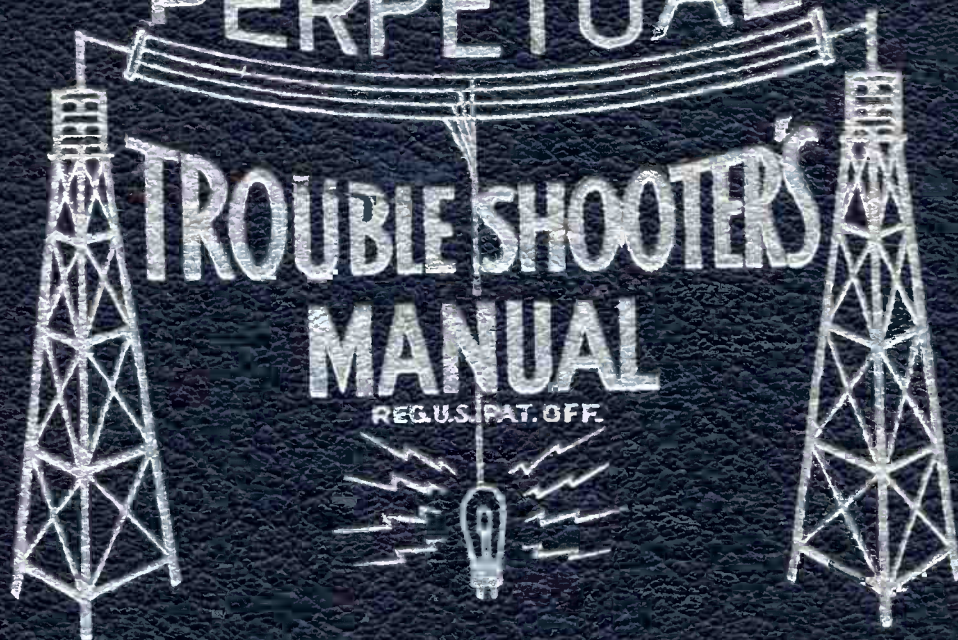


VOLUME XII

PERPETUAL



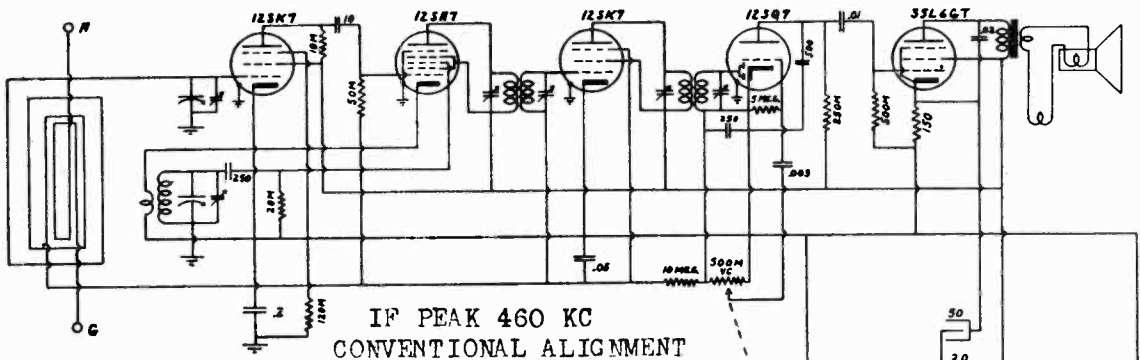
TROUBLE SHOOTER'S  
MANUAL

REG. U.S. PAT. OFF.

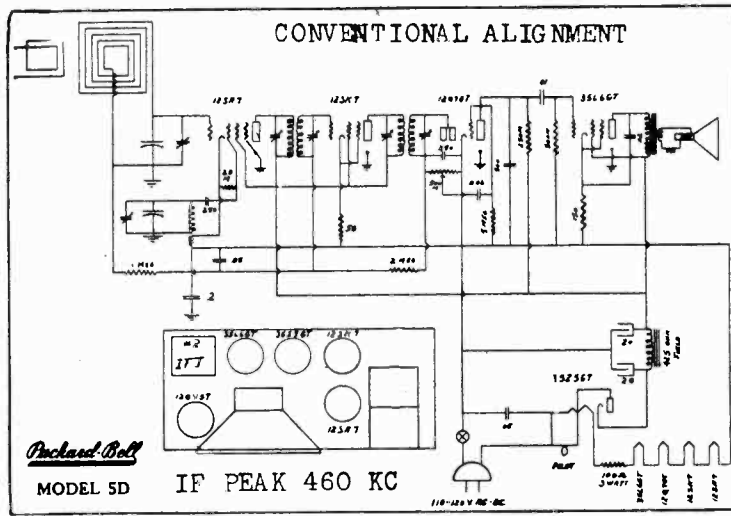
JOHN F. RIDER

PACKARD BELL CO.

MODEL 5D  
 MODEL 6A  
 MODEL 56



IF PEAK 460 KC  
 CONVENTIONAL ALIGNMENT



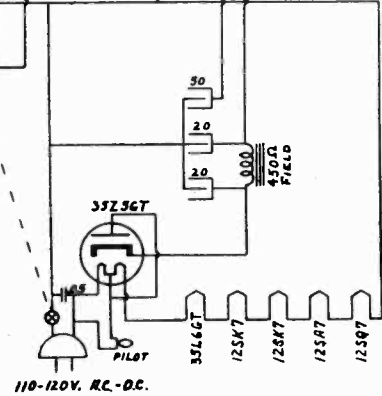
CONVENTIONAL ALIGNMENT

*Packard Bell*

MODEL 5D

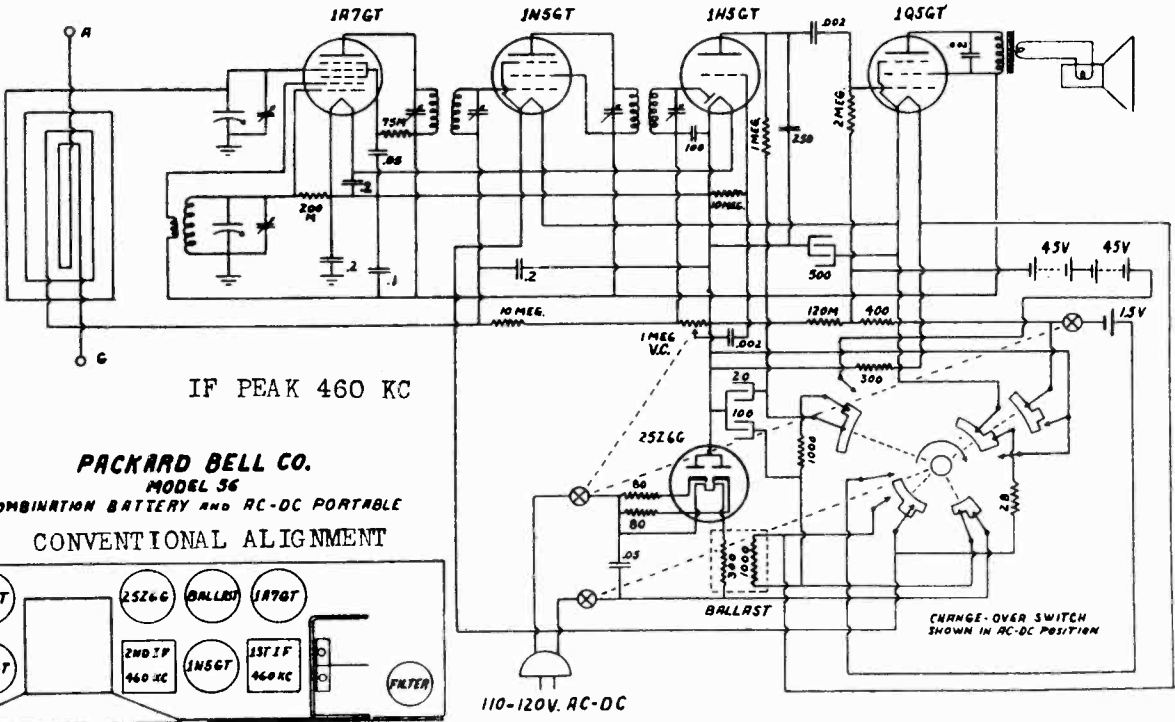
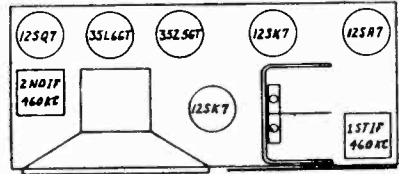
IF PEAK 460 KC

110-120 V. AC-DC



110-120V. AC-DC.

PACKARD BELL CO.  
 MODEL 6A

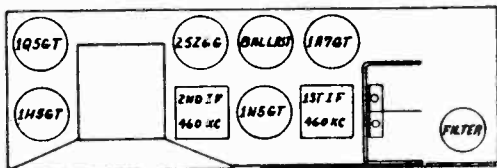


IF PEAK 460 KC

PACKARD BELL CO.  
 MODEL 56

COMBINATION BATTERY AND AC-DC PORTABLE

CONVENTIONAL ALIGNMENT

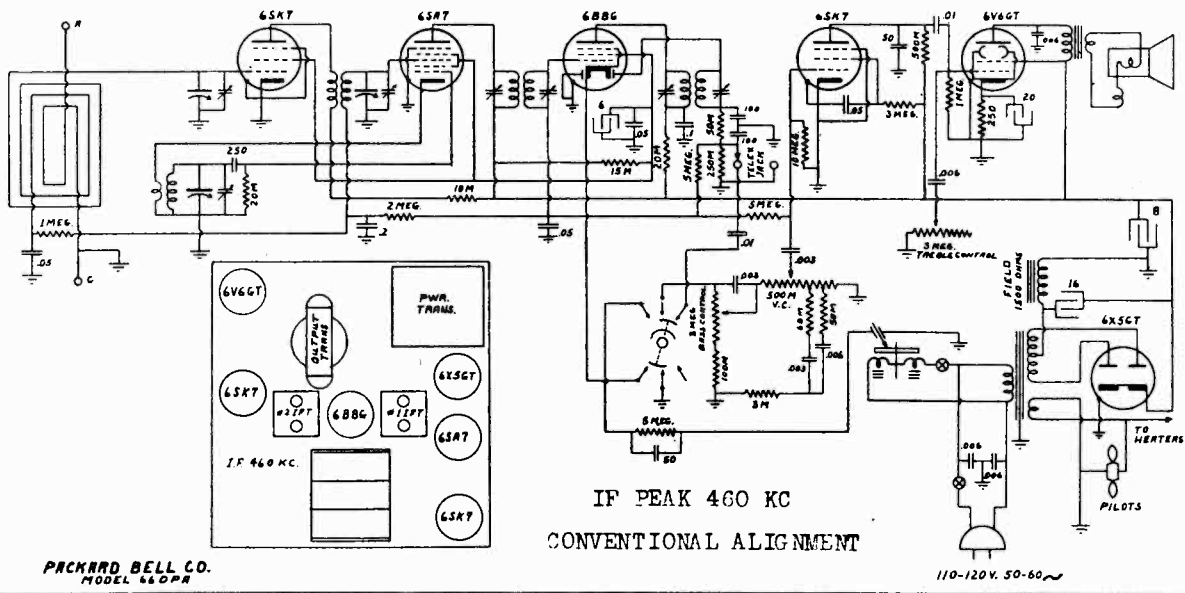
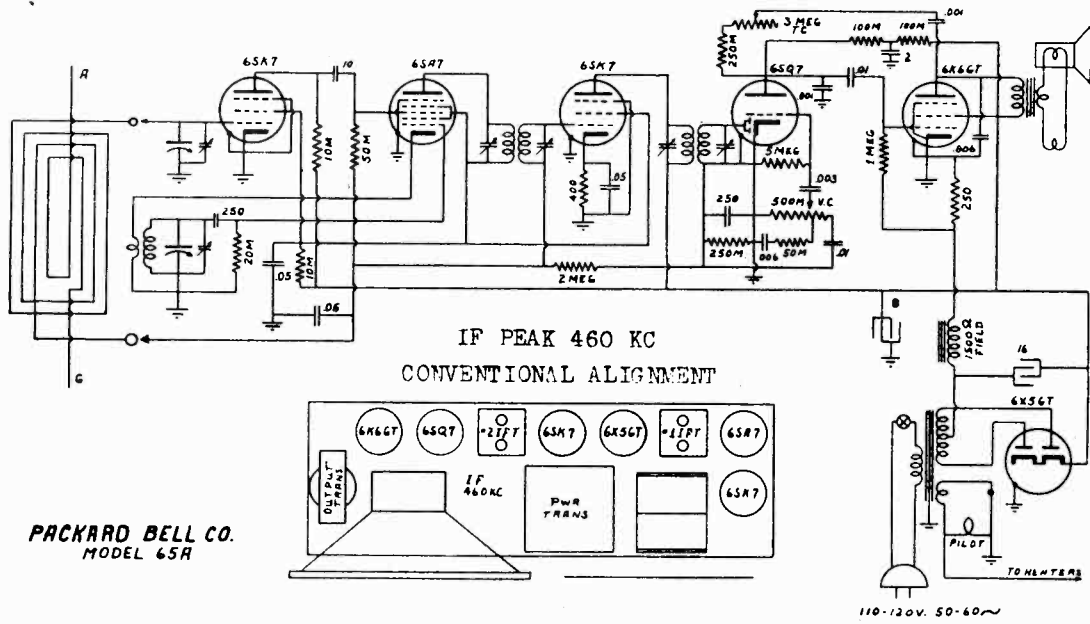
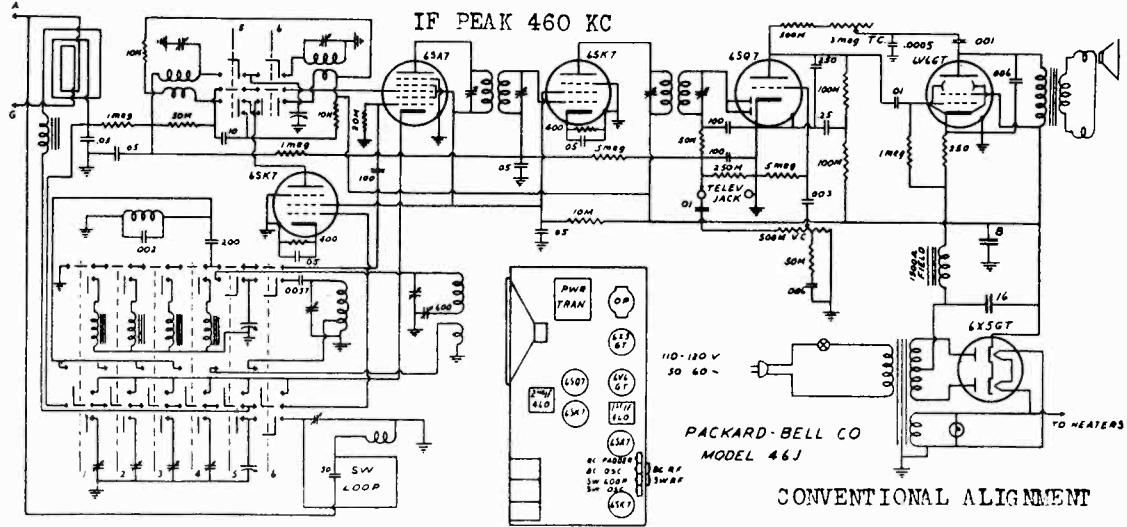


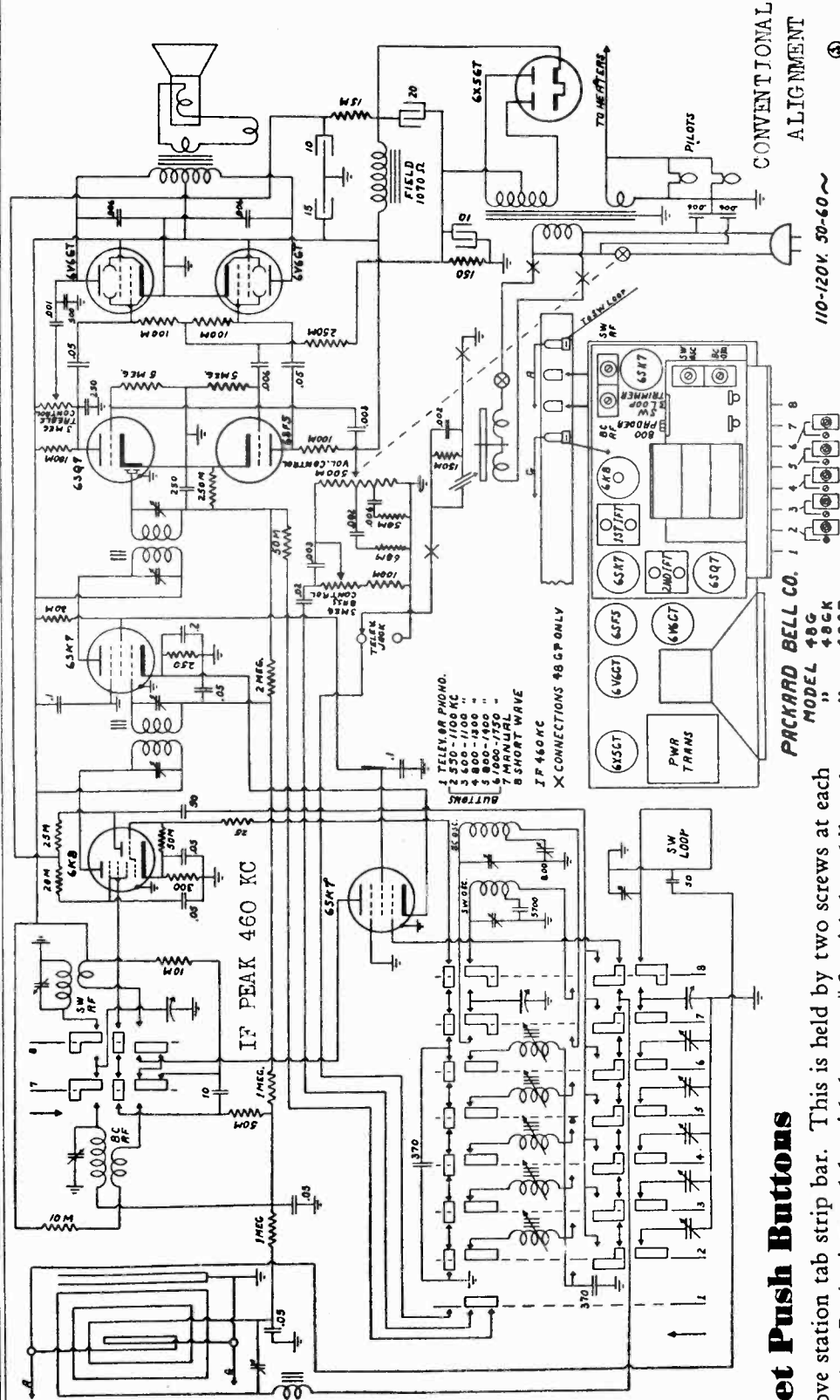
110-120V. AC-DC

CHANGE-OVER SWITCH  
 SHOWN IN AC-DC POSITION

MODEL 46J  
MODEL 65A  
MODEL 66DPA

PACKARD BELL CO.





### To Set Push Buttons

Remove station tab strip bar. This is held by two screws at each end of strip. Beginning at left with button #2 with low kilocycle frequency stations, five stations may be set on buttons in the order of their kilocycle frequency as follows:

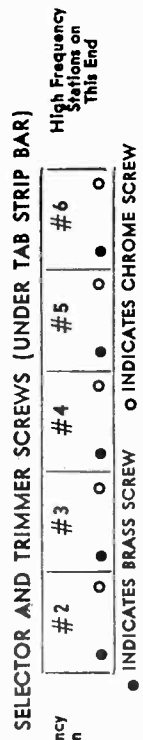
Tune and play the station desired on manual tuning, (7th button) for identification purposes. Now, push button #2 "in." Using small screw driver, rotate #2 brass selector screw (oscillator) until desired station is heard with maximum volume. Then rotate #2 chrome selector screw (loop trimmer) until station is heard best.

Repeat this procedure for each of the other four broadcast station buttons using corresponding selector and trimmer screws until a total of five stations have been set.

CONVENTIONAL ALIGNMENT

110-120V. 50-60~

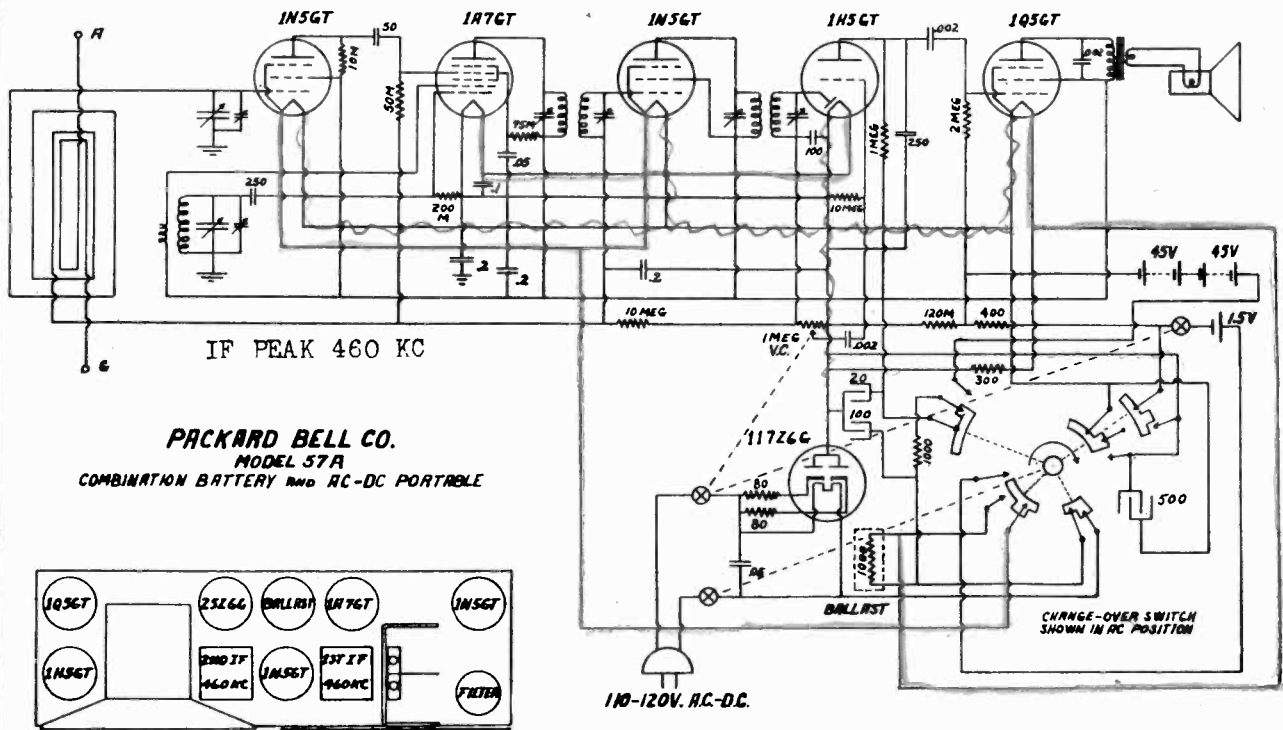
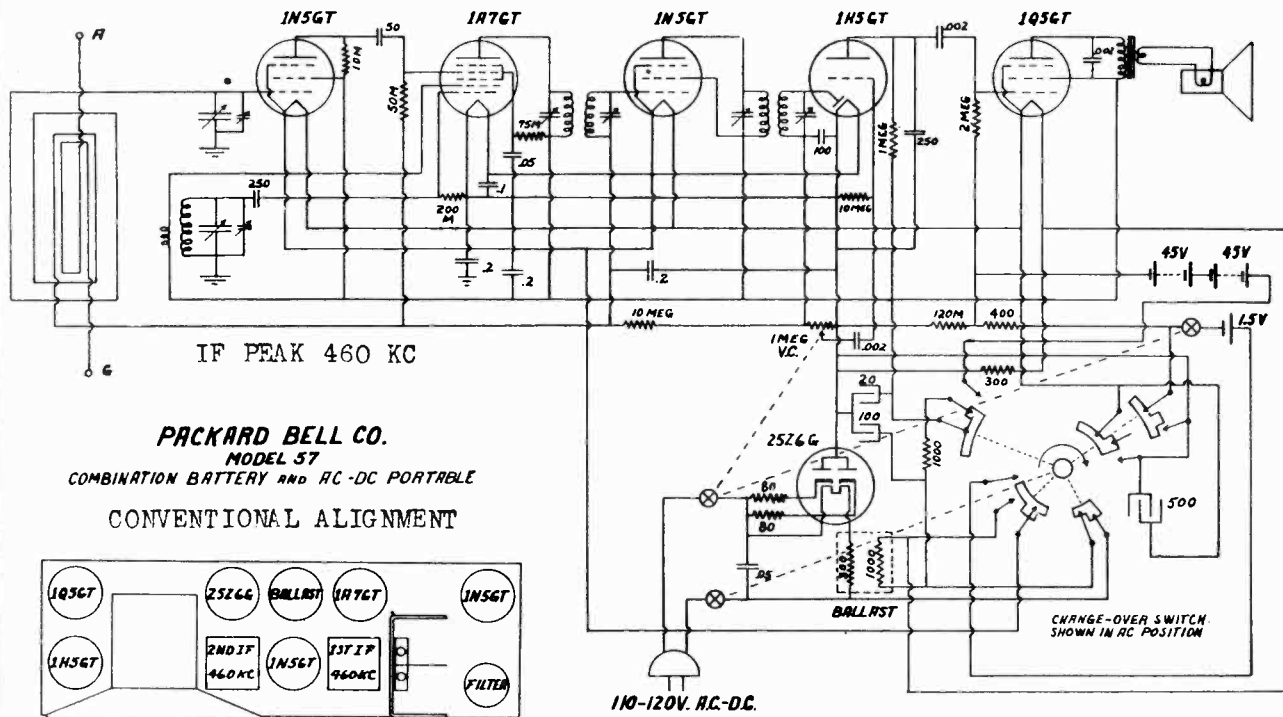
PACKARD BELL CO.  
MODEL 48G  
" 48GK  
" 48GP



Button #	Broadcast Station	Broadcast Station	Broadcast Station	Broadcast Station	Broadcast Station	Manual Dial Tuning	Shortwave Tuning
#1							
#2	●	○	○	○	○	○	○
#3	○	○	○	○	○	○	○
#4	○	○	○	○	○	○	○
#5	○	○	○	○	○	○	○
#6	○	○	○	○	○	○	○
#7	○	○	○	○	○	○	○
#8	○	○	○	○	○	○	○

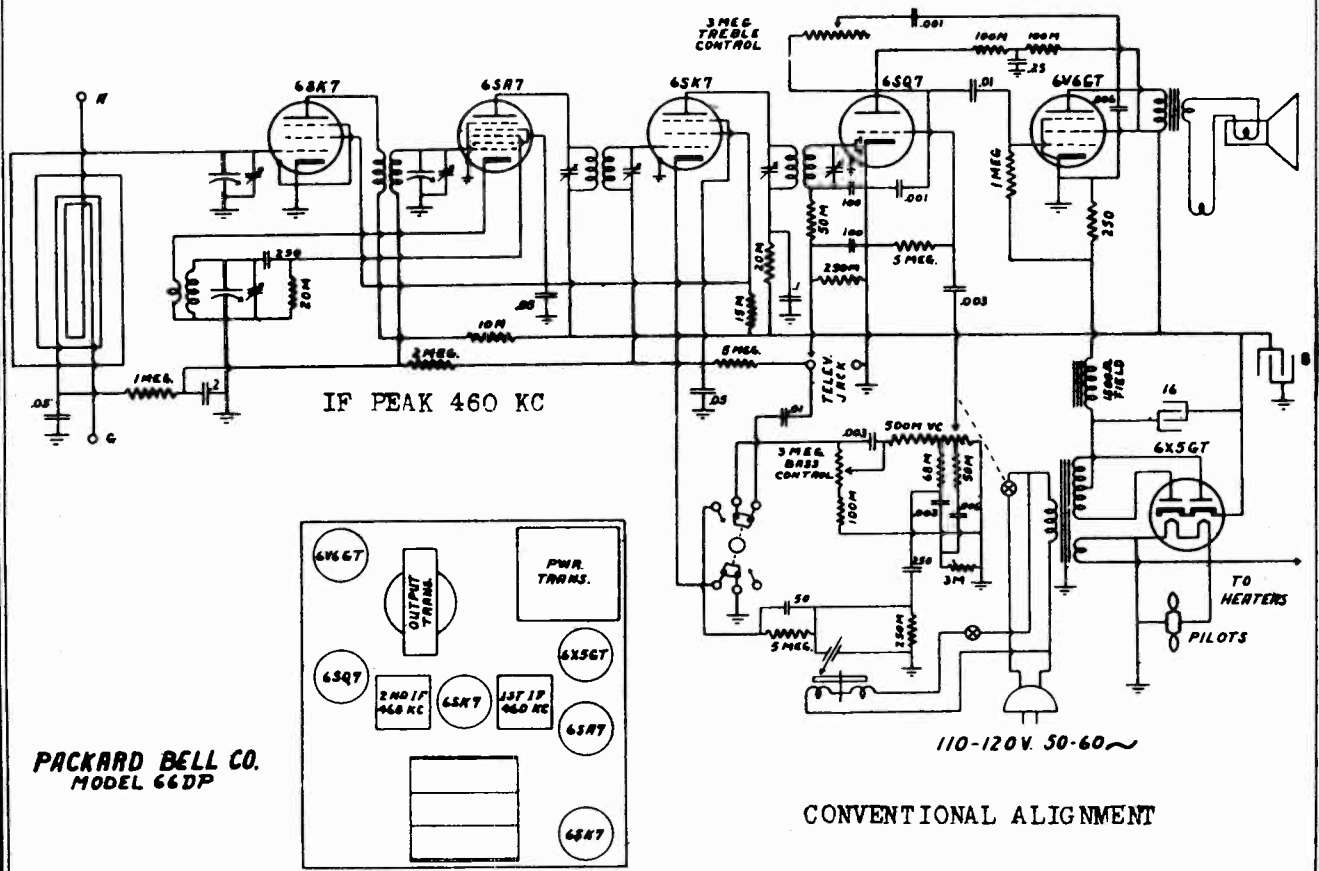
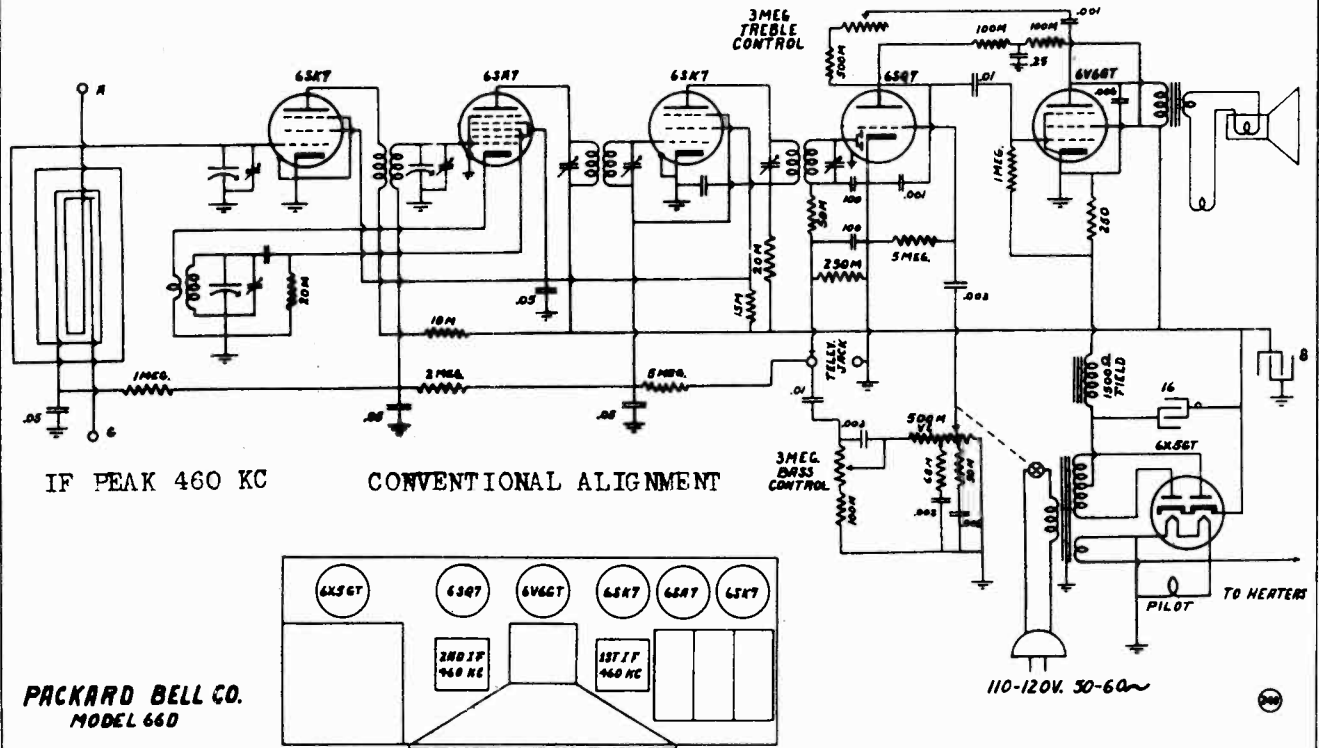
MODELS 57, 57A

PACKARD BELL CO.

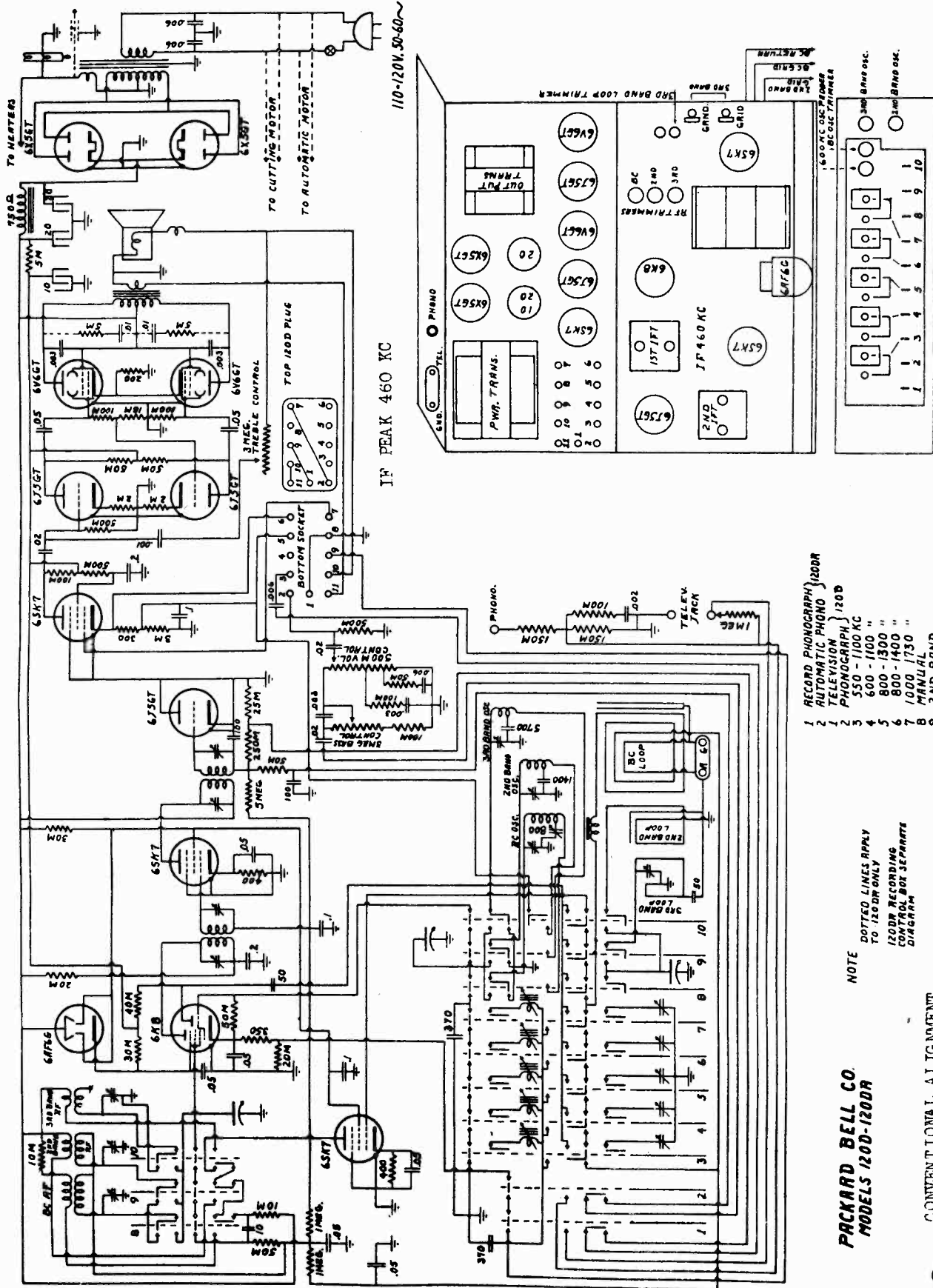


PACKARD BELL CO.

MODELS 66D, 66DP



MODELS 120D, 120 DR



- 1 RECORD PHONOGRAPH } 120DR
- 2 AUTOMATIC PHONO } 120DR
- 1 TELEVISION } 120D
- 1 PHONOGRAPH } 120D
- 3 550 - 1100 "
- 4 600 - 1100 "
- 5 800 - 1300 "
- 6 800 - 1400 "
- 7 1000 - 1750 "
- 8 MANUAL
- 9 2ND BAND
- 10 3RD BAND

NOTE  
 DOTTED LINES APPLY  
 TO 120DR ONLY  
 120DR RECORDING  
 CONTROL BOX SEPARATE  
 DIAGRAM

PACKARD BELL CO.  
 MODELS 120D-120DR

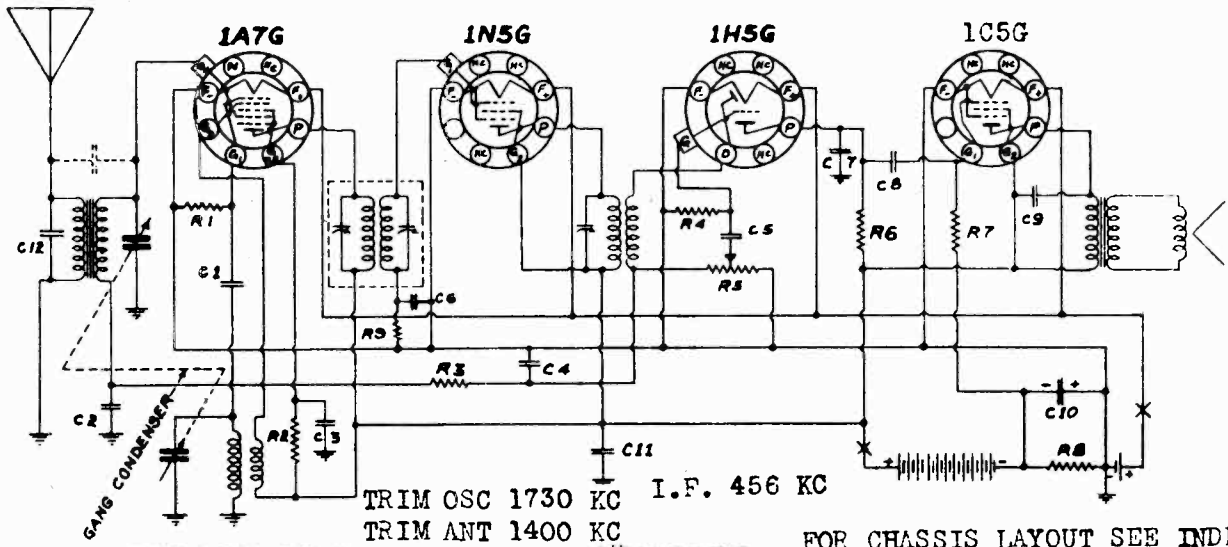
CONVENTIONAL ALIGNMENT

PARKER McCRORY MFG. CO.

1940 DeLuxe MODEL 4A

1939 ROYAL MODEL 4A

1939 MASTERPIECE 6C



TRIM OSC 1730 KC I.F. 456 KC  
TRIM ANT 1400 KC

FOR CHASSIS LAYOUT SEE INDEX

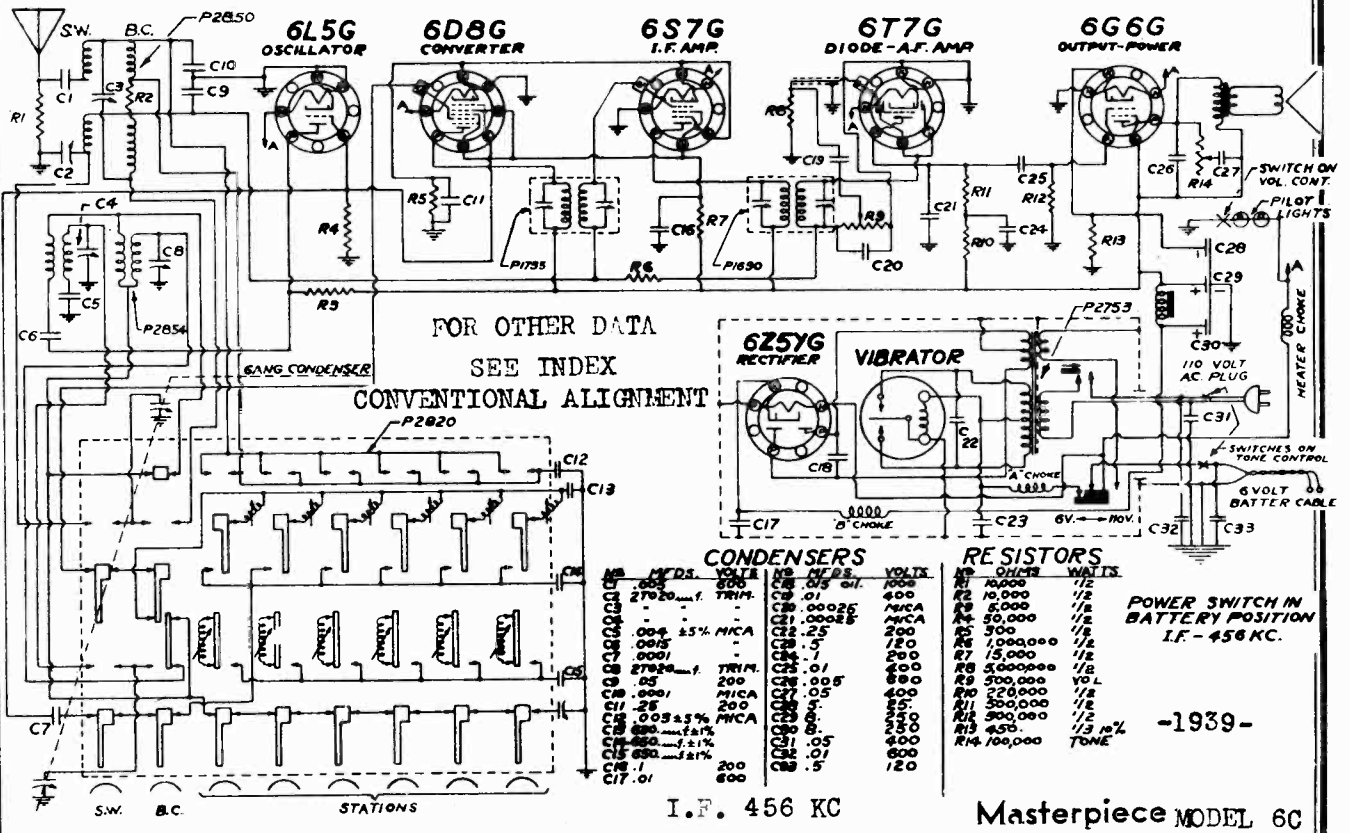
CAPACITORS				RESISTORS					
NO.	CAP.-MFD.	TYPE	VOLTS	NO.	OHMS	WATTS	NO.	OHMS	WATTS
C1	.00025	MICA		R1	200,000	1/2	R6	250,000	1/2
C2	.05	200V.		R2	70,000	1/2	R7	500,000	1/2
C3	1	200V.		R3	1 MEG.	1/2	R8	600	1/2
C4	.00025	MICA		R4	2 MEG.	1/2	R9	2 MEG.	1/2
C5	.01	400V.		R5	500,000				
C6	.002	400V.							
C7	.00025	MICA							
C8	.01	400V.							
C9	1	200V.							
C10	20.	(ELECT.)	25V.						
C11	.1	200V.							
C12	.000000								
C13	.000000								

-1939-

Royal Model 4A

1Q5G used in place of 1C5G in the 1940 DeLuxe Model

CONVENTIONAL ALIGNMENT



FOR OTHER DATA  
SEE INDEX

CONVENTIONAL ALIGNMENT

CONDENSERS				RESISTORS					
NO.	VAL.	TYPE	VOLTS	NO.	OHMS	WATTS	NO.	OHMS	WATTS
C1	.005	TRIM.	1000	R1	70,000	1/2	R1	70,000	1/2
C2	.005	TRIM.	400	R2	10,000	1/2	R2	10,000	1/2
C3	.005	TRIM.	400	R3	5,000	1/2	R3	5,000	1/2
C4	.005	TRIM.	400	R4	50,000	1/2	R4	50,000	1/2
C5	.005	TRIM.	400	R5	300	1/2	R5	300	1/2
C6	.005	TRIM.	400	R6	1,000,000	1/2	R6	1,000,000	1/2
C7	.005	TRIM.	400	R7	15,000	1/2	R7	15,000	1/2
C8	.005	TRIM.	400	R8	5,000,000	1/2	R8	5,000,000	1/2
C9	.05	TRIM.	400	R9	500,000	1/2	R9	500,000	1/2
C10	.05	TRIM.	400	R10	270,000	1/2	R10	270,000	1/2
C11	.05	TRIM.	400	R11	550,000	1/2	R11	550,000	1/2
C12	.05	TRIM.	400	R12	300,000	1/2	R12	300,000	1/2
C13	.05	TRIM.	400	R13	456	1/2	R13	456	1/2
C14	.05	TRIM.	400	R14	100,000	1/2	R14	100,000	1/2
C15	.05	TRIM.	400						
C16	.05	TRIM.	400						
C17	.05	TRIM.	400						

POWER SWITCH IN  
BATTERY POSITION  
I.F. - 456 KC.

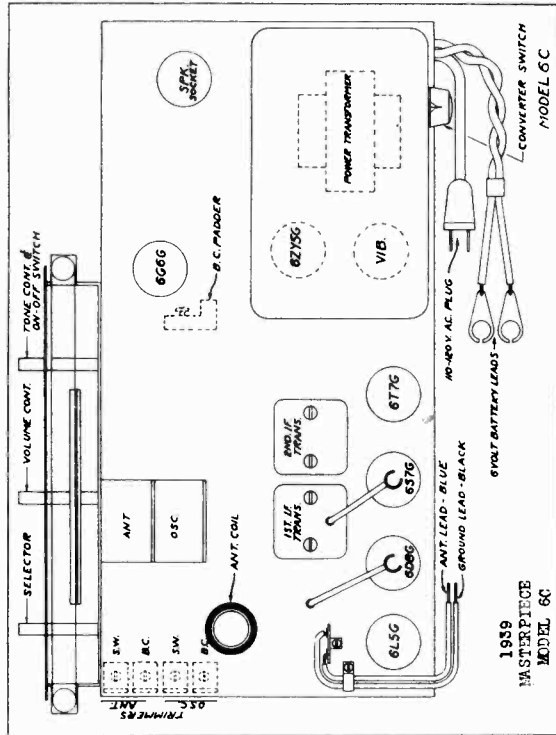
-1939-

Masterpiece MODEL 6C



1939 ROYAL MODEL 4A  
 1939 MASTERPIECE 6C  
 1937 VICTORY MODEL 400

PARKER McCRORY MFG. CO.

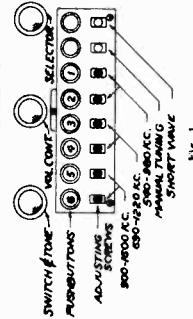
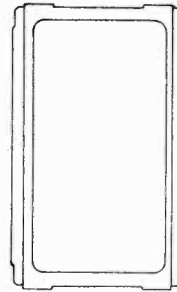


PROCEDURE FOR SETTING UP  
 AUTOMATIC PUSH BUTTONS  
 1939  
 MASTERPIECE

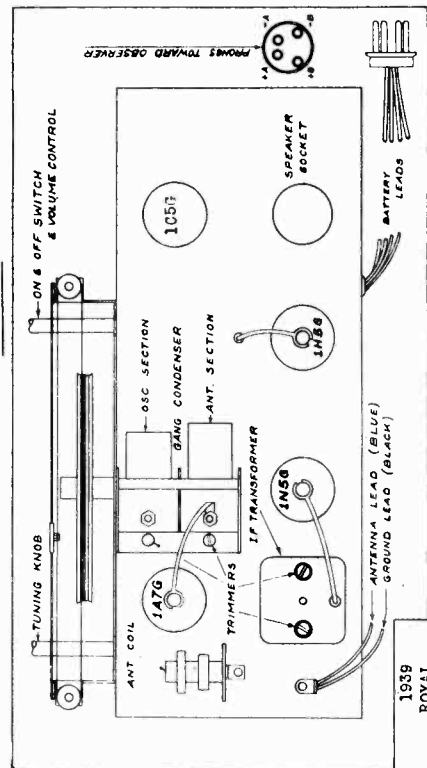
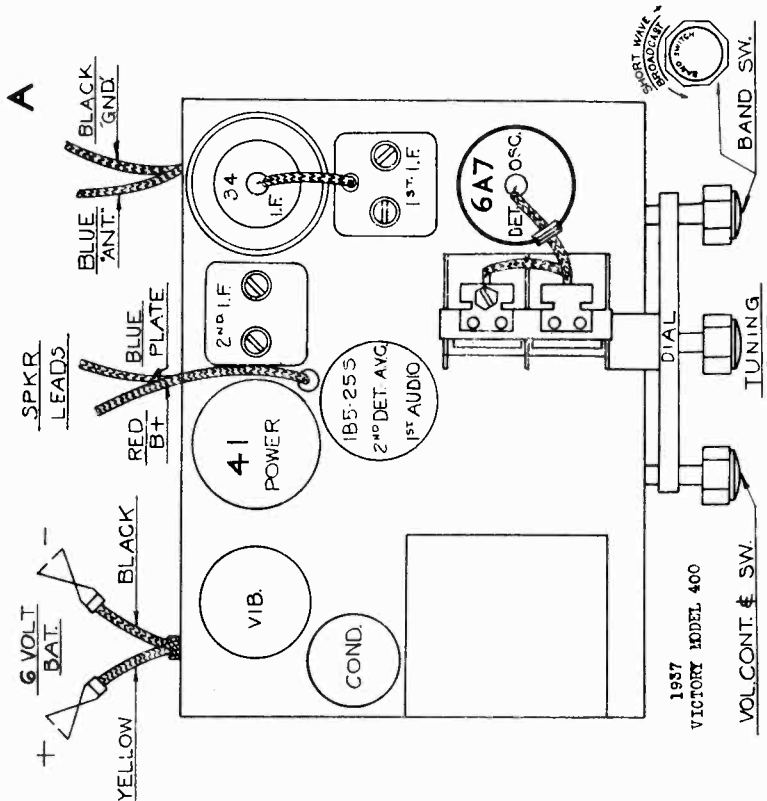
The remaining two (2) push buttons located at the extreme right hand end of the push button plate are for short wave and manual tuning. See Fig. 1. Short wave tuning is accomplished by pressing "short wave" button and tuning with the selector knob. By pressing "manual tuning" button, the automatic disconnects and the selector knob becomes active for the broadcast band.

1. Choose a station having a frequency within the range of button No. 1 (540 to 980 kc).
2. Press "Manual Tuning" button and tune this station conventionally by using the selector knob.
3. Now press button No. 1 and turn adjusting screw in either direction until the previously selected station is heard. Adjust the screw until the station is received with maximum volume.
4. Remove the call letters of the station from the call letter sheet furnished and insert in the window of the adjusting screw.
5. Repeat the above procedure for the remaining five (5) stations.

NOTE: It is advisable to retain the call letter sheet in case of station change later on.



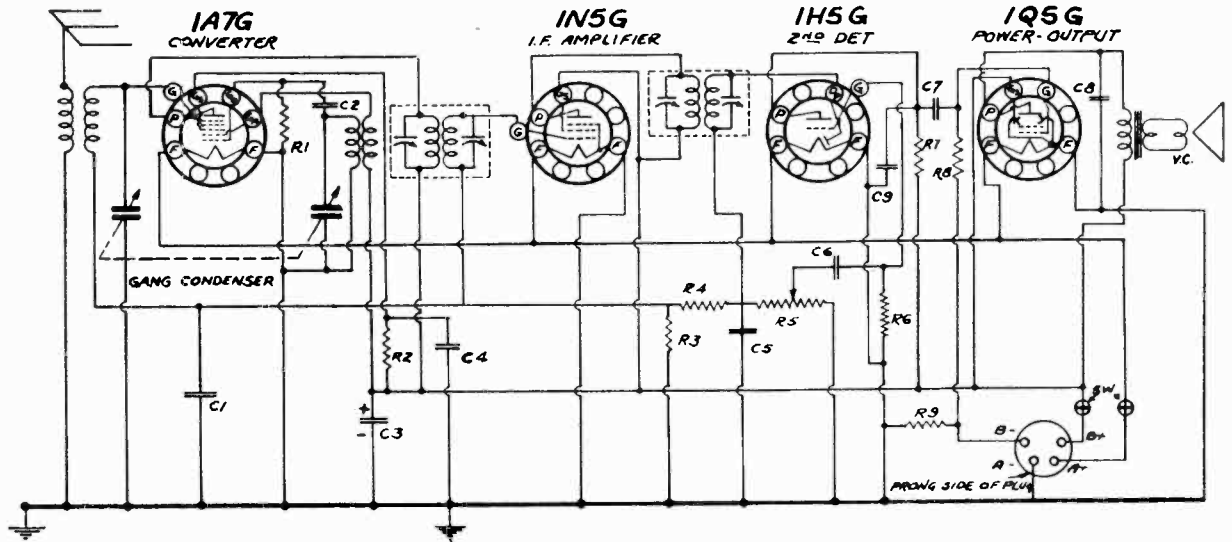
A glance at Fig. 1 will show that there are eight (8) push buttons, six (6) of which are for automatic use; the adjusting screws are located directly below these push buttons. Fig. 1 also shows the tuning range or frequencies covered by each button.



PARKER McCRORY MFG. CO.

1940 ROYAL MODEL 4J

1940 IMPERIAL  
TABLE MODEL 7C



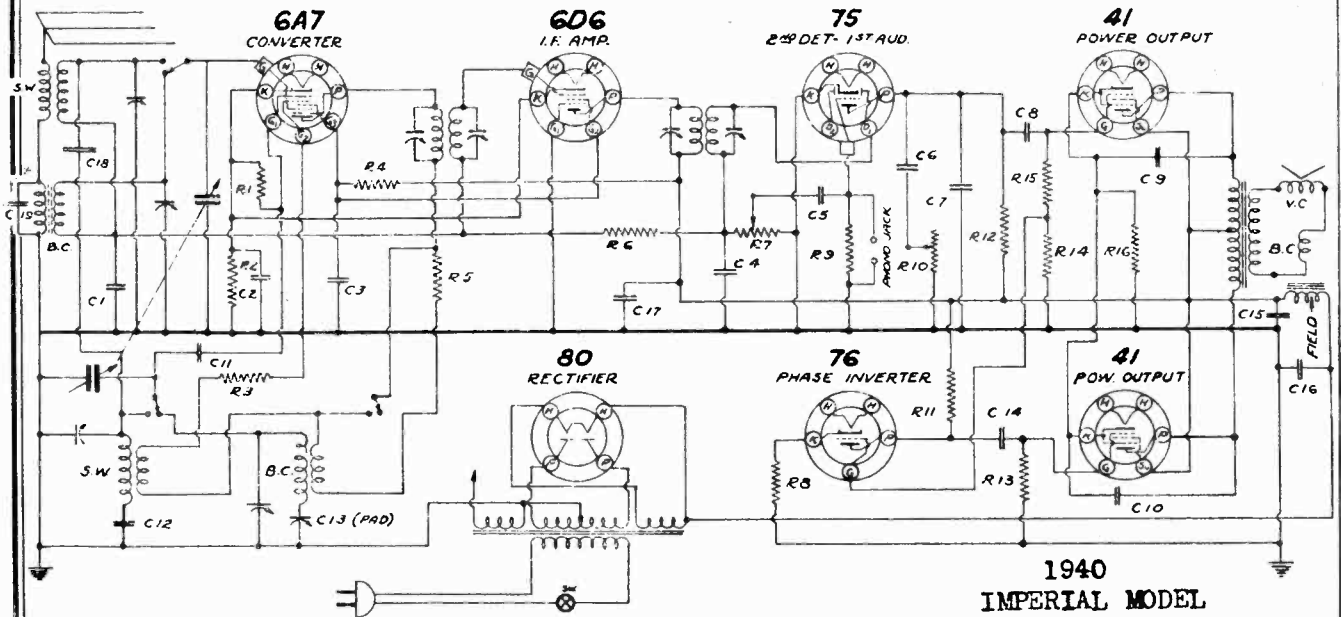
CONVENTIONAL ALIGNMENT - TRIM OSC 1730 KC, ANT 1400 KC

CAPACITORS				RESISTORS			
No.	MFDs	VOLTS	No.	MFDs	VOLTS	No.	OHMS WATTS
C1	.05	200	C6	.01	400	R1	200,000 1/2
C2	.00005	MICA	C7	.01	400	R2	70,000 1/2
C3	4.0 (ELECT.)	150	C8	.002	400	R3	2,000,000 1/2
C4	.05	200	C9	.00025	MICA	R4	2,000,000 1/2
C5	.00025	MICA				R5	300,000 1/2
						R6	2,000,000 1/2
						R7	400,000 1/2
						R8	1,000,000 1/2
						R9	440 1/2

1940  
ROYAL MODEL 4J

I.F. 455 K.C.

CONVENTIONAL ALIGNMENT



CAPACITORS				RESISTORS			
No.	MFDs	VOLTS	No.	MFDs	VOLTS	No.	OHMS WATTS
C1	.05	200	C11	.0001	MICA	R1	50,000 1/2
C2	.25	200	C12	.0045%	MICA	R2	200 1/2
C3	.05	400	C13	1005 CONN	MICA	R3	350 1/2
C4	.00025	MICA	C14	.01	100	R4	20,000 1/2
C5	.01	400	C15	10.0	350	R5	1,000 1/2
C6	.005	600	C16	10.0	350	R6	2 MEG 1/2
C7	.00025	MICA	C17	.05	400	R7	300,000 VOL CON.
C8	.01	400	C18	GIMMICK		R8	3,000 1/2
C9	.005	600	C19	.0001	MICA	R9	5 MEG 1/2
C10	.025	600				R10	500,000 TONE SW
						R11	50,000 1/2
						R12	250,000 1/2
						R13	500,000 1/2
						R14	100,000 1/2
						R15	400,000 1/2
						R16	300 1/2

1940  
IMPERIAL MODEL  
7C

I.F. 455 K.C.  
BAND SWITCHES SHOWN IN BROADCAST  
POSITION  
BOTTOM VIEW OF TUBE SOCKETS SHOWN  
GANG CONDENSER CAPACITY 443 MFDs.

FOR OTHER DATA SEE INDEX

1940 IMPERIAL  
TABLE MODEL 7C

PARKER McCRORY MFG. CO.

1940 IMPERIAL  
CONSOLE MODEL 7H

**SERVICE INFORMATION**  
1940 IMPERIAL TABLE MODEL 7C

**SPEAKER** (Part No. P2499) 6" Dynamic  
No. 1, AVC; No. 2, grid; No. 3, Ant.; No. 4, ground.  
No. 4 is grounded to the mounting strip.  
Primary—No. 3 and No. 4—Resistance...27.1 ohms  
Secondary—No. 1 and No. 2—Resistance 1.9 ohms

**Short Wave Oscillator Coil** (Part No. P3198)  
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, Plate; No. 2, B+; No. 3, Grid; No. 4, Pad.  
Secondary—No. 3 and No. 4—Resistance .07 ohm

**Broadcast Oscillator Coil** (Part No. P3535)  
Looking at the connection end in a clockwise direction starting at the mounting lug side (with dot) the connections are: No. 1, B+; No. 2, Grid; No. 3, Plate; No. 4, Pad.  
Primary—No. 1 and No. 2—Resistance 1.1 ohms  
Secondary—No. 2 and No. 4—Resistance 4.7 ohms

**6A7 tube**  
Plate (P) to ground.....190 volts  
Screen grid (G3) to ground.....94 volts  
Anode grid (G2) to ground.....183 volts  
Cathode (K) to ground.....3 1/2 volts

**6D8 tube**  
Plate (P) to ground.....190 volts  
Screen grid (G2) to ground.....94 volts  
Cathode (K) to ground.....3 1/2 volts

**75 tube**  
Plate (P) to ground.....85 volts

**76 tube**  
Plate (P) to ground.....103 volts  
Screen grid (G3) to ground.....5 volts  
Cathode (K) to ground.....24.1 ohms

**41 tube**  
Plate (P) to ground.....181 volts  
Screen grid (G2) to ground.....190 volts  
Cathode (K) to ground.....12 volts

**80 tube**  
Filament (F) to ground.....260 volts

**Short Wave Antenna Coil** (Part No. P3378)  
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, AVC; No. 2, Ant; No. 3, Grid; No. 4, Ground.  
Primary—No. 2 and No. 4—Resistance... .3 ohm  
Secondary—No. 1 and No. 3—Resistance .07 ohm

**Broadcast Antenna Coil** (Part No. C6031)  
Looking at the connection end in a clockwise direction starting at the mounting strip the terminals are:

**6A7 tube**  
Field resistance.....1400 ohms  
D.C. voice coil resistance.....23 ohms  
Voice coil impedance at 400 cycles.....2.5 ohms  
Voltages—Line 115 volts A.C. Power consumption 75 watts. Volume control maximum. Meter 1000 ohms-per volt.

**6A7 tube**  
Plate (P) to ground.....195 volts  
Screen grid (G3) to ground.....95 volts  
Anode grid (G2) to ground.....187 volts  
Cathode (K) to ground.....3 1/2 volts

**6D8 tube**  
Plate (P) to ground.....195 volts  
Screen grid (G2) to ground.....95 volts  
Cathode (K) to ground.....3 1/2 volts

**75 tube**  
Plate (P) to ground.....75 volts

**76 tube**  
Plate (P) to ground.....100 volts  
Cathode (K) to ground.....5 volts

**41 tube**  
Plate (P) to ground.....184 volts  
Screen grid (G2) to ground.....196 volts  
Cathode (K) to ground.....13.5 volts

**80 tube**  
Filament (F) to ground.....302 volts

**Short Wave Antenna Coil** (Part No. P3378)  
Looking at the connection end in a clockwise direction starting at the mounting lug side the connections are: No. 1, AVC; No. 2, Ant; No. 3, Grid; No. 4, Ground.  
Primary—No. 2 and No. 4—Resistance... .3 ohm  
Secondary—No. 1 and No. 3—Resistance .07 ohm

**Broadcast Antenna Coil** (Part No. C6031)  
Looking at the connection end in a clockwise direction starting at the mounting strip the terminals are:

**ALIGNMENT DATA**

**LF 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 LF 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 .002 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 screwdrivers (See Index for trimmer locations.) The next step is to set the signal generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. Next, re-set the dial pointer on the receiver and the signal generator to 600 KC. Slowly increase or decrease the oscillator padding condenser and at the same time continuously tune back and forth across the signal with the receiver until the maximum reading is obtained on the output meter.

Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not

**SERVICE INFORMATION**  
1940 IMPERIAL CONSOLE MODEL 7H

**TUNING DRIVE**  
If the drive shaft slips when using manual tuning, push this drive shaft toward the power transformer until it clicks and then loosen the two set screws holding the driven wheel in place on the gang condenser shaft. (See Fig. 2.) Move this wheel in or out on the shaft so it is 1/16 of an inch from the rubber ring on the drive shaft. CAUTION, do not turn the dial pointer setting to be incorrect. Turning the drive shaft should now cause it to make a firm contact with the driven wheel and then, when this shaft is pushed toward the power transformer, if it swings free of the driven wheel, the adjustment is correct. The driven wheel should now be firmly secured. The drive wheel condenser shaft by means of the set screws.

**SPEAKER** (Part No. P3398) 8" Dynamic  
Field resistance.....1400 ohms  
D.C. voice coil resistance.....23 ohms  
Voice coil impedance at 400 cycles.....2.5 ohms  
Voltages—Line 115 volts A.C. Power consumption 75 watts. Volume control maximum. Meter 1000 ohms-per volt.

**6A7 tube**  
Plate (P) to ground.....195 volts  
Screen grid (G3) to ground.....95 volts  
Anode grid (G2) to ground.....187 volts  
Cathode (K) to ground.....3 1/2 volts

**6D8 tube**  
Plate (P) to ground.....195 volts  
Screen grid (G2) to ground.....95 volts  
Cathode (K) to ground.....3 1/2 volts

**75 tube**  
Plate (P) to ground.....75 volts

**76 tube**  
Plate (P) to ground.....100 volts  
Cathode (K) to ground.....5 volts

**41 tube**  
Plate (P) to ground.....184 volts  
Screen grid (G2) to ground.....196 volts  
Cathode (K) to ground.....13.5 volts

**80 tube**  
Filament (F) to ground.....302 volts

**Short Wave Antenna Coil** (Part No. P3378)  
Looking at the connection end in a clockwise direction starting at the mounting lug side (with dot) the connections are: No. 1, B+; No. 2, Grid; No. 3, Plate; No. 4, Pad.  
Primary—No. 1 and No. 2—Resistance 1.1 ohms  
Secondary—No. 2 and No. 4—Resistance 4.7 ohms

**First LF Transformer** (Part No. P3334)  
Primary—Blue white, plate; red white B+.  
Resistance.....238 ohms  
Secondary—White, grid; black white.  
AVC—Resistance.....24.1 ohms

**Second LF Transformer** (Part No. P2606)  
Primary—Blue white, plate; red white B+.  
Resistance.....15.1 ohms  
Secondary—White, grid; black white.  
AVC—Resistance.....11.8 ohms

**Power Transformer** (Part No. P3325)  
Primary—115 volt, 60 cycle; black leads.  
Resistance.....7.4 ohms  
Secondary—6.3 volt filament; black leads.  
(Sleeved) Resistance......25 ohm  
Secondary—5 volt rectifier filament; yellow leads. Resistance......22 ohm  
Secondary—High voltage; red leads.  
Resistance.....500.5 ohms  
High voltage center tap; green lead.  
Resistance to one side.....242.7 ohms  
Resistance to other side.....258.4 ohms

**Loop Antenna**  
Since the loop antenna acts also as the broadcast antenna coil the set will not operate properly with the loop antenna disconnected.

receiver should be checked at 6000 KC to determine whether the circuits are in line at this frequency. Should the receiver lack sensitivity at 6000 KC, the antenna and oscillator coils, as well as the .004 mica padding condenser, should be tested.

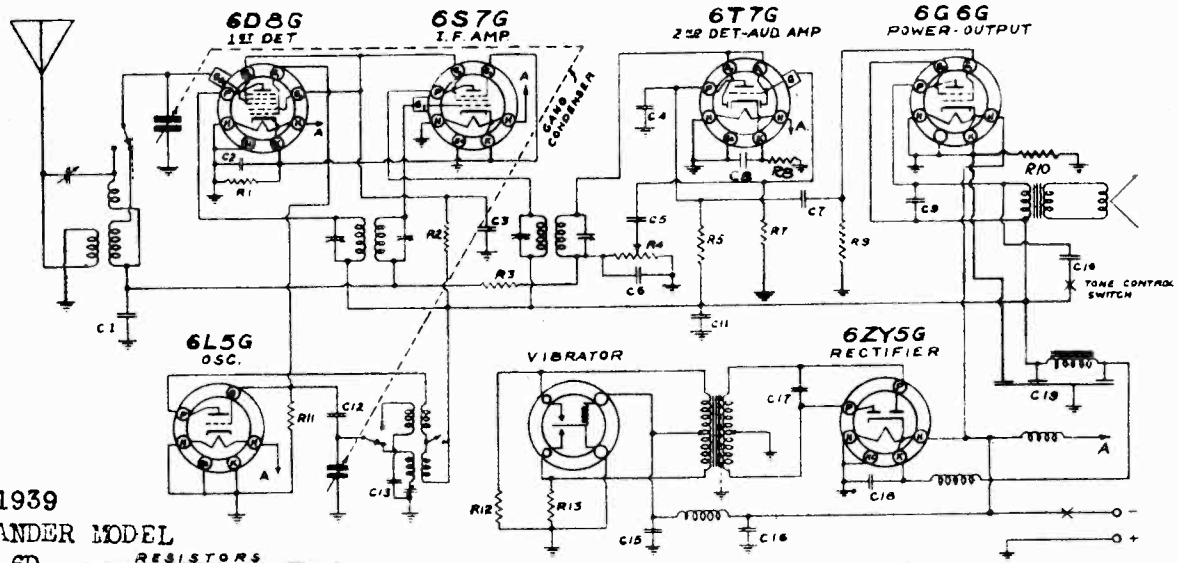
Because of the built-in loop antenna, it is necessary to align this receiver while in the cabinet. Otherwise the procedure is the same as for the Model 40 described above. Trim the broadcast band oscillator at 1580 KC instead of 1730 KC.

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

PARKER McCRORY MFG. CO.

1939 COMMANDER  
MODEL 6D  
1940 IMPERIAL  
CONSOLE MODEL 7H



1939  
COMMANDER MODEL  
6D

**RESISTORS**

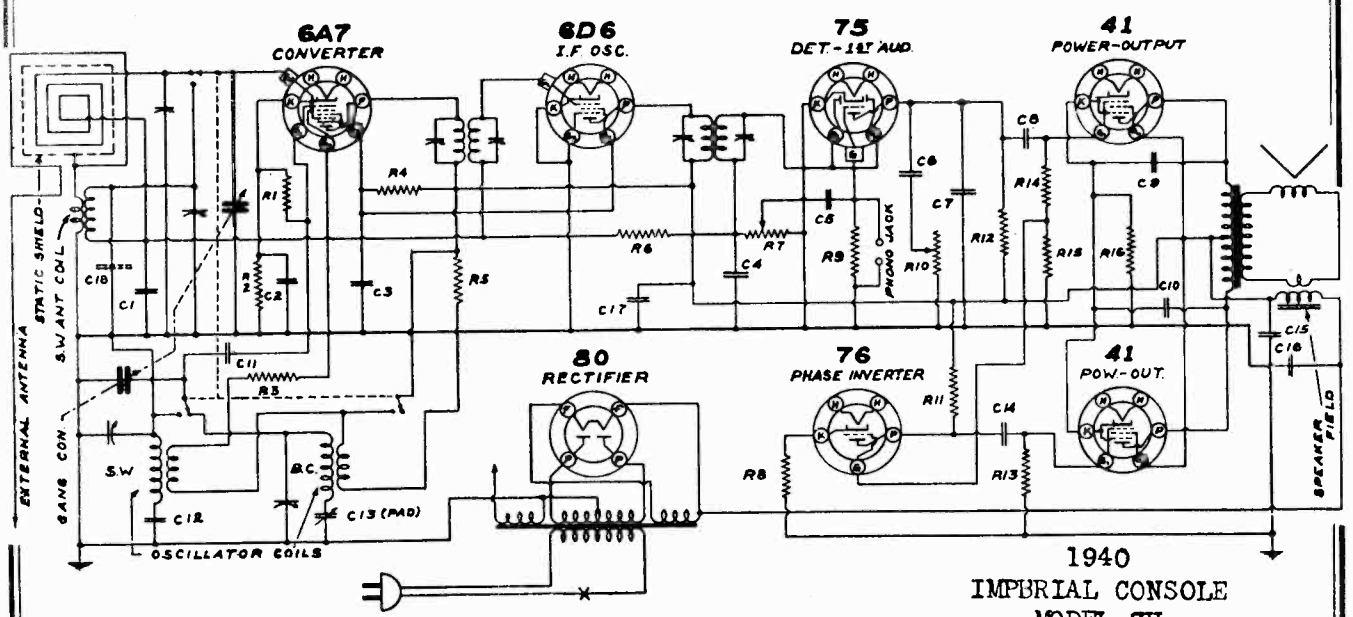
NO.	OHMS	WATTS	TOL.
1	500	1/4	± 10%
2	10,000	1/4	
3	1 MEG	1/4	
4	500,000	1/4	(VOL. CON.)
5	150,000	1/4	
7	1000-600	1/4	
8	10,000	1/4	
9	400,000	1/4	
10	800	1/4	
11	40,000	1/4	
12	150	1/4	
13	150	1/4	

**CONDENSERS**

NO.	CAP-MED	TYPE	NO.	CAP-MED	TYPE
1	.05	200V.	11	.1	200V.
2	.25	200V.	12	.00005	MICA
3	1	200V.	13	.004 (±5%)	MICA
4	.00025	MICA	14		
5	.01	400V.	15	.3	50V.
6	.01	MICA	16	.5	50V.
7	.00025	MICA	17	.015	1000V.
8	.01	400V.	18	.01	400V.
9	.005	200V.	19	5	200W.V.
10	.02	400V.			25W.V.

SWITCHES IN BROADCAST POSITION  
I.F. 455 K.C.

FOR OTHER DATA  
SEE INDEX



1940  
IMPERIAL CONSOLE  
MODEL 7H

**CAPACITORS**

NO.	MFDS.	VOLTS	NO.	MFDS.	VOLTS
C1	.05	200	C10	.005	800
C2	.25	200	C11	.0001	MICA
C3	.05	400	C12	.004 (±5%)	MICA
C4	.0025	MICA	C13	300-600	M.F.F.S.
C5	.01	400	C14	.01	400
C6	.005	600	C15	10.0	350
C7	.00025	MICA	C16	10.0	350
C8	.01	400	C17	.05	400
C9	.005	600	C18	GIMMICK	

**RESISTORS**

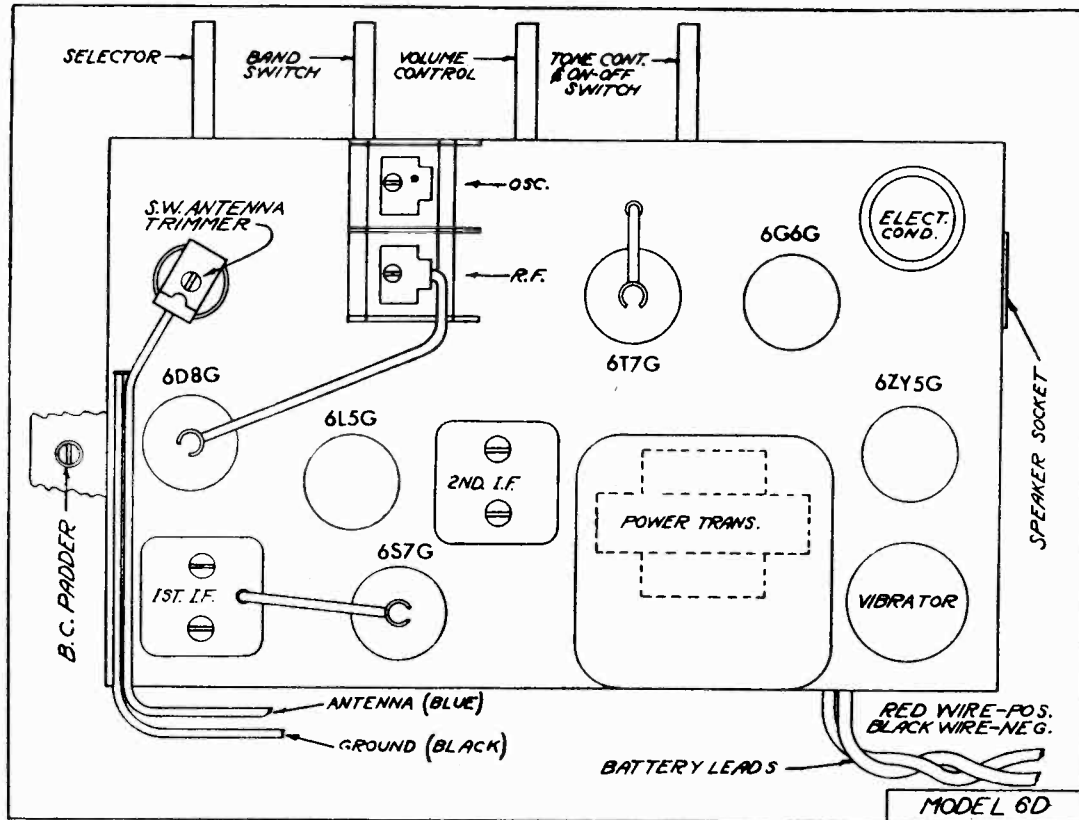
NO.	OHMS	WATTS	NO.	OHMS	WATTS
R1	50,000	1/2	R10	500,000	TONE CON.
R2	300	1/2	R11	50,000	1/2
R3	250	1/2	R12	250,000	1/2
R4	20,000	1/2	R13	500,000	1/2
R5	1,000	1/2	R14	400,000	1/2
R6	2 MEG.	1/2	R15	100,000	1/2
R7	500,000	VOL. CON.	R16	300	1/2
R8	3,000	1/2			
R9	5 MEG.	1/2			

I.F. - 455 K.C.  
SWITCHES SHOWN IN BROADCAST POSITION  
BOTTOM VIEW OF SOCKETS SHOWN.  
GANG CONDENSER CAPACITY 443 μ.F.F.S.

FOR OTHER DATA  
SEE INDEX

1939 COMMANDER  
MODEL 6D

PARKER McCRORY MFG. CO.

CHASSIS LAYOUT  
1939 COMMANDER MODEL 6D

## ALIGNMENT DATA AND SERVICING

## 1939 COMMANDER MODEL 6D

## GENERAL DATA

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

CORRECT ALIGNMENT  
PROCEDURE

The intermediate frequency I.F. stage should be aligned properly as the first step. After the I.F. transformers have been properly adjusted and peaked, the Broadcast Band should always be the next procedure; after which, the Short Wave Band may be aligned.

## I.F. ALIGNMENT

With the wave switch in the broadcast band and the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output of test oscillator or signal generator to the grid of the first detector tube (6D8G) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all four I.F. trimmers to peak or maximum reading on the output meter.

BROADCAST BAND  
ALIGNMENT

Connect the output of the signal generator to the antenna lead (blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum and the oscillator to 1730 KC and

adjust the Broadcast "oscillator trimmer" to receive this signal. Make no other adjustments at this frequency. Then set the generator to 1400 KC and tune in this signal by rotating the gang to 1400 on the dial. Adjust the Broadcast "antenna" trimmer to a maximum signal. Set the signal generator to 600 KC and tune in the signal on the receiver.

**Note:** Approximately the same sensitivity should be noted at this point as was at 1400 KC. The signal strength may sometimes be improved by padding the circuits. This is done by slowly increasing or decreasing the oscillator padding condenser and, at the same time, continuously tuning back and forth across the signal with the receiver until the maximum reading is obtained on the output meter. This adjustment may seem a little complicated but is the easiest way to adjust the oscillator to the antenna. Return to 1400 KC and again go over the adjustments of this frequency to be certain that they were not put slightly out of alignment when adjustment was made at 600 KC.

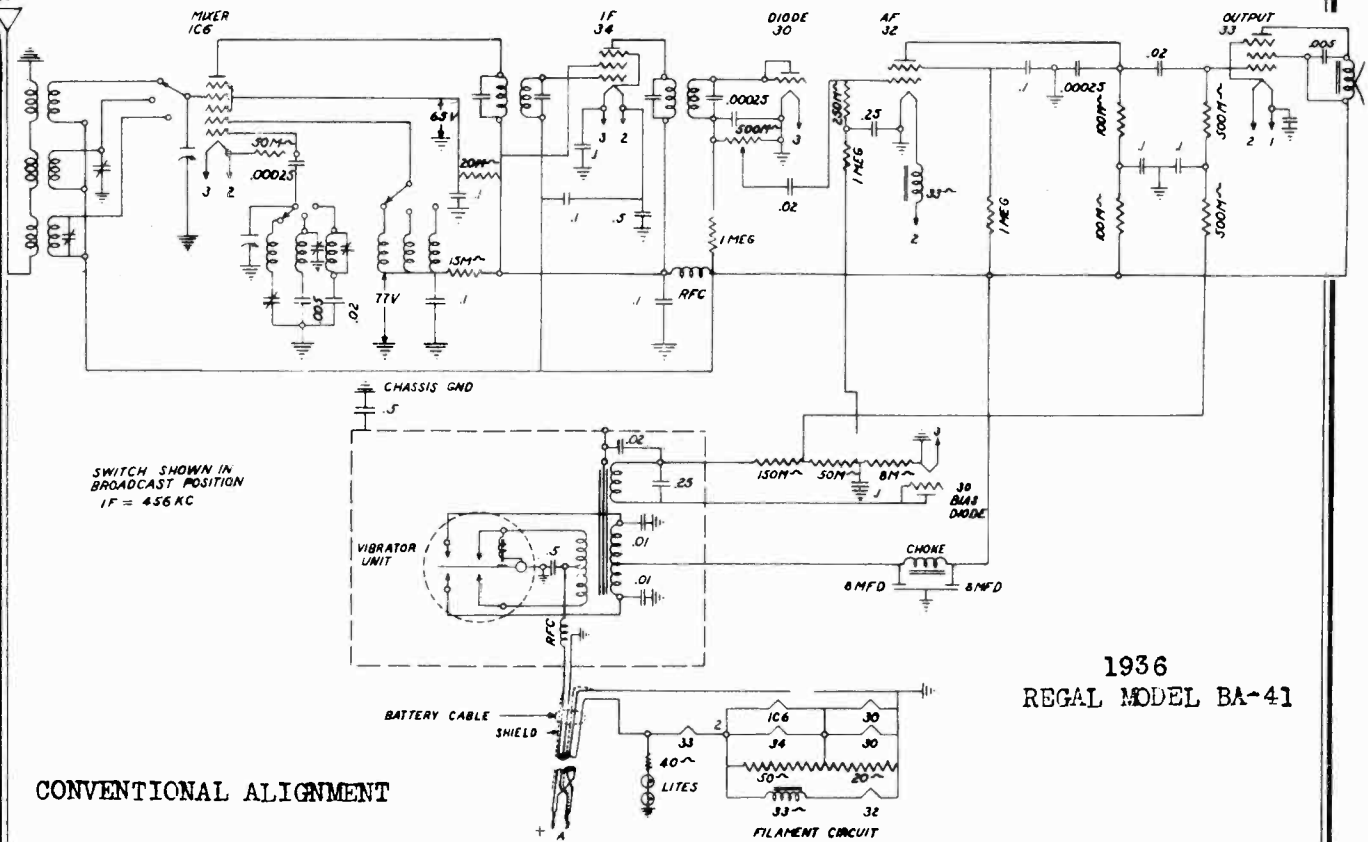
SHORT WAVE BAND  
ALIGNMENT

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

1936 REGAL  
MODEL BA-41

PARKER McCRORY MFG. CO.

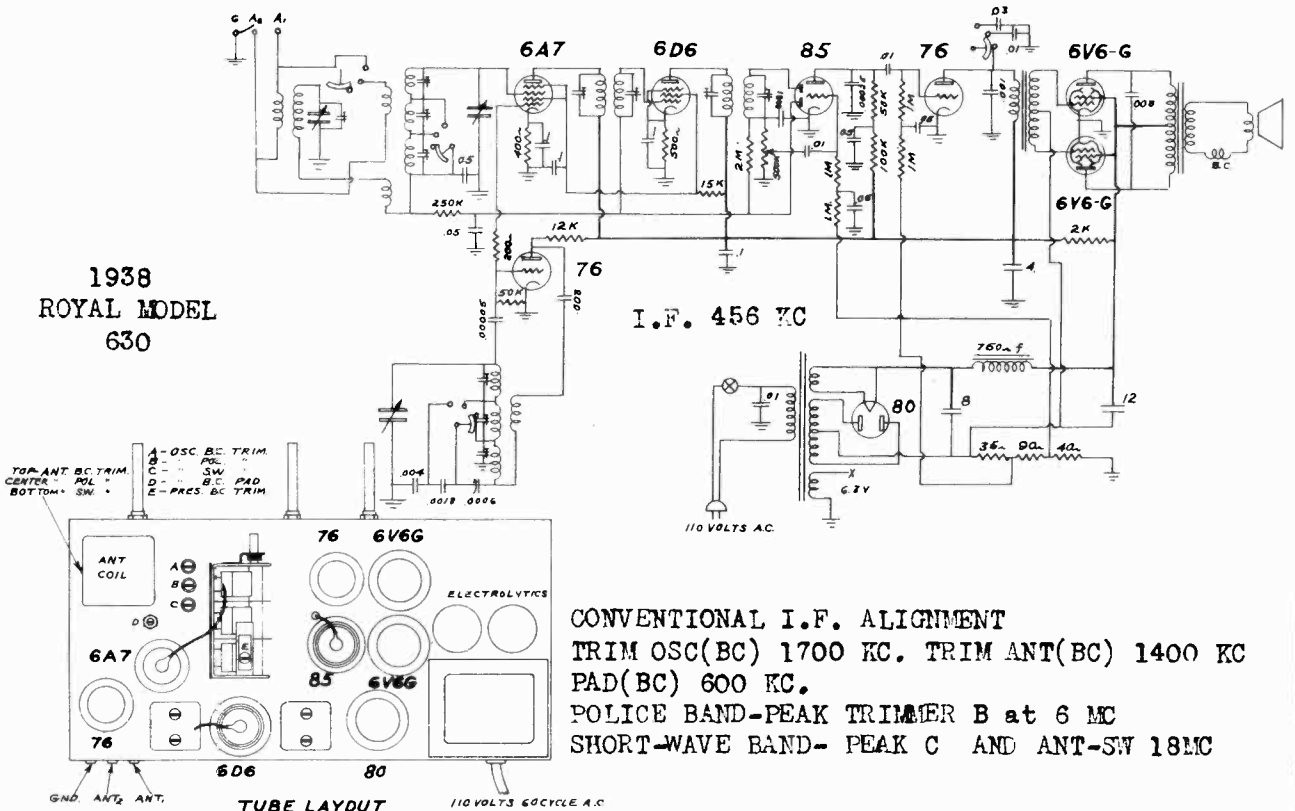
1936 ROYAL  
MODEL 630



CONVENTIONAL ALIGNMENT

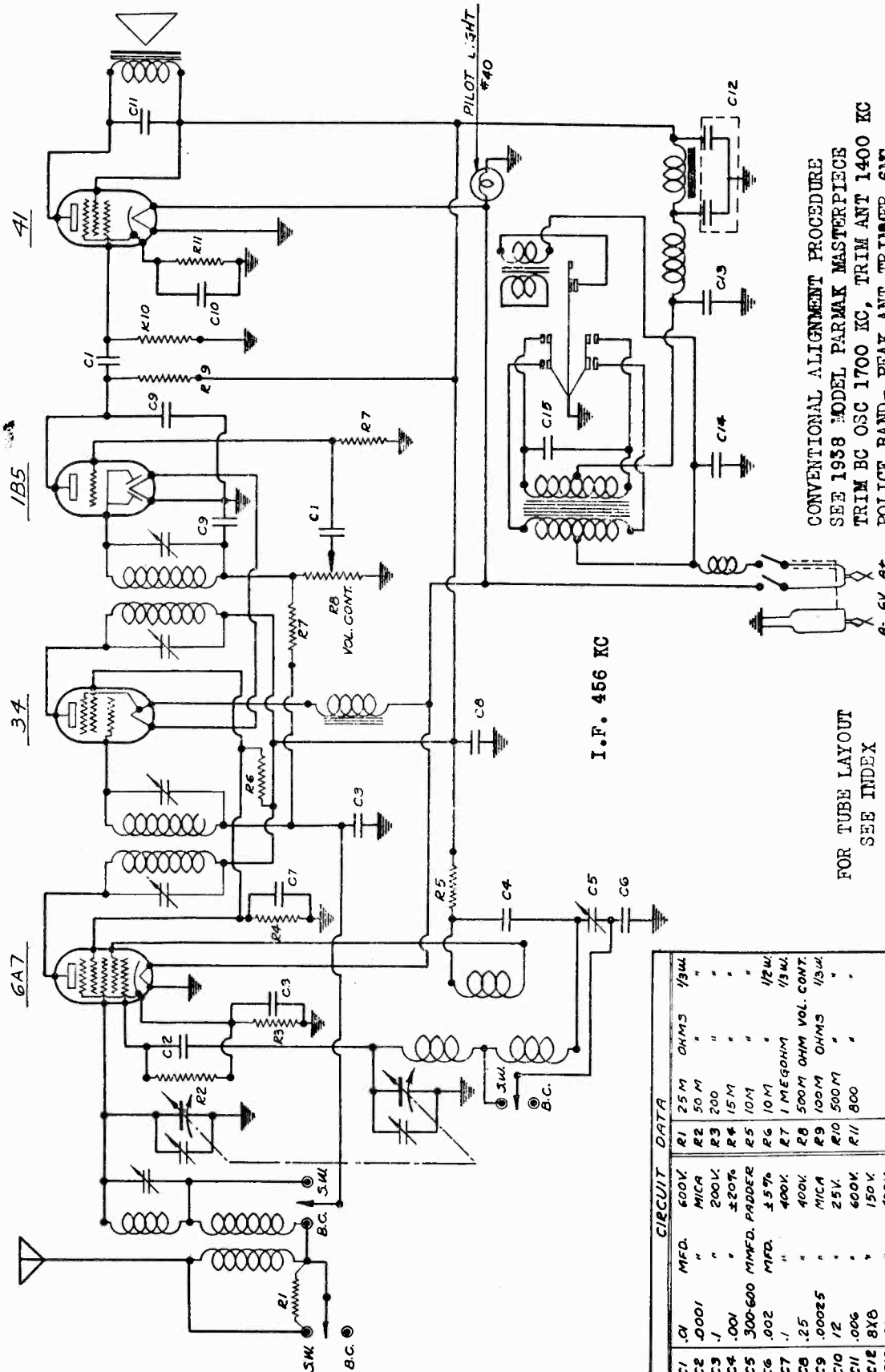
1936  
REGAL MODEL BA-41

1938  
ROYAL MODEL  
630



1937 VICTORY  
MODEL 400

PARKER McCRORY MFG. CO.



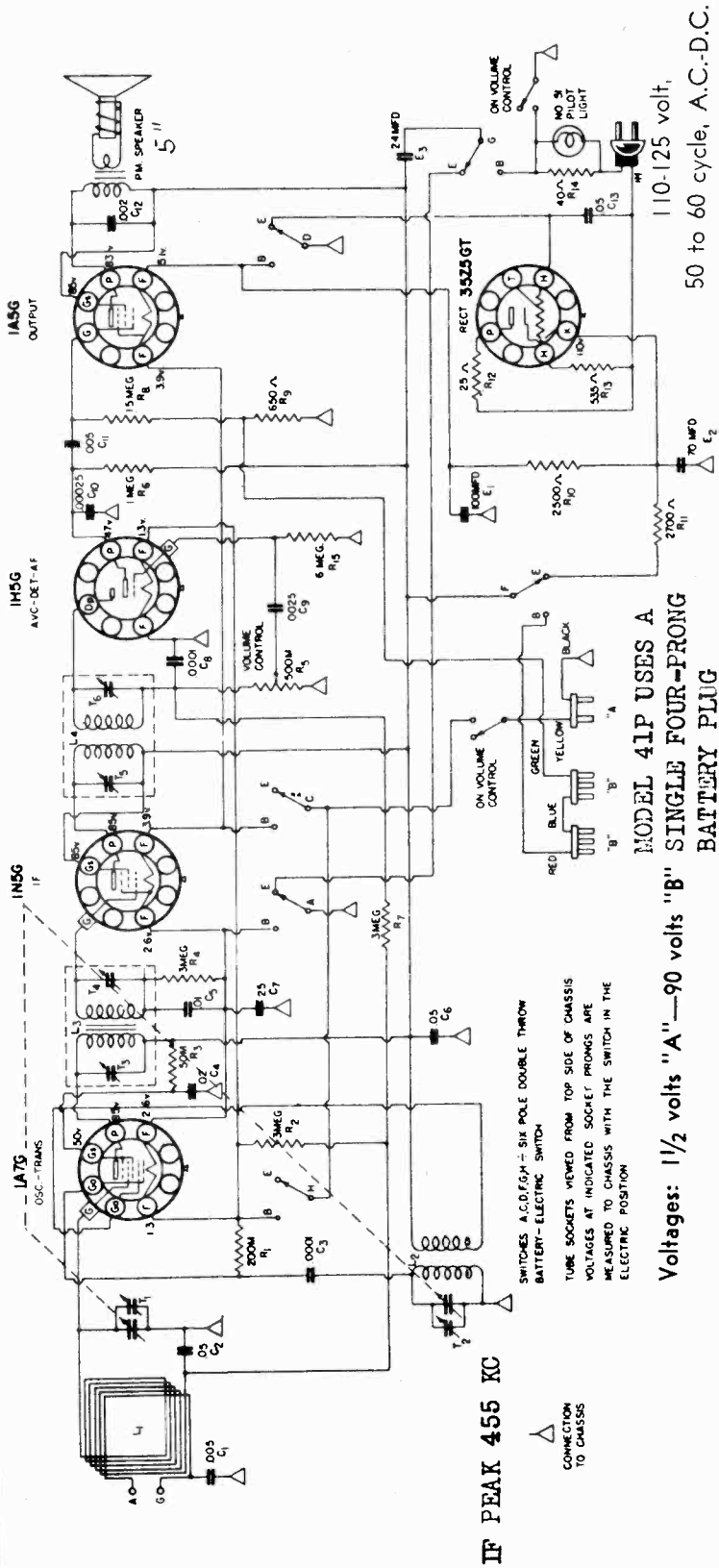
CONVENTIONAL ALIGNMENT PROCEDURE  
SEE 1938 MODEL PARMAK MASTERPIECE  
TRIM BC OSC 1700 KC, TRIM ANT 1400 KC  
POLICE BAND- PEAK ANT TRIMMER 6M

FOR TUBE LAYOUT  
SEE INDEX

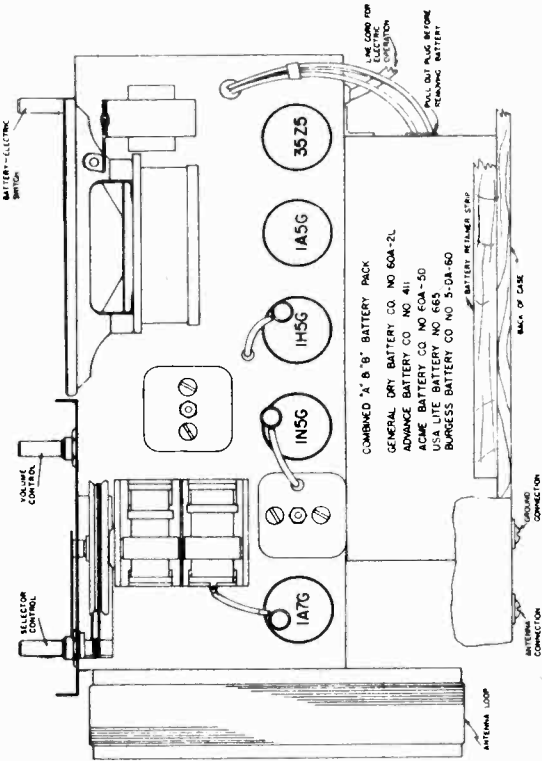
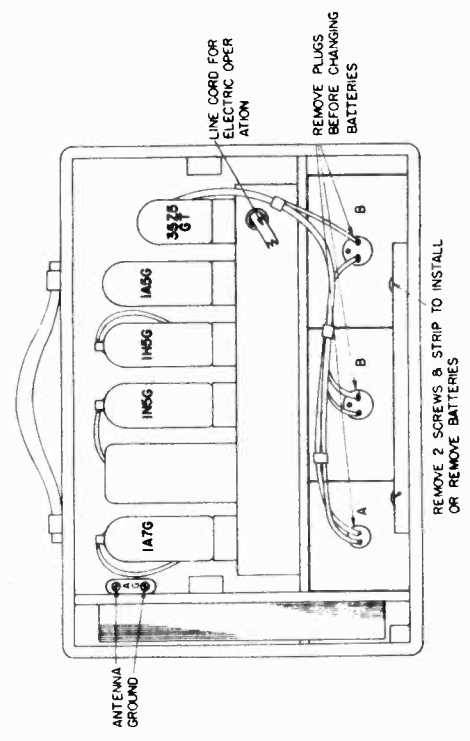
CIRCUIT DATA	
C1	.01 MFD. 600V.
C2	.0001 " " 25M OHMS
C3	.001 " " 50M "
C4	.001 " " 200V. ±20%
C5	300-600 MMFD. PADDER
C6	.002 MFD. ±5%
C7	.1 " 400V.
C8	.25 " 400V.
C9	.00025 " MICA
C10	.12 " 25V.
C11	.006 " 600V.
C12	8X8 " 150V.
C13	.01 " 400V.
C14	.5 " 180V.
C15	.0075 " 1000V.
R1	25M OHMS
R2	50M "
R3	200 "
R4	15M "
R5	10M "
R6	10M " 12W.
R7	1 MEGOHM 1/3W.
R8	500M OHM VOL. CONT.
R9	100M OHMS
R10	500M "
R11	800 "

MODEL 41P  
MODEL 342P

PATHE



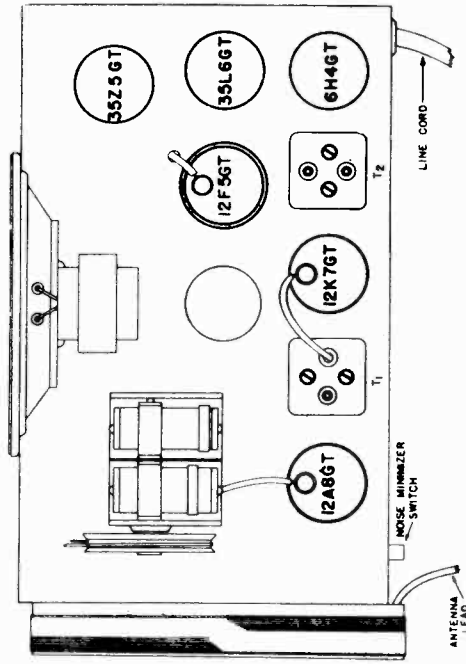
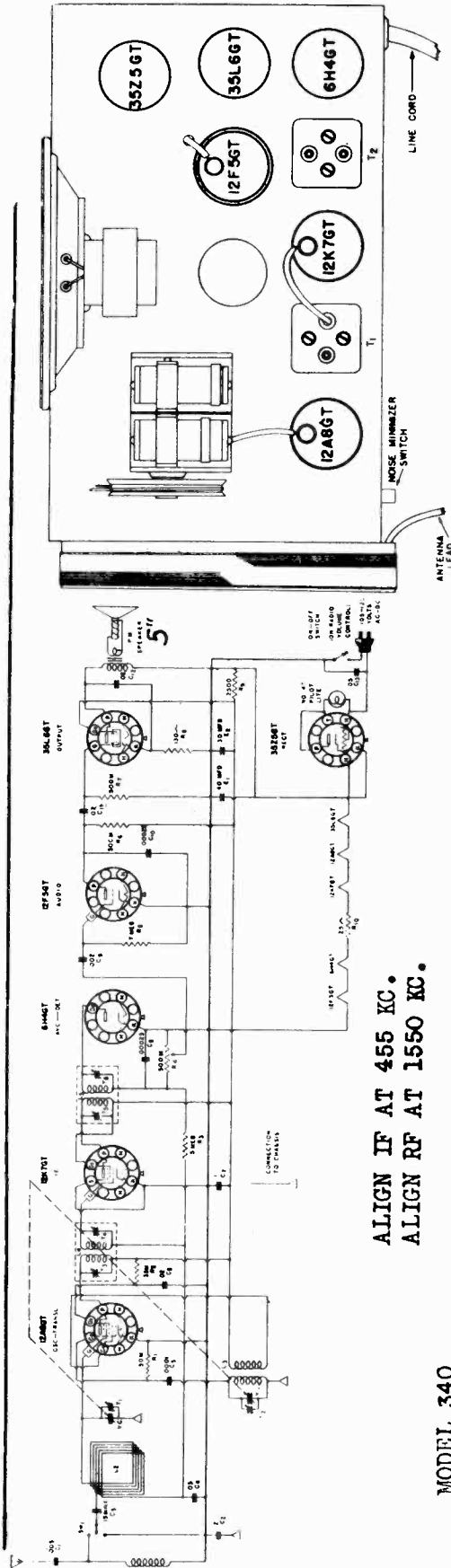
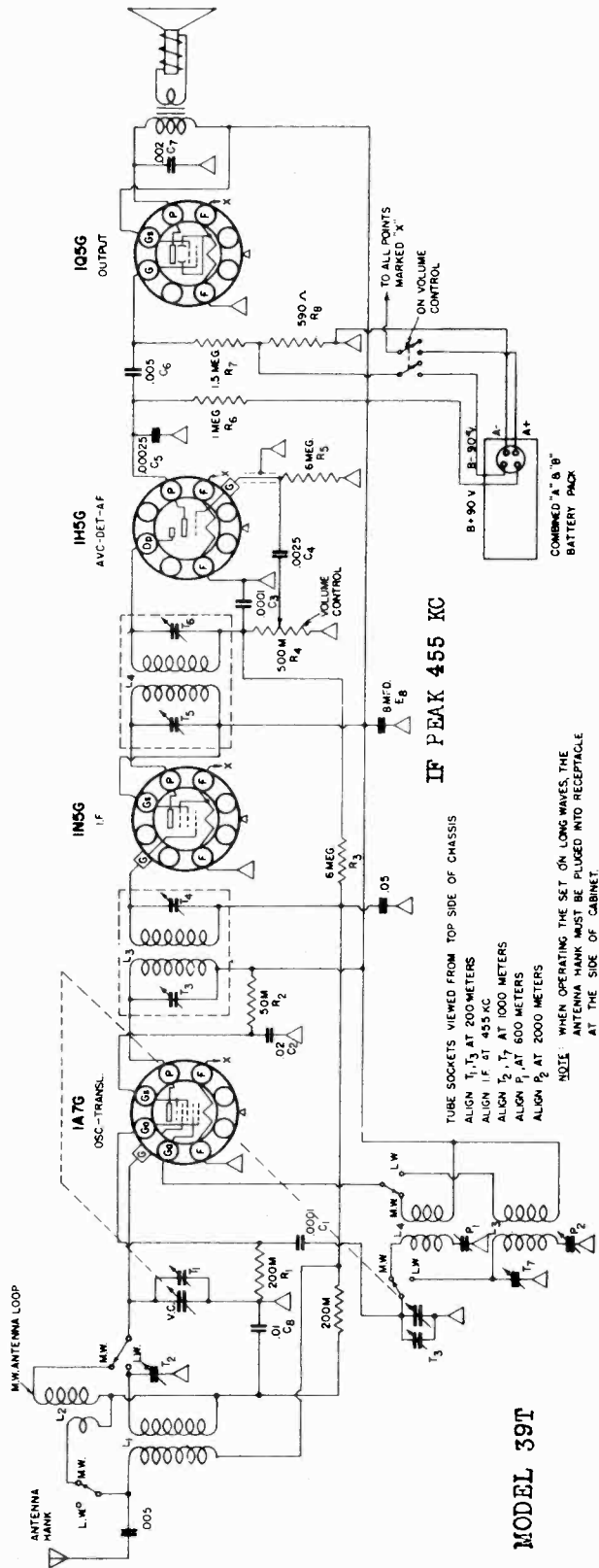
LOCATION OF TUBES & BATTERIES





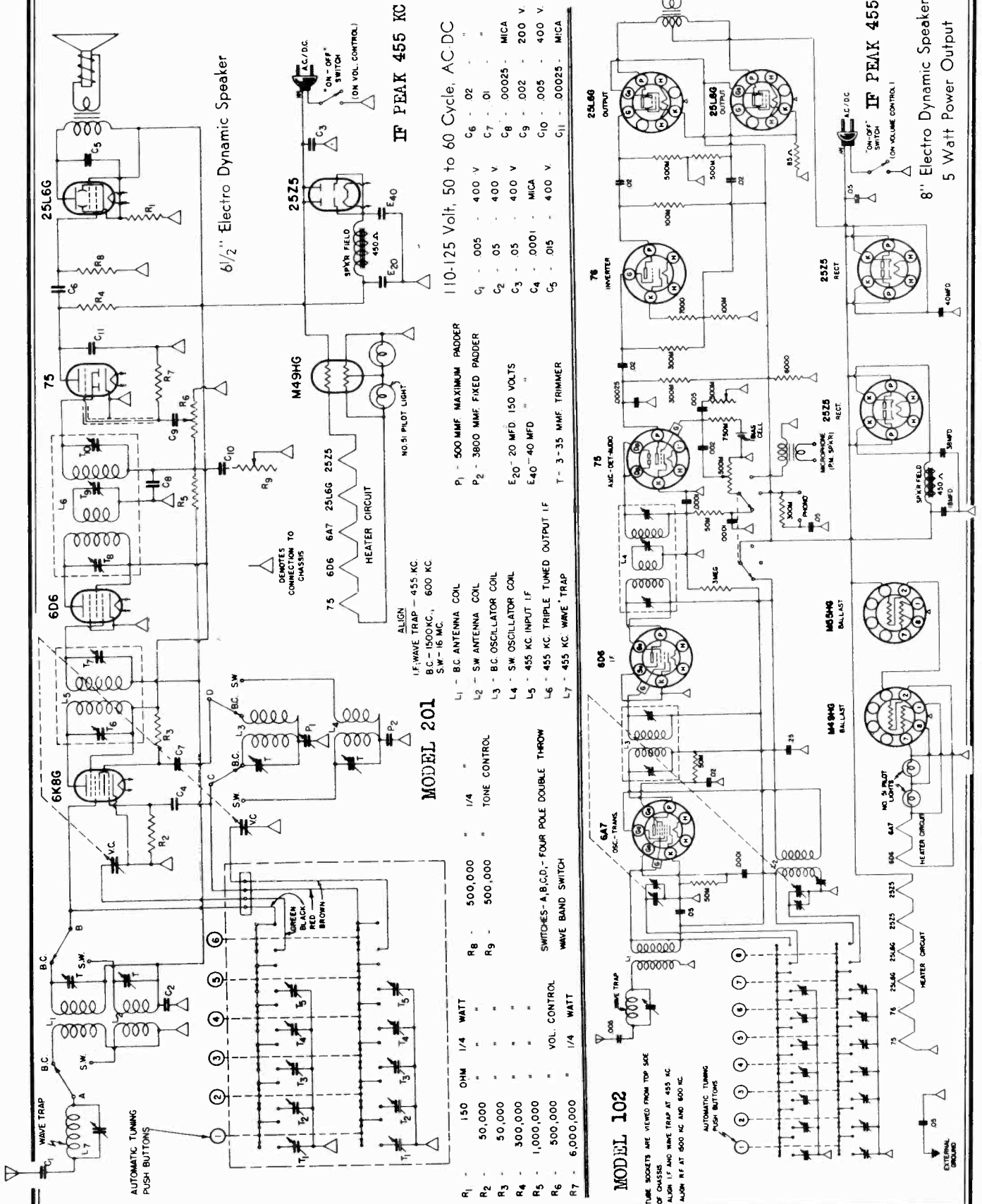
MODEL 39T  
MODEL 340

PATHE



PATHE

MODEL 102  
MODEL 201



6 1/2" Electro Dynamic Speaker  
IF PEAK 455 KC

110-125 Volt, 50 to 60 Cycle, AC-DC

ALIGN  
IF WAVE TRAP - 455 KC  
B.C. - 1500 KC, 600 KC  
S.W. - 16 MC.

MODEL 201

- R1 - 150 OHM 1/4 WATT
- R2 - 50,000 " " " "
- R3 - 50,000 " " " "
- R4 - 300,000 " " " "
- R5 - 1,000,000 " " " "
- R6 - 500,000 " " " "
- R7 - 6,000,000 " " " "
- R8 - 500,000 " " " "
- R9 - 500,000 " " " "

- P1 - 500 MMF. MAXIMUM PADDER
- P2 - 3800 MMF. FIXED PADDER

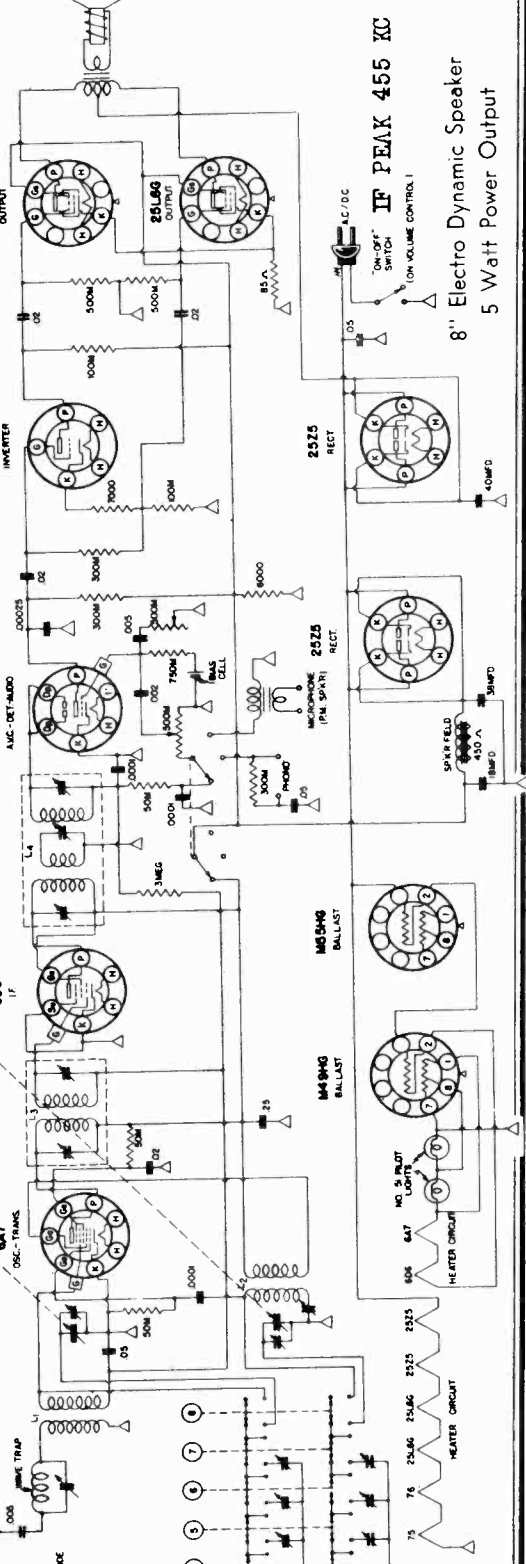
- C1 - .005 4.00 V
- C2 - .05 4.00 V
- C3 - .05 4.00 V
- C4 - .0001 MICA
- C5 - .015 4.00 V
- C6 - .02 " "
- C7 - .01 " "
- C8 - .00025 MICA
- C9 - .002 200 V
- C10 - .005 4.00 V
- C11 - .00025 MICA

- L1 - BC ANTENNA COIL
- L2 - SW ANTENNA COIL
- L3 - BC OSCILLATOR COIL
- L4 - SW OSCILLATOR COIL
- L5 - 455 KC INPUT IF
- L6 - 455 KC. TRIPLE TUNED OUTPUT IF
- L7 - 455 KC. WAVE TRAP

- S.W. - 16 MC.
- SWITCHES - A, B, C, D - FOUR POLE DOUBLE THROW
- WAVE BAND SWITCH

MODEL 102

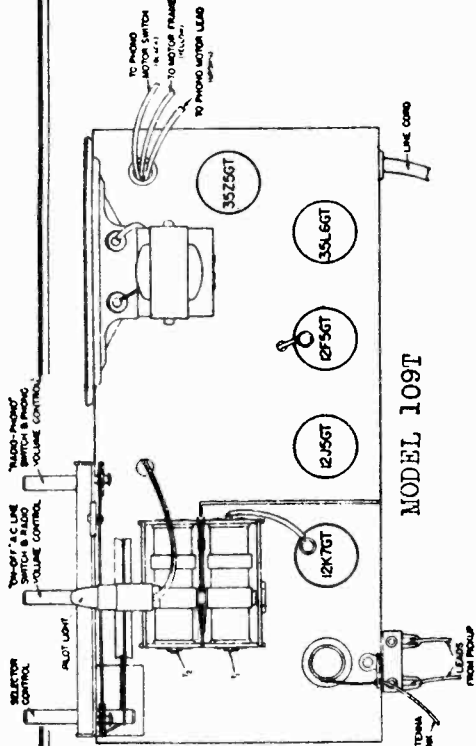
THE SOCKETS ARE VIEWED FROM TOP SIDE OF CHASSIS  
ALIGN IF AND WAVE TRAP AT 455 KC  
ALIGN R.F. AT 600 KC AND 800 KC



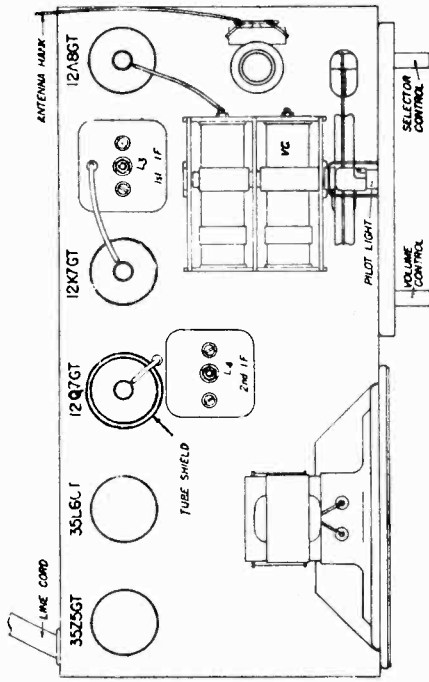
8" Electro Dynamic Speaker  
5 Watt Power Output  
IF PEAK 455 KC  
ON VOLUME CONTROL

PATHE

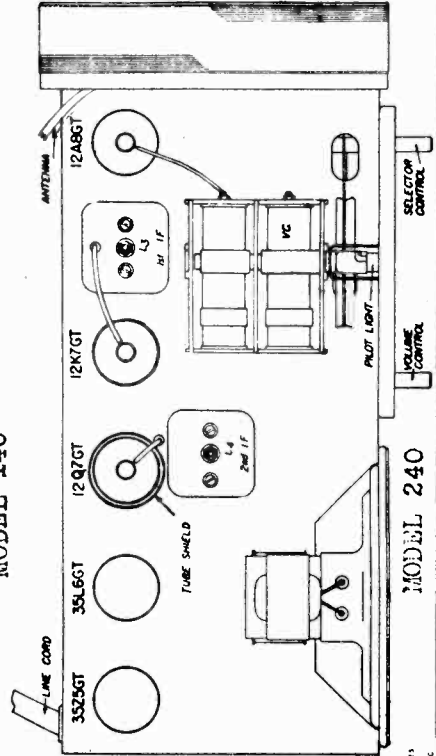
MODEL 109T  
MODEL 140  
MODEL 240



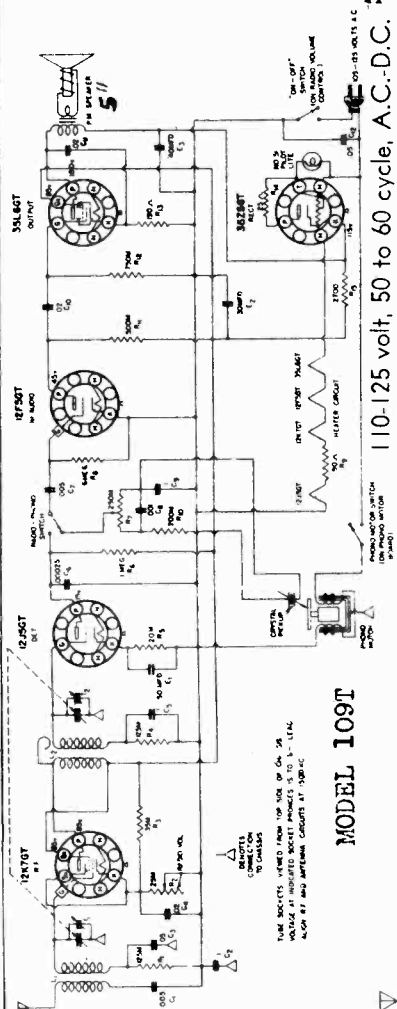
MODEL 109T



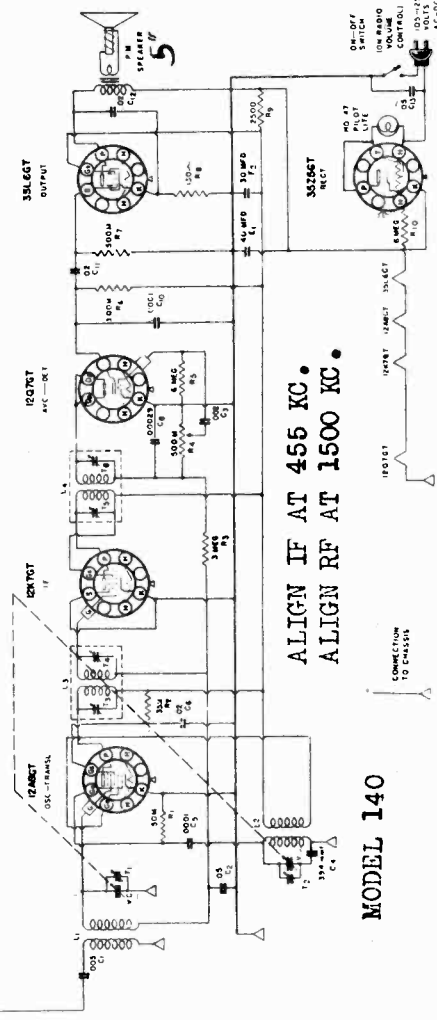
MODEL 140



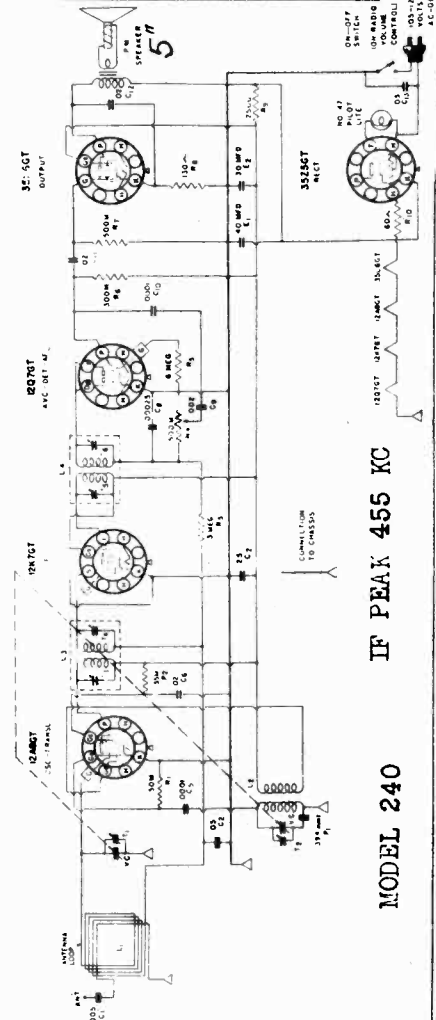
MODEL 240



MODEL 109T



MODEL 140



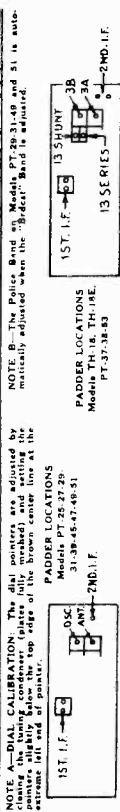
MODEL 240

MODELS TH-9, TH-18, TH-22, TH-25 (121-122); PT-27 (121-122) PT-29-31-37-38-39-45-47-49-51-53

CONNECTING ALIGNING INSTRUMENTS
AUDIO OUTPUT METER: If an aligning indicator of this type is used, connect it to the plate and screen terminals of the output tube.
VACUUM TUBE VOLTMETER: To use the vacuum tube voltmeter as an aligning indicator, make either of the following connections:
1—Attach the negative terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to (B-) of the receiver. (Cathode 7C6)
2—An aligning adaptor, Philco Part No. 45-2767 can be obtained from your Philco Distributor for use with the vacuum tube voltmeter. To use the adaptor, remove the second detector tube from the socket and insert the aligning adaptor in the socket, the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the

Table with columns: Oper. Units in Order, SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Models TH-9, TH-18, TH-22, TH-25, PT-27, PT-29-31-37-38-39-45-47-49-51-53.

Table with columns: Oper. Units in Order, SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Models TH-14, TH-15, TH-16, TH-17, PT-26-28-33-41 (121-122); 46-48-50-57, PT-61 (121-122); and 65-66-69 (121-122).



MODELS TH-14, TH-15, TH-16, TH-17, PT-26-28-33-41 (121-122); 46-48-50-57, PT-61 (121-122); and 65-66-69 (121-122)

Table with columns: Oper. Units in Order, SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Models TH-14, TH-15, TH-16, TH-17, PT-26, PT-28, PT-45, PT-46, PT-58, PT-61, PT-65, PT-66, PT-69.

MODELS TP-20, TP-21, PT-35-36-43, Codes 121-122; and 55-59-67

Table with columns: Oper. Units in Order, SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Models TP-20, TP-21, PT-35-36-43, Codes 121-122; and 55-59-67.

Table with columns: Oper. Units in Order, SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Models TP-20, PT-43 (121, 122)-38-55-87.

NOTE A—Turn the tuning condenser to the extreme high position... NOTE B—Turn the tuning condenser to the extreme low position... NOTE C—Model 36 antenna padder must be adjusted with the loop connected and assembled in the cabinet.

SETTING AND OPERATING ELECTRIC PUSH-BUTTON TUNING MODELS TP-21, PT-45-46-47-48-57-65 and 67

Select five of your favorite nearby broadcast stations and remove their call letters from the station call letter tab sheets supplied. Place the call letters in the windows below the buttons, making sure that each respective button covers the frequency of the station for which it is to be used.

Table with columns: Padder (from rear), Circuit, Buttons (from front), Frequency Range, Padder (from rear), Circuit, Buttons (from front), Frequency Range.

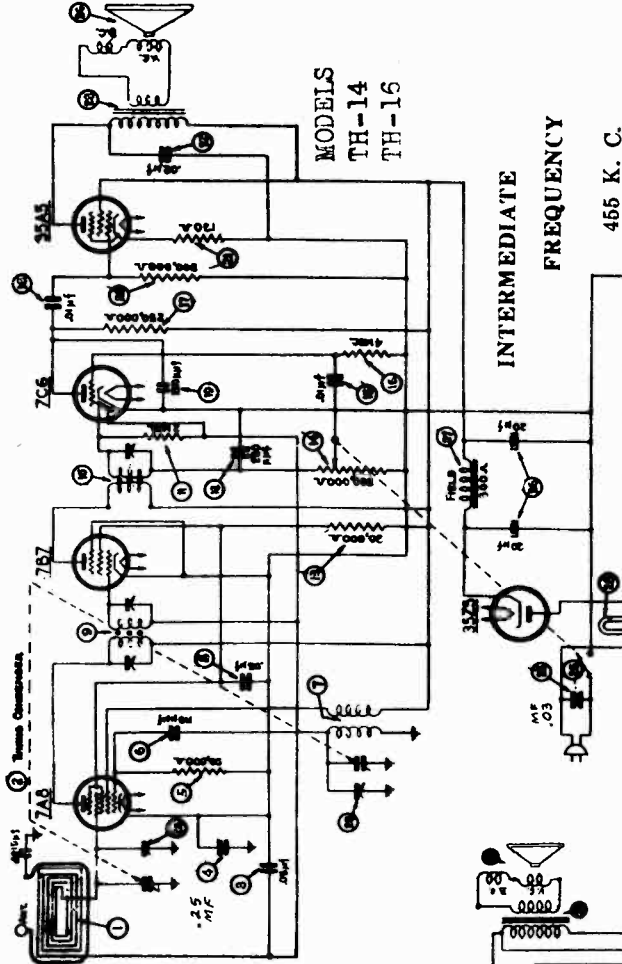
The left-hand button looking at the front of the cabinet corresponds to the two right-hand padder screws looking at the rear and covers the lowest frequency range. Turn the dial button depressed, tune in the station whose call letters are on the button. Turn the dial button to the right-hand button, tune in this station by rotating the No. 2 "OSC." screw (next to the right end of the unit looking at the rear of the chassis.)

MODELS TH-9,  
TH-18, TH-22  
MODELS TH-14, TH-16  
MODEL TP-20

PHILCO RADIO & TELEVISION CORP.

TH-9 — 540 — 1720 K. C. 3.0 — 10 M. C.  
TH-18 — 540 — 1720 K. C. 5.5 — 19 M. C.  
TH-22 — 540 — 1720 K. C. 7.0 — 24 M. C.

These models are similar with the exception of the tuning frequency ranges and cabinets.



MODELS  
TH-14  
TH-16

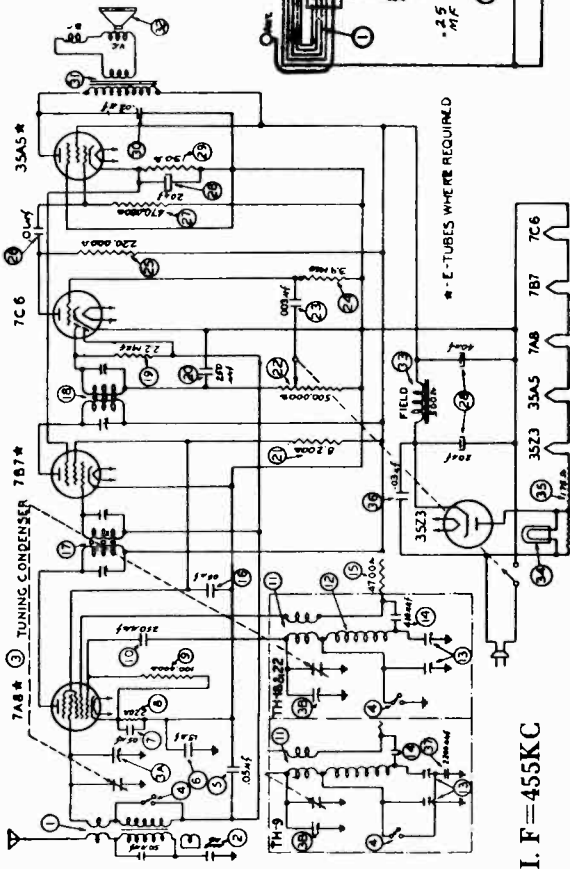
INTERMEDIATE  
FREQUENCY  
455 K. C.

Models TH-14 and TH-16 are five tube, superheterodyne radios covering a frequency range from 540 to 1580 K. C.

These models are similar with the exception of the cabinets.

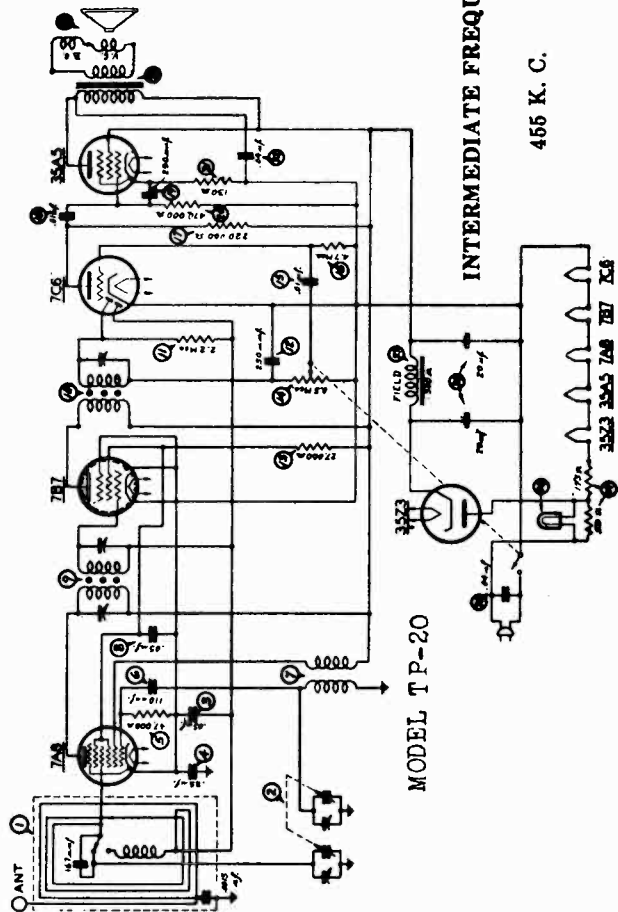
FOR OTHER DATA, SEE INDEX

Model TP-20 is a five tube, superheterodyne radio covering a frequency range from 540 to 1580 K. C. on the broadcast band and 2.3 to 2.5 M. C. on the local police tuning range.



I. F. = 455 KC

MODELS TH-9, TH-18, TH-22



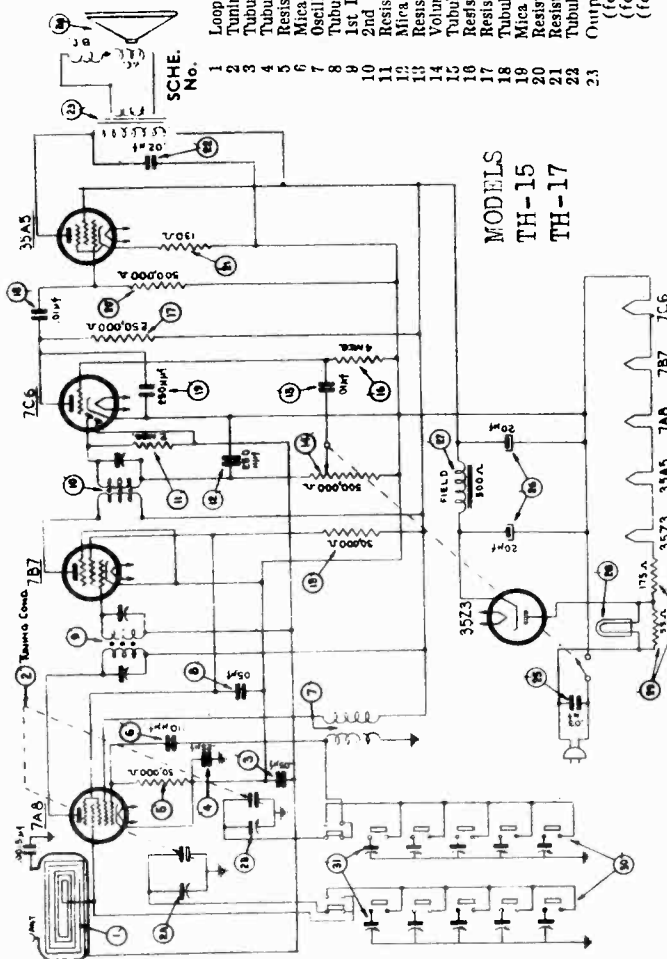
MODEL TP-20

INTERMEDIATE FREQUENCY

455 K. C.

PHILCO RADIO & TELEVISION CORP. MODELS TH-15, TH-17  
MODEL TP-21

Models TH-15 and TH-17 are five tube, electric push-button tuning, superheterodyne radios with a manual tuning range covering 540 to 1580 K. C. These models are similar with the exception of the cabinet.



MODELS TH-15 TH-17

INTERMEDIATE FREQUENCY: 455 K. C.

Six electric push-buttons are provided on this model.

Five are used for stations and one push-button for selecting dial tuning. The push buttons cover a frequency range as follows: 540 to 1600 kilocycles.

FOR OTHER DATA SEE INDEX

Model TP-21 is a five tube, electric push-button tuning superheterodyne radio with a manual tuning range covering 540 to 1580 K.

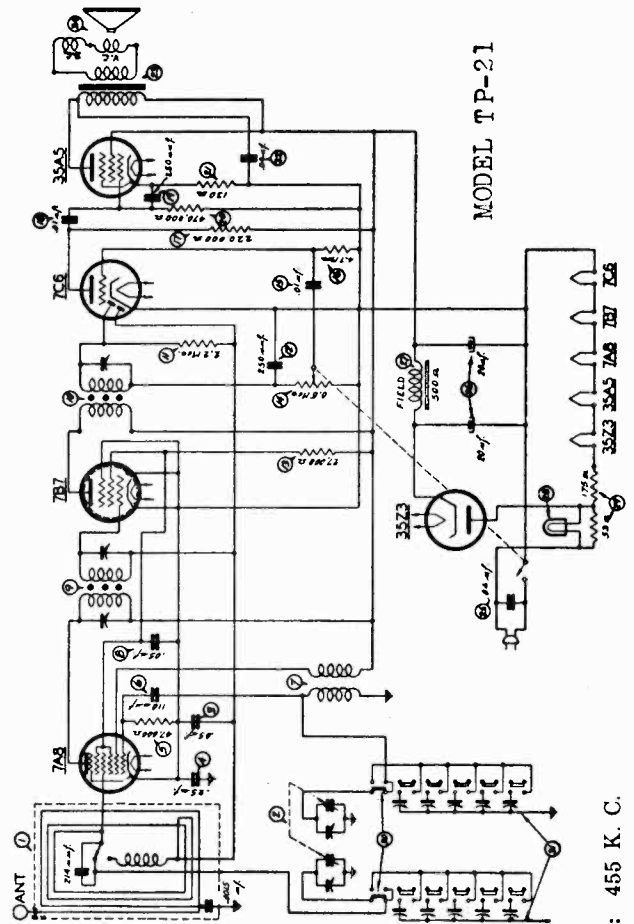
Six electric push-buttons are provided on this model. Five are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

INTERMEDIATE FREQUENCY: 455 K. C.

SCHE. No.	DESCRIPTION	PART No.	DESCRIPTION	PART No.
1	Loop Antenna Assembly	32-8186	Speaker	36-1469
2	Tuning Condenser	31-2371	Cone Assembly (for Speaker 36-1469.1)	36-4115
3	Tubular Condenser (.05 mf., 200 v.)	40-4519S	(for Speaker 36-1469.2)	36-4132
4	Tubular Condenser (.25 mf., 400 v.)	30-4604S	(for Speaker 36-1469.5)	36-4113
5	Resistor (30,000 ohms, 1/3 watt)	33-350244	Tubular Condenser (.03 mf., 400 v.)	30-4449S
6	Mica Condenser (110 mmf.)	30-1031	Electrolytic Condenser (20-20 mf., 150 v.)	38-1460
7	Oscillator Transformer	32-3152	Field Coil — Part of Speaker No.	34-2068
8	Tubular Condenser (.05 mf., 200 v.)	30-4519S	Line Resistor	33-3367
9	1st I. F. Transformer	32-3178	Push Button Switch	42-1485
10	2nd I. F. Transformer	32-3178	Padding Condenser Strip	31-6296
11	Resistor (2 megs., 1/3 watt)	33-320241		
12	Mica Condenser (.250 mmf.)	30-1032		
13	Resistor (30,000 ohms, 1/3 watt)	33-330244		
14	Volume Control (500,000 ohms)	33-5306		
15	Tubular Condenser (.01 mf., 200 v.)	30-4479S		
16	Resistor (4 megs., 1/3 watt)	33-540244		
17	Resistor (250,000 ohms, 1/3 watt)	33-452244		
18	Mica Condenser (.01 mf., 400 v.)	30-4572S		
19	Resistor (500,000 ohms, 1/3 watt)	33-440244		
20	Resistor (130 ohms, 1/2 watt)	33-113336		
21	Resistor (130 ohms, 1/2 watt)	33-113336		
22	Tubular Condenser (.02 mf., 400 v.)	30-4519S		
23	Output Transformer (for Speaker 36-1469.1)	32-8047		
	(for Speaker 36-1469.2)	32-8044		
	(for Speaker 36-1469.9)	32-8044		

MISCELLANEOUS PARTS

Cable (Power)	1-3183
Cabinet (TH-15)	10376A
Cabinet Back (TH-15)	27-9358
Cabinet (TH-17)	10379A
Cabinet Back (TH-17)	27-4822
Clip (Coil Mounting)	28-5002
Dial	27-5499
Dial Window	27-5472
Drive Cord (Dial)	31-2358



MODEL TP-21

MODELS PT25,  
PT27 (121, 122), PT39  
MODELS PT26, PT28, PT36

PHILCO RADIO & TELEVISION CORP.

**CIRCUIT DESIGN:** Models PT-25, Codes 121 and 122, Pt-27, Codes 121 and 122, and PT-39 are five tube superheterodyne radios covering a frequency range from 540 to 1720 K. C. These models are similar with the exception of the cabinets. Codes 121 and 122 of Models PT-25 and PT-27 differ also in the type of cabinet used.

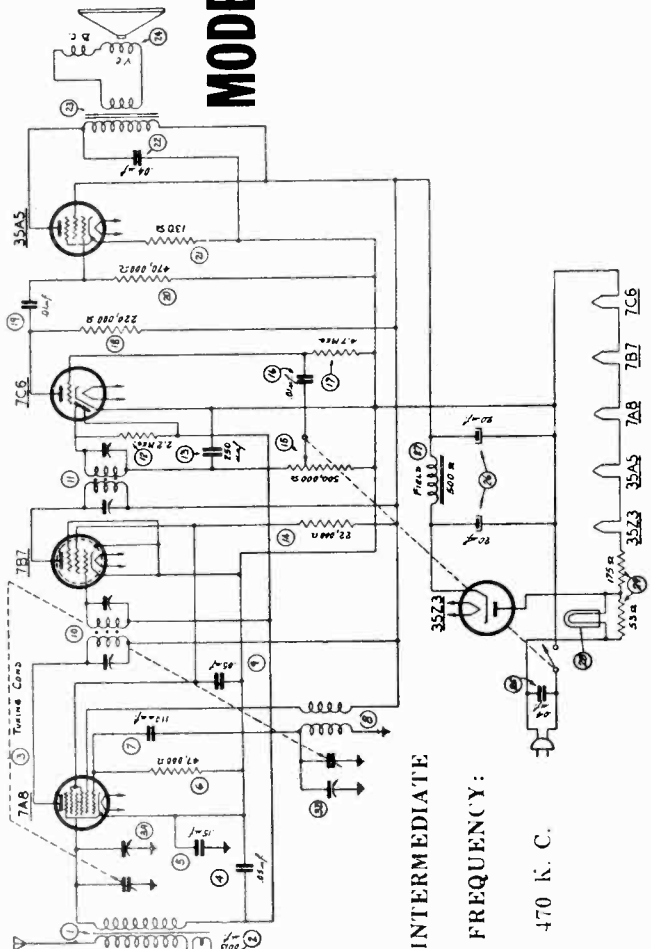
**MODELS PT-25, PT-27, Codes 121-122; and PT-39**

**POWER SUPPLY:** The receivers are designed for operation on either a 115 volt alternating current (A. C.) or 115 volt direct current (D. C.) power supplies.

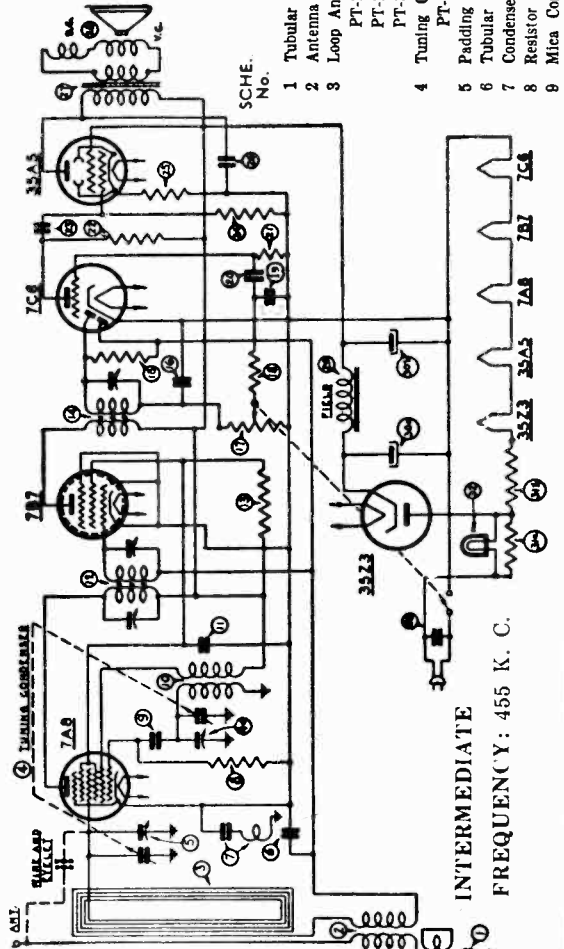
Models PT-25, PT-28 and PT-36 are five tube superheterodyne radios covering a tuning frequency range from 540 to 1580 K. C. and designed with a built-in loop aerial for portable use. To obtain maximum performance, however, in steel reinforced buildings, apartment houses, hotels and other shielded locations where signal strength is weak, provisions are also provided at the rear of the cabinet for an outside aerial.

10	Oscillator Transformer	.....	32-3182
11	Tubular Condenser (.05 mf., 200V)	.....	30-45188
12	1st I. F. Transformer	.....	32-3390
13	Resistor (22,000 ohms, 1/2 watt)	.....	33-322334
14	2nd I. F. Transformer	.....	32-3391
15	Resistor (2.2 meg., 1/4 watt)	.....	33-522154
16	Mica Condenser (250 mmf.)	.....	61-0033
17	Volume Control (500,000 ohms)	.....	33-5306
18	Resistor (47,000 ohms, 1/4 watt)	.....	33-347154
19	Mica Condenser (250 mmf.)	.....	61-0033
20	Tubular Condenser (.01 mf., 200V)	.....	30-44798
21	Resistor (4.7 meg., 1/4 watt)	.....	33-547154
22	Resistor (220,000 ohms, 1/4 watt)	.....	33-422154
23	Tubular Condenser (.01 mf., 400V)	.....	30-45728
24	Resistor (470,000 ohms, 1/4 watt)	.....	33-447154
25	Resistor (130 ohms, 1/2 watt)	.....	33-113336
26	Tubular Condenser (.04 mf., 400V)	.....	30-41198
27	Output Transformer—Part of Speaker No. 36-1469	.....	
28	Speaker	.....	36-1469
29	Field Coil—Part of Speaker No. 36-1469	.....	36-1469
30	Electrolytic Condenser (20-20 mf., 150V)	.....	30-2882
31	Line Resistor	.....	33-2307
32	Pilot Lamp	.....	34-2088
33	Tubular Condenser (.04 mf., 400V)	.....	30-41198

1	Tubular Condenser (.0015 mf., 200V)	.....	30-45558
2	Antenna Transformer	.....	32-3394
3	Loop Antenna — Part of cabinet and loop Assy.	.....	
PT-26	.....	.....	76-1005
PT-28	.....	.....	76-1013
PT-36	.....	.....	76-1014
4	Tuning Condenser — PT-26 & PT-28	.....	31-2439
PT-36	.....	.....	31-2443
5	Padding Condenser	.....	31-6344
6	Tubular Condenser (.1 mf., 200V)	.....	30-44998
7	Condenser & Choke Assy.	.....	76-1019
8	Resistor (22,000 ohms, 1/4 watt)	.....	33-322154
9	Mica Condenser (110 mmf.)	.....	30-1130



FOR ALIGNMENT, SEE INDEX



PHILCO RADIO & TELEVISION CORP. MODELS PT-29, PT-31

MODELS PT-33,  
PT-41 (121, 122),  
PT-61 (121, 122)

Models PT-29 and PT-31 are five tube superheterodyne radios covering a frequency range from 540 to 1720 K. C. on the broadcast band and 2.3 to 2.5 megacycles (M. C.) on the local police range. These models are similar with the exception of the cabinets.

INTERMEDIATE

FREQUENCY: 470 K. C.

