-1065	15M OHMS 1 W.
8	63-1140	4700 OHMS 2 W.
9	63-271	1 MEGOHM 1/4 W.
10	63-647	39M OHMS 1/4 W.
11	63-713	47M OHMS 1/4 W.
12	63-296	220M OHMS 1/4 W.
13	63-581	470 OHMS 1/4 W.
14	63-712	33M OHMS 1/4 W.
15	63-1129	VOL. CONT.-TONE CONT. & SW.
16	63-649	56M OHMS 1/4 W.
17	63-649	56M OHMS 1/4 W.
18	63-948	330 OHMS 1 W.
19	63-968	1800 OHMS 2 W.
20	63-971	220 OHMS 1/2 W.
21		1/2 MEGOHM 1/4 W.

DIAG. NO.	PART NO.	MISCELLANEOUS
1	S-8819	ANTENNA MOTOR NOISE CHOKE
2	S-8927	ANTENNA COIL
3	95-762	R.F. TRANSFORMER
4	95-742	1ST. I.F. TRANSFORMER
5	95-738	2ND. I.F. TRANSFORMER
6	95-732	AUDIO INPUT TRANSFORMER
7	95-735	AUDIO OUTPUT TRANSFORMER
8	78-208	SPEAKER SOCKET
9	52-196	SPEAKER CABLE & PLUG
10	49-413	SPEAKER
11	20-231	SPEAKER FIELD CHOKE
12	78-284	TUNING EYE SOCKET
13	190-15	NON-SYNCHRONOUS VIBRATOR
14	95-731	POWER TRANSFORMER
15	20-213	VIBRATOR HASH CHOKE
16	S-9172	MANUAL SELECTOR SWITCH
17	20-232	HEATER LINE CHOKE
18		"A" LINE SWITCH-ON VOLUME CONTROL
19	20-229	"A" LINE CHOKE
20	85-252	AUTOMATIC SELECTOR SOLENOID
21	78-406	SAFETY FOOT CONTROL SOCKET
22	136-12	FUSE - 20 AMPERES
23	85-264	SAFETY FOOT CONTROL SWITCH
24	S-9182	OSCILLATOR COIL
25	100-32	DIAL LIGHT - MAZDA NO. 51
26	S-8971	AUTOMATIC OSCILLATOR COIL
27	S-8972	AUTOMATIC OSCILLATOR COIL
28	S-8973	AUTOMATIC OSCILLATOR COIL
29	S-8974	AUTOMATIC OSCILLATOR COIL
30	S-8975	AUTOMATIC OSCILLATOR COIL

ZENITH RADIO

NASH—A.C.6001—DELUXE
ZENITH SAFETY FOOT CONTROL MODEL—7MN596

MADE ESPECIALLY FOR NASH MOTORS

NASH—A.C.6001—

DELUXE ZENITH SAFETY FOOT

CONTROL MODEL—7MN596

MODEL 7MN596
MODEL 6MN595

ZENITH RADIO CORP.

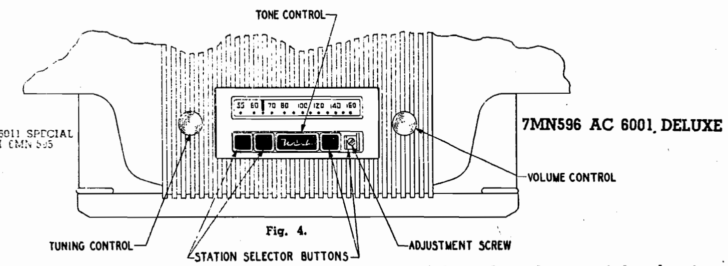


Fig. 4.

NOTE: This receiver is equipped with an adjustable sensitivity control located on the top of the chassis as shown in Fig. 5. The control is set at the factory to a position which gives sensitivity of 8 microvolts at 1 watt output. It is found advisable to hold the receiver at this level as any higher sensitivity may result in excessive background noise and unless laboratory equipment is available for measuring sensitivity, it is not advisable to change this setting.

I.F.: The receiver must be in one of the automatic positions. The signal generator is set at 455 K.C. and fed through the special Zenith antenna dummy to the receiver. The code trap adjustment screw A (see Fig. 5) is adjusted for maximum response. The adjustment screws B, C, D and E are then adjusted in order for maximum response on the output meter (See Fig. 5). The code trap A is then adjusted for minimum response.

R.F.: The receiver is returned to manual and the tuning control is rotated until the condenser plates are out of mesh (1600 K.C.) Set the signal generator to 1600 K.C. and adjust the 1600 K.C. osc. trimmer F (See Fig. 5) for maximum response.

Set the signal generator to 1400 K.C. and rotate the tuning control until a signal is heard and adjust the R.F. trimmer G and antenna trimmer H (See Fig. 5) for maximum response.

Set the signal generator to 600 K.C. and rotate the tuning control until the signal is heard. The condenser gang is then rocked slightly while adjusting the 600 K.C. padder I (See Fig. 5) to maximum reading on output meter.

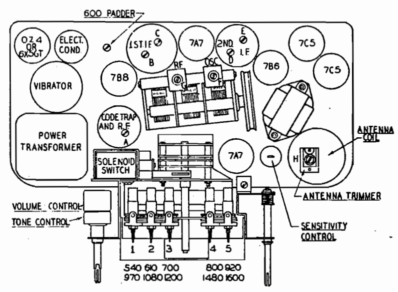


Fig. 5.
NASH AC 6001 DELUXE
ZENITH 7MN 596

IMPORTANT — Unless certain dummy antenna capacities are employed with either the signal generator, or in making the adjustments on stations, a receiver will not respond properly. The capacities provided in the Zenith dummy antenna part No. S7694 shown in Fig. 6 are identical with the conditions found in the Nash car, and if adjusted accordingly, the instrument will operate properly when reinstalled in the automobile. The Zenith dummy antenna is especially priced very low, and should be purchased at once for use in servicing the Zenith built Nash receiver.

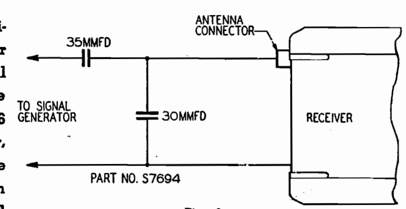
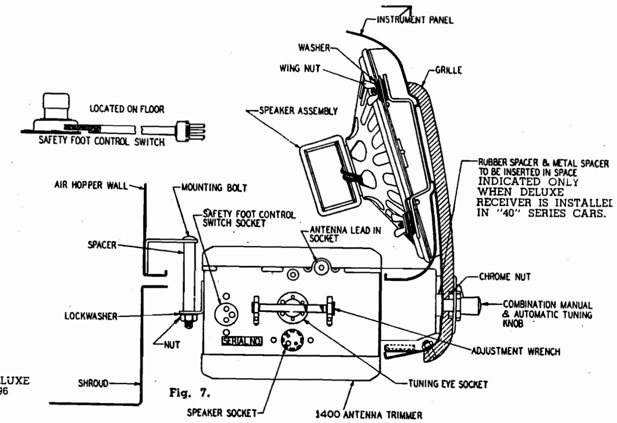


Fig. 6.
NASH AC 6011 SPECIAL
ZENITH 6MN 595
NASH AC 6001 DELUXE
ZENITH 7MN 596

SETTING THE SAFETY AUTOMATIC ELECTRIC TUNING

(A) The automatic station adjusting eye is plugged into the socket on the receiver. (See Fig. 7)



NASH AC 6001 DELUXE
ZENITH 7MN 596

Fig. 7.

(B) The indicator window is removed from the receiver by inserting a small screw driver underneath the left edge of the indicator window and pressing outward. This makes the adjustment screws available.

The set should be turned on and allowed to warm up at least half an hour.

(C) The range for each adjustment is located underneath the adjustment number.

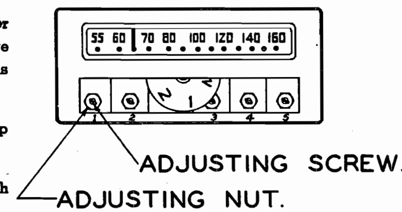


Fig. 8.
NASH AC 6001 DELUXE
ZENITH 7MN 596

A station close to 580 K.C. is set by having the figure 1 so it would appear in indicator window. The adjustment screw No. 1 (See Fig. 8) is then adjusted to the proper signal until the tuning eye gap can not be decreased in size. The No. 1 nut (See Fig. 8) is then adjusted until the gap on the tuning eye cannot be further decreased in size. A wrench for making these adjustments is located on the side of the receiver. (See Fig. 7)

(D) For stations 2, 3, etc. on the Safety Automatic Electric Tuner you set the adjustment screws and nuts the same as for station 1.

The Safety Automatic Station Adjusting Eye is available at all Zenith distributors.

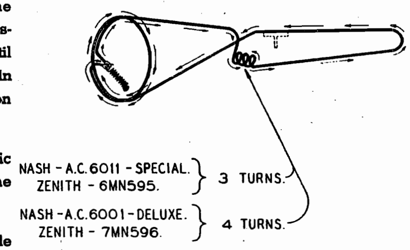


Fig. 9.

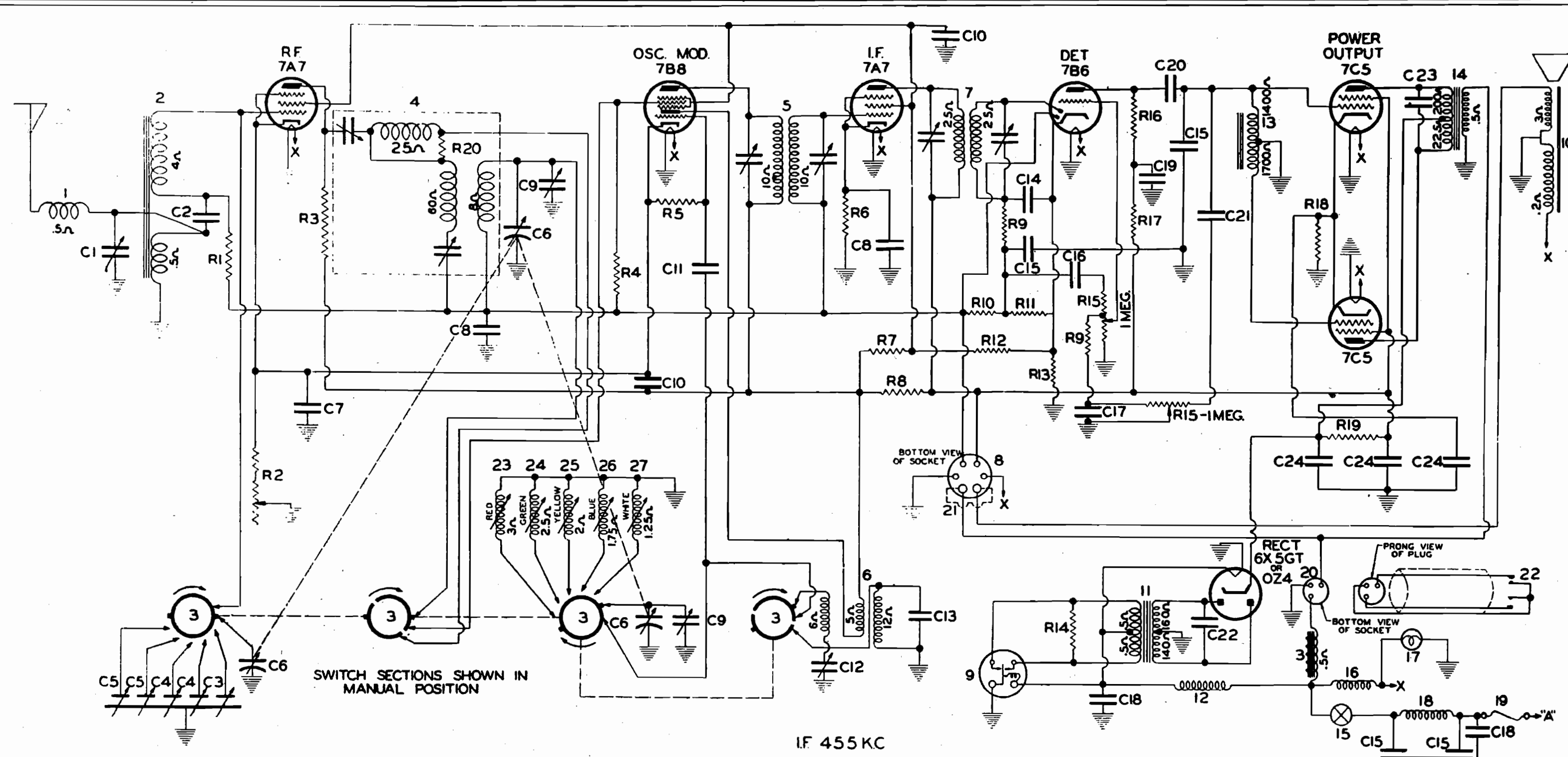
The stringing of the dial cord is very important for unless properly strung the cord will jump off the pulleys. Figure 9 shows the proper way to string the cords on both receivers.

ZENITH RADIO CORP.

MODEL 7ML592, Chassis 7A09 Lincoln

Sensitivity—6 microvolts at one watt output. **Power Output**—6 watts measured at the voice coil. **Tuning Range**—540 to 1600 K.C. **Speaker**—full size electrodynamic. **I.F.**—455 K.C. **Roto-Selector tuning** with foot control switch—Selection of any five desired stations automatically by using the foot control or Roto-Selector on instrument panel.

Tube Complement—7A7 R.F. — 7B8 oscillator and modulator — 7A7 I.F. — 7B6 2nd detector and A.V.C. — two 7C5 beam power push pull output — 6X5GT or 0Z4 rectifier — **Current consumption** 8 amperes.



I.F. 455 KC

1941 ROTO-SELECTOR 16H-18805-A WITH FOOT CONTROL SWITCH LINCOLN MOTOR CAR DIVISION FORD MOTOR COMPANY

SOCKET VOLTAGES AS MEASURED WITH 1000 OHM PER VOLT METER TO CHASSIS. VOLUME CONTROL AT MAXIMUM WITH NO SIGNAL. BATTERY 6.3 VOLTS.

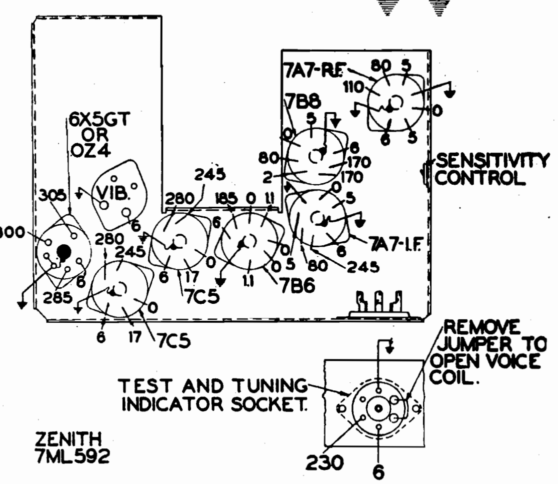


FIG. 1

DIAG. NO.	PART NO.	CONDENSERS
C1	22-1109	ANTENNA TRIMMER
2	22-1115	.05 MFD 200 VOLTS
3	22-1093	TRIMMER CAP 70-375
4	22-1094	TRIMMER CAP 35-275
5	22-1095	TRIMMER CAP 13-160
6	22-1084	3 GANG VARIABLE
7	22-190	.1 MFD 200 VOLTS
8	22-250	.05 MFD 200 VOLTS
9	22-1106	R.F.&OSC. 2 GANG TRIMMER
10	22-170	.1 MFD 400 VOLTS
11	22-162	100 MMFD 600 VOLTS MICA
12	22-1106	600 PADDER MANUAL
13	22-956	500MMFD SILVER MICA
14	22-182	250MMFD 600 VOLTS MICA
15	22-1076	250MMFD-DUAL MICA
16	22-185	.01 MFD 200 VOLTS
17	22-906	.005MFD 200 VOLTS
18	22-908	.5 MFD 120 VOLTS
19	22-212	.05 MFD 400 VOLTS
20	22-435	.02 MFD 600 VOLTS
21	22-1075	.007MFD 200 VOLTS
22	22-1105	.008MFD 1600 VOLTS
23	22-838	.005MFD 600 VOLTS
24	22-917	20-10-20MFD 450-400-25V.

DIAG. NO.	PART NO.	RESISTORS
R1	63-597	470 M-OHMS 1/4 W. ±20%
2	63-1131	200 TO 800 OHMS SEN. CONT.
3	63-311	15 M-OHMS 1/4 W. ±10%
4	63-718	330 M-OHMS 1/4 W. ±20%
5	63-713	47 M-OHMS 1/4 W. ±20%
6	63-634	820 OHMS 1/4 W. ±10%
7	63-1065	15 M-OHMS 1 W. ±10%
8	63-1140	4700 OHMS 2 W. ±10%
9	63-712	33 M-OHMS 1/4 W. ±20%
10	63-271	1 MEGOHM 1/4 W. ±20%
11	63-296	220 M-OHMS 1/4 W. ±20%
12	63-647	39 M-OHMS 1/4 W. ±10%
13	63-747	470 OHMS 1/4 W. ±10%
14	63-971	220 OHMS 1/2 W. ±20%
15	63-1134	VOL. CONT.-TONE CONT. & SW.
16	63-768	56 M-OHMS 1/4 W. ±10%
17	63-649	56 M-OHMS 1/4 W. ±10%
18	63-948	330 OHMS 1 W. ±10%
19	63-968	1800 OHMS 2 W. ±10%
20	63-595	100 M-OHMS 1/4 W ±20%

DIAG. NO.	PART NO.	MISCELLANEOUS
1	S-8819	ANTENNA MOTOR NOISE CHOKE
2	S-9087	ANTENNA COIL
3	85-261	AUTOMATIC SELECTOR SWITCH
4	S-8988	R.F TRANSFORMER
5	95-737	1ST I.F. TRANSFORMER
6	S-9171	OSCILLATOR COIL
7	95-738	2ND I.F. TRANSFORMER
8	78-284	TUNING EYE TUBE SOCKET
9	190-15	NON-SYNCHRONOUS VIBRATOR
10	49-422	ELECTRO-DYNAMIC SPEAKER
11	95-751	POWER TRANSFORMER
12	20-213	VIBRATOR HASH CHOKE
13	95-749	AUDIO INPUT TRANSFORMER
14	95-750	AUDIO OUTPUT TRANSFORMER
15	63-1134	"A" LINE SWITCH ON VOLUME CONTROL
16	20-228	HEATER LINE CHOKE
17	100-36	DIAL LIGHT MAZDA NO. 44
18	20-229	"A" LINE CHOKE
19	136-12	FUSE-20 AMPERES
20	78-406	FOOT CONTROL SOCKET
21	58-92	TUNING EYE SOCKET JUMPER
22	85-265	FOOT CONTROL SWITCH ASSEMBLY
23	S-8971	AUTOMATIC OSCILLATOR COIL
24	S-8972	AUTOMATIC OSCILLATOR COIL
25	S-8973	AUTOMATIC OSCILLATOR COIL
26	S-8974	AUTOMATIC OSCILLATOR COIL
27	S-8975	AUTOMATIC OSCILLATOR COIL

MODEL 7ML592

ZENITH RADIO CORP.

ALIGNMENT:

The alignment of the receiver is one of the most important functions that a service man performs, and the instructions must be carefully followed.

CAUTION:

Great care should be taken while making all adjustments on the receiver to have the volume control turned full on. The intensity of the signal should be reduced only at the signal generator.

The signal for the entire alignment procedure, both I.F. and R.F. is fed through a special Zenith dummy which can be purchased from your Zenith distributor—Part No. S9189.

The capacities in the Zenith dummy as shown in Fig. 2 are identical with the Lincoln antenna, and if the receiver is adjusted accordingly, the instrument will operate properly when installed in the car.

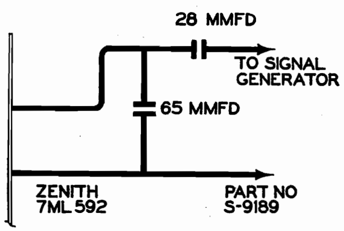
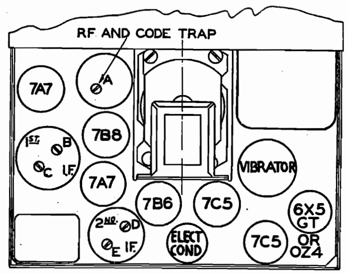


FIG. 2

NOTE:

This receiver is equipped with an adjustable sensitivity control located on the side of the chassis as shown in Fig. 1. The control is set at the factory to a position which gives sensitivity of 6 microvolts at 1 watt output. It is found advisable to hold the receiver at this level as any higher sensitivity may result in excessive background noise and unless laboratory equipment is available for measuring sensitivity, it is not advisable to change this setting.

3. The R.F. and code trap adjustment screw A (see Fig. 3) is adjusted for maximum response.
4. The adjustment screws B, C, D and E (see Fig. 3) are then adjusted in order for maximum response.
5. The code trap A is then adjusted for minimum response.



TUBE LAYOUT—MODEL 7ML 592
FIG. 3

R.F.—

1. The receiver is returned to manual tuning.

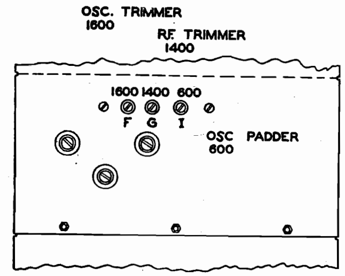
2. The tuning control is rotated until the condenser plates are out of mesh (1600 K.C.)

3. The signal generator is set to 1600 K.C.
4. Adjust the 1600 K.C. oscillator trimmer F (see Fig. 4) for maximum response.

5. Set signal generator to 1400 K.C. and rotate the tuning control until a signal is heard.

6. Adjust the R.F. trimmer G (see Fig. 4) and the antenna trimmer H (see Fig 5) for maximum response.
7. Set the signal generator to 600 K.C. and rotate the tuning control until signal is heard.

8. The condenser gang is then rocked slightly while adjusting the 600 K.C. padder I (see Fig. 4) for maximum response.



TRIMMER LAYOUT FIG. 4 MODEL 7ML592

3. Adjust the No. 1 screw (see Fig. 5) with the wrench provided until the desired station is tuned to the loudest point.

4. Adjust No. 1 nut (see Fig. 5) for maximum signal.

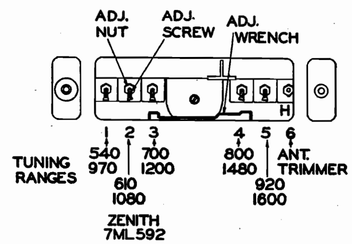


FIG. 5

5. Repeat the last two above operations to make sure the adjustments are accurate.

6. The same procedure is followed in setting the remaining four adjustments, selecting a station within the tuning range of each adjustment screw and placing the selector switch in the corresponding position for each adjustment screw.

SETTING THE ROTO-SELECTOR:

The tuning range is shown below each adjustment number (see Fig. 5).

1. Turn receiver on and allow it to operate for half an hour before making any adjustment.

2. Select a station within the range of position 1 on the Roto-Selector

7. Place escutcheon in position and secure in place with screws (see Fig. 6).

8. Place the control knobs in the proper position.

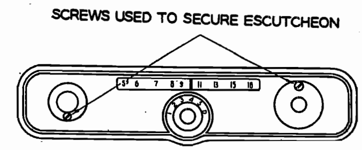


FIG. 6

A station adjusting eye is available at your Zenith distributor. It is especially essential when setting the Roto-Selector on a strong signal. This eye may also be used for alignment work instead of an output meter.

A jumper is provided on the test socket (see Fig. 1) located on the bottom of the receiver. Removing of this jumper will open the voice coil and allow you to connect your output meter to the voice coil side of the output transformer.

If you have the type of output meter which is usually connected to the plate of the output tube, it may be adapted for

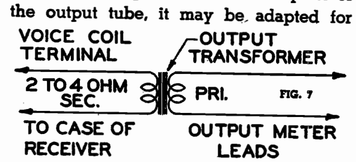


FIG. 7

this type of connection by following the instructions shown in Fig. 7.

The stringing of the dial cord is most important for unless properly strung the cord will jump off the pulleys. Fig 8 shows the proper way to string the dial cord.

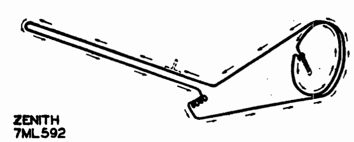
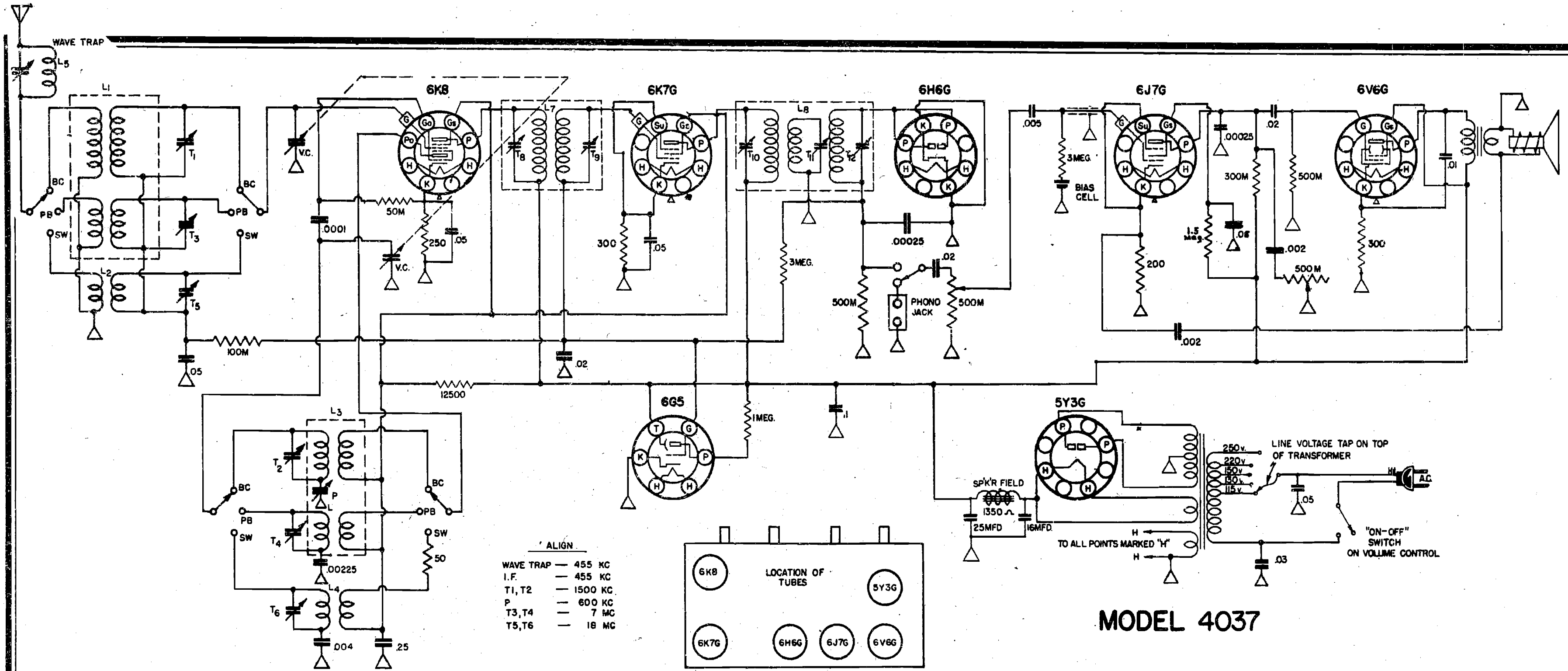


FIG. 8

AIR-KING PRODUCTS CO. INC.

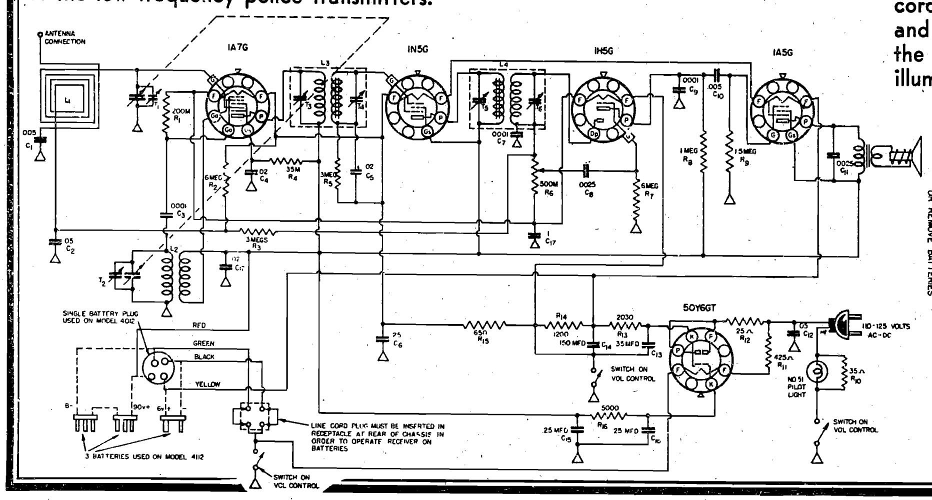
MODEL 4016
MODEL 4037



MODEL 4037

This receiver comprises a five tube superheterodyne receiver, employing the new 1.4 volt battery tubes. This receiver operates on either batteries, or 110-125 volts A.C.-D.C.

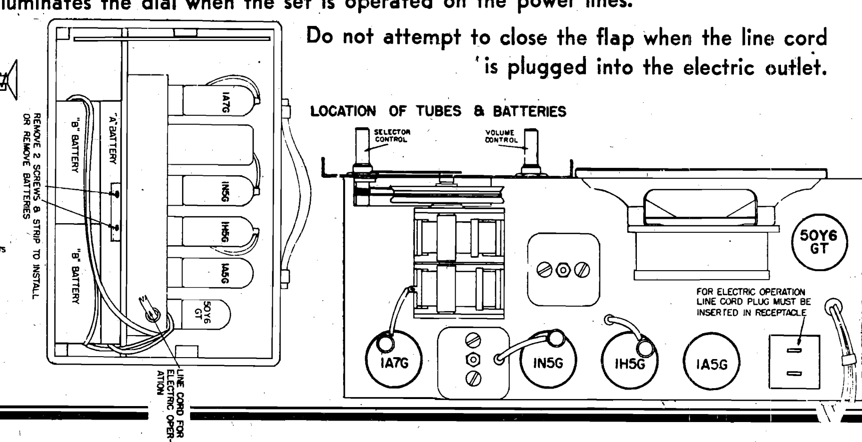
The trequency range covered is standard broadcast, 530 to 1730 kc and some of the low frequency police transmitters.



ELECTRIC OPERATION:

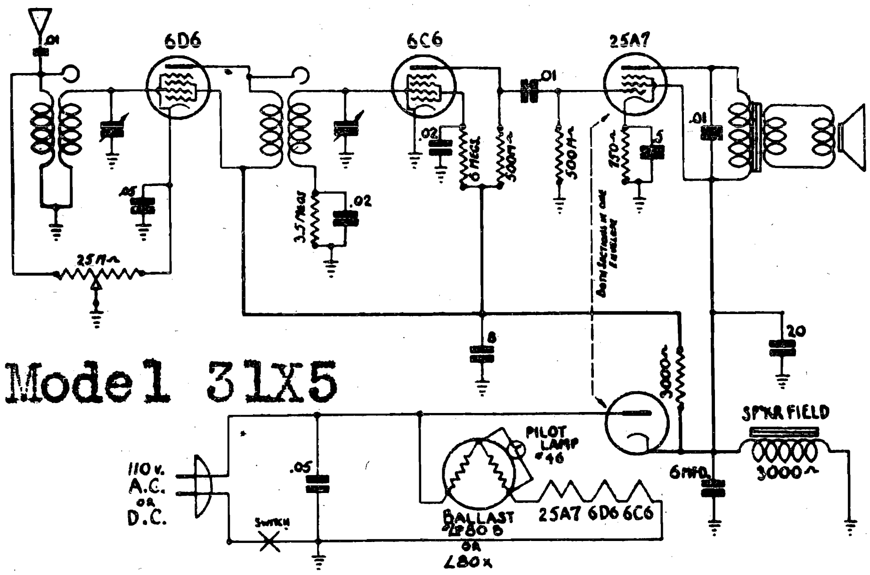
A power cord and plug is provided in a compartment at the rear of the cabinet. To place the set in operation, open the flap cover which is secured by the snap fastener and remove the power cord plug from its receptacle in the chassis. Stretch the line cord to its full length and plug it into the electric outlet. Finally, the set may be switched on by turning the volume control knob in a clockwise direction. A pilot light is provided which illuminates the dial when the set is operated on the power lines.

Do not attempt to close the flap when the line cord is plugged into the electric outlet.

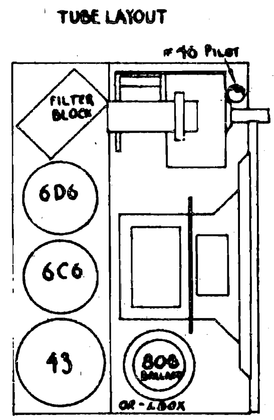


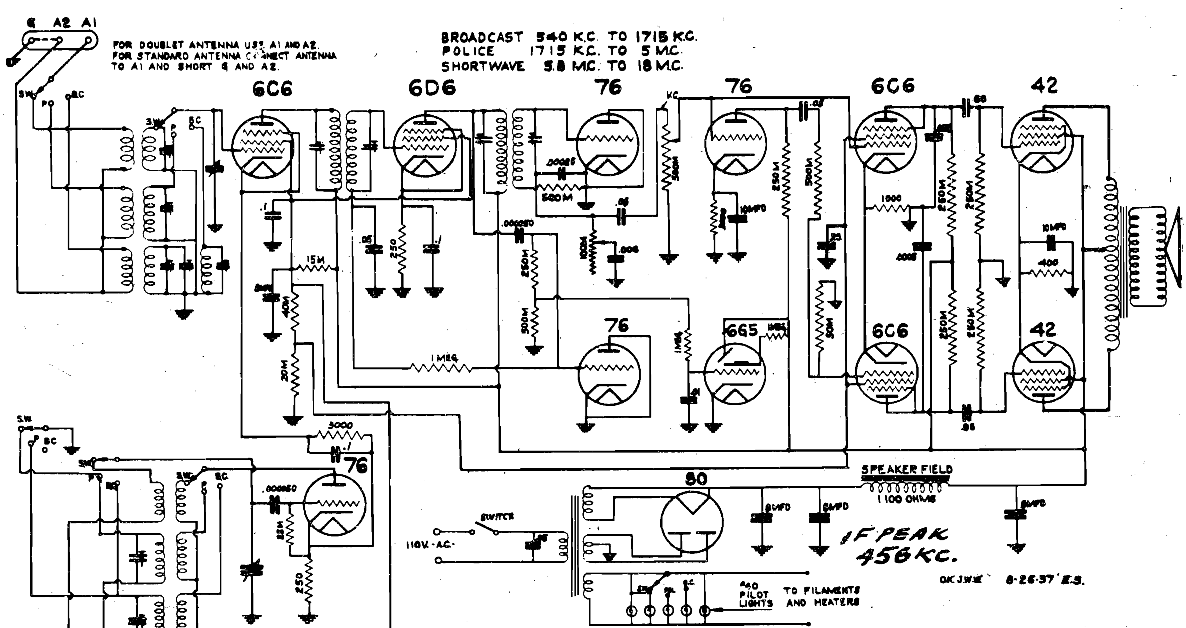
MODEL 31X5
MODEL 36Y12

ZEPHYR RADIO CO.

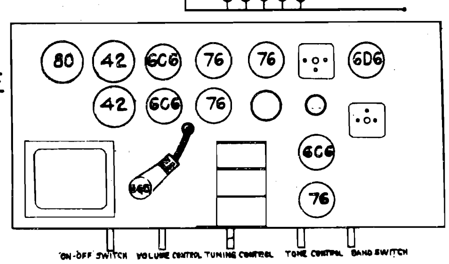


Model 31X5





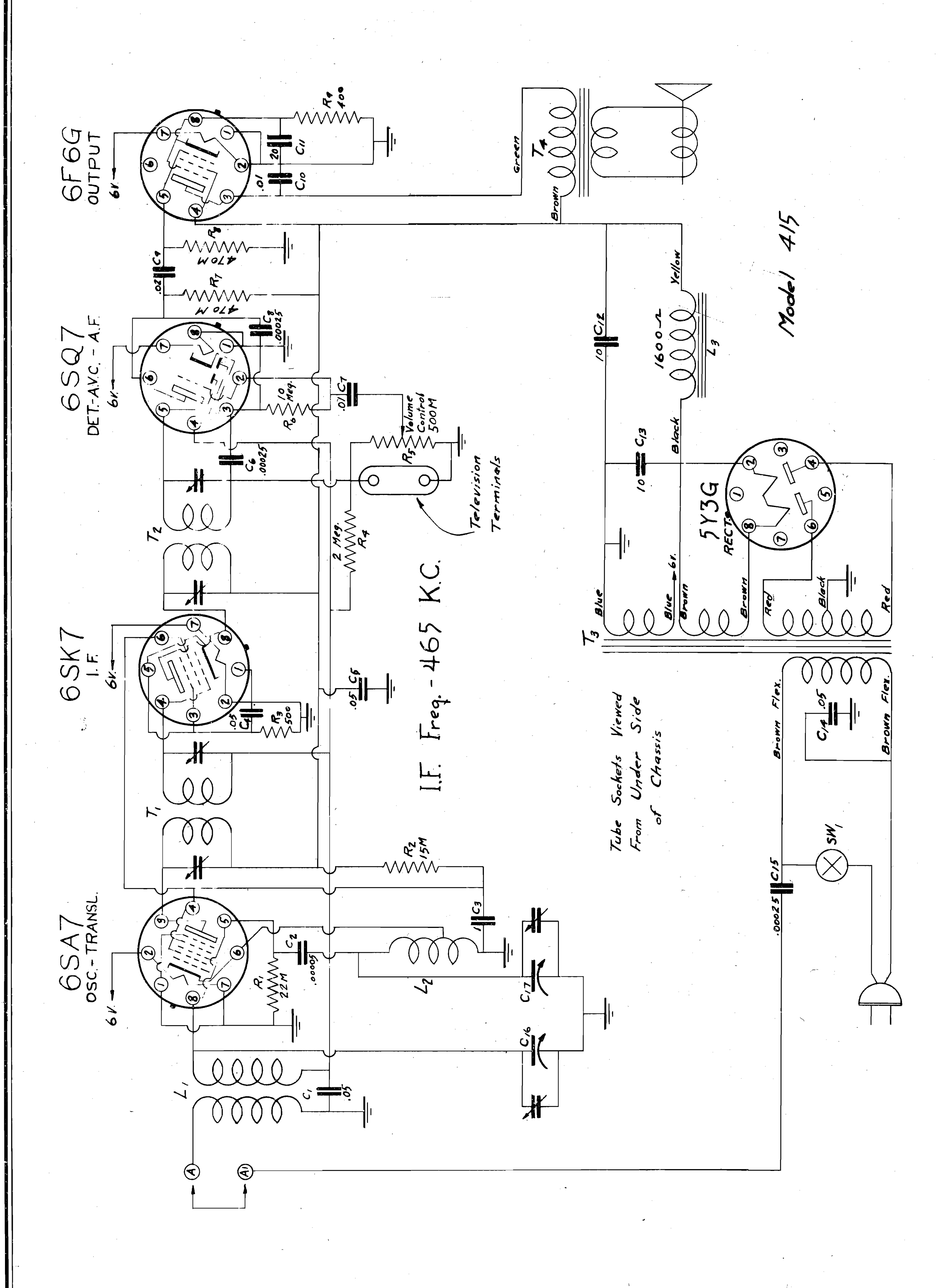
12 TUBE-3 BAND-A.C
SUPERHETERODYNE
WITH MAGIC EYE



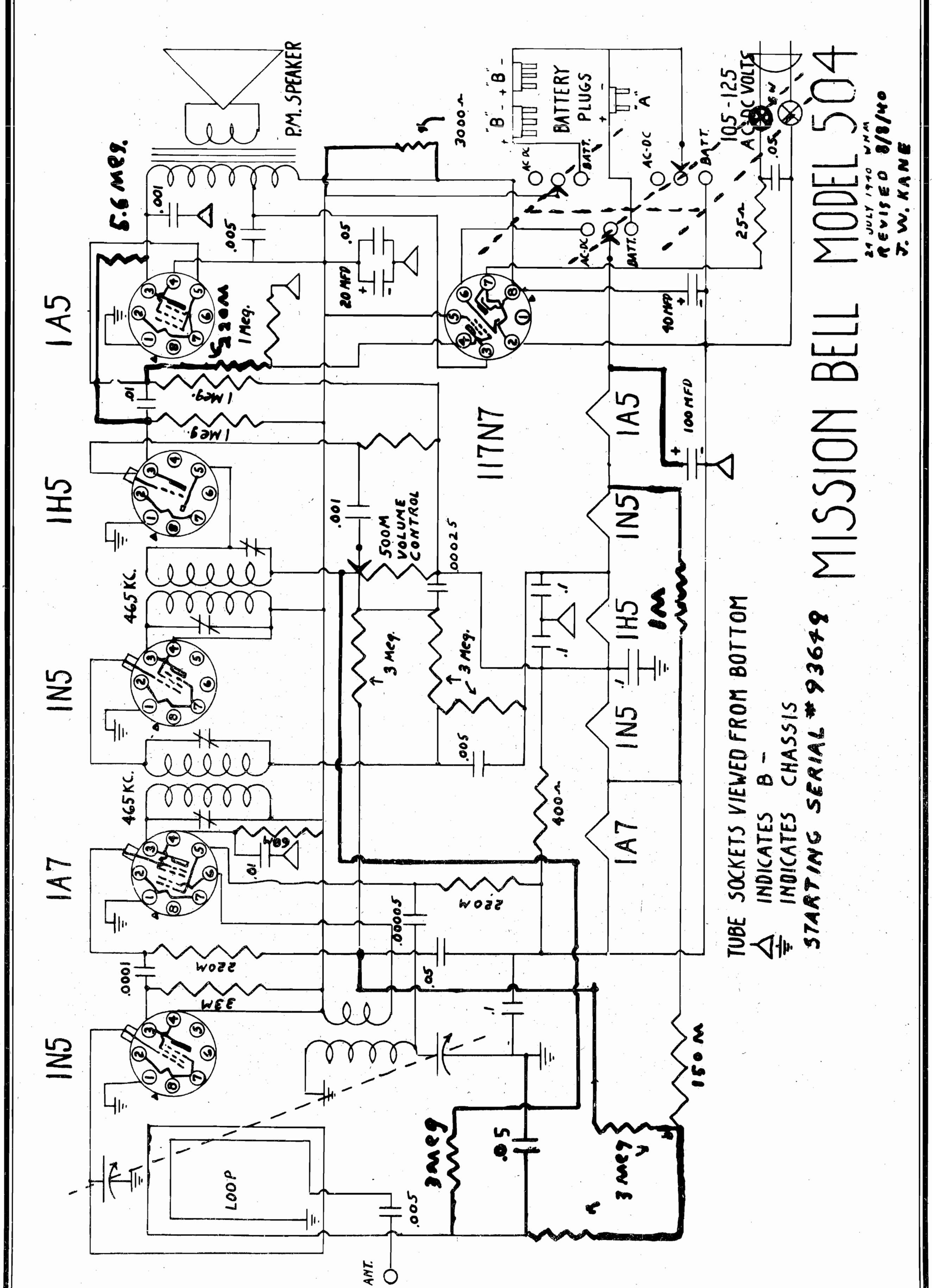
C208	8 MFD 450V DRY TUBULAR ELECT.
L 18	WAVE TRAP
L34	B.C. ANT PRESELECTOR COIL
C9	3-GANG VARIABLE CONDENSER
T21	POWER TRANSFORMER
DA36	DIAL ASSEMBLY
X-100	AC SWITCH
X-14	BAND SWITCH
V-15	VOLUME CONTROL
V-[illegible]	TONE CONTROL
L32	S.W. ANT. COIL
L33	POLICE ANT. COIL
L31	3 BAND OSCILLATOR COIL
I-18	1st I.F.
I-6	2nd I.F.
C-216	8 MFD 500 V. WET ELECTROLYTIC
S-1203	SPEAKER
PART	PART NAME

MODEL 36Y12

MISSION BELL RADIO MFG. CO., INC. **MODEL 415**



MODEL 504 MISSION BELL RADIO MFG. CO., INC.



CLARIFIED SCHEMATICS

The diagrams on the yellow sheets in this section indicate the breakdown of the individual bands of the multi-wave band receivers specified in the corner cards and shown in the respective manufacturers' sections in the main part of this Manual. Those schematics for which breakdowns have been made bear a designation (☛) in the upper margin. The purpose of these breakdowns is to show how the components, that is the coils, condensers and switch contacts, are used when the receiver is set to different bands. In the majority of cases the circuits shown are the r-f and oscillator systems; however, in a few instances, a-f breakdowns are given.

The switch contacts which are associated with the various circuits, are represented as small circles, bearing either numerical or alphabetical designations corresponding to those designations shown upon the complete diagram contained in the respective manufacturers' sections in the main part of the Manual. The connections between the switch points are shown by dotted lines.

Each of the main diagrams, that is complete schematics, shows the wave-band switch in a certain position; usually this is the broadcast-band position. This same position is shown as the first position in the breakdown diagram unless the contrary is specified. Reference in the breakdown diagrams to the fact that the switch is shown as having been moved from one position, indicates the first position immediately following either the broadcast band, if that is the first shown, or whatever the band may be which is the first shown. Expressed differently this is, if the designation is "switch moved one position", this means that the wave-band switch has been turned one position from the reference point designated as "switch as shown".

When all switches associated with the movement turn in the same direction, this is specified as "clockwise" or "counter-clockwise" as the case may be.

You will note that corner cards on some of the "Clarified Schematic" breakdowns indicate several receivers. This means that the r-f and oscillator sections, as shown in the breakdown, apply to those receivers. However, this should not be construed as signifying that all these receivers are the same throughout. It simply means that the wave-band positions and associated circuits are the same for each model or chassis listed under the same "Clarified Schematic".

In some cases sections of the wave-band switch are used to short-circuit coils which are not in operation on the particular band shown in the schematic. In cases where inclusion of these shorted coils unnecessarily complicates the breakdown, they have been omitted, since they are not essential to the operation of the signal-carrying circuits.

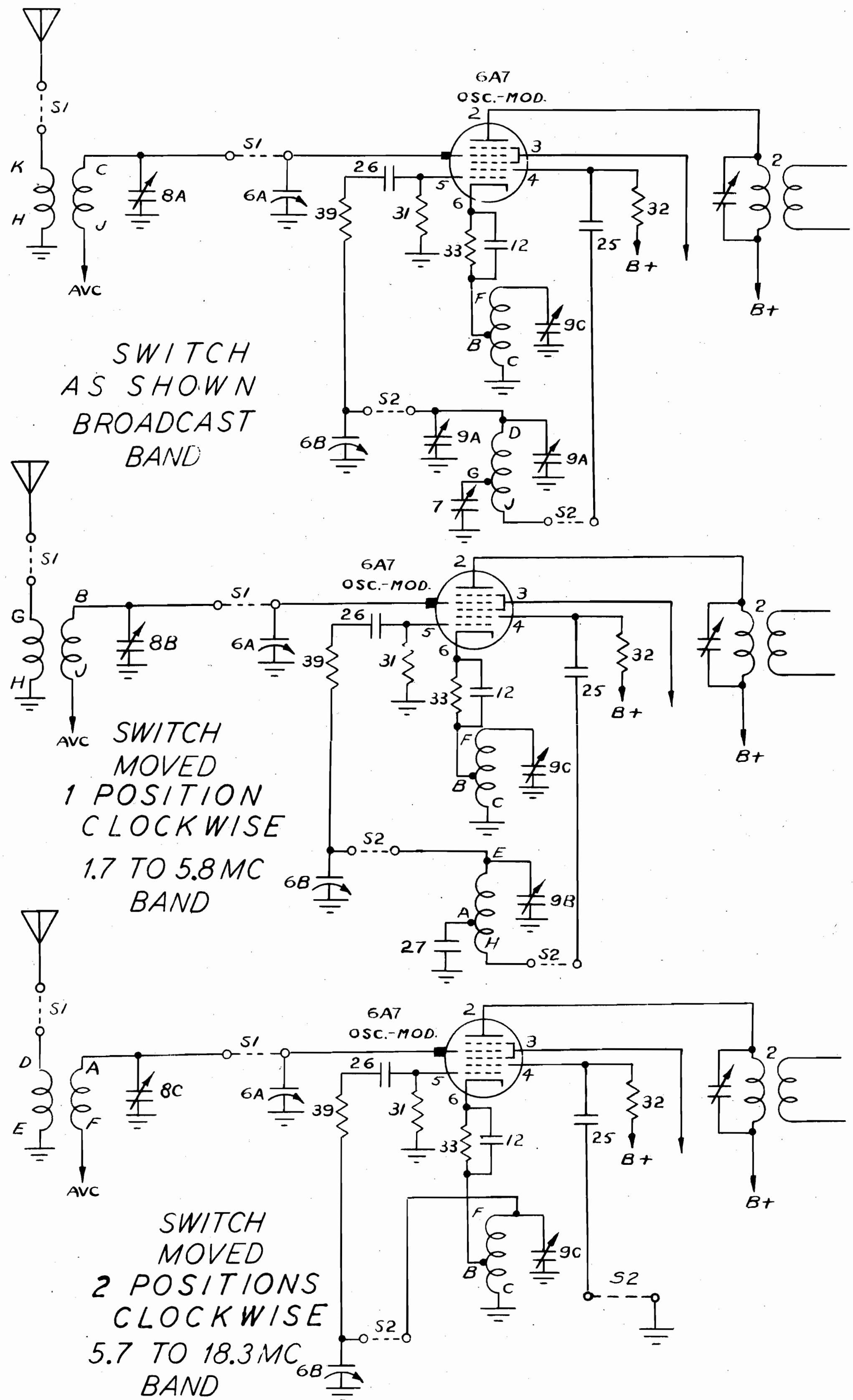
In the case of audio-frequency circuit breakdowns, the designations shown upon the breakdown schematics correspond with the designations shown upon the complete schematics.

For your convenience the pin terminals for each tube represented in the breakdown diagrams have been numbered according to the RMA system.

You will note that in some cases the bands are identified in accordance with the frequency range covered. Then again in some instances these frequency ranges are omitted. The reason for the omission is that we were unable to identify the specific ranges covered by the various bands and it was felt that, since all receivers do not employ switch arrangements which increase the frequency range in exact sequence as the range switch is advanced, it was deemed advisable to speak simply in terms of the switch positions, rather than the frequency ranges. Of course, where the frequency range was known it has been identified.

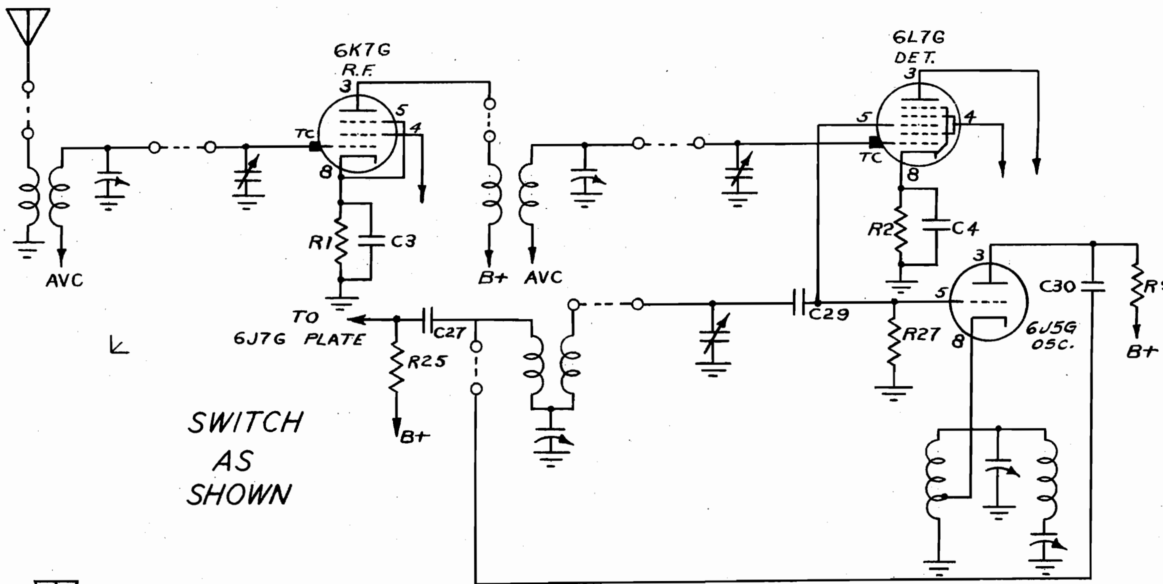
ALLIED RADIO CORP. MODELS B-10572, B-10585, B-10586

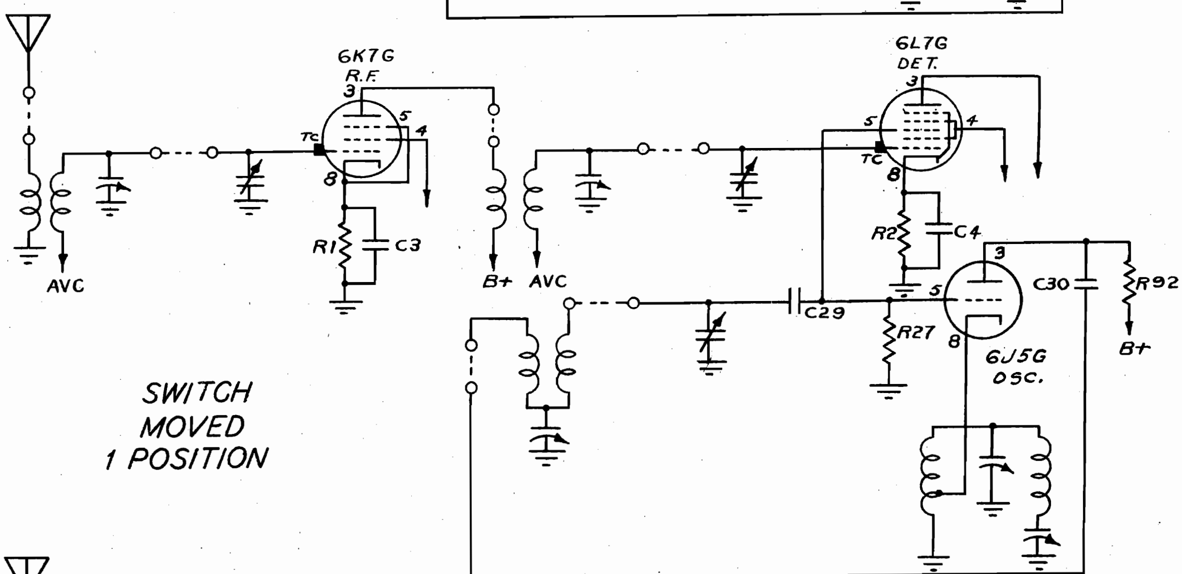
See Allied Page 12-9

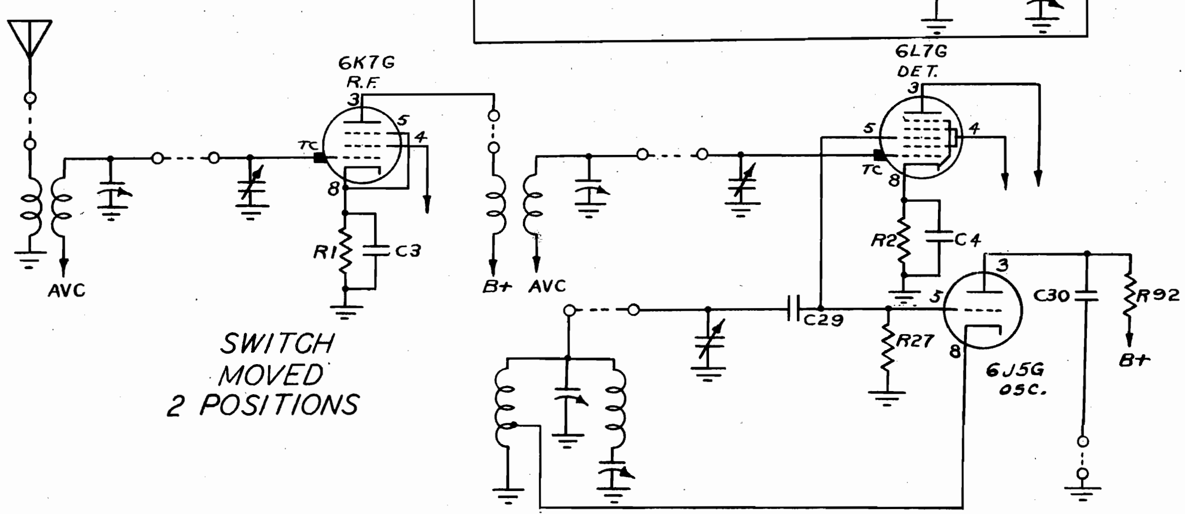


ALLIED RADIO CORP.

MODEL E-10880
See Allied Page 12-27

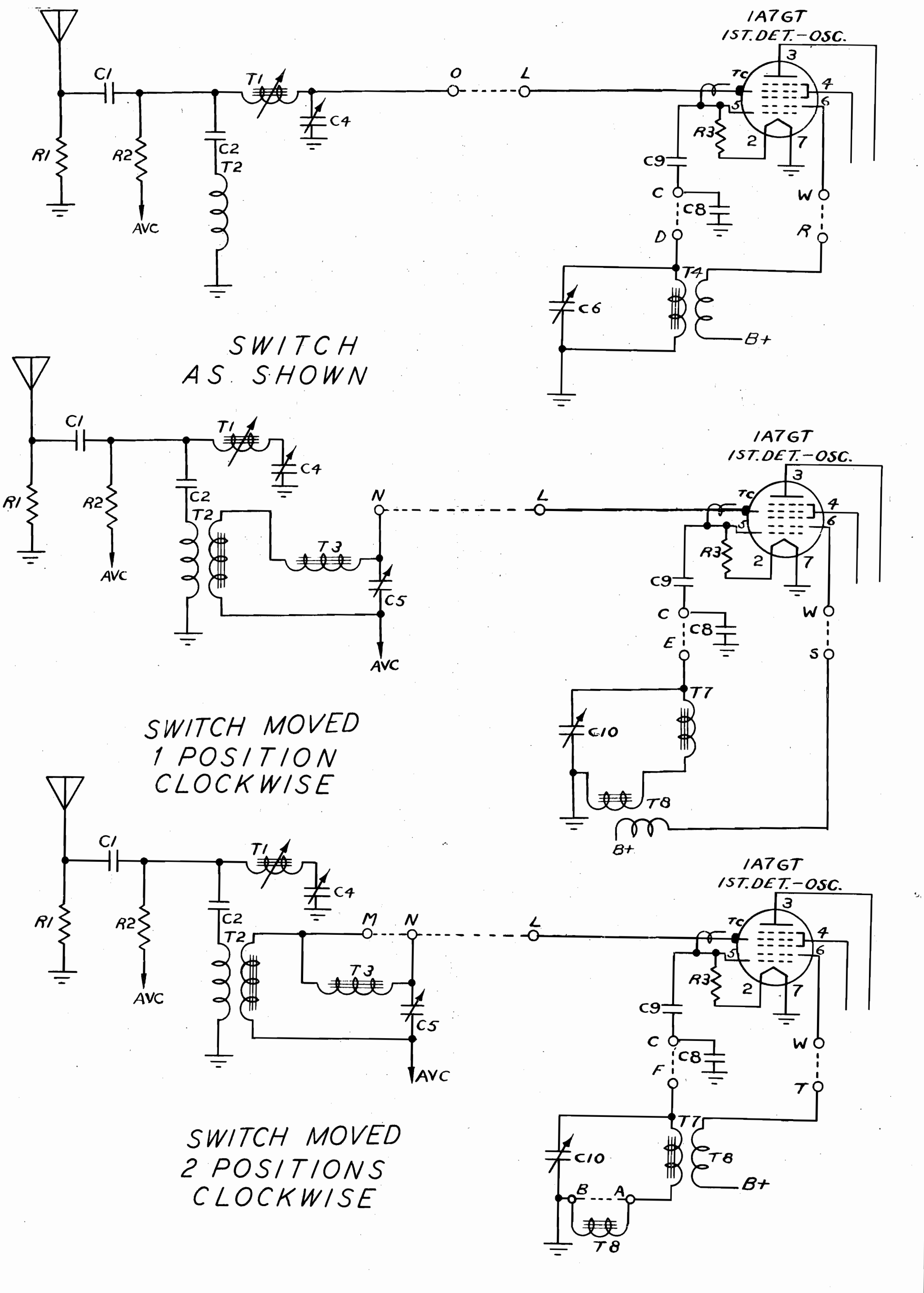






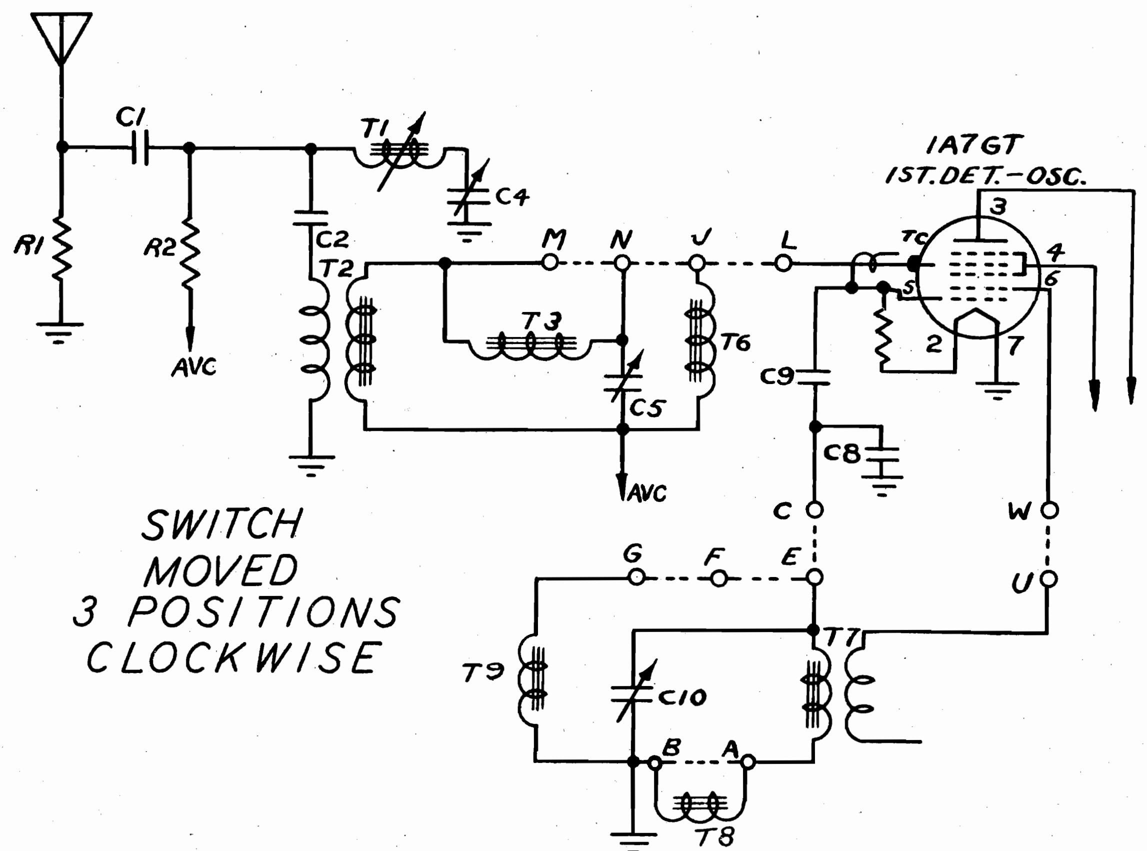
BELMONT RADIO CORP.

MODEL 509
See Belmont Page 12-41

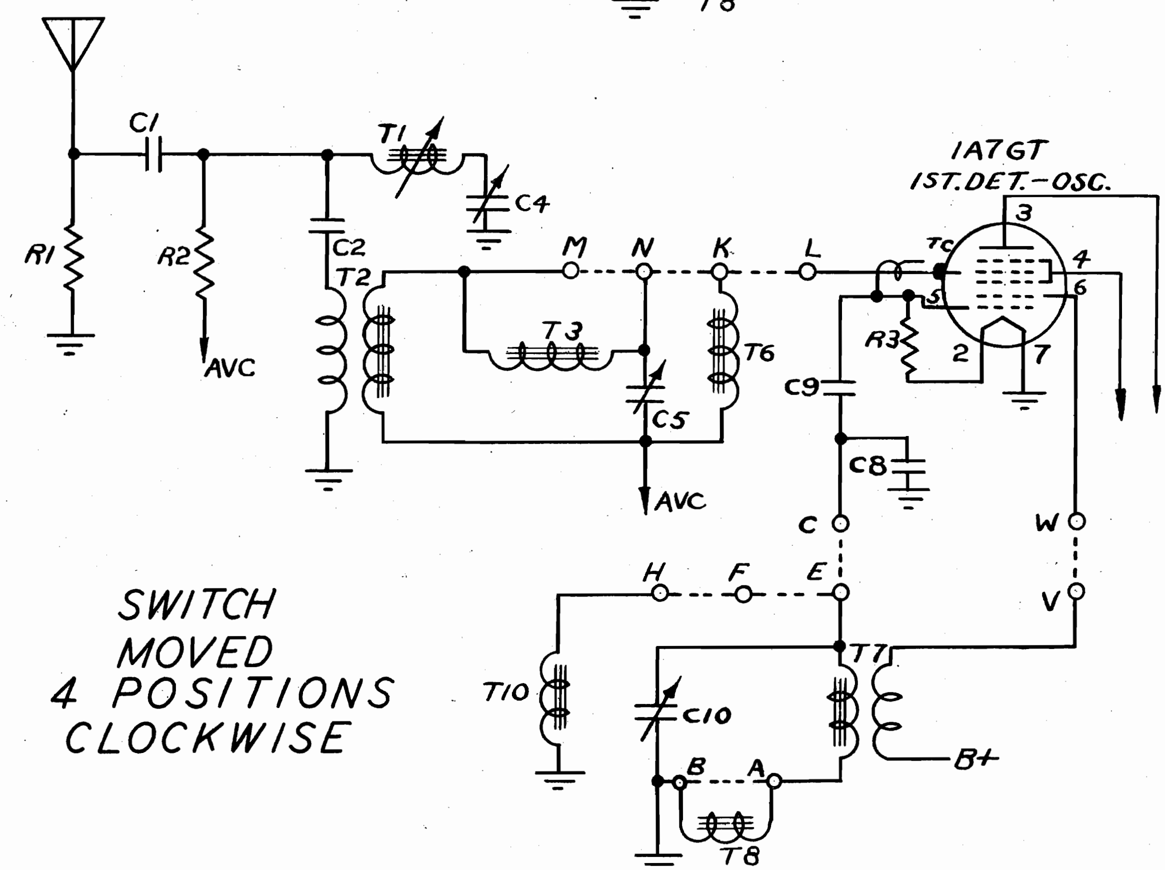


MODEL 509
See Belmont Page 12-41

BELMONT RADIO CORP.



SWITCH MOVED 3 POSITIONS CLOCKWISE

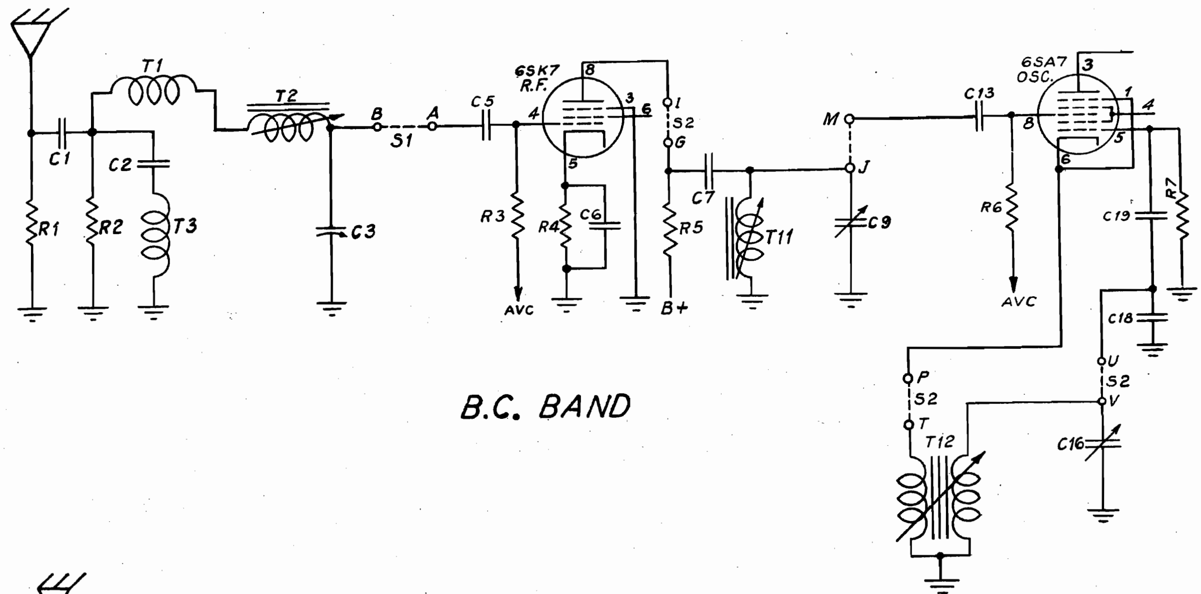


SWITCH MOVED 4 POSITIONS CLOCKWISE

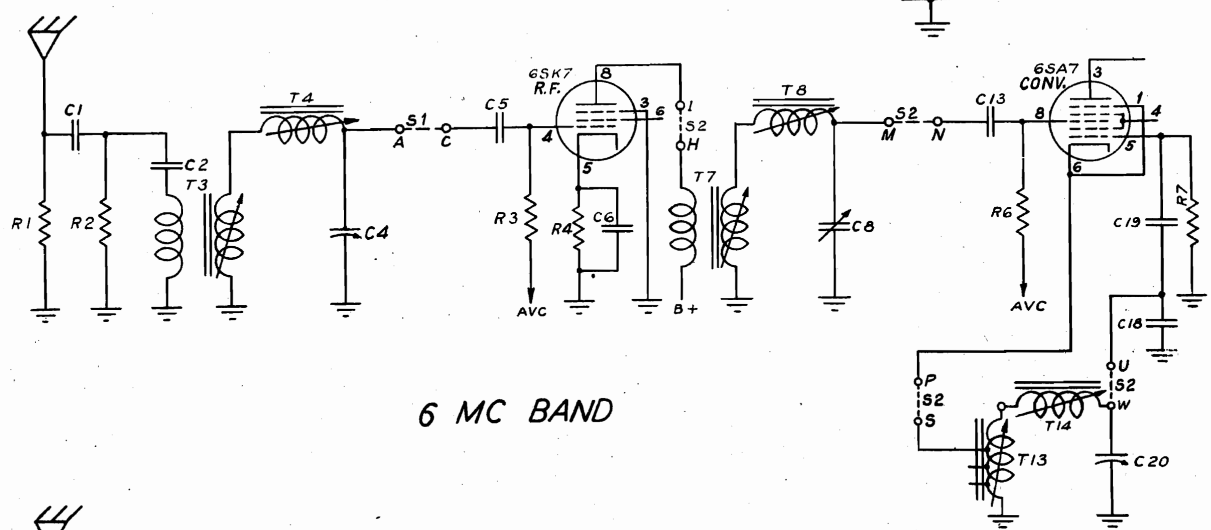
MODEL 902
See Belmont Page 12-38

BELMONT RADIO CORP.