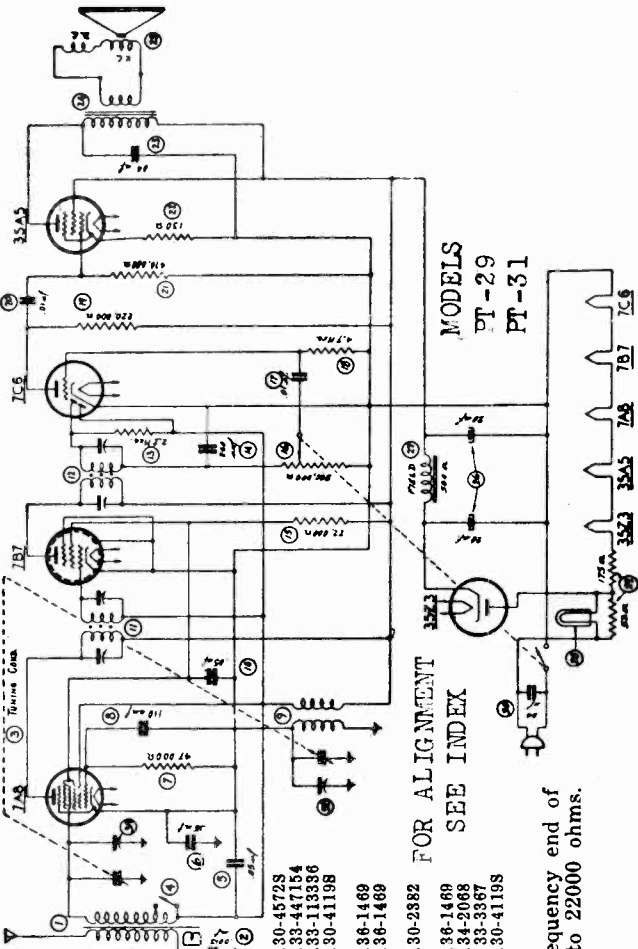
- 1 Antenna Transformer ..... 32-3164
- 2 Tubular Condenser (.0015 mf., 200 v.) 30-45353
- 3 Switch ..... 31-2427
- 4 Tuning Condenser ..... 42-1406
- 5 Tubular Condenser (.05 mf., 200 v.) 30-45198
- 6 Tubular Condenser (.15 mf., 400 v.) 30-45058
- 7 Resistor (47,000 ohms, 1/2 watt) 33-44714
- 8 Mica Condenser (.110 mmf.) 30-1180
- 9 Oscillator Transformer ..... 32-3132
- 10 Tubular Condenser (.05 mf., 200 v.) 30-45198
- 11 1st I. F. Transformer ..... 32-3149
- 12 2nd I. F. Transformer ..... 32-3150
- 13 Resistor (2.2 meg., 1/2 watt) 33-522154
- 14 Mica Condenser (250 mmf.) 61-0083
- 15 Resistor (22,000 ohms, 1/2 watt) 33-329334
- 16 Volume Control (500,000 ohms) 33-3306
- 17 Tubular Condenser (.01 mf., 200 v.) 30-44798
- 18 Resistor (4.7 meg., 1/2 watt) 33-547154
- 19 Resistor (220,000 ohms, 1/2 watt) 33-422154

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

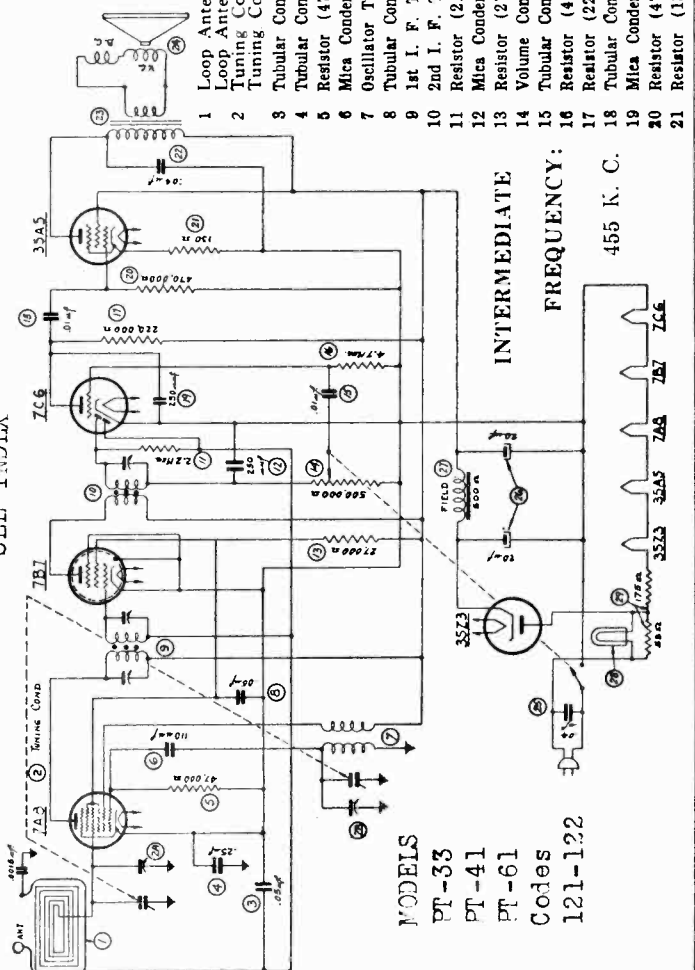
FOR ALIGNMENT

SEE INDEX



FOR ALIGNMENT  
SEE INDEX  
MODELS  
PT-29  
PT-31

Models PT-33, PT-41, Codes 121 and 122, PT-61, Codes 121 and 122, are five tube superheterodyne radios covering a frequency range from 540 to 1580 kilocycles (K. C.)



MODELS  
PT-33  
PT-41  
PT-61  
Codes  
121-122

INTERMEDIATE

FREQUENCY: 455 K. C.

- 22 Tubular Condenser (.04 mf., 400 V.) ..30-41198
- 23 Output Transformer  
Part of Speaker No. 36-1469-1..32-8047  
Part of Speaker No. 36-1469-9..32-8044  
Part of Speaker No. 36-1469-2..32-8044
- 24 Speaker .....36-1469
- 25 Tubular Condenser (.04 mf., 400 V.) ..30-41198
- 26 Electrolytic Condenser  
(20-20 mf., 150 V.) .....30-2382
- 27 Field Coil .....36-1469
- 28 Pilot Lamp .....34-2088
- 29 Line Resistor .....33-3367

PRODUCTION CHANGES

Several parts were changed in these models and the code numbers changed from 121 to 122. These changes are as follows:

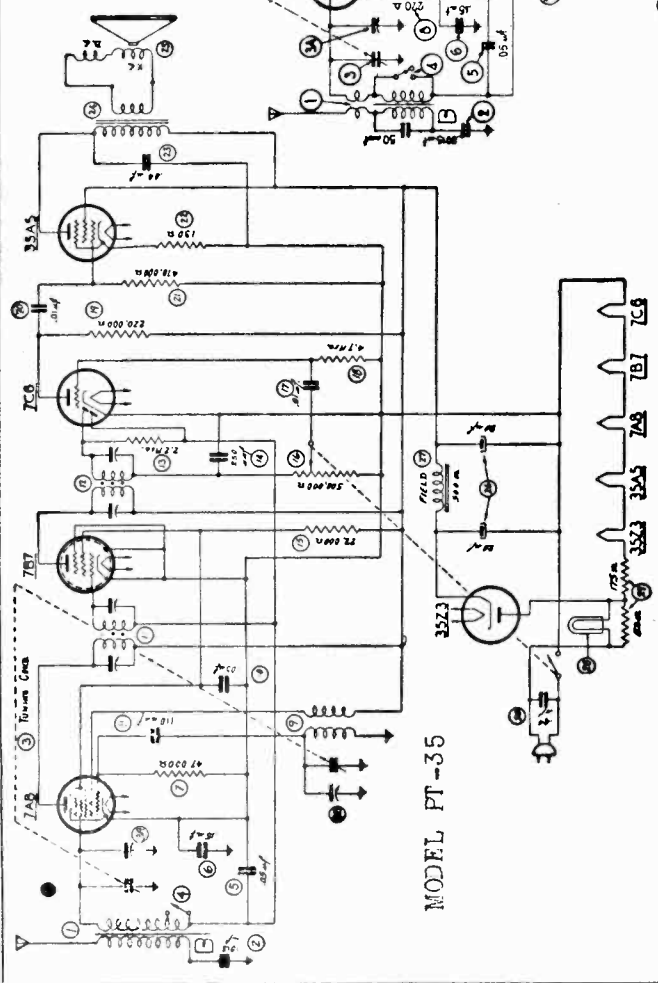
- MODEL PT-41
- Code 121 .....27-5570
- Code 122 .....39-6570
- Dial .....32-3179
- Instructions .....31-2429
- Loop Aerial Assembly .....31-2448
- Tuning Condenser .....27-5570
- MODEL PT-61
- Dial .....39-6570
- Instructions .....38-9858
- Loop Aerial Assembly .....31-2429
- Tuning Condenser .....27-5554
- 39-6570
- 38-9858
- 31-2429



PHILCO RADIO & TELEVISION CORP.

MODEL PT-35  
 MODEL PT-50  
 MODELS PT-37,  
 PT-38, PT-53

Model PT-35 is a five tube superheterodyne radio, covering a frequency range from 540 to 1720 kilocycles (K. C.) on the broadcast band and 2.3 to 2.5 megacycles (M. C.) on the local police band.  
 INTERMEDIATE FREQUENCY: 470 K. C.



MODEL PT-35

MODELS  
 PT-37  
 PT-38  
 PT-53

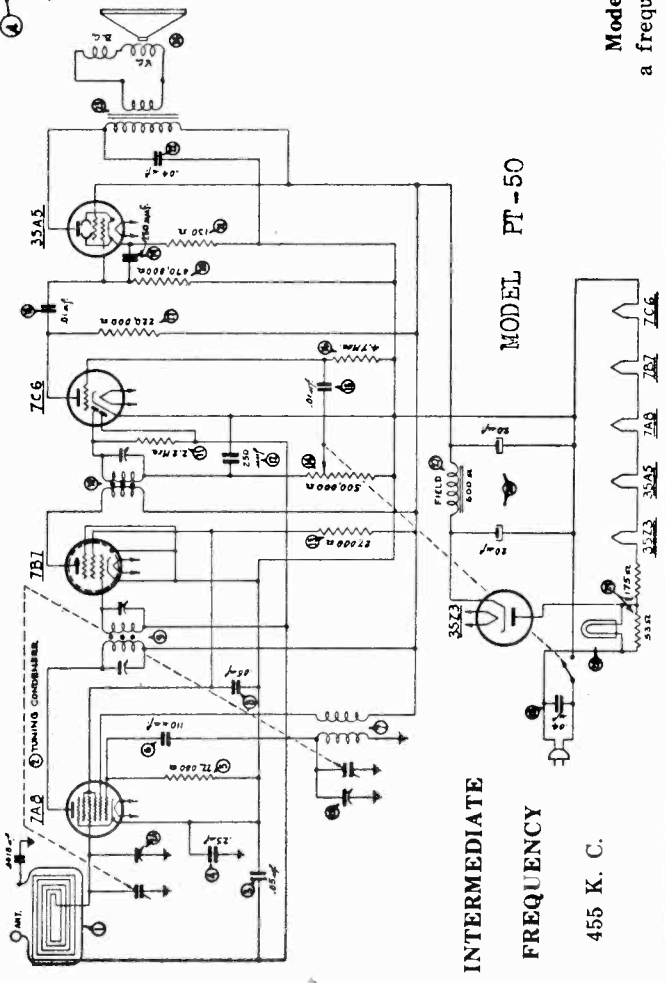
INTERMEDIATE  
 FREQUENCY  
 470 K. C.

Models PT-37 and PT-53 are five tube superheterodyne radios covering a tuning frequency range from 540 to 1720 kilocycles (K. C.) on the broadcast band and 5.5 to 19 megacycles (M. C.) on the short wave band. These models are similar with the exception of the cabinet.

Model PT-38 is a five tube superheterodyne radio, covering a frequency range from 540 to 1720 kilocycles (K. C.) on the broadcast band and from 5.5 to 19 megacycles (M. C.) on the short-wave band.

FOR OTHER DATA SEE INDEX

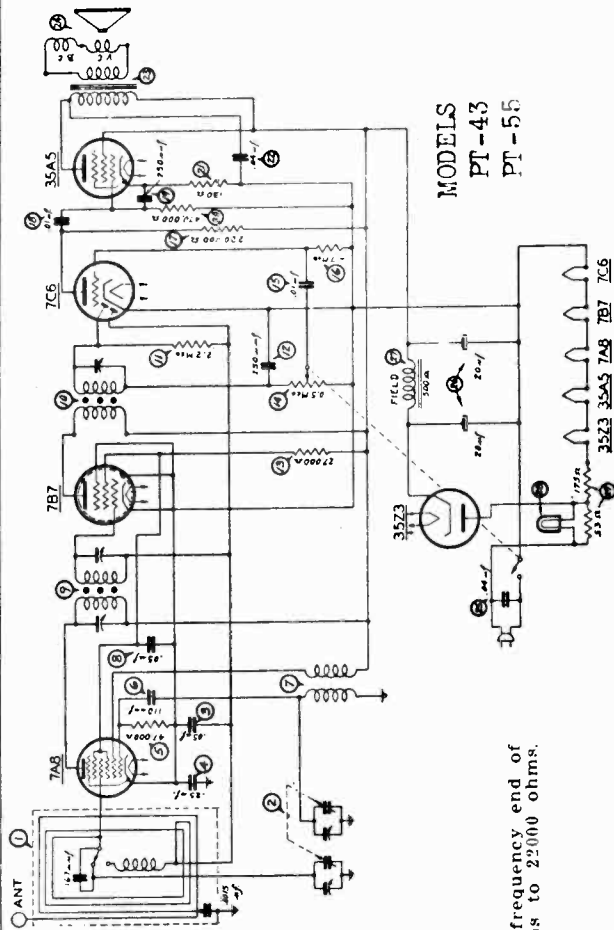
Model PT-50 is a five-tube superheterodyne radio covering a frequency range from 540 to 1580 kilocycles (K. C.)



MODEL PT-50

INTERMEDIATE  
 FREQUENCY  
 455 K. C.

PHILCO RADIO & TELEVISION CORP. MODELS PT-43(121, 122), PT-55  
MODELS PT-45, PT-47



MODELS  
PT-43  
PT-55

**PRODUCTION CHANGES**

MODEL PT-43

Code number changed from 121 to 122 in addition to several part changes. These are as follows:

Loop Aerial Ass'y	Code 121	Code 122
Tuning Condenser	38-9936	32-3402
	31-2436	31-2446

Models PT-45 and PT-47 are five tube electric push-button tuning, superheterodyne radios with a manual tuning range covering 540 to 1720 kilocycles (K. C.)

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

The procedure for adjusting and operating the electric push-buttons for stations will be found on page 10.

**INTERMEDIATE FREQUENCY:** 470 K. C.

One 7A8, converter; one 7B7, I. F. amplifier; one 7C6, 2nd detector, 1st audio, A. V. C.; one 35A5, audio output and one 35Z3, rectifier.

**PRODUCTION CHANGE**

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

Models PT-43 and PT-55 are five tube superheterodyne radios, covering a frequency range from 540 to 1580 kilocycles (K. C.) on the broadcast band and 2.3 to 2.5 megacycles (M. C.) on the local police police range.

These models are similar with the exception of the cabinets. The circuit diagram and parts list shown below apply to both models.

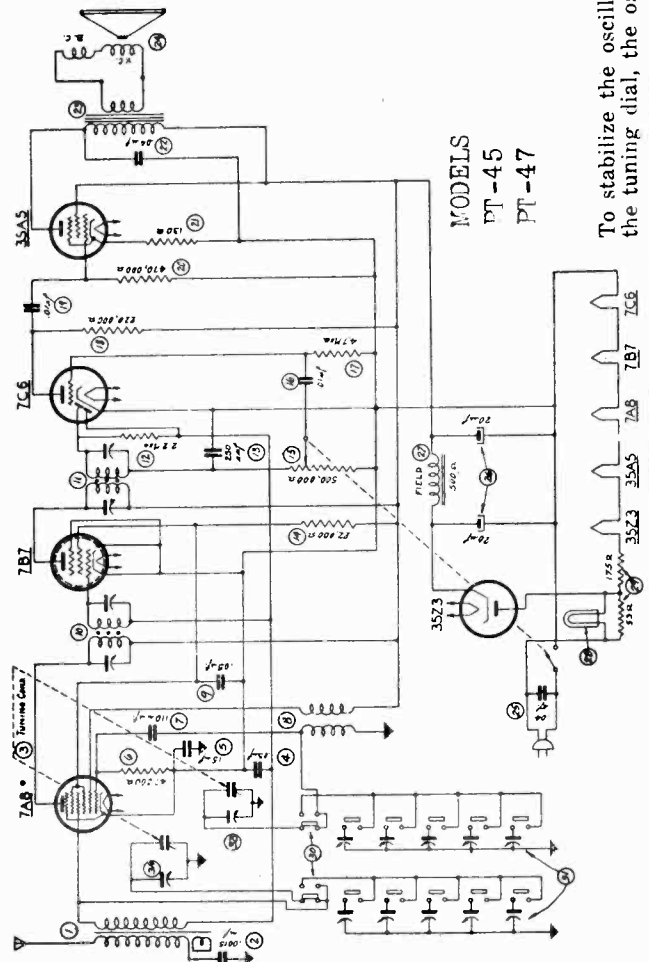
**INTERMEDIATE FREQUENCY:** 455 K. C.

One 7A8, converter; one 7B7, I. F. amplifier; one 7C6, 2nd detector, 1st audio, A. V. C.; one 35A5, audio output and one 35Z3, rectifier.

**PRODUCTION CHANGE**

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

**FOR OTHER DATA AND TUNER, SEE INDEX**



MODELS  
PT-45  
PT-47

PHILCO RADIO & TELEVISION CORP.

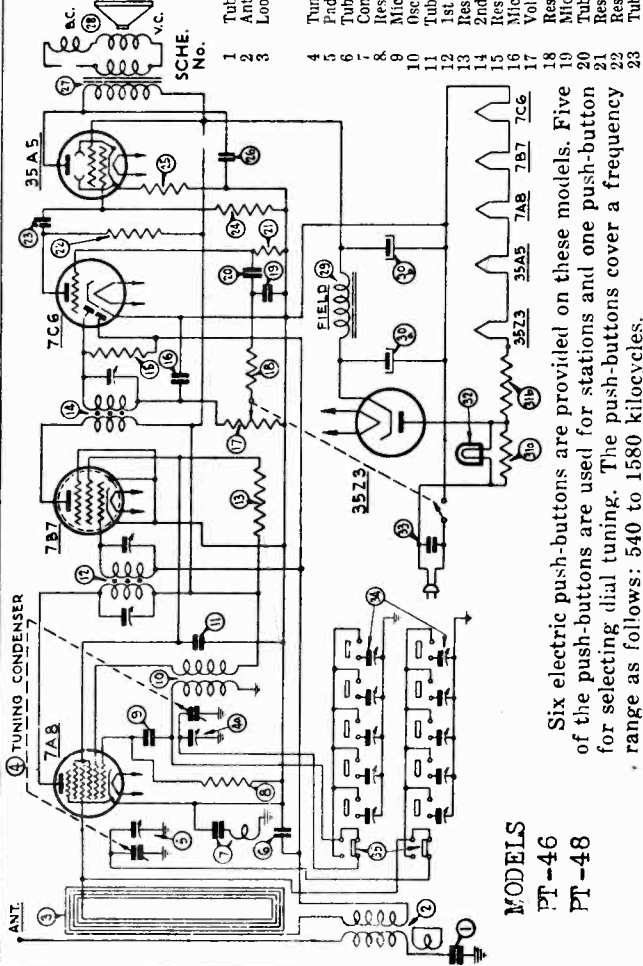
MODELS PT-46, PT-48  
MODELS PT-49, PT-51

Models PT-46 and PT-48 are five tube electric push-button tuning superheterodyne radios with a manual tuning range covering 540 to 1580 K. C.

These models are similar with the exception of the cabinets.

INTERMEDIATE

FREQUENCY: 455 K. C.

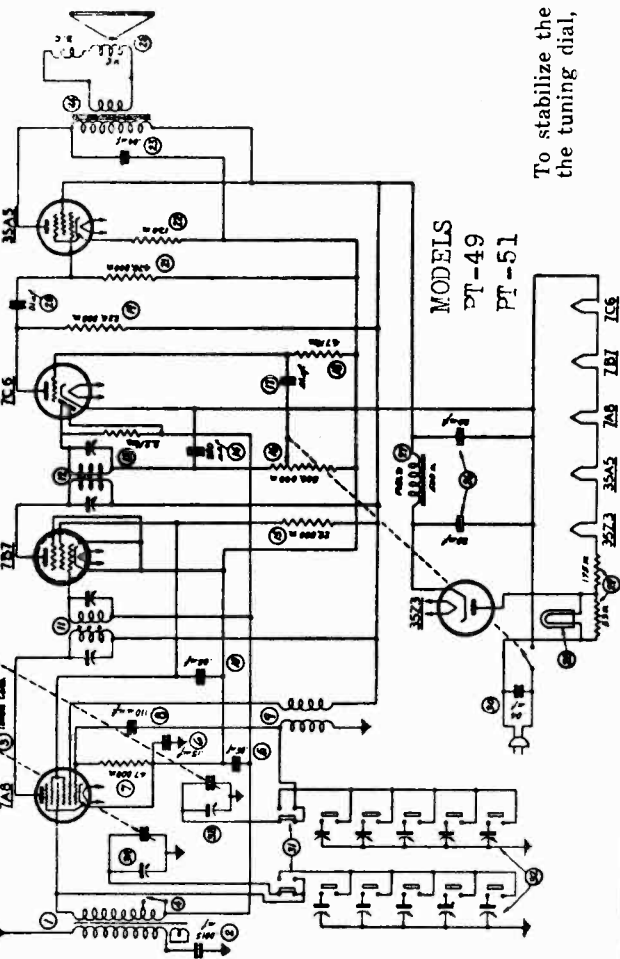


MODELS  
PT-46  
PT-48

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1580 kilocycles.

SCHE. No.	DESCRIPTION	PART No.
1	Tubular Condenser (.0015 mf., 200 v.)	30-4555
2	Antenna Transformer	32-3394
3	Loop Antenna — Part of Cabinet and Loop Assy.	PT-46
4	PT-48	76-1015
5	Tuning Condenser (PT-46 and PT-48)	31-2445
6	Padding Condenser	31-6344
7	Tubular Condenser (.1 mf., 200 v.)	30-4499
8	Condenser & Choke Assy.	76-1019
9	Resistor (22,000 ohms, 1/2 watt)	33-322154
10	Mica Condenser (110 mmf.)	30-1130
11	Oscillator Transformer	32-3152
12	Tubular Condenser (.05 mf., 200 v.)	30-4519
13	1st I. F. Transformer	32-3390
14	Resistor (22,000 ohms, 1/2 watt)	33-322334
15	2nd I. F. Transformer	32-3391
16	Resistor (2.2 meg., 1/2 watt)	33-322154
17	Mica Condenser (250 mmf.)	61-0033
18	Volume Control (500,000 ohms)	33-3306
19	Resistor (47,000 ohms, 1/2 watt)	33-347154
20	Mica Condenser (250 mmf.)	61-0033
21	Tubular Condenser (.01 mf., 200 v.)	30-4479
22	Resistor (4.7 meg., 1/2 watt)	33-347154
23	Resistor (220,000 ohms, 1/2 watt)	33-422154
24	Tubular Condenser (.01 mf., 400 v.)	30-4372

SCHE. No.	DESCRIPTION	PART No.
24	Resistor (470,000 ohms, 1/2 watt)	33-447154
25	Resistor (130 ohms, 1/2 watt)	33-113336
26	Tubular Condenser (.04 mf., 400 v.)	30-4119
27	Output Transformer (for Speaker 36-1469-1)	32-8047
	(for Speaker 36-1469-2)	32-8044
	(for Speaker 36-1469-9)	32-8044
28	Speaker	36-1469
29	Field Coil	Part of Speaker No. 36-1469
30	Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
31	Line Resistor	33-3387
32	Pilot Lamp	34-2068
33	Tubular Condenser (.04 mf., 400 v.)	30-4119
34	Padding Condenser Strip	31-6324
35	Push Button Switch	42-1485



MODELS  
PT-49  
PT-51

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47,000 ohms to 220,000 ohms.

PRODUCTION CHANGE

INTERMEDIATE FREQUENCY: 470 K. C.

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

Models PT-49 and PT-51 are five tube electric push button tuning superheterodyne radios with a manual tuning covering 540 to 1720 K. C. on the broadcast range and 2.3 to 2.5 megacycles (M. C.) on the local police range. These models are similar with the exception of the cabinet.

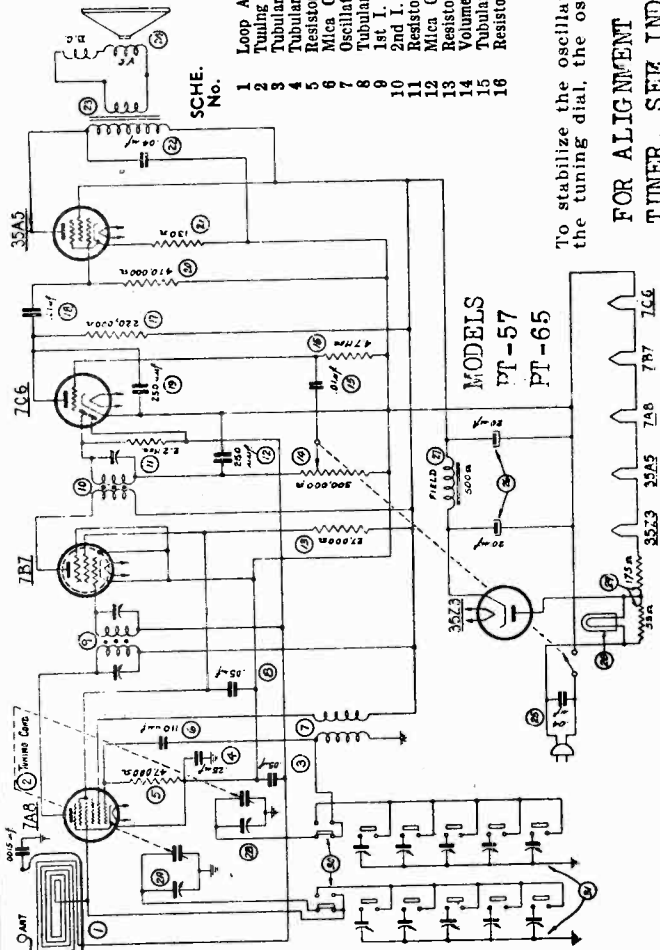
One 7A8, converter; one 7B7, I. F. amplifier; one 7C6, 2nd detector, 1st audio, A. V. C.; one 35A5, audio output and one 35Z3, rectifier.

FOR OTHER DATA AND TUNER, SEE INDEX

PHILCO RADIO & TELEVISION CORP. MODELS PT-57, PT-65  
MODEL PT-59

Models PT-57 and PT-65 are five tube electric push-button tuning superheterodyne radios with a manual tuning range covering 540 to 1580 K. C.

The models are similar with the exception of the cabinets  
INTERMEDIATE FREQUENCY: 455 K. C.



DESCRIPTION	PART No.
Loop Antenna Assembly	38-9859
Tuning Condenser	31-2430
Tubular Condenser (.05 mf., 200 v.)	30-45198
Tubular Condenser (.25 mf., 400 v.)	30-46048
Resistor (47,000 ohms, 1/2 watt)	33-547154
Mica Condenser (110 mmf.)	30-1130
Oscillator Transformer	32-3152
Tubular Condenser (.05 mf., 200 v.)	30-45198
1st I. F. Transformer	32-3178
2nd I. F. Transformer	33-522154
Resistor (2.2 megs, 1/2 watt)	33-522154
Mica Condenser (250 mmf.)	61-0033
Resistor (27,000 ohms, 1/2 watt)	33-327334
Volume Control (500,000 ohms)	33-5306
Tubular Condenser (.01 mf., 200 v.)	30-44798
Resistor (4.7 megs, 1/2 watt)	33-547154
Resistor (220,000 ohms, 1/2 watt)	33-422154
Tubular Condenser (.01 mf., 400 v.)	30-45728
Mica Condenser (250 mmf.)	61-0033
Resistor (130 ohms, 1/2 watt)	33-113336
Tubular Condenser (.04 mf., 400 v.)	30-41198
Output Transformer	(for Speaker 36-1469-1) 32-8047 (for Speaker 36-1469-2) 32-8044 (for Speaker 36-1469-9) 32-8044
Speaker	36-1469
Tubular Condenser (.04 mf., 400 v.)	30-41198
Electrolytic Condenser	(20-20 mf., 150 v.) 30-2382
Field Coil—Part of Speaker No.	36-1469
Pilot Lamp	34-2068
Line Resistor	33-3387
Push Button Switch	42-1485
Padding Condenser Strip	31-6286

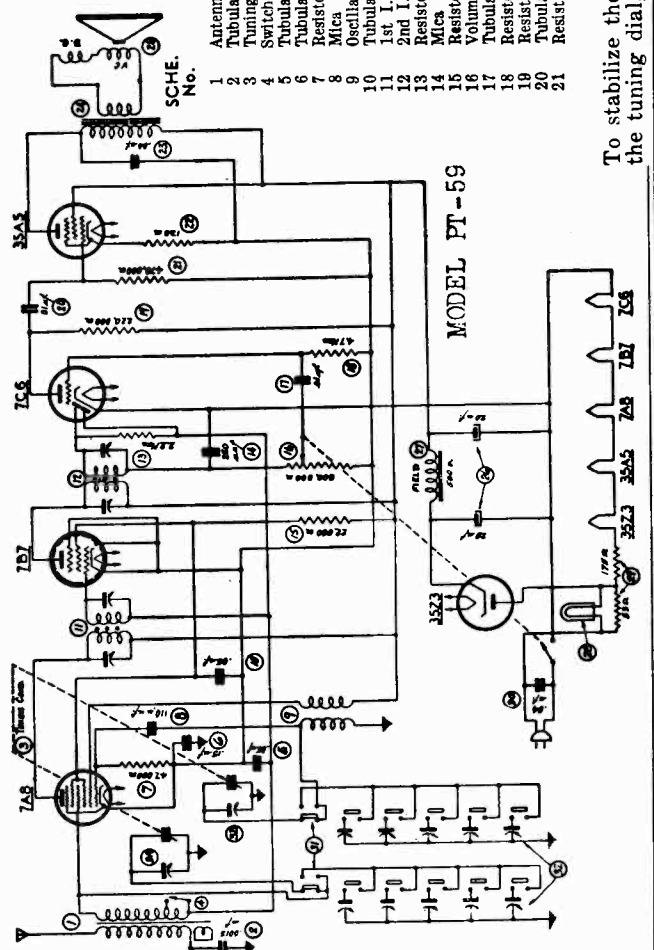
PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

FOR ALIGNMENT AND TUNER, SEE INDEX

Six electric push-buttons are provided on these models. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

Model PT-59 is a five tube electric push-button tuning superheterodyne radio with a manual tuning covering 540 to 1720 K. C. on the broadcast range and 2.3 to 2.5 mcgacycles (M. C.) on the local police range.



DESCRIPTION	PART No.
Antenna Transformer	32-3164
Tubular Condenser (.0015 mf., 200 v.)	30-45558
Tuning Condenser	31-2430
Switch	42-1406
Tubular Condenser (.05 mf., 200 v.)	30-45198
Tubular Condenser (.15 mf., 400 v.)	30-45658
Resistor (47,000 ohms, 1/2 watt)	33-347154
Mica Condenser (110 mmf.)	30-1130
Oscillator Transformer	32-3152
Tubular Condenser (.05 mf., 200 v.)	30-45198
1st I. F. Transformer	32-3149
2nd I. F. Transformer	33-522154
Resistor (2.2 meg, 1/2 watt)	33-522154
Mica Condenser (250 mmf.)	61-0033
Resistor (22,000 ohms, 1/2 watt)	33-322354
Volume Control (500,000 ohms)	33-5306
Tubular Condenser (.01 mf., 200 v.)	30-44798
Resistor (4.7 meg, 1/2 watt)	33-547154
Resistor (220,000 ohms, 1/2 watt)	33-422154
Tubular Condenser (.01 mf., 400 v.)	30-45728
Resistor (470,000 ohms, 1/2 watt)	33-447154
Resistor (130 ohms, 1/2 watt)	33-113336
Tubular Condenser (.4 mf., 400 v.)	30-41198
Output Transformer	(for Speaker 36-1469-1) 32-8047 (for Speaker 36-1469-2) 32-8044 (for Speaker 36-1469-9) 32-8044
Cone Assembly	(for Speaker 36-1469-1) 36-4115 (for Speaker 36-1469-2) 36-4132 (for Speaker 36-1469-9) 36-4113
Electrolytic Condenser	(20-20 mf., 150 v.) 30-2382
Field Coil	Part of Speaker, Part No. 36-1469
Pilot Lamp	34-2068
Line Resistor	33-3387
Tubular Condenser (.04 mf., 400 v.)	30-41198

INTERMEDIATE FREQUENCY: 470 K. C.

PRODUCTION CHANGE

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

MODEL PT-63  
MODEL PT-66

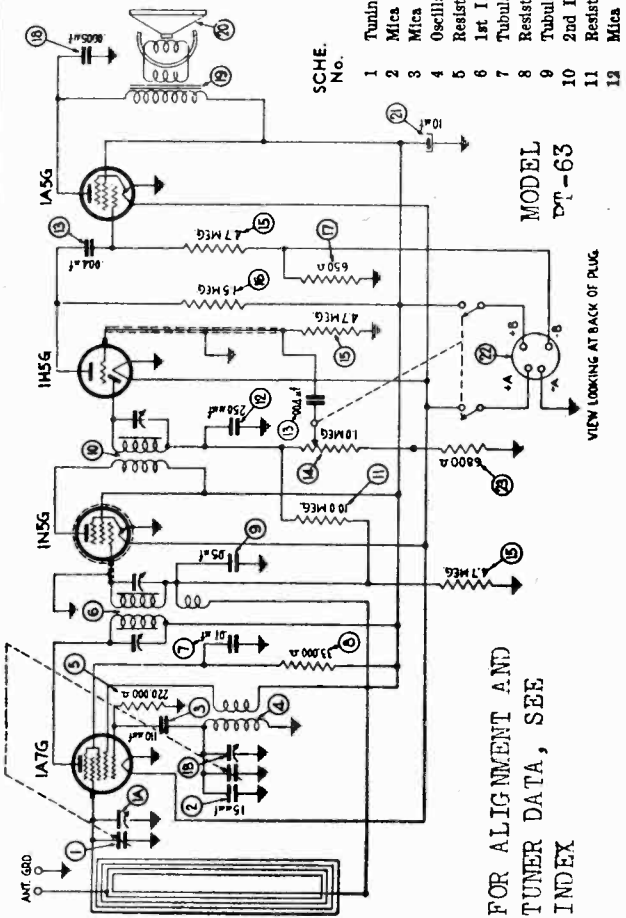
PHILCO RADIO & TELEVISION CORP.

Model PT-63 is a four tube portable battery operated superheterodyne receiver designed for reception of standard broadcast stations. In addition other features included are a loop aerial built into the cabinet, extremely sensitive permanent magnet field speaker, automatic volume control and pentode audio output. INTERMEDIATE FREQUENCY: 455 K. C.

TUNING RANGE: 540 to 1550 K. C.

BATTERY CURRENT: "A" 200 M. A. "B" 5.6 M. A.

DESCRIPTION	PART No.	DESCRIPTION	PART No.
1 Tuning Condenser (15 mmf.)	31-2432	13 Tubular Condenser (.004 mf., 400 v.)	30-45788
2 Mica Condenser (.05 mf., 200 v.)	30-4519	14 Volume Control	33-5331
3 Mica Condenser (110 mmf.)	30-1031	15 Resistor (4.7 megs. 1/2 watt)	33-547154
4 Oscillator Transformer	32-3277	16 Resistor (1.5 meg. 1/2 watt)	33-515154
5 Resistor (220,000 ohms 1/2 watt)	33-422154	17 Resistor (650 ohms 1/2 watt)	33-165326
6 1st. I. F. Transformer	32-3265	18 Mica Condenser (.0005 mf.)	30-1114
7 Tubular Condenser (.01 mf., 400 v.)	30-45728	19 Output Transformer	32-8062
8 Resistor (33,000 ohms 1/2 watt)	33-333154	20 Speaker	36-1481
9 Tubular Condenser (.05 mf., 200 v.)	30-45198	21 Electrolytic Condenser	30-2396
10 2nd I. F. Transformer	32-3266	22 Battery Cable	41-3487
11 Resistor (10 megs. 1/2 watt)	33-610154	23 Resistor (6800 ohms 1/2 watt)	33-268154
12 Mica Condenser (250 mmf.)	61-0033		

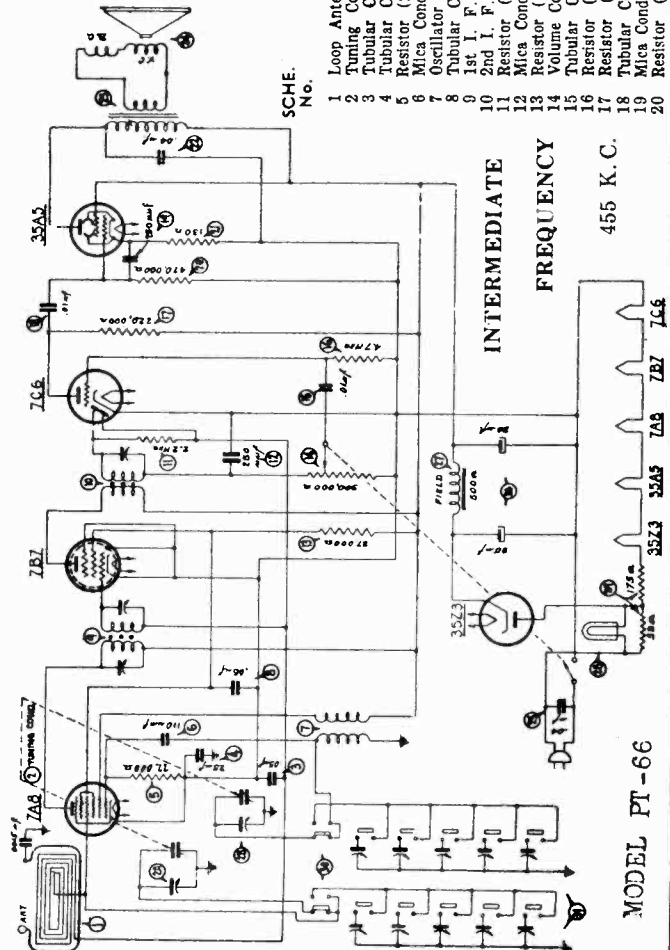


FOR ALIGNMENT AND TUNER DATA, SEE INDEX

VIEW LOOKING AT BACK OF PLUG

Model PT-66 is a five tube, electric push-button tuning, superheterodyne radio with a manual tuning range covering 540 to 1580 K. C.

Six electric push-buttons are provided on this model. Five of the push-buttons are used for stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.



FOR ALIGNMENT AND TUNER DATA, SEE INDEX

VIEW LOOKING AT BACK OF PLUG

DESCRIPTION	PART No.	DESCRIPTION	PART No.
1 Loop Antenna Assembly	32-3186	21 Resistor (130 ohms, 1/2 watt)	33-113338
2 Tuning Condenser (.05 mf., 200 v.)	30-4519	22 Tubular Condenser (.04 mf., 400 v.)	30-4119
3 Tubular Condenser (.25 mf., 400 v.)	30-4604	23 Output Transformer	32-8047
4 Tubular Condenser (.05 mf., 200 v.)	30-4519	24 Speaker	36-1469.2
5 Resistor (22,000 ohms, 1/2 watt)	33-322154	25 Cone Assembly	36-1469.1
6 Mica Condenser (110 mmf.)	30-1130	26 Tubular Condenser (.04 mf., 400 v.)	30-4119
7 Oscillator Transformer	32-3130	27 Electrolytic Condenser (20-20 mf., 150 v.)	30-2382
8 Tubular Condenser (.05 mf., 200 v.)	30-4519	28 Field Coil—Part of Speaker No.	36-1489
9 1st. I. F. Transformer	32-3177	29 Pilot Lamp	34-2068
10 2nd I. F. Transformer	32-3178	30 Push Button Switch	33-3367
11 Resistor (2.2 megs., 1/2 watt)	33-522154	31 Padding Condenser Strip	42-1485
12 Mica Condenser (250 mmf.)	61-0033		
13 Volume Control (500,000 ohms)	33-327334		
14 Tubular Condenser (.01 mf., 200 v.)	33-5306		
15 Resistor (4.7 megs., 1/2 watt)	33-547154		
16 Resistor (220,000 ohms, 1/2 watt)	33-422154		
17 Tubular Condenser (.01 mf., 400 v.)	30-4572		
18 Mica Condenser (250 mmf.)	61-0033		
19 Resistor (470,000 ohms, 1/2 watt)	33-471154		

MODEL PT-66

PHILCO RADIO & TELEVISION CORP.

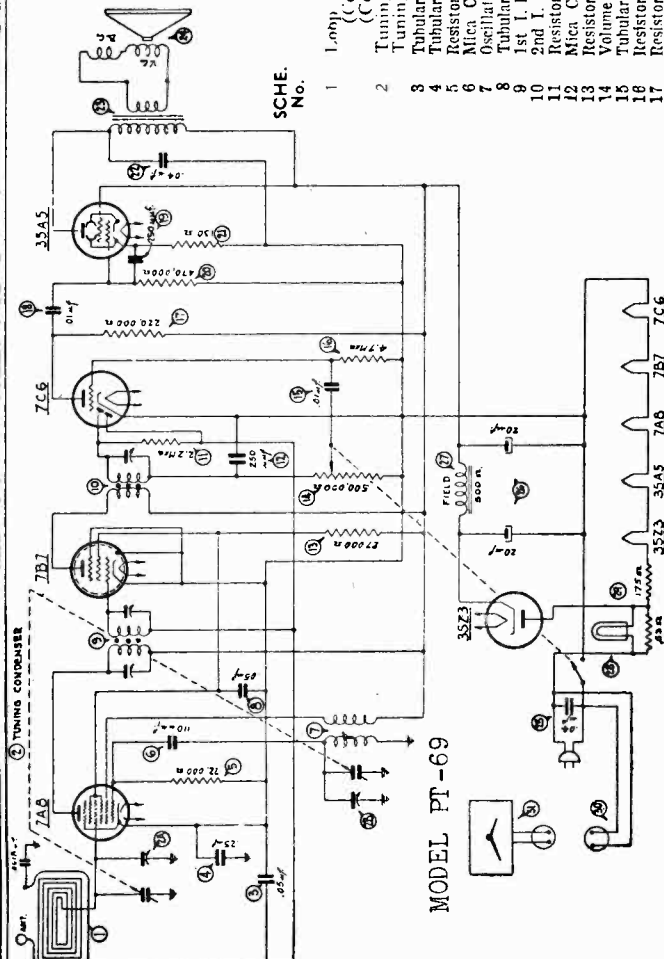
MODEL PT-67

MODEL PT-69 (121, 122)

MODEL PT-69

Several parts were changed in this model and the code number changed from 121 to 122. These changes are as follows:

	Code 121	Code 122
Dial	27-5554	27-5570
Instructions	39-6573	39-6712
Loop Aerial Assy.	38-9858	32-3179
Tuning Condenser	31-2429	31-2448



DESCRIPTION MODEL PT-69

PART No.	DESCRIPTION	Code 121	Code 122
1	Loop Antenna Assembly (Code 121)	38-9858	
2	Tuning Condenser (Code 121)	31-2429	
3	Tuning Condenser (Code 122)	31-2448	
4	Tubular Condenser (.05 mf., 200 v.)	30-4519	
5	Tubular Condenser (.25 mf., 400 v.)	30-4604	
6	Mica Condenser (110 mmf.)	33-322154	
7	Oscillator Transformer	30-1130	
8	Tubular Condenser (.05 mf., 200 v.)	30-4519	
9	1st I. F. Transformer	32-3177	
10	2nd I. F. Transformer	32-3178	
11	Resistor (2.2 megs., 1/2 watt)	33-522154	
12	Mica Condenser (250 mmf.)	61-0033	
13	Resistor (27,000 ohms, 1/2 watt)	33-327334	
14	Volume Control (500,000 ohms)	33-3306	
15	Tubular Condenser (.01 mf., 200 v.)	30-4479	
16	Resistor (4.7 megs., 1/2 watt)	33-547154	
17	Resistor (220,000 ohms, 1/2 watt)	33-422154	

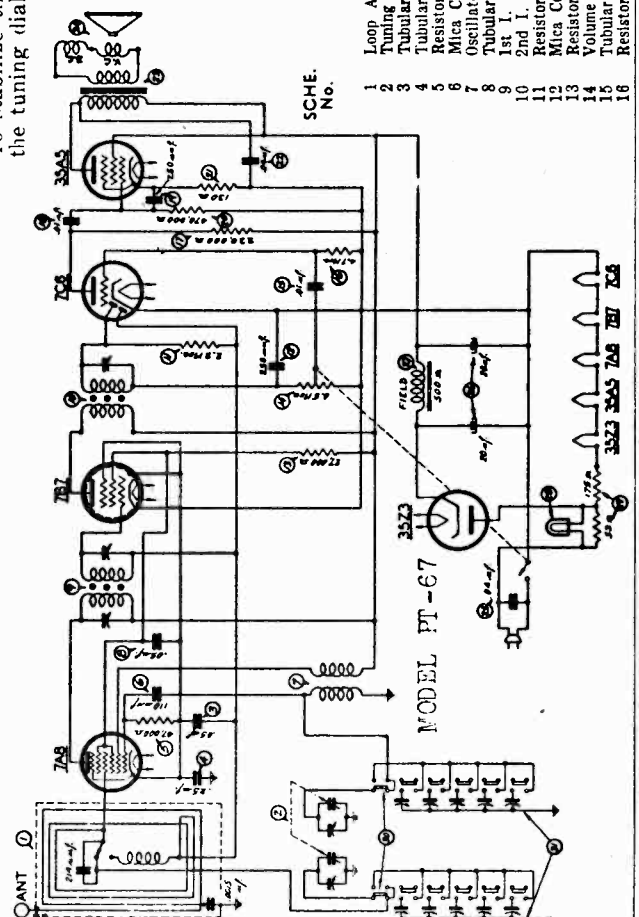
INTERMEDIATE FREQUENCY: 455 K. C.

PRODUCTION CHANGE MODELS PT-67, PT-69

To stabilize the oscillator circuit and prevent oscillation at the high frequency end of the tuning dial, the oscillator grid leak was changed from 47000 ohms to 22000 ohms.

Model PT-67 is a five tube electric push-button tuning, superheterodyne radio with a manual tuning range covering 540 to 1580 K. C. on the broadcast band and 2.3 to 2.5 M. C. on the local police range.

Six electric push-buttons are provided on this model. Five push-buttons are used for selecting stations and one push-button for selecting dial tuning. The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.



DESCRIPTION MODEL PT-67

PART No.	DESCRIPTION	Code 121	Code 122
1	Loop Antenna Assembly	38-9837	
2	Tuning Condenser	31-2437	
3	Tubular Condenser (.05 mf., 200 v.)	30-4519	
4	Tubular Condenser (.25 mf., 400 v.)	30-4604	
5	Resistor (47,000 ohms, 1/2 watt)	33-347154	
6	Mica Condenser (110 mmf.)	30-1130	
7	Oscillator Transformer	32-3152	
8	Tubular Condenser (.05 mf., 200 v.)	30-4519	
9	1st I. F. Transformer	32-3177	
10	2nd I. F. Transformer	32-3178	
11	Resistor (2.2 megs., 1/2 watt)	33-522154	
12	Mica Condenser (250 mmf.)	61-0033	
13	Resistor (27,000 ohms, 1/2 watt)	33-327334	
14	Volume Control (500,000 ohms)	33-3306	
15	Tubular Condenser (.01 mf., 200 v.)	30-4479	
16	Resistor (4.7 megs., 1/2 watt)	33-547154	

MODEL 40-74  
MODEL 40-84

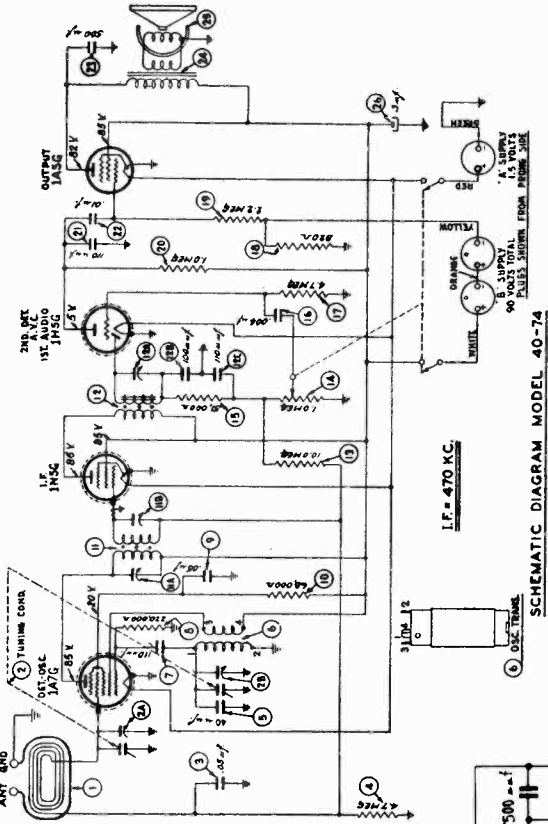
PHILCO RADIO & TELEVISION CORP.

**TYPE OF CIRCUIT:** Model 40-74 is a portable, four-tube, battery operated superheterodyne radio, designed with a built-in loop aerial. Connections are also provided for an external aerial and ground.

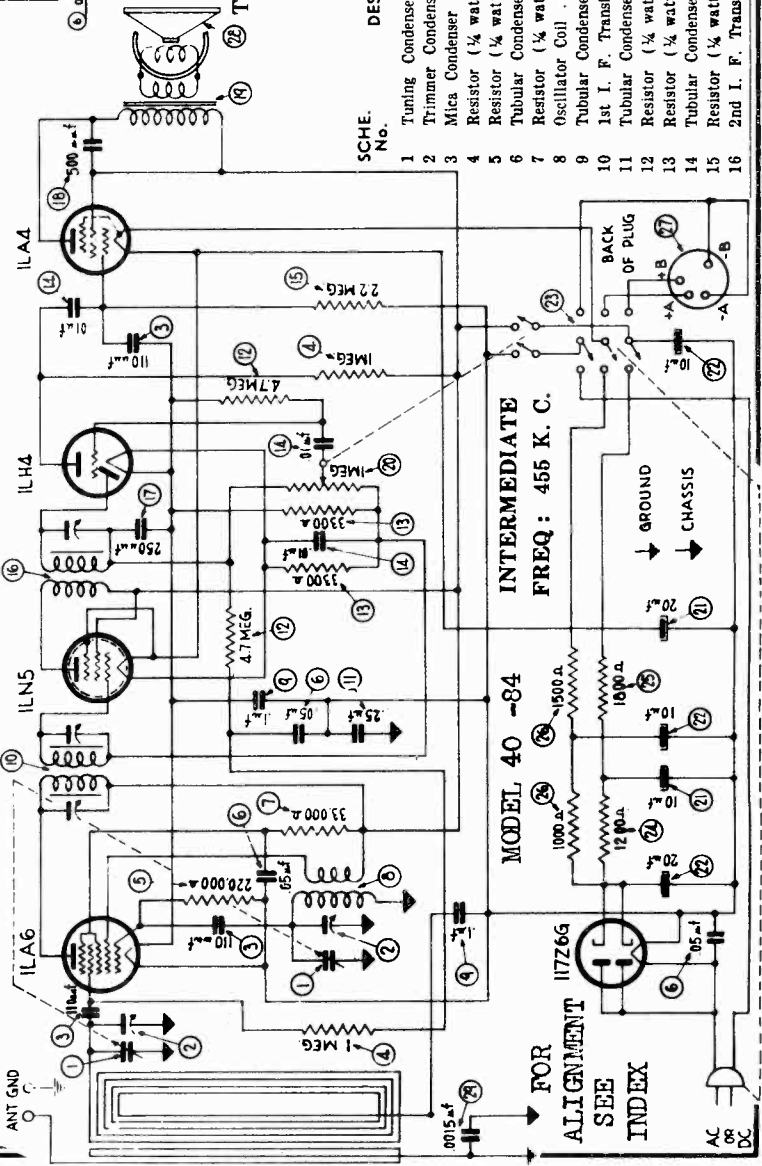
**BATTERY DRAIN:** "A" 200 M. A.; "B" 7.2 M. A.

The R. F. and I. F. aligning procedure for this model is the same as that listed for Model 40-81 in Vol. X with the exception of the padder numbers. Model 40-74 I. F. padders are 12A, 11B and 11A. The R. F. padder located on the bottom of the condenser and reached through the bottom of the cabinet are 2B oscillator and 2A (aerial).

- 1 Loop Assembly ..... 40-6421
- 2 Tuning Condenser ..... 31-2403
- 3 Tubular Condenser (.05 mfd.) ..... 30-4519
- 4 Resistor (4.7 meg., 1/2 watt) ..... 33-547339
- 5 Mica Condenser (40 mmfd.) ..... 30-1095
- 6 Oscillator Transformer ..... 32-3274
- 7 Mica Condenser (110 mmfd.) ..... 30-1031
- 8 Resistor (220,000 ohms, 1/2 watt) ..... 33-422339
- 9 Tubular Condenser (.05 mfd.) ..... 30-4444
- 10 Resistor (68,000 ohms, 1/2 watt) ..... 33-368339
- 11 First I. F. Transformer Assembly ..... 32-3103
- 12 Second I. F. Trans. Assembly ..... 32-3176
- 12-C Mica Condenser (110 mmfd.) ..... 30-1031
- 13 Resistor (10.0 meg., 1/2 watt) ..... 33-610339
- 14 Volume Control (1.0 meg.) ..... 33-5310
- 15 Resistor (51,000 ohms, 1/2 watt) ..... 33-351339
- 16 Tubular Condenser (.004 mfd.) ..... 30-4578
- 17 Resistor (4.7 meg., 1/2 watt) ..... 33-547339
- 18 Resistor (820 ohms, 1/2 watt) ..... 33-182339
- 19 Resistor (7.2 meg., 1/2 watt) ..... 33-522339
- 20 Resistor (1.0 meg., 1/2 watt) ..... 33-510339
- 21 Mica Condenser (110 mmfd.) ..... 30-1031
- 22 Tubular Condenser (.01 mfd.) ..... 30-4572
- 23 Mica Condenser (500 mmfd.) ..... 30-1114
- 24 Output Transformer ..... 32-8096
- 25 Cone and Voice Coil Assembly (Speaker Part No. 36-1482-3) ..... 36-4121
- 26 Electrolytic Condenser (3 mfd.) ..... 30-2359



Model 40-84 is a portable five (5) tube A.C.-D.C. power line or battery operated superheterodyne radio. This model covers a tuning frequency range of 540 K. C. to 1550 K. C. To operate the radio on 115 volt A.C. or D.C. power supply, insert the power line cord plug into the socket on the back of the chassis. This plug-in arrangement automatically disconnects the A.-B. battery from the circuits of the set.



SCH. No.	DESCRIPTION	PART No.
1	Tuning Condenser	31-2438
2	Trimmer Condenser	31-6211
3	Mica Condenser	30-1130
4	Resistor (1/2 watt, 1 meg.)	33-510154
5	Resistor (1/2 watt, 220,000 ohms)	33-422154
6	Tubular Condenser (.05 mfd., 400 V.)	30-4518
7	Resistor (1/2 watt, 33,000 ohms)	33-333154
8	Oscillator Coil	32-3385
9	Tubular Condenser (.1 mfd., 400 V.)	30-4455
10	1st I. F. Transformer	32-3384
11	Tubular Condenser (.25 mfd., 400 V.)	32-4448
12	Resistor (1/2 watt, 4.7 megs.)	33-547154
13	Resistor (1/2 watt, 10,000 ohms)	33-310154
14	Tubular Condenser (.01 mfd., 400 V.)	30-4572
15	Resistor (1/2 watt, 2.2 meg.)	33-522154
16	2nd I. F. Transformer	32-3266
17	Mica Condenser (250 mmf.)	61-0033
18	Mica Condenser (500 mmf.)	30-1114
19	Output Transformer	32-8100
20	Volume Control	33-5375
21	Electrolytic Condenser (20-10 mfd., 150 V.)	30-2453
22	Electrolytic Condenser (10-10 mfd., 150 V.; 20 mfd., 25 V.)	30-2452
23	Automatic T. P. D. T. Switch	42-1553
24	Resistor (1/2 watt, 1200 ohms)	33-212334
25	Filament Resistor	33-218334
26	Filament Resistor	33-3387
27	Battery Cable	41-3226
28	Speaker	36-1476

PHILCO RADIO & TELEVISION CORP. MODEL 40-81 (121, 122)

MODEL 40-81T, CSL  
 MODEL 40-82 (121)  
 MODEL 40-83

Model 40-82, Code 121, is a 4-tube portable battery operated superheterodyne radio and covers the standard broadcast frequency range from 540 to 1550 K. C. This Model is similar to Philco Model 40-81, Code 122, with the exception of the cabinet, and several of the replacement parts.

The following service data listed for Model 40-81, Code 122, also applies to Model 40-82, Code 121. The parts used in 40-82 which differ from those shown for Model 40-81, Code 122, are as follows:

Knobs	27-4876
Pointer	27-4891
Scale	27-5561
Tuning Condenser	31-2432
Grille Screen	56-1255
Cabinet	10450A

**MODEL 40-83**

Model 40-83 is similar to Model 40-81, Code 122, with the exception of the following parts:

Grille Screen	56-1539
Pointer	27-5550
Pointer	56-1326

The service data listed for Model 40-81, Code 122, applies to Model 40-83.

**MODEL 40-81, CODES 121-122**

To improve the padding at 1500 K. C. condenser (2) 25 mmfd. Part No. 30-1137 changed to 15 mmfd. Part No. 61-0038.

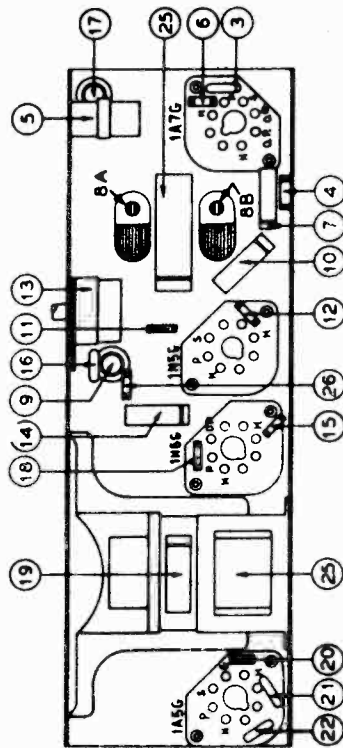
Tuning condenser, dial scale, and pointer changed on later production receivers. These changes are as follows:

(8) Tuning Condenser	Production	31-2402	Later
Dial Scale	Production	27-5558	31-2432
Pointer	Production	56-1326	27-5561
Pointer	Production	56-1326	27-4891

**MODEL 40-81, CODE 122**

To improve the operating characteristics of the receiver at 550 K. C. and prevent oscillation the following items should be observed:

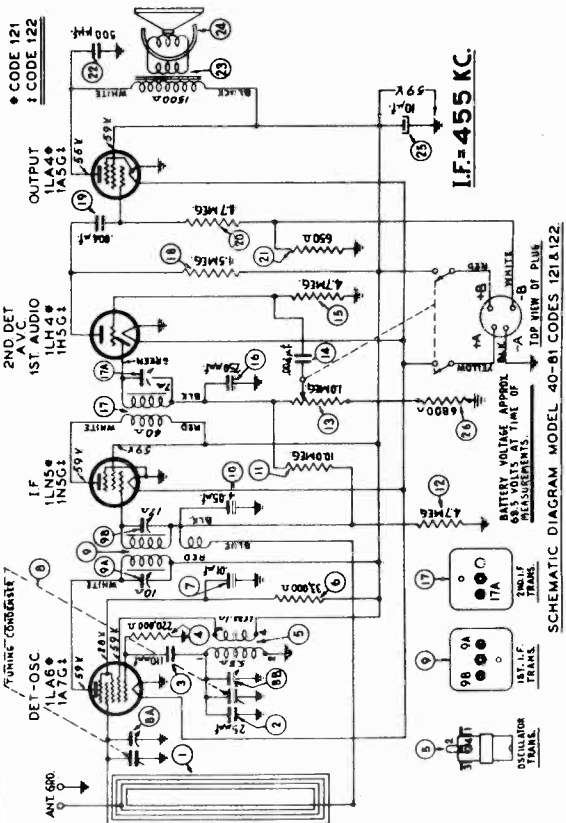
- The loop wire going to the 1A7 grid, the wire from the 1A7 grid to the tuning panel and the wire from the tuning condenser antenna section lug to the wiring panel must be kept as far away from the 1A7 tube as is possible.
- The second I. F. Shield must be tightly fastened to the sub-base so that no openings exist between the base and the bottom of the shield.



PART LOCATIONS, UNDERSIDE OF CHASSIS, MODEL 40-81

FOR ALIGNMENT  
 SEE INDEX

**BATTERY CURRENT:**  
 "A" Battery, 200 M. A.  
 "B" Battery, 5.6 M. A.



Models 40-81, Codes 121 and 122 are 4 tube portable battery operated superheterodyne receivers. These receivers are similar with the exception of the type tubes used. Incorporated in the receivers is a self-contained loop aerial and an extremely sensitive permanent magnet field speaker. In addition terminals are provided for connection an outside aerial and ground. The receiver is operated from a self-contained A-B battery pack.

**TUNING RANGE:** 540 to 1550 K. C.  
**INTERMEDIATE FREQUENCY:** 455 K. C.

SCH. No.	DESCRIPTION	PART No.
1	Loop Assembly (Part of Cabinet)	10413A
2	Mica Condenser (18 mmfd.)	61-0038
3	Mica Condenser (110 mmfd.)	30-1031
4	Resistor (220,000 ohms, 1/2 watt)	31-22339
5	Oscillator Transformer	31-3277
6	Resistor (33,000 ohms, 1/2 watt)	31-33339
7	Tubular Condenser (.01 mfd.)	30-4872
8	Tuning Condenser Assembly	31-2432
9	1st I. F. Transformer Assembly	31-3268
10	Tubular Condenser (.05 mfd.)	30-4810
11	Resistor (10.0 meg., 1/2 watt)	31-10139
12	Resistor (6.7 meg., 1/2 watt)	31-67339
13	Volume Control and On-Off Switch	31-2321
14	Tubular Condenser (.004 mfd.)	30-4878
15	Resistor (4.7 meg., 1/2 watt)	31-54739
16	Mica Condenser (280 mmfd.)	61-0033
17	2nd I. F. Transformer Assembly	31-3266
18	Resistor (1.5 meg., 1/2 watt)	31-15339
19	Tubular Condenser (.004 mfd.)	30-4878
20	Resistor (4.7 meg., 1/2 watt)	31-54739
21	Resistor (850 ohms, 1/2 watt)	31-16336
22	Mica Condenser (800 mmfd.)	30-1114
23	Output Transformer	31-6042
24	Cone and Voice Coil Assembly (Speaker Part No. 36-1481.3)	36-4121
25	Electrolytic Condenser (10 mfd., 180 V.)	30-2396
26	Resistor (6800 ohms, 1/2 watt)	31-26839

PART No.	DESCRIPTION	PART No.
27-4876	Knobs (Volume and Tuning)	27-4876
27-4891	Pointer	27-4891
36-1481	Speaker	36-1481
56-1566	Shield (Tube, Code 121)	56-1566
56-0378	Sockets (Lokal, Code 121)	56-0378
27-6133	Sockets (Octal, Code 122)	27-6133
28-8751	Spring (Drive Cord)	28-8751
38-9878	Tuning Shaft Assembly	38-9878

MODEL 40-82	
Knobs	27-4876
Pointer	27-4891
Scale	27-5561
Tuning Condenser	31-2432
Grille Screen	56-1255
Cabinet	10450A

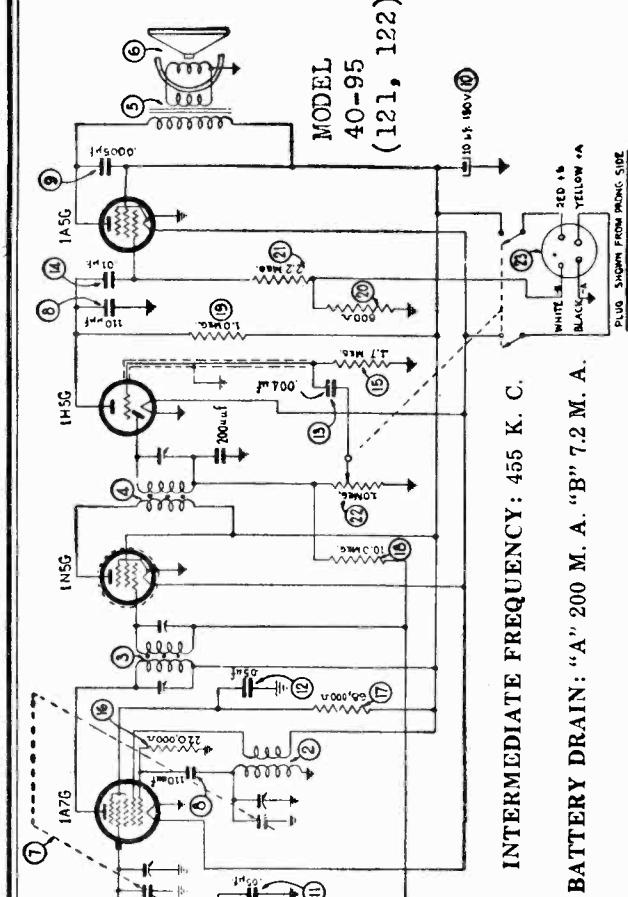
MODEL 40-81T, CSL	
Cabinet	10413C
Dial	27-5561
Knob Assembly	27-4876
Pointer	27-4891

This model is the same as 40-81, Code 122, with the exception of the above parts.



PHILCO RADIO & TELEVISION CORP.

MODEL 40-90  
MODEL 40-95 (121, 122)



INTERMEDIATE FREQUENCY: 455 K. C.  
BATTERY DRAIN: "A" 200 M. A. "B" 7.2 M. A.

Model 40-95 is a four (4) tube battery operated superheterodyne radio covering a tuning frequency range from 540 to 1720 K. C.

FOR ALIGNMENT, SEE INDEX

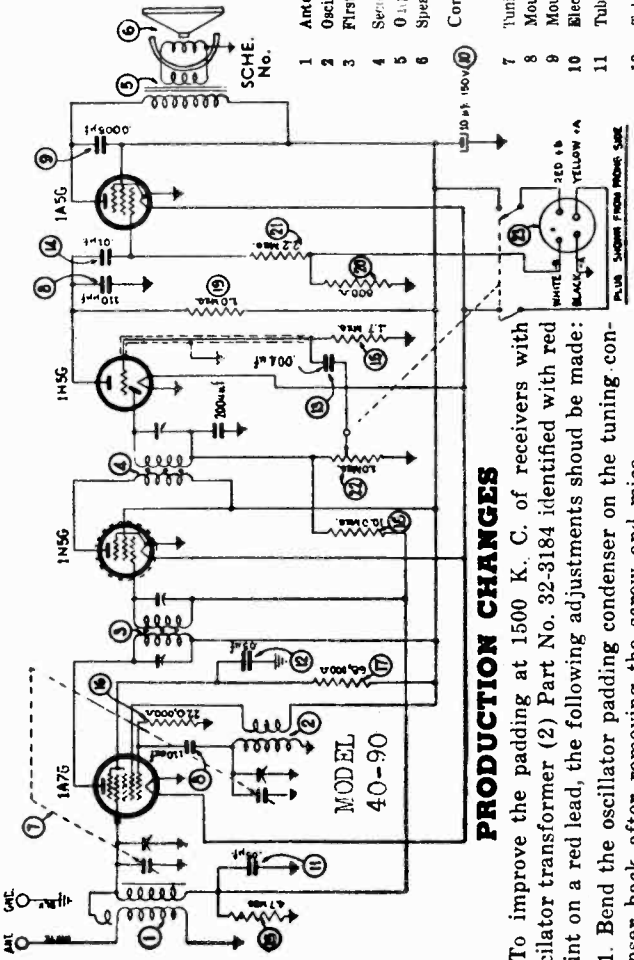
Model 40-90 is a four (4) tube battery operated superheterodyne radio covering a tuning frequency range from 540 to 1720 K. C.

**PRODUCTION CHANGES**

The two codes of this model differ only in cabinets, speakers, and cables as shown below:

Code 121	Code 122
36-1477-3	35-1488-3
36-4121	36-4129
41-3478	41-3505
32-8051	27-6115
Output Transformer	32-8051

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3183
2	Oscillator Transformer	32-3184
3	1st I. F. Transformer	32-3198
4	2nd I. F. Transformer	32-3199
5	Output Transformer (Code 121)	32-8051
5	Output Transformer (Code 122)	32-8051
6	Speaker (Code 121)	36-1477-3
6	Speaker (Code 122)	36-1488-3
7	Cone Assembly (for Speaker 36-1477-3)	36-4121
7	Cone Assembly (for Speaker 36-1488-3)	36-4129
8	Moulded Mica Condenser	31-2373
8	Moulded Mica Condenser (110 mmf.)	30-1031
9	Moulded Mica Condenser (500 mmf.)	30-1114
10	Electrolytic Condenser (10 mf., 150 v.)	30-2566
11	Tubular Condenser (.05 mf., 200 v.)	30-4519S
12	Tubular Condenser (.05 mf., 200 v.)	30-4444
13	Tubular Condenser (.004 mf., 400 v.)	30-4578
14	Tubular Condenser (.004 mf., 400 v.)	30-4578
15	Resistor (4.7 meg., 1/3 watt)	33-517244
16	Resistor (220,000 ohms, 1/3 watt)	33-422244
17	Resistor (68,000 ohms, 1/3 watt)	33-368244
18	Resistor (10 meg., 1/3 watt)	33-610244
19	Resistor (1 meg., 1/3 watt)	33-510244
20	Resistor (800 ohms, 1/2 watt)	33-180326
21	Resistor (2.2 meg., 1/3 watt)	33-522244
22	Volume Control (1 meg., with D.P.S.T. Switch)	33-5321
23	Battery Cable (Code 121)	41-3478
23	Battery Cable (Code 122)	41-3505
	Flag Arm Spring	28-8949
	Flag Arm Transformer Lever Assembly	38-9848
	Flag Cam Assembly	38-9723
	Flag Assembly	38-9844



**PRODUCTION CHANGES**

To improve the padding at 1500 K. C. of receivers with oscillator transformer (2) Part No. 32-3184 identified with red paint on a red lead, the following adjustments should be made:

1. Bend the oscillator padding condenser on the tuning condenser back after removing the screw and mica.
2. Set the top of the pointer even with the bottom of the 1500 K. C. division line with set tuned to 1500 K. C.

INTERMEDIATE FREQUENCY: 455 K. C.

SCHE. No.	DESCRIPTION	PART No.	DESCRIPTION	PART No.	
1	Antenna Transformer	32-3183	14	Tubular Condenser (.01 mf.)	30-4572
2	Oscillator Transformer	32-3184	15	Resistor (4.7 meg., 1/3 watt)	33-517244
3	First I. F. Transformer	33-3186	16	Resistor (320,000 ohms, 1/3 watt)	33-422244
4	Second I. F. Transformer	32-3181	17	Resistor (68,000 ohms, 1/3 watt)	33-368244
5	Output Transformer	32-8061	18	Resistor (10 meg., 1/3 watt)	33-610244
6	Speaker	36-1476	19	Resistor (1 meg., 1/3 watt)	33-510244
	Cone Assembly (for Speaker 36-1476-3)	36-4121	20	Resistor (800 ohms, 1/2 watt)	33-180326
7	Tuning Condenser	32-2372	21	Resistor (2.2 meg., 1/3 watt)	33-522244
8	Moulded Mica Condenser (110 mmf.)	30-1031		Volume Control (1 meg., with D.P.S.T. Switch)	33-5312
9	Moulded Mica Condenser (500 mmf.)	30-1114		Battery Cable	41-3477
10	Electrolytic Condenser (10 mf., 150 v.)	30-2566		Flag Arm Spring	28-8947
11	Tubular Condenser (.05 mf., 200 v.)	30-4519S		Flag Cam Assembly	38-9723
12	Tubular Condenser (.05 mf., 200 v.)	30-4444		Flag Assembly	38-9838
13	Tubular Condenser (.004 mf., 400 v.)	30-4578		Battery Drain "A" 200 M. A. "B" 7.2 M. A.	

PHILCO RADIO & TELEVISION CORP. MODEL 40-100(121, 122)  
MODEL 40-105

Model 40-100 is a four (4) tube battery operated super-heterodyne receiver with electric push-button tuning. This model covers a tuning frequency range of 540 to 1720 K. C. Features of design included in this model are: low current drain tube; automatic volume control and pentode audio output. The differences in the "codes" of this model are in the cabinets. Code 121 is assembled in a table model cabinet and Code 122 in a floor model.

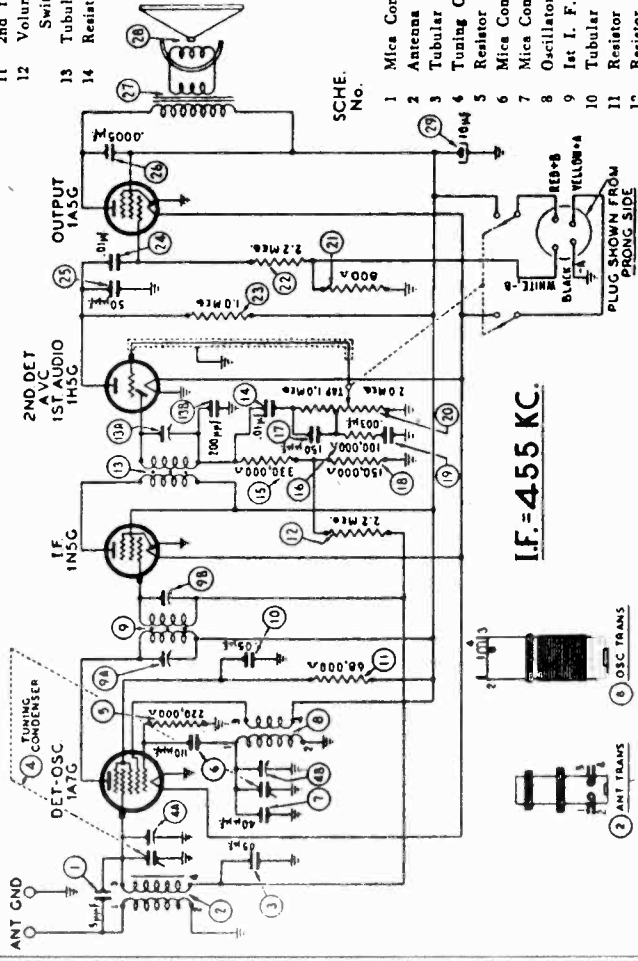
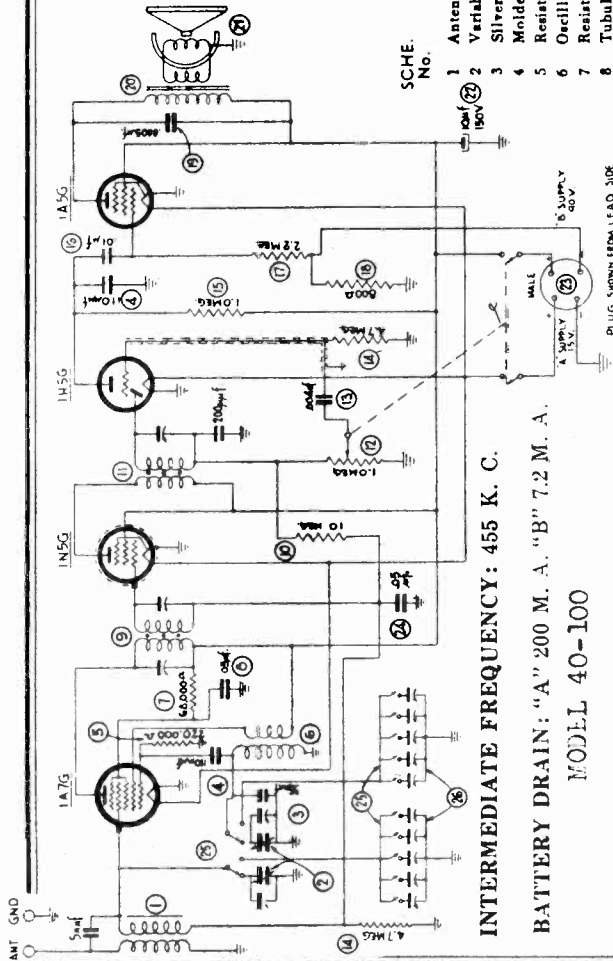
**ELECTRIC PUSH-BUTTON TUNING:** Five (5) push-buttons are used for the broadcast stations and one push-button for selecting "dial tuning." The push-buttons cover a frequency range as follows: 540 to 1600 kilocycles.

SCHE. No.	DESCRIPTION	PART No.	DESCRIPTION	PART No.	
1	Antenna Transformer	32-3248	15	Resistor (1 meg., 1/4 watt)	33-510244
2	Variable Condenser	31-2384	16	Tubular Condenser (.01 mf., 400 v.)	30-4572
3	Silver Mica Condenser	30-1113	17	Resistor (2.2 meg., 1/4 watt)	33-522244
4	Molded Mica Condenser (110 mmf.)	30-1081	18	Resistor (800 ohms., 1/4 watt)	33-180326
5	Resistor (220,000 ohms., 1/4 watt)	33-422244	19	Molded Mica Condenser (500 mmf.)	30-1114
6	Oscillator Transformer	32-3214	20	Output Transformer	32-8051
7	Resistor (68,000 ohms., 1/4 watt)	33-368244	21	Speaker	36-1477
8	Tubular Condenser (.05 mf., 200 v.)	30-4444	22	Electrolytic Condenser (10 mf., 150 v.)	30-2396
9	1st I. F. Transformer	32-3198	23	Battery Cable	41-3478
10	Resistor (10 meg., 1/4 watt)	33-610244	24	Tubular Condenser (.05 mf., 200 v.)	30-4519S
11	2nd I. F. Transformer	32-3199	25	Push Button Condenser Strip	42-1835
12	Volume Control (1 meg. and D. P. S. T. Switch)	33-5321	26	Flag Arm Spring	31-6309
13	Tubular Condenser (.004 mf., 400 v.)	30-4578	27	Flag Arm Transfer Lever Assembly	38-9843
14	Resistor (4.7 meg., 1/4 watt)	33-547244	28	Flag Cam Assembly	38-9723
			29	Flag Assembly	38-9844

INTERMEDIATE FREQUENCY: 455 K. C.

BATTERY DRAIN: "A" 200 M. A. "B" 7.2 M. A.

MODEL 40-100



I.F. = 455 KC.

SCHEMATIC DIAGRAM MODEL 40-105

BATTERY CURRENT DRAIN: "A" 200 M. A. "B" 8 M. A.

FOR ALIGNMENT AND TUNER, SEE INDEX

Model 40-105 is a four (4) tube battery operated super-heterodyne radio covering a tuning frequency range from 540 to 1720 K. C.

SCHE. No.	DESCRIPTION	PART No.	DESCRIPTION	PART No.	
1	Mica Condenser (5 mmf.)	30-1097	15	Resistor (330,000 ohms, 1/4 watt)	33-433339
2	Antenna Transformer	32-3248	16	Resistor (100,000 ohms, 1/4 watt)	33-410339
3	Tubular Condenser (.05 mfd.)	30-4519	17	Mica Condenser (150 mmf.)	30-1083
4	Tuning Condenser Assembly	31-2384	18	Resistor (150,000 ohms, 1/4 watt)	33-415339
5	Resistor (220,000 ohms, 1/4 watt)	33-422339	19	Tubular Condenser (.003 mf.)	30-4469
6	Mica Condenser (110 mmf.)	30-1130	20	Volume Control (2.0 meg.)	33-5326
7	Mica Condenser (40 mmf.)	30-1132	21	Resistor (800 ohms, 1/4 watt)	33-180326
8	Oscillator Transformer	32-3214	22	Resistor (2.2 meg., 1/4 watt)	33-522339
9	1st I. F. Transformer Assembly	32-3198	23	Tubular Condenser (.01 mf.)	33-510339
10	Tubular Condenser (.05 mf.)	30-4444	24	Mica Condenser (50 mmf.)	30-4572
11	Resistor (68,000 ohms, 1/4 watt)	33-368339	25	Mica Condenser (50 mmf.)	30-1029
12	Resistor (2.2 meg., 1/4 watt)	33-522339	26	Mica Condenser (.0005 mf.)	30-1114
13	2nd I. F. Transformer Assembly	32-3199	27	Output Transformer	32-7984
14	Tubular Condenser (.01 mf.)	30-4572	28	Speaker	36-1410
			29	Electrolytic Condenser (10 mf., 150 v.)	30-2396

SEE MODELS  
BELOW

PHILCO RADIO & TELEVISION CORP.

SETTING AND OPERATING ELECTRIC PUSH-BUTTON TUNING

In order to adjust the electric automatic tuning push-button accurately for reception of broadcast stations, a signal generator, such as Philco Model 077, and a padding screw driver, Philco Part No. 45-2610, are required. With this equipment at hand, proceed as follows: —

1 — Select five (5); seven (7) or eight (8) of the most popular stations received in the locality (depending on the number of push-buttons on the model to be adjusted). Insert the station call letters into the windows above the buttons. The station with the lowest frequency is placed in the first button on the left and the highest frequency station in the extreme right button. Each push-button is adjusted by two set screws. These set screws are located on the rear of the chassis or push-button unit. Each set of screws is numbered and covers a frequency range as follows: —

FREQUENCY RANGES OF PUSH-BUTTONS

Models 40-100, 40-110		Models 40-195, 40-200		Models 40-160, 40-185	
Push-Button	Frequency Range	Push-Button	Frequency Range	Push-Button	Frequency Range
1	540-1030 K. C.	1, 2, 3	540-1030 K. C.	1	540-1000 K. C.
2	650-1100 K. C.	4, 5	670-1160 K. C.	2	650-1100 K. C.
3	650-1100 K. C.	6, 7, 8	900-1600 K. C.	3	740-1300 K. C.
4	740-1240 K. C.			4	900-1500 K. C.
5	1160-1600 K. C.			5	1100-1600 K. C.
6	Dial				

Models 40-124, 40-125, 40-135, 40-145, 40-503, 40-506, 40-507, 40-525 (121), 40-526 (121)		Models 40-150, 40-155, 40-180, 40-185, 40-190, 40-508, 40-509	
Push-Button	Frequency Range	Push-Button	Frequency Range
1	540-1030 K. C.	1, 2, 3	540-1060 K. C.
2	650-1100 K. C.	4, 5	650-1110 K. C.
3	740-1240 K. C.	6, 7	920-1600 K. C.
4	960-1470 K. C.		
5	1160-1600 K. C.		
6	Dial		

Looking at the front of the cabinet, the first button on the left is adjusted by "Osc." and "Ant." set screws No. 1; the next push-button by "Osc." and "Ant." set screws No. 2, and the remaining push-buttons in order.

2 — Turn the receiver "on" and set the "Tuning Range Selector" or push-button for "Dial" tuning.

3 — Set up the Model 077 signal generator about 3 feet from the receiver and connect a loop aerial (made from a few turns of wire 12 inches in diameter) to the "high" and "ground" output jacks of the signal generator. Turn the output controls to maximum and set the modulation control to "Mod. ON".

4 — Manually tune in on the radio the first station to be set up; (usually No. 1 push-button first). After doing this, set the indicator of the 077 signal generator to the frequency of the station being received. As the indicator approaches the frequency of the station, a whistle will be heard; leave the indicator at this point.

5 — Turn the receiver tuning range selector to "push-button" and press in No. 1 button. (Models without a tuning range selector, simply press in push-button to be set up). Using the insulated screw

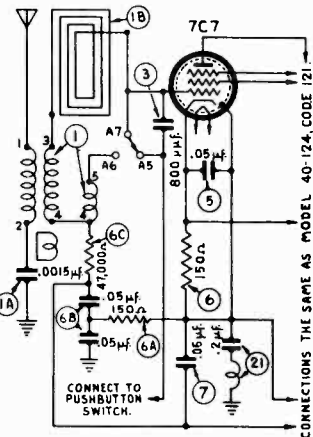
driver, turn the No. 1 "Osc." screw until the broadcast station identified by the signal generator is heard; then turn signal generator indicator off the frequency of the station.

6 — Readjust No. 1 "Osc." and "Ant." screws until the station is heard clearly and distinctly. The adjustment of No. 1 push-button is then complete. After setting up the first station the same procedure as outlined above is used for the remaining stations.

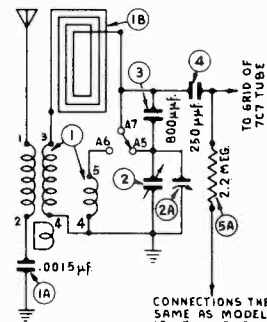
While the above procedure is satisfactory in setting up push-buttons for stations, a very accurate adjustment can be obtained with a vacuum tube voltmeter. The instructions for using a vacuum tube voltmeter will be found on page 10 under "Using Vacuum Tube Voltmeter for Aligning Compensators and Adjusting Push-Buttons."

When any of these models are to be set up to receive the sound of a television program, tuned in by special type Philco television sets, or if they are to be used in conjunction with a Philco Record Player, push-button No. 1 should be used. To adjust the push-button on these instruments, the same procedure as outlined above is used.

Further details for setting up this receiver for operation with Philco Television sets and Record Players are supplied with the instruments.



CONNECTIONS FOR MODEL 40-124 CODE 122.



CONNECTIONS FOR MODEL 40-115 CODE 121.

MODEL 40-124, CODE 122

Model 40-124, Code 122, is similar to Code 121 with the addition of a loop aerial mounted inside the cabinet and several part changes in the aerial circuit. These changes are shown in the following circuit diagram and parts list. The service information in RIDER'S VOLUME XI, for Model 40-124, Code 121, with these changes, applies to Model 40-124, Code 122.

SCHEMATIC NUMBER	DESCRIPTION	PART No. CODE 122
1	Antenna Transformer	32-3404
1A	Tubular Condenser (.0015 mfd.)	30-4555
1B	Loop Assembly	32-3411
2	Tuning Condenser	31-2450
3	Mica Condenser (800 mmfd.)	30-1135
4	Not used.	
5	Tubular Condenser (.05 mfd.)	30-4519
6	Resistor (150 ohm, 1/2 watt)	33-115336
6A	Resistor (150 ohm, 1/2 watt)	33-115336
6B	Tubular Condenser (.05, .05 mfd.)	30-4522
6C	Resistor (47,000 ohms, 1/2 watt)	33-347339
7	Tubular Condenser (.05 mfd.)	30-4519
21	Choke and Condenser Assembly (.2 mfd.)	76-1034

MODEL 40-115, CODE 122

Model 40-115, Code 122, is similar to Code 121 with the addition of a loop aerial mounted inside the cabinet and several part changes in the aerial circuit. These changes are shown in the following circuit diagram and parts list. The service information in RIDER MANUAL VOL. XI for Model 40-115, Code 121, with these changes, applies to Model 40-115, Code 122.

SCHEMATIC NUMBER	DESCRIPTION	PART No. CODE 122
1	Antenna Transformer	32-3404
1A	Tubular Condenser (.0015 mfd.)	30-4555
1B	Loop Assembly	32-3405
2	Tuning Condenser	31-2450
3	Mica Condenser (800 mmfd.)	30-1135
	Cabinet	10432B

PHILCO RADIO & TELEVISION CORP.

MODELS 40-120  
40-125

SCH. No. DESCRIPTION PART No.

1	Loop Antenna Assy. (Model 40-120)	38-0889
1A	Mica Cond. (500 mmfd.)	38-0890
1B	Mica Cond. (500 mmfd.)	30-1114
1C	Motor (150,000 ohms, 1/2 watt)	30-1114
2	Tuning Cond. Assy. (Model 40-120)	31-2306
3	Mica Cond. (600 mmfd., Model 40-120)	30-1136
4	Mica Cond. (600 mmfd., Model 40-120)	30-1135
5	Resistor (180 ohms, 1/2 watt)	30-4819
6	Resistor (180 ohms, 1/2 watt)	33-118339
7	Resistor (180 ohms, 1/2 watt)	33-118339
8	Resistor (180 ohms, 1/2 watt)	33-118339
9	Resistor (180 ohms, 1/2 watt)	33-118339
10	Resistor (180 ohms, 1/2 watt)	33-118339
11	Resistor (180 ohms, 1/2 watt)	33-118339
12	Resistor (180 ohms, 1/2 watt)	33-118339
13	Resistor (180 ohms, 1/2 watt)	33-118339
14	Resistor (180 ohms, 1/2 watt)	33-118339
15	Resistor (180 ohms, 1/2 watt)	33-118339
16	Resistor (180 ohms, 1/2 watt)	33-118339
17	Resistor (180 ohms, 1/2 watt)	33-118339
18	Resistor (180 ohms, 1/2 watt)	33-118339
19	Resistor (180 ohms, 1/2 watt)	33-118339
20	Resistor (180 ohms, 1/2 watt)	33-118339
21	Resistor (180 ohms, 1/2 watt)	33-118339
22	Resistor (180 ohms, 1/2 watt)	33-118339
23	Resistor (180 ohms, 1/2 watt)	33-118339
24	Resistor (180 ohms, 1/2 watt)	33-118339
25	Resistor (180 ohms, 1/2 watt)	33-118339
26	Resistor (180 ohms, 1/2 watt)	33-118339
27	Resistor (180 ohms, 1/2 watt)	33-118339
28	Resistor (180 ohms, 1/2 watt)	33-118339
29	Resistor (180 ohms, 1/2 watt)	33-118339
30	Resistor (180 ohms, 1/2 watt)	33-118339
31	1.5pF. Trans. Assy.	32-8047
32	1.5pF. Trans. Assy.	32-8047
33	1.5pF. Trans. Assy.	32-8047
34	1.5pF. Trans. Assy.	32-8047
35	1.5pF. Trans. Assy.	32-8047
36	1.5pF. Trans. Assy.	32-8047
37	1.5pF. Trans. Assy.	32-8047
38	1.5pF. Trans. Assy.	32-8047
39	1.5pF. Trans. Assy.	32-8047
40	1.5pF. Trans. Assy.	32-8047
41	1.5pF. Trans. Assy.	32-8047
42	1.5pF. Trans. Assy.	32-8047
43	1.5pF. Trans. Assy.	32-8047
44	1.5pF. Trans. Assy.	32-8047
45	1.5pF. Trans. Assy.	32-8047
46	1.5pF. Trans. Assy.	32-8047
47	1.5pF. Trans. Assy.	32-8047
48	1.5pF. Trans. Assy.	32-8047
49	1.5pF. Trans. Assy.	32-8047
50	1.5pF. Trans. Assy.	32-8047

31	1.5pF. Trans. Assy.	32-8047
32	1.5pF. Trans. Assy.	32-8047
33	1.5pF. Trans. Assy.	32-8047
34	1.5pF. Trans. Assy.	32-8047
35	1.5pF. Trans. Assy.	32-8047
36	1.5pF. Trans. Assy.	32-8047
37	1.5pF. Trans. Assy.	32-8047
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39	1.5pF. Trans. Assy.	32-8047
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45	1.5pF. Trans. Assy.	32-8047
46	1.5pF. Trans. Assy.	32-8047
47	1.5pF. Trans. Assy.	32-8047
48	1.5pF. Trans. Assy.	32-8047
49	1.5pF. Trans. Assy.	32-8047
50	1.5pF. Trans. Assy.	32-8047
51	1.5pF. Trans. Assy.	32-8047
52	1.5pF. Trans. Assy.	32-8047
53	1.5pF. Trans. Assy.	32-8047
54	1.5pF. Trans. Assy.	32-8047
55	1.5pF. Trans. Assy.	32-8047
56	1.5pF. Trans. Assy.	32-8047
57	1.5pF. Trans. Assy.	32-8047
58	1.5pF. Trans. Assy.	32-8047
59	1.5pF. Trans. Assy.	32-8047
60	1.5pF. Trans. Assy.	32-8047
61	1.5pF. Trans. Assy.	32-8047
62	1.5pF. Trans. Assy.	32-8047
63	1.5pF. Trans. Assy.	32-8047
64	1.5pF. Trans. Assy.	32-8047
65	1.5pF. Trans. Assy.	32-8047
66	1.5pF. Trans. Assy.	32-8047
67	1.5pF. Trans. Assy.	32-8047
68	1.5pF. Trans. Assy.	32-8047
69	1.5pF. Trans. Assy.	32-8047
70	1.5pF. Trans. Assy.	32-8047
71	1.5pF. Trans. Assy.	32-8047
72	1.5pF. Trans. Assy.	32-8047
73	1.5pF. Trans. Assy.	32-8047
74	1.5pF. Trans. Assy.	32-8047
75	1.5pF. Trans. Assy.	32-8047
76	1.5pF. Trans. Assy.	32-8047
77	1.5pF. Trans. Assy.	32-8047
78	1.5pF. Trans. Assy.	32-8047
79	1.5pF. Trans. Assy.	32-8047
80	1.5pF. Trans. Assy.	32-8047

MISCELLANEOUS PARTS—MODEL 40-125

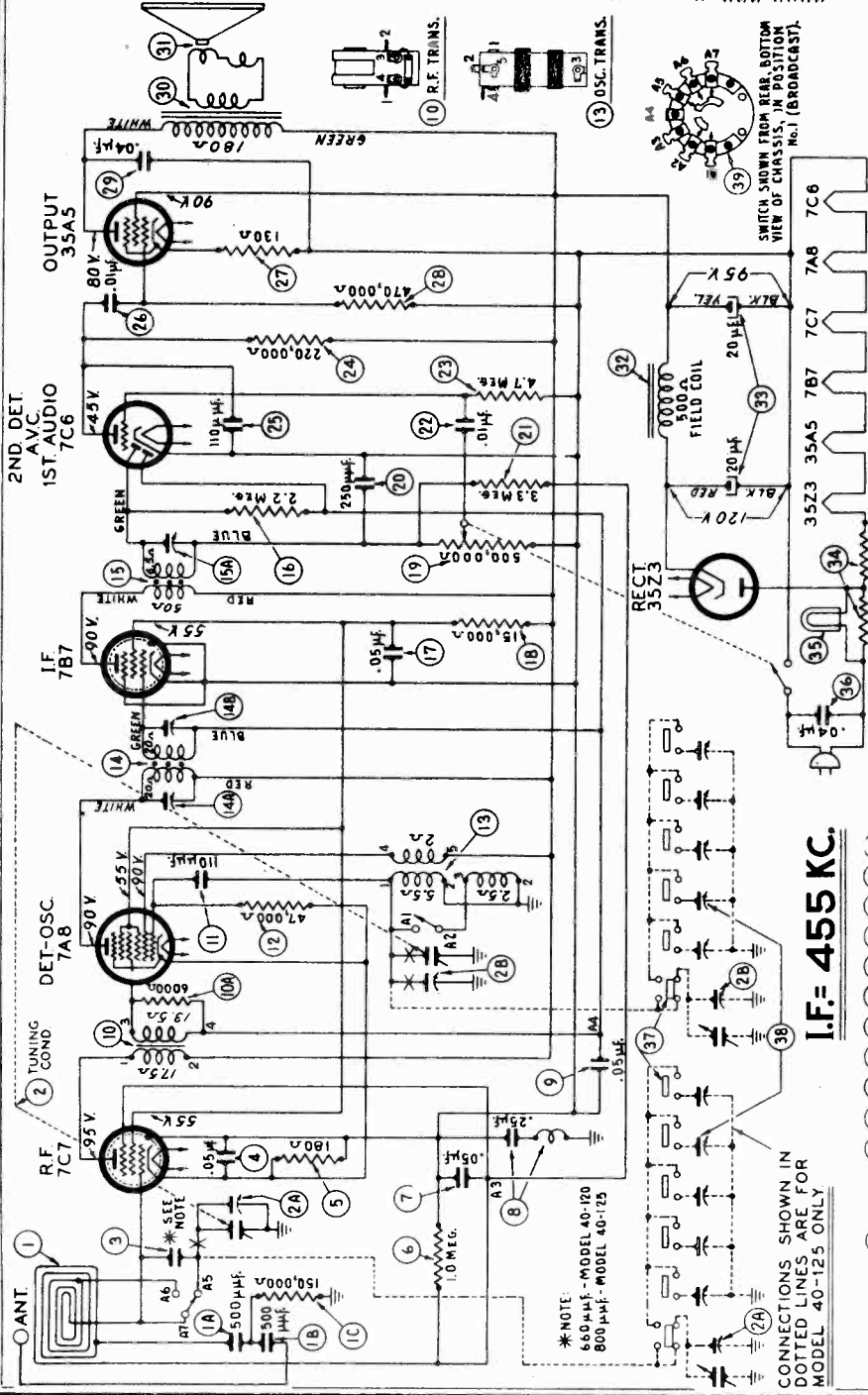
Cabinet Plate (pushbutton)	10-990A
Knobs (Pushbutton)	28-3742
Knobs (Pushbutton)	27-1074
Tab (Blk)	27-5824
Tab (Blk)	27-5824
Tab Kit	40-6473

FOR ALIGNMENT AND TUNER, SEE INDEX

TUNING RANGE: 540 to 1600 K. C. 1.6 to 3.3 M. C.

POWER CONSUMPTION: 28 watts.

AUDIO OUTPUT: 1 watt.

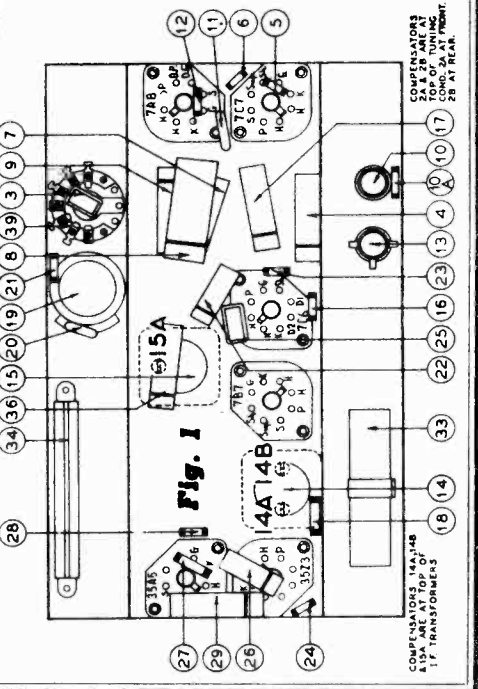


Models 40-120 and 40-125 are six (6) tube super-heterodyne receivers employing the new Philco built-in super aerial system which eliminates an outside aerial, and Philco High-Efficiency Loktal tubes. In addition, other features of design are: two tuning ranges; special high gain R. F. stage; automatic volume control and a Beam power audio output stage. In general, these models are similar but differ in their tuning mechanisms and cabinets.

Model 40-120 is dial tuned and assembled in cabinet type "C".

Model 40-125 is equipped with six electric push buttons for automatically selecting stations in addition to dial tuning. Five push buttons are used for stations one of which can be used in combination with a Special type PHILCO TELEVISION receiver for reception of television sound programs. The sixth push button selects dial tuning.

POWER SUPPLY: 115 volts A. C. or D. C. current.



MODELS 40-120 and 40-125

Table with columns: SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Rows include Output Connections, Dummy Note A, and various frequency settings.

Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, the tuning pointer is set horizontal at the low frequency end of the scale (540 K. C.).

NOTE C.—Compensators 2A and 2B are at the top of the tuning condenser. Compensator 2A is on the front section and compensator 2B on the rear section. When padding the I. F. the signal generator can be attached to the TCI grid on the front section of the tuning condenser.

Connecting Aligning Instruments

VACUUM TUBE VOLTMETER.—To use the vacuum tube voltmeter as an alignment indicator make the following connections:

- 1. Adjusting I. F. Circuit.
2. Adjusting R. F. Circuit.
3. Adjusting the R. F. circuit, the aligning adaptor is inserted in the 7CG A. F. tube socket.

MODELS 40-150, 40-155 40-180, -185, -190

Table with columns: SIGNAL GENERATOR, RECEIVER, Remarks. Rows include Output Connections, Dial Frequency, Control Settings, and Adjust Compensators for Max. Signal.

NOTE A.—A "Dummy Antenna" consisting of a 1 mfd. condenser is connected in series with the signal generator output lead (high side).
NOTE B.—DIAL CALIBRATION. In order to adjust the receiver correctly to the dial, proceed as follows.

ALIGNING PROCEDURE MODELS 40-81, 40-82, 40-83, 40-84, 40-88, 40-90, 40-95, 40-100, 40-105, 40-110

CONNECTING THE ALIGNING METERS

Aligning Meters. If an antenna is used, connect the antenna to the dummy antenna terminals of the output subunit. Adjust the meters to the 5 to 10 scale.

NOTE A.—Before adjusting the R. F. padders, the signal generator is connected to the dummy antenna terminals of the output subunit.

Table with columns: SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Rows include Output Connections, Dial Setting, Control Settings, and Adjust Compensators.

Model 40-88, Code 121

Table with columns: SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Rows include Output Connections, Dial Setting, Control Settings, and Adjust Compensators.

Model 40-90

Table with columns: SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Rows include Output Connections, Dial Setting, Control Settings, and Adjust Compensators.

Models 40-95, 40-100, 40-105

Table with columns: SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Rows include Output Connections, Dial Setting, Control Settings, and Adjust Compensators.

Model 40-110

Table with columns: SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS. Rows include Output Connections, Dial Setting, Control Settings, and Adjust Compensators.

NOTE A.—DIAL CALIBRATION: Before adjusting the R. F. padders, the signal generator is connected to the dummy antenna terminals of the output subunit.

PRODUCTION CHANGES

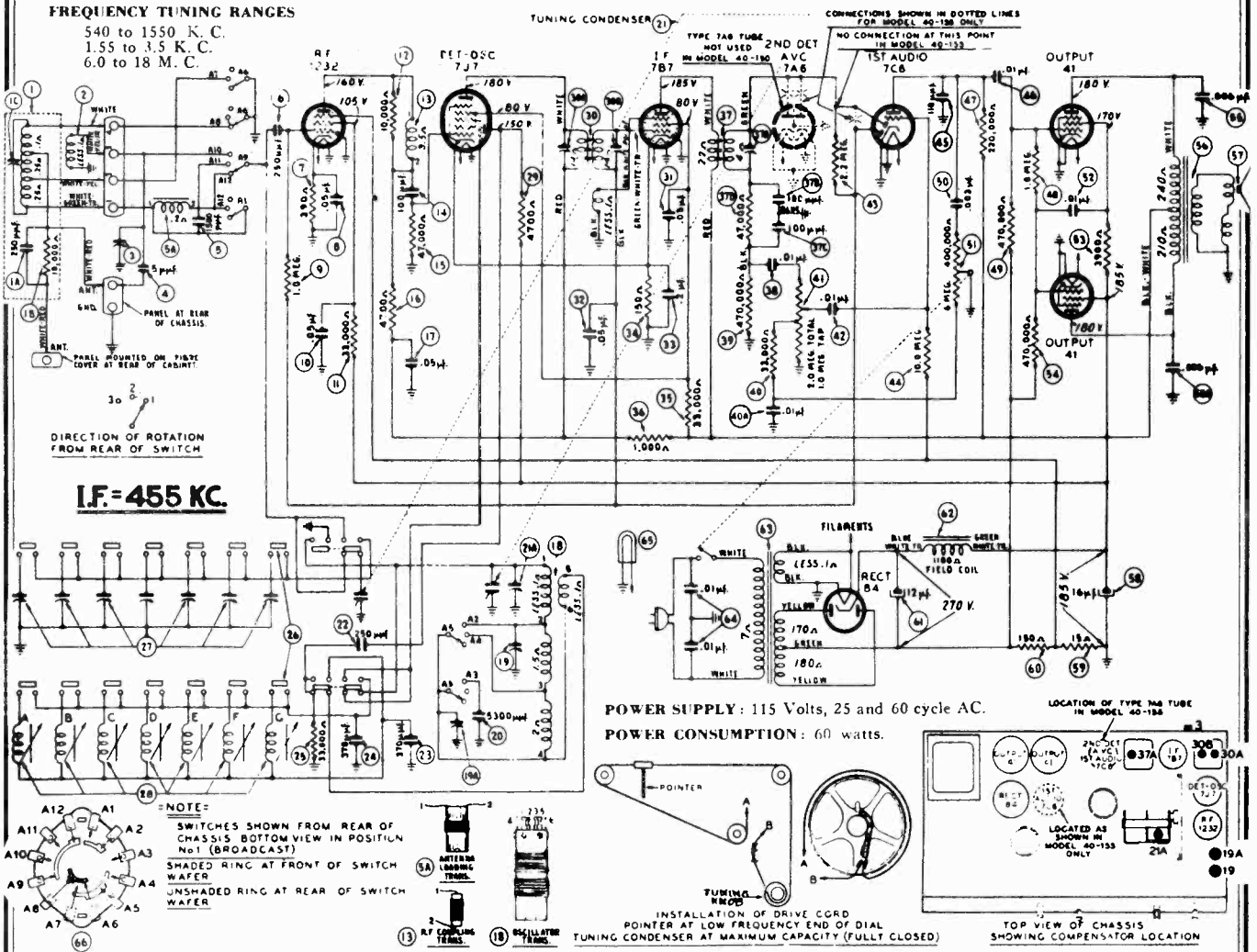
MODEL 40-120 Tuning condenser (2) changed from Part No. 31-2268 to Part No. 31-2297 to compensate for manufacturing tolerances.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-150  
40-155

FREQUENCY TUNING RANGES

540 to 1550 K. C.  
1.55 to 3.5 K. C.  
6.0 to 18 M. C.



IF = 455 KC.

POWER SUPPLY: 115 Volts, 25 and 60 cycle AC.  
POWER CONSUMPTION: 60 watts.

Fig. 1. Schematic diagram, models 40-150, 40-155

Each model is equipped with eight electric tuning push buttons for automatically selecting stations. Six of the push buttons are used for broadcast stations, one for selecting dial tuning and one push button may

**PRODUCTION CHANGES**

**MODEL 40-150**

Beginning with Run 1 receivers the converter tube was changed from a 7J7 loktal type to a 6J8G octal type. Tube sockets changed from Part 27-6129 loktal to 27-6120 octal.

Run 2 - New resistor Part No. 33-115339, 150 ohms connected in series with 6J8G tube plate. Change made to stabilize oscillator action at 18 M. C. Cathode resistor (34) changed from Part No. 33-115339 to 33-115336. Power transformer Part No. changed from 32-8065 to 32-8052.

Run 3 - Receivers marked with this run number have the converter changed from a 6J8G to a 7J7 loktal type tube as indicated in Service Bulletin. When this change was made, the resistor Part No. 33-115336 in Run 2 was removed. Shortwave loop changed from Part No. 38-9884 to 38-9935.

**MODEL 40-155**

Run 1 - Beginning with Run 1 receivers the converter tube was changed from a 7J7 loktal type to a 6J8G octal type. Tube sockets changed from Part 27-6129 (loktal) to 27-6120 octal.

Shortwave loop (2) changed from Part No. 38-9884 to Part No. 38-9335. Run 2 - New resistor Part No. 33-115339, 150 ohms connected in series with 6J8G tube plate. Change made to stabilize oscillator action at 18 M. C. Cathode resistor (34) Part No. 33-115339 changed to wirewound type Part No. 33-115336.

Power transformer changed from Part No. 32-8065 to Part No. 32-8052. Run 3 - Receivers marked with this run number have the converter tube changed from a type 6J8G octal tube to a 7J7 loktal tube. When this change was made the resistor Part No. 33-115339 added in Run 2 was removed.

**MODELS 40-150, 40-155**

To prevent oscillation at the low end of the broadcast band the 2nd I. F. transformer (37) changed from Part No. 32-3246 to Part No. 32-3383. Loop assembly (1) (Broadcast) Part No. 38-9894 is changed to Part No. 38-9994, a production design change.

The physical location of condenser (4) as shown in Fig. 2 of the service bulletin has been changed to prevent oscillation at 540 K. C. The condenser is now wired to a three lug wiring panel between the range switch and volume control. The antenna lead is connected to one lug of this panel. This change is made on all sets marked Run No. 6.

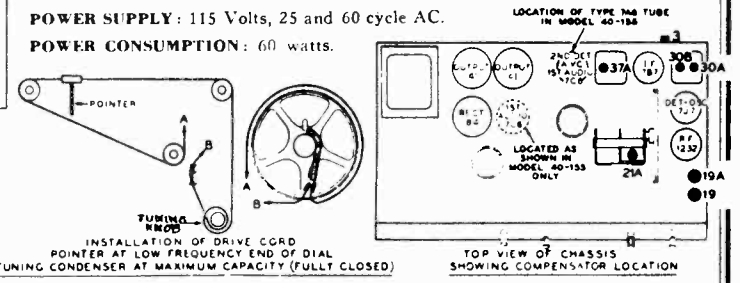
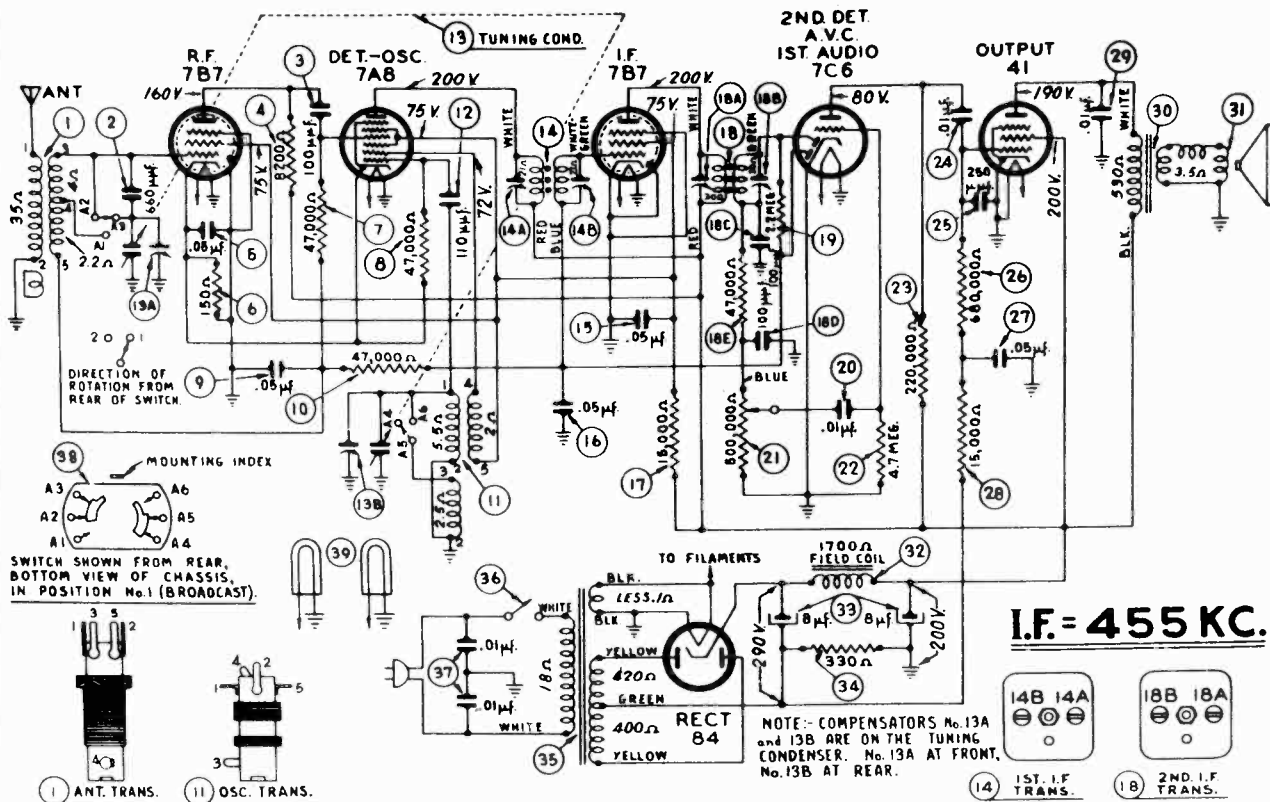


Fig. 2. Part locations, underside of chassis.

MODEL 40-158 (121)

PHILCO RADIO & TELEVISION CORP.



- 1 Antenna Transformer 32-3303
- 2 Mica Condenser (660 mmfd.) 30-1136
- 3 Mica Condenser (100 mmfd.) 30-1128
- 4 Resistor (8200 ohms, 1/2 watt) 33-282339
- 5 Tubular Condenser (.05 mfd.) 30-4519
- 6 Resistor (150 ohms, 1/2 watt) 33-115339
- 7 Resistor (47,000 ohms, 1/2 watt) 33-347339
- 8 Resistor (47,000 ohms, 1/2 watt) 33-347339
- 9 Tubular Condenser (.05 mfd.) 30-4519
- 10 Resistor (47,000 ohms, 1/2 watt) 33-347339
- 11 Oscillator Transformer 30-1130
- 12 Mica Condenser (110 mmfd.) 30-1130
- 13 Tuning Condenser Assembly 31-2418
- 14 1st I. F. Transformer Assy. 32-3361
- 15 Tubular Condenser (.05 mfd.) 30-4519
- 16 Tubular Condenser (.05 mfd.) 30-4519
- 17 Resistor (15,000 ohms, 1 watt) 33-315439
- 18 2nd I. F. Transformer Assembly 32-3211
- 19 Resistor (2.2 meg., 1/2 watt) 33-522339
- 20 Tubular Condenser (.01 mfd.) 30-4572
- 21 Volume Control (500,000 ohms) 33-5319
- 22 Resistor (4.7 meg., 1/2 watt) 33-547339
- 23 Resistor (220,000 ohms, 1/2 watt) 33-422339
- 24 Tubular Condenser (.01 mfd.) 30-4572
- 25 Mica Condenser (250 mmfd.) 61-0033
- 26 Resistor (680,000 ohms, 1/2 watt) 33-468339
- 27 Tubular Condenser (.05 mfd.) 30-4519
- 28 Resistor (15,000 ohms, 1/2 watt) 33-315339
- 29 Tubular Condenser (.01 mfd.) 30-4501
- 30 Output Transformer 32-8056
- 31 Cone and Voice Coil Assembly (Speaker Part No. 36-1480-3) 36-4086
- 32 Field Coil (Replace Speaker Part No. 36-1480) 30-2447
- 33 Elec. Cond. (8-8 mfd., 450 V.) 30-2447
- 34 Resistor (330 ohms, 1 watt) 33-133439
- 35 Power Transformer (115-130 V., 50-60 cycles) 32-8055 (115-130 V., 25 cycle) 32-8076
- 36 A. C. Switch 42-1545
- 37 Bakelite Cond. (.01-.01 mfd.) 3903-DG
- 38 Wave Switch 42-1494
- 39 Pilot Lamps 34-2064

- MISCELLANEOUS PARTS**
- Bezel 27-4842
  - Cabinet 10398C
  - Cable and Plug (Power Supply) L-3199
  - Clip (Coil Mounting) 28-5002
  - Dial 27-5551
  - Drive Cord Assembly (Tuning Condenser) 31-2400 (Pointer Operation) 31-2382
  - Insulating Bushing (Dr. Shaft) 27-9437
  - Knobs (A. C. Switch, Volume, Tuning and Wave Switch) 27-4332

- Pilot Lamp Socket Assembly 38-9904
- Pointer 56-1479
- Rubber Insulator (Drive Shaft) 27-9432
- Socket (5 prong, type 84 tube) 27-6035
- Socket (6 prong, type 41 tube) 27-6036
- Socket (Loktal) 27-6131
- Spring (Drive Cord, Tuning) 27-8751
- Spring (Drive Cord, Pointer) 27-8953
- Spring (Dr. Shaft, Grounding) 27-8955
- Tuning Drive Drum Assembly 38-9883
- Tuning Shaft 56-6052
- Washer ("C" type, tun. shaft) 28-2043

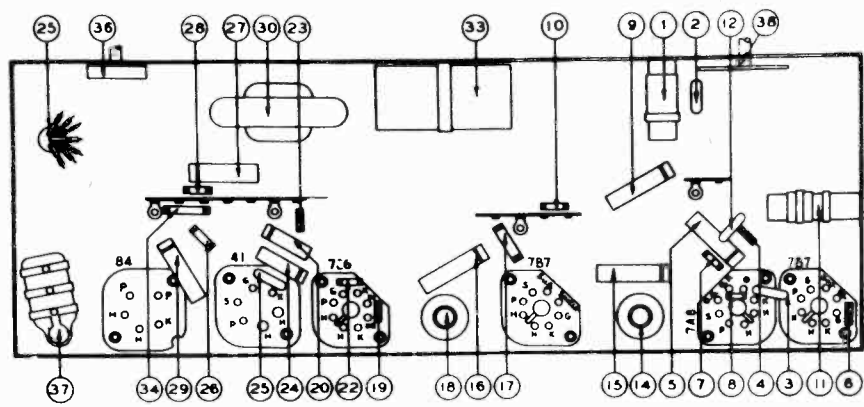


FIG. 2. PART LOCATIONS. UNDERSIDE OF CHASSIS.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Antenna Terminal	455 K. C.	580 K. C.	Vol. Cont. Max. Range Switch "Brdcat"	18A, 18B 14A, 14B	Note A
2	Antenna Terminal	1500 K. C.	1500 K. C.	Vol. Cont. Max. Range Switch "Brdcat"	13B, 13A Note B	

**NOTE A — DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

**NOTE B —** The oscillator padder (13B) and antenna padder (13A) are located on top of the tuning condenser (13B) at the rear and (13A) at the front of the tuning condenser.

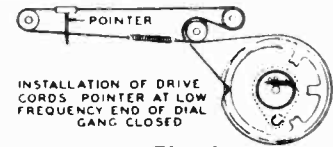
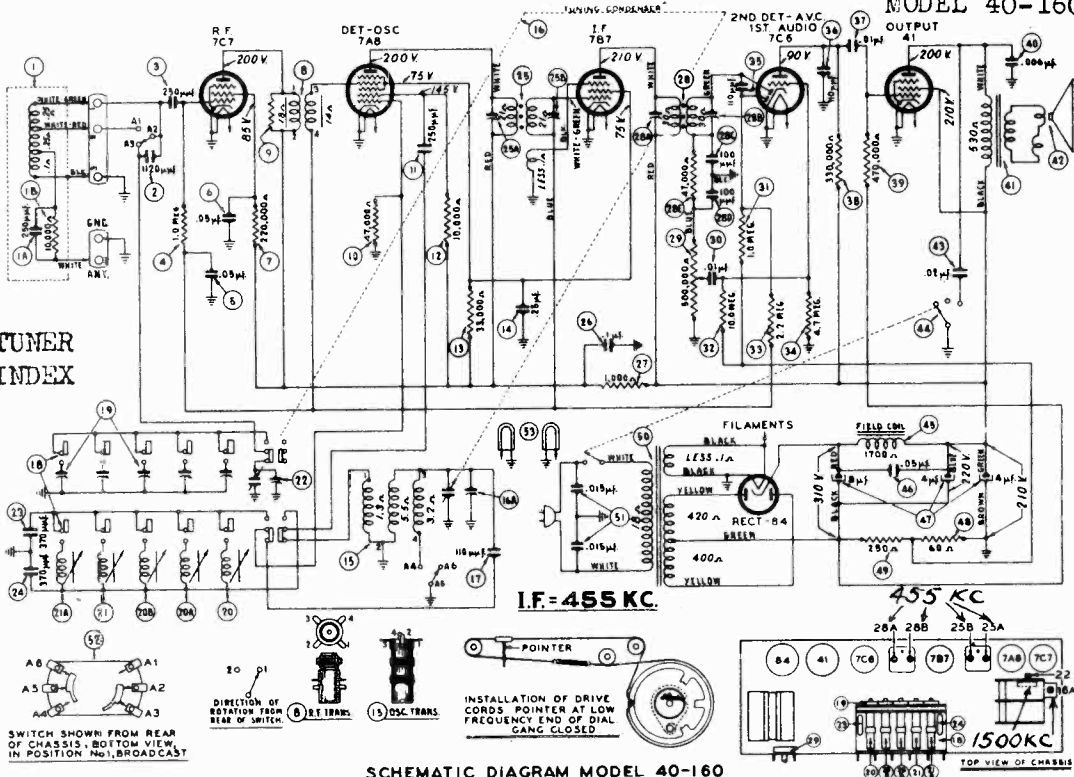


FIG. 1.

**PHILCO RADIO & TELEVISION CORP.**

MODELS 40-130,  
40-135, 40-170CS  
MODEL 40-140, 40-145  
MODEL 40-160

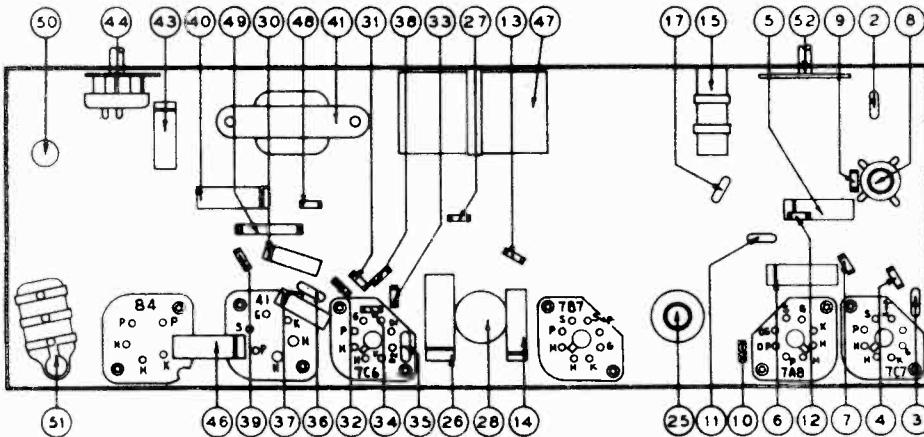
FOR TUNER  
SEE INDEX



SCHMATIC DIAGRAM MODEL 40-160

Run 3—To prevent oscillation on push-button tuning, resistors (9) Part No. 33-268339 were removed from R. F. transformer (9) secondary. A new resistor Part No. 33-260339 is now added across primary winding of the same transformer.

CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOL. VIII



Models 40-135 and 40-170 are similar in design with the exception of the cabinets, speakers, and several circuit changes. The Service information for Model 40-135 covers the Model 40-170 with the exception of the part changes listed below.

Sche. No.	Description	Part No.
1	Loop Assembly	38-9985
3	Mica Condenser	30-1110
30	Tubular Condenser (.006 mfd., 600 V.)	30-4504
31	Tubular Condenser (.02 mfd., 600 V.)	30-4599
34	Cone and Voice Coil Assembly (For Speaker Part No. 36-1480-3)	36-4086
	Cable (A. C.)	L-3240
	Cabinet	10453A
	Speaker	36-1480

**PRODUCTION CHANGES**

**MODELS 40-130 RUN 3, 40-135, 40-170CS**  
To prevent oscillation at the low end of the broadcast band and 2nd I. F. transformer (21) changed from Part No. 32-3281 to Part No. 32-3382.

**MODEL 40-170CS**  
The speaker, Part No. 36-1480-3 and cone assembly, Part No. 36-4086 listed in No. 1 change notice for Model 40-170CS has been changed on later production receivers to speaker 36-1480-4. The cone assembly for this new speaker is 36-4136.

**PRODUCTION CHANGES**

Dial Scale changed from Model 40-140 Part No. 27-5507 to Part No. 27-5552.  
Tone Control (27) changed from Part No. 42-1496 to 33-5353.  
Dial Scale changed from Model 40-145 Part No. 27-5507 to Part No. 27-5552.  
Tone Control (27) changed from Part No. 42-1496 to 33-5353.  
Models 40-140, 40-145, 60 Cycle Current Operating on 115 Volts, 25 cycle current the power transformer (52) Part No. 32-8064, 115 volts, 60 cycle lined in the Service Bulletin, must be changed to Part No. 32-8073, 115 volts, 25 cycle. In addition, electronic condenser (49) Part No. 30-2409, 12 mfd., 400 volts must be changed to Part No. 32-8064, 115 volts, 60 cycle to Part No. 32-8098, 220 volts, 60 cycle. Bulletin 328, from Part No. 32-8064, 115 volts, 60 cycle to Part No. 32-8098, 220 volts, 60 cycle, connecting the primary wiring as listed below:  
Power Supply: 220 Volts—Red and Yellow to White.  
Connect together: 220 Volts—Black and White to Red.  
110 Volts—Black and White to Red and Yellow.  
Part No. 32-3281 and Part No. 32-3382.  
The cabinet and B. C. loop assembly was changed on late production receivers as follows:  
Model 40-145 Part No. 10395B Cabinet, B. C. Loop.  
Model 40-140 Part No. 10365A Cabinet, B. C. Loop.  
Model 40-145 Part No. 10464A Cabinet, B. C. Loop.  
Model 40-145 Part No. 10395B Cabinet, B. C. Loop.  
Model 40-140 Part No. 10365A Cabinet, B. C. Loop.



MODEL 40-165  
MODELS 40-180,  
40-185, 40-190

PHILCO RADIO & TELEVISION CORP.

MODEL 40-165 PRODUCTION CHANGES

Run 1 — Beginning with Run 1 receivers the converter tube was changed from a 7J7 loktal type to a 6J8G octal type. Tube sockets change from 27-6129 loktal to 27-6120 octal.

Run 2 — Additional condenser Part No. 30-4123 added across condenser (54) to reduce hum.

Run 3 — 6J8G converter tube socket Part No. 27-6120 reversed 180 degrees to prevent oscillation at 18 M. C. This reversed the position of the socket as wired in Run 1 receiver.

Run 4 — Converter tube changed back to a 7J7 loktal type from a 6J8G tube. This change makes the set correspond to the circuit diagram in the Service Bulletin.

S. W. loop assembly in Model 40-165K is Part No. 38-9968. This differs from loops used in the "F" cabinet.

For other data, see Index

MODELS 40-180,40-185,40-190

In general, these models are similar with the exception of the number of tubes used and the cabinet design. Model 40-180 employs a seven tube receiver. Models 40-185 and 40-190 employ eight tube receivers assembled in different type cabinets.

MODELS 40-180,40-185,40-190

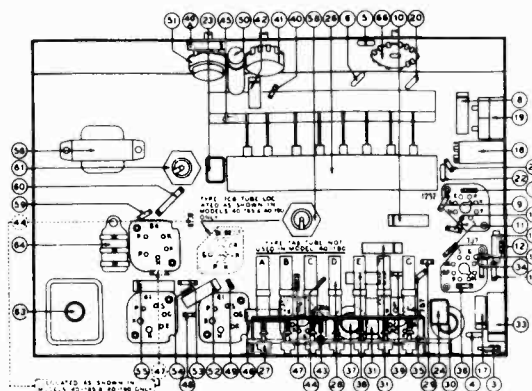


Fig. 1 — Part locations underside of chassis

PRODUCTION CHANGES

**MODEL 40-180**  
Run 4 — Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type.

Run 5 — A new resistor Part No. 33-115339 not shown on diagram of Service Bulletin was added in series with plates of the 6J8G tube. This change made to improve oscillation action at 18 M. C.  
Cathode resistor (34) changed from Part No. 33-115339 carbon type to Part No. 33-115336 wirewound.

**MODEL 40-185**  
Run 4 — Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

**MODEL 40-190**  
Run 4 — Beginning with Run 4 receivers the converter tube was changed from a type 7J7 loktal to a 6J8G octal type. Tube sockets changed from Part No. 27-6129 to Part No. 27-6120.

Run 5 — A new resistor Part No. 33-115339 not shown on diagram of the Service Bulletin was added in series with the plates of the 6J8G tube. This change was made to improve oscillation action at 18 M. C.  
Cathode resistor (34) changed from Part No. 33-115339 carbon type to Part No. 33-115336 wirewound.

**MODELS 40-180, 40-190**  
To prevent oscillation at the low end of the broadcast band the 2nd I. F. transformer (37) changed from Part No. 32-3246 to Part No. 32-3383.

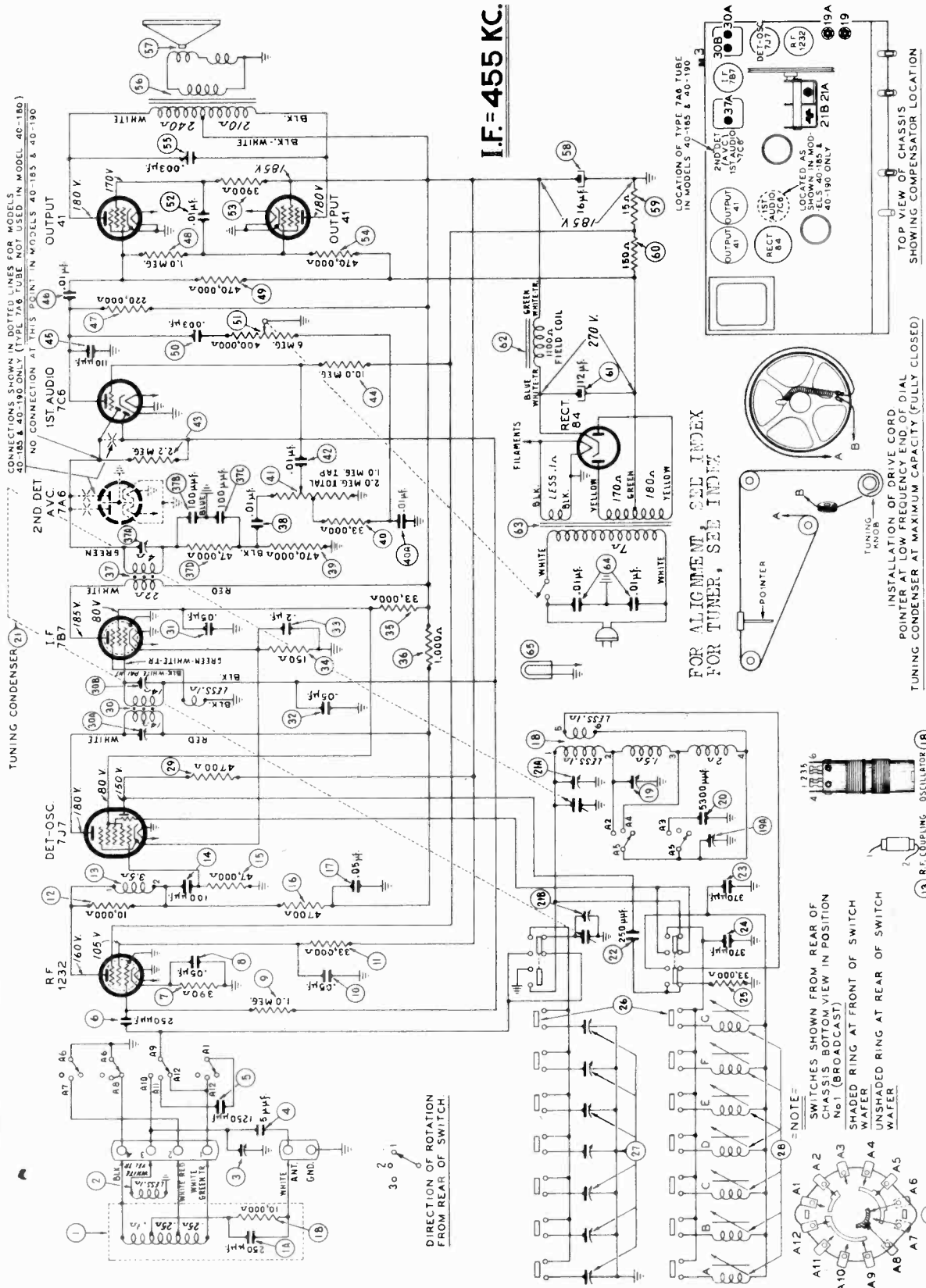
The physical location of condenser (4) as shown in Fig. 2 of the Service Bulletin has been changed to prevent oscillation at 340 K. C. The condenser is now wired to a three lug wiring panel between the range switch and the volume control. The antenna lead is connected to one lug of the panel. This change is made on all sets marked Run No. 9, Model 40-180 and Run No. 10, Mod-1 40-190.

**MODELS 40-185, 40-190**  
Beginning with Run "8" receivers the converter tube is changed from a type 6J8G octal to a 7J7 loktal. Tube sockets changed from Part No. 27-6120 to 27-6129 loktal.  
This change reverses the change made on Run "4" receivers.

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Loop Ass'y (Broadcast)	38-9880	32	Tubular Cond. (.05 mfd.)	30-4519	64	Line Cond. (Bakelite, .01-.01 mfd.)	3903-1DG
1A	Mica Cond. (250 mmfd.)	61-0033	33	Tubular Cond. (.2 mfd.)	30-4536	65	Pilot Lamp	34-2210
1B	Resistor (10,000 ohms, 1/2 watt)	33-110339	34	Resistor (150 ohms, 1/2 watt)	33-115339	66	Wave Switch	42-1490
2	Loop Ass'y (Short Wave)	38-9884	35	Resistor (33,000 ohms, 1/2 watt)	33-333339			
3	Compensator	31-6308	36	Resistor (1000 ohms, 1/2 watt)	33-210339			
4	Mica Cond. (5 mmfd.)	30-1097	37	2nd I. F. Trans. Ass'y	32-3246			
5	Mica Cond. (1250 mmfd.)	5886	38	Tubular Cond. (.01 mfd.)	30-4479			
6	Mica Cond. (250 mmfd.)	61-0033	39	Resistor (470,000 ohms, 1/2 watt)	33-447339			
7	Resistor (390 ohms, 1/2 watt)	33-139339	40	Resistor (33,000 ohms, 1/2 watt)	33-333339			
8	Tubular Cond. (.05 mfd.)	30-4444	40A	Tubular Cond. (.01 mfd.)	30-4479			
9	Resistor (1.0 meg., 1/2 watt)	33-510339	41	Volume Control (2.0 meg.)	33-5275			
10	Tubular Cond. (.05 mfd.)	30-4123	42	Tubular Cond. (.01 mfd.)	30-4479			
11	Resistor (33,000 ohms, 1/2 watt)	33-247339	43	Resistor (2.2 megs., 1/2 watt)	33-522339			
12	Resistor (10,000 ohms, 1/2 watt)	33-310339	44	Resistor (10.0 megs., 1/2 watt)	33-610339			
13	R. F. Coupling Trans.	32-3194	45	Mica Cond. (110 mmfd.)	30-1130			
14	Mica Cond. (100 mmfd.)	30-1128	46	Tubular Cond. (.01 mfd.)	30-4572			
15	Resistor (47,000 ohms, 1/2 watt)	33-347339	47	Resistor (220,000 ohms, 1/2 watt)	33-422339			
16	Resistor (4700 ohms, 1/2 watt)	33-247339	48	Resistor (1.0 meg., 1/2 watt)	33-510339			
17	Tubular Cond. (.05 mfd.)	30-4123	49	Resistor (470,000 ohms, 1/2 watt)	33-447339			
18	Oscillator Trans.	32-3195	50	Tubular Cond. (.003 mfd.)	30-4469			
19	Compensator (2 Section)	31-6298	51	Tone Control & On-Off Switch	33-5314			
20	Mica Cond. (5300 mmfd.)	30-1134	52	Tubular Cond. (.01 mfd.)	30-4572			
21	Tuning Cond. Ass'y	31-2391	53	Resistor (3900 ohms, 1/2 watt)	33-239339			
22	Mica Cond. (250 mmfd.)	61-0033	54	Resistor (470,000 ohms, 1/2 watt)	33-447339			
23	Silver Mica Cond. (.370 mmfd.)	30-1110	55	Tubular Cond. (.003 mfd.)	30-4469			
24	Silver Mica Cond. (.370 mmfd.)	30-1110	56	Output Trans.	32-8053			
25	Resistor (33,000 ohms, 1/2 watt)	33-333339	57	Cone & Voice Coil Ass'y				
26	Push Button Switch	42-1489		(Spkr. Part No. 36-1479-2)	36-4089			
27	Padder Strip (Push Buttons)	31-6299		(Spkr. Part No. 36-1479-4)	36-4111			
28	Coil Strip Ass'y		58	Electrolytic Cond. (16 mfd., 200 V.)	30-2406			
28A	Coil No. 1		59	Resistor (15 ohms, 1/2 watt)	33-015351			
28B	Coil No. 2	540-1060 K. C.	60	Resistor (150 ohms, 1 watt)	33-115451			
28C	Coil No. 3		61	Electrolytic Cond. (12 mfd., 350 V.)	30-2405			
28D	Coil No. 4		62	Field Coil (Replace Speaker, Part No. 36-1479)				
28E	Coil No. 5	650-1110 K. C.		Power Transformer				
28F	Coil No. 6			(115 Volts, 50 to 60 Cycle)	32-8052			
28G	Coil No. 7	920-1600 K. C.		(115 Volts, 25 Cycle)	32-8086			
29	Resistor (4700 ohms, 1/2 watt)	33-247339		(120/240 Volts, 60 Cycle)	32-8092			
30	1st I. F. Trans. Ass'y	32-3245						
31	Tubular Cond. (.05 mfd.)	30-4123						

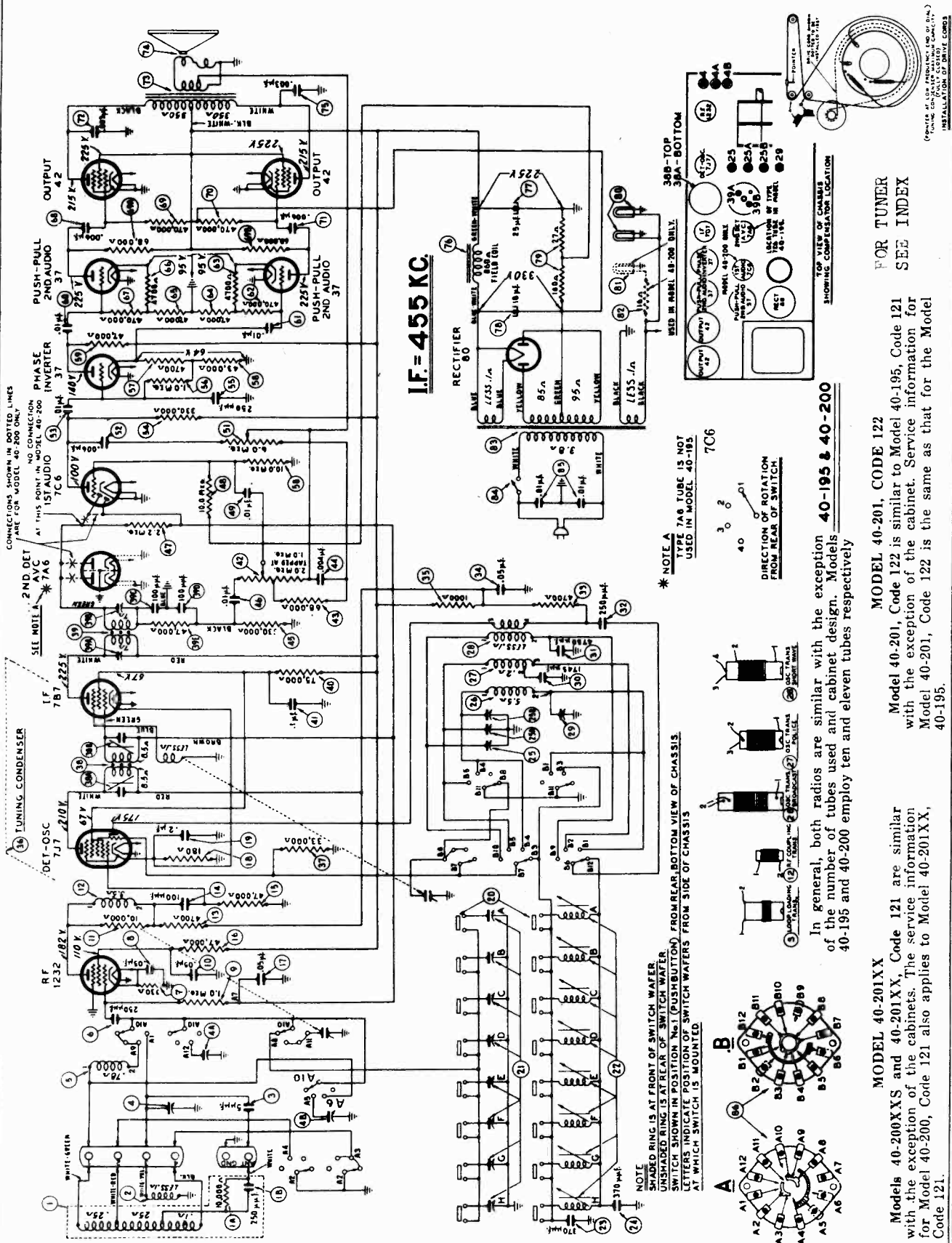
**MISCELLANEOUS PARTS**

Bezel Ass'y	40-6489
Bezel Gasket	27-9175
Cable & Plug (Power Supply)	L-3199
Cabinet Model 40-180	10372H
Cabinet Model 40-185	10400A
Cabinet Model 40-190	10391A
Clip (Coil mtg.)	28-5003
Dial	27-5508
Dial Tuning Drum Ass'y	38-9856
Drive Cord Ass'y	31-2383
Knobs (Tuning, Tone, Volume, Wave Switch)	27-4332
Knobs (Pushbuttons)	27-4852
Pilot Lamp Socket Ass'y	38-9607
Pointer	56-1516
Screws (Bezel mtg.)	W-1834FG1
Spring (Drive Cord)	28-8913
Spring (Dial Background Plate mtg.)	28-8908
Socket (Type 84 Tube)	27-6035
Socket (Type 41 Tube)	27-6036
Socket (Loktal, Type 7J7 Tube)	27-6129
Socket (Loktal, Type 7A6, 7C6 Tubes)	27-6131
Speaker	36-1479
Tab (Dial)	27-5530
Tab (Television)	27-9449
Tab Kit	40-6475
Tuning Shaft Ass'y	38-9874
Washer	
("C" Type, Tuning Shaft Ass'y)	28-2043
(Spring Type, Tuning Shaft Ass'y)	28-4186



MODELS 40-195  
40-200  
40-201(121, 122)

PHILCO RADIO & TELEVISION CORP.



(OPERATE AS USUALLY - LINE OF 204-)  
 (PRINTING CO. - ONLY COLOR COPY)  
 INSTALLATION OF DRIVE COMBO

I.F. = 455 KC.

\* NOTE  
 TYPE 7A6 TUBE IS NOT  
 USED IN MODEL 40-195  
 7C6

DIRECTION OF ROTATION  
 FROM REAR OF SWITCH

In general, both radios are similar with the exception of the number of tubes used and cabinet design. Models 40-195 and 40-200 employ ten and eleven tubes respectively

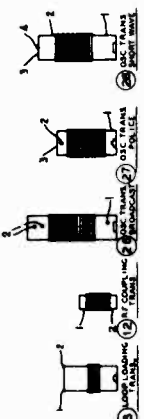
MODEL 40-201, CODE 122

Model 40-201, Code 122 is similar to Model 40-195, Code 121 with the exception of the cabinet. Service information for Model 40-201, Code 122 is the same as that for the Model 40-195.

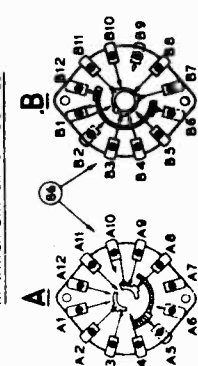
MODEL 40-201XX

Models 40-200XXS and 40-201XX, Code 121 are similar with the exception of the cabinets. The service information for Model 40-200, Code 121 also applies to Model 40-201XX, Code 121.

FOR TUNER  
SEE INDEX



NOTE  
 SHARDED RING IS AT FRONT OF SWITCH WAFER  
 UNSHARDED RING IS AT REAR OF SWITCH WAFER  
 SWITCH SHOWN IN POSITION No. 1 (PUSHBUTTON)  
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM SIDE OF CHASSIS  
 AT WHICH SWITCH IS MOUNTED



**Connecting Aligning Instruments**

**VACUUM TUBE VOLTMETER** — To use the vacuum tube voltmeter as an alignment indicator make the following connections:

1. **ADJUSTING I. F. CIRCUIT:**  
Remove the 12Z2 R. F. tube from its socket and insert the aligning adaptor, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the chassis.
2. **ADJUSTING R. F. CIRCUIT:**  
To adjust the R. F. circuit, the aligning adaptor is inserted in the 7C6 A. F. tube socket. The vacuum tube voltmeter terminals connected to the adaptor as given in the above paragraph with the voltmeter connected in this manner a very sensitive indication of the A. V. C. voltage is obtained when the padders are adjusted. If an audio output meter is used, connect it to the plate and socket terminals of the 42 type tube and adjust the output meter for the 0 to 30 A. C. scale.

After connecting the aligning indicator, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown on the schematic diagram page No. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

**SIGNAL GENERATOR:** When adjusting the I. F. padders, the high side of the signal generator is connected through a 1 mfd. condenser to terminal No. 1 of the loop terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiving loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until there is no further gain in output reading.

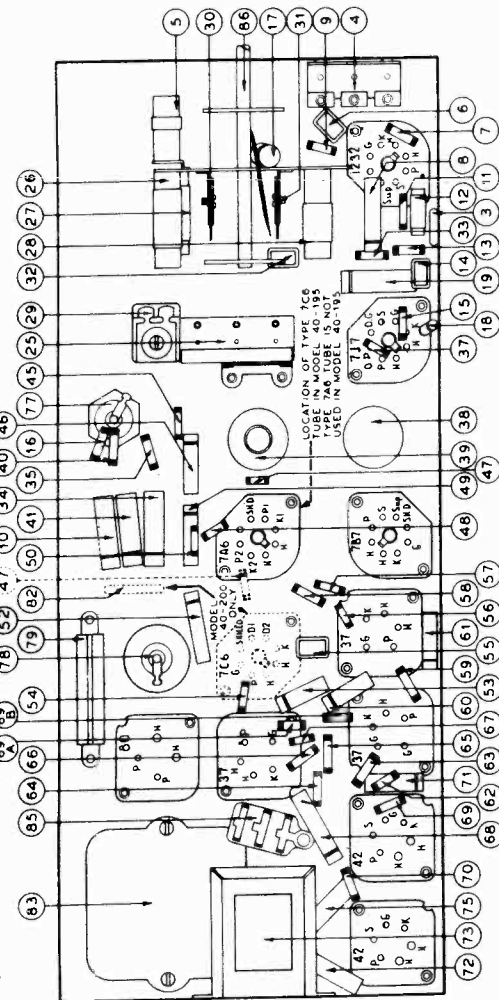
**NOTE D —** To accurately adjust the high frequency oscillation, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator until the output meter indicates maximum output. Adjust the compensator for maximum output at this second peak.

If the above procedure is correctly performed, the image frequency should be at least 10 K. C. below the frequency being used on any high frequency range.

POWER CONSUMPTION: 110 watts.

LOCATED AS SHOWN IN MODEL 40-200 ONLY.

AUDIO OUTPUT: 5 watts.



**PRODUCTION CHANGES**  
MODEL 40-195

Run 2—A mica condenser Part No. 61-0038 was added to the noise band and oscillator padder (25A) to improve padding of the circuit.

Run 4—Beginning with Run 4 receiver the converter tube was changed from a type 7J7 loktal to a 6J8G octal. Tube sockets changed from Part No. 27-6129 to 27-6120.

Run 5—To improve the operating characteristics of the set, screen by-pass condensers were changed from .05 mfd. Part No. 30-4319 to .01 mfd. Part No. 30-4572.

Run 6—A resistor, 27 ohms Part No. 33-097930 was connected in series with the oscillator grid circuit of sets using the 6J8G tube. This change was made to improve the oscillator performance.

MODEL 40-200

Run 3—A mica condenser Part No. 62-0038 was added to the police band oscillator padder (25A) to improve padding of the circuit.

Run 4—Beginning with Run 4 receiver the converter tube was changed from a type 7J7 loktal to a 6J8G octal. Tube sockets changed from Part No. 27-6129 to 27-6120.

Runs 5 and 6—Same as Model 40-195.

**MODEL 40-195, 40-200**

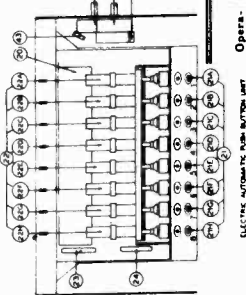
Beginning with Run "77" receivers the converter tube is changed from a type 6J8G octal to a 7J7 loktal. The tube sockets are changed from Part No. 27-6120 to Part No. 27-6129.

This change is the reverse of the change made on Run "4" receivers.

MODEL 40-195, 40-200, 40-201

To improve the padding at 1500 K. C. a mfd. condenser Part No. 30-1097 was connected in parallel with compensator (25B). This change is on all sets marked Run 8.

To prevent low frequency rumble at various points on the dial, other compensator Part No. 30-4334, .004 mfd. was connected in parallel with the present condenser (44) in the bass compensation circuit.



**SIGNAL GENERATOR**

NOTE A — A "Dummy Antenna" consisting of a .1 mfd. condenser is connected in series with the signal generator output lead (high side).

NOTE B — **DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned and dial procedure as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the drive cable in this position is shown in Fig. 4.

NOTE C — When adjusting the low frequency compensator of Range One (Broadcast) or the antenna and R. F. compensators of the high frequency tuning range, allow the receiver to tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now

Operations in Order	Output Condenser in Receiver	Dummy Condenser Note A	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order See Fig.	SPECIAL INSTRUCTIONS
1	High Side to Loop Panel	.1 mfd.	485 K. C.	560 K. C.	Vol. Max. Range Switch "Broadcast."	38B, 39A 38B, 38A	See Note A
2	Use Loop on Generator		1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Broadcast."	29B, 4B	See Note B
3	Use Loop on Generator		560 K. C.	560 K. C.	Vol. Max. Range Switch "Broadcast."	29	Roll Tuning Condenser Note C
4	Use Loop on Generator		1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Broadcast."	26B, 4B	
5	Use Loop on Generator		3.5 M. C.	3.5 M. C.	Vol. Max. Range Switch "Police"	25A, 4A	
6	Use Loop on Generator		18.0 M. C.	18.0 M. C.	Vol. Max. Range Switch "S.W."	25, 4	Check Image Signal Note D

Fig. 3

**MODELS 40-195, 40-200, and 40-201, Codes 121-122**

MODELS 40-215RX  
40-217RX

# PHILCO RADIO & TELEVISION CORP.

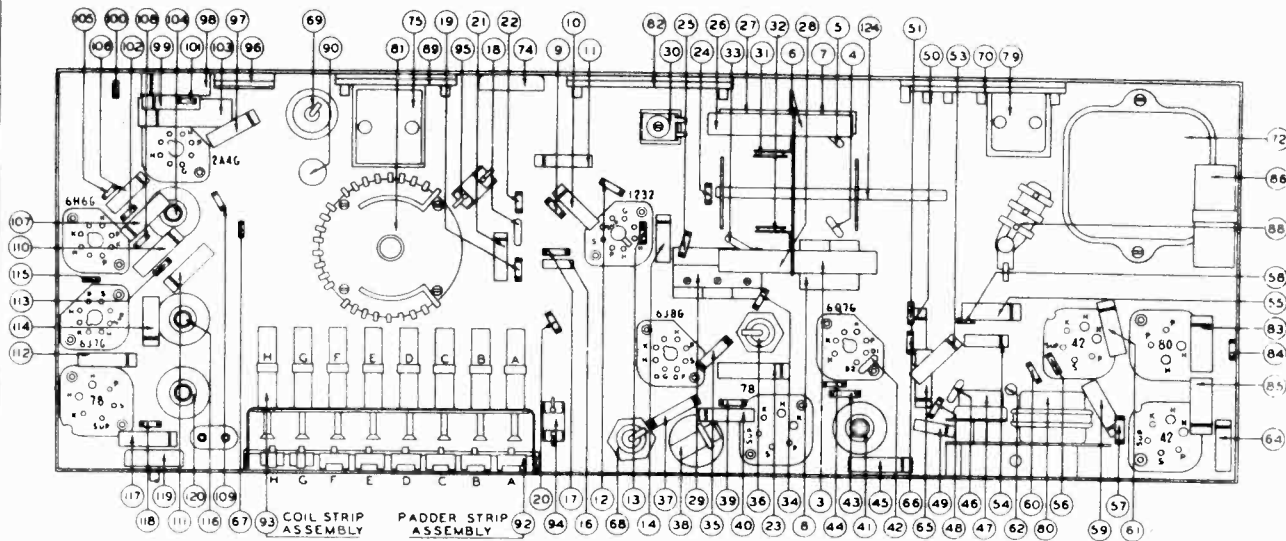


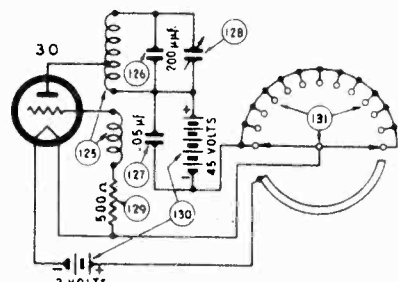
FIG. 2. REPLACEMENT PARTS, UNDERSIDE OF CHASSIS.

## REPLACEMENT PARTS

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	
1	Loop Assembly (Broadcast)	38-9982	84	Resistor (150 ohms, 1/2 watt)	33-115339	110	Tubular Condenser (.05 mfd.)	30-4123	
1A	Resistor (10,000 ohms, 1/2 watt)	33-310339	85	Tubular Condenser (1 mfd.)	30-4499	111	Tubular Condenser (.05 mfd.)	30-4123	
1B	Mica Condenser (250 mmfd.)	61-0033	86	Electric Condenser (30 mfd., 30 V.)	30-2361	112	Tubular Condenser (.05 mfd.)	30-4123	
2	Loop Assembly (Short Wave)	38-9977	87	Stepper Unit (Complete)	38-9689	113	Resistor (1.5 meg., 1/2 watt)	33-515339	
2A	Compensator	31-8326	87A	Spark Fil. Assy. (Inside of Stepper Unit)	32-3276	114	Tubular Condenser (.05 mfd.)	30-4519	
3	Short Wave Series Transformer	32-3378	87B	Spark Filter Choke	32-3276	115	Tubular Condenser (.05 mfd.)	33-359339	
4	Mica Condenser (.5 mfd.)	30-1097	87C	Tubular Condenser (.05 mfd.)	30-4444	116	No. 2 Control Amplifier Transformer	32-3087	
5	Mica Condenser (250 mmfd.)	61-0033	87D	Tubular Condenser (.05 mfd.)	30-4444	117	Tubular Condenser (.05 mfd.)	30-4444	
6	Broadcast Series Transformer	32-3376	87E	Resistor (100 ohms, 1/2 watt)	33-110339	118	Resistor (99,000 ohms, 1/2 watt)	33-3295	
7	Police Shunt Transformer	33-3377	88	Resistor (150 ohms, wirewound)	33-3362	119	Sensitivity Control (50,000 ohms)	32-3086	
8	Compensator (2 section)	31-8339	89	Resistor (100 ohms, 1/2 watt)	33-3362	120	No. 1 Control Amplifier Transformer	32-3086	
9	Resistor (82,000 ohms, 1/2 watt)	33-282339	90	Electric Condenser (18 mfd., 150 V.)	30-2387	121	Silver Mica Cond. (155 mmfd.)	30-1121	
10	Tubular Condenser (.05 mfd.)	30-1023	91	Pilot Lamp (Station Indicator)	34-2064	122	Compensator (Secondary Inductor)	31-6266	
11	Resistor (1.0 meg., 1/2 watt)	30-4444	92A	Compensator Strip (Pushbuttons)	31-6264	123	Secondary Inductor (Remote Tuning)	40-6414	
12	Resistor (1.0 meg., 1/2 watt)	33-310339	92B	Compensator No. 1		124	Wave Switch	42-1550	
13	Resistor (330 ohms, 1/2 watt)	30-4444	92C	Compensator No. 2		125	Wireless Remote Control Unit	45-2709	
14	Tubular Condenser (.05 mfd.)	33-133339	92D	Compensator No. 3		126	Primary Inductor	30-4319	
15	Tuning Condenser Assembly	30-4444	92E	Compensator No. 4		127	Silver Mica Cond. (200 mmfd.)	30-1115	
16	Peaking Transformer	32-3372	92F	Compensator No. 5		128	Compensator (Primary Inductor)	31-6266	
17	Resistor (10,000 ohms, 1/2 watt)	33-310339	92G	Compensator No. 6		130	Resistor (500 ohms, 1/2 watt)	31-50339	
18	Mica Condenser (100 mmfd.)	30-1128	92H	Compensator No. 7		131	Remote Control Battery Pack	41-NR-23	
19	Resistor (4700 ohms, 1/2 watt)	33-247339	92I	Compensator No. 8			Dial Unit (Pulser)	36-9704	
20	Resistor (1000 ohms, 1/2 watt)	33-210339							
21	Tubular Condenser (.05 mfd.)	30-4123							
22	Tubular Condenser (.05 mfd.)	33-347339							
23	Resistor (23,000 ohms, 1/2 watt)	30-1623							
24	Resistor (27,000 ohms, 1/2 watt)	33-333339							
25	Resistor (27,000 ohms, 1/2 watt)	33-310339							
26	Oscillator Transformer (Broadcast)	32-3373							
27	Oscillator Transformer (Police)	32-3374							
28	Oscillator Transformer (Short Wave)	32-3375							
29	Compensator (3 section)	31-6338							
30	Compensator	31-6230							
31	Tracking Condenser (Police, 1330 mmfd.)	31-6230							
32	Tracking Condenser (Short Wave, 250 mmfd.)	31-6341							
33	Mica Condenser (250 mmfd.)	61-0033							
34	Resistor (1.0 meg., 1/2 watt)	33-310339							
35	Resistor (15,000 ohms, 1/2 watt)	33-310339							
36	Resistor (15,000 ohms, 1/2 watt)	30-2334							
37	Electric Condenser (4 mfd., 250 V.)	33-250839							
38	Resistor (3000 ohms, 1/2 watt)	33-139339							
39	1st I.F. Transformer Assembly	30-1889							
40	Resistor (390 ohms, 1/2 watt)	33-139339							
41	Tubular Condenser (.05 mfd.)	30-1023							
42	1st I.F. Transformer Assembly	32-2645							
43	Resistor (10,000 ohms, 1/2 watt)	33-510339							
44	Resistor (33,000 ohms, 1/2 watt)	30-1031							
45	Mica Condenser (110 mmfd.)	33-520339							
46	Resistor (2.0 meg., 1/2 watt)	33-510339							
47	Resistor (1.0 meg., 1/2 watt)	33-510339							
48	Tubular Condenser (.01 mfd.)	30-4479							
49	Mica Condenser (50 mmfd.)	30-1029							
50	Volume Control (2.0 meg.)	33-5300							
51	Resistor (70,000 ohms, 1/2 watt)	33-703339							
52	Tubular Condenser (.04 mfd.)	30-4334							
53	Tubular Condenser (.015 mfd.)	30-4338							
54	Resistor (1.0 meg., 1/2 watt)	33-510339							
55	Tone Control (3.0 meg.)	33-5267							
56	Tubular Condenser (.02 mfd.)	30-4481							
57	Tubular Condenser (.06 mfd.)	30-4485							
58	Tubular Condenser (.03 mfd.)	30-4517							
59	Resistor (490,000 ohms, 1/2 watt)	33-449339							
60	Resistor (330,000 ohms, 1/2 watt)	33-449339							
61	Resistor (99,000 ohms, 1/2 watt)	33-339339							
62	Tubular Condenser (.01 mfd.)	30-4501							
63	Tubular Condenser (.01 mfd.)	30-4501							
64	Cone and Voice Coil Assembly (Speaker Part No. 36-1450-3)	36-4089							
65	(Speaker Part No. 36-1450-4)	36-4111							
66	Tubular Condenser (.01 mfd.)	30-4501							
67	Tubular Condenser (.01 mfd.)	30-4501							
68	Resistor (1.0 meg., 1/2 watt)	33-510339							
69	Resistor (1000 ohms, 1/2 watt)	33-230339							
70	Electric Condenser (25 mfd., 300 V.)	33-1368							
71	Electric Condenser (18 mfd., 475 V.)	30-2200							
72	Resistor (Wirewound)	33-3360							
73	Field Coil (Replace Spkr. Part No. 36-1450)	33-3361							
74	Power Trans. (115 V., 50-60 cycles)	32-7999							
75	Power Trans. (115 V., 25-40 cycles)	32-8013							
76	Bypass Condenser (.05 mfd., 110 V. Plug)	30-4578							
77	Choke Coil	32-1281							
78	Filament Trans. (115 V., 50-60 cycles)	32-8013							
79	Filament Trans. (115 V., 25-40 cycles)	32-8018							
80	Resistor (18 ohms, Pilot Lamp)	33-916239							
81	Pilot Lamp (Bulbtype)	34-2210							
82	Pilot Lamp (Dial)	34-2084							
83	Motor Trans. (115 V., 50-60 cycles)	32-8015							
84	Motor Trans. (115 V., 25-40 cycles)	32-8015							
85	Motor Assembly (Volume Control, 60 cycles)	35-1151							
86	(110 volts, 25 cycles)	35-1182							
87A	Switch (Volume Control Motor)	42-1469							
88	Rotary Switch (Stepper Unit)	42-1468							
89	Resistor (10 ohms, wirewound)	33-3363							
90	Tubular Condenser (.1 mfd.)	30-4499							

## MISCELLANEOUS PARTS

Bezel	56-1509
Bezel Gasket and Staple Assembly	38-9734
Cabinet (Model 40-215RX)	104028
Cabinet (Model 40-217RX)	104038
Cable (Power Supply)	4-3176
Dial	27-3583
Drive Cord (Tuning Condenser)	31-2315
Driver Cord (Pulser Operation)	31-2320
Disc (Tuning)	27-4786
Disc (Volume)	27-4785
Disc (Wave Switch)	27-4326
Disc (Tone Control)	27-4764
Knob (Sensitivity Control)	38-9711
Pilot Lamp Assy. (R. H. Bracket)	38-9694
Pilot Lamp Assy. (L. H. Bracket)	38-9711
Pilot Lamp Assy. (Station Light)	38-9709
Pilot Lamp Assy. (Cabinet Bulbtype)	38-9712
Pilot Lamp Jewel (Bulbtype)	27-4777
Socket (4 prong, type 80 tube)	27-6044
Socket (6 prong, type 42 & 78 tubes)	27-6036
Socket (Octal, type 6T7 tube)	27-6057
Socket (Octal, type 6H6C, 2A4 & 6Q7 tubes)	27-6086
Socket (Lantal, type 1232 tube)	27-6099
Spring (Drive Cord)	28-8913
Speaker	36-1450
Washer (Keyed Washer, Tuning Disc)	56-1029



SCHEMATIC DIAGRAM OF WIRELESS REMOTE CONTROL UNIT  
FIG. 3. SCHEMATIC DIAGRAM, WIRELESS REMOTE CONTROL.

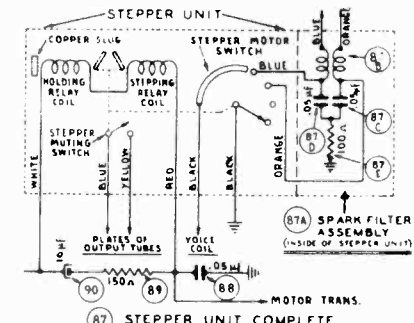
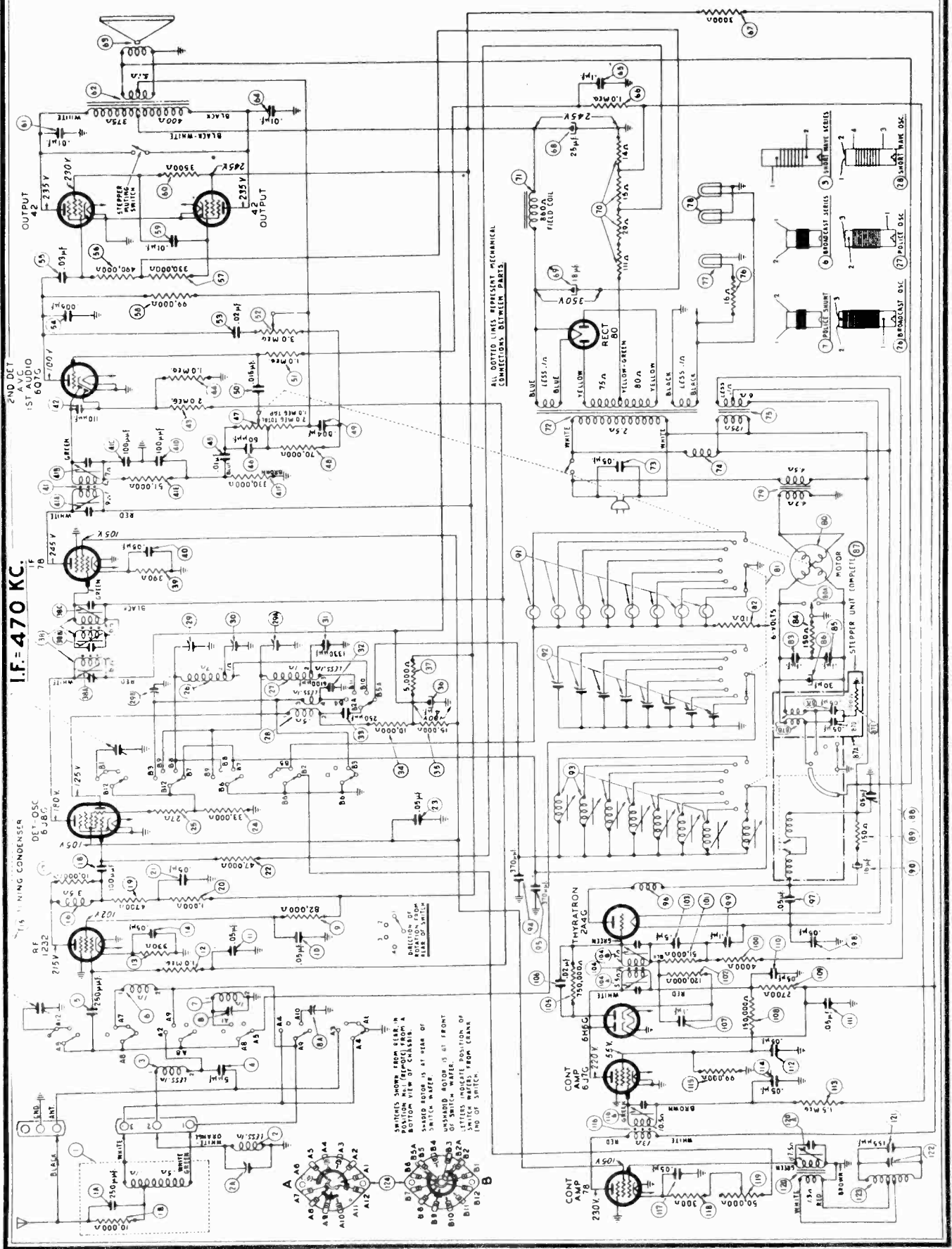


FIG. 4. WIRING OF STEPPER UNIT, WIRELESS REMOTE CONTROL.

PHILCO RADIO & TELEVISION CORP.

MODELS 40-215RX  
40-217RX



MODELS 40-215RX  
40-217RX

PHILCO RADIO & TELEVISION CORP.

SPECIFICATIONS

Models 40-215, code 121, and 40-217, code 121, are twelve (12) tube super-heterodyne radios employing Philco Wireless Remote Control and a Built-in Super-Aerial System. Three tuning ranges are provided for reception of standard, Police and Short Wave Broadcast stations. These models are also designed to receive the sound of a television program, tuned in by Philco Television Sets and can be set up for use with a Wireless Record Player.

The Wireless Remote Control will automatically tune in eight (8) broadcast stations, increase and decrease volume and turning off the radio without any connections between the set and the control unit.

The Built-in Super-Aerial System eliminates an outside aerial and ground. Included in the Built-in Super Aerial System is a statically shielded loop for broadcast band reception and a short wave broadcast loop. The feature of the built-in broadcast band statically shielded loop, is that it may be turned to the position in which it picks up a minimum amount of interference, or if interference is not present, the loop may be set in the position where best reception is obtained.

In addition, other features of design are: automatic volume control, continuously variable tone control, bass compensation, and degenerated push-pull pentode audio output. Outside aerial

connections are also provided for remote localities where station signal strength is exceptionally weak.

**POWER SUPPLY:** 115 volts, 60 cycles.  
This model can also be operated on a 115 volt, 25 cycle power supply, changing the power transformers and several parts as indicated on the replacement parts on page 79.

**FREQUENCY TUNING RANGES:**  
340 to 1520 K. C. 1.4 to 3.6 M. C. 6.0 to 18 M. C.

**INTERMEDIATE FREQUENCY:** 470 K. C.

**PHILCO TUBES USED:** Receiver — 1232, R. F. Amplifier: 6J8G, Detector Oscillator: 78, I. F. Amplifier: 6Q7G, 2nd Detector: A. V. C.: 1st Audio; two 42, Push-Pull Audio Output; 80, Rectifier.

Control Frequency Amplifier — 78, 6J7G, 6H6G, 2A4G.

Wireless Remote Control — Type 30 tube.

**AUDIO OUTPUT:** 7 Watts.

**CABINET DIMENSIONS:** Height Width Depth  
Model 40-215 ..... 38" 30" 16 1/2"  
Model 40-217 ..... 38 1/4" 35" 14 1/4"

CONNECTING ALIGNING INSTRUMENTS

**Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (-) terminal of the voltmeter through a 2 meg. resistor to the grid of the 78 I. F. tube. The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

**Audio Output Meter:** If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of one of the 42 tubes. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the R. F. and I. F. compensators in the order as shown in the tabulation

below. Locations of the compensators are shown in Fig. 5, page 80. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

**Signal Generator:** When adjusting the I. F. padders, the high side of the signal generator is connected through a 1 mfd. condenser to the grid of the tubes. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders a loop antenna is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiver loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

RECEIVER CIRCUIT ADJUSTMENTS — Models 40-215, 40-217

Operation	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators	
1	78 I. F. Grid	470 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcat"	41A, 41B	Turn Out 38B Full
2	6J8G Det. Osc. Grid	470 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcat"	38A, 38C, 38B	Note A
3	Use Loop on Generator	18.0 M. C.	18.0 M. C.	Vol. Max. Range Switch "Short Wave"	29B, 2A	Note C, Note D 2A on SW Loop
4	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcat"	29, 8A	Note A
5	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcat"	30	Rollgang
6	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcat"	29	
7	Use Loop on Generator	3.5 M. C.	3.5 M. C.	Vol. Max. Range Switch "Police"	29A, 8	Note B

**NOTE A — DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable and dial pointer is shown in Fig. 1.

**NOTE B — See** Wireless Remote Control Amplifier adjustments.

**NOTE C —** If two peaks (signals) are observed on the aligning meter when adjusting the oscillator padder No. 29B, tune the padder to the second peak from the maximum capacity position (screw all the way in).

**NOTE D —** If two peaks (signals) are observed on the aligning meter when adjusting the loop padder 2A, tune the padder to the first peak signal from the maximum capacity position (screw all the way in). When adjusting the padders to this first peak roll the tuning condenser (rock) slightly back and forth to obtain the maximum readings on the aligning meter.

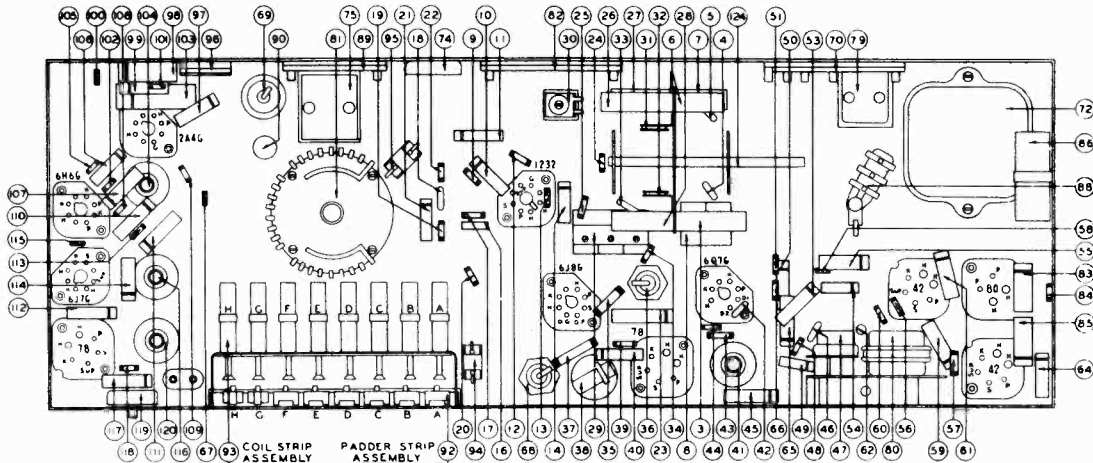


FIG. 2. REPLACEMENT PARTS. UNDERSIDE OF CHASSIS.

PHILCO RADIO & TELEVISION CORP. MODELS 40-501 (121) 40-502 (121, 122)

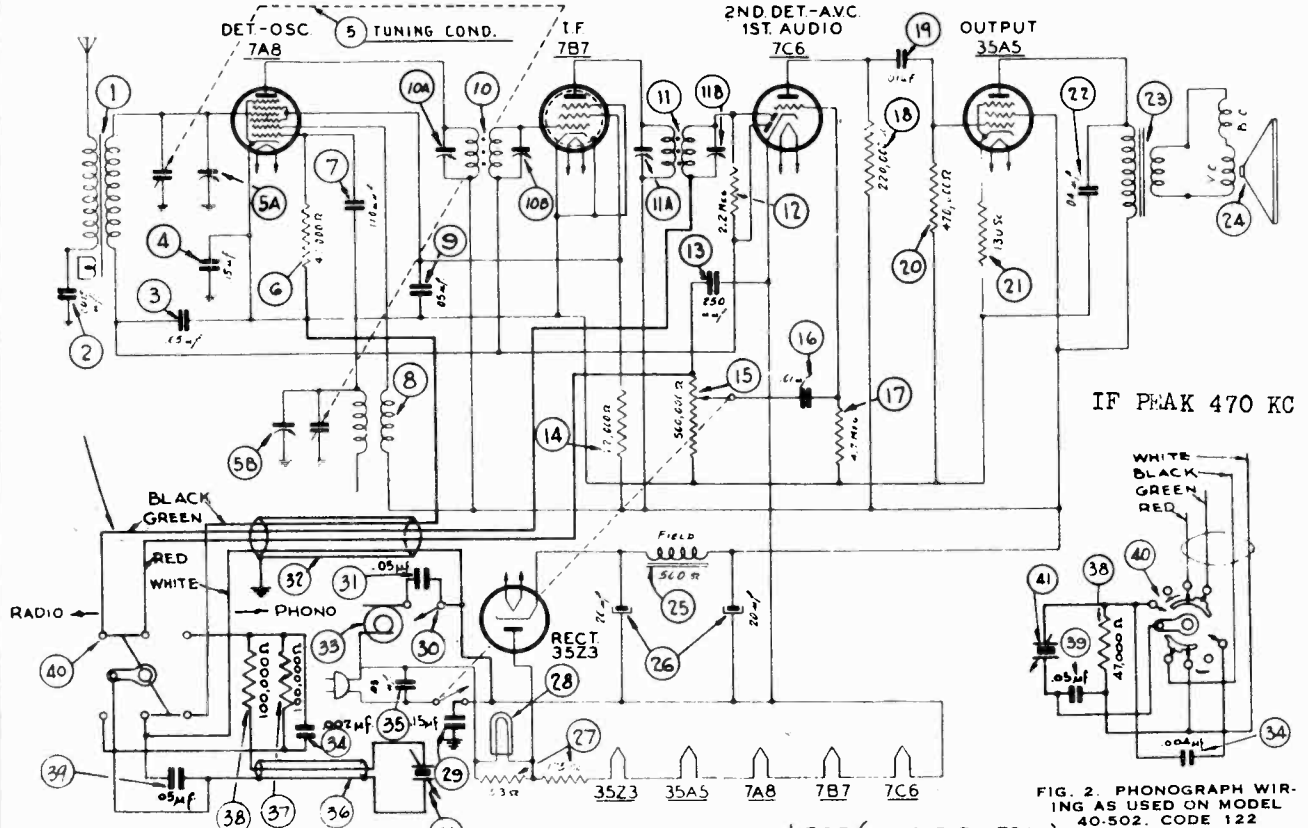


FIG. 2. PHONOGRAPH WIRING AS USED ON MODEL 40-502. CODE 122

MODELS 40-501, CODE 121 AND 40-502, CODES 121 AND 122

SCHE. No.	DESCRIPTION	PART No.
1	Antenna Transformer	32-3151
2	Condenser (.0015 mfd., 200 volts)	30-4555
3	Condenser (.05 mfd., 400 volts)	30-4519
4	Condenser (.15 mfd., 400 volts)	30-4505
5	Tuning Condenser	31-2354
5A	Antenna Compensator, Part of 5	33-347339
6	Resistor (47,000 ohms, Model 40-502, Code 122)	33-322339
7	Condenser (.110 mmd.)	30-1130
8	Oscillator Transformer	32-3192
9	Condenser (.05 mfd., 200 volts)	30-4519
10	1st I. F. Transformer	32-3149
11	2nd I. F. Transformer	32-3180
12	Resistor (2.2 megohms)	33-522339
13	Condenser, Mica (250 mmd.)	61-0033
14	Resistor (22,000 ohms, Model 40-502, Code 122)	33-322339
15	Volume Control	33-8306
16	Condenser (.01 mfd., 200 volts)	30-4479
17	Resistor (4.7 megohms, Model 40-502, Code 122)	33-547339
18	Resistor (220,000 ohms, Model 40-502, Code 122)	33-422339
19	Condenser, Tubular (.01 mfd., 400 volts)	30-4872
20	Resistor (470,000 ohms, Model 40-502, Code 122)	33-447339
21	Resistor (130 ohms)	33-113339
22	Condenser (.02 mfd., 400 volts)	30-4516
23	Output Transformer For use with Speaker 36-1469-1	32-8057
24	Cone Assembly for Speaker 36-1469-1 Cone Assembly for Speaker 36-1469-9	32-8044
25	Field Coil—Replace Speaker 36-1469	36-4115
26	Electrolytic Condenser (20-20 mfd.)	30-2382
27	Resistor	33-3367
28	Pilot Lamp	34-2068
29	Condenser (.15 mfd.)	30-4579
30	Motor Switch (40-501, 121, 40-502, 121-122)	42-1521
31	Condenser, Tubular (.05 mfd.)	30-4518
32	Radio-Phono Cable, Model 40-501, Code 121-122	L-3192
33	Motor (115 volts, 60 cycle) 40-501, Code 121, 40-502, Code 121, 40-502, Code 122	L-3206 35-1158 35-1216
34	Condenser (.002 mfd., 40-501, 40-502, Code 121)	30-4579
35	Condenser (.004 mfd., 40-502, Code 122)	30-4378
36	Condenser (.03 mfd., 400 volts)	30-4449
38	Pickup Cable	42-1523
39	Pickup Crystal Cartridge	41-1027
40	Pickup Cable	35-2069

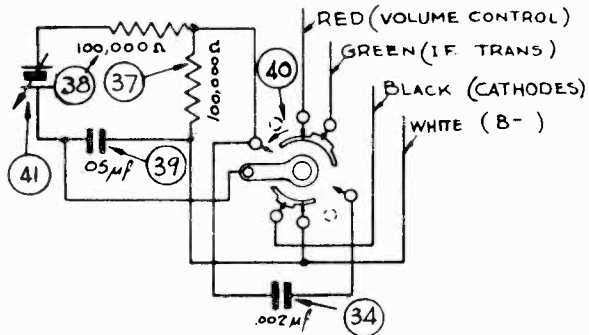


FIG. 1. PHONOGRAPH WIRING AS USED ON MODEL 40-502. CODE 121

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
37	Resistor (100,000 ohms, 40-501, Code 121, 40-502, Code 121)	33-410339	37	Resistor (100,000 ohms, 40-501, 40-502, Code 121)	33-410339
38	Resistor (100,000 ohms, 40-501, 40-502, Code 121)	33-410339	38	Resistor (100,000 ohms, 40-501, 40-502, Code 121)	33-410339
39	Resistor (47,000 ohms, 40-502, Code 122)	33-347339	39	Condenser, Tubular (.05 mfd., 400 volts)	30-4519
40	Radio-Phono Switch (Model 40-501)	42-1523	40	Radio-Phono Switch (Model 40-501)	42-1524
41	Pickup Crystal Cartridge	41-1027	41	Pickup Crystal Cartridge	41-1027
				Condenser (.03 mfd., 400 volts)	30-4449

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	470 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max.	11A, 11B 10A, 10B	
2	Ant. Ter.	1700 K. C.	1700 K. C.	Vol. Max.	5B	Note A
3	Ant. Ter.	1500 K. C.	1500 K. C.	Vol. Max.	5A	

NOTE A — DIAL CALIBRATION: The dial pointer is adjusted by closing the tuning condenser (plates fully meshed) and setting the pointer on the dot below 55 on the dial.

33-322339. This change was made to stabilize oscillator circuit. Output Transformer for Speaker Part No. 36-1469-1 listed as Part No. 32-8057 should be Part No. 32-8047.

PRODUCTION CHANGES

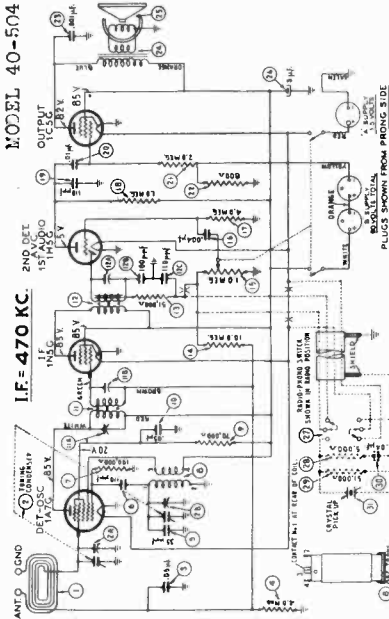
MODELS 40-501, CODE 121; 40-502, CODES 121-122  
Beginning with sets marked Run 2 resistor (6) 47000 ohms, Part No. 33-347339 was changed to 22000 ohms, Part No.

MODEL 40-502, CODE 122  
Motor (33) 115 volts, 60 cycle, Part No. 35-1216 changed to Part No. 35-1222. The turntable for the new motor is Part No. 35-3044.



MODEL 40-504  
 MODELS 40-525,  
 40-526, 40-527

PHILCO RADIO & TELEVISION CORP.



REPLACEMENT PARTS — Models 40-525, 40-526, 40-527

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	38-9897	36	Electrolytic Capacitor (4 mfd., 400 V.)	30-2401
1A	Compensator	31-6038	37	Electrolytic Capacitor (12-20 mfd., 475 V.)	30-2437
1B	Mica Condenser (250 mmfd.)	61-0033	38	Resistor (39 ohms, 1/2 watt)	33-039339
2	Mica Condenser (250 mmfd.)	61-0033	39	Resistor (220 ohms, 1/2 watt)	33-122431
3	Mica Condenser (1120 mmfd.)	60-1140	40	Power Transformer	32-9064
4	Tubular Condenser (.05 mfd.)	30-4518	41	Bakelite Cond. (.01-.01 mfd.)	3903.DG
5	Resistor (1.0 meg., 1/2 watt)	33-510339	42	Pilot Lamp	34-2064
6	Tubular Condenser (.05 mfd.)	30-4518	43	Wave Switch	42-1494
7	Resis. (270,000 ohms, 1/2 watt)	33-427339	44	Pushbutton Switch	42-528
8	Tuning Condenser	32-3263	45	Slide Switch	41-6315
9	Resistor (5600 ohms, 1/2 watt)	33-266339	46	Motor Switch	42-1548
10	Resistor (47,000 ohms, 1/2 watt)	33-373339	47	Motor (110 volts, 60 cycles)	35-1204
11	Mica Condenser (250 mmfd.)	61-0033	48	Switch (Part of 46)	35-2030
12	Tubular Condenser (.05 mfd.)	30-4518	49	Crystal Cartridge (Pickup)	28-2487
13	Tubular Condenser (.05 mfd.)	30-4518	50	Pickup Cable Assembly	41-3508
14	Resist. (10,000 ohms, 1/2 watt)	33-310339		Change	318-1775
15	Mica Condenser (250 mmfd.)	61-0033		Radio-Phono Switch	42-1561
16	Mica Condenser (250 mmfd.)	61-0033		Cable (Radio-Phono Switch)	L-3217
17	Oscillator Transformer	32-3212		Condenser (.05 mfd.)	30-4518
18	1st I. F. Trans. Assembly	32-3210		Automatic Record Changer	35-1180
19	Resistor (27,000 ohms, 1/2 watt)	33-327439		Cabinet	1042-A
20	Resistor (1,000 ohms, 1/2 watt)	33-210339		Cable (Speaker)	L-3199
21	2nd I. F. Trans. Assembly	32-3281		Cable (Radio-Phono)	41-3329
22	Resistor (2.2 meg., 1/2 watt)	33-523339		Dial Scale	L-3217
23	Tubular Condenser (.01 mfd.)	30-4572		Drive Cord (Pointer Drive)	31-2506
24	Volume Control (.5 meg., 1/2 watt)	33-5332		Drive Cord (Cond. Drive)	31-2400
25	Resistor (4.7 meg., 1/2 watt)	33-547339		Ecutechcon (Station Tabs)	38-9983
26	Mica Condens. (.004 mfd.)	61-0033		Knobs (Vol., Tone, Wave Sw.)	28-5742
27	Tubular Cond. (.004 mfd.)	30-4578		Knob (Pushbutton Switch)	27-4824
28	Resistor (1.0 meg., 1/2 watt)	33-510339		Knob (Phono Off-On)	27-4827
29	Resis. (330,000 ohms, 1/2 watt)	33-433339		Pilot Light Socket Assy.	38-9904
30	Tubular Cond. (.006 mfd.)	30-4445		Pointer	56-1632
31	Tubular Condens. (.02 mfd.)	30-4481		Shaft (Tuning)	318-1506
32	Tone Control & On-Off Switch	42-1520			
33	Output Transformer	32-8063			
34	Cone & Voice Coil Assembly	36-4086			
35	Field Coil (Replace Spkr. Part No. 36-1460)	36-4086			

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Loop Assembly	40-6421	17	Resistor (4.0 meg., 1/2 watt)	33-540339
2	Tuning Condenser	31-2322	18	Resistor (1.0 meg., 1/2 watt)	33-510339
3	Tubular Cond. (.05 mfd.)	30-4519	19	Mica Cond. (110 mmfd.)	30-1031
4	Resistor (4.0 meg., 1/2 watt)	33-540339	20	Tubular Cond. (.01 mfd.)	30-4572
5	Mica Cond. (.35 mmfd.) mounted at top of tuning	30-1095	21	Resistor (2.0 meg., 1/2 watt)	33-520339
6	Mica Cond. (110 mmfd.)	30-1031	22	Resistor (800 ohms, 1/2 watt)	33-180339
7	Resistor (190,000 ohms, 1/2 watt)	33-419339	23	Tubular Cond. (.001 mfd.)	30-4201
8	Oscillator Trans.	32-3118	24	Output Trans. (Spir. No. 36-1451-3)	32-8036
9	Resistor (70,000 ohms, 1/2 watt)	33-370339	25	Cone & Voice Coil Assy. (Spir. No. 36-1451-5)	36-4090
10	Tubular Cond. (.05 mfd.)	30-4444	26	Electrolytic Cond. (2 mfd., 150 V.)	30-2359
11	1st I. F. Trans. Assy.	32-3103	27	Radio-Phono Switch	42-1501
12	2nd I. F. Trans. Assy.	32-3176	28	Resistor (5000 ohms, 1/2 watt)	33-250339
13	Resistor (51,000 ohms, 1/2 watt)	33-351339	29	Resistor (51,000 ohms, 1/2 watt)	33-351339
14	Resistor (10.0 meg., 1/2 watt)	33-610339	30	Tubular Cond. (.04 mfd.)	30-4119
15	Volume Control (1.0 meg.)	33-5310	31	Crystal Pickup (less tone arm com-plate)	35-2033
16	Tubular Cond. (.004 mfd.)	30-4578		Tone arm (less pickup)	35-2037

MODEL 40-504

SIGNAL GENERATOR			RECEIVER		
Order	Out-put Connections to Receiver	Dummy Antenna (Note A)	Dial Setting	Control Setting	Adjust Compensators in Order
1	1A7C Grid	.1 mfd.	470 K. C.	580 K. C.	12A, 11B, 11A
2	Ant. & Grid Terminals	400 ohms	1650 K. C.	1890 K. C.	2B, 2A

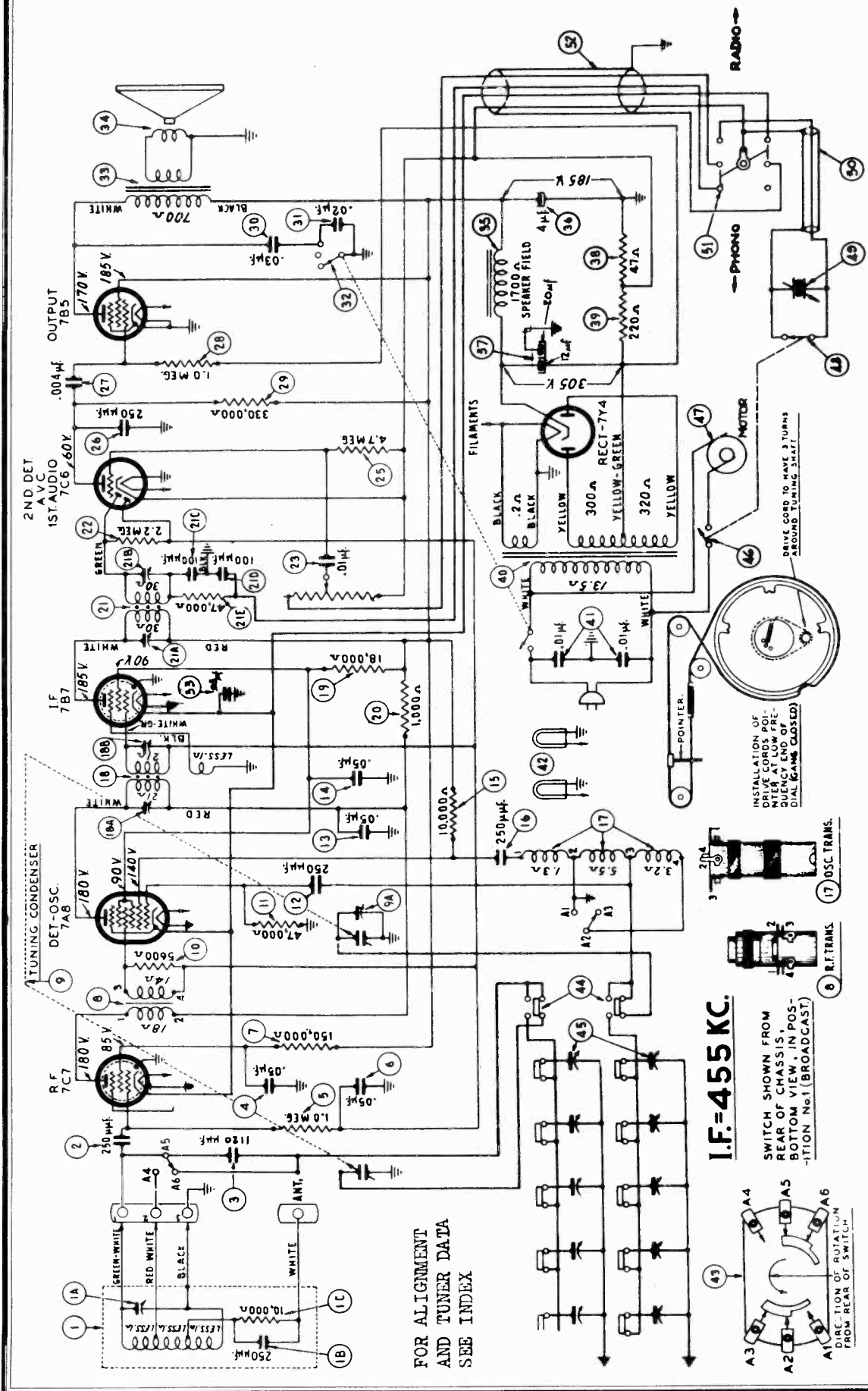
NOTE: A—The "Dummy Antenna" consists of a condenser or resistor connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.  
 NOTE: B—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: Turn the tuning condenser to maximum capacity (plates fully meshed). With tuning condenser in this position set the pointer to the small "black dot" at the low frequency end of the scale.  
 NOTE: C—To adjust the I. F. compensators, remove the back cover (in addition to connections for an external serial)

MODEL 40-525 is similar to Model 40-526, Code 121 with the exception of the cabinet and phonograph mechanism. The service information for the Model 40-525, Code 121, also applies to Model 40-527, Code 121.  
 Model 40-504 is a portable battery operated combination phonograph and radio. The radio consists of a four tube super-heterodyne circuit covering a frequency range from 540 to 1600 K. C. A loop aerial is also built into the cabinet for portable use in addition to connections for an external serial

MODEL 40-525 is a combination radio-phonograph consisting of a six tube electric push-button tuning superheterodyne radio receiver and an automatic record changer. The radio receiver contains six (6) electric push-buttons; five (5) of the push-buttons are used for reception of stations and one (1) to select manual turn (Dial). The Specifications with the exception of those listed below are the same as Model 40-135.  
 The Automatic Record Changer, Philco Part No. 35-1180, plays twelve 10-inch records or ten 12-inch records at one loading.  
 MODEL 40-526, Code 121  
 Model 40-526, Code 121, is similar to Model 40-525, Code 121, with the exception of the cabinet and phonograph mechanism. The service information for the Model 40-525, Code 121, also applies to Model 40-527, Code 121.  
 Model 40-504 is a portable battery operated combination phonograph and radio. The radio consists of a four tube super-heterodyne circuit covering a frequency range from 540 to 1600 K. C. A loop aerial is also built into the cabinet for portable use in addition to connections for an external serial

PHILCO RADIO & TELEVISION CORP.

MODELS 40-525,  
40-526, 40-527



**MODEL 40-525, 40-526**

The cabinet and speaker of these models were changed in later production. The part number changes are as follows:

Cabinet Model (40-526)	Early Production	104526
Cabinet Model (40-525)	Later Production	104525
Speaker and Silk Assembly		40-522
Cone and Voice Coil Assembly		40-523
For Speaker 36-1480-2		36-1482
For Speaker 36-1491-2		36-1496
For Speaker 36-1491-4		36-4133
		36-4147

**MODEL 40-525**

**RADIO-PHONOGRAPH**

To prevent oscillation at the low end of the Broadcast Band, the 2nd I.F. transformer (21) Part No. 32-3281 is changed to Part No. 32-3382.

To stabilize the R. F. circuit and prevent oscillation, the cathode of the 7C7 R. F. tube is removed from the common connection of the R. F. I. F. and converter cathodes and connected directly to the ground. See diagram on page 9. Sets with this change marked "Run No. 3".

MODELS 40-508,  
40-509, 40-515

Replacement Parts — Models 40-508, 40-509

Models 40-508 and 40-509 are radio-phonograph combinations consisting of an 8 tube electric push button tuning superheterodyne radio and an automatic record changer. The same radio receiver is used in each model. The automatic record changer and cabinet, however, are different.

Model 40-508 employs an improved type automatic record changer, Philco Part No. 35-1180, which plays twelve 10" records or ten 12" records at one loading.

Model 40-509 incorporates the Philco Inter-Mix Record Changer Part No. 35-1176. This record changer plays fourteen 10" and 12" records intermixed, or fifteen 10" or thirteen 12" records at one loading.

The radio receiver of these models contains 8 electric push buttons; 6 of the electric push buttons are used for reception of stations, one for television sound and one to switch to dial tuning.

In addition, the Philco Built-In Super Aerial System is included in these models. This system eliminates an outside aerial and reduces local static interference to a minimum. Included in the Built-In Super Aerial System is a statically shielded loop for broadcast band reception and a shortwave receiving loop. A feature of the built-in broadcast band statically shielded loop is that it may be turned to the position in which it picks up a minimum amount of interference or if interference is not present, the loop may be set in the position where best reception is obtained. Outside aerial connections are also provided for remote localities where signal strength is weak.

POWER SUPPLY: 115 volts, 60 cycle A. C.

POWER CONSUMPTION:

Model 40-508—90 watts.

Model 40-509—110 watts.

TUNING RANGES: Three

540 to 1550 K. C. 1.5 to 3.4 M. C. 6 to 18 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 2 watts.

SCHE. No.	PART No.	DESCRIPTION	SCHE. No.	PART No.	DESCRIPTION	PART No.
1	36-9940	Loop Assy. (Broadcast)	38	40-478	Tubular Cond. (.01 mfd.)	30-4478
1A	81-0033	Resistor (10,000 ohms, 1/2 watt)	39	33-447339	Resistor (470,000 ohms, 1/2 watt)	33-447339
1B	35-9940	Loop Assy. (500 mfd.)	40	33-420338	Resistor (220,000 ohms, 1/2 watt)	33-420338
2	35-9941	Loop Assy. (Short Wave)	40A	33-420339	Resistor (220,000 ohms, 1/2 watt)	33-420339
3	31-6308	Compensator	41	33-420340	Volume Control (2.0 meg.)	33-420340
4	30-1097	Mica Cond. (.5 mfd.)	42	33-420341	Volume Control (2.0 meg.)	33-420341
5	8586	Mica Cond. (5 mfd.)	43	33-822338	Resistor (2.2 meg., 1/2 watt)	33-822338
6	81-0033	Mica Cond. (1250 mfd.)	44	33-810338	Resistor (10.0 meg., 1/2 watt)	33-810338
7	33-103338	Mica Cond. (250 mfd.)	45	30-1130	Mica Cond. (.110 mfd.)	30-1130
8	33-103339	Resistor (390 ohms, 1/2 watt)	46	33-447338	Tubular Cond. (.002 mfd.)	33-447338
9	30-4444	Resistor (1.0 meg., 1/2 watt)	47	33-447339	Resistor (100,000 ohms, 1/2 watt)	33-447339
10	33-103339	Tubular Cond. (.05 mfd.)	48	33-447340	Resistor (470,000 ohms, 1/2 watt)	33-447340
11	33-333339	Resistor (33,000 ohms, 1/2 watt)	49	30-4488	Resistor (470,000 ohms, 1/2 watt)	30-4488
12	32-3194	R. F. Coupling Trans.	50	30-4489	Tubular Cond. (.004 mfd.)	30-4489
13	32-3194	R. F. Coupling Trans.	51	33-347339	Tone Control and On-Off Switch	33-347339
14	30-1128	Mica Cond. (100,000 ohms, 1/2 watt)	52	30-4496	Resistor (47,000 ohms, 1/2 watt)	30-4496
15	33-347339	Resistor (47,000 ohms, 1/2 watt)	53	33-447339	Tubular Cond. (.004 mfd.)	33-447339
16	33-247339	Resistor (470,000 ohms, 1/2 watt)	54	33-447339	Resistor (470,000 ohms, 1/2 watt)	33-447339
17	30-4123	Tubular Cond. (.05 mfd.)	55	33-447339	Resistor (47,000 ohms, 1/2 watt)	33-447339
18	32-3192	Compensator (2 Section)	56	30-4496	Resistor (470,000 ohms, 1/2 watt)	30-4496
19	30-1134	Resistor (10,000 ohms, 1/2 watt)	57	30-4488	Resistor (470,000 ohms, 1/2 watt)	30-4488
20	30-1134	Resistor (10,000 ohms, 1/2 watt)	58	30-4489	Tubular Cond. (.003 mfd.)	30-4489
21	31-2391	Tuning Cond. Assy.	59	32-8070	Output Transformer	32-8070
22	81-0033	Mica Cond. (250 mfd.)	60	36-4089	Cone and Voice Coil Assy.	36-4089
23	30-1110	Silver Mica Cond. (370 mfd.)	61	30-4489	Tubular Cond. (.003 mfd.)	30-4489
24	33-333339	Resistor (33,000 ohms, 1/2 watt)	62	33-288339	Resistor (8900 ohms, 1/2 watt)	33-288339
25	33-333339	Resistor (33,000 ohms, 1/2 watt)	63	30-4123	Tubular Cond. (.05 mfd.)	30-4123
26	31-6299	Push Button Switch	64	30-2412	Electrolytic Cond. (16 mfd., 300 V.)	30-2412
27	42-1489	Push Button Switch	65	33-118481	Resistor (180 ohms, 1/2 watt)	33-118481
28	32-3042	Coil No. 1	66	30-2413	Resistor (180 ohms, 1/2 watt)	30-2413
28A	32-3042	Coil No. 2	67	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
28B	32-3042	Coil No. 3	68	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
28C	32-3042	Coil No. 4	69	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
28D	32-3042	Coil No. 5	70	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
28E	32-3042	Coil No. 6	71	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
28F	32-3042	Coil No. 7	72	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
29	32-247339	Resistor (4700 ohms, 1/2 watt)	73	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
30	32-3242	1st I. F. Trans. Assy.	74	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
31	30-4123	1st I. F. Trans. Assy.	75	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
32	30-4123	Tubular Cond. (.05 mfd.)	76	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
33	30-4123	Tubular Cond. (.05 mfd.)	77	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
34	33-118339	Resistor (150 ohms, 1/2 watt)	78	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
35	33-333339	Resistor (33,000 ohms, 1/2 watt)	79	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
36	33-333339	Resistor (33,000 ohms, 1/2 watt)	80	36-1480-2	Field Coil (Replace Spkr. Part No. 36-1480)	36-1480-2
37	32-3246	2nd I. F. Trans. Assy.				

MODEL 40-515, CODE 121 SERVICE INFORMATION

Model 40-515, Code 121 is a radio phonograph combination similar to Model 40-509, Code 121, with the exception of the cabinets. The service information listed in Radio Service Bulletin No. 323A for Model 40-509, also applies to Model 40-515 P-W, and P-M with the part changes as follows:

- Cable Assembly (Power from chassis to changer) 41-3506
- Cable and Plug (Speaker) 41-3515
- Cable Assembly (Terminal Strip Change) 41-3510
- Cable and Plug Assembly (Motor) 41-3523
- Cabinet Walnut (40-515 P-W) 10471A
- Cabinet Mahogany (40-515 P-M) 10471B
- Pilot Lamp Socket Assembly 35-9922

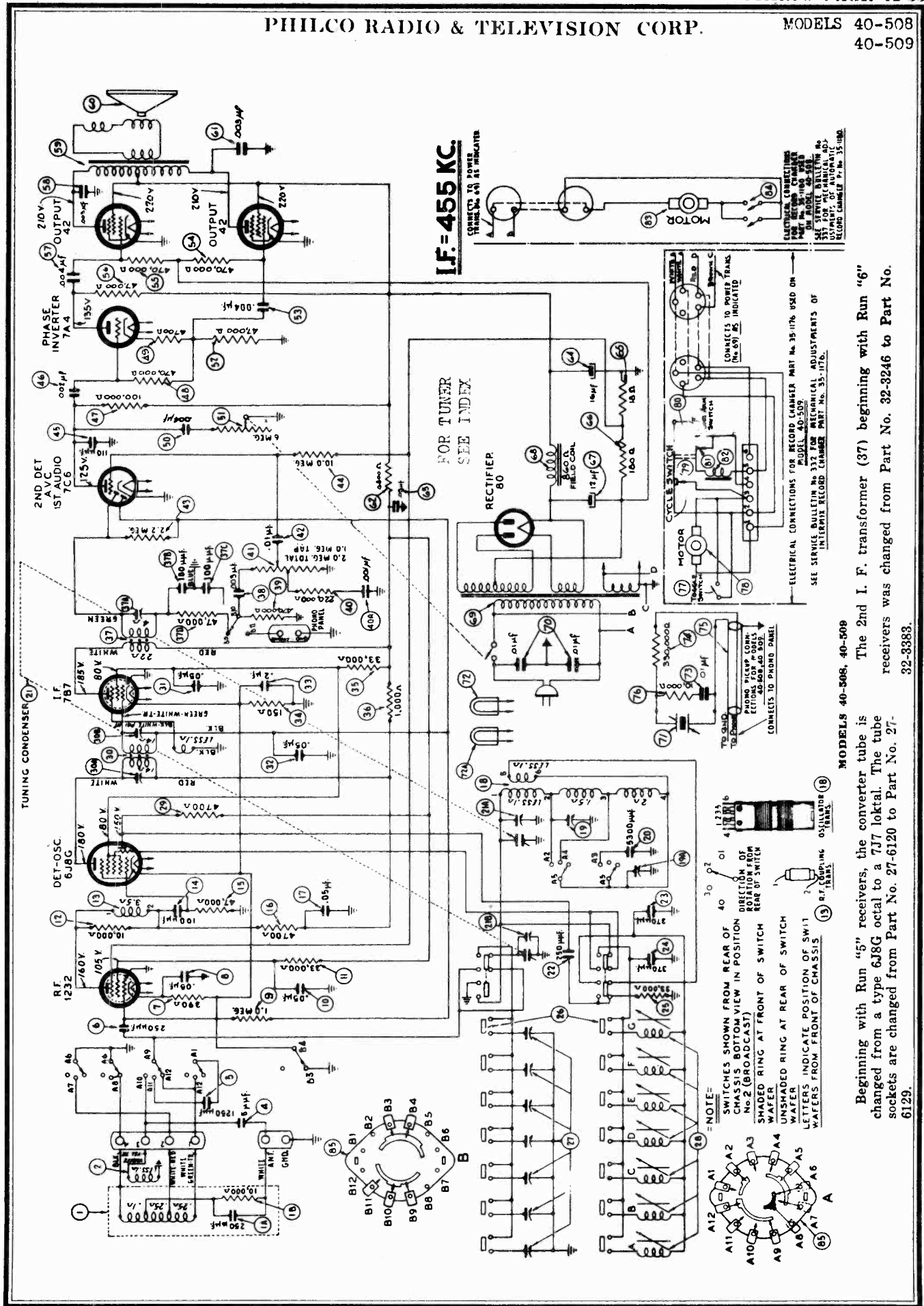
SCHE. No.	PART No.	DESCRIPTION	PART No.
60	56-1663	Tone Arm Switch Contact Spring Blade	56-1663
61	42-1182	Tone Arm Switch Adjusting Screw	42-1182
62	42-1182	Reject Solenoid	42-1182
63	35-1264	On-Off Switch (40-508)	35-1264
64	42-1548	On-Off Switch (Phono Motor)	42-1548
65	42-1530	Wave Switch (Tuning Ranges)	42-1530

MISCELLANEOUS PARTS

Automatic Record Changer (Model 40-509)	35-1176
Additional Parts Bulletin 332)	
Automatic Record Changer (Model 40-508)	35-1180
Additional Parts Bulletin 337)	
Bezel Assembly	40-6489
Bezel Gasket	27-9175
Cable Speaker (Model 40-508)	41-3489
Cable Speaker (Model 40-509)	41-3489
Cable (Chassis to Changer, Model 40-509)	41-3489
Cable (Power)	L-3199
Cable (Chassis to Changer, Model 40-508)	41-3516
Cabinet (Model 40-508)	10410A
Cabinet (Model 40-509)	
Dial Scale	27-5508
Drive Cord Drum Assy.	31-2383
Drive Cord (Phono Motor)	35-9886
Knob Assembly (Pilot Lamp)	27-4372
Knob (Push-Button)	27-4372
Motor (Automatic Record Changer Model 40-509)	27-4866
Pointer	35-1177
Shaft (Tuning)	56-1516
Socket Assembly Cabinet	34-2210
Socket (Loktal) (Pilot Lamp, Chassis)	35-9939
Socket (Loktal)	35-9939
Socket (Loktal)	27-6135
Socket (42 tubes)	27-6036
Speaker	36-1480
Terminal Panel (Phono)	36-9918
Terminal Panel (Loop)	36-9970
TAB Television	27-9449
TAB Kit	27-9530
TAB Kit	40-6478

PHILCO RADIO & TELEVISION CORP.

MODELS 40-508  
40-509



**I.F. = 455 KC.**  
CONNECTS TO POWER TRANSFORMER AS INDICATED

FOR TUNER  
SEE INDEX

ELECTRICAL CONNECTIONS FOR RECORD CHANGER PART No. 35-1176 USED ON MODEL 40-509  
SEE SERVICE BULLETIN No. 337 FOR MECHANICAL ADJUSTMENTS OF INTERMIT RECORD CHANGER PART No. 35-1176.  
RECORD CHANGER P. No. 35-1180

ELECTRICAL CONNECTIONS FOR RECORD CHANGER PART No. 35-1176 USED ON MODEL 40-509  
SEE SERVICE BULLETIN No. 337 FOR MECHANICAL ADJUSTMENTS OF INTERMIT RECORD CHANGER PART No. 35-1176.

MODELS 40-508, 40-509

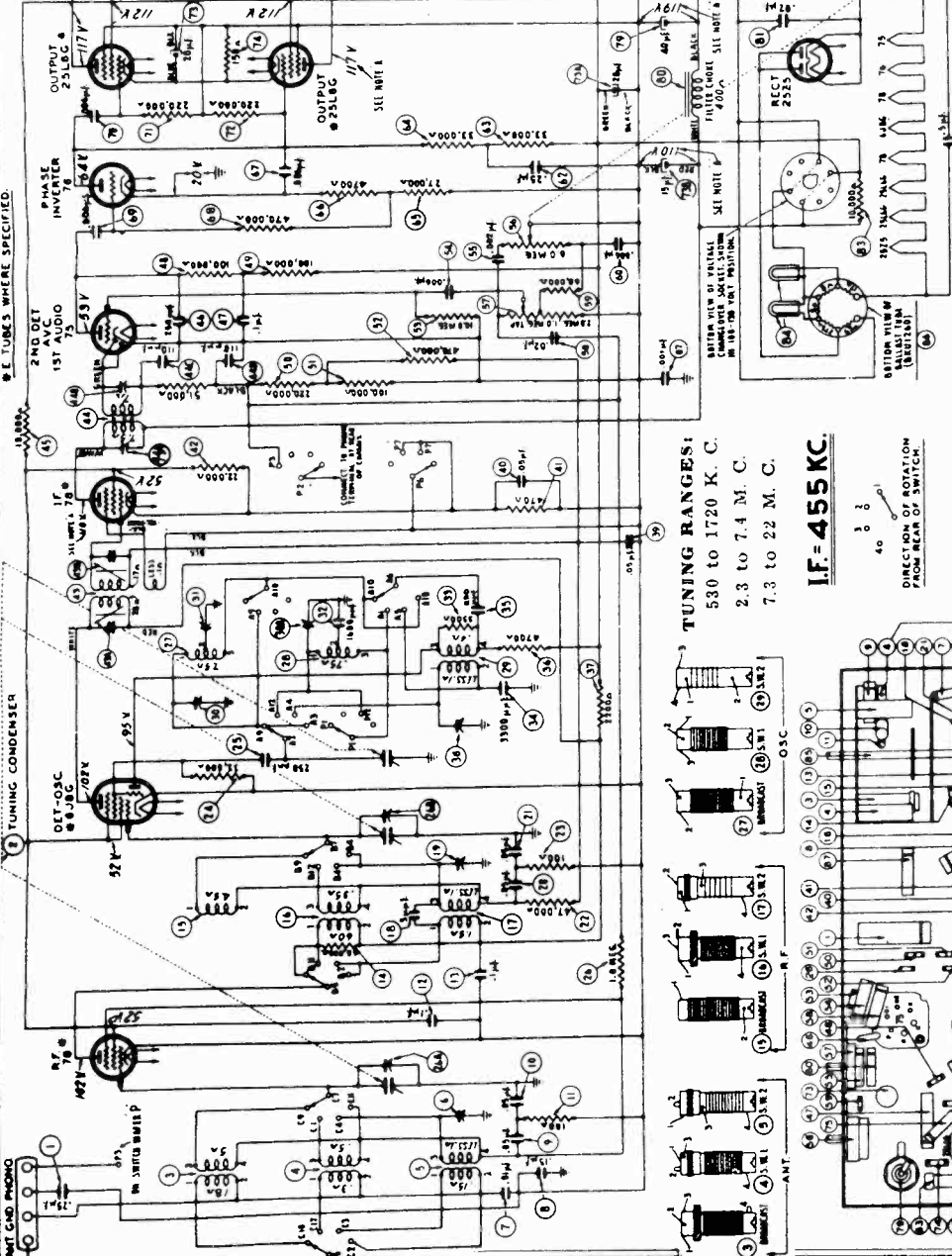
Beginning with Run "5" receivers, the converter tube is changed from a type 6J8G octal to a 7J7 loktal. The tube sockets are changed from Part No. 27-6120 to Part No. 27-6129.

The 2nd I. F. transformer (37) beginning with Run "6" receivers was changed from Part No. 32-3246 to Part No. 32-3383.

MODEL 40-756 (121)

**POWER CONSUMPTION:**  
50 watts at 120 volts.  
100 watts at 210 volts.

NO. 1  
AT 240 VOLTS LINE VOLTAGE,  
THE FOLLOWING NOTES WILL  
BE APPLICABLE TO MODEL



**TUNING RANGES:**  
530 to 1720 K. C.  
2.3 to 7.4 M. C.  
7.3 to 22 M. C.

**IF = 455 KC.**

DIRECTION OF ROTATION  
FROM REAR OF SWITCH

MODEL 40-756

TUBES: 78E, R. F. Amplifier; 6J7EG, Converter-Oscillator; 78E, I. F. Amplifier; 75, Second Detector, First Audio and A. V. C.; 76, Phase Inverter; two 25L6EG, Pentode Audio Output; BKU126D, Ballast Tube; and 25Z5, Rectifier.

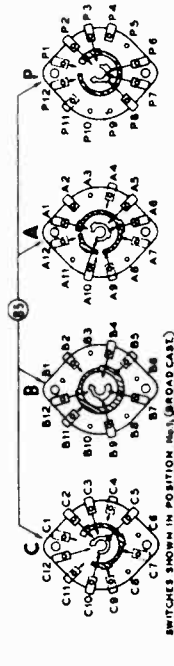


FIG. 1. PART LOCATIONS, UNDERSIDE OF CHASSIS  
POWER SUPPLY: 100-130 or 200-260 volt. A. C. or D. C. current  
The voltage ranges are selected by inserting the changeover  
plug as indicated on top of the chassis.

NO.	DESCRIPTION	PART No.
1	Tubular Condenser (.25 mfd.)	30-4388
2	Antenna Transformer (Broadcast)	31-2888
3	Antenna Transformer (Short Wave 1)	32-3063
4	Antenna Transformer (Short Wave 2)	37-2888
5	Tubular Condenser (.01 mfd.)	30-4372
6	Tubular Condenser (.15 mfd.)	30-4800
7	Tubular Condenser (.05 mfd.)	30-4819
8	Resistor (100 ohms, 1/2 watt)	33-11036
9	Tubular Condenser (.1 mfd.)	30-4896
10	Resistor (50,000 ohms, 1/2 watt)	33-388339
11	R. F. Transformer (Broadcast)	32-2376
12	R. F. Transformer (Short Wave 1)	32-2378
13	R. F. Transformer (Short Wave 2)	32-3108
14	500K Condenser (.5 mfd.)	30-1120
15	Compensator (.05 mfd.)	31-8288
16	Tubular Condenser (.05 mfd.)	30-4819
17	Resistor (47,000 ohms, 1/2 watt)	33-347339
18	Resistor (500 ohms, 1/2 watt)	33-11036
19	Resistor (100 ohms, 1/2 watt)	33-11036
20	500K Condenser (.5 mfd.)	30-1120
21	Resistor (2.0 meg., 1/2 watt)	33-510339
22	Oscillator Transformer (Broadcast)	32-2376
23	Oscillator Transformer (Short Wave 1)	32-2378
24	Oscillator Transformer (Short Wave 2)	32-2388
25	Compensator (2 section)	31-8288
26	Compensator (.05 mfd.)	31-8288
27	Resistor (3300 ohms, 1/2 watt)	33-233339
28	Tuning Condenser (3300 m.m.f.d.)	31-8288
29	Resistor (4700 ohms, 1/2 watt)	33-247339
30	Resistor (2200 ohms, 1/2 watt)	33-222339
31	Compensator resistor (.05 mfd.)	30-4819
32	Tubular Condenser (.05 mfd.)	30-4819
33	Resistor (470 ohms, 1/2 watt)	33-177336
34	Resistor (500 ohms, 1/2 watt)	33-177336
35	Resistor (500 ohms, 1/2 watt)	33-177336
36	Resistor (100,000 ohms, 1/2 watt)	33-177336
37	2nd I. F. Transformer Assembly	32-3133
38	Resistor (10,000 ohms, 1/2 watt)	30-4888
39	Tubular Condenser (.1 mfd.)	33-10339
40	Resistor (100,000 ohms, 1/2 watt)	33-410339
41	Resistor (100,000 ohms, 1/2 watt)	33-410339
42	Resistor (100,000 ohms, 1/2 watt)	33-410339
43	Resistor (470,000 ohms, 1/2 watt)	33-47339
44	Resistor (470,000 ohms, 1/2 watt)	33-47339
45	Tubular Condenser (.005 mfd.)	30-4888
46	Tubular Condenser (.002 mfd.)	30-4888
47	Tone Control and On-Off Switch	30-4888
48	Volume Control (2.0 meg.)	33-5599
49	Tubular Condenser (.02 mfd.)	33-5304
50	Tubular Condenser (.02 mfd.)	33-5304
51	Tubular Condenser (.006 mfd.)	30-4888
52	Removed in first production run	
53	Resistor (33,000 ohms, 1/2 watt)	33-333339
54	Resistor (33,000 ohms, 1/2 watt)	33-333339
55	Resistor (33,000 ohms, 1/2 watt)	33-37339
56	Resistor (33,000 ohms, 1/2 watt)	33-37339
57	Tubular Condenser (.006 mfd.)	30-4810
58	Resistor (470,000 ohms, 1/2 watt)	33-47339
59	Tubular Condenser (.006 mfd.)	30-4810
60	Resistor (230,000 ohms, 1/2 watt)	33-23339
61	Resistor (230,000 ohms, 1/2 watt)	33-23339
62	Resistor (150 V. 50 mfd., 300 V.)	30-2448
63	Resistor (150 ohms, 1 watt)	33-11849
64	Tubular Condenser (.01 mfd.)	30-4888
65	Output Transformer (.01 mfd.)	33-8072
66	Cone and Voice Coil Assembly (Speaker Part No. 38-145E-3)	36-4107
67	Electrolytic Capacitor (40 mfd., 500 V.)	30-2373
68	Filter Choke Inductor (.02 mfd.)	32-8029
69	Tubular Condenser (.15 mfd.)	30-4590
70	Tubular Condenser (.15 mfd.)	30-4590
71	Resistor (10,000 ohms, 3 watt)	33-3366
72	Resistor (10,000 ohms, 3 watt)	33-3366
73	Resistor (10,000 ohms, 3 watt)	42-1078
74	Ballast Tube (BKU126D)	30-4888
75	Tubular Condenser (.001 mfd.)	34-4522
76	Tubular Condenser (.001 mfd.)	34-4522

PHILCO RADIO & TELEVISION CORP.

MODEL 40-756  
MODEL 40-780  
(121, 251)

MODEL 40-756

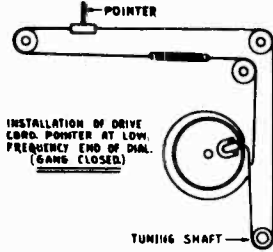


FIG. 2. TUNING DRIVE CORD AND POINTER ARRANGEMENT.

REPLACEMENT PARTS Model 40-780

SCH. No.	DESCRIPTION	PART No.
1	Antenna Trans. (Brdcst)	32-2588
2	Antenna Trans. (S.W.1)	32-3191
3	Antenna Trans. (S.W.2)	32-3196
4	Mica Cond. (.70 mmfd.)	30-1117
5	Compensator	31-6288
6	Resistor (470,000 ohms, 1/2 watt)	33-447339
7A	Tubular Cond. (.05 mfd.)	30-4609
7B	Tubular Cond. (.05 mfd.)	30-4518
8	Mica Cond. (5 mmfd.)	30-1120
9	Resistor (68,000 ohms, 1/2 watt)	33-368339
10	Resistor (22,000 ohms, 1/2 watt)	33-322339
11	Resistor (33,000 ohms, 1/2 watt)	33-333339
12	Resistor (10,000 ohms, 1 watt)	33-310439
13	R. F. Trans. (Broadcast)	32-3189
14	R. F. Trans. (S.W.1)	32-3190
15	R. F. Trans. (S.W.2)	32-3197
16	Mica Cond. (.70 mmfd.)	30-1117
17	Tubular Cond. (.05 mfd.)	30-4519
18	Compensator	31-6288
19	Tubular Cond. (.1 mfd.)	30-4611
20	Resistor (470,000 ohms, 1/2 watt)	33-447339
21	Tubular Cond. (.05 mfd.)	30-4609
22	Resistor (22,000 ohms, 1/2 watt)	33-322339
23	Electrolytic Condenser (4 mfd., 300 V.)	30-2415
24	Resistor (33,000 ohms, 1/2 watt)	33-333339
25	Mica Cond. (250 mmfd.)	30-1119
26	Tuning Cond. Assy.	31-2386
27	Compensator (2 section)	31-6287
28	Oscillator Trans. (Brdcst)	32-3254
29	Oscillator Trans. (S.W.1)	32-3094
30	Oscillator Trans. (S.W.2)	32-3102
31	Compensator	31-6289
32	Tracking Condenser (1850 mmfd.)	31-6310
33	Compensator	31-6288
34	Tracking Condenser (3500 mmfd.)	31-6311
35	Resistor (3300 ohms, 1/2 watt)	33-233339
35A	Resistor (4700 ohms, 1/2 watt)	33-247339
35B	Tubular Cond. (.05 mfd.)	30-4519
36	1st I. F. Trans. Assy.	32-3284
37	2nd I. F. Trans. Assy.	32-3285
38	3rd I. F. Trans. Assy.	32-3286
39	Mica Cond. (110 mmfd.)	30-1118
40	Mica Cond. (110 mmfd.)	30-1118
41	Mica Cond. (110 mmfd.)	30-1118
42	Resistor (47,000 ohms, 1/2 watt)	33-347339
43	Tubular Cond. (.01 mfd.)	30-4581
44	Resistor (330,000 ohms, 1/2 watt)	33-433339
45	Mica Cond. (110 mmfd.)	30-1118
46	Tubular Con. (.006 mfd.)	30-4591
47	Resistor (68,000 ohms, 1/2 watt)	33-368339
48	Tubular Con. (.006 mfd.)	30-4583
49	Resistor (10,000 ohms, 1/2 watt)	33-310339
50	Tone Control and On-Off Switch	33-5335

Operations In Order	SIGNAL GENERATOR Model 40-756				RECEIVER		SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8C Grid and Ground	.1 mfd.	485 K. C.	880 K. C.	Vol. Max. Tone Treble Range Switch "Brdcst"	44A, 44B, 43A, 43B	
2	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	30, 26B, 26A	Note B
3	Ant. & Grnd.	200 mmfd.	880 K. C.	880 K. C.	Vol. Max.	31	Roll Gang Repeat Operation 2
4	Ant. & Grnd.	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	30A	Roll Gang
5	Ant. & Grnd.	400 ohms	21 M. C.	21 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	38, 19, 6	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning

condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (38) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 20,090 M. C.

MODEL 40-780, Codes 121-251

Signal Generator: The signal generator is connected to the receiver as indicated in the tabulations below under "output connections to receiver". A Dummy Antenna is also required. This is listed under column, "Dummy Antenna, Note A".

Vacuum Tube Voltmeter: To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the Det-Osc. tube grid (6J8EG). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the other end of the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

Audio Output Meter: If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of one of the 6V6EG tubes. Adjust the meter of the 0 to 30 volt A. C. scale.

After connecting the aligning meters, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram. If the aligning meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations In Order	SIGNAL GENERATOR				RECEIVER		SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8C Grid and Ground	.1 mfd.	485 K. C.	880 K. C.	Vol. Max. Tone Treble	38A, 37A, 37B, 36A, 36C	Note D
2	Antenna and Ground	200 mmfd.	1800 K. C.	1800 K. C.	Vol. Max. Range Switch "Brdcst"	27, 26B, 26A	Note B
3	Antenna and Ground	200 mmfd.	880 K. C.	880 K. C.	Vol. Max.	31	Roll Gang
4	Antenna and Ground	200 mmfd.	1800 K. C.	1800 K. C.	Vol. Max.	27, 26B, 26A	
5	Antenna and Ground	400 ohms	6.0 M. C.	6.0 M. C.	Vol. Max. Tone Treble Range Switch "S.W.1"	27A	Roll Gang
6	Antenna and Ground	400 ohms	20 M. C.	20 M. C.	Vol. Max. Tone Treble Range Switch "S.W.2"	33, 18, 5	Note C

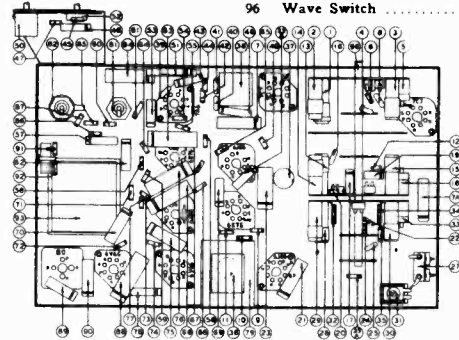
NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (33) be sure to tune in the fundamental signal (20 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 19,090 M. C.

NOTE D — Before adjusting padders 36A, 37A, 37B, 36A, 36C, turn padder 36B all the way out. After the padders are adjusted to maximum, then adjust padder 36B for maximum.

51	Tubular Cond. (.01 mfd.)	30-4581
52	Vol. Control (2.0 meg.)	33-5334
53	Tubular Cond. (.02 mfd.)	30-4516
54	Resistor (1.5 meg., 1/2 watt)	33-515339
55	Resistor (1.5 meg., 1/2 watt)	33-515339
56	Resistor (470,000 ohms, 1/2 watt)	33-447339
57	Tubular Cond. (.05 mfd.)	30-4519
58	Resistor (220,000 ohms, 1/2 watt)	33-422339
59	Resistor (33,000 ohms, 1/2 watt)	33-333339
60	Resistor (1.0 meg., 1/2 watt)	33-510339
61	Resistor (1.0 meg., 1/2 watt)	33-510339
62	Tubular Cond. (.05 mfd.)	30-4518
63	Tubular Cond. (.1 mfd.)	30-4611
64	Resistor (47,000 ohms, 1/2 watt)	33-347339
65	Resistor (220,000 ohms, 1/2 watt)	33-422339
66	Tubular Cond. (.1 mfd.)	30-4611
67	Resistor (68,000 ohms, 1/2 watt)	33-368339
68	Resistor (1.0 meg., 1/2 watt)	33-510339
69	Tubular Con. (.003 mfd.)	30-4582
70	Tubular Con. (.006 mfd.)	30-4610
71	Resistor (68,000 ohms, 1/2 watt)	33-368339
72	Resistor (470,000 ohms, 1/2 watt)	33-447339
73	Resistor (68,000 ohms, 1/2 watt)	33-368339
74	Resistor (470,000 ohms, 1/2 watt)	33-447339
75	Tubular Con. (.006 mfd.)	30-4610
76	Electrolytic Condenser (4 mfd., 300 V.)	30-2415
77	Resistor (47,000 ohms, 1/2 watt)	33-347339
78	Tubular Con. (.003 mfd.)	30-4582
79	Output Transformer	32-8058
80	Cone and Voice Coil Assy. (Spr. Pt. No. 36-1459-2)	36-4106
	(Spr. Pt. No. 36-1460-3)	36-4105
81	Electrolytic Condenser (40 mfd., 300 V.)	30-2366
82	Electrolytic Condenser (16 mfd., 400 V.)	30-2364
83	Field Coil (Replace Spkr.)	
84	Tubular Cond. (.2 mfd.)	30-4587
85	Resistor (33,000 ohms, 1/2 watt)	33-333339
86	Resistor (100,000 ohms, 1/2 watt)	33-410339
87	Resistor (1.0 meg., 1/2 watt)	33-510339
88	Tubular Cond. (.5 mfd.)	30-4590
89	Tubular Con. (.003 mfd.)	30-4608
90	Tubular Con. (.003 mfd.)	30-4608
91	Resistor (150,000 ohms, 1/2 watt)	33-415339
92	Resistor (150,000 ohms, 1/2 watt)	33-415339
93	Power Trans. (100-130 V., 200-260 V., 50-60 cycles)	32-8007
94	Pilot Lamps (Dial)	34-2064E
95	Pilot Lamp (XX Cabinet only)	34-2210E
96	Wave Switch	42-1525

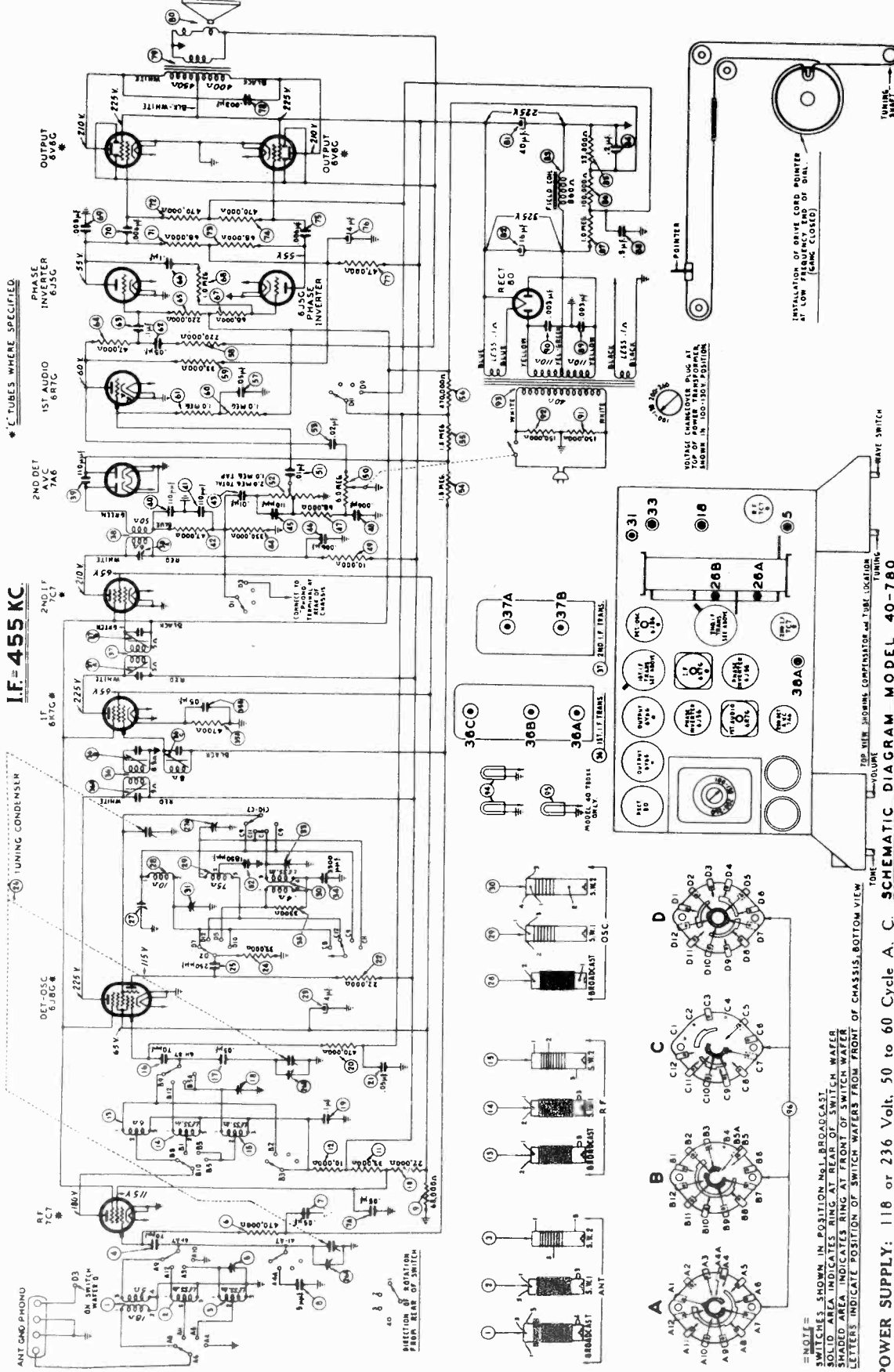


MODEL 40-780  
(121, 251)

PHILCO RADIO & TELEVISION CORP.

I.F. = 455 KC.

\* C-TUBES WHERE SPECIFIED



TUNING RANGES:  
550 to 1720 K. C.      2.3 to 7.4 M. C.      7.4 to 22 M. C.

SCHEMATIC DIAGRAM MODEL 40-780

POWER SUPPLY: 118 or 236 Volt; 50 to 60 Cycle A. C.  
118 or 236 Volt; 25 to 40 Cycle A. C.

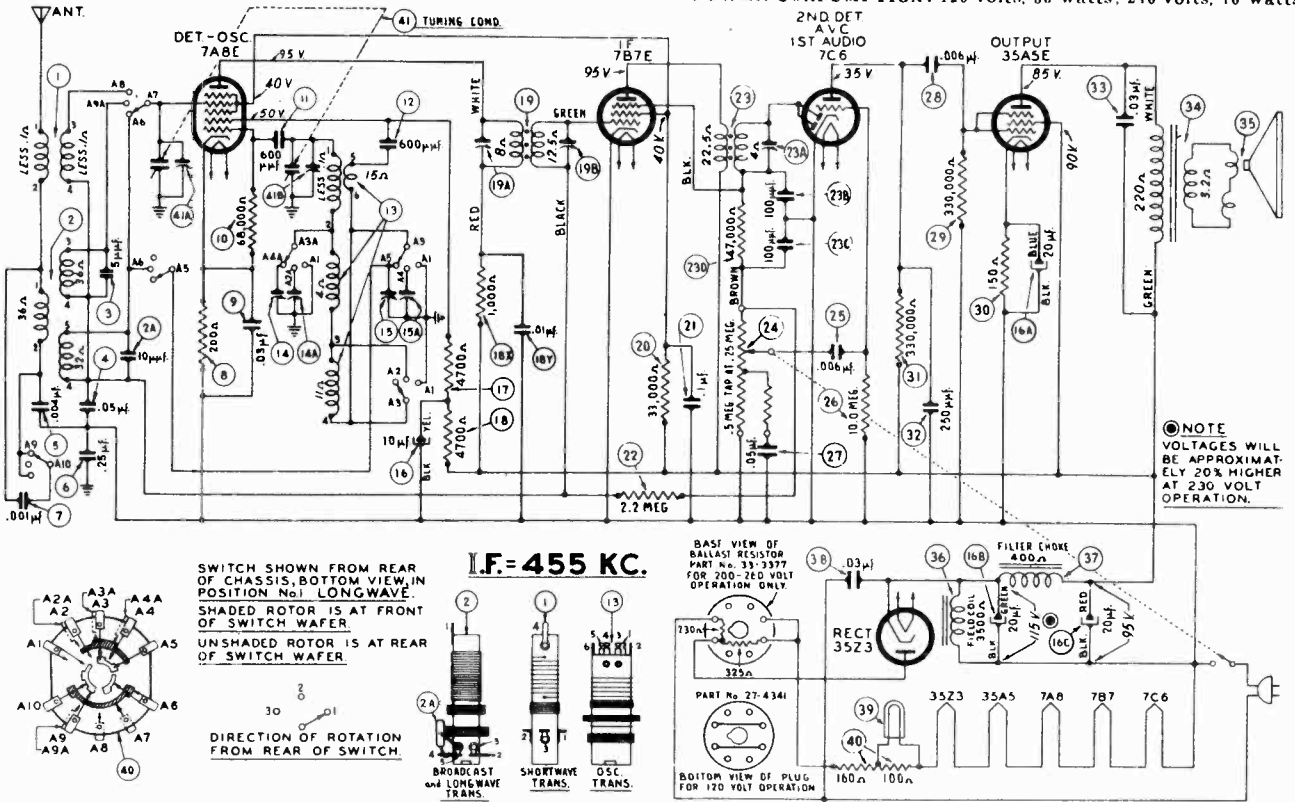
The receiver is adjusted for operation on either of the above operating voltages by inserting the plug as indicated on top of the power transformer.

PHILCO RADIO & TELEVISION CORP.

MODEL 40-2710

**TUNING RANGES:**  
 530 to 1720 K. C.      150 to 390 K. C.      7.2 to 24 M. C.  
**I. F. FREQUENCY:** 455 K. C.  
**AUDIO OUTPUT:** 1 watt.

**POWER SUPPLY:** 100-130 or 200-260 v. lts. A. C. or D. C. To operate the receiver on 200-260 volts A. C. or D. C. requires the use of a Ballast resistor, Part No. 33-3377 which can be obtained from your distributor. The Ballast resistor is inserted in the socket provided on the top of the chassis.  
**POWER CONSUMPTION:** 120 volts, 35 watts; 240 volts, 70 watts.



SCHEMATIC DIAGRAM MODEL 40-2710

Replacement Parts — Model 40-2710

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	
1	Antenna Trans. (Short Wave)	32-3381	40	Filament Resistor (Wirewound)	33-3372		Knobs (Volume, Tuning, Wave Switch)	27-4632	
2	Antenna Transformer (Broadcast, Long Wave)	32-3370	41	Tuning Condenser Assembly	31-2410		Pointer	28-5201	
2A	Mica Condenser (10 mmdf., Part of No. 2)	30-1124	42	Wave Switch	42-1549		Pilot Lamp Assembly	38-9127	
3	Mica Condenser (5 mmdf.)	30-1120	<b>MISCELLANEOUS PARTS</b>					Socket (Lokalt Tubes)	27-6131
4	Tubular Condenser (.05 mfd.)	30-4609		Acetate Window	27-5370		Socket (8 prong, Ballast Resis.)	27-6058	
5	Tubular Condenser (.004 mfd.)	30-4578		Ballast Resistor (200-260 V. operation)	33-3377		Spring (Drive Cord)	28-8953	
6	Tubular Condenser (.25 mfd.)	30-4589		Changeover Plug (Voltage, 115-130 V. operation)	27-4341		Spring Clip (Mtg. and Trans.)	28-5002	
7	Tubular Condenser (.001 mfd.)	30-4601		Cabinet	10313B		Spring Clip (Mtg. Osc. Trans.)	28-5003	
8	Resistor (200 ohms, 1/2 watt)	33-120339		Cable and Plug (Power Supply)	L-2289		Speaker	36-1486	
9	Tubular Condenser (.03 mfd.)	30-4585		Dial	27-5566		Tube Shield	56-1586	
10	Resistor (68,000 ohms, 1/2 watt)	33-368339		Drive Cord Assembly	31-2415		Tube Shield Clip	56-1567	
11	Mica Condenser (600 mmdf.)	30-1154					Tuning Drum	31-1283	
12	Mica Condenser (600 mmdf.)	30-1154					Tuning Shaft & Bracket Assy.	38-9888	
13	Oscillator Transformer	32-3371							
14	Compensator (2 section)	31-6337							
15	Compensator	31-6044							
16	Electrolytic Condenser (20, 20, 20, 10 mfd., 250 V.)	30-2436							
17	Resistor (4700 ohms, 1/2 watt)	33-247339							
18	Resistor (4700 ohms, 1/2 watt)	33-247339							
18X	Resistor (1000 ohms, 1/2 watt)	33-210339							
18Y	Tubular Condenser (.01 mfd.)	30-4581							
19	1st I. F. Transformer Assembly	32-3297							
20	Resistor (33,000 ohms, 1/2 watt)	33-333339							
21	Tubular Condenser (.1 mfd.)	30-4586							
22	Resistor (2.2 meg., 1/2 watt)	33-522339							
23	2nd I. F. Transformer Assembly	32-2674							
24	Volume Control and On-Off Switch (.5 meg.)	33-5336							
25	Tubular Condenser (.006 mfd.)	30-4583							
26	Resistor (10.0 meg., 1/2 watt)	33-610339							
27	Tubular Condenser (.05 mfd.)	30-4519							
28	Tubular Condenser (.006 mfd.)	30-4610							
29	Resist. (330,000 ohms, 1/2 watt)	33-433339							
30	Resistor (150 ohms, 1/2 watt)	33-115339							
31	Resist. (330,000 ohms, 1/2 watt)	33-433339							
32	Mica Condenser (250 mmdf.)	30-1119							
33	Tubular Condenser (.03 mfd.)	30-4585							
34	Output Transformer	32-8095							
35	Cone and Voice Coil Assembly (Spkr. Part No. 36-1486-2)	36-4126							
36	Field Coil (Replace Speaker Part No. 36-1486)	36-4126							
37	Filter Choke	32-8073							
38	Tubular Condenser (.03 mfd.)	30-4520							
39	Pilot Lamp	34-2086E							

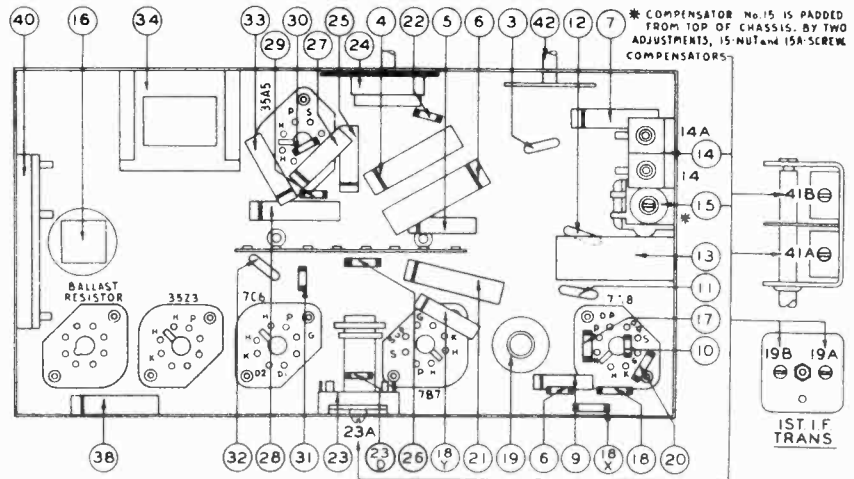


FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.



MODEL 40-2710  
MODEL 40-2725

PHILCO RADIO & TELEVISION CORP.

MODEL 40-2710

CONNECTING ALIGNING INSTRUMENTS

**Signal Generator:** The signal generator is connected to the receiver as indicated in the tabulations below under "Output Connections to Receiver." A dummy antenna is also required. This is listed under column, "Dummy Antenna, Note A."

**Vacuum Tube Voltmeters:** To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit with the Philco aligning adaptor, Part No. 45-2767, as follows:

Remove the 7C6 tube from its socket and insert the aligning adaptor in the socket, then replace the tube in the adaptor. Connect the negative terminal of the vacuum tube voltmeter to the light colored wire which protrudes from the side of the adaptor. Attach the positive terminal of the voltmeter to the black wire.

**Audio Output Meter:** If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 35A5 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 2. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

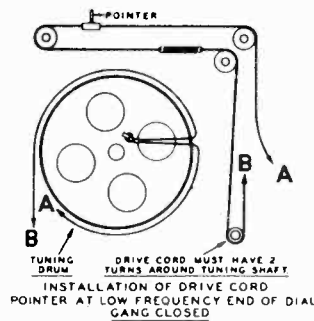


FIG. 1. DIAL CALIBRATION.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	Antenna	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcat"	23A, 19A, 19B	
2	Ant. & Grnd.	400 ohms	21 M. C.	21 M. C.	Range Switch "S.W."	41B, 41A	Notes B-C
3	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcat"	14A	
4	Ant. & Grnd.	200 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcat"	15A (Nut)	Roll Gang
5	Ant. & Grnd.	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcat"	14A	
6	Ant. & Grnd.	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	14	
7	Ant. & Grnd.	200 mmfd.	175 K. C.	175 K. C.	Range Switch "L.W."	15 (Screw)	
8	Ant. & Grnd.	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	14	

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

NOTE C — When adjusting compensator (41B) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 20.090 M. C.

Model 40-2725

CONNECTING ALIGNING INSTRUMENTS

**Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the voltmeter through a 2 meg. resistor to the converter grid (6J8G). The resistor must be connected directly to the grid of the tube and the voltmeter wire attached to the resistor.

2. Connect the positive (+) terminal to the chassis ground terminal.

**Audio Output Meter:** If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 41 tube. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in Fig. 1. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR			RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators	
1	6J8G	.1 mfd.	455 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcat"	38B, 38A, 32B, 32A	
2	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcat"	27, 22B, 22A	Note B
3	Antenna and Ground	200 mmfd.	580 K. C.	580 K. C.	Range Switch "Brdcat"	23	
4	Antenna and Ground	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch "Brdcat"	27, 22B, 22A	
5	Antenna and Ground	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	27A	
6	Antenna and Ground	200 mmfd.	175 K. C.	175 K. C.	Range Switch "L.W."	28	
7	Antenna and Ground	200 mmfd.	300 K. C.	300 K. C.	Range Switch "L.W."	27A	
8	Antenna and Ground	400 ohms	21 M. C.	21 M. C.	Range Switch "S.W."	29, 15, 5	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

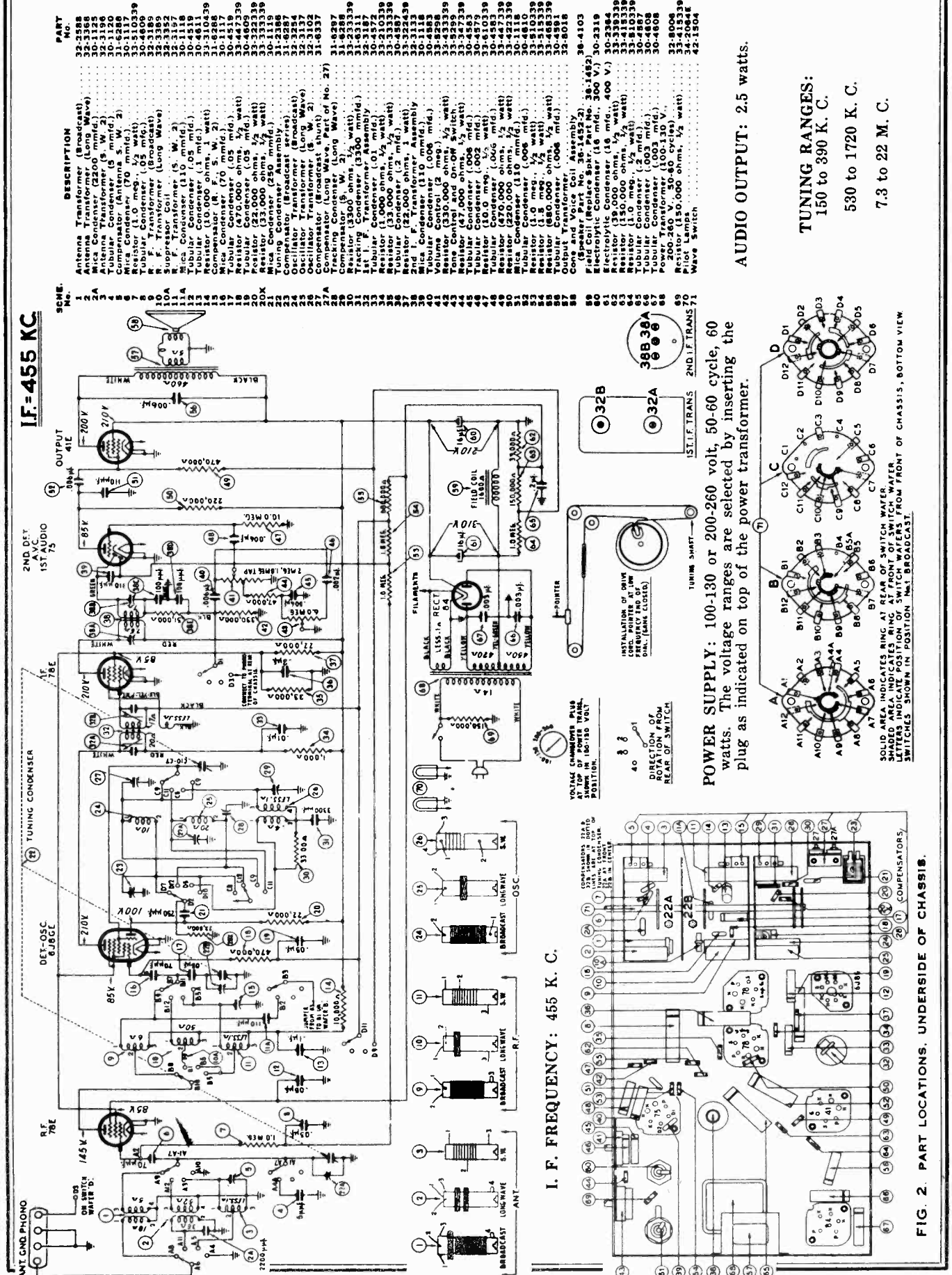
NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale. See Schematic Diagram.

NOTE C — When adjusting compensator (29) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be 910 K. C. below the fundamental signal, which will be 20.090 M. C.

PHILCO RADIO & TELEVISION CORP.

MODEL 40-2725

(121)



IF=455 KC

2ND DET 15.7 AUDIO

DET-OSC 6.06 MC

RF 78E

ANT GND PHONO

SOME No.	DESCRIPTION	PART No.
1	Antenna Transformer (Broadcast)	32-3368
2	Mica Condenser (2200 mmfd.)	30-3135
2A	Antenna Transformer (Long Wave)	30-3136
3	Antenna Transformer (S. W. 2)	32-3190
4	Compensator (Antenna S. W. 2)	31-6280
5	Mica Condenser (70 mmfd.)	30-3117
6	Resistor (1.0 meg., 1/2 watt)	30-4041
7	Resistor (1.0 meg., 1/2 watt)	30-4042
8	R. F. Transformer (Broadcast)	32-3369
9	R. F. Transformer (Long Wave)	32-3370
10	500 P.F. Transformer (S. W. 2)	32-3177
11	Mica Condenser (110 mmfd.)	30-3118
11A	Tubular Condenser (.05 mfd.)	30-4211
12	Resistor (10,000 ohms, 1/2 watt)	30-4212
13	Compensator (R. F. S. W. 2)	33-310439
14	Compensator (R. F. S. W. 2)	31-0248
15	Tubular Condenser (.05 mfd.)	30-4213
16	Resistor (470,000 ohms, 1/2 watt)	33-447339
17	Tubular Condenser (.05 mfd.)	30-4214
18	Resistor (470,000 ohms, 1/2 watt)	33-447339
19	Tubular Condenser (.05 mfd.)	30-4215
20	Resistor (470,000 ohms, 1/2 watt)	33-447339
20X	Mica Condenser (250 mmfd.)	30-3119
21	Volume Control Assembly	30-4583
22	Volume Control (1,000 mfd.)	30-4584
23	Volume Control (2 meg.)	30-4585
24	Resistor (330,000 ohms, 1/2 watt)	33-447339
25	Resistor (47,000 ohms, 1/2 watt)	33-447339
26	Tubular Condenser (.006 mfd.)	30-4583
27	Resistor (1,000 ohms, 1/2 watt)	33-210139
28	Resistor (33,000 ohms, 1/2 watt)	33-210139
29	Resistor (22,000 ohms, 1 watt)	33-224439
30	2nd I. F. Transformer Assembly	32-3132
31	Tubular Condenser (1,000 mfd.)	30-4583
32	Volume Control (2 meg.)	30-4585
33	Resistor (330,000 ohms, 1/2 watt)	33-447339
34	Resistor (47,000 ohms, 1/2 watt)	33-447339
35	Tubular Condenser (.006 mfd.)	30-4583
36	Resistor (1,000 ohms, 1/2 watt)	33-210139
37	Resistor (33,000 ohms, 1/2 watt)	33-210139
38	Resistor (22,000 ohms, 1 watt)	33-224439
39	2nd I. F. Transformer Assembly	32-3132
40	Tubular Condenser (1,000 mfd.)	30-4583
41	Volume Control (2 meg.)	30-4585
42	Resistor (330,000 ohms, 1/2 watt)	33-447339
43	Resistor (47,000 ohms, 1/2 watt)	33-447339
44	Tubular Condenser (.006 mfd.)	30-4583
45	Resistor (1,000 ohms, 1/2 watt)	33-210139
46	Resistor (33,000 ohms, 1/2 watt)	33-210139
47	Tubular Condenser (.006 mfd.)	30-4583
48	Resistor (1,000 ohms, 1/2 watt)	33-210139
49	Resistor (33,000 ohms, 1/2 watt)	33-210139
50	Mica Condenser (110 mmfd.)	30-3118
51	Tubular Condenser (.006 mfd.)	30-4810
52	Resistor (1.0 meg., 1/2 watt)	30-4211
53	Resistor (1.0 meg., 1/2 watt)	30-4212
54	Resistor (10,000 ohms, 1/2 watt)	30-4213
55	Resistor (470,000 ohms, 1/2 watt)	33-447339
56	Tubular Condenser (.006 mfd.)	30-4810
57	Resistor (10,000 ohms, 1/2 watt)	30-4213
58	Resistor (470,000 ohms, 1/2 watt)	33-447339
59	Resistor (10,000 ohms, 1/2 watt)	30-4213
60	Resistor (470,000 ohms, 1/2 watt)	33-447339
61	Resistor (10,000 ohms, 1/2 watt)	30-4213
62	Resistor (470,000 ohms, 1/2 watt)	33-447339
63	Resistor (10,000 ohms, 1/2 watt)	30-4213
64	Resistor (470,000 ohms, 1/2 watt)	33-447339
65	Resistor (10,000 ohms, 1/2 watt)	30-4213
66	Resistor (470,000 ohms, 1/2 watt)	33-447339
67	Resistor (10,000 ohms, 1/2 watt)	30-4213
68	Resistor (470,000 ohms, 1/2 watt)	33-447339
69	Resistor (10,000 ohms, 1/2 watt)	30-4213
70	Resistor (470,000 ohms, 1/2 watt)	33-447339
71	Resistor (10,000 ohms, 1/2 watt)	30-4213
72	Resistor (470,000 ohms, 1/2 watt)	33-447339
73	Resistor (10,000 ohms, 1/2 watt)	30-4213
74	Resistor (470,000 ohms, 1/2 watt)	33-447339
75	Resistor (10,000 ohms, 1/2 watt)	30-4213
76	Resistor (470,000 ohms, 1/2 watt)	33-447339
77	Resistor (10,000 ohms, 1/2 watt)	30-4213
78	Resistor (470,000 ohms, 1/2 watt)	33-447339
79	Resistor (10,000 ohms, 1/2 watt)	30-4213
80	Resistor (470,000 ohms, 1/2 watt)	33-447339
81	Resistor (10,000 ohms, 1/2 watt)	30-4213
82	Resistor (470,000 ohms, 1/2 watt)	33-447339
83	Resistor (10,000 ohms, 1/2 watt)	30-4213
84	Resistor (470,000 ohms, 1/2 watt)	33-447339
85	Resistor (10,000 ohms, 1/2 watt)	30-4213
86	Resistor (470,000 ohms, 1/2 watt)	33-447339
87	Resistor (10,000 ohms, 1/2 watt)	30-4213
88	Resistor (470,000 ohms, 1/2 watt)	33-447339
89	Resistor (10,000 ohms, 1/2 watt)	30-4213
90	Resistor (470,000 ohms, 1/2 watt)	33-447339
91	Resistor (10,000 ohms, 1/2 watt)	30-4213
92	Resistor (470,000 ohms, 1/2 watt)	33-447339
93	Resistor (10,000 ohms, 1/2 watt)	30-4213
94	Resistor (470,000 ohms, 1/2 watt)	33-447339
95	Resistor (10,000 ohms, 1/2 watt)	30-4213
96	Resistor (470,000 ohms, 1/2 watt)	33-447339
97	Resistor (10,000 ohms, 1/2 watt)	30-4213
98	Resistor (470,000 ohms, 1/2 watt)	33-447339
99	Resistor (10,000 ohms, 1/2 watt)	30-4213
100	Resistor (470,000 ohms, 1/2 watt)	33-447339

AUDIO OUTPUT: 2.5 watts.

TUNING RANGES: 150 to 390 K. C.

530 to 1720 K. C.

7.3 to 22 M. C.

POWER SUPPLY: 100-130 or 200-260 volt, 50-60 cycle, 60 watts. The voltage ranges are selected by inserting the plug as indicated on top of the power transformer.

I. F. FREQUENCY: 455 K. C.

FIG. 2. PART LOCATIONS, UNDERSIDE OF CHASSIS.

### SPECIFICATIONS

The Model RP-1 is a remote type record player which can be used in conjunction with any standard broadcast receiver to reproduce phonograph records.

The unit is designed to operate on various power supplies as follows:

- 110 volts, 60 cycles; 110 volts, 25 cycles; 220 volts, 60 cycles.

To operate on any one of these power supplies, it is necessary that the proper power transformer and turntable motor is used as indicated in the parts list below.

To operate the unit:— Place record on turn-table and slide "Off-On Switch" (Diagram "A") to "On" position; this will be indicated by pilot light in tone arm.

After allowing sufficient time for tubes to warm up, place tone arm on record; this automatically starts motor.

Next go to your radio and tune to approximately 540 K. C. (54 on most dials), at which setting the phonograph signal will be picked up. Volume can be regulated by the radio receiver's volume control in the normal way.

At the end of the record, turn the tone arm to rest position, which will automatically turn motor off. It is not necessary to slide "Off-On Switch" to the "Off" position between records.

If interference from broadcast stations is encountered the

frequency of the unit can be changed to any other frequency between 530 K. C. and 580 K. C. by adjusting the small screw indicated in Diagram "B". Turning screw clockwise lowers the frequency, counter-clockwise raises the frequency. **This adjustment is best made while the unit is in operation.**

If hum is experienced it may be necessary to reverse the power plug of the record player, the radio, or both. In most cases it is preferable to use different receptacles for record player and radio.

No definite rule can be established for the relative location of the record player to your radio; individual trial will establish best location. However, in general, satisfactory operation may be obtained up to a distance of fifty (50) feet, provided local noise conditions are not too severe.

### PRODUCTION CHANGES

Master On-Off switch changed from Part No. 42-1406 to 42-1562.

Two types of motor and turntable assemblies were used on this model. The part numbers are as follows:

- Motor — 110 volts, 60 cycles..... 35-1222
- Motor — 110 volts, 60 cycles..... 35-1216
- Turntable for Motor 35-1222..... 35-3044
- Turntable for motor 35-1216..... 35-1217

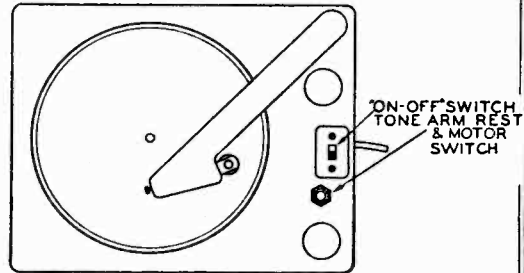
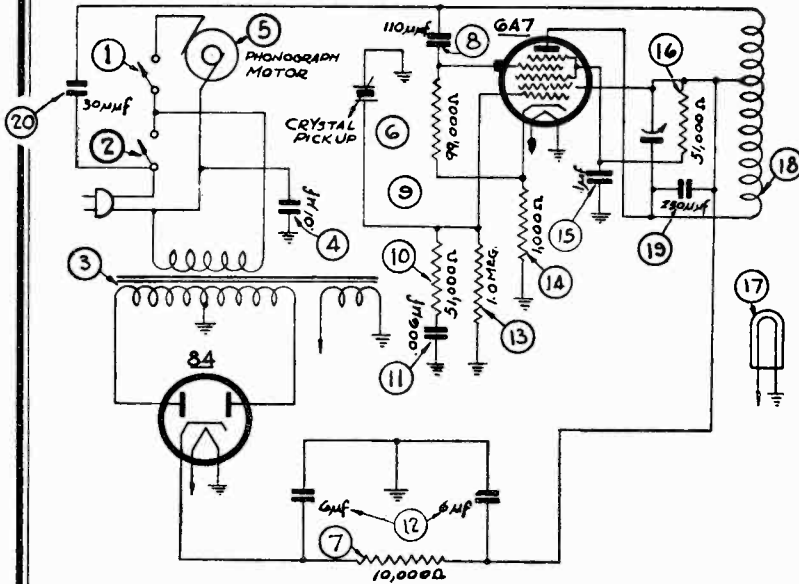


DIAGRAM A

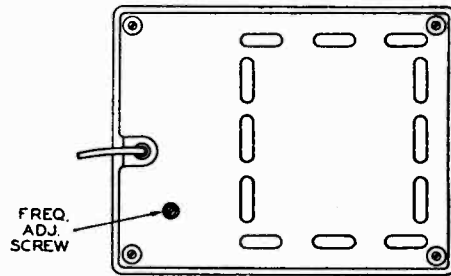


DIAGRAM B

### REPLACEMENT PARTS

SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Motor Switch	42-1557	10	Comp. Resistor (51,000 ohms, ½ watt)	33-351344
2	Master Switch	42-1562	11	Comp. Cond. (.006 mf., 200 V.)	30-4467
3	Power Trans. (110 V., 60 cycles)	32-8043	12	Electrolytic Condenser (6 mf., 6 mf., 150 V., 60 cy.)	30-2388
4	Line Condenser (.01 mf., 600 V.)	3903-SG	13	Grid Resistor (1 meg., ½ watt)	33-510344
5	Motor (110 V., 60 cycles)	35-1222	14	Cathode Bias Resistor (1000 ohms, ½ watt)	33-210344
	Motor (110 V., 60 cycles)	35-1216	15	Screen Bypass (.1 mf., 200 V.)	30-4499-S
	Motor (110 V., 25 cycles)	315-1004	16	Screen Resistor (51,000 ohms, ½ watt)	33-351344
	Motor (220 V., 60 cycles)	315-1005	17	Pilot Light (6-8 V., 250 amp.)	34-2064
	Motor (220 V., 50 cycles)	315-1006	18	Oscillator Coil & Padder Assem.	32-3218
6	Crystal Pickup and Tone Arm	35-2068	19	Mica Condenser (250 mmf.)	30-1032
	Crystal Cartridge	35-2069	20	Coupling Condenser (30 mmf.)	30-1059
7	Filter Resistor (10,000 ohms, ½ watt)	33-310344			
8	Oscillator Grid Cond. (110 mmf.)	30-1031			
9	Oscillator Grid Resistor (99,000 ohms, ½ watt)	33-399344			

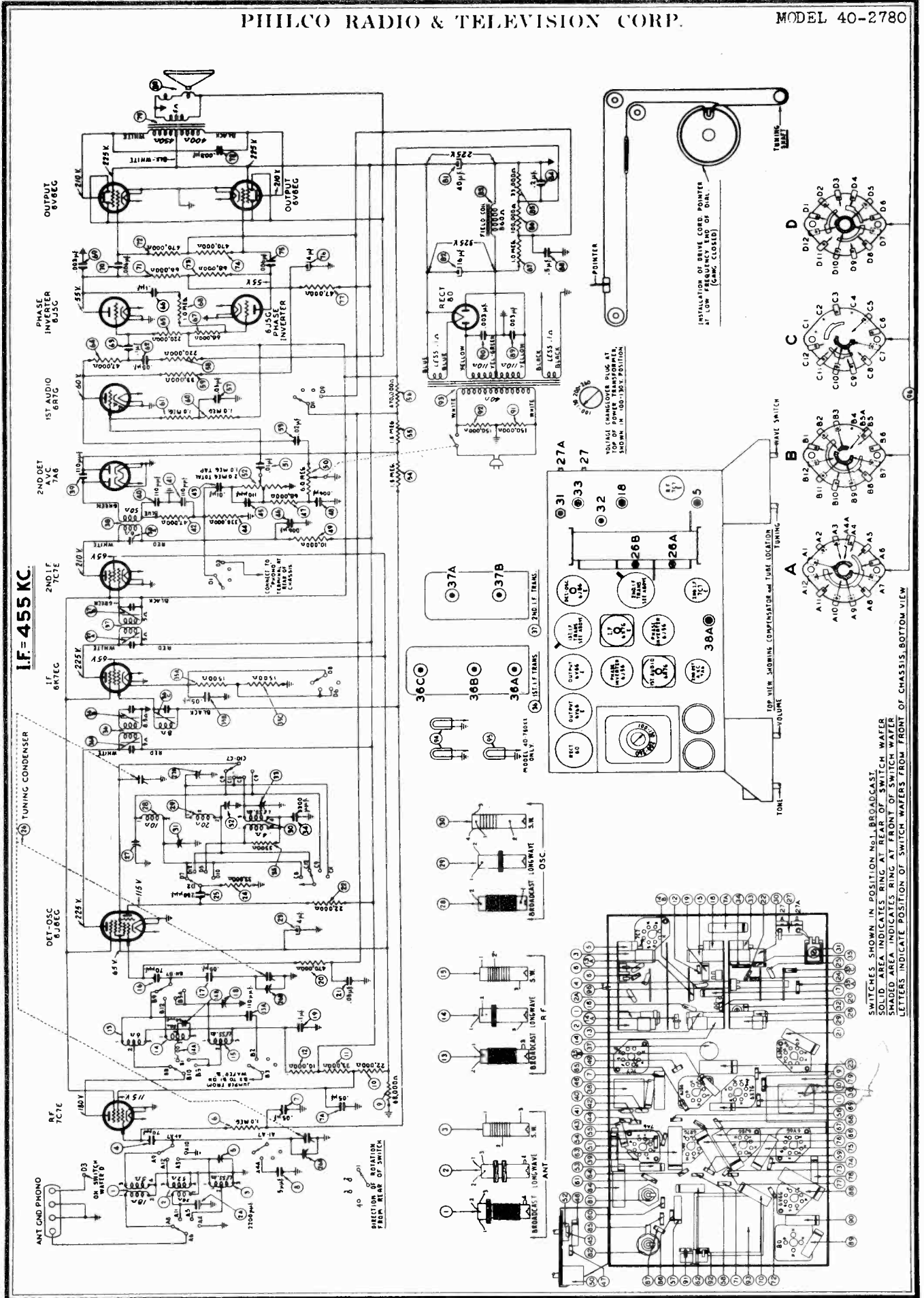
### MISCELLANEOUS PARTS

- Cable (Power) ..... L-2778
- Cover (Bottom of Cabinet)..... 27-9326
- Cabinet ..... 10459
- Mounting Feet Cabinet..... 27-4817
- Switch Plate ..... 56-1383
- Socket (5 prong)..... 27-6035
- Socket (7 prong)..... 27-6037
- Turntable (for Motor 35-1222)..... 35-3044
- Turntable (for Motor 35-1216)..... 35-1217
- Turntable (for Motor 315-1004)..... 35-1004

Two types of 110 volt, 60 cycle motors were used on this model, when ordering be sure correct turntable is ordered for motor.

PHILCO RADIO & TELEVISION CORP.

MODEL 40-2780



MODEL 40-2780

PHILCO RADIO & TELEVISION CORP.

**TYPE CIRCUIT:** Model 40-2780, code 121, is an Eleven (11) Tube A. C. operated Superhetrodyne radio. The features of design included in this model are three (3) tuning ranges for reception of standard, long wave and short wave broadcast stations; connections for attaching a high impedance electric phonograph pick-up; automatic volume control; continuously variable tone control; bass compensation and a regenerated push-pull audio output circuit.

**POWER SUPPLY:** 118 or 236 Volt, 50 to 60 Cycle A. C.  
118 or 236 Volt, 25 to 40 Cycle A. C.

The receiver is adjusted for operation on either of the above operating voltages by inserting the plug as indicated on top of the power transformer.

**TUNING RANGES:** 150 to 380 K. C. 530 to 1720 K. C. 7.4 to 22 M. C.

- 78 Tubular Con. (.003 mfd.) 30-4582
- 79 Output Transformer ... 32-8058
- 80 Cone and Voice Coil Assy. (Spr. Pt. No. 36-1459-2) 36-4106 (Spr. Pt. No. 36-1460-3) 36-4105
- 81 Electrolytic Condenser (40 mfd., 450 V.) ... 30-2445
- 82 Electrolytic Condenser (10 mfd., 300 V.) ... 30-2412
- 83 Field Coil (Replace Spkr.)
- 84 Tubular Cond. (.2 mfd.) 30-4587
- 85 Resistor (33,000 ohms, 1/2 watt) 33-333339
- 86 Resistor (100,000 ohms, 1/2 watt) 33-410339
- 87 Resistor (1.0 meg., 1/2 watt) ... 33-510339
- 88 Tubular Cond. (.5 mfd.) 30-4590
- 89 Tubular Con. (.003 mfd.) 30-4608
- 90 Tubular Con. (.003 mfd.) 30-4608
- 91 Resistor (150,000 ohms, 1/2 watt) 33-413339
- 92 Resistor (150,000 ohms, 1/2 watt) 33-415339
- 93 Power Trans. (100-130 V., 200-260 V., 50-60 cycles) 32-8007
- 94 Pilot Lamps (Dial) ... 34-2064E
- 95 Pilot Lamp (XX Cabinet only) ... 34-2210E
- 96 Wave Switch ... 42-1525

**MISCELLANEOUS PARTS**

- Bezel ... Plug L-3238
- Case and Plug (Power Supply) ... L-1507
- Spec. Export A.C. Plug L-1507
- Cabinet (40-2780T) ... 10419B
- Cabinet (40-2780XX) ... 10421B
- Dial ... 27-5558
- Drive Cord Assy. (Dial) 31-2407
- Felt Strip (Dial Mtg.) ... 27-8225
- Gasket (Dial Mtg.) ... 27-9258
- Knob (Tuning) ... 27-4330
- Knob (Tuning) ... 27-4862
- Knob (Volume and Wave Switch) ... 27-4332
- Knob (Tone Control) ... 27-4872
- Pointer ... 56-1276

Opera-tions in Order	SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	
1	6J6EG Grid	485 K. C.	500 K. C.	Vol. Max., Range Switch "Broadcast"	Note D
2	Antenna to Ground	1600 K. C.	1500 K. C.	Vol. Max., Range Switch "Broadcast"	Note B
3	Antenna to Ground	800 K. C.	500 K. C.	Vol. Max., Range Switch "Broadcast"	Roll Gang
4	Antenna to Ground	1600 K. C.	1500 K. C.	Vol. Max., Range Switch "L.W."	
5	Antenna to Ground	300 K. C.	300 K. C.	Range Switch "L.W."	
6	Antenna to Ground	175 K. C.	175 K. C.	Range Switch "L.W."	
7	Antenna to Ground	300 K. C.	300 K. C.	Range Switch "L.W."	
8	Antenna to Ground	20 M. C.	20 M. C.	Range Switch "S.W."	Note C

NOTE A — The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

NOTE B — **DIAL CALIBRATION:** In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the

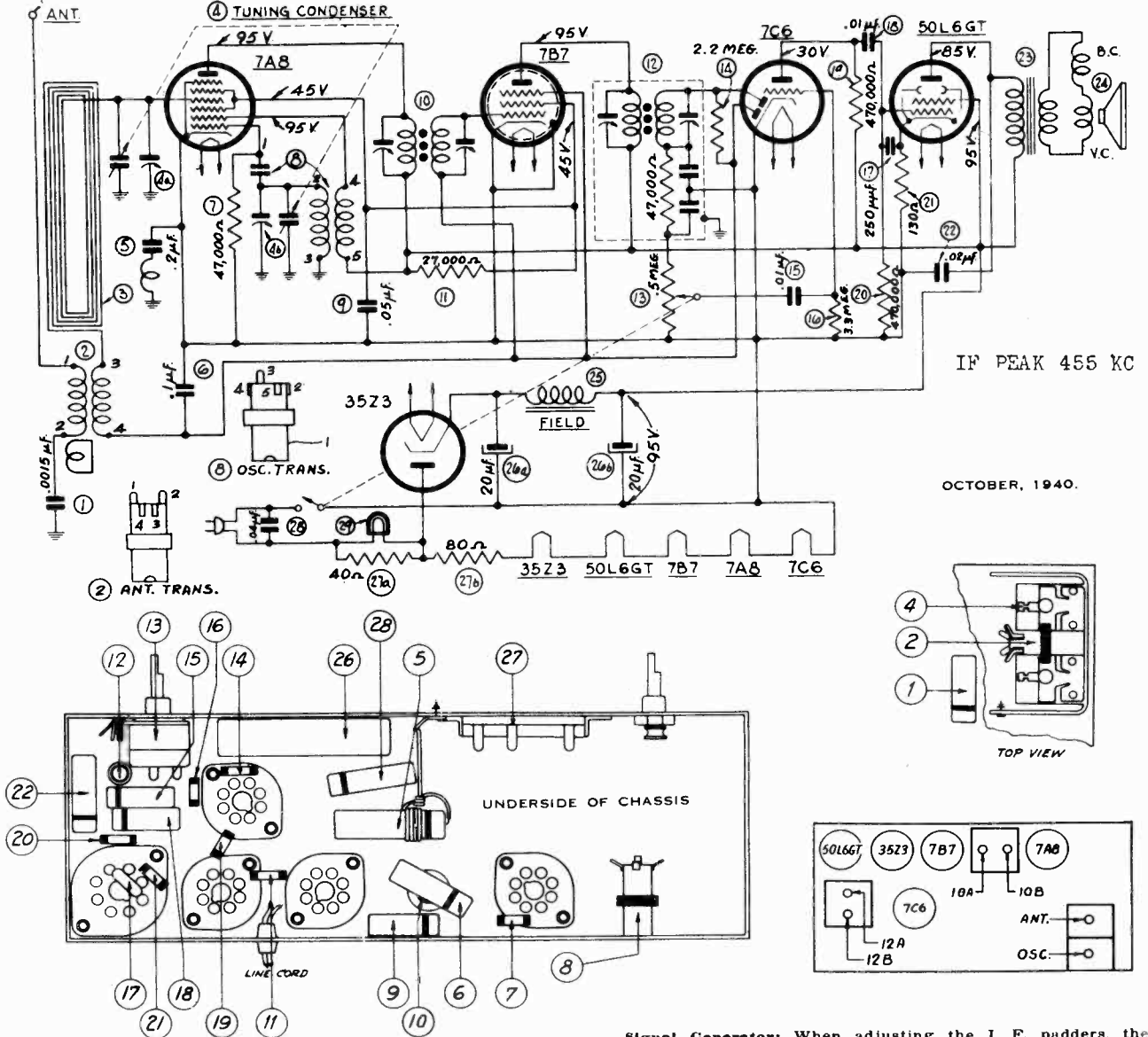
**REPLACEMENT PARTS**  
Model 40-2780

- |           |   |           |           |  |
|-----------|---|-----------|-----------|--|
| SCHE. No. | DESCRIPTION                             | PART No.  | RECEIVER  | SPECIAL INSTRUCTIONS                                   |
| 1         | Antenna Trans. (Broadcast)              | 32-2588   | 31-6337   | 54 Resistor (1.5 meg., 1/2 watt) ... 33-515339         |
| 2         | Ant. Tran. (Long Wave)                  | 32-3368   | 32-3254   | 55 Resistor (1.5 meg., 1/2 watt) ... 33-515339         |
| 2A        | Mica Cond. (2200 mmfd.)                 | 30-1125   | 32-3102   | 56 Resistor (470,000 ohms, 1/2 watt) 33-447339         |
| 3         | Antenna Trans. (S.W.2)                  | 32-3196   | 31-6289   | 57 Tubular Cond. (.05 mfd.) 30-4519                    |
| 4         | Mica Cond. (70 mmfd.)                   | 30-1117   | 31-6297   | 58 Resistor (220,000 ohms, 1/2 watt) 33-422339         |
| 5         | Compensator                             | 31-6288   | 31-6288   | 59 Resistor (33,000 ohms, 1/2 watt) 33-333339          |
| 6         | Resist. (1.0 meg., 1/2 watt)            | 33-510339 | 31-6311   | 60 Resistor (1.0 meg., 1/2 watt) ... 33-510339         |
| 7         | Tubular Cond. (.05 mfd.)                | 30-4609   | 33-23339  | 61 Resistor (150,000 ohms, 1/2 watt) ... 33-510339     |
| 7A        | Tubular Cond. (.05 mfd.)                | 30-4518   | 33-215339 | 62 Tubular Cond. (.05 mfd.) 30-4518                    |
| 8         | Mica Cond. (5 mmfd.)                    | 30-1120   | 33-4519   | 63 Tubular Cond. (.1 mfd.) 30-4611                     |
| 9         | Resistor (68,000 ohms, 1/2 watt)        | 33-368339 | 30-4519   | 64 Resistor (47,000 ohms, 1/2 watt) 33-347339          |
| 10        | Resistor (22,000 ohms, 1/2 watt)        | 33-322339 | 33-215339 | 65 Resistor (220,000 ohms, 1/2 watt) 33-422339         |
| 11        | Resistor (33,000 ohms, 1/2 watt)        | 33-333339 | 32-3284   | 66 Tubular Cond. (.1 mfd.) 30-4611                     |
| 12        | Resistor (10,000 ohms, 1 watt)          | 33-310439 | 32-3285   | 67 Resistor (68,000 ohms, 1/2 watt) 33-368339          |
| 13        | R. F. Trans. (Broadcast)                | 32-3189   | 32-3286   | 68 Resistor (1.0 meg., 1/2 watt) ... 33-510339         |
| 13A       | Mica Cond. (110 mmfd.)                  | 30-1118   | 30-1118   | 69 Tubular Con. (.003 mfd.) 30-4582                    |
| 14        | R. F. Tran. (Long Wave)                 | 32-3369   | 30-1118   | 70 Tubular Con. (.006 mfd.) 30-4610                    |
| 14A       | Suppressor Coil                         | 32-3352   | 30-1118   | 71 Resistor (68,000 ohms, 1/2 watt) 33-368339          |
| 14B       | Mica Cond. (60 mmfd.)                   | 30-1040   | 33-347339 | 72 Resistor (470,000 ohms, 1/2 watt) 33-447339         |
| 15        | R. F. Trans. (S.W.2)                    | 32-3197   | 30-4581   | 73 Resistor (10,000 ohms, 1/2 watt) 33-310339          |
| 16        | Mica Cond. (70 mmfd.)                   | 30-1117   | 33-433339 | 74 Resistor (470,000 ohms, 1/2 watt) 33-447339         |
| 17        | Tubular Cond. (.05 mfd.)                | 30-4519   | 30-1118   | 75 Tubular Con. (.006 mfd.) 30-4610                    |
| 18        | Compensator                             | 31-6288   | 30-4591   | 76 Electrolytic Condenser (4 mfd., 300 V.) ... 30-2415 |
| 19        | Tubular Cond. (.1 mfd.)                 | 30-4611   | 33-368339 | 77 Resistor (47,000 ohms, 1/2 watt) 33-347339          |
| 20        | Resistor (470,000 ohms, 1/2 watt)       | 33-447339 | 30-4583   |  |
| 21        | Tubular Cond. (.05 mfd.)                | 30-4609   | 33-310339 |  |
| 22        | Resistor (22,000 ohms, 1/2 watt)        | 33-322339 | 33-5335   |  |
| 23        | Electrolytic Condenser (4 mfd., 300 V.) | 30-2415   | 30-4581   |  |
| 24        | Resistor (33,000 ohms, 1/2 watt)        | 33-333339 | 33-5334   |  |
| 25        | Mica Cond. (250 mmfd.)                  | 30-1119   | 30-4516   |  |

PHILCO RADIO & TELEVISION CORP.

MODELS PT2, PT6

NOTE: GROUND TO CHASSIS FOR LOOP OPERATION.



OCTOBER, 1940.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

Signal Generator: When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcat.	12A, 12B, 10A, 10B	Note B
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcat.	(4B, Note C)	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcat.	(4A, Note D)	

NOTE A: DIAL POINTER CALIBRATION—In order to adjust the receiver correctly, the pointer must be adjusted to track properly with the tuning condenser. To do this, turn the tuning condenser to the maximum capacity (plates fully meshed). With the condenser in this position, set the tuning pointer on the first small line stamped in the scale plate on the left side.

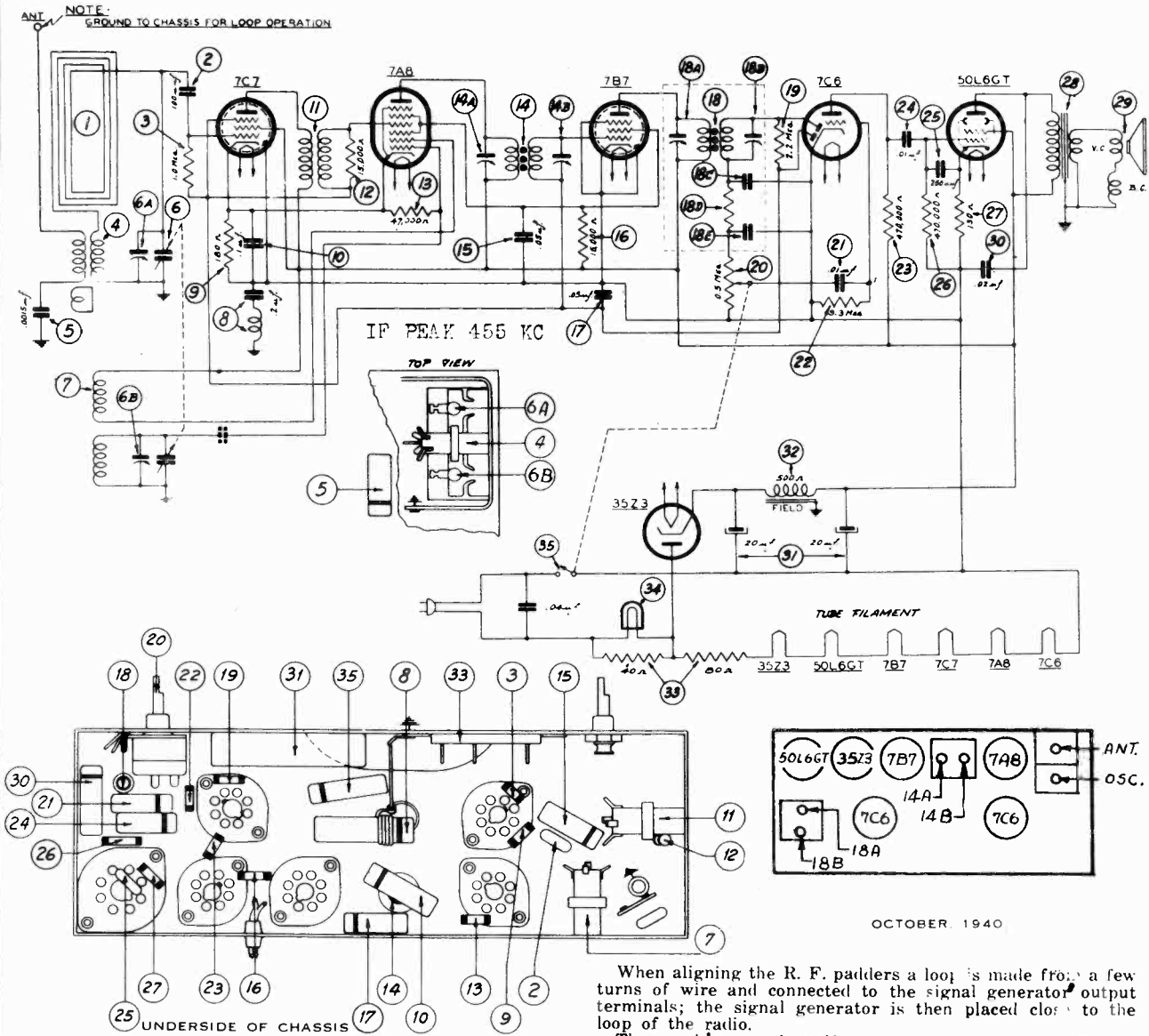
NOTE B—Before adjusting compensators, turn down (10B) to tight position. Then adjust the compensators for maximum output in the following order: 12A, 12B, 10A and 10B.

NOTE C—Turn tuning condenser until dial pointer is on the first small line stamped in the scale plate from right side of chassis. Adjust padder (4B) to maximum at this point.

NOTE D—Turn tuning condenser until dial pointer is on the second small line stamped in the scale plate from right side of chassis. Adjust padder (4A) to maximum at this point.

PHILCO RADIO & TELEVISION CORP.

MODEL PT 12



OCTOBER 1940

**Signal Generator.** When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

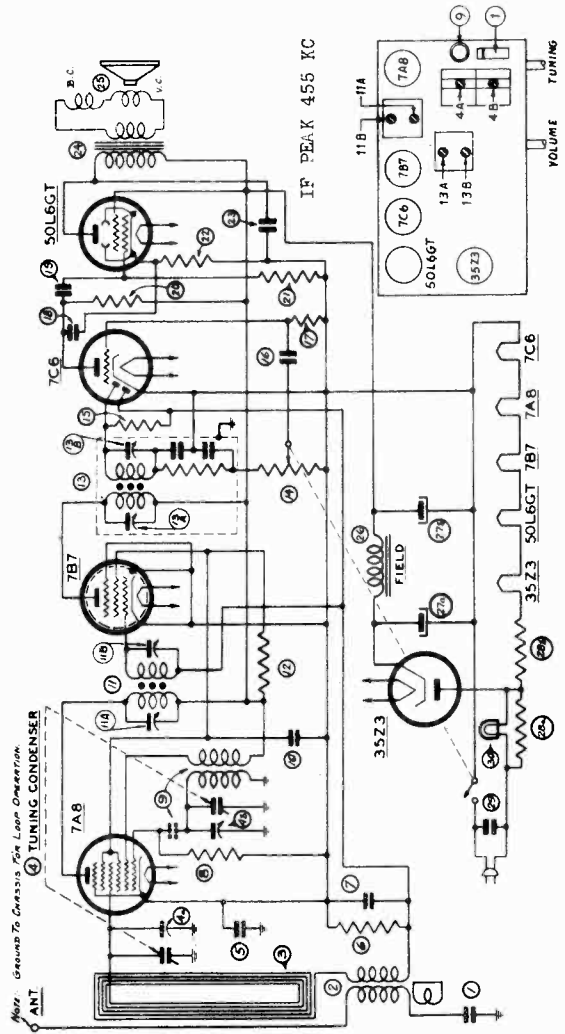
When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled. Locations are shown on Schematic.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcast.	18A, 18B, 14A, 14B	Note B
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcast.	(6B, Note C)	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcast.	(6A, Note D)	

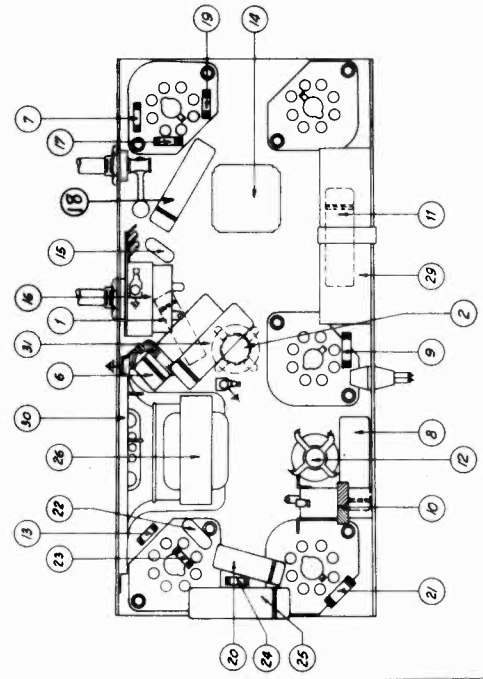
- NOTE A: DIAL POINTER CALIBRATION**—In order to adjust the receiver correctly, the pointer must be adjusted to track properly with the tuning condenser. To do this, turn the tuning condenser to the maximum capacity (plates fully meshed). With the condenser in this position, set the tuning pointer on the first small line stamped in the scale plate on the left side.
- NOTE B**—Before adjusting compensators, turn down (14B) to tight position. Then adjust the compensators for maximum output in the following order: 18A, 18B, 14A and 14B.
- NOTE C**—Turn tuning condenser until dial pointer is on the first small line stamped in the scale plate from right side of chassis. Adjust padder (6B) to maximum at this point.
- NOTE D**—Turn tuning condenser until dial pointer is on the second small line stamped in the scale plate from right side of chassis. Adjust padder (6A) to maximum at this point.

PHILCO RADIO & TELEVISION CORP.

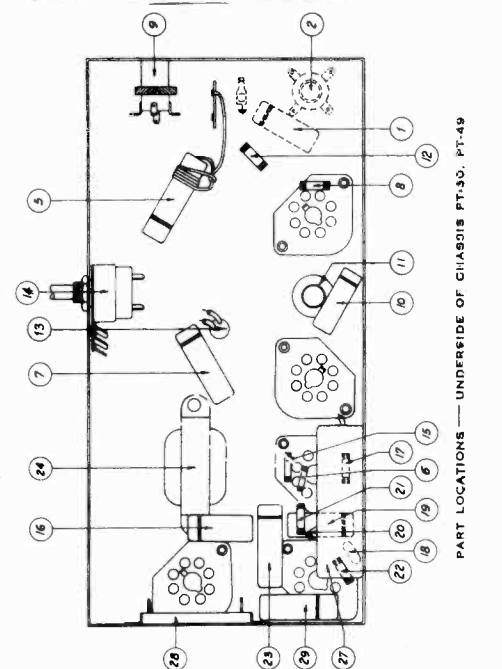
MODELS PT30, PT49  
MODELS PT42, PT44



SCHEMATIC DIAGRAM — PT-30, PT-49 FOR ALIGNMENT SEE INDEX

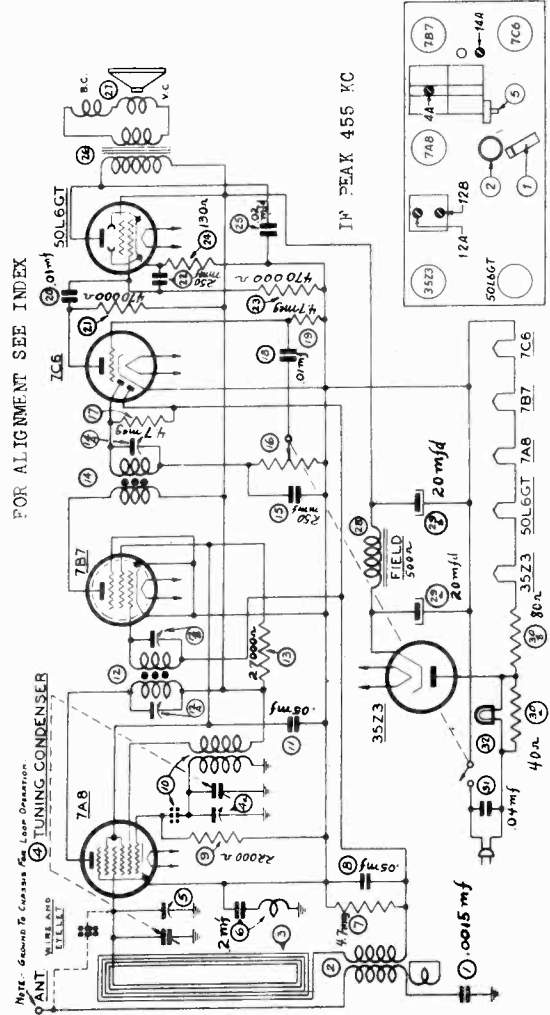


PART LOCATIONS — UNDERSIDE OF CHASSIS PT-42, PT-44



PART LOCATIONS — UNDERSIDE OF CHASSIS PT-30, PT-49

AUGUST, 1940.



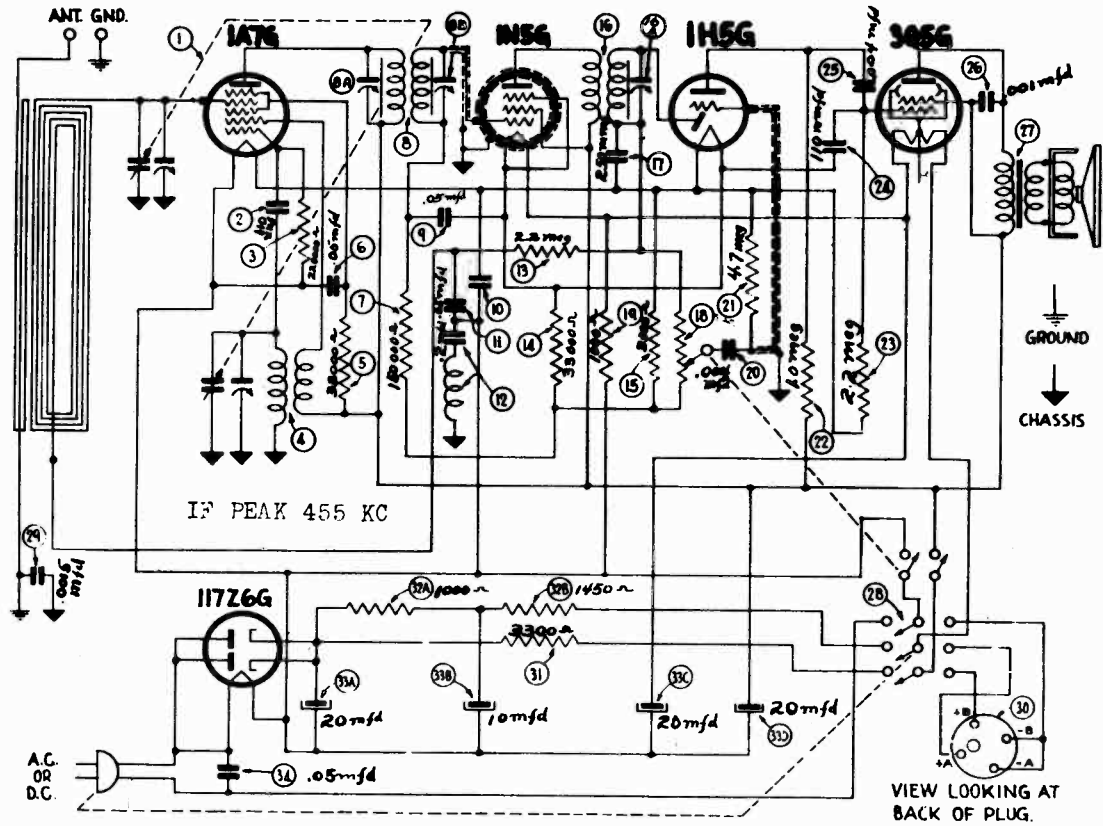
SCHEMATIC DIAGRAM — PT-42, PT-44 FOR ALIGNMENT SEE INDEX

PART LOCATIONS — UNDERSIDE OF CHASSIS PT-42, PT-44

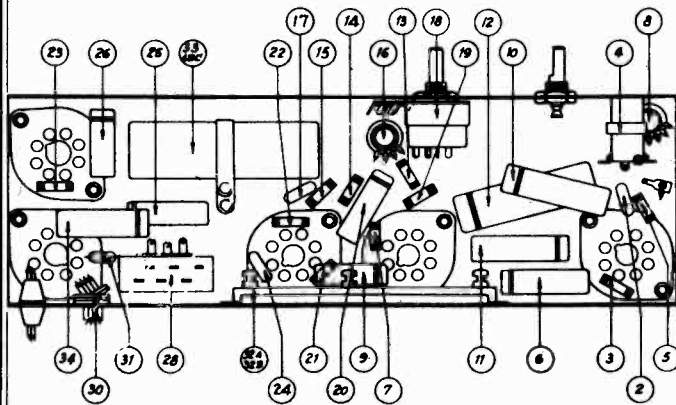


MODEL PT87  
 MODELS PT30,  
 PT42, PT44, PT49

PHILCO RADIO & TELEVISION CORP.