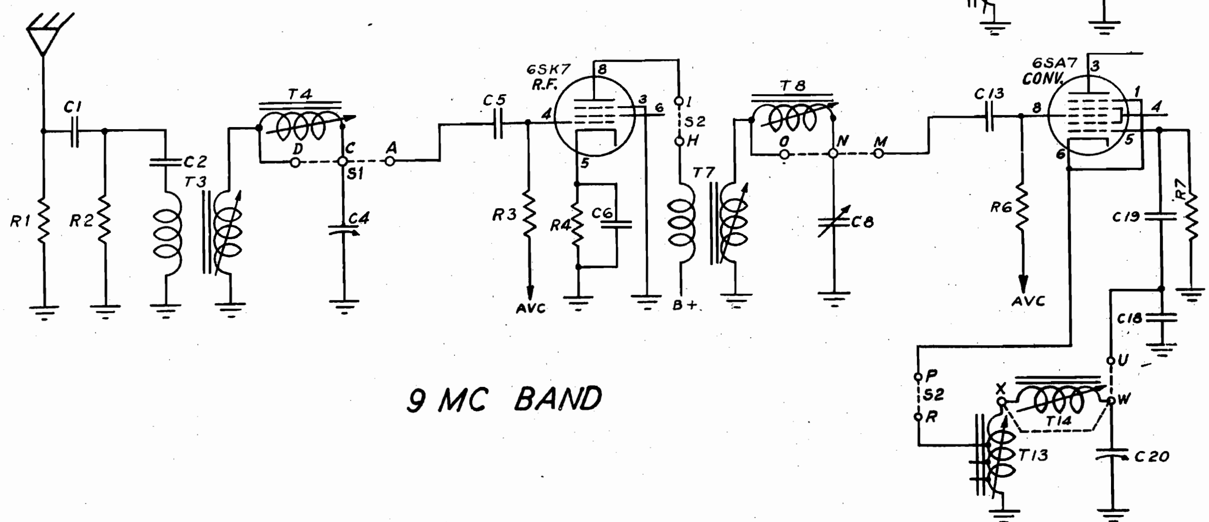
MODEL 800
See Belmont Page 12-31
MODEL 801
See Belmont Page 12-34



B.C. BAND



6 MC BAND

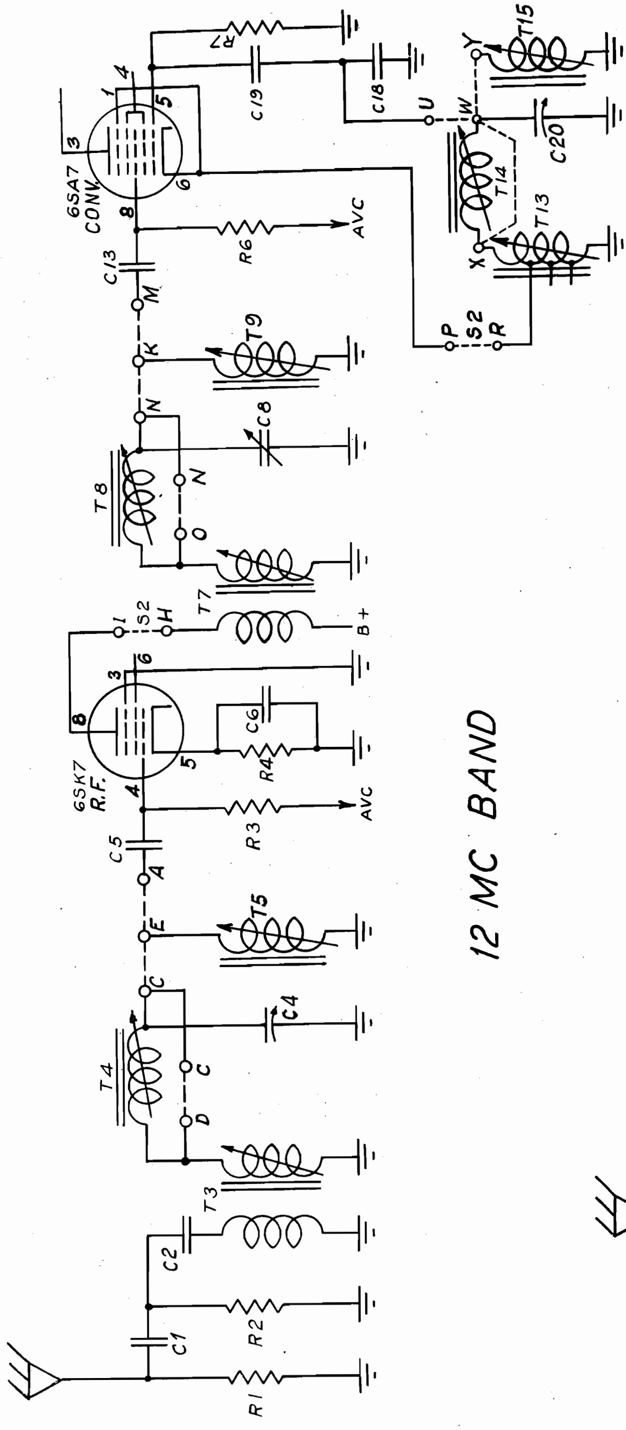


9 MC BAND

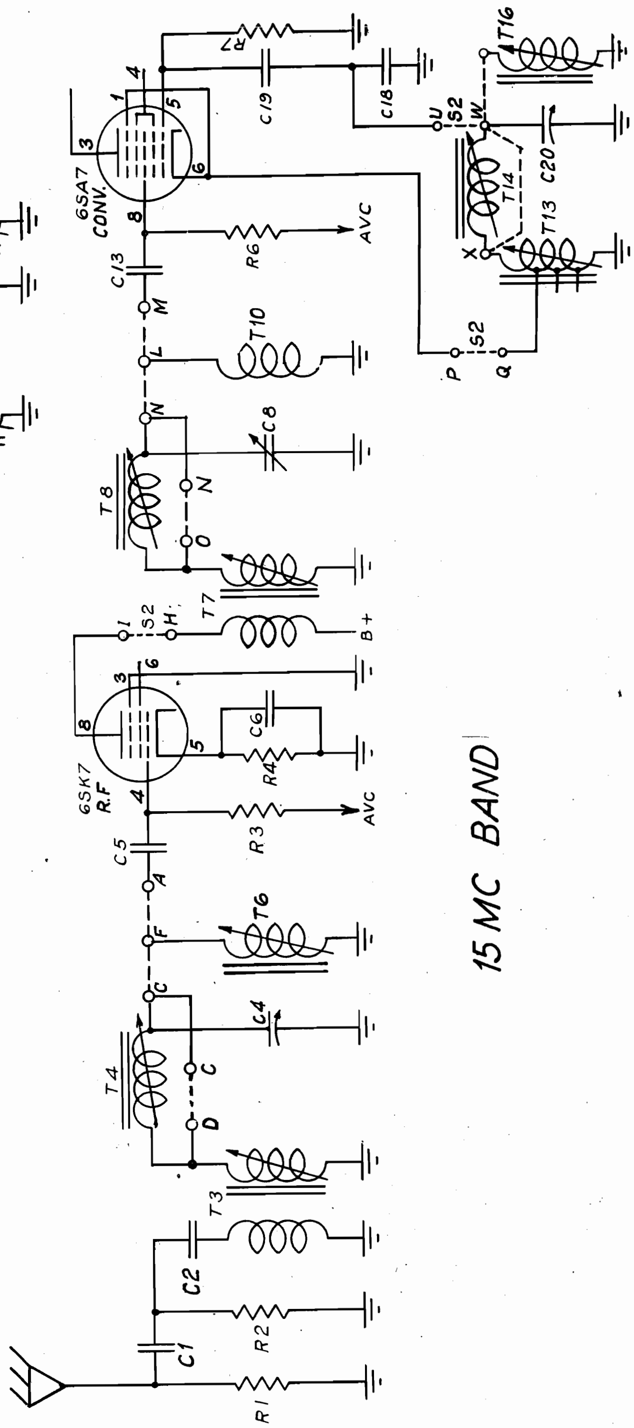
MODEL 800
See Belmont Page 12-31
MODEL 801
See Belmont Page 12-34

BELMONT RADIO CORP.

MODEL 902
See Belmont Page 12-38



12 MC BAND

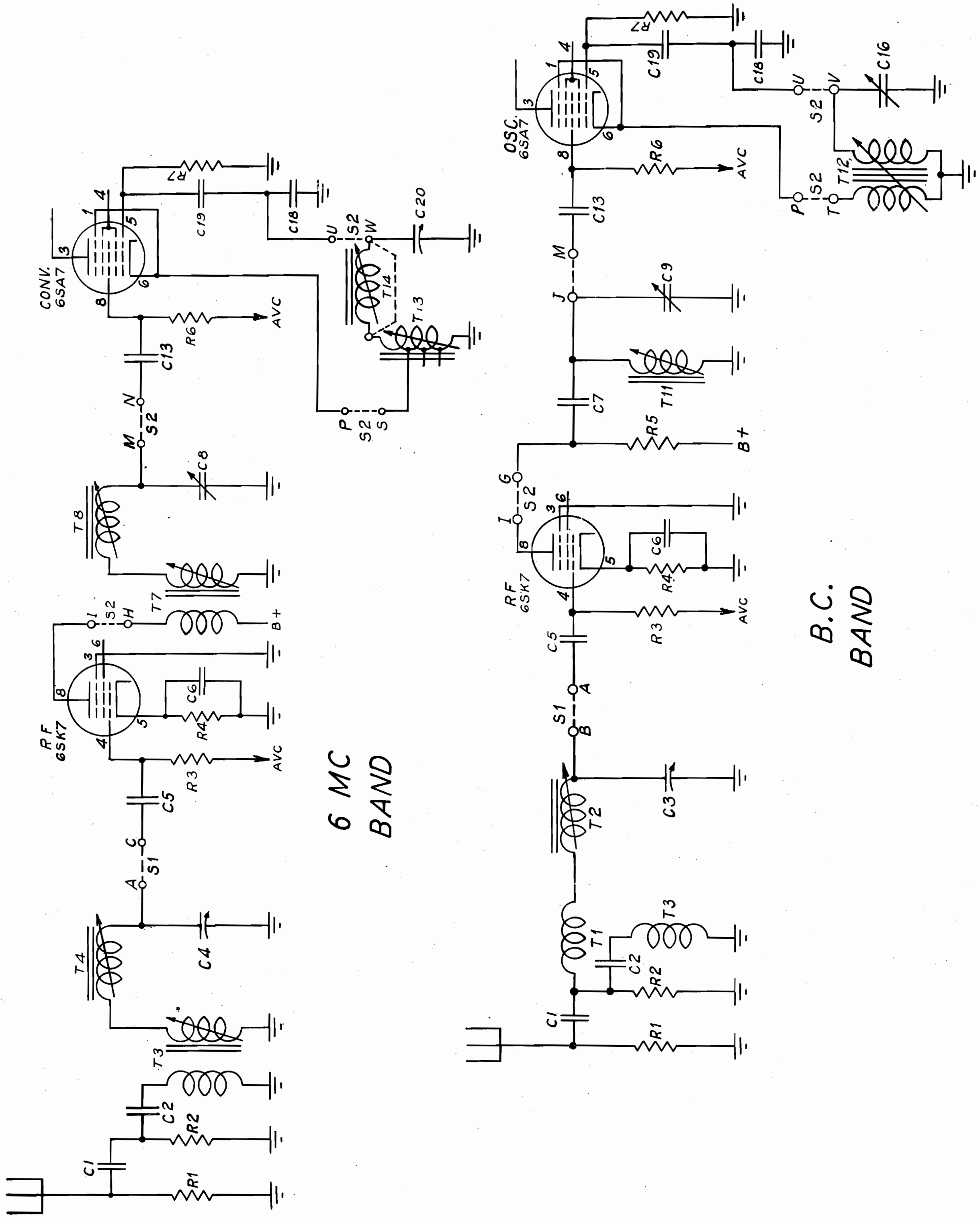


15 MC BAND

BELMONT RADIO CORP.

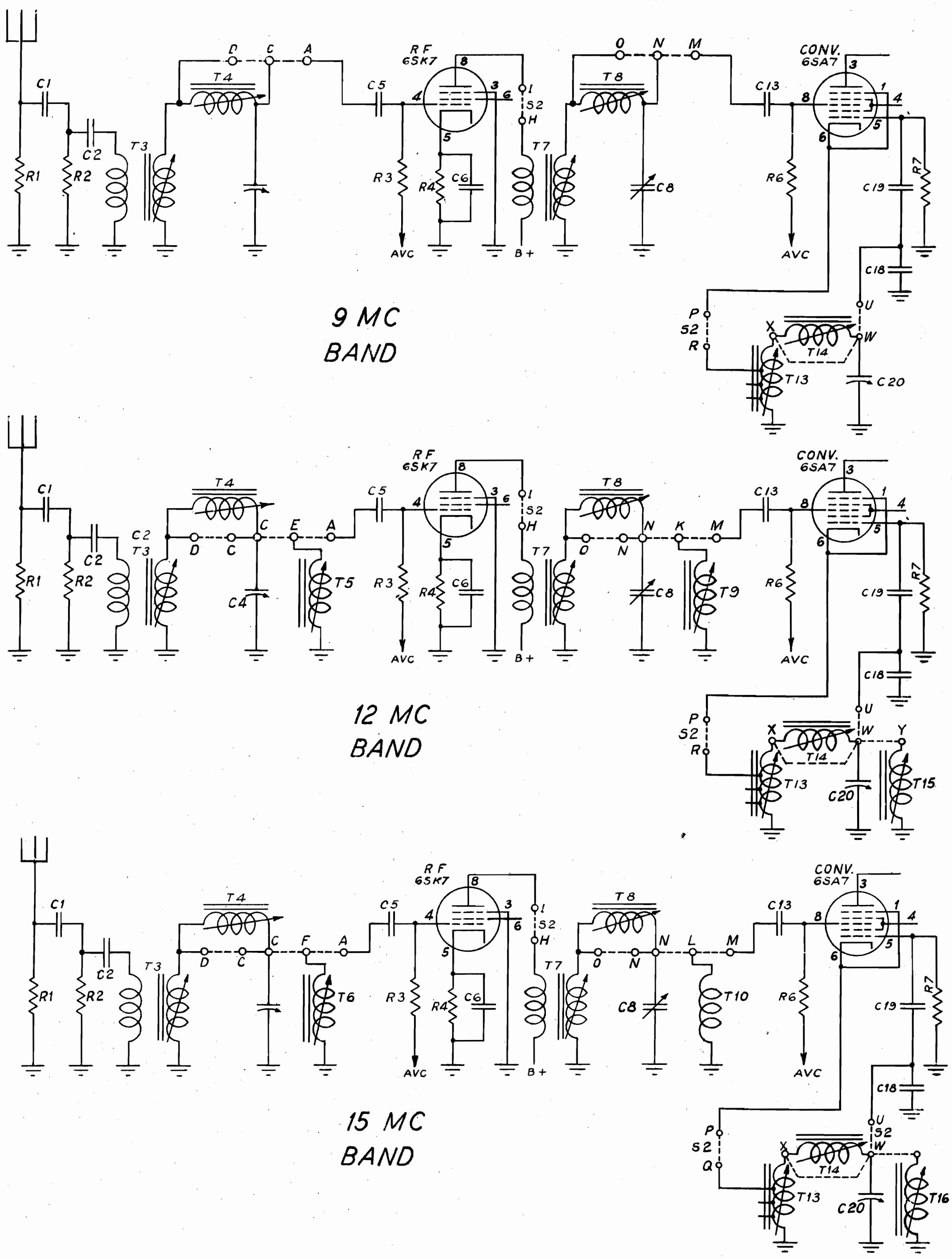
MODEL 1100 Series A

See Belmont Page 12-39



MODEL 1100 Series A
See Belmont Page 12-39

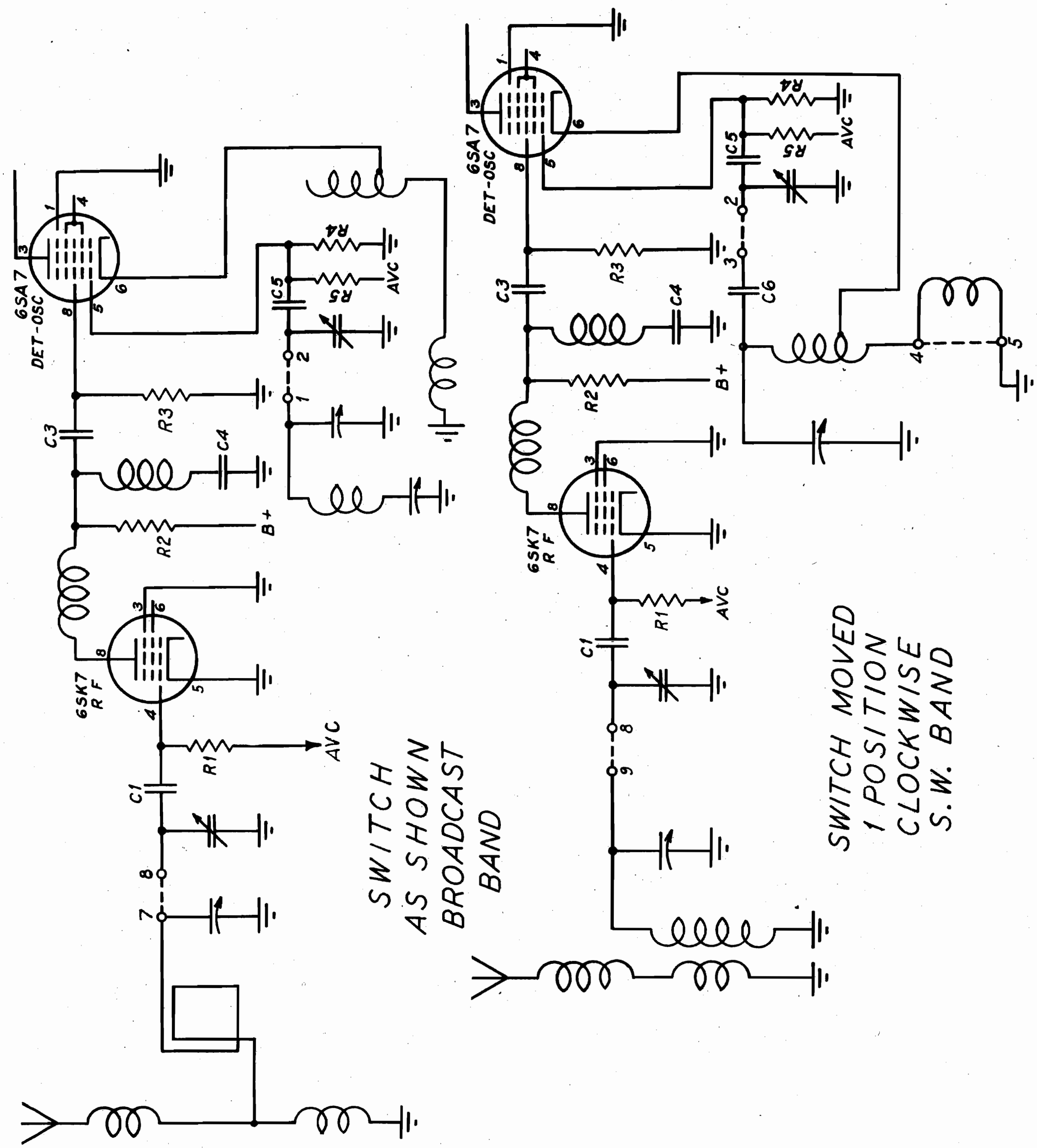
BELMONT RADIO CORP.



MODEL B-7
See Continental
Page 12-13

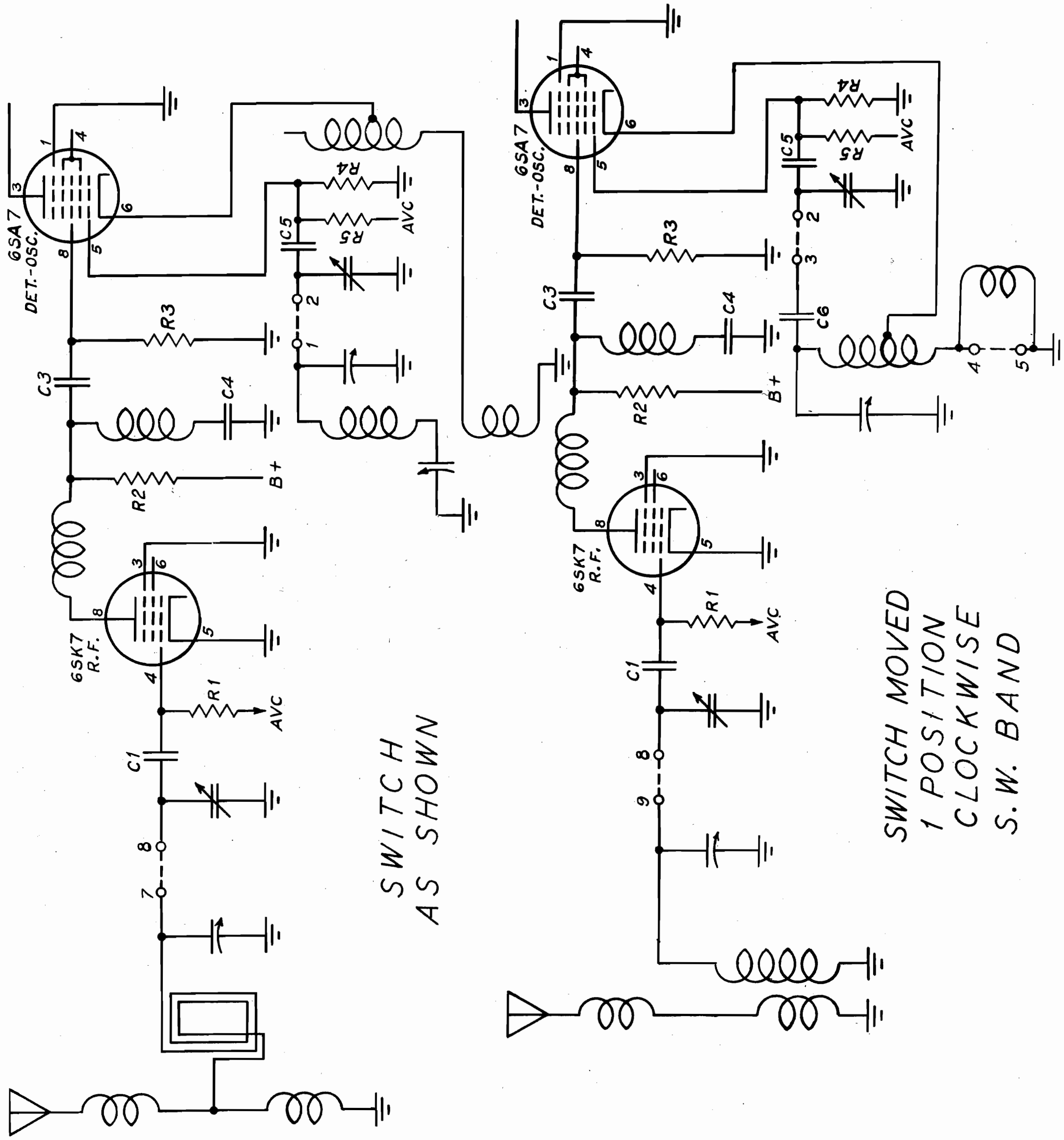
CONTINENTAL RADIO & TELEV. CORP.

MODEL A-7
See Continental
Page 12-12



CONTINENTAL RADIO & TELEV. CORP. MODEL A-77

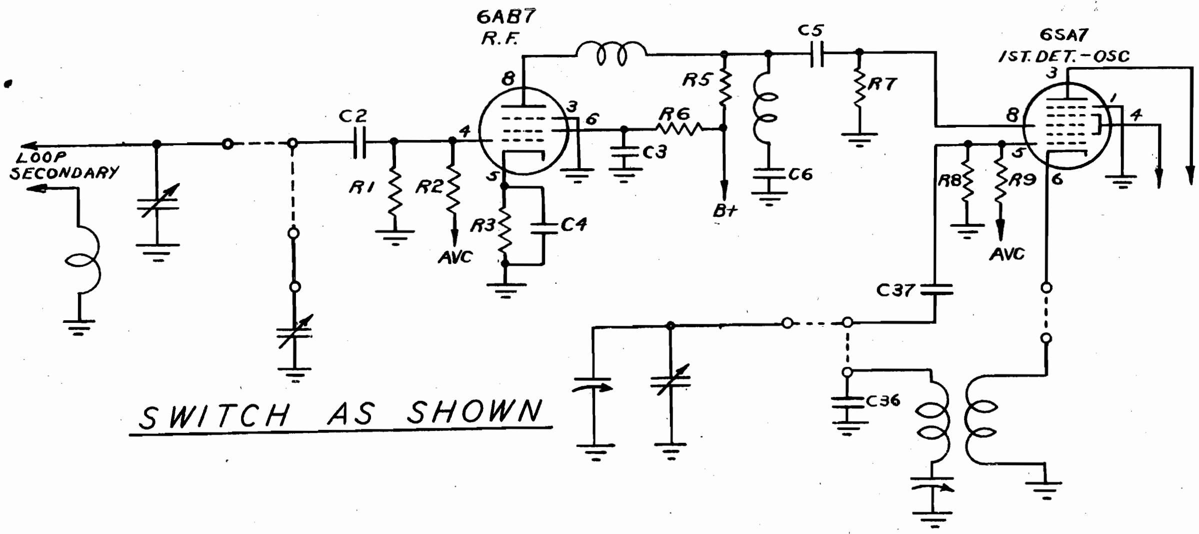
See Continental
Page 12-22



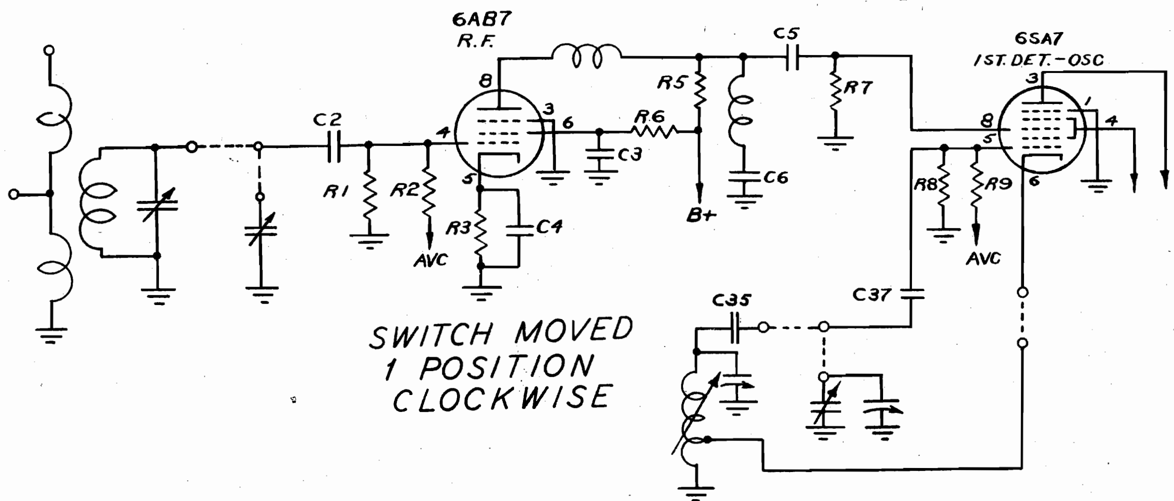
MODEL B11
See Continental
Page 12-19

CONTINENTAL RADIO & TELEV. CORP.

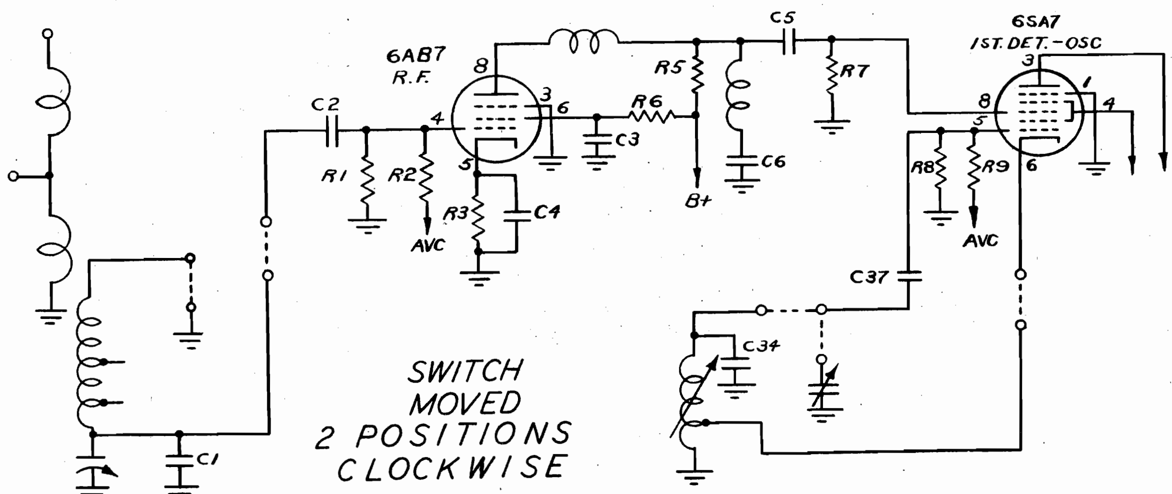
MODELS A11, A11-PH
See Continental
Page 12-15



SWITCH AS SHOWN



SWITCH MOVED
1 POSITION
CLOCKWISE

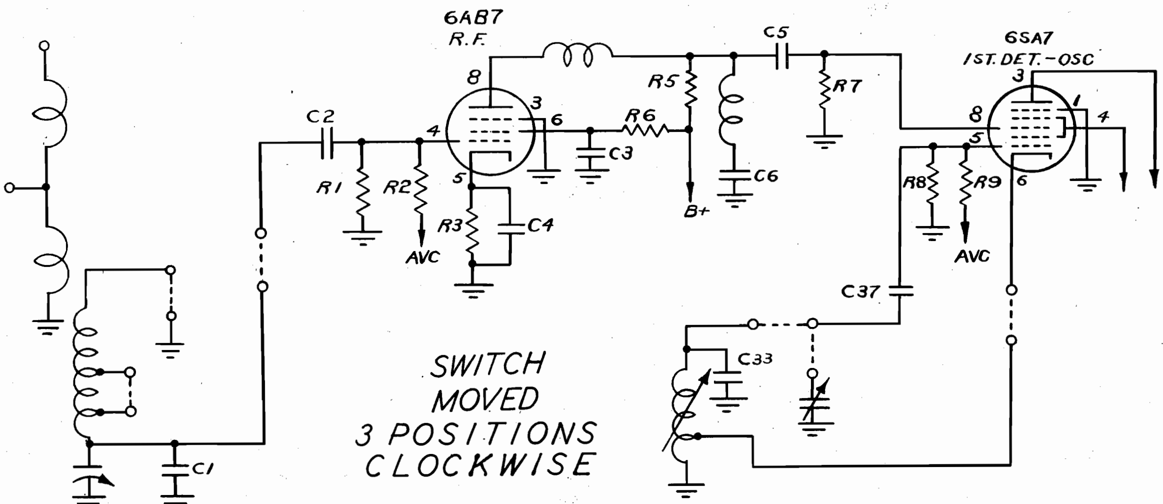


SWITCH
MOVED
2 POSITIONS
CLOCKWISE

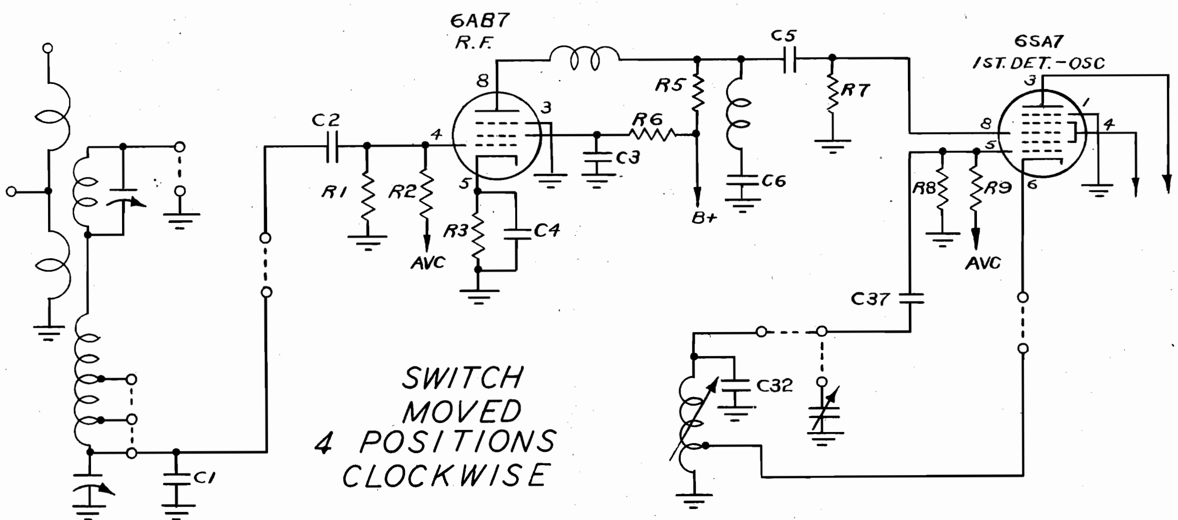
MODEL B11
See Continental
Page 12-19

CONTINENTAL RADIO & TELEV. CORP.

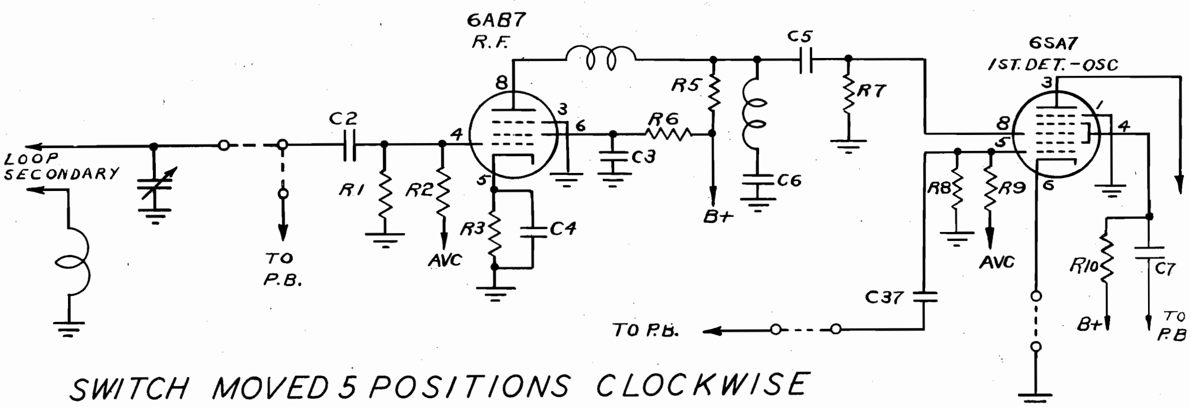
MODEL A11, A11-PH
See Continental
Page 12-15



SWITCH MOVED 3 POSITIONS CLOCKWISE



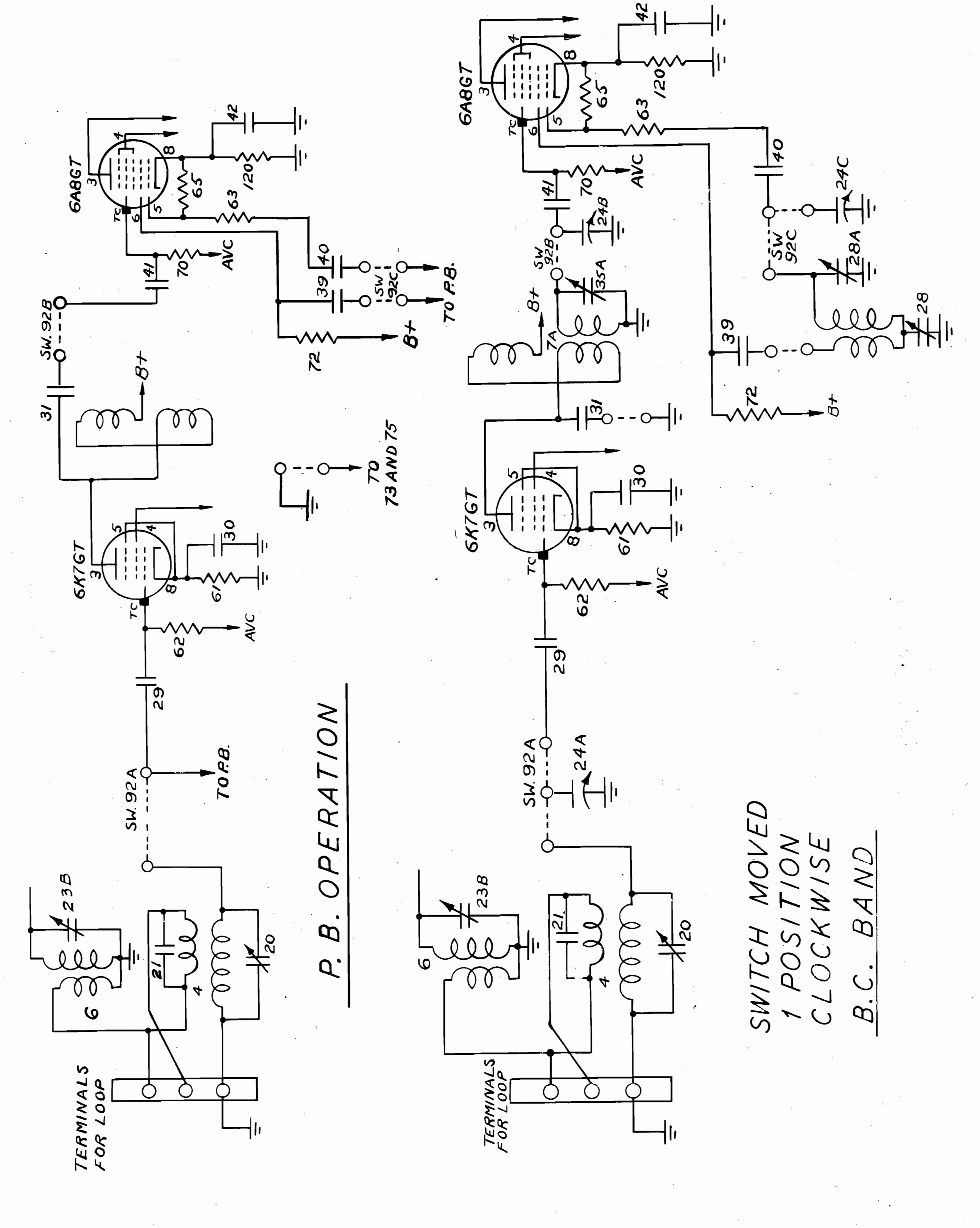
SWITCH MOVED 4 POSITIONS CLOCKWISE



SWITCH MOVED 5 POSITIONS CLOCKWISE

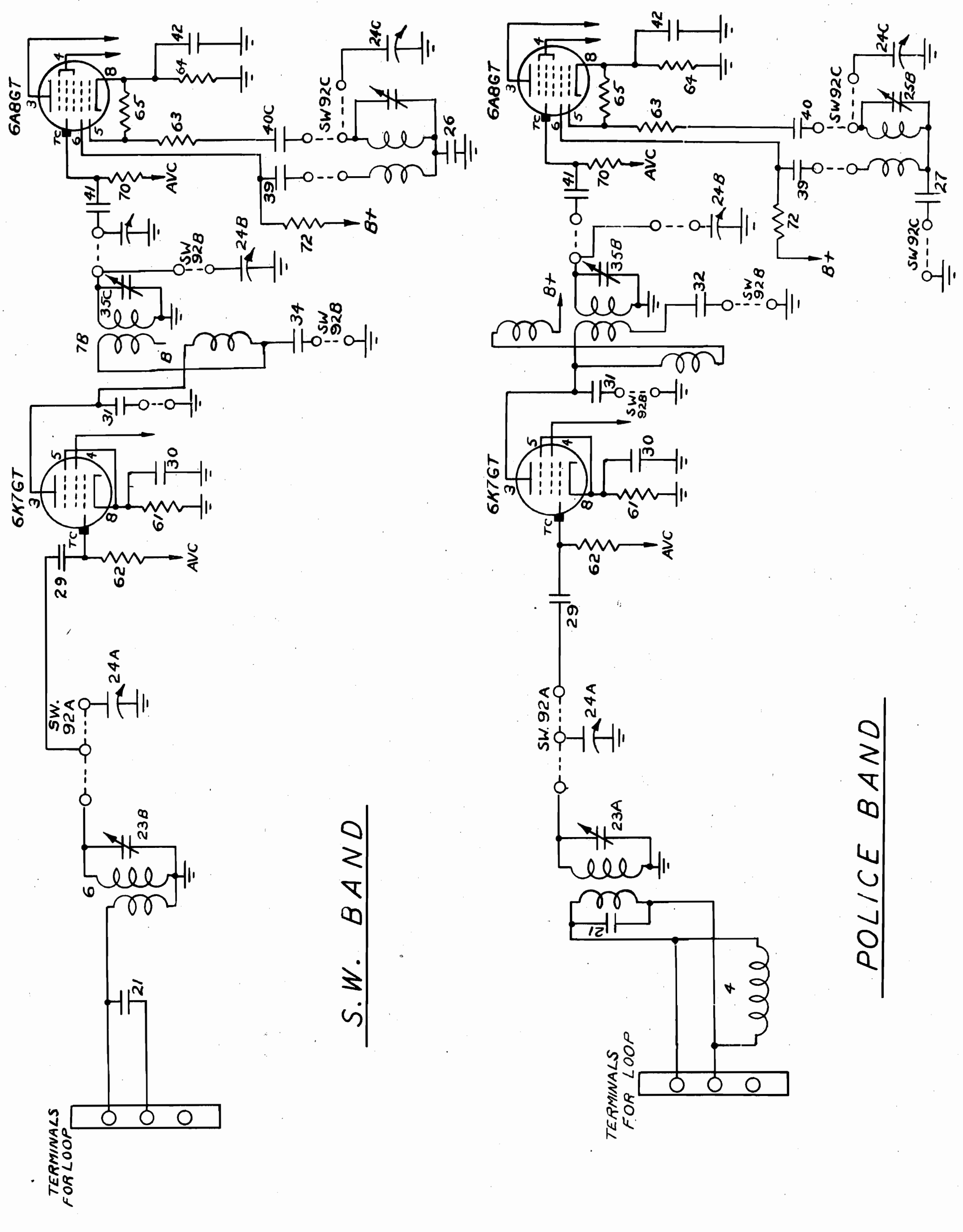
CROSLEY CORP.

MODEL 26
MODEL 26 Revised
See Crosley Page 12-21



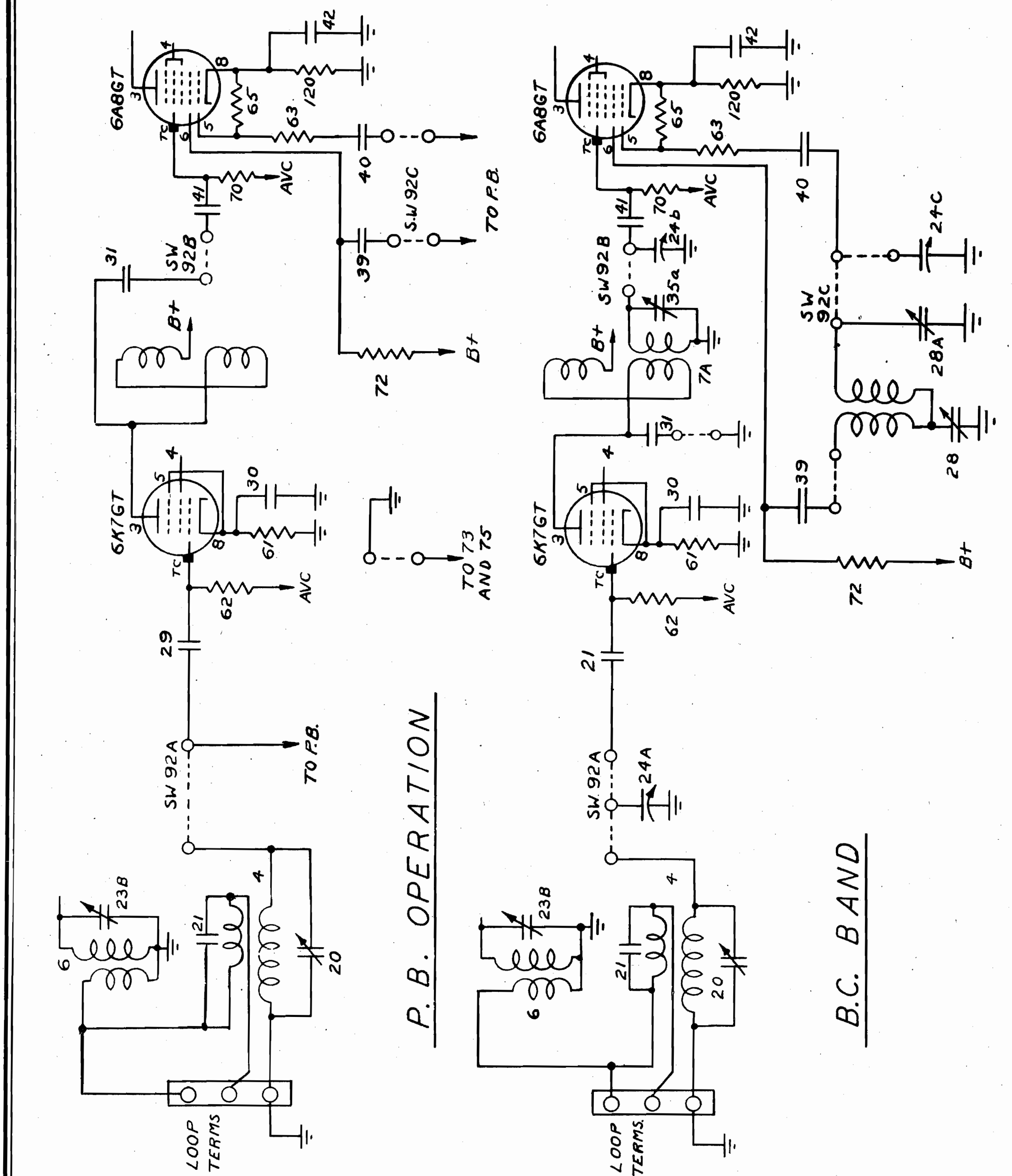
MODEL 26
MODEL 26 Revised
See Crosley Page 12-21

CROSLEY CORP.



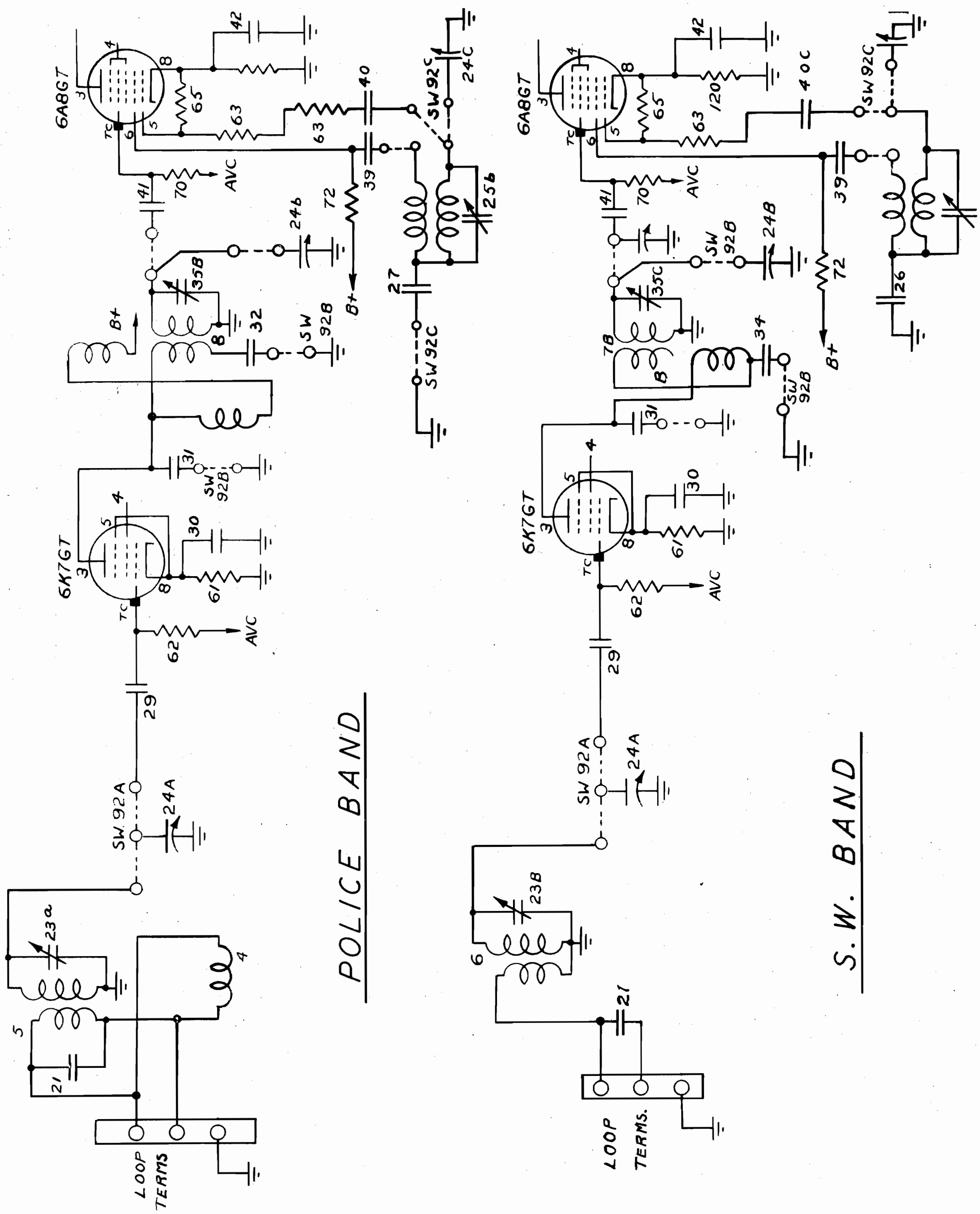
CROSLEY CORP.

MODEL 29
See Crosley Page 12-25



MODEL 29
See Crosley
Page 12-25

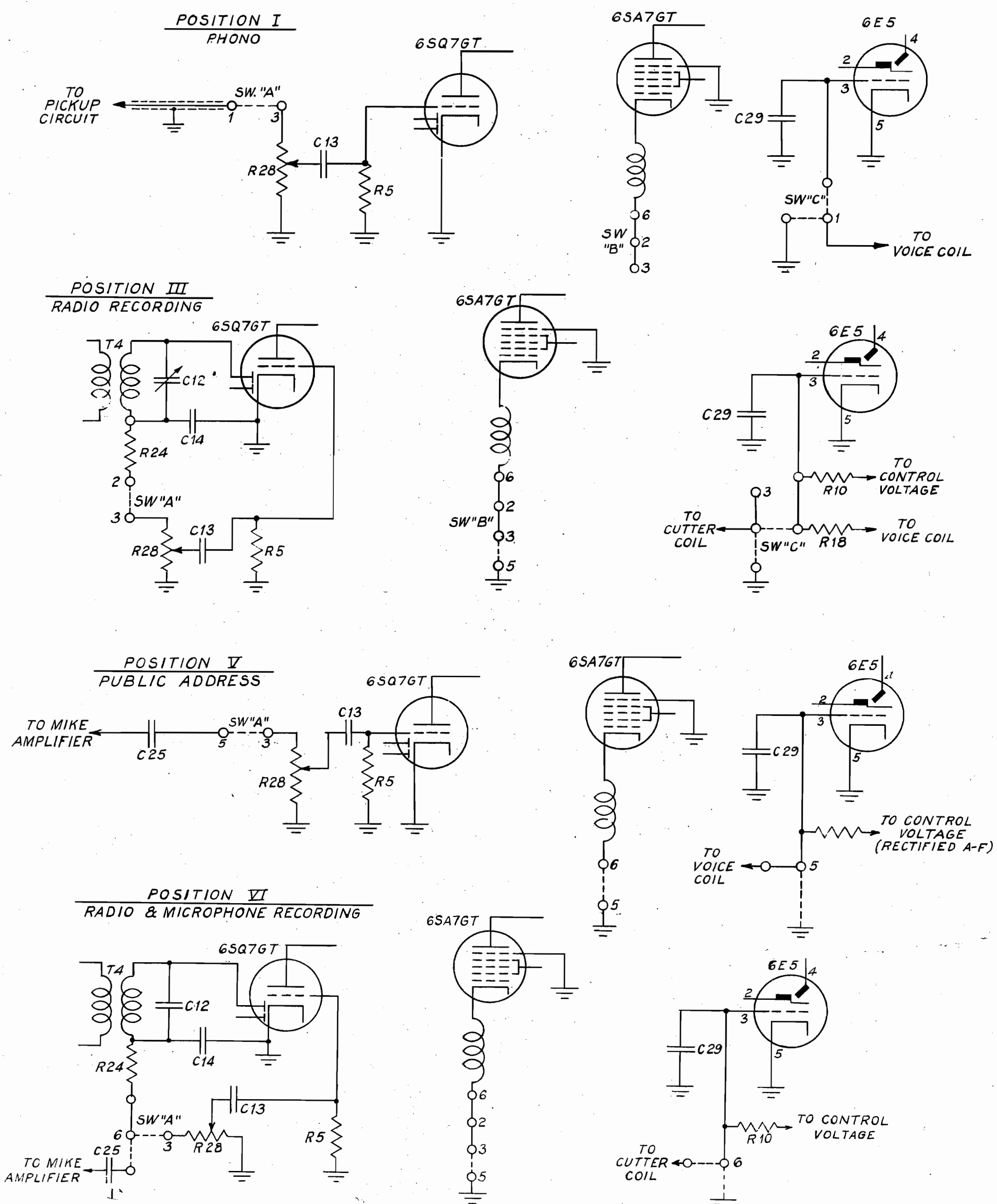
CROSLEY CORP.



EMERSON RADIO & PHONOGRAPH CORP.

MODELS
DV-364, DZ-371

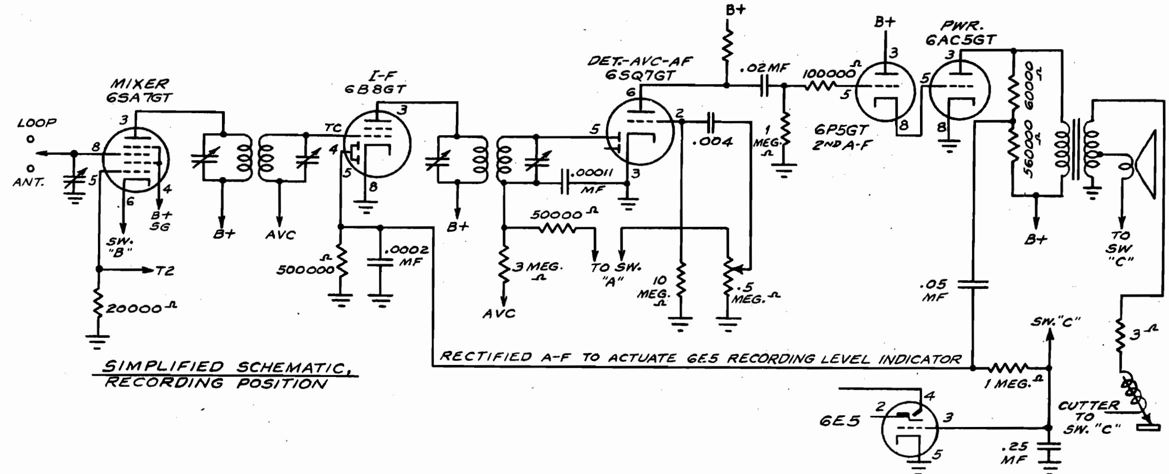
See Emerson Page 12-17



MODELS
DV-364, DZ-371

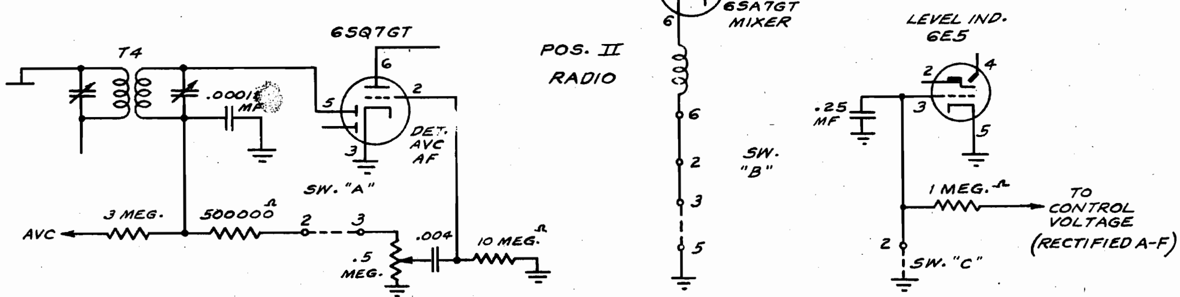
See Emerson Page 12-17

EMERSON RADIO & PHONOGRAPH CORP.

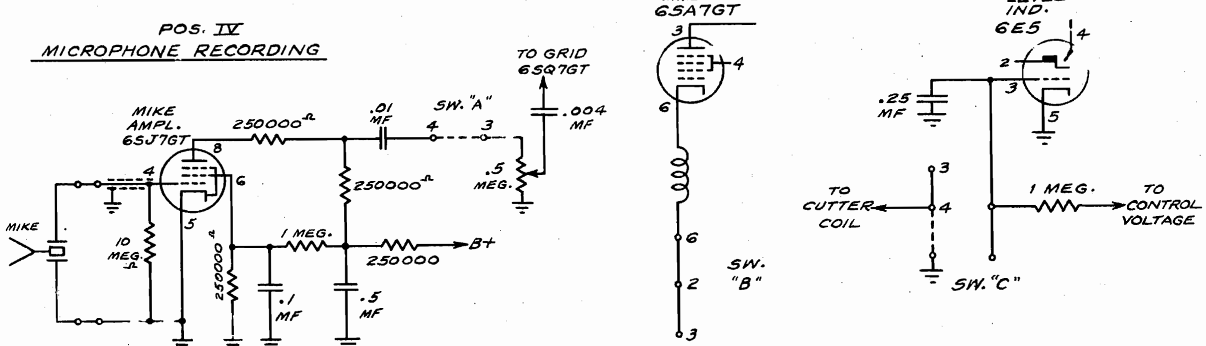


SIMPLIFIED SCHEMATIC, RECORDING POSITION

CIRCUIT CONNECTIONS FOR RADIO RECEPTION

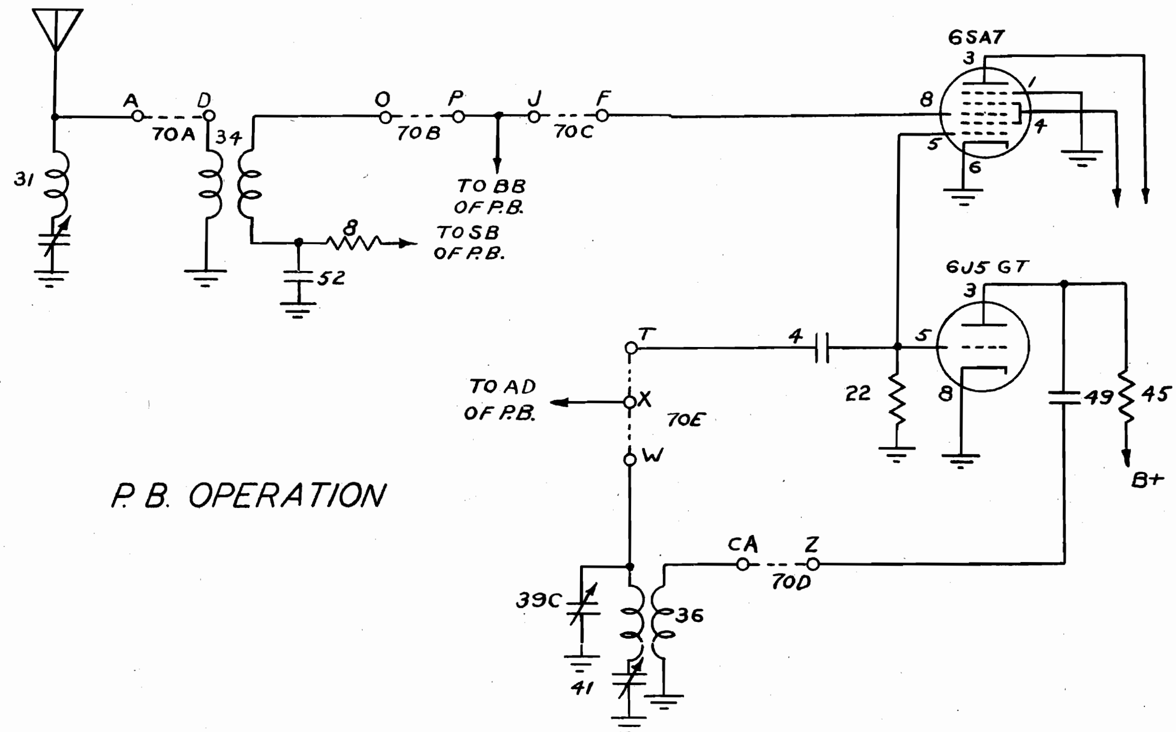


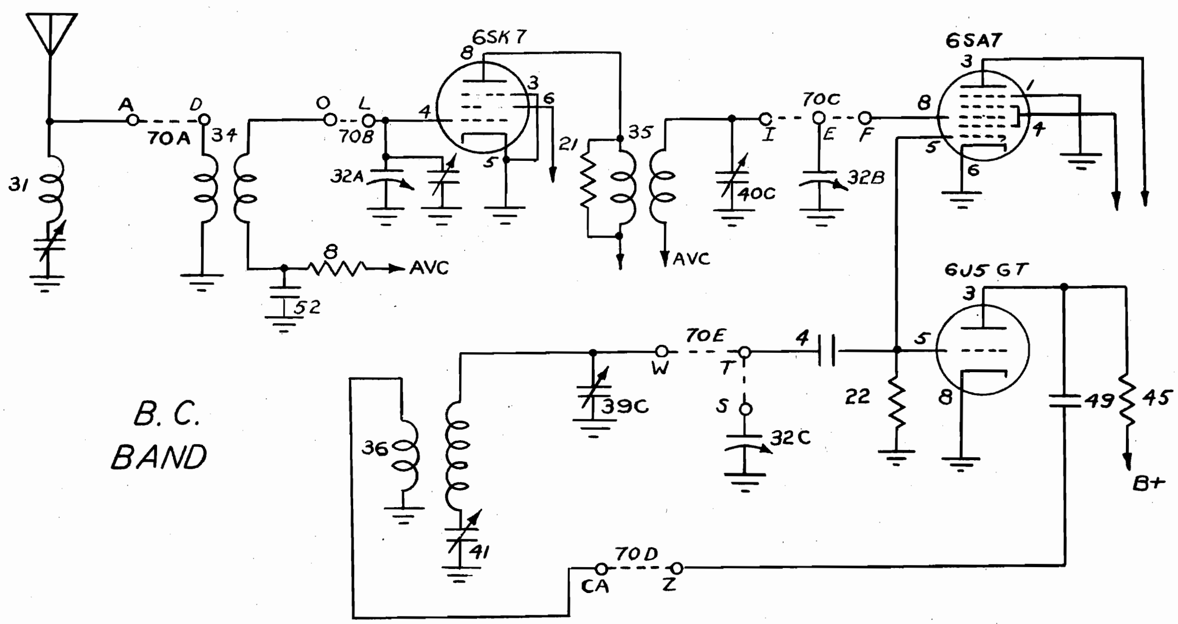
POS. IV
MICROPHONE RECORDING



FIRESTONE TIRE & RUBBER CO.

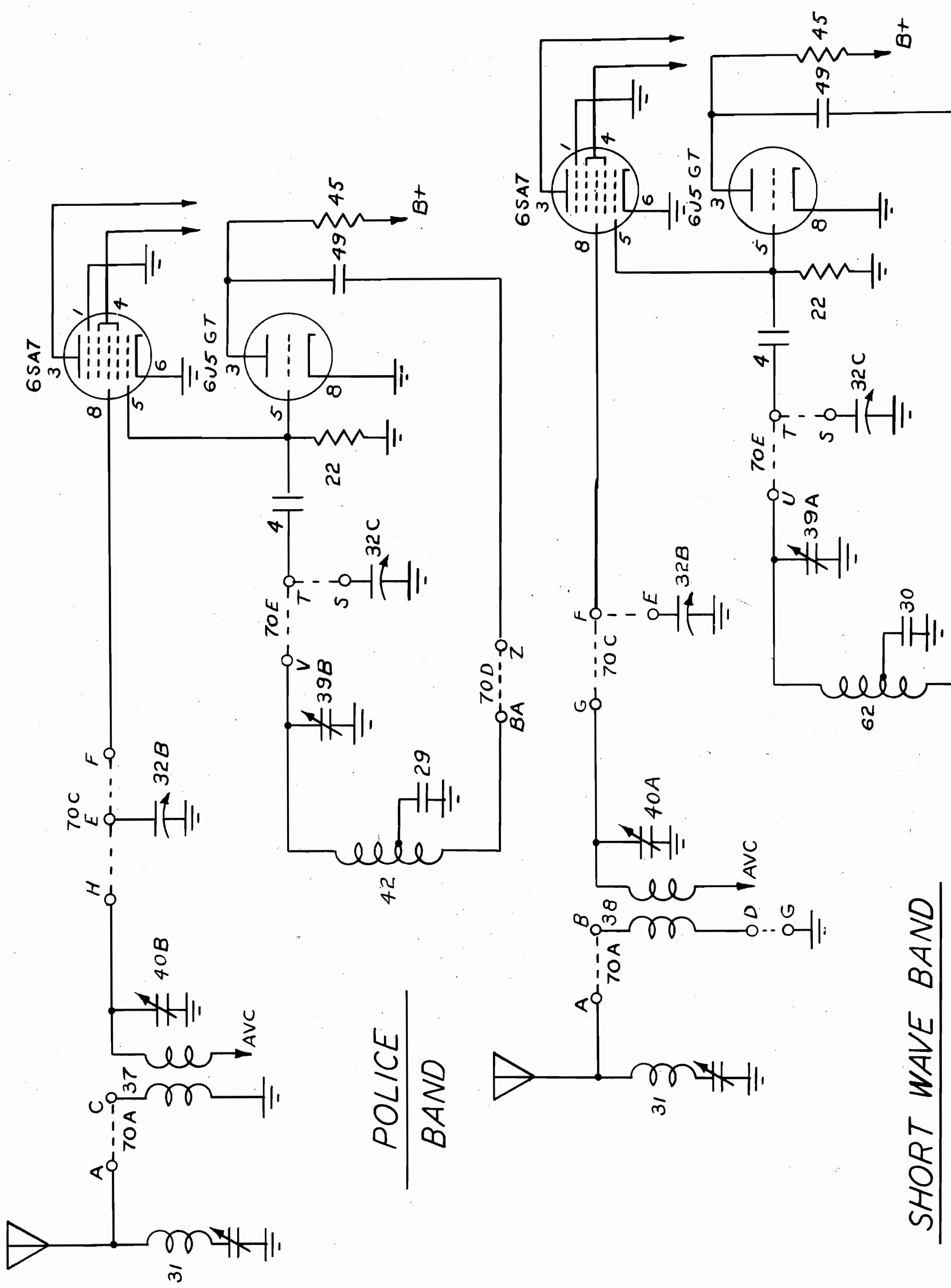
MODEL S-7404-3
See Firestone Page 12-7, 8





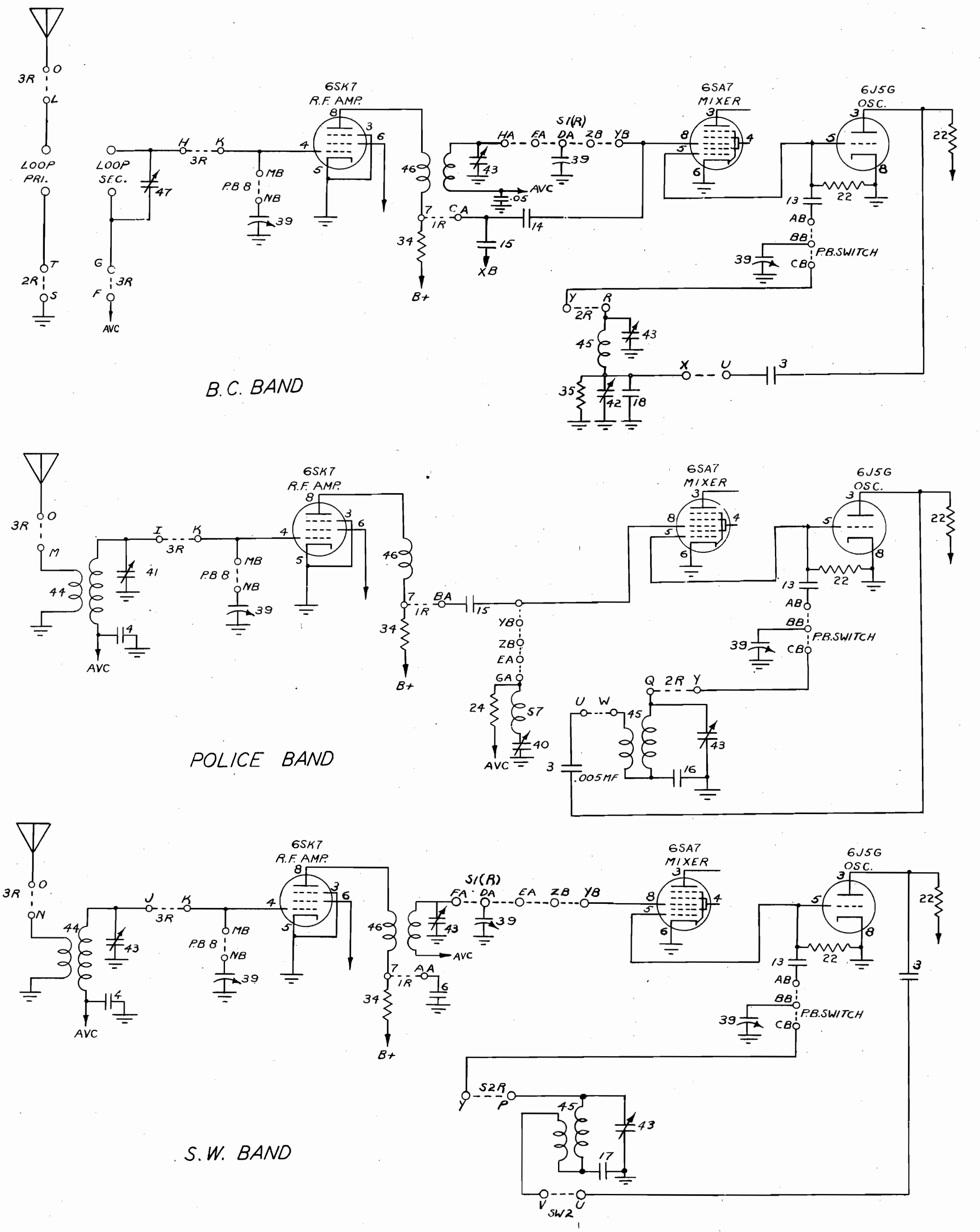
MODEL S-7404-3
See Firestone
Page 12-7, 8

FIRESTONE TIRE & RUBBER CO.



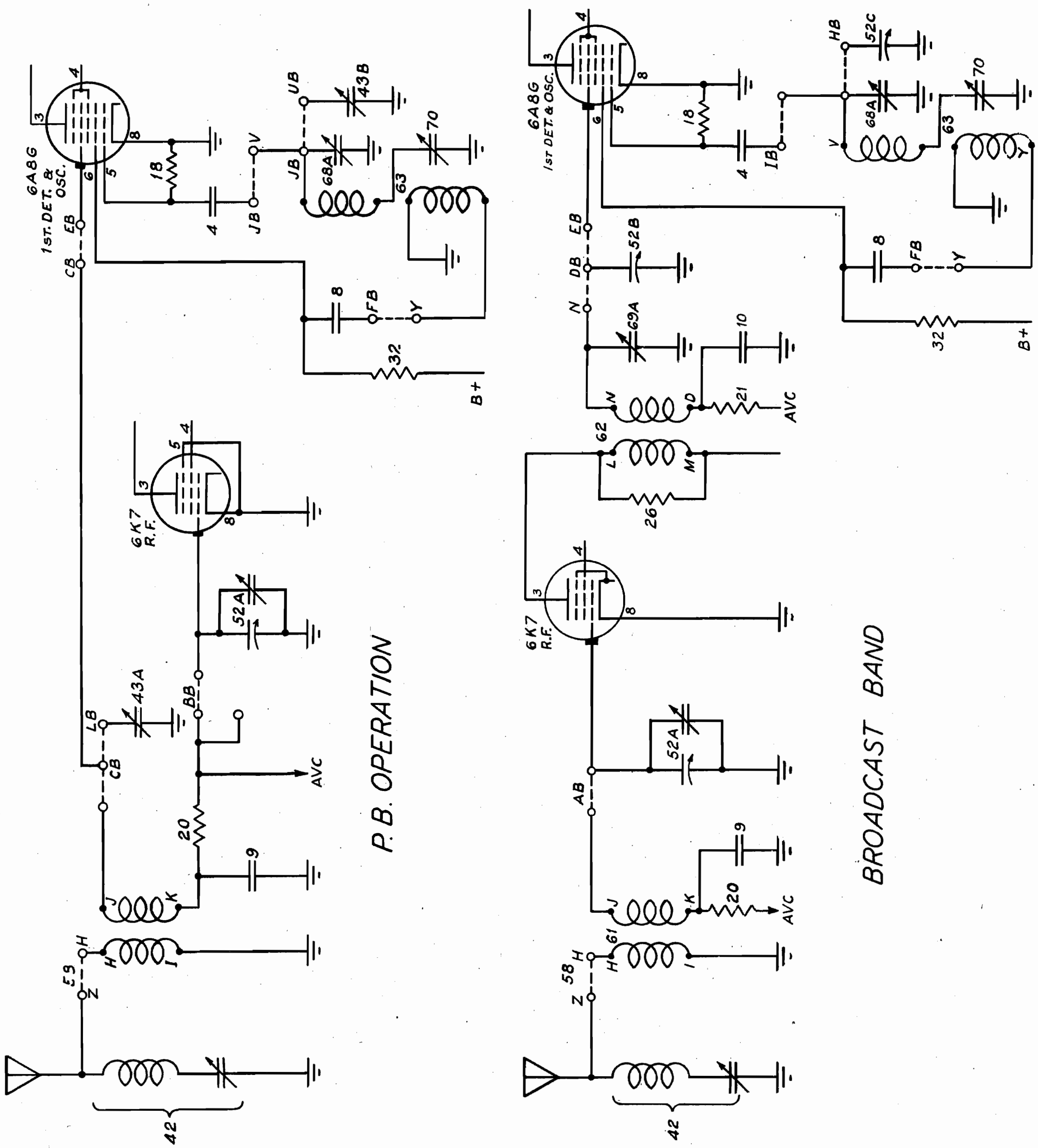
FIRESTONE TIRE & RUBBER CO.

MODEL S-7406-7
See Firestone Page 12-17



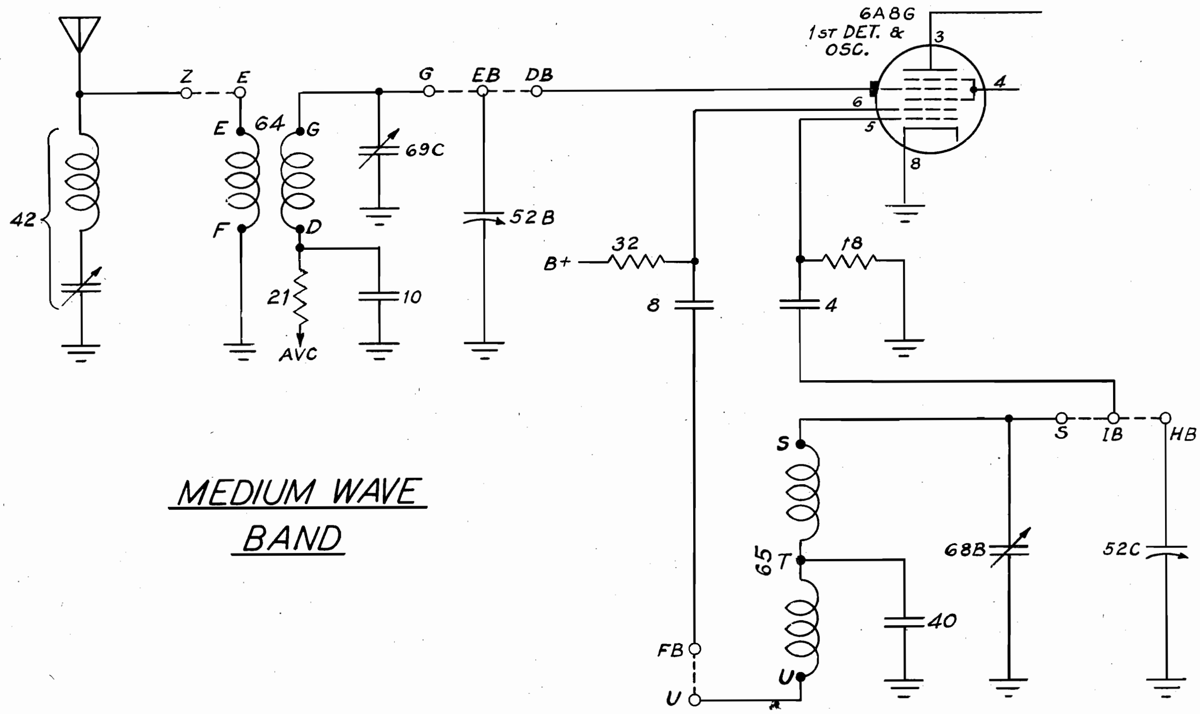
FIRESTONE TIRE & RUBBER CO.

MODEL S-7427-2
See Firestone
Page 12-19, 20

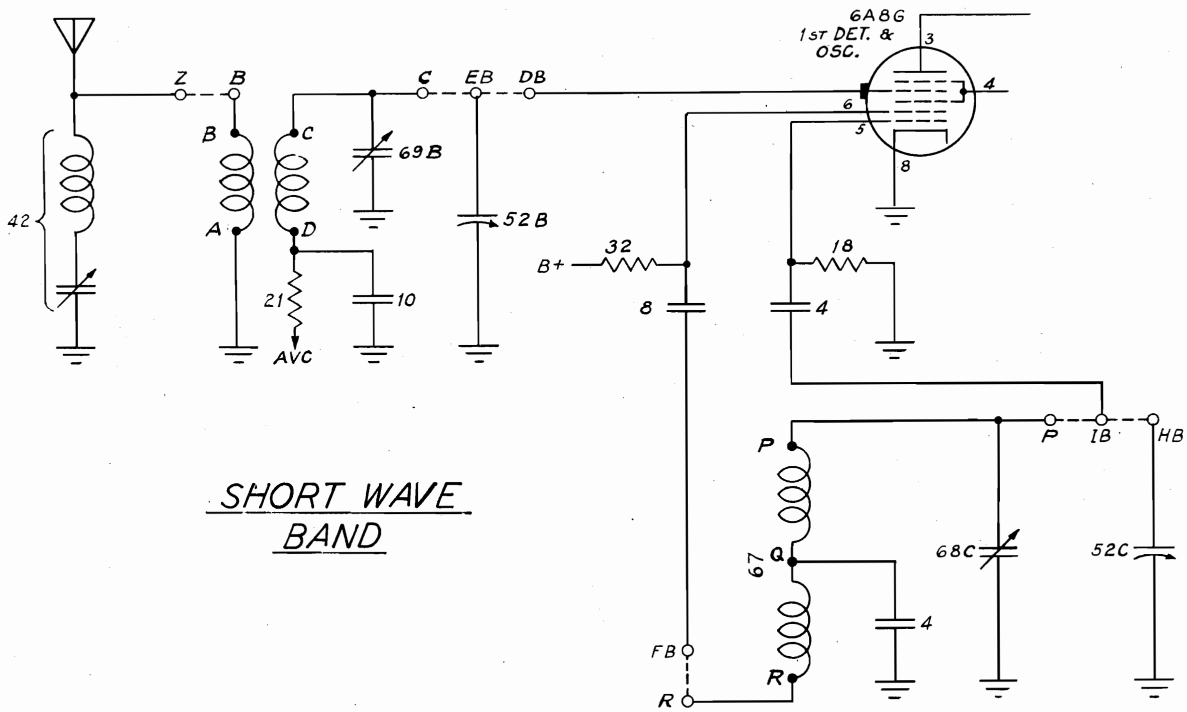


MODEL S-7427-2
See Firestone
Page 12-19, 20

FIRESTONE TIRE & RUBBER CO.



MEDIUM WAVE BAND

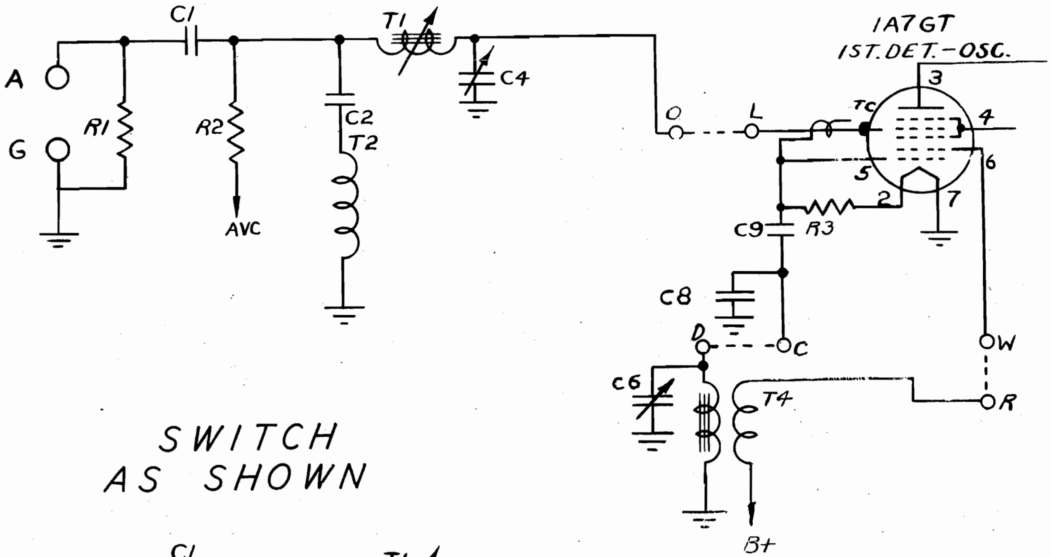


SHORT WAVE BAND

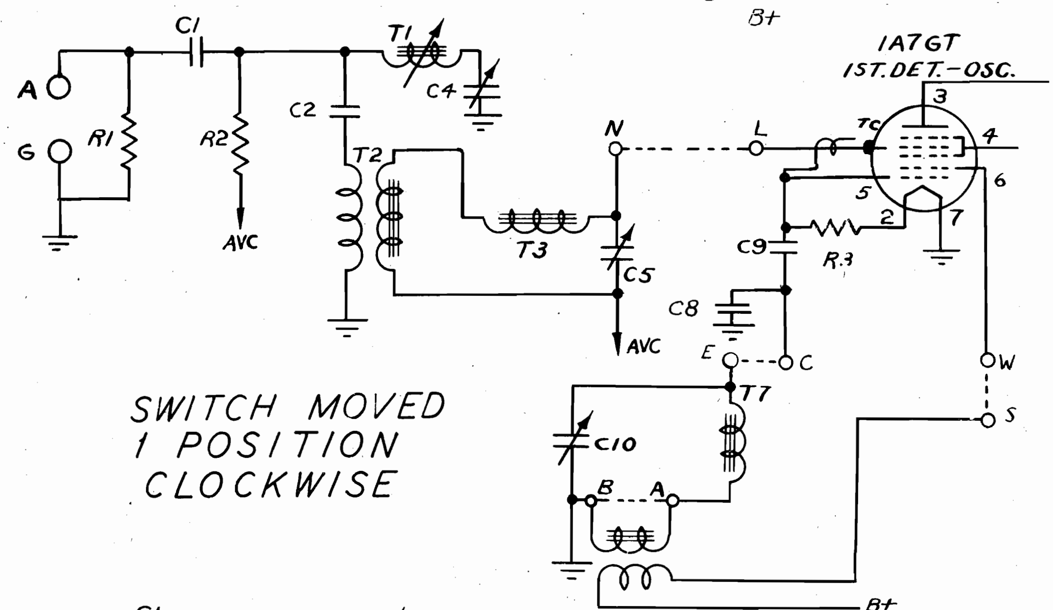
GAMBLE-SKOGMO, INC.

MODEL C509

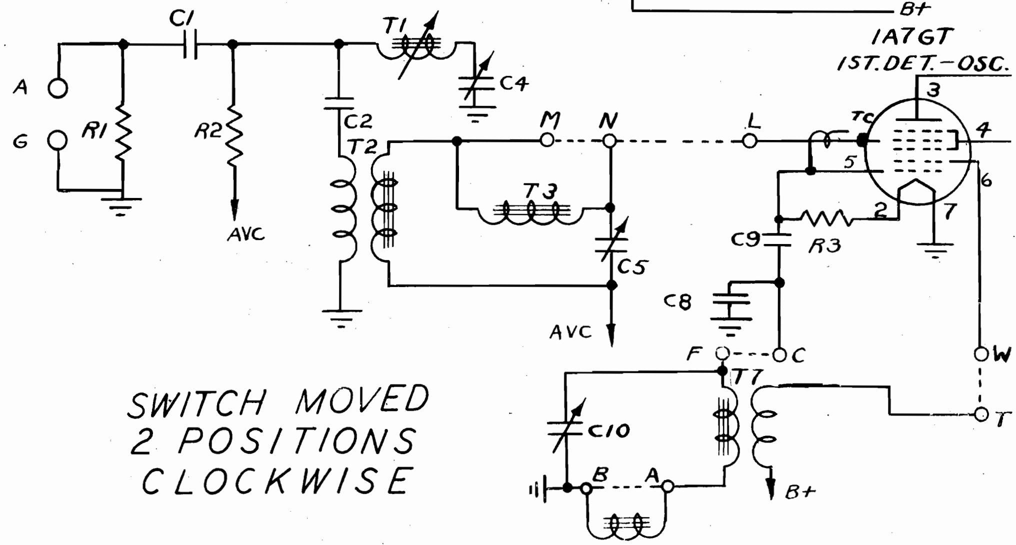
See Gamble Page 12-3



SWITCH AS SHOWN



SWITCH MOVED 1 POSITION CLOCKWISE

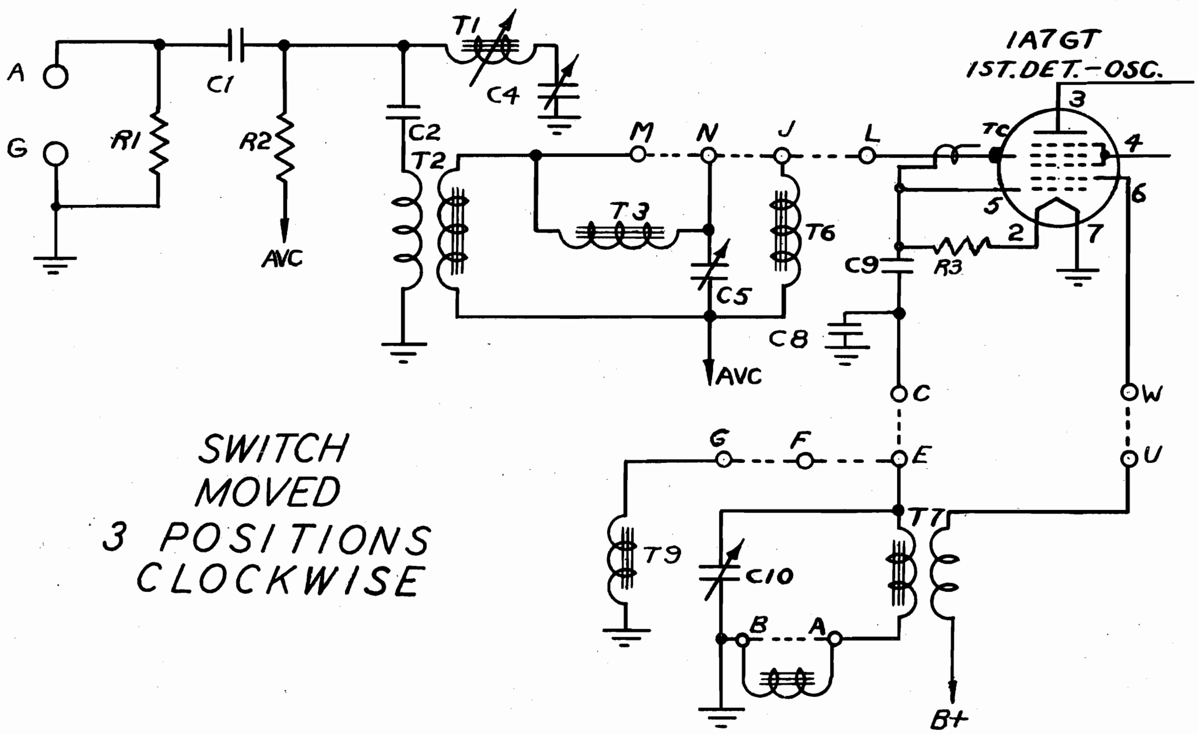


SWITCH MOVED 2 POSITIONS CLOCKWISE

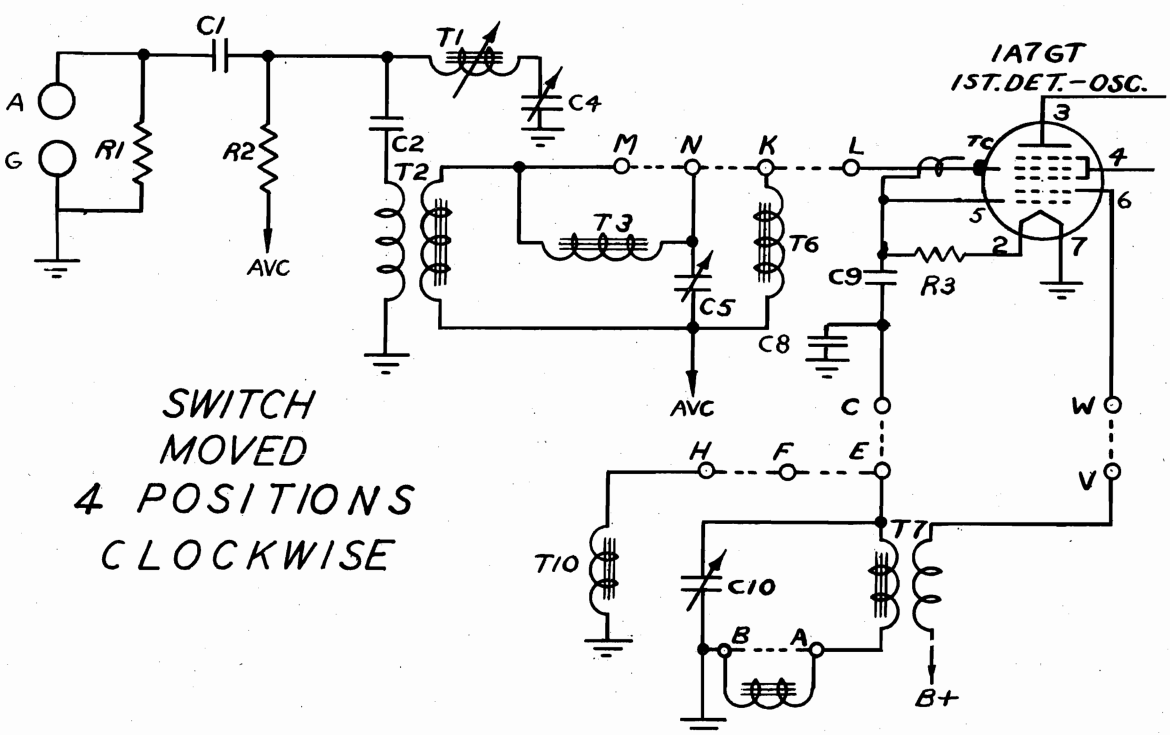
MODEL C509
See Gamble Page 12-3

GAMBLE SKOGMO, INC.

MODEL C-509 (CONTINUED)



SWITCH MOVED 3 POSITIONS CLOCKWISE

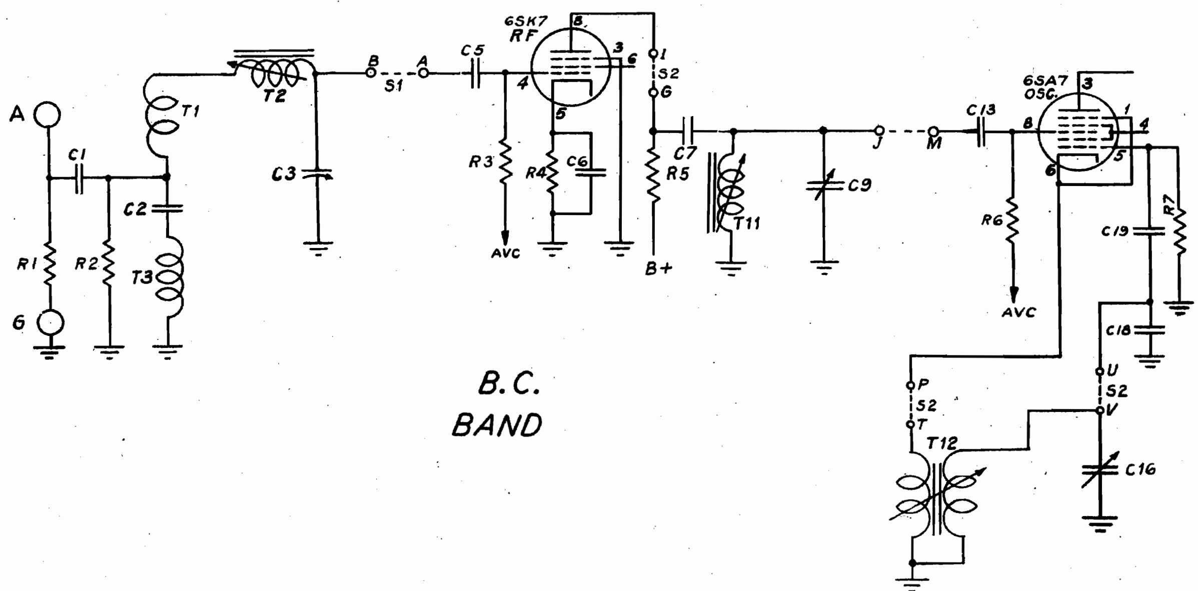


SWITCH MOVED 4 POSITIONS CLOCKWISE

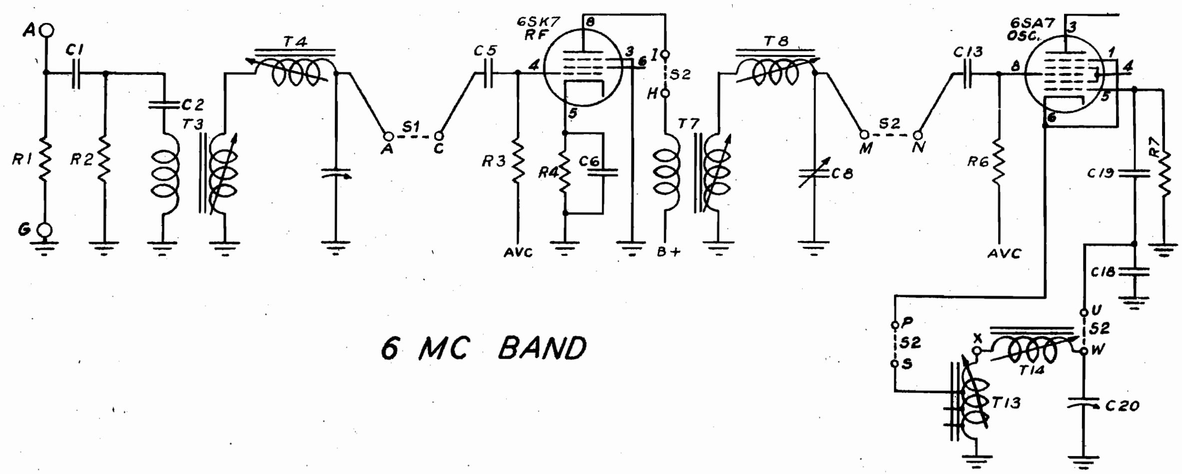
MODEL C1100
See Gamble Page 12-23

GAMBLE-SKOGMO, INC.

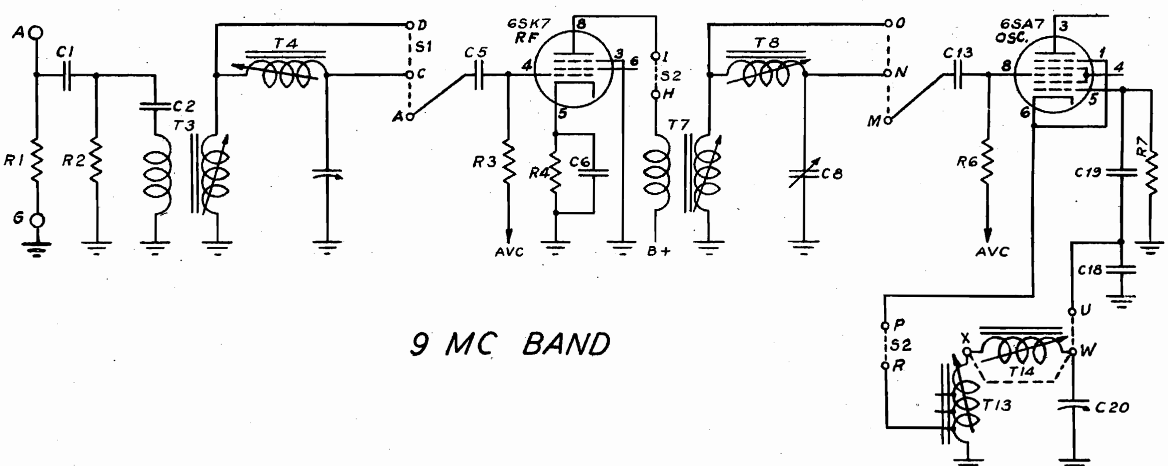
MODEL C800
See Gamble Page 12-17
MODEL C901
See Gamble Page 12-19



B.C. BAND



6 MC BAND

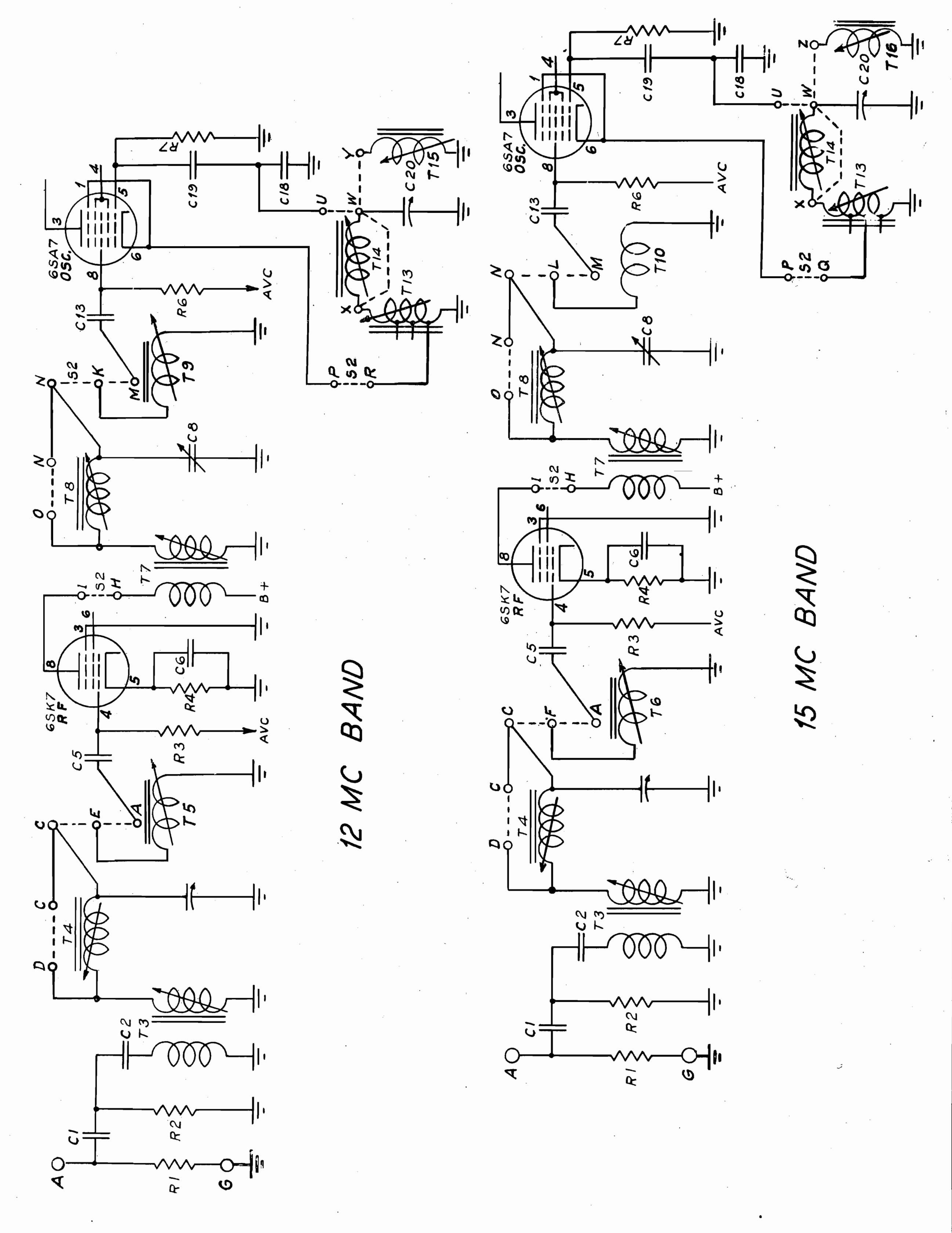


9 MC BAND

GAMBLE SKOGMO, INC.

MODEL C800
See Gamble Page 12-17
MODEL C901
See Gamble Page 12-19

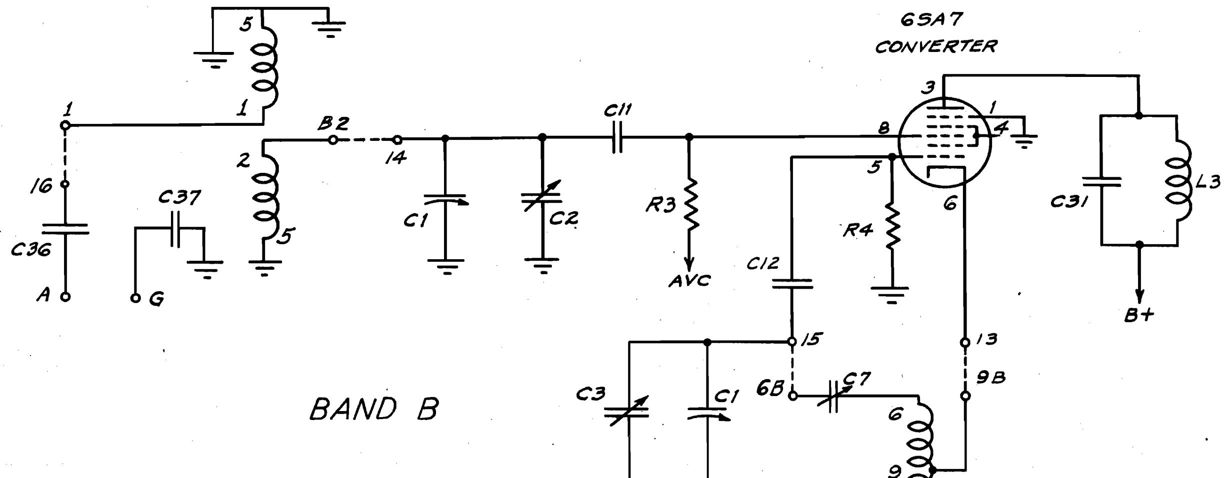
MODEL C1100
See Gamble Page 12-23



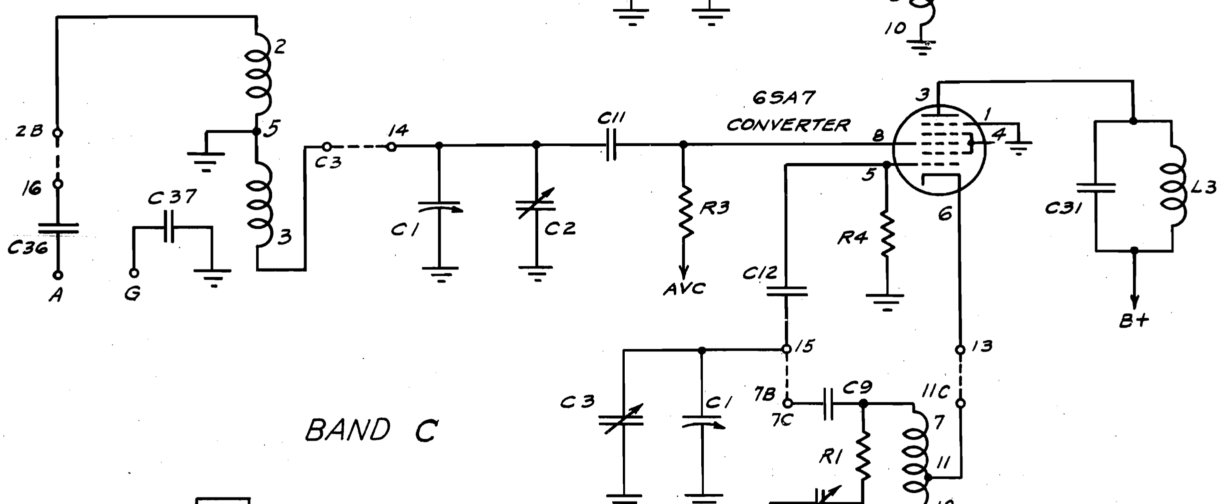
MODEL HE-540
See G.E.Page 12-66

GENERAL ELECTRIC CO.

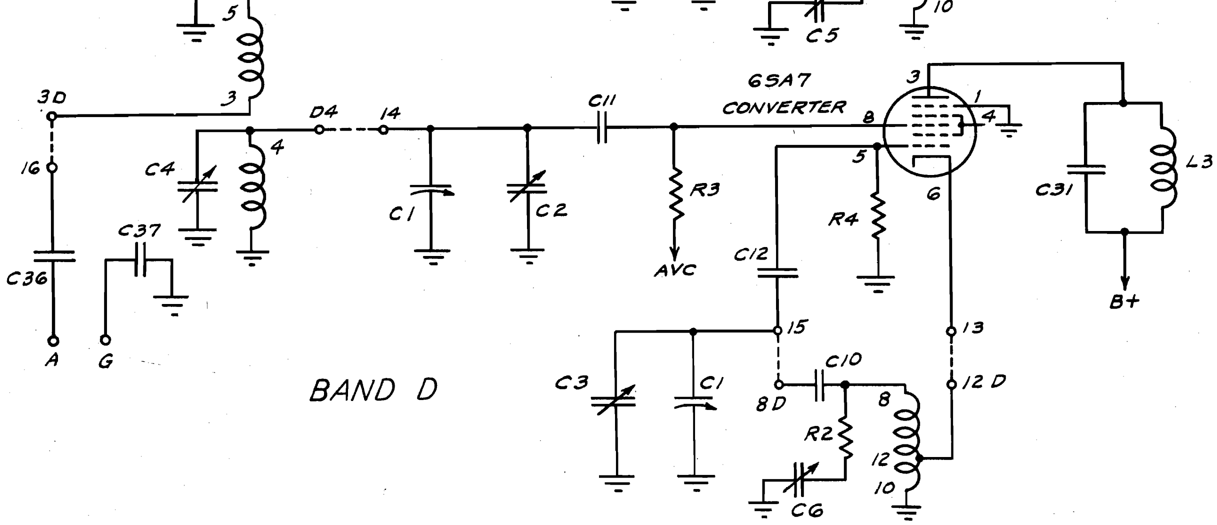
MODEL HE-50
See G.E. Page 12-23
MODEL JE-61L
See G.E. Page 12-18



BAND B



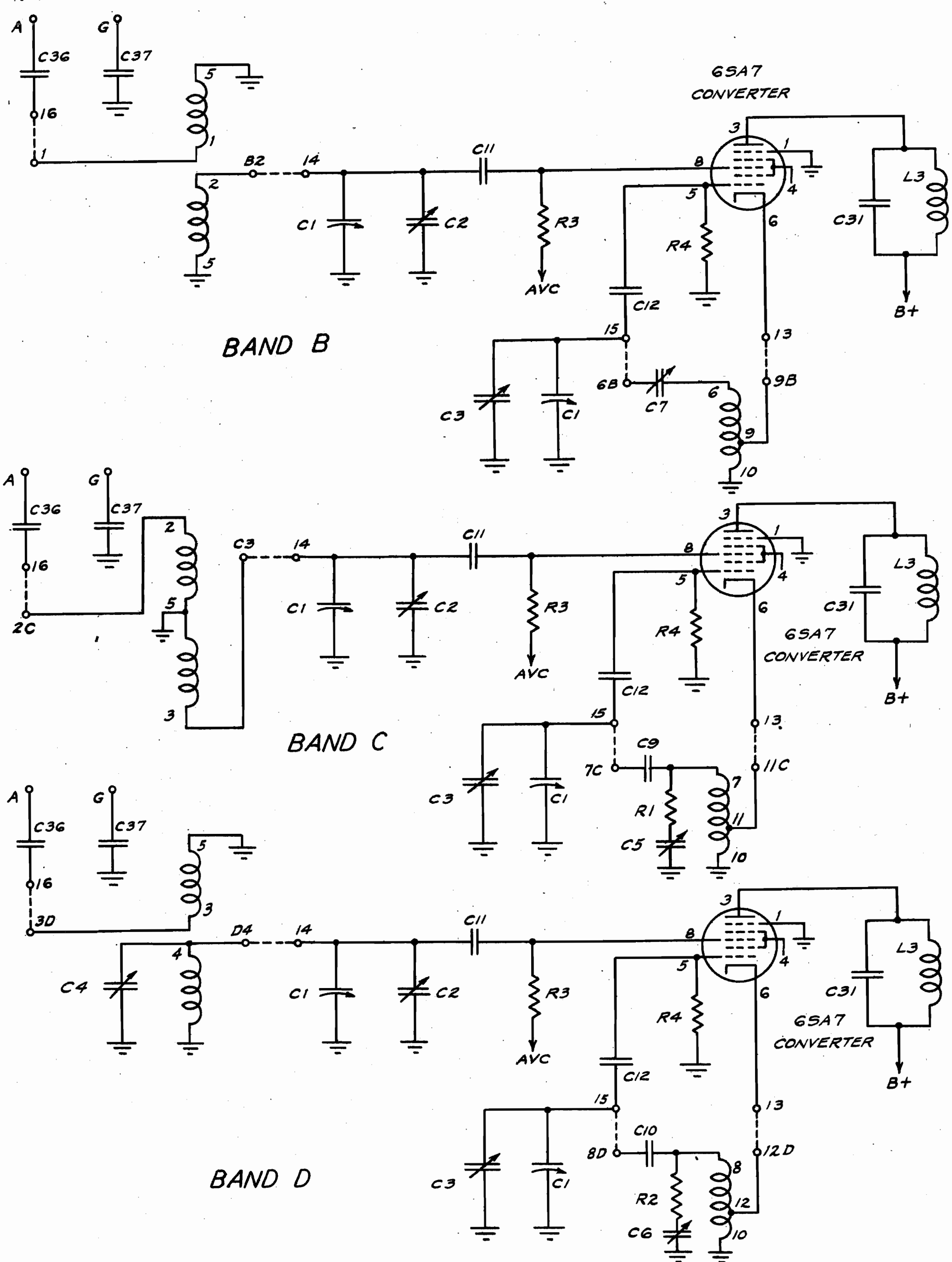
BAND C



BAND D

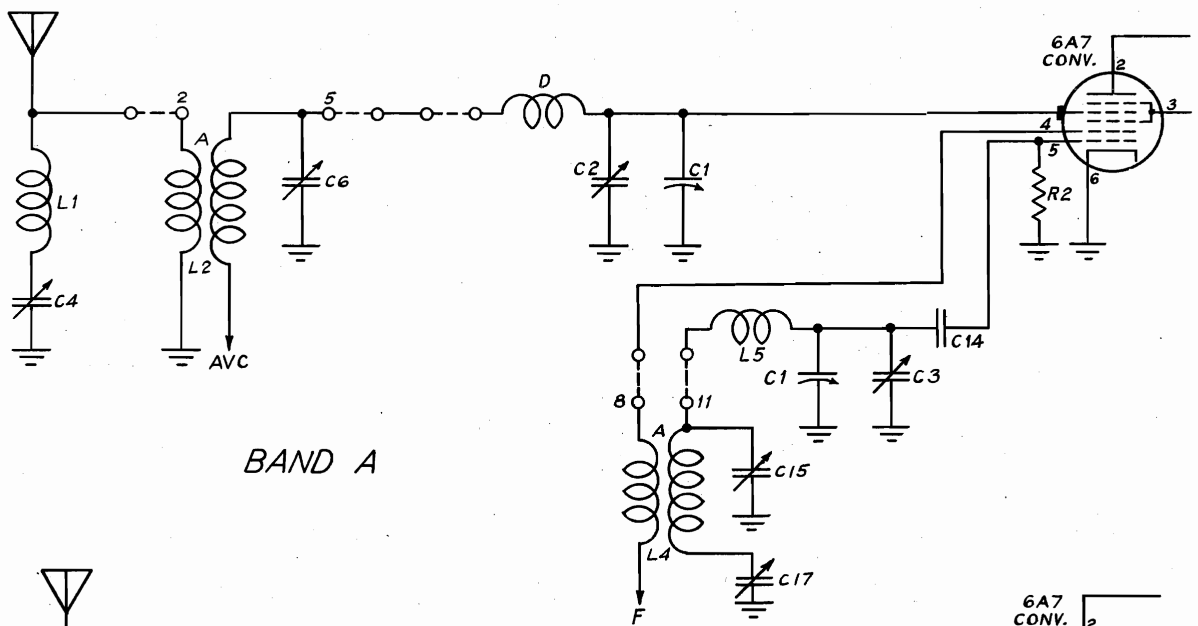
GENERAL ELECTRIC CO. MODELS JE-51, JE-61, JE-510

See G.E. Page 12-9

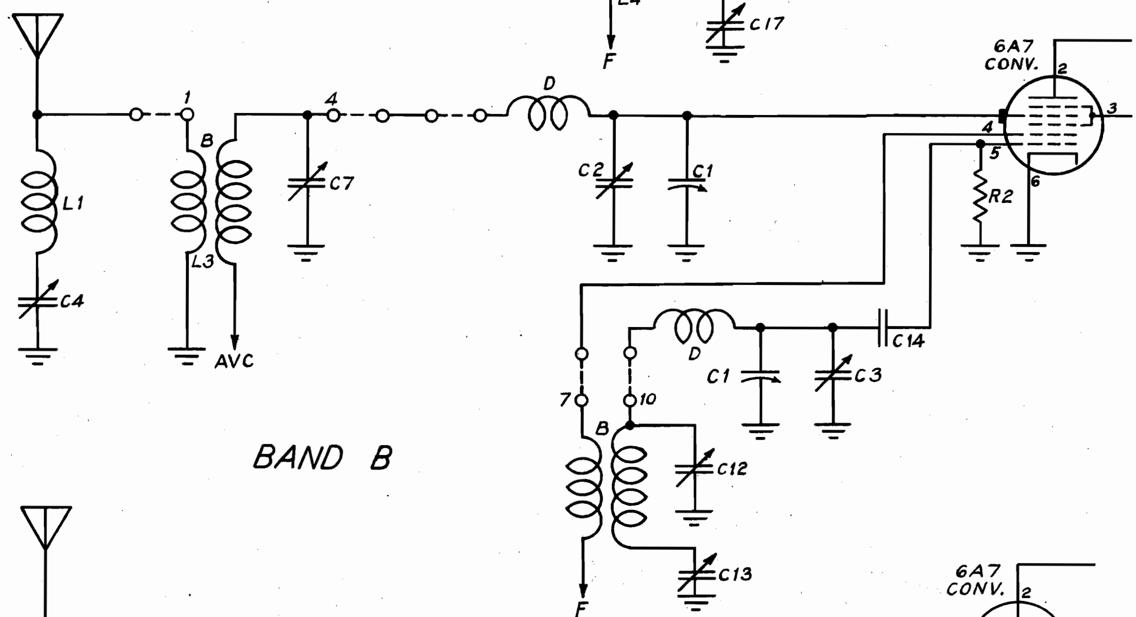


GENERAL ELECTRIC CO. MODELS FE-62, FE-67, FE-68

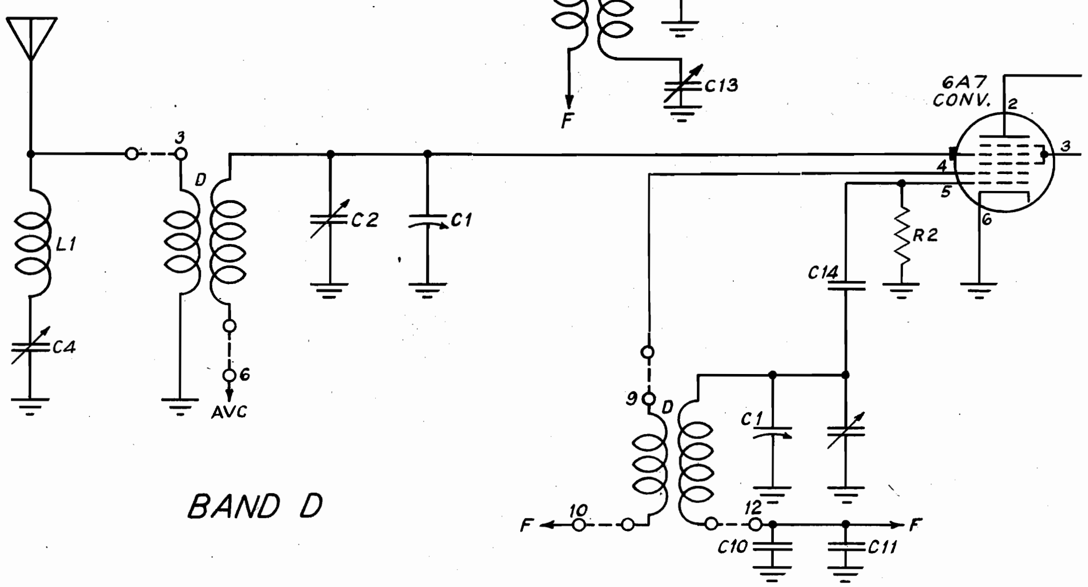
See G.E. Page 12-19



BAND A



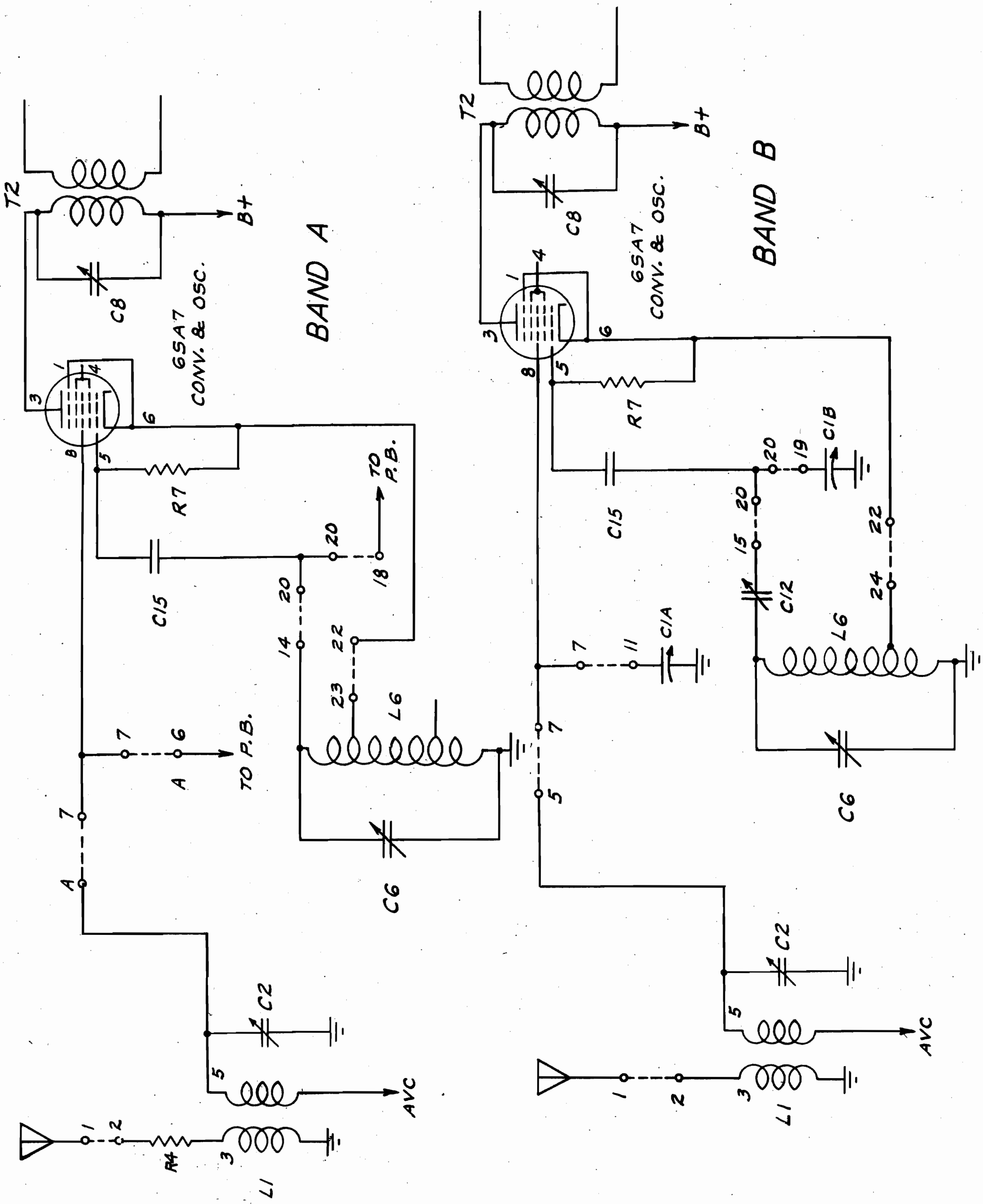
BAND B



BAND D

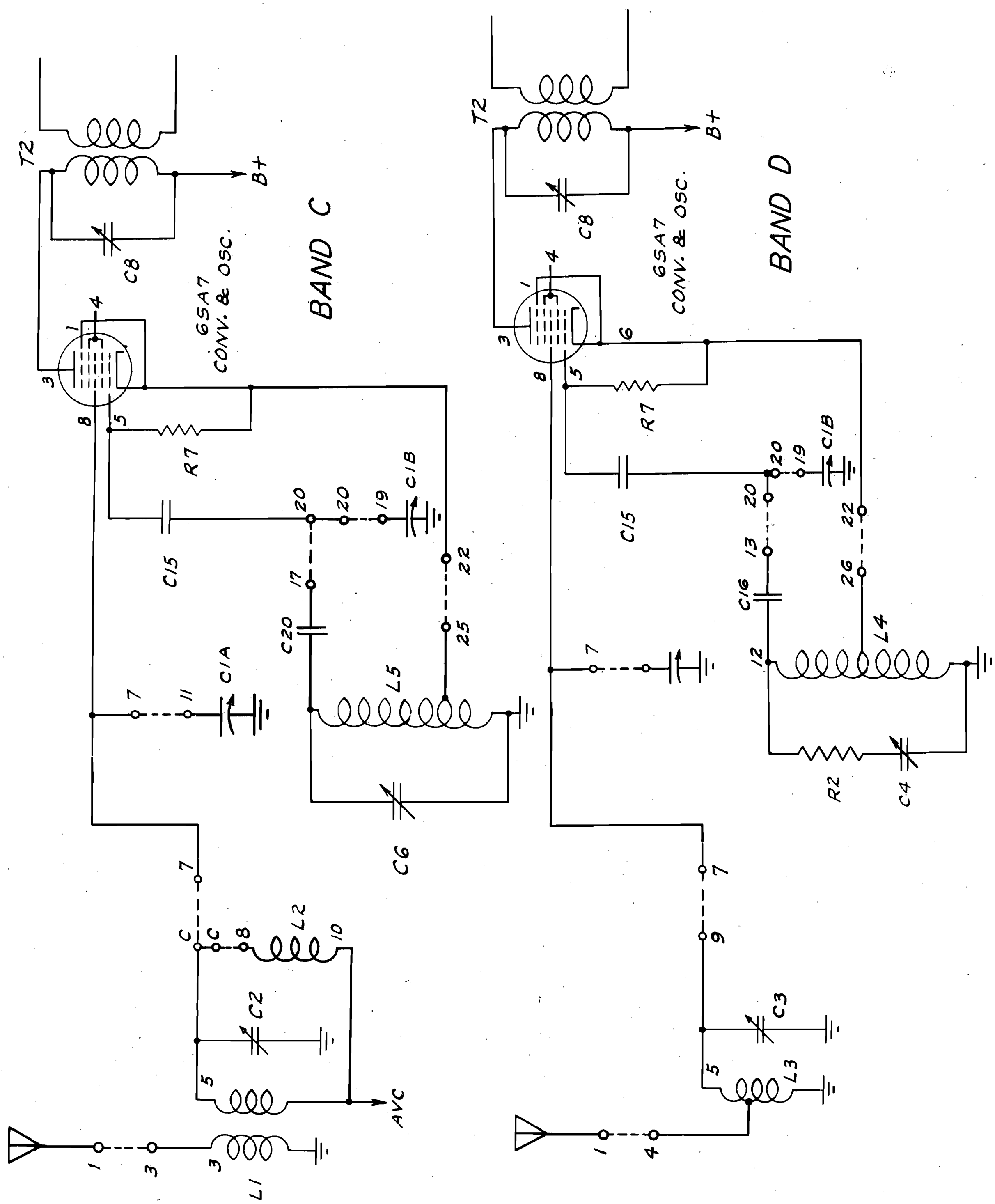
GENERAL ELECTRIC CO.

MODEL J-64
See G.E. Page 12-25



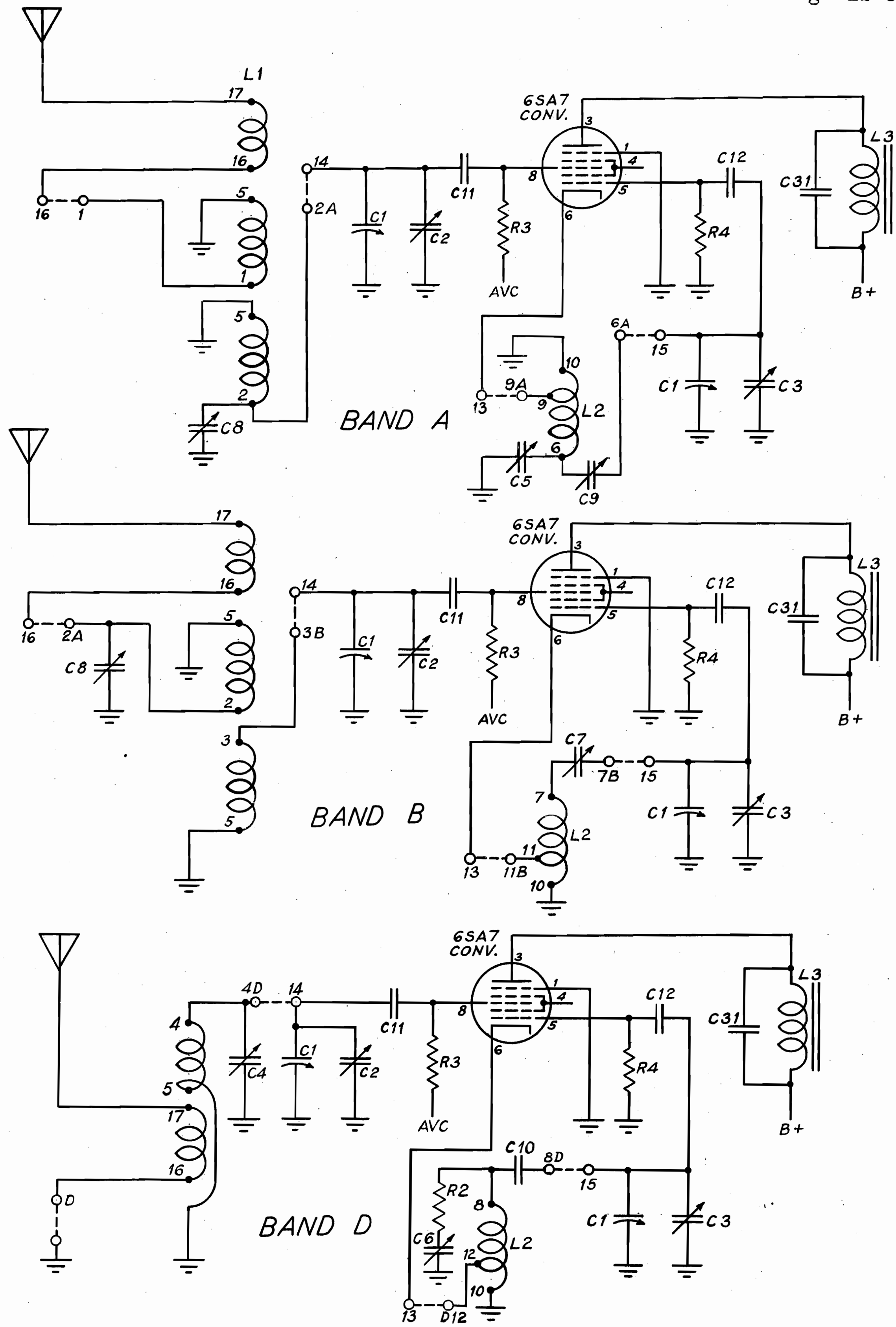
MODEL J-64
See G.E. Page 12-25

GENERAL ELECTRIC CO.



GENERAL ELECTRIC CO.

MODEL HE-64L
See G.E. Page 12-2
MODEL HE-640L
See Page 12-62



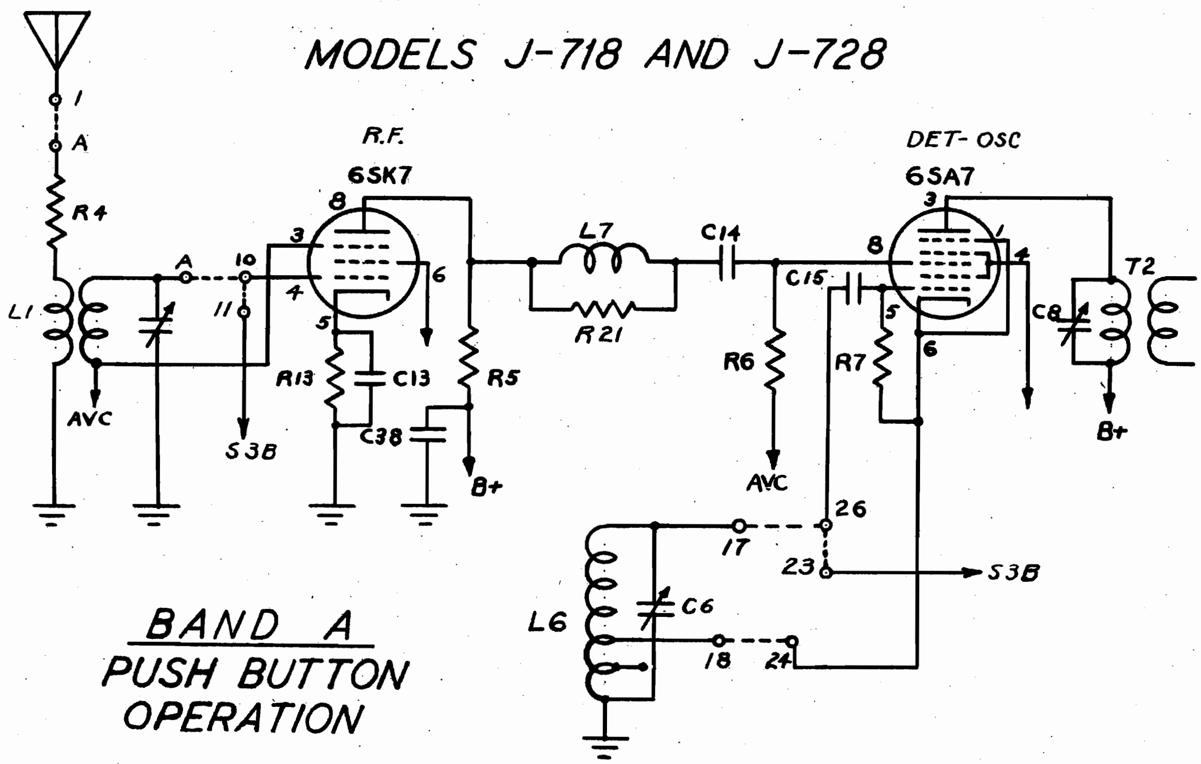
MODELS J-718, J-728
See G.E. Page 12-77

GENERAL ELECTRIC CO.

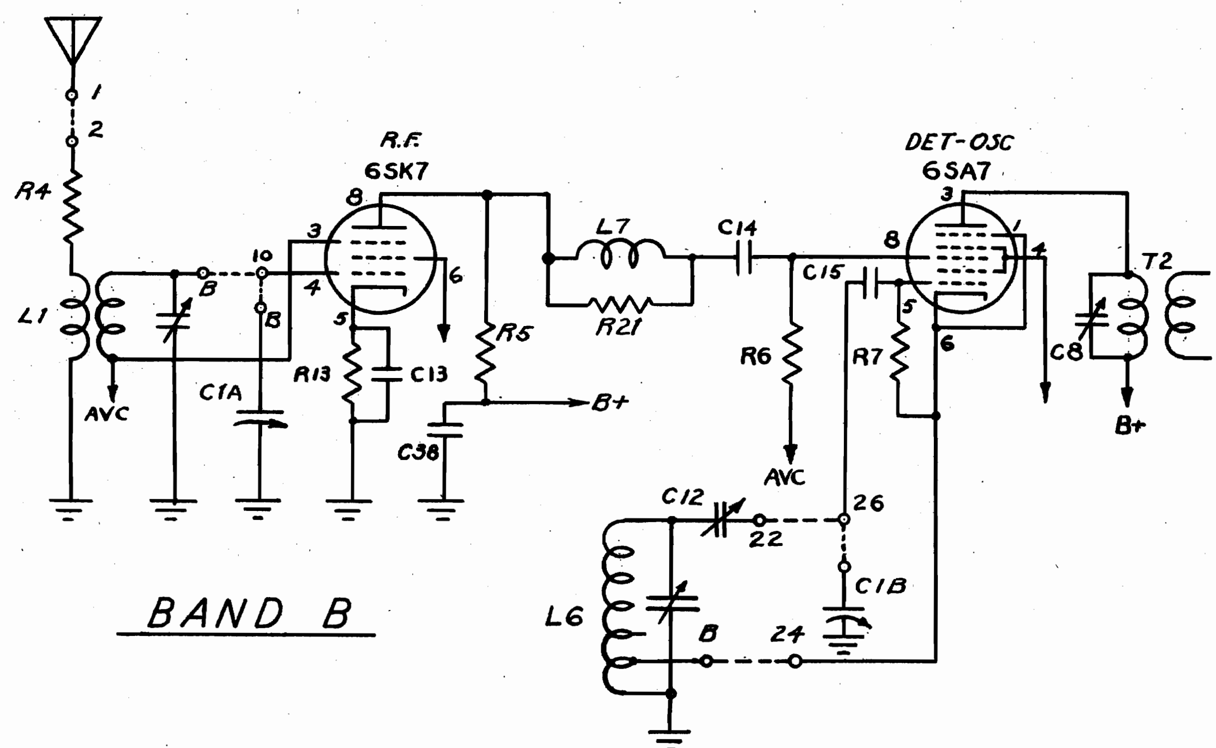
MODEL J-71
See G.E. Page 12-28

MODEL J-71

MODELS J-718 AND J-728



BAND A
PUSH BUTTON
OPERATION



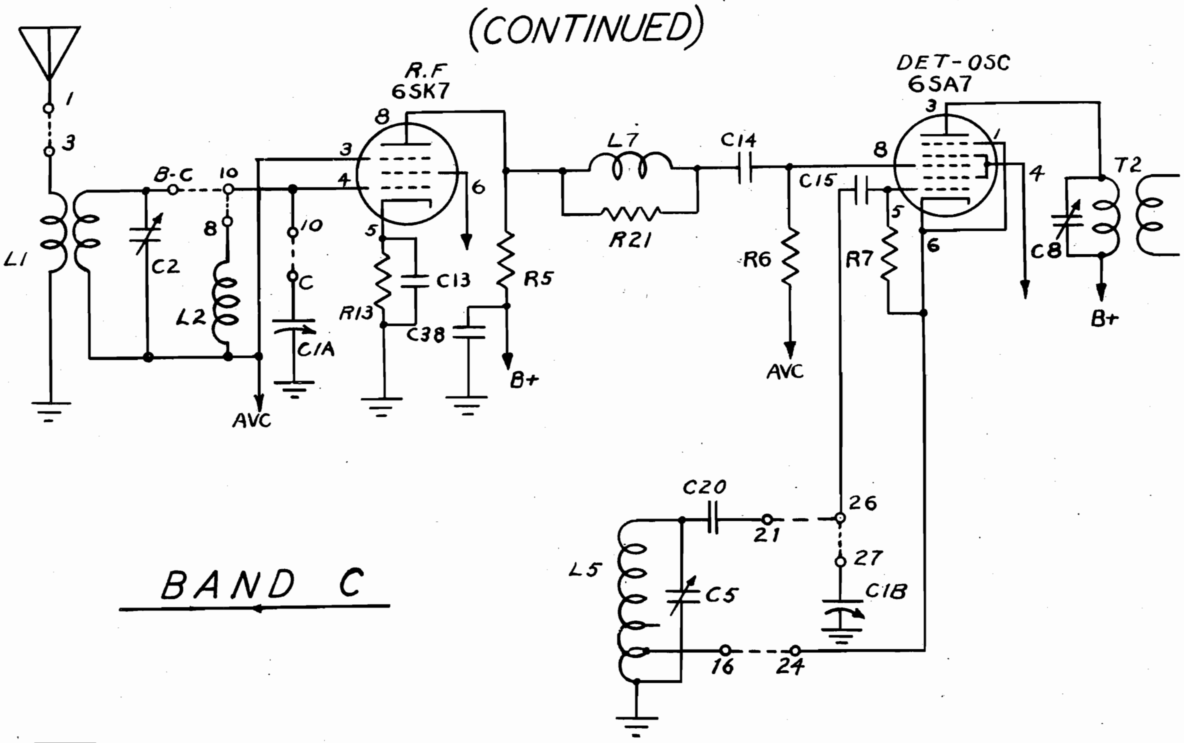
BAND B

MODEL J-71
See G.E. Page 12-28

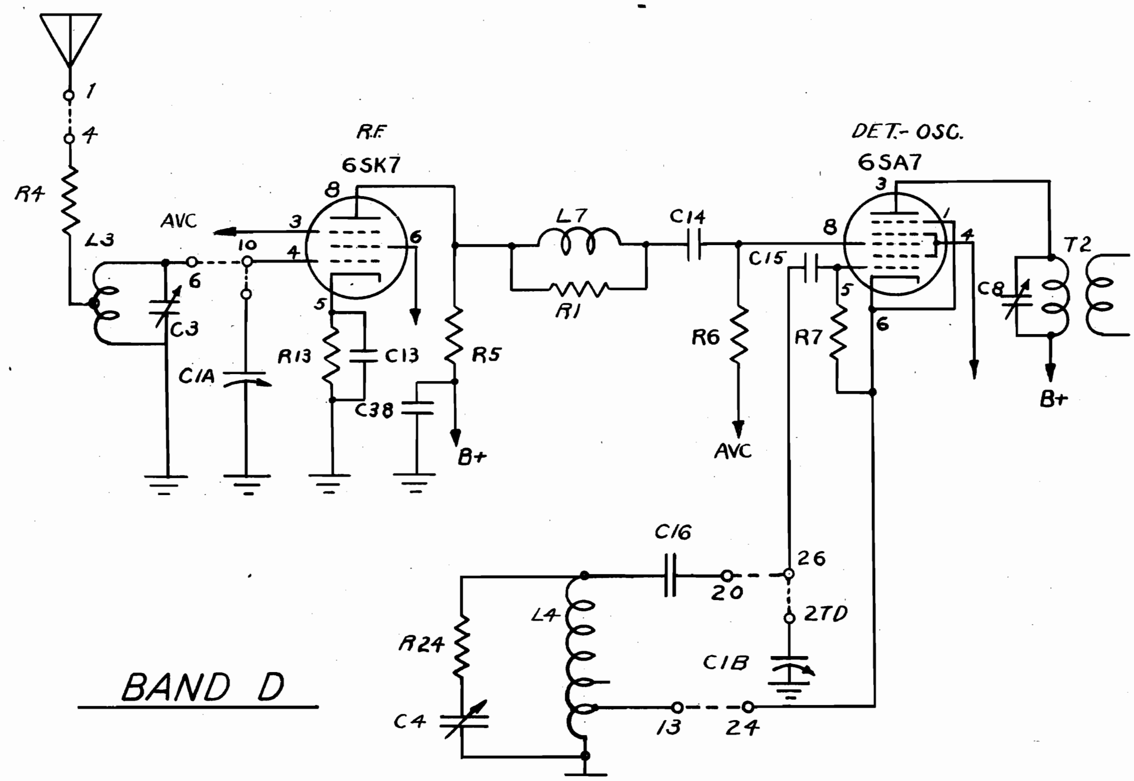
GENERAL ELECTRIC CO.

MODELS J-718, J-728
See G.E. Page 12-77

MODEL J-71
MODELS J-718 AND J-728
(CONTINUED)



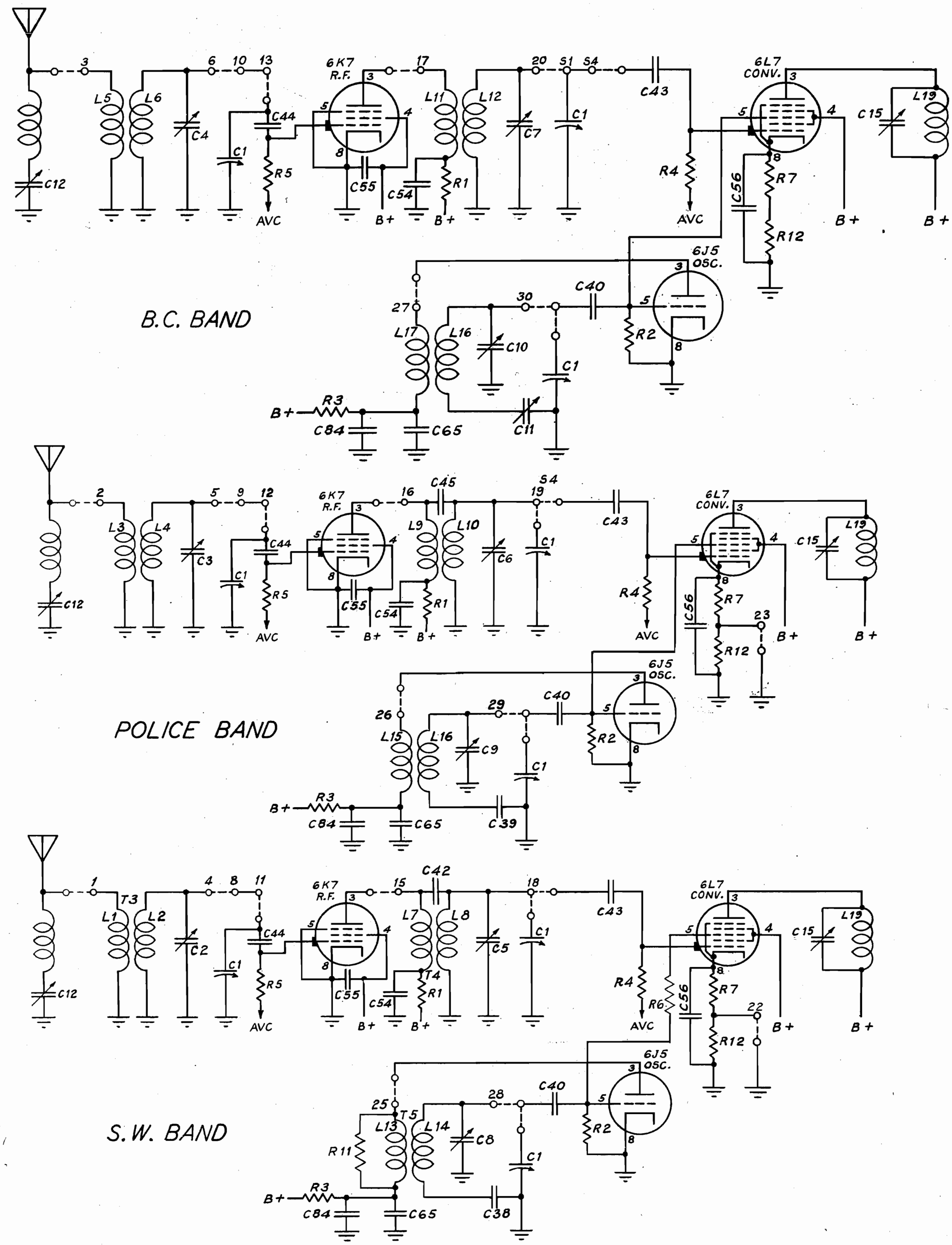
BAND C



BAND D

GENERAL ELECTRIC CO.

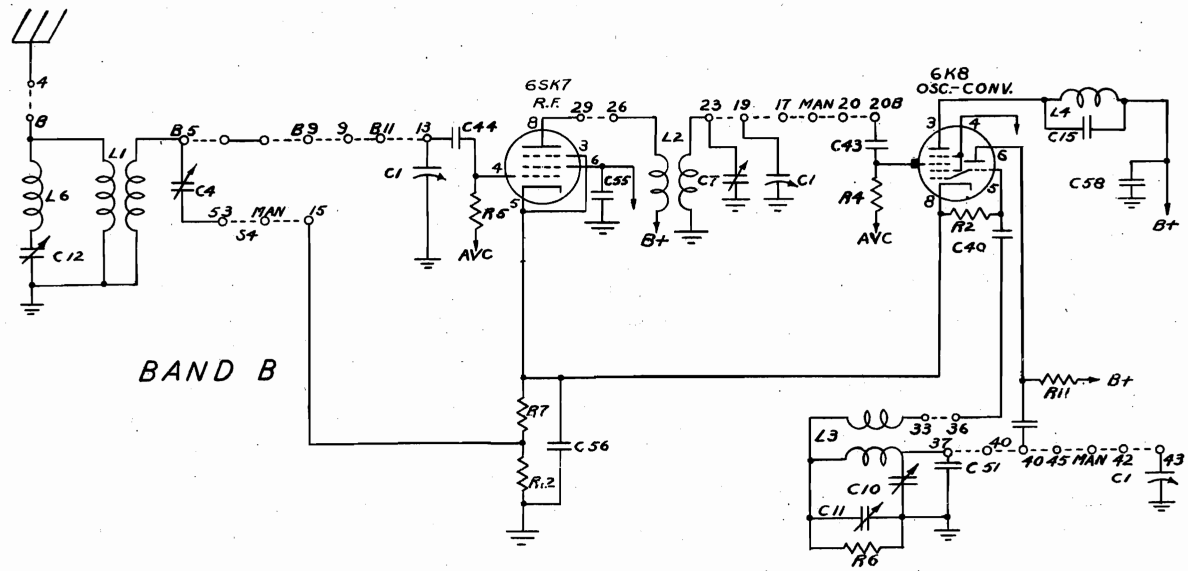
MODELS GE-93, GE-96
See G.E. Page 12-45

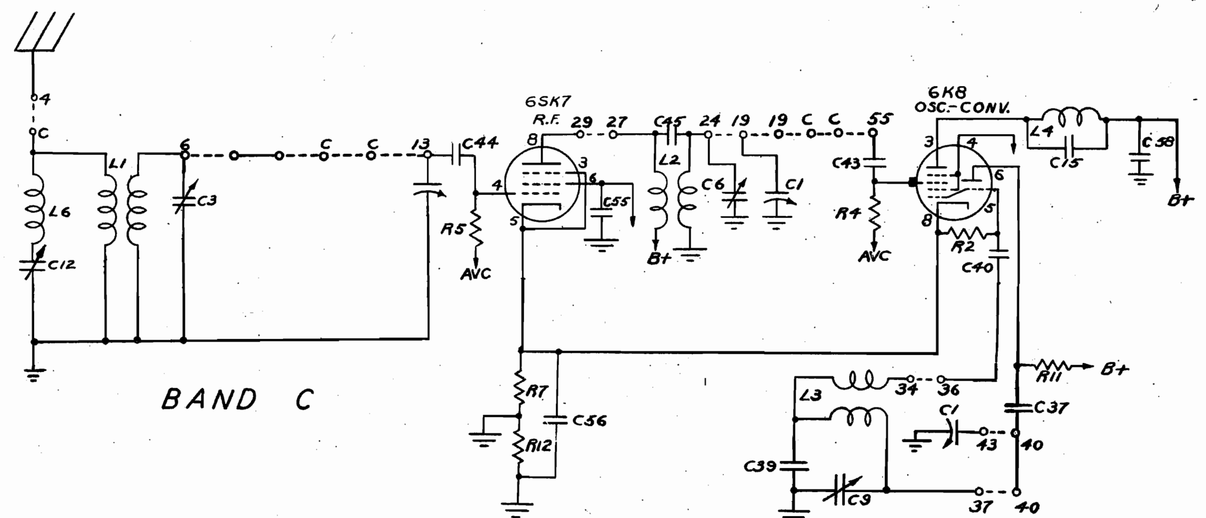


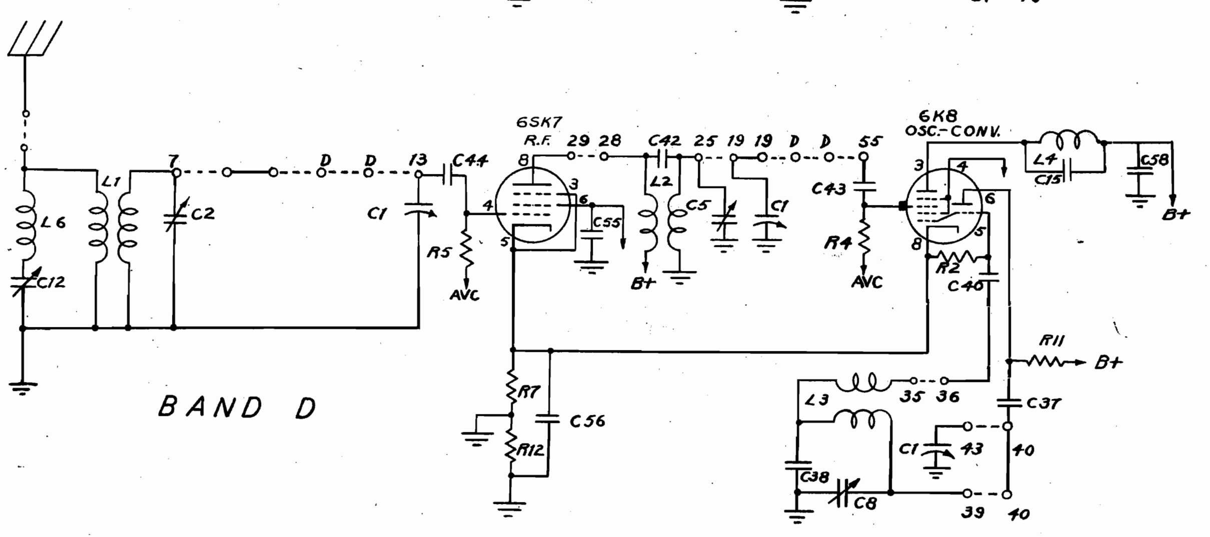
GENERAL ELECTRIC CO.