SCHMATIC DIAGRAM — PT-87



PART LOCATIONS — UNDERSIDE OF CHASSIS PT-87

MODELS PT30, PT42, PT44, PT49, PT87

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments adjust the compensators as shown in the tabulation below.

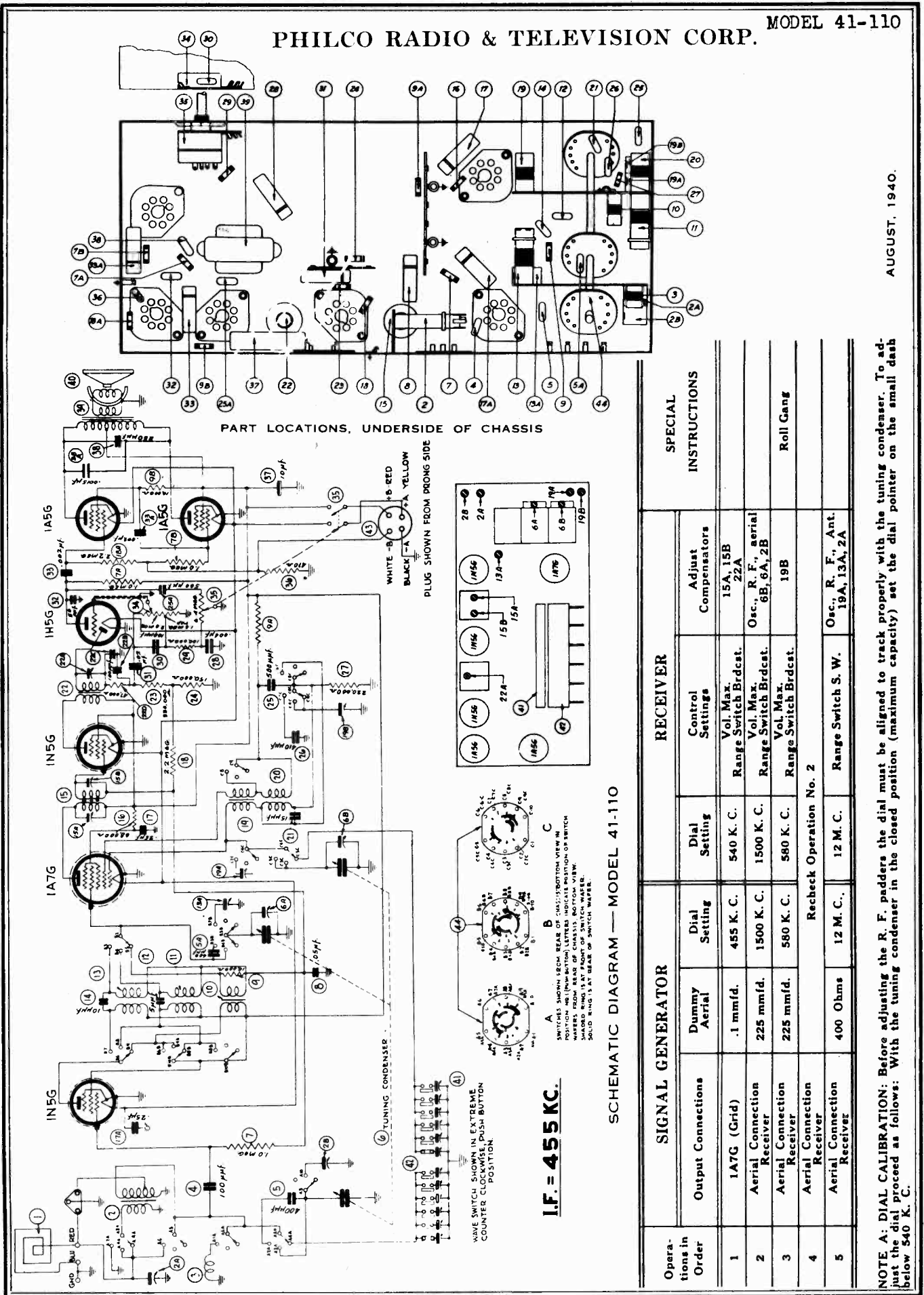
If the indicating meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR		RECEIVER				SPECIAL INSTRUCTIONS	
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order			
					PT-30, 49	PT-42, 44		PT-87
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcast.	11B, 11A 13A, 13B	12A, 12B 14A	8A, 8B 16A	Note B
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcast.	4B	4A	1B	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vpl. Max. Range Switch Brdcast.	4A	5	1A	

NOTE A: — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.

NOTE B: — When adjusting the I. F. compensators of Models PT-30 and PT-49, turn compensator (11B) clockwise to the tight position and pad compensators 11A, 13A and 13B to maximum output, then pad 11B to maximum.

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS, UNDERSIDE OF CHASSIS

SPECIAL INSTRUCTIONS

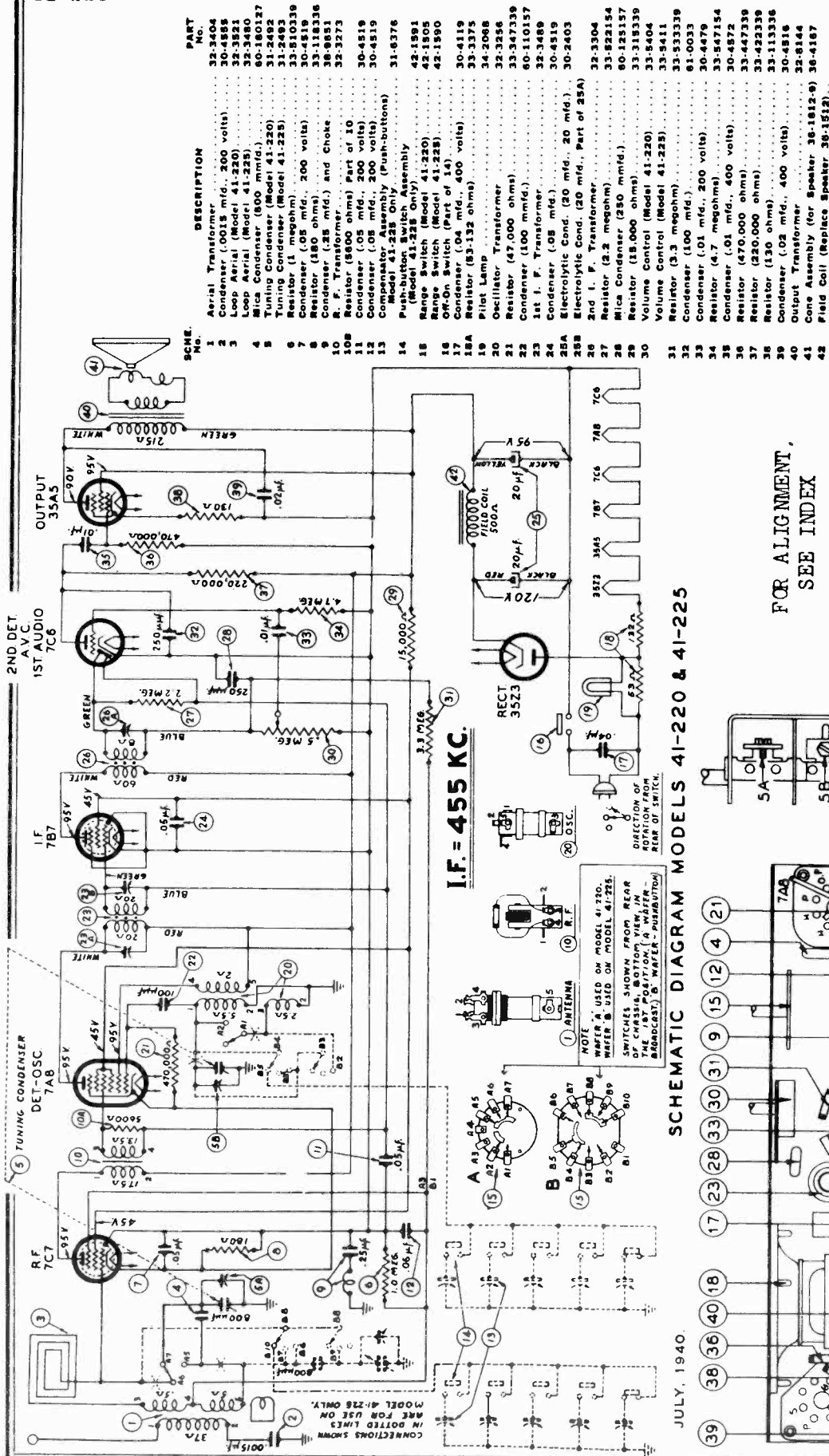
Oper- ations in Order	SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS
	Output Connections	Dummy Aerial	Dial Setting	Control Settings	
1	1A7G (Grid)	.1 mmfd.	455 K. C.	Vol. Max. Range Switch Brdcat.	Adjust Compensators 15A, 15B 22A
2	Aerial Connection Receiver	225 mmfd.	1500 K. C.	Vol. Max. Range Switch Brdcat.	Osc., R. F., aerial 6B, 6A, 2B
3	Aerial Connection Receiver	225 mmfd.	580 K. C.	Vol. Max. Range Switch Brdcat.	Roll Gang 19B
4	Aerial Connection Receiver				Recheck Operation No. 2
5	Aerial Connection Receiver	400 Ohms	12 M. C.	Range Switch S. W.	Osc., R. F., Ant. 19A, 13A, 2A

NOTE A: DIAL CALIBRATION: Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dash below 540 K. C.

AUGUST, 1940.

MODELS 211-220,  
41-225

PHILCO RADIO & TELEVISION CORP.



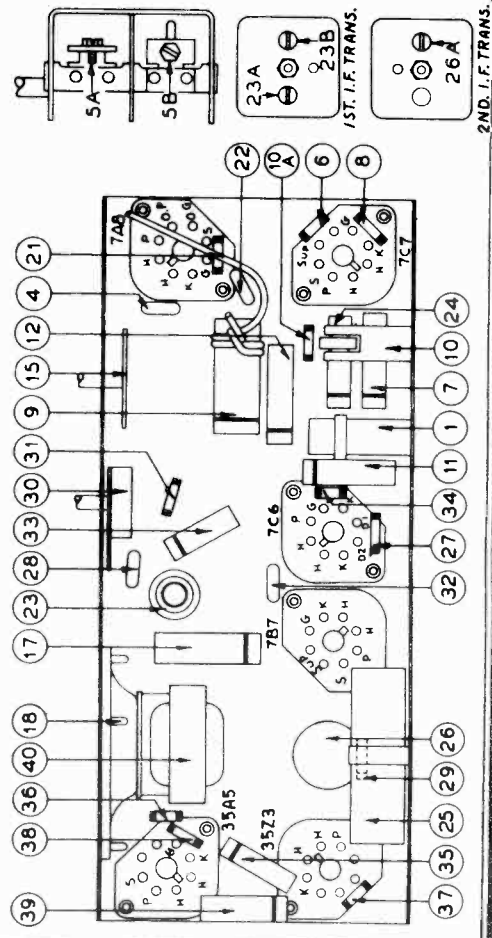
SCHE. No.	DESCRIPTION	PART No.
1	Aerial Transformer	32-2404
2	Coil (20.5 mfd., 200 volts)	30-4888
3	Loop Aerial (Model 41-225)	32-3440
4	Loop Aerial (Model 41-220)	32-3440
5	Mica Condenser (500 mmfd.)	60-180127
6	Tuning Condenser (Model 41-220)	31-2492
7	Tuning Condenser (Model 41-225)	31-2493
8	Resistor (1 megohm)	33-510339
9	Resistor (.05 mfd., 200 volts)	30-4519
10	Resistor (.25 mfd., 200 volts)	33-118336
11	Resistor (100 ohms)	32-3273
12	Resistor (100 ohms) Part of 10	30-4519
13	Condenser (.05 mfd., 200 volts)	30-4519
14	Compensator Assembly (Push-buttons) Model 41-225 Only	31-6376
15	Push-button Switch Assembly	42-1591
16	Range Switch (Part of 14)	42-1505
17	Range Switch (Model 41-220)	42-1590
18	OR-On Switch (Part of 14)	30-4119
19	Condenser (.04 mfd., 400 volts)	33-3375
20	Resistor (83-132 ohms)	34-2068
21	Pilot Lamp	32-3256
22	Oscillator Transformer	33-247339
23	Resistor (47,000 ohms)	60-110137
24	Condenser (100 mmfd.)	30-4519
25	1st I. F. Transformer	30-2403
26A	Electrolytic Cond. (20 mfd., 20 mfd.)	32-3304
26B	Electrolytic Cond. (20 mfd., 20 mfd.)	32-3304
27	2nd I. F. Transformer	33-522154
28	Resistor (2.2 megohm)	60-13157
29	Mica Condenser (250 mmfd.)	33-315359
30	Volume Control (Model 41-220)	33-5404
31	Volume Control (Model 41-225)	33-5411
32	Resistor (3.3 megohm)	33-53339
33	Condenser (100 mfd.)	61-0035
34	Condenser (.01 mfd., 200 volts)	30-4476
35	Resistor (4.7 megohms)	33-547134
36	Resistor (.01 mfd., 400 volts)	30-4872
37	Resistor (470,000 ohms)	33-447339
38	Resistor (220,000 ohms)	33-422339
39	Resistor (130 ohms)	33-113336
40	Condenser (.02 mfd., 400 volts)	30-4816
41	Output Transformer	32-8144
42	Cone Assembly (for Speaker 38-1512-9) Field Coil (Replace Speaker 38-1512-9)	36-4167

FOR ALIGNMENT,  
SEE INDEX

Model 41-220, is manually tuned and employs two tuning ranges covering 540 to 1600 K. C. and 1.6 to 3.3 M. C. Model 41-225 has Electric Push-button tuning in addition to Manual tuning and two tuning ranges covering the same frequencies as Model 41-220. The electric push-button mechanism consists of six (6) push-buttons. One push-button is used to turn the power source OFF and ON and the remaining five (5) for automatically tuning in broadcasting stations.

SCHEMATIC DIAGRAM MODELS 41-220 & 41-225

JULY, 1940.



PHILCO RADIO & TELEVISION CORP. MODELS 41-220, 41-225  
MODEL 41-RP6

Model 41-RP-6 is a remote type record player which can be used in conjunction with any standard broadcast radio to reproduce phonograph records.

POWER SUPPLY: 115 volts, 60 cycle, A. C.

POWER CONSUMPTION: 30 watts.

This model may be also operated on a 115 volts, 50 cycle power supply by changing the motor as indicated in the parts list.

PHILCO TUBES USED: 6A7, Oscillator; 84, Rectifier.

OPERATION

Place record on turntable and slide "Off-On Switch" (Figure 1) to "On" position; this will be indicated by pilot light in tone arm. After allowing sufficient time for tubes to warm up, place tone arm on record; this automatically starts motor.

Tune the radio to approximately 540 KC. (54 on most dials) at which setting the phonograph signal will be picked up. Volume can be regulated by the radio receiver's volume control in the normal way.

At the end of the record, return the tone arm to rest position which will automatically turn motor off. It is not necessary to slide "Off-On" Switch to the "Off" position between records.

OPERATION VERY CLOSE TO THE RECEIVER: A range switch

will be found on the lower side of the drawer. (See Figure 2). If the player is installed very close to the receiver, slide this switch to the "near" position for best tone quality. When the player is more than a short distance from the receiver, with the switch in the "near" position, the noise in the receiver will be louder than the music from the record. In this case, leave the range switch in the "distant" position. After the best position for the range switch is determined, it is not necessary to change it as long as the player and receiver are not moved. Note after changing position of switch it is advisable to either retune the record player or the radio.

INTERFERENCE

If interference from broadcasting stations is encountered, the frequency of the unit can be changed to any other frequency between 530 KC. and 570 KC. by removing snap button and adjusting small screw indicated in Diagram "A". This adjustment is best made while the unit is in operation.

If hum is experienced it may be necessary to reverse the power plug of the record player, the radio, or both. In most cases it is

preferable to use different receptacles for record player and radio. No definite rule can be established for the relative location of the record player to your radio; individual trial will establish best location. However, in general, satisfactory operation may be obtained up to a comfortable listening distance, provided local noise conditions are not too severe.

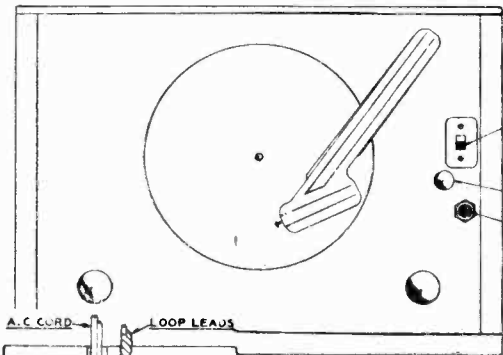


FIGURE 1

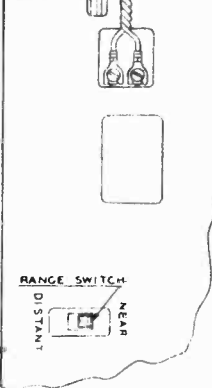
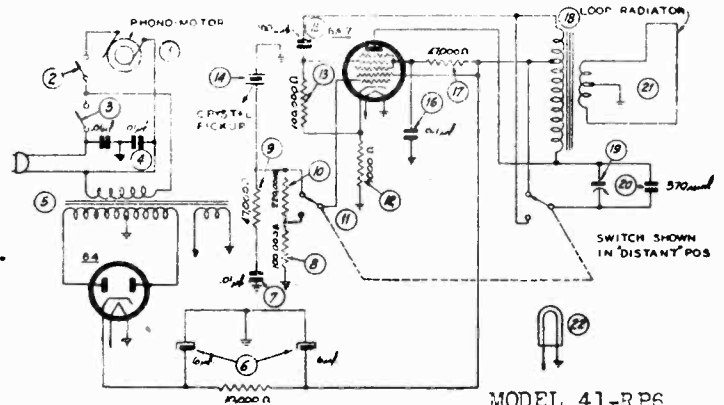


FIGURE 2



MODEL 41-RP6

Schem. No.	Description	Part No.
1	Phono-motor (115 volts, 60 cycles)	35-1240
	Screw (Mtg.)	W-89
	Turntable	35-3017
2	Motor Switch	42-1051
3	Motor "On-Off" Power Switch	42-1592-2
4	Line Filter Condenser (.01-.01 mfd.)	3903-10G
5	Power Transformer (115 volts, 60 cycle)	32-8043
6	Electrolytic Condenser (4-6 mfd.)	30-2388
	Clamp	56-1346
7	Condenser (.01 mfd.)	30-4372
8	Resistor (100,000 ohms)	33-410339
9	Resistor (47,000 ohms)	33-347339
10	Resistor (220,000 ohms)	33-422339
11	Range Switch	42-1657
12	Resistor (1,000 ohms)	33-210339
13	Resistor (100,000 ohms)	33-410339
14	Crystal Pickup (Complete)	35-2476
	Bumper (Pickup Arm)	51-4070
15	Condenser (100 mmfd.)	60-110157
16	Condenser (.1 mfd.)	30-4455

Schem. No.	Description	Part No.
17	Resistor (47,000 ohms)	33-347339
18	Coupling Transformer	32-3646
	Clip Mtg.	28-5002
19	Compensator	31-6268
20	Silver Mica Condenser (370 mmfd.)	30-1110
21	Loop Aerial	Consists of short piece of wire
22	Pilot Lamp	34-2064
	Cabinet	10534A
	Screw (Chassis Mtg.)	W-218
	Washer (Chassis Mtg.)	W-751
	Bottom Cover	27-9858
	Cable (Power)	1-2778
	Needle Kit	40-0458
	Screw (Chassis Mtg.)	W-218
	Socket (5-prong)	27-4035
	Socket (7-prong)	27-4037

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

MODELS 41-220, 41-225

Operations in Order	SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS	
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting		
1	Ant. Section of Tuning Cond.	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch "Brdst"	26A, 23B, 23A	
2	Loop—See above Instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch "Brdst"	5B Tuning Condenser	Note A
3	Loop—See above Instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdst"	5A Tuning Condenser	

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

MODELS 41-221  
41-226  
MODEL 41-231

PHILCO RADIO & TELEVISION CORP.

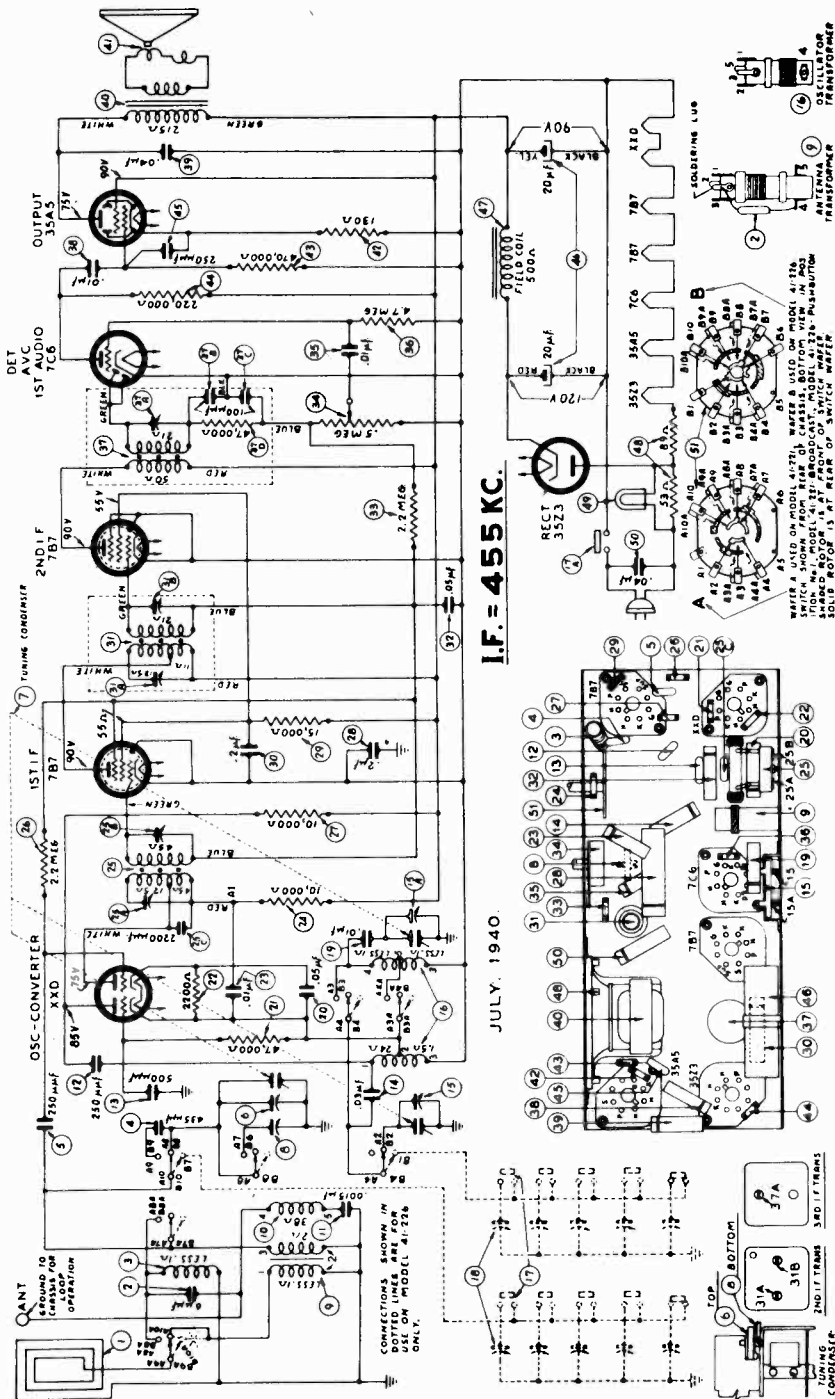
Model 41-221 is manually tuned and is assembled in two type (C & CI.) cabinets. Type "C" is a diagonal grain Sapel wood cabinet with carrying handle. Cabinet Type "CI" use diagonal grained walnut wood with ivory finished bezel, knobs and trim.

Model 41-226 incorporates Electric Push-button tuning in addition to manual tuning and is assembled in a sliced Walnut Cabinet. The electric push-button mechanism consists of six (6) push-buttons. One push-button is used to turn the power off and on. The remaining five (5) push-buttons automatically tune in stations.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.



SCHEMATIC DIAGRAM MODEL 41-221 & 41-226  
ALIGNMENT FOR MODELS 41-221, 41-226, 41-231

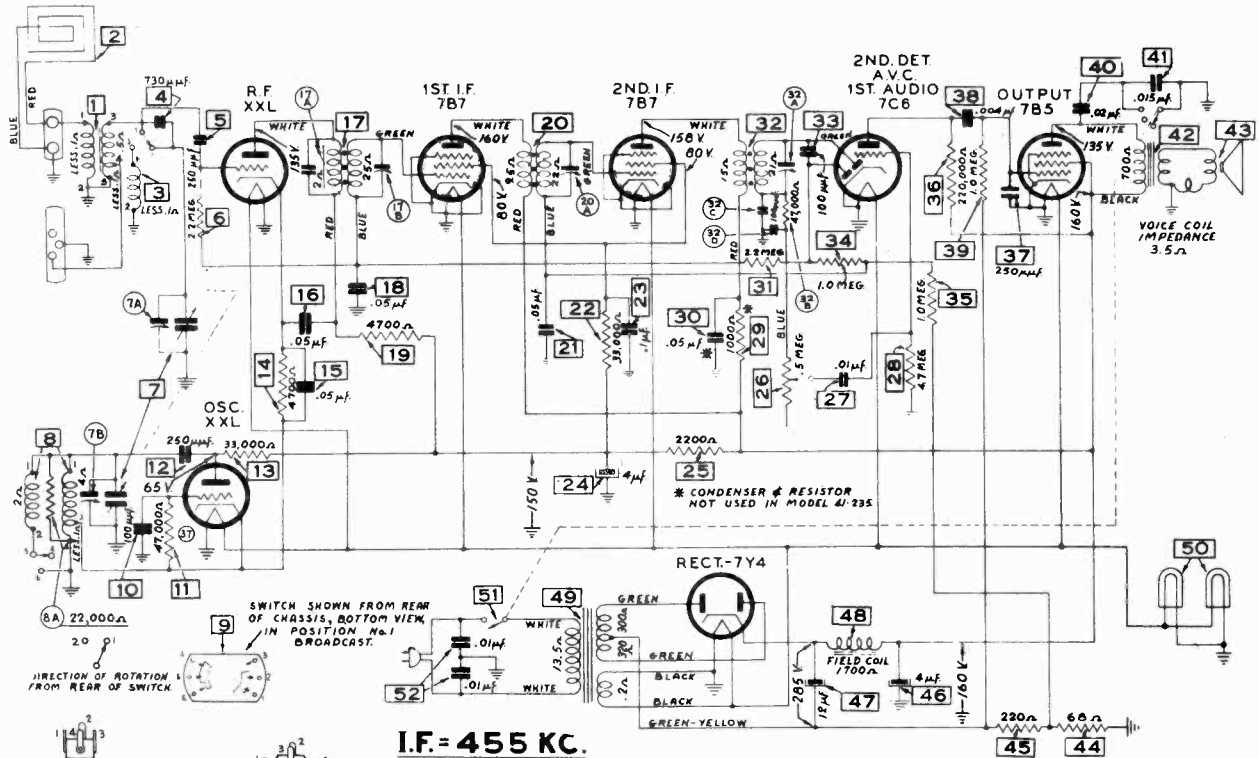
SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS
Output Connections to Receiver	Dial Setting	Dial Setting	Adjust Compensators in Order	
1 Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol Max. Range Switch Brdcat.	37A, 31A, 31B, 25A, 28B
2 Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcat.	Note A
3 Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcat.	6
4 Loop see above instructions	12 M. C.	12 M. C.	Range Switch "S. W."	15A, 8 Roll (S) for Max. Note B

NOTE A: — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.

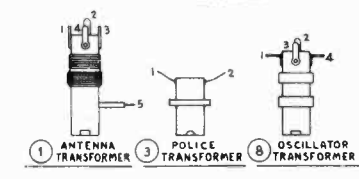
NOTE B — When adjusting oscillator compensator 15A, tune for maximum on the first signal peak from Tight position (compensator closed).

PHILCO RADIO & TELEVISION CORP.

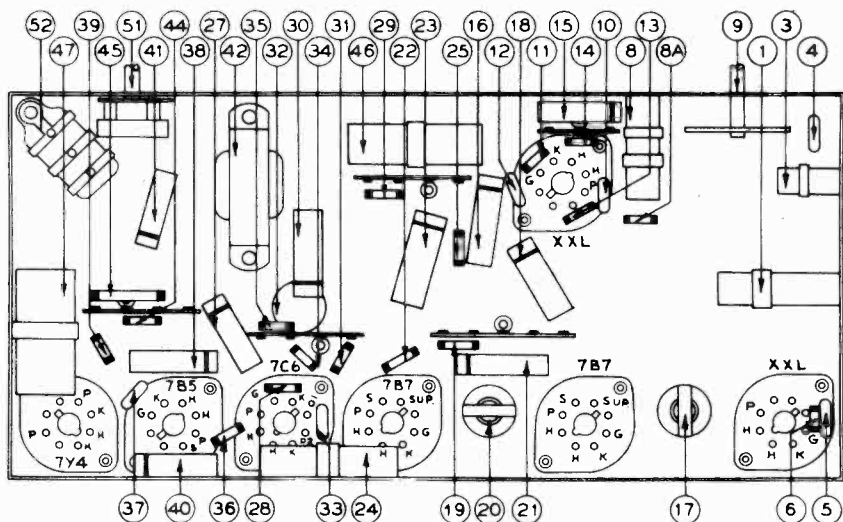
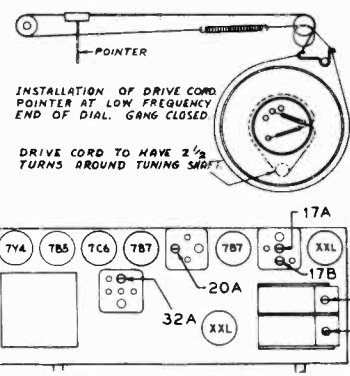
MODELS 41-230,  
41-235 (121)



I.F. = 455 KC.



JUNE, 1940



When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet. If adjustments are made outside the cabinet a

Service Tuning Scale, Part No. 45-2819, will be required. This scale is placed underneath the pointer on the metal dial plate.

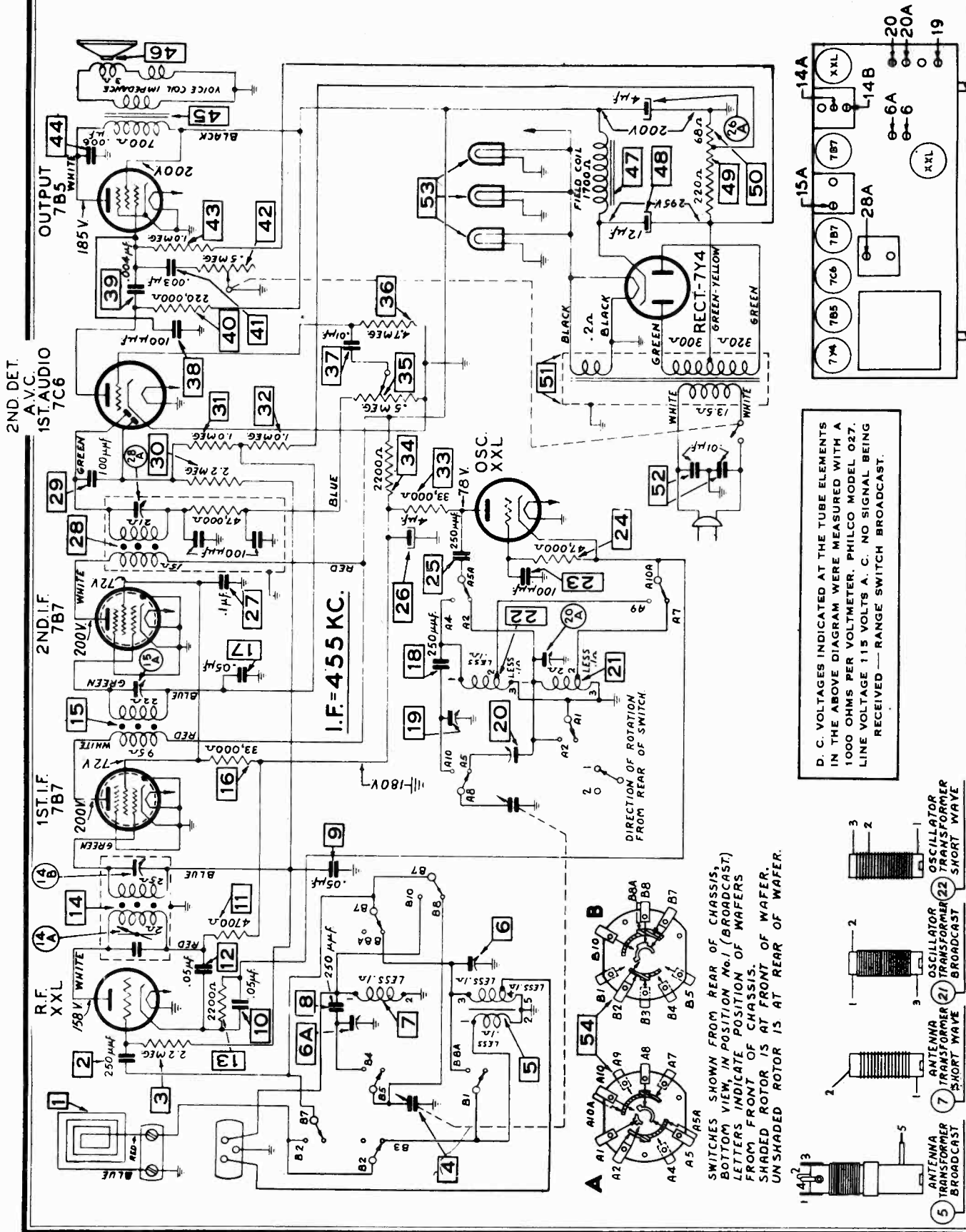
When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond.	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch "Brdcst"	32A, 20A, 17B, 17A	
2	Loop—See above Instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch "Brdcst"	7B	Note A
3	Loop—See above Instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	7A	

NOTE A — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

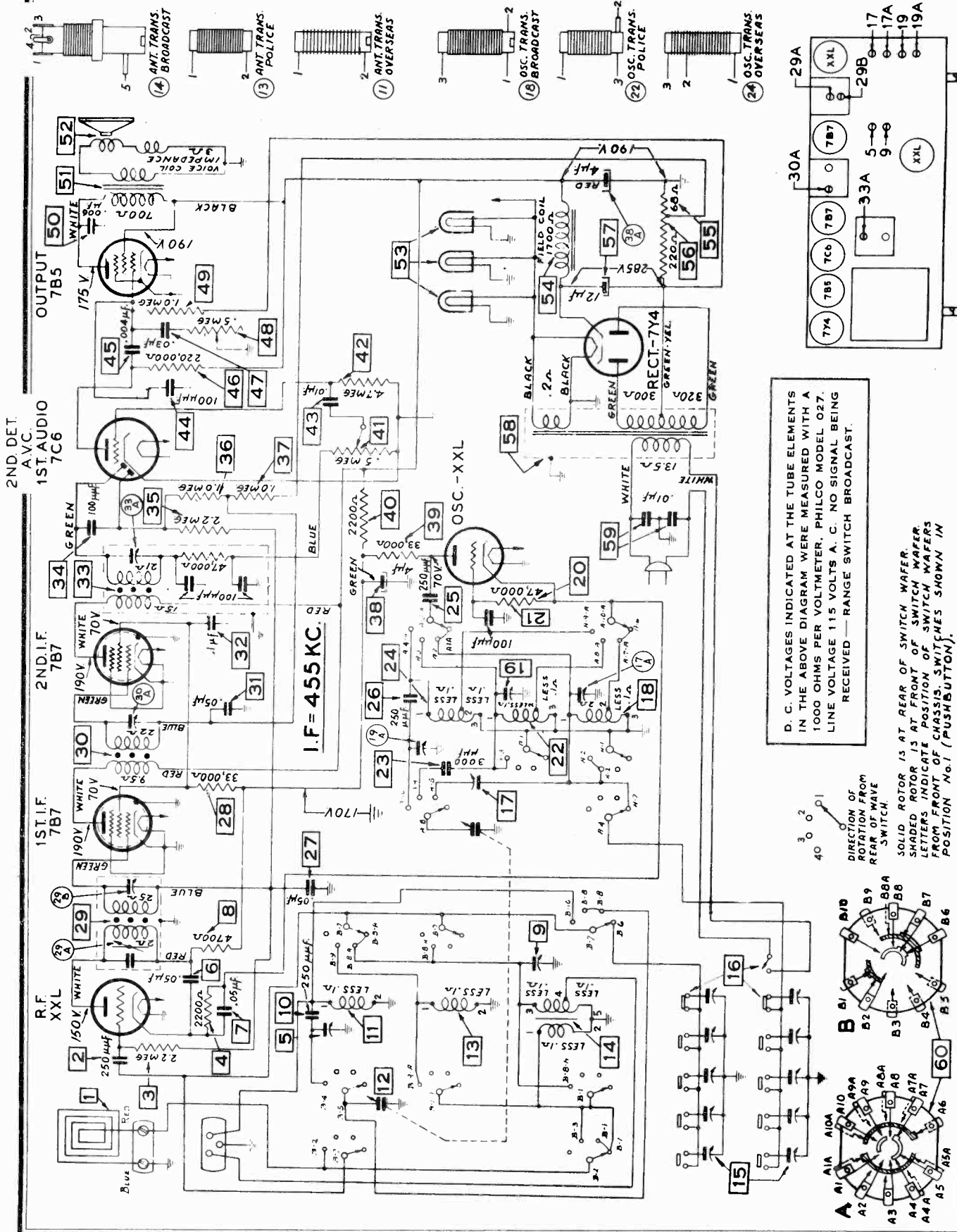
MODEL 41-240 (121)

PHILCO RADIO & TELEVISION CORP.

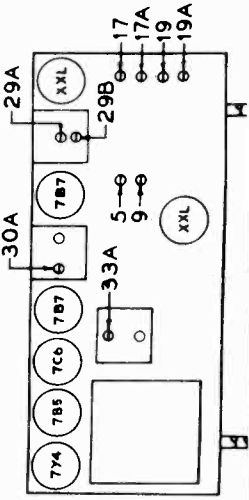


PHILCO RADIO & TELEVISION CORP.

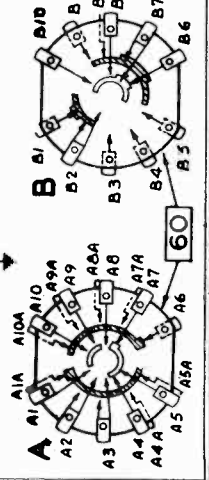
MODEL 41-245 (121)



D. C. VOLTAGES INDICATED AT THE TUBE ELEMENTS IN THE ABOVE DIAGRAM WERE MEASURED WITH A 1000 OHMS PER VOLT-METER, PHILCO MODEL 027. LINE VOLTAGE 115 VOLTS A. C. NO SIGNAL BEING RECEIVED - RANGE SWITCH BROADCAST.



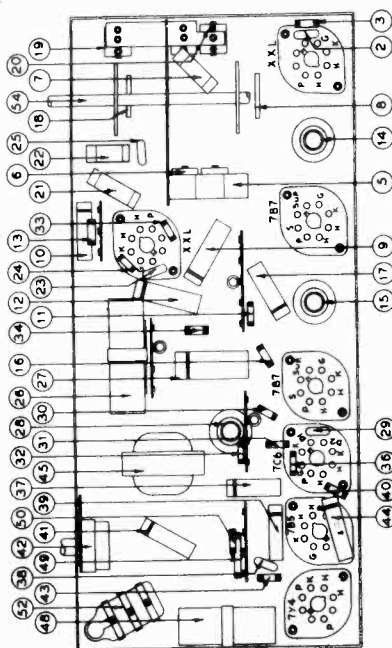
DIRECTION OF ROTATION FROM REAR OF WAVE SWITCH. SOLID ROTOR IS AT REAR OF SWITCH WAFER. SHADED ROTOR IS AT FRONT OF SWITCH WAFER. LETTERS INDICATE POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS. SWITCHES SHOWN IN POSITION No. 1 (PUSHBUTTON).



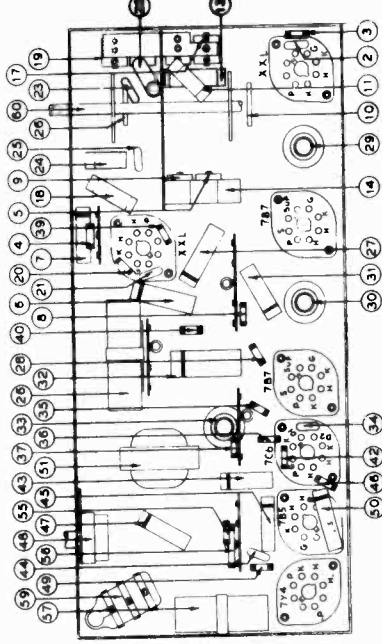


MODELS 41-240  
41-245

PHILCO RADIO & TELEVISION CORP.



MODEL 41-240 — PART LOCATIONS, UNDERSIDE OF CHASSIS



MODEL 41-245 — PART LOCATIONS, UNDERSIDE OF CHASSIS

**SPECIFICATIONS**

**Model 41-240**

**TYPE OF CIRCUIT:** Model 41-240, Code 121, is a seven (7) tube A. C. operated super-heterodyne radio with electric push-button tuning. In addition, the Philco Outdoor aerial is also provided for an outdoor aerial. The Philco Outdoor aerial, Part No. 45-2817, is especially designed for use in addition to other features of design are: two tuning ranges; two I. F. stages; Philco loctal tubes; variable tuning control; automatic tuning range; 540 to 1720 K. C. range; 9 to 12 M. C. TUNING RANGE; 455 K. C. intermediate frequency; 2.0 to 7.0 M. C. INTERMEDIATE FREQUENCY; 455 K. C. To operate the change power transformers as indicated in the parts list. **POWER SUPPLY:** 230 volt, 55 cycle current. It is necessary to AUDIO OUTPUT: 1 watt. **XXL 1st detector:** one XXL oscill. detector; 1st audio, A. V. C. one 7B7, audio output and a 2nd I. F. stage. **CABINET DIMENSIONS:** Height, 11"; Width, 15 1/2"; Depth, 9 1/2".

**Model 41-245**

**TYPE OF CIRCUIT:** Model 41-245, Code 121, is a seven (7) tube A. C. operated super-heterodyne radio with electric push-button tuning. In addition, the Philco Outdoor aerial is also provided for an outdoor aerial. The Philco Outdoor aerial, Part No. 45-2817, is especially designed for use in addition to other features of design are: two tuning ranges; two I. F. stages; Philco loctal tubes; variable tuning control; automatic tuning range; 540 to 1720 K. C. range; 9 to 12 M. C. TUNING RANGE; 455 K. C. INTERMEDIATE FREQUENCY; 455 K. C. To operate the change power transformers as indicated in the parts list. **POWER SUPPLY:** 230 volt, 55 cycle current. It is necessary to AUDIO OUTPUT: 1 watt. **XXL 1st detector:** one XXL oscill. detector; 1st audio, A. V. C. one 7B7, audio output and a 2nd I. F. stage. **CABINET DIMENSIONS:** Height, 11"; Width, 15 1/2"; Depth, 9 1/2".

**ALIGNING R. F. AND I. F. COMPENSATING CONDENSERS**

THE FOLLOWING PROCEDURE IS THE SAME FOR BOTH MODELS.

**Model 41-240**

Opera- tions in Order	SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS
	Output Receiver	Dial Setting	Control Settings	Adjust Compen- sators in Order	
1	Ant. Section of Tuning Condenser	455 K. C.	Vol. Max. Range Switch "Broadcast"	28A, 19A, 14A, 14B	Note A
2	Loop to Radio Loop See Sig. Gen. above	1500 K. C.	Vol. Max. Range Switch "Broadcast"	20A, 6	Note B
3	Loop to Radio Loop See Sig. Gen. above	580 K. C.	Range Switch	20	Rock Comp. to "max." Retback Operation No. 2
4	Loop to Radio Loop See Sig. Gen. above	9.5 M. C.	Range Switch	19, 6A	Note C
5	Loop to Radio Loop See Sig. Gen. above	12 M. C.	Range "W"	19, 6A	Note D

**Model 41-245**

1	Ant. Section of Tuning Condenser	455 K. C.	Vol. Max. Range Switch "Broadcast"	28A, 20A, 25A, 26B	Note A
2	Loop to Radio Loop See Sig. Gen. above	1500 K. C.	Vol. Max. Range Switch "Broadcast"	17A, 9	Note B
3	Loop to Radio Loop See Sig. Gen. above	580 K. C.	Range Switch	17	Rock Comp. to "max." Retback Operation No. 2
4	Loop to Radio Loop See Sig. Gen. above	6 M. C.	Range Switch	19	Rock Comp. to "max."
5	Loop to Radio Loop See Sig. Gen. above	9.5 M. C.	Range Switch	19A, 5	Note C
6	Loop to Radio Loop See Sig. Gen. above	12 M. C.	Range "W"	19A, 5	Note D

**NOTE A** — Compensator (14A) Model 41-240, must be adjusted before (14B) Model 41-240, and should be done in the following manner. Turn 14A all the way up, then slowly turn down and select the first I. F. peak. Padder (14B) is now adjusted to maximum. This procedure applies also to Model 41-245; padder 26A should be adjusted before 26B receiver correctly, the dial must be aligned to track properly with the tuning condenser. **NOTE B** — Dial (14A) Model 41-240, should be adjusted before (14B) Model 41-240, and should be done in the following manner. Turn 14A all the way up, then slowly turn down and select the first I. F. peak. Padder (14B) is now adjusted to maximum. This procedure applies also to Model 41-245; padder 26A should be adjusted before 26B receiver correctly, the dial must be aligned to track properly with the tuning condenser. **NOTE C** — Set pointer at 9.5 M. C. and adjust the second peak from right. Adjust padders (NOTE D) — Set pointer at 12 M. C. and adjust the second peak from right. (This gives the approximate correct setting of padders for next operation.) **(NOTE D)** — Tune in the 2nd signal peak from the right position. Padder 19 Model 240, 19A Model 245; then roll padder 6A Model 41-240, 5 Model 41-245, slowly to maximum on the first peak from right position.

**Replacement Parts — Model 41-245**

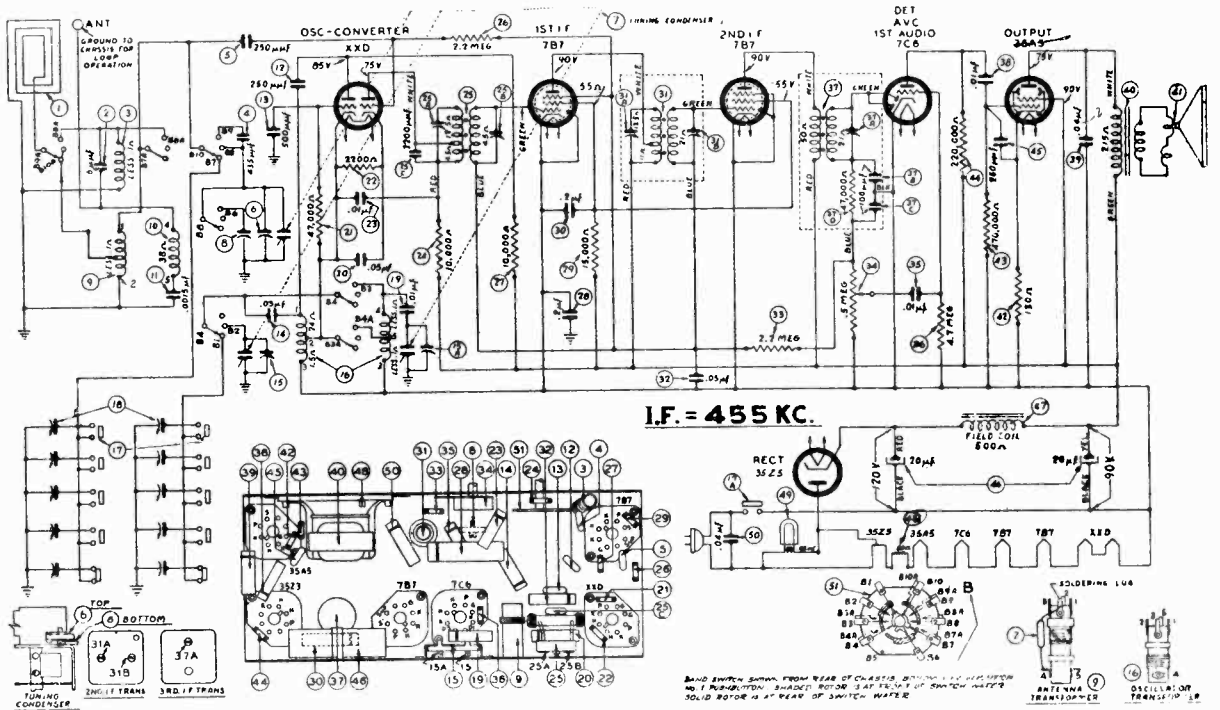
SCHE.	PART	DESCRIPTION
1	Loop Aerial	76, 1092
2	Mid Condenser	51, 522124
3	Tuning Condenser	51, 522124
4	Ant. Transformer (Outdoor Aerial Circuit)	21, 4268
5	Ant. Transformer (Indoor Aerial Circuit)	31, 4371
6	Compensator (Part 1, W)	31, 4371
7	Compensator (Part 2, W)	31, 4371
8	Mid Condenser (250 mmf., 200 volts)	33, 3482
9	Mid Condenser (250 mmf., 200 volts)	33, 3482
10	Mid Condenser (250 mmf., 200 volts)	33, 3482
11	Mid Condenser (250 mmf., 200 volts)	33, 3482
12	Mid Condenser (250 mmf., 200 volts)	33, 3482
13	Mid Condenser (250 mmf., 200 volts)	33, 3482
14	Mid Condenser (250 mmf., 200 volts)	33, 3482
15	Mid Condenser (250 mmf., 200 volts)	33, 3482
16	Mid Condenser (250 mmf., 200 volts)	33, 3482
17	Mid Condenser (250 mmf., 200 volts)	33, 3482
18	Mid Condenser (250 mmf., 200 volts)	33, 3482
19	Mid Condenser (250 mmf., 200 volts)	33, 3482
20	Mid Condenser (250 mmf., 200 volts)	33, 3482
21	Mid Condenser (250 mmf., 200 volts)	33, 3482
22	Mid Condenser (250 mmf., 200 volts)	33, 3482
23	Mid Condenser (250 mmf., 200 volts)	33, 3482
24	Mid Condenser (250 mmf., 200 volts)	33, 3482
25	Mid Condenser (250 mmf., 200 volts)	33, 3482
26	Mid Condenser (250 mmf., 200 volts)	33, 3482
27	Mid Condenser (250 mmf., 200 volts)	33, 3482
28	Mid Condenser (250 mmf., 200 volts)	33, 3482
29	Mid Condenser (250 mmf., 200 volts)	33, 3482
30	Mid Condenser (250 mmf., 200 volts)	33, 3482
31	Mid Condenser (250 mmf., 200 volts)	33, 3482
32	Mid Condenser (250 mmf., 200 volts)	33, 3482
33	Mid Condenser (250 mmf., 200 volts)	33, 3482
34	Mid Condenser (250 mmf., 200 volts)	33, 3482
35	Mid Condenser (250 mmf., 200 volts)	33, 3482
36	Mid Condenser (250 mmf., 200 volts)	33, 3482
37	Mid Condenser (250 mmf., 200 volts)	33, 3482
38	Mid Condenser (250 mmf., 200 volts)	33, 3482
39	Mid Condenser (250 mmf., 200 volts)	33, 3482
40	Mid Condenser (250 mmf., 200 volts)	33, 3482
41	Mid Condenser (250 mmf., 200 volts)	33, 3482
42	Mid Condenser (250 mmf., 200 volts)	33, 3482
43	Mid Condenser (250 mmf., 200 volts)	33, 3482
44	Mid Condenser (250 mmf., 200 volts)	33, 3482
45	Mid Condenser (250 mmf., 200 volts)	33, 3482
46	Mid Condenser (250 mmf., 200 volts)	33, 3482
47	Mid Condenser (250 mmf., 200 volts)	33, 3482
48	Mid Condenser (250 mmf., 200 volts)	33, 3482
49	Mid Condenser (250 mmf., 200 volts)	33, 3482
50	Mid Condenser (250 mmf., 200 volts)	33, 3482
51	Mid Condenser (250 mmf., 200 volts)	33, 3482
52	Mid Condenser (250 mmf., 200 volts)	33, 3482
53	Mid Condenser (250 mmf., 200 volts)	33, 3482
54	Mid Condenser (250 mmf., 200 volts)	33, 3482
55	Mid Condenser (250 mmf., 200 volts)	33, 3482
56	Mid Condenser (250 mmf., 200 volts)	33, 3482
57	Mid Condenser (250 mmf., 200 volts)	33, 3482
58	Mid Condenser (250 mmf., 200 volts)	33, 3482
59	Mid Condenser (250 mmf., 200 volts)	33, 3482

**Replacement Parts — Model 41-240**

SCHE.	PART	DESCRIPTION
1	Loop Aerial	76, 1092
2	Mid Condenser	51, 522124
3	Tuning Condenser	51, 522124
4	Ant. Transformer (Outdoor Aerial Circuit)	21, 4268
5	Ant. Transformer (Indoor Aerial Circuit)	31, 4371
6	Compensator (Part 1, W)	31, 4371
7	Compensator (Part 2, W)	31, 4371
8	Mid Condenser (250 mmf., 200 volts)	33, 3482
9	Mid Condenser (250 mmf., 200 volts)	33, 3482
10	Mid Condenser (250 mmf., 200 volts)	33, 3482
11	Mid Condenser (250 mmf., 200 volts)	33, 3482
12	Mid Condenser (250 mmf., 200 volts)	33, 3482
13	Mid Condenser (250 mmf., 200 volts)	33, 3482
14	Mid Condenser (250 mmf., 200 volts)	33, 3482
15	Mid Condenser (250 mmf., 200 volts)	33, 3482
16	Mid Condenser (250 mmf., 200 volts)	33, 3482
17	Mid Condenser (250 mmf., 200 volts)	33, 3482
18	Mid Condenser (250 mmf., 200 volts)	33, 3482
19	Mid Condenser (250 mmf., 200 volts)	33, 3482
20	Mid Condenser (250 mmf., 200 volts)	33, 3482
21	Mid Condenser (250 mmf., 200 volts)	33, 3482
22	Mid Condenser (250 mmf., 200 volts)	33, 3482
23	Mid Condenser (250 mmf., 200 volts)	33, 3482
24	Mid Condenser (250 mmf., 200 volts)	33, 3482
25	Mid Condenser (250 mmf., 200 volts)	33, 3482
26	Mid Condenser (250 mmf., 200 volts)	33, 3482
27	Mid Condenser (250 mmf., 200 volts)	33, 3482
28	Mid Condenser (250 mmf., 200 volts)	33, 3482
29	Mid Condenser (250 mmf., 200 volts)	33, 3482
30	Mid Condenser (250 mmf., 200 volts)	33, 3482
31	Mid Condenser (250 mmf., 200 volts)	33, 3482
32	Mid Condenser (250 mmf., 200 volts)	33, 3482
33	Mid Condenser (250 mmf., 200 volts)	33, 3482
34	Mid Condenser (250 mmf., 200 volts)	33, 3482
35	Mid Condenser (250 mmf., 200 volts)	33, 3482
36	Mid Condenser (250 mmf., 200 volts)	33, 3482
37	Mid Condenser (250 mmf., 200 volts)	33, 3482
38	Mid Condenser (250 mmf., 200 volts)	33, 3482
39	Mid Condenser (250 mmf., 200 volts)	33, 3482
40	Mid Condenser (250 mmf., 200 volts)	33, 3482
41	Mid Condenser (250 mmf., 200 volts)	33, 3482
42	Mid Condenser (250 mmf., 200 volts)	33, 3482
43	Mid Condenser (250 mmf., 200 volts)	33, 3482
44	Mid Condenser (250 mmf., 200 volts)	33, 3482
45	Mid Condenser (250 mmf., 200 volts)	33, 3482
46	Mid Condenser (250 mmf., 200 volts)	33, 3482
47	Mid Condenser (250 mmf., 200 volts)	33, 3482
48	Mid Condenser (250 mmf., 200 volts)	33, 3482
49	Mid Condenser (250 mmf., 200 volts)	33, 3482
50	Mid Condenser (250 mmf., 200 volts)	33, 3482
51	Mid Condenser (250 mmf., 200 volts)	33, 3482
52	Mid Condenser (250 mmf., 200 volts)	33, 3482
53	Mid Condenser (250 mmf., 200 volts)	33, 3482
54	Mid Condenser (250 mmf., 200 volts)	33, 3482
55	Mid Condenser (250 mmf., 200 volts)	33, 3482
56	Mid Condenser (250 mmf., 200 volts)	33, 3482
57	Mid Condenser (250 mmf., 200 volts)	33, 3482
58	Mid Condenser (250 mmf., 200 volts)	33, 3482
59	Mid Condenser (250 mmf., 200 volts)	33, 3482

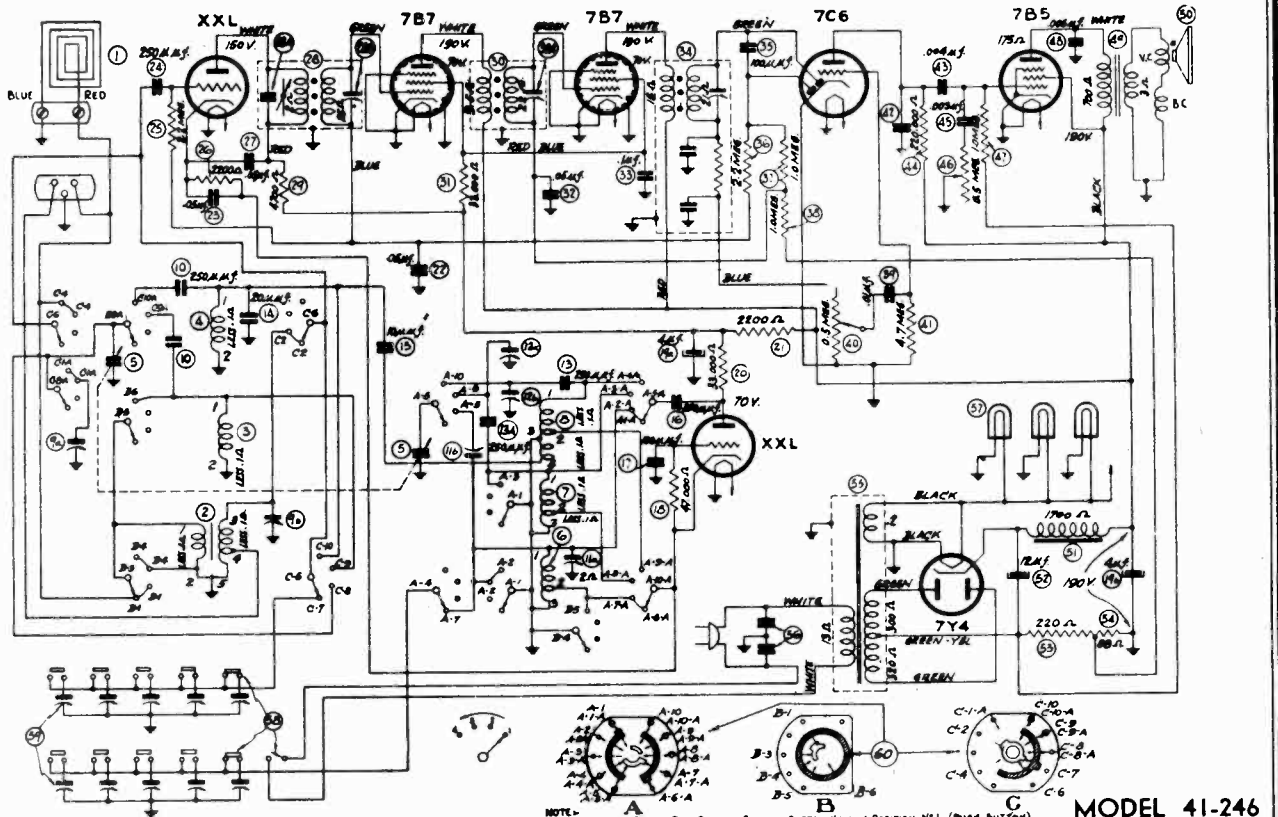
PHILCO RADIO & TELEVISION CORP.

MODELS 41-231, 41-246 (121)



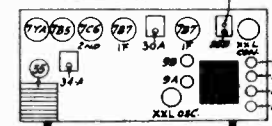
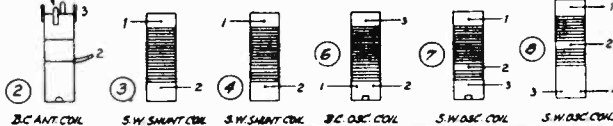
DECEMBER, 1940

**SCHEMATIC DIAGRAM MODEL 41-231 FOR ALIGNMENT SEE INDEX FOR OTHER DATA SEE INDEX**



**MODEL 41-246**

DECEMBER, 1940



MODELS 41-250  
41-255

PHILCO RADIO & TELEVISION CORP.

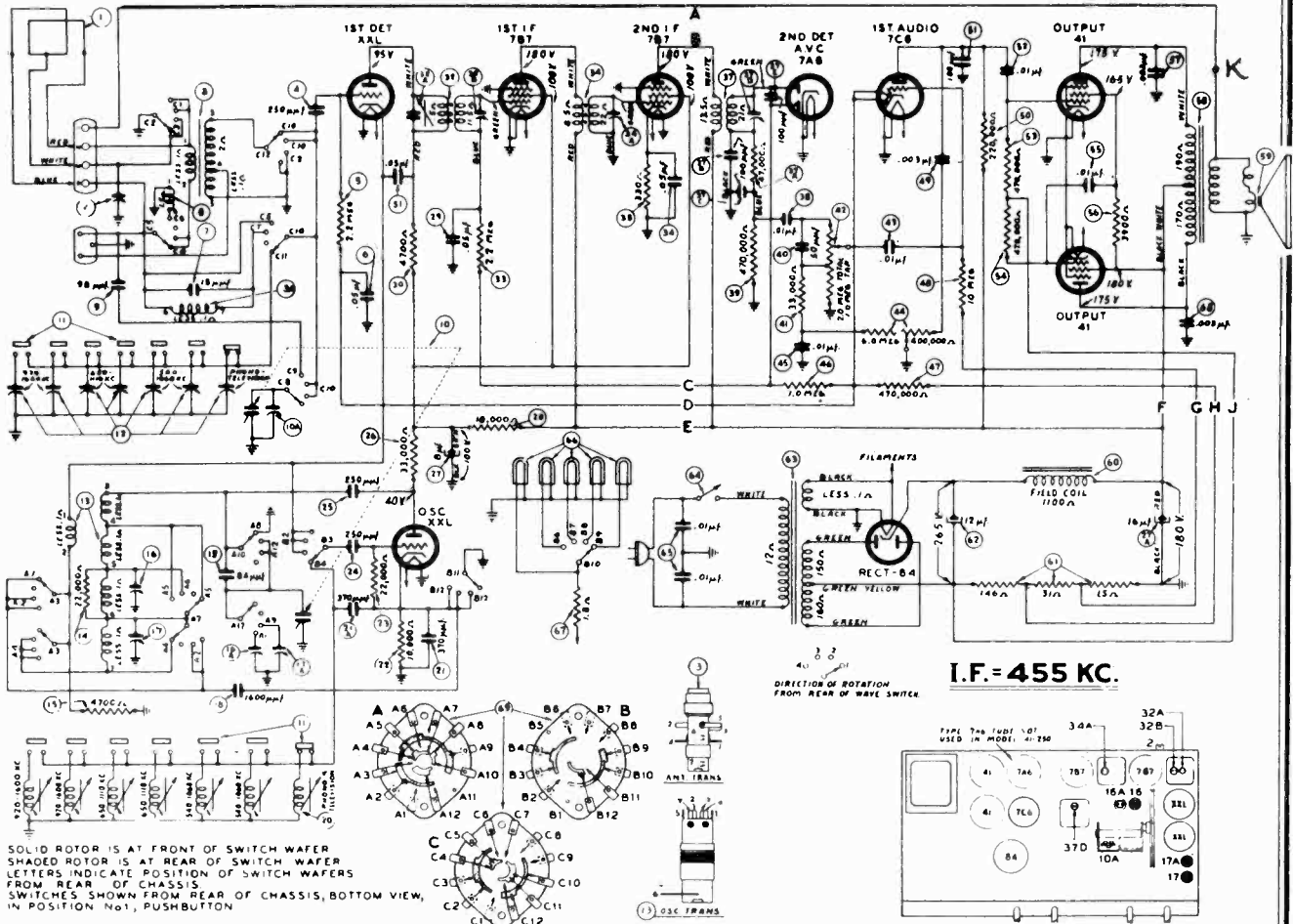


FIG. 1 — SCHEMATIC DIAGRAM — MODELS 41-250, 41-255

The above diagram is the complete electrical circuit for Model 41-255. The same general circuit is also used in Model 41-250 with the exception of the 2nd detector, 1st audio, A. V. C. wiring which is shown in Fig. 4.

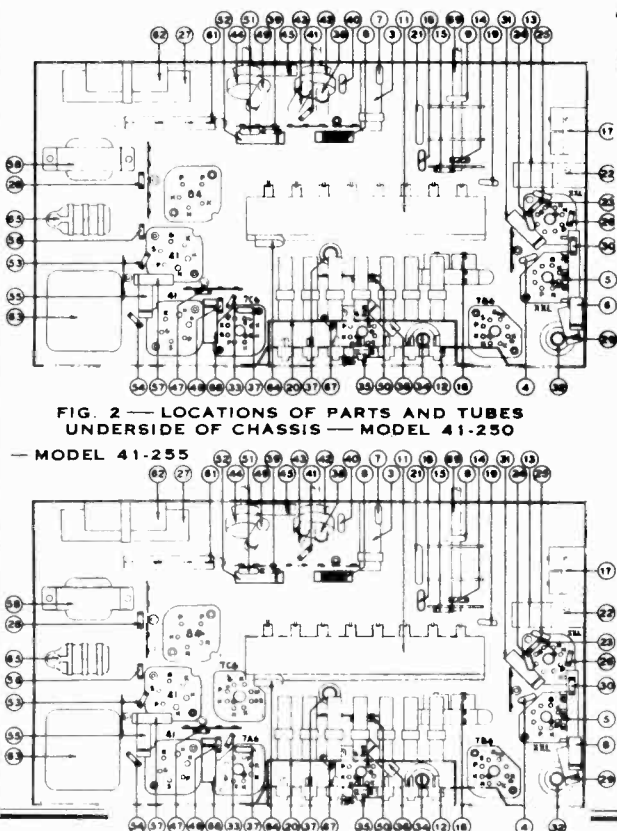


FIG. 2 — LOCATIONS OF PARTS AND TUBES  
UNDERSIDE OF CHASSIS — MODEL 41-250

— MODEL 41-255

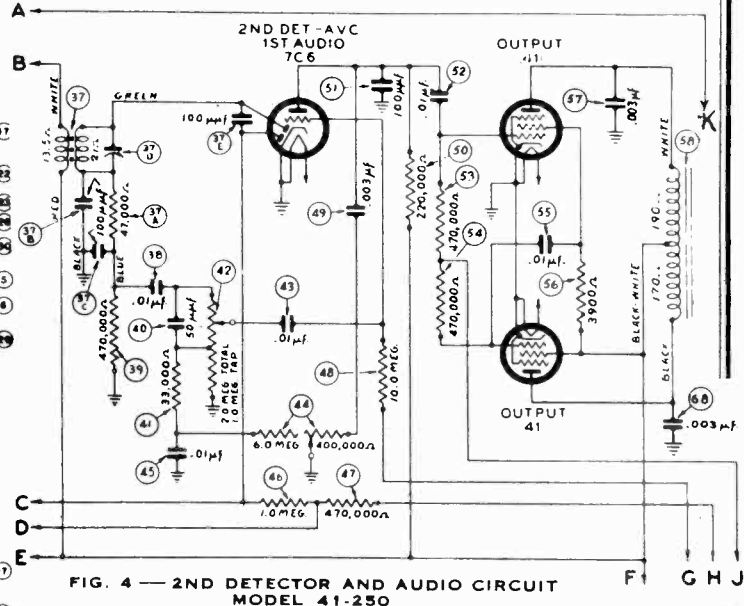
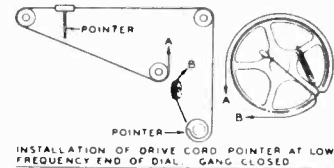


FIG. 4 — 2ND DETECTOR AND AUDIO CIRCUIT  
MODEL 41-250

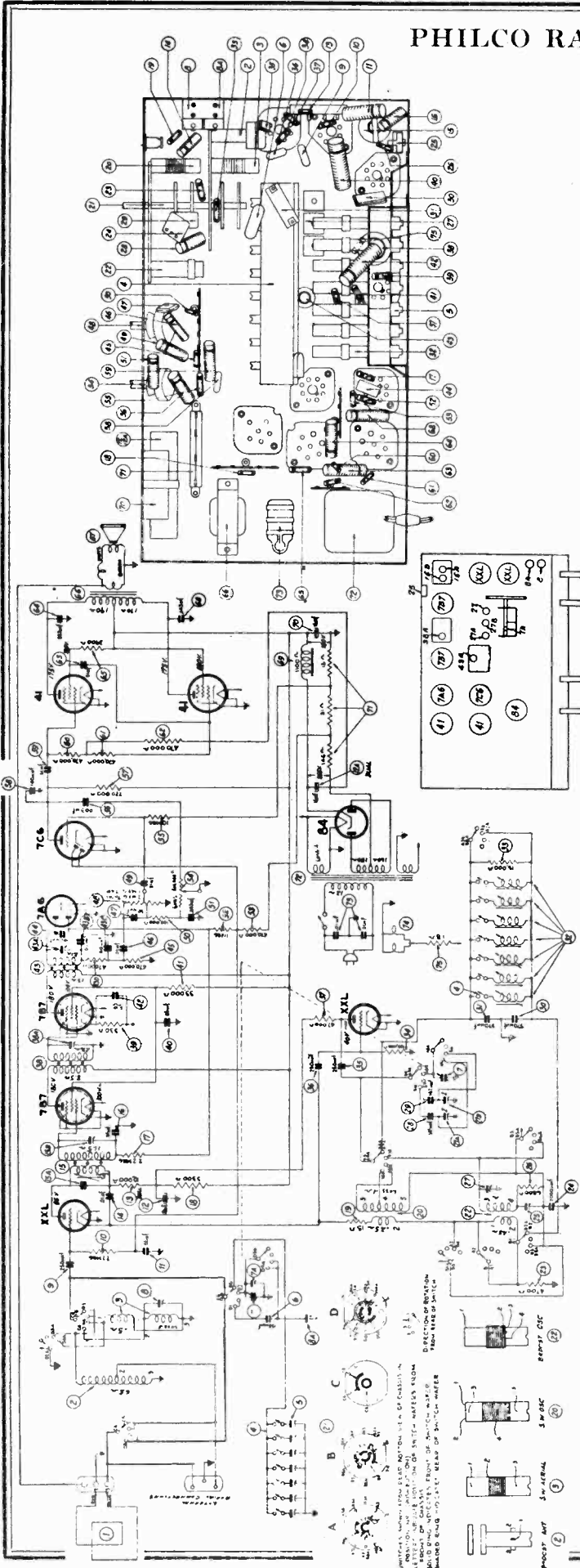
FOR ALIGNMENT  
AND TUNER  
SEE INDEX

JUNE, 1940



PHILCO RADIO & TELEVISION CORP.

MODEL 41-256  
(121)



FOR TUNER  
SEE INDEX

NOVEMBER, 1940

SPECIAL INSTRUCTIONS

Adjust Compensators in Order

15A, 15B  
38A, 43A  
27, 7A  
25  
Roll Tuning Condensers

Note A  
Note B

RECEIVER

Control Settings

Vol. Max. Range Switch "S. W." Positions  
Vol. Max. Range Switch Broadcast  
Vol. Max. Range Switch Broadcast

Perform operation No. 2 again

Range Switch "SW-1"

Range Switch "SW-2"

compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.  
NOTE C—Adjust compensator (27B) to first peak from closed position (maximum capacity). The aerial compensator (8A) must also be adjusted to maximum on the second signal peak by rolling the tuning condenser (See Note B).  
NOTE D—Adjust compensator (27A) to the second signal peak from the closed position (maximum capacity). The aerial compensator (8) must also be adjusted to maximum on the first signal peak by rolling the tuning condenser (See Note B).

SIGNAL GENERATOR

Output Connections to Receiver

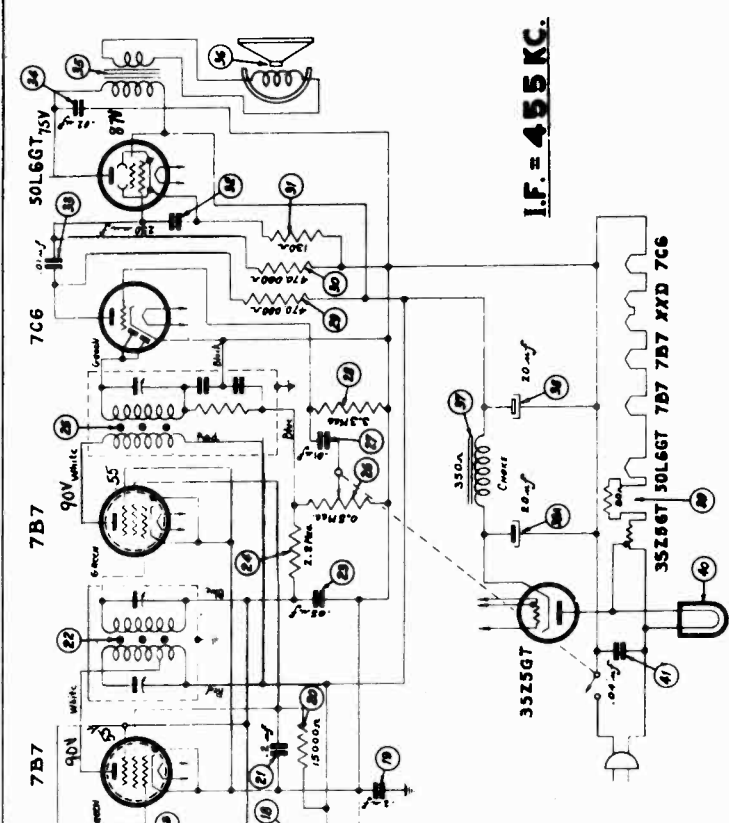
High side to No. 3 terminal loop panel  
Use loop on generator  
Use loop on generator  
Use loop on generator  
Use loop on generator  
Use loop on generator

Dial Setting

455 K. C.  
1500 K. C.  
580 K. C.  
12 M. C.  
18 M. C.

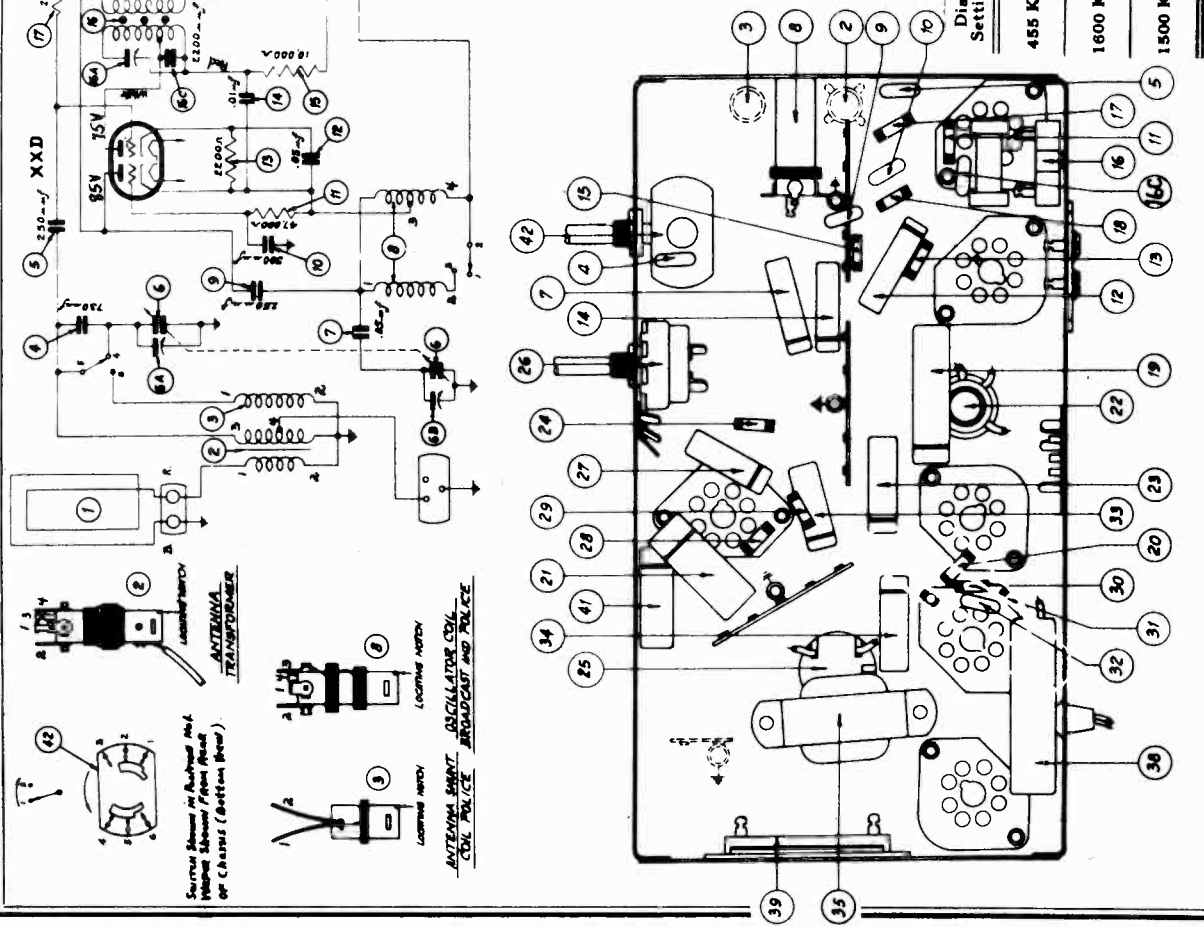
NOTE A—DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic.  
NOTE B—When adjusting the low frequency compensator of the Broadcast or the aerial paddlers of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First, tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the

MODEL 41-258 (122) PHILCO RADIO & TELEVISION CORP.



SCHEMATIC DIAGRAM — MODEL 41-258, CODE 122

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.



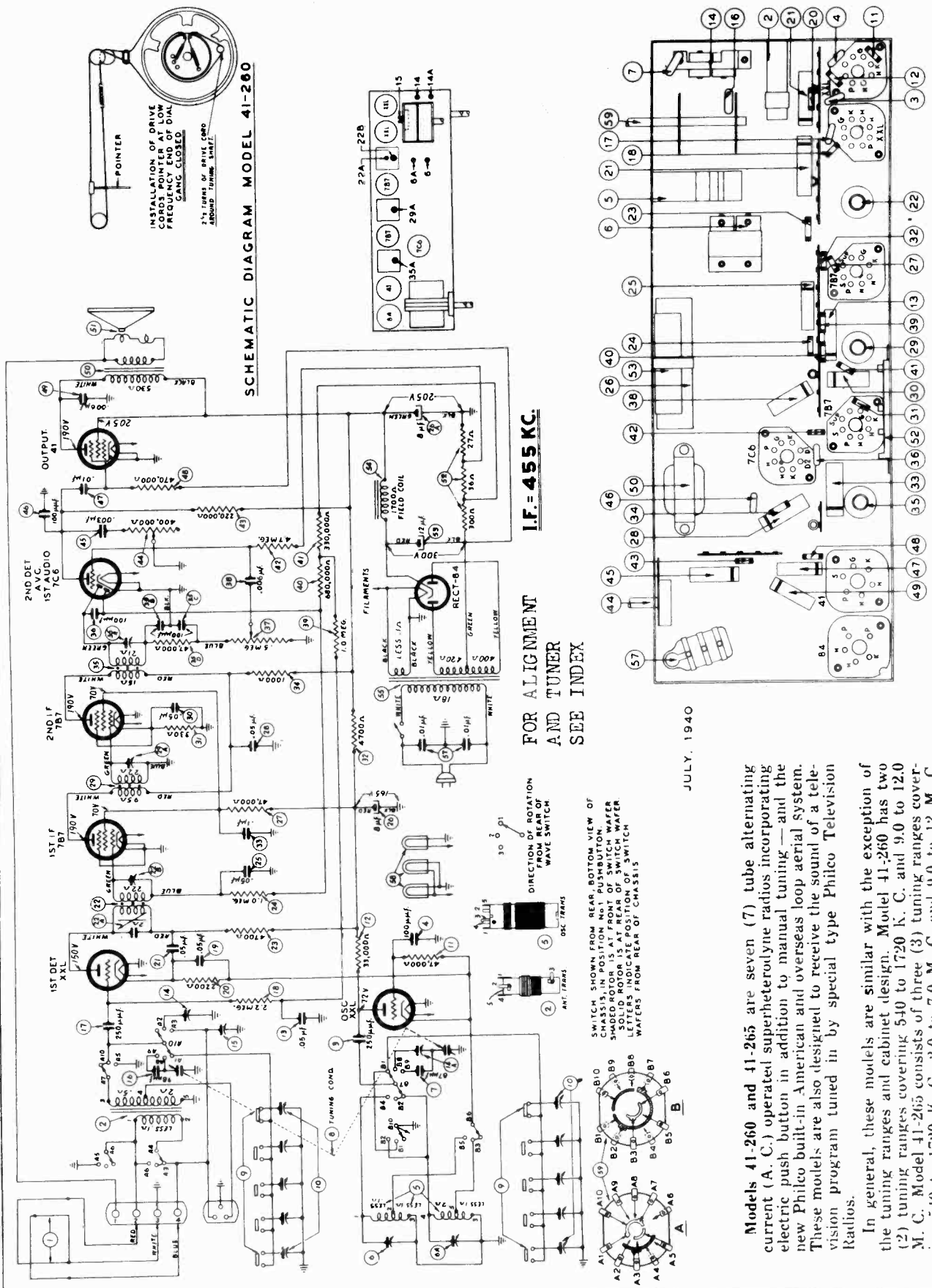
RECEIVER		SPECIAL INSTRUCTIONS	
Dial Setting	Control Settings	Adjust Compensators in order	
455 K. C.	Vol Max. Range Switch Brdcat. Closed	16A, 16B, 22A, 22B, 25A	Note A
1600 K. C.	Vol Max. Range Switch Brdcat.	Tuning Condenser	Note B
1500 K. C.	Vol Max. Range Switch Brdcat.	Tuning Condenser	

**NOTE A — DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 55 on the dial.

**NOTE B:** The police band padding is automatically adjusted by the standard broadcast padders.

AUGUST, 1940.

PHILCO RADIO & TELEVISION CORP.



MODEL 41-260 — PART LOCATIONS, UNDERSIDE OF CHASSIS

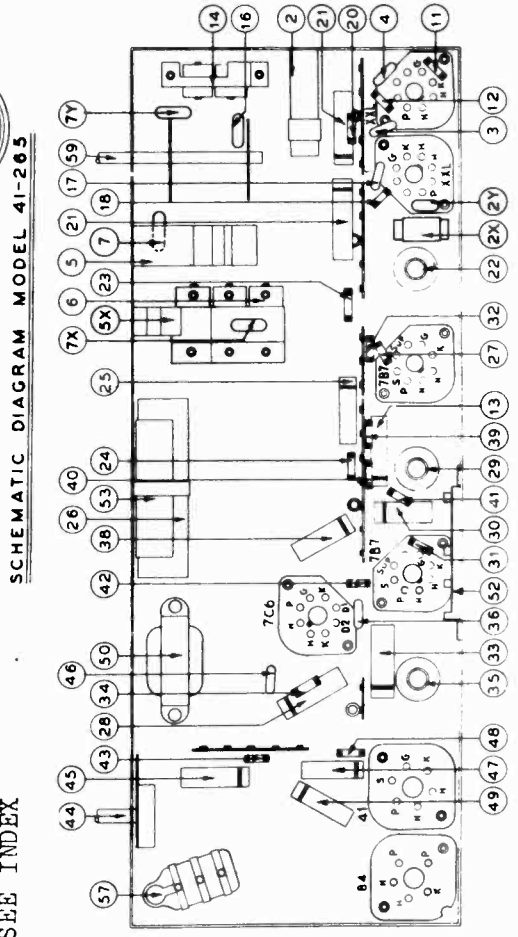
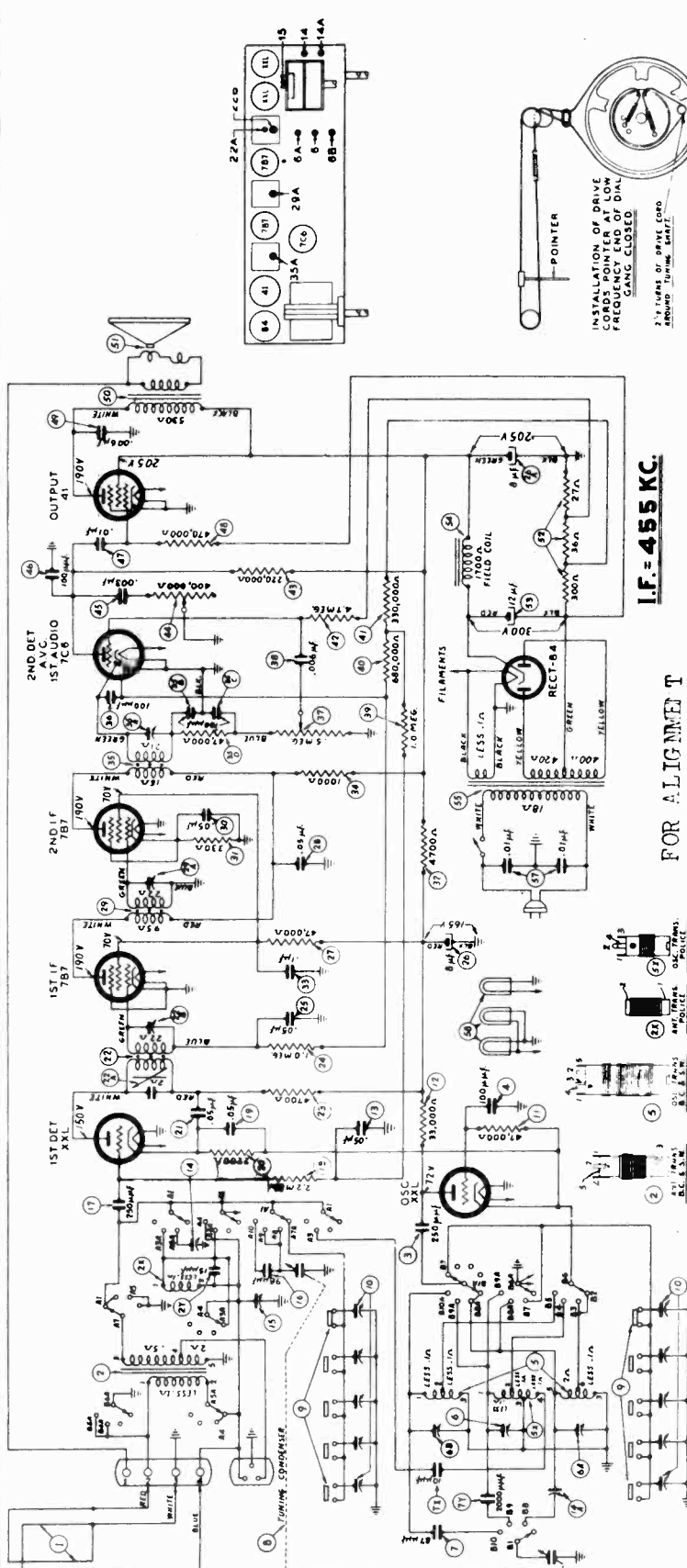
JULY, 1940

Models 41-260 and 41-265 are seven (7) tube alternating current (A. C.) operated superheterodyne radios incorporating electric push button in addition to manual tuning — and the new Philco built-in American and overseas loop aerial system. These models are also designed to receive the sound of a television program tuned in by special type Philco Television Radios.

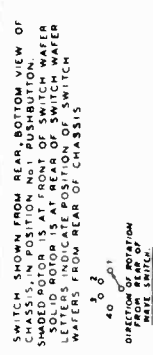
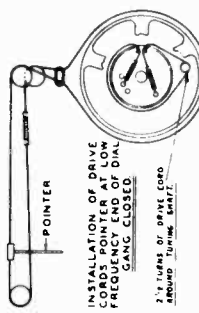
In general, these models are similar with the exception of the tuning ranges and cabinet design. Model 41-260 has two (2) tuning ranges covering 540 to 1720 K. C. and 9.0 to 12.0 M. C. Model 41-265 consists of three (3) tuning ranges covering 540 to 1720 K. C., 2.0 to 7.0 M. C. and 9.0 to 12 M. C.

MODEL 41-265

PHILCO RADIO & TELEVISION CORP.



MODEL 41-265 — PART LOCATIONS, UNDERSIDE OF CHASSIS



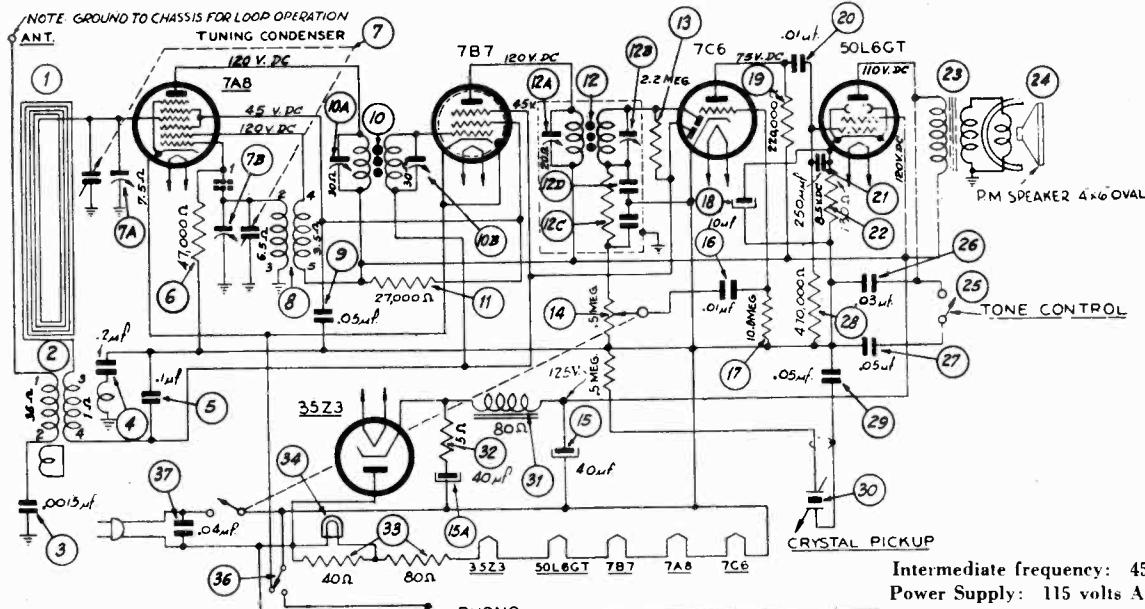
**AERIAL CONNECTIONS:** The built-in loop aerial system is designed to operate without an outside aerial or ground, and to give exceptionally high receiving performance of stations on standard and shortwave frequencies. Another feature is its noise-reducing characteristic. The loop can be turned to the position in which it picks up a minimum amount of interference, or to the position where best reception is obtained.

To operate the radio in steel reinforced buildings and other shielded locations, where signal strength is weak, the Philco 1941 Outdoor Aerial, Part No. 45-2817, is recommended for maximum receiving performance. The outdoor aerial can be easily connected to the radio by inserting the plug attached to the transformer unit into the socket provided at the rear of the Radio chassis. This aerial can be obtained from your local Philco distributor. A ground connection is not required with either type of installation.

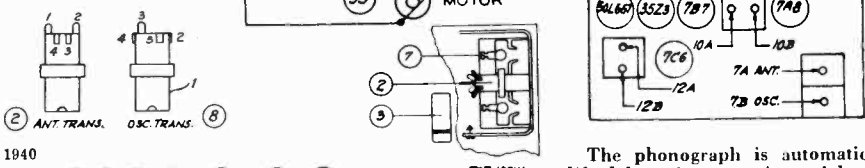




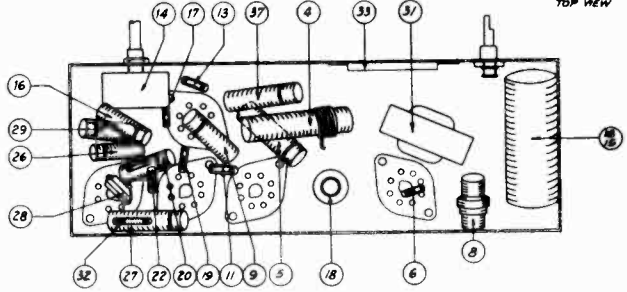
SCHMATIC DIAGRAM — MODEL 41-601, CODE 121



Intermediate frequency: 455 K.C.  
Power Supply: 115 volts A.C.



DECEMBER, 1940



The phonograph is automatically started when the pickup is lifted from its rest. A special switch operated by the pickup rest, applies power to the phonograph motor and opens the cathode circuit of the radio. The sound output of the radio and phonograph is controlled by a new type dual volume control which also operates the power switch.

When aligning the R.F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments adjust the compensators as shown in the tabulation below. Locations are shown on Schematic.

If the indicating meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

**SIGNAL GENERATOR:** When adjusting the I.F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K.C.	540 K.C. Tuning Cond. Closed	Vol. Max. Range Switch Brdest.	12A, 12B, 10A, 10B	Note B
2	Loop see above instructions	1600 K.C.	1600 K.C.	Vol. Max. Range Switch Brdest.	(7B, Note C)	Note A
3	Loop see above instructions	1500 K.C.	1500 K.C.	Vol. Max. Range Switch Brdest.	(7A, Note D)	

**NOTE A: DIAL POINTER CALIBRATION**—In order to adjust the receiver correctly, the pointer must be adjusted to track properly with the tuning condenser. To do this, turn the tuning condenser to the maximum capacity (plates fully meshed). With the condenser in this position, set the tuning pointer on the first small line stamped in the scale plate on the left side.

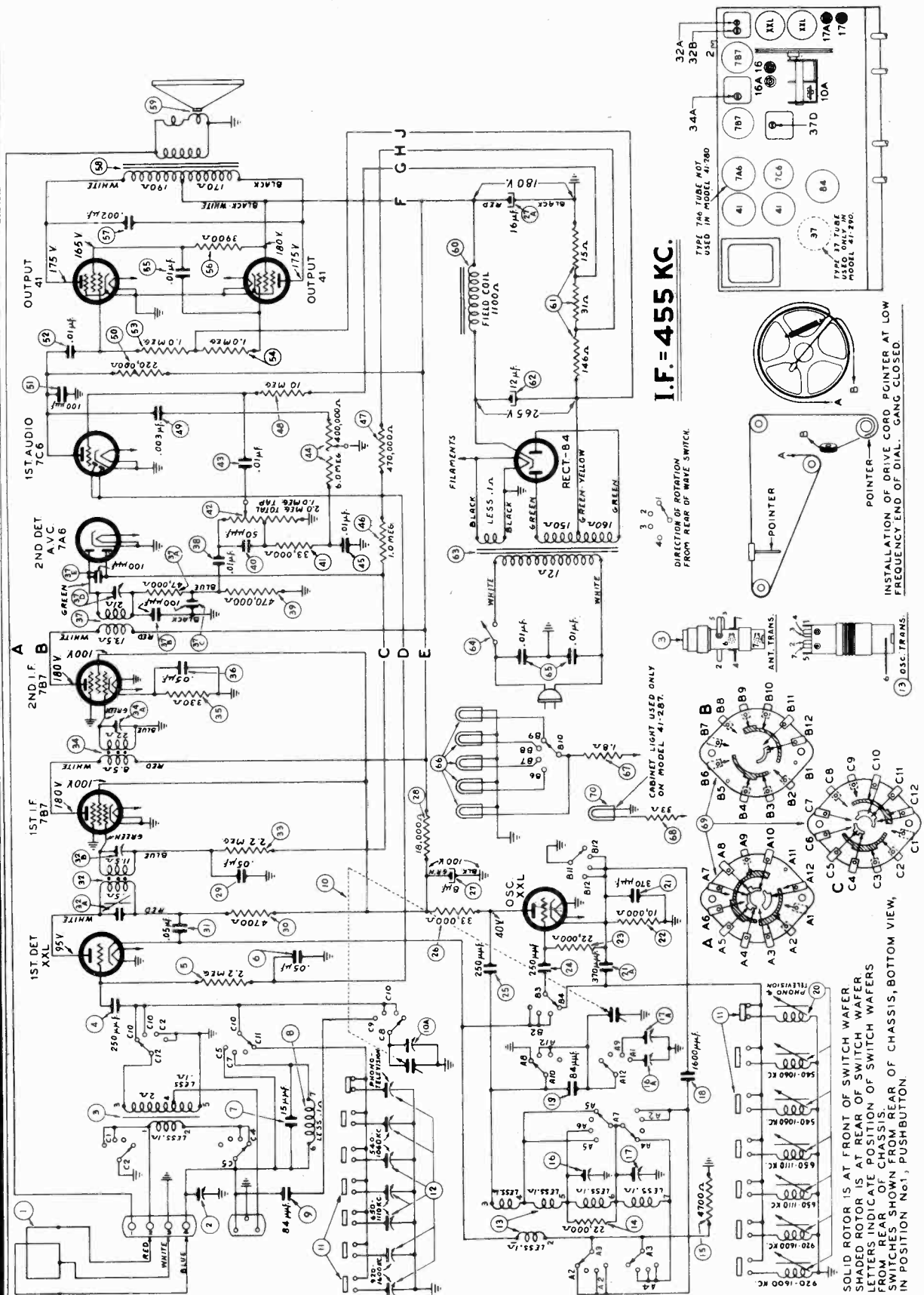
**NOTE B**—Before adjusting compensators, turn down (10B) to tight position. Then adjust the compensators for maximum output in the following order: 12A, 12B, 10A and 10B.

**NOTE C**—Turn tuning condenser until dial pointer is on the first small line stamped in the scale plate from right side of chassis. Adjust padder (7B) to maximum at this point. If the radio is adjusted in the cabinet, set dial pointer to 1600 K.C.

**NOTE D**—Turn tuning condenser until dial pointer is on the second small line stamped in the scale plate from right side of chassis. Adjust padder (7A) to maximum at this point.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-280, 41-285, 41-287, 41-290 (121)

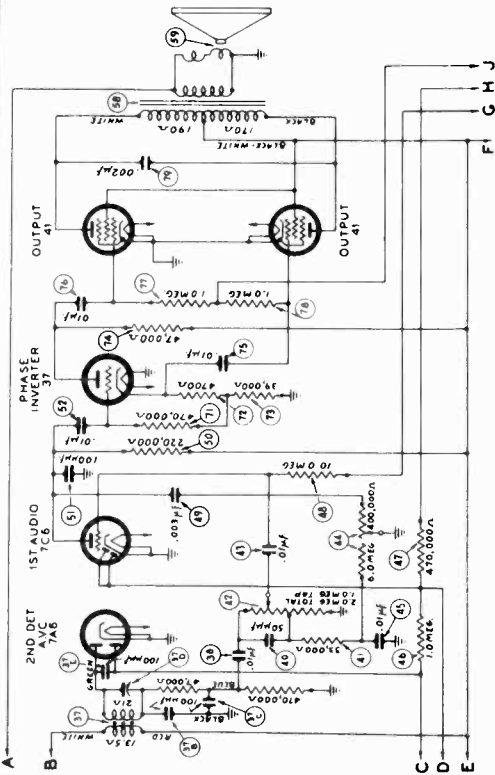


I.F. = 455 KC.

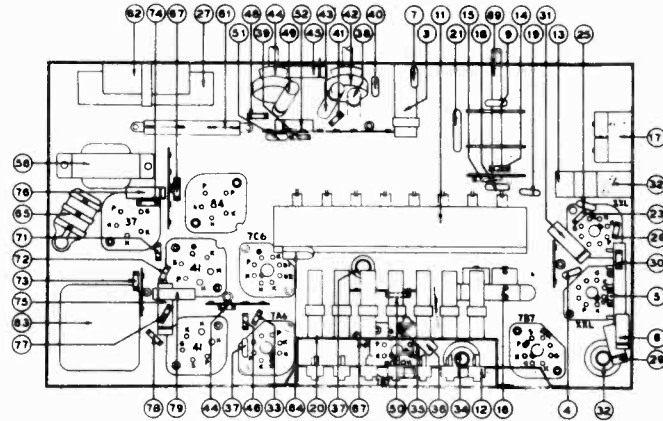
SCHEMATIC DIAGRAM — MODELS 41-280, 41-285, 41-287, 41-290

The above diagram is the complete electrical circuit for the Models 41-285, 41-287. The same general circuit is also used in Models 41-280 and 41-290, with the exception of the 2nd detector, 1st audio A. V. C. wiring, Model 41-280 and the audio circuit, Model 41-290.

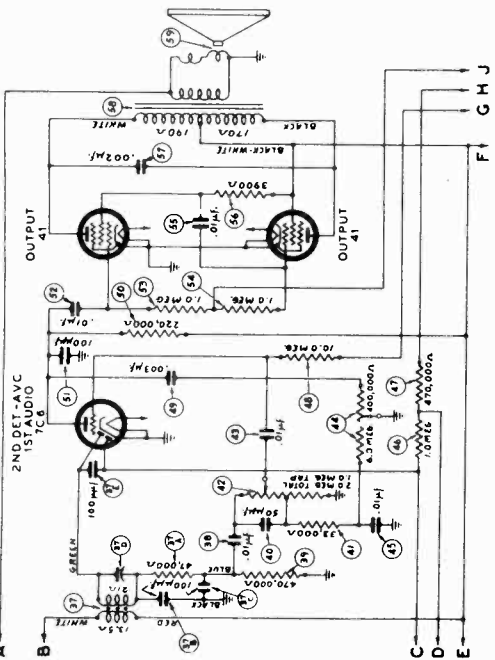
MODELS 41-280, 41-285  
41-287, 41-290 PHILCO RADIO & TELEVISION CORP.



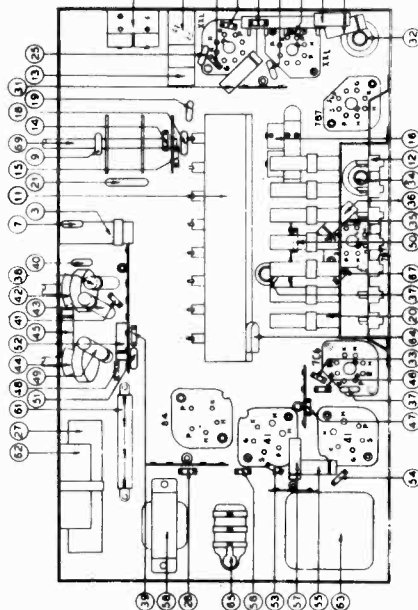
AUDIO CIRCUIT — MODEL 41-290



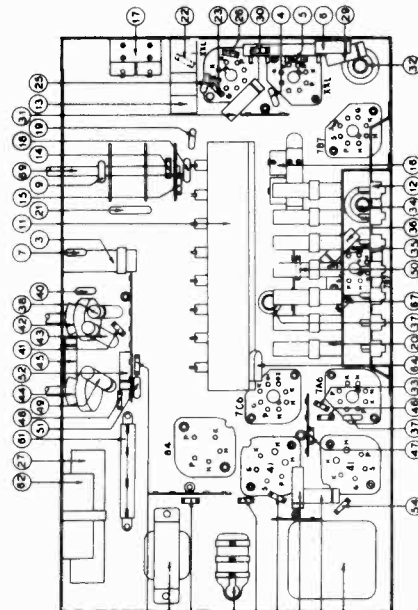
PART LOCATIONS UNDERSIDE — MODEL 41-290



SECOND DETECTOR CIRCUIT — MODEL 41-280



PART LOCATIONS UNDERSIDE — MODEL 41-280



PART LOCATIONS UNDERSIDE — MODELS 41-285-287

FOR ALIGNMENT  
AND TUNER  
SEE INDEX

In general, these models are similar with the exception of the audio circuits, number of tubes used and cabinet design. Model 41-280 is an eight (8) tube radio; Models 41-285 and 41-287 are nine (9) tube radios employing the same chassis but assembled in different cabinets, and Model 41-290 consists of a ten (10) tube chassis. These differences are shown in the schematic diagram and parts lists.

Other features of design included in these models are: Three tuning ranges covering the frequencies listed below; continuously variable tone control; audio bass frequency compensation at low volume; push-pull pentode audio output circuit with screen phase inverter; New Type (12) twelve inch speaker and illuminated push button indicators.

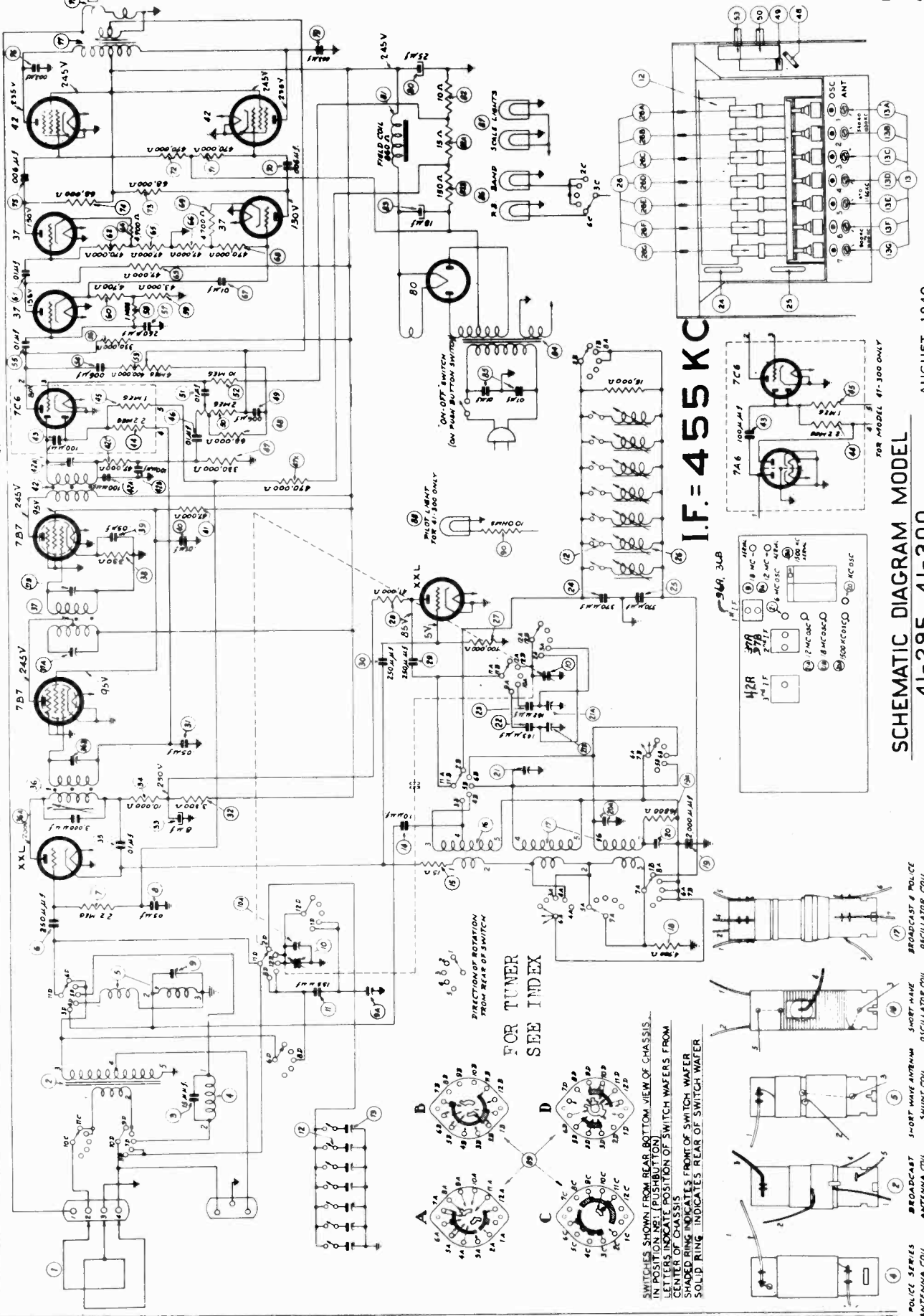
POWER CONSUMPTION: Model 41-280, 41-285-287, 41-290, 60 watts.

FREQUENCY TUNING RANGES: 540 to 1720 K. C.; 2.3 to 7.0 M. C.; 9.0 to 12.0 M. C.

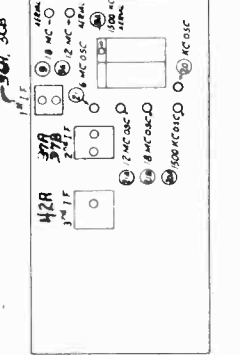
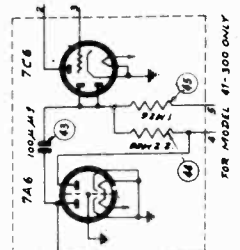
PHILCO RADIO & TELEVISION CORP.

MODEL 41-295  
41-300

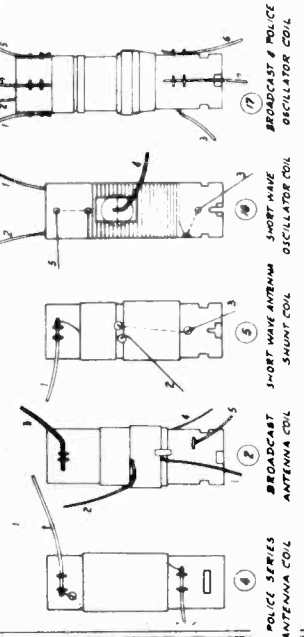
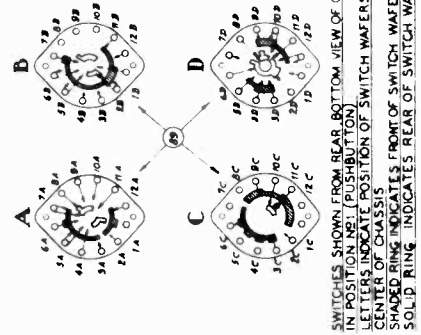
PORTION WITHIN DOTTED LINE  
FOR 41-295 ONLY  
SEE INSERT FOR 41-300



I.F. = 455 KC



FOR TUNER  
SEE INDEX



SCHEMATIC DIAGRAM MODEL  
41-295, 41-300

AUGUST, 1940

MODELS 41-295  
41-300

PHILCO RADIO & TELEVISION CORP.

Either a vacuum tube voltmeter or an audio output meter may be used as a signal indicator when adjusting the receiver.

**Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (-) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

**Audio Output Meter:** Terminal No. 1 is provided on the loop aerial panel for connecting one lead of the audio output meter to the voice coil of the speaker. The other lead of the meter is connected to the chassis. When using these connections, the lowest A. C. scale of the meter must be used. (0 to 10 volts).

The audio output meter can also be connected between the plate of the output tube and the ground of the chassis.

**Signal Generator:** When adjusting the "I. F." padders, the high side of the signal generator is connected through a .1 mfd. condenser to terminal 4 of the loop aerial terminal panel at the rear of the chassis. The ground or low side of the signal generator is connected to the ground of the receiver.

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the loop is then placed two or three feet from the loop in the cabinet. Do not remove the receiving loop from the cabinet. It is necessary when adjusting the padders, that the receiver be left in the cabinet.

After connecting the aligning indicator, adjust the compensators in the order shown in the tabulation below. Locations of the compensators are shown on the schematic diagram. If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	High Side to No. 4 Terminal Loop Panel	455 K. C.	580 K. C.	Vol. Max. Range Switch "S.W.1" Position	36A, 36B, 37A, 37B, 42A	
2	Use Loop on Generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch "Brdcst"	20A, 10A	Note A
3	Use Loop on Generator	580 K. C.	580 K. C.	Vol. Max. Range Switch "Brdcst"	20	Roll Tuning Condenser Note B
4	Use Loop on Generator	Repeat Operation No. 2				
5	Use Loop on Generator	6 M. C.	6 M. C.	Range Switch "Police"	21	Note C
6	Use Loop on Generator	12 M. C.	12 M. C.	Range Switch "S. W. 1"	21A, 9A	Note D
7	Use Loop on Generator	18 M. C.	18 M. C.	Range Switch "S. W. 2"	21B, 9	Note E

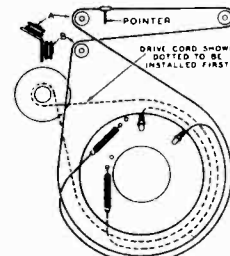
**NOTE A — DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic.

**NOTE B —** When adjusting the compensator the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

**NOTE C —** Adjust compensator (21) to the Second signal peak from the tight (closed) position. The tuning condenser should also be Rolled when the padder is being adjusted on this peak. See Note B on how to Roll the Condenser.

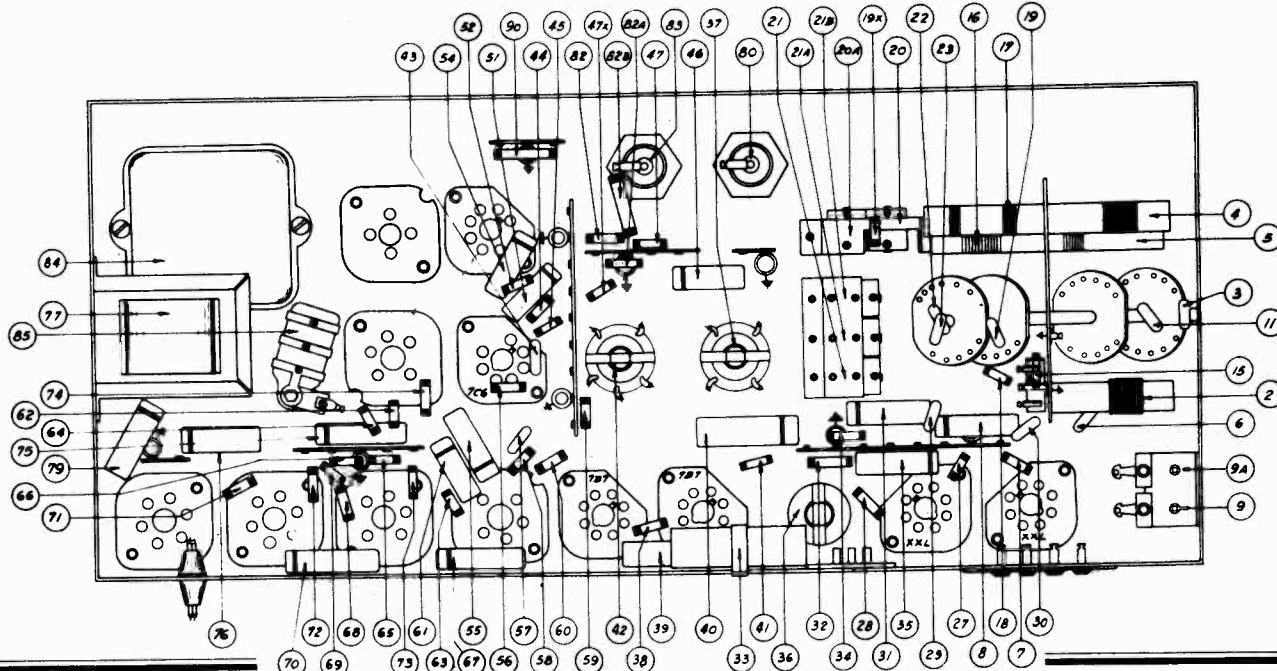
**NOTE D —** Adjust compensator (21A) to the First signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver dial at 12 M. C. and turning the signal generator to 11.090 M. C.

**NOTE E —** Adjust compensator (21B) to the Second signal peak from the tight (closed) position. If the compensator is correctly adjusted the image signal will be weakly heard by leaving the receiver at 18 M. C. and turning the signal generator to 18.910 M. C. When adjusting compensator (9) roll the tuning condenser. See Note B on how to roll the condenser.



(POINTER AT LOW FREQUENCY END OF DIAL) TUNING CONDENSER MAXIMUM CAPACITY (FULLY CLOSED)

INSTALLATION OF DRIVE CORD



PHILCO RADIO & TELEVISION CORP.

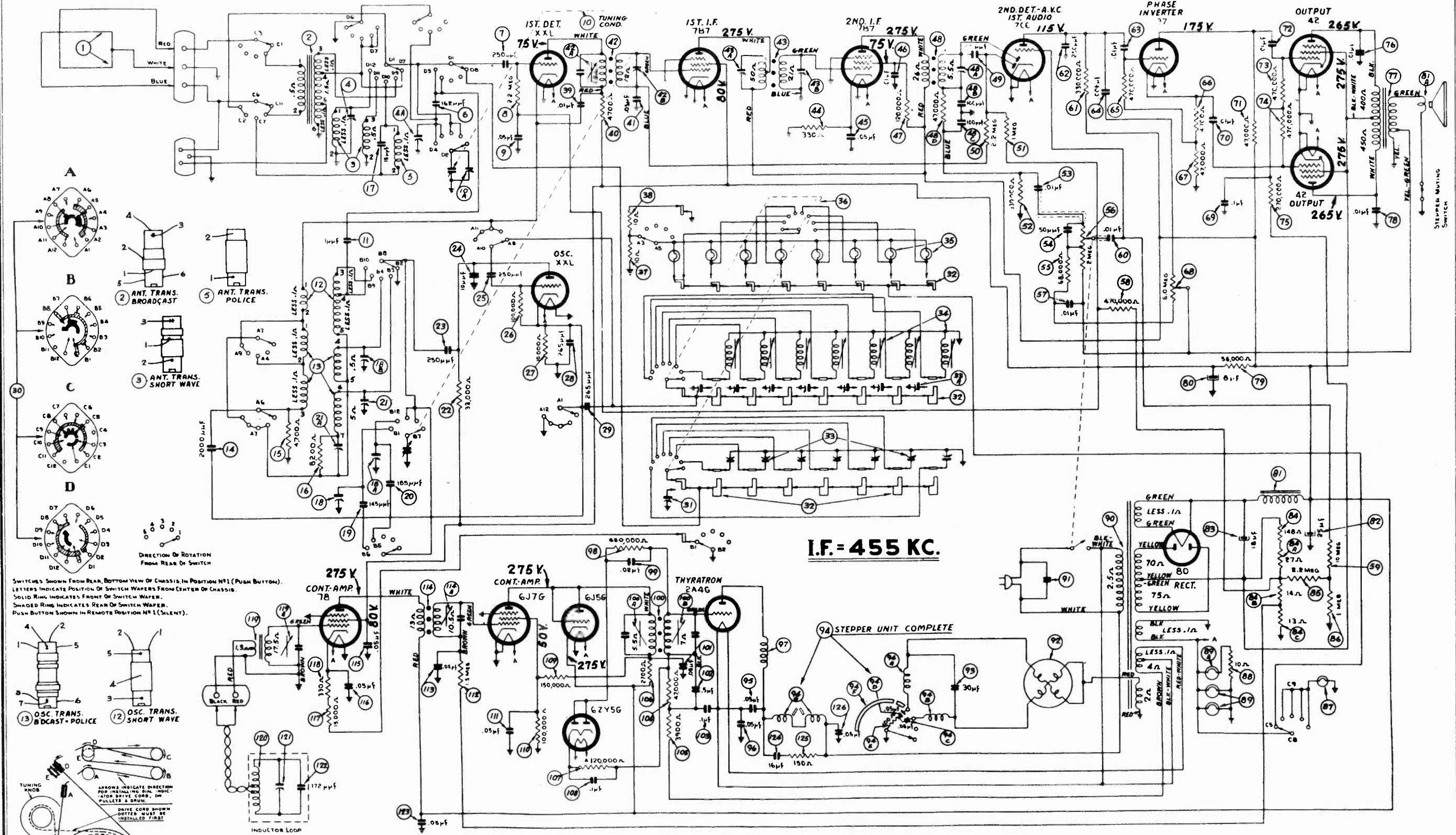


FIG. 5. SCHEMATIC DIAGRAM—MODEL 41-316. CODE 121

THE VOLTAGES INDICATED AT THE TUBE ELEMENTS ABOVE WERE MEASURED WITH A 1000 OHMS PER VOLT VOLTMETER. PHILCO MODEL O27. LINE VOLTAGE 118 VOLTS. A. C. BAND SWITCH (BROADCAST), NO STATION BEING RECEIVED.

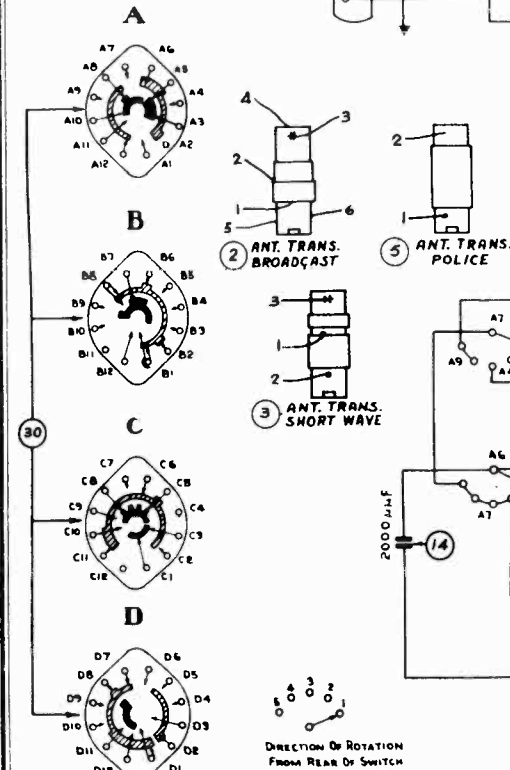
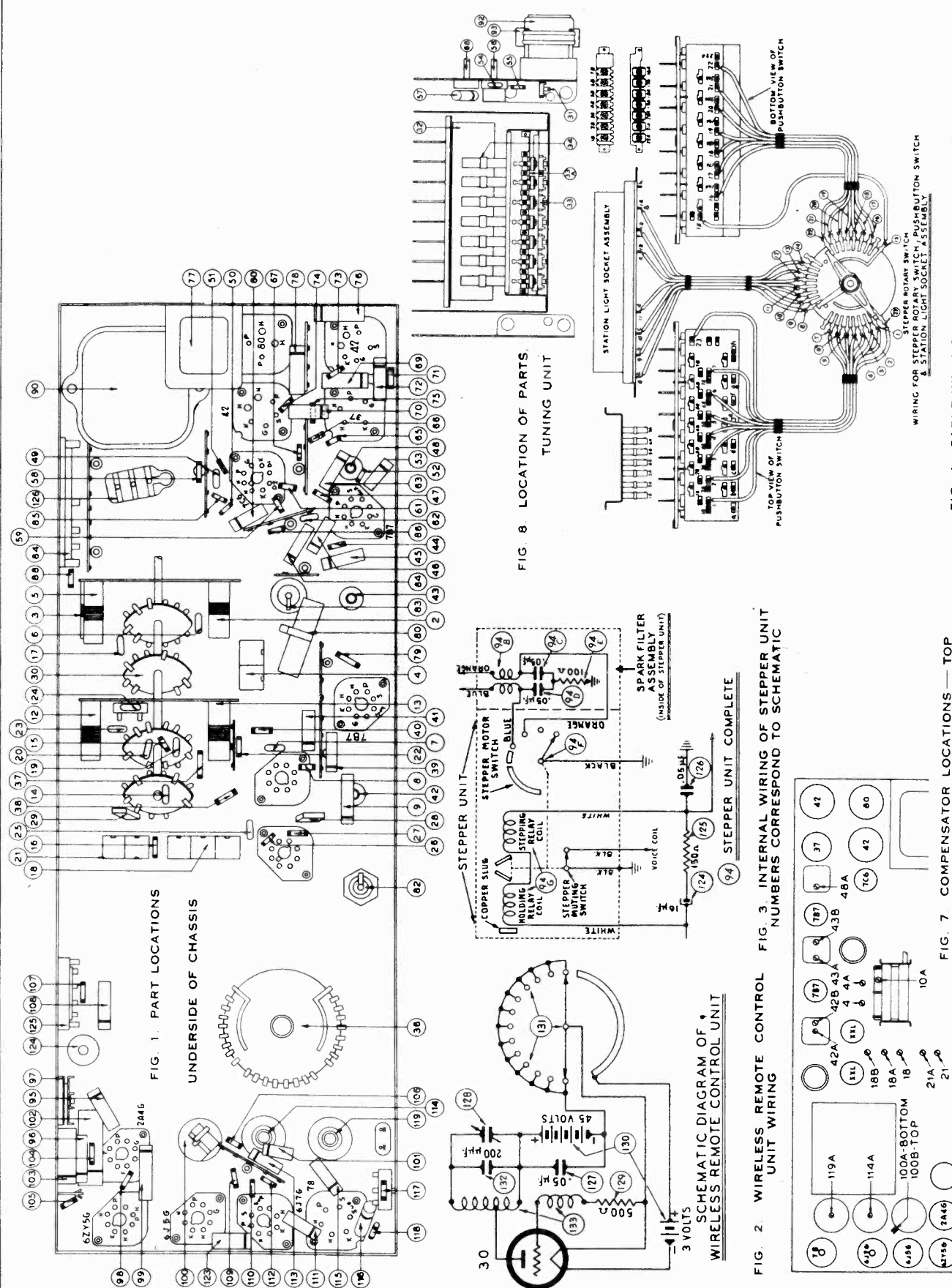


FIG. 6. DIAL POINTER AND CABLE ARRANGEMENT

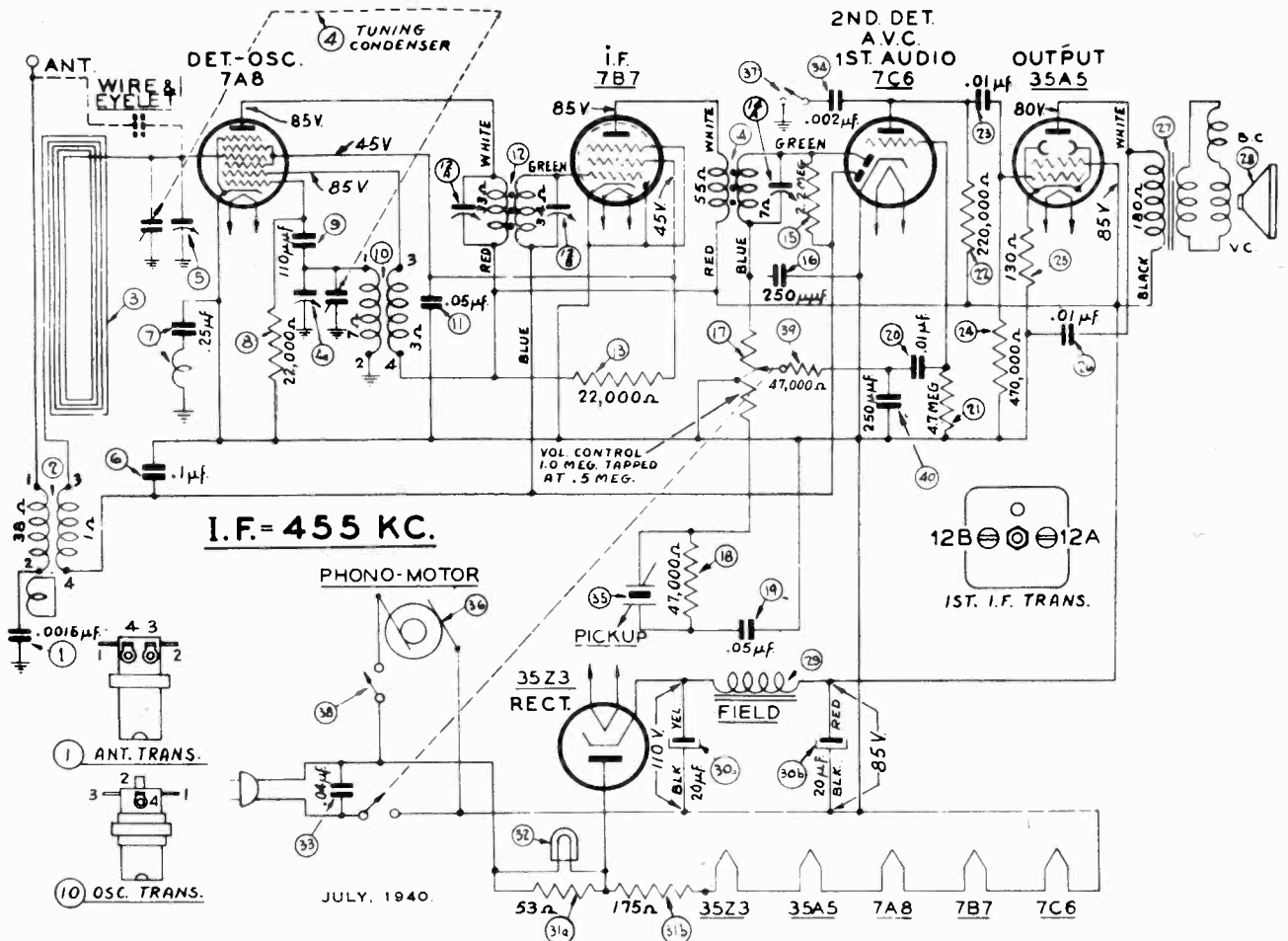
INSTALLATION OF DRIVE CORDS. POINTER AT LOW FREQUENCY END OF DIAL GANG CLOSED.

SEPTEMBER, 1940



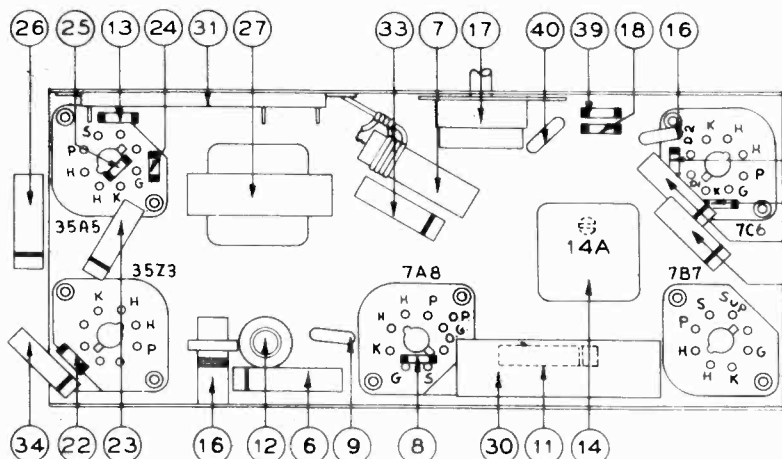
PHILCO RADIO & TELEVISION CORP.

MODEL 41-602



I.F. = 455 KC.

JULY, 1940.



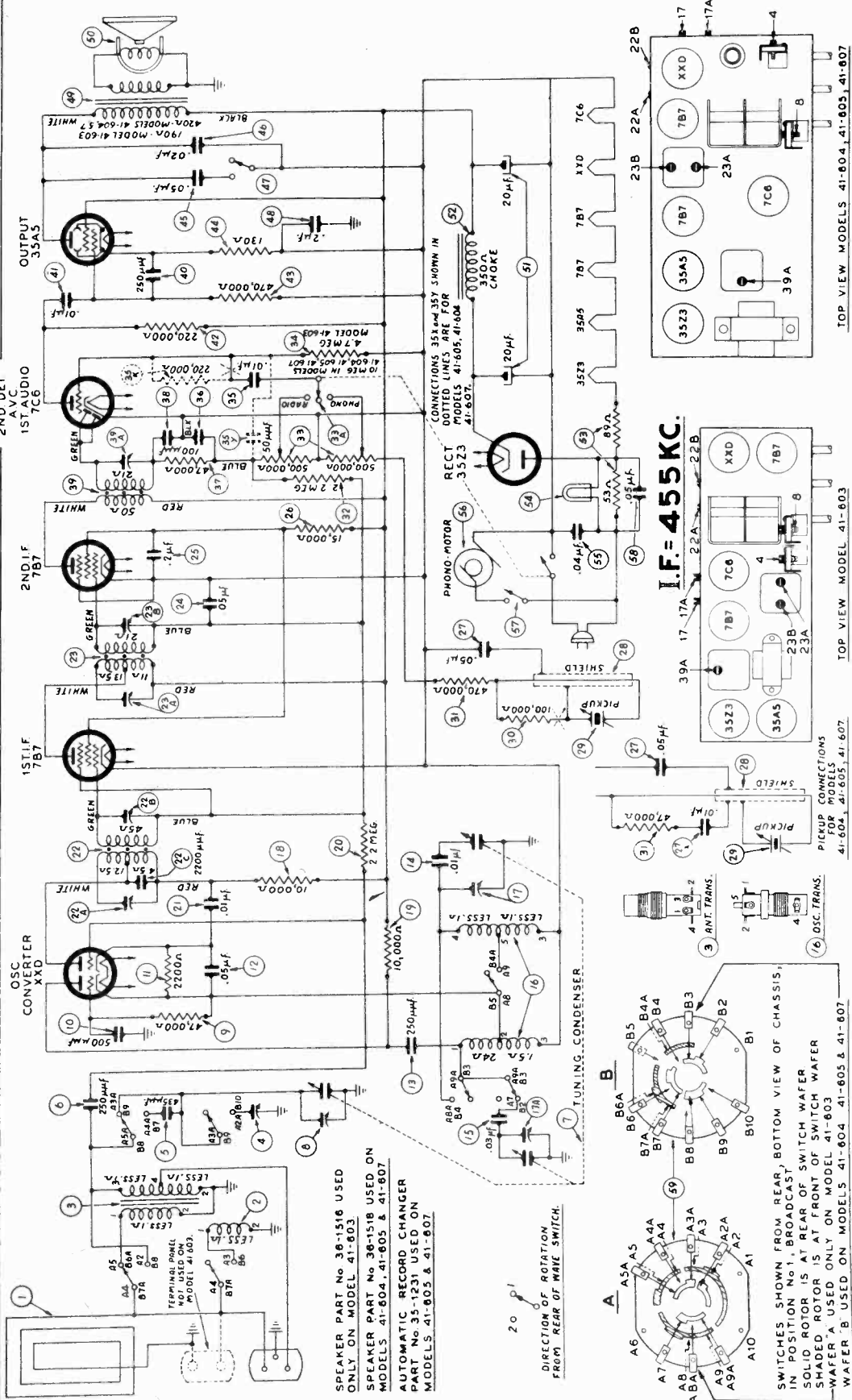
When aligning the R.F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio. After connecting the aligning instruments adjust the compensators as shown in tabulation. Locations of the R.F. compensators are on top of the tuning tuning condenser, oscillator on the front, and aerial on rear. The 1st and 2nd I.F. transformers are on top of the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcat.	14A, 12A, 12B	
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcat.	4A	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcat.	5	

NOTE A: — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.



MODELS 41-603, 41-604  
41-605, 41-607 PHILCO RADIO & TELEVISION CORP.



MODELS 41-603 41-604 41-605 & 41-607

**PHONOGRAPH SECTION**  
 Models 41-603 and 41-604 use the same type phonograph mechanism. This mechanism consists of a manually operated crystal pickup and 115 volt, 60 cycle turntable motor. In addition an automatic motor starting switch is included which starts the motor when the pickup is lifted from its rest.  
 The Automatic Record Changer consists of twelve 10 inch records on ten 12-inch records as one loading. Twelve records can also be manually operated. A crystal pickup is provided on the changer which operates through the audio system of the radio. The same automatic Record Changer is used in both of these models. The service procedure for adjusting the Automatic Record Changer will be found in Radio Service Bulletin No. 358.

**INTERMEDIATE FREQUENCY: 455 K. C.**  
**POWER SUPPLY: 115 Volts, 60 cycle A. C.**  
**POWER CONSUMPTION: 40 watts, Models 41-603, 41-604. 45 watts, Models 41-605, 41-607.**

JULY, 1940.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-280, 41-285, 41-287, 41-290(121)

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in order	
1	High side to No. 4 terminal loop panel.	455 K. C.	580 K. C.	Vol. Max. Range Switch "S. W." Positions	32A, 32B 34A, 37D	
2	Use loop on generator	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Broadcast	16, 10	Note A
3	Use loop on generator	580 K. C.	580 K. C.	Vol. Max. Range Switch Broadcast	17	Roll Tuning Condensers Note B
4	Use loop on generator	Perform operation No. 2 again				
5	Use loop on generator	6 M. C.	6 M. C.	Range Switch "Police"	16A	
6	Use loop on generator	12 M. C.	12 M. C.	Range Switch "S. W."	17A, 2	Note C

**NOTE A — DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity), set the dial pointer on the extreme left index line at the low frequency end of the broadcast scale. The arrangement of the drive cable in this position is shown in the schematic.

**NOTE B —** When adjusting the low frequency compensator of Range One (Broadcast) or the aerial padders of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first

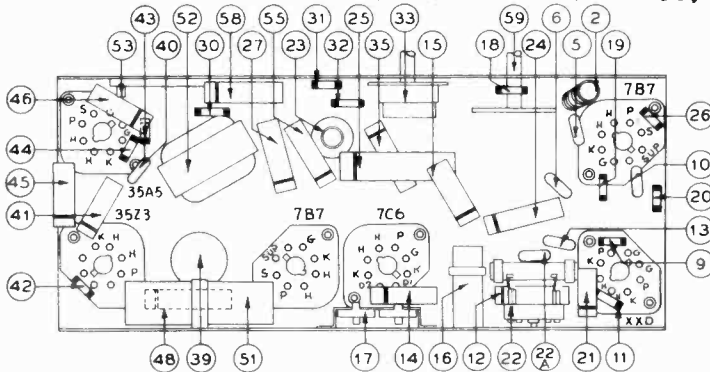
setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

**NOTE C —** To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator (17A) to the maximum capacity position (clockwise). From this position slowly turn the compensator counter-clockwise until a first peak is obtained on the output meter. Adjust the compensator for maximum output at this first peak.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 910 K. C. above the frequency being used on any high frequency range.

The aerial padder (2) must be adjusted to maximum by rolling the tuning condenser. If two signal peaks occur when turning the padder, adjust to maximum output on the second signal peak from the tight position (screw all the way down) of the padder.

MODELS 41-603, 41-604, 41-605, 41-607

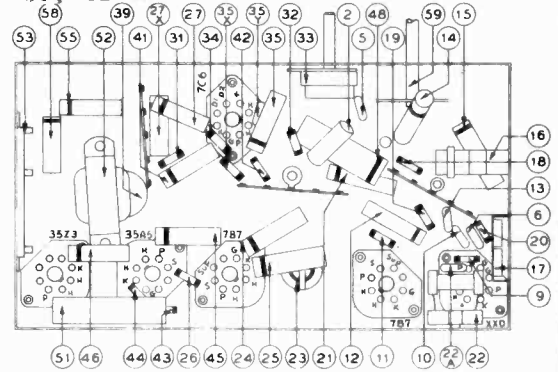


MODEL 41-603  
PART LOCATIONS — UNDERSIDE OF CHASSIS

**Audio Output Meter:** If this type of aligning meter is used, connect it to the voice coil terminals of the speaker or from the plate of the 35A5 tube to the chassis. Adjust the meter for the 0 to 10 volt scale.

**Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator, make the following connections: Attach the negative (—) terminal of the voltmeter to any point in the circuit where the A. V. C. voltage can be obtained. Connect the positive (+) terminal of the vacuum tube voltmeter to the chassis.

**Signal Generator:** When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.



MODELS 41-604, 41-605, 41-607  
PART LOCATIONS — UNDERSIDE OF CHASSIS

When aligning the R. F. padders a loop is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

After connecting the aligning instruments adjust the compensators as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram.

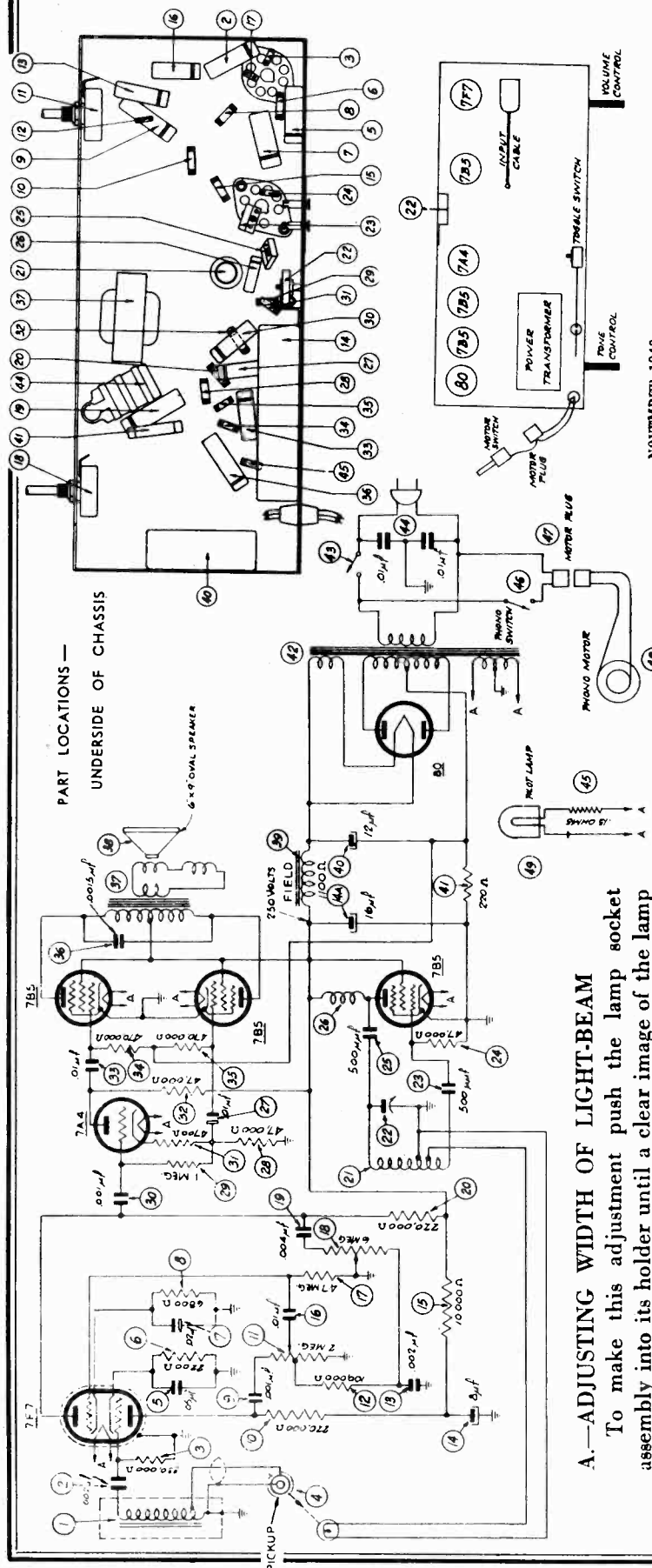
If the indicating meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcast.	39A, 23A, 23B, 22A, 22B	
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcast.	17A	Note A
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcast.	8	
4	Loop see above instructions	12 M. C.	12 M. C.	Range Switch "S. W."	17, 4	Roll (8) for Max. Note B

**NOTE A: — DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed) With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.

**NOTE B: —** When adjusting oscillator compensator 17A, tune for maximum on the first signal peak from Tight position (compensator closed). When adjusting the aerial padder 4 of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

MODEL 41-620



**A.—ADJUSTING WIDTH OF LIGHT-BEAM**

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 5/32" in width. The socket assembly is now rotated so that the spot light is vertical.