MODELS HE-100, HE-100H, HE-105

See G.E. Page 12-47

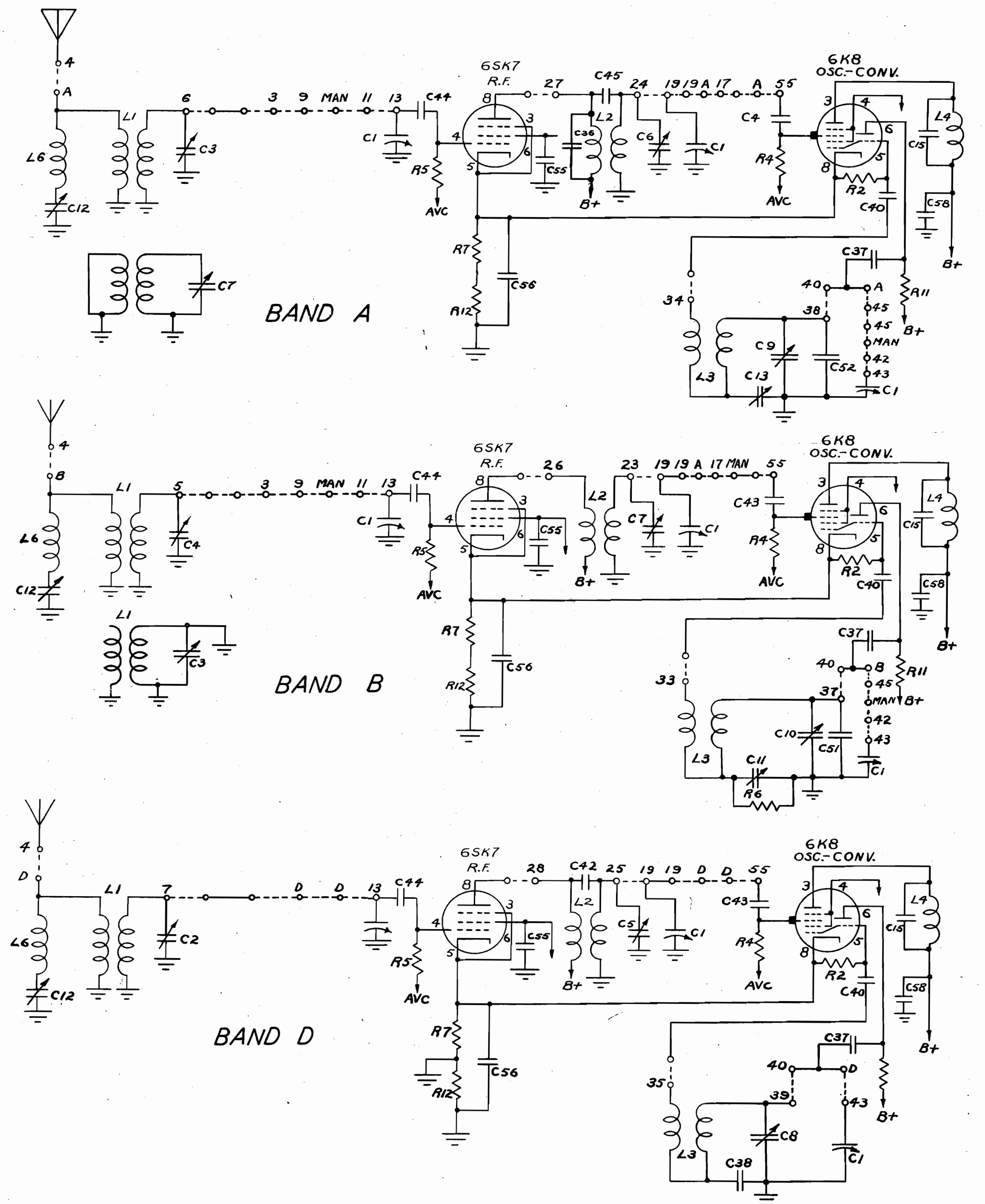






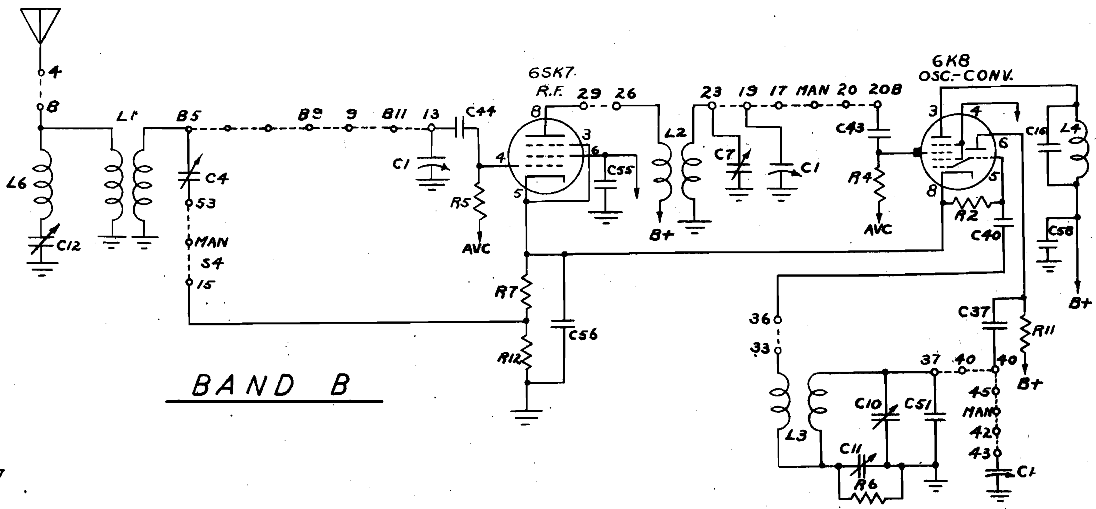
GENERAL ELECTRIC CO. MODELS HE-100L, HE-100LH, HE-105L

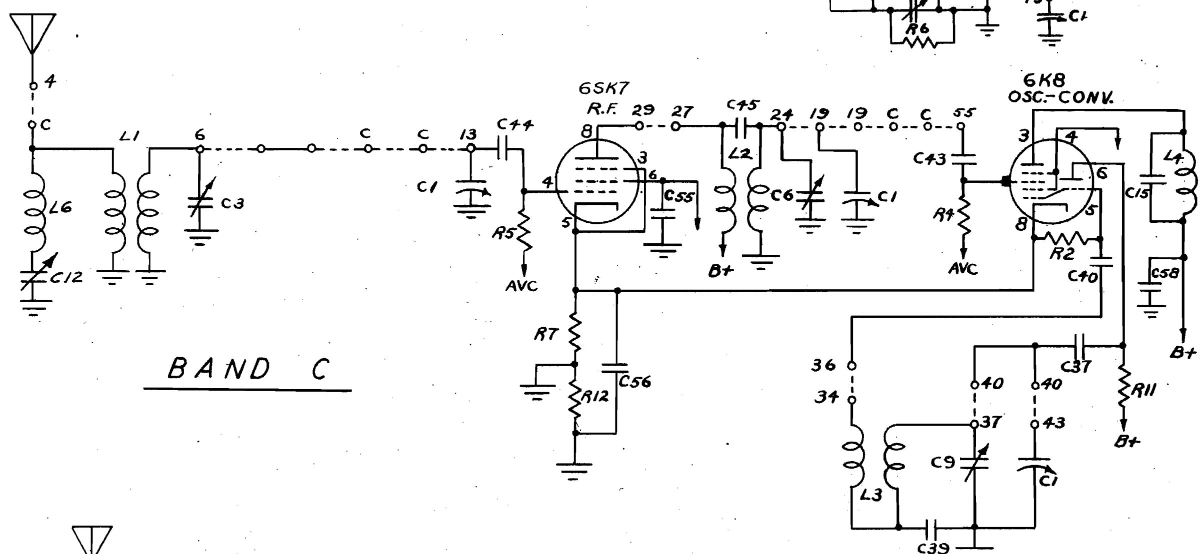
See G.E. Page 12-48

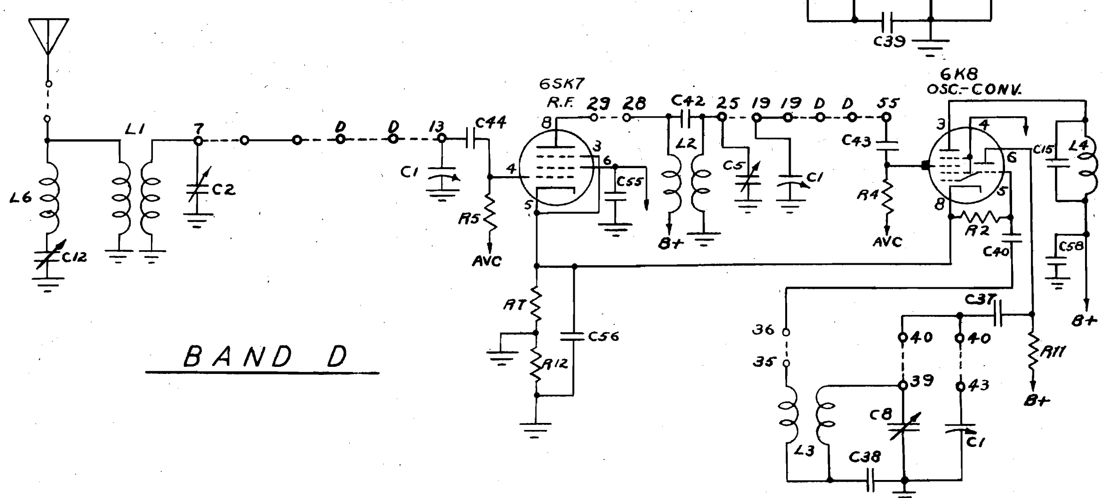


GENERAL ELECTRIC CO. MODELS JE-101, JE-107

See G.E. Page 12-50



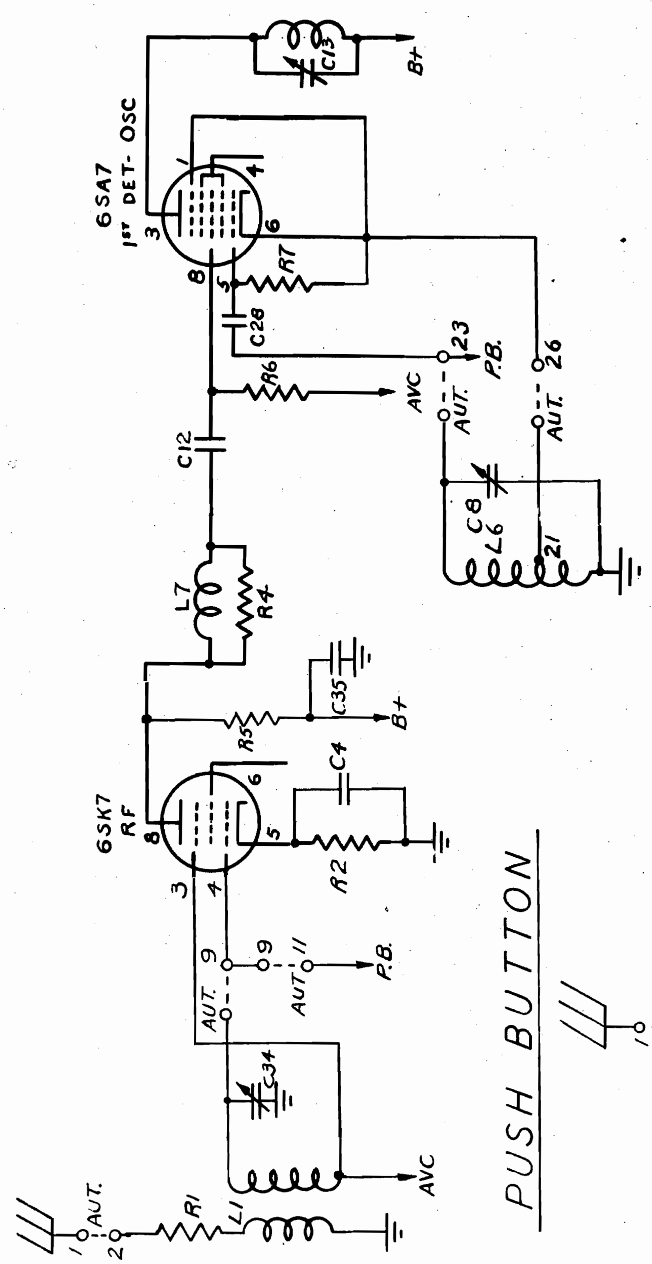




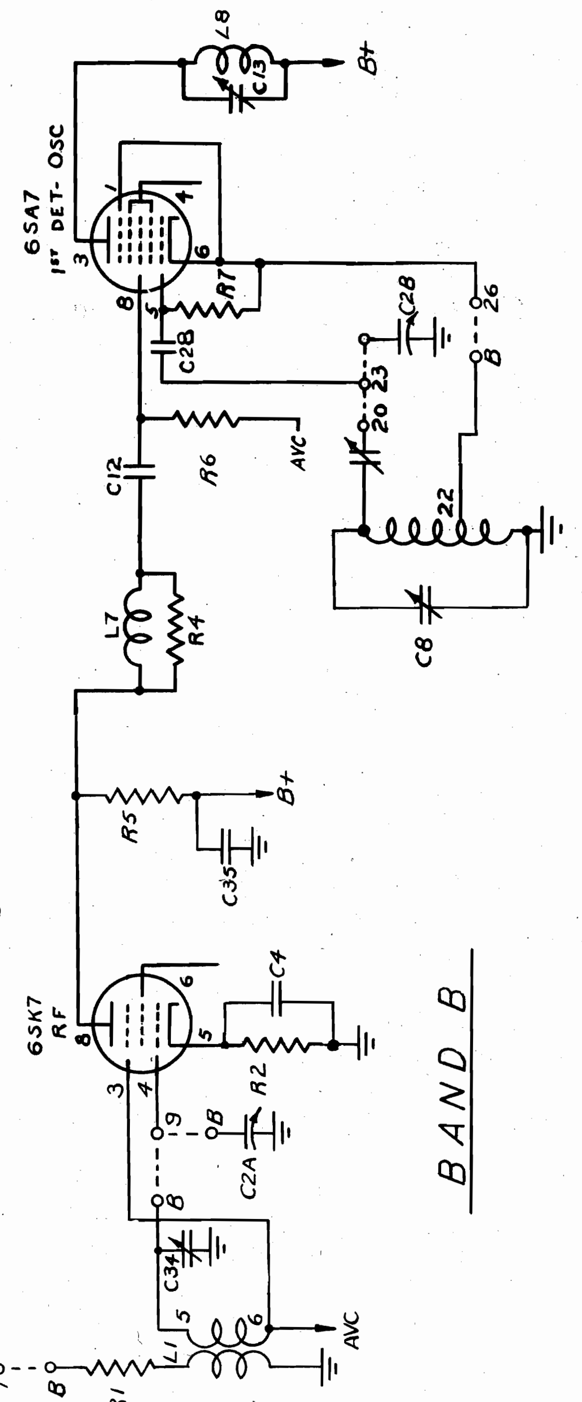
MODELS J-808, J-818, J-828
See G.E. Page 12-83
MODEL J-809
See G.E. Page 12-87

GENERAL ELECTRIC CO.

MODEL J-105, Golden Tone
See G.E. Page 12-53



PUSH BUTTON

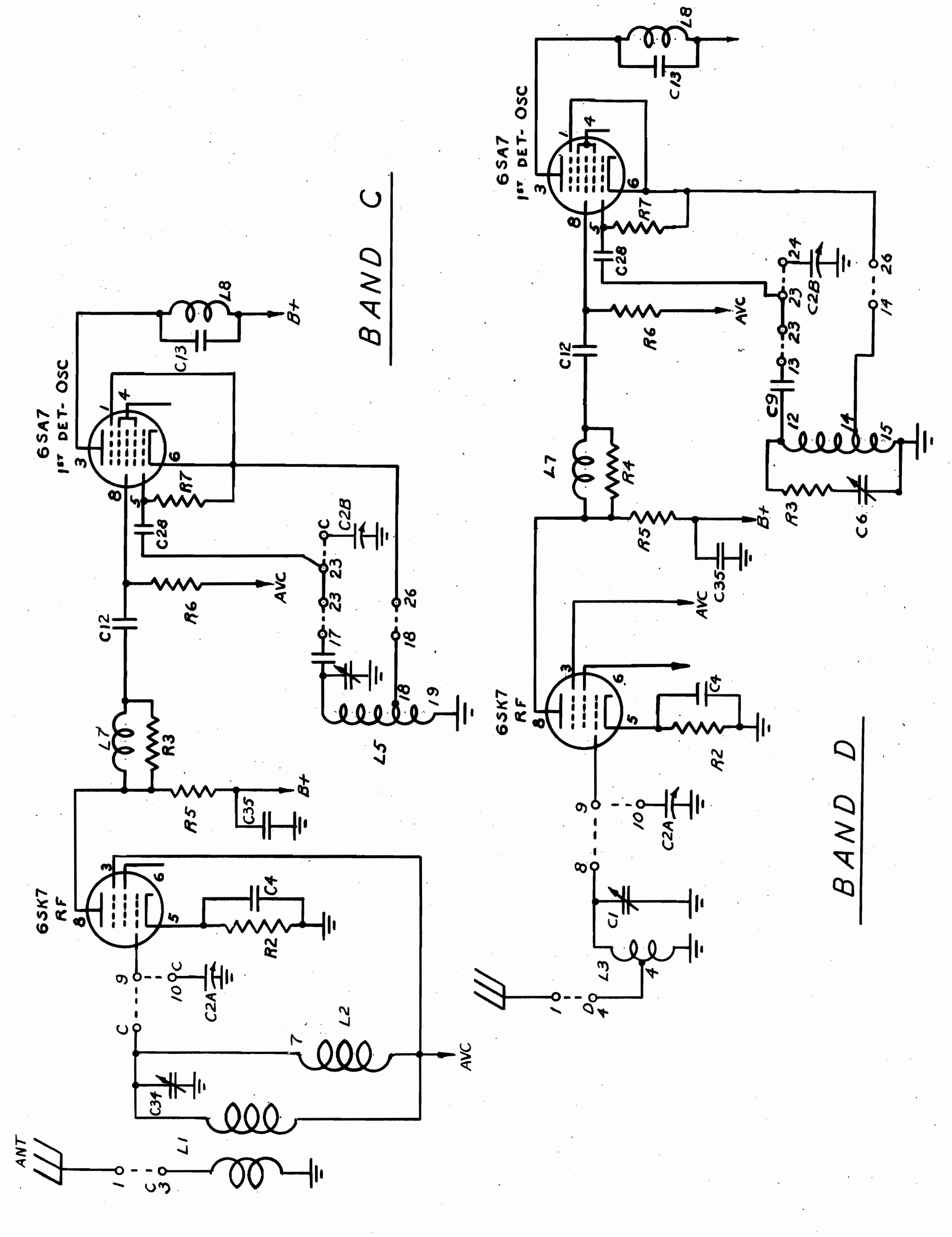


BAND B

MODEL J-105, Golden Tone
See G.E. Page 12-53

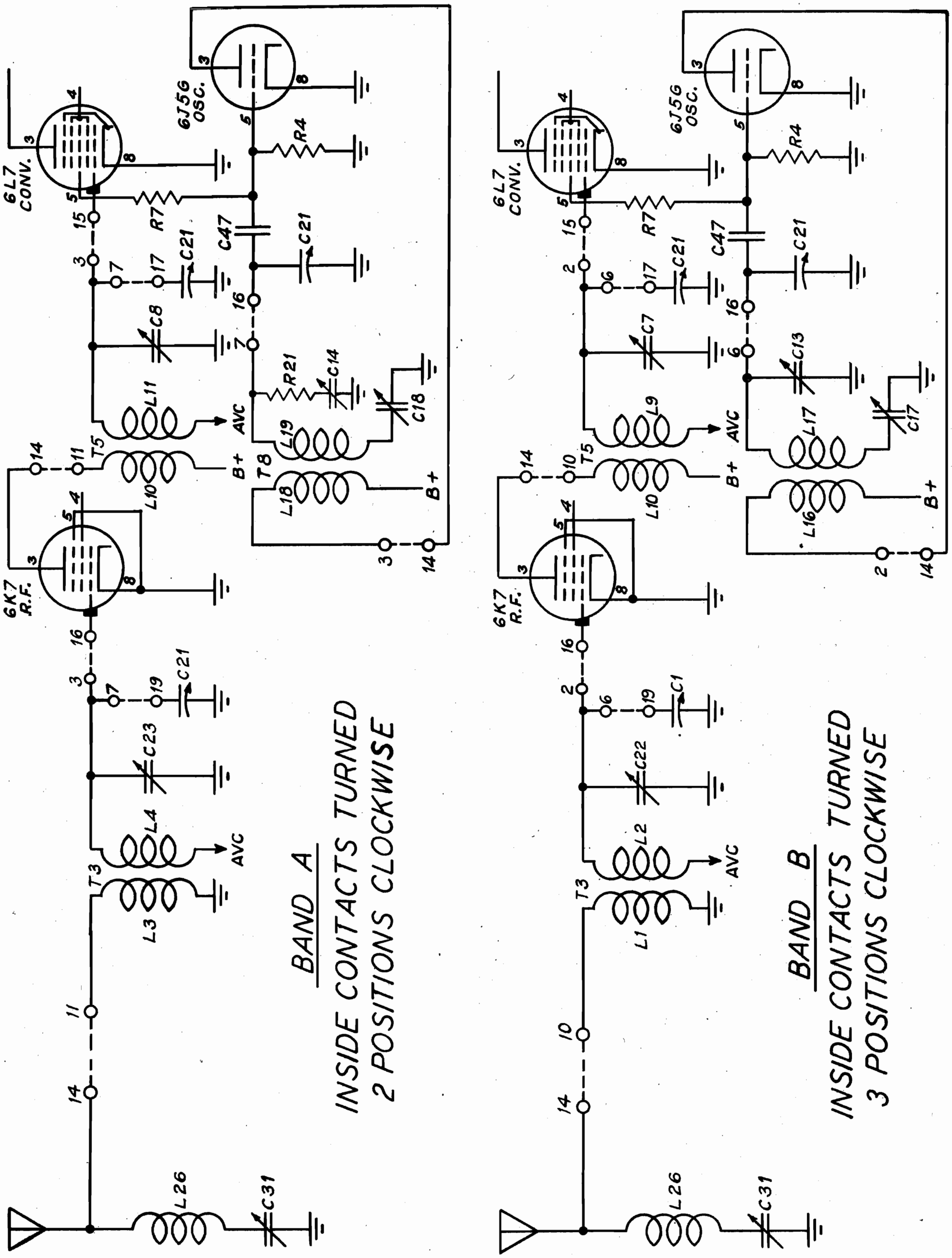
GENERAL ELECTRIC CO.

MODELS J-808, J-818, J-828
See G.E. Page 12-83
MODEL J-809
See G.E. Page 12-87



GENERAL ELECTRIC CO. MODELS FE-112, FE-116, FE-119

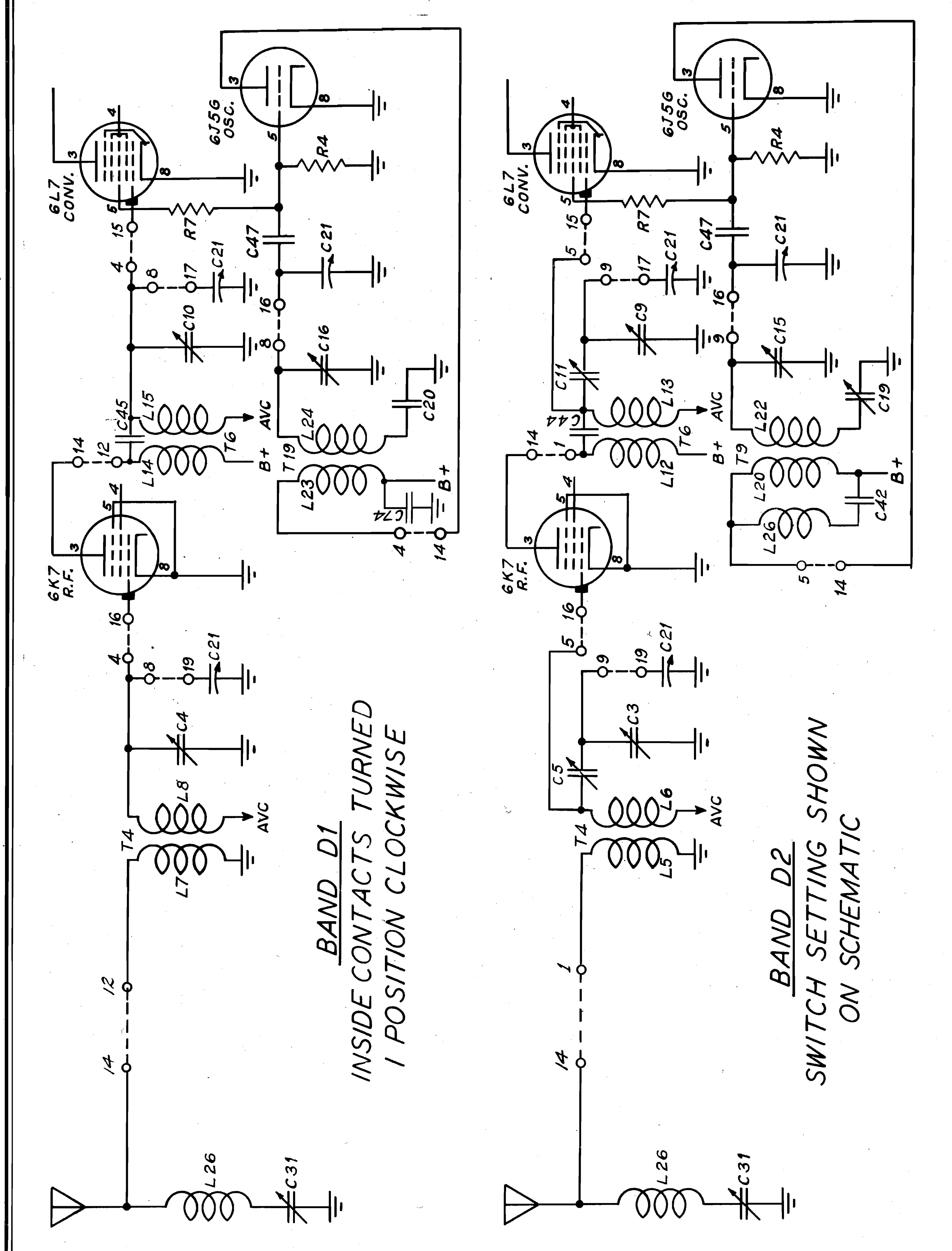
See G.E. Page 12-57



MODELS FE-112, FE-116, FE-119

GENERAL ELECTRIC CO.

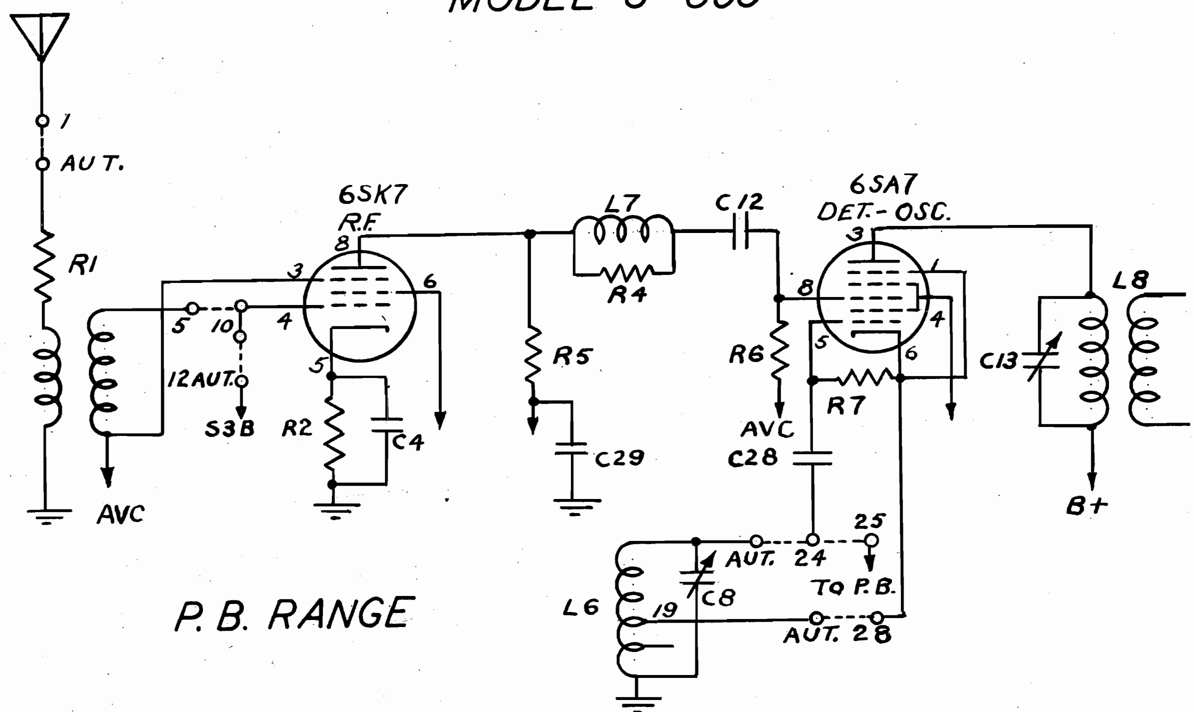
See G.E. Page 12-57



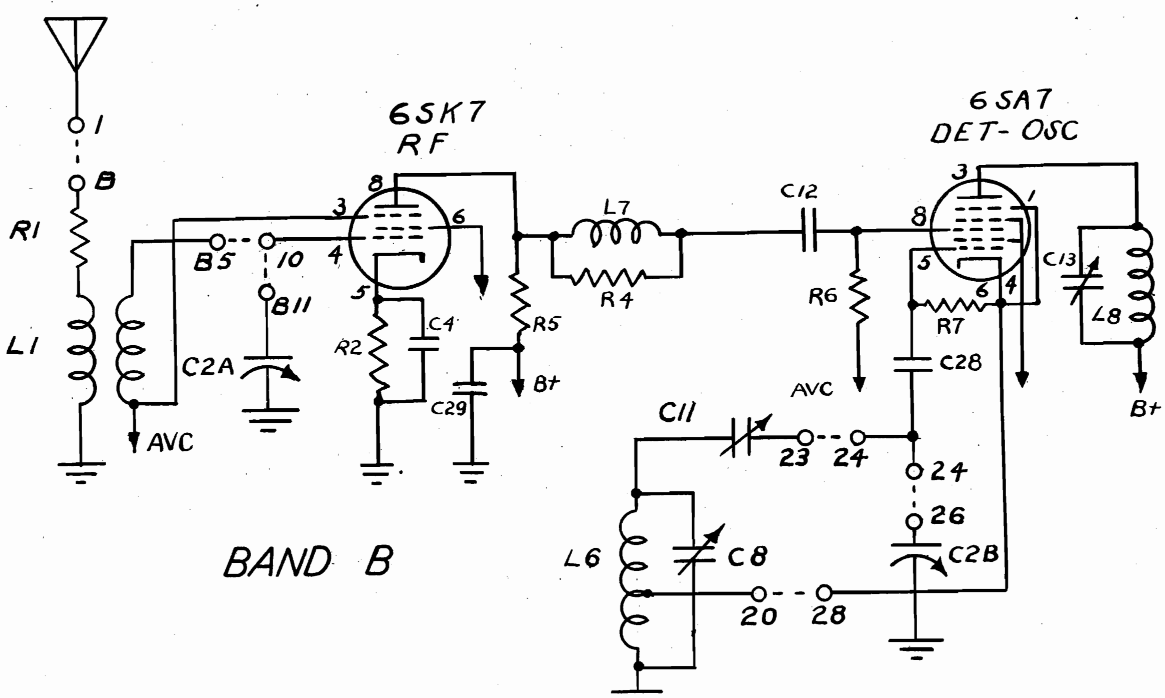
GENERAL ELECTRIC CO.

MODEL J-805
See G.E. Page 12-79

MODEL J-805



P. B. RANGE

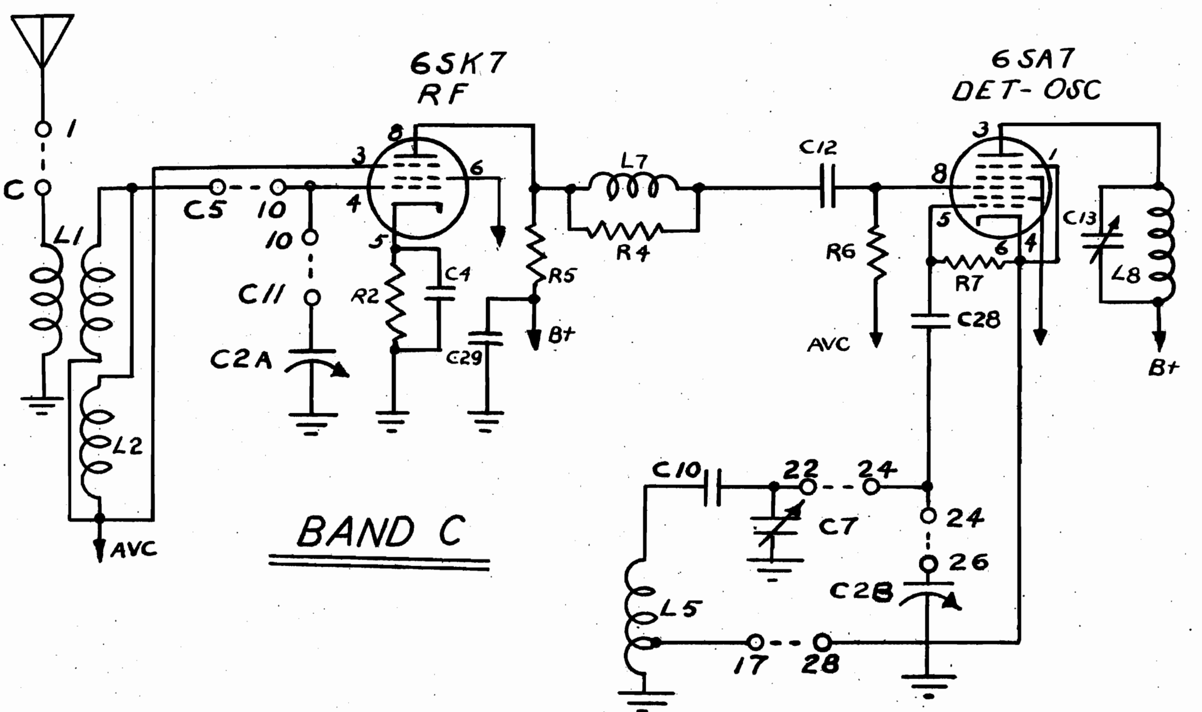


BAND B

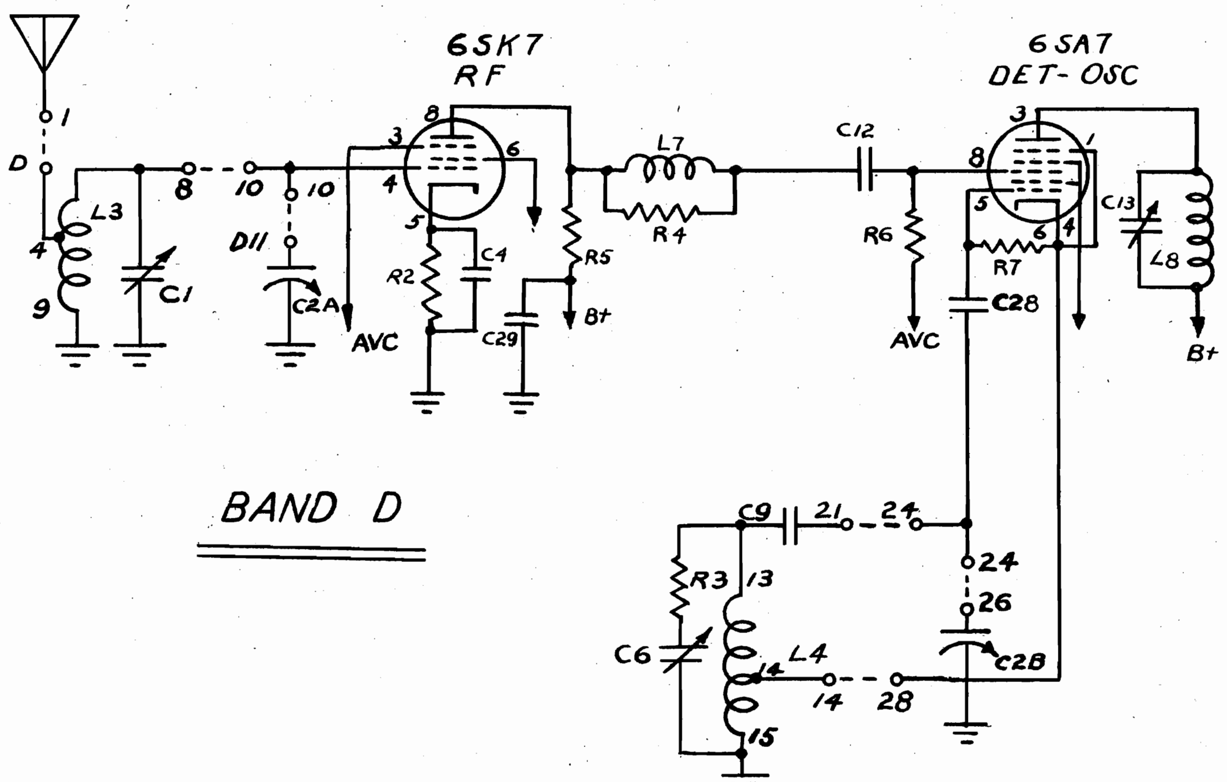
MODEL J-805 GENERAL ELECTRIC CO.

See G.E. Page 12-79

MODEL J-805 (CONTINUED)



BAND C

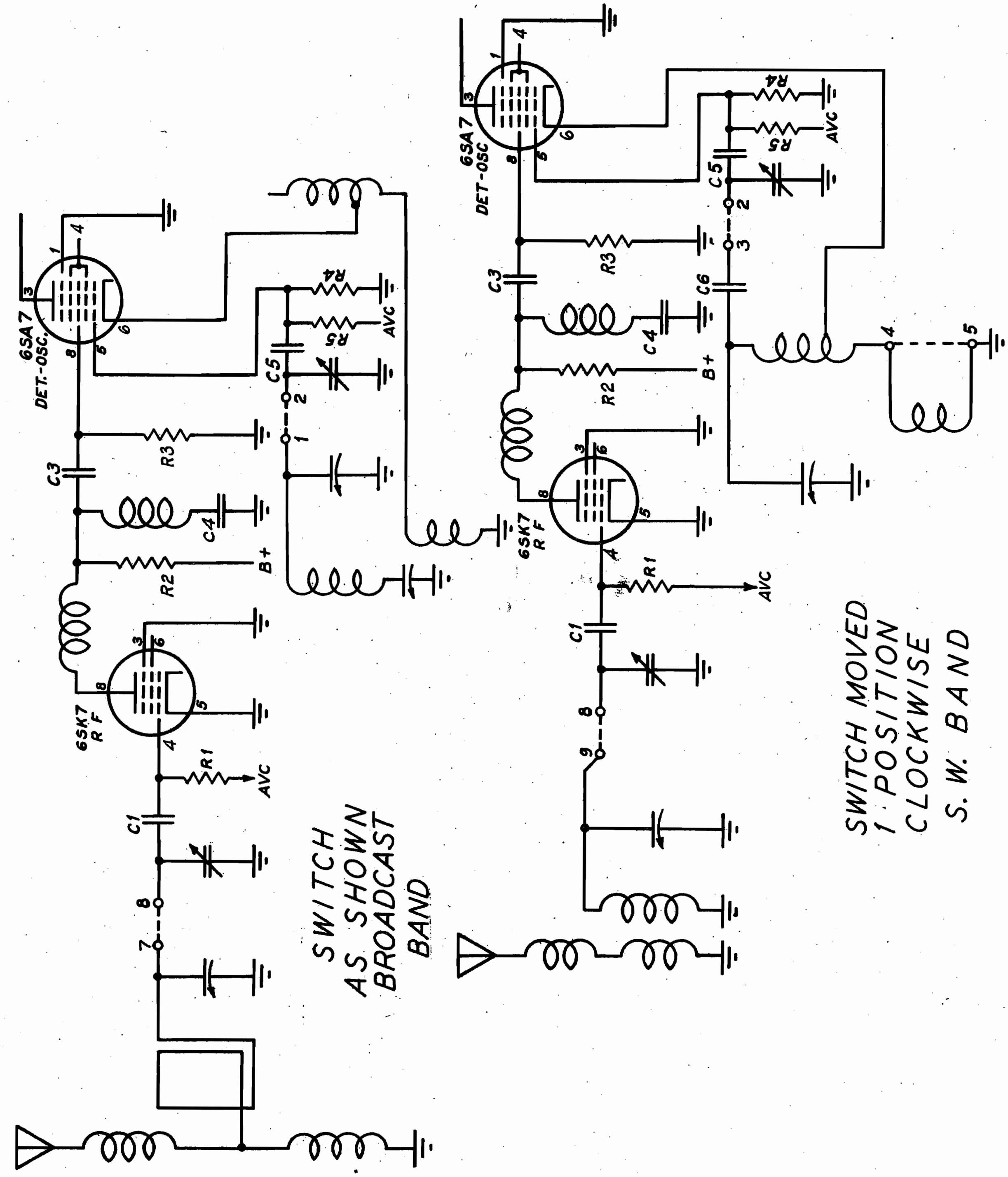


BAND D

MODEL R458
See Goodrich Page 12-24

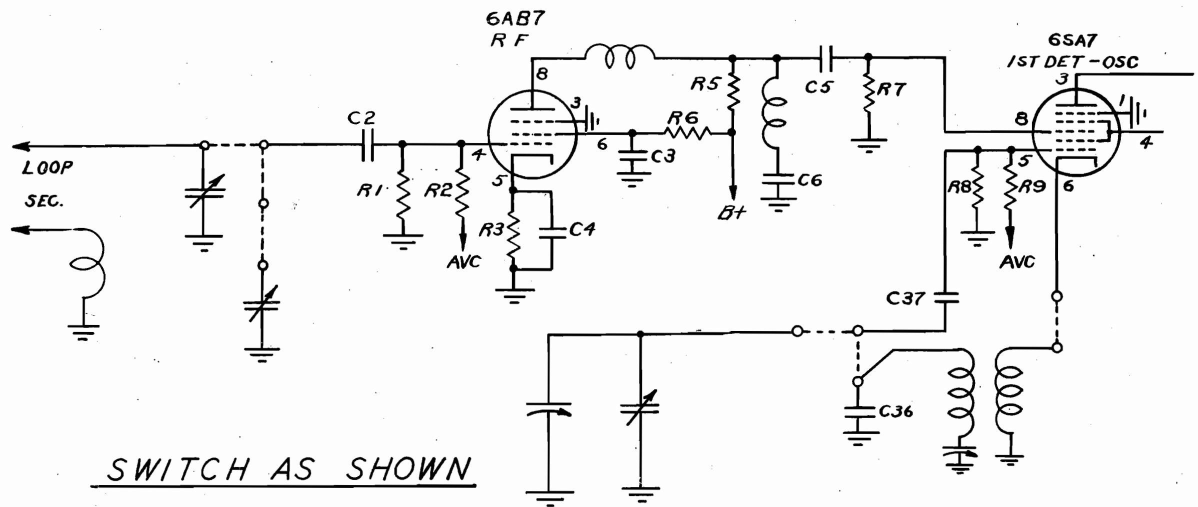
B. F. GOODRICH

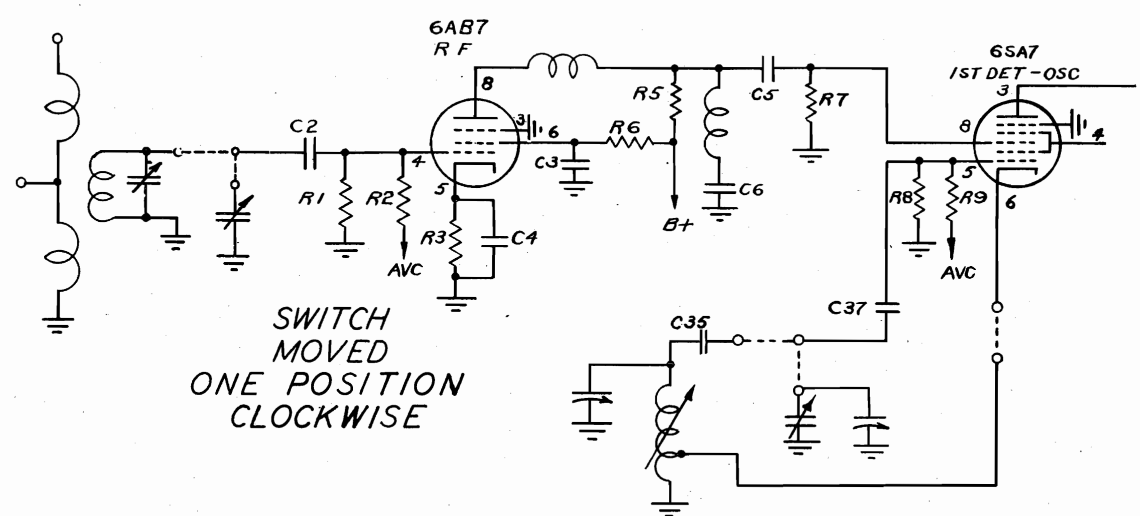
MODEL R454
See Goodrich Page 12-24
MODEL R480
See Goodrich Page 12-26

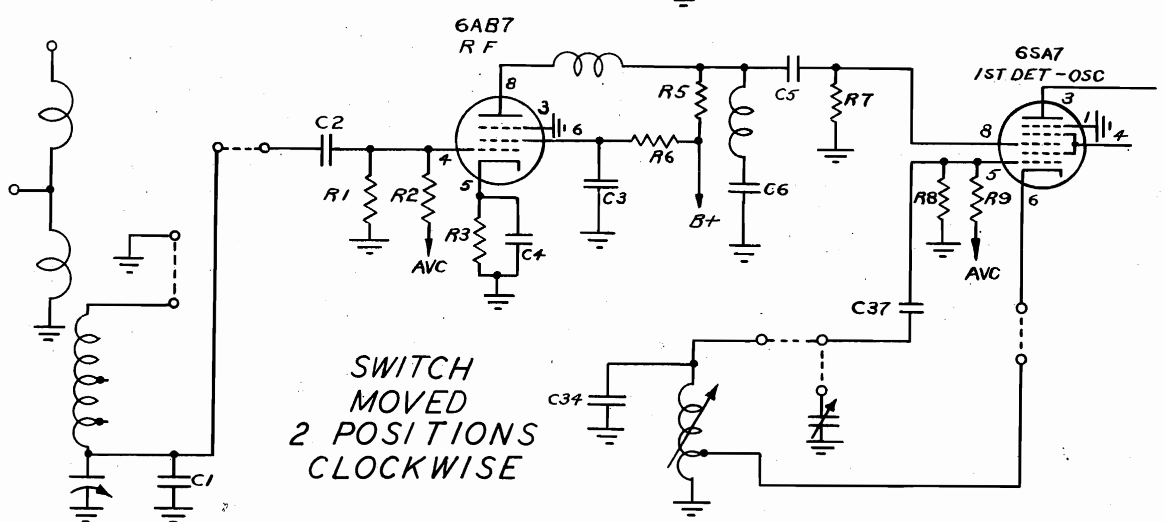


B. F. GOODRICH

MODEL R459
See Goodrich Page 12-25

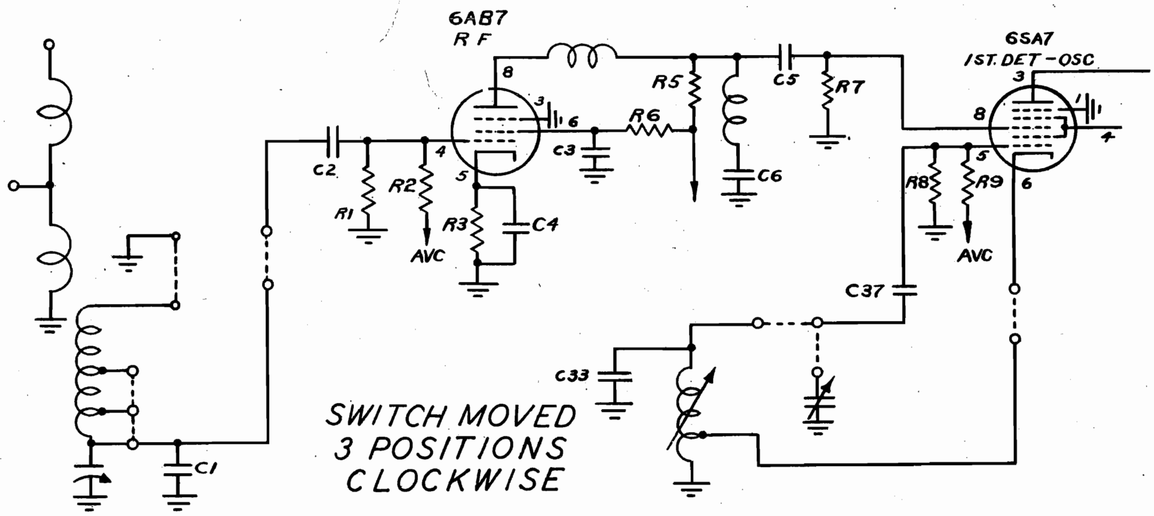




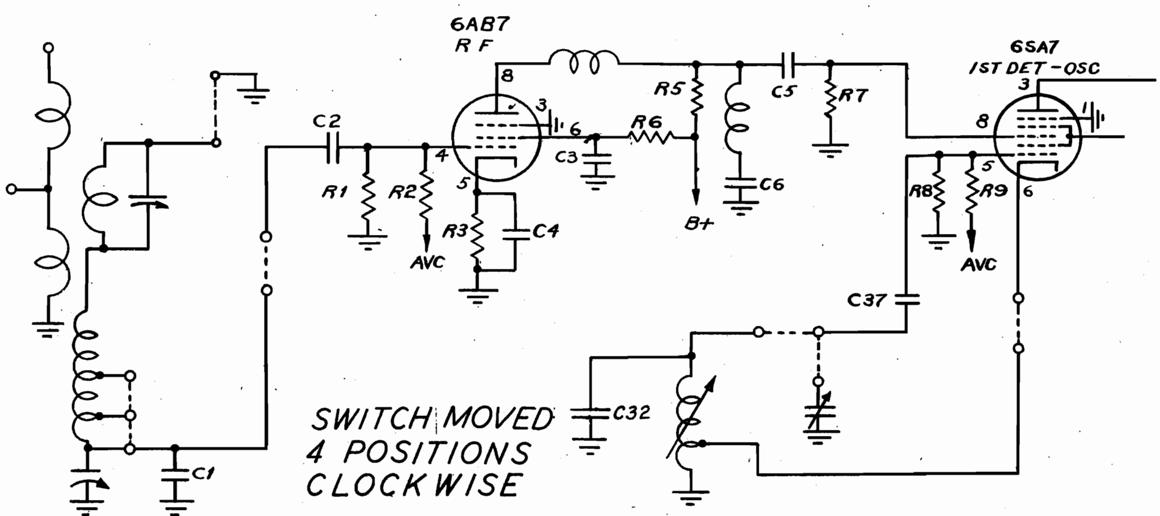


MODEL R459
See Goodrich Page 12-25

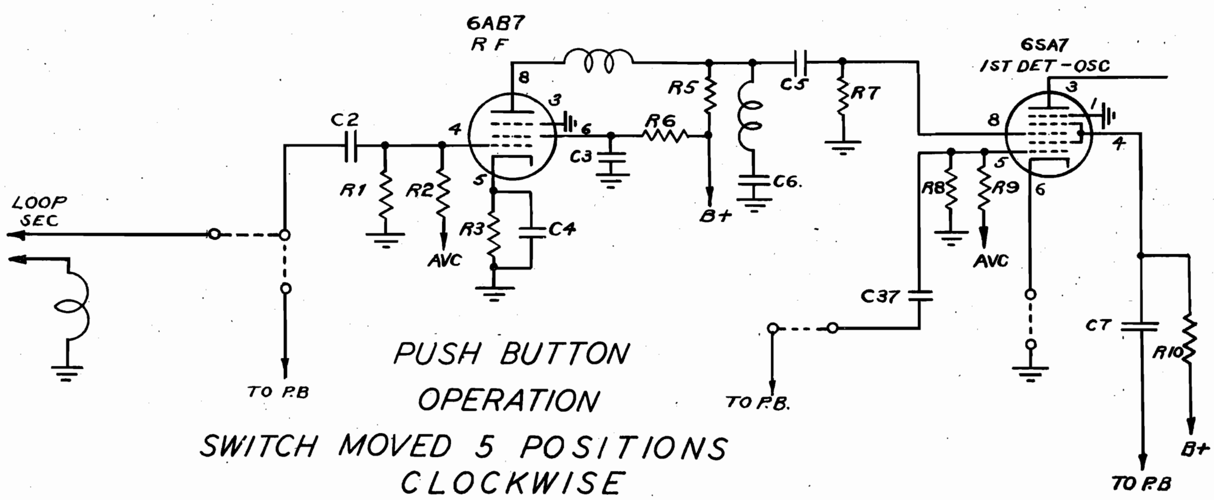
B. F. GOODRICH



SWITCH MOVED 3 POSITIONS CLOCKWISE



SWITCH MOVED 4 POSITIONS CLOCKWISE

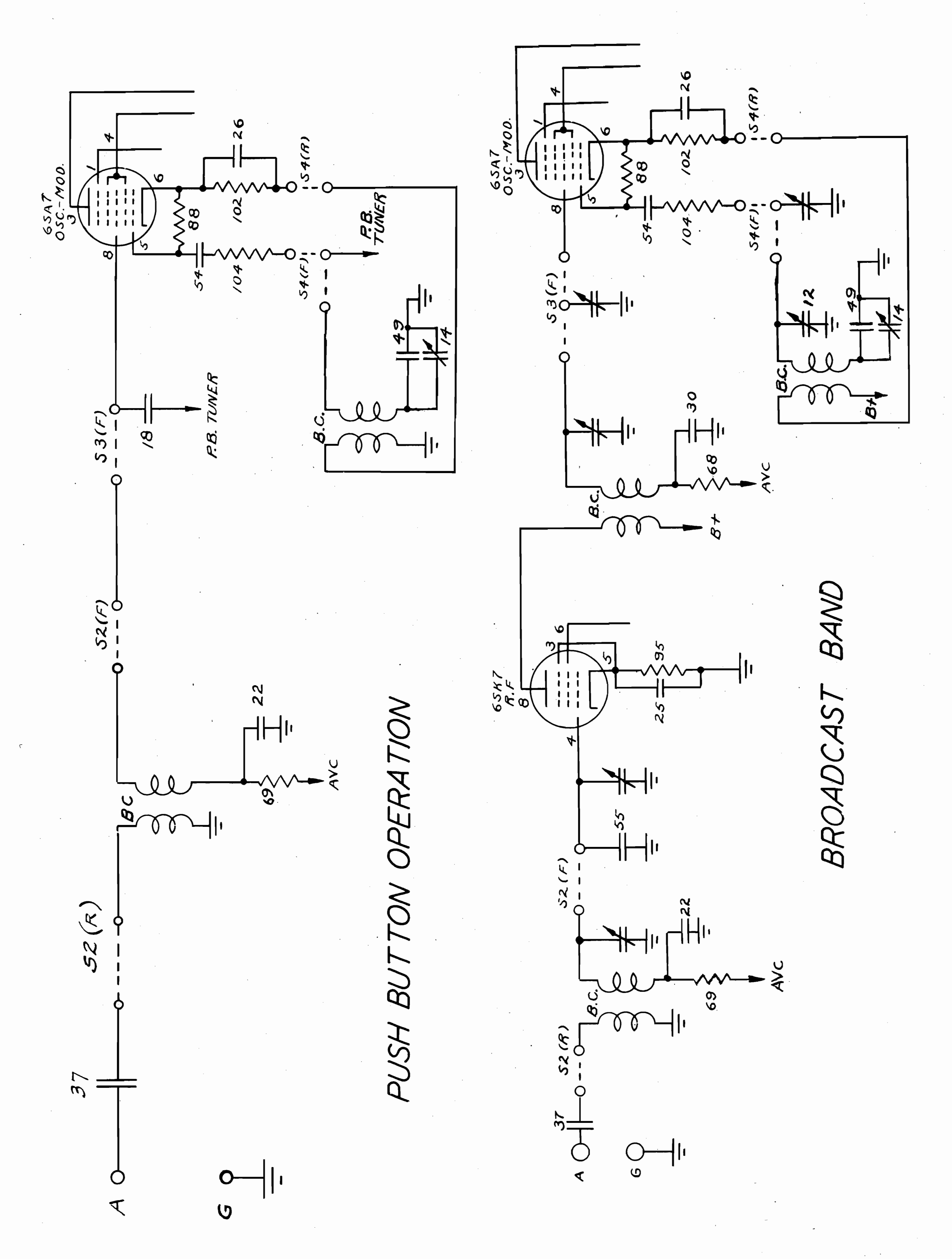


PUSH BUTTON OPERATION

SWITCH MOVED 5 POSITIONS CLOCKWISE

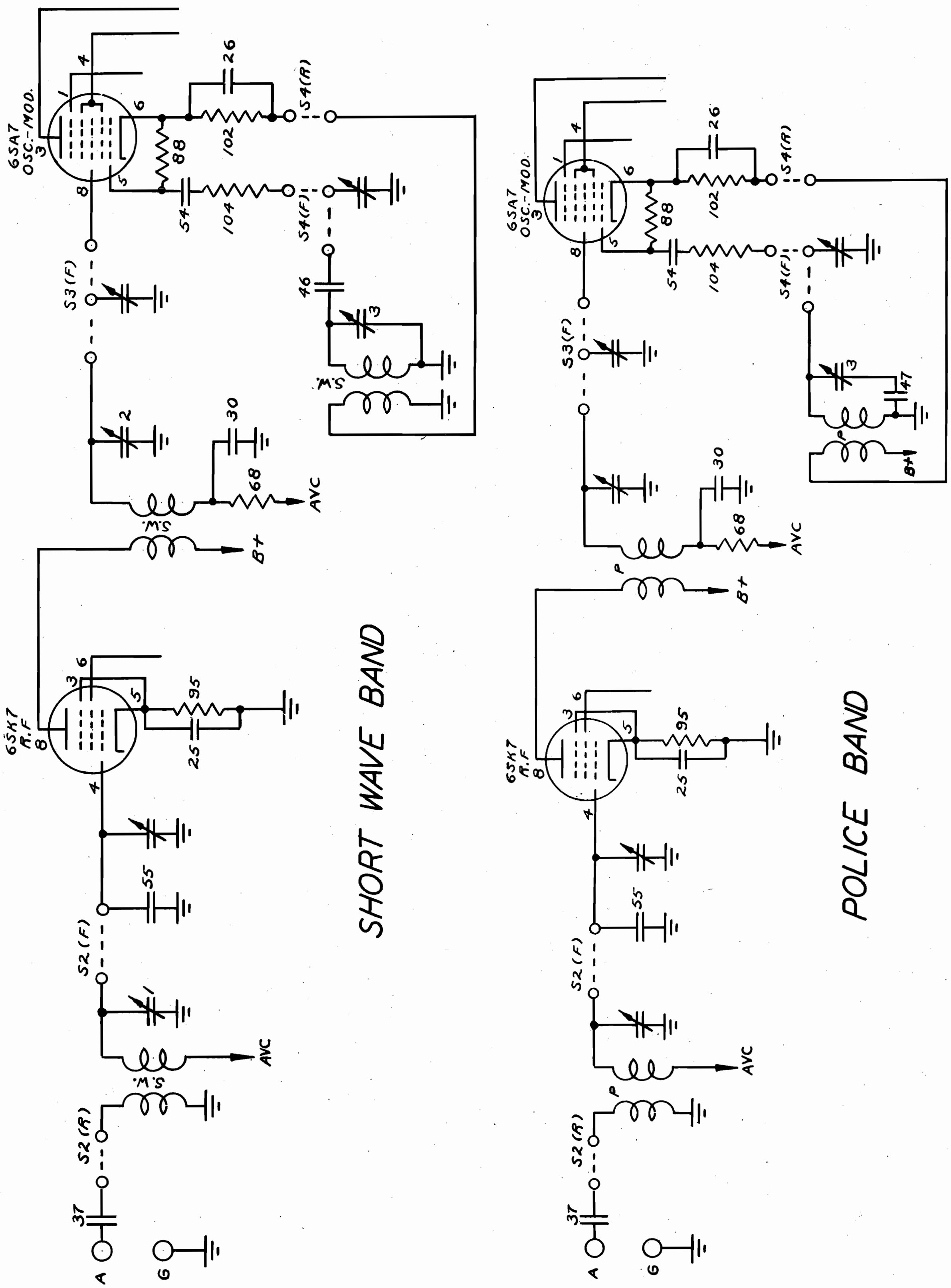
THE MAGNAVOX CO. INC.

CHASSIS CR-149
See Magnavox Page 12-1
CHASSIS CR-152, CR-161
See Magnavox Page 12-3



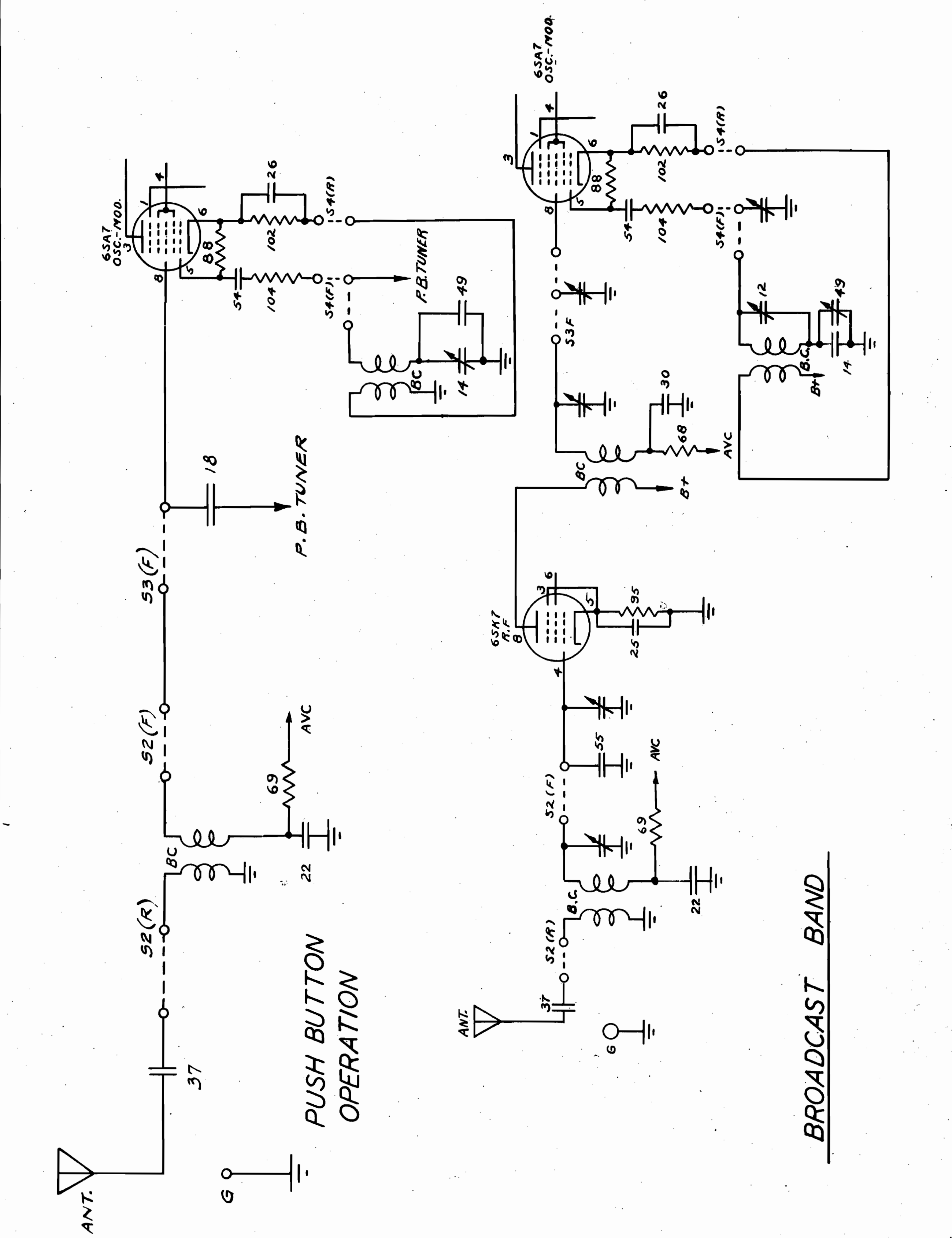
CHASSIS CR-149
See Magnavox Page 12-1
CHASSIS CR-152, CR-161
See Magnavox Page 12-3

THE MAGNAVOX CO. INC.



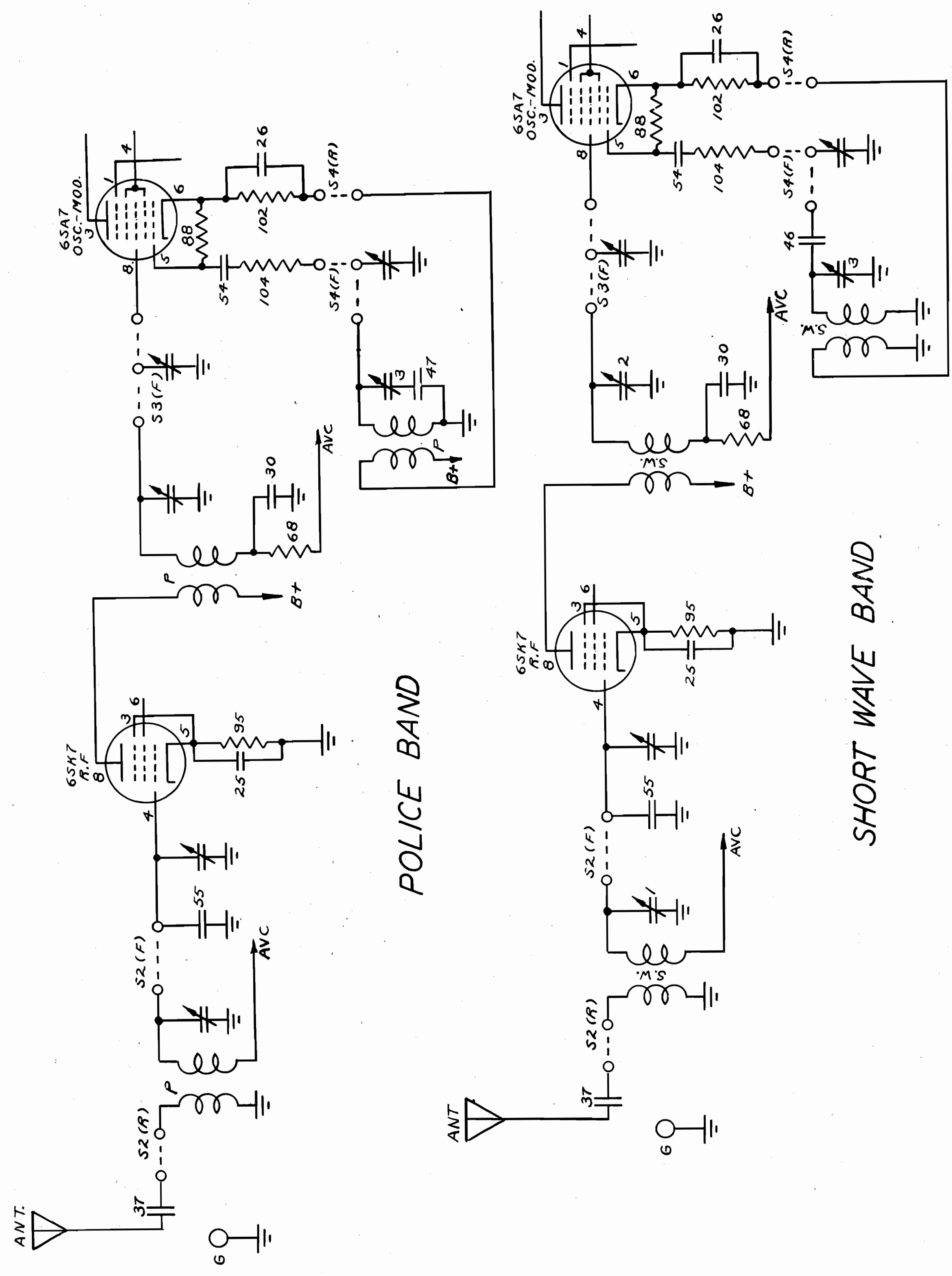
THE MAGNAVOX CO. INC.

CHASSIS CR-154
See Magnavox Page 12-7, 8
CHASSIS CR-155
See Magnavox Page 12-9, 10



CHASSIS CR-154
See Magnavox Page 12-7, 8
CHASSIS CR-155
See Magnavox Page 12-9, 10

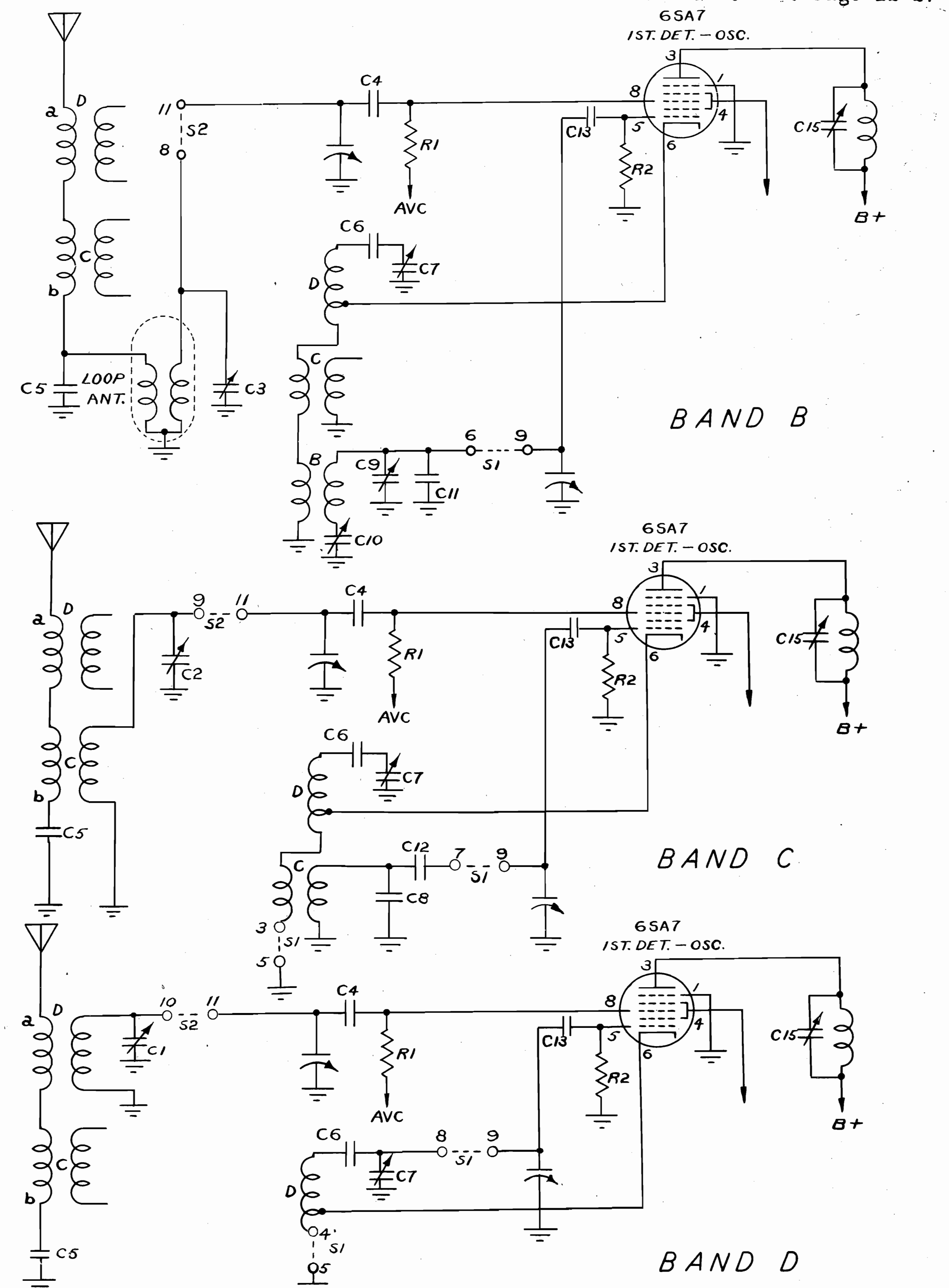
THE MAGNAVOX CO. INC.



MODELS 04WG-622A, 04WG-623A
See Mont.-Ward Page 12-29

MONTGOMERY WARD & CO.

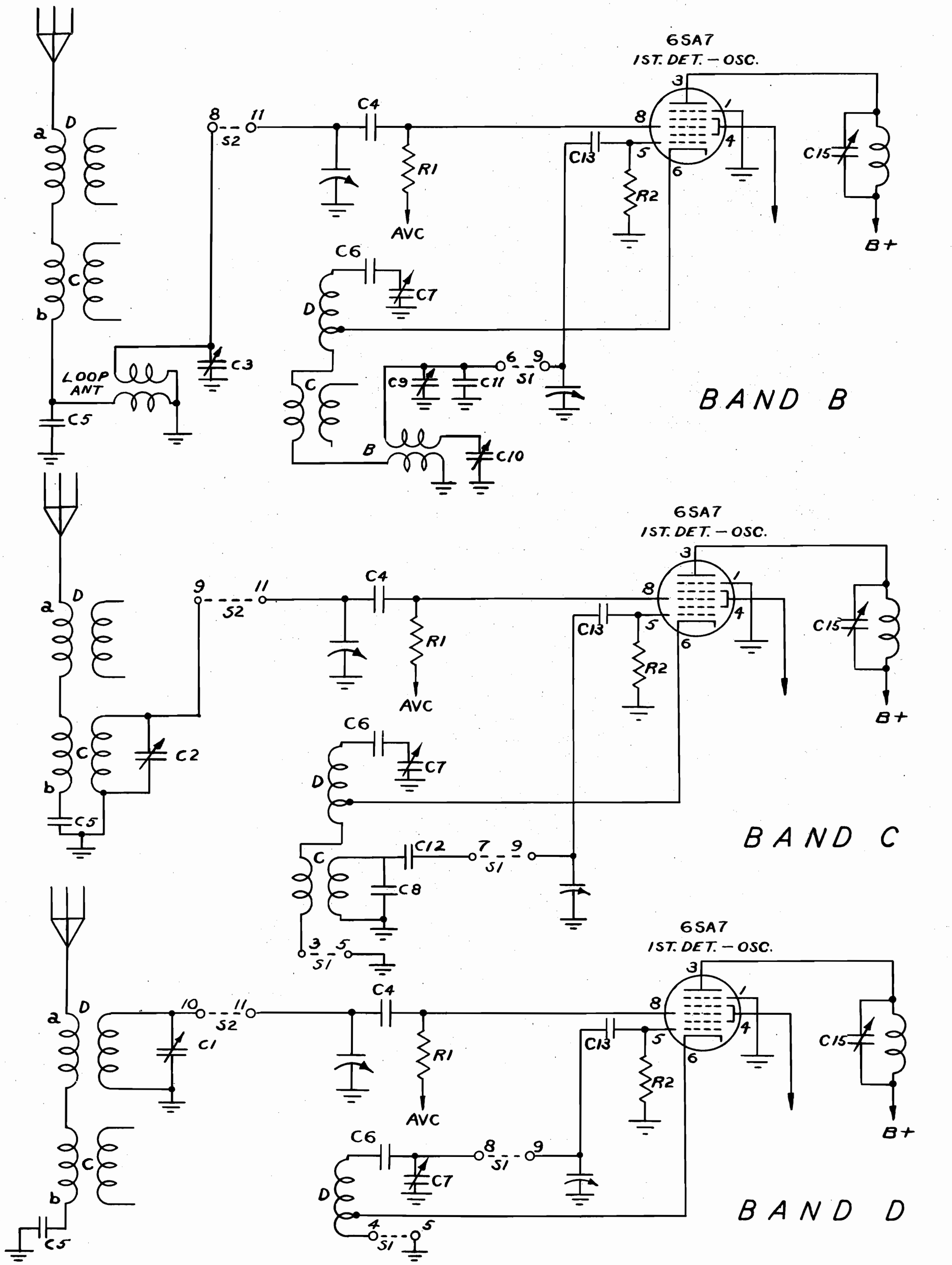
MODEL 04WG-614
See Mont.-Ward. Page 12-23
MODELS 04WG-619, 04WG-621, 04WG-621NI
See Mont.-Ward Page 12-27



MONTGOMERY WARD & CO.

MODELS 04WG-728,
04WG-732

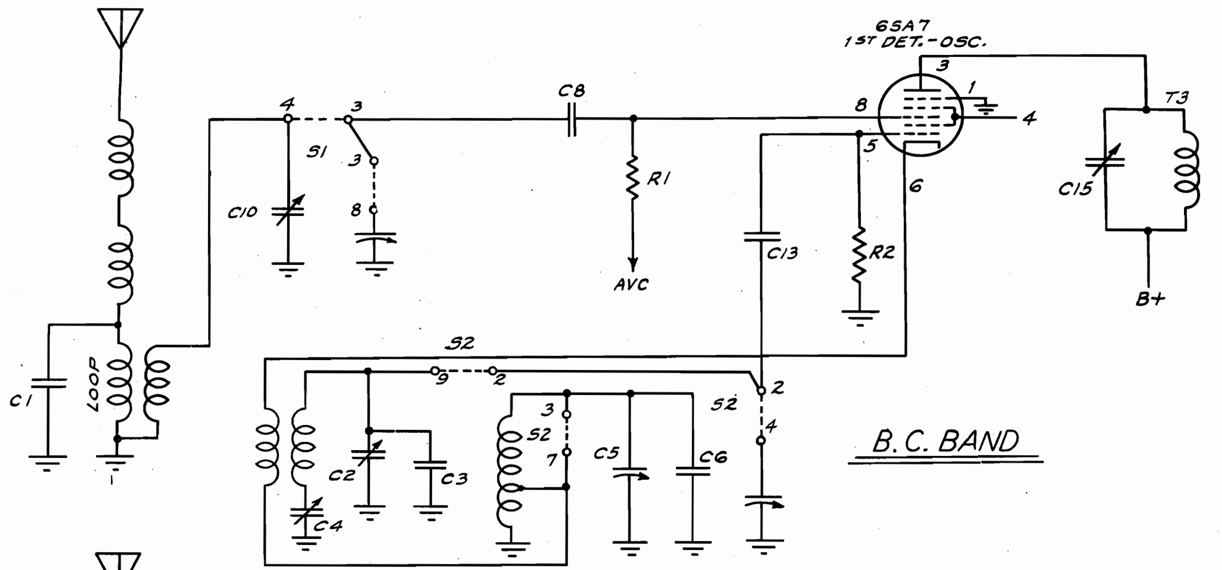
See Mont.-Ward
Page 12-43

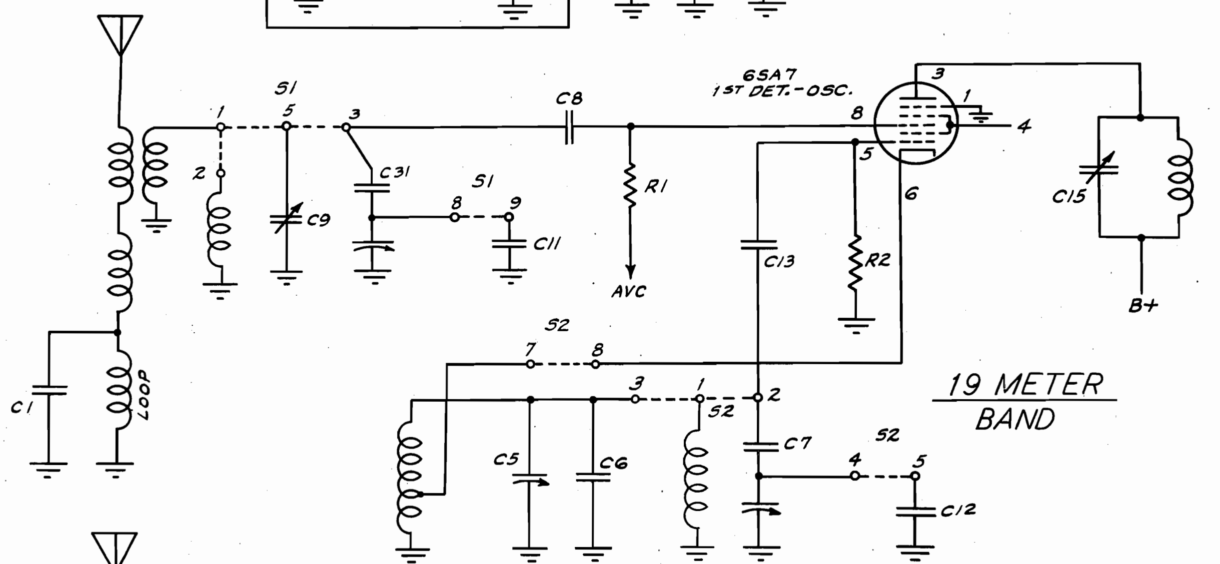


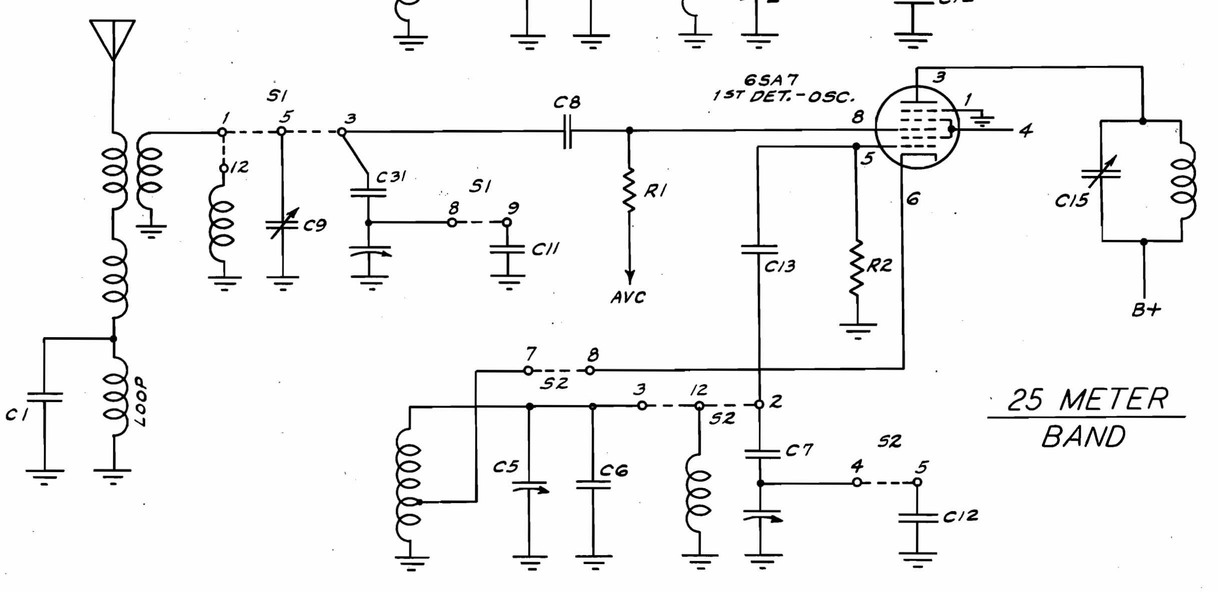
MONTGOMERY WARD & CO.

MODELS 04WG-803, 04WG-803B

See Mont.-Ward Page 12-45



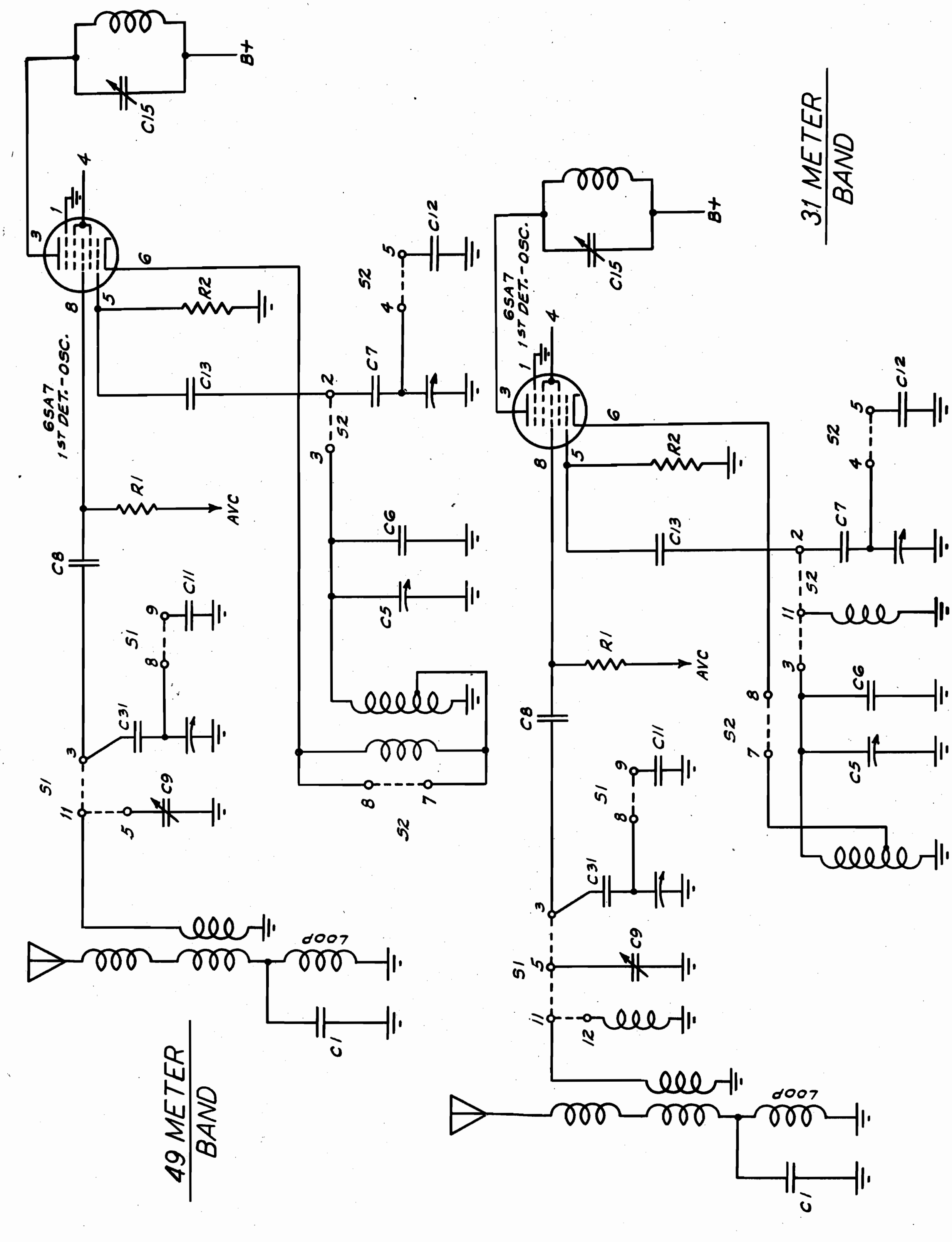




MODELS 04WG-803,
04WG-803B

See Mont.-Ward Page 12-45

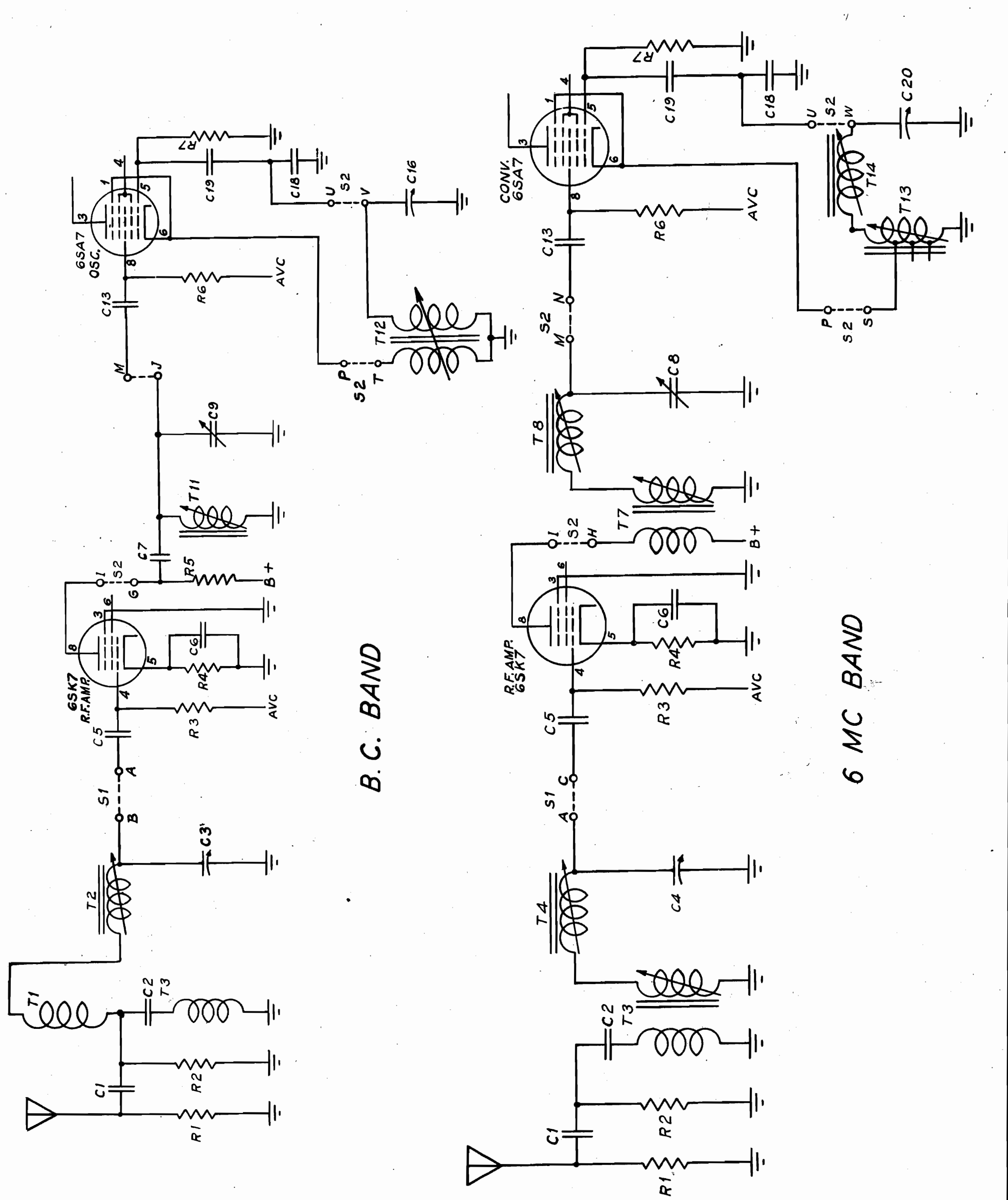
MONTGOMERY WARD & CO.



MONTGOMERY WARD & CO.

MODEL 04BR-1105A,
See Mont.-Ward Page 12-52
MODEL 04BR-1106A
See Mont.-Ward. Page 12-51

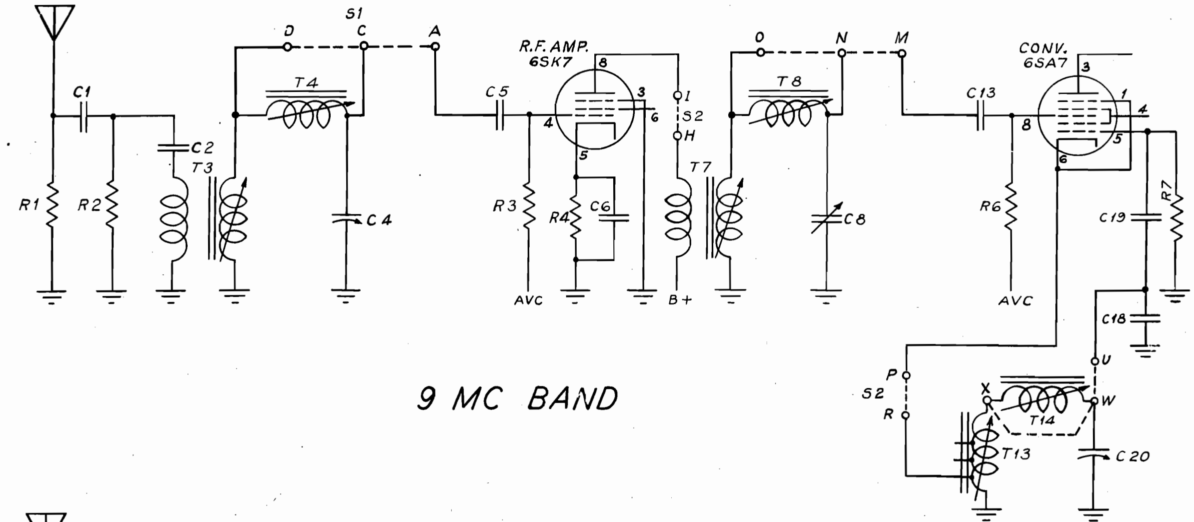
MODELS 04BR-903A, 04BR-907A
See Mont.-Ward Page 12-47
MODELS 04BR-904A, 04BR-906A
See Mont.-Ward Page 12-50



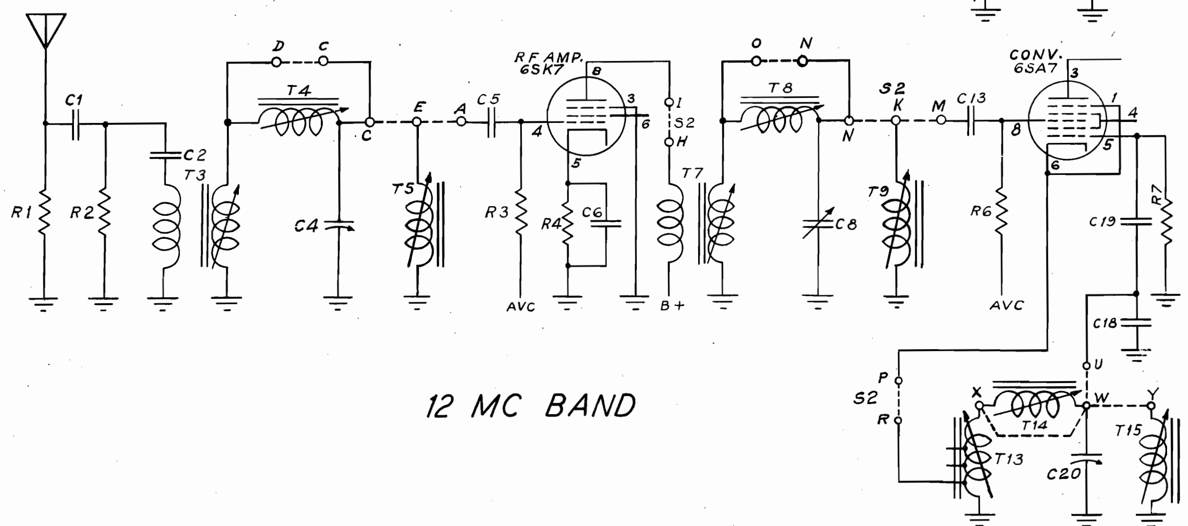
MONTGOMERY WARD & CO.

MODELS 04BR-903A, 04BR-907A
See Mont.-Ward Page 12-47
MODELS 04BR-904A, 04BR-906A
See Mont.-Ward Page 12-50

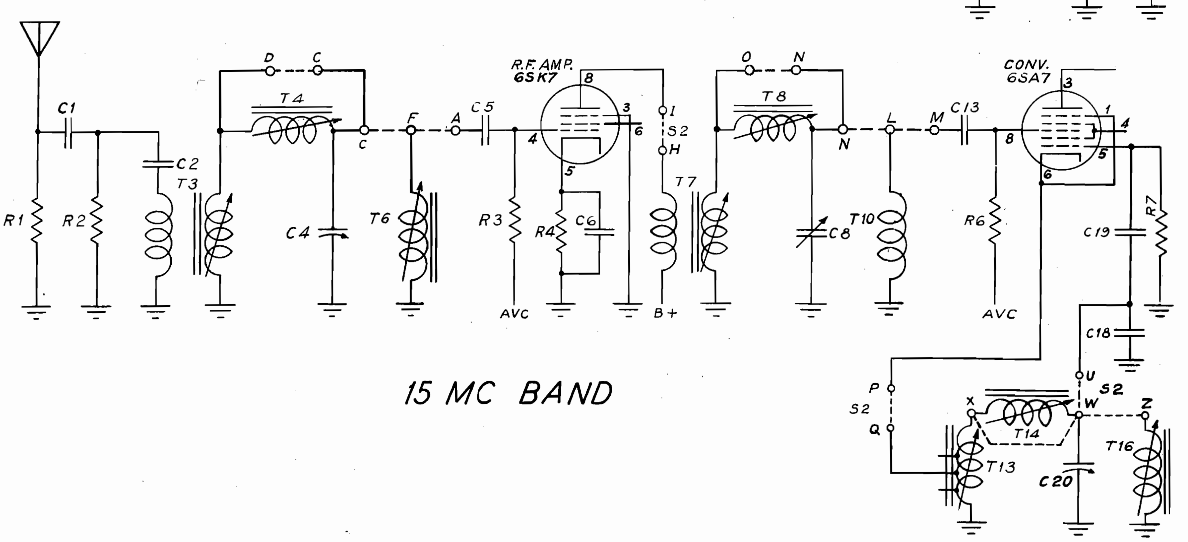
MODEL 04BR-1105A
See Mont.-Ward Page 12-52
MODEL 04BR-1106A
See Mont.-Ward Page 12-51



9 MC BAND



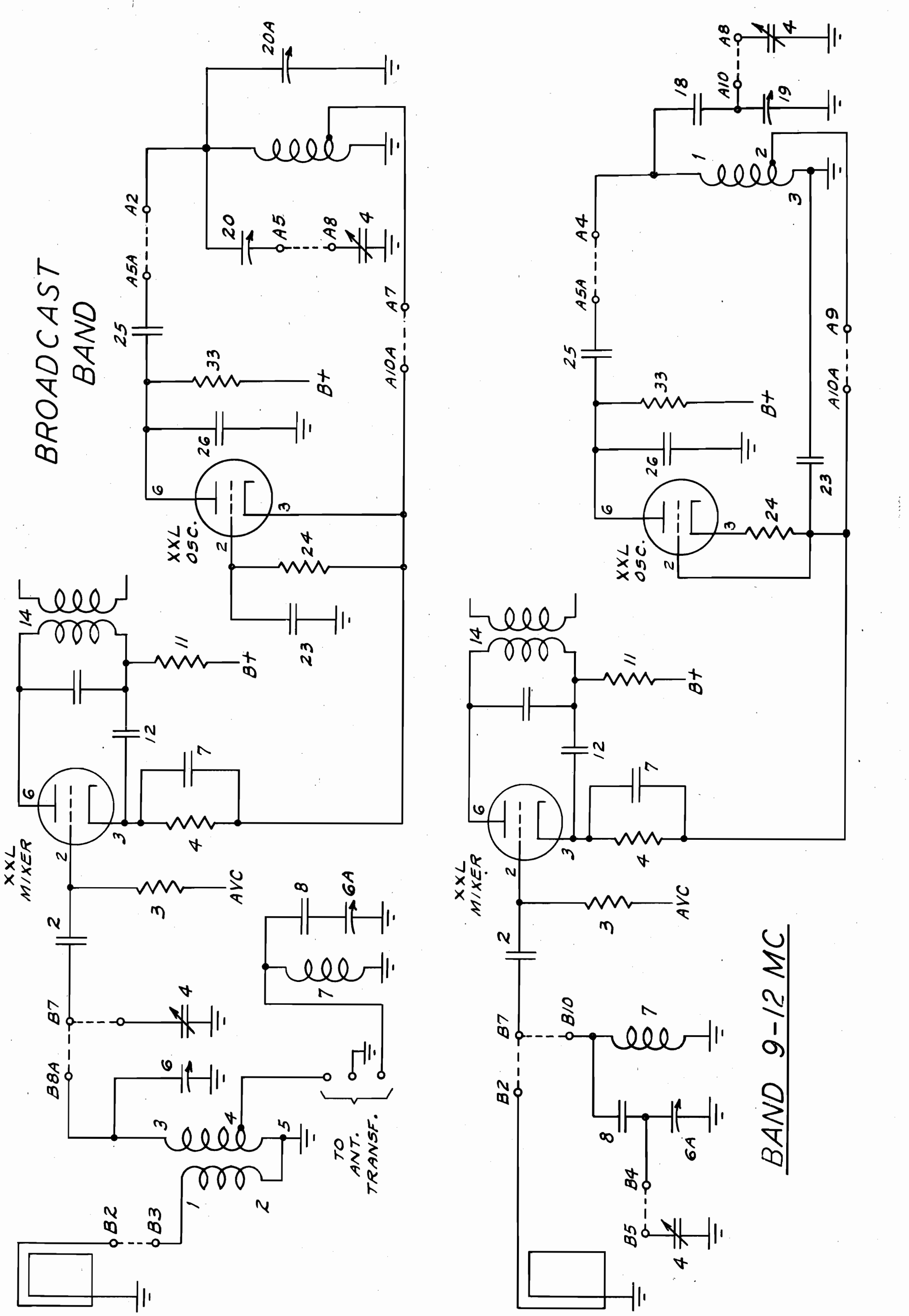
12 MC BAND



15 MC BAND

PHILCO RADIO & TELEV. CORP.

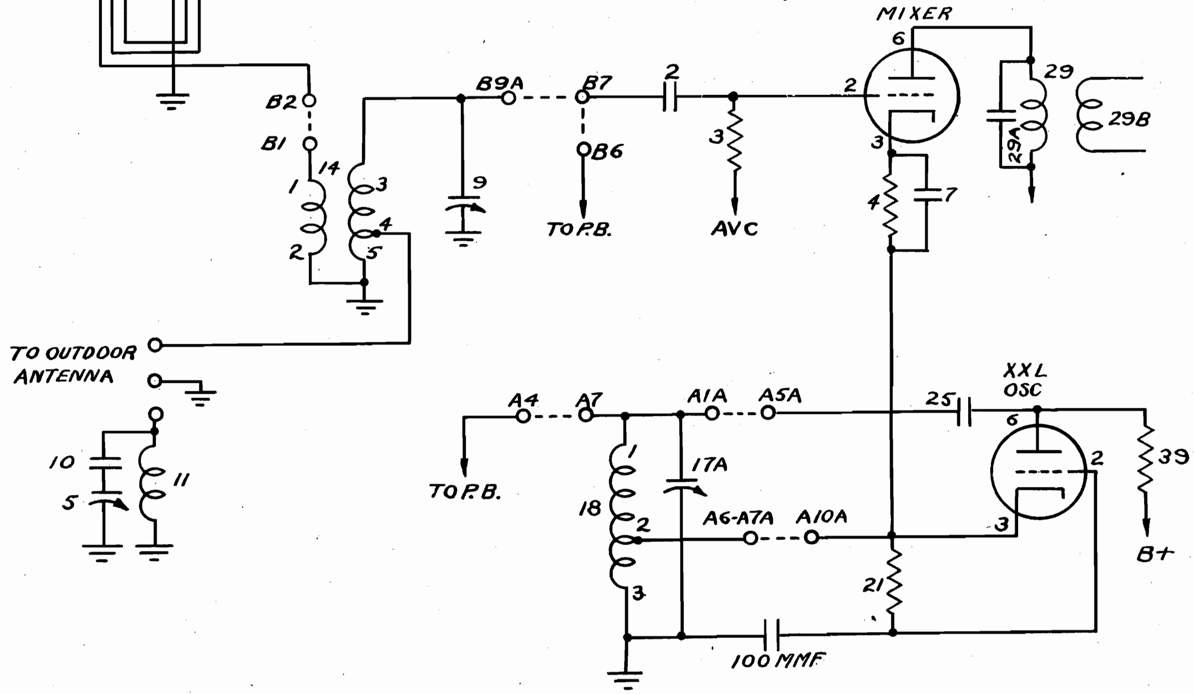
MODEL 41-240
See Philco Page 12-52



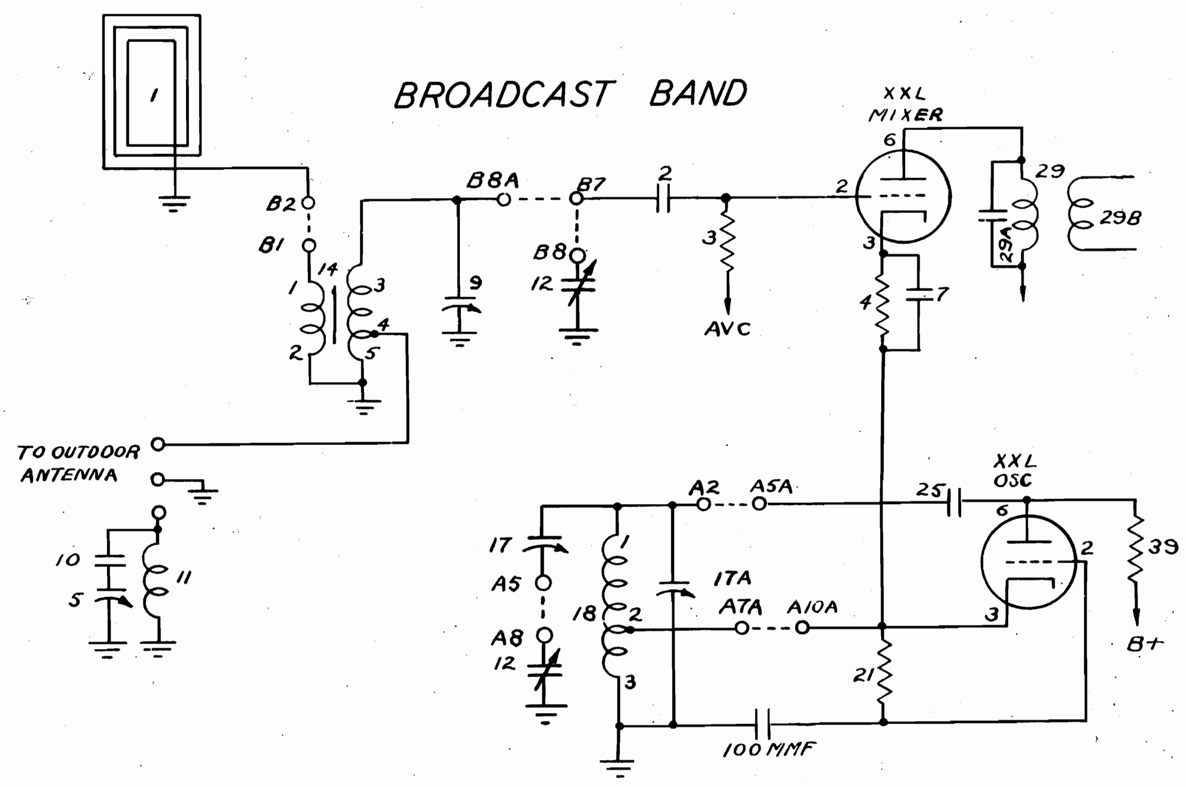
PHILCO RADIO & TELEV. CORP.

MODEL 41-245
See Philco
Page 12-53

SWITCH AS SHOWN PUSH BUTTON OPERATION

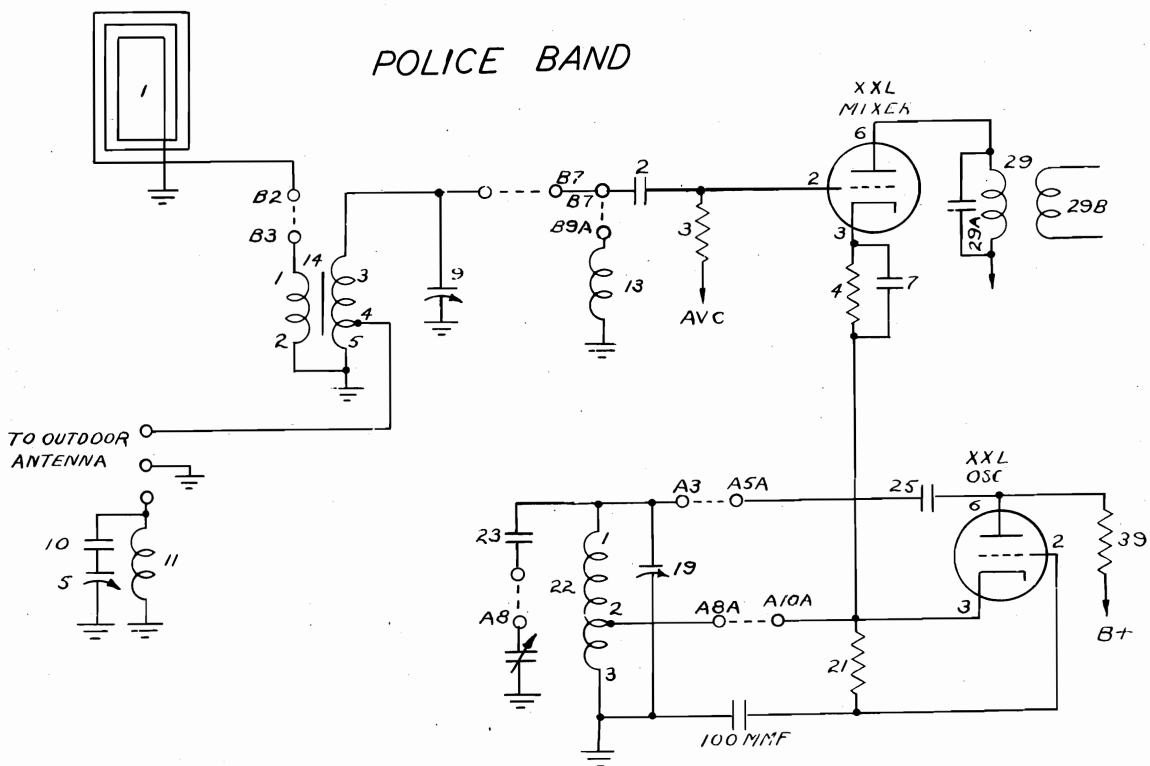


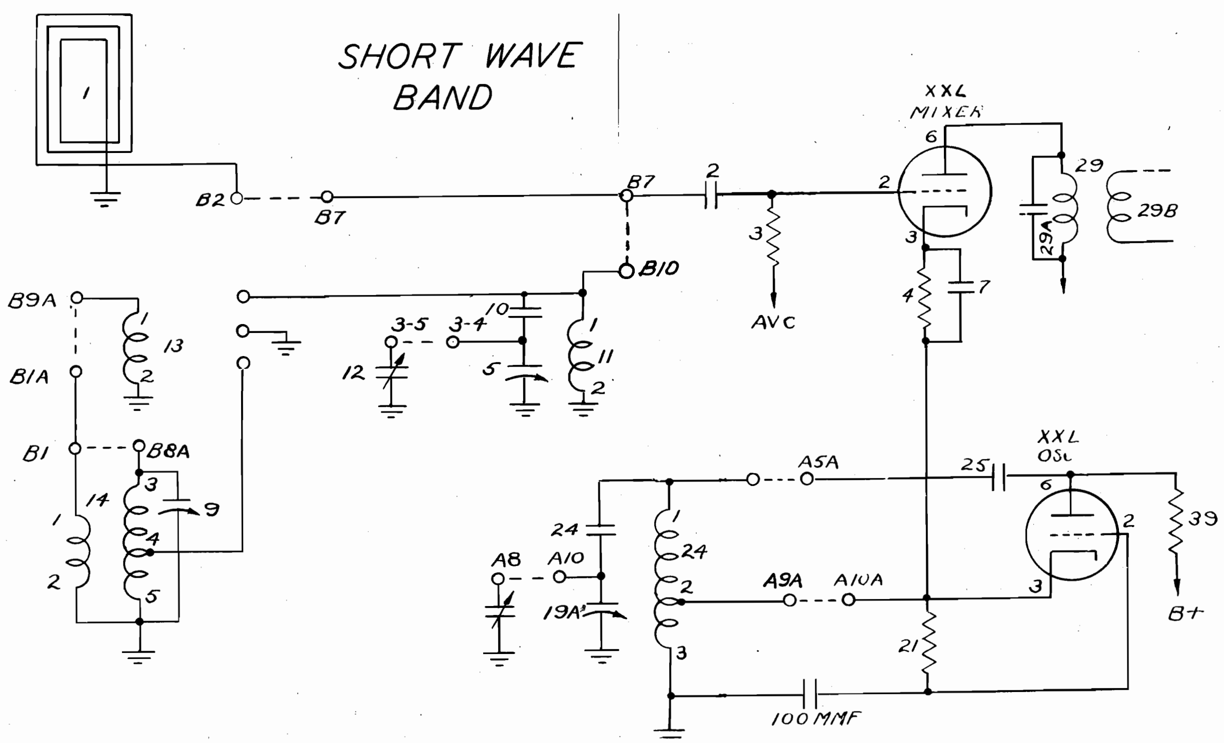
BROADCAST BAND



MODEL 41-245
See Philco
Page 12-53

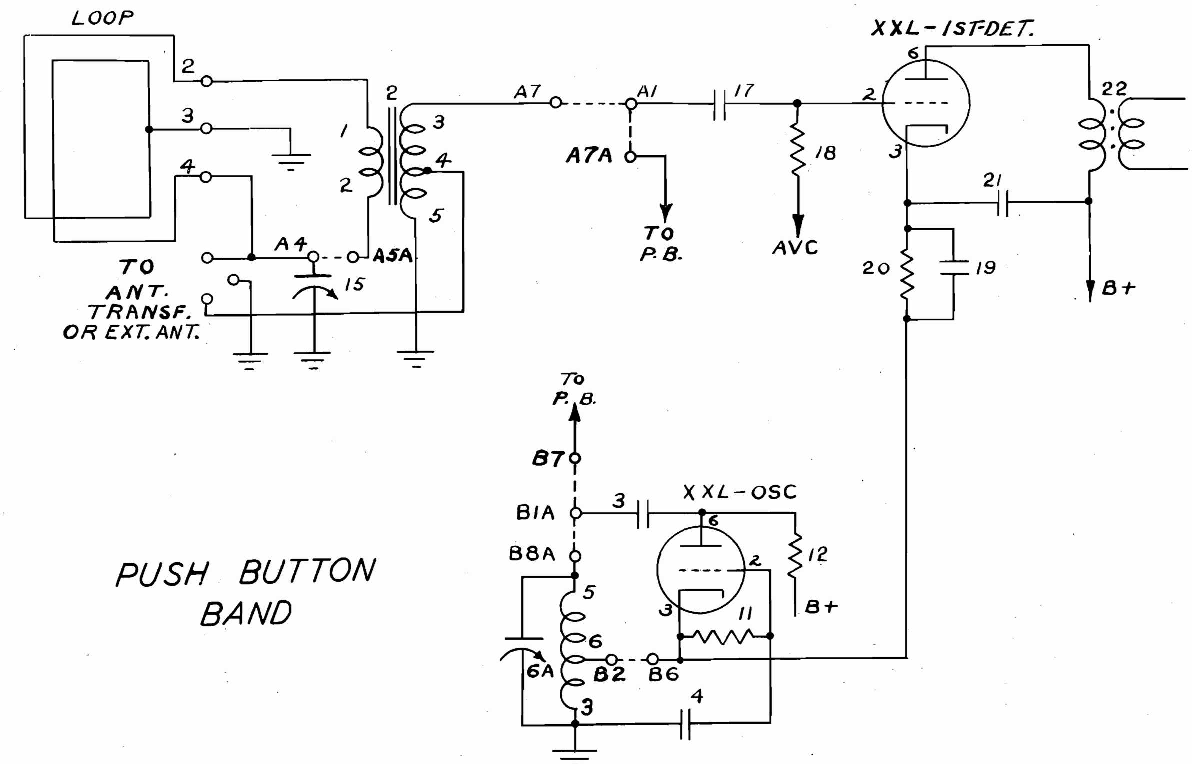
PHILCO RADIO & TELEV. CORP.

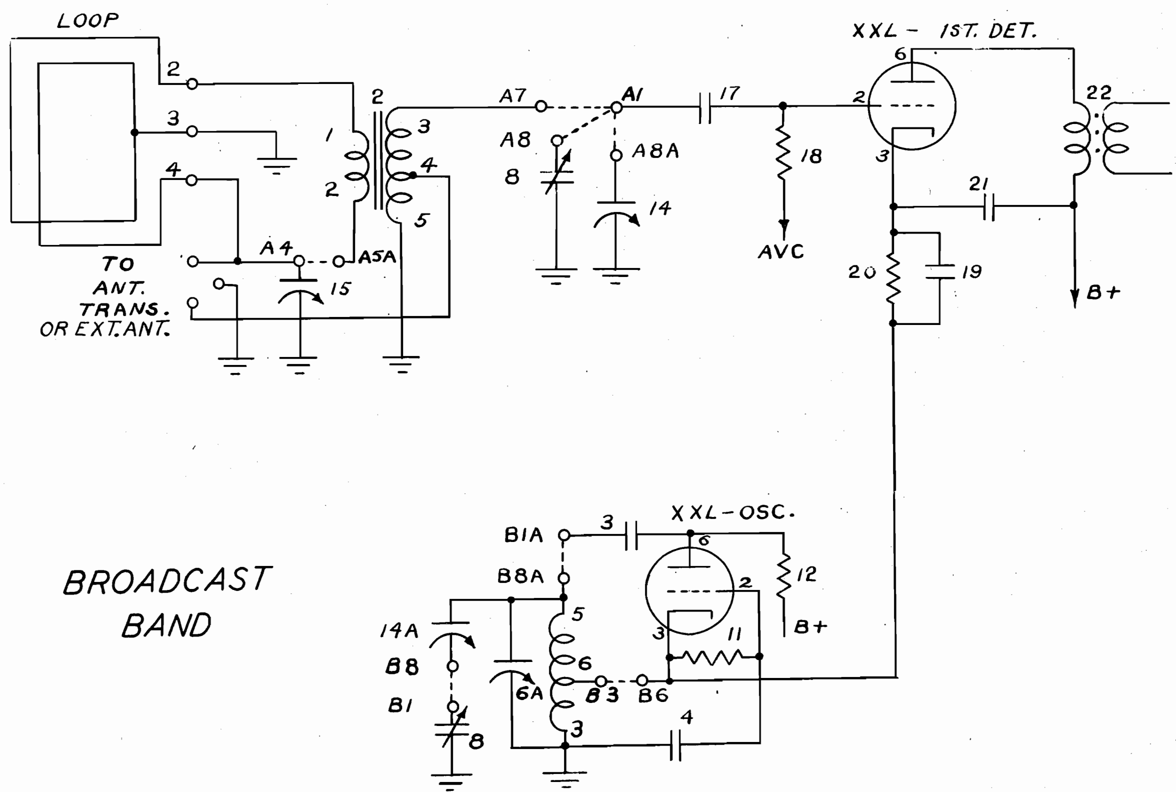




PHILCO RADIO & TELEV. CORP.

MODEL 41-265
See Philco
Page 12-60

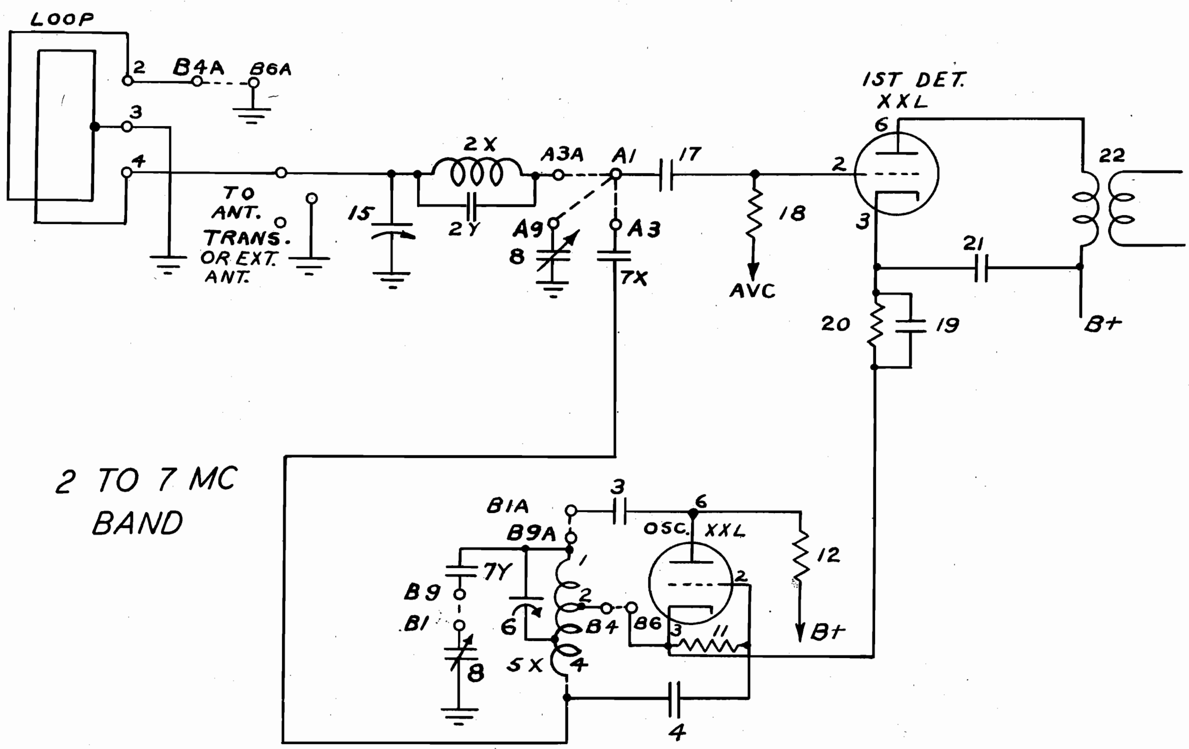


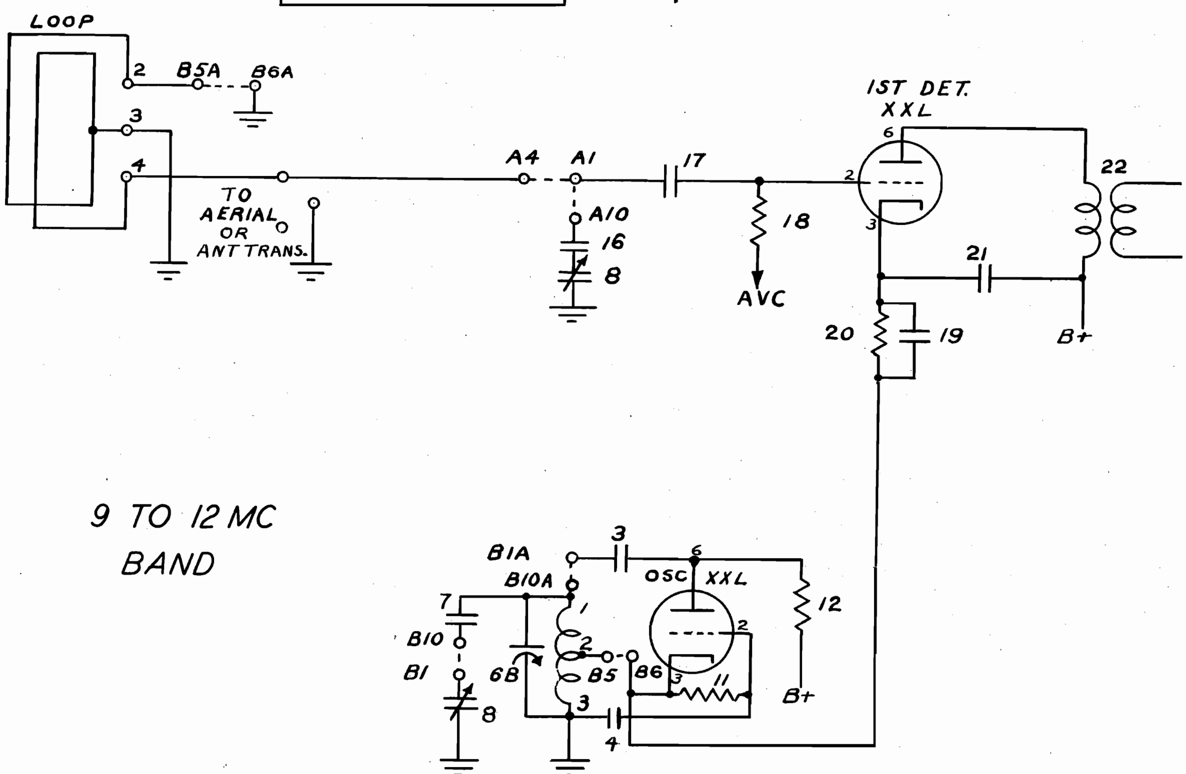


MODEL 41-265

See Philco-Page 12-60

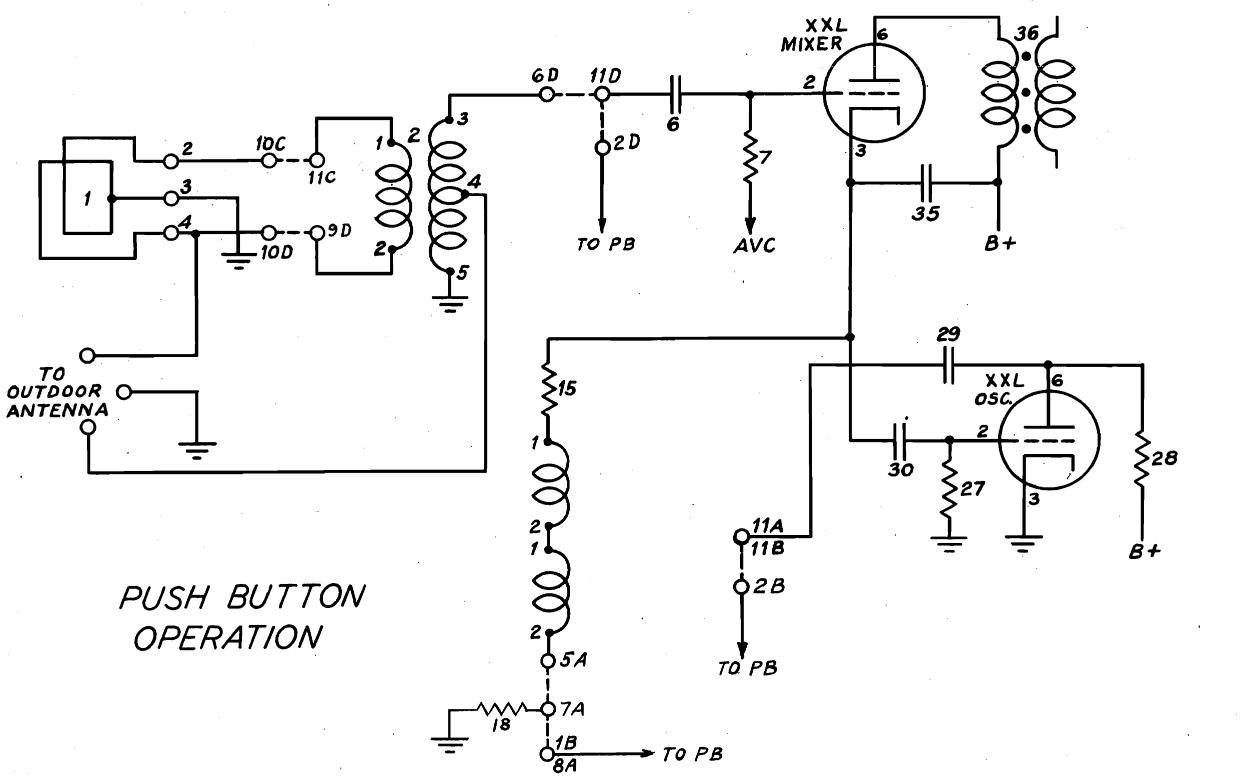
PHILCO RADIO & TELEV. CORP.

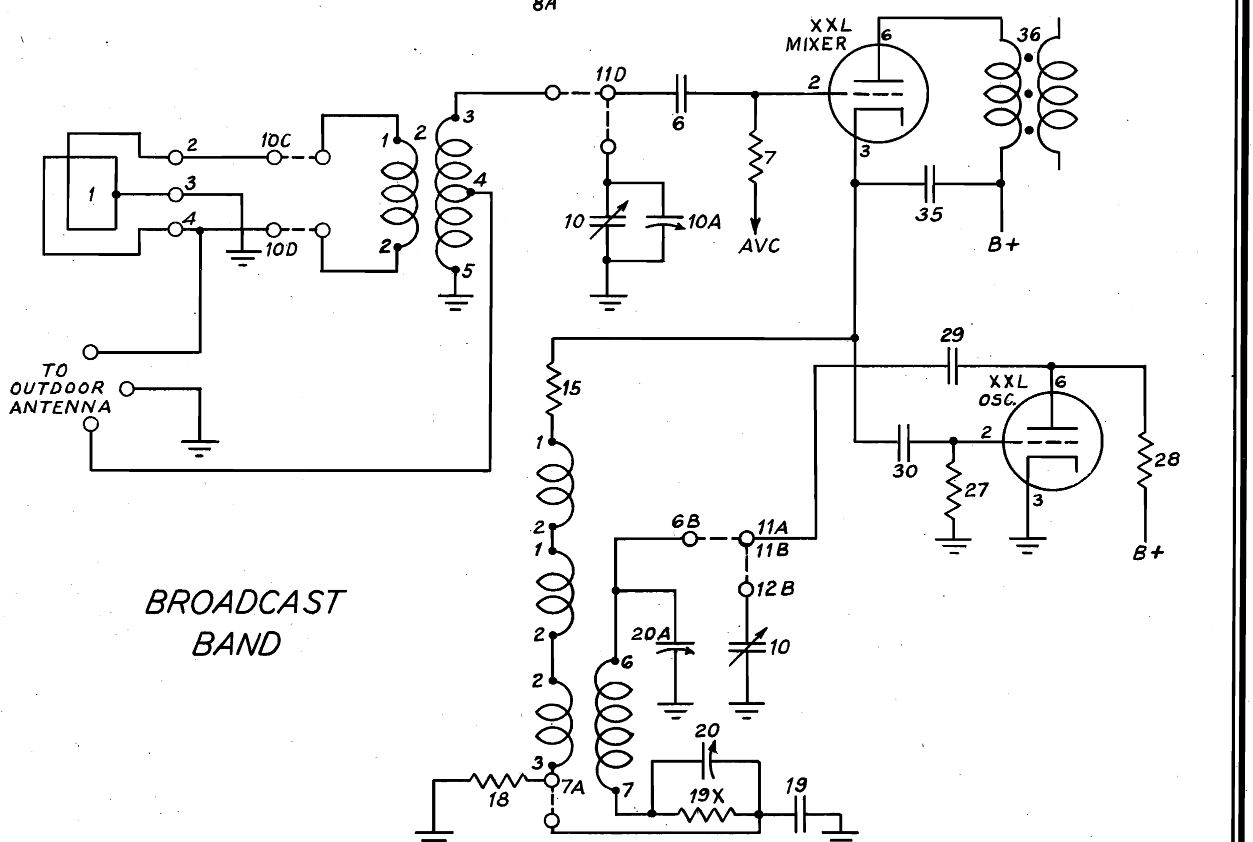




PHILCO RADIO & TELEV. CORP. MODELS 41-295, 41-300

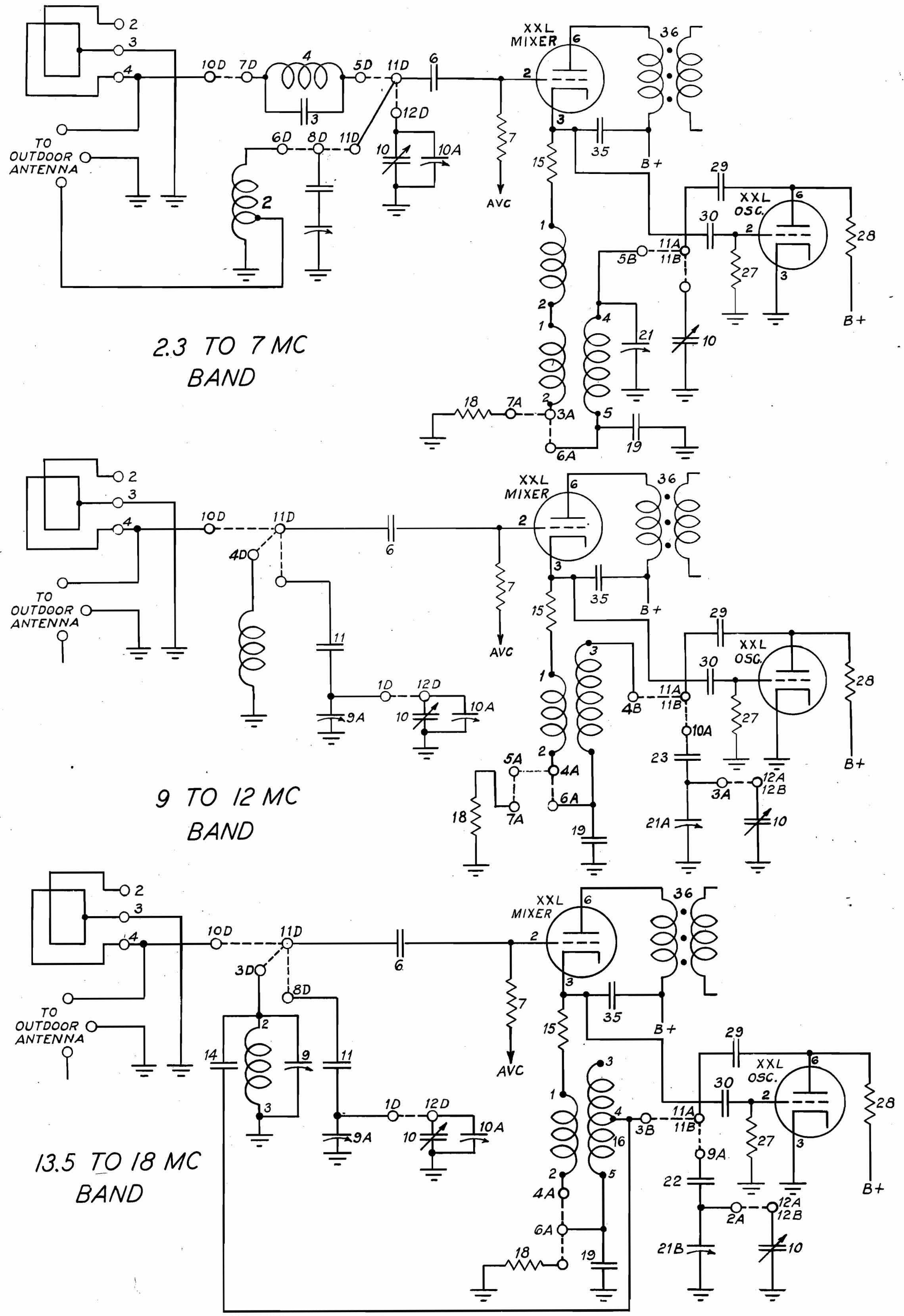
See Philco Page 12-65





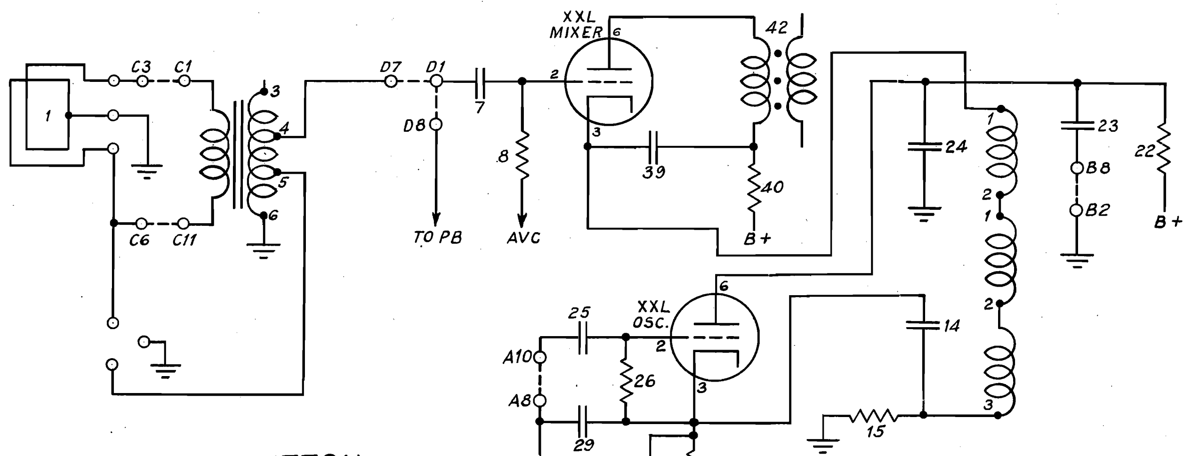
MODELS 41-295, 41-300 PHILCO RADIO & TELEV. CORP.

See Philco Page 12-65

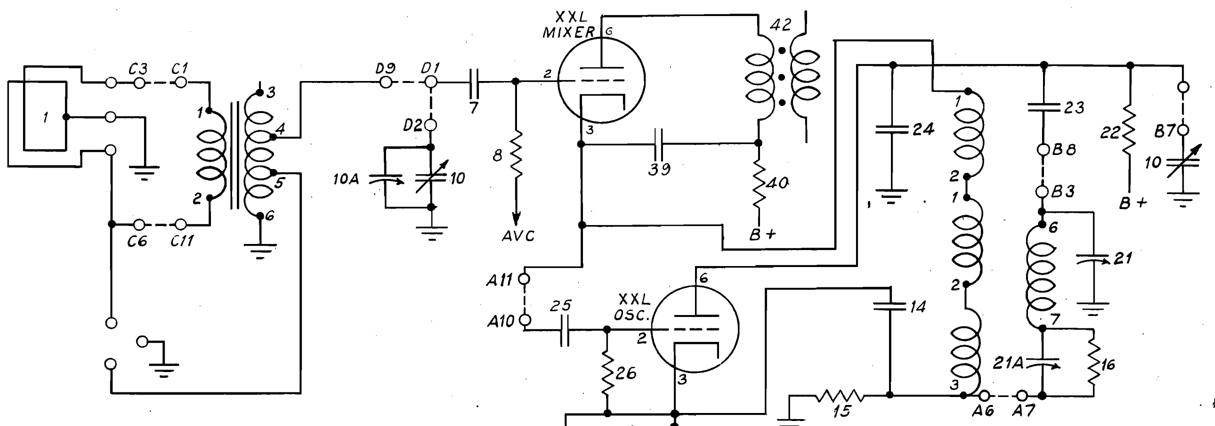


PHILCO RADIO & TELEV. CORP.

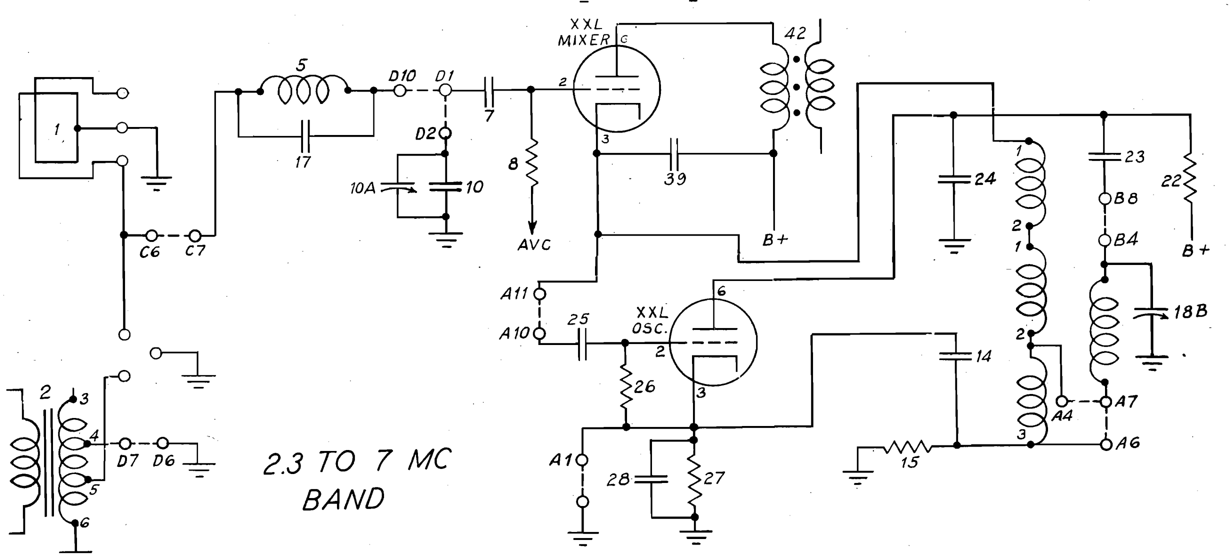
MODEL 41-316
See Philco
Page 12-67, 68



PUSH BUTTON OPERATION



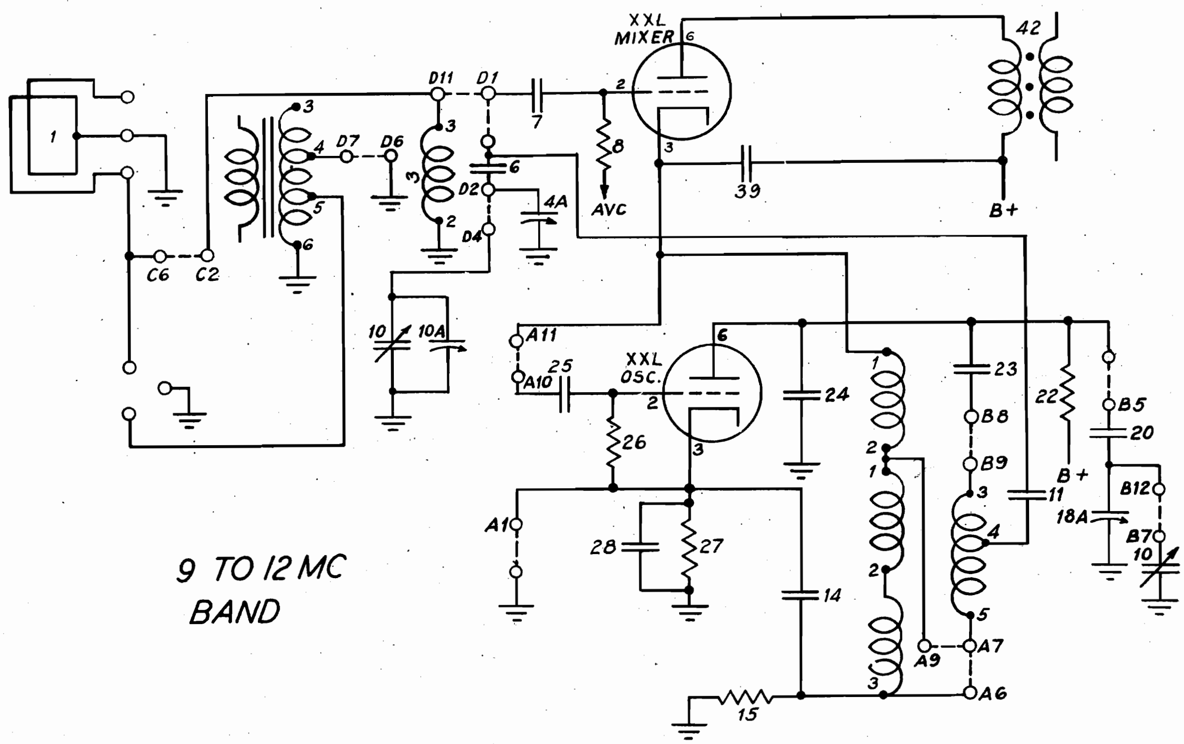
BROADCAST BAND



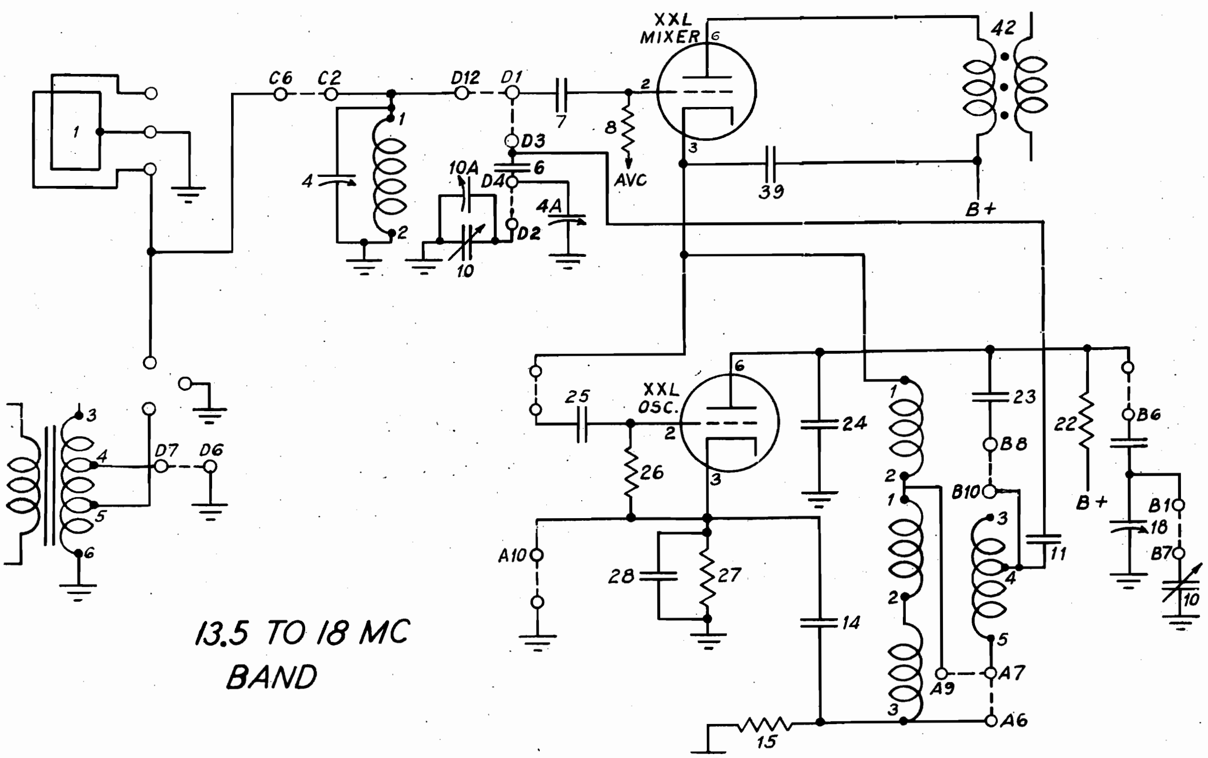
2.3 TO 7 MC BAND

MODEL 41-316 PHILCO RADIO & TELEV. CORP.