**B.—POSITIONING THE LIGHT-BEAM**

To position the light-beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

**C.—ADJUSTING INTENSITY OF LAMP**

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by compensator (22) located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there

may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

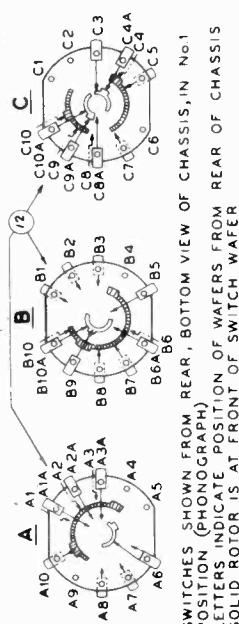
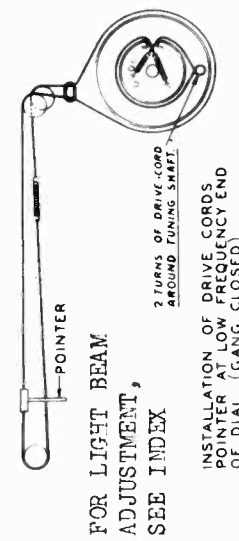
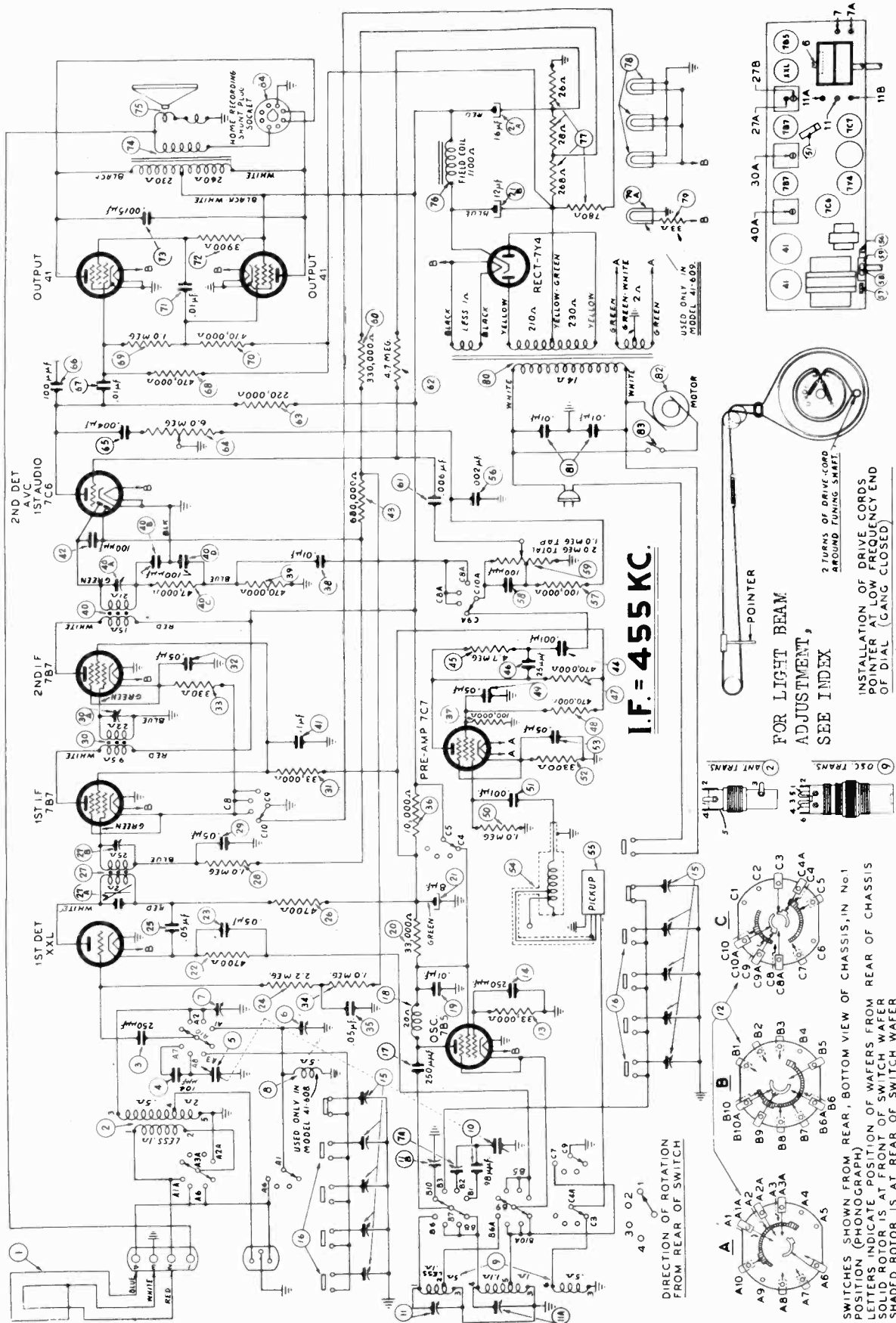
1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

**D.—INSTALLING NEW LAMP**

When installing a new lamp in the socket, there are two positions in which the lamp can be inserted. Ordinarily, either of these positions can be used. In some cases, however, due to the lamp filament being off center, the lamp must be inserted in the position that gives the best centering of the spot of light on the vibrating mirror.

PHILCO RADIO & TELEVISION CORP.

MODELS 41-608, 41-609 (121)



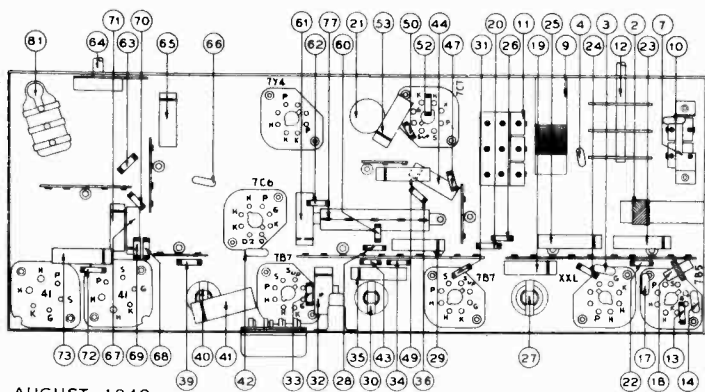
SCHEMATIC DIAGRAM MODELS 41-608 & 41-609

MODELS 41-608, 41-609  
Codes 121 and 122

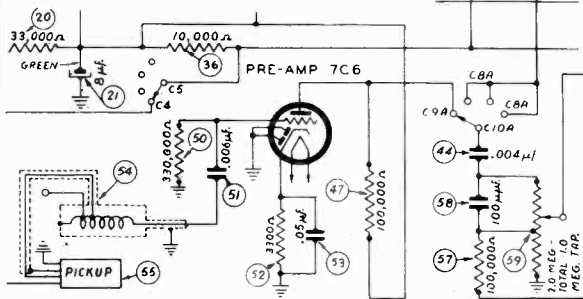
PHILCO RADIO & TELEVISION CORP.

Models 41-608 and 41-609, Code 122, are similar to Models 41-608 and 41-609, Code 121, with the exception of the phonograph amplifier tube and circuit. A type 7C6 tube is used in the phonograph amplifier in the 41-608 and 41-609, Code 122, chassis, whereas a 7C7 tube is used in the Code 121.

The Code 122 "Specifications", "Light-Beam Reproducer Adjustments" and "Aligning R. F. and I. F. Compensators" instructions are the same as those given for Code 121



41-608 AND 41-609. CODE 122



AUGUST, 1940.

PART LOCATIONS — UNDERSIDE OF CHASSIS

MODELS 41-608 AND 41-609. CODE 122

NOTE — PARTS 51, 56, 57, 58 AND 59 LOCATED ON TOP OF CHASSIS

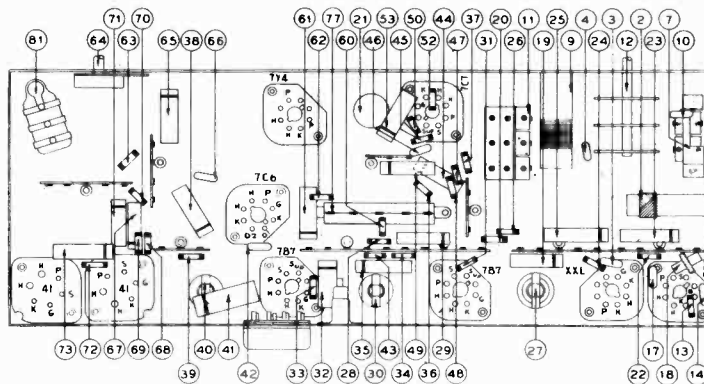
TUBE SOCKET VOLTAGES

D. C. voltages were measured with a 1000 ohms per volt voltmeter, Philco Model 027. Line voltage 120 volts A. C., no signal being received — range switch broadcast.

Tube	Location	Radio Pos. D. C. Volt.	Phono. Pos. D. C. Volt.
7B5 Osc.	Plate	27	185
" "	Screen	27	185
" "	Bias (Grid Leak)	7	47
XXL 1st Det.	Plate	130	180
" "	Bias (Cathode)	6	8
7B7 st & 2nd I. F.	Plate	227	185
" "	Screen	72	185
" "	Bias (Cathode)	1.5	57
7C6 2nd Det. 1st Audio	Plate	165	140
7C6 Preamp.	Plate	45	125
41 Output Phase Inv.	Plate	222	183
" "	Screen	213	177
41 Output	Plate	222	183
" "	Screen	227	185
	12 mf. elect. to ground	305	290
	16 mf. elect. to ground	227	185
	8 mf. elect. to ground	137	178

ON CODE 121 ONLY

7C7 Preamp.	Plate	45	65
" "	Screen	20	28



PART LOCATIONS — UNDERSIDE OF CHASSIS

MODELS 41-608, 41-609

NOTE — PARTS 51, 56, 57, 58 AND 59 LOCATED ON TOP OF CHASSIS

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Settings	Adjust Compensators in order	
1	Ant. Section of Tuning Cond. with .1 mfd. Cond.	455 K. C.	Tuning Cond. Closed	Vol. Max. Bands Switch S. W.	27A, 27B 30A, 40A	Note A
2	Loop Signal Generator	1500 K. C.	1500 K. C.	Bands Switch "Brdcst"	11A, 7	Note B
3	Loop Signal Generator	580 K. C.	580 K. C.	Bands Switch "Brdcst"	7A	Roll comp. (7A) to "max." Recheck Operation No. 2
4	Loop Signal Generator	12 M. C.	12 M. C.	Bands Switch S. W.	11, 6	Note C

NOTE A — Compensator (27A) must be adjusted before compensator (27B) and should be done in the following manner: Turn (27A) all the way up, then turn down selecting the first I. F. peak, compensator (27B) is now padded to maximum.

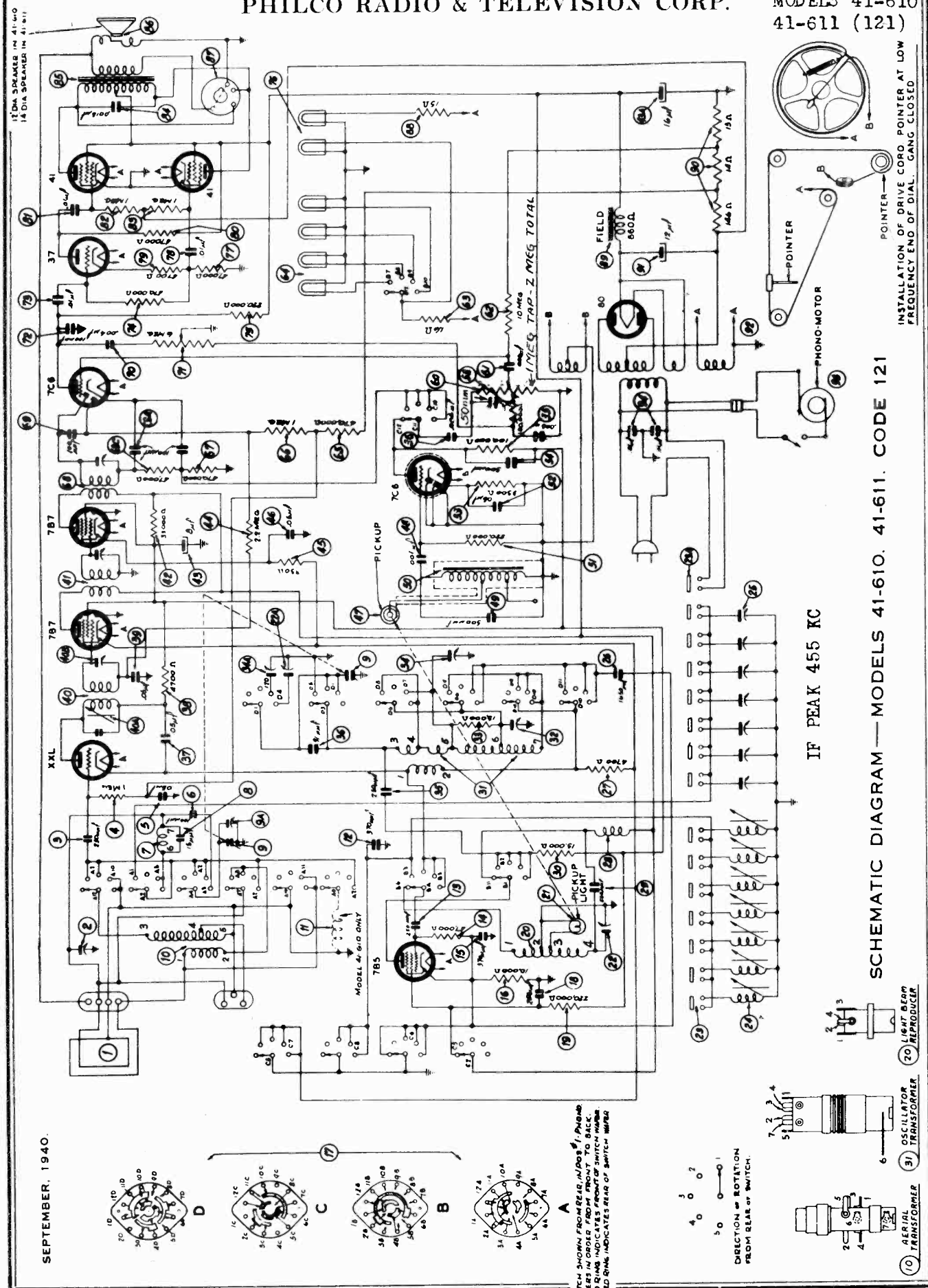
NOTE B — DIAL CALIBRATION: In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser

to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the low frequency end of the broadcast scale.

NOTE C — Adjust padder (11) to the first signal peak from the tight position. Roll padder (6) slowly to maximum on the second peak from loose position.

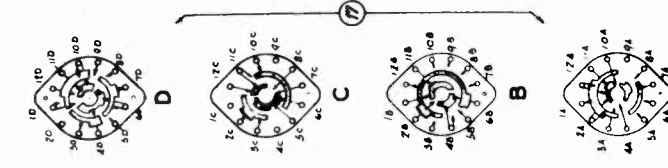
PHILCO RADIO & TELEVISION CORP.

MODELS 41-610  
41-611 (121)

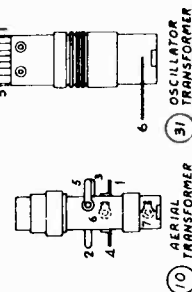
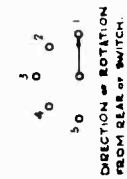


1 1/2" DIA. SPEAKER IN 41-610  
1 1/4" DIA. SPEAKER IN 41-611

SEPTEMBER, 1940.



**A** SWITCH SHOWN FROM REAR. WIPERS IN FRONT. LETTERS IN CIRCLE FROM FRONT TO BACK. SOLID RING INDICATES FRONT OF SWITCH WIPER. SHADED RING INDICATES REAR OF SWITCH WIPER.



SCHEMATIC DIAGRAM—MODELS 41-610. 41-611. CODE 121

IF PEAK 455 KC

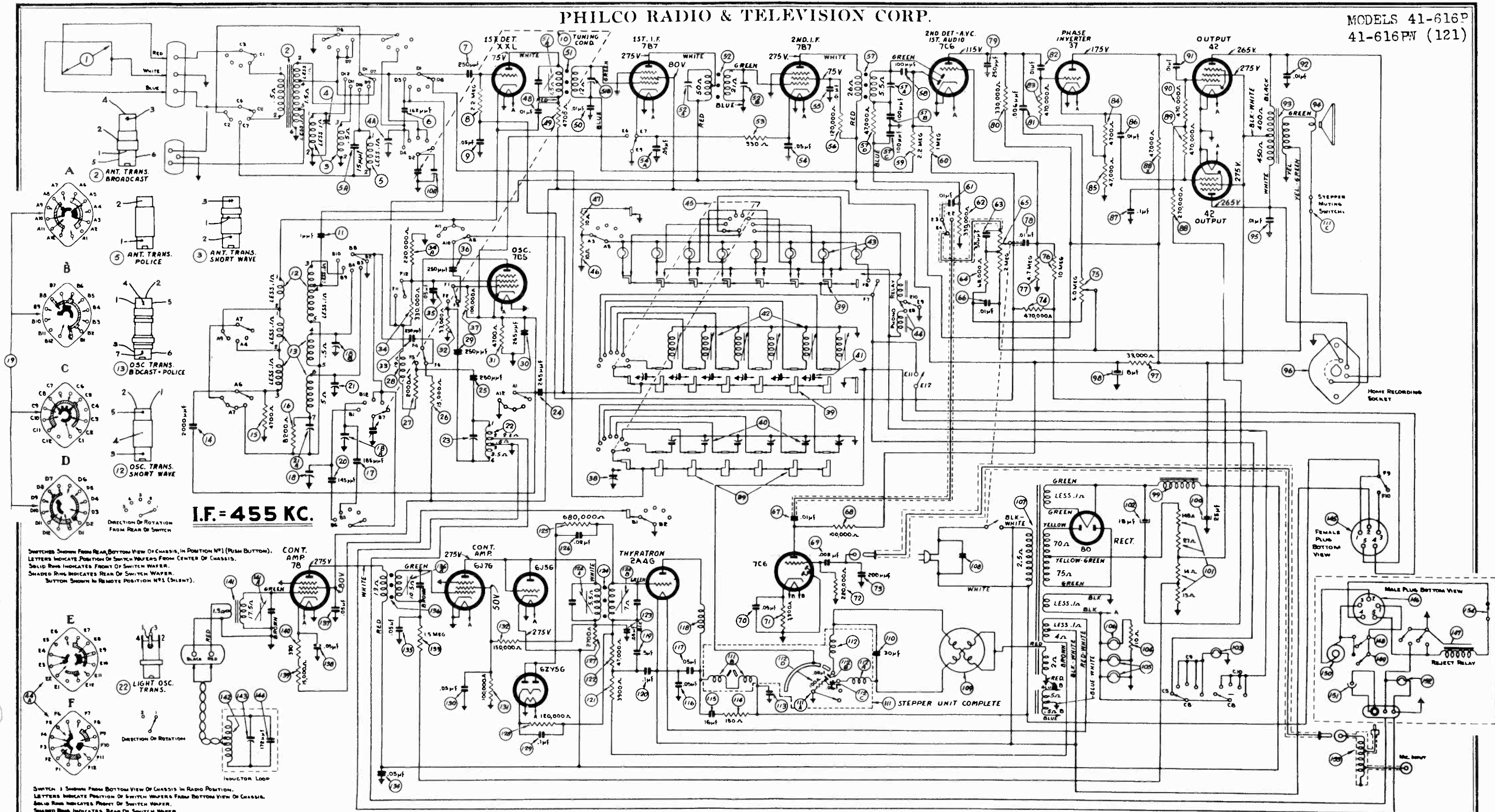
- (10) SERIAL TRANSFORMER
- (31) OSCILLATOR TRANSFORMER
- (20) LIGHT BEAM REPRODUCER

INSTALLATION OF DRIVE CORE POINTER AT LOW FREQUENCY END OF DIAL. GANG CLOSED

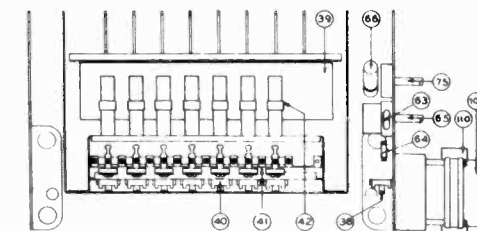
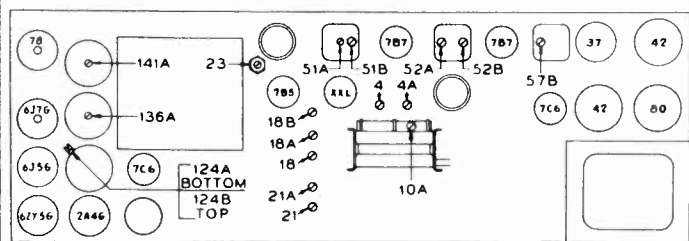


PHILCO RADIO & TELEVISION CORP.

MODELS 41-616P  
41-616PW (121)



LINE VOLTAGE 118 VOLTS. A. C. BAND SWITCH (BROADCAST), NO STATION BEING RECEIVED.



OCTOBER, 1940



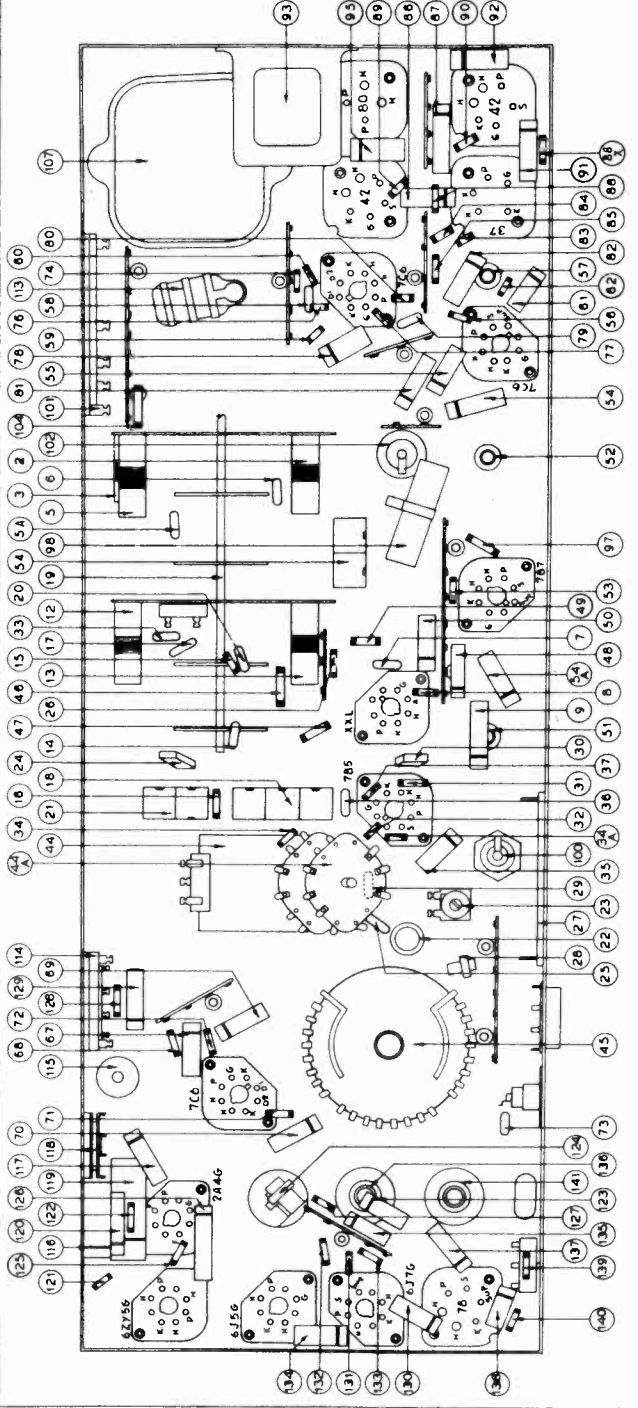


FIG. 1. PART LOCATIONS - UNDERSIDE OF CHASSIS

TUNING BAND FREQUENCIES: 510 to 1720 K. C., 2.3 to 7.0 M. C., 9 to 12 M. C., 13.5 to 18 M. C.

INTERMEDIATE FREQUENCY: 455 K. C.

AUDIO OUTPUT: 10 watts.

POWER SUPPLY: 118 volts, 60 cycle A. C. The radio can also be operated on 115 volts, 50 cycle A. C. To do this it is necessary to replace the record changer motor as indicated in the parts list.

POWER CONSUMPTION: 200 Watts

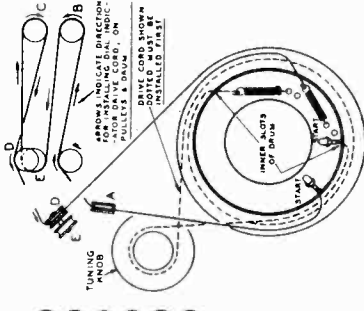


FIG. 4. DIAL POINTER AND CABLE ARRANGEMENT

INSTALLATION OF DRIVE CORDS, POINTER AT LOWEST POINT OF GANG CLOSED

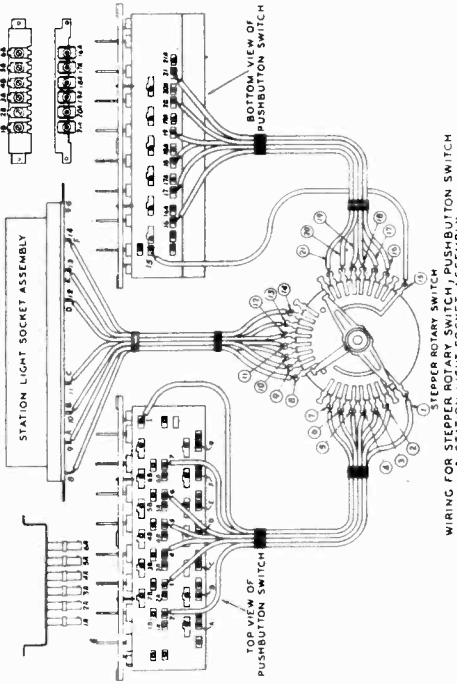


FIG. 5. CABLE WIRING FROM STEPPER ROTARY SWITCH TO PUSH-BUTTON SWITCH AND STATION LIGHTS

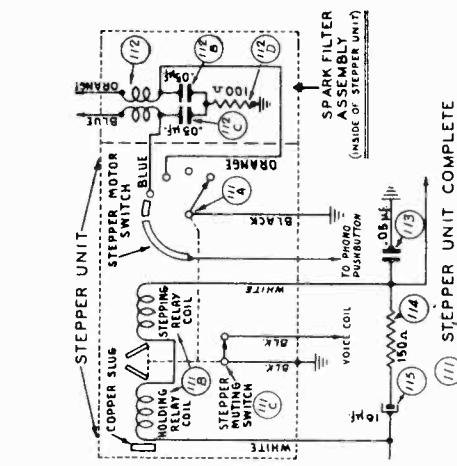


FIG. 6. INTERNAL WIRING OF STEPPER UNIT. NUMBERS CORRESPOND TO SCHEMATIC

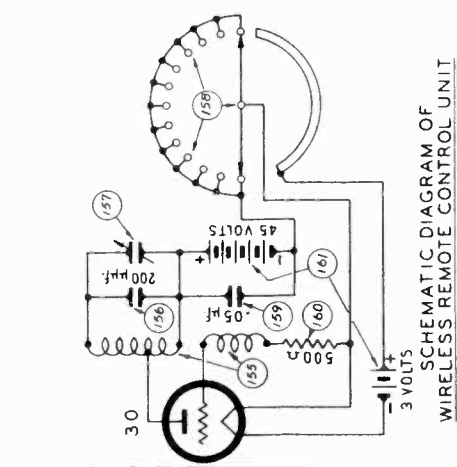


FIG. 3. WIRELESS REMOTE CONTROL UNIT WIRING

SCHEMATIC DIAGRAM OF WIRELESS REMOTE CONTROL UNIT

ADJUSTMENT OF WIRELESS REMOTE CONTROL CIRCUITS

Model 41-616, Code 121

ADJUSTING CONTROL FREQUENCY AMPLIFIER

The wireless remote control models are shipped with 5 different control frequencies which range from 350 to 400 K. C. The control frequency is indicated on the serial number ticket and on the rear of the chassis. The coil numbers and frequencies are as follows: Code 5.....355 K. C. Code 6.....367 K. C. Code 7.....375 K. C. Code 8.....383 K. C. Code 9.....395 K. C. Code 10.....400 K. C.

The purpose of the control frequency compensator is to prevent interaction between two or more wireless remote control models which are on the same floor or exceptionally close together. When several wireless remote control models are to be used together, it is necessary to use different control frequencies. These frequencies should be 20 K. C. apart. For example, if three models are to be operated at the same time and are closely situated, it will be advisable to adjust the control frequency of the first set to 355 K. C., the second set to 375 K. C., and the third set to 395 K. C. In order to resign or change the control frequency of these models, the following equipment is required:

- 1. Philco Model 077 signal generator with a loop attached to the output terminal. (A few turns of wire 12 inch in diameter will do.)
2. Philips wireless remote control aligning adapter. Part No. 45-2768.
3. Philips aligning screw driver, Part No. 45-2610.
4. With this apparatus the control frequency is adjusted as follows:
1. Remove the 2A4G control tube from its socket and replace with the aligning adapter. Connect the red lead of the aligning adapter to the positive terminal of the vacuum tube socket.
2. Remove the 78 control amplifier tube, its shield and the shield selector disc to "remote".

ADJUSTING WIRELESS REMOTE CONTROL UNIT

The wireless remote control unit is now adjusted to the control frequency of the amplifier as follows:
1. Turn off the signal generator, then dial any one of the stations indicated on the remote control unit by pulling the control knob down and hold it in this position.
2. Now bring the wireless remote control unit close to the receiver. Using a padding wrench, Philco Part No. 5164, tune the compensator (157) Fig. 3, located on the bottom of the remote control unit until a maximum voltage reading is obtained.

ADJUSTING REMOTE CONTROL UNIT OPERATING DISTANCE

When shipped from the factory the wireless remote control circuit is adjusted to control the radio from an average distance of 100 feet. If the radio is to be used in a room or building situated near large metal objects or installed in metal shielded areas, it may be necessary to change the control circuit to get adequate remote control (increase sensitivity).

LIGHT-BEAM REPRODUCER ADJUSTMENTS

The reproducer should be adjusted to control the light beam of the light beam reproducer. If the light beam is not correctly set, the sound reproduction will be distorted, muffled or, if the light beam is completely off, no sound will be reproduced. The following adjustment procedure should be made:
1. Turn the reproducer at 18 volt A. C. should be made with the power line voltage at 110 volts A. C.
2. Adjusting width of light beam. The light beam should be adjusted by turning the light beam reproducer until a clear image of the lamp filament appears on the wall. The beam should be adjusted so that the light beam is centered on the point where the light beam is to be reproduced.
3. Positioning the light beam. To position the light beam on the high beam, turn the adjusting screw on the cell and half on the metal frame adjusting the cell.

EQUIPMENT REQUIRED

- 1. Signal generator. Capable of the frequency range of the receiver, such as Philco Model 077 or 177.
2. Aligning indicator. Either a vacuum tube voltmeter or Philco Model 027 and 028. Circuit testers contain both these meters.
3. Philips Fiber Screw Driver, Part No. 45-2610.
4. Connecting aligning instruments.
5. Vacuum tube voltmeter or an audio output meter.
6. A vacuum tube voltmeter or an audio output meter.
7. A vacuum tube voltmeter or an audio output meter.
8. A vacuum tube voltmeter or an audio output meter.

Table with 3 columns: Output Connections to Receiver, Dial Setting, and Special Instructions. It lists settings for various frequency ranges like 488 K. C., 1300 K. C., 500 K. C., 6 M. C., 12 M. C., and 18 M. C.

NOTE A - DIAL CALIBRATION. In order to adjust the receiver correctly, the dial must be aligned to track properly. The following procedure should be followed:
1. With the tuning condenser closed (maximum capacity), tune the receiver to the station frequency. The arrangement of the tuning condenser is shown in the receiver.
2. Tune the receiver to the station frequency. The arrangement of the tuning condenser is shown in the receiver.
3. Adjust the dial to the station frequency.
4. Repeat operation No. 2 again.

WIRELESS REMOTE CONTROL UNIT

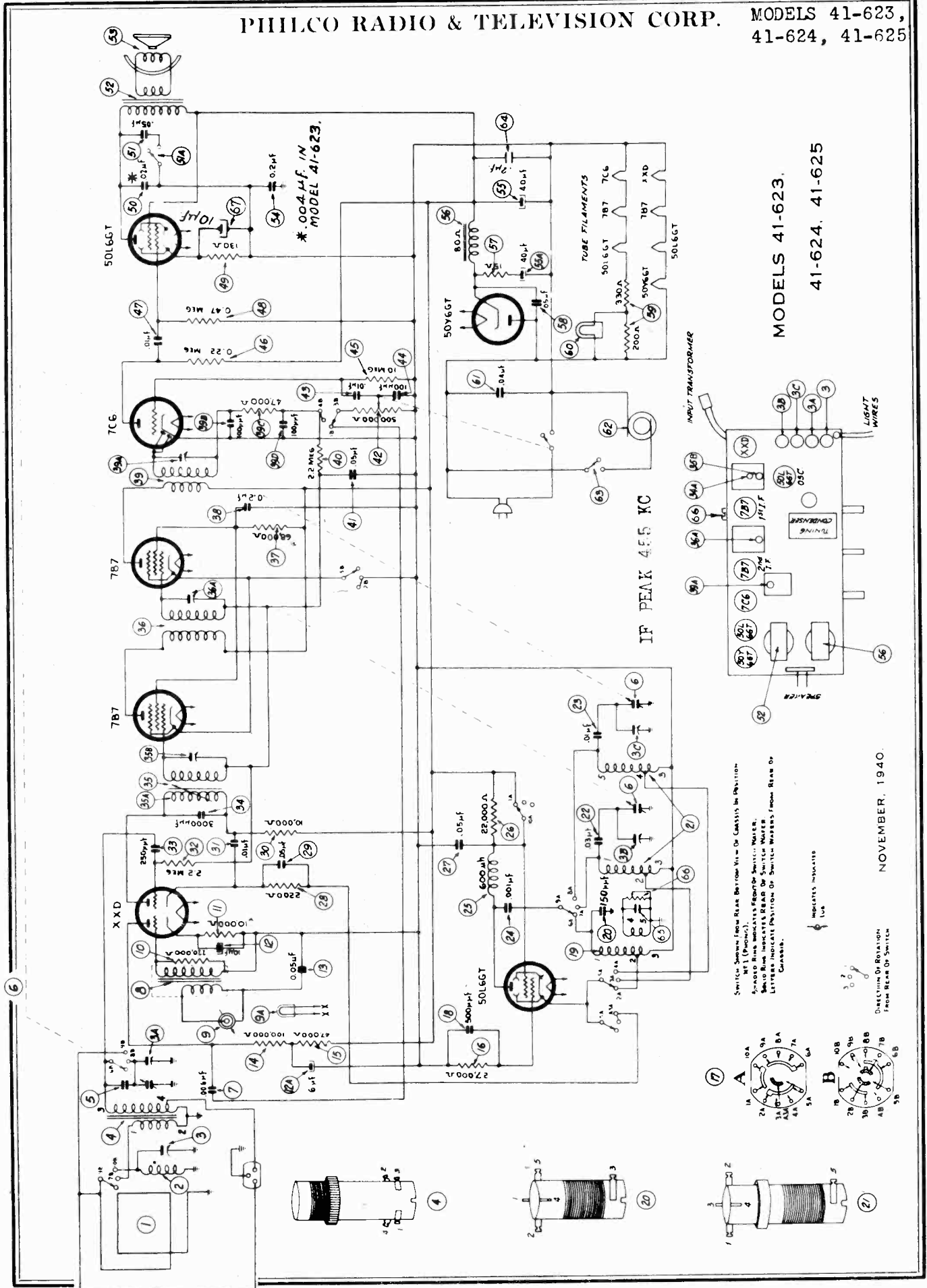
Large table listing various parts and their descriptions, organized into sections like SIGNAL GENERATOR, RECEIVER, SPECIAL INSTRUCTIONS, and WIRELESS REMOTE CONTROL UNIT. It includes part numbers and descriptions for components like capacitors, resistors, and tubes.

MISCELLANEOUS PARTS

Table listing miscellaneous parts and their descriptions, including various types of capacitors, resistors, and tubes.

PHILCO RADIO & TELEVISION CORP.

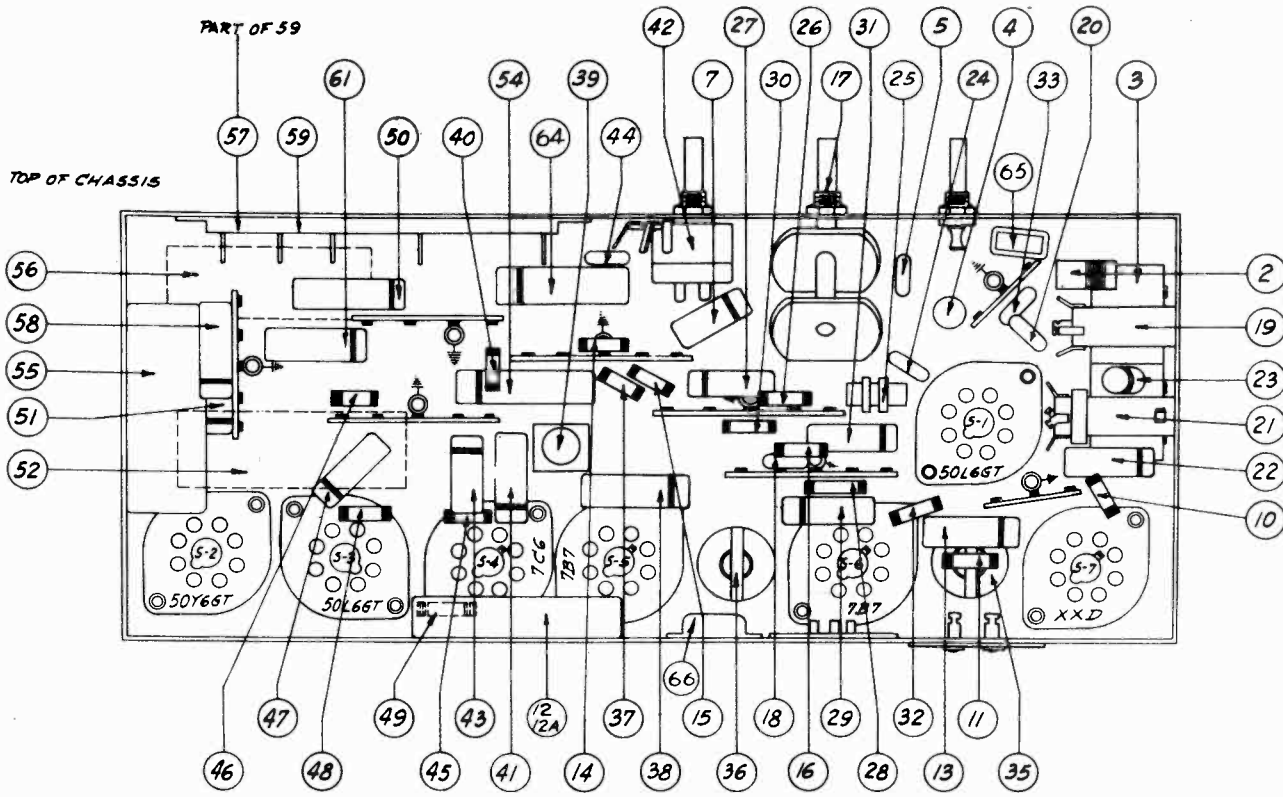
MODELS 41-623, 41-624, 41-625



MODELS 41-623, 41-624, 41-625

MODELS 41-623  
41-624, 41-625

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS — UNDERSIDE OF CHASSIS

**A. ADJUSTING WIDTH OF LIGHT BEAM**

To make this adjustment push the lamp socket assembly into its holder until a clear image of the lamp filament appears on the light cell. The socket should then be slightly pushed in beyond this point until the rectangular spot of light is 5/8" in width. The socket assembly is now rotated so that the spot of light is vertical.

**B. POSITIONING THE LIGHT BEAM**

To position the light beam on the light cell, turn the adjusting screw at the lower left side of the reproducer until the spot is half on the cell and half on the metal frame surrounding the cell.

**C. ADJUSTING INTENSITY OF LAMP**

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator 66 located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 66 in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

Models 41-623, 41-624, 41-625 are radio phonograph combinations which are similar in design with the exception of the cabinets, phonograph mechanism and speaker.

**CONNECTING ALIGNING INSTRUMENTS**

When aligning the R. F. padders a loop aerial is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

The receiver can be adjusted in the cabinet or removed from the cabinet.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

**Signal Generator.** When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of tuning	455 K. C.	540 K. C. Tuning Cond. Closed	Vol. Max. Range Switch Brdcast.	39A, 36A, 35A, 35B	Note A
2	Loop see above instructions	1600 K. C.	1600 K. C.	Vol. Max. Range Switch Brdcast.	3B	Note B
3	Loop see above instructions	1500 K. C.	1500 K. C.	Vol. Max. Range Switch Brdcast.	3A	
4	Loop see above instructions	12 M. C.	12 M. C.	Range Switch "S. W."	3C, 3	Roll (3) for Max. Note C

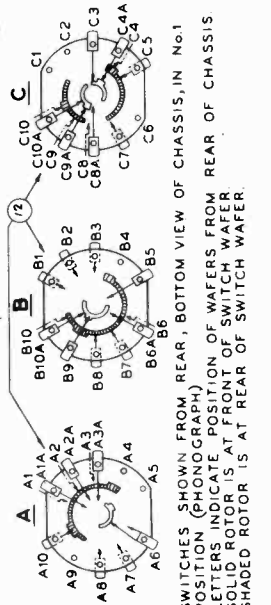
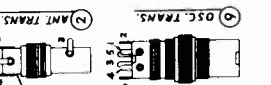
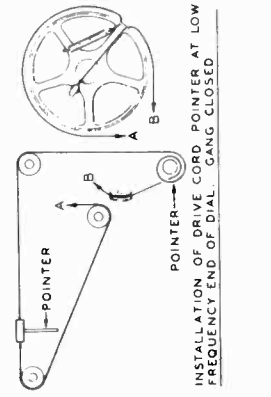
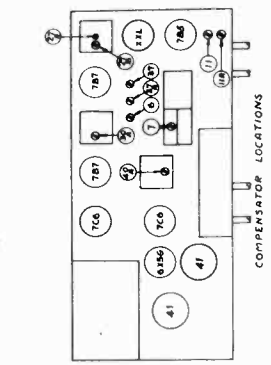
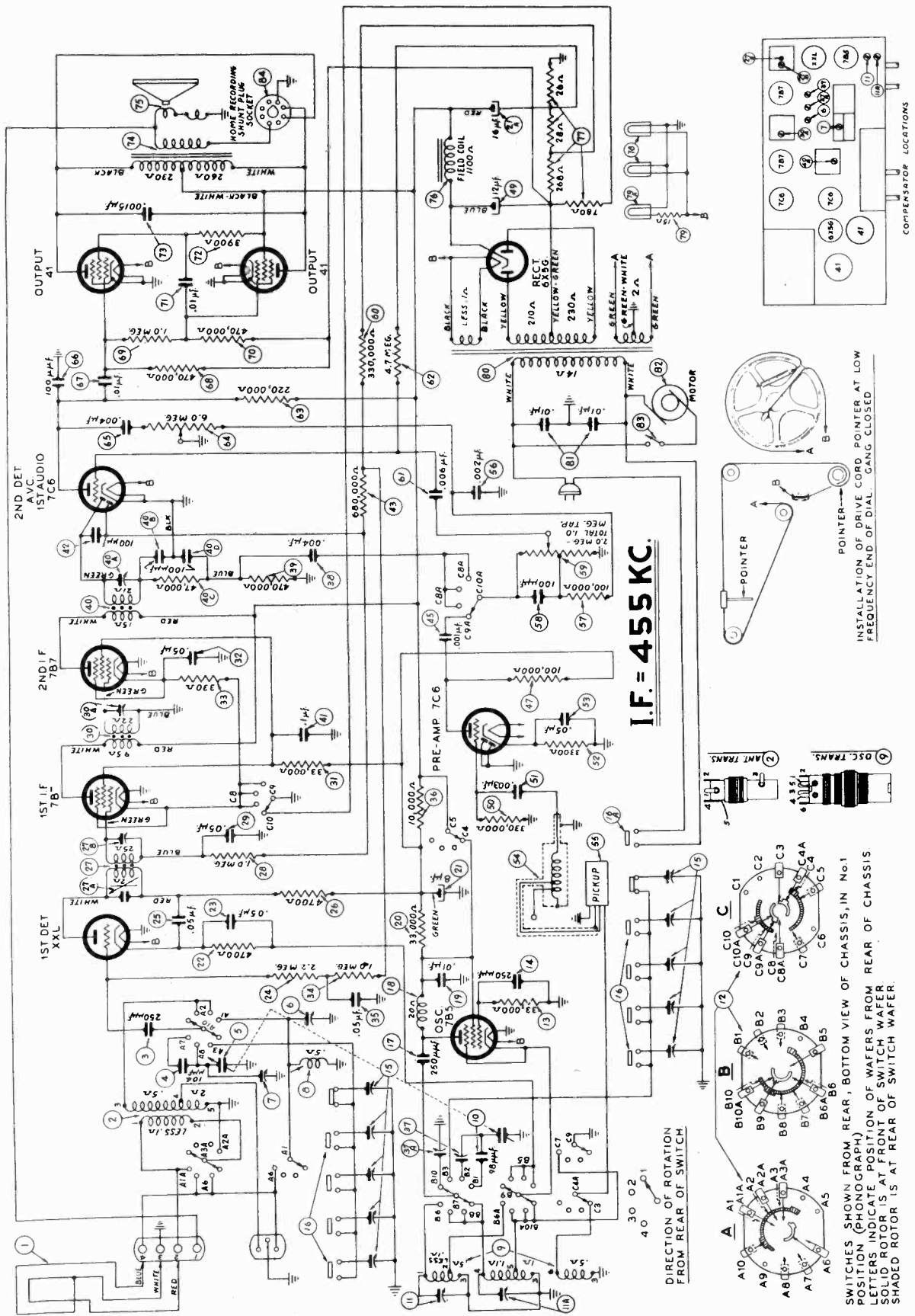
NOTE A: — To adjust the I. F. circuit properly, compensators 36A, 35A and 35B should be depadded first. All compensators are then adjusted to maximum in the order 39A, 36A, 35A and 35B.

NOTE B: — **DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the small dot below 550 K. C.

NOTE C: — When adjusting oscillator compensator 3C, tune for maximum on the first signal peak from Tight position (compensator closed). When adjusting the aerial padder 3 of the high frequency tuning range; the receiver Tuning Condenser must be adjusted (rolled) as follows: First tune the compensator for maximum output, then vary the tuning condenser of the receiver for maximum output. Now turn the compensator slightly to the right or left and again vary the receiver tuning condenser for maximum output. This procedure of first setting the compensator and then varying the tuning condenser is continued until maximum output reading is obtained.

PHILCO RADIO & TELEVISION CORP.

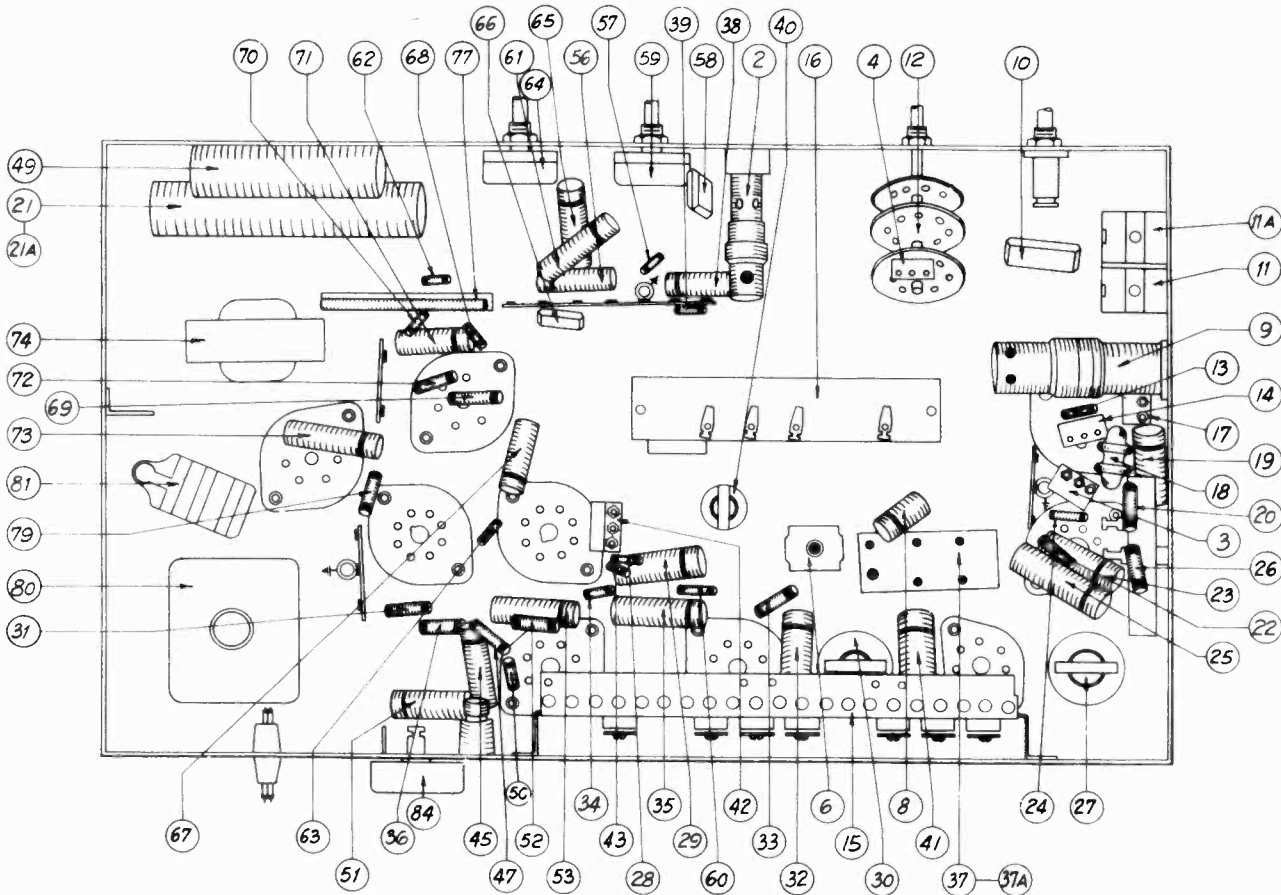
MODEL 41-629(121)



SWITCHES SHOWN FROM REAR, BOTTOM VIEW OF CHASSIS, IN No. 1 POSITION (PHONOGRAPH)  
 LETTERS INDICATE POSITION OF WAFERS FROM REAR OF CHASSIS  
 SOLID ROTOR IS AT FRONT OF SWITCH WAFER  
 SHADED ROTOR IS AT REAR OF SWITCH WAFER.

MODEL 41-629 (121)

PHILCO RADIO & TELEVISION CORP.



PART LOCATIONS — UNDERSIDE OF CHASSIS

C. ADJUSTING INTENSITY OF LAMP

When shipped from the factory, the lamp of the reproducer is adjusted for best operating efficiency. The intensity of the light from the lamp is adjusted by Compensator No. 37A located on the radio chassis. Under ordinary circumstances, an adjustment will not be necessary. When replacing the reproducer or lamp, however, there may be a tendency towards microphonic feedback. In this case the compensator is adjusted as follows:

1. Turn volume control on full and play a record.
2. While the record is playing, turn compensator 37A in the direction necessary to eliminate microphonic feedback. By turning the compensator the strength of the pick-up output is increased or decreased.

**Signal Generator.** When adjusting the I. F. padders, the high side of the signal generator is connected through a .1 mfd. condenser to the antenna section of the tuning condenser. Connect the ground or low side of the generator to the chassis.

When aligning the R. F. padders a loop aerial is made from a few turns of wire and connected to the signal generator output terminals; the signal generator is then placed close to the loop of the radio.

When adjusting the radio outside the cabinet the loop aerial should be placed in approximately the same position around or near the chassis as when assembled.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators in Order	
1	Ant. Section of Tuning Cond. with .1 mfd. Cond.	455 K. C.	Tuning Cond. Closed	Vol. Max. Bands Switch S. W.	27A, 27B 30A, 40A	Note A
2	Loop Signal Generator	1720 K. C.	1720 K. C.	Bands Switch "Brdcst"	11A	Note B
3	Loop Signal Generator	1500 K. C.	1500 K. C.	Bands Switch "Brdcst"	7	Roll comp. to "max." Recheck Operation No. 2
4	Loop Signal Generator	580 K. C.	580 K. C.	Bands Switch "Brdcst"	37	
5	Loop Signal Generator	12 M. C.	12 M. C.	Bands Switch S. W.	11, 6	Note C

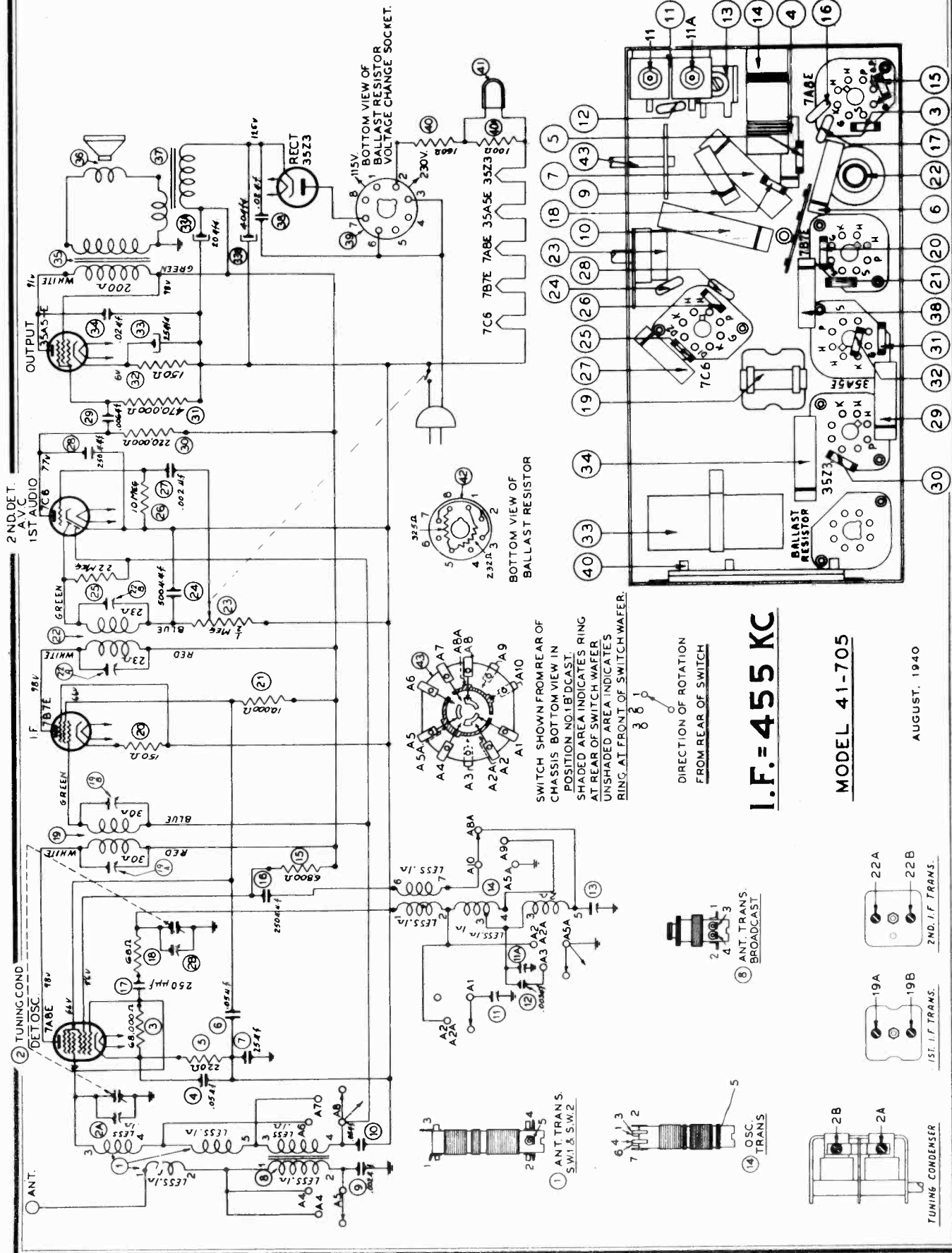
**NOTE A** — Compensator (27A) must be adjusted before compensator (27B) and should be done in the following manner: Turn (27A) all the way up, then turn down selecting the first I. F. peak, compensator (27B) is now padded to maximum.

**NOTE B** — **DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To do this, proceed as follows: Turn the tuning condenser

to the maximum capacity position (plates fully meshed). With the condenser in this position, set the tuning pointer on the extreme left index line at the lowest frequency end of the broadcast scale.

**NOTE C** — Adjust padder (11) to the first signal peak from the tight position. Roll padder (6) slowly to maximum on the second peak from loose position.

# PHILCO RADIO & TELEVISION CORP.



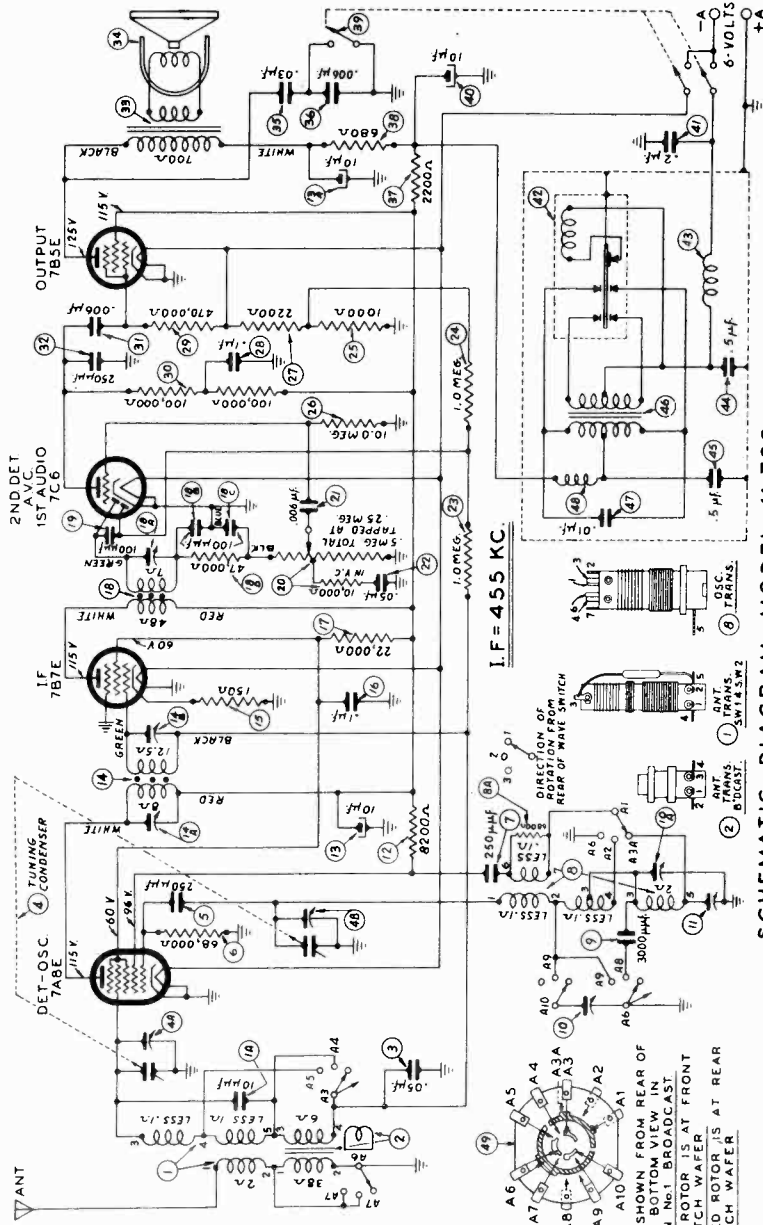
## I.F. = 455 KC

**MODEL 41-705**

AUGUST, 1940

MODELS 41-705  
41-708

PHILCO RADIO & TELEVISION CORP.



SCHEMATIC DIAGRAM MODEL 41-708

ALIGNING R. F. AND I. F. COMPENSATORS

The procedure is the same for both models.

Models 41-705,  
41-708

CONNECTING ALIGNING INSTRUMENTS

**Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator, it should be connected to the A. V. C. circuit as follows:  
1. Connect the negative (-) terminal of the vacuum tube voltmeter through a 2 megohm resistor to any point in the circuit where the A. V. C. voltage can be measured.  
2. Connect the positive (+) terminal to the chassis ground terminal.

**Audio Output Meter:** If this type of meter is used as an aligning indicator, it should be connected to the plate and screen terminals of the 35A5F tube. Model 41-705, 7B5E; Model 41-708. Adjust the meter for the 0 to 30 volt A. C. scale.

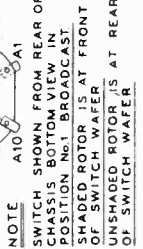
After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below: Locations of the compensators are shown in the schematic diagrams and part locations.

If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.

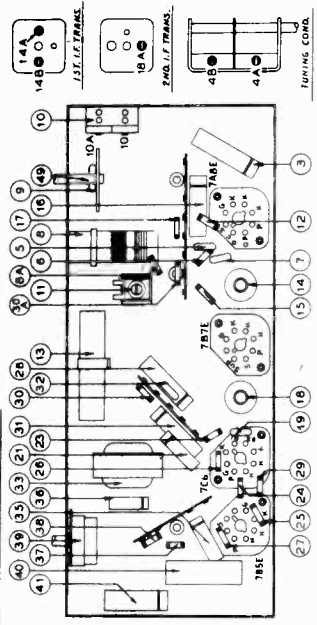
**NOTE A:** The "Dummy Antenna" consists of a condenser of 100µF (high side). Use the capacity or resistance as specified in each step of the above procedure.

**NOTE B:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning capacitor. To adjust the dial, proceed as follows: With the tuning capacitor set at the left edge (low frequency end) of the broadcast scale, adjust the dial to 910 K. C. (1000 K. C. scale).

**NOTE C:** When adjusting compensator (4B), Model 41-708, (2B), Model 41-705, the image signal will be found by turning dial 910 K. C. below the A10 K. C. fundamental signal, which will be 20,050 M. C.



Operations in Order	SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS
	Output Connections to Receiver	Dial Setting	Control Settings	Adjust Compensators	
1	Log of Ant. Tuning Front Section	455 K. C.	Range Switch Broadcast (Vol. Max.)	41-705 41-708	14A, 14B 18A
2	Ant. Lead	21 M. C.	Range Switch S. W. Position 3	28.2A	4B, 4A
3	Ant. Lead	6.0 M. C.	Range Switch S. W. Position 2	11	Note B Note C
4	Ant. Lead	1500 K. C.	Range Switch Broadcast Position 1	11A	Roll Gang
5	Ant. Lead	580 K. C.	Range Switch Broadcast Position 1	13	Roll Gang

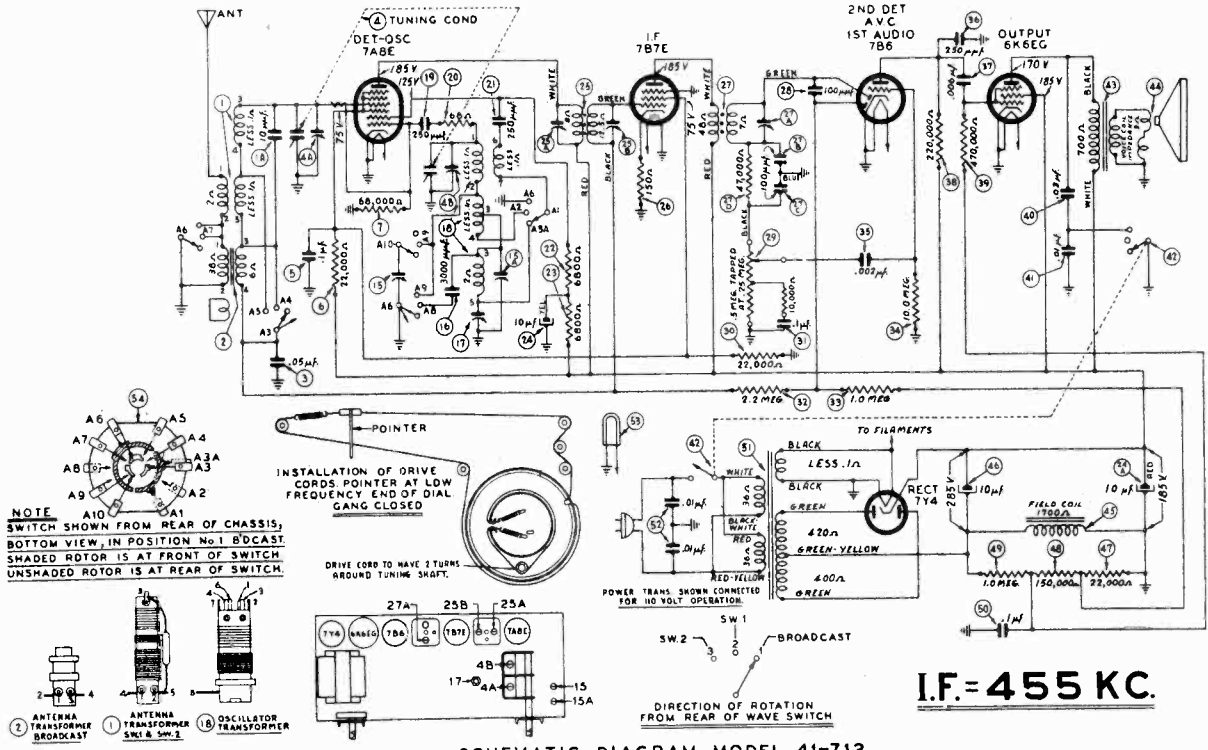


PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-708

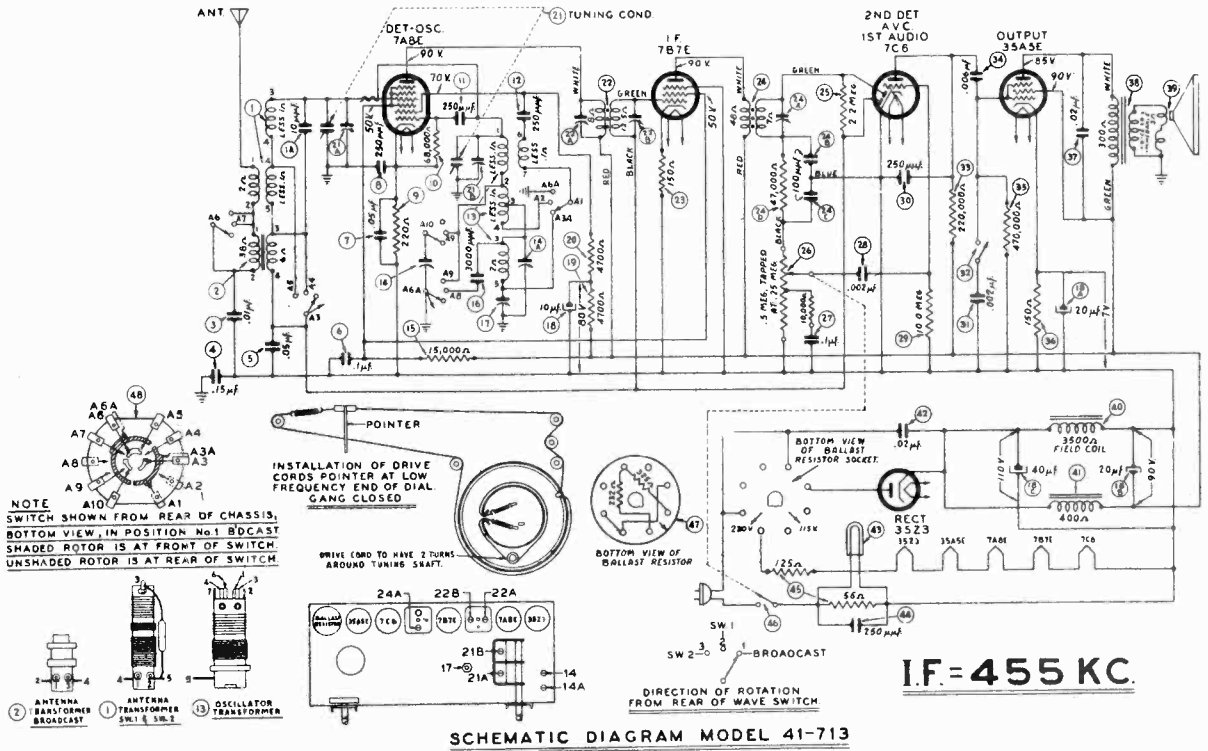
PHILCO RADIO & TELEVISION CORP.

MODEL 41-712

MODEL 41-713



SCHMATIC DIAGRAM MODEL 41-712

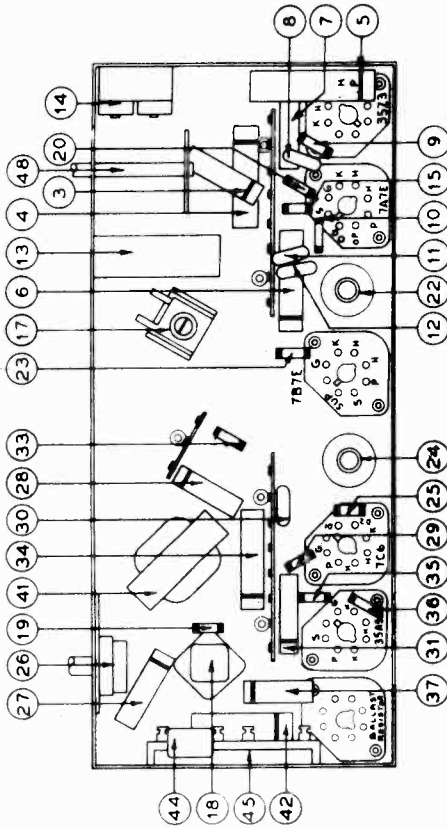


SCHMATIC DIAGRAM MODEL 41-713



PHILCO RADIO & TELEVISION CORP.

MODEL 41-712  
MODEL 41-713

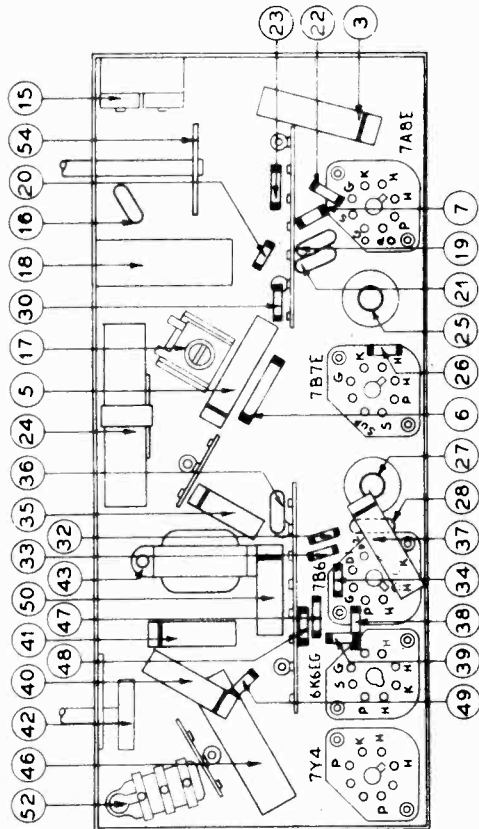


PART LOCATIONS — UNDERSIDE OF 41-713 CHASSIS

screen terminals of the 6K6EG tube, Model 41-712; 35A5E, Model 41-713. Adjust the meter for the 0 to 30 volt A. C. scale.

After connecting the aligning meter, adjust the compensators in the order as shown in the tabulation below. Locations of the compensators are shown in the schematic diagram.

If the output meter pointer goes off scale when adjusting the compensators, reduce the strength of the signal from the generator.



PART LOCATIONS — UNDERSIDE OF 41-712 CHASSIS

**Vacuum Tube Voltmeter:** To use the vacuum tube voltmeter as an aligning indicator, it should be connected to the A. V. C. circuit as follows:

1. Connect the negative (—) terminal of the vacuum tube voltmeter through a 2 megohm resistor to any point in the circuit where the A. V. C. voltage can be measured.
2. Connect the positive (+) terminal to the chassis ground terminal.

**Audio Output Meter:** If this type of meter is used as an aligning indicator, it should be connected to the plate and

**CONNECTING  
ALIGNING  
INSTRUMENTS**

Opera- tions in Order	SIGNAL GENERATOR		RECEIVER		SPECIAL INSTRUCTIONS	
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Control Settings		Adjust Compensators 41-712 41-713
1	Lug of Ant. Tuning Condenser Front Section	.1 mfd	455 K. C.	Range Switch Broadcast (Position 1) Vol. Max.	25A, 25B 27A	
2	Ant. Lead	400 ohms	21 M. C.	Range Switch S. W. Position 3	4B, 4A	Note B Note C
3	Ant. Lead	400 ohms	6.0 M. C.	Range Switch S. W. Position 2	15	Roll Gang
4	Ant. Lead	200 mmfd.	1500 K. C.	Range Switch Broadcast Position 1	15A	Roll Gang
5	Ant. Lead	200 mmfd.	580 K. C.	Range Switch Broadcast Position 1	17	Roll Gang

**NOTE A**—The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

**NOTE B**—DIAL CALIBRATION: In order to adjust the receiver correctly the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning

condenser closed (maximum capacity) set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

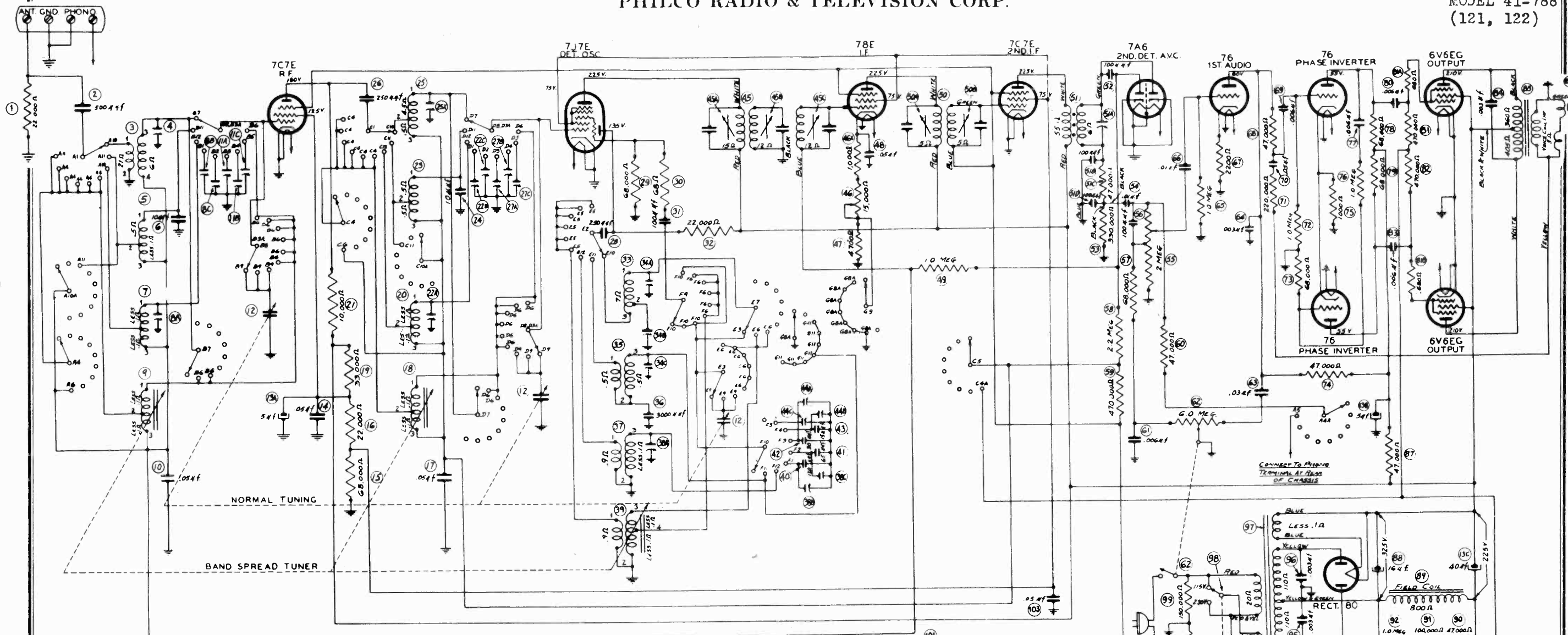
**NOTE C**—When adjusting compensator (4B) be sure to tune in the fundamental signal (21 M. C.) instead of the image signal. If the compensator is correctly adjusted the image signal will be found by turning signal generator dial 910 K. C. below the fundamental signal, which will be 20,090 M. C.

*Models*  
**41-712,  
41-713**

AUGUST, 1940

PHILCO RADIO & TELEVISION CORP.

MODEL 41-788  
(121, 122)

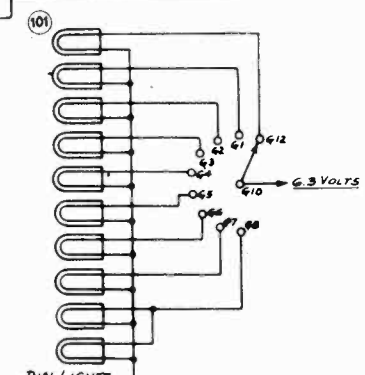


The code numbers (121, 122) of this model refer to the manner in which the power supply is connected for shipment. Code 121 is shipped with the voltage change switch in the 230 volts, 60 cycle A. C. position. Code 122 is shipped with the switch in the 115 volts, 60 cycle A. C. position.

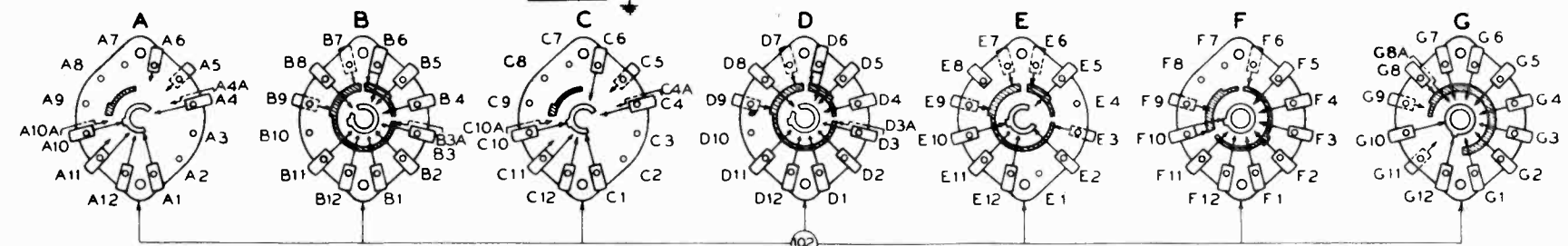
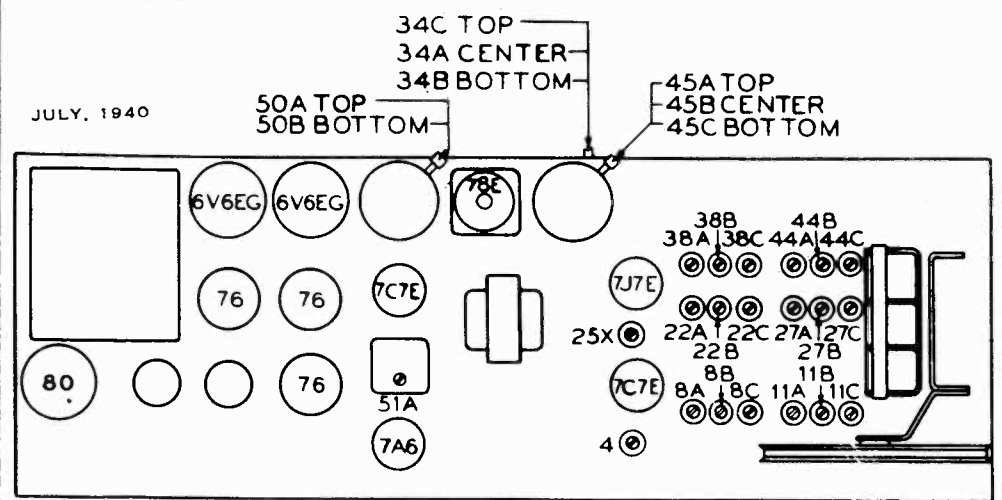
**POWER SUPPLY:** 115 or 230 volts A. C., 50 to 60 cycle, 90 watts.

**INTERMEDIATE FREQUENCY:** 455 K. C.

**TUNING RANGES:**  
 Standard Tuning—540 to 1720 K. C.; 2.3 to 7.2 M. C.; 7.2 to 22 M. C.  
 Spread Band Tuning—9.4 to 9.9 M. C.; 11.4 to 12.0 M. C.; 14.8 to 15.6 M. C.; 17.3 to 18.2 M. C.; 20.9 to 21.9 M. C.



**I.F. = 455 KC.**



**NOTE:** SWITCHES SHOWN FROM REAR BOTTOM VIEW OF CHASSIS, IN POSITION NO. 1 BROADCAST. SHADED ROTOR IS AT FRONT OF SWITCH WAFER. UNSHADED ROTOR IS AT REAR OF SWITCH WAFER. LETTER INDICATES POSITION OF SWITCH WAFERS FROM FRONT OF CHASSIS.

FIG. 6 — TUBE AND COMPENSATOR LOCATIONS. TOP OF CHASSIS

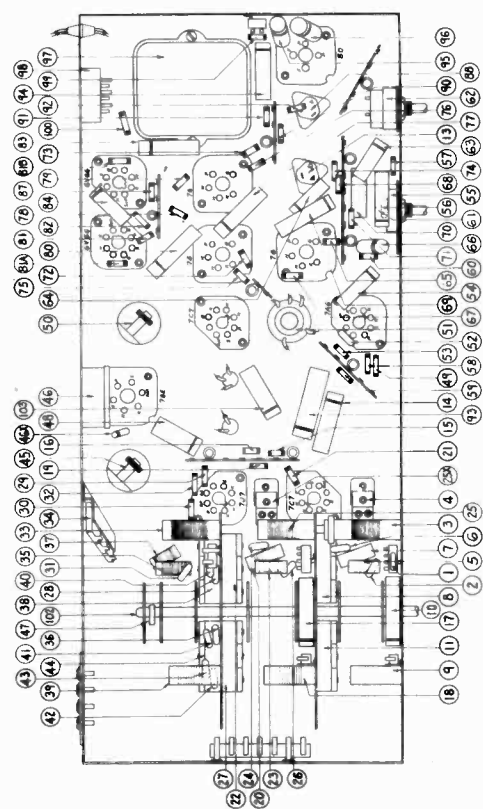


FIG. 4 - PART LOCATIONS, UNDERSIDE OF CHASSIS



FIG. 5 - R F TRANSFORMER WIRING LOCATIONS

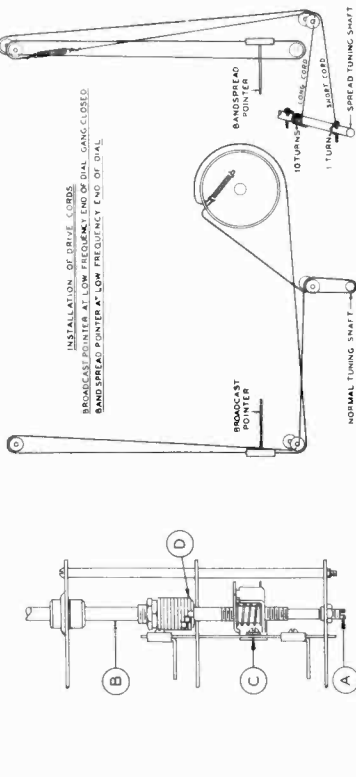


FIG. 1 - BAND SPREAD TUNING MECHANISM

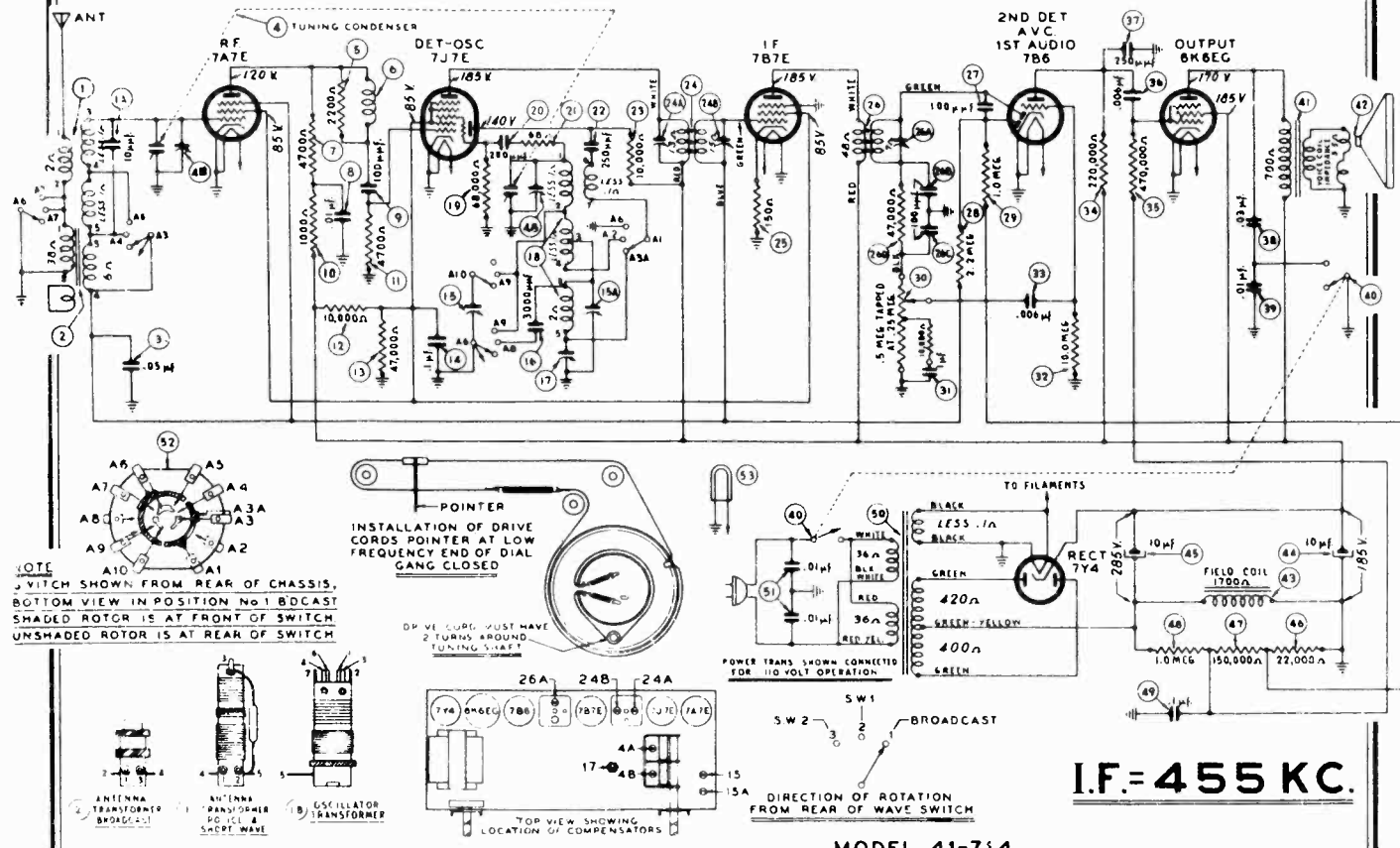


FIG. 2 - INSTALLING TUNING DRIVE CORDS

APRIL, 1940.

MODEL 41-714

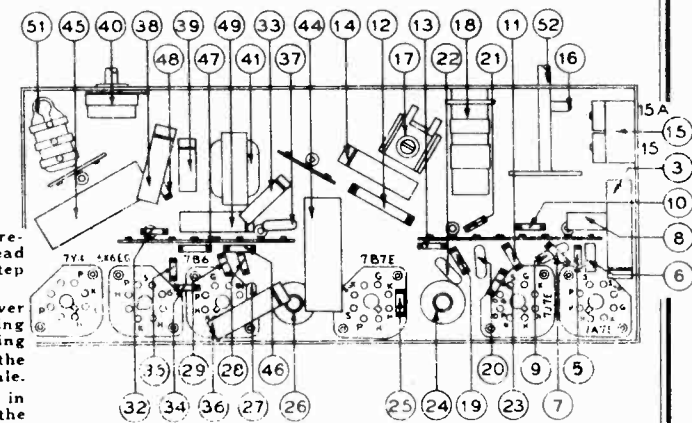


FIG. 3 - BAND SPREAD TUNING MECHANISM

ADJUSTING NORMAL TUNING RANGES

Operations in Order	SIGNAL GENERATOR	RECEIVER	SPECIAL INSTRUCTIONS
1	Dummy Connections to Receiver Output Connections to Receiver	Dial Setting Control Settings Adjust Compensators	
1	Tuning Condenser - 1 mid Sister Lug Middle Section	580 K. C. 1500 K. C.	Note D
2	Antenna and Ground	1500 K. C.	Note B
3	Antenna and Ground	580 K. C.	Roll Gang
4	Antenna and Ground	1500 K. C.	Roll Gang
5	Antenna and Ground	6.0 M. C.	Note C
6	Antenna and Ground	20 M. C.	Note C

ADJUSTING BAND SPREAD TUNING RANGES

**MECHANICAL ADJUSTMENTS:** Before the pointers of the band spread tuning ranges are adjusted, the iron cores of the oscillator transformers must be mechanically set as follows:

- Turn the band spread tuning control to the extreme clockwise position (highest frequency).
- Adjust location of antenna coil, B+ iron core, and transformer. This is done by loosening the screw which holds the iron core bracket and then sliding the bracket until the correct dimension is obtained.
- The oscillator transformers and iron cores are adjusted

Operations in Order	SIGNAL GENERATOR	RECEIVER	SPECIAL INSTRUCTIONS
1	Dummy Connections to Receiver Output Connections to Receiver	Dial Setting Control Settings Adjust Compensators	
1	Antenna and Ground	9.7 M. C.	Note E - Note F
2	Antenna and Ground	11.7 M. C.	Note F
3	Antenna and Ground	18.2 M. C.	Note F
4	Antenna and Ground	17.8 M. C.	Note F
5	Antenna and Ground	21.5 M. C.	Note F

**NOTE A -** The "Dummy Antenna" consists of a condenser or resistance connected in series with the signal generator output lead (high side). Use the capacity or resistance as specified in each step of the above procedure.

**NOTE B - DIAL CALIBRATION:** In order to adjust the receiver correctly, the dial must be aligned to track properly with the tuning condenser. To adjust the dial, proceed as follows: With the tuning condenser closed (maximum capacity) set the dial pointer on the first mark on the left edge (low frequency end) of the broadcast scale.

**NOTE C -** When adjusting compensator (24A) be sure to tune in the fundamental signal, which will be 15,000 M. C.

**NOTE D -** Before adjusting padder (4A, 45C, 50A, 50B, 51A, turn padder as adjusted to maximum, then adjust padder (45B) for maximum strength and known frequency in this method will be found to be easier to align a receiver to a strong signal.

MECHANICAL ADJUSTMENTS OF BAND SPREAD TUNING MECHANISM

- ADJUSTMENT OF TUNING SHAFT**  
End play can be removed by adjusting the rear bearing (No. 1) (Fig. 1). Care should be taken when adjusting the rear bearing. The rear bearing should be inserted in the chassis in line with the shaft.
- INSTALLING NEW BAND SPREAD TUNING SHAFT**  
a. Turn shaft (B) until carriage (C) is approximately six (6) threads from knob end of shaft. See Fig. 1.

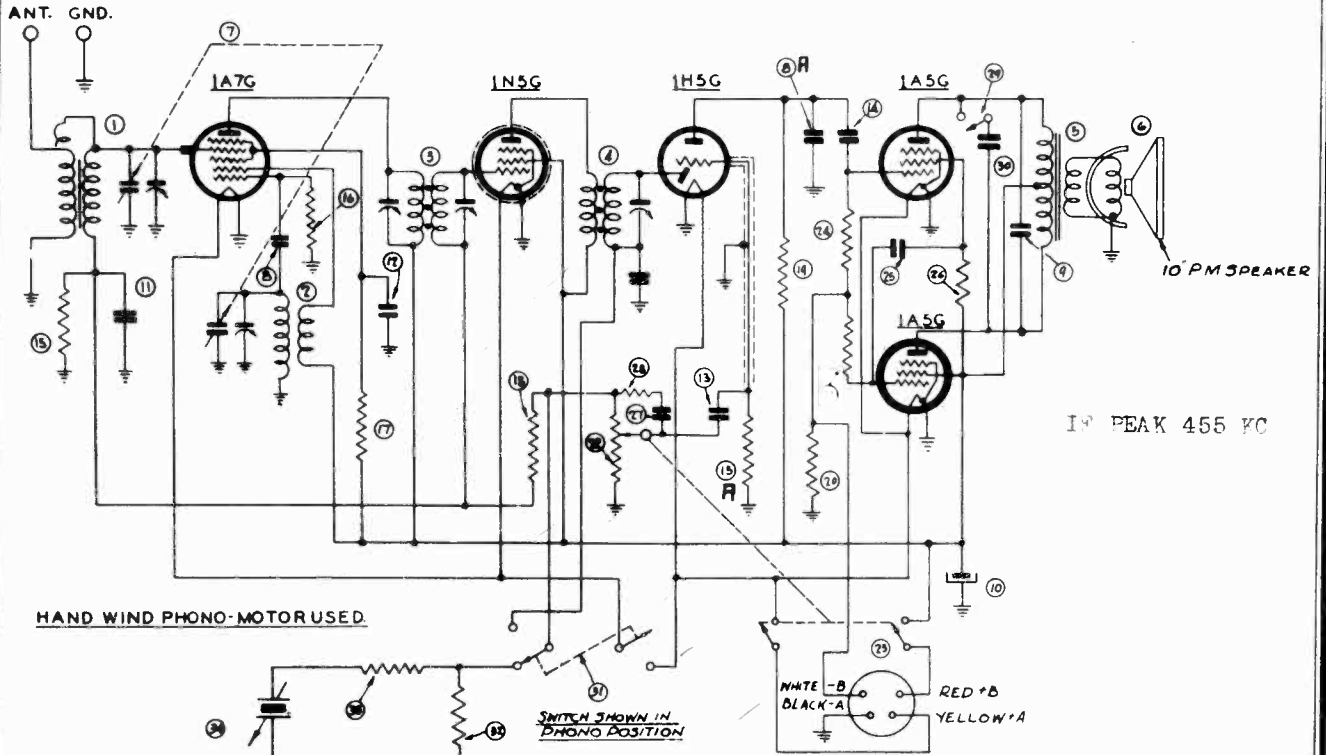
**NOTE E -** Before adjusting padder, turn the band spread tuning knob to its extreme counter-clockwise position. Set the band spread dial to its extreme counter-clockwise position. Set the band spread dial to its extreme counter-clockwise position. Set the band spread dial to its extreme counter-clockwise position. Set the band spread dial to its extreme counter-clockwise position.

**NOTE F -** Refer adjusting padder. Locate a known station near the center of the band spread tuning range. Adjust the padder until the station is in the center of the band spread tuning range. Adjust the padder until the station is in the center of the band spread tuning range.

Operations in Order	SIGNAL GENERATOR			RECEIVER		
	Output Connections to Receiver	Dummy Antenna Note A	Dial Setting	Dial Setting	Control Settings	Adjust Compensators
1	Lug of Ant. Tuning Condenser Front Section	.1 mfd.	455 K. C.	580 K. C.	Range Switch Broadcast (Position 1) Vol. Max.	24A, 24B, 26A
2	Ant. Lead	400 ohms	21 M. C.	21 M. C.	Range Switch S. W. Position 3	4B, 4A Note B Note C
3	Ant. Lead	400 ohms	6.0 M. C.	6.0 M. C.	Range Switch S. W. Position 2	15 Roll Gang
4	Ant. Lead	200 mmfd.	1500 K. C.	1500 K. C.	Range Switch Broadcast Position 1	15A Roll Gang
5	Ant. Lead	200 mmfd.	580 K. C.	580 K. C.	Range Switch Broadcast Position 1	17 Roll Gang

PHILCO RADIO & TELEVISION CORP.

MODEL 41-695



**Model 41-695**

PLUG SHOWN FROM PRONG SIDE

Model 41-695 is a radio-phonograph combination consisting of a five (5) tube super-heterodyne radio, a manually operated, even-speed, spring-wind Phonograph Motor which uses no current and a crystal pickup.

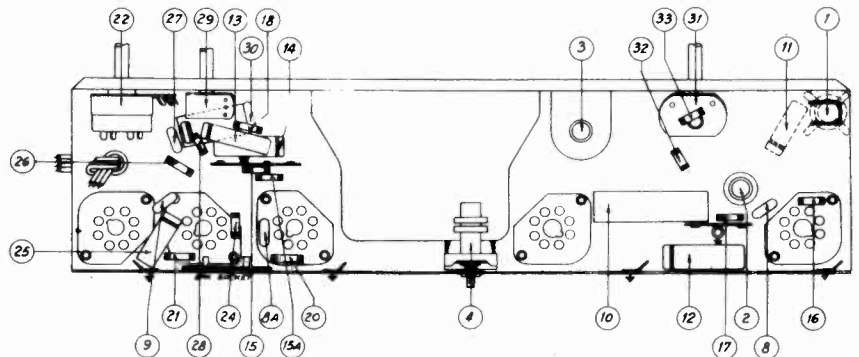
The radio includes: Super-efficient Philco Farm Radio Tubes, designed for low drain, 1 1/2 volt circuit; High Output Permanent Magnet Speaker; Automatic Volume Control; Push-pull Pentode Audio System with screen phase inversion; Automatic "ON-OFF" indicator, and covers a tuning band from 540 to 1720 K. C.

INTERMEDIATE FREQUENCY: 455 K. C.

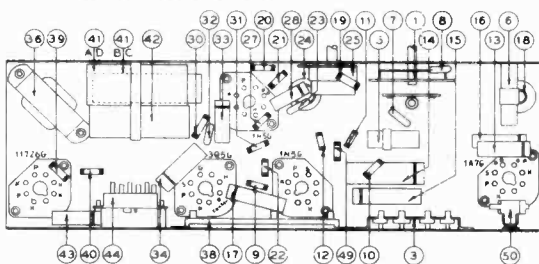
SCH. No.	DESCRIPTION	PART No.	SCH. No.	DESCRIPTION	PART No.	SCH. No.	DESCRIPTION	PART No.
1	Aerial Transformer	32-3183	76-1122	Indicator	76-1122	76-1122	Shield (Tube)	56-1366
2	Oscillator Transformer	32-3184	76-1049	Lever (Indicator)	76-1049	76-1049	Shield Clip	56-1367
3	1st I. F. Transformer	32-3188	38-9861	Cam Assembly	38-9861	38-9861	Screw (Brake Mounting)	W-847
4	2nd I. F. Transformer	32-3189	27-4332	Knob	27-4332	27-4332	Screw (Motor Mounting)	W-2002
5	Output Transformer	32-8107	38-1238	Motor (Phono.)	38-1238	38-1238	Screw (Chassis Mounting)	W-2030
6	Speaker Cone (For Speaker 36-1522-4)	36-4171	35-2038	Turntable	35-2038	35-2038	Socket (6 prong)	27-6133
7	Tuning Condenser	31-2457	35-2074	Coupling	35-2074	35-2074	Socket (Speaker)	35-2206
	Drive Cord (Indicator Drive)	31-2504	56-6110	Spindle	56-6110	56-6110	Spindle (Motor)	56-6110
	Tuning Shaft	31-2468	56-1872	Washer (Coupling)	56-1872	56-1872	Washer (Chassis Mounting)	W-410
	Drive Cord (Pointer Drive)	31-2528						
	Drive Drum	76-1176						
8	Condenser (100 mfd.)	60-110387						
9	Condenser (750 mfd.)	60-173127						
10	Electrolytic Condenser (30 mfd.)	30-2396						
11	Condenser (.05 mfd., 400 volts)	30-4519						
12	Condenser (.25 mfd., 100 volts)	61-0112						
13	Condenser (.004 mfd., 400 volts)	30-4878						
14	Condenser (.01 mfd., 400 volts)	30-4372						
15	Resistor (4.7 megohms)	33-347339						
16	Resistor (220,000 ohms)	33-422339						
17	Resistor (88,000 ohms)	33-288339						
18	Resistor (10 megohms)	33-810339						
19	Resistor (1 megohm)	33-110339						
20	Resistor (50 ohms)	33-156326						
21	Resistor (2.2 megohms)	33-522339						
22	Volume Control	33-5413						
23	Battery Cable	41-3905						
24	Resistor (2.2 megohms)	33-522339						
25	Condenser (.01 mfd., 400 volts)	30-4372						
26	Resistor (10,000 ohms)	33-310339						
27	Condenser (50 mfd.)	60-090137						
28	Resistor (100,000 ohms)	33-410339						
29	Tone Control Switch	42-1810						
30	Condenser (.002 mfd., 400 volts)	30-4378						
31	Radio-Phono Switch	42-1606						
32	Resistor (10,000 ohms)	33-310339						
33	Resistor (47,000 ohms)	33-447339						
34	Crystal Pickup and Tone Arm Complete	35-2205						

**MISCELLANEOUS PARTS**

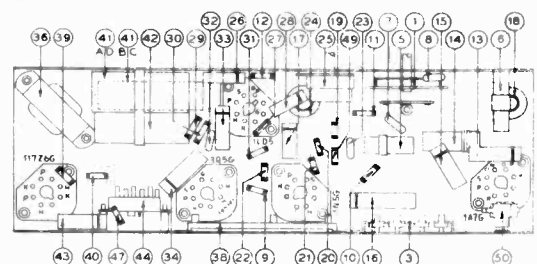
Bezel	27-4975
Glass (Bezel)	27-5610
Speed Clips (Glass Mounting)	56-1876
Speed Clips (Bezel Mounting)	56-1827
Cable (Pickup)	41-3557
Cable (Speaker)	41-3451
Clip (Aerial Transformer)	28-5002
Cabinets	10317A
Clamp (Crank)	56-1366
Dial	27-5591
Pointer	56-1856



PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-695



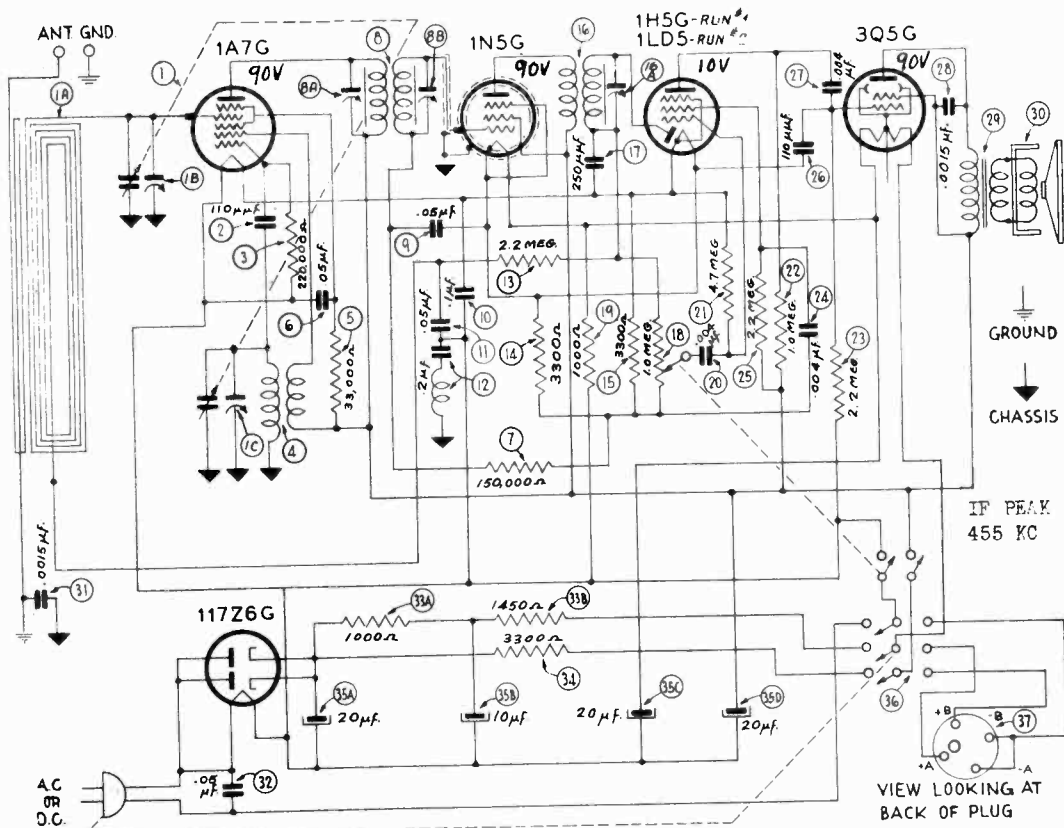
PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-851, RUN 1



PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-851, RUN 2

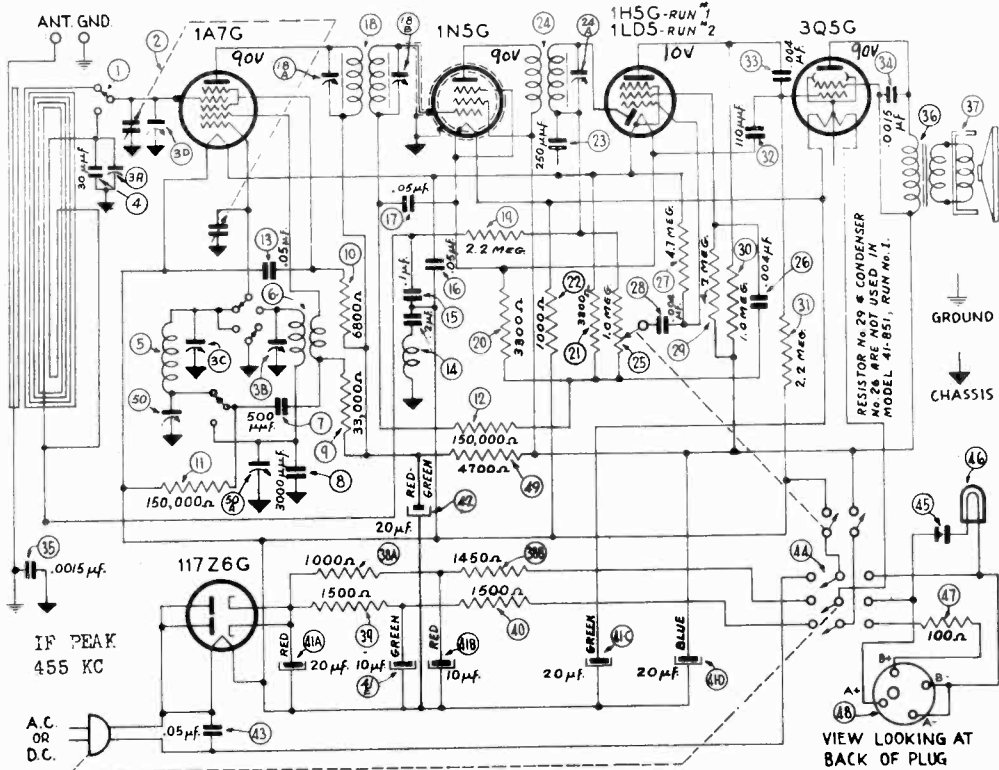
MODEL 41-841  
Code 121, Runs 1,2  
MODEL 41-851  
Code 121, Runs 1.2

PHILCO RADIO & TELEVISION CORP.



Model 41-841, Code 121, Runs 1 and 2

SEPTEMBER, 1940.



Model 41-851, Code 121, Runs 1 and 2

PHILCO RADIO & TELEVISION CORP.

MODELS 41-841,  
41-695, 41-851

**Vacuum Tube Voltmeter:** If a vacuum tube voltmeter is used as an aligning indicator, the negative (-) terminal is connected to the A. V. C. circuit of the receiver through a 2 meg-ohm resistor. The positive (+) terminal is connected to the chassis or ground.

**Signal Generator:** When adjusting the "I. F." padders the high side of the signal generator is connected through a .1 mfd. condenser to the loop tuning condenser stator lug which

connects to the grid of the first detector oscillator tube. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R. F. padders of the portable models a loop aerial is made from a few turns of wire and connected to the signal generator output terminals. The signal generator is then placed a few feet from the set. The loop aerial of the receiver should be assembled in the cabinet together with the battery when adjusting the R. F. padders.

To align the R. F. padders of the 41-695, connect the signal generator to the aerial through a 225 mmfd. condenser.

**Models 41-841, 41-695**

The Model 41-841 may be adjusted when operated by battery or 115 volts A. C.-D. C. power.

Operations in Order	SIGNAL GENERATOR		RECEIVER			SPECIAL INSTRUCTIONS	
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting	Adjust Compensators		
					41-841		41-695
1	See Paragraph on Signal Generator above	455 K. C.	540 K. C.	Vol. Max.	8A, 8B 16A	3A, 3B 4A	Note A
2	Use Loop on Generator as above	1500 K. C.	1500 K. C.	Vol. Max.	1C, 1B	7B, 7A	

**Model 41-851**

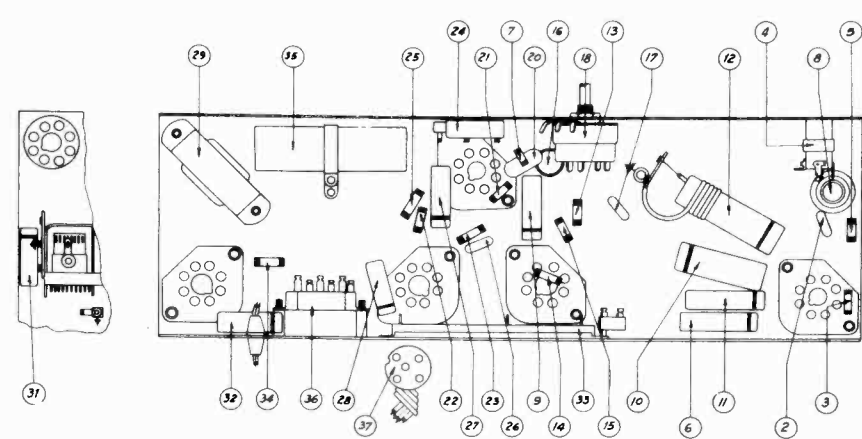
1	Stator Plate Lug Loop Tuning Condenser	455 K. C.	540 K. C.	Vol. Max.	18A, 18B, 24A		
2	Loop on Generator	1500 K. C.	1500 K. C.	Range Switch "Brdcast" Vol. Max.	3C, 3D		Note A
3	Loop on Generator	580 K. C.	580 K. C.	Range Switch "Brdcast" Vol. Max.	50		
4	Recheck operation No. "2"						
5	Loop on Generator	6 M. C.	6 M. C.	Range Switch "S. W."	50A		
6	Loop on Generator	15 M. C.	15 M. C.	Range Switch "S. W."	3B, 3A		Note B

**NOTE A: DIAL CALIBRATION:** Before adjusting the R. F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity) set the dial pointer on the small dot below 550 K. C.

**NOTE B:** When adjusting compensator be sure to tune in the fundamental signal (15 M. C.) instead of the image signal. If the compensator is correctly adjusted, the image signal will be found by turning dial 910 K. C. below the fundamental signal, which will be 14,090 M. C.

**Replacement Parts — Model 41-841, Code 121**

IN RUN 1 RADIOS WHICH USE A 1M5C IN THE SECOND DETECTOR CIRCUIT. PARTS 24 AND 25 ARE NOT REQUIRED								
SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Tuning Condenser	31-2529	Dial	27-5579	27-6151	Socket (Tubes, 1LDS Tube, Run 2)	27-6151	
	Tuning Shaft	56-6080	Dial Pointer	27-0127	27-4978	Rubber Grommet (Socket 1LDS Tube)	27-4112	
	"C" Washer	31-2380	Knobs	27-4970	36-1826	Rubber Washer (Socket 1LDS Tube)	W-792	
	Drive Cord	28-8882	Speaker	31-2380	27-6137	Socket (Tubes, R. F. I. F. Audio)	W-2030	
	Spring		Socket (Tubes, Rectifier)			Washer (Chassis Mounting)	W-410	
1A	Loop Aerial (Part of Cabinet 10473A)							
1B	Comp. (Aerial Adjustment, Part of 1)							
2	Comp. (Oscillator Adjustment, Part of 1)	60-110157						
3	Mica Condenser (10 mmfd.)	33-422339						
4	Resistor (220,000 ohms, 1/2 watt)	32-3424						
5	Oscillator Transformer	33-333339						
6	Resistor (33,000 ohms, 1/2 watt)	30-4519						
7	Condenser (.05 mfd., 400 volts)	33-415339						
8	Resistor (150,000 ohms, 1/2 watt)	32-3583						
9	1st I. F. Transformer	30-4519						
10	Condenser (.05 mfd., 200 volts)	30-4455						
11	Condenser (.1 mfd., 400 volts)	30-4519						
12	Condenser (.05 mfd., 200 volts)	76-1034						
13	Condenser and R. F. Choke (2 mfd.)	33-522339						
14	Resistor (2.2 megohms)	33-233339						
15	Resistor (3300 ohms, 1/2 watt)	33-233339						
16	2nd I. F. Transformer	33-2266						
17	Mica Condenser (250 mmfd.)	60-125157						
18	Volume Control	33-5390						
19	Palnut	W-2157						
20	Resistor (1000 ohms, 1/2 watt)	33-210339						
21	Resistor (4.7 megohms)	36-4578						
22	Resistor (1 megohm)	33-57339						
23	Resistor (2.2 megohms)	33-510339						
24	Condenser (.004 mfd., 400 volts)	33-522339						
25	Resistor (2.2 megohms)	30-4456						
26	Mica Condenser (110 mmfd.)	33-522339						
27	Condenser (.004 mfd., 400 volts)	30-4578						
28	Condenser (.0015 mfd., 200 volts)	30-4455						
29	Output Transformer	32-8139						
30	Cone Assem. (For Speaker 36-1526-3)	36-4175						
31	Condenser (.0015 mfd., 200 volts)	30-4455						
32	Condenser (.05 mfd., 400 volts)	30-4518						
33A	Resistor (1000 ohms)	33-3400						
34	Resistor (3300 ohms, 1/2 watt)	33-233339						
35A	Comp. (Brdcast. Oscillator) Part of 3A	30-2492						
35B	Electrolytic Cond. (10 mfd., 25 v.) Part of 35A							
35C	Elec. Cond. (20 mfd., 25 v.) Part of 35A							
35D	Electrolytic Cond. (20 mfd., 25 v.) Part of 35A							
36	Automatic Power Changeover Switch	42-1553						
37	Battery Cable	41-3592						



PART LOCATIONS — UNDERSIDE OF CHASSIS MODEL 41-841, CODE 121, RUNS 1 AND 2

**Replacement Parts — Model 41-851, Runs 1 and 2**

PARTS 26 AND 29 ARE NOT USED IN EARLY PRODUCTION RUN 1 RADIOS.								
SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.	SCHE. No.	DESCRIPTION	PART No.
1	Band Switch	42-1870	23	Mica Condenser (250 mmfd.)	60-125157	49	Resistor (4700 ohms)	33-247339
1A	Loop Aerial (Run Two)	76-1175	24	2nd I. F. Transformer	32-3266	50	Compensator	31-6100
2	Loop Aerial (Run One)	76-1156	25	Volume Control	33-5390	50A	Compensator (Part of 50)	
3	Tuning Condenser	31-2459	26	Condenser (.004 mfd., 400 volts)	30-4578			
4	Drive Cord	31-2380	27	Resistor (4.7 megohms)	33-522339			
	Tuning Shaft	56-6080	28	Condenser (.004 mfd., 400 volts)	30-4578			
	"C" Washer	31-2380	29	Resistor (2.2 megohms)	33-510339			
3A	Compensator (Short Wave Aerial)	31-6347	30	Resistor (1 megohm)	33-510339			
3B	Compensator (S. W. Oscillator) Part of 3A		31	Resistor (2.2 megohms)	33-522339			
3C	Comp. (Brdcast. Oscillator) Part of 3A		32	Mica Condenser (110 mmfd.)	60-111157			
3D	Compensator (Brdcast. Aerial) Part of 3A		33	Condenser (.01 mfd., 400 volts)	30-4572			
4	Mica Condenser (50 mmfd., Mounted on Loop, Run 2)	60-050127	34	Condenser (.0015 mfd., 200 volts)	30-4555			
5	Oscillator Transformer (Broadcast.)	32-3431	35	Output Transformer	32-8139			
6	Oscillator Transformer (Short Wave)	32-3577	36	Cone Assem. (For Speaker 36-1506-1)	36-4175			
7	Mica Condenser (500 mmfd.)	60-150137	36A	Resistor (Wirewound, 1000 ohms)	33-3387			
8	Mica Condenser (3000 mmfd.)	60-230334	36B	Resistor (Wirewound, 1450 ohms) Pt. of 36A	33-215339			
9	Resistor (33,000 ohms)	33-233339	37	Resistor (1500 ohms)	33-215339			
10	Resistor (6800 ohms)	33-268339	40	Resistor (1500 ohms)	33-215339			
11	Resistor (150,000 ohms)	33-415339	41	Electrolytic Cond. (20 mfd., 150 volts)	30-2452			
12	Resistor (150,000 ohms)	33-415339	42	Electrolytic Cond. (10 mfd., 150 volts)	30-2453			
13	Condenser (.05 mfd., 400 volts)	30-4518	41C	Elec. Cond. (20 mfd., 25 v.) Part of 41B				
14	Condenser (2 mfd.) and R. F. Choke	76-1161	41D	Elec. Cond. (10 mfd., 30 v.) Part of 41A				
15	Condenser (.1 mfd., 400 volts)	30-4455	41E	Elec. Cond. (10 mfd., 150 v.) Part of 41A				
16	Condenser (.05 mfd., 400 volts)	30-4518	42	Electrolytic Condenser (20 mfd.)	30-2382			
17	Condenser (.05 mfd., 200 volts)	30-4519	43	Condenser (.05 mfd., 400 volts)	30-4518			
18	1st I. F. Transformer	32-3583	44	Automatic Power Switch	42-1553			
19	Resistor (2.2 megohms)	33-522339	45	Pilot Lamp Switch	56-1487			
20	Resistor (3300 ohms, 1/2 watt)	33-233339	46	Pilot Lamp	34-2031			
21	Resistor (3300 ohms, 1/2 watt)	33-233339	47	Resistor (100 ohms, 1/2 watt)	33-110339			
22	Resistor (1000 ohms, 1/2 watt)	33-210339	48	Battery Cable	41-3592			

**MISCELLANEOUS PARTS**

Cord (Power)	L-3199
Cabinet	10473B
Clip (Coil Mounting)	28-5002
Indicator Arm Assembly	28-8987
Spring	28-8987
Cam and Hub Assembly	38-9861
Knob (Tuning Volume)	27-4878
Push-button (Pilot Lamp)	27-4844
Screw (Chassis Mounting)	W-2030
Rubber Washer	56-1956
Shield (1M5C Tube)	56-1568
Shield Clip	56-1567
Socket (Loop Terminal)	27-6141
Socket (1LDS Tube, Run 2)	27-6151
Rubber Grommet	54-4020
Washer (Chassis Mounting)	27-4112
Eyelet	W-792
Socket Assembly (Pilot Lamp)	27-6133
Socket (Tubes)	27-6137
Socket (Rectifier)	28-4342
Snap Fastener (Pilot Lamp)	27-6141
Terminal Panel (Loop)	W-410
Washer (Chassis Mounting)	

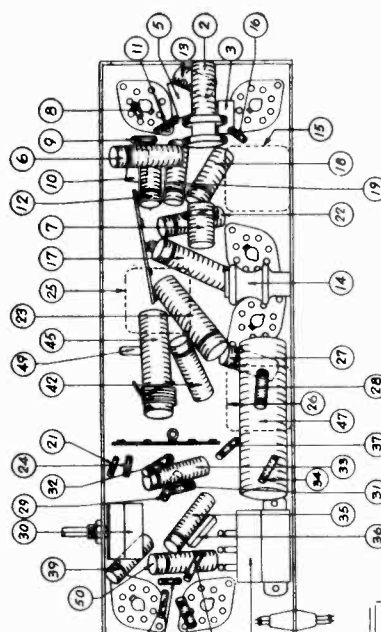
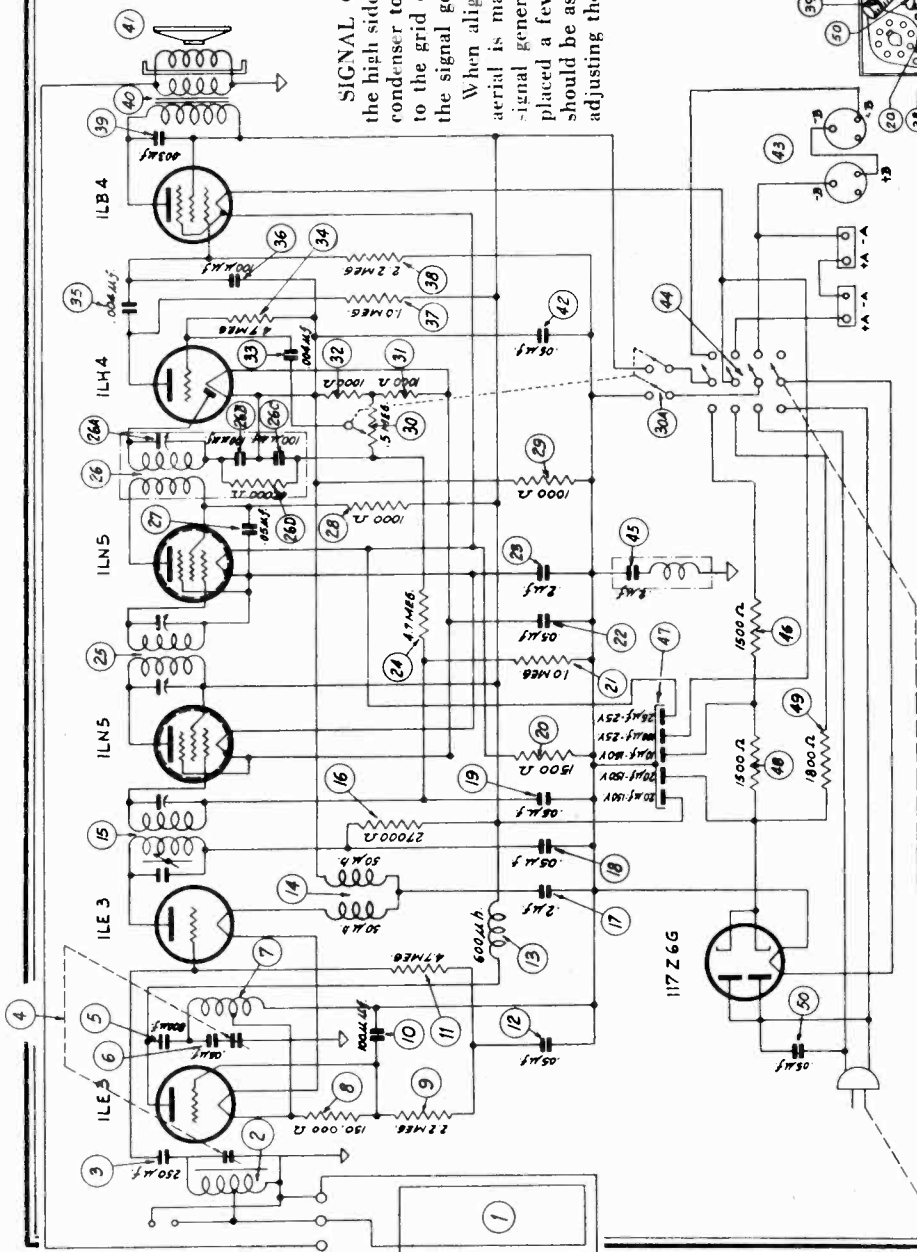
MODELS 41-842,  
41-843, 41-844

PHILCO RADIO & TELEVISION CORP.

MODELS 41-842, 41-843, 41-844

**SIGNAL GENERATOR:** When adjusting the "I.F." padders the high side of the signal generator is connected through a .1 mfd. condenser to the loop tuning condenser stator lug which connects to the grid of the first detector tube. The ground or low side of the signal generator is connected to the chassis of the receiver.

When aligning the R.F. padders of the portable models a loop aerial is made from a few turns of wire and connected to the signal generator output terminals. The signal generator is then placed a few feet from the set. The loop aerial of the receiver should be assembled in the cabinet together with the battery when adjusting the R.F. padders.



UNDERSIDE OF CHASSIS

Note A

These models may be adjusted when operated by battery or 115 volts A.C.-D.C. power.

Operations in Order	SIGNAL GENERATOR		RECEIVER	
	Output Connections to Receiver	Dial Setting	Dial Setting	Control Setting
1	See Paragraph on Signal Generator above	455 K.C.	540 K.C.	Vol. Max.
2	Use Loop on Generator as above	1500 K.C.	1500 K.C.	Vol. Max.
				Adjust Compensators
				26A, 25A, 25B, 15A, 15B
				4B, 4A

**NOTE A: DIAL CALIBRATION**—Before adjusting the R.F. padders the dial must be aligned to track properly with the tuning condenser. To adjust the dial proceed as follows: With the tuning condenser in the closed position (maximum capacity), set the dial pointer on the small dot below 540 K.C.

DECEMBER, 1940

PHILCO RADIO & TELEVISION CORP.

LOUDS PEAKER  
PARTS DATA

**PHILCO 1940 HOME RADIO SPEAKERS**

Listed below are the Philco speakers, replacement cones and output transformers used in the 1939 and 1940 Philco home and auto radio line.

In some models two or more different type speakers are used. These speakers, however, are interchangeable and will have the same part number, with the exception of a suffix number -1, -2, etc., added to the part number. The cone assemblies of these speakers are not interchangeable.

It is important when ordering cone assemblies that the correct part number, as indicated on these pages, be specified.

Speaker	Used In Models	Replacement Cones	Output Transformer
60110	TH-1	36-4130	43118
60112-9	TH-3	36-4119	
36-1266-3	905	36-4146	32-7927
36-1410-1	40-110B	36-4093	32-8066
	39-80B, 39-85B	36-4093	32-7984
36-1426-1	39-17T, 39-19T	36-4083	32-7980
36-1426-3	39-17T, 39-19T	36-4085	32-7980
36-1427-1	905	36-4096	32-7927
36-1435-3	39-70B	36-4090	32-7995
36-1436-1	39-80XF, 39-85XF	36-4094	32-7984
	40-105K, 40-110K	36-4094	32-8066
36-1437-2	39-25XF, 39-30XX	36-4088	32-7978
36-1437-4	39-30XX, 39-25XF	36-4118	32-7978
36-1438-2	39-35	36-4089	32-7978
36-1438-4	39-35XX, 39-31XF, 39-36XX	36-4117	32-7978
36-1439-2	39-25T, 39-30T	36-4087	32-7978
36-1439-8	39-25T, 39-30T	36-4112	32-7978
36-1440-3	39-17F, 39-7CS	36-4086	32-7980
36-1441-2	922 Auto	91-0025	32-8000
36-1442-3	39-70B, 39-75T	36-4090	32-7995
36-1444-1	39-18T	36-4083	32-7986
36-1444-3	39-18T	36-4085	32-7986
36-1445-3	39-18F	36-4086	32-7985
36-1447-3	39-70F, 39-75F	36-4092	32-7995
36-1447-8	39-70F, 39-75F	36-4116	32-7995
36-1449-3	39-19F	36-4086	32-7980
36-1450-2	39-40XX, 39-45XX	36-4089	32-7997
	39-55RX		32-7996
	39-116RX		32-7997
	40-216, 40-205, 40-215RX, 40-516	36-4089	32-7997
	40-510		
	40-195, 40-200	36-4089	32-7981
	40-508, 40-509	36-4089	32-8070
36-1450-4	39-55FX	36-4111	32-7997
	40-508, 40-509		
	39-116RX		
	40-508, 40-509		
36-1451-3	39-71T	36-4090	32-8070
36-1452-2	39-720T	36-4103	32-7996
	40-725T, 40-725, Code 251, 40-2725T		
	39-750T, Code 121	36-4104	32-8019
	39-744T	36-4107	32-8048
	39-751T		32-8026
	40-748T		32-8026
	39-744XX, 39-751XX	36-4108 (39-744) (39-751)	32-8072
	40-748XX		32-8026
	40-756XX, Code 121	36-4106	32-8028
	39-770T	36-4105 (39-750XX) (39-770XX)	32-8072
	39-750XX, 39-770XX		32-8020
	40-755XX		32-8019
	40-780XX, 40-755XX, Code 251		32-8048
	TH3-CB, TH3-CB1, 39-7C		32-8058
	TH-4, TP-4, TP-5, TP-10	36-4114	32-8046
	TH-18, TP-20, TP-21, PT-25	36-4095	32-8040
	PT-26, 27, 29, 31, 33, 35, 36, 39, 41, 43, 45, 46, 47, 49, 50, 53, 55, 57, 59, 61, 65, 67, 69, 40-115, 40-120, 40-124, 40-125, 40-501, 40-502	36-4132 36-4113	32-8047
	TH-4, TH-5		
	40-115C, 40-120, 40-124, 40-125, 40-501, 40-502	36-4086 36-4110	32-8044
	39-25CS		
	39-711		
	40-715T		
	105		
	40-90	36-4120	327978
	40-95, 40-110	36-4121	32-8033
	40-130, 40-140, 40-135, 40-145	36-4121	32-8018
	40-130T, 40-140T, 40-185T	36-4126	32-7980
	40-145T	36-4085	32-8051
	40-130, 40-135, 40-140, 40-145		32-8063
	40-180, 40-185, 40-190	36-4134	32-8063
	40-180, 40-185, 40-190	36-4089	32-8053
	40-180, 40-185, 40-190	36-4117	32-8056
	40-158F	36-4086	32-8036
	40-160, 40-165, 40-170, 40-525	36-4136	32-8056
	40-158, 40-160, 40-165		32-8063
	40-170, 40-525, 40-526		32-8036
	40-81, 40-82	36-4121	32-8062
	40-74, 40-88	36-4121	32-8096
	40-150T, 40-155T	36-4127	32-8033
	40-150T, 40-155T	36-4124	32-8053
	40-150, 40-155	36-4135	32-8053
	40-503	36-4126	32-8063
	36-1484-2	36-4137	32-8063
	40-508	36-4137	32-8063
	40-2780T	36-4106	32-8058
	36-1485-2	36-4126	32-8095
	40-506	36-4126	32-8071
	36-1487-3	36-4128	32-8071
	40-95F, Code 122, 40-100F, Code 122	36-4129	32-8071
	36-1488-3	36-4129	32-8051
	40-507	36-4089	32-8071
	40-527	36-4133	32-8063
	36-1491-2	36-4147	32-8063
	36-1491-4		32-8056
	40-165K		

**With Replacement Cones and Output Transformers**

Speaker	Used In Models	Replacement Cones	Output Transformer
60110	TH-1	36-4130	43118
60112-9	TH-3	36-4119	
36-1266-3	905	36-4146	32-7927
36-1410-1	40-110B	36-4093	32-8066
	39-80B, 39-85B	36-4093	32-7984
36-1426-1	39-17T, 39-19T	36-4083	32-7980
36-1426-3	39-17T, 39-19T	36-4085	32-7980
36-1427-1	905	36-4096	32-7927
36-1435-3	39-70B	36-4090	32-7995
36-1436-1	39-80XF, 39-85XF	36-4094	32-7984
	40-105K, 40-110K	36-4094	32-8066
36-1437-2	39-25XF, 39-30XX	36-4088	32-7978
36-1437-4	39-30XX, 39-25XF	36-4118	32-7978
36-1438-2	39-35	36-4089	32-7978
36-1438-4	39-35XX, 39-31XF, 39-36XX	36-4117	32-7978
36-1439-2	39-25T, 39-30T	36-4087	32-7978
36-1439-8	39-25T, 39-30T	36-4112	32-7978
36-1440-3	39-17F, 39-7CS	36-4086	32-7980
36-1441-2	922 Auto	91-0025	32-8000
36-1442-3	39-70B, 39-75T	36-4090	32-7995
36-1444-1	39-18T	36-4083	32-7986
36-1444-3	39-18T	36-4085	32-7986
36-1445-3	39-18F	36-4086	32-7985
36-1447-3	39-70F, 39-75F	36-4092	32-7995
36-1447-8	39-70F, 39-75F	36-4116	32-7995
36-1449-3	39-19F	36-4086	32-7980
36-1450-2	39-40XX, 39-45XX	36-4089	32-7997
	39-55RX		32-7996
	39-116RX		32-7997
	40-216, 40-205, 40-215RX, 40-516	36-4089	32-7997
	40-510		
	40-195, 40-200	36-4089	32-7981
	40-508, 40-509	36-4089	32-8070
36-1450-4	39-55FX	36-4111	32-7997
	40-508, 40-509		
	39-116RX		
	40-508, 40-509		
36-1451-3	39-71T	36-4090	32-8070
36-1452-2	39-720T	36-4103	32-7996
	40-725T, 40-725, Code 251, 40-2725T		



MODEL PT-36

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Antenna Transformer, Tuning Condenser, Wave Switch, etc.

MODEL PT-38

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Resistor, Tubular Condenser, Electrolytic Condenser, etc.

MODELS TH-9, TH-18, TH-22

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Mica Condenser, Antenna Transformer, Tuning Condenser, etc.

MODEL TP-21

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Loop Antenna Assembly, Tuning Condenser, Wave Switch, etc.

MODELS PT-49, PT-51

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Output Transformer, Speaker, Electrolytic Condenser, etc.

MODELS PT-43

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Loop Antenna Assembly, Tuning Condenser, Resistor, etc.

MODELS PT-37, PT-53

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Volume Control, Tubular Condenser, Resistor, etc.

MODEL TP-21

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Loop Antenna Assembly, Tuning Condenser, Wave Switch, etc.

MODEL PT-50

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists components like Loop Antenna Assembly, Tuning Condenser, Resistor, etc.

MISCELLANEOUS PARTS

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists miscellaneous parts like Cable, Cabinet Back, Pilot Lamp, etc.

MISCELLANEOUS PARTS

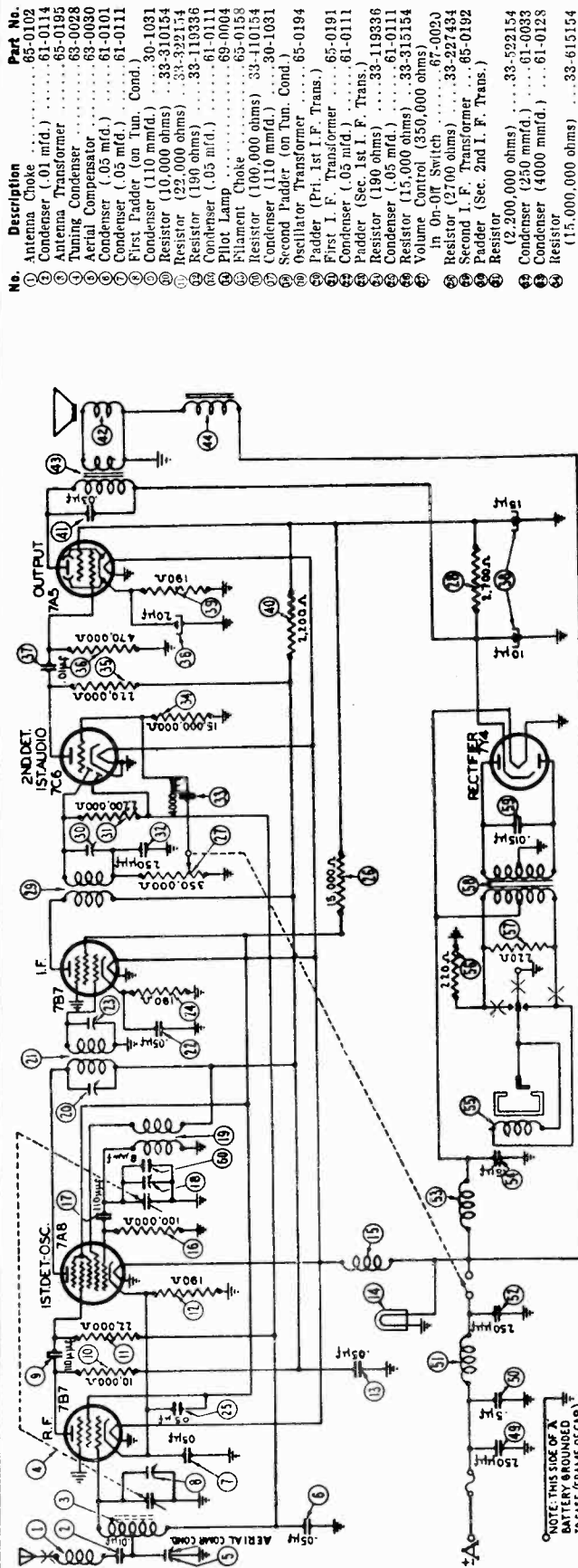
Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists miscellaneous parts like Baffle and Grille, Cable, Cabinet Back, etc.

MISCELLANEOUS PARTS

Table with 4 columns: SCHE. No., DESCRIPTION, PART No., and PART No. (repeated). Lists miscellaneous parts like Volume Control, Tubular Condenser, Resistor, etc.

PHILCO RADIO & TELEV. CORP.

MODEL AR-1

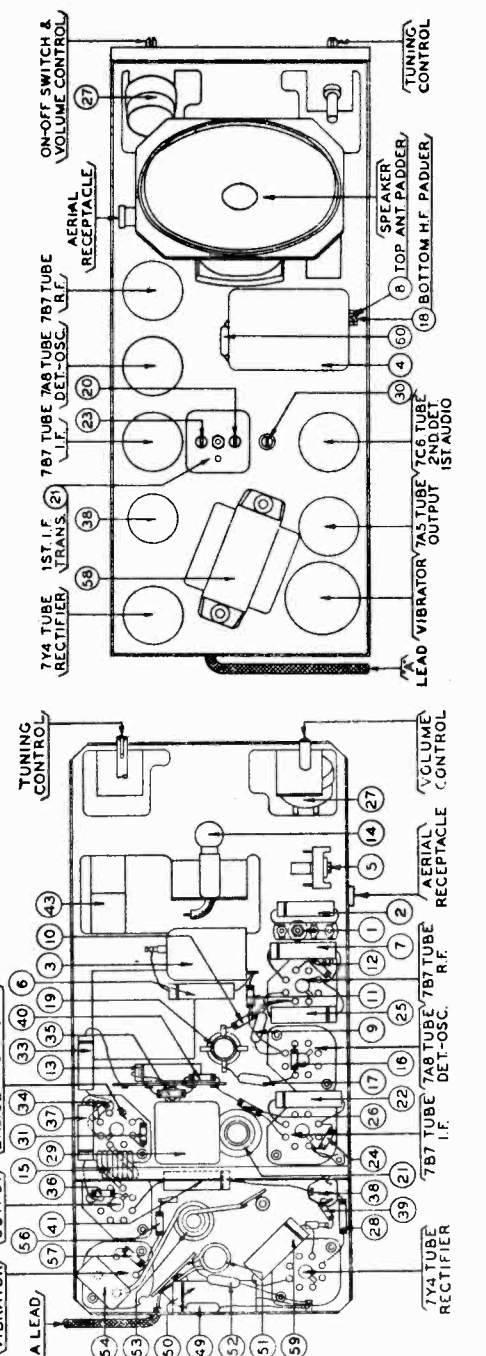


MODEL AR-1 SCHEMATIC  
I.F. = 455KC

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 mfd.)	61-0114
3	Antenna Transformer	65-0195
4	Tuning Condenser	63-0028
5	Aerial Compensator	63-0030
6	Condenser (.05 mfd.)	61-0101
7	Condenser (.05 mfd.)	61-0111
8	First Padder (on Tun. Cond.)	30-1031
9	Condenser (110 mmfd.)	33-310154
10	Resistor (10,000 ohms)	33-322154
11	Resistor (190 ohms)	33-119336
12	Condenser (.05 mfd.)	61-0111
13	Pilot Lamp	69-0004
14	Filament Choke	65-0158
15	Resistor (100,000 ohms)	33-410154
16	Condenser (110 mmfd.)	30-1031
17	Second Padder (on Tun. Cond.)	65-0194
18	Oscillator Transformer	65-0191
19	Padder (Pri. 1st I. F. Trans.)	65-0191
20	Condenser (.05 mfd.)	61-0111
21	Padder (Sec. 1st I. F. Trans.)	33-119336
22	Resistor (190 ohms)	33-119336
23	Condenser (.05 mfd.)	61-0111
24	Resistor (15,000 ohms)	33-315154
25	Volume Control (350,000 ohms)	65-0009
26	In. On-Off Switch	33-227434
27	Resistor (2100 ohms)	65-0192
28	Second I. F. Transformer	65-0192
29	Padder (Sec. 2nd I. F. Trans.)	33-522154
30	Resistor	61-0033
31	Condenser (250 mmfd.)	61-0033
32	Condenser (4000 mmfd.)	61-0128
33	Resistor (15,000,000 ohms)	33-615154
34	Resistor (220,000 ohms)	33-422154
35	Resistor (470,000 ohms)	33-447154
36	Condenser (.01 mfd.)	61-0114
37	Filter Condenser	61-0089
38	Resistor (190 ohms)	33-119336
39	Resistor (2200 ohms)	33-222334
40	Condenser (.03 mfd.)	61-0110
41	Comp. and Voice Coil (For 73-8027-1)	91-0076
42	Output Transformer	91-0077
43	Field Coil	65-0258
44	Condenser (250 mmfd.)	61-0033
45	Condenser (.5 mfd.)	61-0106
46	"A" Choke	32-1644
47	Condenser (250 mmfd.)	61-0033
48	Vibrator Choke	65-0204
49	Vibrator	83-6025
50	Condenser (.5 mfd.)	61-0106
51	Resistor (220 ohms)	33-122334
52	Resistor (220 ohms)	33-122334
53	Power Transformer	65-0185
54	Condenser (.015 mfd.)	61-0138
55	Drive Cord (16 1/4")	30-1106
56	Drive Cord (5 3/4")	55-0588
57	Drive Cord (13 3/4")	55-0589
58	Drive Cord (17 3/4")	55-0652
59	Tuning Shaft	57-0009P33
60	Speaker	73-8097
61	Tube Side Cover	318-196
62	Wiring Slide Cover	77-0837
63	Pointer	57-1431
64	Dial	77-0526
65	Tuning and Volume Knob	55-0547
66	Window Crystal	55-0501

NOTE: THIS SIDE OF A BATTERY BRIDGED TO CASE (PARAM. OF CAR).

PT. NO. 79-0608



MODELS AR-1, AR-4  
AR-9, C-1708

**ALIGNING PROCEDURE MODEL AR-1**

OPERATIONS	SIGNAL GENERATOR CONNECTION		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
	FREQUENCY	CONNECTION			
1	485 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	ADJUST THE AERIAL COMPENSATOR @ TWO TURNS FROM TIGHT	30, 25, 20 30, 25, 20
2	1580 K.C.	To Aerial Receptacle on Radio	30 mmfd. See Note 2	Note 1	18
3	1400 K.C.	To Aerial Receptacle on Radio	30 mmfd. See Note 2	Note 1	Set tuning condenser at 1400 K.C.
4	1200 to 1400 K.C.	To Aerial Receptacle on Radio	Note 4	Note 4	Note 3
5					Note 4

Make all adjustments for maximum reading on the output meter.

NOTE 1—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 2—Connect the aerial lead, Part No. 41-3191, to the antenna receptacle on the radio. Connect a 30 mmfd. condenser in series between the signal generator and the aerial lead.

NOTE 3—When the aerial stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

NOTE 4—When installing the radio in the car, follow the instructions on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover.

**MODEL AR-4**

Make all adjustments for maximum reading on the output meter.

NOTE 1—Connect the aerial lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 10 mmfd. condenser in series between the signal generator and the aerial lead.

NOTE 2—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3—Back the tuning condenser while adjusting the low frequency pad for maximum output. Rotate the tuning condenser the amount for maximum output when adjustment for further improvement is noticed. Repeat this procedure until no further improvement is noticed.

NOTE 4—When the aerial stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

NOTE 5—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast station on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover.

**MODEL AR-9**

OPERATIONS	SIGNAL GENERATOR CONNECTION		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
	FREQUENCY	CONNECTION			
1	485 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE BLACK DOT APPEARS IN THE BAND INDICATOR WINDOW AND STATIONS CAN BE TUNED IN BY MANUAL TUNING.	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
2	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
3	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
4	1200 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
5	1800 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
6	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	10, 9.5, 9, 8.5, 8, 7.5, 7, 6.5, 6, 5.5, 5, 4.5, 4, 3.5, 3, 2.5, 2, 1.5, 1, .5, 0

**INSTRUCTIONS FOR ADJUSTING SHORT WAVE PADDERS**

OPERATION	SIGNAL GENERATOR CONNECTION		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
	FREQUENCY	CONNECTION			
1	10 M.C.	To Aerial Receptacle on Radio	Note 1	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE "RED" DOT APPEARS IN THE BAND INDICATOR WINDOW	1 OSC. 10 M.C. 2 ANT. 9.5 M.C. 3 ANT. 9 M.C. 4 ANT. 8.5 M.C.
2	9.5 M.C.	To Aerial Receptacle on Radio	Note 1	Note 2	1 OSC. 10 M.C. 2 ANT. 9.5 M.C. 3 ANT. 9 M.C. 4 ANT. 8.5 M.C.
3	6 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 9 M.C. Signal Rotate Tuning Condenser to 6 M.C. Signal	1 OSC. 10 M.C. 2 ANT. 9.5 M.C. 3 ANT. 9 M.C. 4 ANT. 8.5 M.C.
4	12.1 M.C.	To Aerial Receptacle on Radio	Note 1	PUSH IN THE RIGHT HAND KNOB ON THE CONTROL UNTIL THE "WHITE" DOT APPEARS IN THE BAND INDICATOR WINDOW	1 OSC. 12.1 M.C. 2 ANT. 11.9 M.C. 3 ANT. 11.7 M.C.
5	11.9 M.C.	To Aerial Receptacle on Radio	Note 1	Note 2	1 OSC. 12.1 M.C. 2 ANT. 11.9 M.C. 3 ANT. 11.7 M.C.
6	11.7 M.C.	To Aerial Receptacle on Radio	Note 1	Rotate Tuning Condenser to 11.9 M.C. Signal Rotate Tuning Condenser to 11.7 M.C. Signal	1 OSC. 12.1 M.C. 2 ANT. 11.9 M.C. 3 ANT. 11.7 M.C.
7	11.7 M.C.	To Aerial Receptacle on Radio	Note 1	OPERATIONS 2 AND 3 ARE IMPORTANT AND MUST BE REPEATED UNTIL MAXIMUM SIGNAL IS RECEIVED	1 OSC. 12.1 M.C. 2 ANT. 11.9 M.C. 3 ANT. 11.7 M.C.