See Philco Page 12-67,68



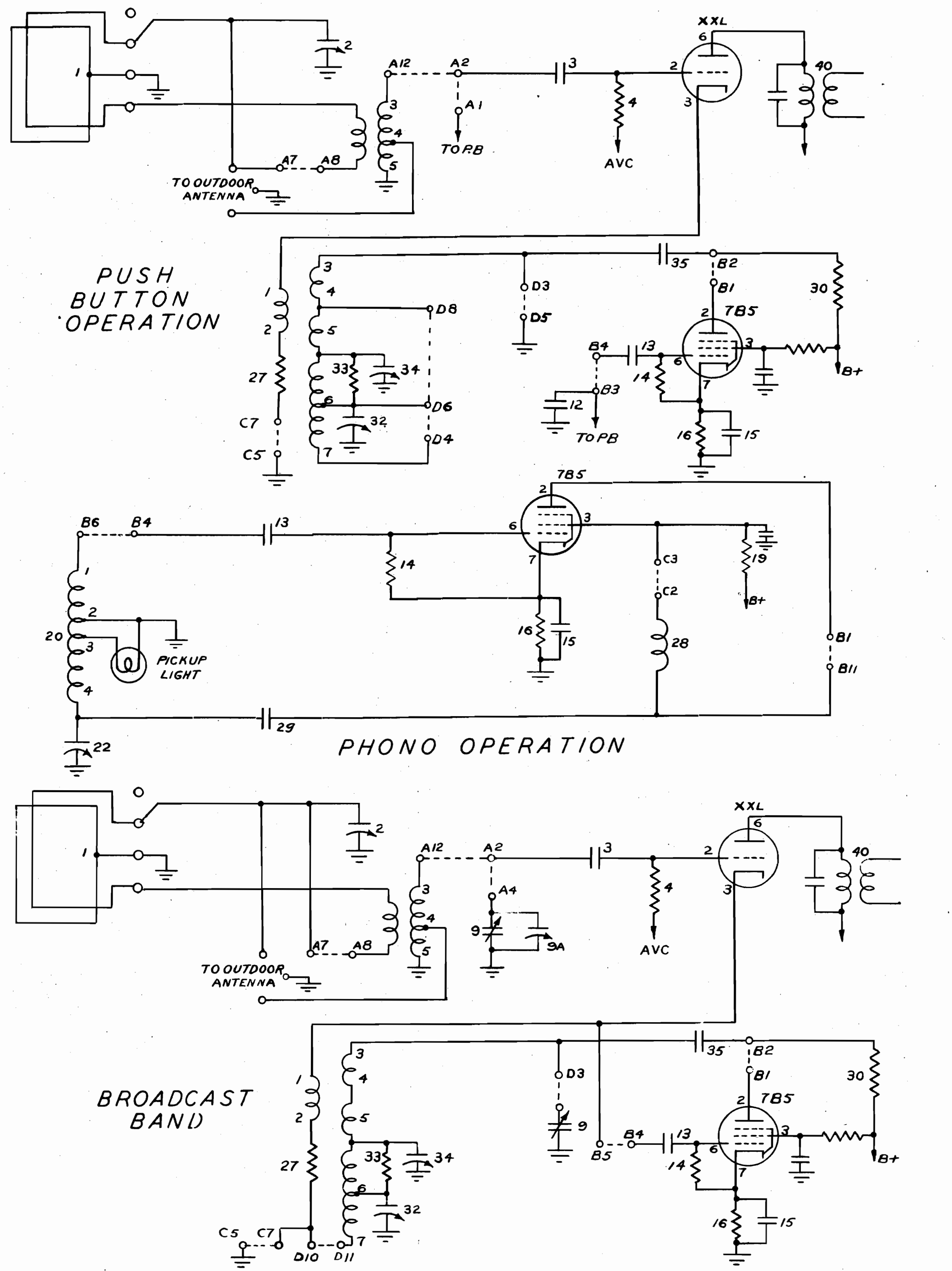
9 TO 12 MC BAND



13.5 TO 18 MC BAND

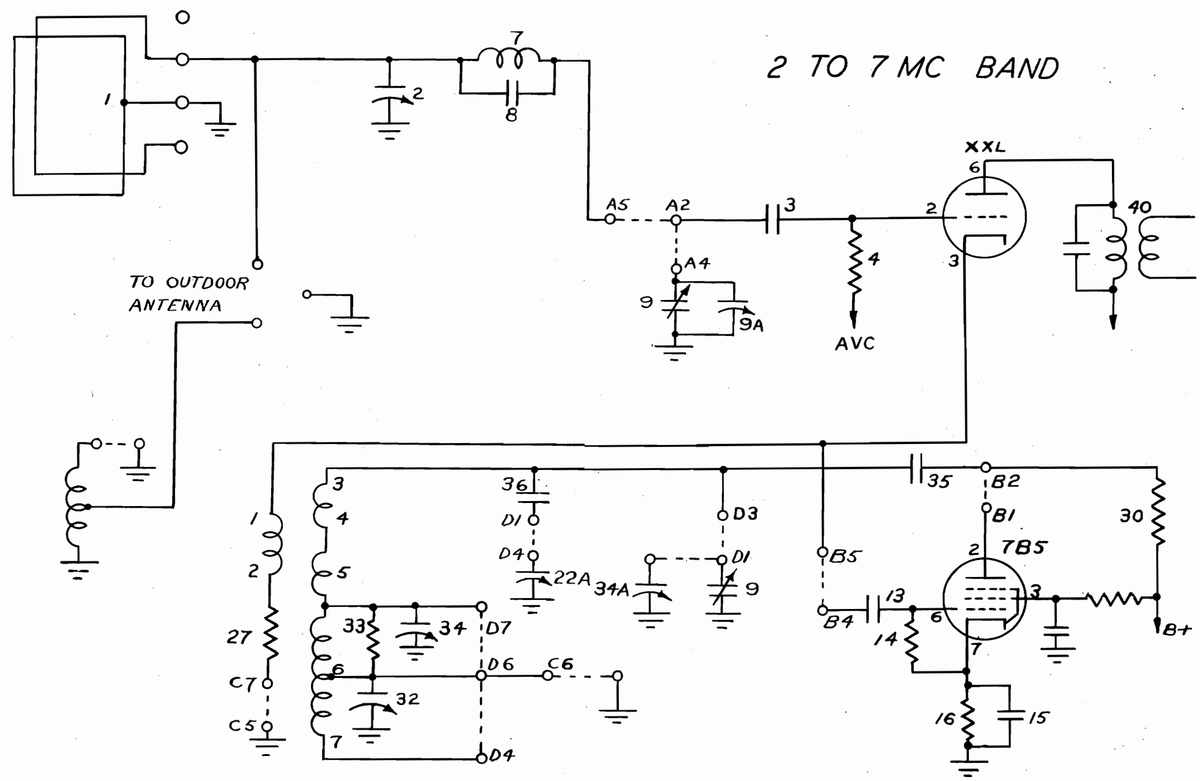
PHILCO RADIO & TELEV. CORP. MODELS 41-610, 41-611

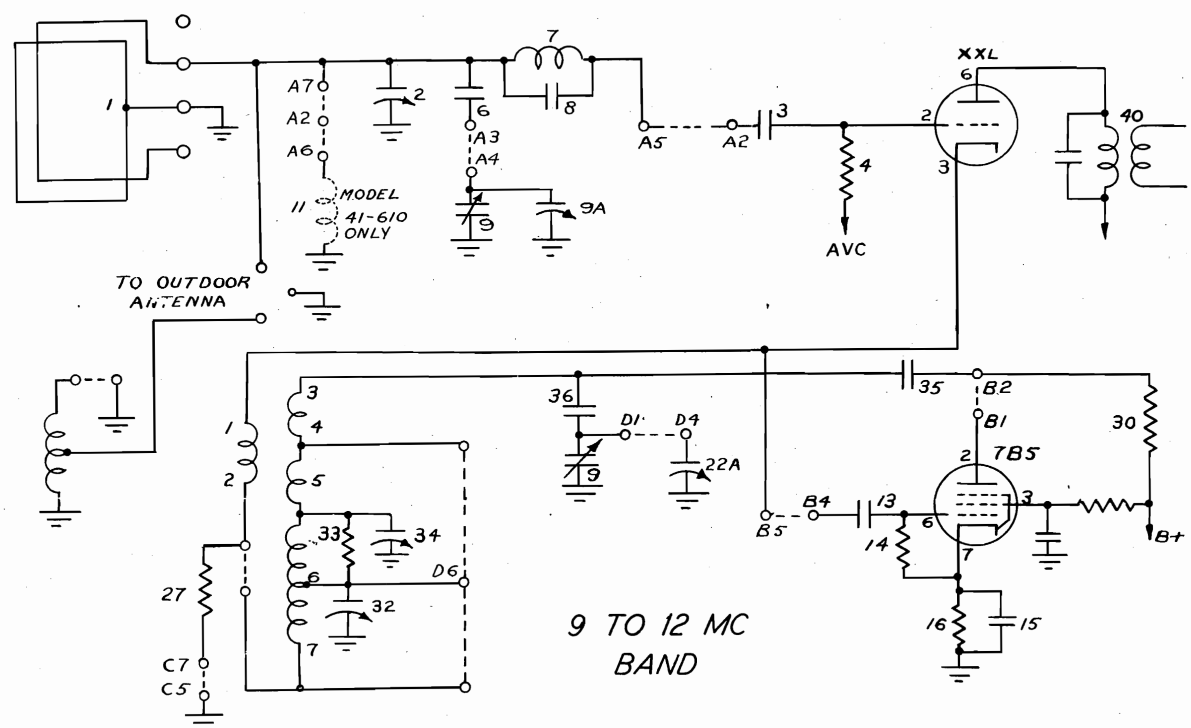
See Philco Page 12-77



MODELS 41-610, 41-611
See Philco Page 12-77

PHILCO RADIO & TELEV. CORP.

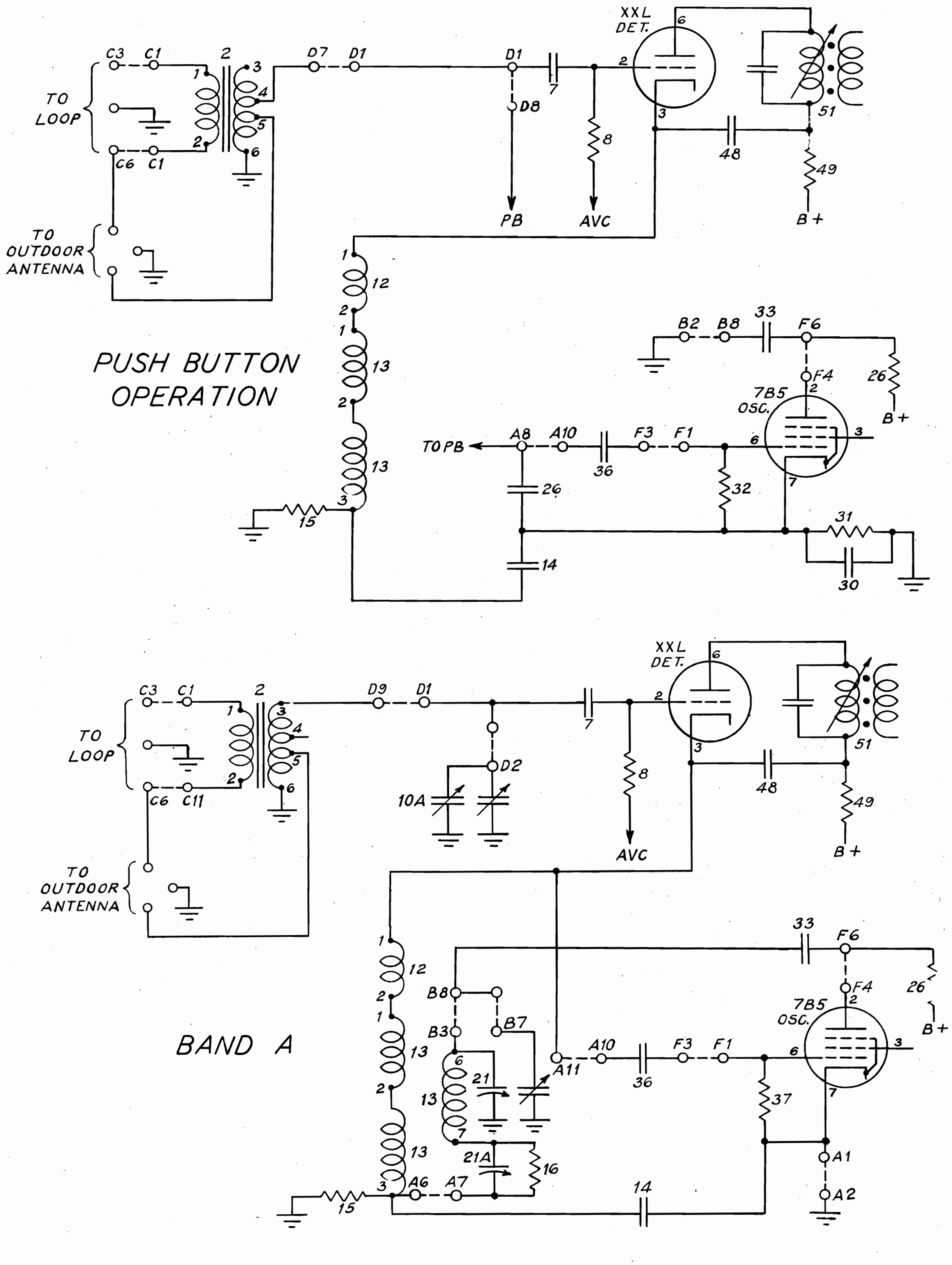




PHILCO RADIO & TELEV. CORP.

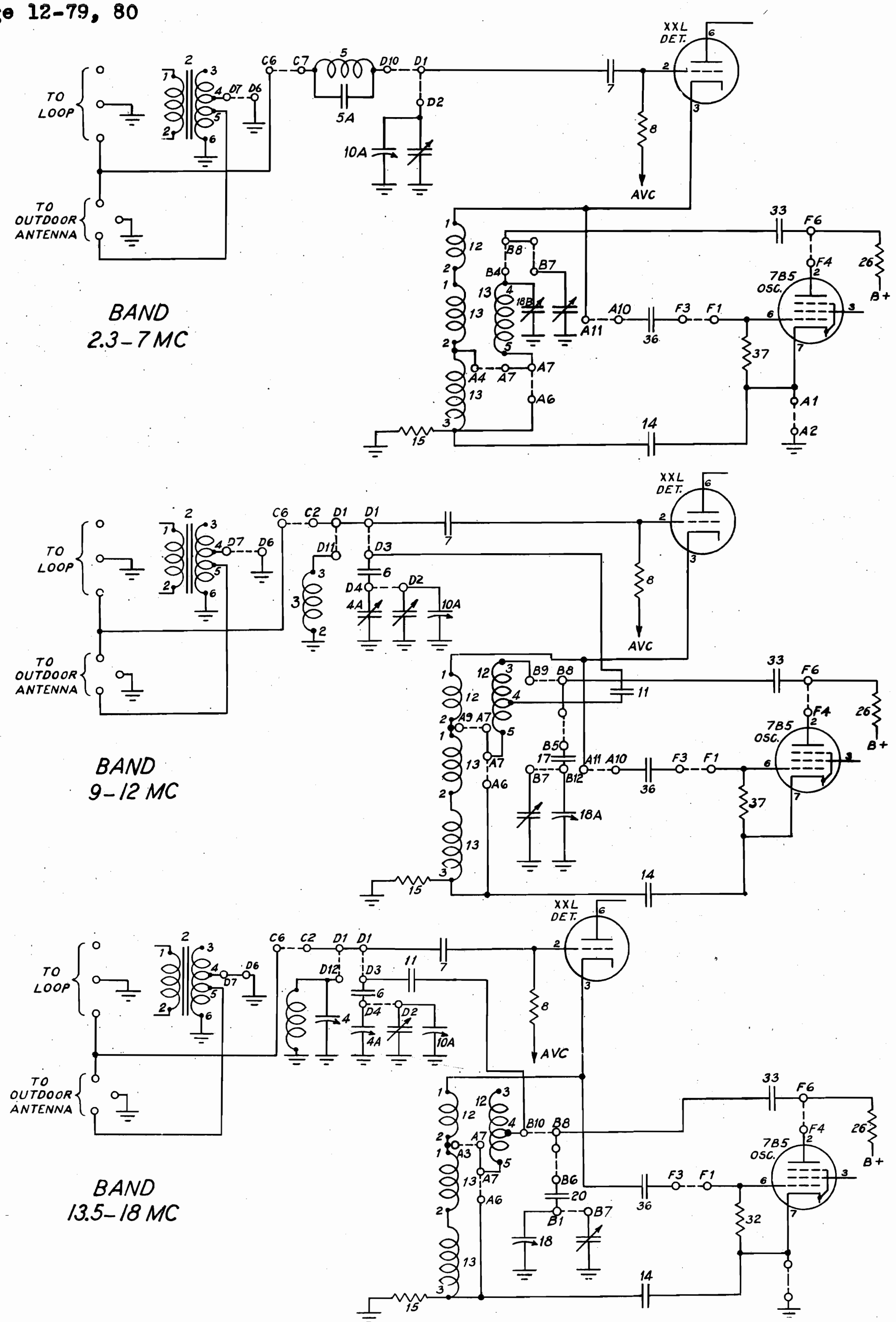
MODELS 41.616P,
41.616PW

See Philco
Page 12-79, 80



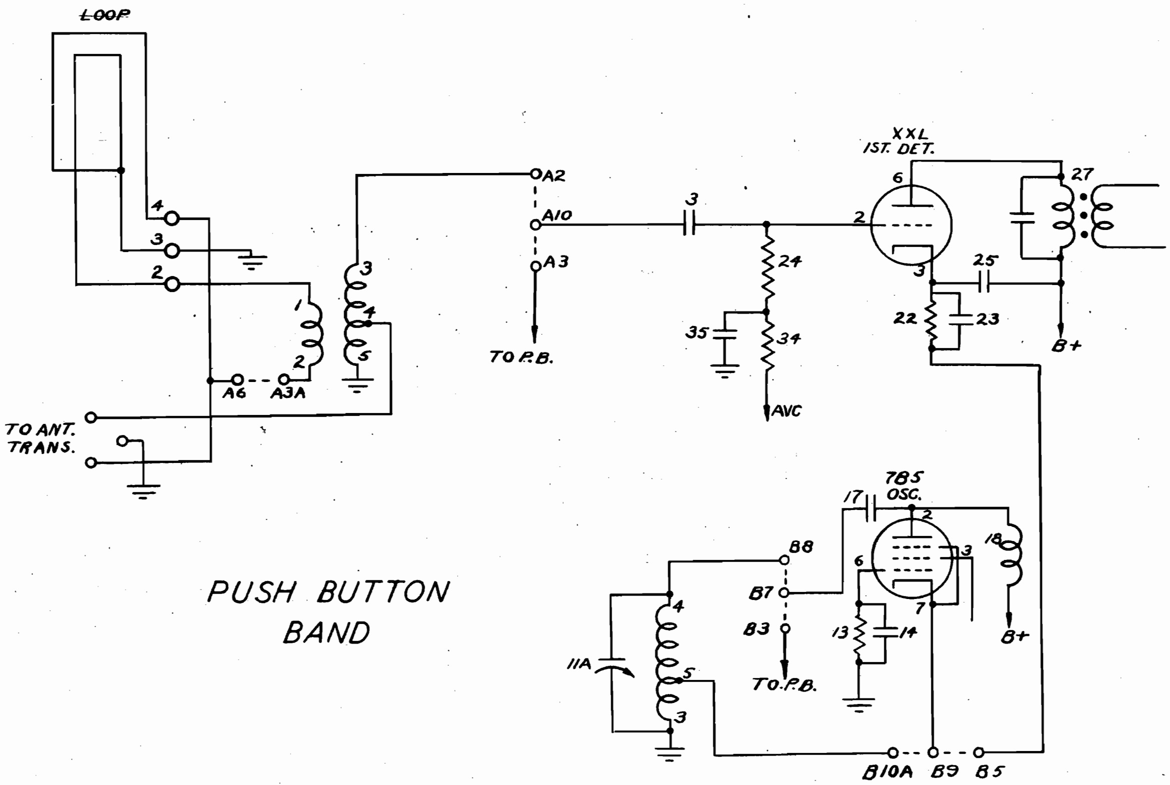
MODELS 41.616P,
41.616PW
See Philco
Page 12-79, 80

PHILCO RADIO & TELEV. CORP.

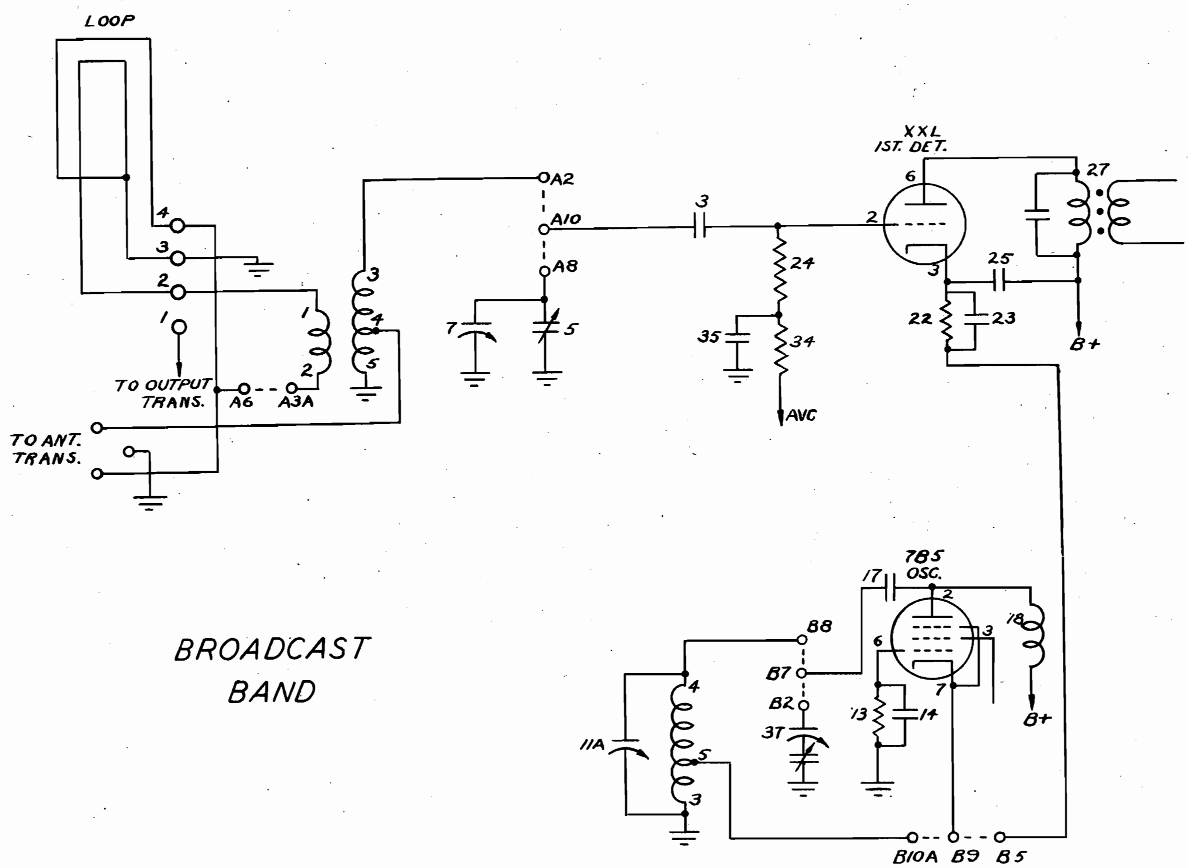


PHILCO RADIO & TELEV. CORP. MODEL 41-629

See Philco Page 12-85



PUSH BUTTON BAND

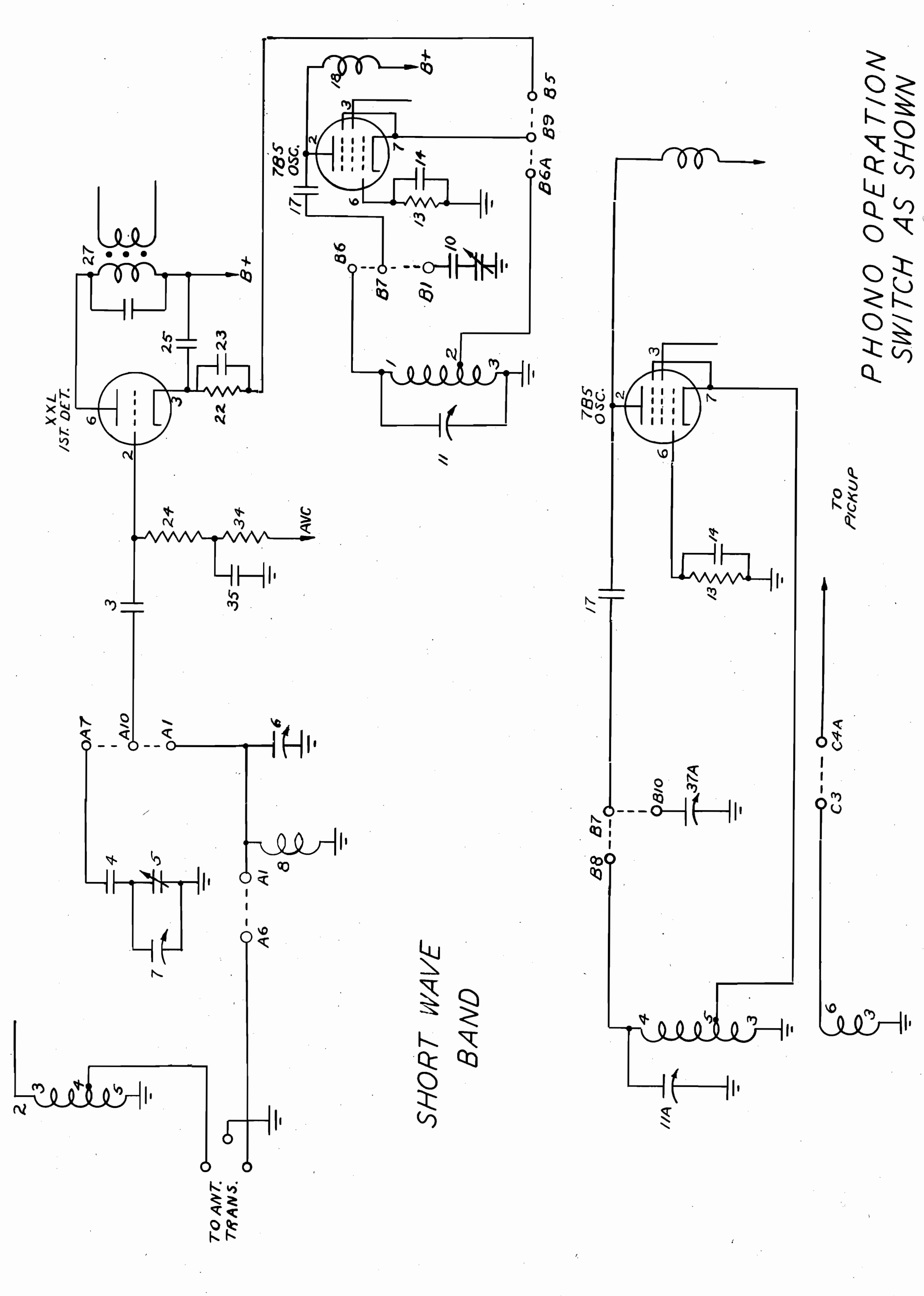


BROADCAST BAND

MODEL 41-629

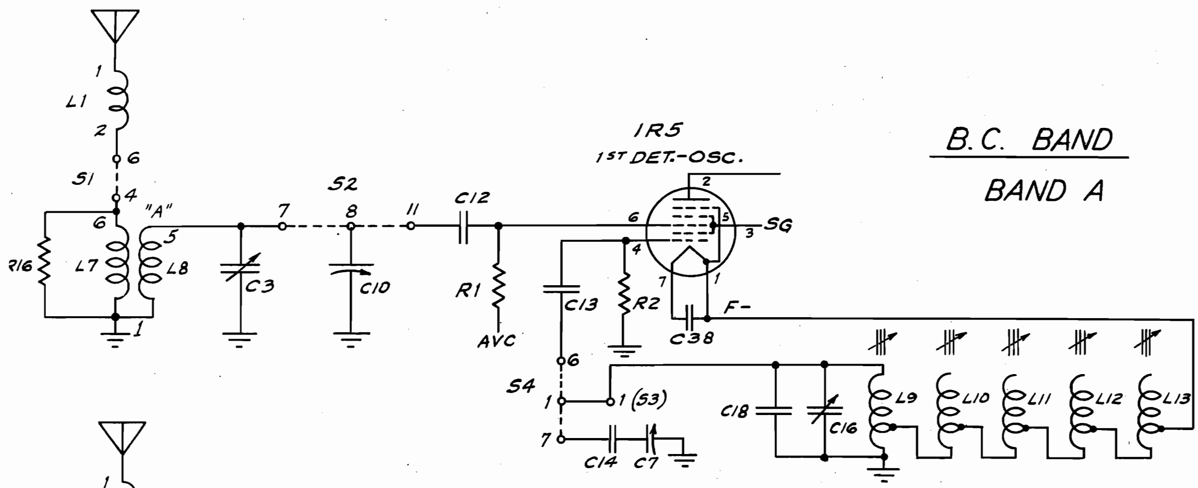
See Philco Page 12-85

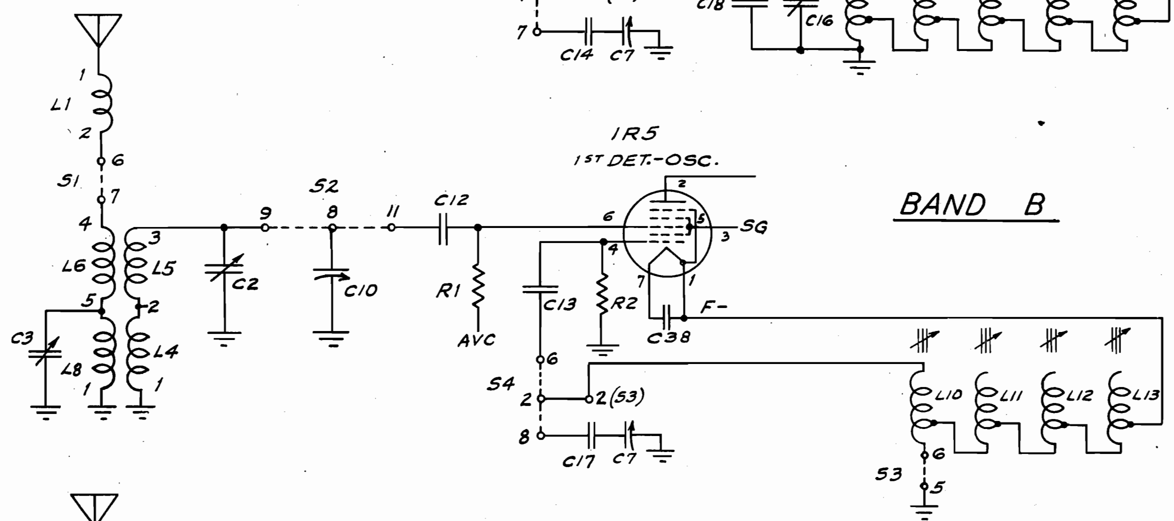
PHILCO RADIO & TELEV. CORP.

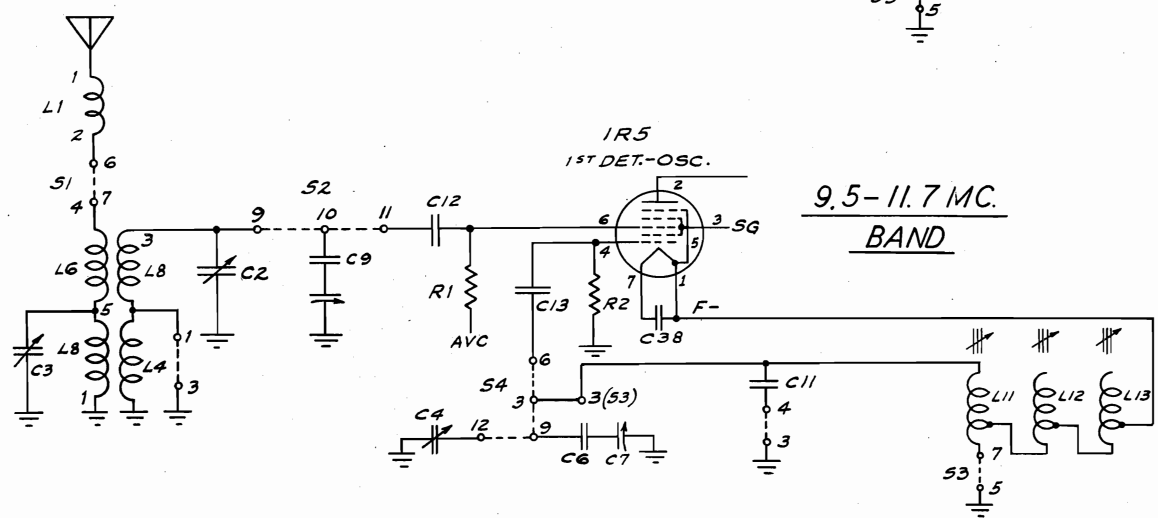


RCA MFG. CO., INC.

MODEL QB2
See RCA Page 12-3

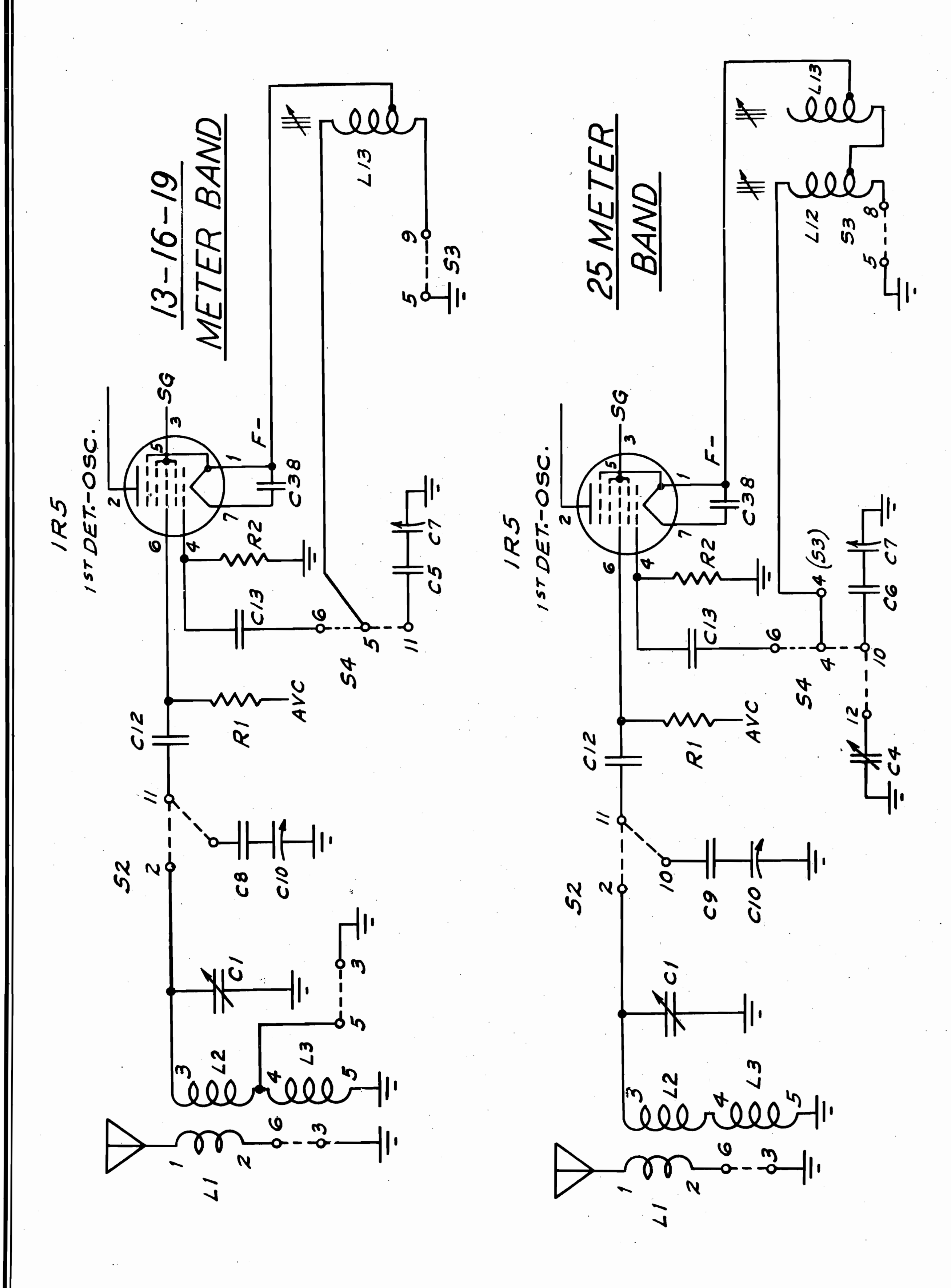






MODEL QB2
See RCA Page 12-3

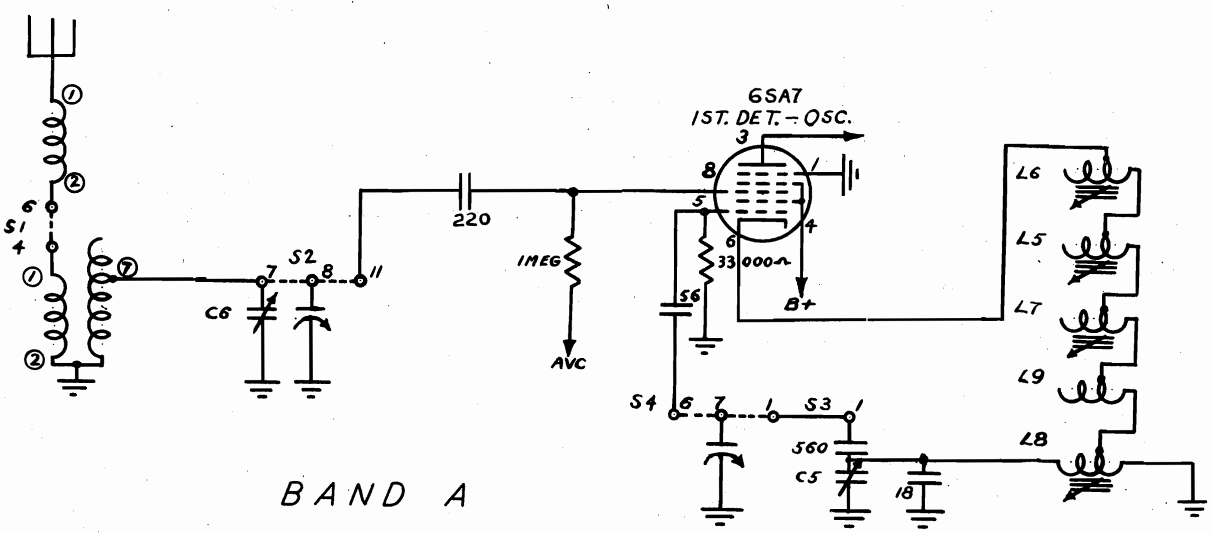
RCA MFG. CO., INC.

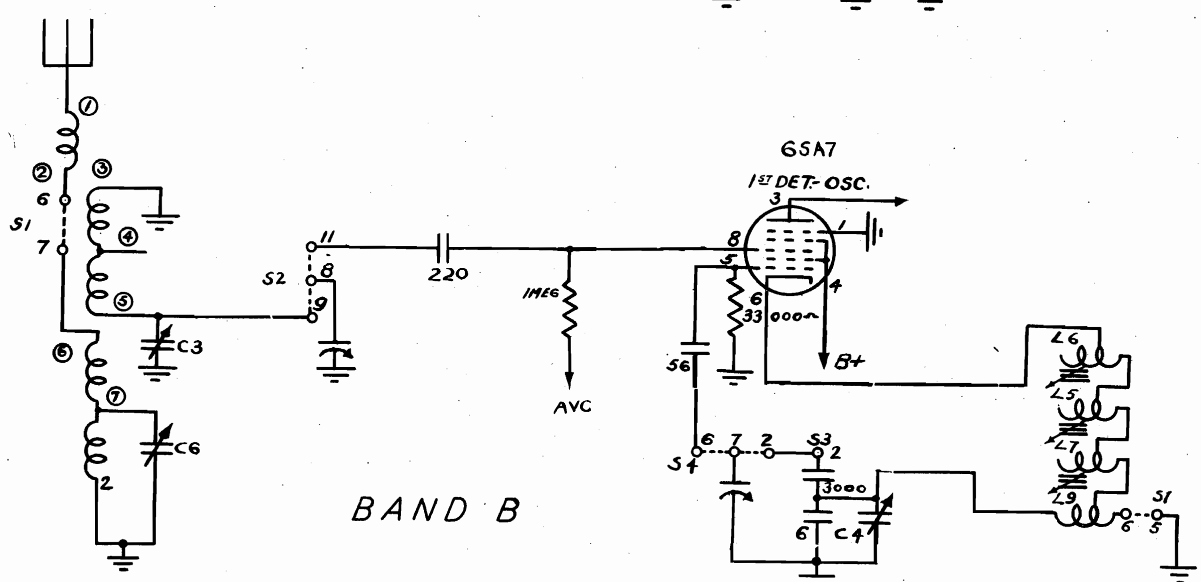


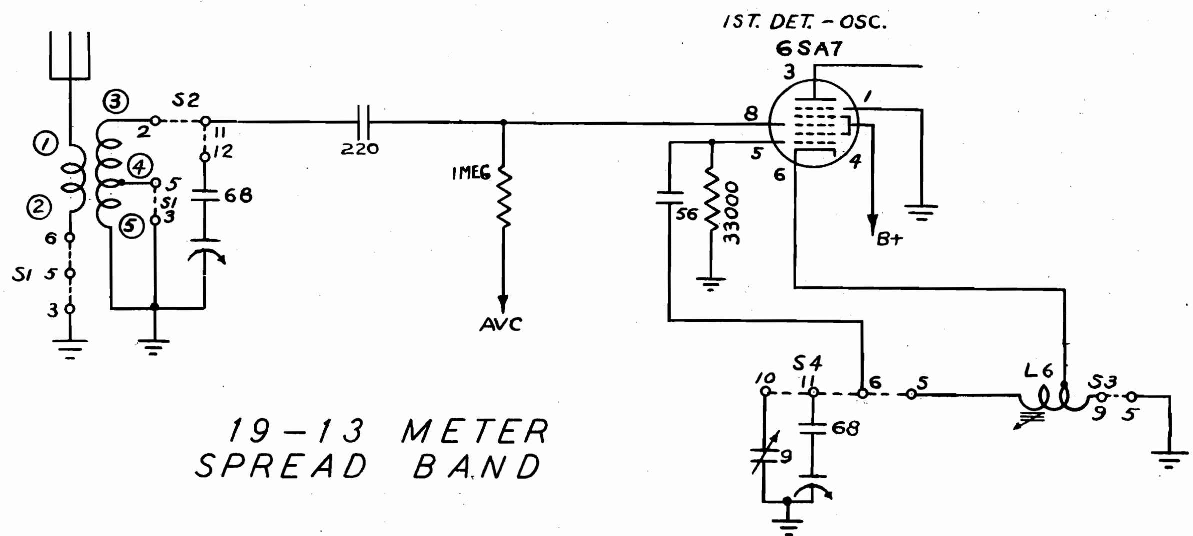
MODEL Q24
See RCA Page 12-33

RCA MFG. CO., INC.

MODELS QU2C, QU2M
See RCA Page 12-5
MODELS Q22, QK23, Q25
See RCA Page 12-31



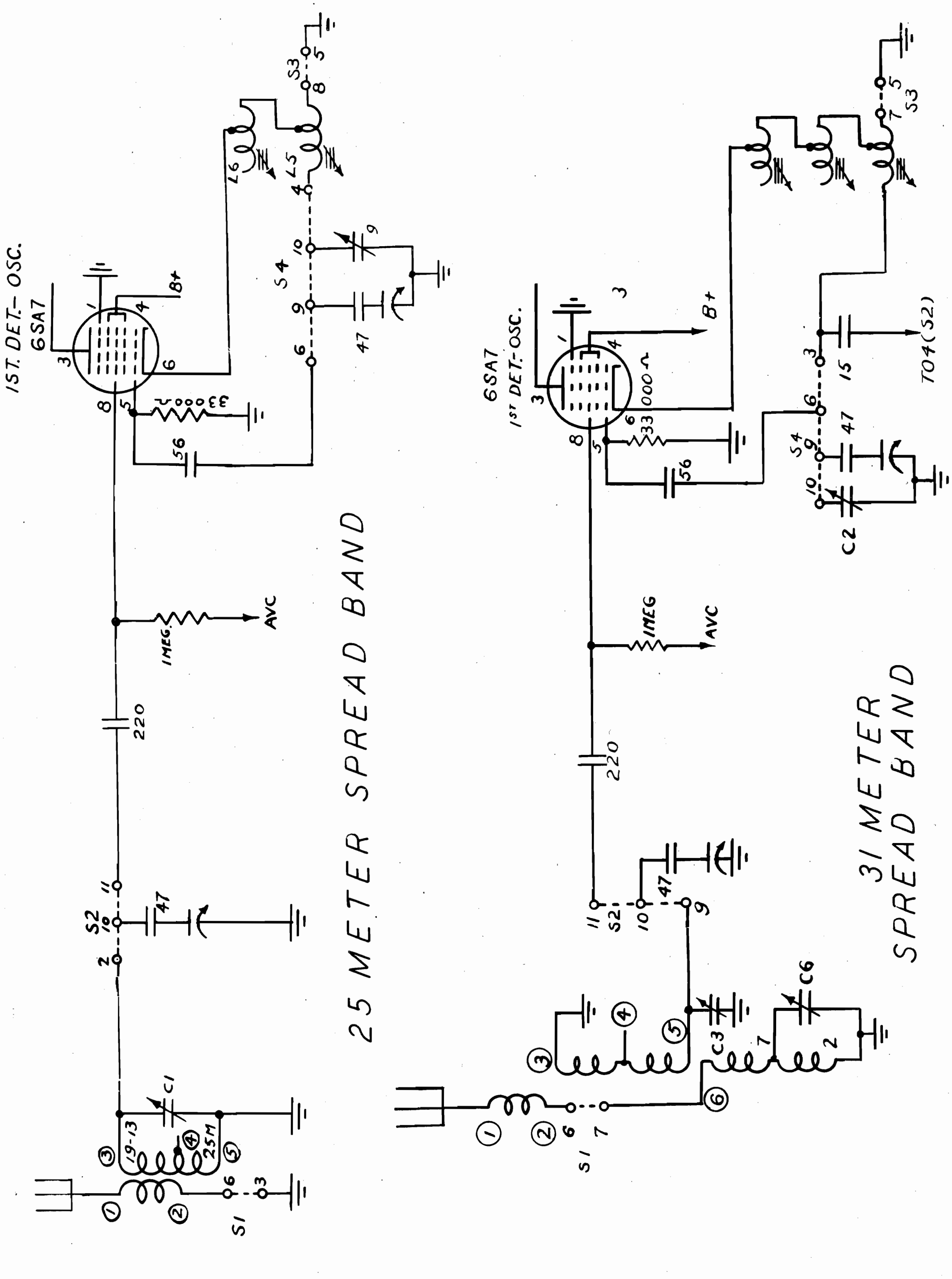




RCA MFG. CO., INC.

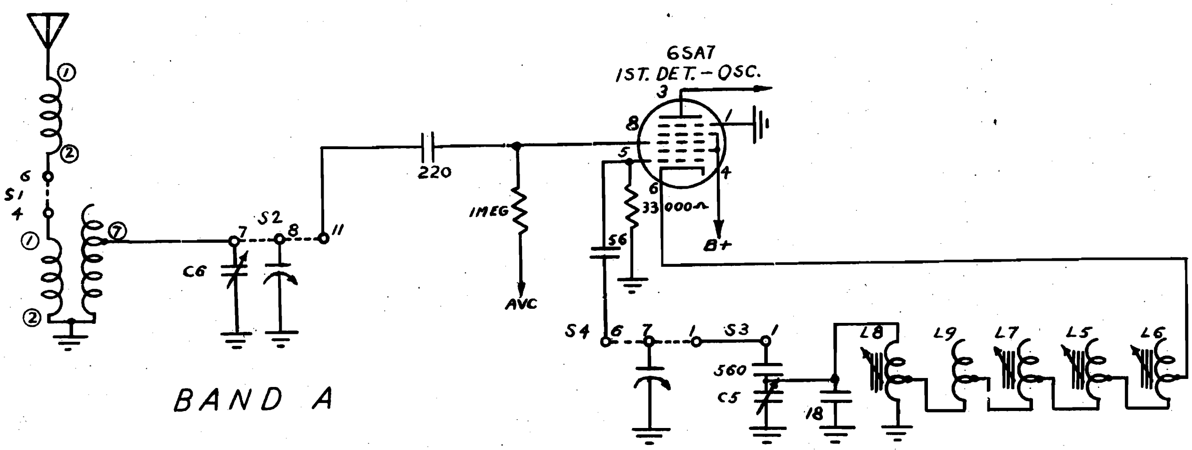
MODELS QU2C, QU2M
See RCA Page 12-5
MODELS Q22, QK23, Q25
See RCA Page 12-31

MODEL Q24
See RCA Page 12-33

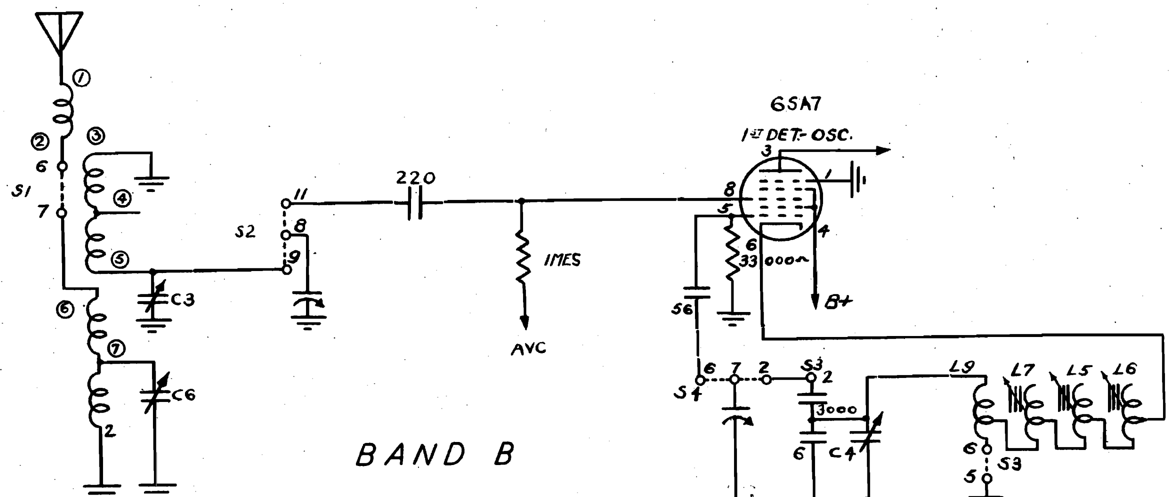


RCA MFG. CO., INC.

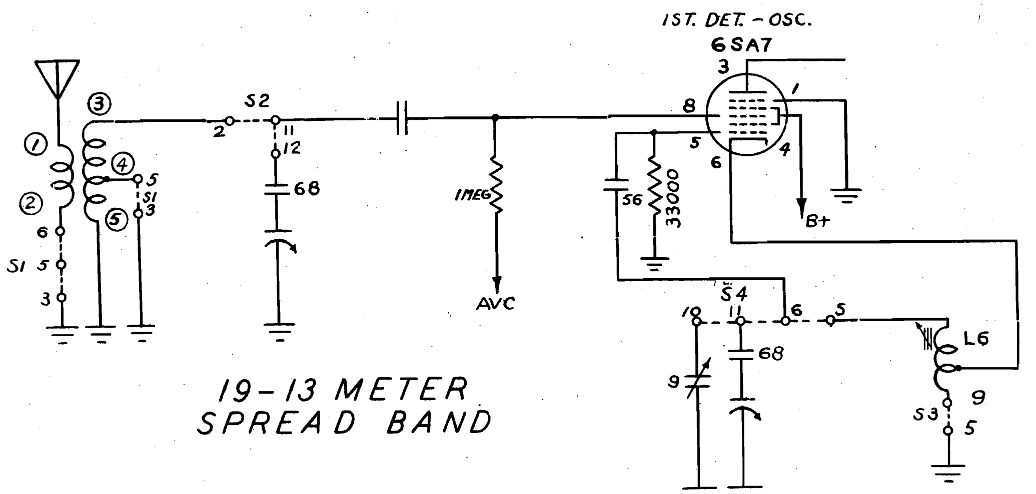
MODELS QU3C, QU3M, Q26
See RCA Page 12-93
MODEL QU5
See RCA Page 12-9



BAND A



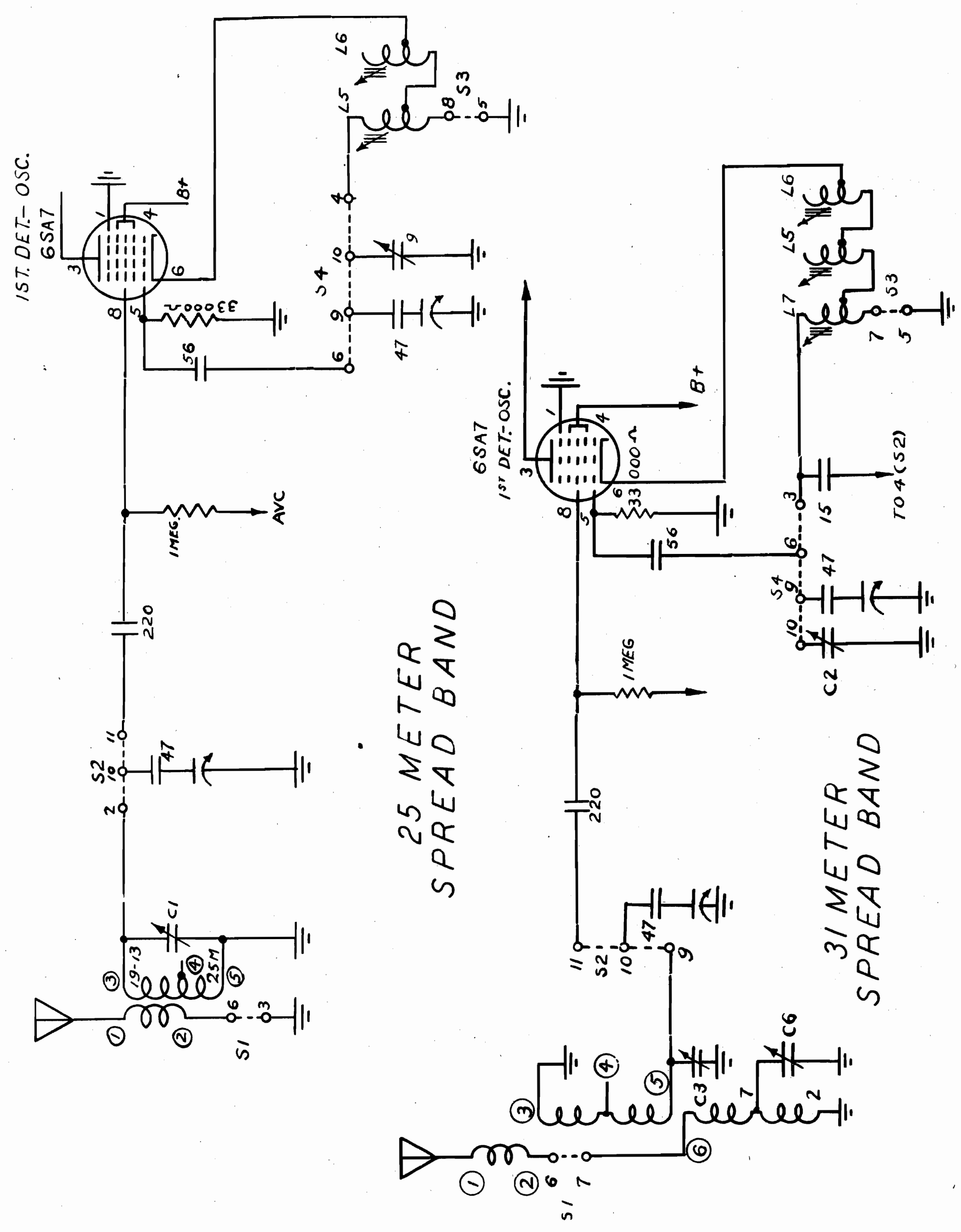
BAND B



19-13 METER
SPREAD BAND

MODELS QU3C, QU3M, Q26
See RCA Page 12-93
MODEL QU5
See RCA Page 12-9

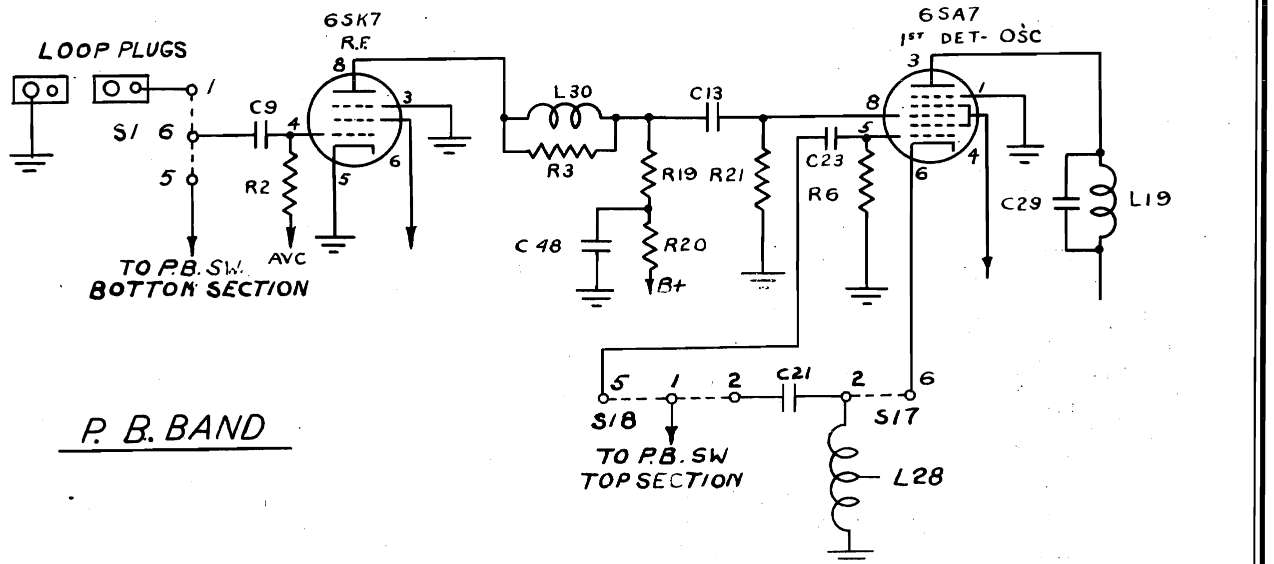
RCA MFG. CO., INC.



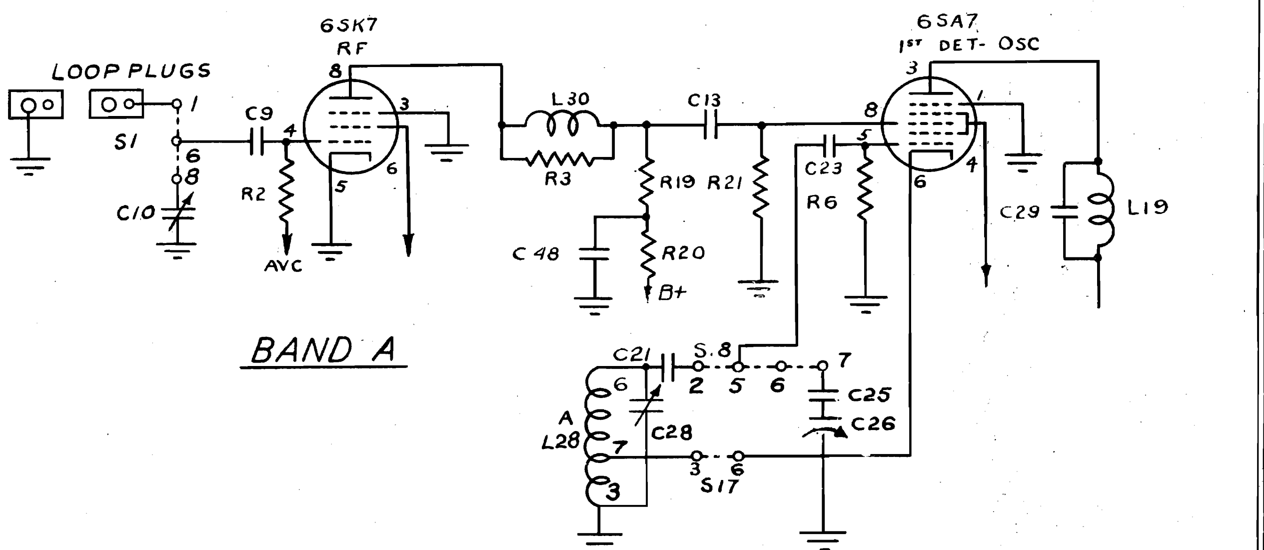
RCA MFG. CO., INC.

MODEL 110K

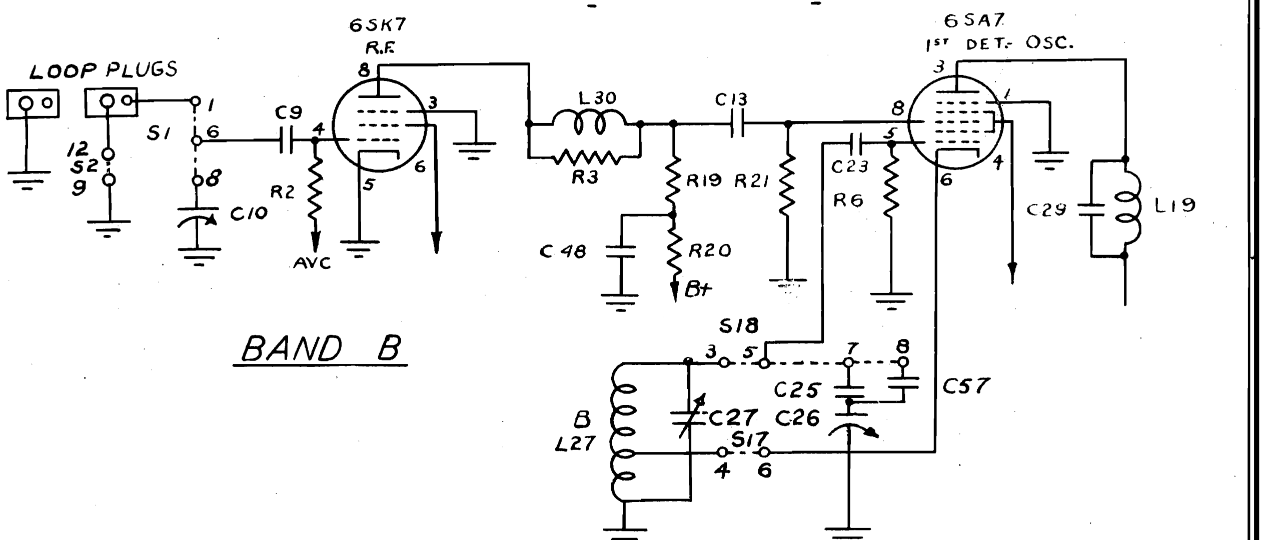
See RCA Page 12-43



P. B. BAND



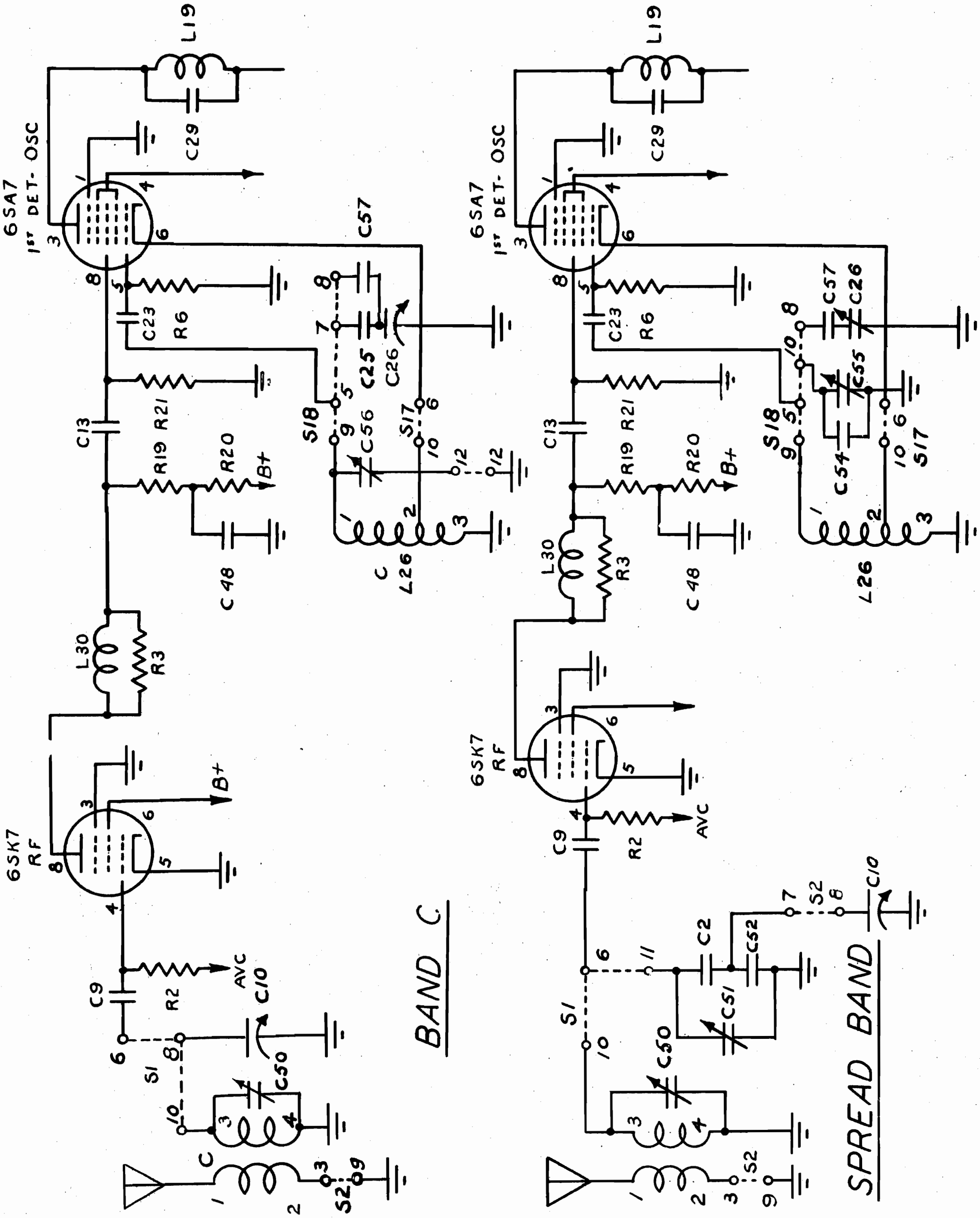
BAND A



BAND B

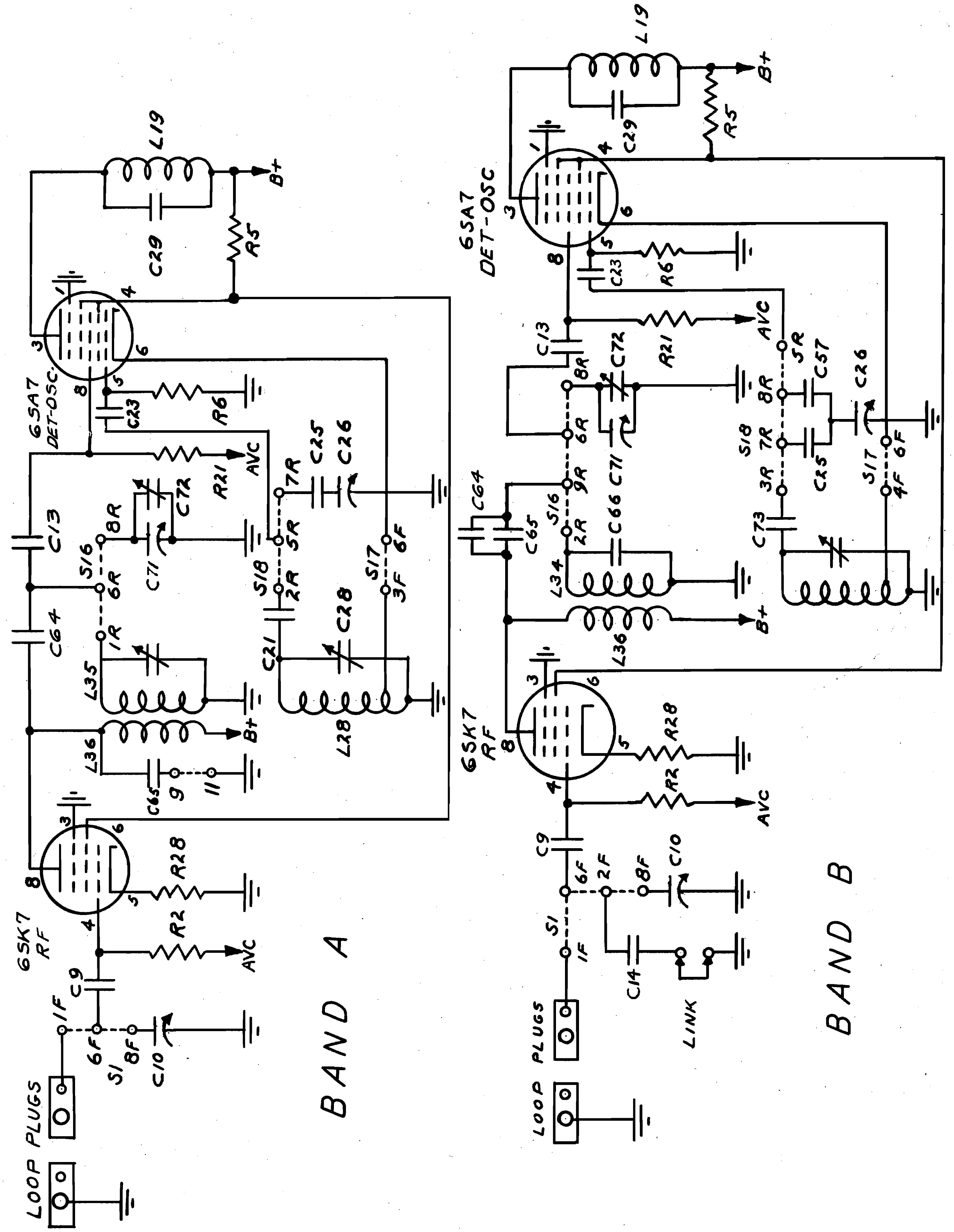
MODEL 110K
See RCA Page 12-43

RCA MFG. CO., INC.



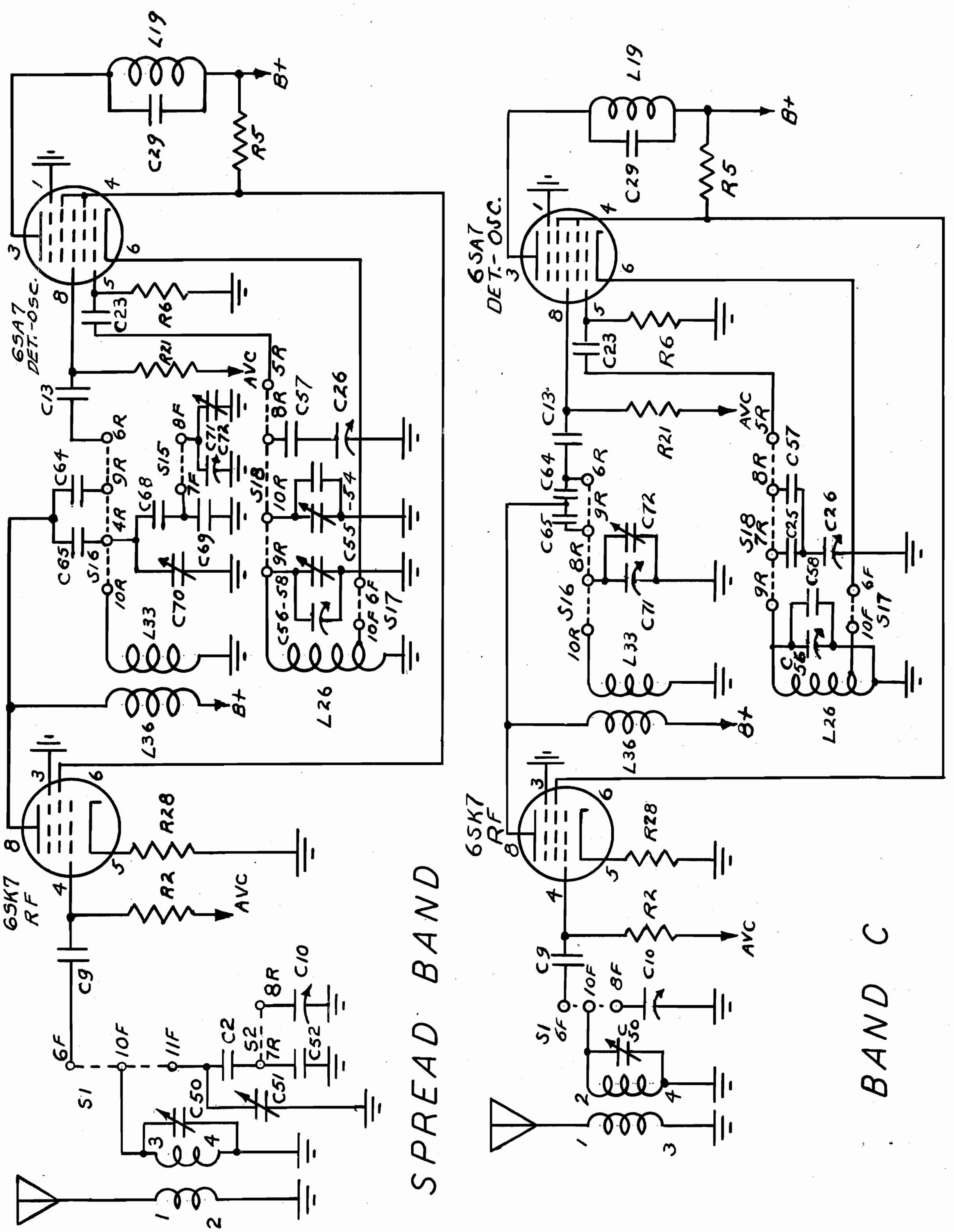
RCA MFG. CO., INC.

MODEL 111K
See RCA Page 12-45



MODEL 111K
See RCA Page 12-45

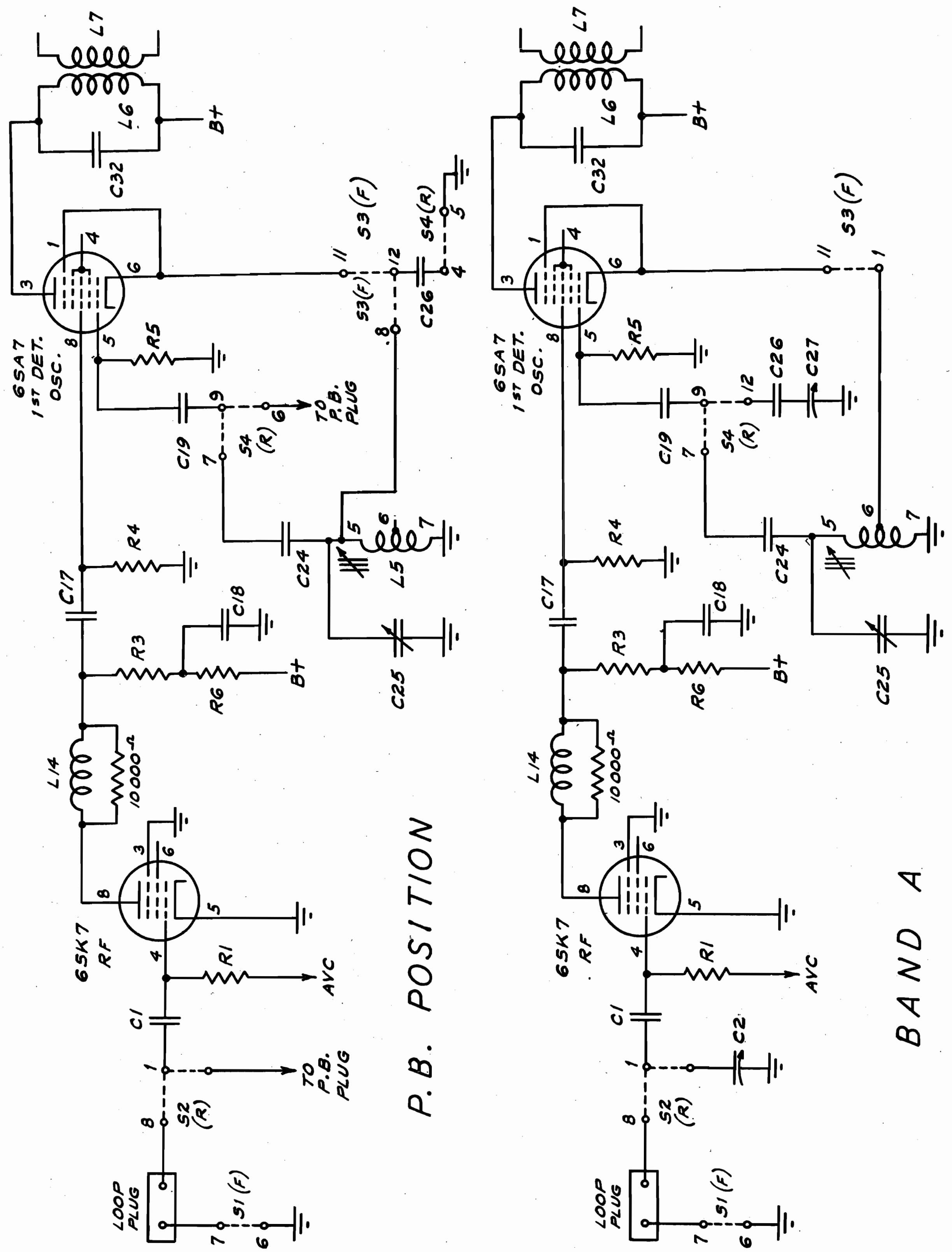
RCA MFG. CO., INC.



RCA MFG. CO., INC.

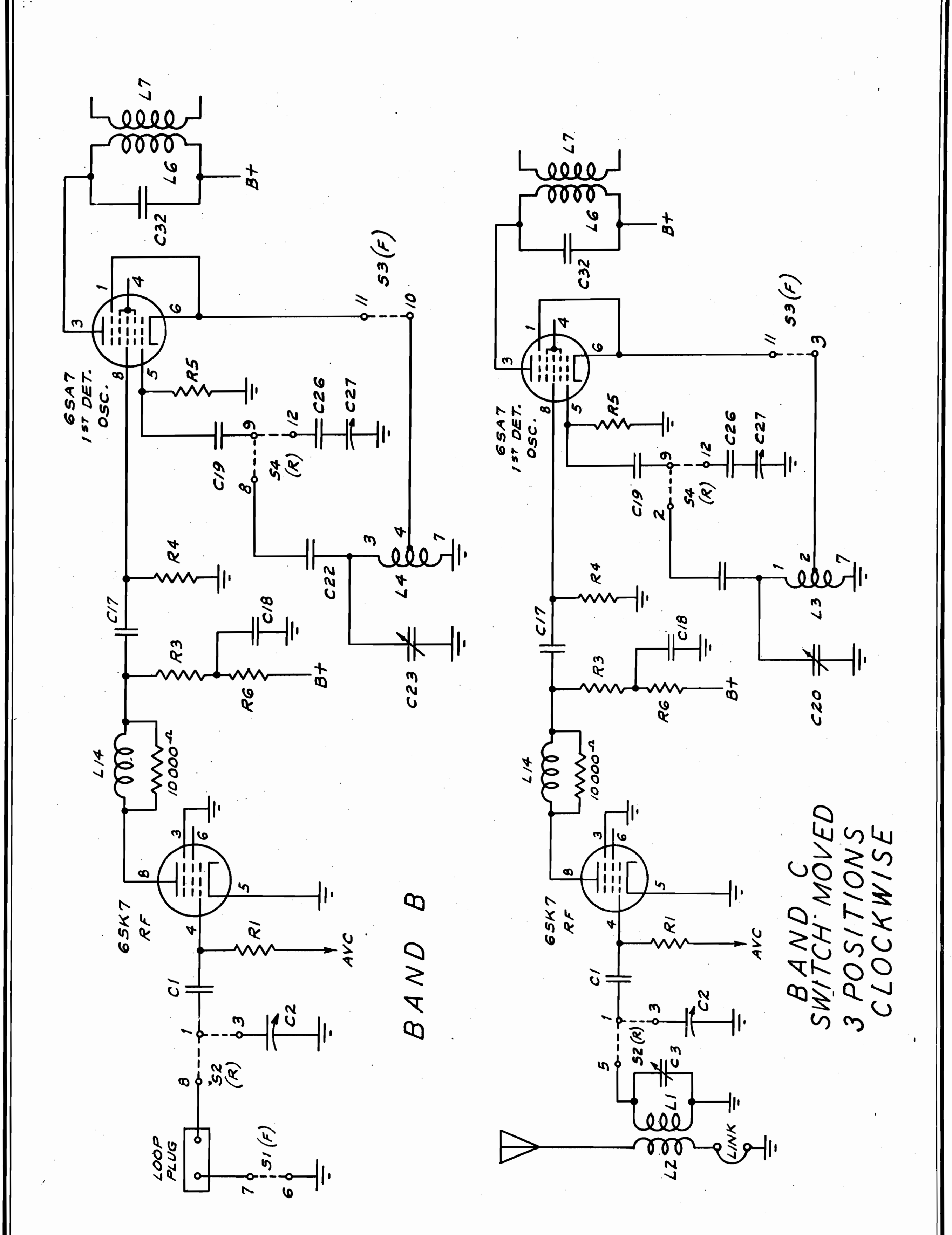
MODELS V205, V405

See RCA Page 12-61



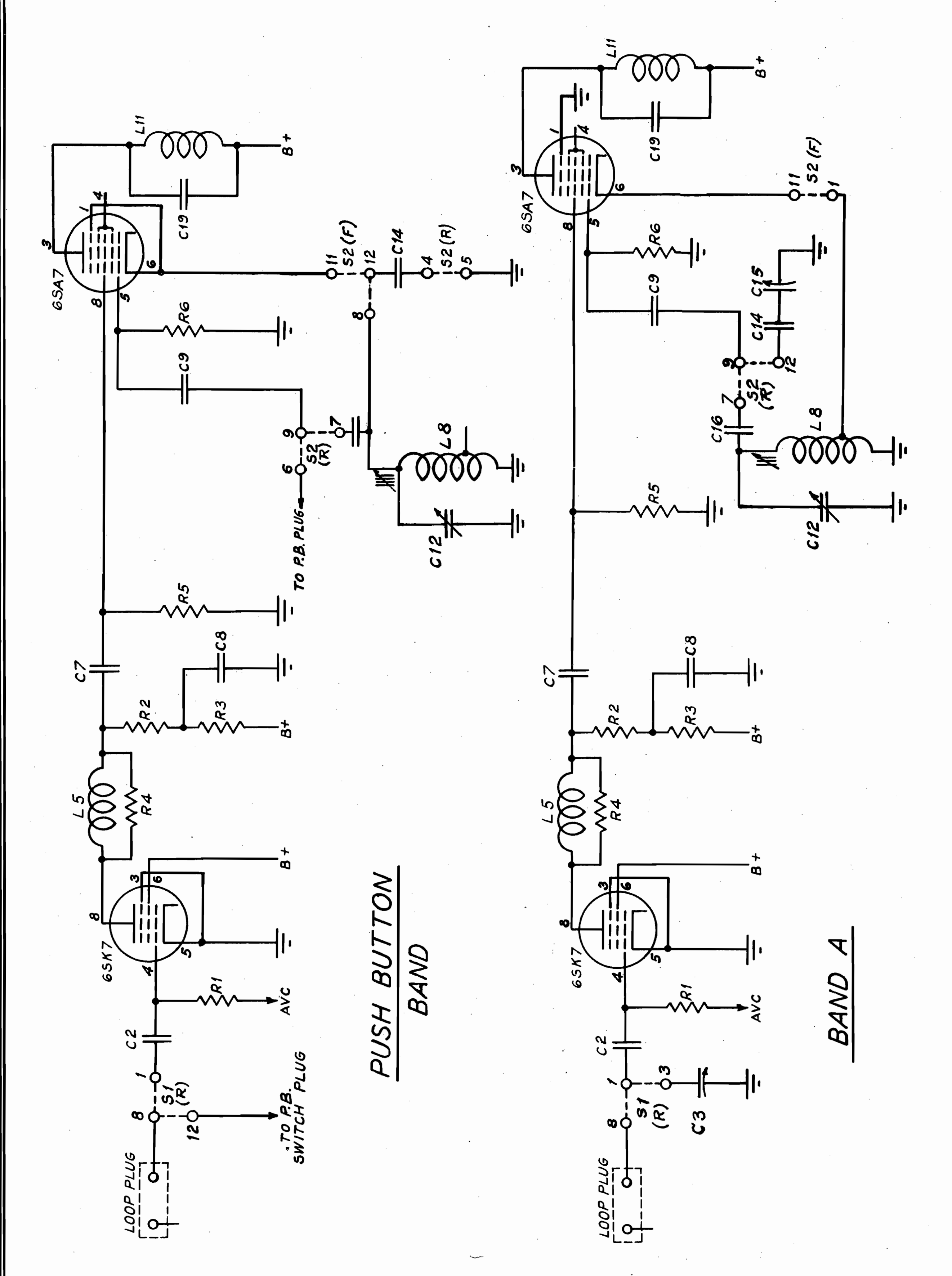
MODELS V205, V405
See RCA Page 12-61

RCA MFG. CO., INC.



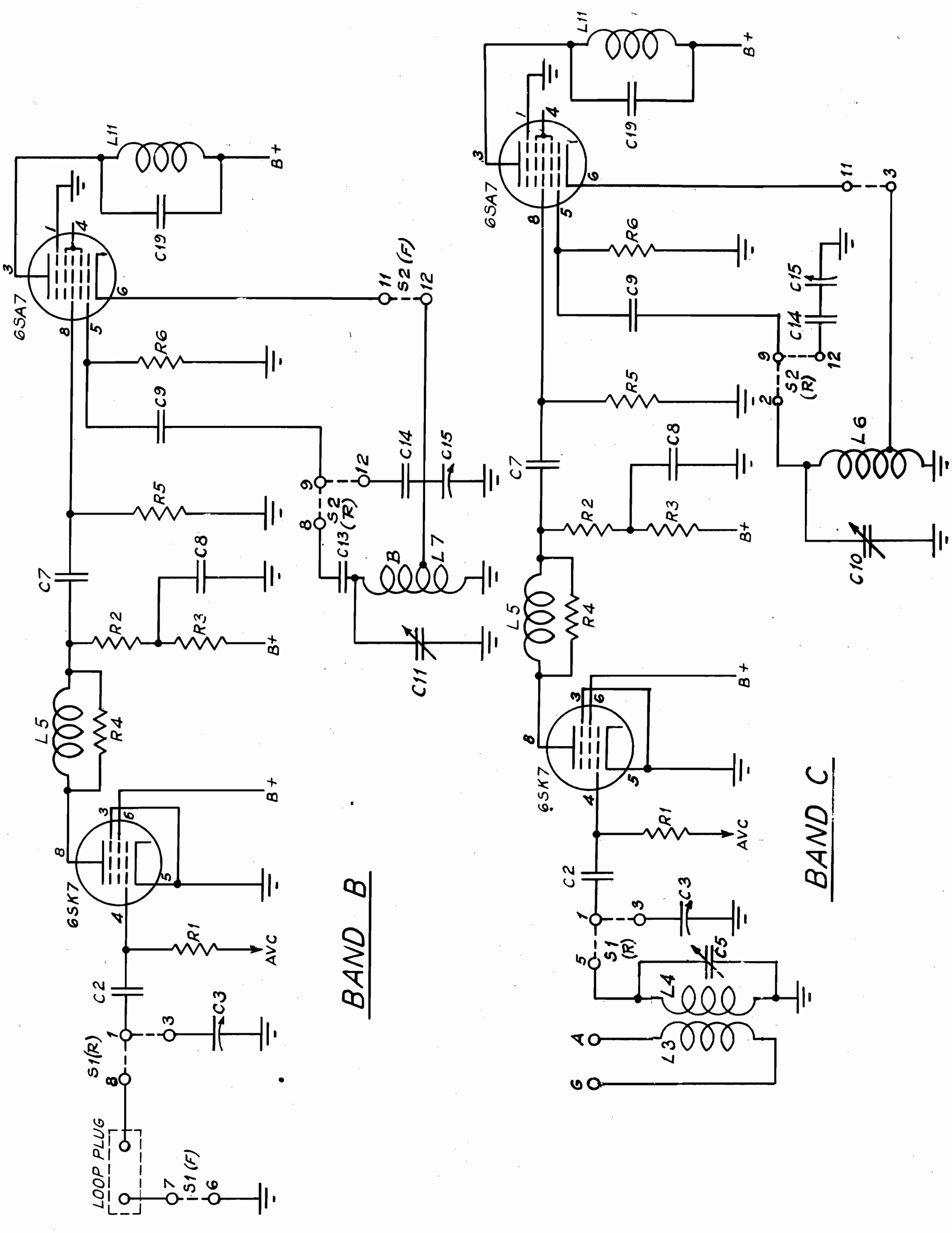
RCA MFG. CO., INC.

MODELS VHR-207, VHR-407
See RCA Page 12-55



MODELS VHR-207, VHR-407 RCA MFG. CO., INC.

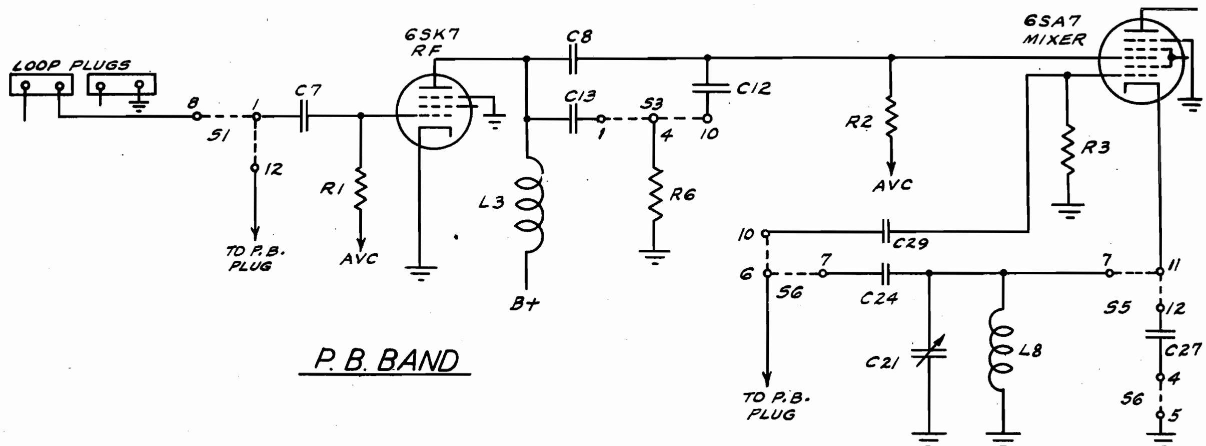
See RCA Page 12-55



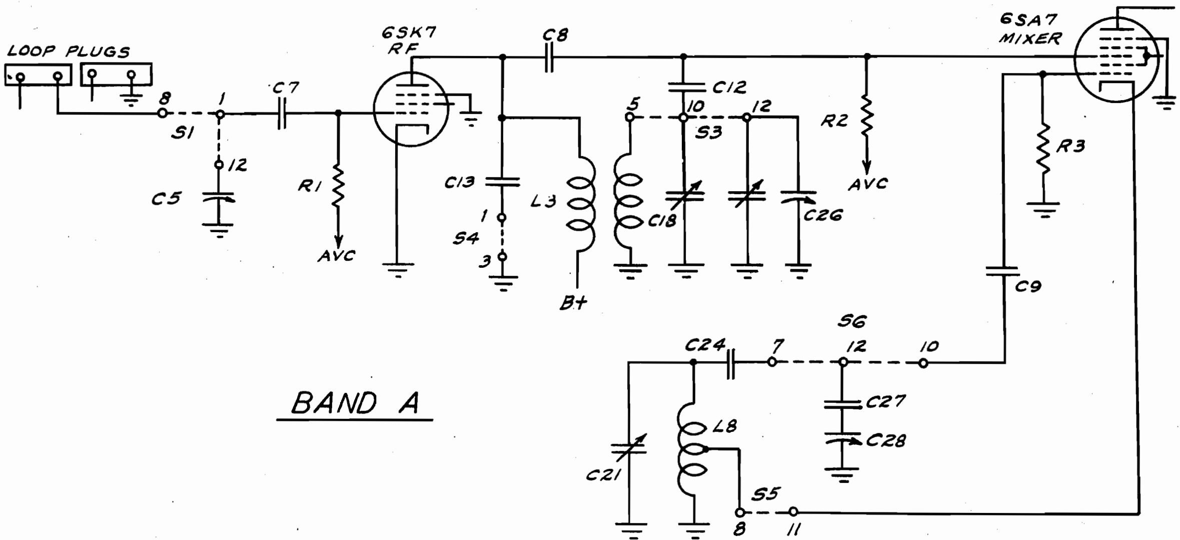
RCA MFG. CO., INC.

MODELS V-300, V-301, V-302

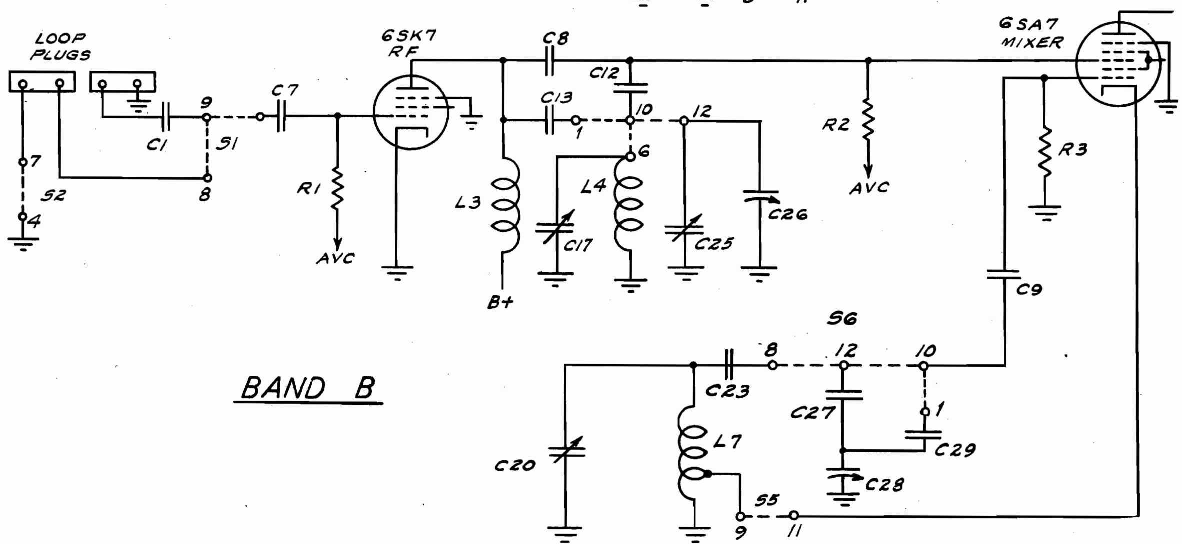
See RCA Page 12-63



P. B. BAND



BAND A

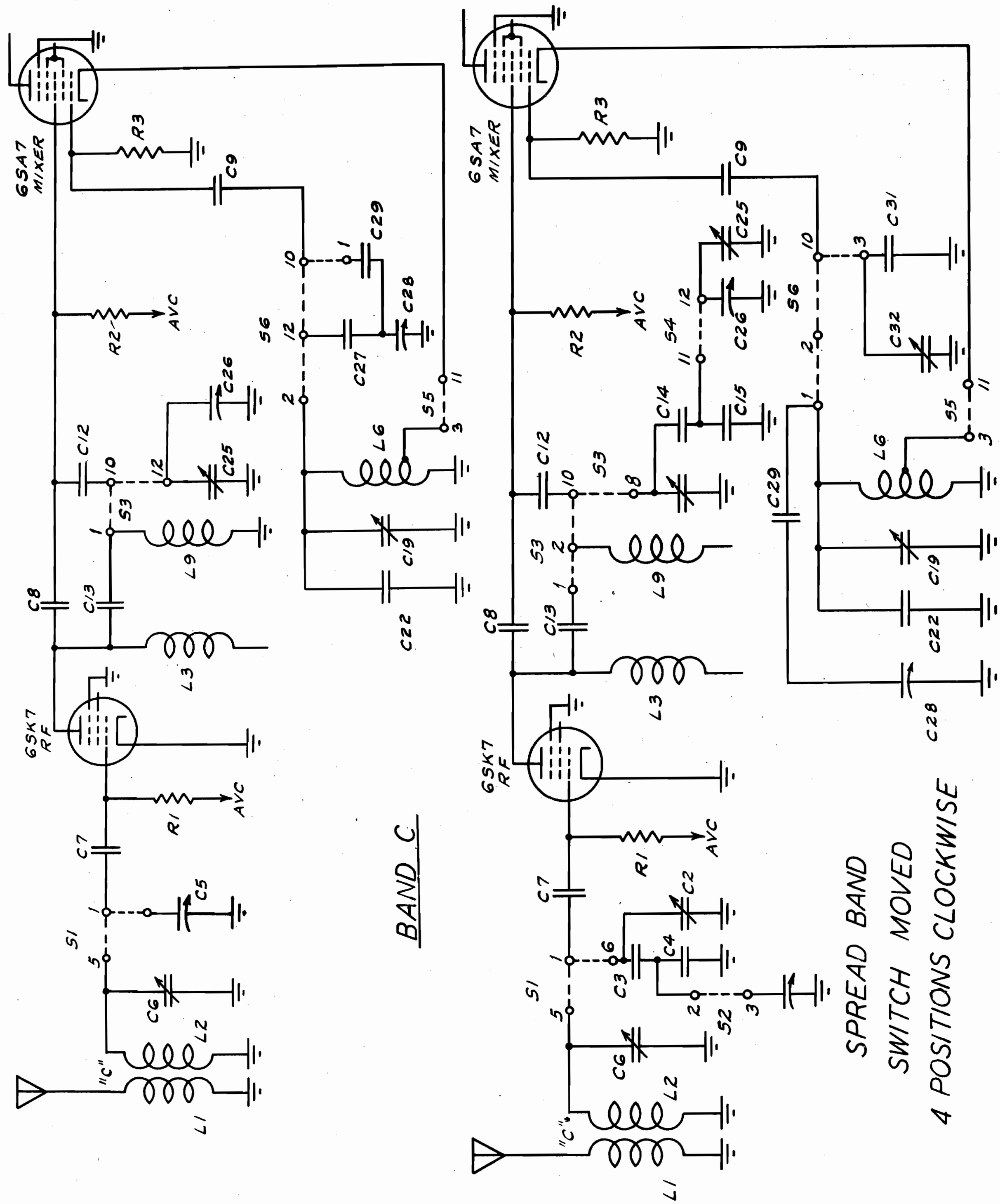


BAND B

MODELS V-300, V-301, V-302

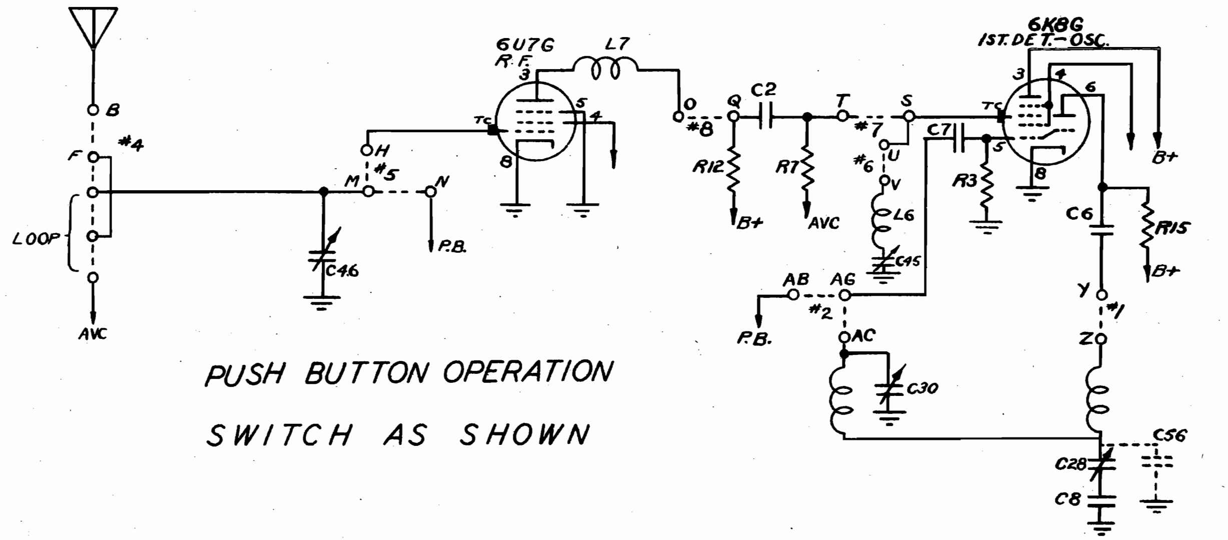
RCA MFG. CO., INC.

See RCA Page 12-63

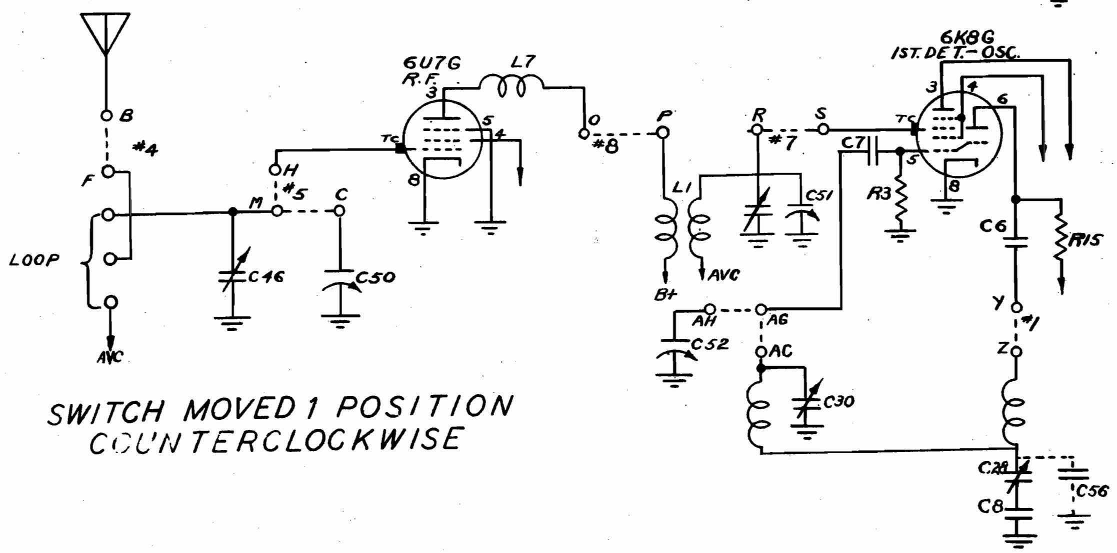


SEARS ROEBUCK & CO.

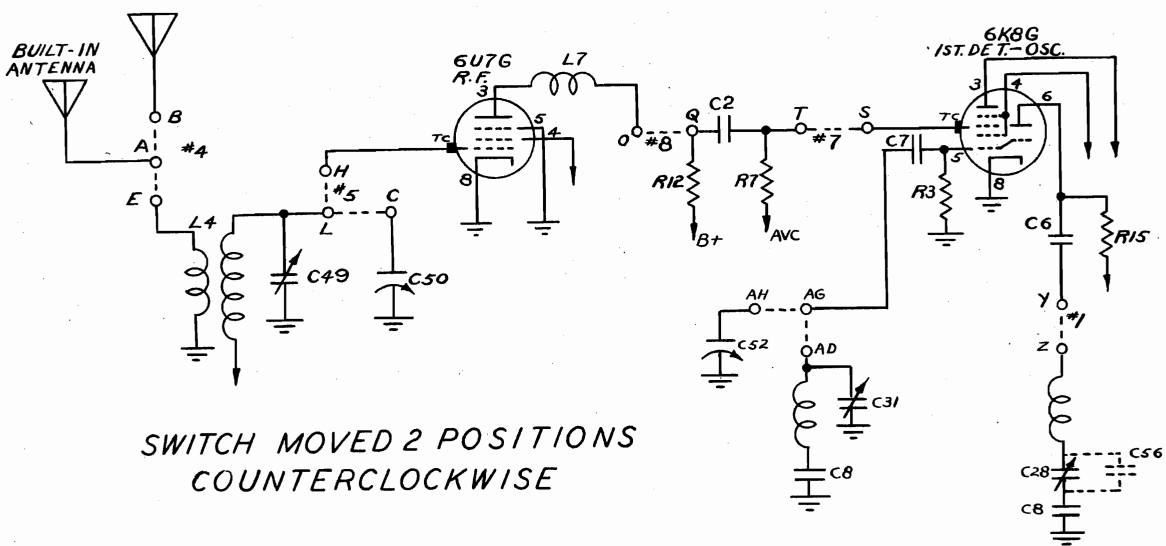
MODEL 1591
See Sears Page 12-17



PUSH BUTTON OPERATION
SWITCH AS SHOWN



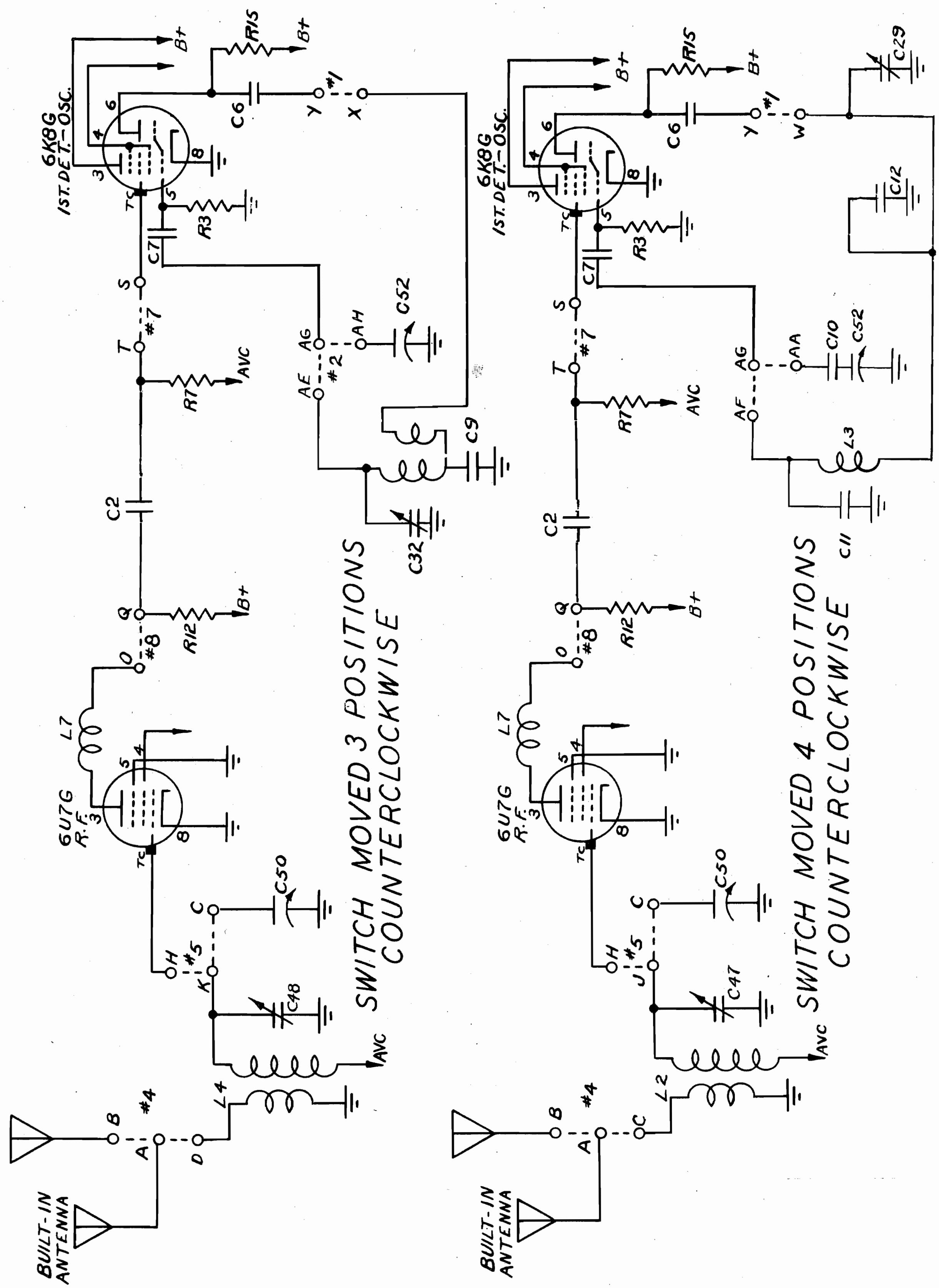
SWITCH MOVED 1 POSITION
COUNTERCLOCKWISE



SWITCH MOVED 2 POSITIONS
COUNTERCLOCKWISE

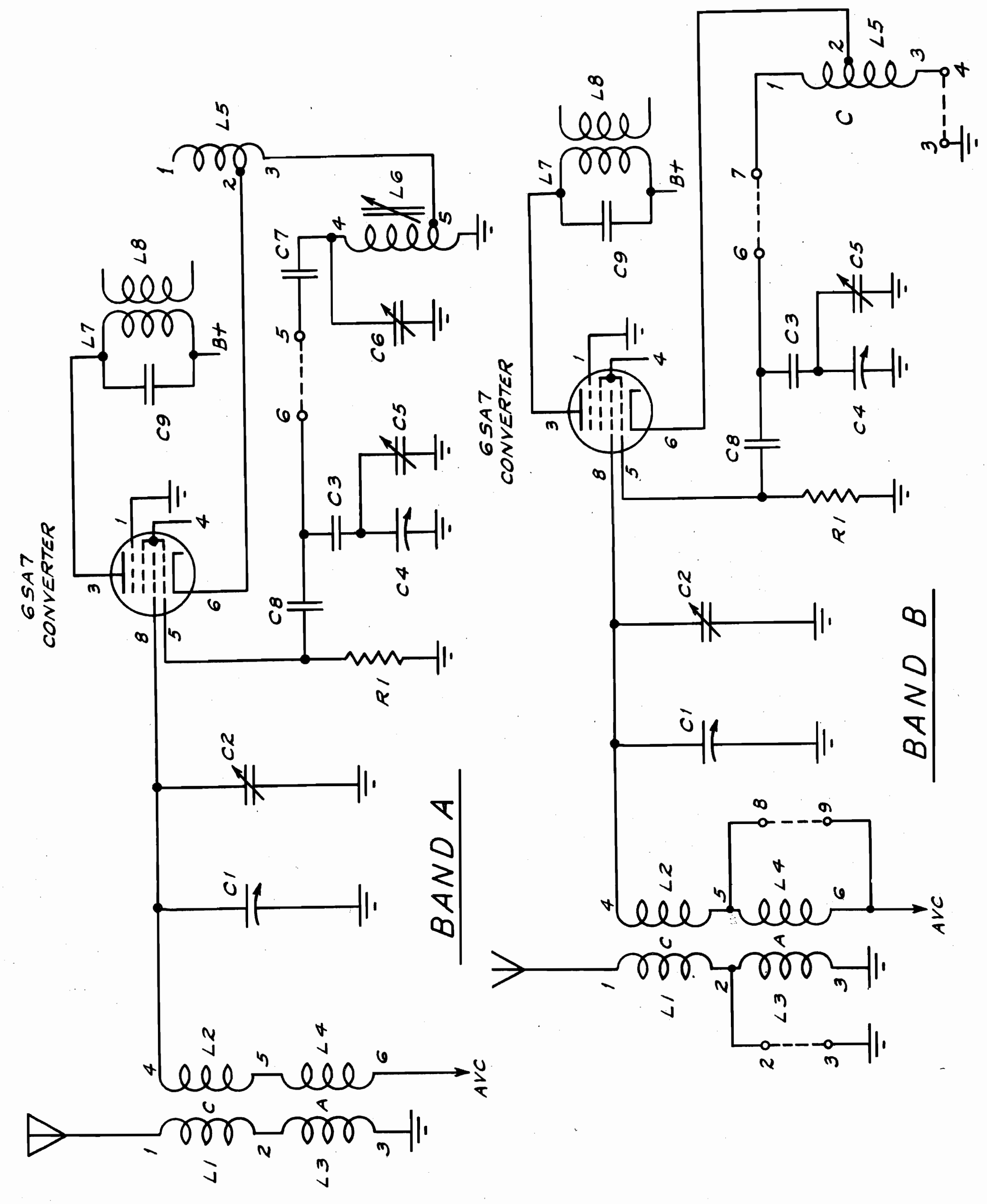
MODEL 1591
See Sears Page 12-17

SEARS ROEBUCK & CO.



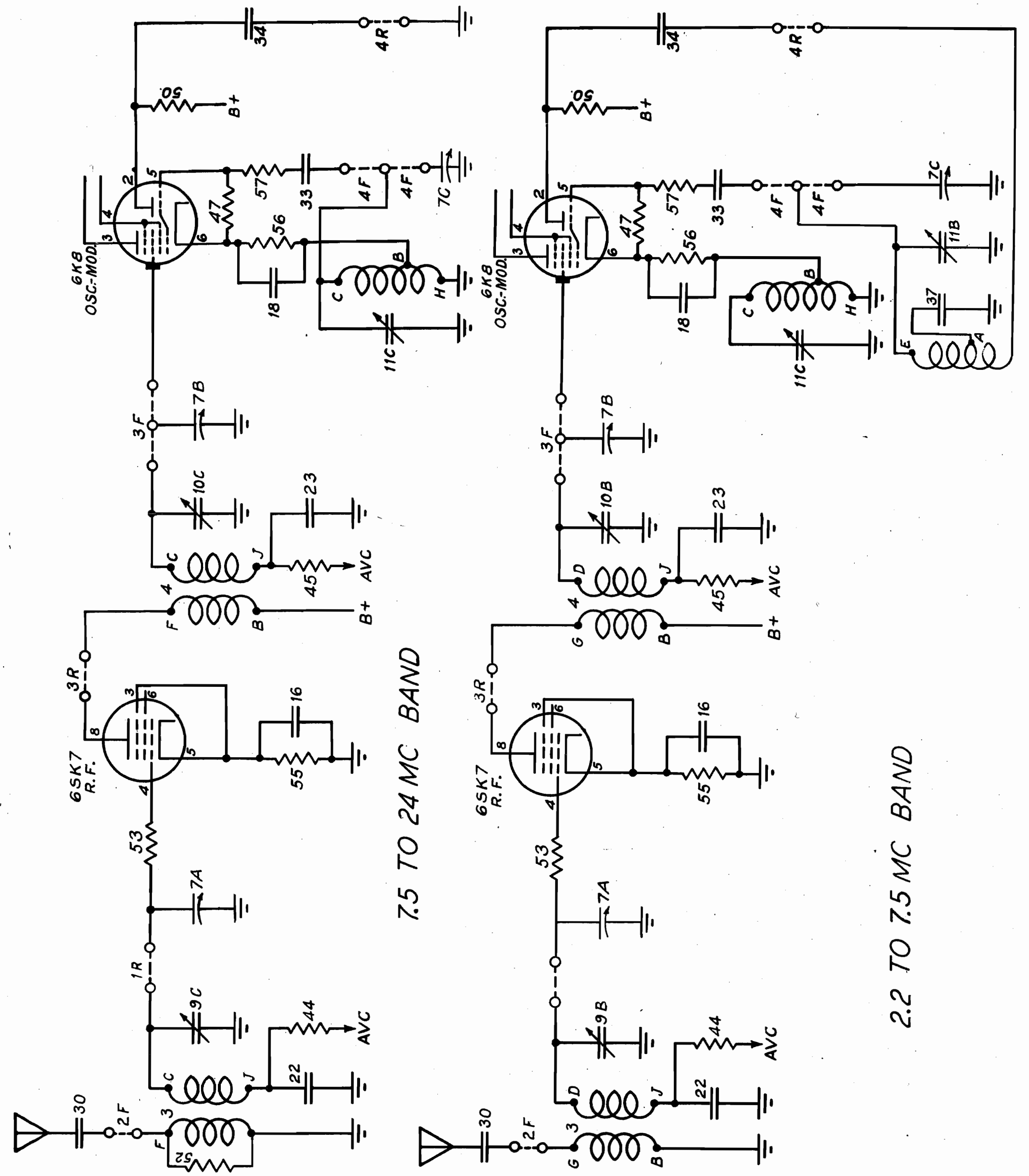
SEARS ROEBUCK & CO.

MODEL 7315, Export
See Sears Page 12-65



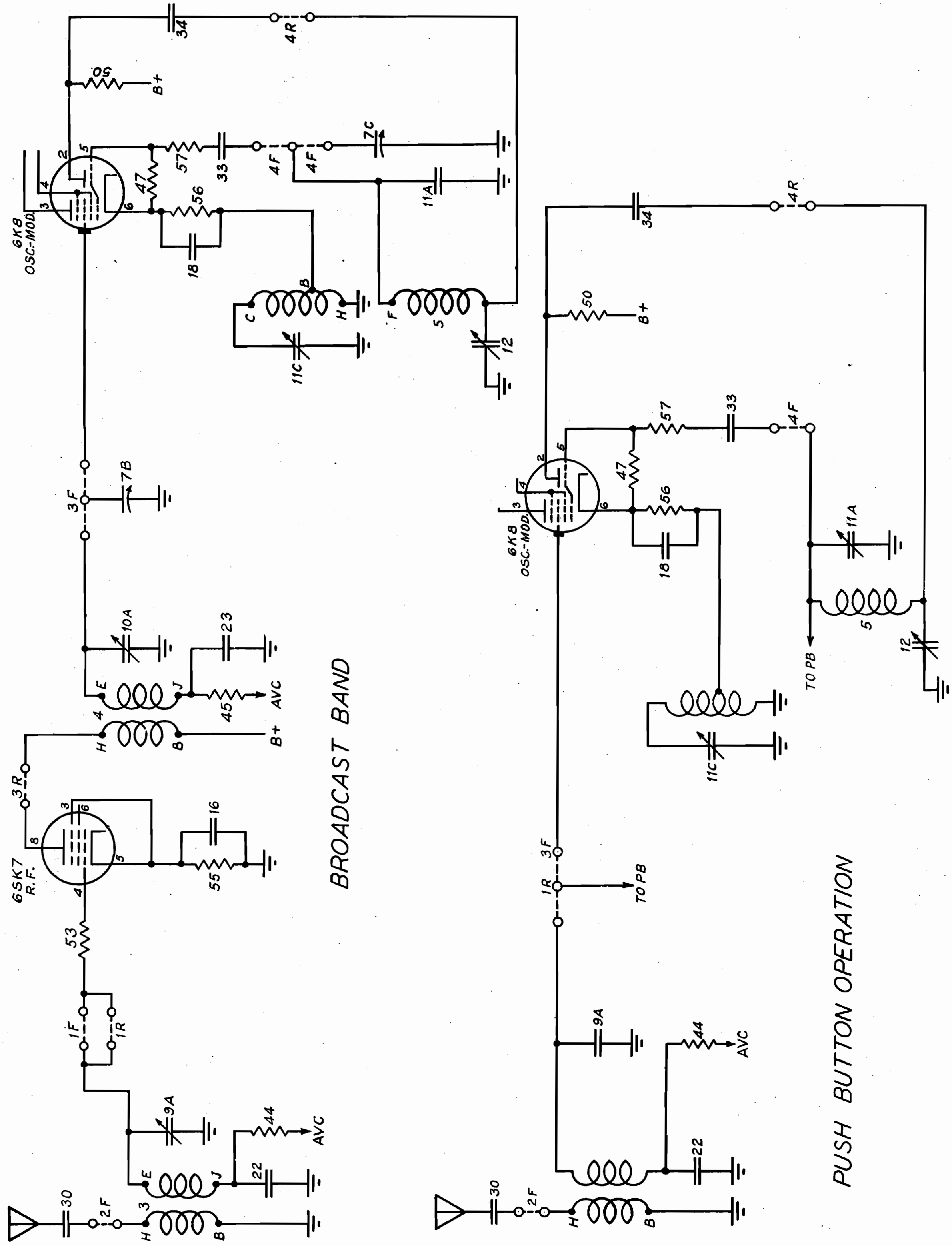
SENTINEL RADIO CORP. MODELS 207-U, 207-UE

See Sentinel Page 12-9, 10



MODELS 207-U, 207-UE
See Sentinel Page 12-9, 10

SENTINEL RADIO CORP.

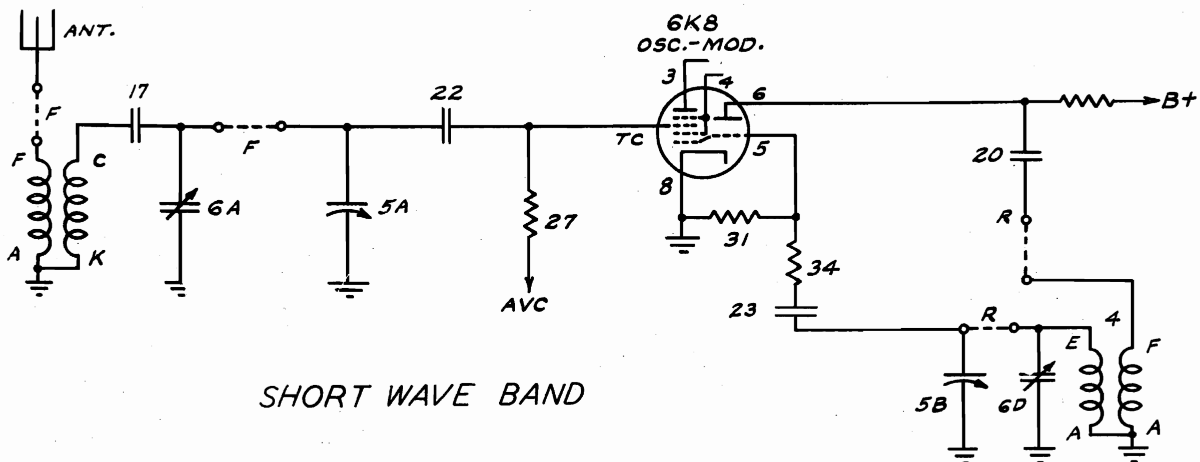


SENTINEL RADIO CORP.

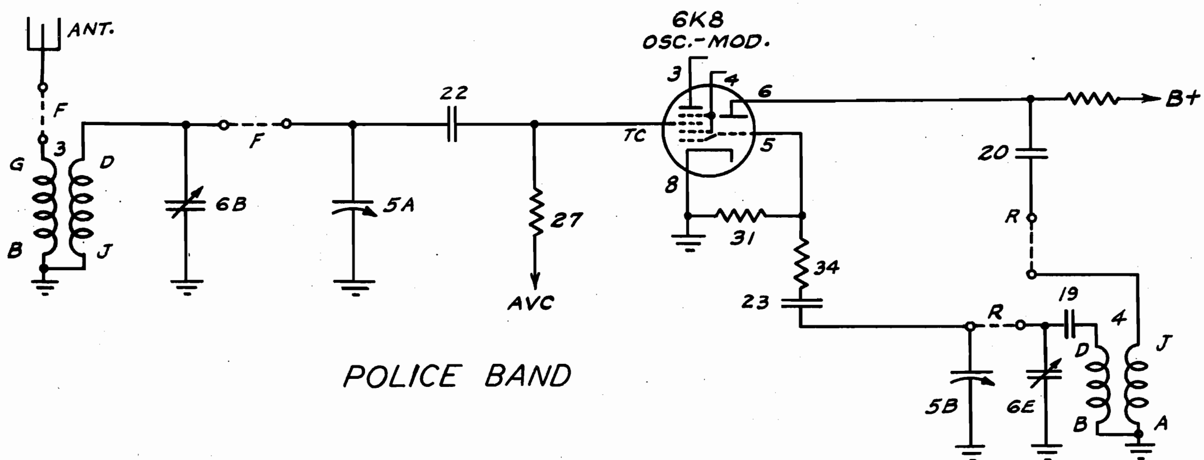
MODEL 236
See Sentinel Page 12-29
MODEL 237
See Sentinel Page 12-37

MODEL 239
See Sentinel Page 12-33

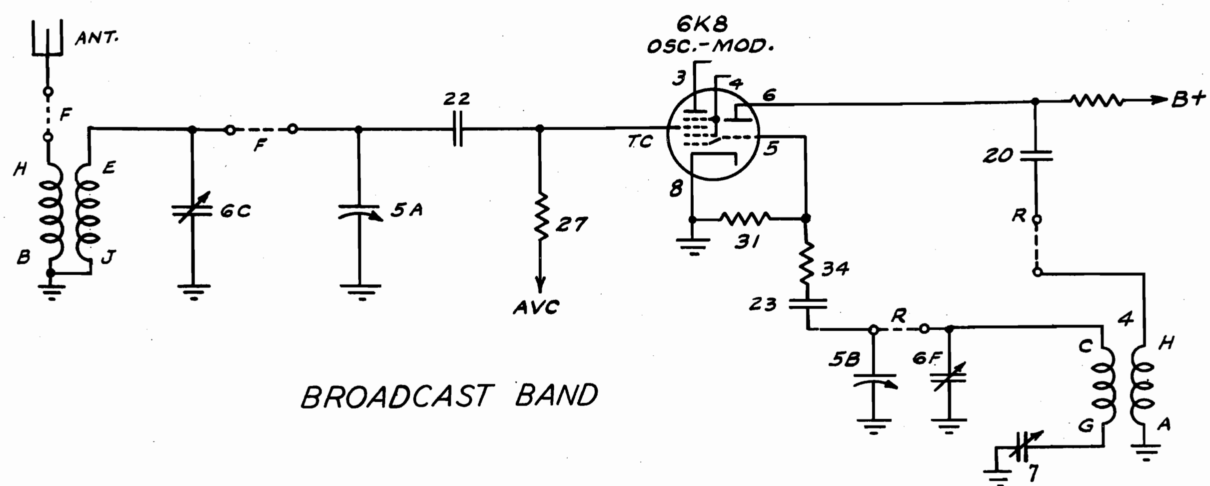
MODEL 234
See Sentinel Page 12-25
MODEL 235
See Sentinel Page 12-27



SHORT WAVE BAND



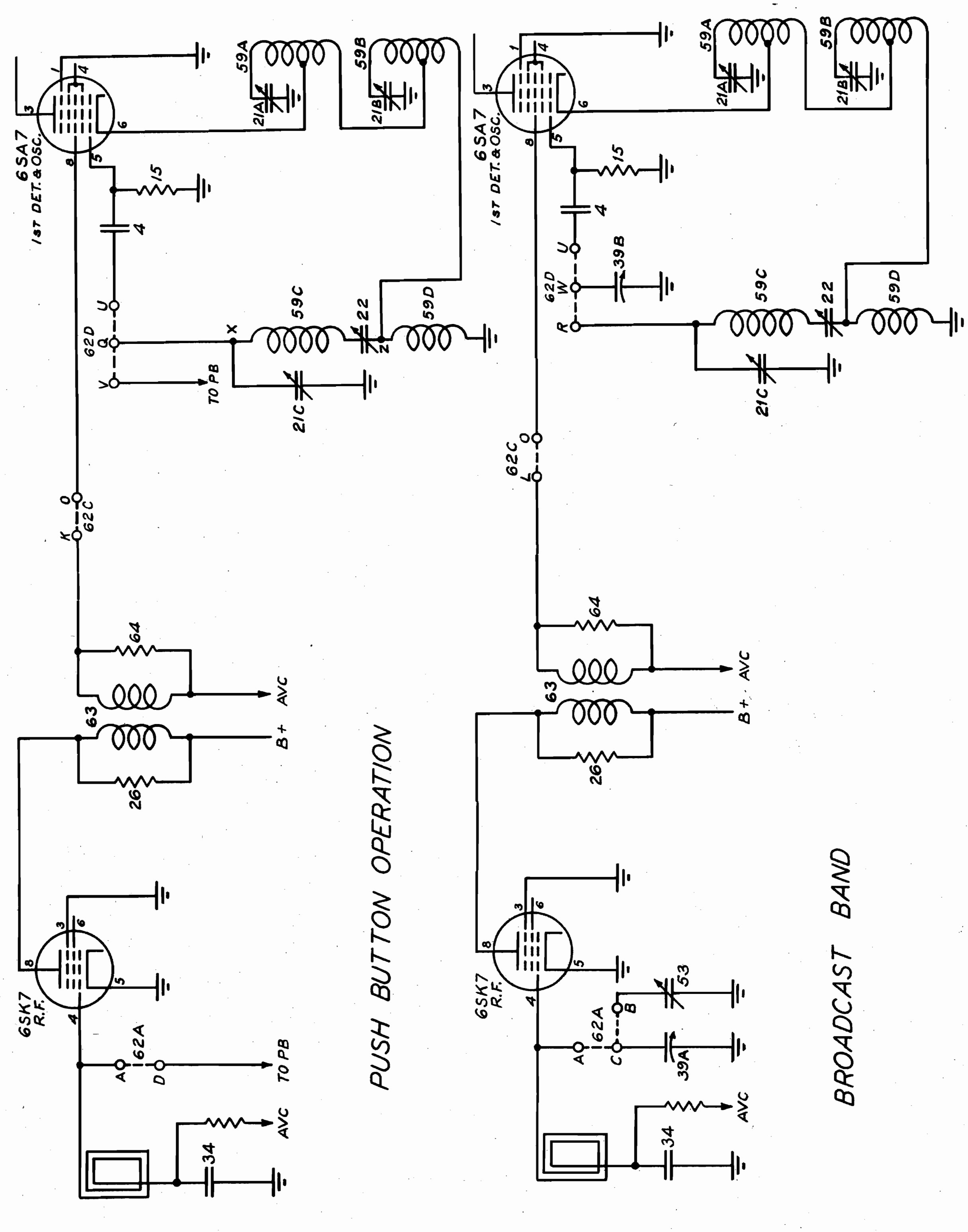
POLICE BAND



BROADCAST BAND

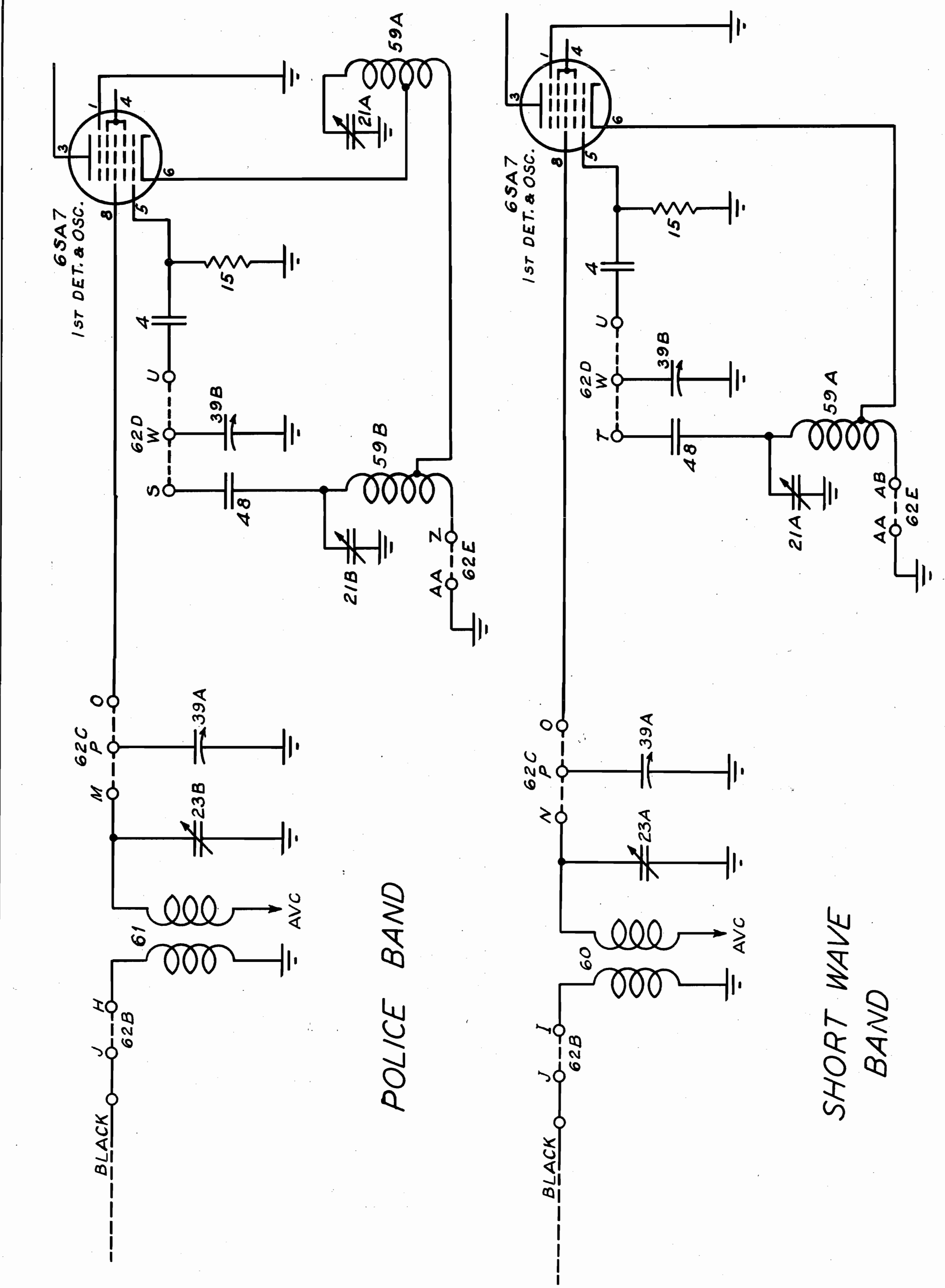
STEWART-WARNER CORP.

MODEL 01-6F9
See Stewart-Warner
Page 12-1, 2



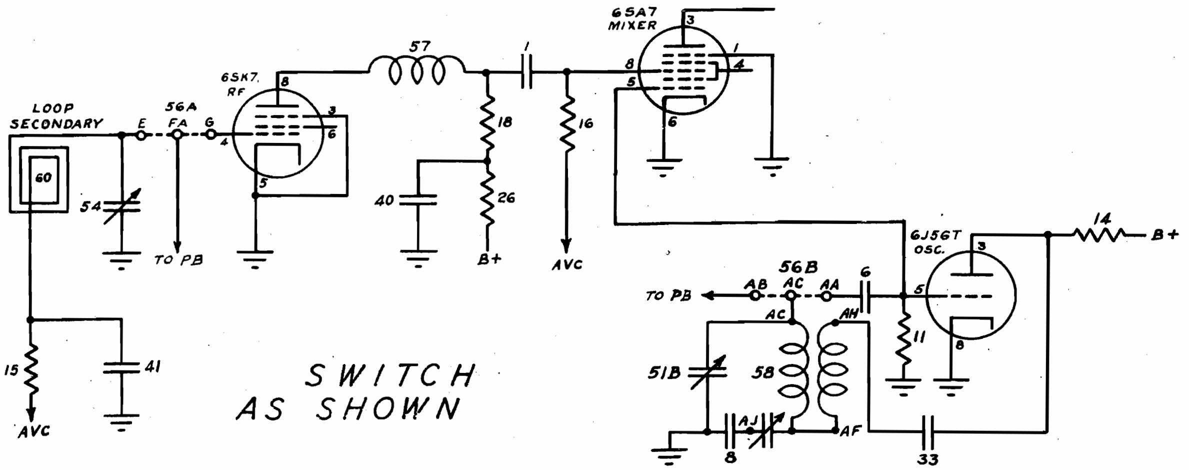
MODEL 01-6F9
See Stewart-Warner
Page 12-1, 2

STEWART-WARNER CORP.

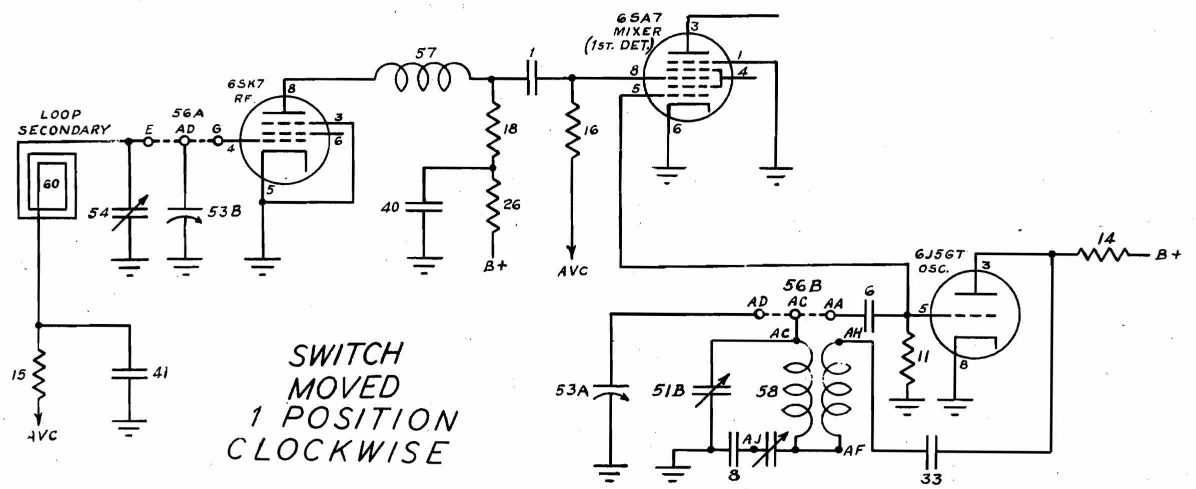


STEWART-WARNER CORP. MODELS 11-8F1 to 11-8F9, 11-8F1Z to 11-8F9Z

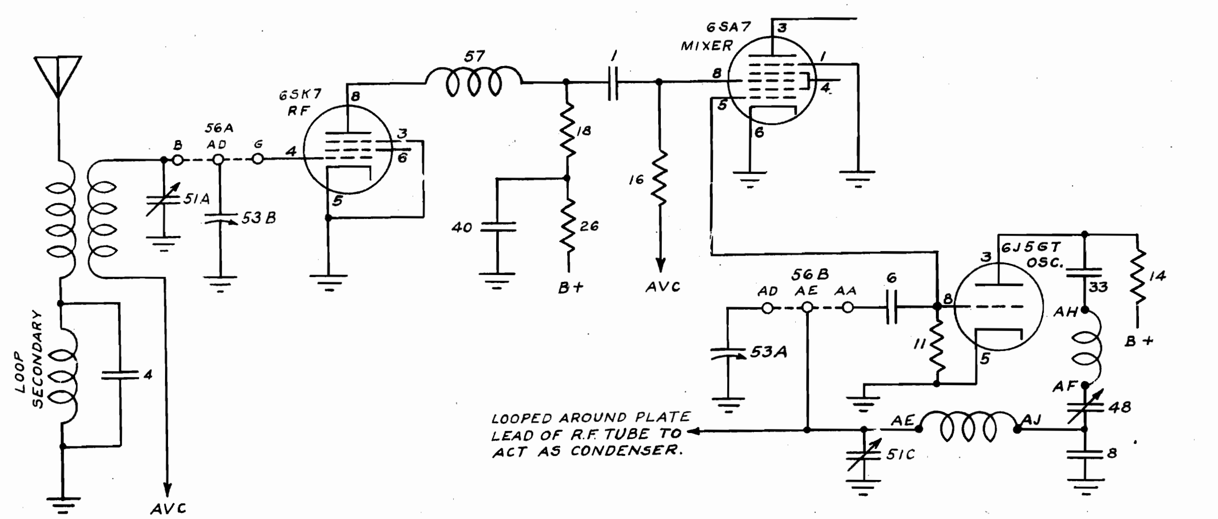
See Stewart-Warner Page 12-23



SWITCH AS SHOWN



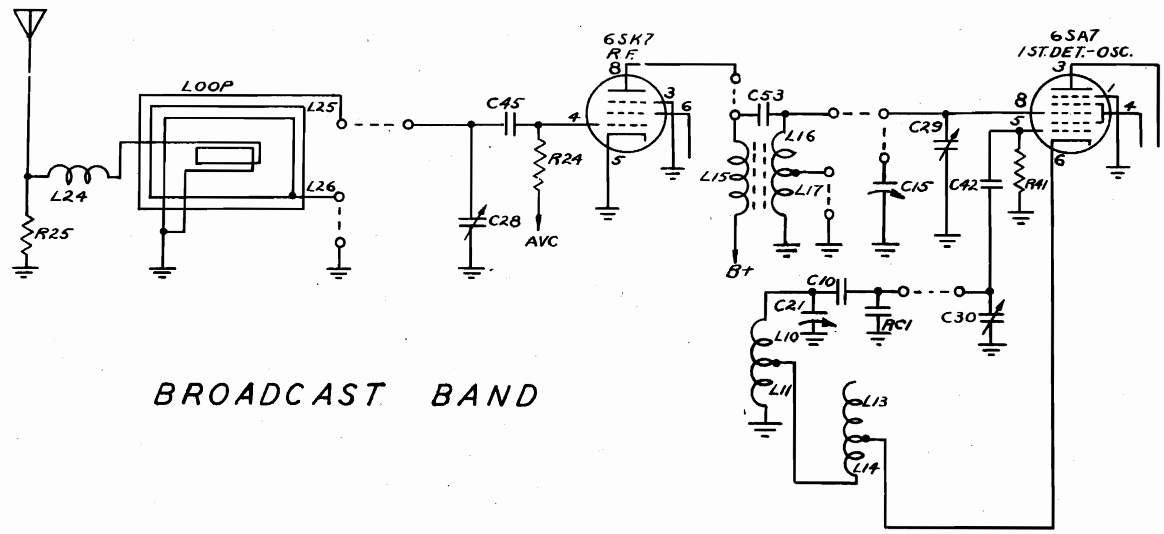
SWITCH MOVED 1 POSITION CLOCKWISE



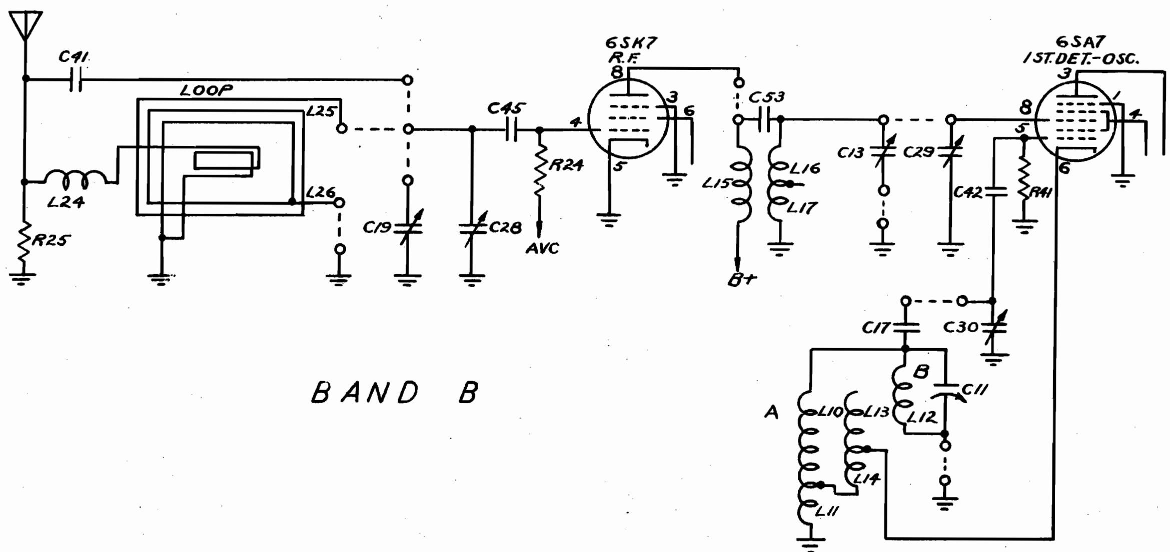
SWITCH MOVED 2 POSITIONS CLOCKWISE

STROMBERG-CARLSON TEL. MFG. CO.

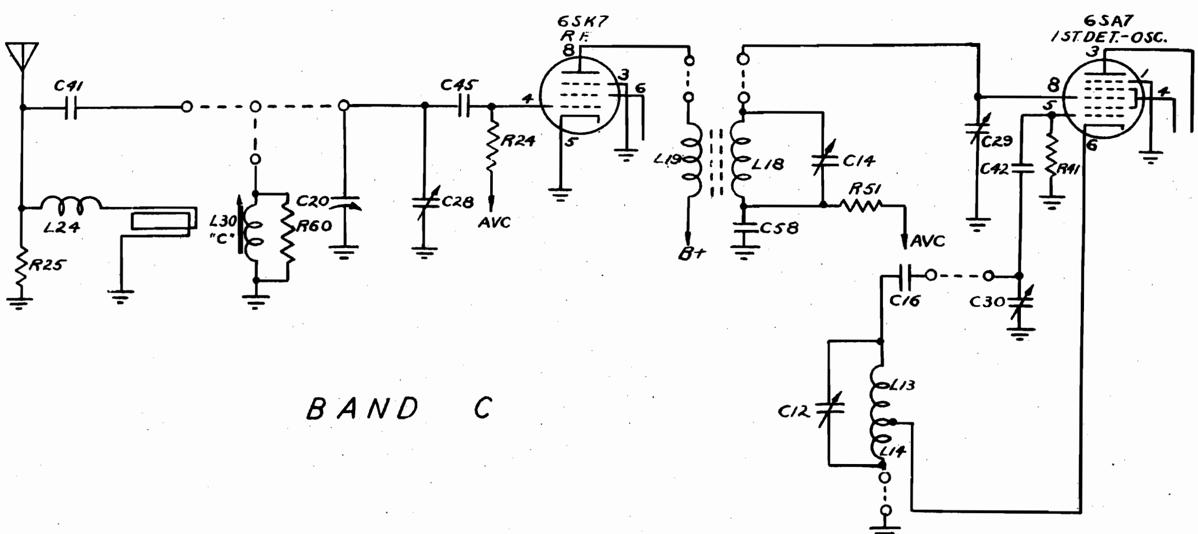
MODELS 530, 535
See Stromberg Page 12-13



BROADCAST BAND



BAND B

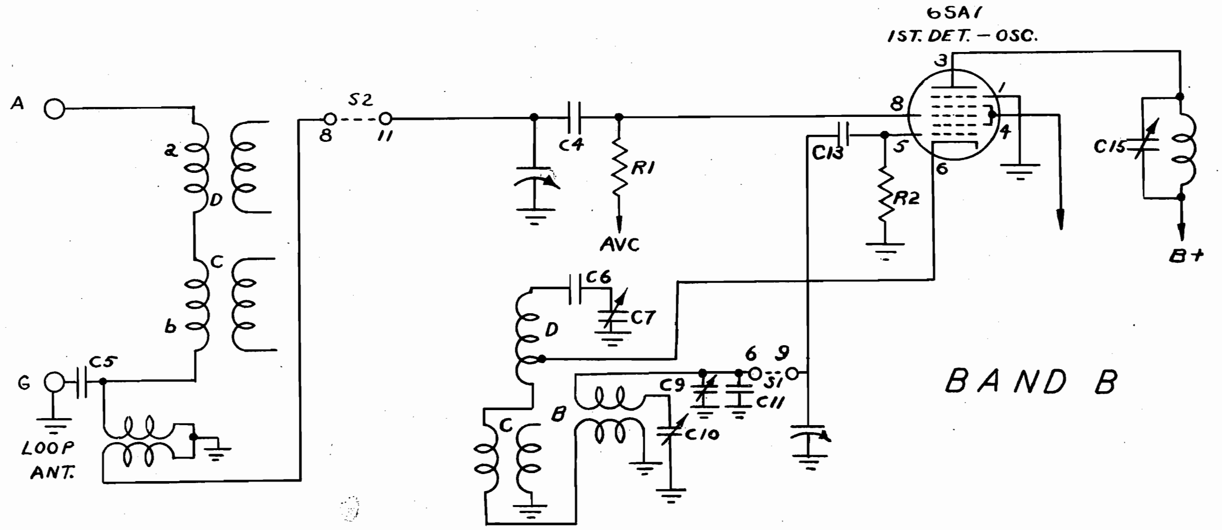


BAND C

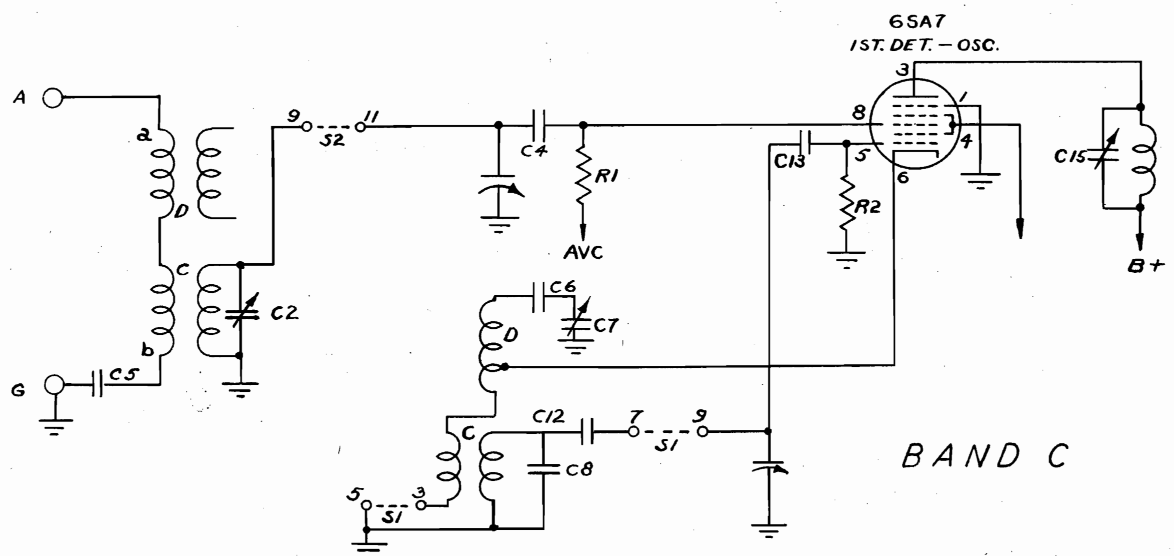
MODEL 7A41 (574X)
See Wells-Gardner Page 12-10

WELLS-GARDNER & CO.