Make all adjustments for maximum reading on the output meter.

NOTE 1—Connect the aerial lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 10 mmfd. condenser in series between the signal generator and the aerial lead.

NOTE 2—Turn the condenser rotor plates completely out of mesh as far as they will go.

NOTE 3—Back the tuning condenser while adjusting the low frequency padder for maximum output. Rotate the tuning condenser the amount for maximum output when adjustment for further improvement is noticed. Repeat this procedure until no further improvement is noticed.

NOTE 4—When the aerial stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

NOTE 5—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast station on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover.

**MODEL C-1708**

OPERATIONS	SIGNAL GENERATOR CONNECTION		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
	FREQUENCY	CONNECTION			
1	485 K. C.	To Antenna Receptacle on Radio	.1 mfd.	ADJUST THE AERIAL COMPENSATOR @ TWO TURNS FROM TIGHT	30, 27, 25, 21 30, 27, 25, 21
2	485 K. C.	To Antenna Receptacle on Radio	.1 mfd.	Note 2	17
3	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Note 2	17
4	580 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set Tuning Condenser at 1400 K.C.	17
5	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set Tuning Condenser at 580 K.C.	17
6	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Note 2	17
7	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set Tuning Condenser at 1400 K.C.	17
8	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Set Tuning Condenser at 580 K.C.	17
9	1400 K. C.	To Antenna Receptacle on Radio	20 mmfd. Note 2	Note 5	17

**Model C-1708**

Make all adjustments for maximum reading on the output meter unless otherwise specified.

NOTE 1—Turn the tuning control knob clockwise as far as it will go.

NOTE 2—Connect the Chrysler Antenna lead, Part No. 95-0106, to the antenna receptacle on the radio. Connect a 20 mmfd. condenser in series between the signal generator and the antenna lead.

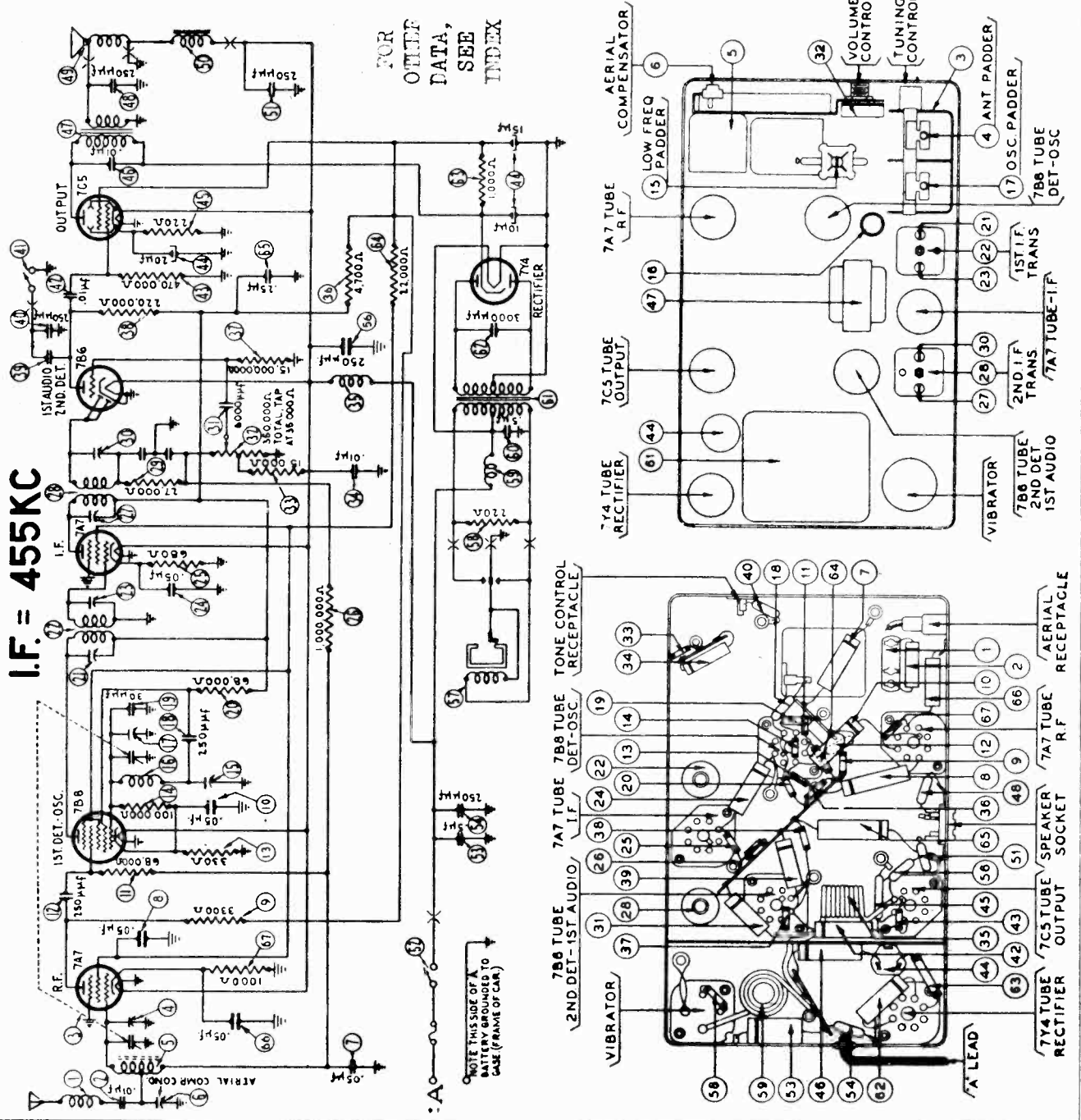
NOTE 3—Rotate the tuning control when adjusting the low frequency screw. Tune to the signal and adjust the signal and adjust for maximum signal at 1400 K. C.

NOTE 4—When the Antenna Stage adjustment is made with the Radio installed in the car, the Radio Antenna lead must be connected to the Cowl Antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna lead but not connected to it and adjust padder for maximum signal at 1400 K. C.

NOTE 5—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast station on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover. Broadcast signal between 1300 and 1400 K. C. on the cover.

PHILCO RADIO & TELEV. CORP.

No.	Descriptions	Part No.
1	Antenna Choke	85-0102
2	Condenser (.01 Mfd.)	81-0014
3	Tuning Condenser	85-0047
4	Antenna Padder (on Tun. Cond.)	85-0323
5	Antenna Transformer	77-0545
6	Aerial Compensator	61-0101
7	Condenser (.05 Mfd.)	61-0101
8	Condenser (.05 Mfd.)	33-23334
9	Resistor (3,300 ohms)	61-0101
10	Condenser (.05 Mfd.)	61-0101
11	Resistor (68,000 ohms)	33-368154
12	Resistor (250 Mmfd.)	61-0033
13	Resistor (330 ohms)	33-133336
14	Resistor (100,000 ohms)	33-410154
15	Low Frequency Padder	63-0048
16	Oscillator Transformer (on Tun. Cond.)	65-0052
17	Condenser (250 Mmfd.)	85-0112
18	Condenser (30 Mmfd.)	61-0033
19	Resistor (65,000 ohms)	60-030337
20	Padder (Pri. 1st I. F. Trans.)	33-368534
21	First I. F. Transformer	65-0319
22	Padder (Sec. 1st I. F. Trans.)	61-0101
23	Resistor (680 ohms)	33-168336
24	Resistor (1,000,000 ohms)	33-510154
25	Padder (Pri. 2nd I. F. Trans.)	65-0320
26	Second I. F. Transformer	33-327154
27	Resistor (27,000 ohms)	61-0103
28	Padder (Sec. 2nd I. F. Trans.)	(350,000 ohms)
29	Volume Control	67-0032-1
30	Resistor (15,000 ohms)	33-515154
31	Condenser (.01 Mfd.)	61-0114
32	Flament Choke	32-1604
33	Resistor (4,700 ohms)	33-247334
34	Resistor (15,000,000 ohms)	33-615154
35	Resistor (220,000 ohms)	33-422334
36	Condenser (4,000 Mmfd.)	61-0129
37	Condenser (250 Mmfd.)	61-0033
38	Tone Control Switch	85-0111
39	Resistor (.01 Mfd.)	85-0111
40	Resistor (470,000 ohms)	33-447154
41	Filter Condenser	(10-15-20 Mfd.)
42	Resistor (220 ohms)	61-0089
43	Condenser (.01 Mfd.)	33-122438
44	Output Transformer	61-0124
45	Replacement Cone	65-0317
46	(For 73-0045-2 Speaker)	61-0083
47	(For 73-0045-3 Speaker)	91-0086
48	(For 73-0047-2 Speaker)	91-0126
49	(For 73-0047-3 Speaker)	91-0086
50	Field Coil	91-0126
51	Condenser (250 Mmfd.)	Not Replaceable
52	On-Off Switch	85-0112
53	Condenser (.5 Mfd.)	61-0106
54	Condenser (250 Mmfd.)	61-0033
55	Vibrator	83-0025
56	Resistor (220 ohms)	33-122334
57	Vibrator Choke	65-0075
58	Condenser (.5 Mfd.)	61-0137
59	Power Transformer	65-0318
60	Resistor (1,000 ohms)	61-0115
61	Resistor (3,000 Mmfd.)	33-210434
62	Resistor (25 Mfd.)	33-322434
63	Condenser (25 Mfd.)	61-0125
64	Condenser (105 Mmfd.)	61-0111
65	Resistor (1,000 ohms)	33-210336
66	Interference Condenser	30-4007
67	Distributor Resistor	33-1196



FOR OTHER DATA, SEE INDEX

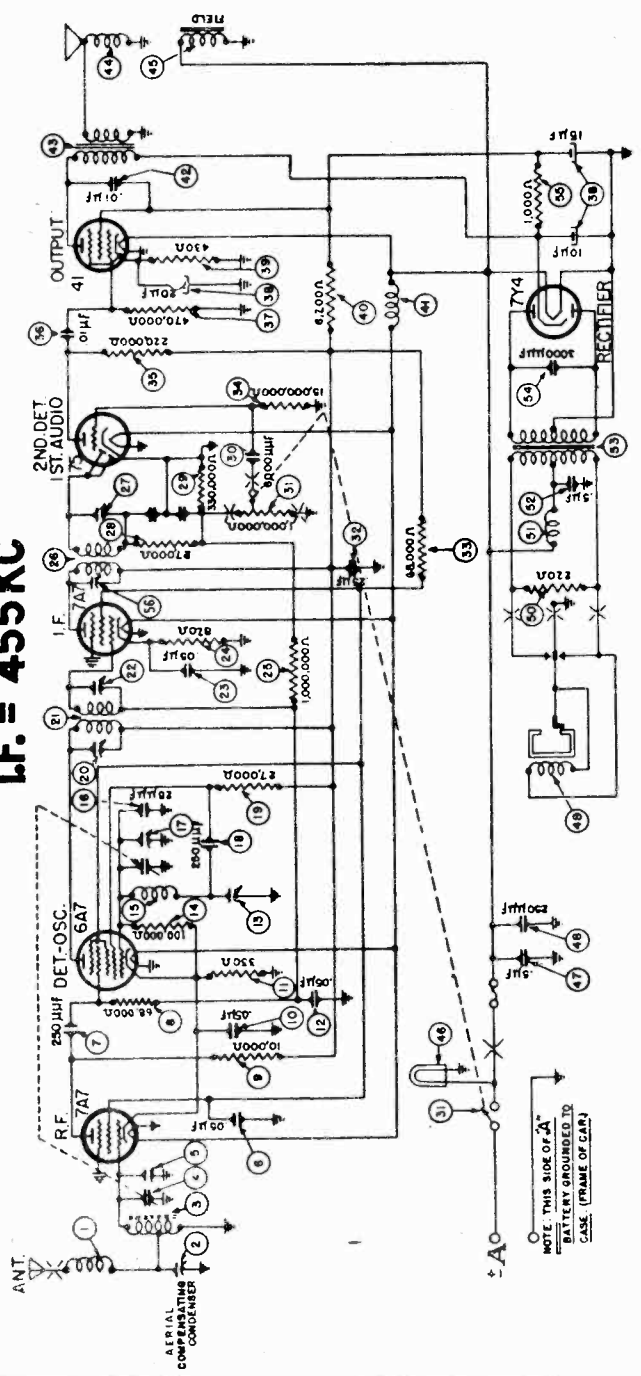
I.F. = 455KC

PHILCO RADIO & TELEV. CORP.

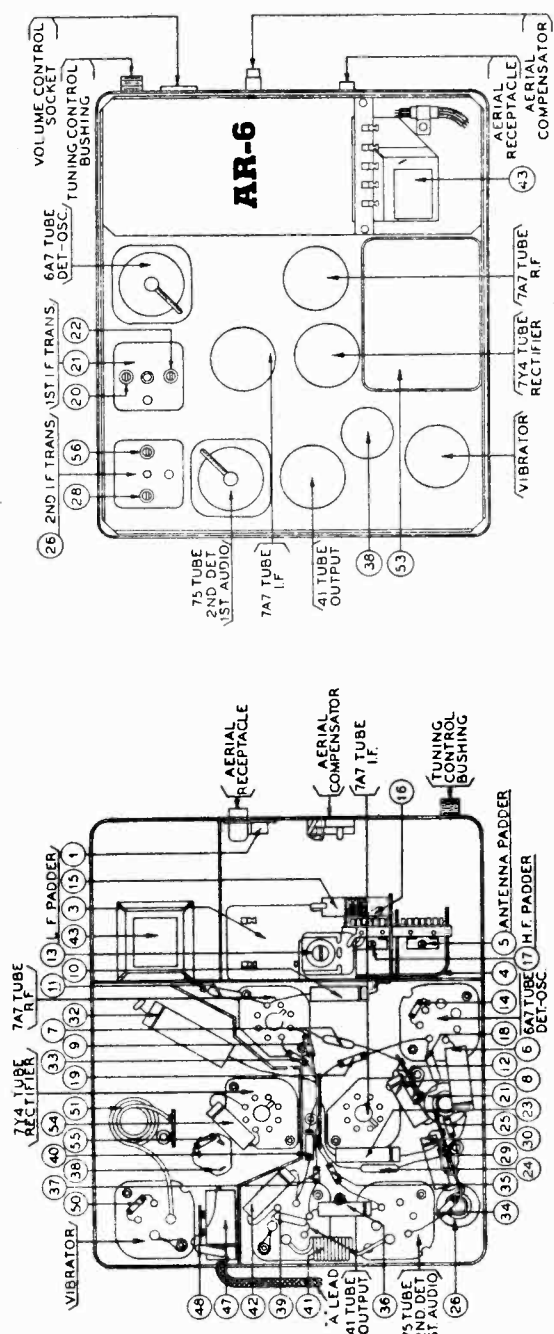
MODEL AR-6

No.	Description	Part No.
1	Aerial Choke	65-0102
2	Aerial Padder	31-5248
3	Antenna Transformer	65-0085
4	Tuning Condenser	65-0016
5	Aerial Padder (on Tun. Cond.)	61-0101
6	Condenser (.05 Mfd.)	61-0033
7	Resistor (250,000 ohms)	33-368184
8	Resistor (10,000 ohms)	33-310334
9	Condenser (.05 Mfd.)	61-0101
10	Resistor (330 ohms)	33-183436
11	Condenser (.65 Mfd.)	61-0111
12	Low Frequency Padder	31-6230
13	Resistor (100,000 ohms)	33-410154
14	Oscillator Transformer	65-0134
15	Condenser (.25 Mfd.)	30-1108
16	Oscillator Padder (on Tun. Cond.)	61-0033
17	Condenser (.25 Mfd.)	33-327334
18	Resistor (27,000 ohms)	33-327344
19	Resistor (330,000 ohms)	33-433154
20	Condenser (6,000 Mmfd.)	61-0103
21	Volume Control (1,000,000 ohms)	33-52668
22	Condenser (.25 Mfd.)	61-0125
23	Resistor (68,000 ohms)	33-368334
24	Resistor (15,000,000 ohms)	33-615154
25	Resistor (220,000 ohms)	33-422334
26	Condenser (.01 Mfd.)	61-0100
27	Resistor (470,000 ohms)	33-447154
28	Filter Condenser (110-15-50 Mfd.)	61-0089
29	Resistor (330 ohms)	33-183438
30	Resistor (6,200 ohms)	33-262434
31	Element Choke	32-1644
32	Condenser (.01 Mfd.)	61-0120
33	Output Transformer	65-0048
34	Core & Voice Coil	01-0028
35	Grid Lamp	24-2040
36	Condenser (.5 Mfd.)	61-0106
37	Condenser (230 Mmfd.)	61-0025
38	Vibrator (220 ohms)	33-192334
39	Vibrator Choke (65-0075)	61-0137
40	Condenser (.5 Mfd.)	61-0159
41	Power Transformer	61-0115
42	Condenser (3,000 Mmfd.)	61-0115
43	Resistor (1,000 ohms)	33-210334
44	Padder (Pri. 1st I. F. Trans.)	31-6044
45	4 Prong Socket	27-6036
46	6 Prong Socket	27-6037
47	7 Prong Socket	27-6037
48	Lokal Sockets	57-6131
49	Volume Control Socket	55-0415
50	Radio Housing	72-0020
51	Speaker Unit	57-1380745
52	Front Cover	57-1380745
53	Nut (Radio Mtg.)	28-618183
54	Washer (Radio Mtg.)	28-2808741
55	Interference Condenser	30-4007
56	Distributor Resistor	33-1196
57	Fuse	33-7927
58	Standard Control Assembly	65-0117
59	Dial	55-0304
60	Flexible Shaft	37-0681

LF = 455KC

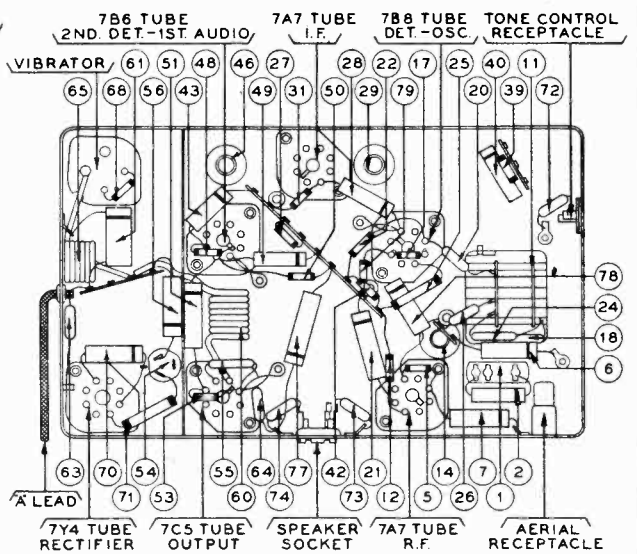
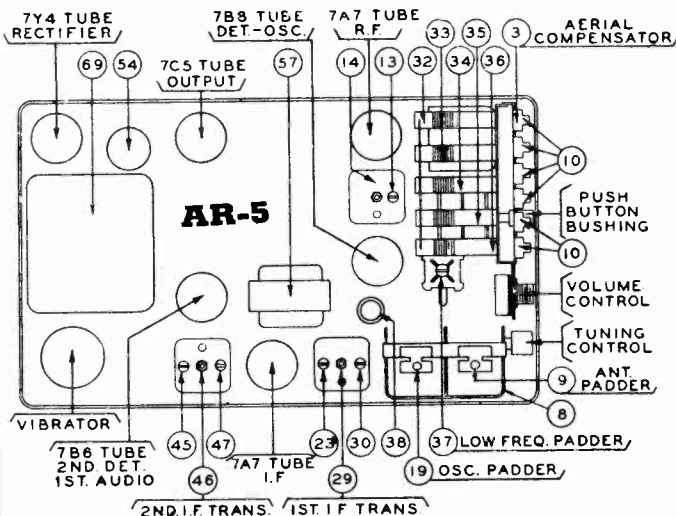
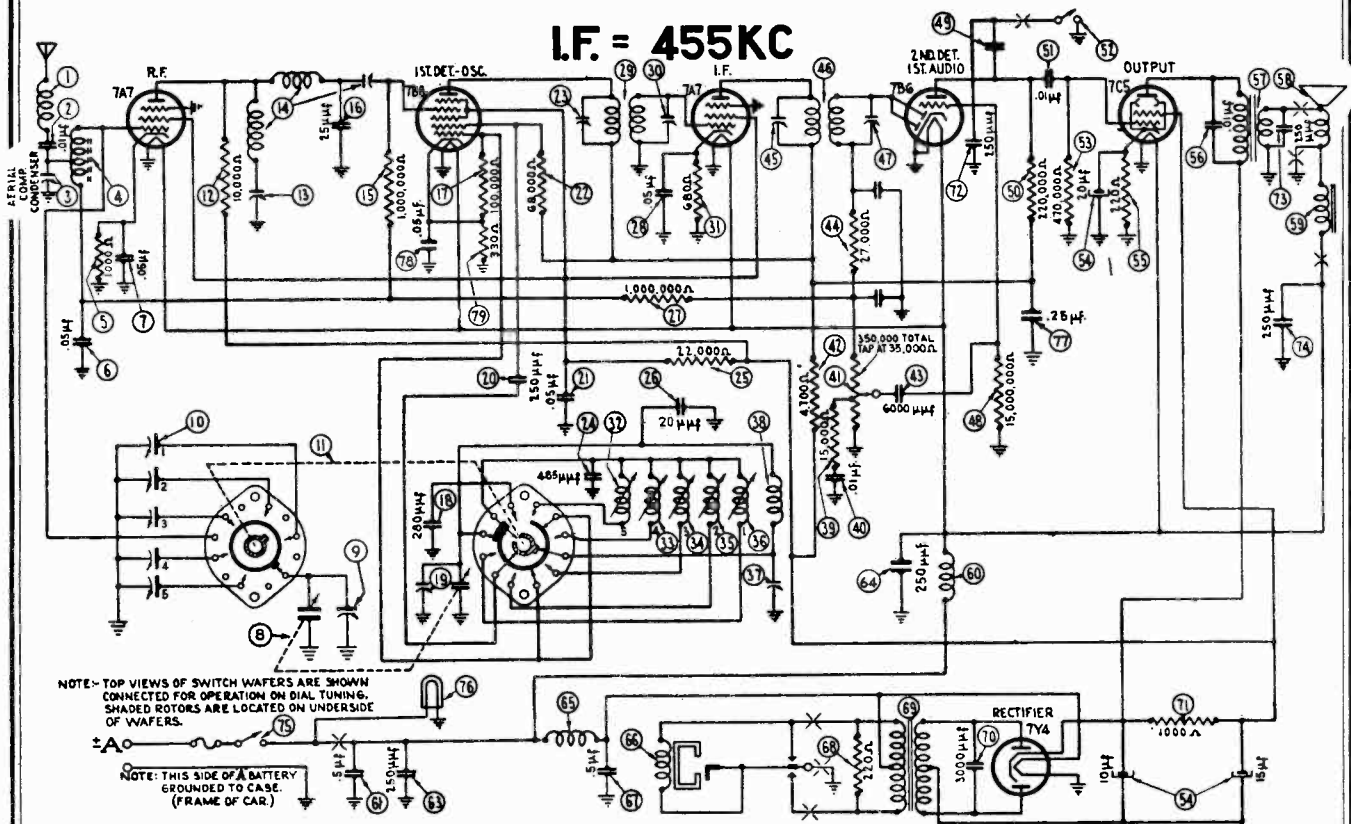


FOR OTHER DATA, SEE INDEX.



PHILCO RADIO & TELEV. CORP.

MODEL AR-5



No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0114
3	Aerial Compensator	Part of 10
4	Antenna Transformer	65-0323
5	Resistor (1,000 ohms)	33-210338
6	Condenser (.05 Mfd.)	61-0101
7	Condenser (.05 Mfd.)	61-0111
8	Tuning Condenser	63-0047
9	Antenna Padder (on Tun. Cond.)	
10	Antenna Padder Assembly	77-0512
11	Wafer Switch	77-0506
12	Resistor (10,000 ohms)	33-310334
13	I. F. Wave Trap Padder	
14	R. F. Transformer	65-0321
15	Resistor (1,000,000 ohms)	33-510154
16	Condenser (.25 Mmfd.)	30-1067
17	Resistor (100,000 ohms)	33-410154
18	Silver Mica Condenser (280 Mmfd.)	61-0043
19	Oscillator Padder (on Tun. Cond.)	
20	Condenser (250 Mmfd.)	61-0033
21	Condenser (.05 Mfd.)	61-0101
22	Resistor (68,000 ohms)	33-368334
23	Padder (Pri. 1st I. F. Trans.)	
24	Silver Mica Condenser (485 Mmfd.)	61-0144
25	Resistor (22,000 ohms)	33-325434
26	Condenser (15 Mmfd.)	61-0039
27	Resistor (1,000,000 ohms)	33-510154
28	Condenser (.05 Mfd.)	61-0101
29	First I. F. Transformer	65-0319
30	Padder (Sec. 1st I. F. Trans.)	
31	Resistor (680 ohms)	33-168336
32	Oscillator Transformer (550 to 1065 KC)	65-0173
33	Oscillator Transformer (600 to 1165 KC)	65-0172
34	Oscillator Transformer (660 to 1240 KC)	65-0171
35	Oscillator Transformer (750 to 1410 KC)	65-0170
36	Oscillator Transformer (855 to 1580 KC)	65-0169
37	Low Frequency Padder	63-0048
38	Manual Oscillator Transformer	65-0052
39	Resistor (15,000 ohms)	33-315154
40	Condenser (.01 Mfd.)	61-0114
41	Volume Control (350,000 ohms)	67-0032-1
42	Resistor (47,000 ohms)	33-247334
43	Condenser (6,000 Mmfd.)	61-0103
44	Resistor (27,000 ohms)	33-327154
45	Padder (Pri. 2nd I. F. Trans.)	
46	Second I. F. Transformer	65-0320
47	Condenser (15,000,000 ohms)	33-615154
48	Resistor (220,000 ohms)	33-422334
49	Condenser (.01 Mfd.)	61-0100
50	Tone Control Switch	85-0111
51	Resistor (470,000 ohms)	33-447154
52	Filter Condenser (10-15-20 Mfd.)	61-0089
53	Resistor (220 ohms)	33-122438
54	Condenser (.01 Mfd.)	61-0124
55	Output Transformer	65-0317
56	Replacement Cone (For 73-0045-2 Speaker)	91-0086
57	Replacement Cone (For 73-0045-3 Speaker)	91-0126
58	Replacement Cone (For 73-0047-2 Speaker)	91-0086
59	Replacement Cone (For 73-0047-3 Speaker)	91-0126
60	Field Coil	Not Replaceable
61	Pilament Choke	32-1604
62	Condenser (.5 Mfd.)	61-0106
63	Condenser (250 Mmfd.)	61-0033
64	Condenser (250 Mmfd.)	61-0033
65	Vibrator Choke	65-0075
66	Vibrator	83-0025
67	Condenser (.5 Mfd.)	61-0137
68	Resistor (220 ohms)	33-122331
69	Power Transformer	65-0318
70	Condenser (3,000 Mmfd.)	61-0115
71	Resistor (1,000 ohms)	33-210434
72	Condenser (250 Mmfd.)	61-0033
73	Condenser (250 Mmfd.)	61-0033
74	Condenser (250 Mmfd.)	61-0112
75	On-Off Switch	85-0112
76	Pilot Lamp	34-2064
77	Condenser (.25 Mfd.)	61-0125
78	Condenser (.05 Mfd.)	61-0101
79	Resistor (330 ohms)	33-133336
80	Hook Bolts (Radio Mtg.)	57-1340FA3
81	Nut (Radio Mtg.)	W98FA3
82	Tube Side Cover	318-1997
83	Wiring Slide Cover	57-1345FC45
84	4 Prong Socket	27-8044

MODELS AR-5, AR-6, AR-7  
AR-8, C-1708

PHILCO RADIO & TELEV. CORP.

MODEL C-1708  
**SETTING UP ELECTRIC TUNING**

1. With the antenna installed and connected, turn on the radio and allow it to operate for TWENTY minutes before making adjustments.

The Receiver must be adjusted with the Skyway antenna fully extended and it is recommended that adjustments be made with the car in a shielded area such as under a viaduct or in a steel constructed building. However best results may be obtained using the new signal Antennuator. This permits setting up nearby local stations on the buttons without having the car in a shielded area.

2. Push in the dial button and tune with manual control a weak station between 1350 and 1500 kilocycles. Pull push buttons off. Adjust the antenna compensator with a screw driver by turning the adjusting screw either to the left or right until maximum volume is reached. See illustration.

3. If numbers on buttons are not desired, select and remove from the call letter sheet, five call letter tabs of popular stations received in the area in which the receiver is to be operated, selecting stations within the range of each button as shown in illustration, Model C-1708. Reference to programs published in your local newspaper aids in quick selection of stations. Remove metal caps to install the tabs in push buttons.

4. Push dial button and tune in the station you have selected for the No. 1 button, identify the program and push in the No. 1 push button shaft. Using a small screw driver, turn the No. 1 adjusting screw (inner screw) and tune in the station selected for this position by turning the screw driver counter-clockwise to increase frequency and clockwise to decrease frequency.

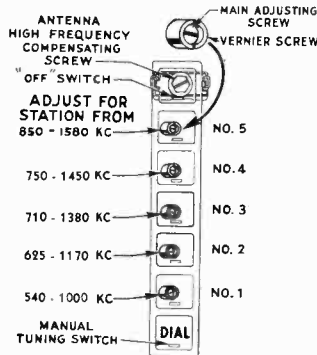
After the station has been tuned in accurately, (see illustration) a finer adjustment can be made by adjusting the vernier screw, which is the outside shell of the adjusting screw. Use a larger screw driver for this operation. Careful adjustment of this screw will insure maximum performance in areas where broadcasting reception is poor.

Proceed in like manner with the adjustment of No. 2, 3, 4 and 5 screws in the order of frequency until all five stations have been tuned in. It is recommended that the above procedure of setting up stations should be repeated in order that accurate adjustments may be insured, for satisfactory reception at some distance from stations.

5. The push buttons may now be replaced on their respective shafts.

The Receiver may be set up before installing in the car, but FINAL adjustments must be made with the radio operating on the antenna in the car. Eight hundred call letter tabs in sheet form are furnished so that at least five popular radio broadcasting stations can be selected.

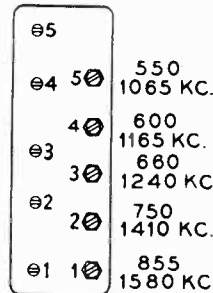
BE SURE AND SAVE THE UNUSED CALL LETTERS, GIVING THEM TO THE OWNER AS THEY MAY BE NEEDED AT SOME FUTURE TIME IF THE RADIO IS TO BE OPERATED IN A DIFFERENT AREA WHERE THE LOCAL STATIONS ARE NOT THE SAME.



AUTOMATIC ADJUSTING SCREWS

**Setting Up Automatic Tuning  
MODEL AR-5**

Turn on the radio and allow it to operate for twenty minutes or longer if possible. During this time, proceed as follows:  
1. Remove the plate on the end of the radio which covers the adjusting screws. This is held by two screws.  
2. Select five popular local stations whose frequencies come within the ranges of the five automatic tuning circuits, and list them on the Owner's Reference Label. List the highest frequency station as 1, and so on down to the lowest frequency station, which should be 5.



ADJUSTING SCREWS AND FREQUENCY RANGE  
The range of each automatic tuning circuit is given below:  
855 K.C. to 1580 K.C.    750 K.C. to 1410 K.C.    660 K.C. to 1240 K.C.    400 K.C. to 1165 K.C.    550 K.C. to 1065 K.C.

3. Push in the right knob until "D" appears in the station indicator window. This adjusts the radio so that it can be tuned with the tuning control knob in the conventional manner.

5. Tune in with the dial tuning control knob, the station having the highest frequency, and note the program. Now push in the right hand knob until No. 1 appears in the station indicator window.

With a small screw driver, turn the bottom adjusting screw (number one) in the left column, to the right or left until the same station is tuned in. Then adjust the corresponding screw in the right column, turning right or left until maximum volume is obtained. If in doubt as to the station, push the right knob until "D" appears and recheck. The adjustment on strong signals can be made best inside a shielded area such as in a reinforced steel building, or under a viaduct.

Continue the above procedure for the stations selected for Nos. 2, 3, 4, and 5 position in the given order, working from left to right, and adjusting each pair of corresponding adjusting screws from the bottom to the top until all five stations are set up. It is advisable to repeat the entire adjustment procedure to be sure the settings are correct.

The automatic tuning adjustments may be made before installing the radio in the car, but FINAL adjustments must be made with the radio installed and operating on the aerial in the car.

**Setting Up Automatic Electric Tuning  
MODELS AR-7, AR-8**

Turn on the radio and allow it to operate for twenty minutes or longer if possible. During this time, proceed as follows:

1. Remove the plate on the end of the radio which covers the adjusting screws. This is held by snap springs and can easily be pried off.

2. Select and remove from the station call letter sheets, five call letter tabs of the popular stations received in the area where the radio will be operated, selecting stations within the range of each button. Reference to programs published in the local newspaper will aid in the quick selection of the proper stations.

3. In Models 937 and 938 place the call letter tabs in the station selector buttons in the order of the station frequencies, with the call letters of the station of lowest frequency at the left.

Example: Place the call letter tab of station WPIL, whose frequency is 540 K. C., in the left button, and the call letter tab of Station WOPR, whose frequency is 710 K. C. in the next button, always progressing from left to right.

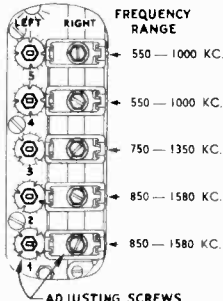
In Models 937X, 938KX, AR7 and AR8 insert the numbered station indicating tabs in the station selector buttons. List the highest frequency station as 1, and so on down to the lowest frequency station, which should be 5. The range of each automatic tuning circuit in these models is given below:  
850 K.C. to 1580 K.C.    750 K.C. to 1450 K.C.    550 K.C. to 1380 K.C.    1580 K.C.    1000 K.C.

After the station tabs are inserted the following procedure to use in adjusting any of the above models:

4. Push in the last button—"Dial". This adjusts the Radio so that it can be tuned with the tuning control knob in the conventional manner.

Tune in with the dial tuning control knob, the station whose call letters are in the left selector button and note the program. Now push in the selector button corresponding to these call letters.

With a small screw driver, turn the top adjusting screw (number five) in the left column, to the right or left until the



ADJUSTING SCREWS AND FREQUENCY RANGE

same station is tuned in. Then adjust the corresponding screw in the right column, turning right or left until the maximum volume is obtained. If in doubt as to the station, push the "Dial" button and recheck. The adjustment on strong signals can be made best inside a shielded area such as in a reinforced steel building, or under a viaduct.

Continue the above procedure for each push button, working from left to right, and adjusting each pair of corresponding

adjusting screws from top to bottom until all five stations are set up and are received correctly when their particular buttons are depressed. It is advisable to repeat the entire adjustment procedure to be sure the settings are correct.

The automatic tuning adjustments may be made before installing the radio in the car, but FINAL adjustments must be made with the radio installed and operating on the antenna in the car.

**ALIGNING PROCEDURE MODEL AR-5**

OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
	PUSH IN THE RIGHT KNOB ON THE CONTROL UNTIL "D" APPEARS IN THE STATION INDICATOR WINDOW AND STATIONS CAN BE TUNED IN BY MANUAL TUNING. ADJUST THE AERIAL COMPENSATOR @ TWO TURNS FROM TIGHT.				
1				Note 2	⊕⊕⊕⊕
2	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	⊕⊕⊕⊕
3	455 K.C.	To Aerial Receptacle on Radio	.1 Mfd.	Note 2	⊕⊕⊕⊕
4	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	⊕
5	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	⊕
6	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⊕
7	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	⊕
8	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	⊕
9	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⊕
10	1200 to 1400 K.C.	Note 5	Note 5	Note 5	⊕

Make all adjustments for maximum reading on the output meter.  
NOTE 1—Connect the aerial lead, Part No. 41-2191, to the aerial receptacle in the radio. Connect a 10 Mmfd. Condenser in series between the signal generator and the aerial lead.  
NOTE 2—Turn the condenser rotor plates completely out of mesh as far as they will go.  
NOTE 3—Lock the tuning condenser while adjusting the low frequency padder. Turn the condenser to the signal and adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.  
NOTE 4—When the aerial stage adjustment is made with the Radio installed in the car, the Radio aerial lead must be connected to the car aerial in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.  
NOTE 5—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1400 Kilocycles on the control scale. Remove the plug button on the end of the radio and adjust the aerial compensator @ for maximum signal.  
NOTE 6—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal between 1200 and 1300 Kilocycles on the control scale. Adjust the aerial compensator @ for maximum signal.

**MODEL AR-6**

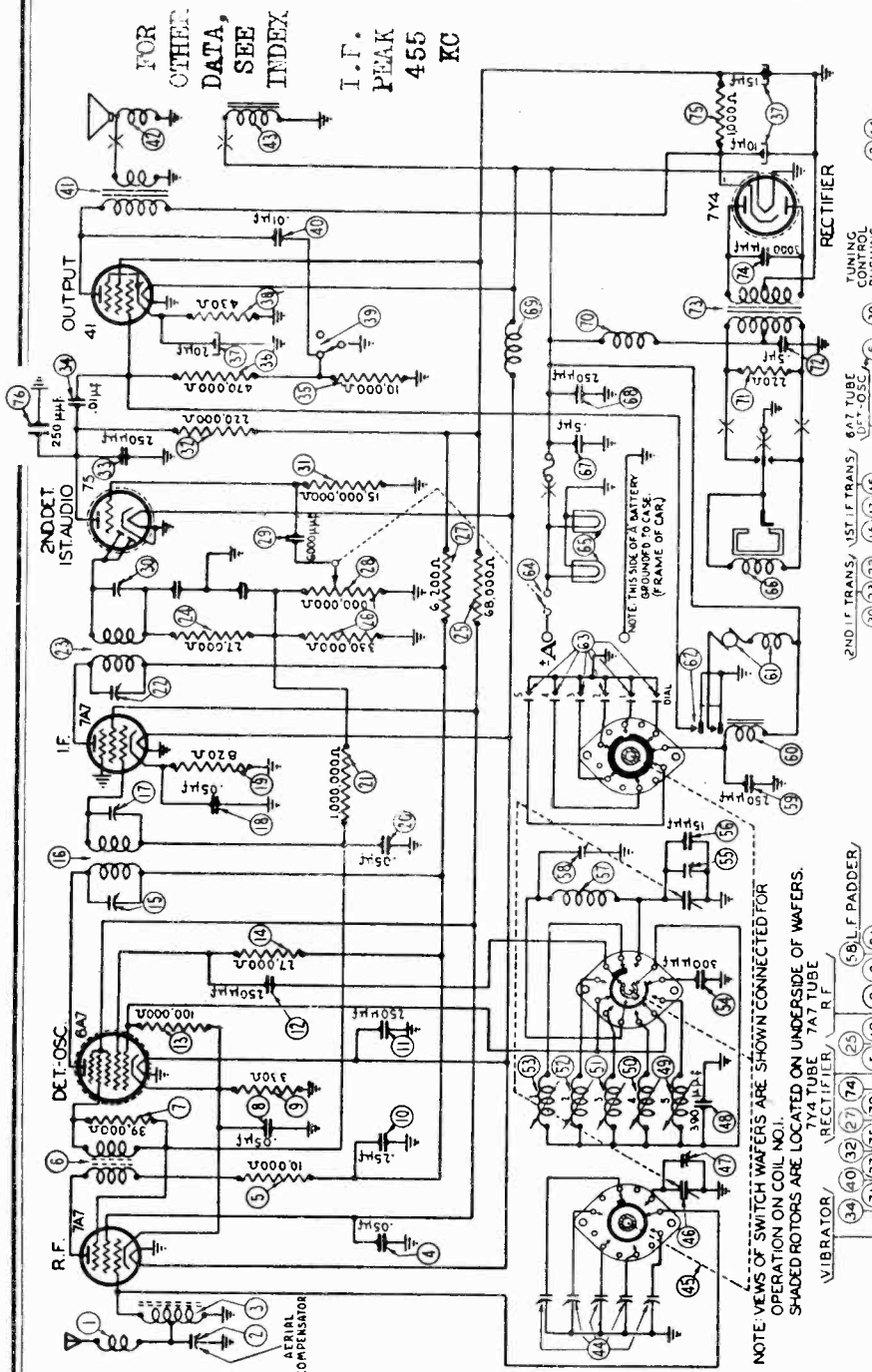
OPERATION	SIGNAL GENERATOR		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
	FREQUENCY	CONNECTION			
	ADJUST THE AERIAL COMPENSATOR @ TWO TURNS FROM TIGHT				
1				Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	⊕⊕⊕⊕
2	455 K.C.	To Grid of A47 Tube	.1 Mfd.	Note 2	⊕⊕⊕⊕
3	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	⊕
4	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	⊕
5	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⊕
6	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Note 2	⊕
7	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	⊕
8	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	⊕
9	1200 to 1400 K.C.	Note 6	Note 6	Note 6	⊕

SEE NOTES ABOVE

PHILCO RADIO & TELEV. CORP.

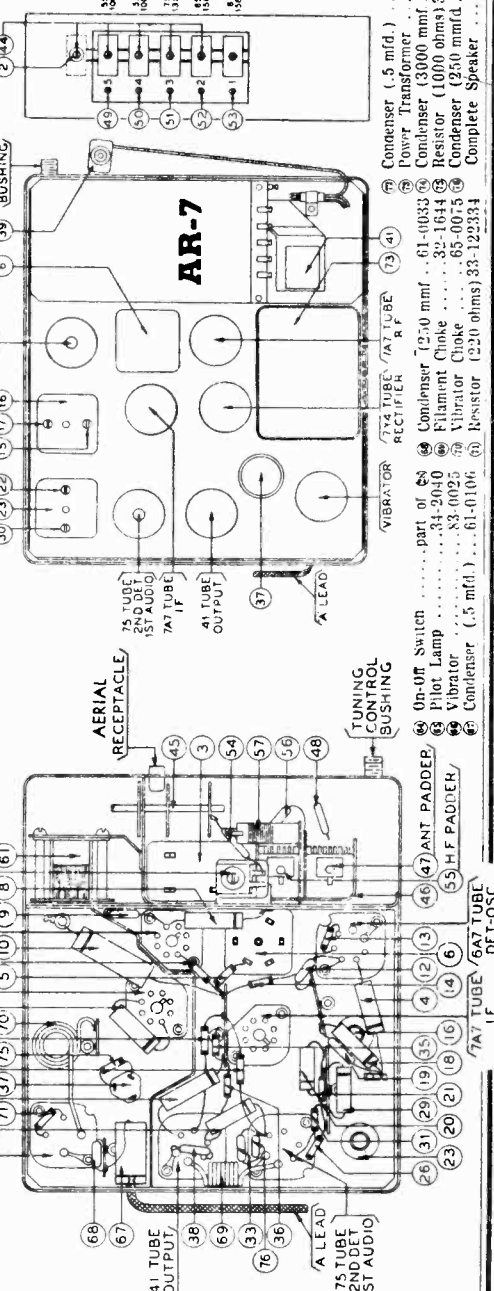
MODEL AR-7

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Aerial Compensator	part of 49
3	Antenna Transformer	65-0085
4	Condenser (.05 mfd.)	61-0101
5	Resistor (10,000 ohms)	33-310334
6	R. F. Transformer	65-0069
7	Resistor (39,000 ohms)	33-331154
8	Condenser (.05 mfd.)	61-0101
9	Resistor (330 ohms)	33-133336
10	Condenser (.25 mfd.)	61-0125
11	Condenser (250 mfd.)	61-0033
12	Resistor (100,000 ohms)	33-410154
13	Resistor (27,000 ohms)	33-327154
14	Padder (Pri. 1st I.F. Trans.)	65-0044
15	First I. F. Transformer	65-0044
16	Condenser (.05 mfd.)	61-0101
17	Resistor (820 ohms)	33-182438
18	Condenser (.05 mfd.)	61-0111
19	Resistor	
20	Padder (Pri. 2nd I.F. Trans.)	65-510154
21	Second I. F. Transformer	65-0230
22	Resistor (27,000 ohms)	33-327154
23	Resistor (68,000 ohms)	33-368334
24	Resistor (330,000 ohms)	33-433154
25	Resistor (6200 ohms)	33-262434
26	Volume Control (1,000,000 ohms) and On-Off Switch	33-5268
27	Condenser (5000 mfd.)	61-0103
28	Padder (Sec. 2nd I.F. Trans.)	
29	Resistor (15,000,000 ohms)	33-615154
30	Resistor (220,000 ohms)	33-422334
31	Condenser (250 mfd.)	61-0033
32	Resistor (.01 mfd.)	61-0120
33	Resistor (10,000 ohms)	33-310334
34	Resistor (470,000 ohms)	33-447154
35	Filter Condenser	
36	Resistor (10-15-20 mfd.)	61-0089
37	Resistor (430 ohms)	33-143438
38	Tone Control Switch	85-0102
39	Condenser (.01 mfd.)	61-0120
40	Output Transformer	65-0048
41	Cone and Voice Coil	91-0028
42	Field Coil	(Not Replaceable)
43	Antenna Padders Assy.	77-0207
44	Water Switch	77-0207
45	Tuning Condenser	63-0016
46	Antenna Padder (on Tun. Cond.)	
47	Silver Mica Condenser (300 mfd.)	61-0031
48	Oscillator Transformer (550 to 1000 Kc.)	65-0090
49	Oscillator Transformer (350 to 1000 Kc.)	65-0090
50	Oscillator Transformer (750 to 1350 Kc.)	65-0089
51	Oscillator Transformer (850 to 1580 Kc.)	65-0088
52	Oscillator Transformer (850 to 1580 Kc.)	65-0088
53	Silver Mica Condenser (300 mfd.)	61-0003
54	H. F. Padder (on Tun. Cond)	61-0038
55	Condenser (15 mfd.)	61-0038
56	Oscillator Transformer (Manual)	65-0134
57	Low Frequency Padder	31-6230
58	Condenser (250 mfd.)	61-0033
59	Control Magnet	part of 60
60	Molar Assembly	77-0229
61	Relay	61-0033
62	Push Button Switch Assy	85-0114



FOR OTHER DATA, SEE INDEX

I. F. PEAK 455 KC



NOTE: VIEWS OF SWITCH WAFERS ARE SHOWN CONNECTED FOR OPERATION ON COIL NO. 1.  
SHADED ROTORS ARE LOCATED ON UNDERSIDE OF WAFERS.



MODELS AR-7, AR-8  
F-1641

PHILCO RADIO & TELEV. CORP.

**ALIGNING PROCEDURE MODEL AR-7**

OPERATION	FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
1	485 K.C.	TO GRID OF 6A7 Tube	UNTIL STATIONS CAN BE TUNED IN BY MANUAL TUNING. ADJUST THE AERIAL COMPENSATOR ① TWO TURNS .1 Mfd.	TURN THE RADIO "ON" AND ALLOW IT TO OPERATE FOR AT LEAST TWENTY MINUTES BEFORE MAKING ADJUSTMENTS.	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
2	1500 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	Note 4
3	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	Note 3
4	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	Note 4
5	1500 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	Note 3
6	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	Note 4
7	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	Note 3
8	1200 to 1400 K.C.	To Aerial Receptacle on Radio	Note 5	SEE NOTES ABOVE	①

Make all adjustments for maximum reading on the output meter. Connect the signal generator to the aerial receptacle in the radio. Connect a .50 Mmfd. Condenser in series between the signal generator and the aerial lead.

**NOTE 1**—Turn the condenser rotor plates completely out of mesh as far as they will go.

**NOTE 2**—Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

**NOTE 3**—When the aerial stake adjustment is made with the Rods installed in the car, the Radio aerial lead must be connected to the aerial stake in the usual manner. Connect the signal generator output lead to a wire placed near the car aerial but not connected to it.

**NOTE 4**—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal before making adjustments.

**NOTE 5**—When installing the radio in the car, follow the installation instructions carefully. Tune in a weak broadcast signal before making adjustments. Remove the plug button on the end of the radio and adjust the aerial compensator ① (See Figure 3) for maximum signal.

**MODEL AR-8**

OPERATION	FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
1	485 K.C.	TO GRID OF 6A7 Tube	UNTIL STATIONS CAN BE TUNED IN BY MANUAL TUNING. ADJUST THE AERIAL COMPENSATOR ① TWO TURNS .1 Mfd.	TURN THE RADIO "ON" AND ALLOW IT TO OPERATE FOR AT LEAST TWENTY MINUTES BEFORE MAKING ADJUSTMENTS.	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
2	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	Note 4
3	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	Note 3
4	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	Note 4
5	1580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	Note 3
6	1400 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 1400 K.C.	Note 4
7	580 K.C.	To Aerial Receptacle on Radio	See Note 1	Set Tuning Condenser at 580 K.C.	Note 3
8	1200 to 1400 K.C.	To Aerial Receptacle on Radio	Note 6	SEE NOTES ABOVE	①

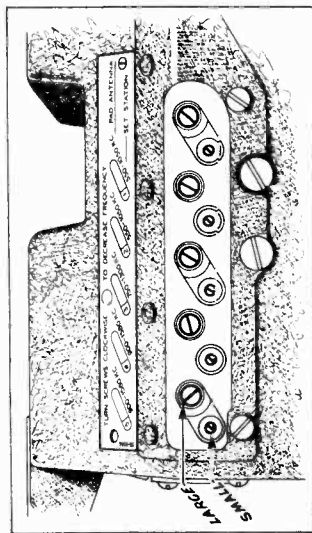
**MODEL F-1641**

OPERATION	FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
1	470 K.C.	To Antenna Receptacle on Radio	.5 Mfd.	Press the Automatic Station Selector button until "DIAL" appears in the window and stations can be tuned in by Manual Tuning	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
2	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd.	Note 2	Note 4
3	580 K.C.	To Antenna Receptacle on Radio	30 Mmfd.	Note 2	Note 3
4	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd.	Set Tuning Condenser at 580 K.C.	Note 3
5	1580 K.C.	To Antenna Receptacle on Radio	30 Mmfd.	Note 2	①

**MODEL F-1641  
SETTING UP AUTOMATIC TUNING**

TURN THE RADIO "ON" AND ALLOW IT TO OPERATE FOR AT LEAST TWENTY MINUTES BEFORE MAKING ADJUSTMENTS.

1—Select five popular local stations whose frequencies come within the ranges of the five Automatic Tuning Circuits and list them on the back of the OWNER'S MANUAL under "STATION RECORD," for the Owner's reference, also on the chart above the adjusting screws. List the lowest frequency station as No. "1" and so on down to the highest frequency station as No. "5."



BOTTOM VIEW OF RADIO SHOWING LOCATION OF ADJUSTING SCREWS

2—Remove the cover plate over the Automatic Adjusting Screws from the bottom of the Radio Housing by removing the two snap buttons holding it in place. There are two rows of adjusting screws—the LARGE ones for antenna adjustment and the SMALL ones for setting the stations.

3—Push the Automatic Station Selector, repeating if necessary until the DIAL appears in the dial window. Then tune in with the manual tuning control the selected station having adjusting screws.

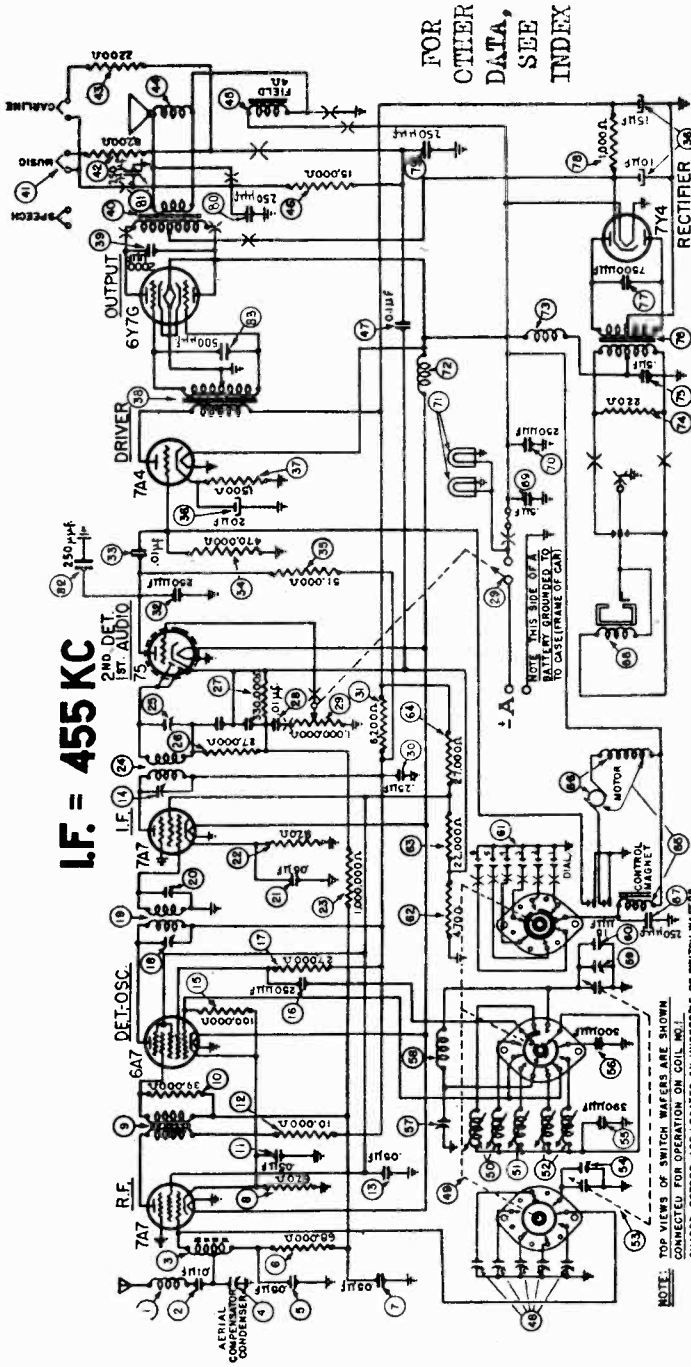
4—When the ANT-SPACE ADJUSTMENT IS MADE WITH THE RADIO INSTALLED IN THE CAR, THE RADIO-ANT. LEAD MUST BE CONNECTED TO THE CAR ANTENNA IN THE USUAL MANNER. CONNECT SIGNAL-GEN. OUTPUT-LEAD TO A WIRE PLACED NEAR THE CAR-ANTENNA, BUT NOT CONNECTED DIRECTLY TO IT.

**ALIGNMENT NOTES FOR MODEL F-1641**  
NOTE 1 - CONNECT 50 MAFD COND. IN SERIES BETWEEN SIG. GEN. & ANT. LEAD.  
NOTE 2 - TURN COND. ROTOR PLATES COMPLETELY OUT OF MESH AS FAR AS THEY WILL GO.  
NOTE 3 - ROCK TUNING COND. BACK & FORTH WHILE ADJUSTING LOW-FREQ. PADDER (45).

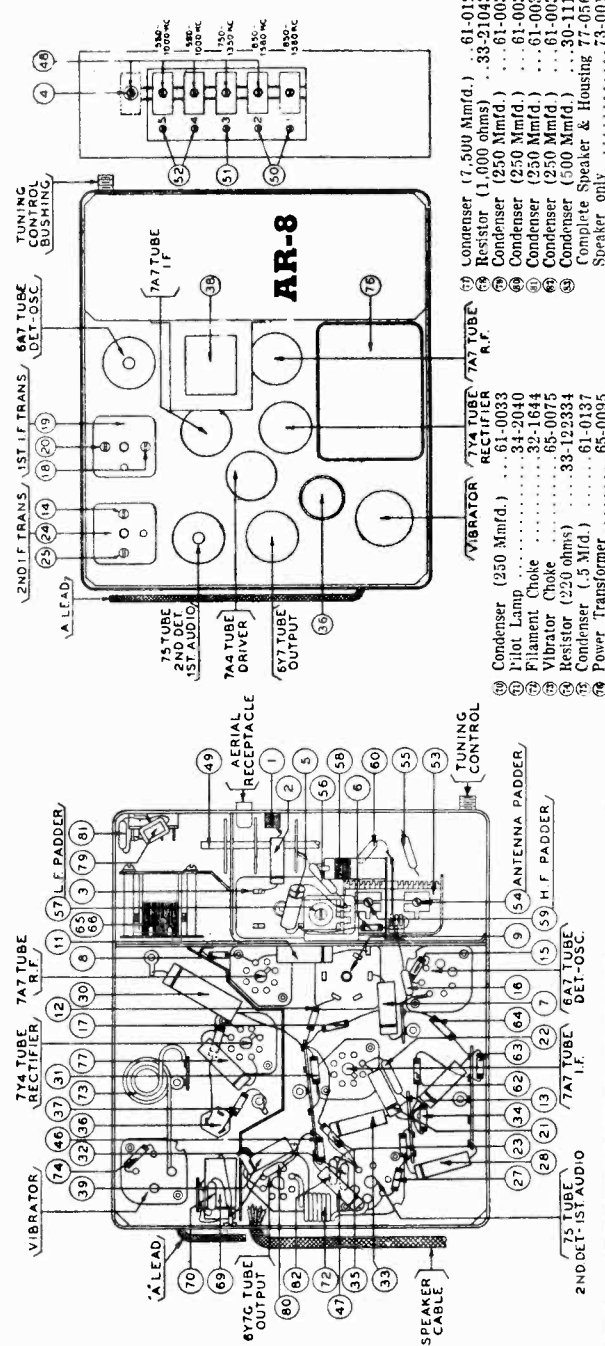
PHILCO RADIO & TELEV. CORP.

MODEL AR-8

No.	Description	Part No.
1	Antenna Choke	65-0102
2	Condenser (.01 Mfd.)	61-0110
3	Antenna Transformer	65-0085
4	Aerial Compensator	Part of 4
5	Condenser (.05 Mfd.)	61-0111
6	Resistor (68,000 ohms)	33-368154
7	Condenser (.05 Mfd.)	61-0101
8	Resistor (620 ohms)	33-162336
9	R. F. Transformer	65-0009
10	Resistor (39,000 ohms)	33-339154
11	Condenser (.05 Mfd.)	61-0101
12	Resistor (10,000 ohms)	33-310334
13	Condenser (.05 Mfd.)	61-0101
14	Padder (Pri. 2nd I. F. Trans.)	33-410334
15	Resistor (100,000 ohms)	33-410334
16	Condenser (250 Mmfd.)	61-0033
17	Resistor (27,000 ohms)	33-327334
18	Padder (Pri. 1st I. F. Trans.)	65-0044
19	First I. F. Transformer	65-0044
20	Padder (Sec. 1st I. F. Trans.)	61-0101
21	Condenser (.05 Mfd.)	61-0101
22	Resistor (820 ohms)	33-182438
23	Resistor (1,000,000 ohms)	33-510154
24	Second I. F. Transformer	65-0230
25	Padder (Sec. 2nd I. F. Trans.)	33-327154
26	Resistor (27,000 ohms)	33-433154
27	Resistor (330,000 ohms)	33-433154
28	Condenser (.01 Mfd.)	61-0114
29	Volume Control (1,000,000 ohms)	33-5268
30	& On-Off Switch	33-5268
31	Condenser (.25 Mfd.)	61-0125
32	Resistor (6,200 ohms)	33-262434
33	Condenser (250 Mmfd.)	61-0033
34	Condenser (.01 Mfd.)	61-0100
35	Resistor (470,000 ohms)	33-471534
36	Resistor (51,000 ohms)	33-351334
37	Filter Condenser (10-15-20 Mfd.)	61-0089
38	Resistor (1,500 ohms)	33-313334
39	Input Transformer	65-0097
40	Condenser (2,000 Mmfd.)	61-0123
41	Output Transformer	65-0093
42	Reception Control	Part of 4
43	Resistor (8,200 ohms)	33-282334
44	Resistor (3,300 ohms)	33-22334
45	Cone & Voice Coil	45-26-3
46	Field Coil	Not Replaceable
47	Resistor (15,000 ohms)	33-315334
48	Condenser (.1 Mfd.)	61-0104
49	Antenna Padder Assy.	77-0172
50	Wafer Switch	77-0207
51	Oscillator Transformers (850 to 1360 KC)	65-0088
52	Oscillator Transformer (750 to 1350 KC)	65-0089
53	Oscillator Transformers (550 to 1000 KC)	65-0090
54	Tuning Condenser	63-0016
55	Antenna Padder (on Tun. Cond.)	61-0031
56	Silver Mica Condenser (390 Mmfd.)	61-0031
57	Silver Mica Condenser (300 Mmfd.)	61-0003
58	Low Frequency Padder	31-6230
59	Oscillator Transformer (Manual)	65-0134
60	Oscillator Padder (on Tun. Cond.)	61-0038
61	Condenser (15 Mmfd.)	61-0038
62	Push Button Switch Assy.	77-0539
63	Resistor (370 ohms)	33-147336
64	Resistor (22,000 ohms)	33-322334
65	Resistor (27,000 ohms)	33-321434
66	Control Magnet	Part of 4
67	Motor & Relay Assy.	77-0229
68	Condenser (250 Mmfd.)	61-0033
69	Vibrator	85-0025
70	Complete Speaker & Housing	77-0561
71	Speaker only	73-0016



FOR OTHER DATA, SEE INDEX

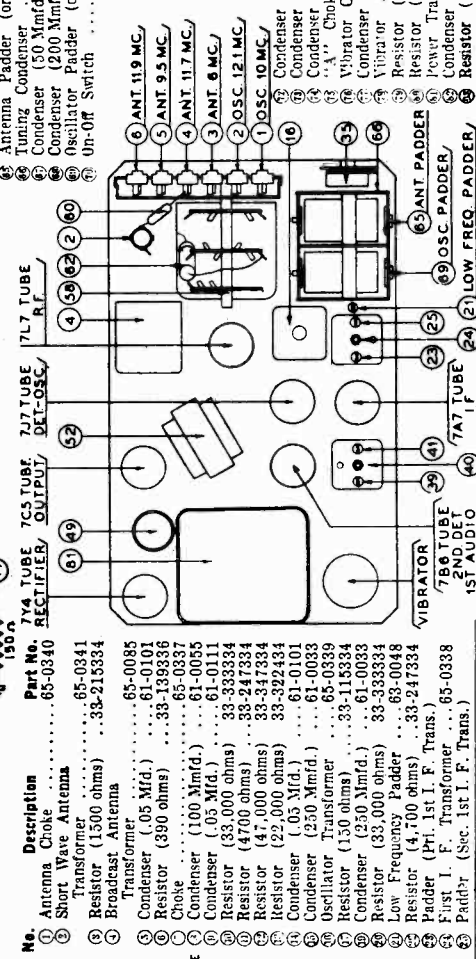
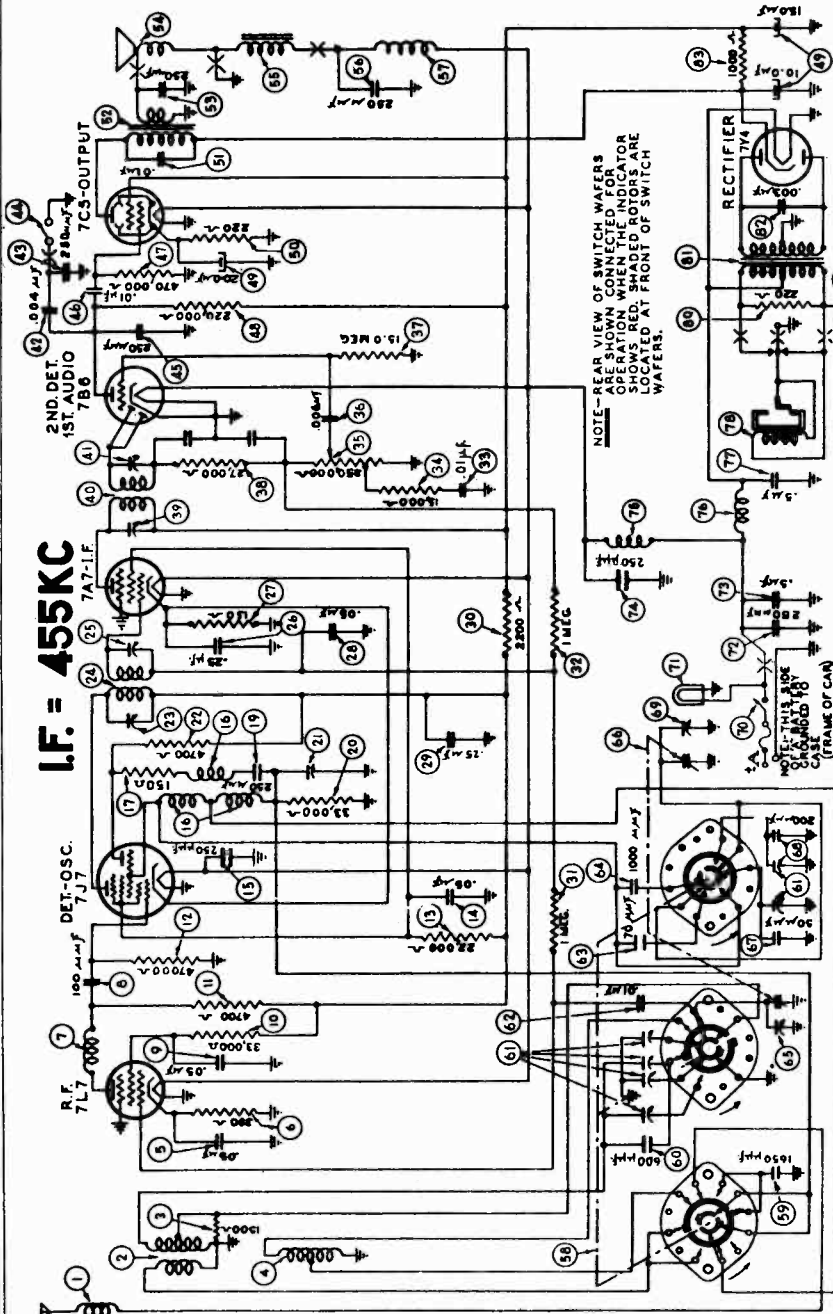


MODEL AR-9

PHILCO RADIO & TELEV. CORP.

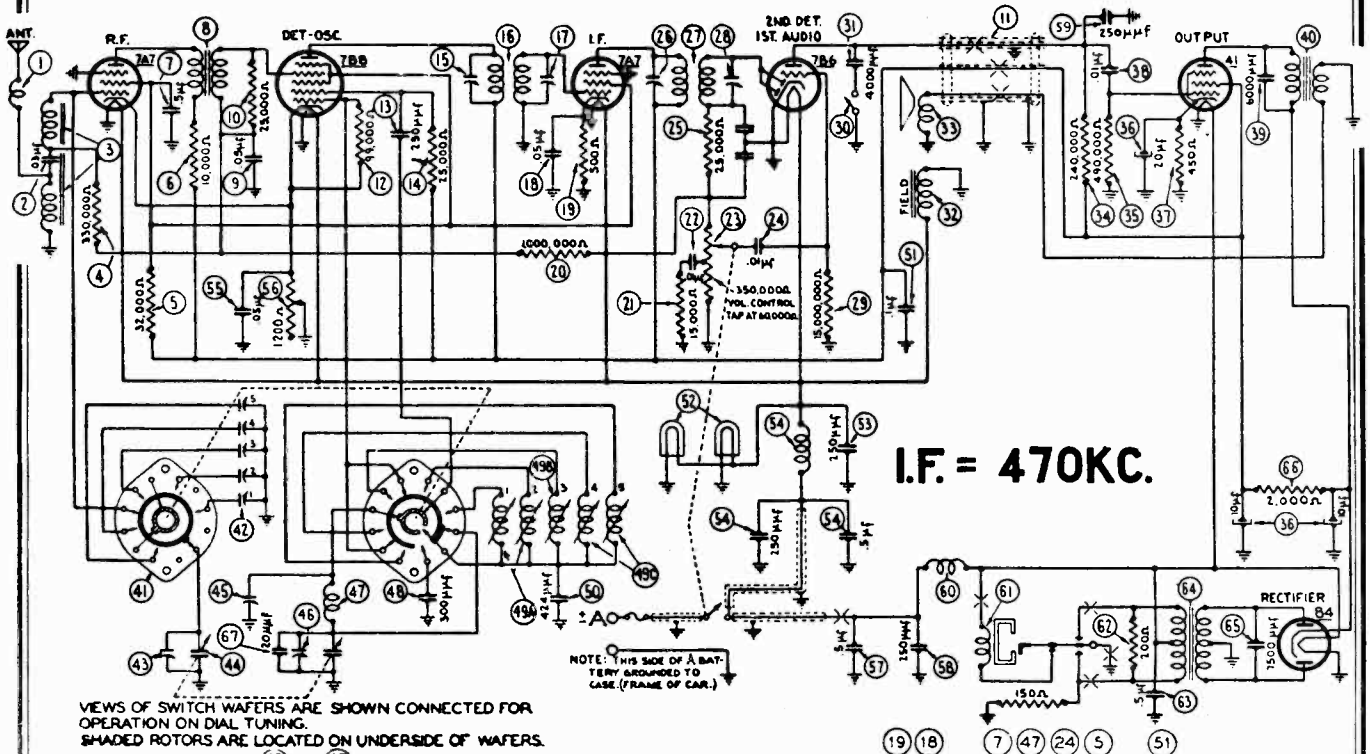
- ④ Condenser (.25 Mfd.) ... 61-0112
- ⑤ Resistor (150 ohms) ... 33-115334
- ⑥ Condenser (.05 Mfd.) ... 61-0111
- ⑦ Condenser (.25 Mfd.) ... 61-0125
- ⑧ Resistor (2200 ohms) ... 33-222434
- ⑨ Resistor
- ⑩ (1000,000 ohms) ... 33-510154
- ⑪ Resistor
- ⑫ (1,000,000 ohms) ... 33-510154
- ⑬ Condenser (.01 Mfd.) ... 61-0114
- ⑭ Resistor (15,000 ohms) ... 33-315154
- ⑮ Volume Control
- ⑯ (330,000 ohms) ... 67-0032-2
- ⑰ Condenser (6000 Mmfd.) ... 61-0103
- ⑱ Resistor
- ⑲ (15,000,000 ohms) ... 33-615154
- ⑳ Resistor (27,000 ohms) ... 33-327154
- ㉑ Padder (Pri. 2nd I. F. Trans.)
- ㉒ Second I. F. Transformer 65-0320
- ㉓ Padder (Sec. 2nd I. F. Trans.)
- ㉔ Condenser (4000 Mmfd.) ... 61-0129
- ㉕ Condenser (250 Mmfd.) ... 61-0033
- ㉖ Tone Control Switch ... 85-0111
- ㉗ Condenser (250 Mmfd.) ... 61-0033
- ㉘ Condenser (.01 Mfd.) ... 61-0100
- ㉙ Resistor (470,000 ohms) ... 33-447164
- ㉚ Resistor (220,000 ohms) ... 33-422334
- ㉛ Filter Condenser
- ㉜ (10-15-20 Mfd.) ... 61-0089
- ㉝ Resistor (220 ohms) ... 33-122438
- ㉞ Condenser (.01 Mfd.) ... 61-0124
- ㉟ Output Transformer ... 65-0317
- ㊱ Condenser (250 Mmfd.) ... 61-0033
- ㊲ Replacement Cone
- ㊳ (For 73-0043-2 Speaker) 91-0089
- ㊴ (For 73-0043-3 Speaker) 91-0120
- ㊵ (For 73-0047-2 Speaker) 91-0086
- ㊶ (For 73-0047-3 Speaker) 91-0126
- ㊷ Field Coil ... Not Replaceable
- ㊸ Condenser (250 Mmfd.) ... 61-0033
- ㊹ Choke ... 3-1644
- ㊺ Water Switch ... 77-0567
- ㊻ Silver Mica Condenser (1650 Mmfd.) ... 5877
- ㊼ Silver Mica Condenser (600 Mmfd.) ... 60-160314
- ㊽ Padder Assembly ... 77-0560
- ㊾ Condenser (.01 Mfd.) ... 61-0110
- ㊿ Condenser (70 Mmfd.) ... 61-0146
- 1 Condenser (1000 Mmfd.) ... 61-0079
- 2 Antenna Padder (on Tun. Cond.)
- 3 Tuning Condenser ... 62-0050
- 4 Condenser (50 Mmfd.) ... 61-0140
- 5 Condenser (200 Mmfd.) ... 61-0141
- 6 Oscillator Padder (on Lum. Cond.)
- 7 Un-Off Switch ... 85-0112

FOR OTHER DATA, SEE INDEX



- No. Description Part No.
- ① Antenna Choke 65-0340
- ② Short Wave Antenna
- ③ Transformer 65-0341
- ④ Resistor (1500 ohms) ... 33-215334
- ⑤ Broadcast Antenna
- ⑥ Transformer 65-0085
- ⑦ Condenser (.05 Mfd.) ... 61-0101
- ⑧ Resistor (390 ohms) ... 33-138336
- ⑨ Choke 65-0337
- ⑩ Condenser (100 Mmfd.) ... 61-0055
- ⑪ Resistor (33,000 ohms) ... 33-333334
- ⑫ Resistor (47,000 ohms) ... 33-247334
- ⑬ Resistor (22,000 ohms) ... 33-322434
- ⑭ Condenser (.05 Mfd.) ... 61-0101
- ⑮ Oscillator Transformer ... 65-0339
- ⑯ Resistor (150 ohms) ... 33-115334
- ⑰ Condenser (250 Mmfd.) ... 61-0033
- ⑱ Resistor (33,000 ohms) ... 33-333334
- ⑲ Low Frequency Padder ... 65-0048
- ⑳ Resistor (47,000 ohms) ... 33-247334
- ㉑ Padder (Pri. 1st I. F. Trans.) ... 65-0338
- ㉒ First I. F. Transformer ... 65-0338
- ㉓ Padder (Sec. 1st I. F. Trans.)

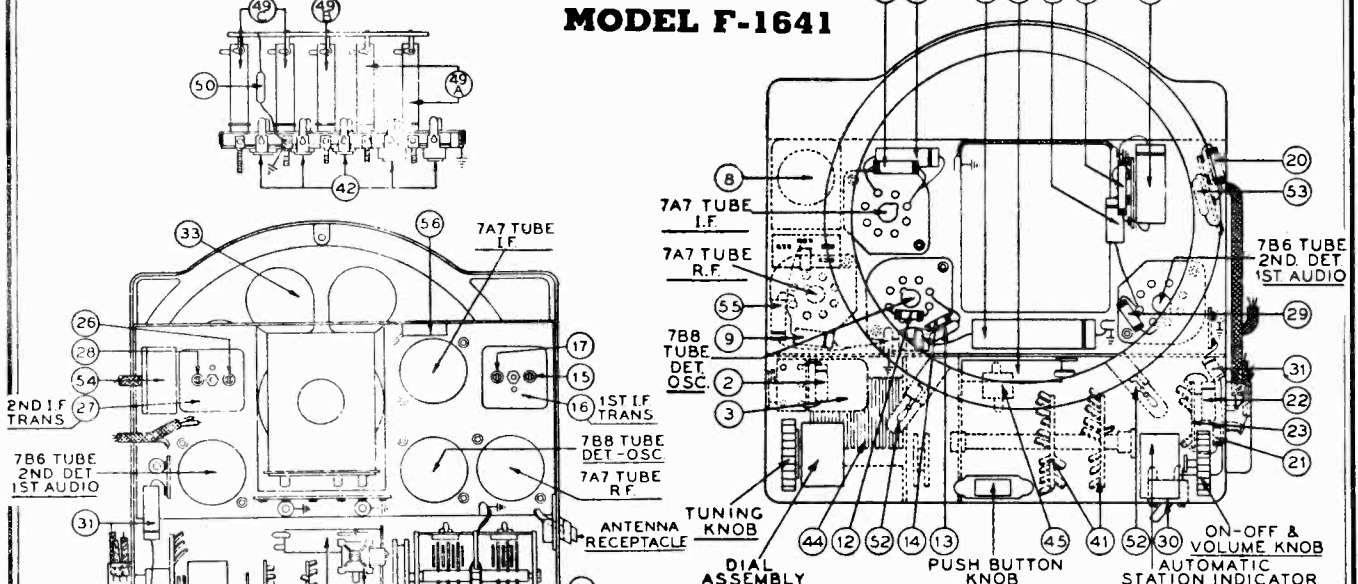
PHILCO RADIO & TELEV. CORP. MODEL F-1641



I.F. = 470KC.

VIEWS OF SWITCH WAFERS ARE SHOWN CONNECTED FOR OPERATION ON DIAL TUNING. SHADED ROTORS ARE LOCATED ON UNDERSIDE OF WAFERS.

MODEL F-1641



No.	Description	Part No.
1	Antenna Choke	65-0197
2	Condenser (.03 mfd.)	61-0064
3	Antenna Transformer	65-0190
4	Resistor (330,000 ohms)	33-433237
5	Resistor (32,000 ohms)	33-332437
6	Resistor (10,000 ohms)	33-310237
7	Condenser (.5 mfd.)	30-4585
8	R. F. Transformer	65-0189
9	Condenser (.05 mfd.)	30-4444
10	Resistor (25,000 ohms)	33-325244
11	Power Cable	95-0091
12	Resistor (99,000 ohms)	33-399237
13	Condenser (250 mmfd.)	61-0034
14	Resistor (25,000 ohms)	33-325347
15	Padder (Pri. 1st I. F. Trans.)	65-0177
16	First I. F. Transformer	65-0177
17	Padder (Sec. 1st I. F. Trans.)	65-0178
18	Condenser (.05 mfd.)	30-4569

19	Resistor (500 ohms)	33-150438
20	Resistor (1,000,000 ohms)	33-510237
21	Resistor (15,000 ohms)	33-315237
22	Condenser (.01 mfd.)	30-4479
23	Volume Control (350,000 ohms) and on-off switch	67-0018
24	Condenser (.01 mfd.)	30-4479
25	Resistor (25,000 ohms)	33-325344
26	Padder (Pri. 2nd I. F. Trans.)	65-0178
27	Second I. F. Transformer	65-0178
28	Padder (Sec. 2nd I. F. Trans.)	65-0179
29	Resistor (15,000,000 ohms)	33-615247
30	Tone Control Switch	85-0093
31	Condenser (4,000 mmfd.)	30-4456
32	Field Coil	Not Replaceable
33	Cone Kit	91-0070
34	Resistor (240,000 ohms)	33-424337
35	Resistor (490,000 ohms)	33-449247

36	Filter Condenser (10-10-20 mfd.)	61-0028
37	Resistor (450 ohms)	33-145438
38	Condenser (.01 mfd.)	30-4501
39	Condenser (8,000 mmfd.)	61-0052
40	Output Transformer	65-0180
41	Wafer Switch Assembly	77-0363
42	Antenna Padder Assembly	77-0292
43	First Padder (on Tun. Cond.)	63-0026
44	Tuning Condenser	63-0031
45	Low Frequency Padder	63-0031
46	Second Padder (on Tun. Cond.)	63-0031
47	Oscillator Transformer (Dial)	65-0007
48	Silver Mica Condenser (300 mmfd.)	61-0003
49a	Oscillator Transformer (1-2)	65-0198
49b	Oscillator Transformer (3)	65-0199
49c	Oscillator Transformer (4-5)	65-0200
50	Silver Mica Condenser (424 mmfd.)	61-0067
51	Condenser (.1 mfd.)	30-4455
52	Pilot Lamp	34-2040
53	Condenser (250 mmfd.)	61-0033
54	"A" Filter Assembly	77-0333
55	Condenser (.05 mfd.)	30-4569
56	Sensitivity Control	33-5248
57	Condenser (.5 mfd.)	30-4565
58	Condenser (250 mmfd.)	61-0033
59	Vibrator Choke	65-0204
60	Vibrator	41-3398
61	Resistor (200 ohms)	33-120337
62	Condenser (.5 mfd.)	30-4565
63	Power Transformer	65-0179
64	Condenser (7500 mmfd.)	30-4567
65	Resistor (2,000 ohms)	33-220537
66	Condenser (20 mmfd.)	30-1038
67	Loktal Socket	55-0575
68	Socket	55-0431
69	Drive Cord	55-0428
70	Tuning and Volume Knob	55-0426
71	Push Button Knob	55-0198
72	Dial Assembly (Manual)	85-0091

FOR OTHER DATA, SEE INDEX

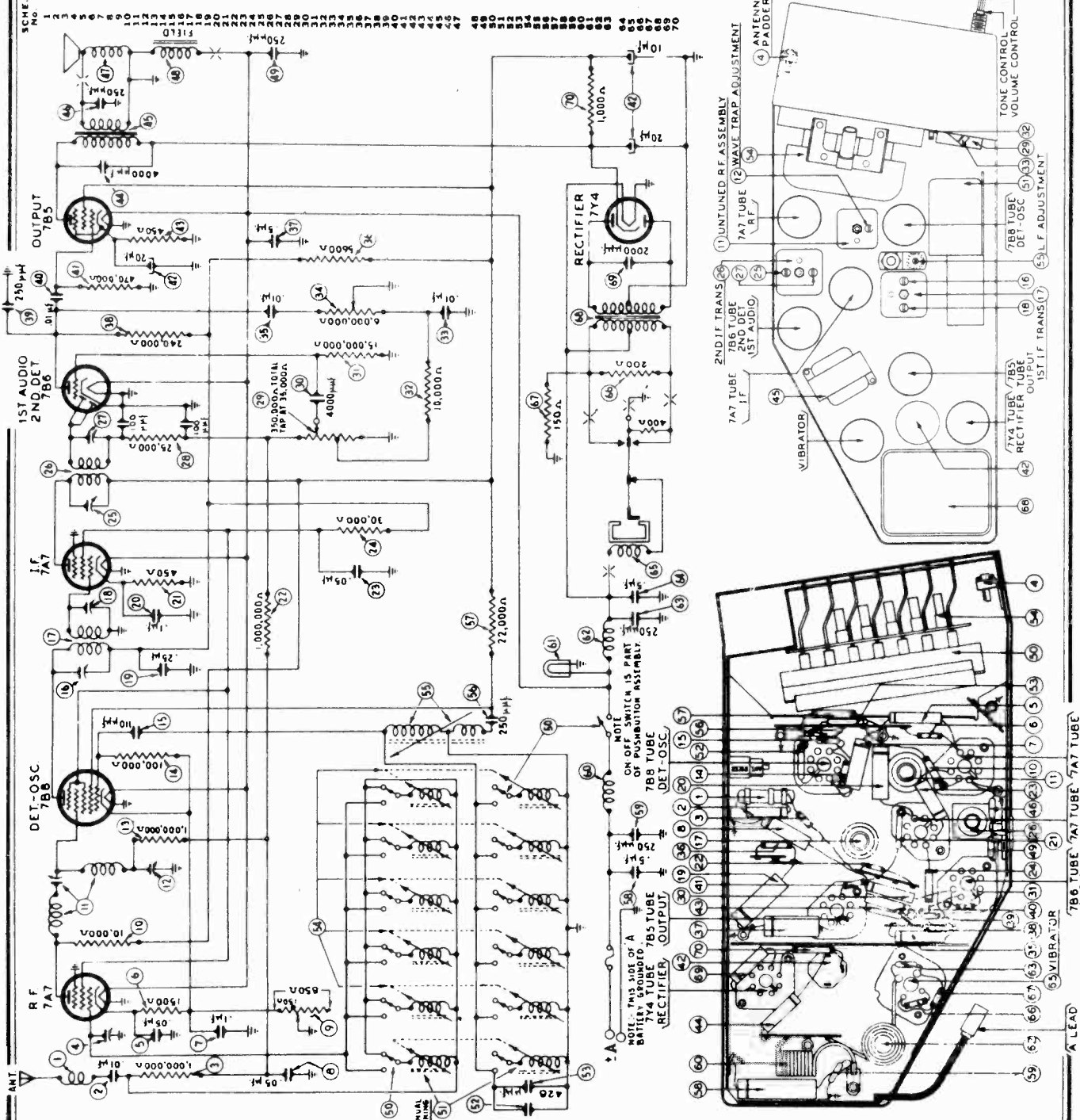
MODEL C-17C3

PHILCO RADIO & TELEV. CORP.

SCHE. No.	PART No.	DESCRIPTION
1	65-0102	Antenna Choke (1.000 mfd.)
1	61-0014	Resistor (1,000,000 ohms)
1	63-0035	Antenna Padder
3	30-4444	Condenser (.05 mfd.)
4	30-4444	Condenser (.1 mfd.)
5	30-4444	Condenser (.3 mfd.)
6	30-4444	Condenser (.5 mfd.)
7	67-0025	Resistor (1,000,000 ohms)
8	65-0271	Untuned R.F. Assembly
10	33-161154	F. Wave Trap Padder
11	33-410154	Resistor (100,000 ohms)
12	33-410154	Resistor (110 mfd.)
13	33-10131	F. Wave Trap Transformer (Trans.)
14	33-10131	Padder (Sec. 1st I. F. Trans.)
15	30-4604	Condenser (.25 mfd.)
16	30-4604	Resistor (450 ohms)
17	33-145338	Resistor (1,000,000 ohms)
18	33-10154	Resistor (100,000 ohms)
19	33-330434	Resistor (30,000 ohms)
20	65-0237	Padder (Pri. 2nd I. F. Trans.)
21	33-325154	Volume Control (350,000 ohms)
22	67-0022	Resistor (25,000 ohms)
23	33-141154	Resistor (15,000,000 ohms)
24	33-310154	Resistor (10,000,000 ohms)
25	33-141154	Resistor (15,000,000 ohms)
26	30-4479	Ten-ohm Resistor (16,000,000 ohms)
27	30-4479	Condenser (.01 mfd.)
28	33-256334	Resistor (3600 ohms)
29	33-256334	Resistor (240,000 ohms)
30	33-141154	Resistor (15,000,000 ohms)
31	30-4195	Resistor (470,000 ohms)
32	30-4195	Resistor (10,200 ohms)
33	61-0072	Filter Condenser (10-20-20 mfd.)
34	33-145338	Resistor (450 ohms)
35	61-0033	Output Transformer (mid.)
36	61-0033	Output Transformer (high.)
37	61-0033	Output Transformer (low.)
38	61-0088	Conc. Kit (For 73-0030-3)
39	Not Replaceable	Field Coil (240 mfd.)
40	61-0033	Condenser (250 mfd.)
41	61-0033	Condenser (5 mfd.)
42	77-0440	Inductive Tuning Unit
43	61-0080	Thermol Compensator
44	61-0080	Push-Button Switch and Trans.
45	65-0229	Oscillator Tracking Coil
46	61-0033	Condenser (2,900 mfd.)
47	30-4491	Condenser (.3 mfd.)
48	61-0033	Condenser (250 mfd.)
49	61-0033	Pilot Lamp
50	33-2019	Vibrator
51	65-0222	Condenser (250 mfd.)
52	30-4593	Resistor (200 ohms)
53	33-120154	Resistor (150 ohms)
54	33-11334	Resistor (100,000 ohms)
55	61-0074	Condenser (12000 mfd.)
56	61-0074	Resistor (1000 ohms)
57	61-0081	Diode Cord
58	61-0081	Printer
59	61-0081	Window Crystal

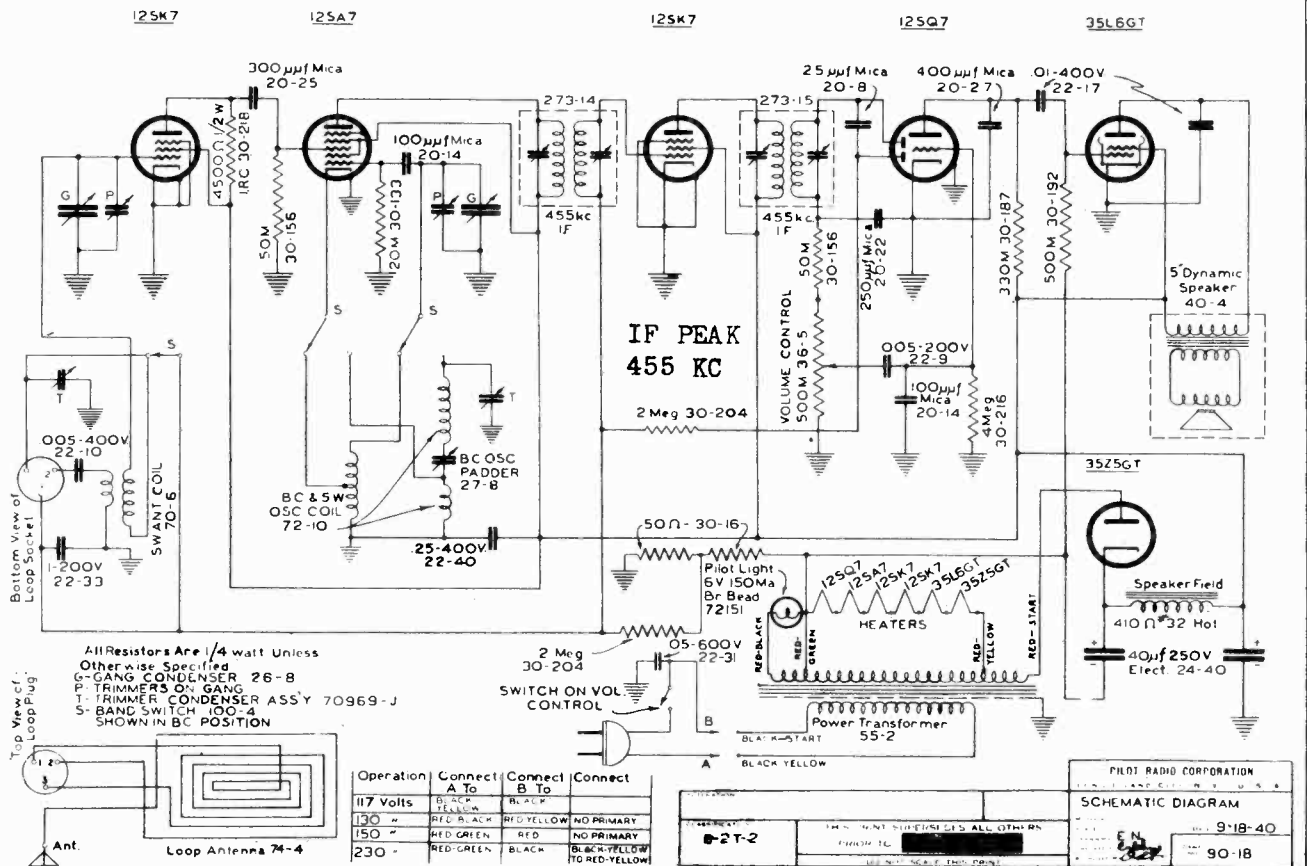
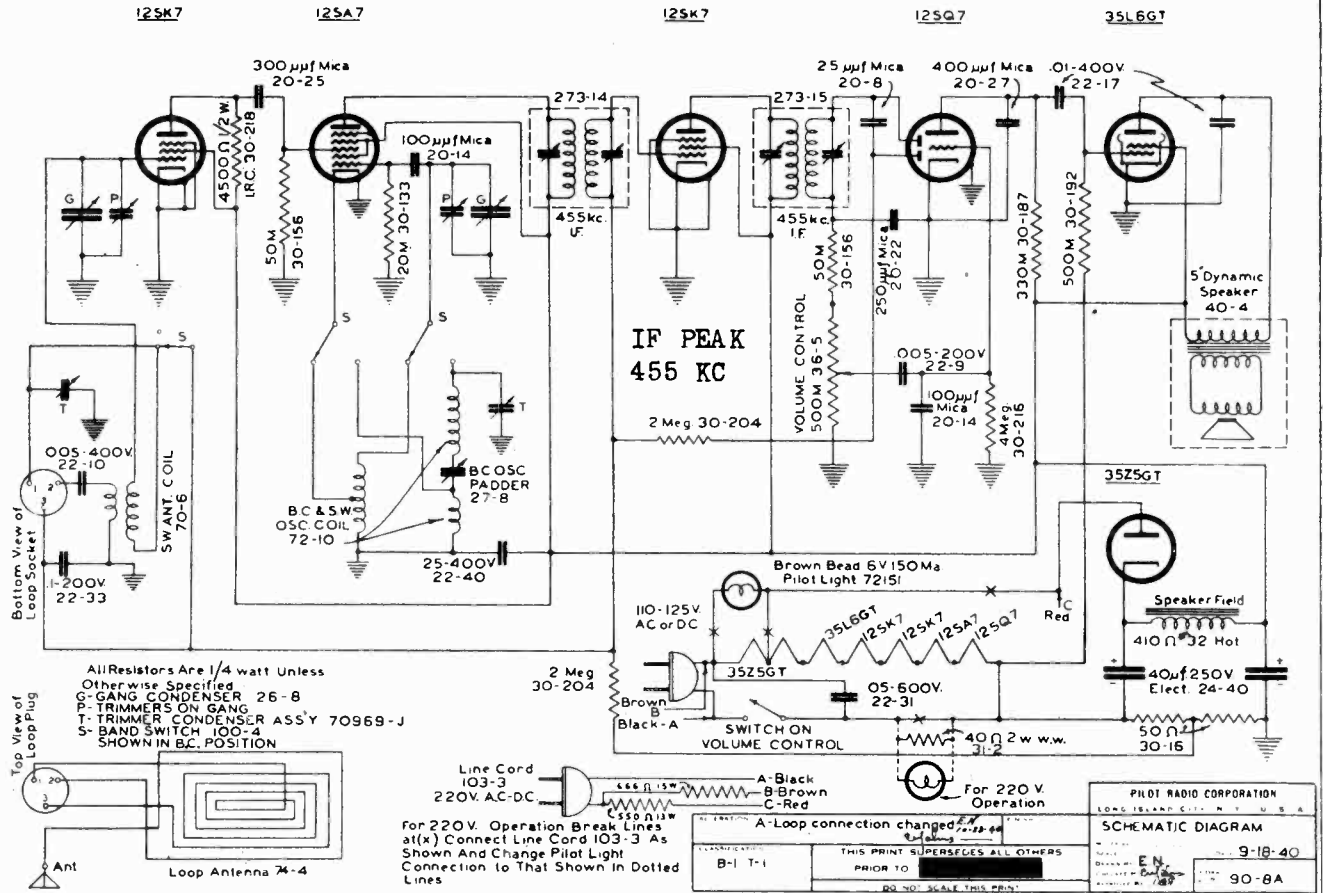
I.F. = 455 KC.

FOR OTHER DATA, SEE INDEX.



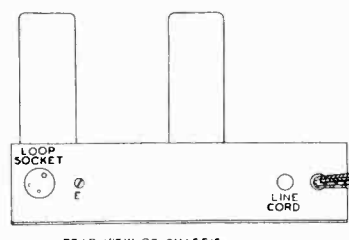
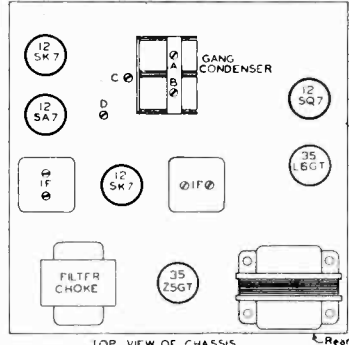
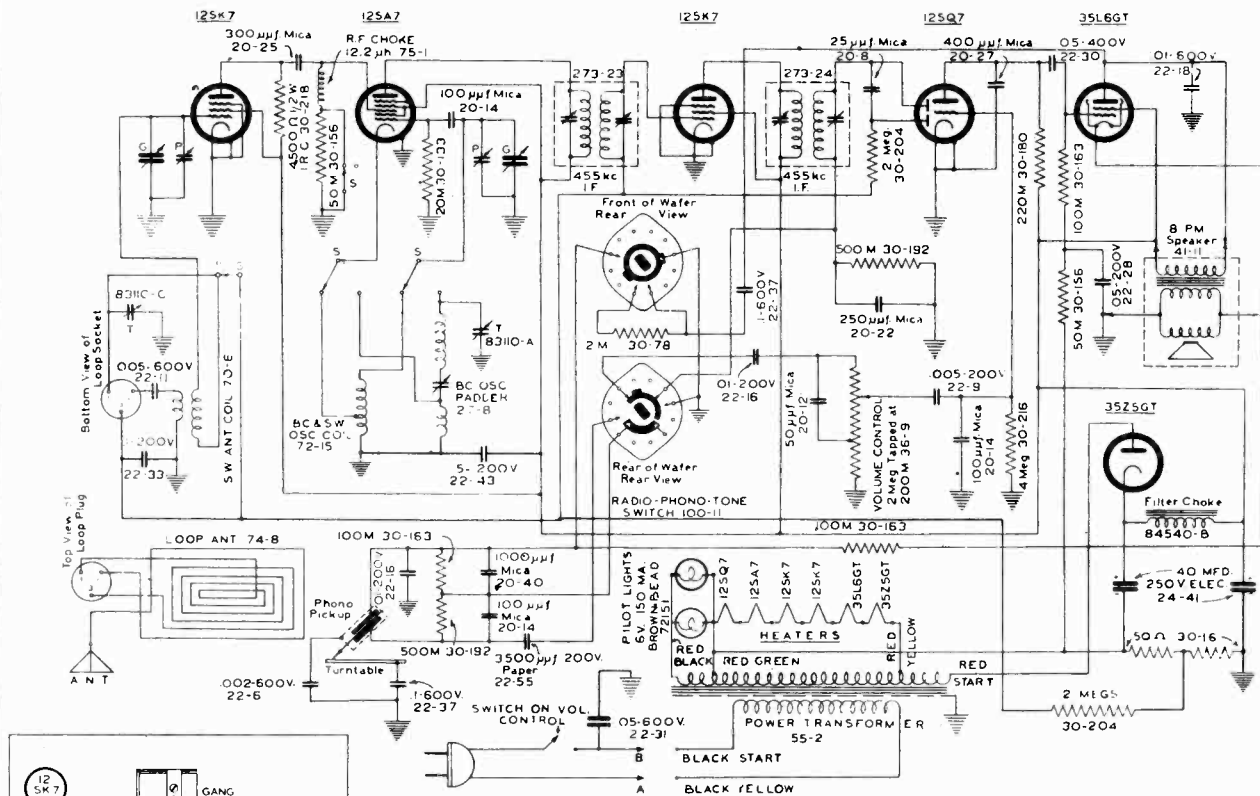
PILOT RADIO CORP.

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



MODEL TP-32

PILOT RADIO CORP.



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 SW 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 CW Dalr 12-2-40  
Checked by [Signature] Drawg No  
Approved by [Signature] 30-24

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.

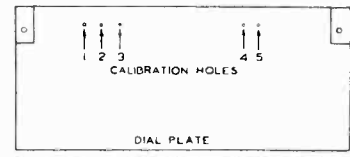
The tone control and phono radio switch must be in either of the three clockwise positions for phonograph operation.

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.

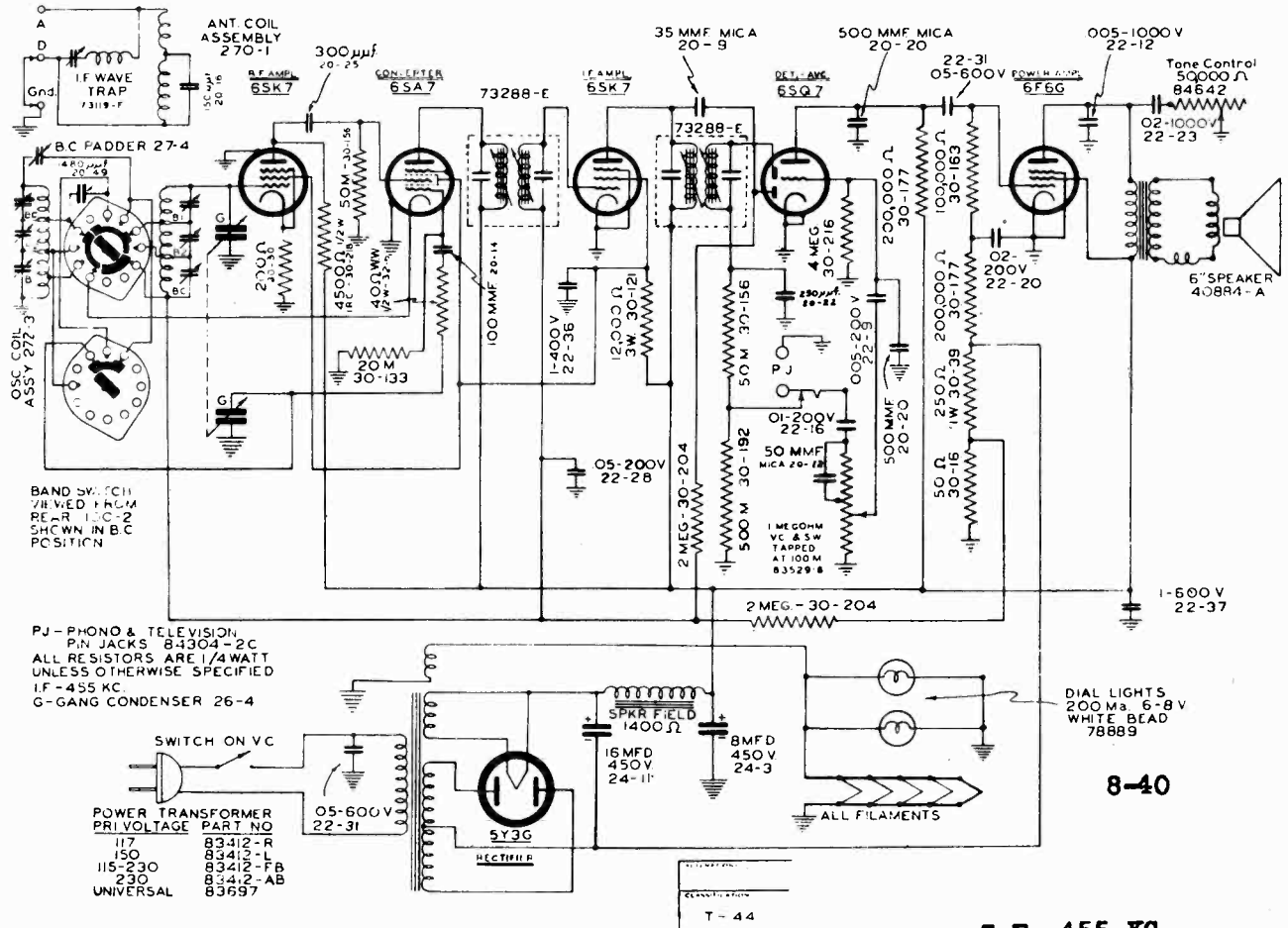
- TRIMMERS  
IF ADJUSTED AT 455 KC  
A- ANTENNA SW 210 MC  
B- OSCILLATOR SW 240 MC  
C- OSCILLATOR BC 1490 KC  
D- OSCILLATOR Padder 500 KC  
E- LOOP ANTENNA 1400 KC

- DIAL PLATE CALIBRATION HOLES  
1- START 535 KC  
2- 600 KC  
3- 800 KC  
4- 1400 KC  
5- 2100 KC



PILOT RADIO CORP.

MODEL T-44



PJ - PHONO & TELEVISION P.I.N JACKS 8-4304-2C  
 ALL RESISTORS ARE 1/4WATT UNLESS OTHERWISE SPECIFIED  
 I.F. - 455 KC.  
 G - GANG CONDENSER 26-4

POWER TRANSFORMER PRIVOLTAGE	PART NO
117	83412-R
150	83413-L
115-230	83412-TB
230	83412-AB
UNIVERSAL	83697

**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**

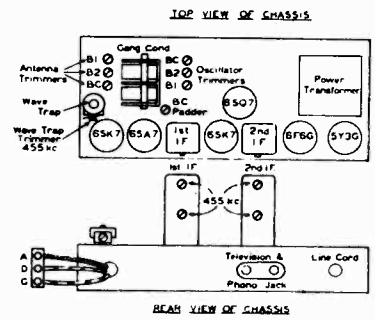
The location of all adjustments used in re-aligning this receiver, and the frequencies at which these adjustments should be made, are shown in the accompanying diagram.

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.

**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.

I.F. 455 KC



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

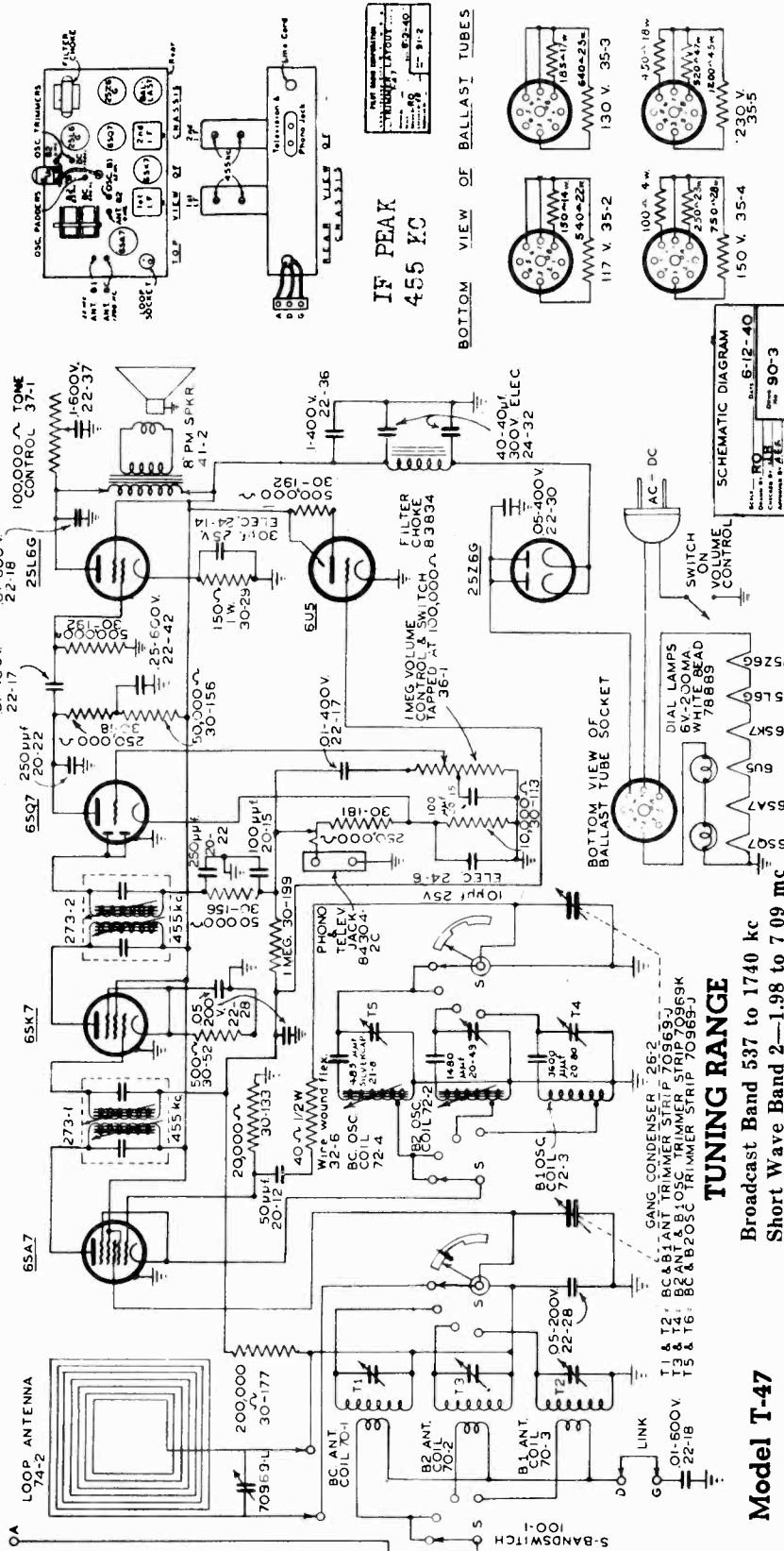
- ANT. TRIMMERS**
- BC- 1400 KC
  - B1- 18 MC
  - B2- 6 MC

BC Padder- 600 KC



MODEL T-47

PILOT RADIO CORP.



Model T-47

A.C.-D.C. Receiver

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.

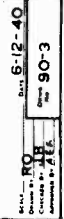
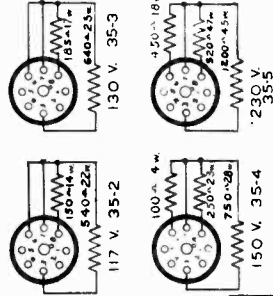
SERVICE NOTES

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.

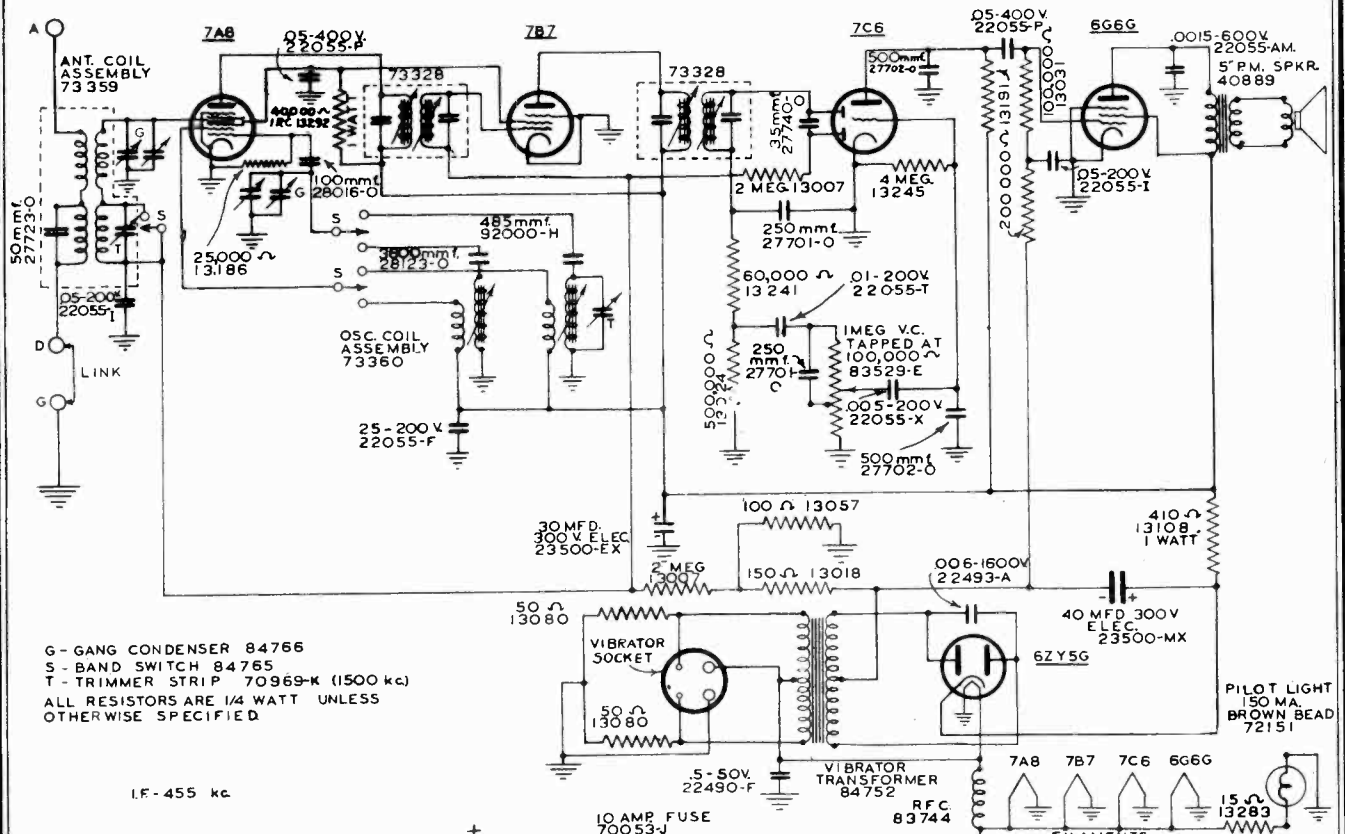
IF PEAK  
455 KC

BOTTOM VIEW OF BALLAST TUBES



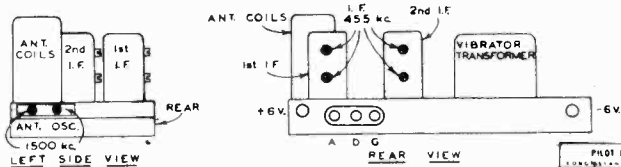
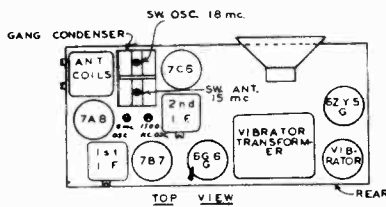
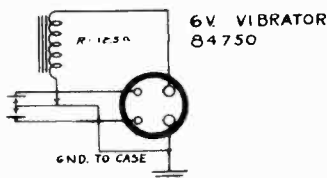
PILOT RADIO CORP.

MODEL 91



G - GANG CONDENSER 84766  
 S - BAND SWITCH 84765  
 T - TRIMMER STRIP 70969-K (1500 kc)  
 ALL RESISTORS ARE 1/4 WATT UNLESS OTHERWISE SPECIFIED

IF - 455 kc



PILOT RADIO CORPORATION	
SCHEMATIC DIAGRAM	
91 SERIES	
THIS PRINT SUPERSEDES ALL OTHERS	
PRIOR TO [REDACTED]	
REV. 4-2-40	
25259	

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

**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 91**

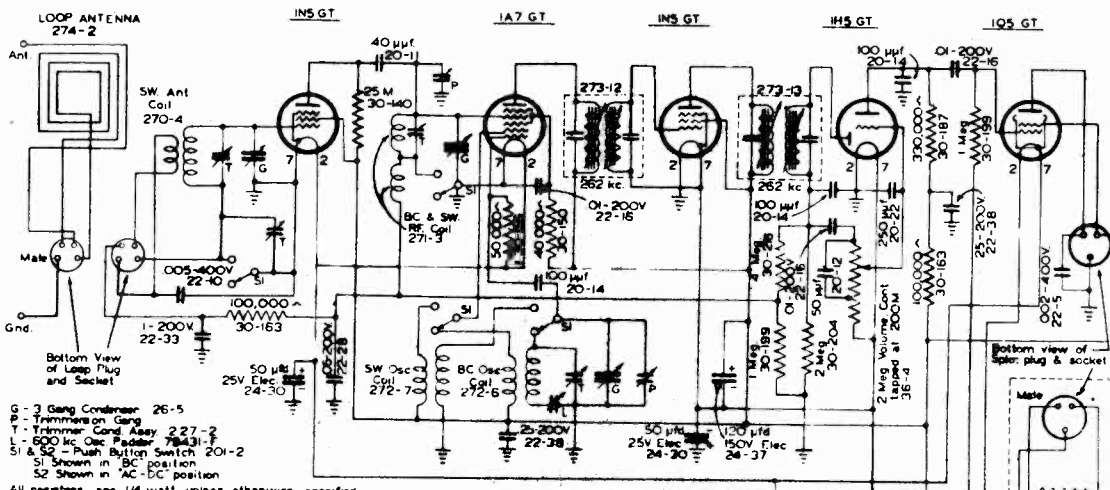
**6 Volt D.C. Receiver**

**TUNING RANGE**

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

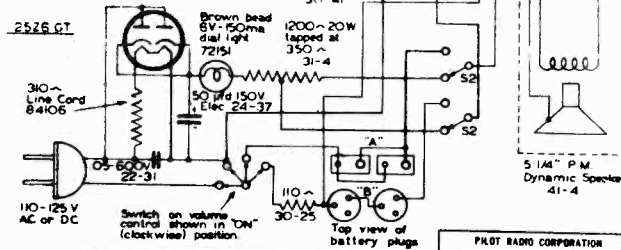
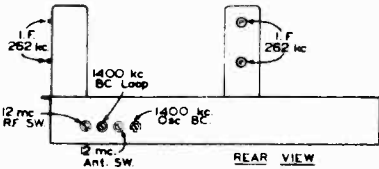
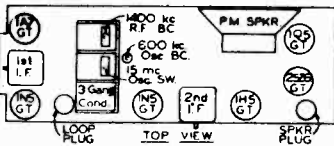
MODEL T-186  
MODEL T-187

PILOT RADIO CORP.

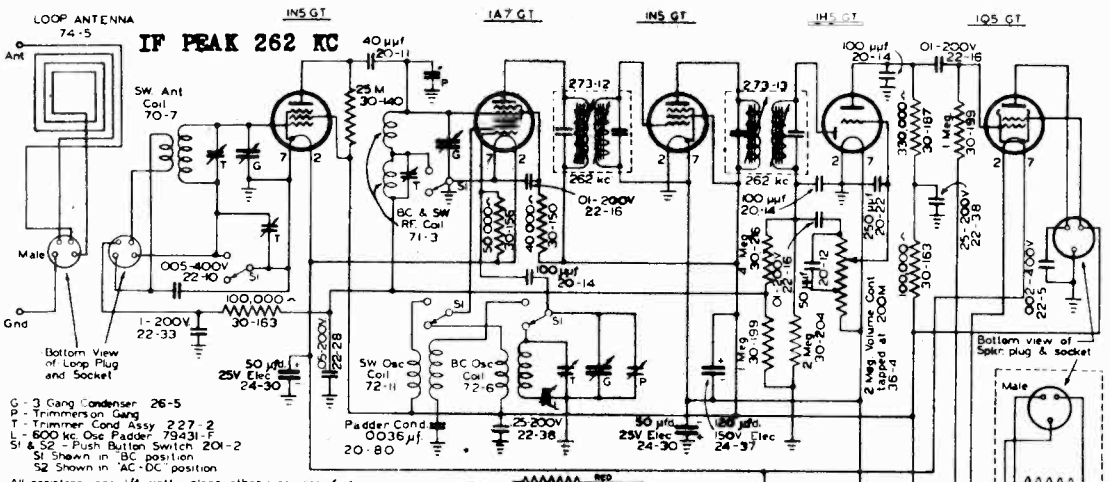


- G - 3 Gang Condenser 26-5
  - P - Trimmer on Gang
  - T - Trimmer Cond Assy 227-2
  - L - 600 kc Osc Padler 79431-F
  - S1 & S2 - Push Button Switch 201-2
  - S1 Shown in "BC" position
  - S2 Shown in "AC-DC" position
- All resistors are 1/4 watt unless otherwise specified.

IF PEAK 262 KC

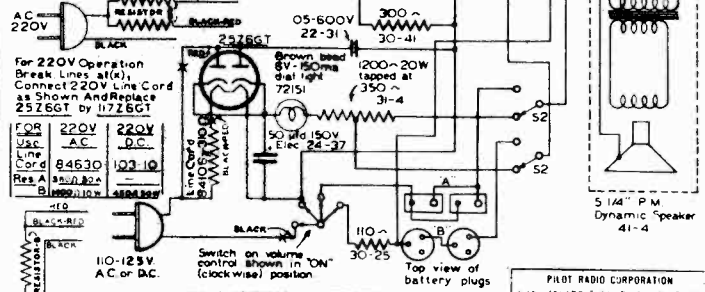
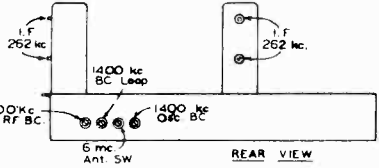
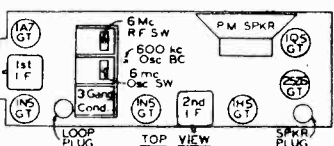


PILOT RADIO CORPORATION  
Schematic Diagram  
T-186  
THIS PRINT SUPERSEDES ALL OTHERS  
PRIOR TO [REDACTED]  
AC [REDACTED]  
89-15-40  
90-5



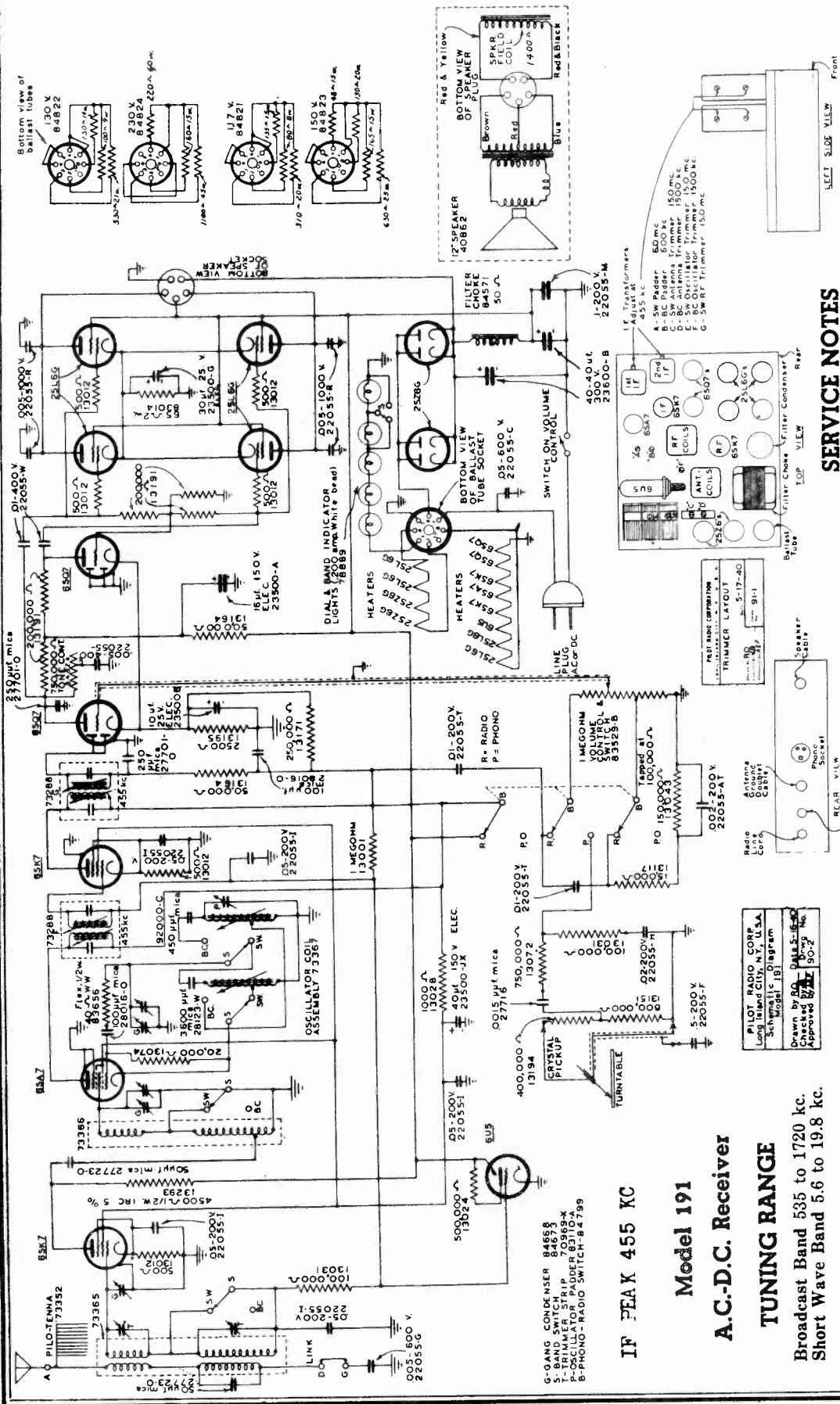
- G - 3 Gang Condenser 26-5
  - P - Trimmer on Gang
  - T - Trimmer Cond Assy 227-2
  - L - 600 kc Osc Padler 79431-F
  - S1 & S2 - Push Button Switch 201-2
  - S1 Shown in "BC" position
  - S2 Shown in "AC-DC" position
- All resistors are 1/4 watt unless otherwise specified.

IF PEAK 262 KC



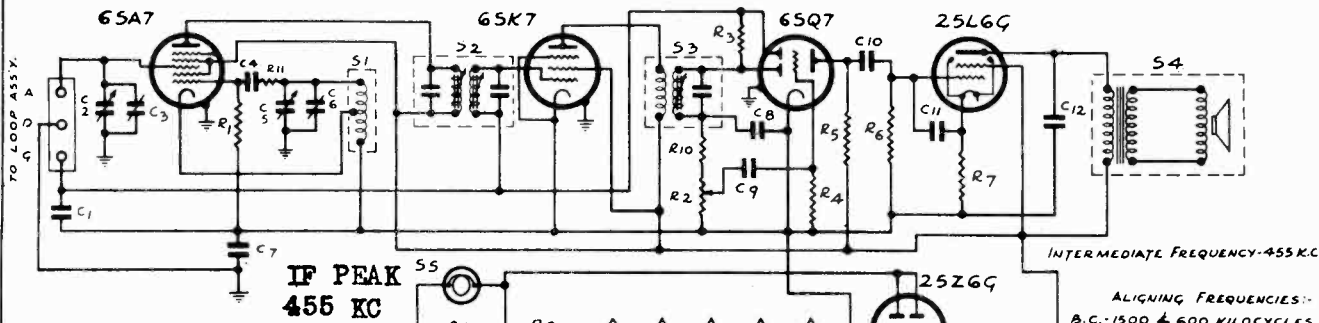
PILOT RADIO CORPORATION  
Schematic Diagram  
T-187  
THIS PRINT SUPERSEDES ALL OTHERS  
PRIOR TO [REDACTED]  
AC [REDACTED]  
8-19-40  
90-15

# PILOT RADIO CORP.



MODEL T-1151  
Early and Late

PILOT RADIO CORP.

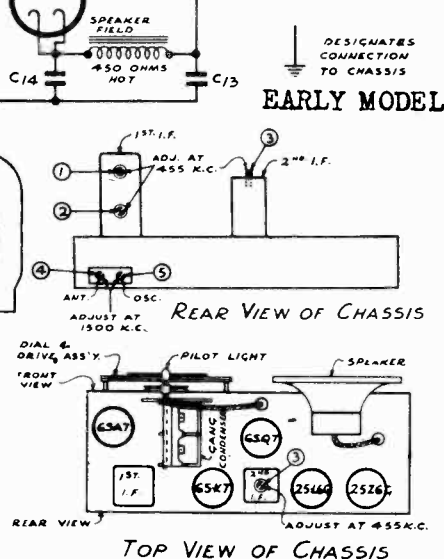


CONDENSERS FOR MODEL T-1151		
C1	22055-1	0.5 MFD. 200V. PAPER
C2, C5	84054	CANIC CONDENSER
C3, C6	84063	TRIMMER ASS'Y.
C4	28016-0	0.001 MFD. MICA
C7	22055-7	25 MFD. 200V. PAPER
C8, C11	27701-0	0.0025 MFD. MICA
C9	22055-AU	0.05 MFD. 400V. PAPER
C10, C12	22055-W	0.1 MFD. 400V. PAPER
C13, C14	23500-J	40 MFD. 150V. MIDGET ELECT.
C15	22055-U	0.1 MFD. 1000V. PAPER

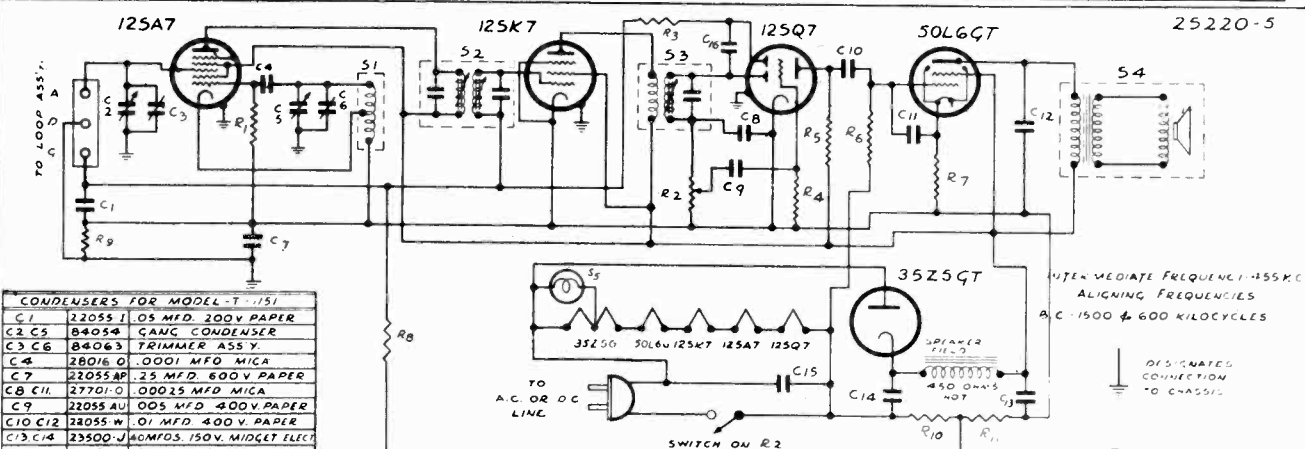
RESISTORS FOR MODEL T-1151		
R1	13074	20,000 OHMS 1/2 WATT
R2	794298	500,000 OHMS VOLUME CONTROL & SWITCH
R3	13007	2 MEG OHMS 1/4 WATT
R4	13245	4 MEG OHMS 1/4 WATT
R5	13224	330,000 OHMS 1/4 WATT
R6	13028	500,000 OHMS 1/4 WATT
R7	13018	150 OHMS 1/4 WATT
R8, R9	84049	WIRE WOUND RESISTOR 180 OHMS TAPPED @ 40"
R10	13225	47,000 OHMS 1/4 WATT
R11	13220	470 OHMS 1/4 WATT

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

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.



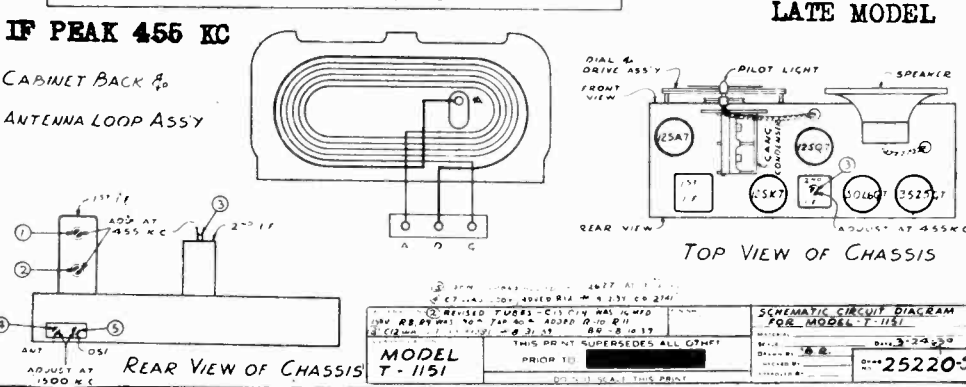
REAR VIEW OF CHASSIS  
TOP VIEW OF CHASSIS  
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [REDACTED] DO NOT SCALE THIS PRINT



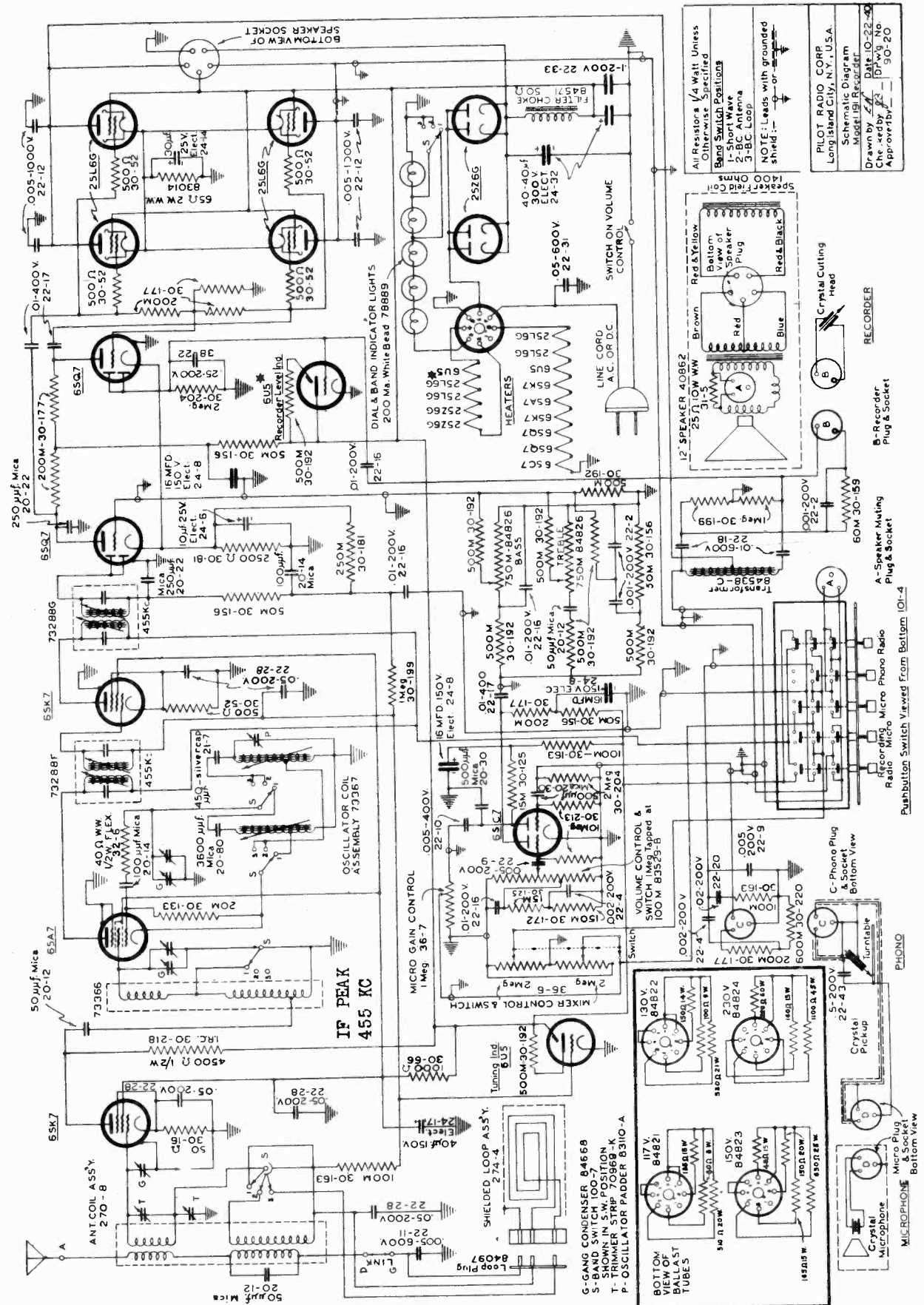
CONDENSERS FOR MODEL T-1151		
C1	22055-1	0.5 MFD. 200V. PAPER
C2, C5	84054	CANIC CONDENSER
C3, C6	84063	TRIMMER ASS'Y.
C4	28016-0	0.001 MFD. MICA
C7	22055-7	25 MFD. 200V. PAPER
C8, C11	27701-0	0.0025 MFD. MICA
C9	22055-AU	0.05 MFD. 400V. PAPER
C10, C12	22055-W	0.1 MFD. 400V. PAPER
C13, C14	23500-J	40 MFD. 150V. MIDGET ELECT.
C15	22055-U	0.1 MFD. 1000V. PAPER

RESISTORS FOR MODEL T-1151		
R1	13074	20,000 OHMS 1/2 WATT
R2	794298	500,000 OHMS VOLUME CONTROL & SWITCH
R3, R8	13007	2 MEG OHMS 1/4 WATT
R4	13245	4 MEG OHMS 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

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 24V. 150 MA



REAR VIEW OF CHASSIS  
TOP VIEW OF CHASSIS  
THIS PRINT SUPERSEDES ALL OTHERS PRIOR TO [REDACTED] DO NOT SCALE THIS PRINT



PILOT RADIO CORP.  
 Long Island City, N.Y., U.S.A.  
 Schematic Diagram  
 Model D-194 Recorder  
 Drawn by *Z.A.* Date 10-22-49  
 Checked by *Z.A.* Date 10-26-49  
 Approved by *Z.A.* Date 10-30-49

All Resistors 1/4 Watt Unless Otherwise Specified  
 Band Switch Positions  
 1-Short Wave  
 2-BC Antenna  
 3-BC Loop  
 NOTE: Leads with grounded shield :- or -

MODEL D-194

PILOT RADIO CORP.

This Pilot Superheterodynes 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

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.

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

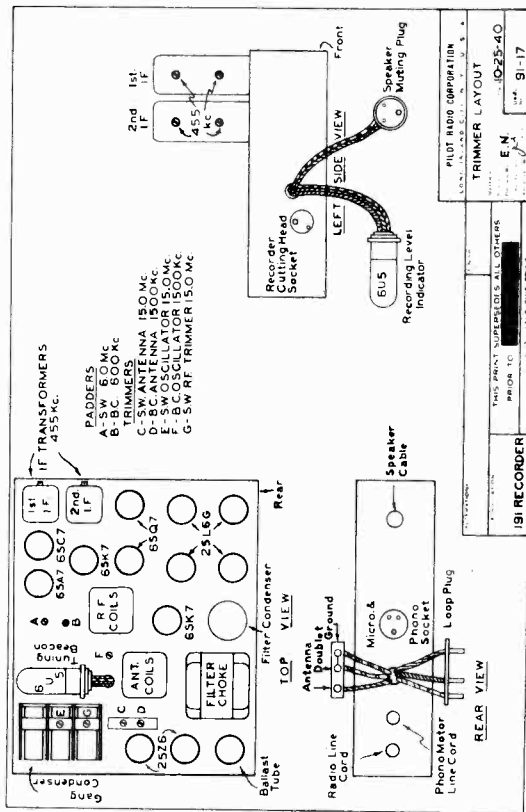
1. Operate the receiver for Bc & Sw reception.
2. Play commercial recordings.
3. Record radio programs.
4. Record his voice separately or in conjunction with a radio program.
5. Play these records back
6. Do his own broadcasting by means of the microphone.

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 voice recording 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 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.



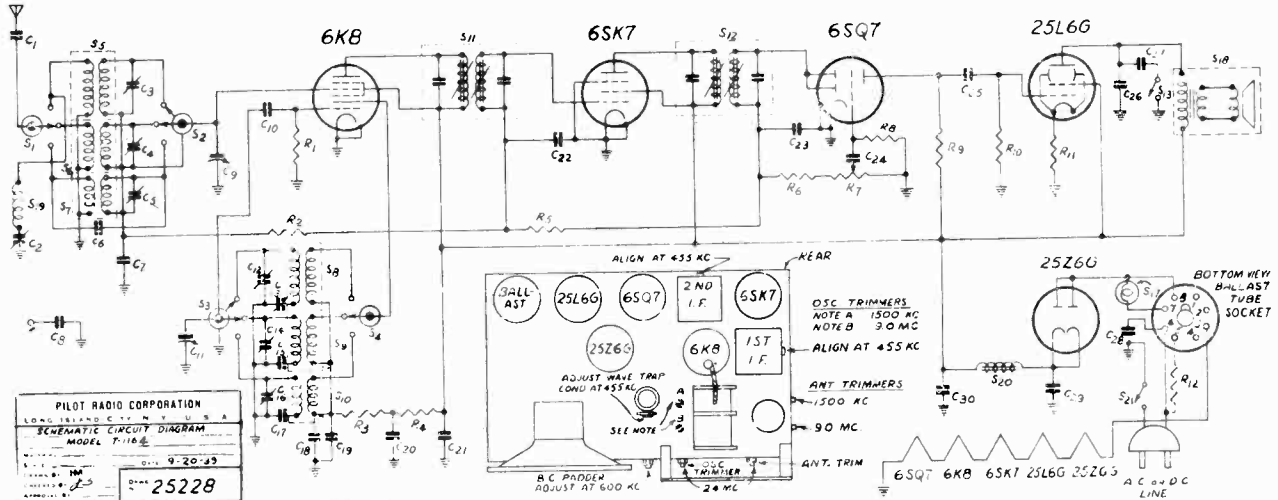
ANTENNA

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".

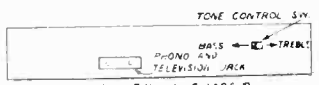
PILOT RADIO CORP.