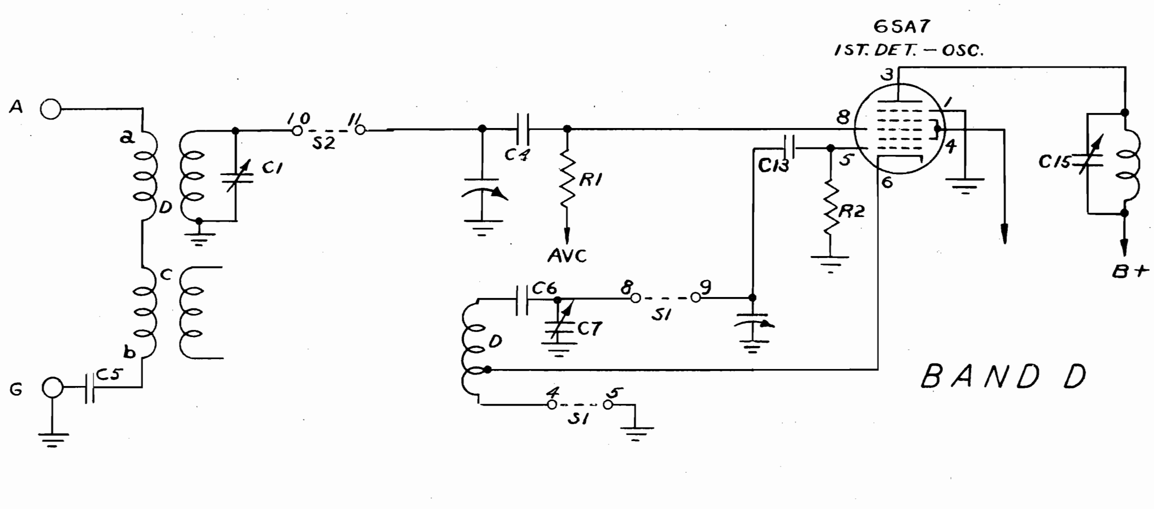
MODEL 6A43
See Wells-Gardner Page 12-1
MODEL 7A41 (704)
See Wells-Gardner Page 12-9



BAND B



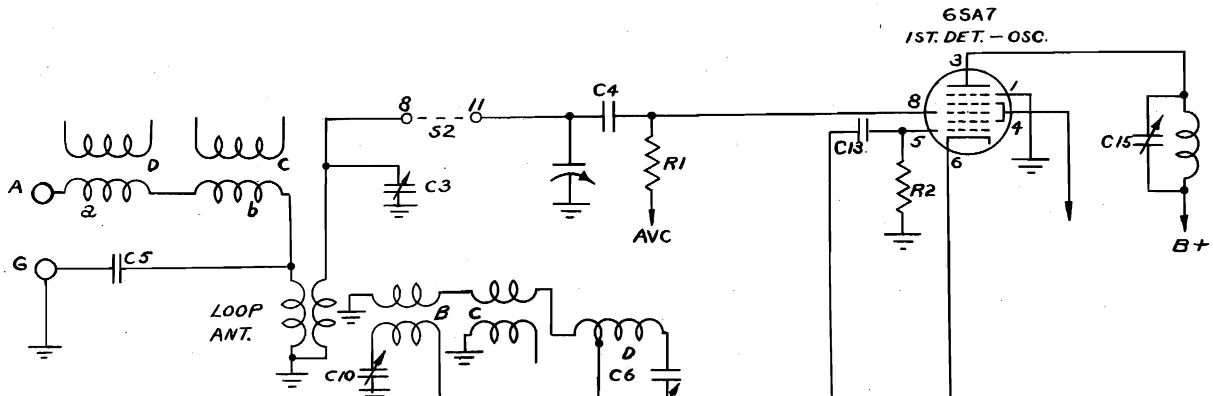
BAND C



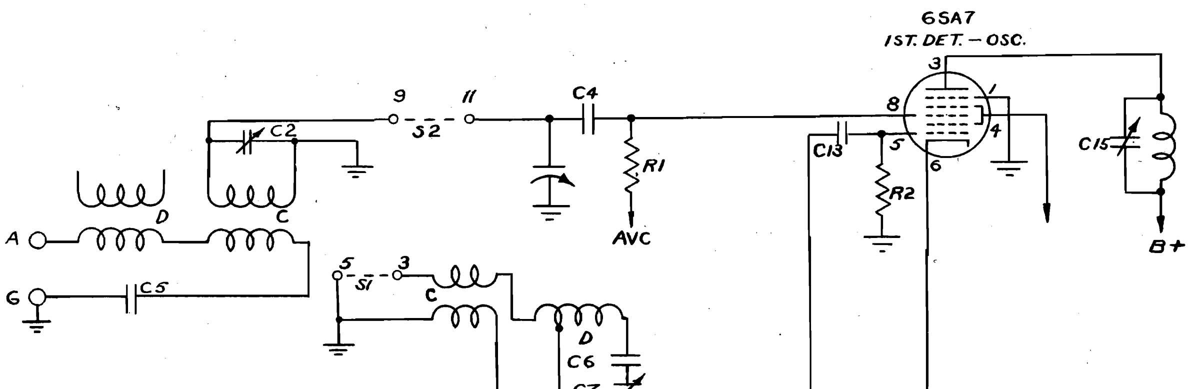
BAND D

WESTERN AUTO SUPPLY CO.

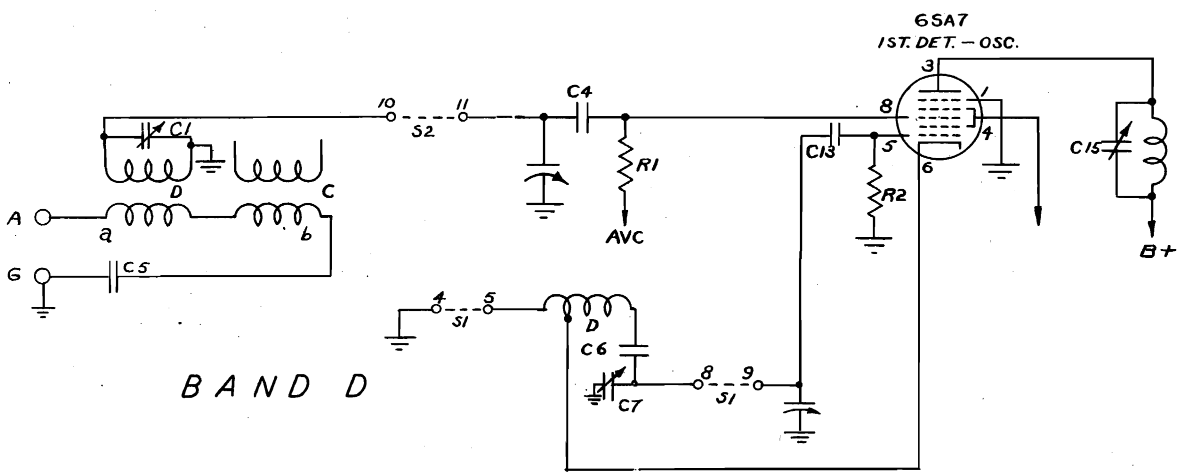
MODEL D1042
See Truetone
Page 12-17, 18



BAND B



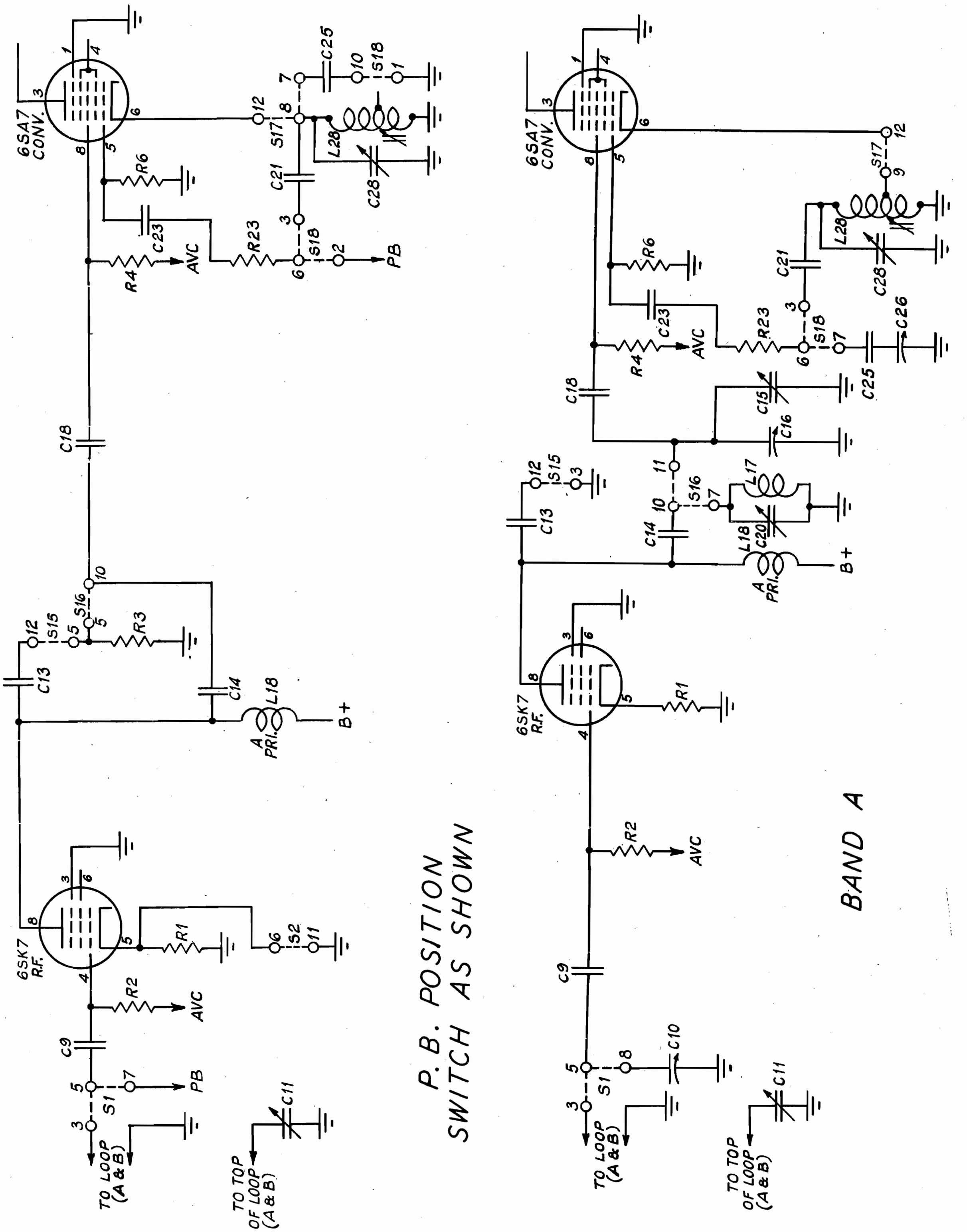
BAND C



BAND D

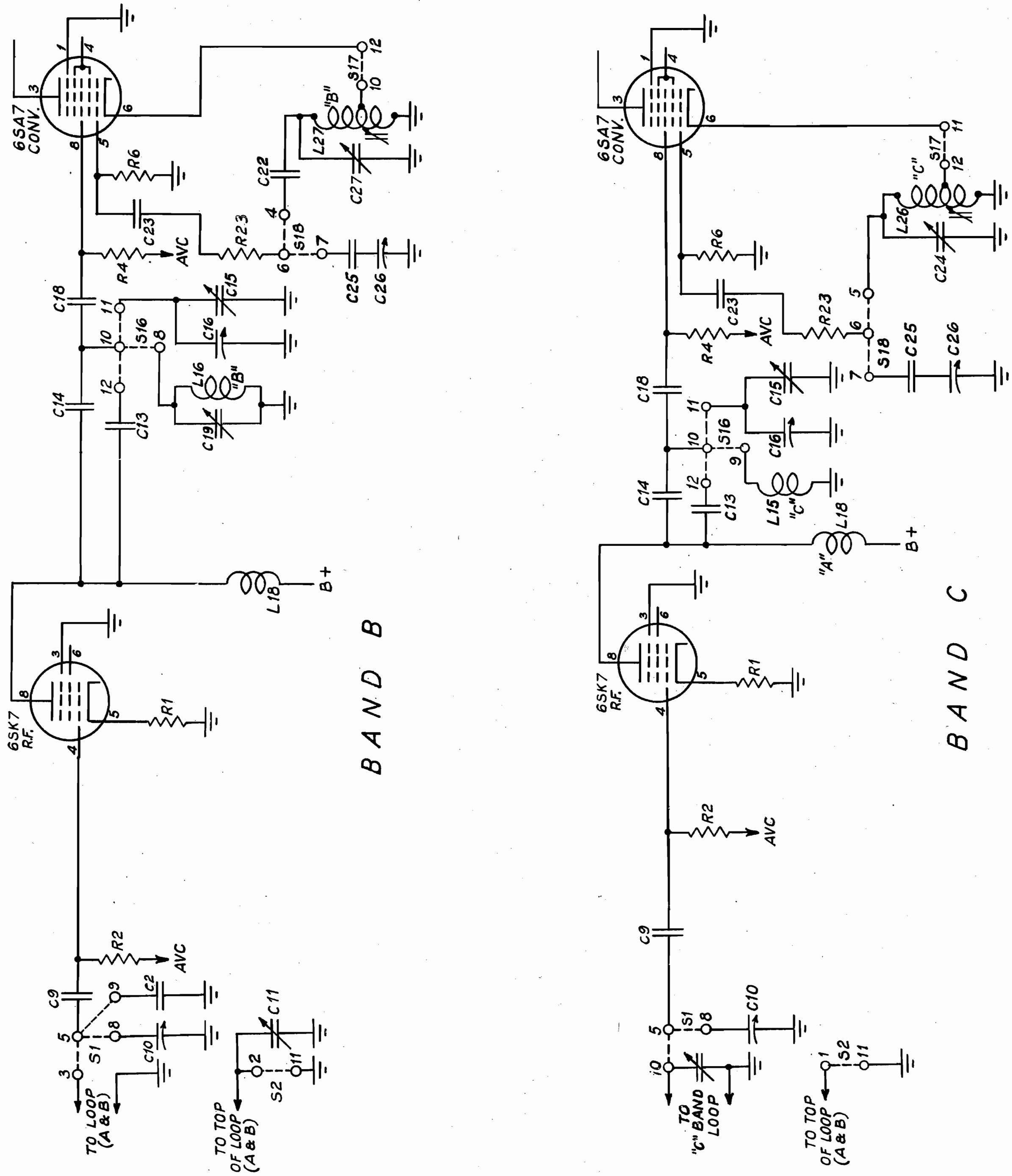
WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR290
See Westinghouse
Page 12-41



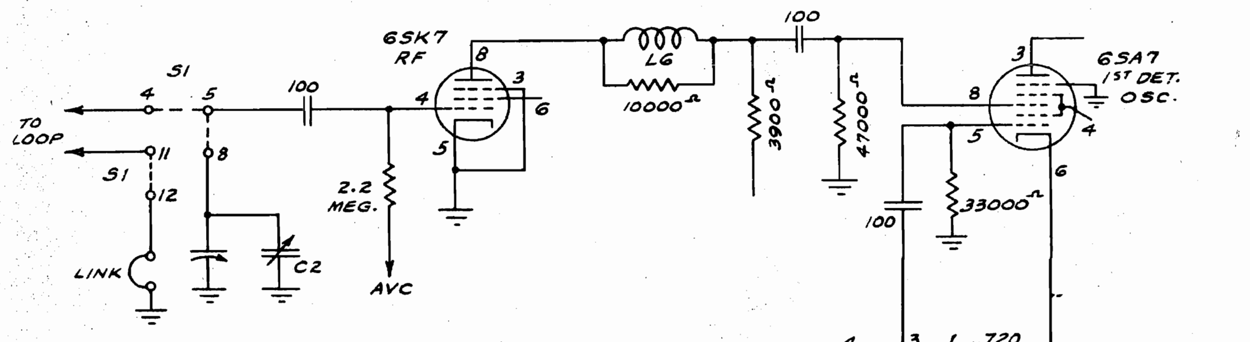
WESTINGHOUSE ELEC. SUPPLY CO.

MODEL WR290
See Westinghouse
Page 12-41

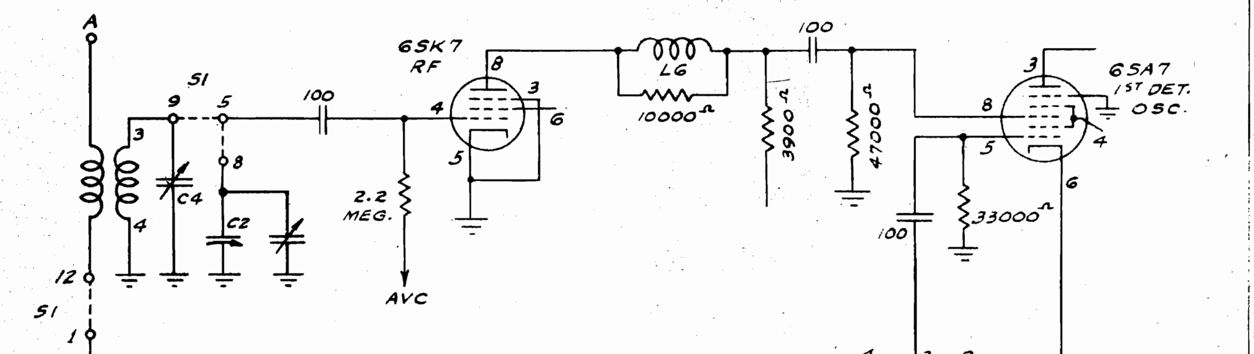


WESTINGHOUSE ELEC. SUPPLY CO.

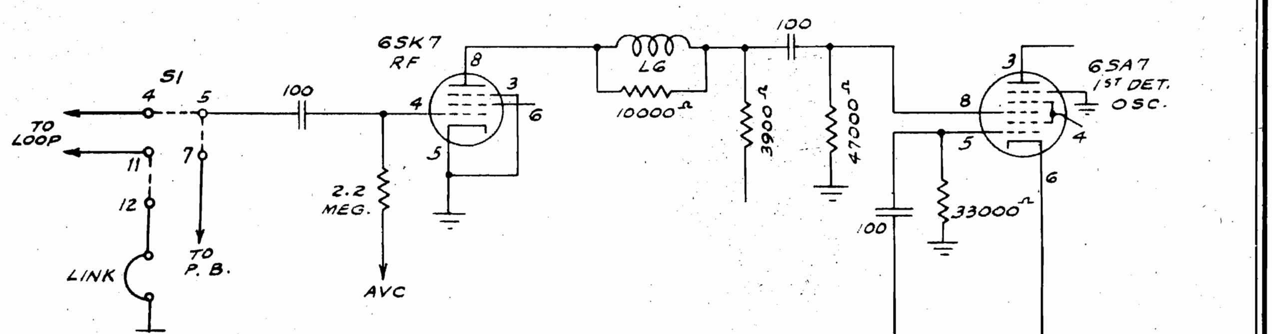
MODEL WR 386
See Westinghouse Page 12-26



BAND A



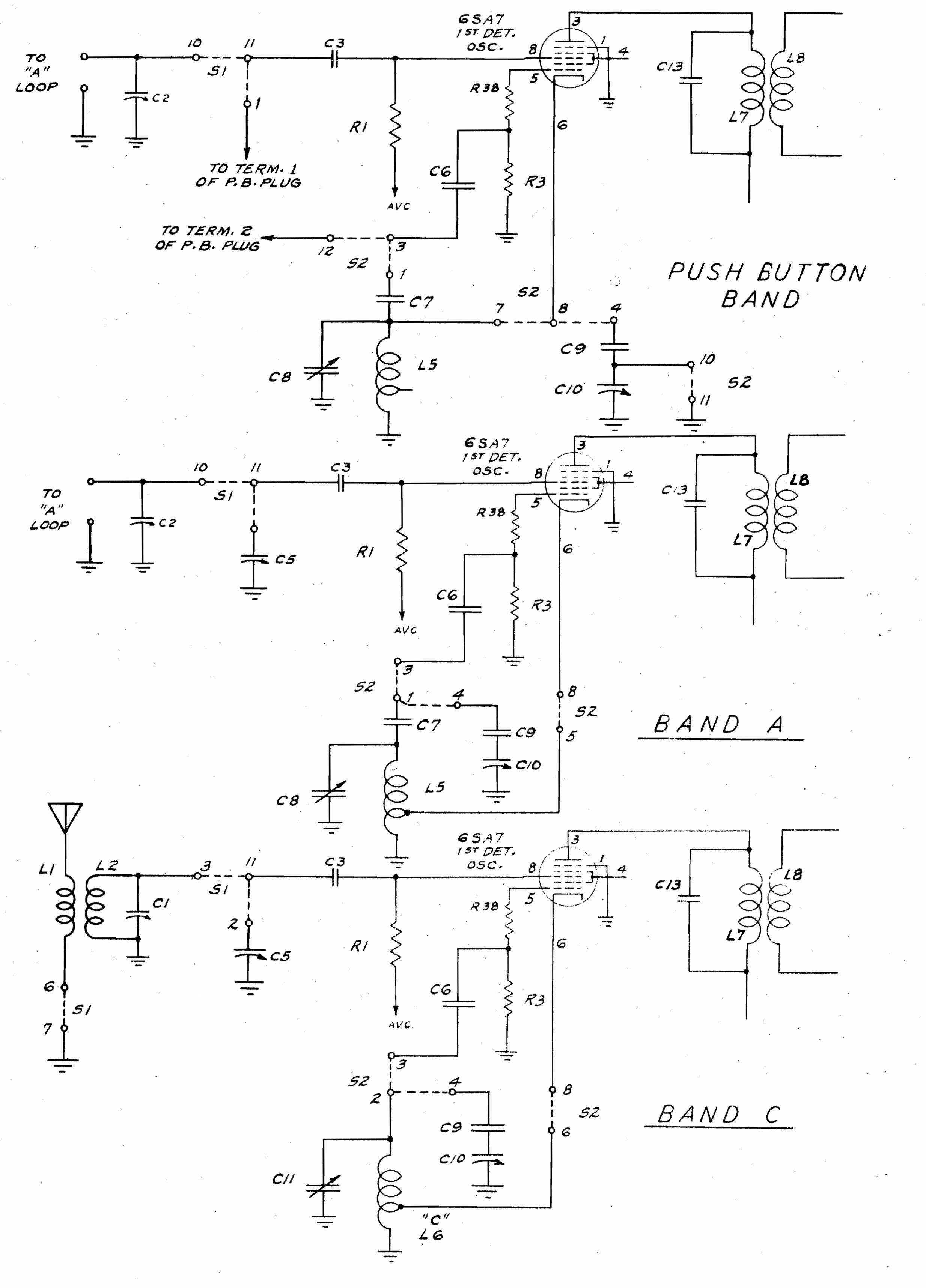
BAND C



P. B. POSITION

WESTINGHOUSE ELEC. SUPPLY CO. INC.

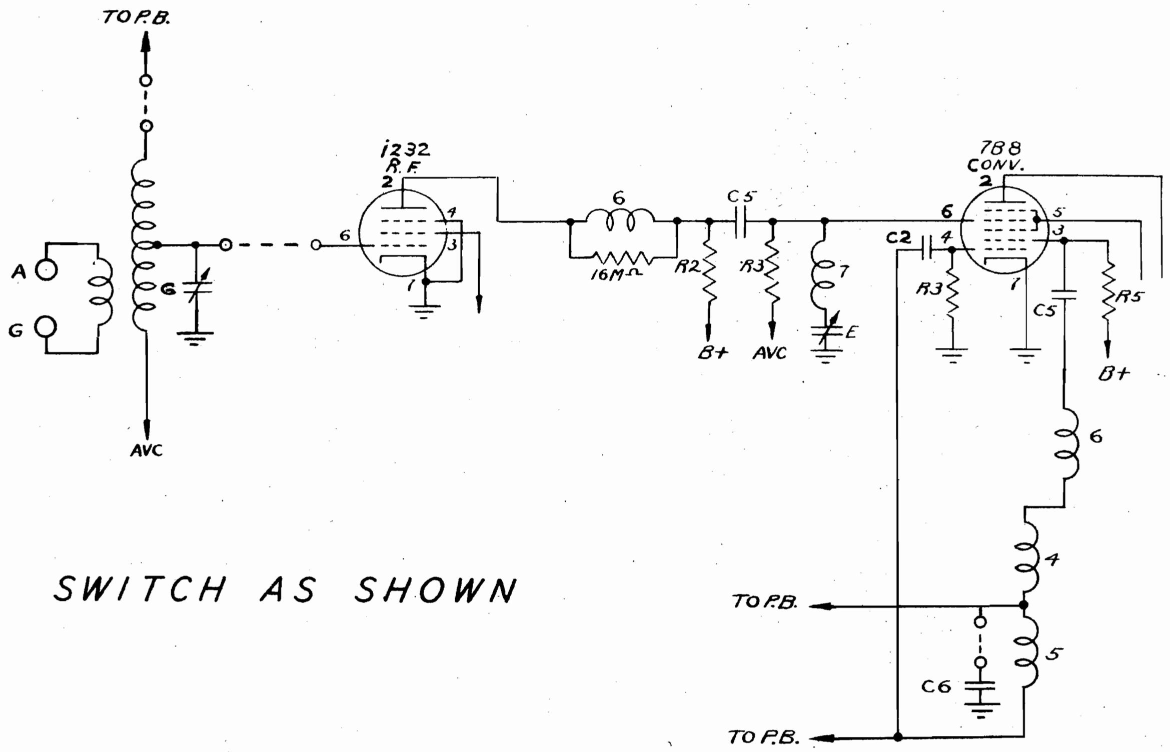
MODEL WR 486
See Westinghouse Page 12-36

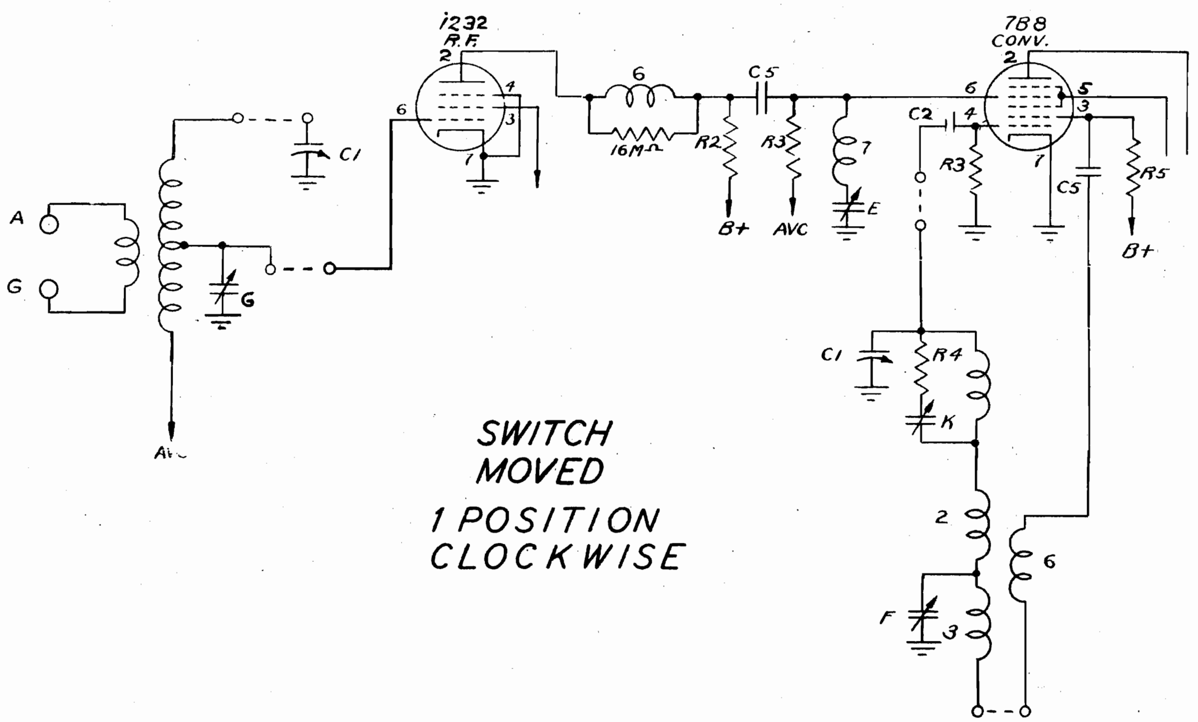


ZENITH RADIO CORP.

MODELS 7S-529, 7S-530, 7S-547, 7S-557, 7S-558, 7S-559

See Zenith Page 12-15

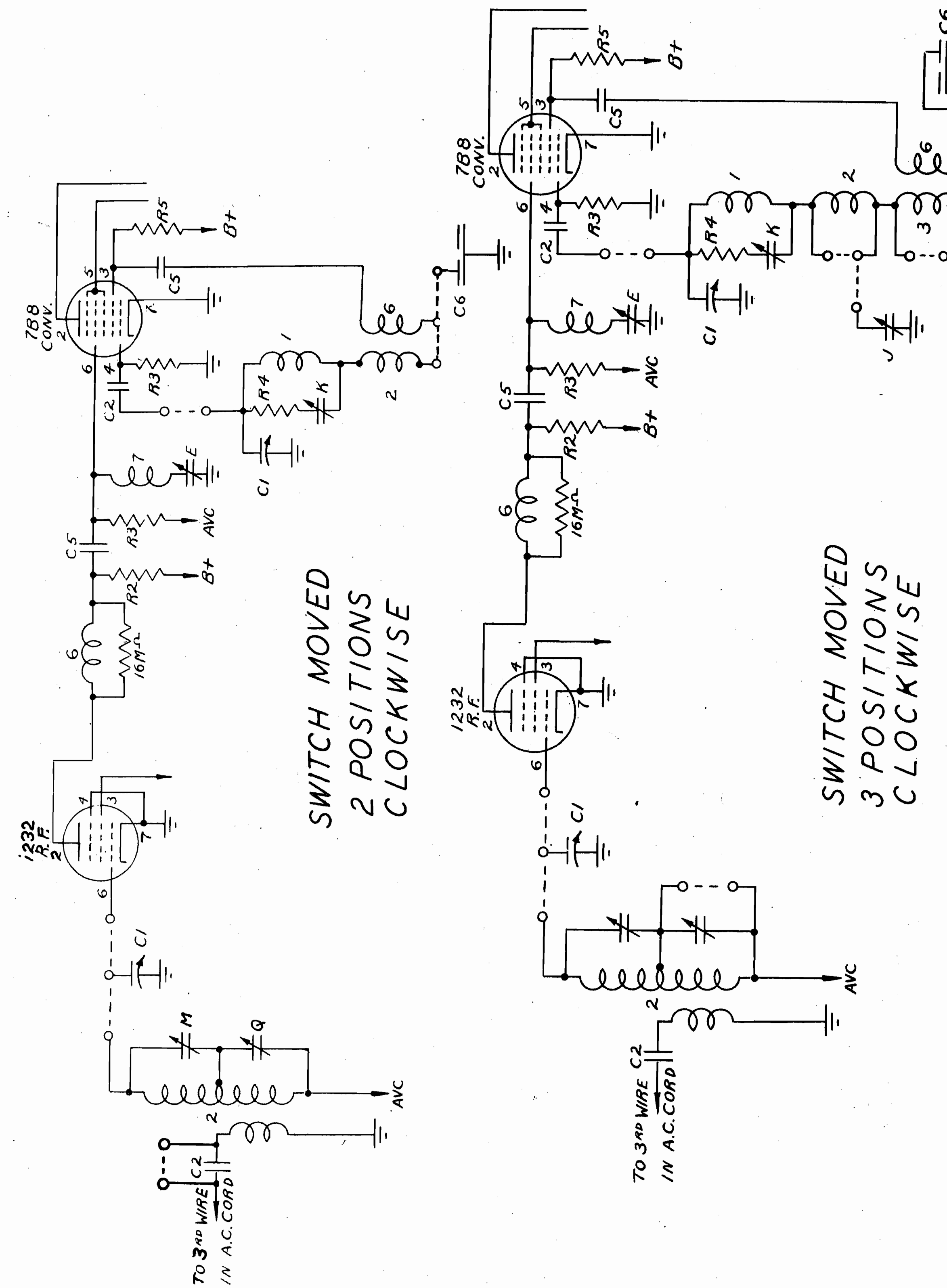




MODELS 7S-529, 7S-530, 7S-547, 7S-557, 7S-558, 7S-559

See Zenith Page 12-15

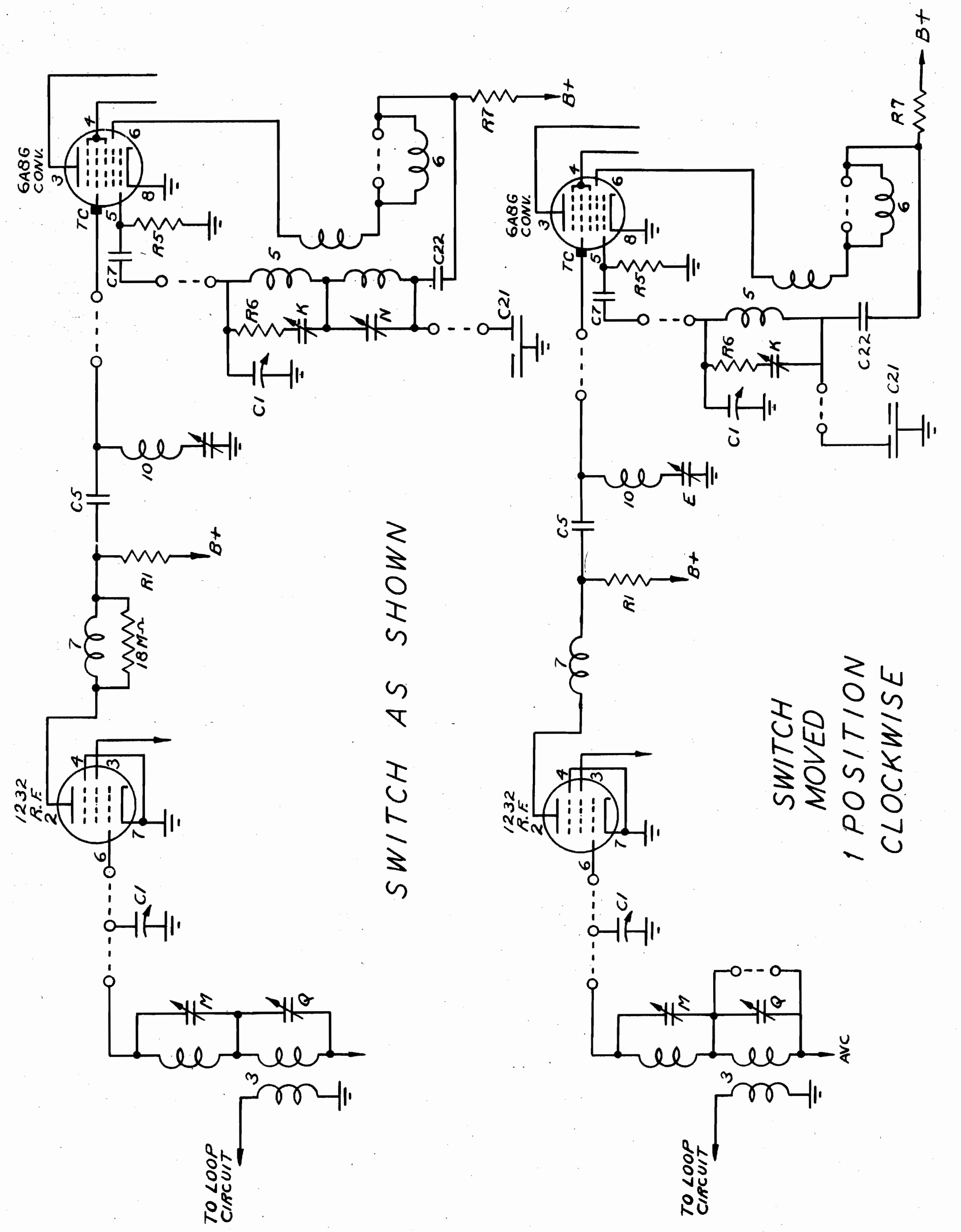
ZENITH RADIO CORP.



ZENITH RADIO CORP.

MODELS 10S-531, 10S-549, 10S-566, 10S-589, 10S-590

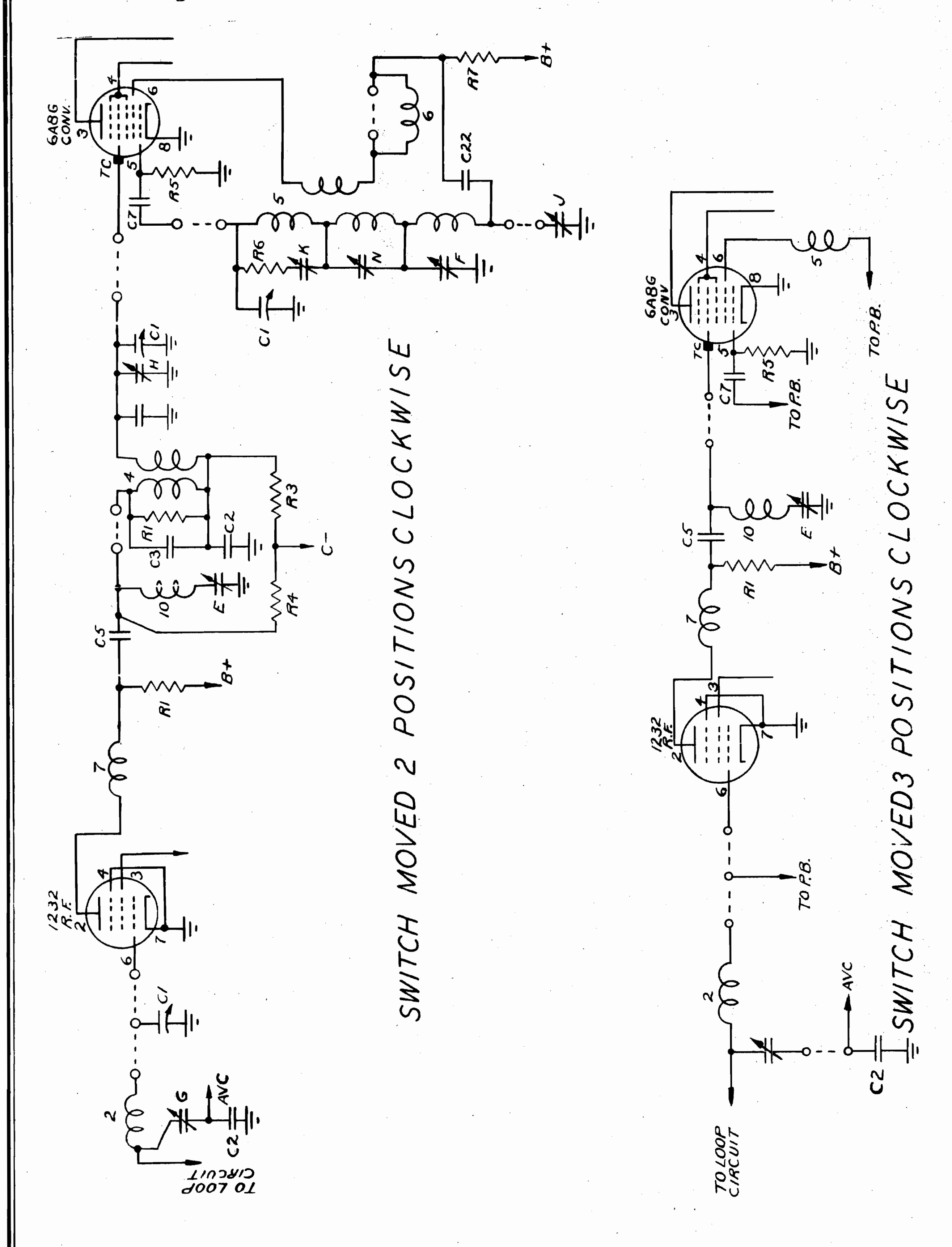
See Zenith Page 12-23



MODELS 10S-531, 10S-549, 10S-566, 10S-589, 10S-590

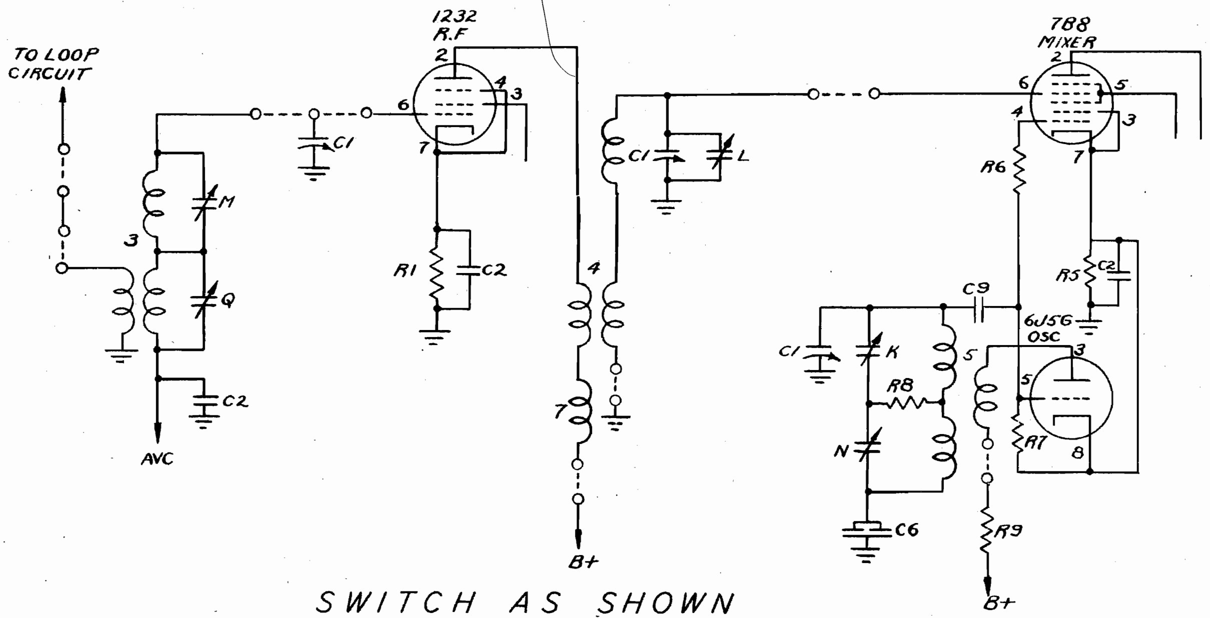
ZENITH RADIO CORP.

See Zenith Page 12-23

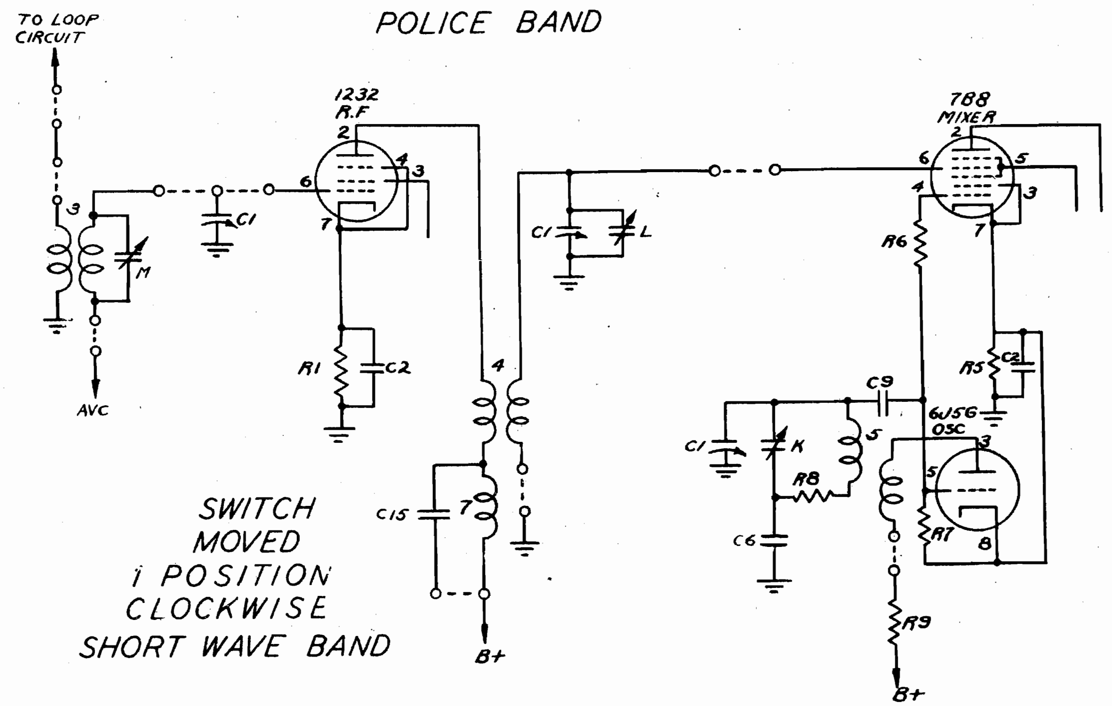


ZENITH RADIO CORP. MODELS 12S-550Z, 12S-568E, 12S-568Z, 12S-569E, 12S-569Z, 12S-595Z

See Zenith Page 12-25



SWITCH AS SHOWN
POLICE BAND

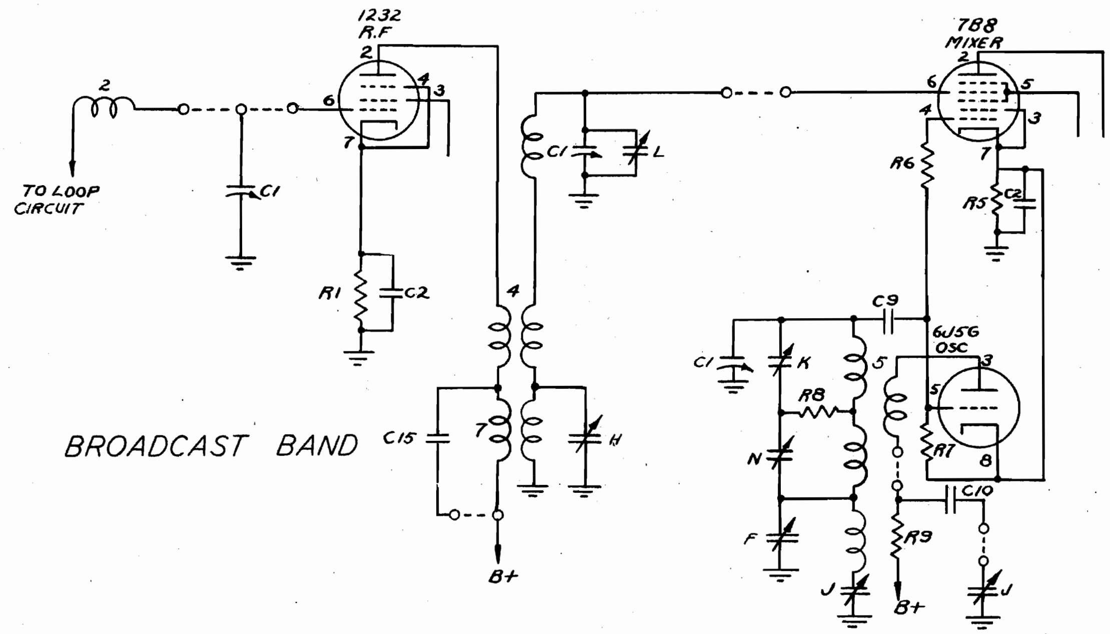


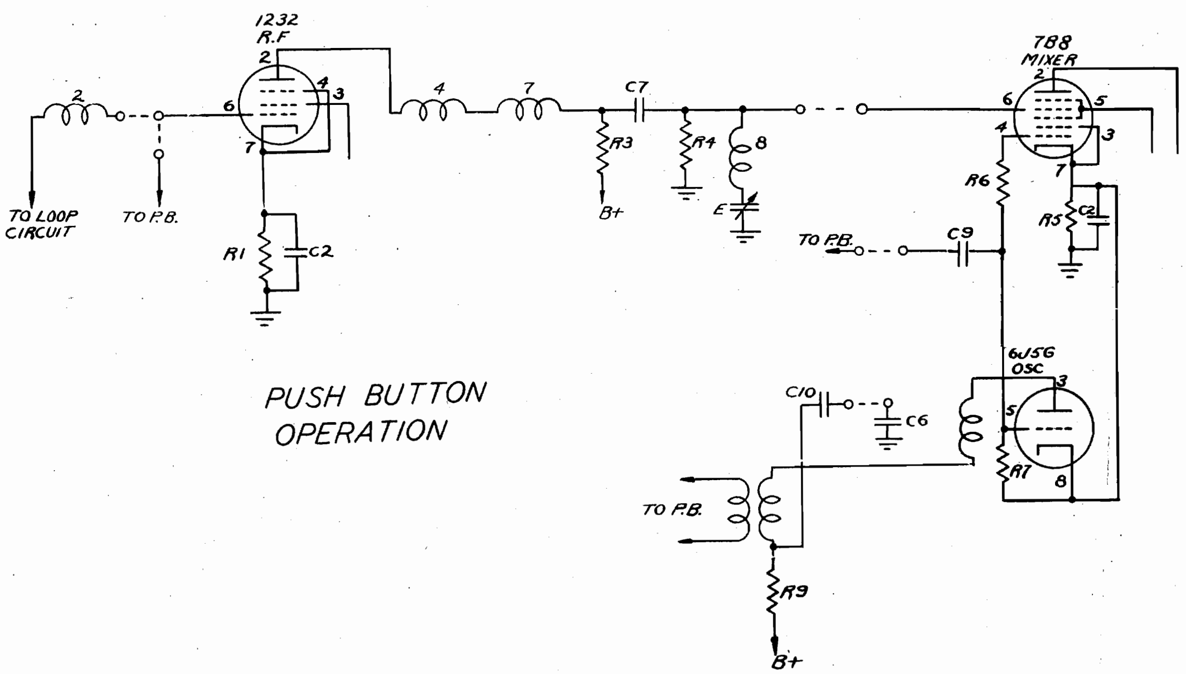
SWITCH MOVED 1 POSITION CLOCKWISE SHORT WAVE BAND

MODELS 12S-550Z, 12S-568E, 12S-568Z, 12S-569E, 12S-569Z, 12S-595Z

ZENITH RADIO CORP.

See Zenith Page 12-25

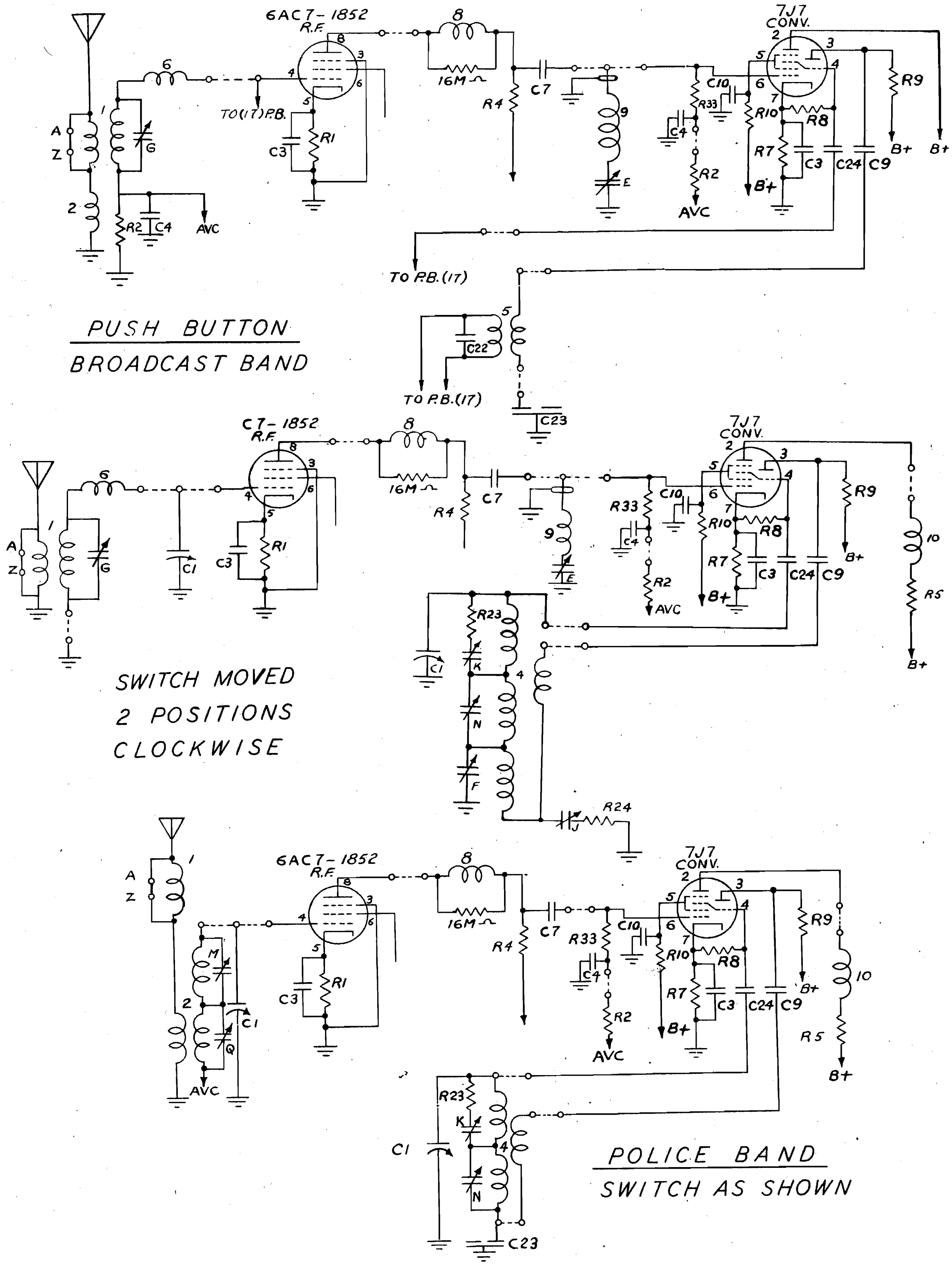




ZENITH RADIO CORP.

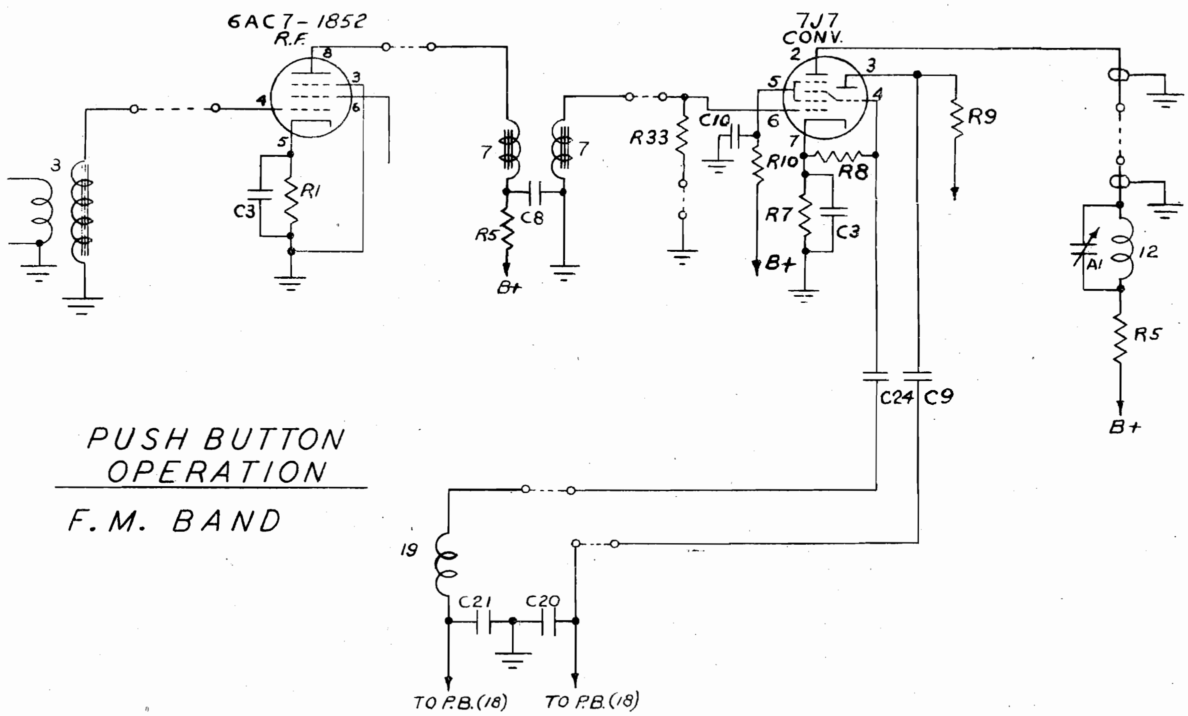
MODELS 10H551, 10H571

See Zenith Page 12-22



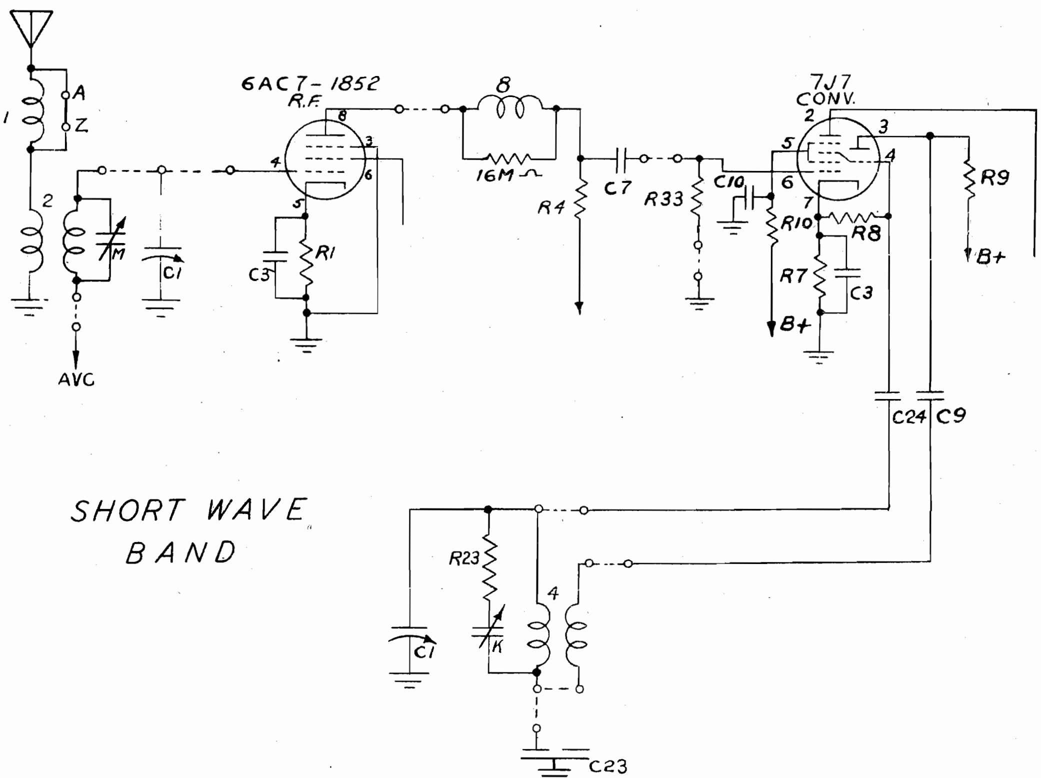
MODELS 10H551, 10H571
See Zenith Page 12-22

ZENITH RADIO CORP.



PUSH BUTTON
OPERATION

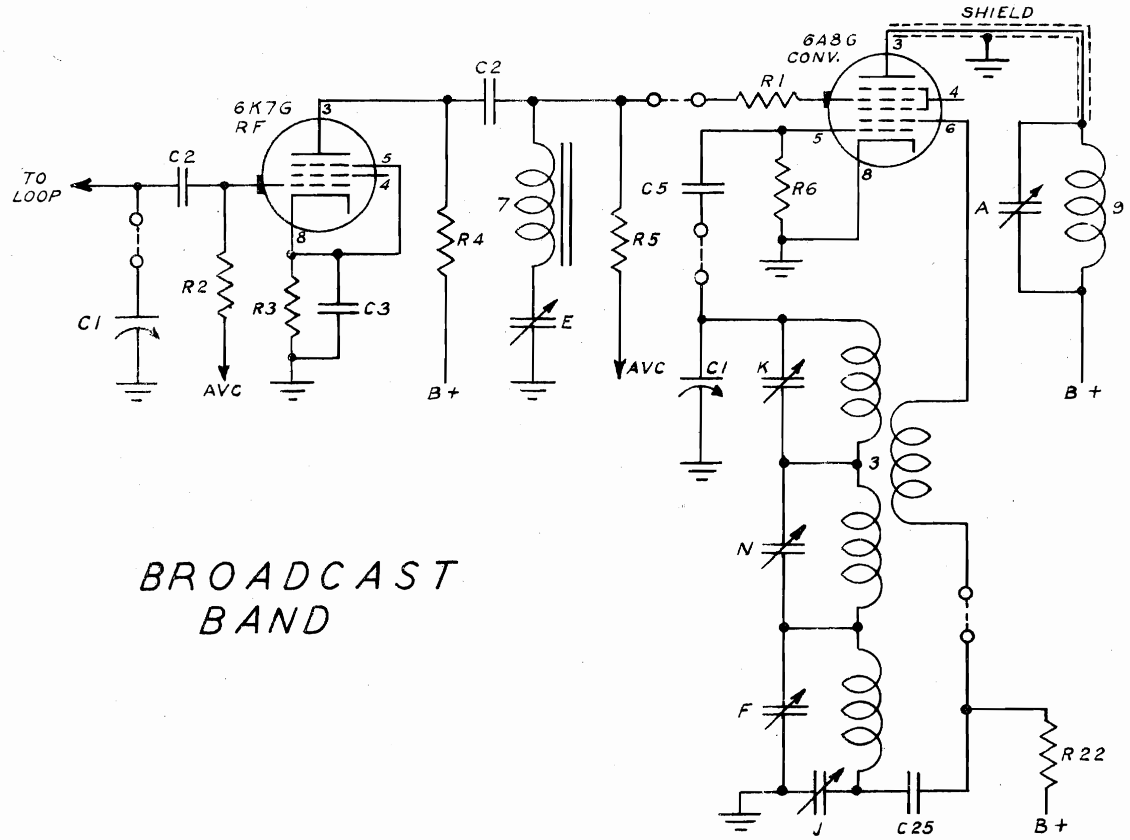
F.M. BAND



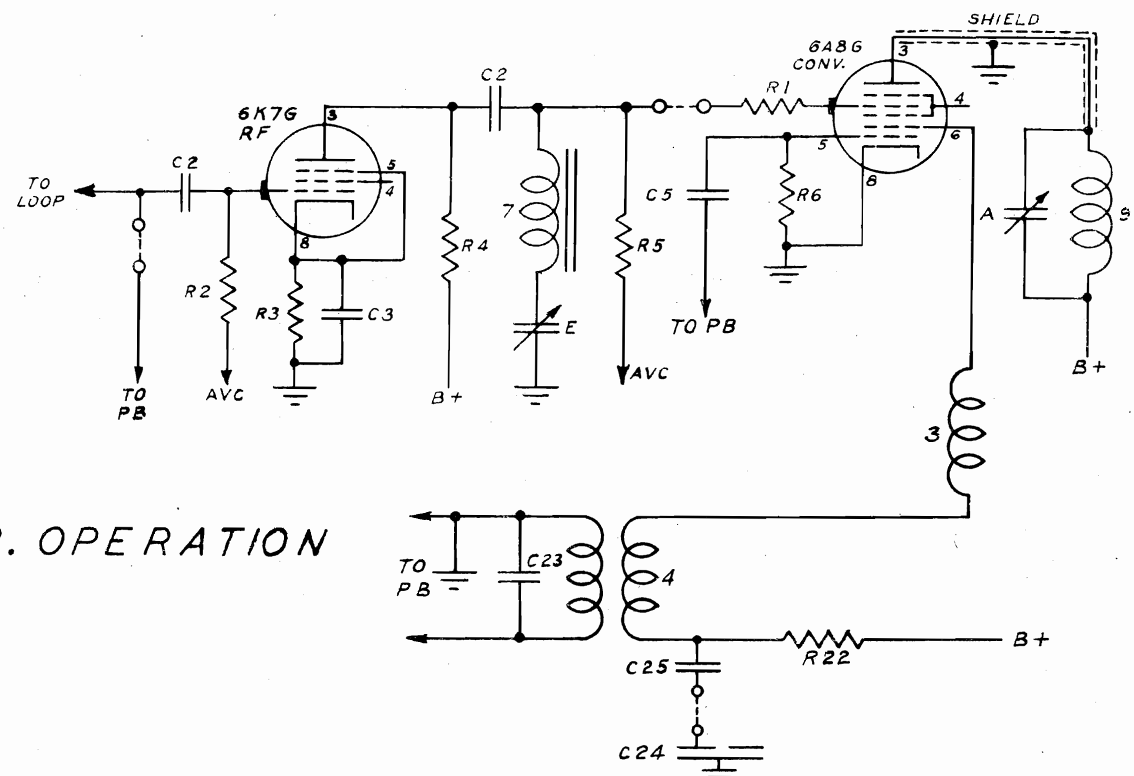
SHORT WAVE
BAND

ZENITH RADIO CORP.

MODEL 7S-585
See Zenith Page 12-17



BROADCAST BAND

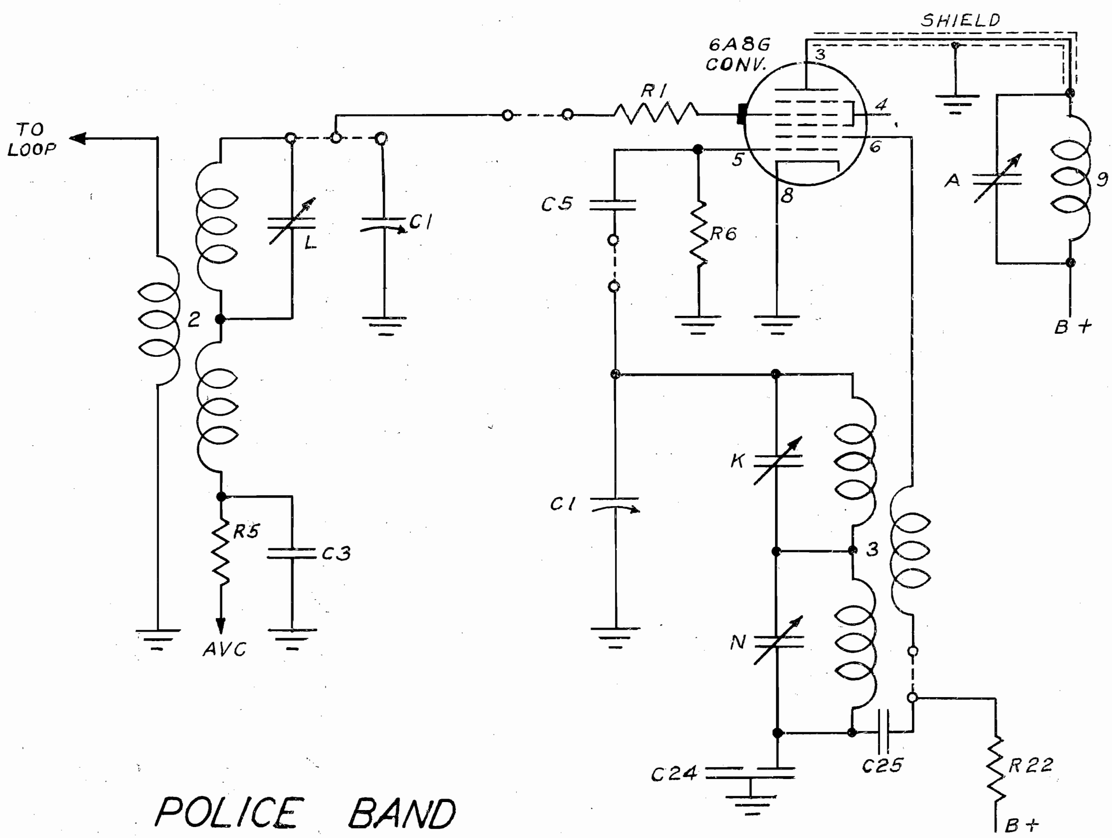


P. B. OPERATION

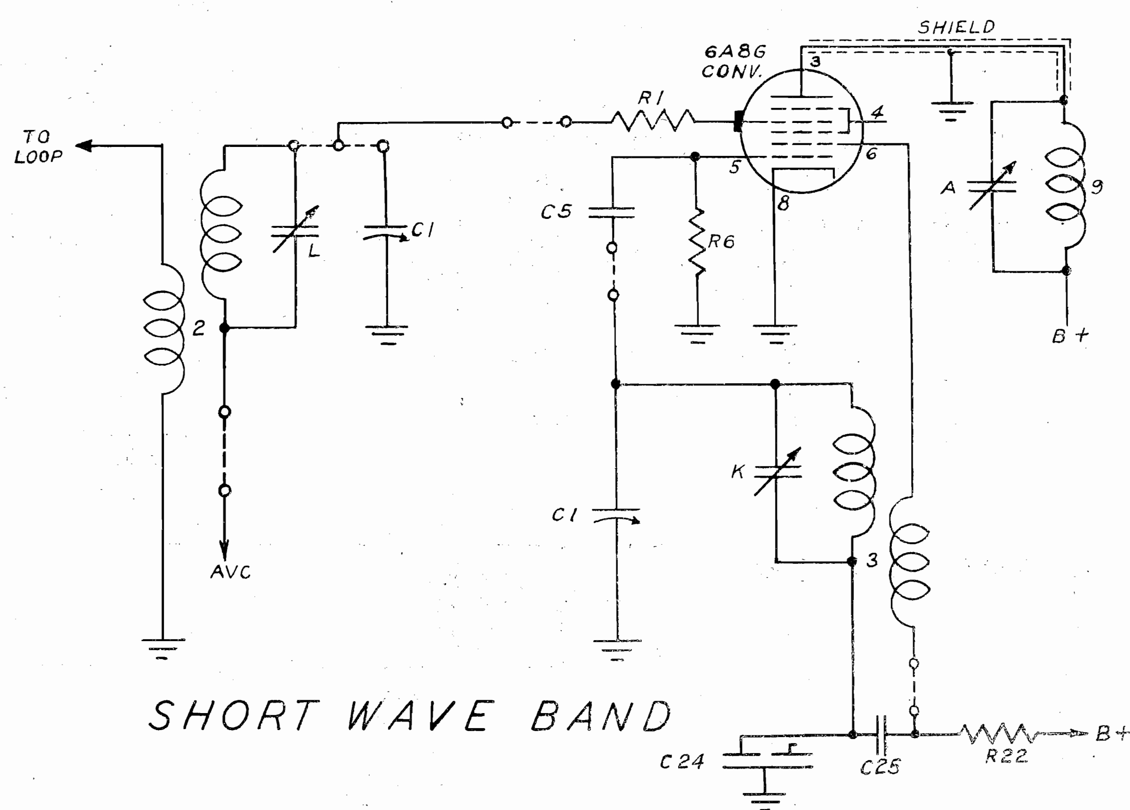
MODEL 7S-585

See Zenith Page 12-17

ZENITH RADIO CORP.



POLICE BAND

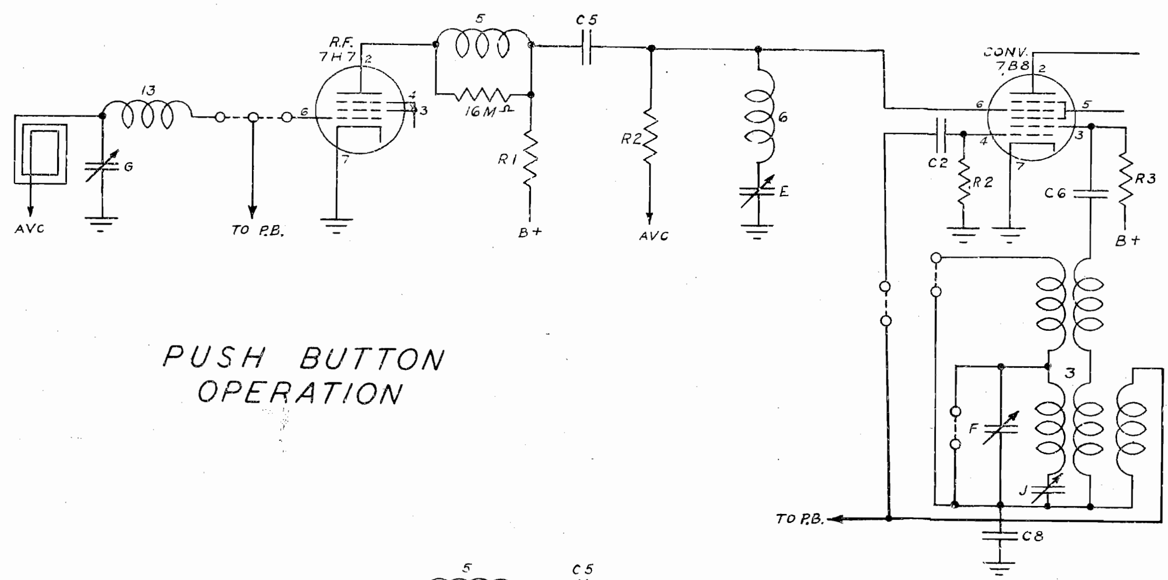


SHORT WAVE BAND

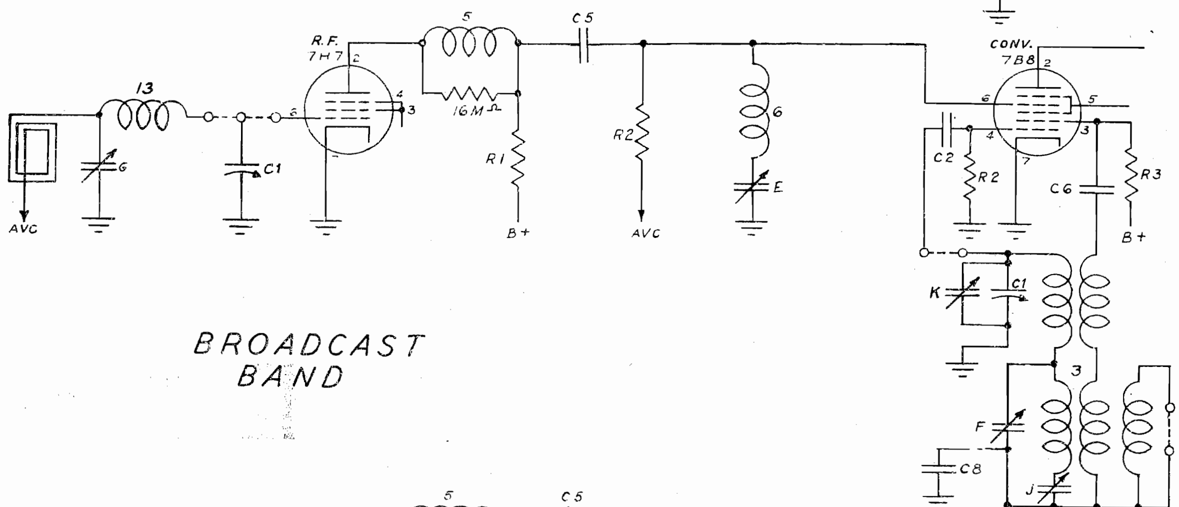
MODEL 6S-596, 6S-597
See Zenith Page 12-14

ZENITH RADIO CORP.

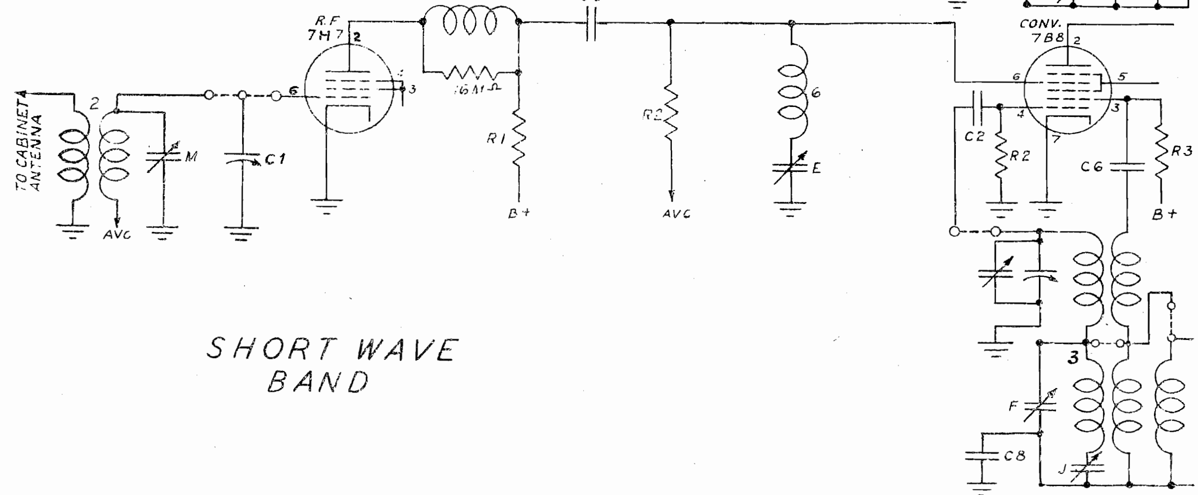
MODELS 6S-532, 6S-546, 6S-556
See Zenith Page 12-36



PUSH BUTTON
OPERATION



BROADCAST
BAND



SHORT WAVE
BAND