MODEL T-1164  
MODEL X-1252



PILOT RADIO CORPORATION  
SCHEMATIC CIRCUIT DIAGRAM  
MODEL T-1164  
REV. 9-20-35  
25228

T-1164  
THIS PRINT SUPERSEDES ALL OTHERS  
PRIOR TO [REDACTED]



IF PEAK  
455 KC

CONDENSERS FOR MODEL T-1164

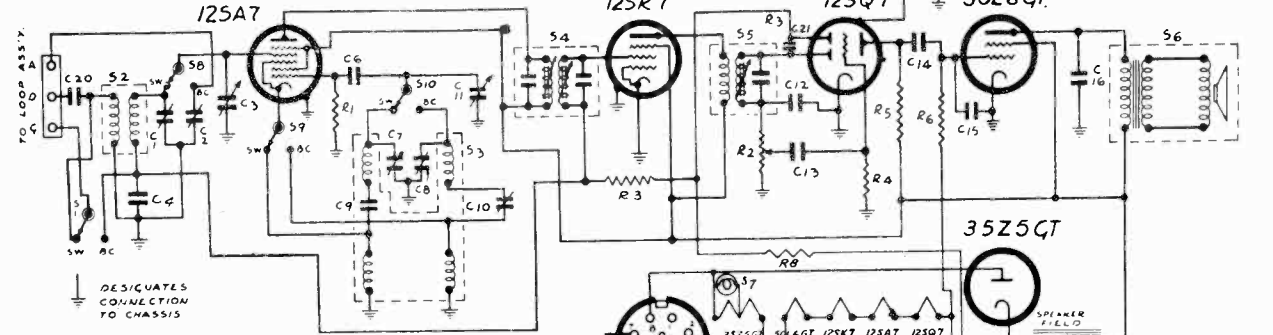
C1	22055 AM	0.05 MFD 1000V PAPER
C2	79425 R	25 125 MMFD WAVE TRAP TR
C3	22055 R	0.05 MFD 1000V PAPER
C4	831C	TRIMMERS
C5	70969 E	TRIMMER ASSY
C6	70969 E	TRIMMER ASSY
C7	70969 E	TRIMMER ASSY
C8	70969 E	TRIMMER ASSY
C9	70969 E	TRIMMER ASSY
C10	70969 E	TRIMMER ASSY
C11	70969 E	TRIMMER ASSY
C12	70969 E	TRIMMER ASSY
C13	70969 E	TRIMMER ASSY
C14	70969 E	TRIMMER ASSY
C15	70969 E	TRIMMER ASSY
C16	70969 E	TRIMMER ASSY
C17	70969 E	TRIMMER ASSY
C18	70969 E	TRIMMER ASSY
C19	70969 E	TRIMMER ASSY
C20	70969 E	TRIMMER ASSY
C21	70969 E	TRIMMER ASSY
C22	70969 E	TRIMMER ASSY
C23	70969 E	TRIMMER ASSY
C24	70969 E	TRIMMER ASSY
C25	70969 E	TRIMMER ASSY
C26	70969 E	TRIMMER ASSY

RESISTORS FOR MODEL T-1164

R1	13018	50,000 OHMS 1/4 WATT
R2	13031	100,000 OHMS 1/4 WATT
R3	13028	10,000 OHMS 1/4 WATT
R4	13007	2 MEG OHMS 1/4 WATT
R5	13245	4 MEG OHMS 1/4 WATT
R6	13245	4 MEG OHMS 1/4 WATT
R7	13245	4 MEG OHMS 1/4 WATT
R8	13245	4 MEG OHMS 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	250 OHMS LINE CORD FOR 220-240 VOLTS

MISCELLANEOUS FOR MODEL T-1164

S1	73179	ANTENNA COIL ASSY BC B1
S2	73153	ANTENNA COIL ASSY BC B1
S3	73170	OSC COIL ASSY BC B1
S4	73153	OSC COIL ASSY BC B1
S5	73179	OSC COIL ASSY BC B1
S6	73179	OSC COIL ASSY BC B1
S7	73179	OSC COIL ASSY BC B1
S8	73179	OSC COIL ASSY BC B1
S9	73179	OSC COIL ASSY BC B1
S10	73179	OSC COIL ASSY BC B1
S11	73179	OSC COIL ASSY BC B1
S12	73179	OSC COIL ASSY BC B1
S13	73179	OSC COIL ASSY BC B1
S14	73179	OSC COIL ASSY BC B1
S15	73179	OSC COIL ASSY BC B1
S16	73179	OSC COIL ASSY BC B1
S17	73179	OSC COIL ASSY BC B1
S18	73179	OSC COIL ASSY BC B1
S19	73179	OSC COIL ASSY BC B1
S20	73179	OSC COIL ASSY BC B1
S21	73179	OSC COIL ASSY BC B1
S22	73179	OSC COIL ASSY BC B1
S23	73179	OSC COIL ASSY BC B1
S24	73179	OSC COIL ASSY BC B1
S25	73179	OSC COIL ASSY BC B1
S26	73179	OSC COIL ASSY BC B1
S27	73179	OSC COIL ASSY BC B1
S28	73179	OSC COIL ASSY BC B1
S29	73179	OSC COIL ASSY BC B1
S30	73179	OSC COIL ASSY BC B1
S31	73179	OSC COIL ASSY BC B1
S32	73179	OSC COIL ASSY BC B1
S33	73179	OSC COIL ASSY BC B1
S34	73179	OSC COIL ASSY BC B1
S35	73179	OSC COIL ASSY BC B1
S36	73179	OSC COIL ASSY BC B1
S37	73179	OSC COIL ASSY BC B1
S38	73179	OSC COIL ASSY BC B1
S39	73179	OSC COIL ASSY BC B1
S40	73179	OSC COIL ASSY BC B1
S41	73179	OSC COIL ASSY BC B1
S42	73179	OSC COIL ASSY BC B1
S43	73179	OSC COIL ASSY BC B1
S44	73179	OSC COIL ASSY BC B1
S45	73179	OSC COIL ASSY BC B1
S46	73179	OSC COIL ASSY BC B1
S47	73179	OSC COIL ASSY BC B1
S48	73179	OSC COIL ASSY BC B1
S49	73179	OSC COIL ASSY BC B1
S50	73179	OSC COIL ASSY BC B1
S51	73179	OSC COIL ASSY BC B1
S52	73179	OSC COIL ASSY BC B1
S53	73179	OSC COIL ASSY BC B1
S54	73179	OSC COIL ASSY BC B1
S55	73179	OSC COIL ASSY BC B1
S56	73179	OSC COIL ASSY BC B1
S57	73179	OSC COIL ASSY BC B1
S58	73179	OSC COIL ASSY BC B1
S59	73179	OSC COIL ASSY BC B1
S60	73179	OSC COIL ASSY BC B1



CONDENSERS FOR MODEL X-1252

C1	70969 K	TRIMMER ASSY
C2	70969 E	TRIMMER ASSY
C3	84037	CANG CONDENSER
C4	22055 L	1 MFD 200V PAPER
C5	28016 D	0.001 MFD MICA
C6	27794 W	5000 MMFD MICA
C7	19431 B	385 MMFD PAPER
C8	17701 D	0.0025 MFD MICA
C9	13025 AU	0.05 MFD 400V PAPER
C10	12055 W	0.1 MFD 400V PAPER
C11	23500 E	30 MFD 300V MIDDLE ELEC
C12	12055 S	0.2 MFD 600V PAPER
C13	22055 W	0.1 MFD 400V PAPER
C14	12055 A	0.1 MFD 600V PAPER
C15	27736 B	25 MMFD MICA
C16	28122 D	0.004 MICA

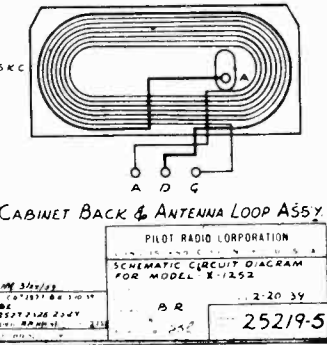
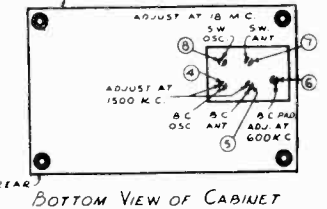
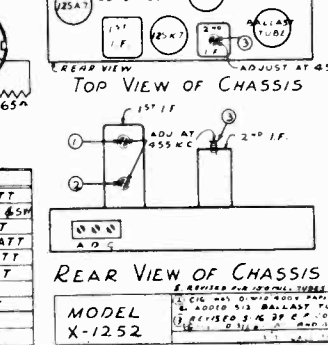
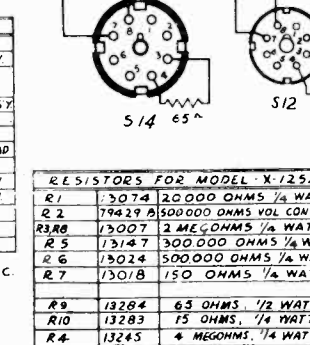
RESISTORS FOR MODEL X-1252

R1	13074	20,000 OHMS 1/4 WATT
R2	13074	20,000 OHMS 1/4 WATT
R3	13007	2 MEG OHMS 1/4 WATT
R4	13147	300,000 OHMS 1/4 WATT
R5	13024	500,000 OHMS 1/4 WATT
R6	13024	500,000 OHMS 1/4 WATT
R7	13018	150 OHMS 1/2 WATT
R8	13264	65 OHMS 1/2 WATT
R9	13263	15 OHMS 1/4 WATT
R10	13245	4 MEG OHMS 1/4 WATT

MISCELLANEOUS FOR MODEL X-1252

S1	84060	BAND SWITCH
S2	73263	5W ANTENNA COIL ASSY
S3	73262	BC & SW OSCILLATOR COIL ASSY
S4	73192 D	1W IF TRANSFORMER ASSY
S5	73267	1W IF
S6	40869	5 SPEAKER
S7	72151	PILOT LIGHT BROWN BEAD
S8	84060	BAND SWITCH
S9	84431	BALLAST TUBE 100V
S10	84431	BALLAST TUBE 230V
S11	84429	BALLAST TUBE 130V
S12	84430	BALLAST TUBE 150V

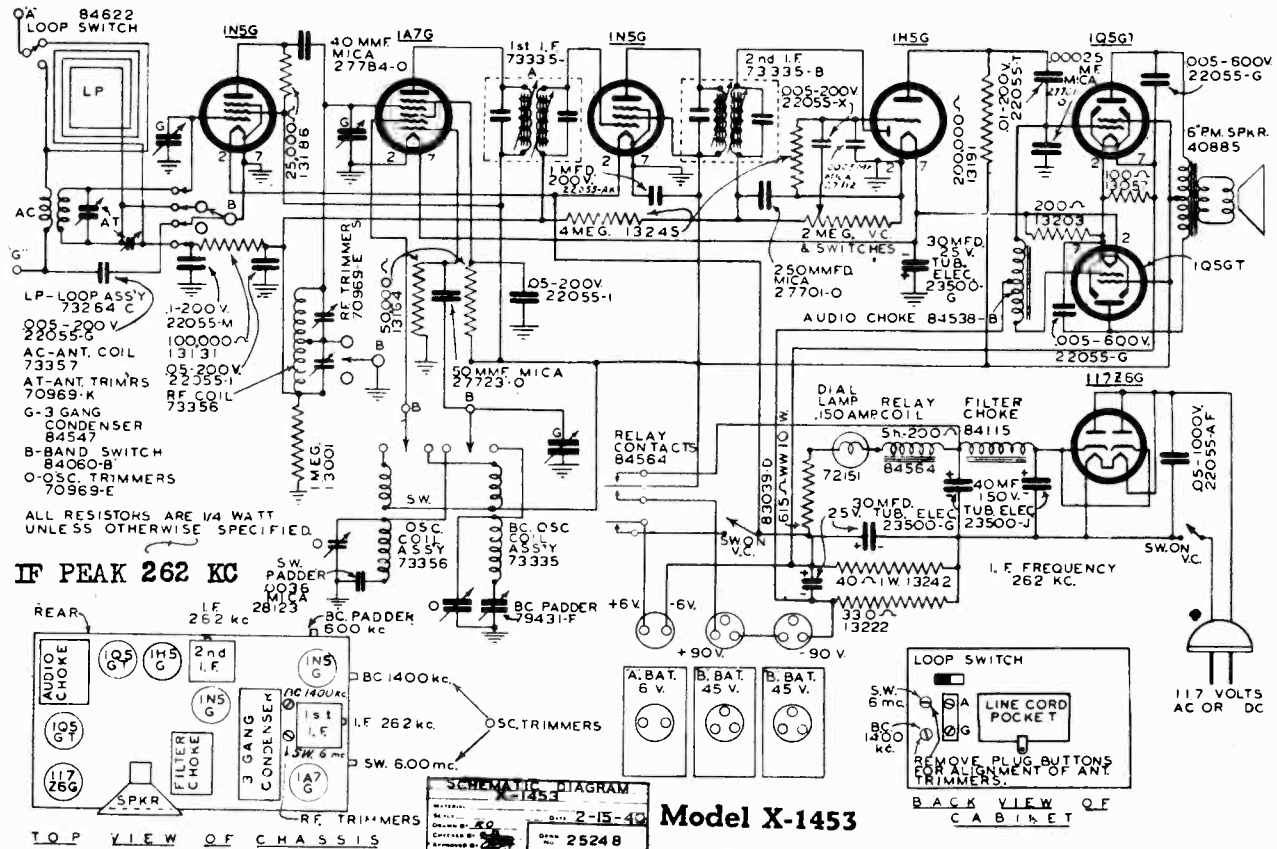
INTERMEDIATE FREQUENCY - 455 K.C.  
ALIGNING FREQUENCIES:  
BC - 1500 & 600 KILOCYCLES.  
S.W. - (ALIGN AT 18 MEGACYCLES.  
CHECK AT 6



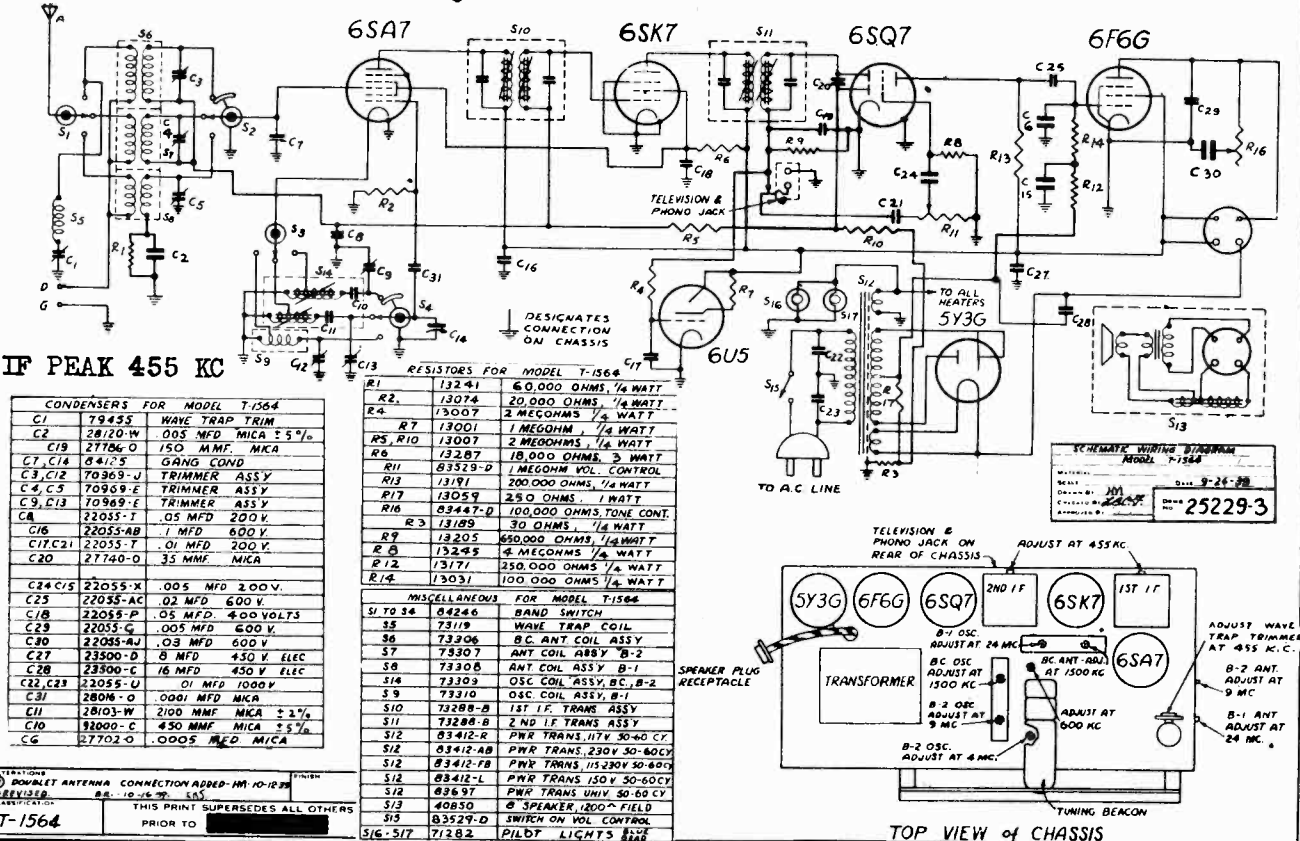


MODELS X-1452, X-1453  
MODEL T-1564

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.

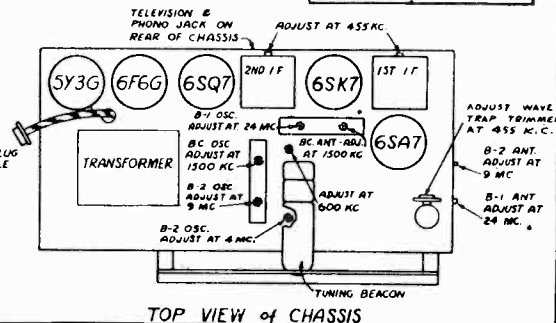


IF PEAK 455 KC

CONDENSERS FOR MODEL T-1564	
C1	79455 WAVE TRAP TRIM
C2	28/20-W 0.05 MFD MICA ± 5%
C19	27706-O 150 MMF. MICA
C7, C14	8412-S GANG COND
C3, C12	70369-J TRIMMER ASSY
C4, C5	70969-E TRIMMER ASSY
C9, C13	70969-E TRIMMER ASSY
C8	22055-T .05 MFD 200V
C16	22055-AB 1 MFD 600V
C17, C21	22055-T .01 MFD 200V
C20	27740-O .35 MFD MICA
C24, C15	22055-X .005 MFD 200V
C25	22055-AC .02 MFD 600V
C18	22055-P .05 MFD .400 VOLTS
C29	22055-G .005 MFD 600V
C30	22055-AJ .03 MFD 600V
C27	22500-D 8 MFD 450 V ELEC
C28	22300-C 16 MFD 450 V ELEC
C22, C23	22055-U .01 MFD 1000V
C31	28086-O .0001 MFD MICA
C11	28103-W 210 MMF MICA ± 2%
C10	82000-C 450 MMF MICA ± 5%
CG	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 MEG OHMS 1/4 WATT
R7	13001 1 MEG OHM 1/4 WATT
R5, R10	13007 2 MEG OHMS 1/4 WATT
R6	13287 18,000 OHMS 3/4 WATT
R11	83529-D 1 MEG OHM 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	13249 5 MEG OHMS 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	73206 BC ANT COIL ASSY
S7	73307 ANT COIL ABBY B-2
S8	73308 ANT COIL ASSY B-1
S14	73309 OSC COIL ASSY BC, B-2
S9	73310 OSC COIL ASSY B-1
S10	73288-B 1ST I.F. TRANS ASSY
S11	73288-B 2ND I.F. TRANS ASSY
S12	83412-R PWR TRANS. 117V 30-60CY
S12	83412-AB PWR TRANS. 230V 30-60CY
S12	83412-FB PWR TRANS. 115/230V 50-60CY
S12	83412-L PWR TRANS. 150V 50-60CY
S12	83697 PWR TRANS. UNIV. 50-60CY
S13	40850 2 SPEAKER 8 OHM FIELD
S15	83529-D SWITCH ON VOL. CONTROL
S16-S17	71282 PILDT LIGHTS BASE



T-1564  
PRIOR TO

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.

**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.

**ELECTRICAL SPECIFICATIONS**

Motor	Synchronous (Manual Starting)
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	1 1/2 Volts across 250,000 ohm load at 1,000 cps

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.

Stock No.	DESCRIPTION	Stock No.	DESCRIPTION
	<b>MOTOR ASSEMBLIES PRP-1 AND PRP-2</b> (60 cycles—110 volts)	33654	Frame—Rotor frame
32654	Ball—Steel ball	33641	Lamination—Rotor lamination
31045	Base—Motor support, damper and bearing cup assembly	34878	Lamination—Stator lamination
31046	Bearing—Bearing assembly	32469	Motor—110 volt, 60 cycle, complete with mounting for PRP-1
32472	Cap—PRP-1 rubber spindle cap	9841	Motor—110 volt, 60 cycle, complete with mounting for PRP-2
31041	Cap—PRP-2 rubber spindle cap	31040	Mounting—Turntable top rubber mountings sufficient for one turntable—PRP-1
31917	Coil—Motor field coil	32471	Mounting—Turntable top rubber mountings sufficient for one turntable—PRP-2
31047	Cushion—Rubber cushion for bearing		
	<b>MOTOR ASSEMBLIES PRP-1 AND PRP-2</b> (60 cycles—110 volts)	34810	Mounting—1 set mounting hardware
33041	Ring—Retaining ring and metal washer to mount turntable plate	33345	Cap—Rubber spindle cap for PRP-1
31042	Stator—Stator assembly comprising coils and laminations for 60 cycle operation	33353	Cap—Rubber spindle cap for PRP-2
32473	Turntable—PRP-1 finished turntable top plate only—less rubber mountings		<b>PICKUP AND ARM ASSEMBLIES</b>
31039	Turntable—PRP-2 finished turntable top plate only—less rubber mountings	32624	Pickup Arm—less crystal, PRP-1
4083	Washer—Leather washer	32474	Pickup Arm—less crystal, PRP-2
14231	Washer—Metal spacing washer	31050	Crystal—Pickup crystal and needle screw
33642	Wedge—Coil wedge	31745	Ring—Retaining ring for pickup arm base
	<b>MOTOR ASSEMBLIES</b> (Motor mounted by "T" shaped rubber hanger) (110 volts—60 cycles)	12539	Screw—Pickup needle screw
	Note.—For additional motor parts see 60 cycle motor assemblies at top of list.		<b>PICKUPS USING CRYSTALS HAVING VISCALOID DAMPING</b>
35724	Cap—Rubber spindle cap for PRP-1	33587	Arm—Pickup arm shell only PRP-1
33345	Cap—Rubber spindle cap for PRP-2	33588	Arm—Pickup arm shell only PRP-2
33346	Coil—Motor field coil	35720	Pickup pivot arm for PRP-1
33350	Frame—Motor support frame and bearing cup	35722	Pickup pivot arm for PRP-2
35746	Frame—Rotor frame, laminations and spindle shaft assembled	35721	Base—Pickup arm base for PRP-1
34480	Hanger—Rubber mounting hanger	35723	Base—Pickup arm base for PRP-2
35745	Lamination—Stator lamination and bearing	33217	Crystal—Pickup crystal cartridge
33348	Washer—Leather and metal washer for stator bearing	32500	Mounting—Rubber spacer, flat washer and snap ring for mounting pickup arm base
34863	Wedge—Wooden wedge	34311	Ring—Retaining ring for pivot arm base
	<b>MOTOR ASSEMBLIES</b> (110 volts—50 cycles)	31160	Screw—Needle screw
	Note.—For additional motor parts see 60 cycle motor assemblies at top of list.		<b>MISCELLANEOUS ASSEMBLIES</b>
31918	Coil—Motor field coils	31052	Control—Volume control and power switch
33941	Frame—Rotor frame complete with spindle and rotor laminations	14086	Cord—Power cord with male plug
33658	Laminations—Rotor laminations	33680	Cup—Needle cup for PRP-2
33354	Laminations—Stator laminations	35717	Decalcomania—"Symphonic De Luxe"
		31051	Foot—Rubber mounting 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

**GENERAL DESCRIPTION**

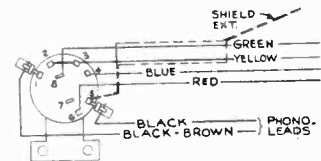
These instruments employ a crystal pickup unit which depends upon torsional vibration to provide the necessary output voltage. The crystal unit is contained in a metal case securely sealed against extremes of climate. An offset mounting for the pickup head gives an ideal tracking angle between the needle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

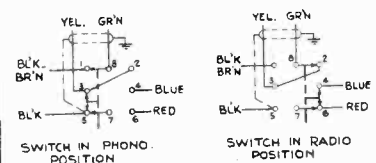
**CONNECTING RECORD PLAYER TO RADIO RECEIVER**

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.

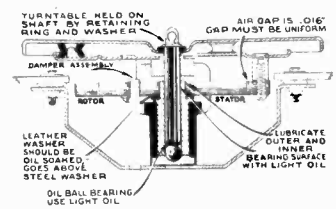
**DO NOT CONNECT THE RECORD PLAYER INTO A PLATE OR CATHODE CIRCUIT.** It must always be connected into a high impedance circuit (100,000 ohms or more). If the player is to be used in connection with an AC-DC receiver it is necessary to insert a capacitor (0.1 mfd.—400 volts) in series with the ground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



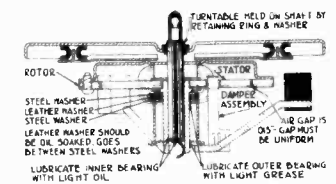
**Radio-Phono Switch supplied with Record Player**



**Diagrams showing Switch in Radio and Phono positions**



**Motor using Solid Base with Bolts for Mounting**



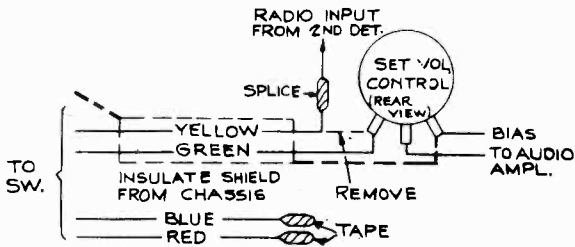
**Motor using "T" Shaped Rubber Hanger Mounting**

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

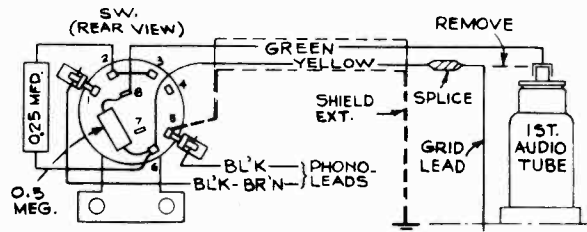
MODEL PRP-1  
MODEL PRP-2

RCA MFG. CO., INC.

TYPICAL CONNECTION DIAGRAMS

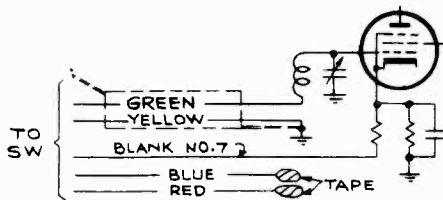


Radio Receivers where Receiver Volume Control is in Audio Input Circuit

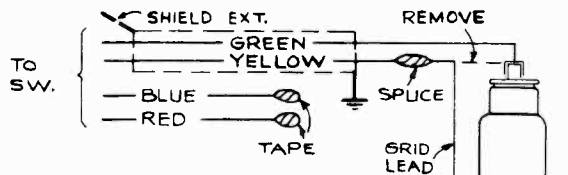


NOTE: REMOVE BLUE AND RED LEADS. CONNECT YELLOW LEAD TO TERMINAL NO. 6. ADD 0.5 MEG. RESISTOR AND 0.25 MFD. CAPACITOR AS SHOWN.

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

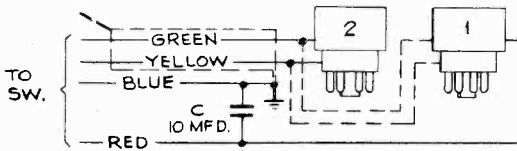


Radio Receivers using Biased-Type Detector



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 grid return.

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

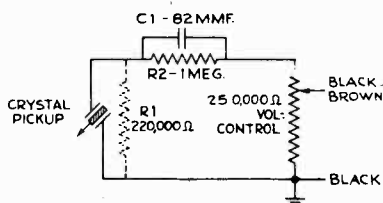
TONE COMPENSATION

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.

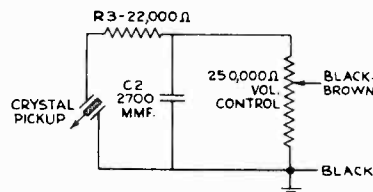
In "A" R1 controls the low frequency response; higher values of R1 give increased lows. For maximum low frequency response, remove R1. R2 controls pickup output, smaller values of R2 giving increased output. C1 controls high frequency response; to increase highs increase C1.

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.

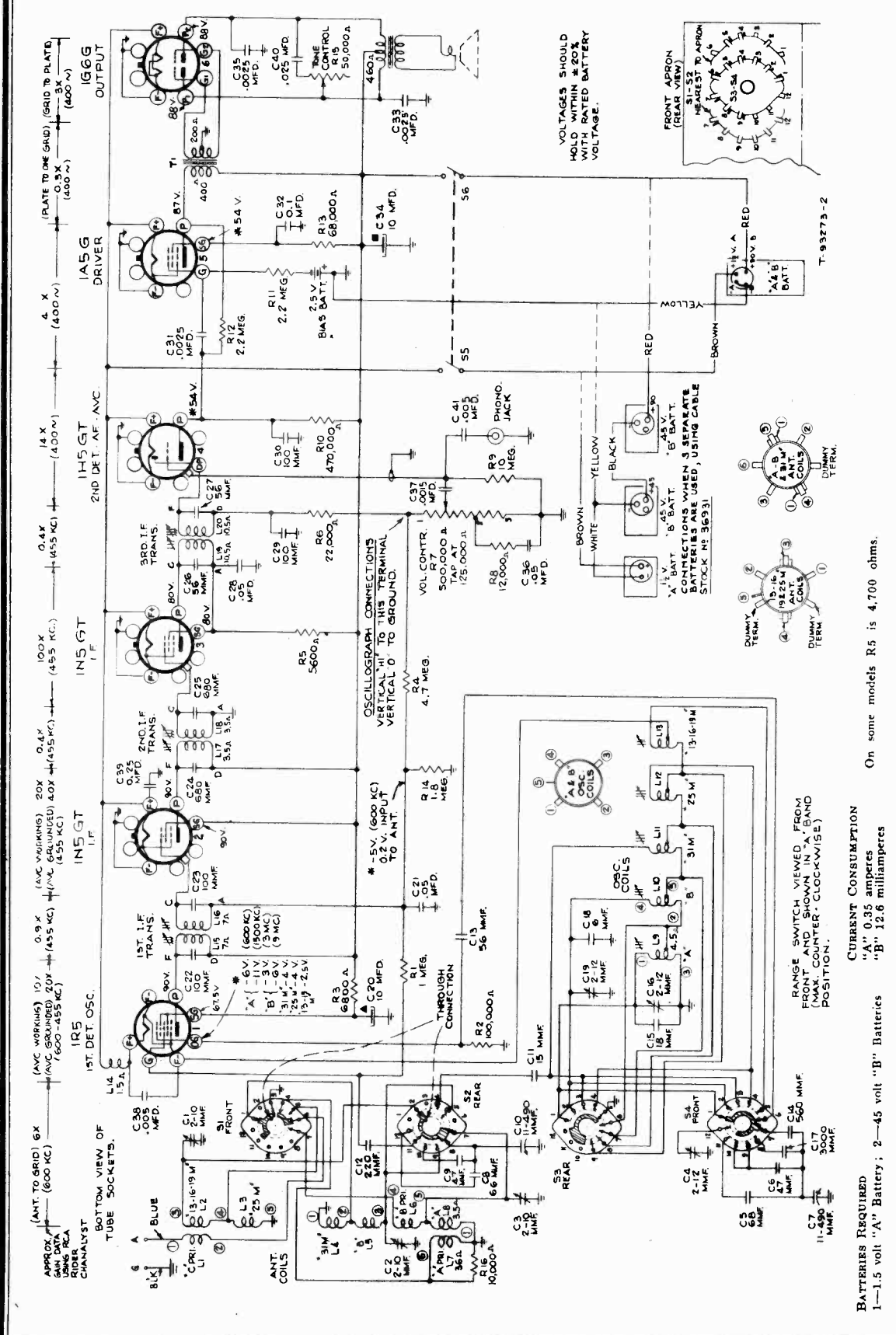
The suggested values shown in "A" and "B" should serve as a basis from which slight alterations may be made to suit individual cases.



"A"



"B"



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 1.9 watts  
"B" current drain..... 13.9 milliamperes at 9 volts dc output  
"A" current drain..... 0.35 amperes at 1.4 volts dc output

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

CURRENT CONSUMPTION  
"A" 0.35 amperes  
"B" 12.6 milliamperes  
On some models R5 is 4,700 ohms.

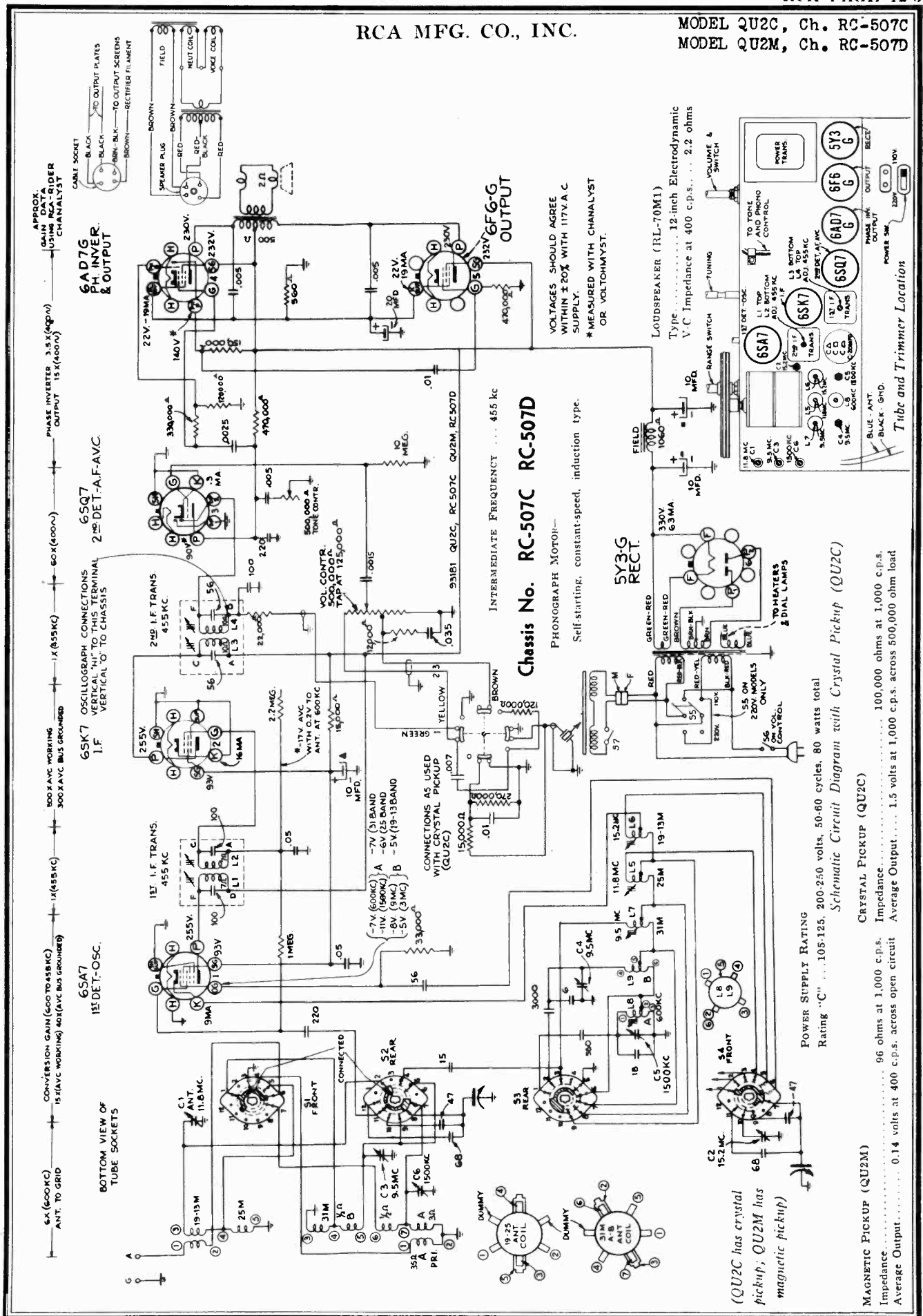
BATTERIES REQUIRED  
1—1.5 volt "A" Battery; 2—45 volt "B" Batteries

FREQUENCY RANGES  
Standard Broadcast ("A" Band)..... 540-1,720 kc (555-174 m)  
Medium Wave ("B" Band)..... 300-5 mc (1100-21.5 m)  
Short Wave..... 9-17 mc (31.8-19.9 m)  
Short Wave..... 11.7-15.1 mc (24.9-19.9 m)  
Short Wave..... 15.1-22.5 mc (19.9-13.3 m)  
INTERMEDIATE FREQUENCY..... 455 kc



RCA MFG. CO., INC.

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



APPROX. GAIN DATA USING CHANNELYST

PHASE INVERTER 3.5 X (4000 $\omega$ )  
OUTPUT 15 X (4000 $\omega$ )

6AD7G P.H. INVERTER & OUTPUT

65Q7 2<sup>nd</sup> DET.-A.F. AVC

6SK7 OSCILLOGRAPH CONNECTIONS I.F. DET.-A.F. AVC

6SA7 1<sup>st</sup> DET-OSC.

Chassis No. RC-507C RC-507D

19-25 MC ANT. COIL

31M ANT. COIL

POWER SUPPLY RATING  
Rating "C" ... 105-125, 200-250 volts, 50-60 cycles, 80 watts total

Schematic Circuit Diagram with Crystal Pickup (QU2C)

CRYSTAL PICKUP (QU2C)

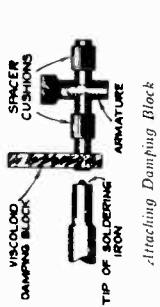
MAGNETIC PICKUP (QU2M)

Impedance ... 96 ohms at 1,000 c.p.s. ... 100,000 ohms at 1,000 c.p.s.  
Average Output ... 0.14 volts at 400 c.p.s. across open circuit ... 1.5 volts at 1,000 c.p.s. across 500,000 ohm load

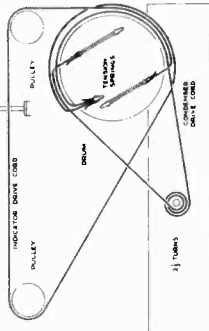
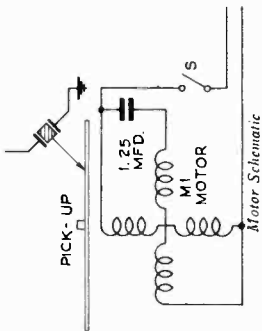
QU2C has crystal pickup; QU2M has magnetic pickup

Tube and Trimmer Location

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

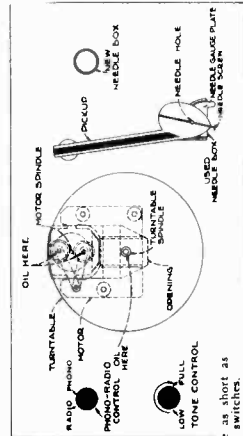


Attaching Damping Block



Dial-Indicator and Drive Mechanism

Table with 2 columns: FREQUENCY BANDS and Standard Broadcast, Medium Wave, and Meter Spread Band values.



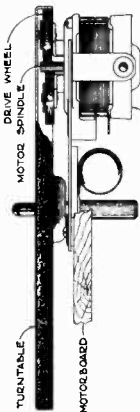
Motorboard and Controls

Power Output: Undistorted: 3 watts, Maximum: 3.5 watts

QU2C-QU2M

Damping Block—The sixoled damping block which is attached to the front end of the armature shaft serves to reduce undesirable vibrations...

The phonograph motor has its bearing filled with oil and sealed at the factory and hence should not require lubrication in the field...



Motor Detail

The motor switch is automatic for both starting and stopping. The motor switch, when properly adjusted, will turn the motor on as the pick-up is moved from the pickup rest toward the turntable...

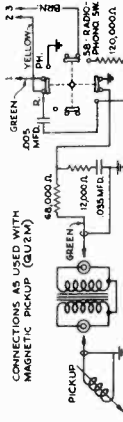


MERCURY SWITCH MECHANISM SHOWN WITH PICK-UP IN REST POSITION

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.

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 compensating circuit...



Schematic Showing Magnetic Pickup Connections (QU2M)

Crystal Pickup—The 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 horn-like magnet is rigidly secured to the pole pieces...

Centering Armature—Refer to the figure showing the pickup inner structure. The armature is shown in its proper relation to the pole pieces...

Remaking 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...



Magnetic Pickup Detail

Table with 4 columns: Steps, Tune test-osc., Range switch, Turn ratio dial-to, Adjust the following max. output

Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak frequency to approximately 14.29 mc (29'') where a peak is obtained.

Calibration Scale on Indicator-Drive-Card Drum—The tuning dial drum which is mounted on the shaft of the indicator-drive card drum which is mounted on the shaft of the gang condenser. The drum is marked on this scale, which is calibrated in degrees.

Pointer for Calibration Scale—Improve a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and send the wire so that it points to the 180° mark on the calibration scale.

Spread-Band Alignment—The most satisfactory method of aligning or zeroing the spread-band ranges on actual reception of short-wave stations is accomplished by adjusting the drive coil and the oscillator coil for each band so that these stations come in at the center of the scale.

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

RCA MFG. CO., INC.

MODELS IAX, IAX2  
Ch. PC1003A  
MODELS IX, IX2  
Ch. PC-1003

APPROX GAIN DATA USING RCA RIDER CHANALYST.

14X 400 ~  
50 L6 GT OUTPUT

40X 400 ~  
12 SA7 2ND DET. A.F. & AVC.

200X (455 KC.) (455 KC.)  
1X (455 KC.)  
15 X (600-455 KC.) (455 KC.)  
MEASURED WITH -3V. FIXED BIAS ON AVC. BUS

0.6X (455 KC.) (455 KC.)  
12 SA7 I.F.

15 X (600-455 KC.) (455 KC.)  
12 SA7 1ST DET & OSC.

50 X (600 KC.)  
ANT. TO GRID

15 X (600-455 KC.) (455 KC.)  
MEASURED WITH -3V. FIXED BIAS ON AVC. BUS

0.6X (455 KC.) (455 KC.)  
12 SA7 I.F.

15 X (600-455 KC.) (455 KC.)  
12 SA7 1ST DET & OSC.

50 X (600 KC.)  
ANT. TO GRID

15 X (600-455 KC.) (455 KC.)  
MEASURED WITH -3V. FIXED BIAS ON AVC. BUS

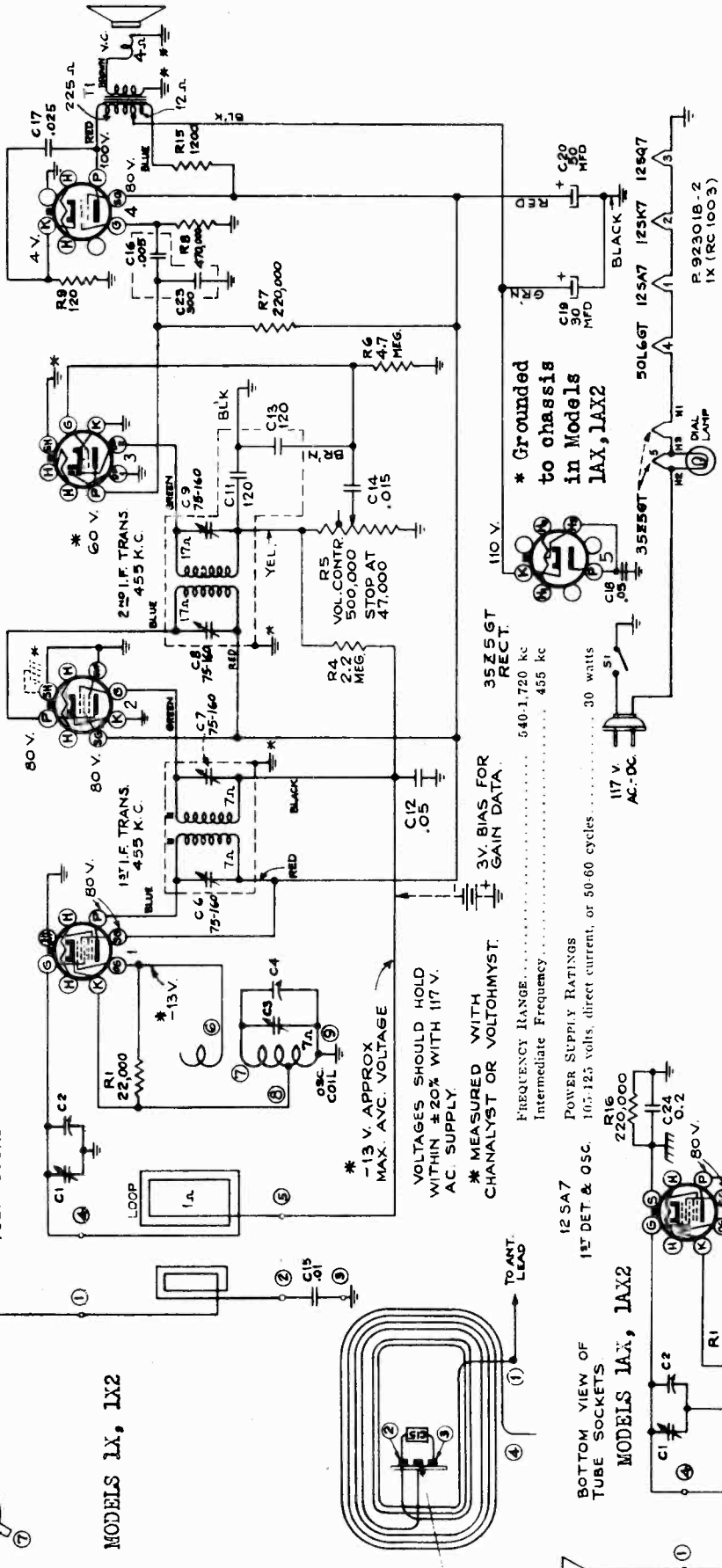
0.6X (455 KC.) (455 KC.)  
12 SA7 I.F.

15 X (600-455 KC.) (455 KC.)  
12 SA7 1ST DET & OSC.

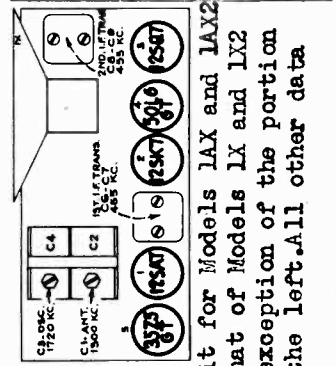
50 X (600 KC.)  
ANT. TO GRID

15 X (600-455 KC.) (455 KC.)  
MEASURED WITH -3V. FIXED BIAS ON AVC. BUS

0.6X (455 KC.) (455 KC.)  
12 SA7 I.F.



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.	1,720 kc	Gang at minimum	C8, C7 1st I.F. Transformer
3	Ant. terminal in series with 100 mmdfd.	1,300 kc	Signal Frequency	C3 (osc.)
4	Radiated signal	Repeat steps 3 and 4.		C1 (ant.)



The circuit for Models IAX and IAX2 is like that of Models IX and IX2 with the exception of the portion shown at the left. All other data apply.

\* Grounded to chassis in Models IAX, IAX2

35Z5GT RECT. 110 V.

540-1,720 kc  
Intermediate Frequency

30 watts  
Power Supply Ratings

105-125 volts, direct current, or 50-60 cycles  
AC-DC

117 V. AC-DC

3V. BIAS FOR GAIN DATA.

MEASURED WITH CHANALYST OR VOLTOHMYST.

VOLTAGES SHOULD HOLD WITHIN ±20% WITH 117 V. AC SUPPLY

-13 V. APPROX MAX. AVC. VOLTAGE

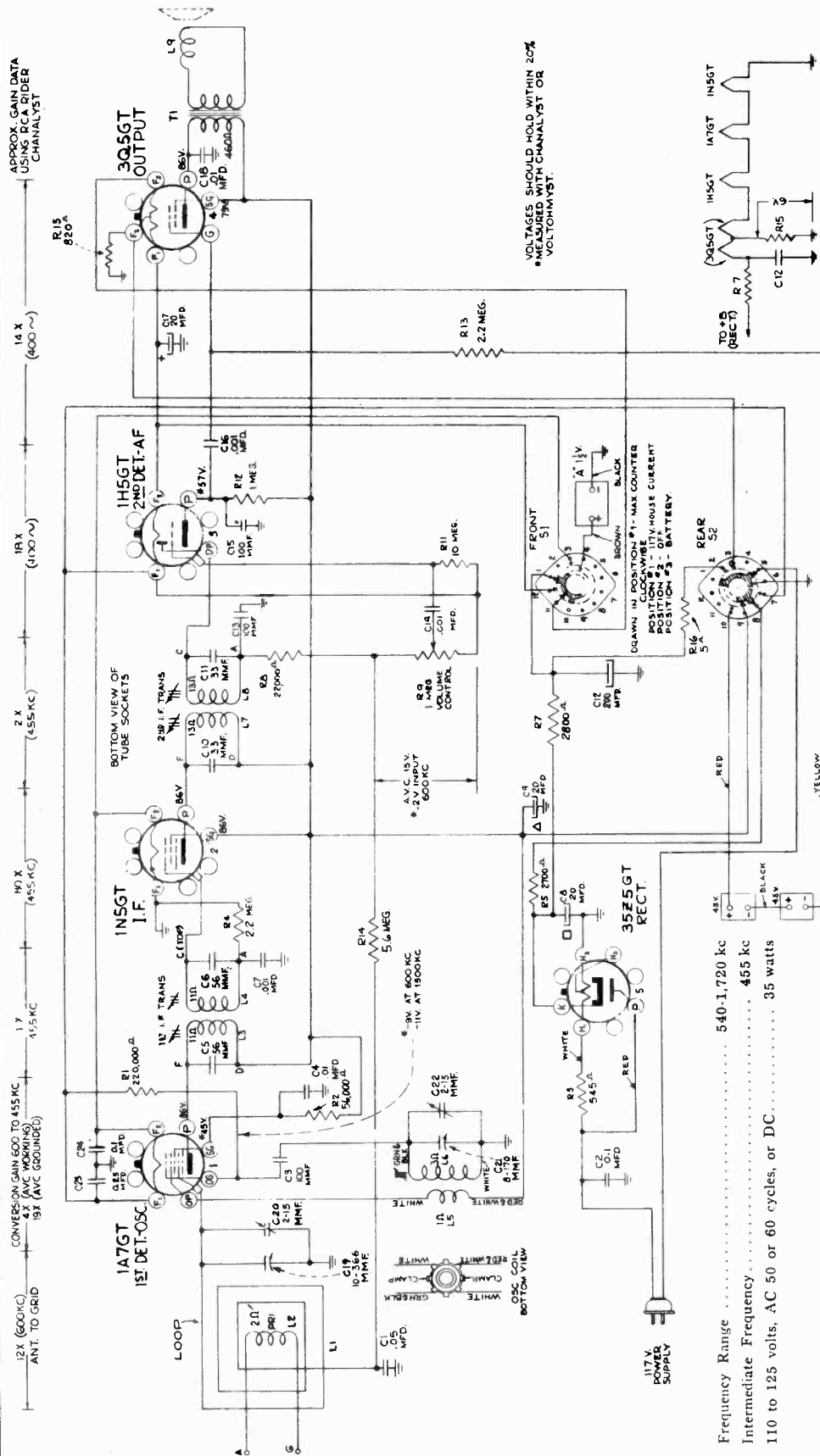
OSC. COIL

LOOP

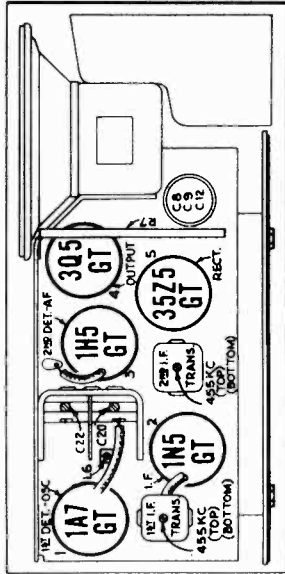
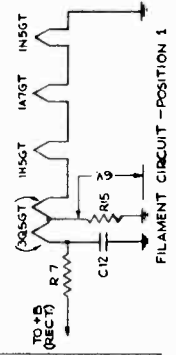
1A

TO ANT. LEAD

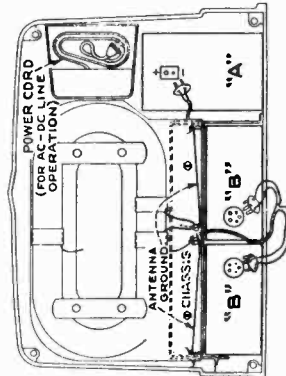




VOLTAGES SHOULD HOLD WITHIN 20% WHEN USED WITH CHANNELYST OR VOLTOMMETER.



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



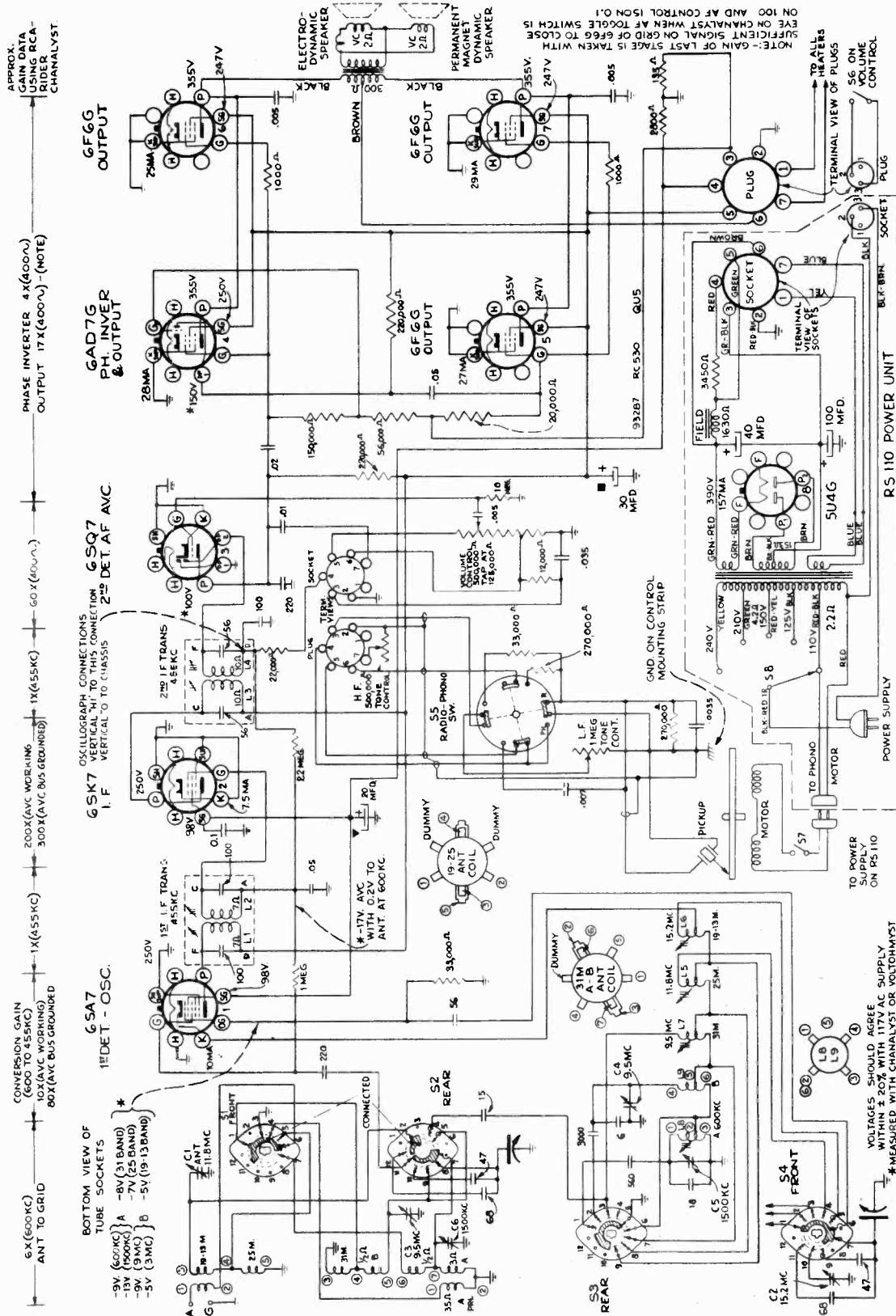
**BATTERIES REQUIRED**  
 "A" one 1.5 volt dry plug-in type "A," (Eveready No. 743 or equivalent)  
 "B" two 45 volt dry plug-in type "B," (Eveready No. 482 or equivalent)

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

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

RCA MFG. CO., INC.

MODEL 2U5  
Ch. RC-530



APPROX. DATA USING RCA-CHANALYST

PHASE INVERTER 4X(4000A) OUTPUT 17X(400V) (NOTE)

60X(600V) 1X(455KC) 200X(AVC WORKING) 300X(AVC BUS GROUND)

CONVERSION GAIN (600 TO 455KC) 10X(AVC WORKING) 90X(AVC BUS GROUND)

6X(600KC) ANT TO GRID

OSCILLOGRAPH CONNECTIONS GSK7 VERTICAL 'H' TO THIS CONNECTION 2ND DET AF AVC VERTICAL 'O' TO CHASSIS

BOTTOM VIEW OF TUBE SOCKETS

\* -9V (600KC) } A -8V (31BAND) }  
 -3V (500KC) } B -7V (25BAND) }  
 -5V (31MC) } C -5V (19-13BAND)

**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

**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

**POWER SUPPLY RATING**  
 105-125, 200-250 volts, 50-60 cycles, 160 watts

**PILOT LAMPS** { Mazda No. 55, 6.5 volts 0.4 amp.  
 { Mazda No. 51, 7.5 volts 0.2 amp.

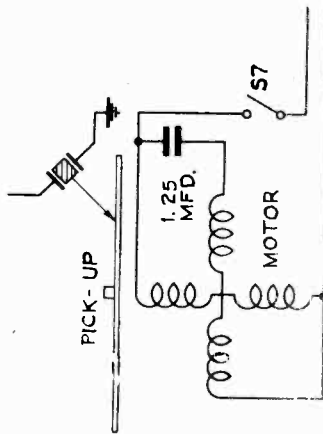
**POWER OUTPUT RATING**  
 Undistorted..... 20 watts  
 Maximum..... 24 watts

**FOR OTHER DATA SEE INDEX**

MODEL QU5  
Ch. RC-1530

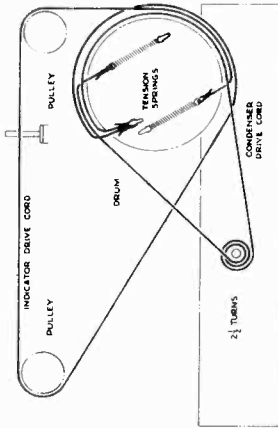
RCA MFG. CO., INC.

**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

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



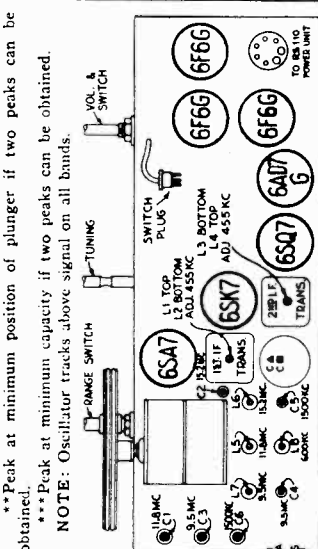
Dial-Indicator and Drive Mechanism

**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.—**Alter 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 actual reception of short-wave stations of known frequency, by adjusting the magnetron-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:

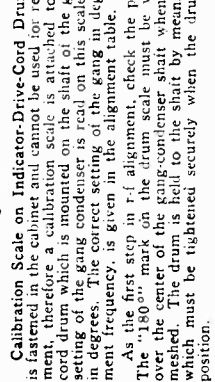
1. Determine the exact dial settings of the test-oscillator (for frequencies at or close to the specified alignment frequencies) by zero-beating the test-oscillator against short-wave stations of known frequency.
2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the 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 magnetron-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 by tuning receiver to approximately 14.29 mc (20°) 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.

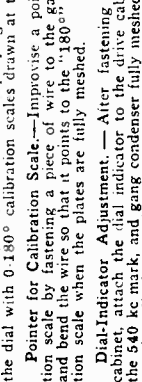


Tube and Trimmer Locations

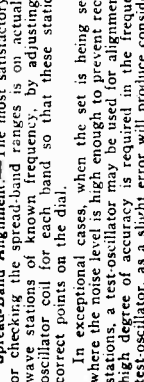
**Connections and Colors of Loudspeaker and Cable**



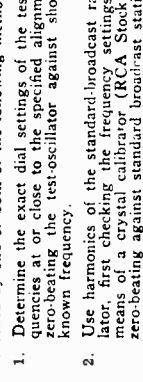
Connections and Colors of Loudspeaker and Cable



Output Plate Connections

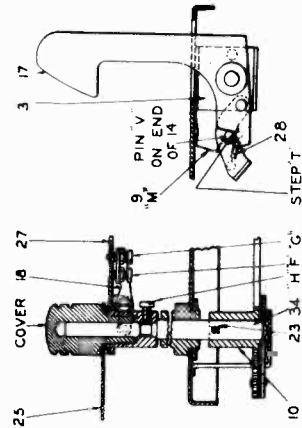


Cable Socket Connections

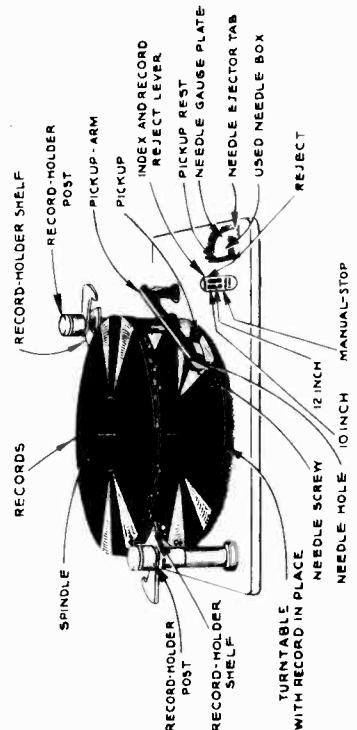


RLTOME SPEAKER PLUG

Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for maximum output
1	6SK7 I-F grid in series with .01 mfd.	456 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	6SA7 1st Det. grid in series with .01 mfd.	11.8 mc	25M	138.5°	L1 and L2 1st I-F Trans.
3		15.2 mc		17°	L5 (osc.) C1 (ant.)
4		Repeat steps 3 and 4			C2 (osc.)*
5	Ant. lead in series with 500 ohms	15.2 mc	19-13M	166°	L6 (osc.)**
6		9.5 mc	31M	156°	L7 (osc.)**
7		9.5 mc	B	11.5°	C3 (ant.)***
8		1,500 kc	A	26°	C5 (osc.) C6 (ant.)
9	Ant. lead in series with 200 ohms	600 kc		150°	L8 (osc.) (Rock gang)
10					
11					Repeat steps 9 and 10



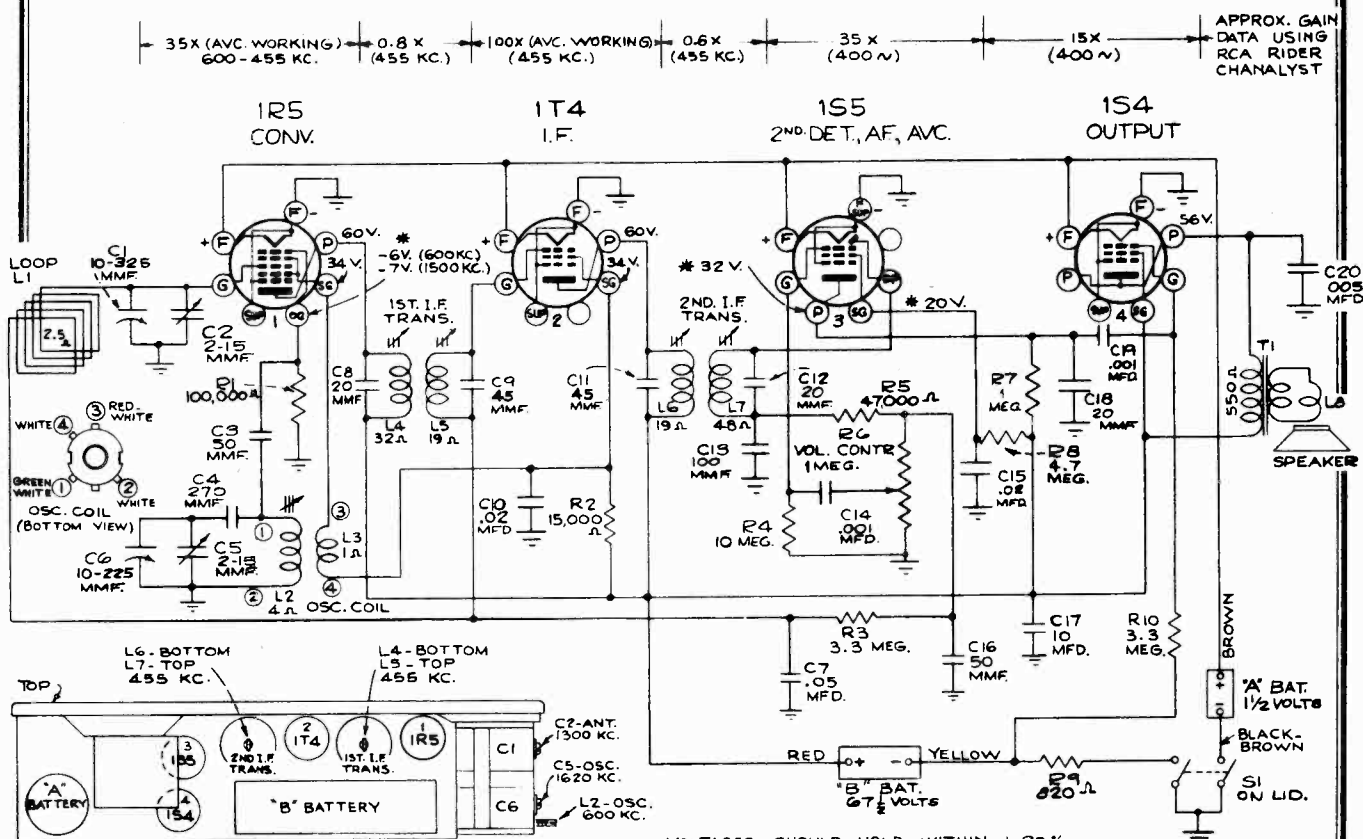
Details of Record Shelf Posts, and Locating Lever Assemblies



Top View of Automatic Record Changer

RCA MFG. CO., INC.

MODEL BP-10  
"Personal"



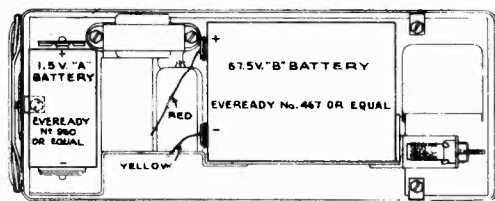
VOLTAGES SHOULD HOLD WITHIN  $\pm 20\%$  WITH RATED BATTERY VOLTAGE.  
\* MEASURED WITH CHANALYST OR VOLTOHMYST.

P. 64996

### 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	2.5 milliamperes	25-40 hours

**POWER OUTPUT**

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

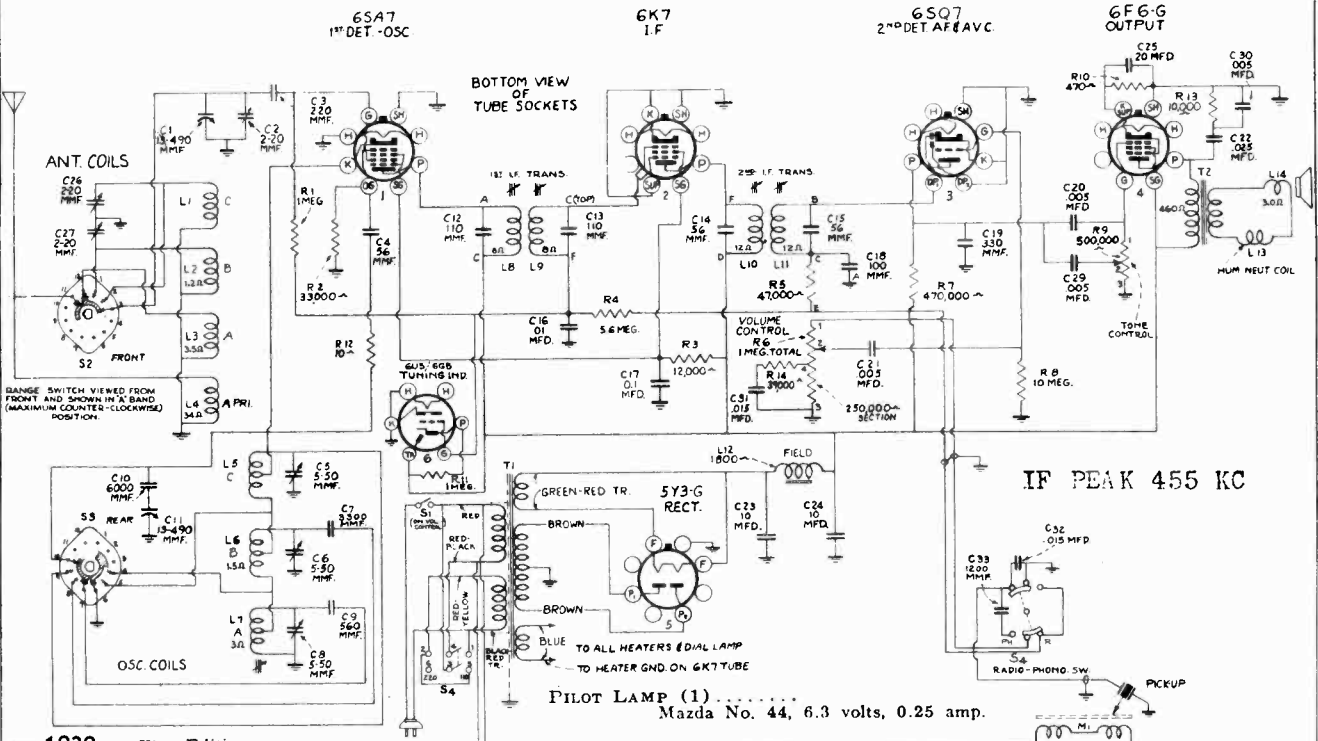
**LOUDSPEAKER**

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

Cabinet Dimensions (inches)	Height	Width	Depth
.....	3	8 1/2	3 1/2
Weight .....	3 1/2 lbs. (net)	4 1/2 lbs. (shipping)	
Tuning Drive Ratio .....	1 to 1		

MODEL 6QU  
Ch. RC-414

RCA MFG. CO., INC.

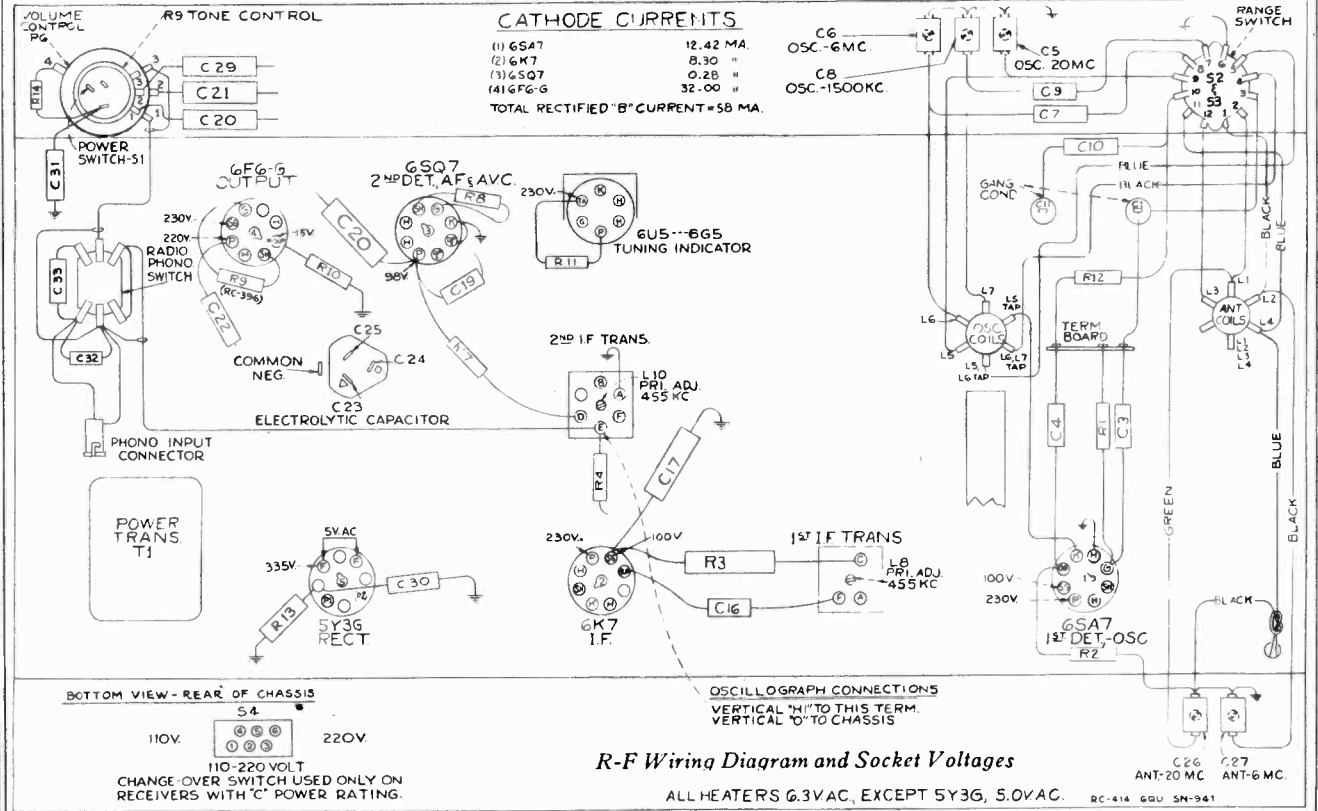


— 1939 — First Edition

**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... 1 1/2 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



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.

RCA MFG. CO., INC.

MODEL 6QU  
Ch. RC-414

### 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

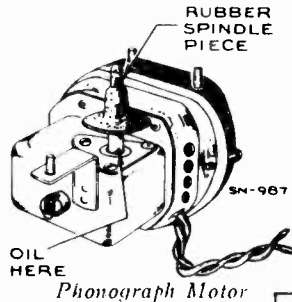
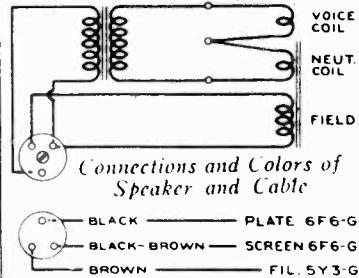
is moved from the pickup rest toward the turntable. The switch should be adjusted so that it will snap into the "off" position when the pickup needle is  $1\frac{1}{2}$  inches from the center line of the spindle shaft. The motor may be shut off at any time by placing the pickup on the pickup rest.

#### 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.

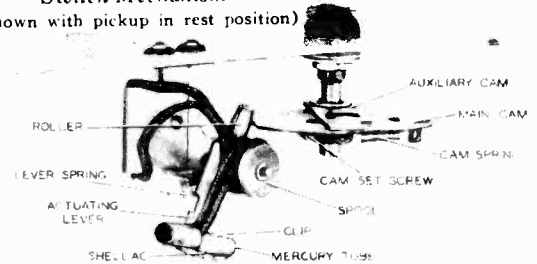
#### Precautionary Lead Dress:

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).



#### 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.

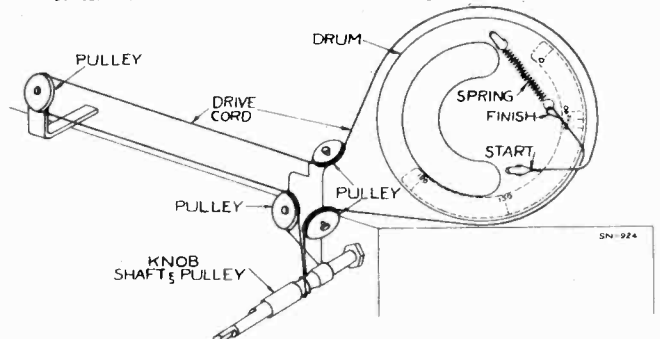
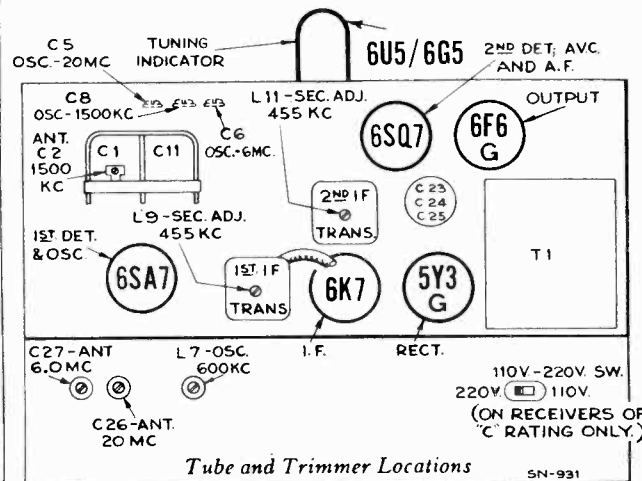
As the first step in r-f alignment, check the position of the drum. The 135° mark on the drum scale must be vertical, and directly under the center of the gang-condenser shaft when the plates are fully meshed. The drum is held to the shaft by means of two set screws, which must be tightened securely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

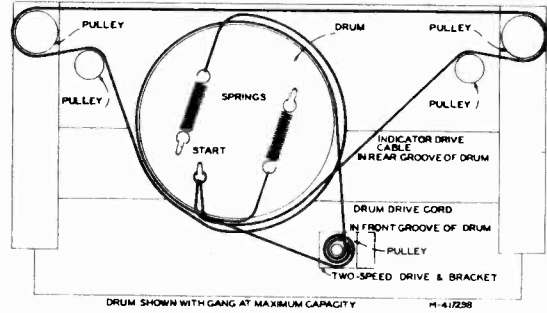
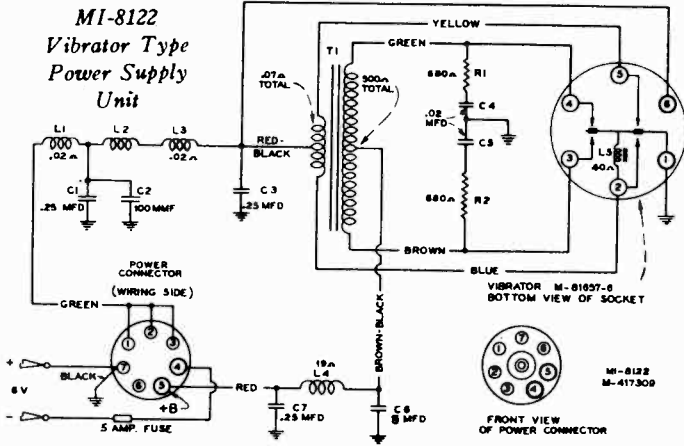


Arrangement of Drive Cord for Tuning Condenser and Dial Indicator. Drum Shown with Gang at Maximum Capacity

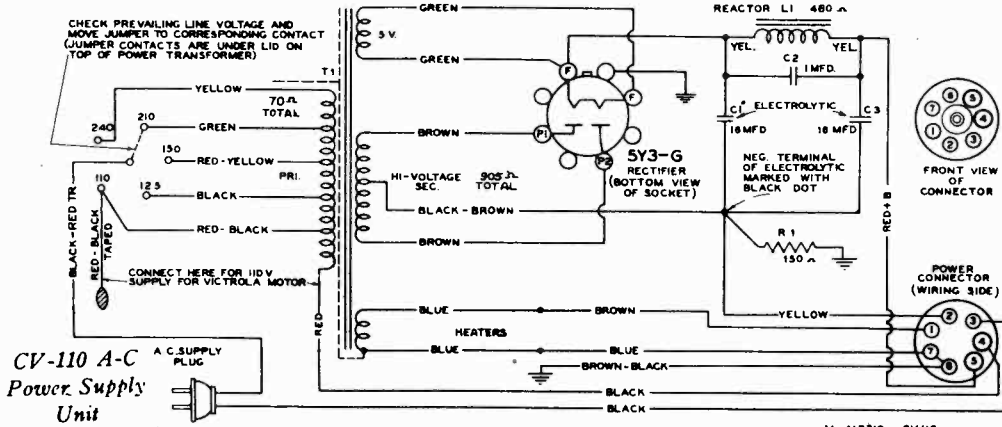
MODELS 7QB, 7QBK  
Ch. RC-496

RCA MFG. CO., INC.

**MI-8122**  
**Vibrator Type**  
**Power Supply**  
**Unit**

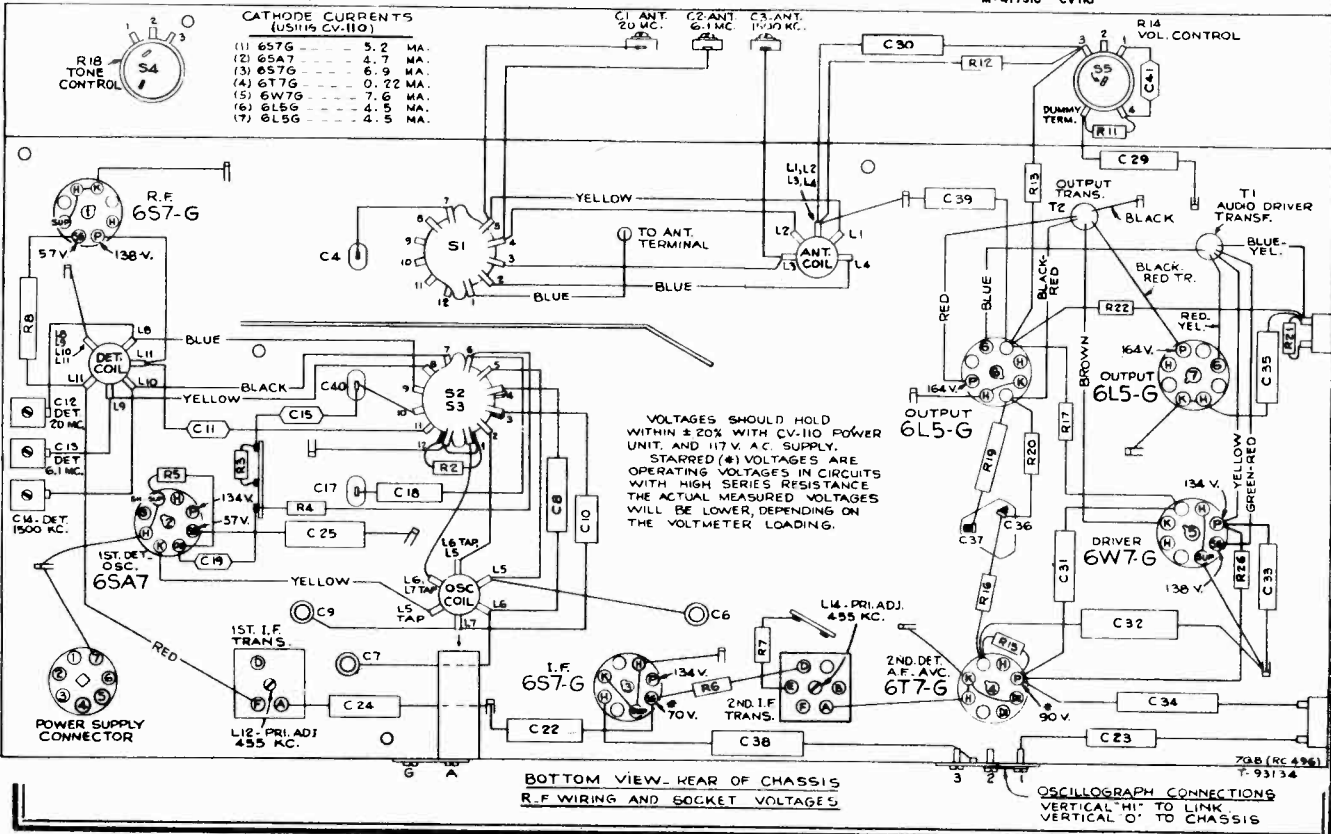


*Above—Arrangement of  
Drive Cords for Tuning  
Condenser and Dial Indicator*



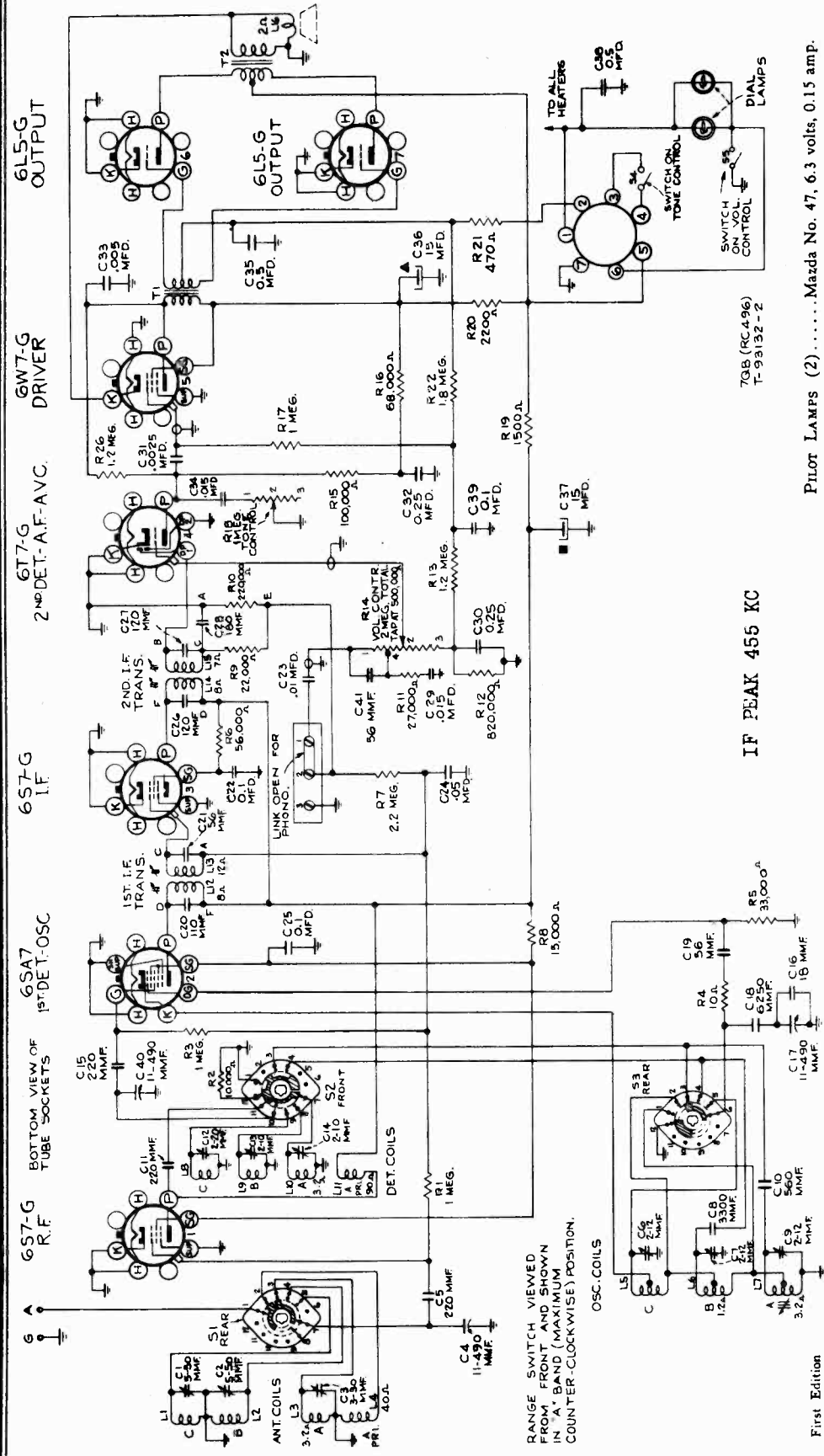
**CATHODE CURRENTS**  
(USING CV-110)

(1) 6S7G	5.2 MA.
(2) 6SA7	4.7 MA.
(3) 6S7G	6.9 MA.
(4) 6T7G	0.72 MA.
(5) 6W7G	7.6 MA.
(6) 6L6G	4.9 MA.
(7) 6L5G	4.5 MA.



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

**OSCILLOGRAPH CONNECTIONS**  
VERTICAL "H" TO LINK  
VERTICAL "O" TO CHASSIS



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 .....

Undistorted .....

LOUDSPEAKERS (Permanent-Magnet Dynamics)

7QB (RL-90-2) .....

7QBK (RL-71-5) .....

Voice-coil impedance at 400 cycles . . . 2.4 ohms

IF PEAK 455 KC

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.

- 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.

First Edition

— 1939 —



## 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.

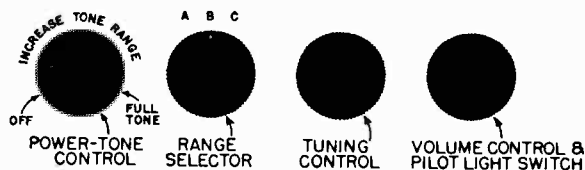
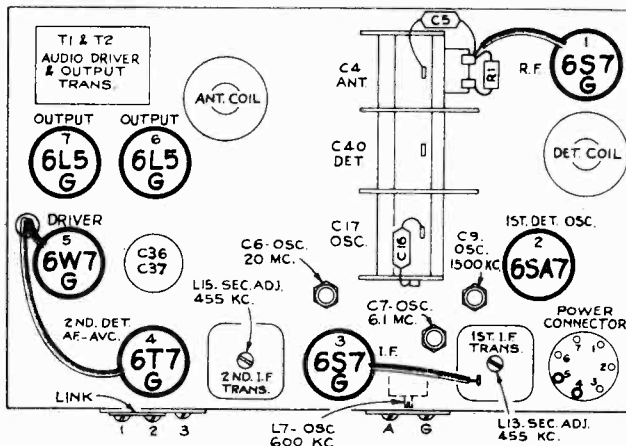
**Test-Oscillator.**—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

**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.



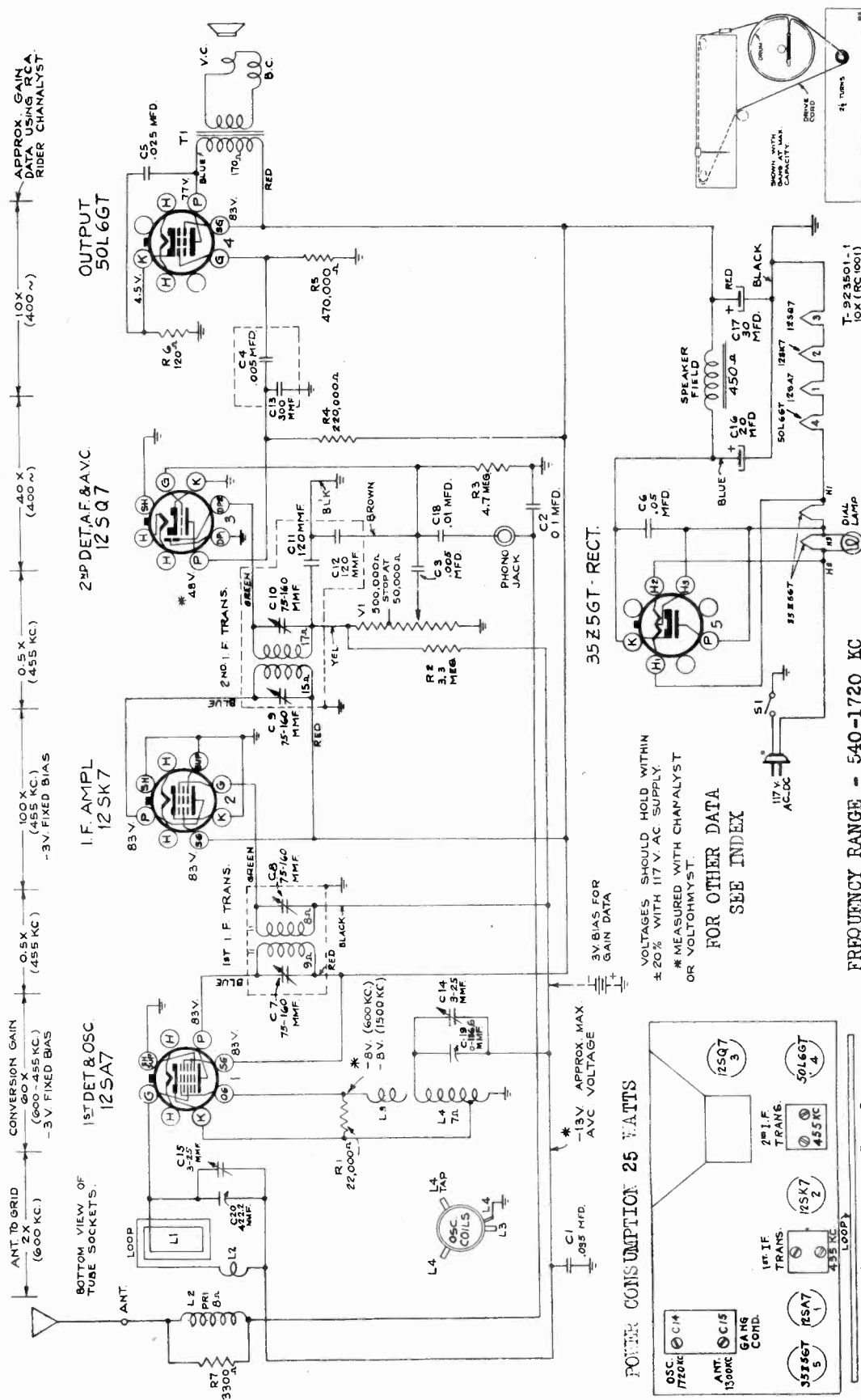
The pilot lights are illuminated by pressing in the volume-control knob. (The pilot lights are not controlled by this action when the receiver is operated with the CV-110 a-c power supply unit.)

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.



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 1,800 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	STOCK No.	DESCRIPTION	Unit List Price
<b>CHASSIS ASSEMBLIES</b> Model 10X (RC-1001)					
33584	Capacitor—.005 mfd.	.25	37352	Shaft—Tuning shaft	.15
37359	Capacitor—1 section of .005 mfd., and 1 section of 300 mmfd.	.25	34449	Socket—Dial lamp socket	.30
14393	Capacitor—.01 mfd.	.30	31251	Socket—Tube socket (wafer type)	.25
30938	Capacitor—.025 mfd.	.20	37605	Socket—Tube socket (moulded type)	.25
5196	Capacitor—.035 mfd.	.20	37357	Spacer—Wood spacer for antenna loop	.10
32787	Capacitor—.05 mfd.	.20	31418	Spring—Drive cord spring	.05
4839	Capacitor—.01 mfd.	.30	37350	Transformer—Audio transformer (output)	1.35
34505	Capacitor—.02 mfd.	.30	36232	Transformer—First I.F. transformer	1.50
35348	Capacitor—Electrolytic comprising 1 section of 30 mfd., and 1 section of 20 mfd.	.95	36233	Transformer—Second I.F. transformer	1.50
37356	Coil—Loop primary coil (Antenna)	.35	33726	Washer—"C" washer for tuning shaft	.02
36234	Coil—Oscillator coil	.60	37358	Winding—Antenna loop winding only	.55
37353	Condenser—Tuning condenser	2.75	<b>SPEAKER ASSEMBLIES</b> (RL-86A1)		
36584	Control—Volume control and power switch	1.50	32907	Cap—Dust cap	.02
32634	Cord—Drive cord (approx. 32-in. overall length)	.10	35570	Cone—Cone complete with voice coil	1.20
37068	Indicator—Station selector indicator	.20	37332	Speaker—5-inch dynamic speaker complete with cone and voice coil	3.25
37351	Plate—Dial back plate complete with pulleys—less dial	.60	<b>MISCELLANEOUS ASSEMBLIES</b>		
36230	Pulley—Drive cord pulley	.04	37360	Back—Cabinet back	.25
37355	Receptacle—Receptacle and terminal board	.20	36681	Base—Roto base complete	.35
12312	Resistor—3,300 ohms, ½ watt	.20	37362	Clamp—Dial clamp (1 set)	.20
13998	Resistor—22,000 ohms, ½ watt	.20	37363	Dial—Dial scale	.75
12264	Resistor—220,000 ohms, ½ watt	.20	37831	Fastener—Push-on fastener for back	.10
30848	Resistor—470,000 ohms, ½ watt	.20	37361	Knob—Volume control or tuning knob	.20
12928	Resistor—3.3 meg., ½ watt	.20	11765	Lamp—Dial lamp	.15
30271	Resistor—4.7 meg., ½ watt	.20	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 1800 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 shown 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

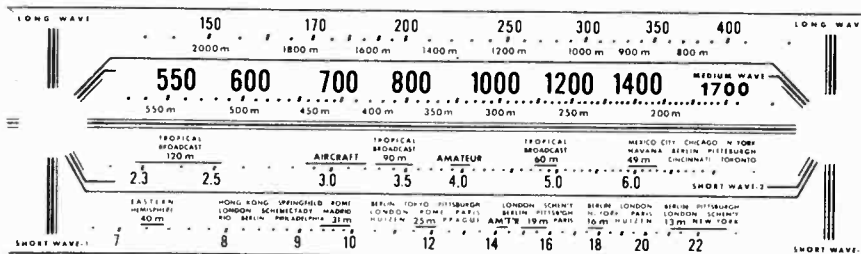
**CABINET DIMENSIONS**

- 7Q4..... 15<sup>9</sup>/<sub>16</sub>-inches x 20<sup>5</sup>/<sub>8</sub>-inches x 9<sup>7</sup>/<sub>8</sub>-inches
- 7QK4..... 38-inches x 26-inches x 11<sup>3</sup>/<sub>4</sub>-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.

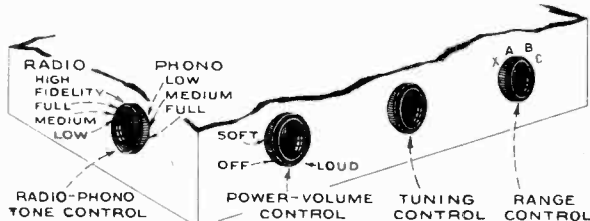


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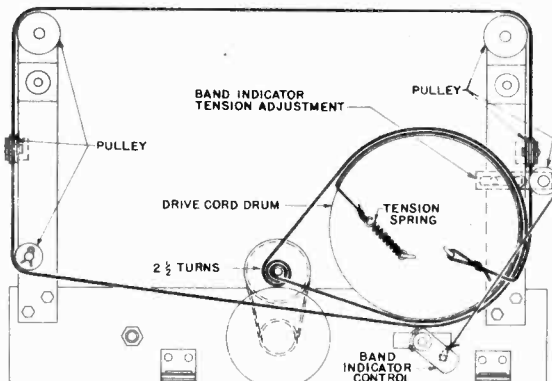
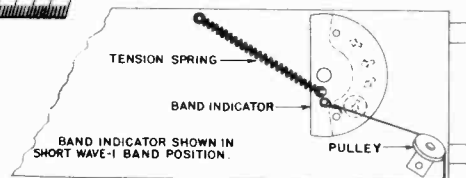
At Right—Dial Drive Mechanism and Band Indicator

Below—Controls



Dial Drive and Controls

for Models 7Q4, 7QK4 and 7Q4X



SN 1006

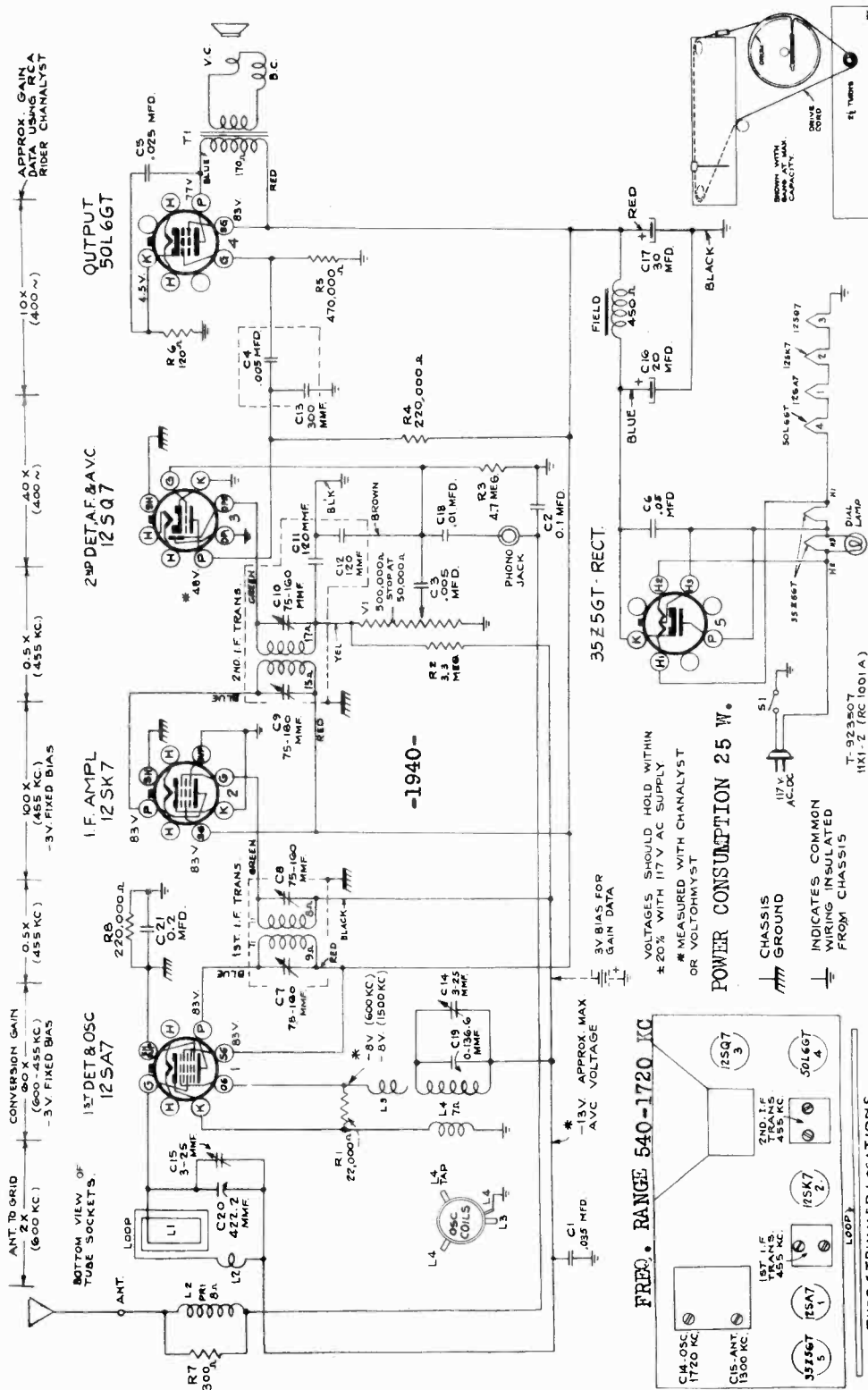
SHOWN WITH GANG AT MAXIMUM CAPACITY

— 1939 —

First Edition

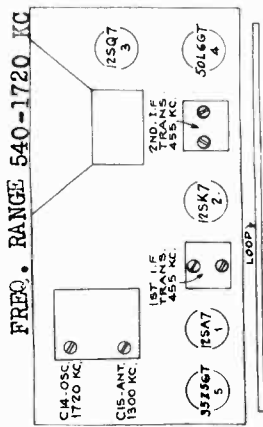
MODEL 11X-1  
Ch. RC-1001-A

RCA MFG. CO., INC.



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.



TUBE TRIMMER LOCATIONS

FREQ. RANGE 540-1720 KC

POWER CONSUMPTION 25 W.

CHASSIS GROUND

INDICATES COMMON WIRING INSULATED FROM CHASSIS

T-923507  
11K1-Z (RC 1001A)

VOLTAGES SHOULD HOLD WITHIN ± 20% WITH 117 V AC SUPPLY  
\* MEASURED WITH CHANNELYST OR VOLTORMYST

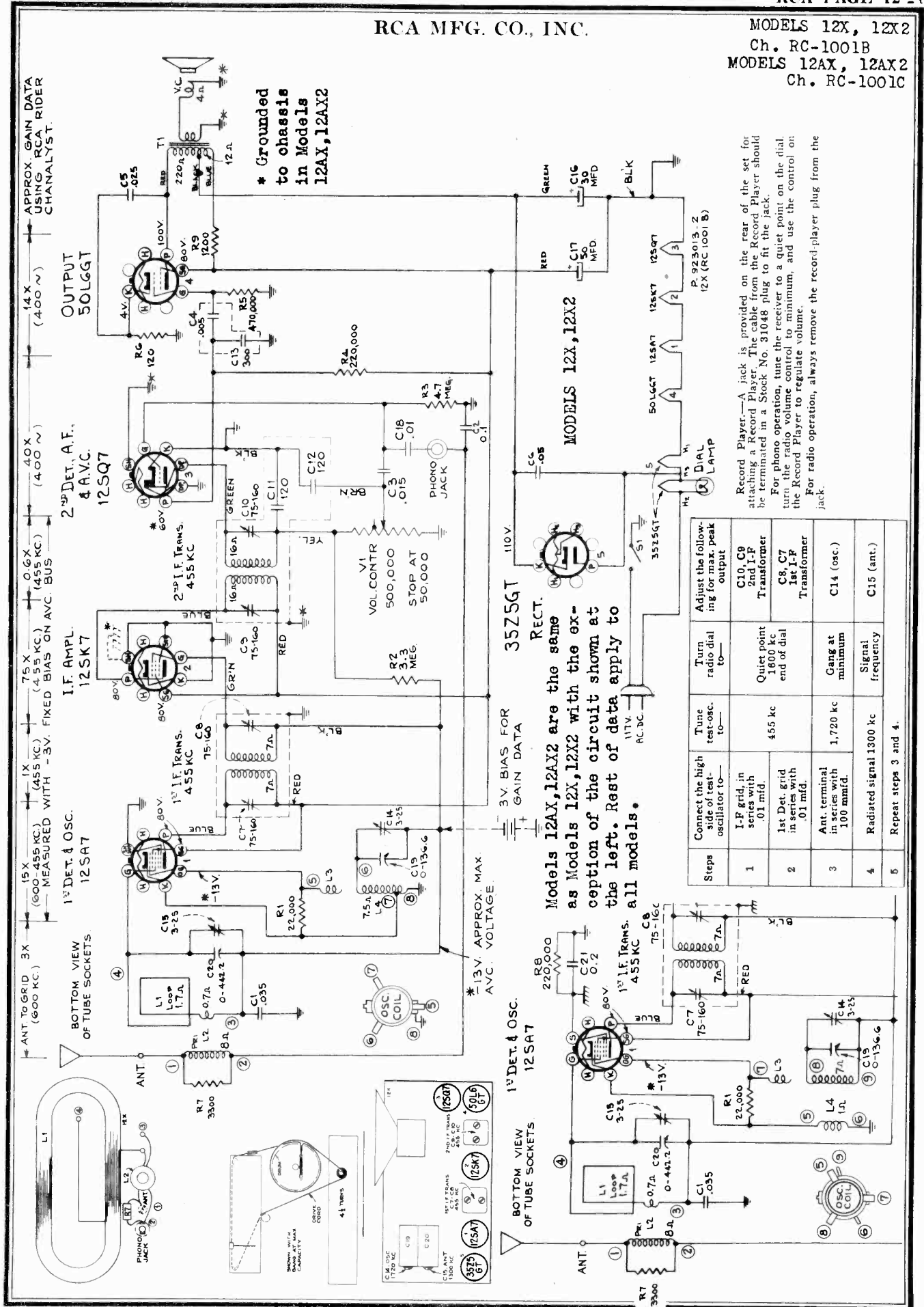
3V BIAS FOR GAIN DATA

17V AC-DC

APPROX. GAIN OF CHANNELYST RIDER CHANNELYST

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 1800 kc	C10, C9 2nd I-F Transformer
2	1st Det. grid in series with .01 mfd.	1,720 kc	Gang at minimum	C8, C7 1st I-F Transformer
3	Ant. terminal in series with 100 mmfd.	Radiated signal 1300 kc	Signal frequency	C14 (osc.) C15 (ant.)
4	Repeat steps 3 and 4.			

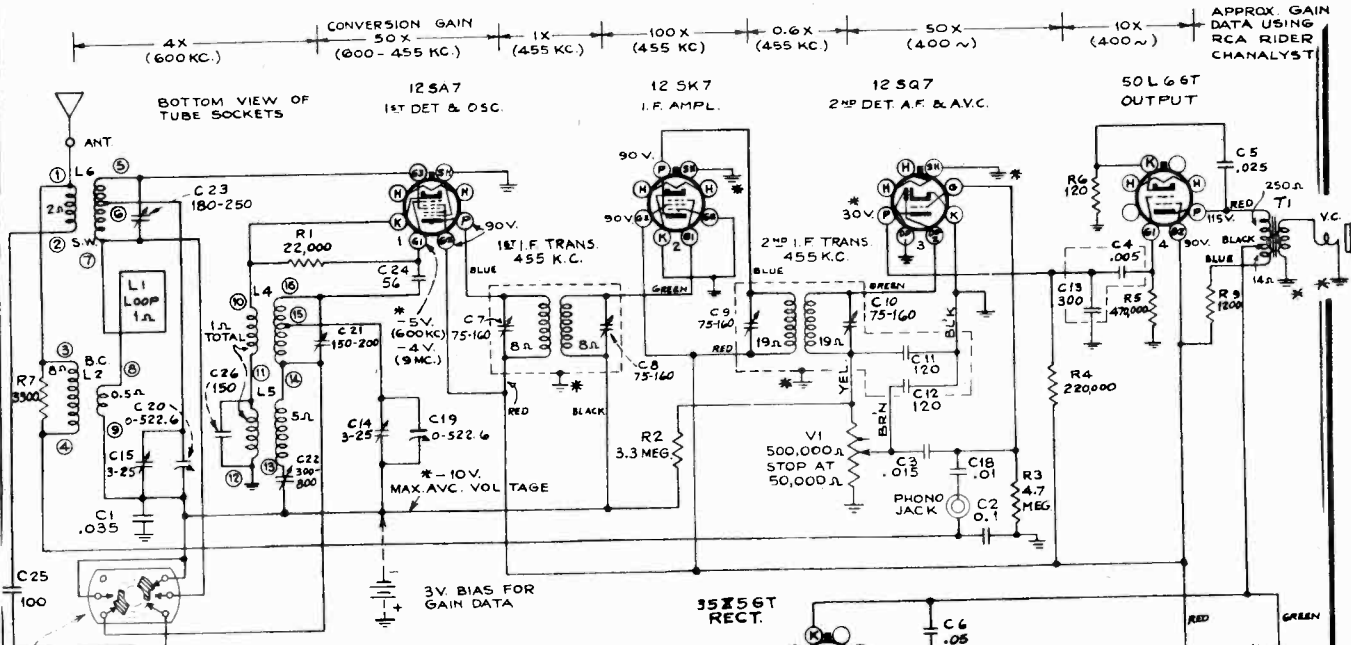
**Record Player**—A jack is provided on the rear of the set for attaching a Record Player. The cable from the Record Player should be terminated in a Stock No. 31048 plug to fit the jack.

For radio 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.



APPROX. GAIN DATA USING RCA RIDER CHANALYST

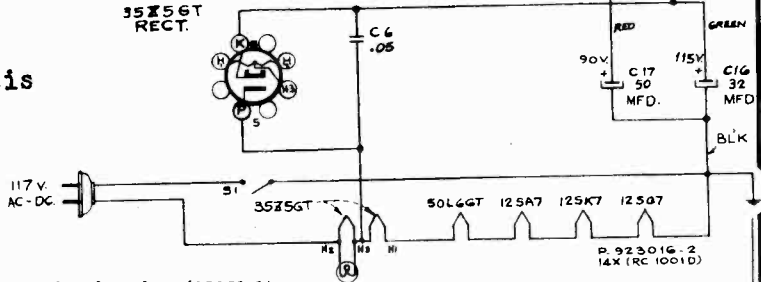
S2 (REAR VIEW) SHOWN IN BROADCAST POSITION

\* Grounded to chassis in Model 14AX.

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

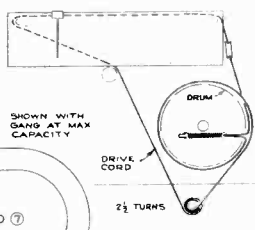
12SA7  
 1ST DET. & OSC.

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

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

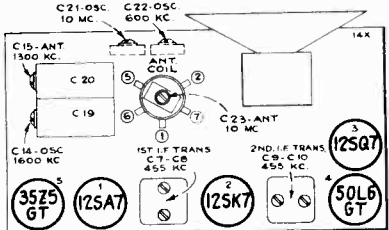


Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	12SK7 grid in series with 0.1 mfd.	455 kc	Quiet Point at 1,600 kc end of dial	C10, C9 2nd I-F Transformer
2	12SA7 grid in series with 0.1 mfd.			C8, C7 1st I-F Transformer
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.—

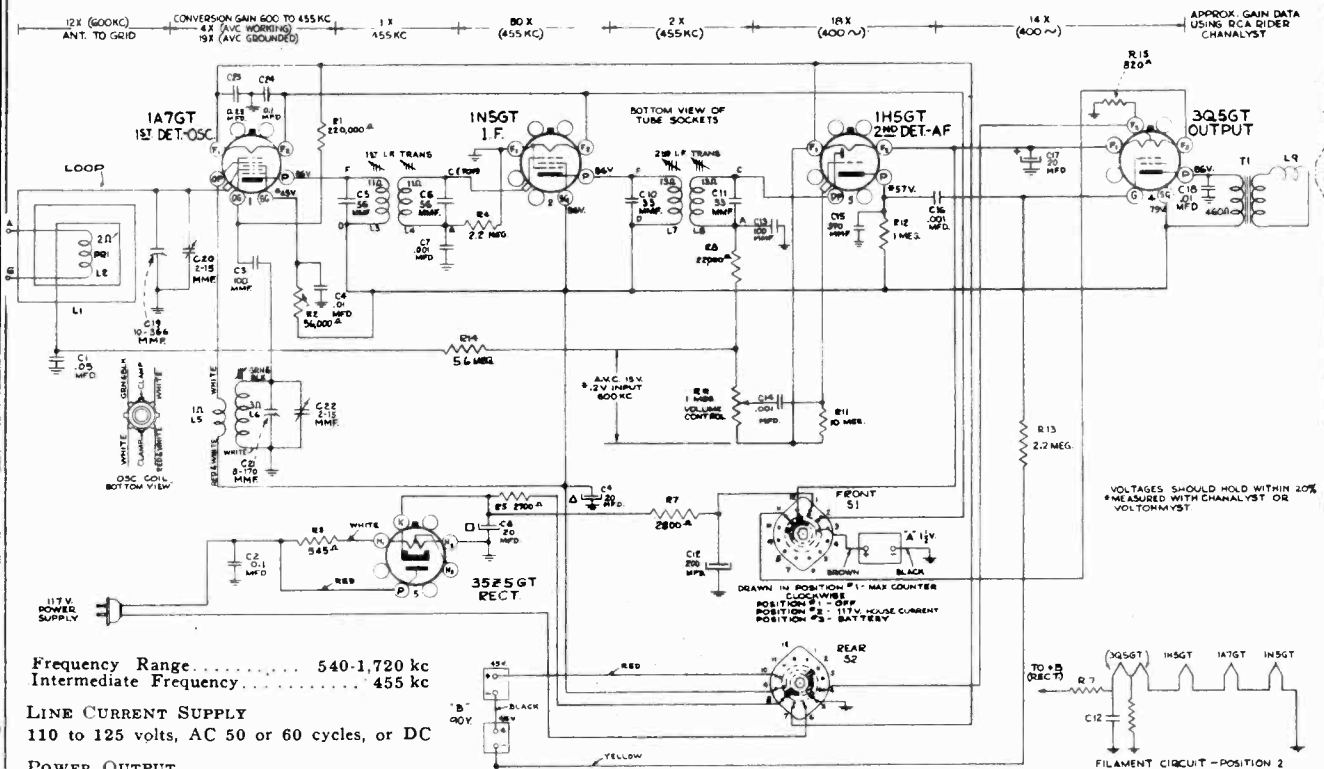
1. Dress the power cable to switch on the volume control close to the chassis and away from all grid and diode leads and condensers.
2. Dress capacitors in the 12SQ7 grid circuit away from all wiring.
3. Green and black phono wires should be twisted and dressed away from other parts and leads.
4. 50L6-GT 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 } Battery Operation  
"B" 11.5 milliamperes }

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

### Alignment Procedure

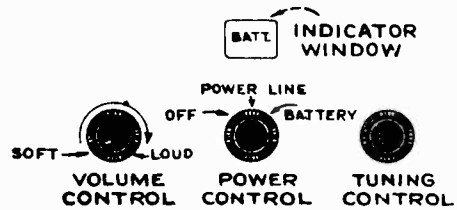
**Output Meter Alignment.**—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

**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.

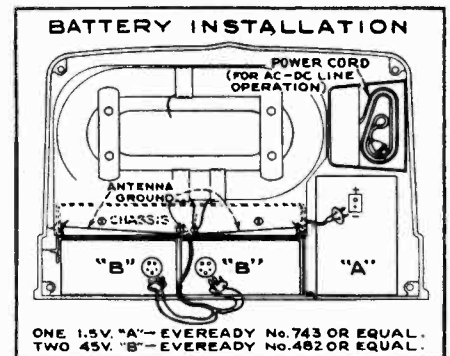
1. Lead from I-F tube grid and from the loop to variable capacitor should not be disturbed after receiver has been aligned.
2. Grid lead to the 1N5-GT tube should be kept away from leads to filament resistors.



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

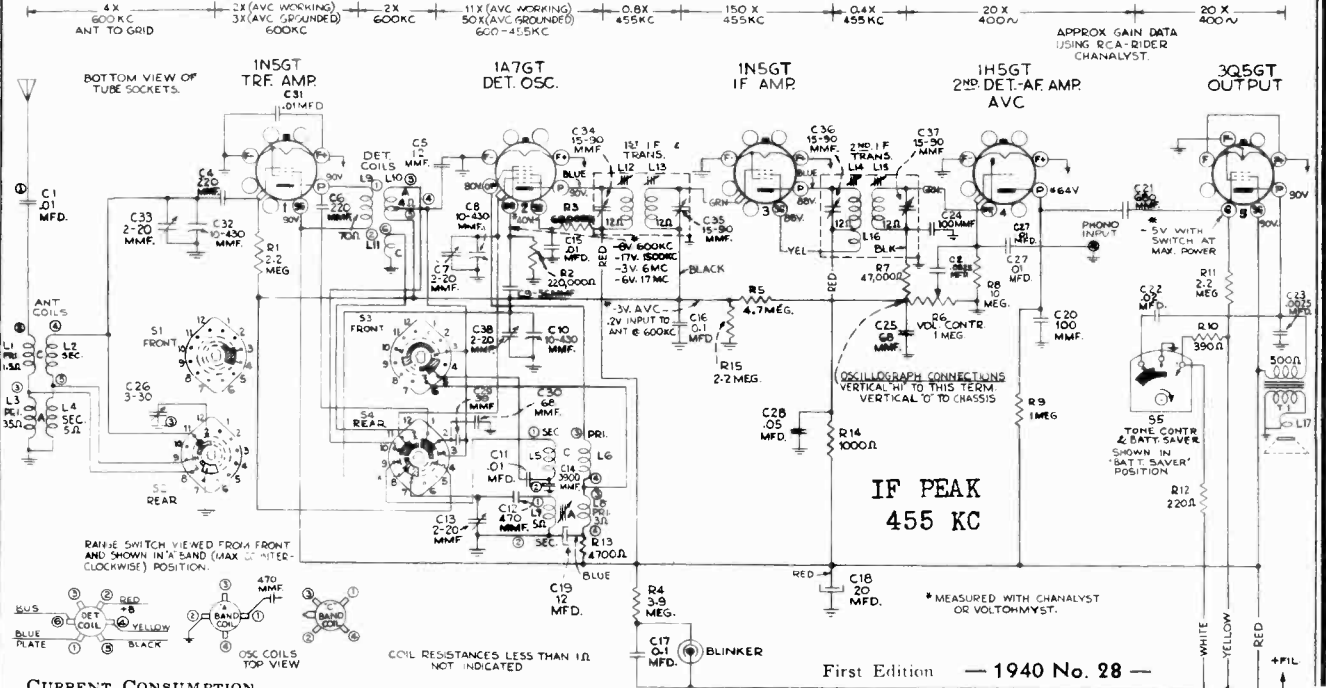
—1940 No. 26—  
First Edition





RCA MFG. CO., INC.

MODEL 15BT  
Ch. RC-526



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  
Identification Number..... RL-93-1

Alignment Procedure

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

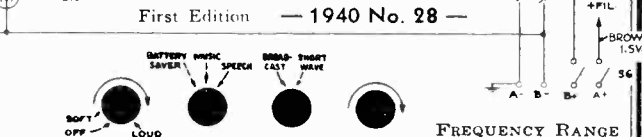
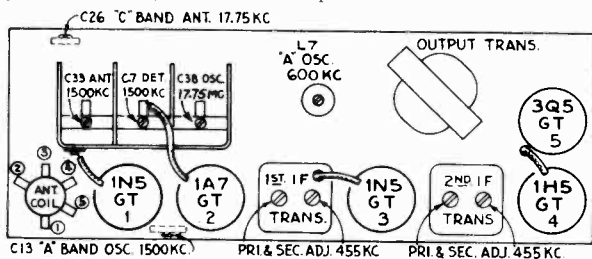
**Output Meter Alignment.**—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

**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.

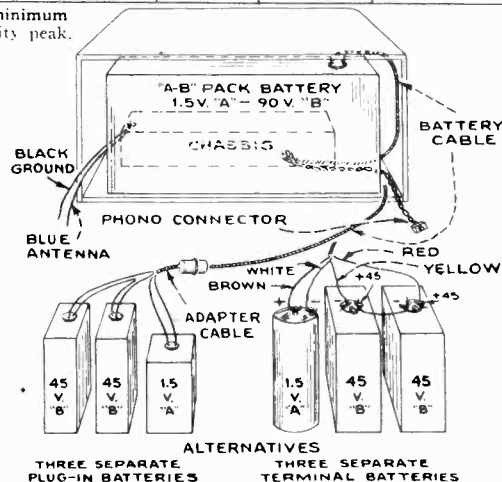
**Calibration Scale.**—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference during alignment.

- Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
- With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
- 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.



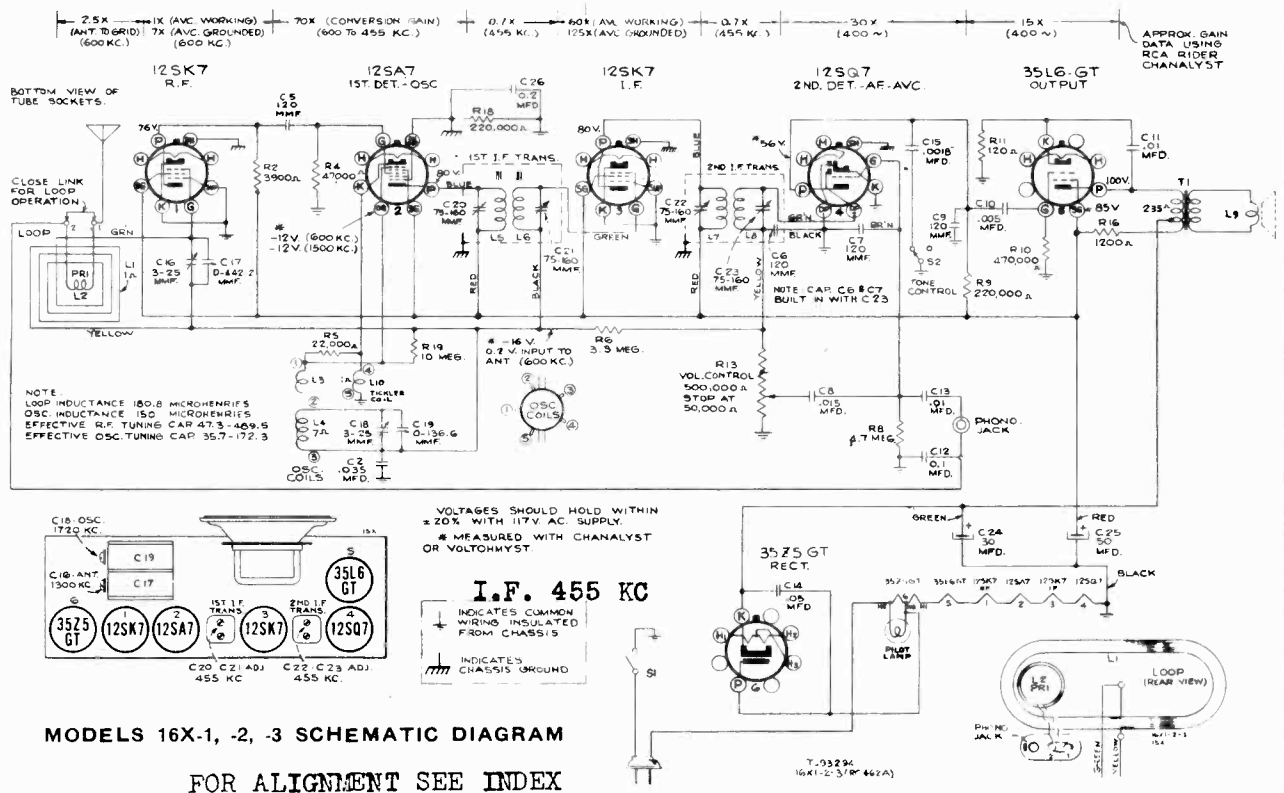
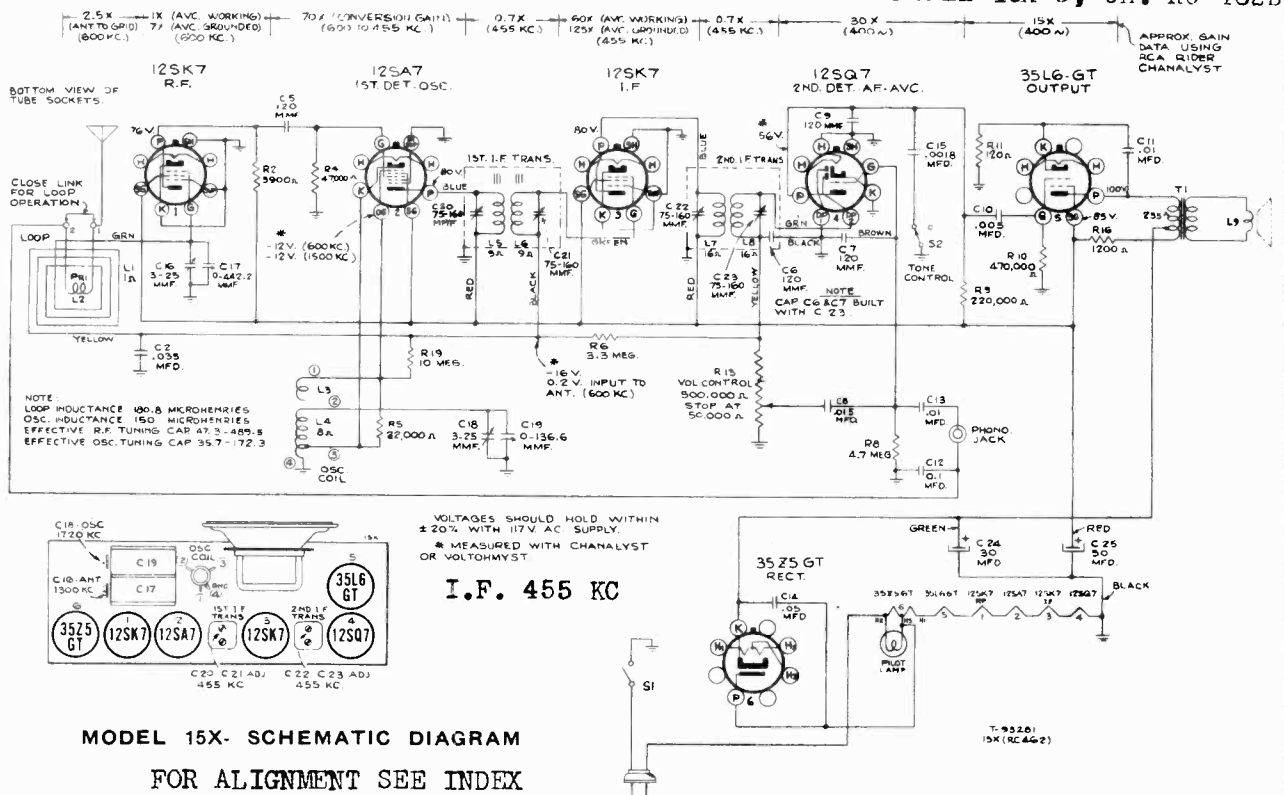
Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	1N5GT I-F grid cap in series with 0.1 mfd.	455 kc	"A" band Quiet point between 550-750 kc	C37, C36 2nd I-F transformer
No. 2	1A7GT 1st-Det. grid cap, in series with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



FREQUENCY RANGE..... 535-1720 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

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

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.

Precautionary Lead Dress:

- .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.
- Filament lead to pin No. 7 on 35L6-GT socket to be dressed away from 1st audio grid.
- Dress B+ lead on 12SK7 I.F. socket across bottom of socket between grid and plate contacts to aid reduction of grid plate capacitance.
- Dress excess lead lengths of I.F. transformer, grid and plate leads into cans to aid shielding.
- Dress filament leads of 35L6-GT around 12SQ7 socket and into chassis corner to reduce hum.

MODELS 500, 501

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 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)

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.

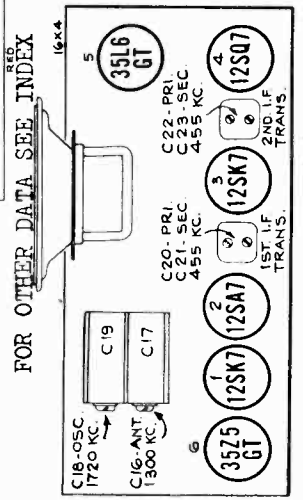
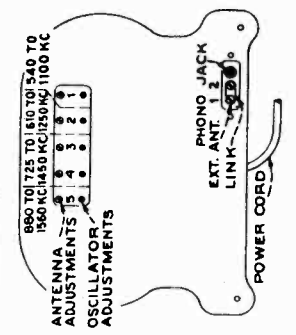
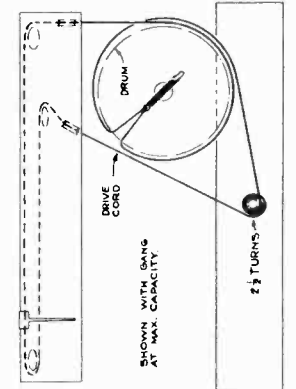
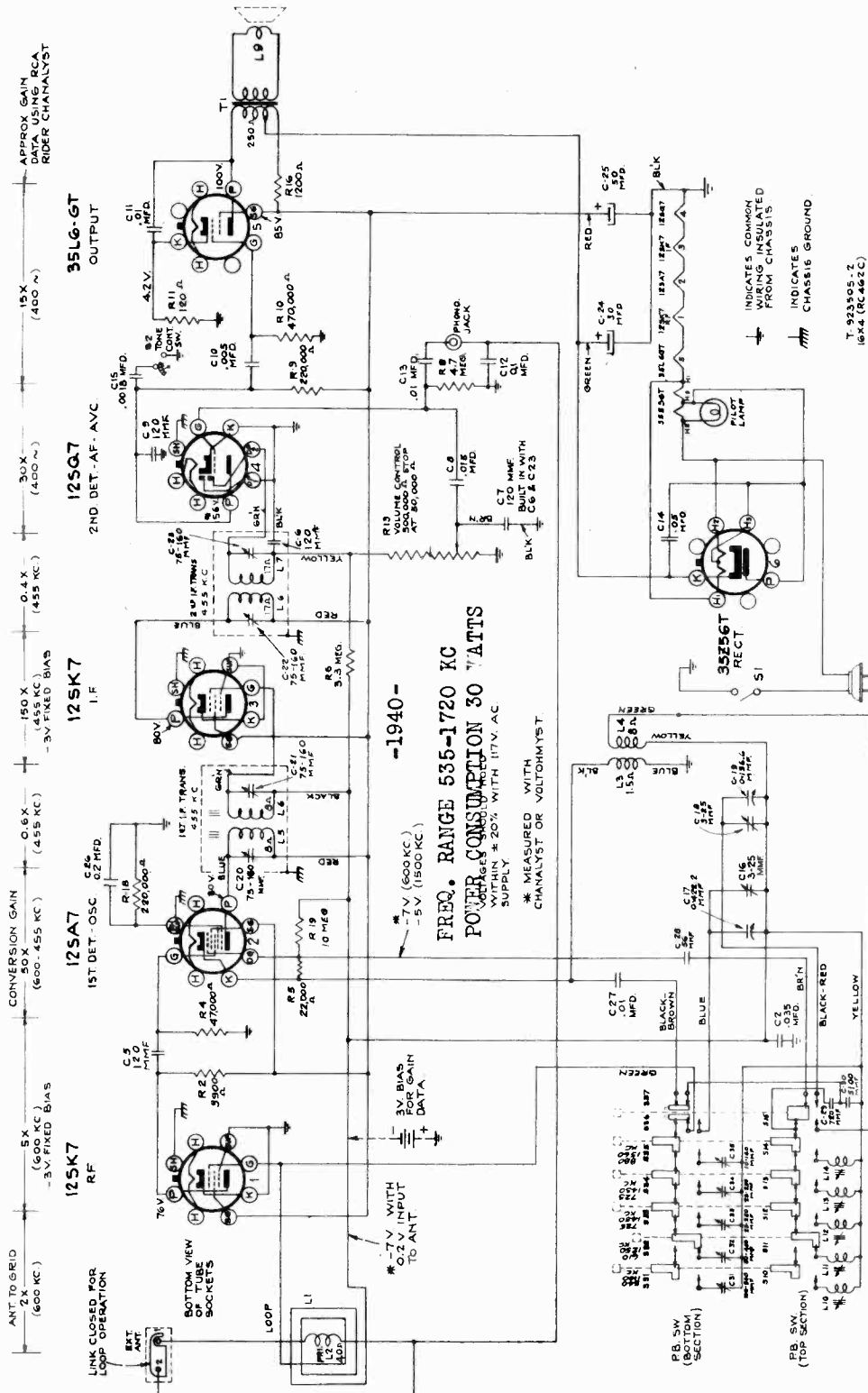
**Calibration Scale.**—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the dial backing plate for quick reference during alignment.

Replacement Parts MODEL BP-10

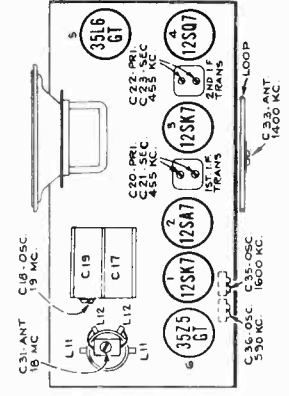
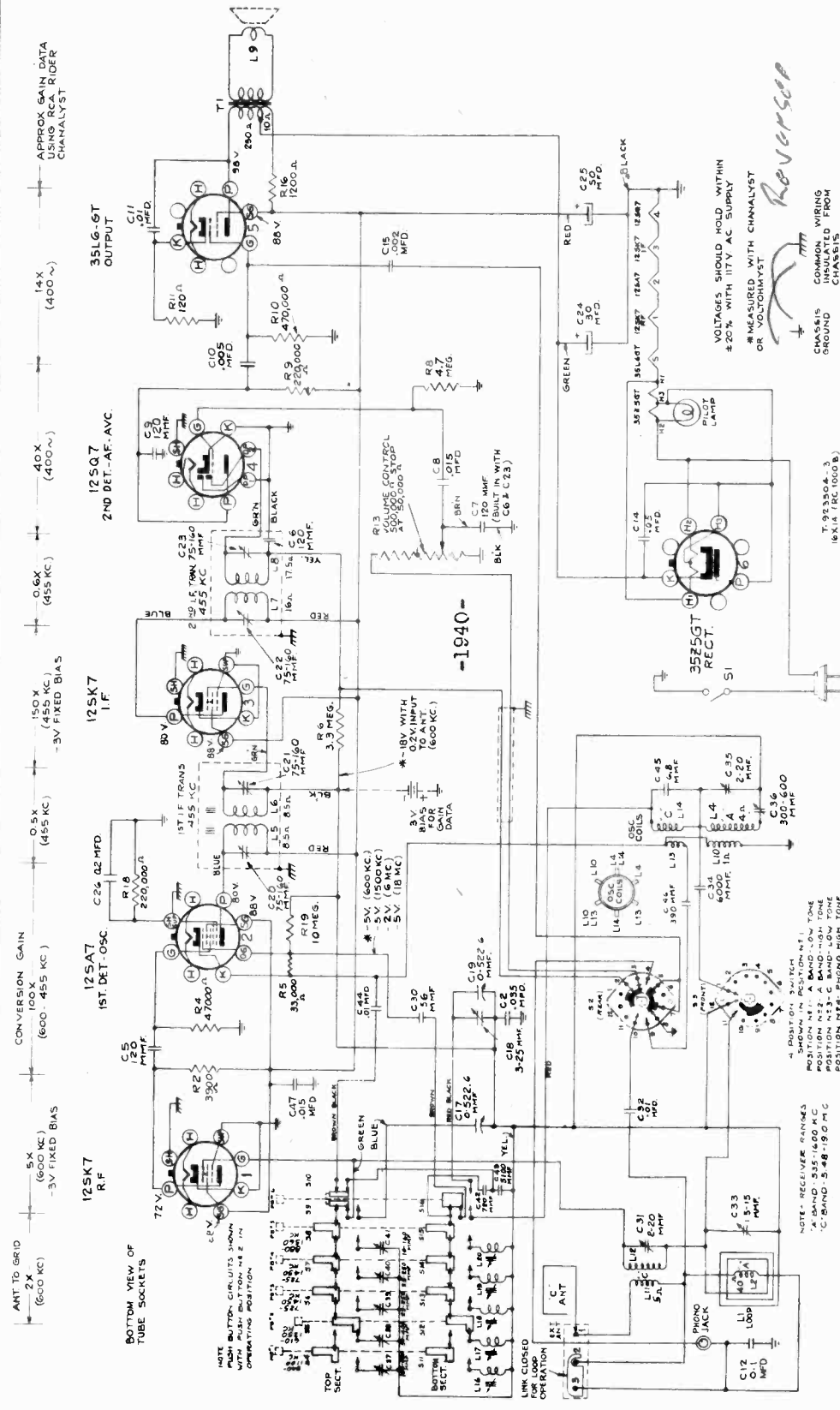
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>CHASSIS ASSEMBLIES (RC-544)</b>					
36717	Capacitor—20 mmfd.	.40	30992	Resistor—10 megohm, 1/2 watt	.20
36715	Capacitor—50 mmfd.	.40	31085	Screw—No. 8-32 x 1/2 set screw for knobs	.15
36716	Capacitor—300 mmfd.	.40	36500	Socket—Tube socket	.15
12488	Capacitor—270 mmfd.	.35	36089	Socket—1T4 tube socket	.20
36183	Capacitor—.001 mfd.	.25	36498	Transformer—First I.F. transformer	1.90
33584	Capacitor—.005 mfd.	.25	36499	Transformer—Second I.F. transformer	1.90
36248	Capacitor—.02 mfd.	.20	<b>SPEAKER ASSEMBLIES (84991-501)</b>		
32787	Capacitor—.05 mfd.	.20	36504	Speaker—3-inch P. M. speaker, complete with cone and voice coil, less output transformer	2.50
36718	Capacitor—Electrolytic, 10 mfd., 60 volts	.40	36505	Transformer—Output transformer	.75
36497	Coil—Oscillator coil	.70	<b>MISCELLANEOUS ASSEMBLIES</b>		
36496	Condenser—Variable tuning condenser	2.75	38510	Antenna—Antenna loop and cover	1.75
36495	Control—Volume control	1.00	38507	Bottom—Receiver case bottom cover	1.50
36606	Core—Adjustable core and stud for oscillator coil	.15	38508	Center—Receiver case center strip	2.50
36503	Holder—Battery holder complete	.75	36509	Handle—Carrying handle and bracket	.45
36501	Knob—Tuning knob	.60	36896	Initials—100 initials to each set comprising 25 groups of the average initials and one tube of cement	2.00
36502	Knob—Volume control knob	.20	36511	Lid—Receiver case top cover and panel	5.50
30158	Resistor—820 ohms, 1/2 watt	.20	36895	Strap—Shoulder strap	.60
36714	Resistor—15,000 ohms, 1/2 watt	.20	36506	Switch—Power switch	.40
30787	Resistor—47,000 ohms, 1/2 watt	.20			
3252	Resistor—100,000 ohms, 1/2 watt	.20			
30652	Resistor—1 megohm, 1/2 watt	.20			
31417	Resistor—3.3 megohm, 1/2 watt	.20			
30931	Resistor—4.7 megohm, 1/2 watt	.20			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.



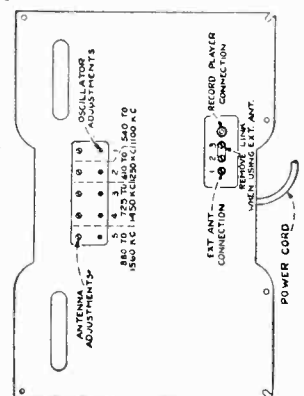


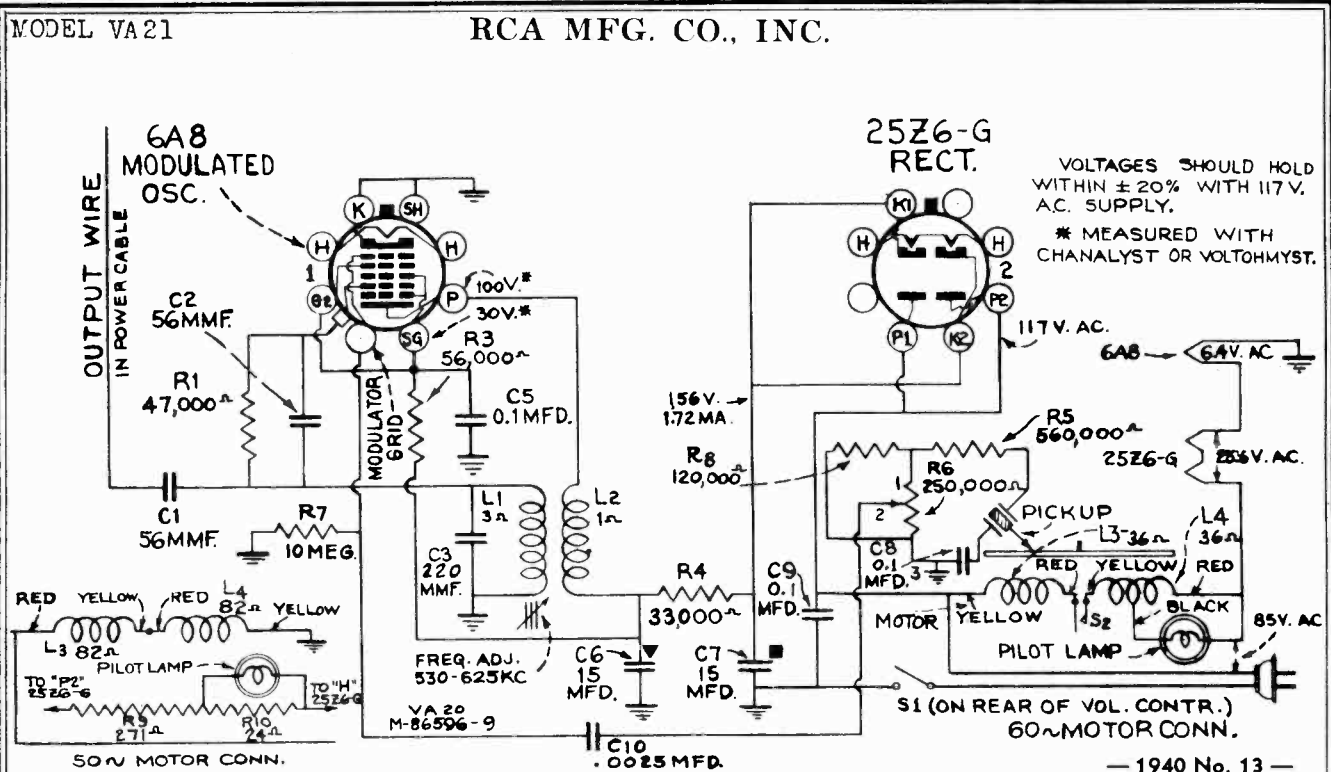


FOR OTHER DATA  
SEE INDEX

**POWER CONSUMPTION 50 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.





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

**Electrical and Mechanical Specifications**

— 1940 No. 13 —  
First Edition

- 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 .....  $1\frac{1}{2}$  volts at 1000 cycles with 250,000 ohm load.
- CABINET DIMENSIONS**
- Height .....  $3\frac{1}{2}$  inches
- Width .....  $12\frac{1}{2}$  inches
- Depth .....  $8\frac{1}{2}$  inches
- Over-All Height ..... 5 inches
- Turntable Diameter ..... 7 inches
- Weight  $7\frac{1}{2}$  lbs. (net), 9  $\frac{1}{2}$  lbs. (shipping)

**Set-Up Procedure**

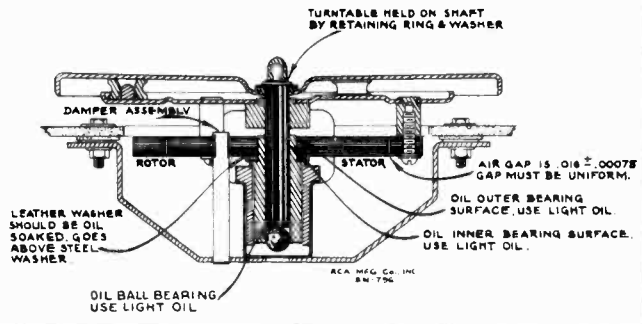
1. Insert plug in power supply outlet, and turn the power-switch—volume control knob on top of VA-21 to full clockwise position. Start a record on the VA-21. The motor is a synchronous manual-starting type, and requires a clockwise spin to start.
2. Tune the radio receiving set to a quiet point between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

**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.

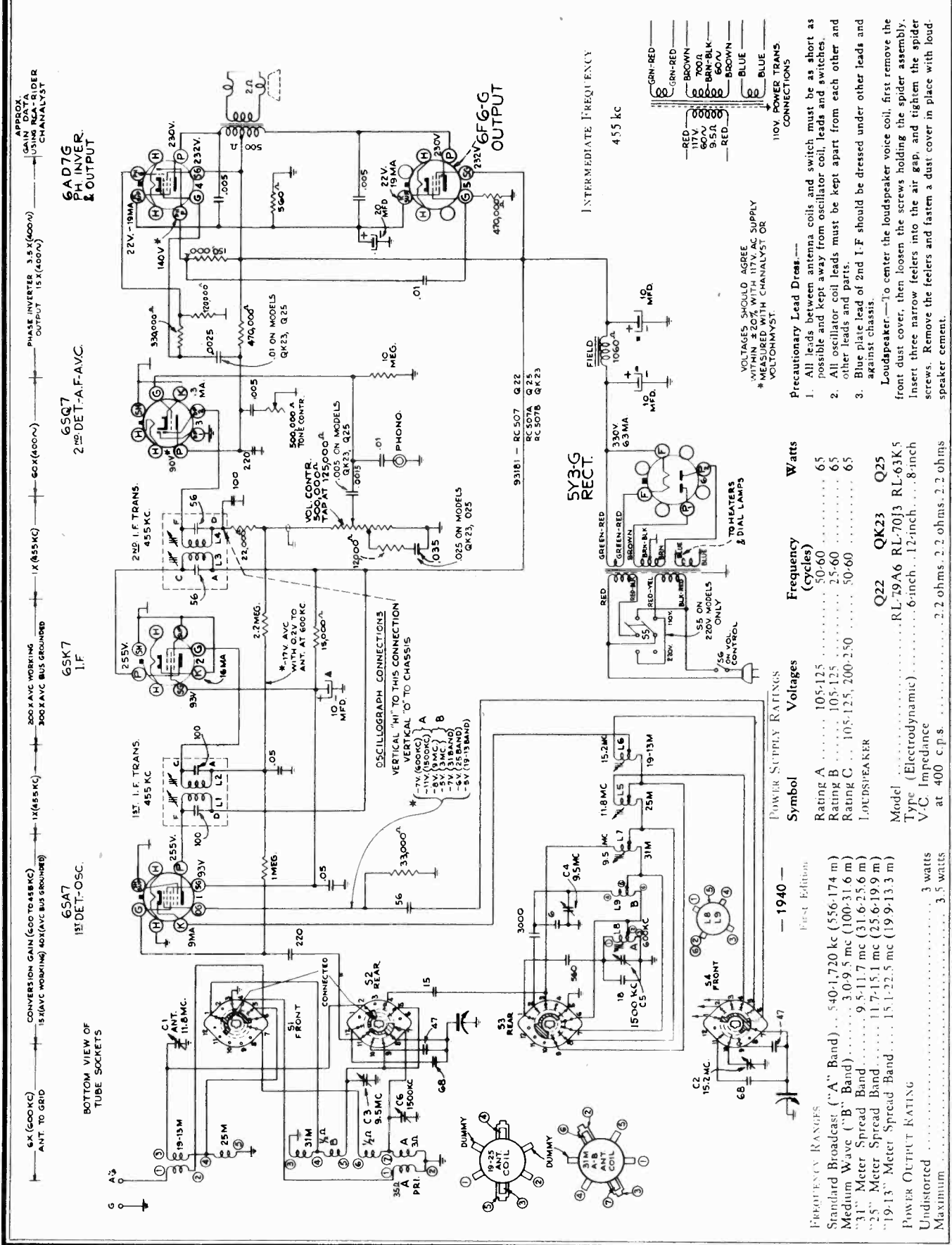
**Precautionary Lead Dress**

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.



RCA MFG. CO., INC.

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



APPROX. GAIN DATA  
 PHASE INVERTER 3.5 X (400M)  
 OUTPUT 15 X (400M)  
 CHANNELYST

6AD7G PH INVER. & OUTPUT

65Q7 2<sup>nd</sup> DET.-A.F.-A.V.C.

65K7 I.F.

65A7 1<sup>st</sup> DET.-OSC.

OSCILLOGRAPH CONNECTIONS  
 VERTICAL "HI" TO THIS CONNECTION  
 VERTICAL "O" TO CHASSIS

INTERMEDIATE FREQUENCY 4.55 kc

6FG-G OUTPUT

5Y3G RECT.

TO HEATERS & DIAL LAMPS

110V. POWER TRANS. CONNECTIONS

VOLTAGES SHOULD AGREE WITHIN 20% WITH 117V. AC SUPPLY \* MEASURED WITH CHANNELYST OR VOLTOHMYST.

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 loud-speaker cement.

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

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

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

— 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



Alignment Procedure

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

**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 received 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.

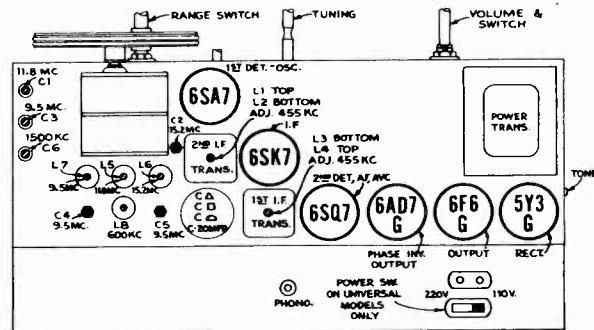
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

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.				L1 and L2 1st I-F Trans.
3	Ant. lead in series with 300 ohms	11.8 mc	25 M	138.5°	L5 (osc.) C1 (ant.)
4		15.2 mc		17°	C2 (osc.)*
5		Repeat steps 3 and 4			
6		15.2 mc	19-13 M	156°	L6 (osc.)**
7	Ant. lead in series with 200 mmf.	9.5 mc	31 M	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			

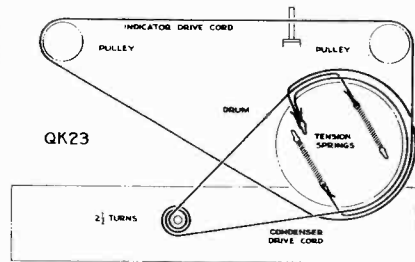
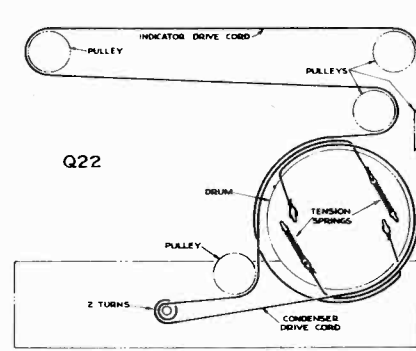
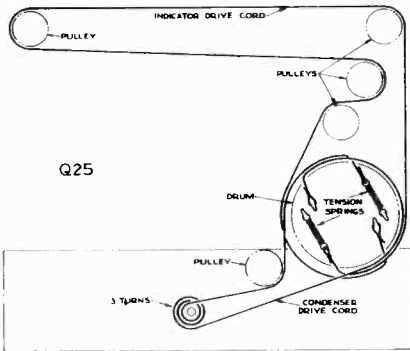
\* Use minimum capacity peak if two can be obtained. Check image to determine that C2 has been adjusted to the correct peak by tuning receiver to approximately 14.29 mc (29°) where a weaker signal should be received.

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

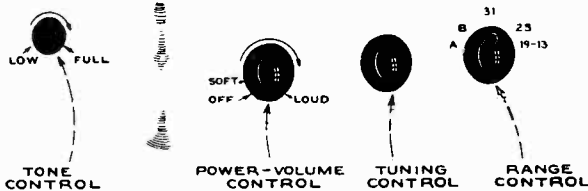
\*\*\* Peak at minimum capacity if two peaks can be obtained.  
 NOTE: Oscillator tracks above signal on all bands.



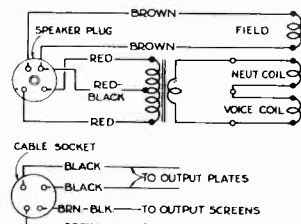
Tube and Trimmer Location



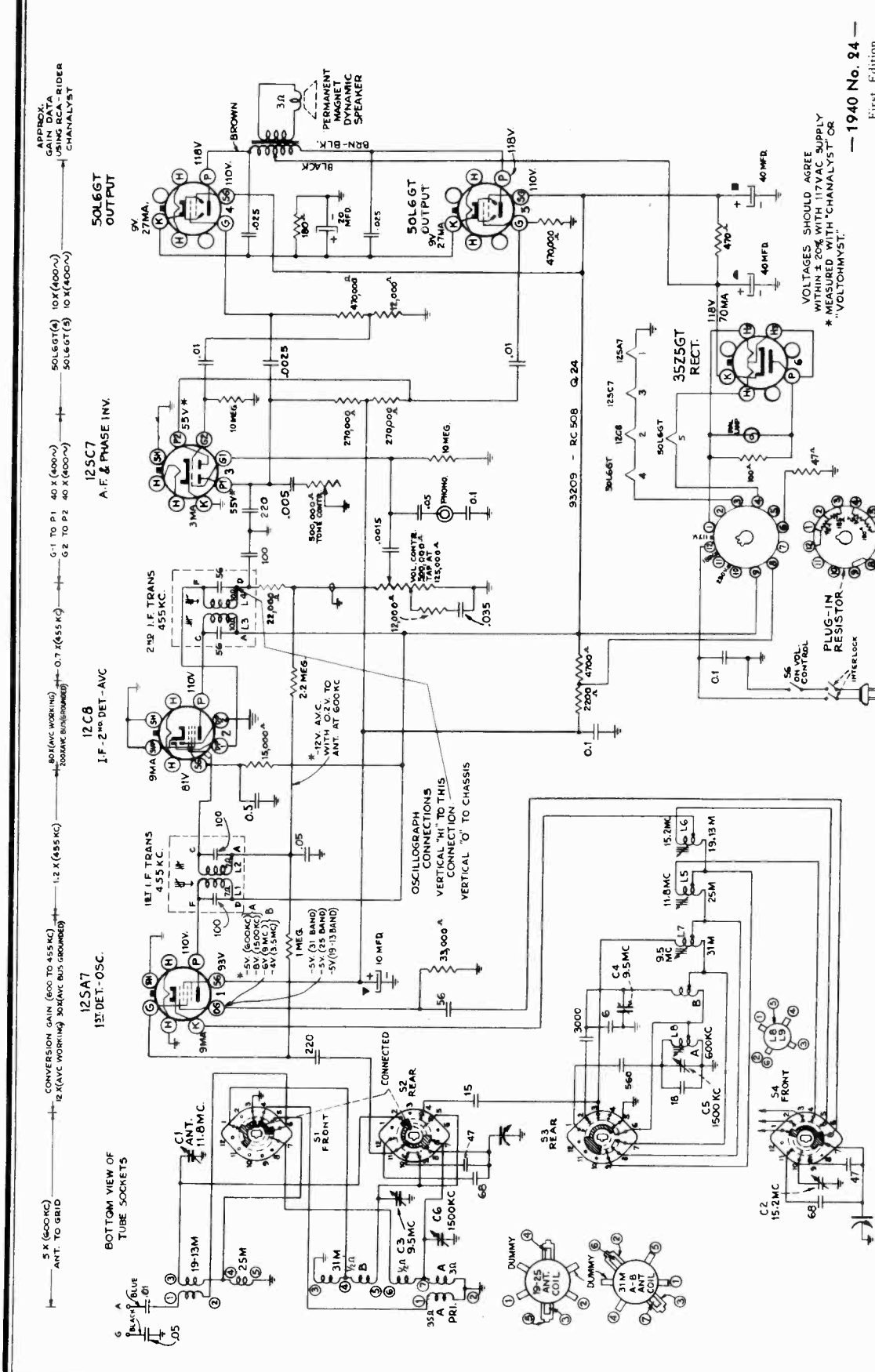
Dial-Indicator and Drive Mechanism



Location of Controls



Connections and Colors of Loudspeaker and Cable



**FREQUENCY RANGES**  
 Standard Broadcast ("A" Band) 540-1,720 kc (558-174 m)  
 Medium Wave ("B" Band) 470-1,600 mc (100-31.6 m)  
 31 Meter Spread Band 9.5-10.5 mc (31.6-28.6 m)  
 25 Meter Spread Band 11.7-15.7 mc (25.6-19.1 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  
 210-230 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.

**VOLTAGES SHOULD AGREE WITHIN ± 20% WITH 117VAC SUPPLY \* MEASURED WITH "CHANALYST" OR "VOLTOHMYST."**

— 1940 No. 24 —  
 First Edition

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.

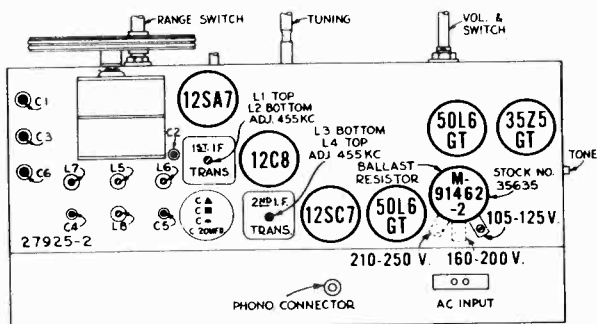
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	12C8 I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	12SA7 1st Det. grid in series with .01 mfd.				L1 and L2 1st 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°
5		Repeat steps 3 and 4			
6		15.2 mc	19-13M	156°	L6 (osc.)**
7	Ant. lead in series with 200 mmf.	9.5 mc	31M	166°	L7 (osc.)** C3 (ant.)
8		9.5 mc	B	11.5°	C4 (osc.)***
9		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.



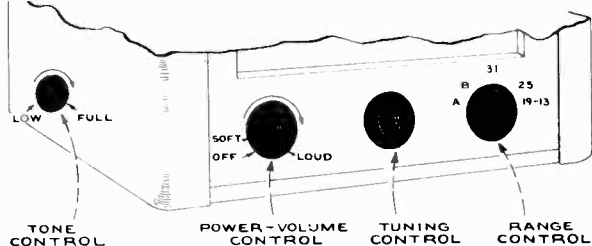
Tube and Trimmer Location

**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.

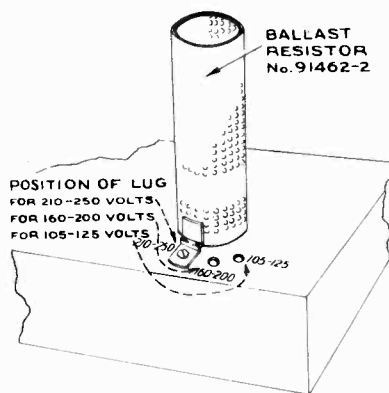
In exceptional cases, when the set is being serviced in a location where the noise level is high enough to prevent reception of short-wave stations, a test-oscillator may be used for alignment, but an extremely high degree of accuracy is required in the frequency settings of the test-oscillator, as a 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.

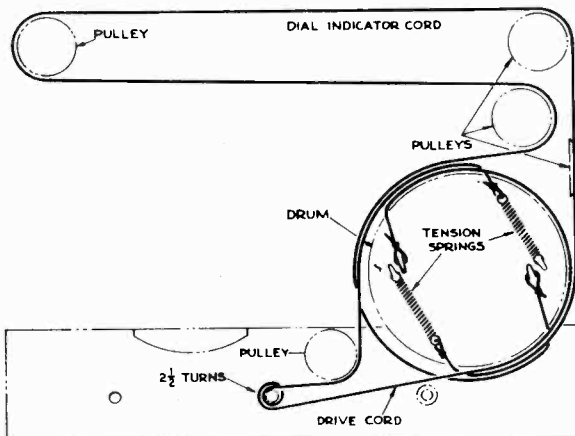
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnetite-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.



Controls



Ballast Resistor



Dial-Indicator and Drive Mechanism

RCA MFG. CO., INC.

MODEL 45X18  
Ch. RC-541-C

ANT. TO GRID (600 KC) 7 X

CONVERSION GAIN 35X (600-455 KC) -3V FIXED BIAS

150 X (455 KC) -3V FIXED BIAS

0.4 X (455 KC)

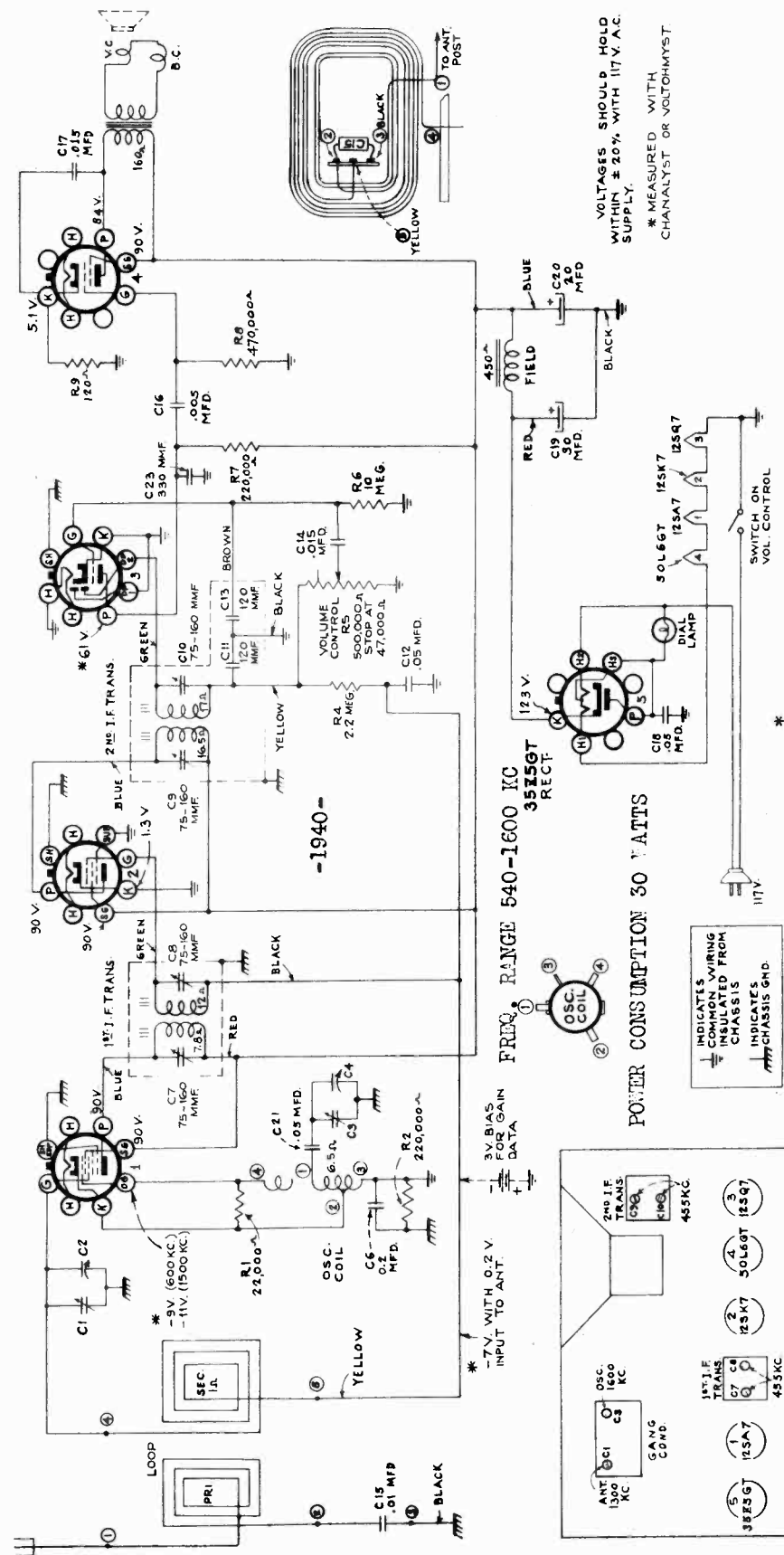
0.8 X (455 KC)

30 X (400 ~)

10 X (400 ~)

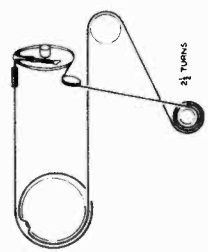
APPROX GAIN DATA USING RCA RIDER CHANNELYST

BOTTOM VIEW OF TUBE SOCKETS



VOLTAGES SHOULD HOLD WITHIN  $\pm 20\%$ , WITH 117 V. A.C. SUPPLY.

\* MEASURED WITH CHANNELYST OR VOLTOHMYST



Drive Cord Detail

FREQ. RANGE 540-1600 KC

3515GT RECT.

POWER CONSUMPTION 30 WATTS

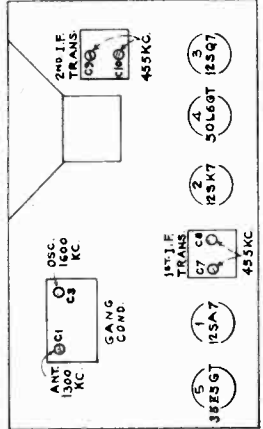


FOR OTHER DATA SEE INDEX

POWER OUTPUT (125 volts, 60 cycle supply)  
Undistorted.....0.8 watts  
Maximum.....1.2 watts

LOUDSPEAKER..... 5 inch electrodynamic

TUBE & TRIMMER LOCATIONS



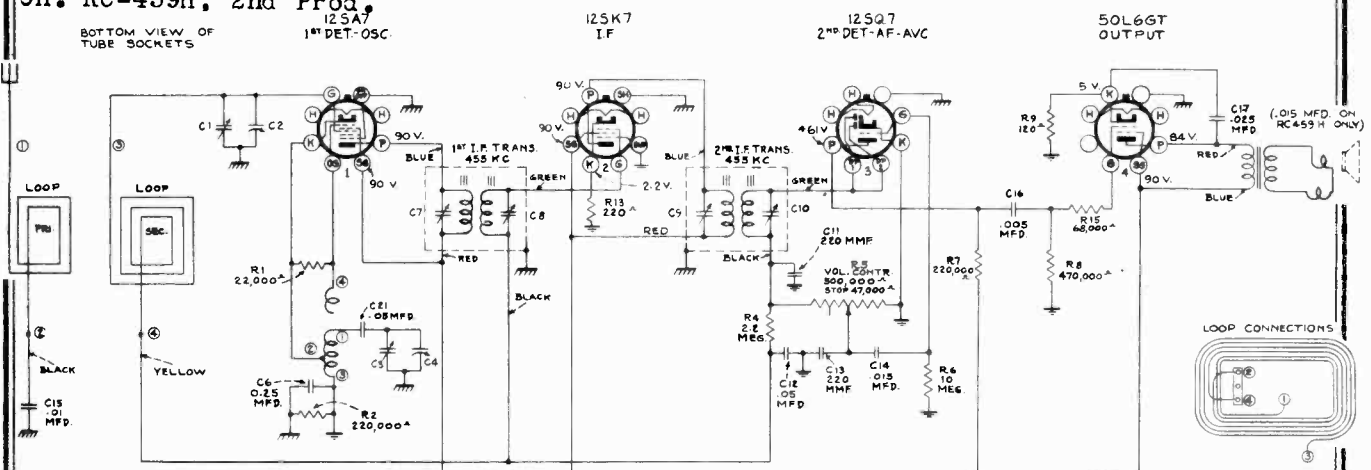
- Precautionary Lead Dress:
1. Dress 1st I.F. plate and grid leads against chassis and away from each other.
  2. Dress plate lead from 12SK7 close to chassis.
  3. Dress leads from terminal board on loop support away from loop.

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.

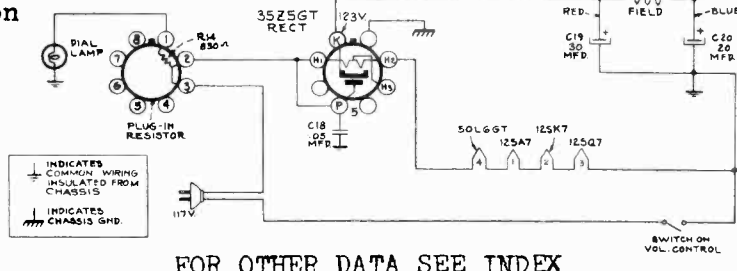
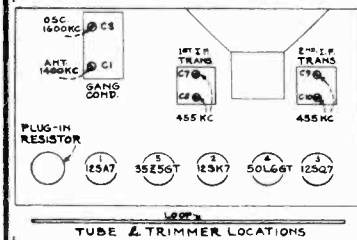
MODELS 46X-1, 46X-2  
Ch. RC-459F, 2nd Prod.  
MODEL 46X-3  
Ch. RC-459H, 2nd Prod.

RCA MFG. CO., INC.

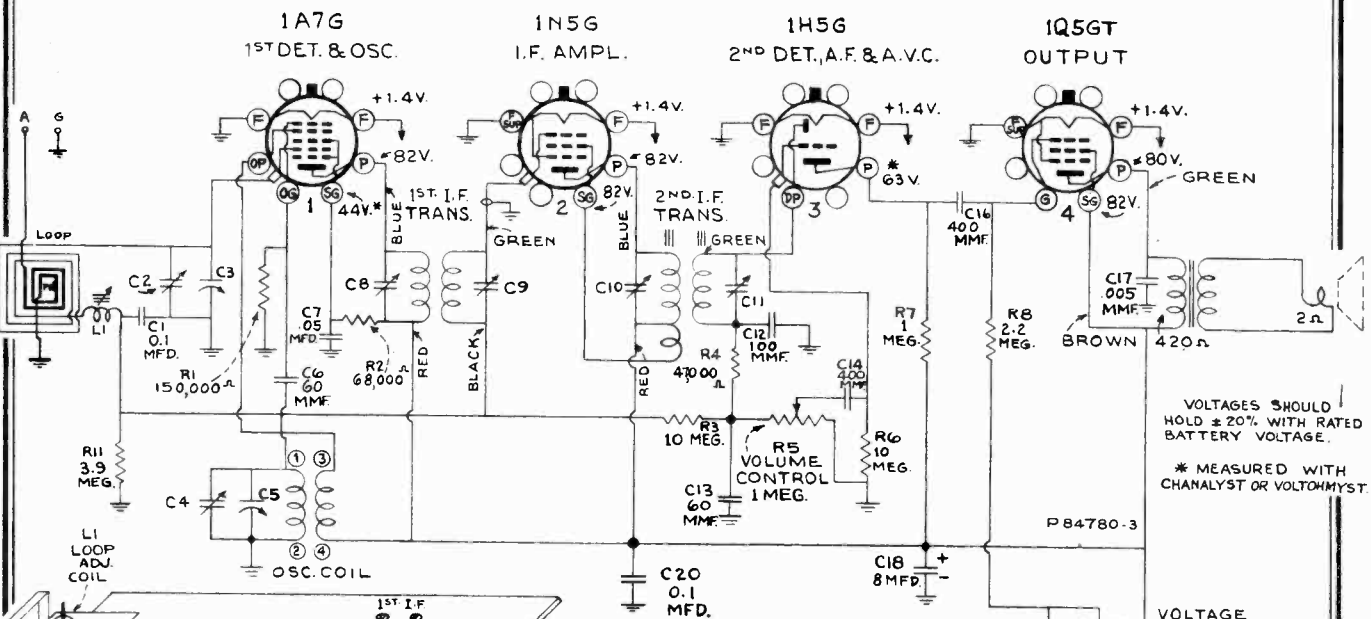
MODEL 94BP-1  
Ch. RC-407B, 2nd Prod.



MODEL 46X-1, 46X-2, 46X-3  
2nd Production

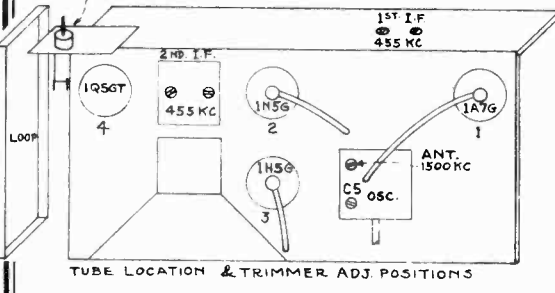


FOR OTHER DATA SEE INDEX



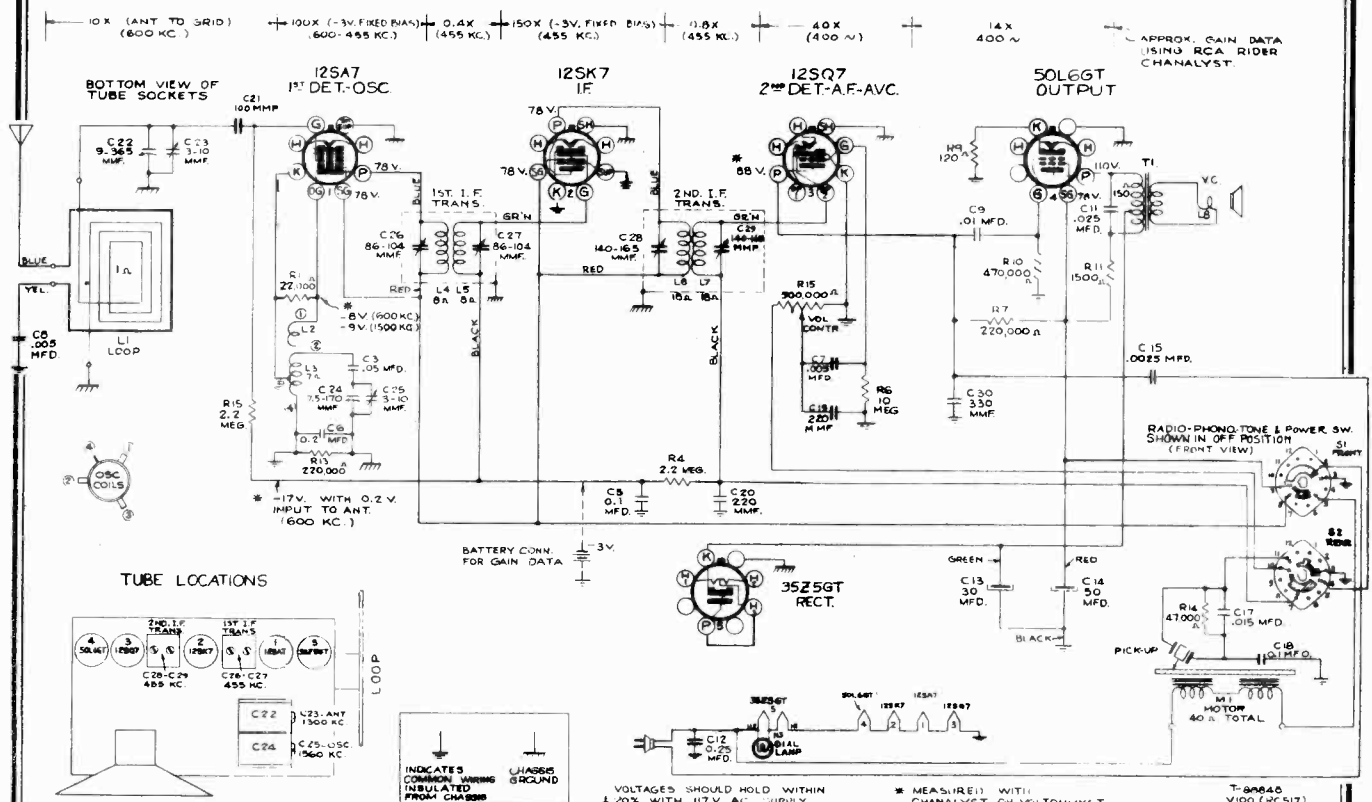
MODEL 94BP-1  
2nd Production

FOR OTHER DATA SEE INDEX



RCA MFG. CO., INC.

MODEL V-100  
Ch. RC-517

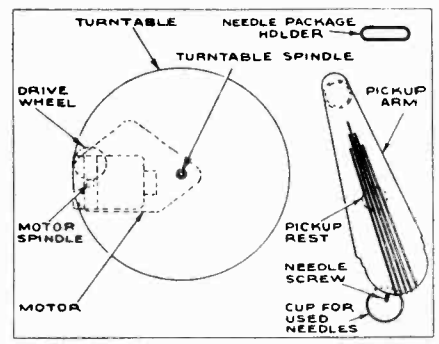


Alignment Procedure

**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 1,580 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      |         |          |

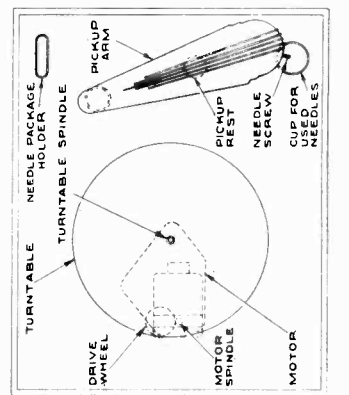
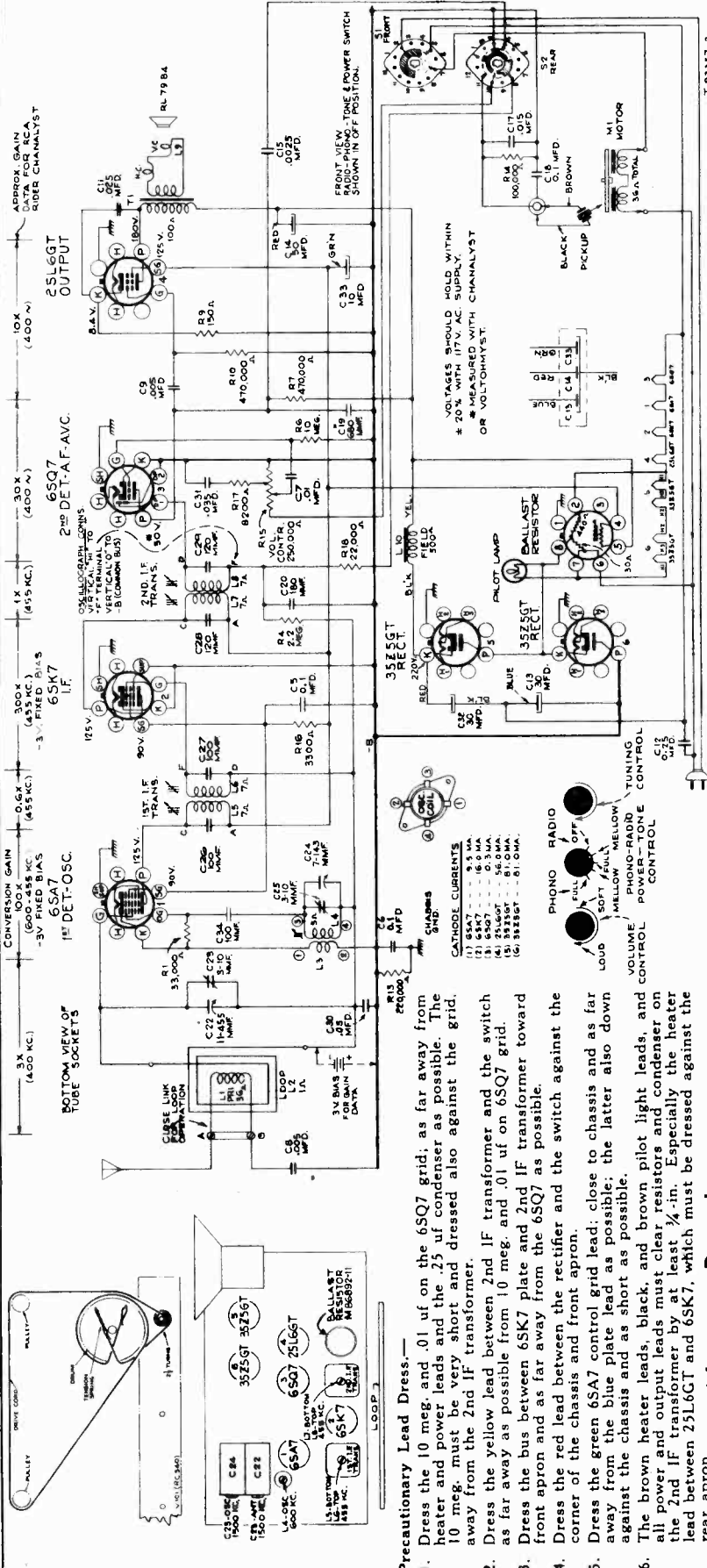
Phonograph Motor Service Data:—

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.

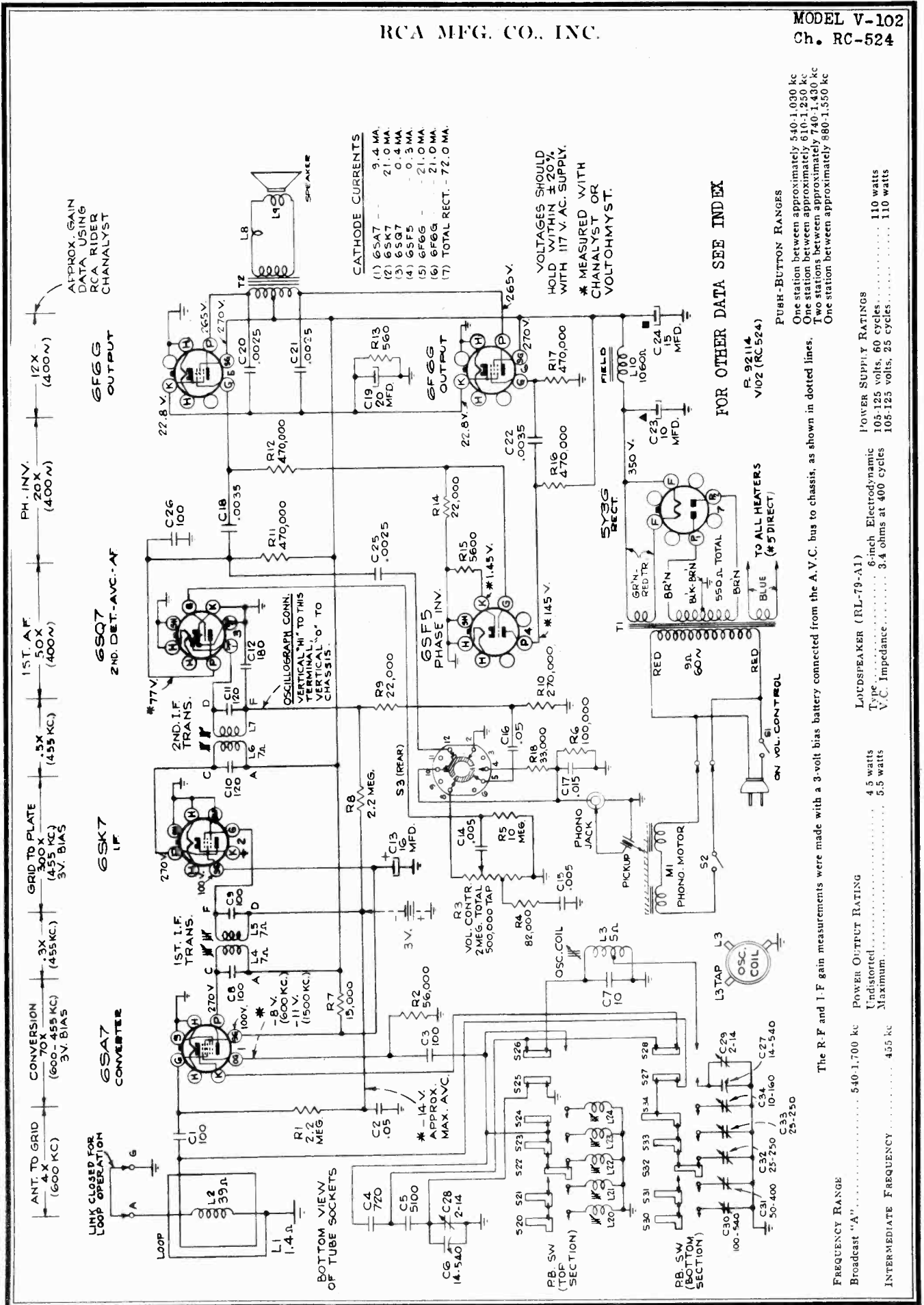
MODEL V-101  
Ch. RC-540



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

RCA MFG. CO., INC.

MODEL V-102  
Ch. RC-524



**CATHODE CURRENTS**

- (1) 6SA7 - 9.4 MA.
- (2) 6SK7 - 21.0 MA.
- (3) 6SQ7 - 0.4 MA.
- (4) 6SF5 - 0.3 MA.
- (5) 6F6G - 21.0 MA.
- (6) 6F6G - 21.0 MA.
- (7) TOTAL RECT. - 72.0 MA.

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

FOR OTHER DATA SEE INDEX

P. 92114  
V102 (RC-524)

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.

**POWER SUPPLY RATINGS**

Type	6-inch Electrodynamic	110 watts
V.C. Impedance	3.4 ohms at 400 cycles	110 watts

**LOADSPEAKER (RL-79-A1)**

Type	6-inch Electrodynamic	110 watts
V.C. Impedance	3.4 ohms at 400 cycles	110 watts

**POWER OUTPUT RATING**

Undistorted	4.5 watts
Maximum	5.5 watts

**FREQUENCY RANGE**

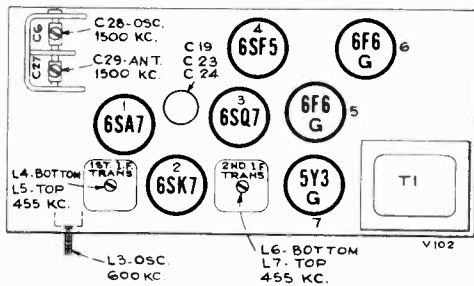
Broadcast "A"	540-1,700 kc
INTERMEDIATE FREQUENCY	455 kc



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.—

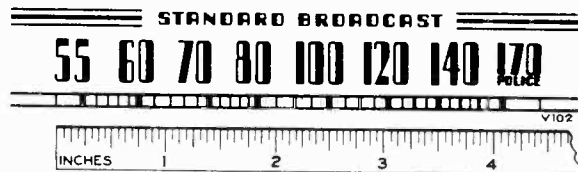
- Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
- With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
- Place the glass dial under the pointer so that the extreme left scale graduations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

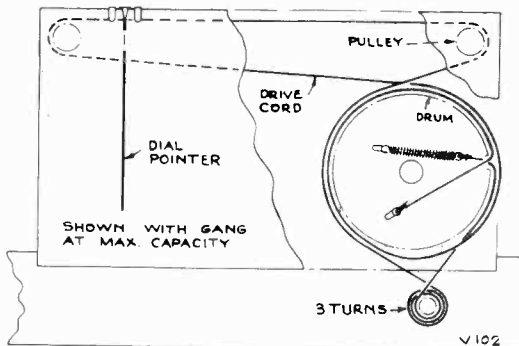
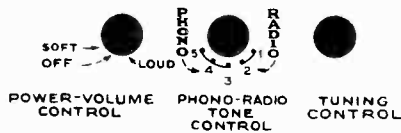
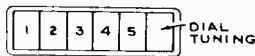
- With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
- Place a flat 12-inch ruler on the dial backing plate so the left-end of ruler is at the reference mark at left-end of backing plate. Temporarily fasten the ruler with scotch tape to the backing plate.
- 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.			



#### PUSH BUTTONS



#### 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.—

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

#### The Phono-Radio Tone Control.—

The five positions of the knob are:

- Fully counterclockwise—radio mellow tone with emphasis on lows and reduction of static and high pitched interference.
- Radio full tone with all sound effects.
- Phonograph—mellow tone—with reduction of high pitched surface noise and emphasis on lows.
- Phonograph—full tone—all sound effects from the record.
- 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 1/4 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			

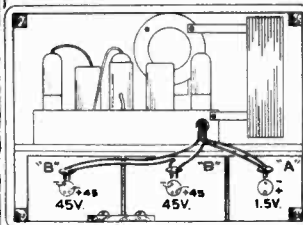


Figure 1. No. 762 No. 762 No. 742

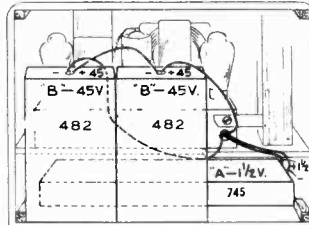


Figure 2.

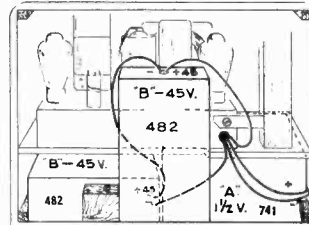
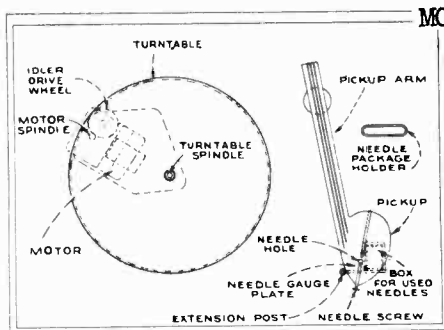


Figure 3.

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 1 1/2 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



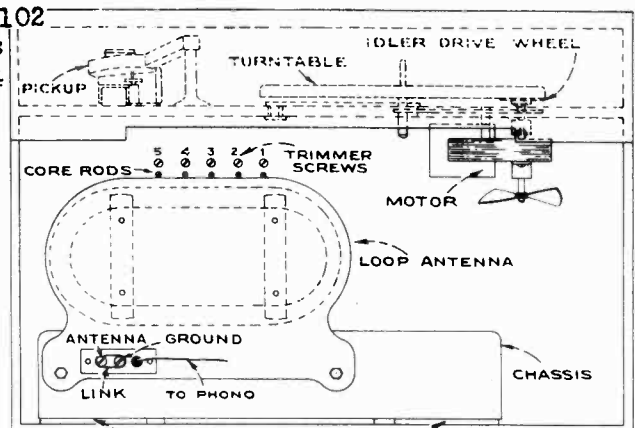
**Push Button Adjustments**

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.

MODEL V-102  
Chassis RC-524



TWO SHIPPING STRIPS AND TWO SCREWS  
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

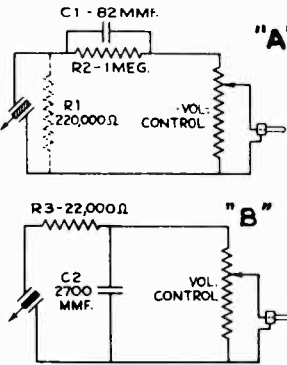
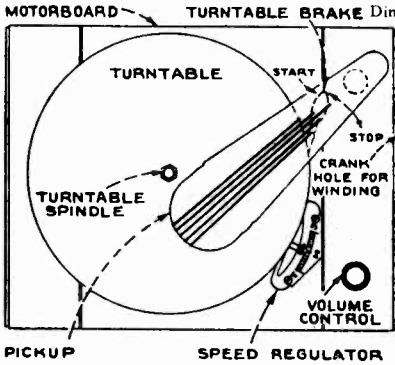
**Specifications**

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

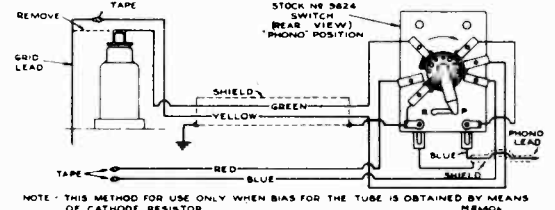
**CRYSTAL PICKUP**

Impedance... 100,000 ohms at 1,000 cycles  
 Average Output Voltage..... 1½ Volts at 1,000 cycles across 250,000 ohms load  
 Dimensions..... 6-in. high, 12½-in. wide, 10-in. deep

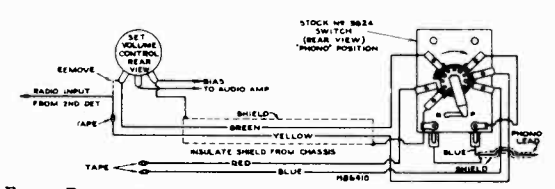
**Lubrication.**—All moving parts of the motor should be thoroughly cleaned and lubricated every six months to prevent excess wear and to assure proper operation. A small amount of grease should be applied to the worm gear of the governor, the gear of the winding shaft, and on the small pinion gear. 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.



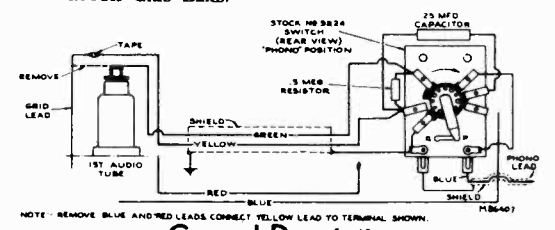
**RADIO RECEIVERS WHOSE FIRST AUDIO AMPLIFIER TUBE IS OF THE GRID CAP TYPE.**



**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.**



**SERVICE DATA**

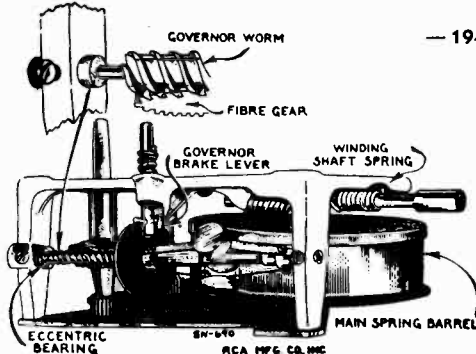
**Motor.**—The drive motor is of simple design and substantial construction. It should require little or no service if properly maintained. Attention to lubrication of the moving parts and occasional cleaning of the mechanism will go far to prevent faulty operation. Should it become necessary to repair 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



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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.

**General Description**

The R-103-S is designed for use with a battery-operated receiver where a mechanical fide 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.

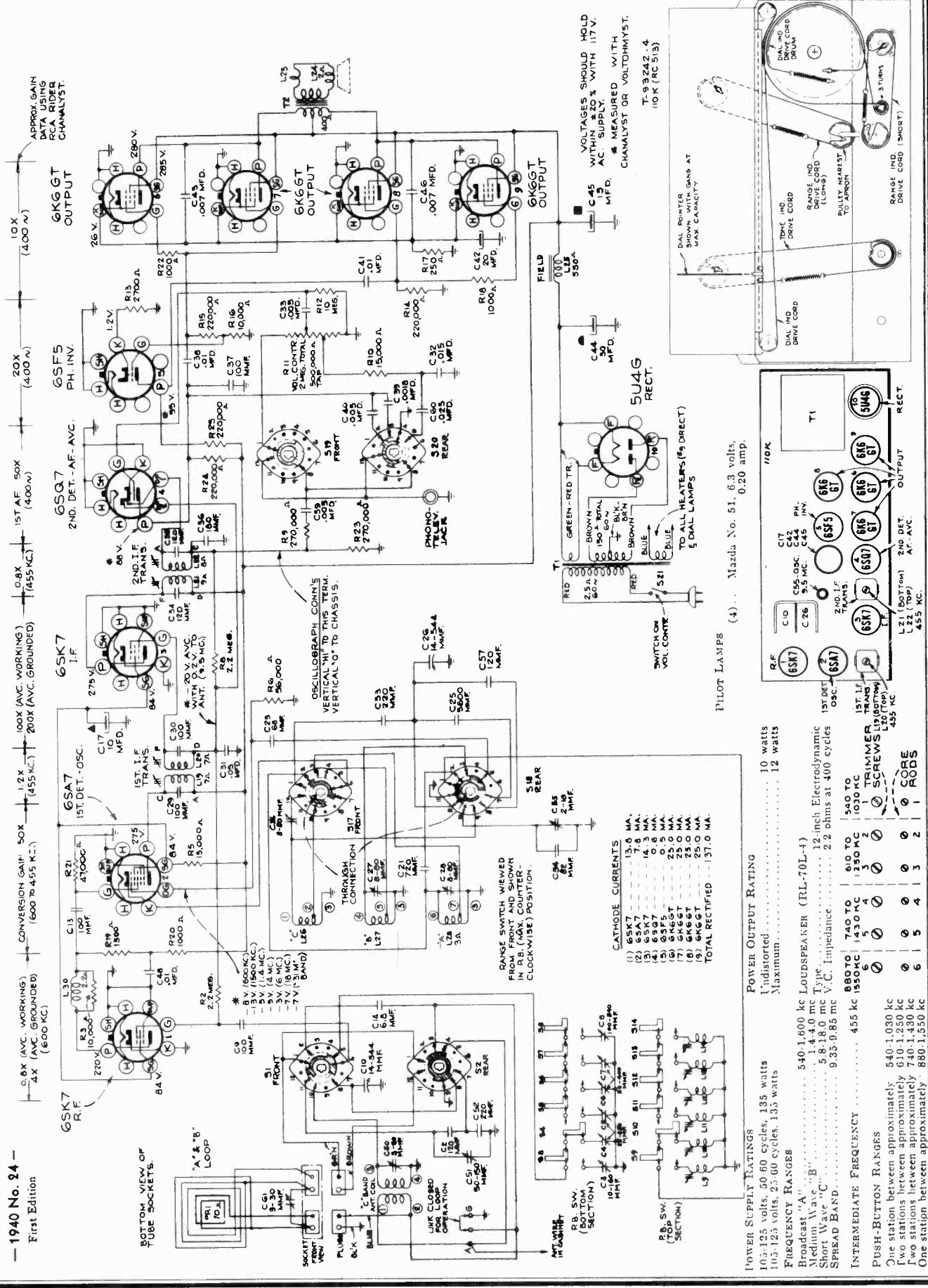
In "A" R1 controls the low-frequency response; larger values of R1 give increased lows. For maximum low-frequency response, remove R1. R2 controls pickup output, smaller values of R2 giving increased output. C1 controls high-frequency response; to increase highs, increase C1.

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

RCA MFG. CO., INC.

MODEL 110K  
Ch. RC-513



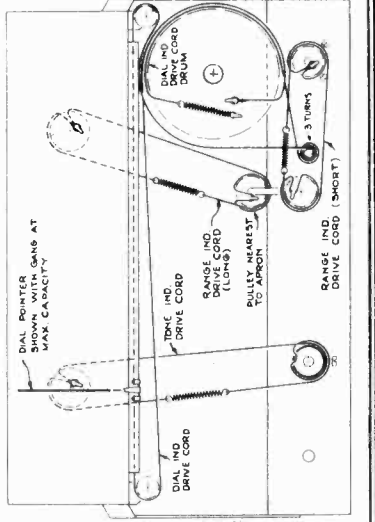
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First Edition

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

T-932A2-4  
10K (RC513)



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

CATHODE CURRENTS

(1) 6SK7	13.5 MA.
(2) 6SA7	7.8 MA.
(3) 6SK7	14.3 MA.
(4) 6SK7	0.5 MA.
(5) 6SK7	0.5 MA.
(6) 6GK7	23.0 MA.
(7) 6GK6	23.0 MA.
(8) 6GK5	23.0 MA.
(9) 6GK4	23.0 MA.
(10) 6GK3	23.0 MA.
(11) 6GK2	23.0 MA.
(12) 6GK1	23.0 MA.
(13) 6GK0	23.0 MA.
TOTAL RECTIFIED	137.0 MA.

POWER SUPPLY RATINGS

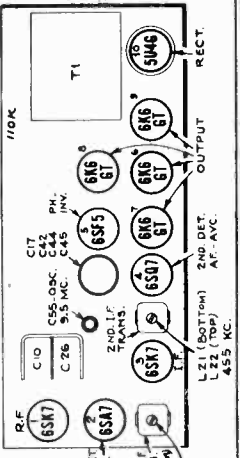
Undisorted	10 watts
Maximum	12 watts

FREQUENCY RANGES

Broadcast "A"	540-1,600 kc	LOUDSPEAKER (RL-70L-1)
Medium Wave "B"	1.4-4.0 mc type	12-inch Electrodynamic
Short Wave "C"	5.8-18.0 mc	Impedance
SPREAD BAND	9.35-9.85 mc	2.2 ohms at 400 cycles

PUSH-BUTTON RANGES

One station between approximately	540-1,000 kc	1 CORE
Two stations between approximately	910-1,200 kc	2 CORES
One station between approximately	880-1,550 kc	2 CORES



PILOT LAMPS

MODEL 110K  
Ch. RC-513

### Alignment Procedure

### Push Button Adjustment

**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.

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.

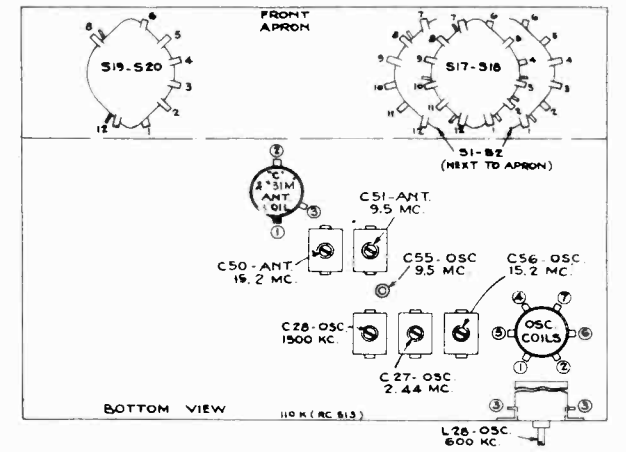
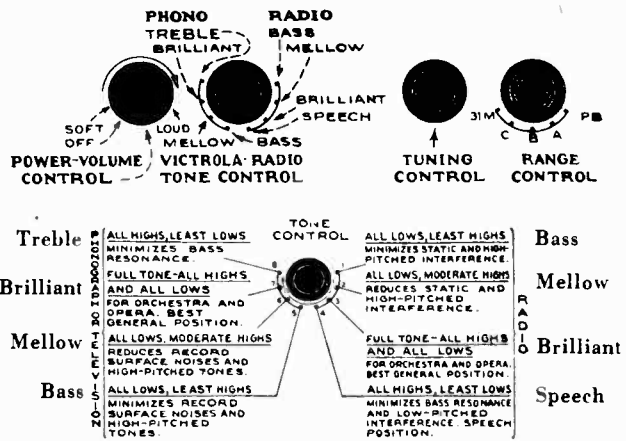
In the event that the receiver is to be used with an external antenna use one or two feet of wire (as an antenna) to ensure sharp peaking during the final adjustment procedure. For loop operation, the link should be strapped across terminals on back of set. In either case the procedure is as follows:

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.

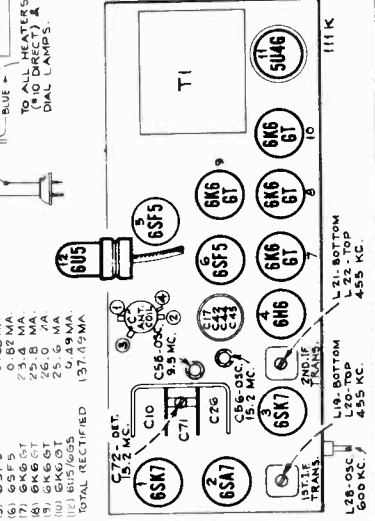
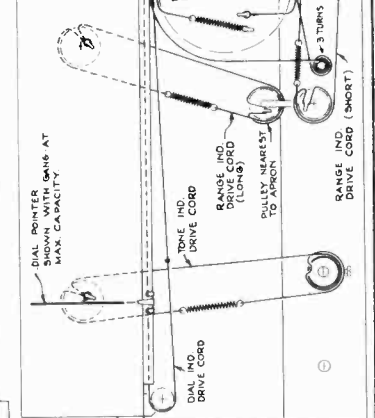
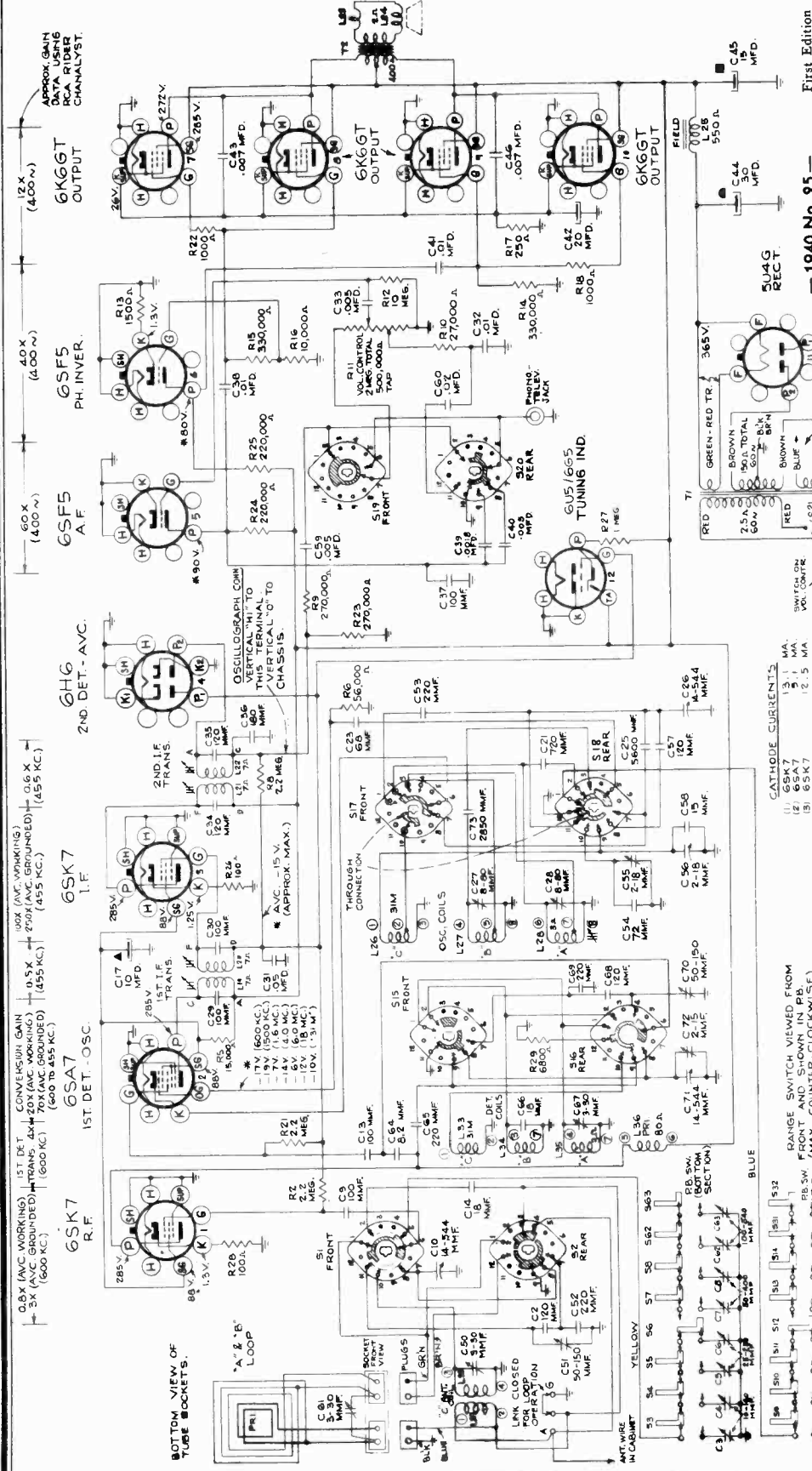
Steps	Connect the high side of the test-osc. to—	Tune test osc. to—	Turn radio dial to—	Adjust the following for maximum peak output—
1	I-F grid in series with .01 mfd.	455 kc	"C" Band Quiet Point at 18 mc end of dial	L21 and L22 (2nd I.F. Trans.)
2	1st-det. grid in series with .01 mfd.			L19 and L20 (1st I.F. Trans.)
3	Antenna terminal (A), in series with 47 mmfd. (link closed)	15.2 mc	15.2mc (149°) "C" band	C58 (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.

RCA MFG. CO., INC.

MODEL 111K  
Ch. RC-513A



CATHODE CURRENTS

1	6SA7	1.1 MA.
2	6SK7	12.5 MA.
3	6SF5	0.68 MA.
4	6G6	2.9 MA.
5	6K6GT	2.9 MA.
6	6K6GT	26.0 MA.
7	6K6GT	2.9 MA.
8	6X4	2.9 MA.
9	6X4	2.9 MA.
10	6X4	2.9 MA.
11	6X4	2.9 MA.
12	6X4	2.9 MA.
13	6X4	2.9 MA.
14	6X4	2.9 MA.
15	6X4	2.9 MA.
16	6X4	2.9 MA.
17	6X4	2.9 MA.
18	6X4	2.9 MA.
19	6X4	2.9 MA.
20	6X4	2.9 MA.
21	6X4	2.9 MA.
22	6X4	2.9 MA.
23	6X4	2.9 MA.
24	6X4	2.9 MA.
25	6X4	2.9 MA.
26	6X4	2.9 MA.
27	6X4	2.9 MA.
28	6X4	2.9 MA.
29	6X4	2.9 MA.
30	6X4	2.9 MA.
31	6X4	2.9 MA.
32	6X4	2.9 MA.
33	6X4	2.9 MA.
34	6X4	2.9 MA.
35	6X4	2.9 MA.
36	6X4	2.9 MA.
37	6X4	2.9 MA.
38	6X4	2.9 MA.
39	6X4	2.9 MA.
40	6X4	2.9 MA.
41	6X4	2.9 MA.
42	6X4	2.9 MA.
43	6X4	2.9 MA.
44	6X4	2.9 MA.
45	6X4	2.9 MA.
46	6X4	2.9 MA.
47	6X4	2.9 MA.
48	6X4	2.9 MA.
49	6X4	2.9 MA.
50	6X4	2.9 MA.
51	6X4	2.9 MA.
52	6X4	2.9 MA.
53	6X4	2.9 MA.
54	6X4	2.9 MA.
55	6X4	2.9 MA.
56	6X4	2.9 MA.
57	6X4	2.9 MA.
58	6X4	2.9 MA.
59	6X4	2.9 MA.
60	6X4	2.9 MA.
61	6X4	2.9 MA.
62	6X4	2.9 MA.
63	6X4	2.9 MA.
64	6X4	2.9 MA.
65	6X4	2.9 MA.
66	6X4	2.9 MA.
67	6X4	2.9 MA.
68	6X4	2.9 MA.
69	6X4	2.9 MA.
70	6X4	2.9 MA.

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POWER SUPPLY RATINGS

Two stations between approximately 540-1,030 kc  
 Medium Wave "A" ..... 1.6-4.0 mc  
 Two stations between approximately 610-1,250 kc  
 Short Wave "B" ..... 5.8-18.0 mc  
 Two stations between approximately 740-1,430 kc  
 Spread Band "C" ..... 9.85-9.85 mc Maximum

INTERMEDIATE FREQUENCY ..... 455 kc LOUSPEAKER (RL-70L-4)  
 Type ..... 12-inch Electrodynamic  
 V.C. Impedance ..... 2.2 ohms at 400 cycles

FREQUENCY RANGES

Push-Button Ranges

Two stations between approximately 540-1,030 kc  
 Medium Wave "A" ..... 1.6-4.0 mc  
 Two stations between approximately 610-1,250 kc  
 Short Wave "B" ..... 5.8-18.0 mc  
 Two stations between approximately 740-1,430 kc  
 Spread Band "C" ..... 9.85-9.85 mc Maximum

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

### 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.

### Push Button Adjustment

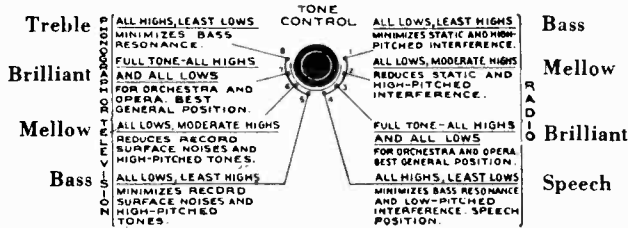
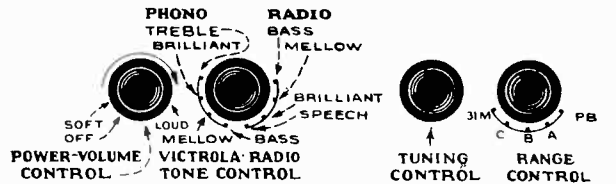
The station push buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

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:

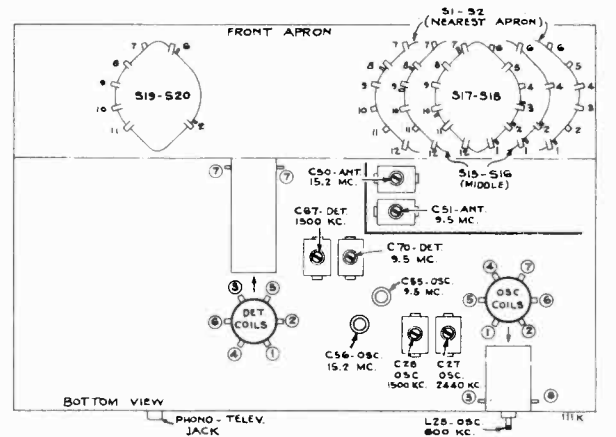
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range selector to "A" band, and manually tune in the first station on the list.
3. Turn range selector to "PB" position, push in station button No. 1 (extreme left). Then adjust the No. 1 oscillator core (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.



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		2.44 mc	2.44 mc (90.5°) "B" band	C27 (osc.)
6	Green lead on loop plug, in series with 300 ohms	600 kc	600 kc (30.5°) "A" band	L28 (osc.)
7		1,500 kc	1,500 kc (180°) "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.			



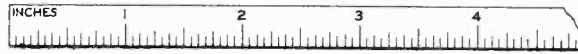




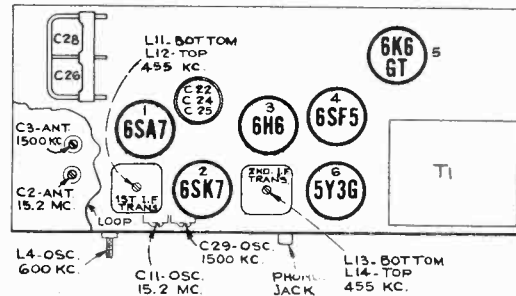
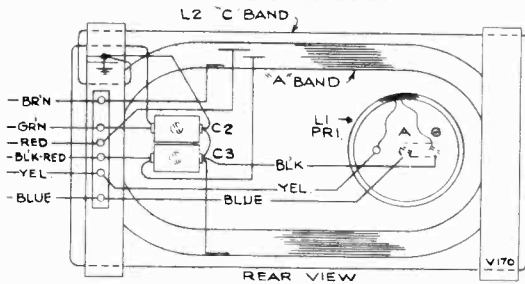
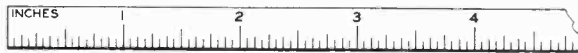
MODEL V-170  
Ch. RC-523

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.—

- Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
- With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
- 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.—

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

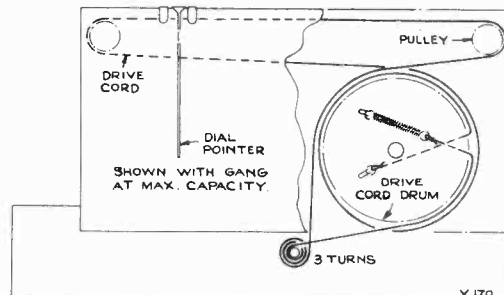
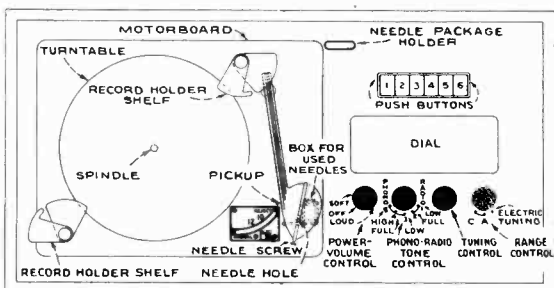
3. Refer to calibration scale printed in this service note. This is a reduced reproduction of the dial with an inch-scale drawn at top and bottom. To find the correct pointer position in inches for any desired frequency, draw a vertical line through this frequency on the calibration scale.

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.

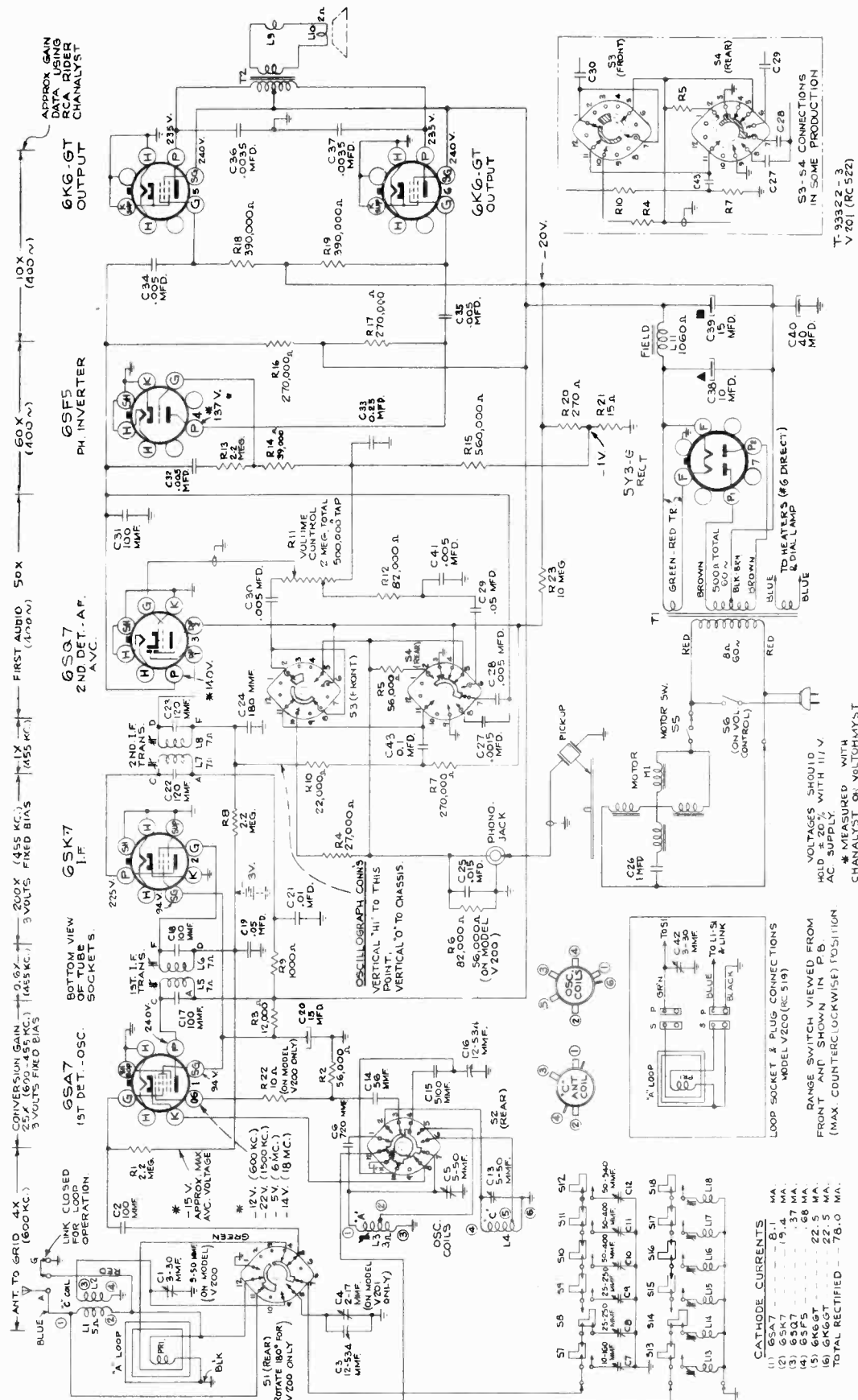
Note: Oscillator tracks above signal on both bands.



RCA MFG. CO., INC.

MODEL V-200, Ch. RC-519

MODEL V-201, Ch. RC-522



T-93322-3  
V201 (RC 522)

880 TC	740 TC	540 TC	1430 KC	1030 KC	140 TC
1	2	3	4	5	6
TRIMMER	TRIMMER	TRIMMER	TRIMMER	TRIMMER	TRIMMER
SCREWS	SCREWS	SCREWS	SCREWS	SCREWS	SCREWS

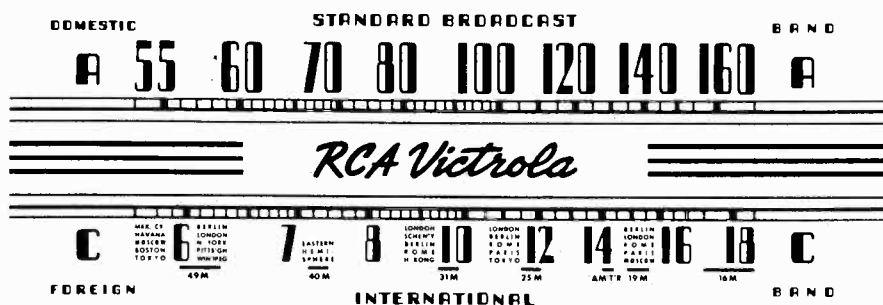
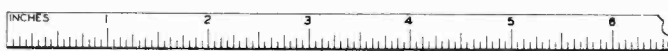
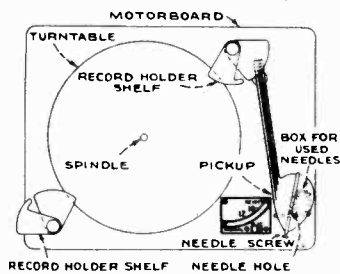
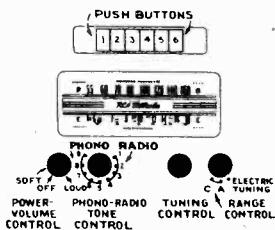
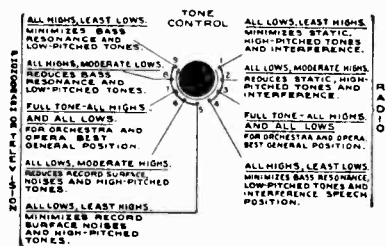
PHONOGRAPH Type: Automatic  
Record Capacity: Eight 10-inch or Seven 12-inch  
Turntable Speed: 78 r.p.m.  
Type Pickup: Crystal  
Pickup Impedance: 100,000 ohms at 1,000 cycles  
Average Output: 1 1/2 watts at 1,000 cycles across 4 meg.

FOR OTHER DATA SEE INDEX

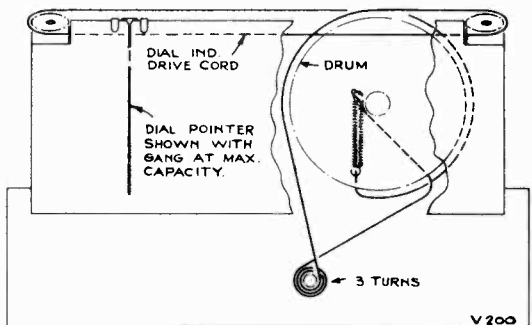
LOUSPEAKER	Size	12-inch
	V. C. impedance at 400 cycles	2.2 ohms
	Identification Number	KL-70L6
POWER SUPPLY RATINGS	105-125 volts, 60 cycles	110 watts
	105-125 volts, 50 cycles	110 watts
	105-125 volts, 25 cycles	110 watts

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

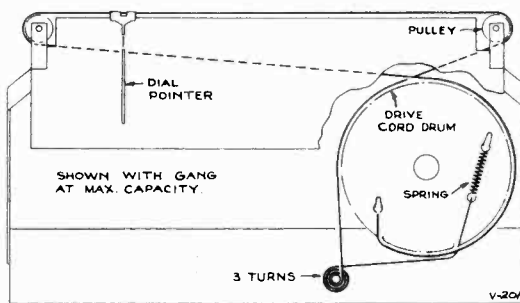
RCA MFG. CO., INC.



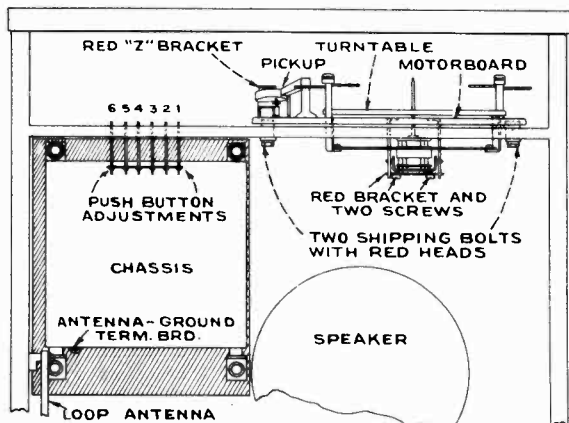
Model V-200 Calibration Scale



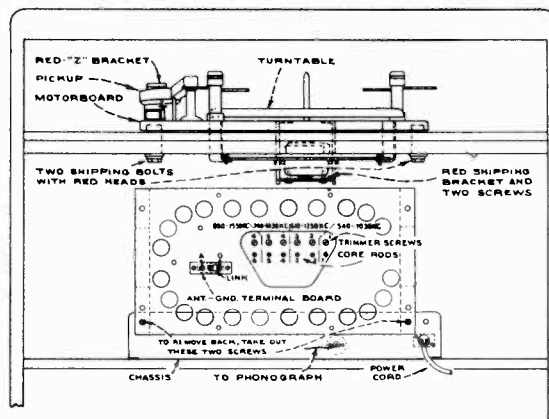
Model V-200



Model V-201



Model V-200



Model V-201

RCA MFG. CO., INC.

MODEL V-200, Ch. RC-519

MODEL V-201, Ch. RC-522

MODEL V-170, Ch. RC-523

**MODEL V-170  
TUNER  
DATA**

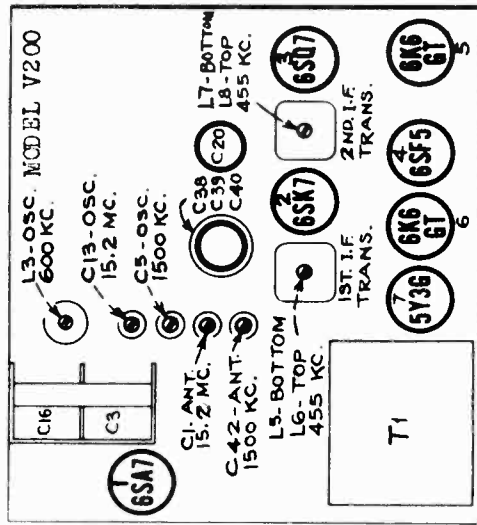
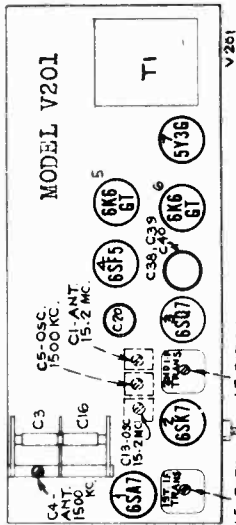
The push buttons connect to separate magnetite-core oscillator coils and separate loop circuit trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow about five minutes warm-up period before making adjustments.

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.



**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, on the chassis, the tuning dial is left in the position it was in when 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.

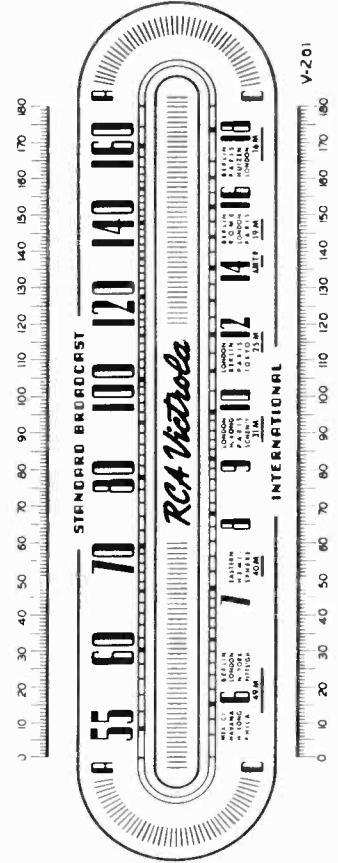
**Using Calibration Scale, Model V-201.**—

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. Then, 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.

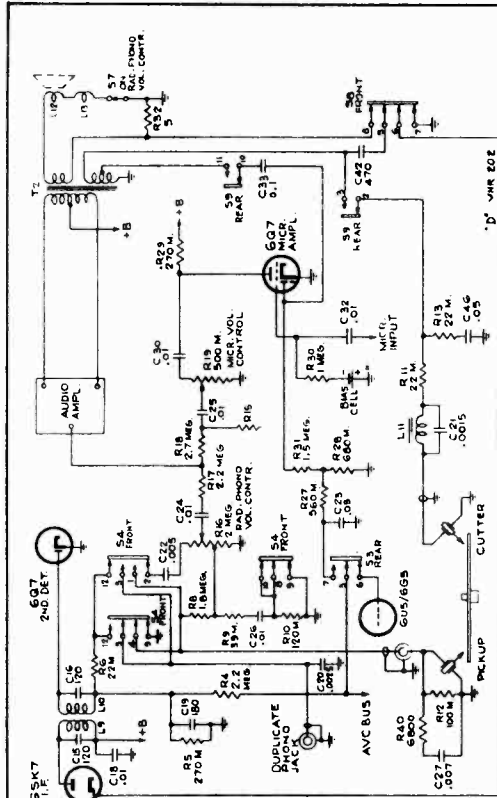
**Dial-Pointer Adjustment.**—After the chassis is replaced in cabinet, move the dial pointer (if necessary) so that it is at the left-hand graduation on the dial with the gang in full mesh.

Steps	Connect the high 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 mid.	455 kc	"C" band, Quiet Point at HP end of dial.	L7 and L8 (2nd I.F. Trans.)
2	1st det. grid, in series with .01 mid.	1,500 kc	1,500 kc "A" band 160°	L5 and L6 (1st I.F. Trans.)
3	Antenna terminal, in series with 200 mmfd. (link open)	600 kc	600 kc "A" band 30.5°	C5 (osc.) C4 (ant. V-201) C42 (ant. V-200)
4	Repeat steps 3 and 4.			L3 (osc.) Rock in
5	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

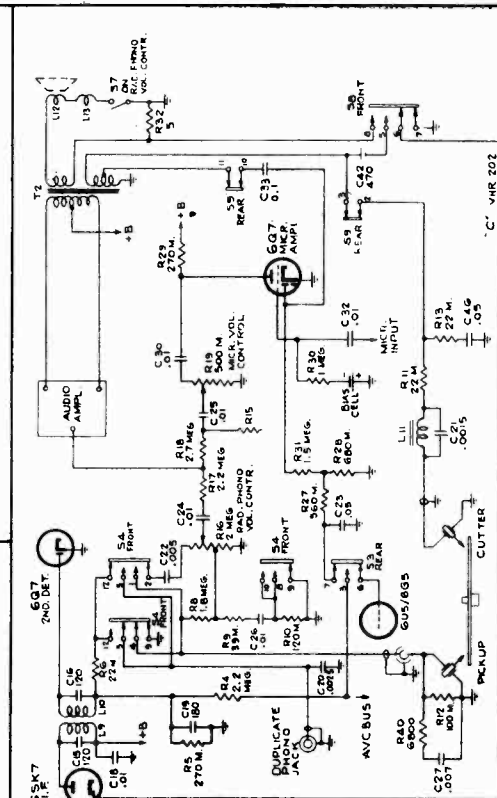
\* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used, by tuning receiver to 14.29 mc. where a weaker signal should be received.  
Note: Oscillator tracks above signal on both bands.



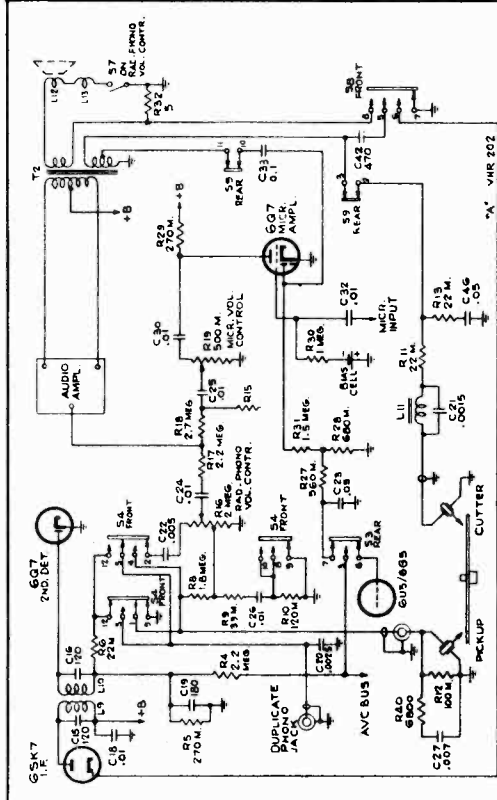
Model V-201 Calibration Scale



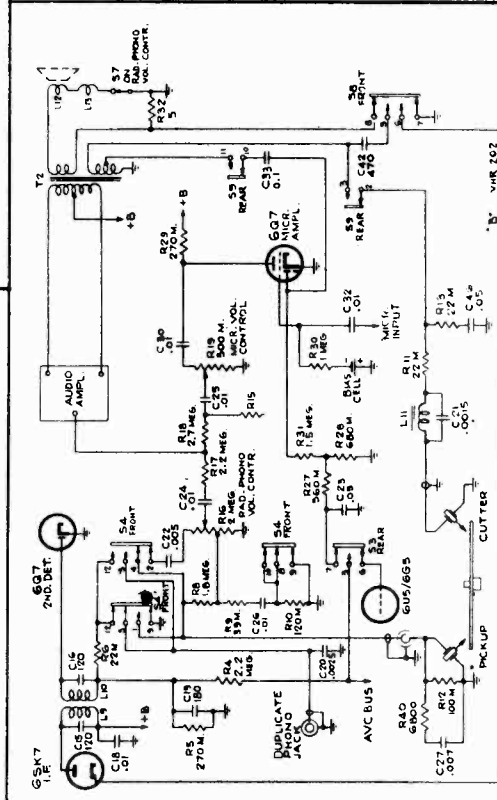
4—"Radio"



3—"Radio Recording"



1—"Recording"



2—"Victrola"

**RADIO:**  
1. RADIO PROGRAMS MIXED WITH VOICE OR MUSIC BY MICROPHONE.  
2. CUTTING RECORDS OF RADIO PROGRAMS.  
3. CUTTING RECORDS OF RADIO PROGRAMS MIXED WITH VOICE OR MUSIC BY MICROPHONE.

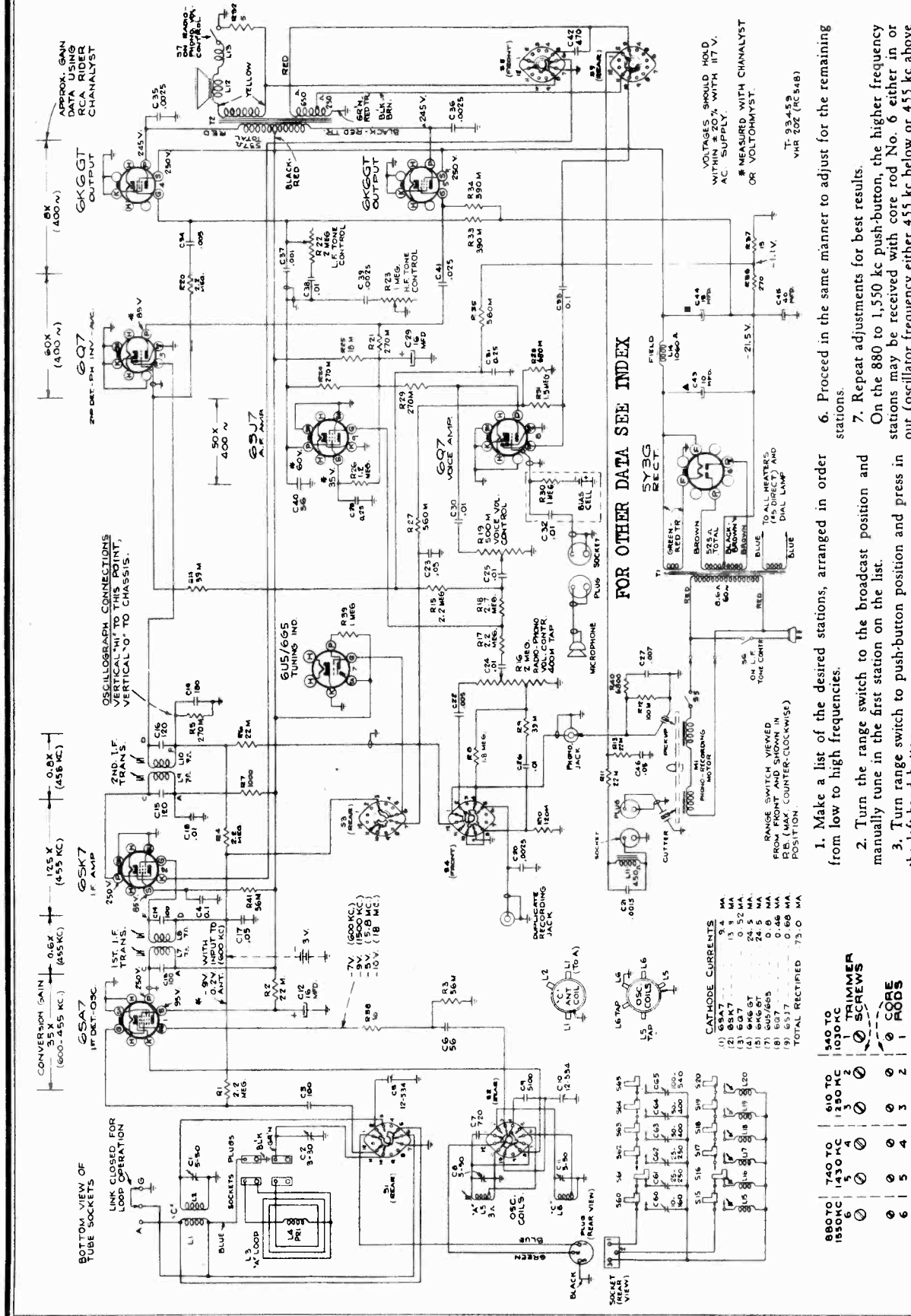
**RADIO RECORDING:**  
1. PHONOGRAM RECORD SECTIONS.  
2. CUTTING RECORDS OF RADIO PROGRAMS MIXED WITH VOICE OR MUSIC BY MICROPHONE.  
3. MICROPHONE ONLY (P.A.).

**VICTROLA:**  
1. PHONOGRAM RECORD SECTIONS.  
2. CUTTING RECORDS OF RADIO PROGRAMS MIXED WITH VOICE OR MUSIC BY MICROPHONE.  
3. MICROPHONE ONLY (P.A.).

Model VHR-202  
Servicer Selector  
Circuits

RCA MFG. CO., INC.

MODEL VHR-202  
Ch. RC-548



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.

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.

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

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	1-F Grid in series with .01 mid.	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 mid.	600 kc	"A" Band	L7 and L8 (1st I.F. Trans.)
3	1st-detector grid, in series with .01 mid.	1,500 kc	"A" Band	L5 (osc.)
4	Repeat steps 3 and 4.	1,500 kc	"A" Band	C8 (osc.)
5	Antenna Terminal, in series with 47 mmfd.	15.2 mc	15.2 mc "C" Band	C11 (osc.) C1 (ant.)**
6	Install and connect chassis in cabinet. Close link on antenna terminal board. Tune in a radiated adjustment.			
7				

\* 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-907, 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	1-F Grid in series with .01 mid.	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 mid.	600 kc	"A" Band	L9 and L10 (1st I.F. Trans.)
3	R.F. Grid in series with .01 mid.	1,500 kc	"A" Band	L8 (osc.)
4	Repeat steps 3 and 4.			C12 (osc.)
5				
6	R.F. Grid in series with .01 mid.	244 mc	"B" Band	C11 (osc.)
7	Antenna Terminal in series with 47 mmfd.	15.2 mc	"C" Band	C10 (osc.) C8 (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). Repeat these adjustments.			

\* Use minimum capacity peak if two peaks can be obtained.  
 \*\* Rock in C8 and use maximum capacity peak if two peaks can be obtained.

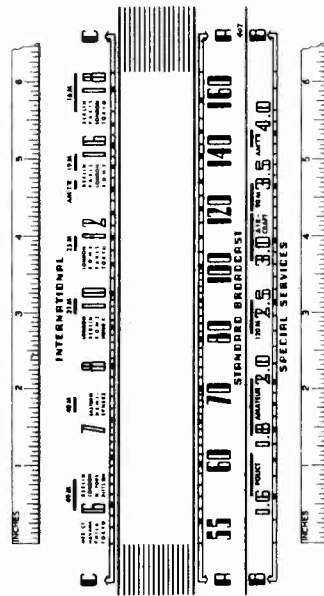
**Cathode-Ray Alignment** is the preferable method. Connections for the oscillograph are shown in the schematic diagram.  
**Output Meter Alignment**—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.  
**Test-Oscillator**—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the output as low as possible to avoid s.w.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 AVC oscillator output adjusted to produce several volts of AVC.  
**Calibration Scale**—The glass tuning dial may be easily removed from the chassis for calibration. The dial should be removed 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.  
 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 scale is to be used in conjunction with 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 the left-hand graduation on the dial with the gang in full mesh is at the reference mark.

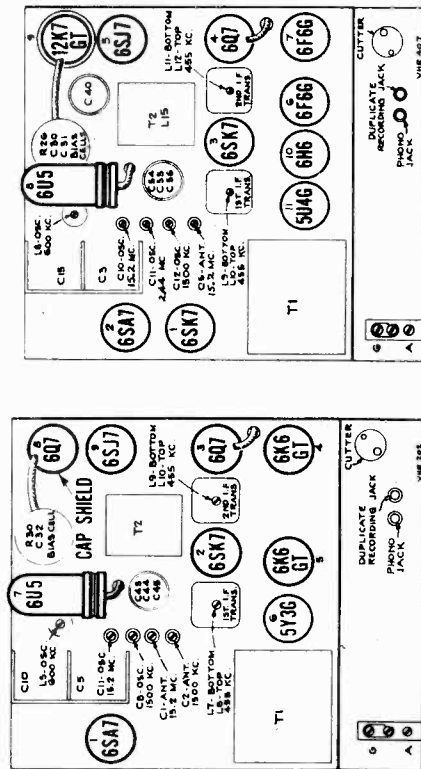
MODELS VHR-202, VHR-207, VHR-407  
 RC-548 RC-547 RC-547A

POWER ON TUNE	VHR-202	VHR-207	VHR-407
Undrained watts	3	5	10
Maximum watts	5	10	12
LINE SPARKER			
(Electrodynamics)	RL-70M-6	RL-70M-3	
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)	17	17 1/2	19
Depth (inches)	15 to 1		



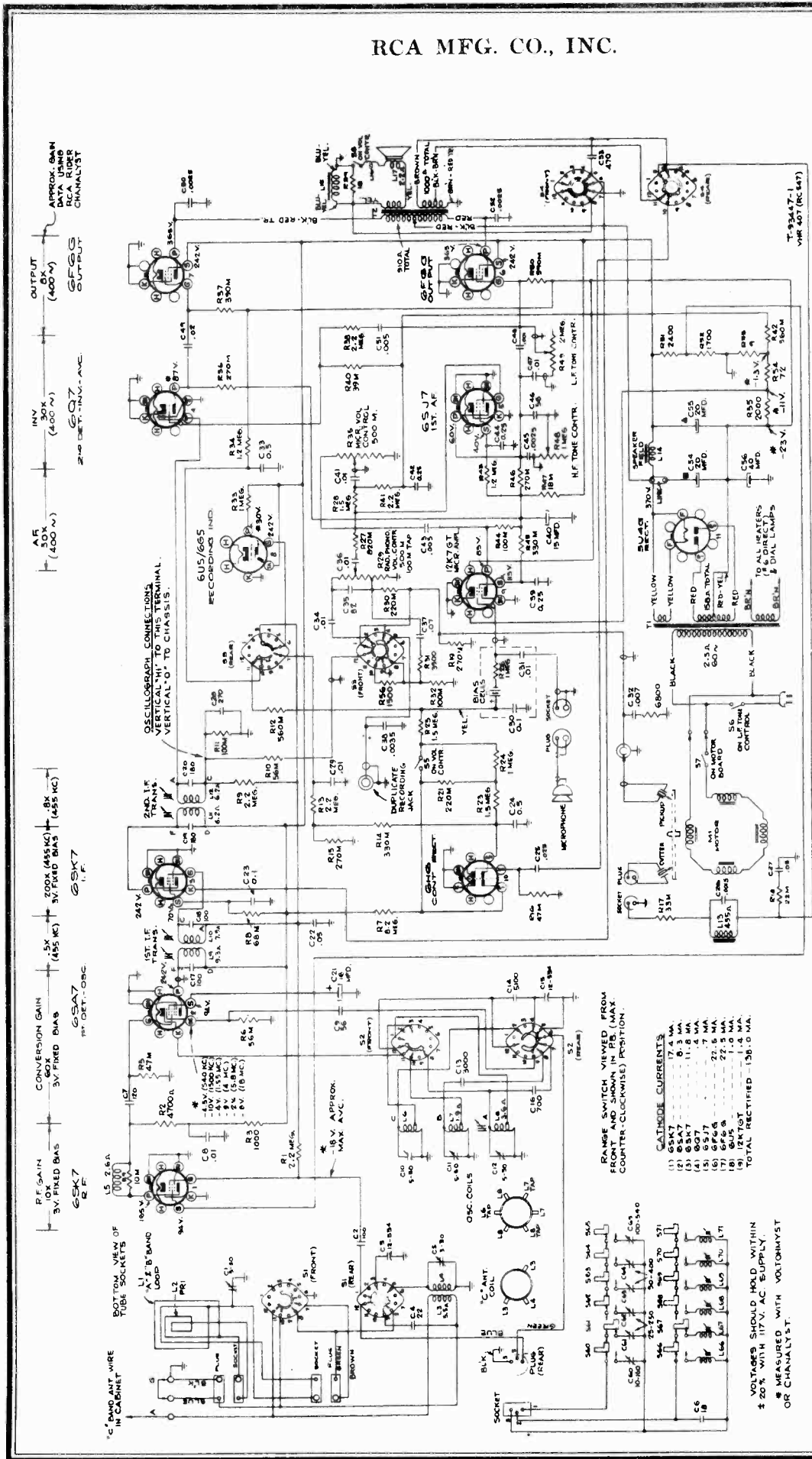
Alignment Procedure

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



Models VHR-207, 407

Model VHR-202



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

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 turn-  
table; the turntable spindle drives a lead screw  
which guides the recorder arm from outside of  
recording blank to inside

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..... 1 1/2 volts at 1,000 cycles across 1/2 meg  
REORDER  
Recording Head (cutter)..... Crystal

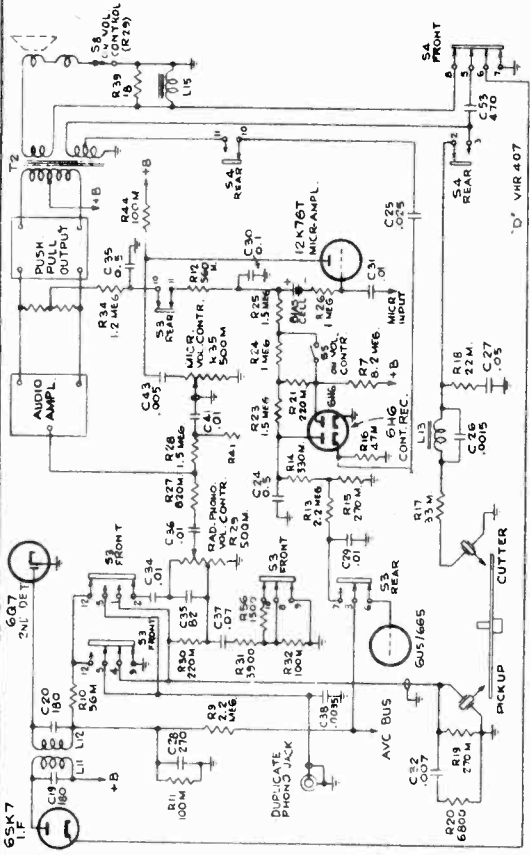
CATHODE CURRENTS

(1) 6SK7	17.4 MA
(2) 6U6	11.8 MA
(3) 6U7	11.8 MA
(4) 6U8	4 MA
(5) 6U5/6G5	22.7 MA
(6) 6U6/6G6	22.7 MA
(7) 6U7	1.0 MA
(8) 6U8	1.0 MA
(9) 6U5/6G5	1.0 MA
(10) 6U6/6G6	1.0 MA
(11) 6U7	1.0 MA
(12) 6U8	1.0 MA
(13) 6U5/6G5	1.0 MA
(14) 6U6/6G6	1.0 MA
(15) 6U7	1.0 MA
(16) 6U8	1.0 MA
(17) 6U5/6G5	1.0 MA
(18) 6U6/6G6	1.0 MA
(19) 6U7	1.0 MA
(20) 6U8	1.0 MA
(21) 6U5/6G5	1.0 MA
(22) 6U6/6G6	1.0 MA
(23) 6U7	1.0 MA
(24) 6U8	1.0 MA
(25) 6U5/6G5	1.0 MA
(26) 6U6/6G6	1.0 MA
(27) 6U7	1.0 MA
(28) 6U8	1.0 MA
(29) 6U5/6G5	1.0 MA
(30) 6U6/6G6	1.0 MA
(31) 6U7	1.0 MA
(32) 6U8	1.0 MA
(33) 6U5/6G5	1.0 MA
(34) 6U6/6G6	1.0 MA
(35) 6U7	1.0 MA
(36) 6U8	1.0 MA
(37) 6U5/6G5	1.0 MA
(38) 6U6/6G6	1.0 MA
(39) 6U7	1.0 MA
(40) 6U8	1.0 MA
(41) 6U5/6G5	1.0 MA
(42) 6U6/6G6	1.0 MA
(43) 6U7	1.0 MA
(44) 6U8	1.0 MA
(45) 6U5/6G5	1.0 MA
(46) 6U6/6G6	1.0 MA
(47) 6U7	1.0 MA
(48) 6U8	1.0 MA
(49) 6U5/6G5	1.0 MA
(50) 6U6/6G6	1.0 MA
(51) 6U7	1.0 MA
(52) 6U8	1.0 MA
(53) 6U5/6G5	1.0 MA
(54) 6U6/6G6	1.0 MA
(55) 6U7	1.0 MA
(56) 6U8	1.0 MA
(57) 6U5/6G5	1.0 MA
(58) 6U6/6G6	1.0 MA
(59) 6U7	1.0 MA
(60) 6U8	1.0 MA
(61) 6U5/6G5	1.0 MA
(62) 6U6/6G6	1.0 MA
(63) 6U7	1.0 MA
(64) 6U8	1.0 MA
(65) 6U5/6G5	1.0 MA
(66) 6U6/6G6	1.0 MA
(67) 6U7	1.0 MA
(68) 6U8	1.0 MA
(69) 6U5/6G5	1.0 MA
(70) 6U6/6G6	1.0 MA
(71) 6U7	1.0 MA
(72) 6U8	1.0 MA
(73) 6U5/6G5	1.0 MA
(74) 6U6/6G6	1.0 MA
(75) 6U7	1.0 MA
(76) 6U8	1.0 MA
(77) 6U5/6G5	1.0 MA
(78) 6U6/6G6	1.0 MA
(79) 6U7	1.0 MA
(80) 6U8	1.0 MA
(81) 6U5/6G5	1.0 MA
(82) 6U6/6G6	1.0 MA
(83) 6U7	1.0 MA
(84) 6U8	1.0 MA
(85) 6U5/6G5	1.0 MA
(86) 6U6/6G6	1.0 MA
(87) 6U7	1.0 MA
(88) 6U8	1.0 MA
(89) 6U5/6G5	1.0 MA
(90) 6U6/6G6	1.0 MA
(91) 6U7	1.0 MA
(92) 6U8	1.0 MA
(93) 6U5/6G5	1.0 MA
(94) 6U6/6G6	1.0 MA
(95) 6U7	1.0 MA
(96) 6U8	1.0 MA
(97) 6U5/6G5	1.0 MA
(98) 6U6/6G6	1.0 MA
(99) 6U7	1.0 MA
(100) 6U8	1.0 MA



MODEL VHR-207  
MODEL VHR-407

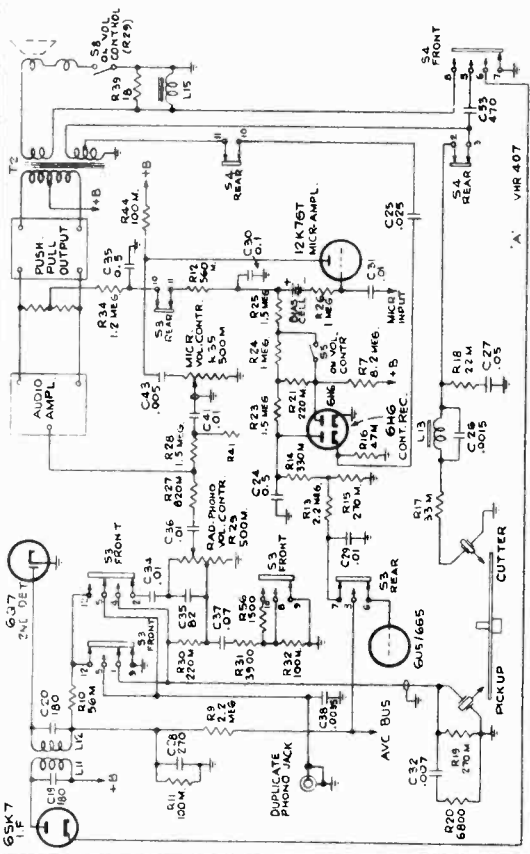
RCA MFG. CO., INC.



In some production, the wording on the Service Selector plate is like that shown for Model VHR-202.

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

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

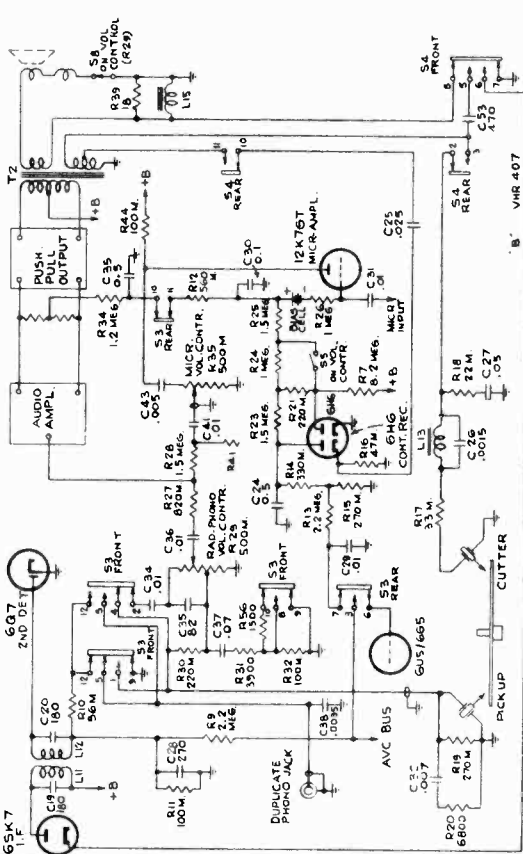
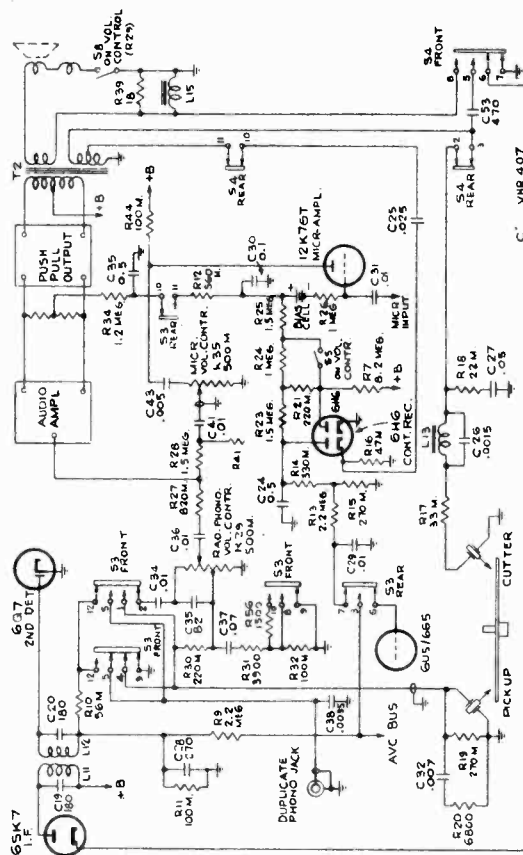


**RE-RECORDING:**  
1. PHONOGRAM RECORD OR MUSIC THROUGH MICROPHONE SELECTIONS USING AUXILIARY MICROPHONE.  
2. CUTTING RECORDS OF PHONOGRAM SELECTIONS WITH VOICE OR MUSIC MIXED IN THROUGH MICROPHONE.

**VICTROLA:**  
1. PHONOGRAM RECORD SELECTIONS WITH VOICE OR MUSIC BY MICROPHONE ONLY (RA).

1—"Re-Recording" Models VHR-207, VHR-407 Service Selector Circuits

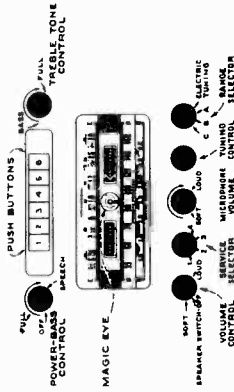
2—"Victrola"



RCA MFG. CO., INC.

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

Recorder Operating Instructions



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

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-phonograph 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-phonograph volume control so the "Magic Eye" just closes during loudst passages.
4. Push turntable switch "on."
5. Lift the recording arm, move it over so the stylus is about 1/4-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-phonograph 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-phonograph volume control. Use a new needle for play-back.

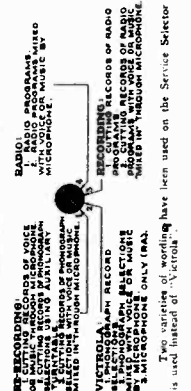
Microphone Recording.

- 1. Turn service selector to position "1."
2. Turn radio-phonograph volume control to its "off" position.
3. Turn power-bass and treble tone controls 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 the recording disc, the volume control will not require continual readjustment.
5. Start the turntable and place cutter on the disc.
6. Talk into the microphone and make the desired recording, and readjust the "Magic Eye" 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.

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

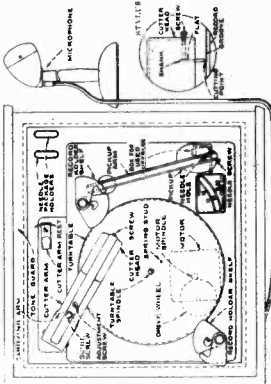
SERVICE SELECTOR



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 recording is noisy or poor in quality, first try a new stylus. The stylus cutting point can be raised by dropping the cutter on the recording blank, or by cutting 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.

Recorder Cutting Adjustments

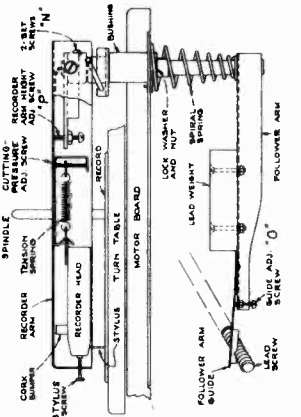


must be adjusted by removal and reinsertion. If the threads continue to collect toward the outside, use a new stylus. When the stylus is correctly inserted, with the cuttings collecting toward the center of the disc, lift the cutter, place the cuttings under it, and stop the turntable. Then examine the cuttings. They should be thin, even, hair-like threads, about three-thousandths of an inch across, and 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. Increase the pressure and increase size of cuttings. Turn counter-clockwise to decrease pressure and decrease size of cuttings. Check the cuttings and groove width each time a new disc is used. The stylus pressure, when adjusted for correct cutting, is approximately 1 1/2 ounces, measured at the end of the stylus arm.

Recorder Mechanism Adjustments

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.



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 on the left. Tighten the screw. Turn the turntable on and lift on the shank. Beighen 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 "blank" 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 "ring" end at front and the "variable engaged" with the "on" position of the disc. This prevents the disc from slipping during recording.
3. Turn on power-bass control and turntable switch. Turn radio-phonograph and microphone volume controls fully counter-clockwise.
4. Lift the cutter arm well up and move it over so the stylus is about 1/4-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

"N" Recorder Arm Stop. An extension on the cross-back of the motorboard limits the inward movement of the stylus arm to 1 1/2 inches from the spindle. The correct distance can be obtained by loosening set screw "N," moving the recorder arm in the required direction, and tightening the set screw. "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 adjusted so that 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.

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

RCA MFG. CO., INC.

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

- 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. Push the record forward until it is in the 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.

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- 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.
- 4. See that the recording arm is in its rest position at rear of turntable.
- 5. Turn power-bass control on, turn service selector to "Victrola," and turn microphone volume control fully counter-clockwise.
- 6. 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.
- 7. Select a series of eight 10-inch records, or seven 12-inch records, and place them on the record-holder posts, in good order and are correctly assembled.
- 8. Push the index lever to "10" for a series of 10-inch records, or to "12" for a series of 12-inch records.
- 9. 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.
- 10. Adjust the radio-phonograph volume control for the desired volume, and adjust the tone controls for best reproduction.
- 11. 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.
- 12. 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 upwards and the next record will automatically start. Upon playing the index lever, it will automatically return to the "10" position. If the record is in the 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.
- 13. 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.
- 14. 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" and place the pickup on its rest and turn off the turntable switch.
- 15. When discontinuing operation, turn off both the turntable switch and power-bass control.
- 16. 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

The turntable in BR-1155 can be removed by tapping lightly on the top of the spindle while pulling upward on opposite sides of the turntable.

Lubrication.—Petroleum 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. The motor pulleys on underside of motor board of underneath turntable should be oiled.

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.

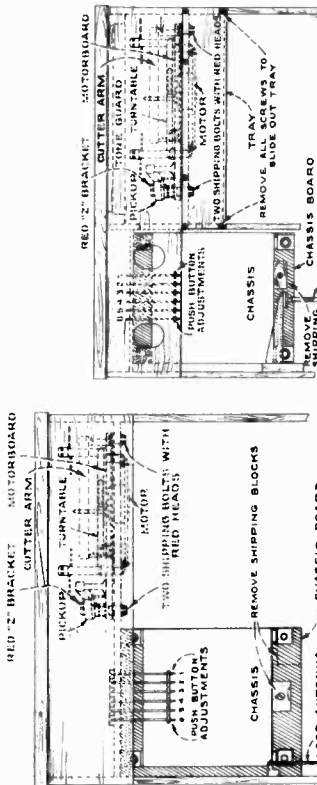
RECORD CHANGER SERVICE DATA

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.

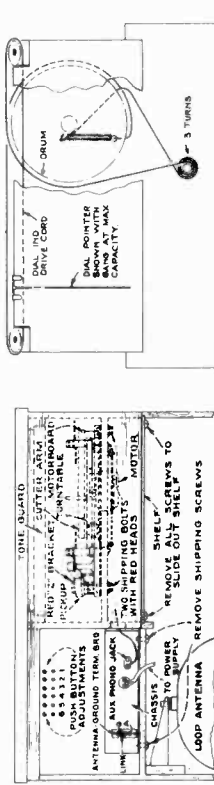
The changer can be rotated through its change cycle by pushing the index lever to "Reject" and revolving the turntable by hand. Six turntable revolutions are required for one change cycle.

A bind or jam in the mechanism can usually be relieved by turning the turntable in the reverse direction. The 10-inch 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.

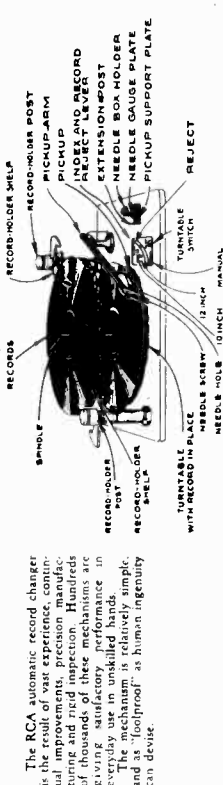


Model VHR-202



Dial Drive Cord Arrangement

Automatic Record Changer Mechanism



Cycle of Operation

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-bearing support made in the record-holder shelf on each post (10-inch and 12-inch records). The 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) moves to its forward position, toward the spindle, and sets the rest of the record stack down, it pushes 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.

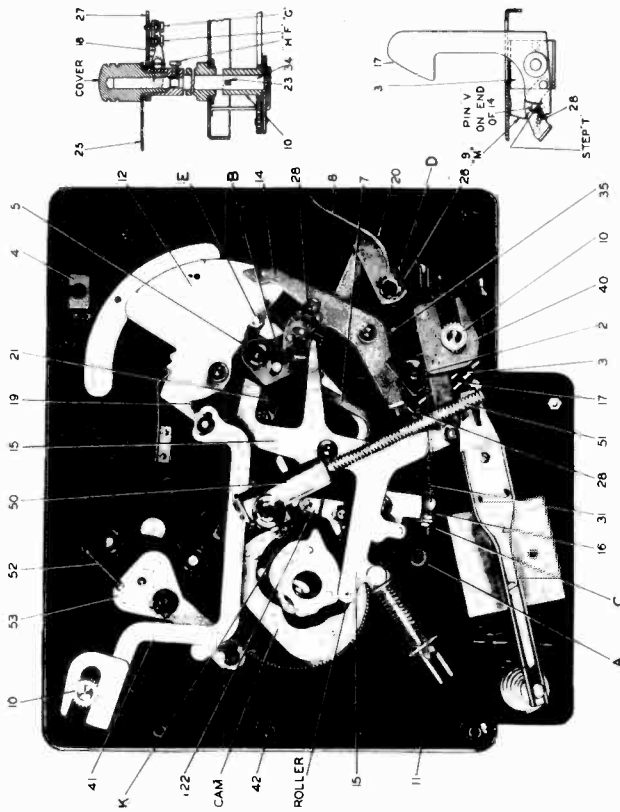
The RCA automatic record changer is the result of vast experience, continual improvements, precision manufacturing, and the use of thousands of thousands of these mechanisms are giving satisfactory performance in everyday use in unskilled hands. The mechanism is relatively simple, and "foolproof" as human ingenuity can devise.

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 the mechanism which:

1. Lifts up the pickup arm and swings it out clear of the record.
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 "knives," while the rest of the stack of records are supported by the rest of the record.
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.

**Quick-Reference Chart for Automatic Record Changer Adjustments**

General operation.	Adjustment
Fails to trip at end of record.	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.
Needle repeats grooves (does not follow the grooves). "Change cycle starts before record is finished."	Increase clutch friction by turning clutch screw clockwise.
Pickup arm strikes lever record in stack.	Decrease clutch friction by turning clutch screw counter-clockwise. Tighten the roller on end of pickup arm bearing, raised pickup output cable, or rubbing between the friction finger and the index-lever finger.
Pickup needle drops 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 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 inch from the nearest side of the turntable spindle).	Place 10-inch record on turntable, push record-discriminating lever to "10," and return it to "10." Rotate mechanism through cycle until needle is just ready to land on record. Hold pin on leading lever against stop 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 separator cable, then tighten one (the blunt nose) set-screw. Run mechanism through cycle as a check, and then tighten the conjoined 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 on end toward rest of motorboard as indicated. (Keep eccentric on end toward rest 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 normally .058 inch, and for the 12-inch record is .075 inch. To adjust, rotate the knife to the point of minimum vertical clearance between the knife and record shelf. Then adjust the set screw to give .058-.060 inch separation. Screw "G" and lock it by depressing during this adjustment. After setting screw "E," 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 sleeves are bent, or if record grooves are bent, or if proper operations and timing 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 allow. Then 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) first. Then adjust the other (long-pointed) set screw.
Pickup arm supports 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 groove of 12-inch record, 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 Adjustments**

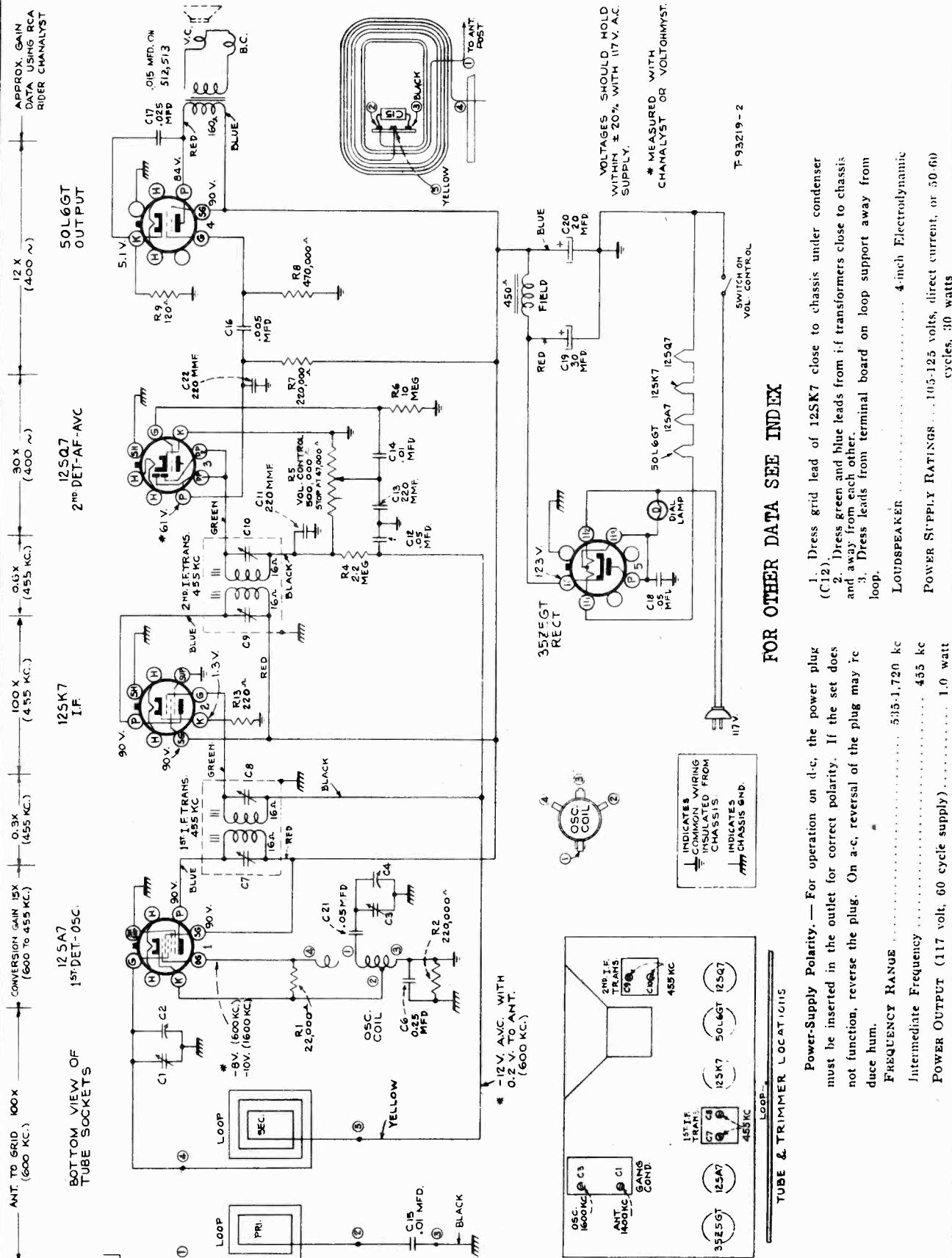
- "A" - Rubber Bumper. Maintains 1/16-inch clearance between roller (on end of main lever) and cam plate.
- "B" - Friction Clutch Adjustment.—Regulates tripping of record-changing cycle when pickup swings in eccentric groove.
- "C" - Pickup Lift-Cable Adjustment.—Regulates height that pickup arm is lifted during record-changing cycle.
- "D" - Needle Landing Position for 10-inch Records.—The relation between pickup shaft and trip lever "20," which is raised 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 shelf on each record post, so the shelves move out from under pickup 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.

**Names of Mechanism Parts**

- 1 - Pickup-lift-cable guide.
- 2 - Bracket.
- 3 - Record-discriminating-lever bracket.
- 4 - Turntable motor switch.
- 5 - Clutch.
- 6 - Trip-lever friction finger.
- 7 - Finger.
- 8 - Trip-lever friction finger.
- 9 - Trip-lever friction finger.
- 10 - Gear.
- 11 - Record-separator-shaft gear. (flat).
- 12 - Guide.
- 13 - Main-lever-spring guide.
- 14 - Index lever.
- 15 - Locating lever and pawl.
- 16 - Lever.
- 17 - Main lever.
- 18 - Record-discriminating lever and pawl.
- 19 - Record-separator elevating lever.
- 20 - Trip-detecting lever.
- 21 - Trip lever.
- 22 - Trip-regulator lever.
- 23 - Pawl.
- 24 - Separator-shaft pin (engages gear).
- 25 - Pin.
- 26 - Record-separator knife.
- 27 - Pickup-arm starting spring.
- 28 - Spring.
- 29 - Record-support shelf.
- 30 - Record-support shelf.
- 31 - Record-support shelf.
- 32 - Record-support shelf.
- 33 - Record-support shelf.
- 34 - Record separator shaft.
- 35 - Record separator shaft.
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- 51 - Record separator shaft.
- 52 - Record separator shaft.
- 53 - Record separator shaft.

MODEL Radiola 500, 501  
Ch. RC-464

RCA MFG. CO., INC.

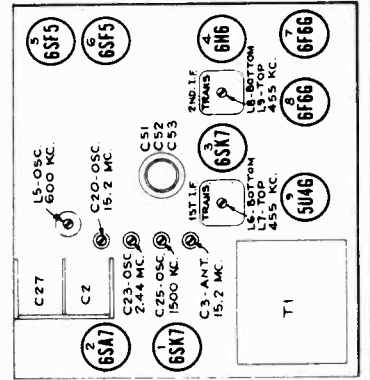
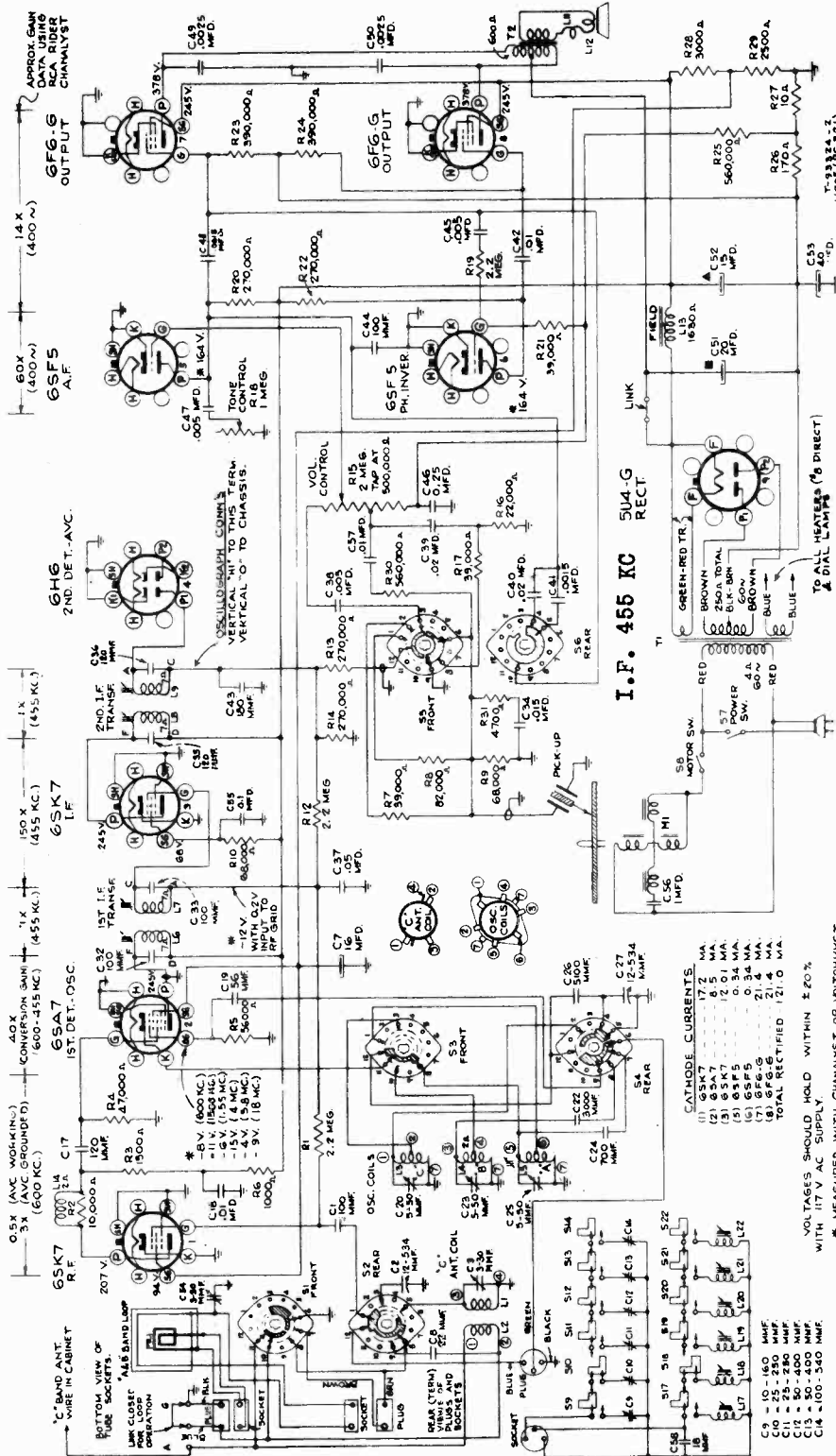


FOR OTHER DATA SEE INDEX

- 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
- 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

RCA MFG. CO., INC.

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



**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

1	Appr. Range
2	540-1,030 kc
2	810-1,250 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 65—6.8 volts, 0.4 amps.

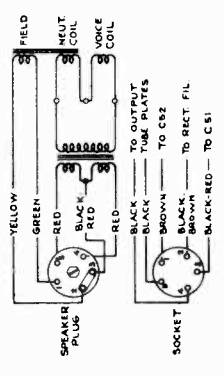
**LOUDSPEAKER**

12-inch electrodynamic  
 Type .....  
 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

ON SOME MODELS R31 IS 3900 OHMS



Speaker Connections

FOR OTHER DATA SEE INDEX

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.

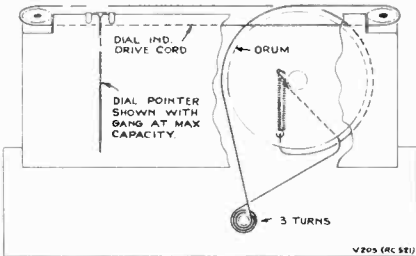
**Using Tuning Dial.**—

- Slide out the flat spring clamp at each end of the dial, and remove the glass dial from the cabinet.
- With gang in full mesh, move the dial pointer to the reference mark at the left-hand end of the dial backing plate.
- 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.
- 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.**—

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

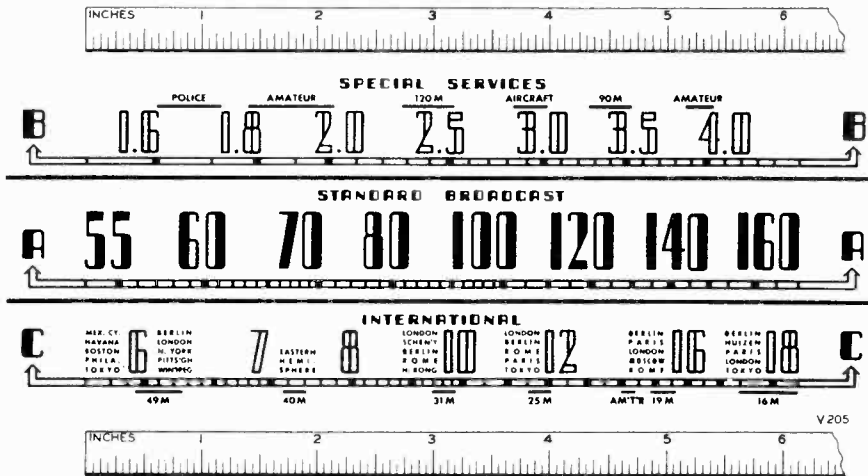
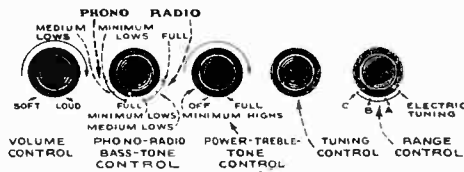
For information regarding the automatic record changer refer to service note covering RP-152 record changers.

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.	1,500 kc	"A" Band 1,500 kc	L7, L6 (1st I-F Trans.)
3				C25 (osc.)
4				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.	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.

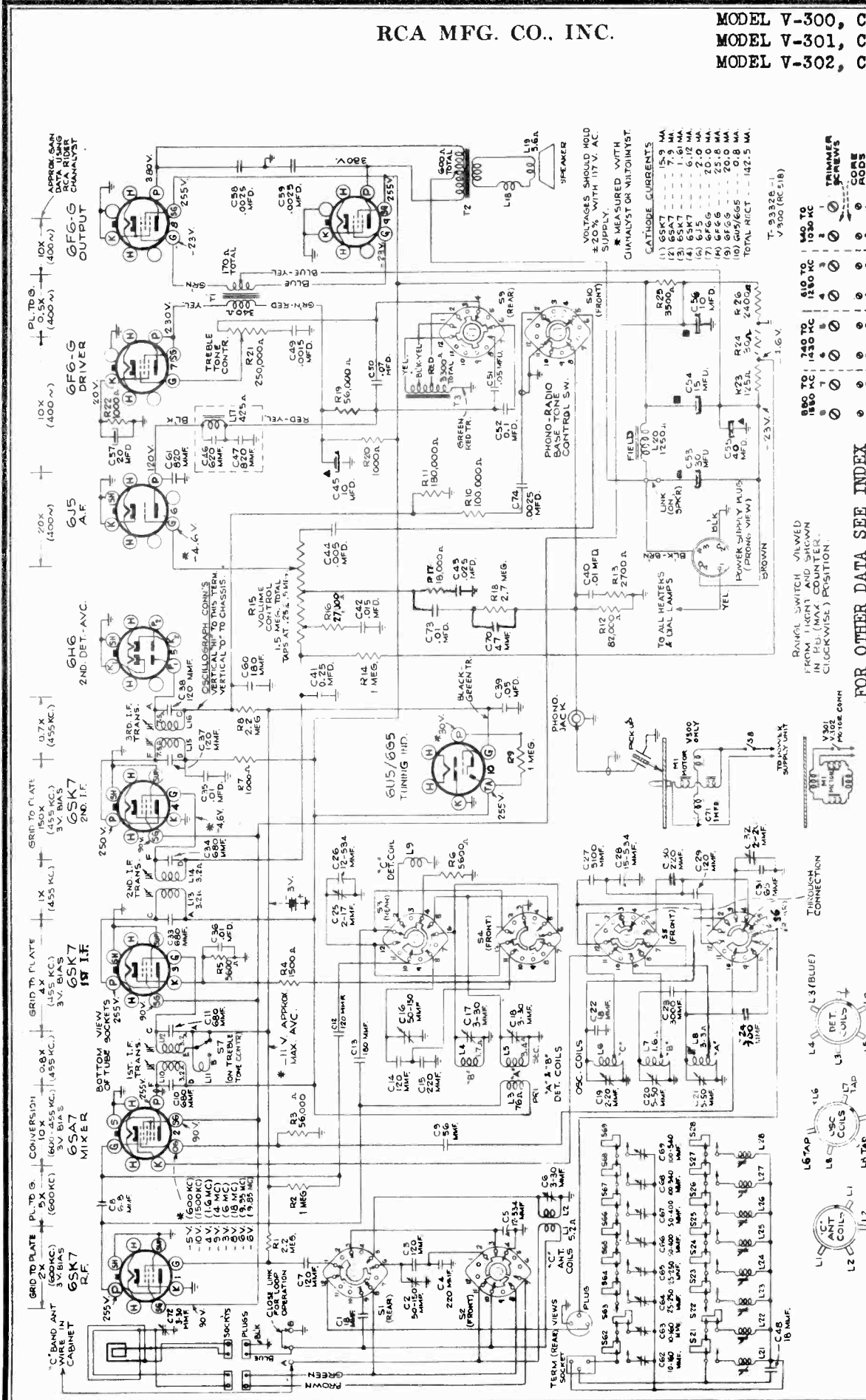
**Precautionary Lead Dress:**

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



**Calibration Scale**

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



**CATHODE CURRENTS**

(1) 6SK7	15.9 MA.
(2) 6SK7	7.9 MA.
(3) 6SK7	1.6 MA.
(4) 6J5	2.0 MA.
(5) 6G6	20.0 MA.
(6) 6F6-G	25.8 MA.
(7) 6F6-G	20.0 MA.
(8) 6F6-G	20.0 MA.
(9) 6F6-G	20.0 MA.
TOTAL RECT.	142.5 MA.

**VOLTAGES SHOULD HOLD WITH 117 V. AC SUPPLY \* MEASURED WITH CATHYST OR VAITHYST.**

**TRIMMER SCREWS**

1	2	3	4	5	6	7	8	9	10
1	1	1	1	1	1	1	1	1	1

**POWER SUPPLY RATINGS**

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

**FOR OTHER DATA SEE INDEX**

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.

**FREQUENCY RANGES**

Broadcast "A"	540-1,600 kc
Medium Wave "B"	1,575-4.0 mc
Short Wave "C"	5.3-18.0 mc
SPREAD BAND	9.34-9.86 mc

**POWER OUTPUT RATING**

Undistorted	18 watts
Maximum	20 watts

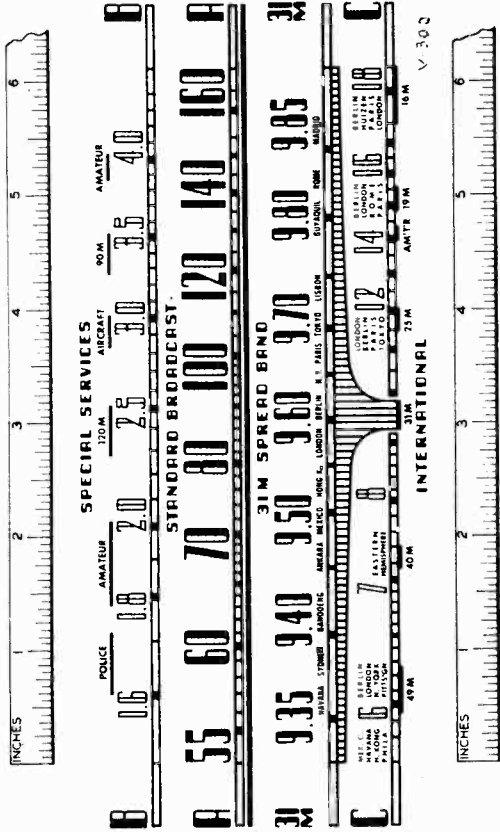
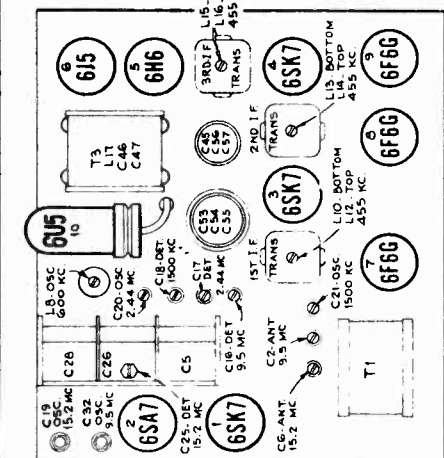
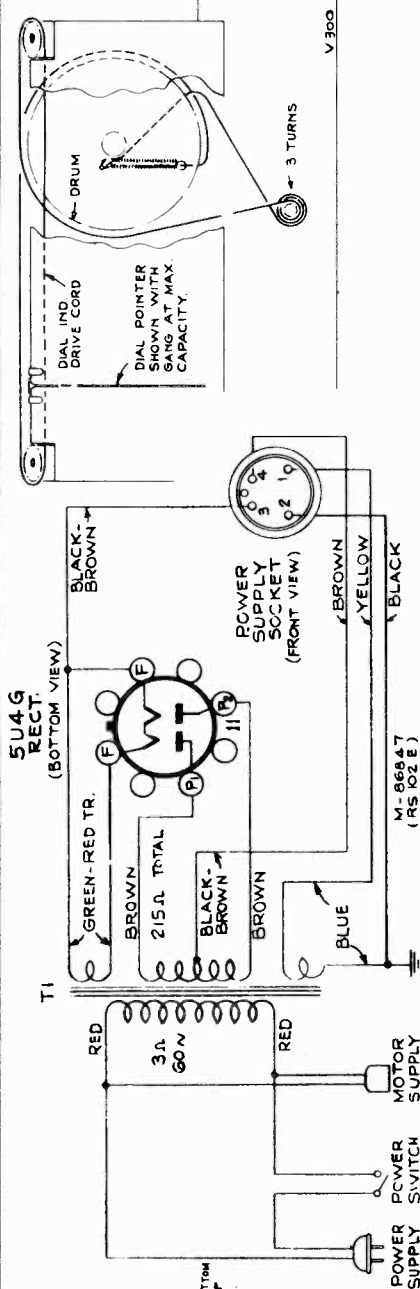
**V.C. Impedance**

7.2 ohms at 400 cycles
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MODEL V-300, Ch. RC-518  
 MODEL V-301, Ch. RC-518A  
 MODEL V-302, Ch. R-518A

RCA MFG. CO., INC.



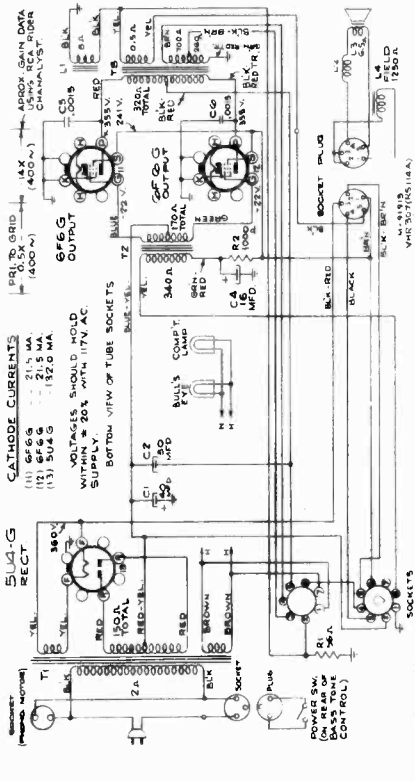
**Using Calibration Scale.—**  
 1. With gang in full mesh move the dial pointer to the reference mark at the left-hand end of the dial backing plate.  
 2. Place a flat 12-inch ruler on the dial backing plate so the left end of ruler is at the reference mark at left-end of backing plate. Temporarily 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.

**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.

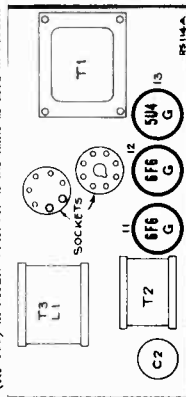
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for maximum peak output
1	Turn "Treble Tone Control" (center knob) counter-clockwise so that I-F is in "Sharp" position.			
2	2nd I-F grid, in series with .01 mfd.			L15 and L16* (3rd I-F Trans.)
3	1st I-F grid, in series with .01 mfd.	455 kc	"A" Band Quiet Point at HF end	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 mfd (link closed)	15.2 mc	"C" Band 15.2 mc	C19 (osc.)** C25 (det.) C8 (ant.)
7		9.5 mc	"31M" Band 9.5 mc	C32 (osc.)** C16 (ant.) 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.)

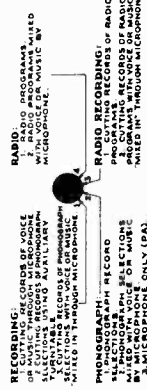




The recorder and automatic record-changer mechanism VHR-202, 207, 407. Refer to the service note on these (RP-155) in Model VHR-307 is the same as used in Models models for service data and replacement parts list.



**SERVICE SELECTOR**



**Push Button Adjustments**

The push buttons connect to separate magnetic coils, which are energized by the push-button mechanism which must be adjusted for the desired station. 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:

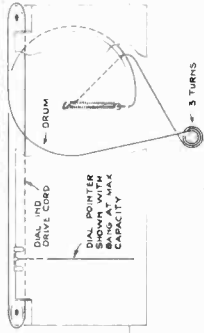
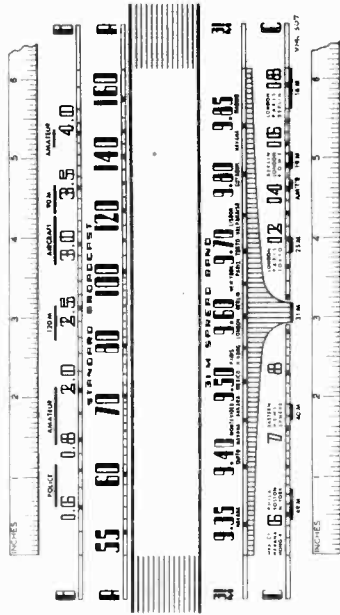
1. Make a list of the desired stations, arranged in order from low to high frequencies.
2. Turn the range switch to the broadcast position and manually tune in the first station on the list.
3. Turn range switch to push-button position and press in the left-hand button.
4. Adjust core rod No. 1 to receive the first station. To receive other stations, adjust core rod No. 1 for peak output and adjust core rod No. 2 for peak output on the first station.
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 (station frequency). The adjustment with the core in its station frequency) is the correct one. The adjustment with the core in its station frequency) is the correct one.

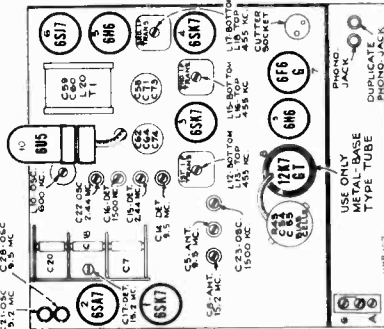
**NOTE:** Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.



**Calibration Scale**—The glass tuning dial may be easily removed from the cabinet and temporarily attached to the chassis for quick reference 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 as a guide in tuning the radio. The scale is printed on a ruler as an accurate and convenient substitute for the regular dial.

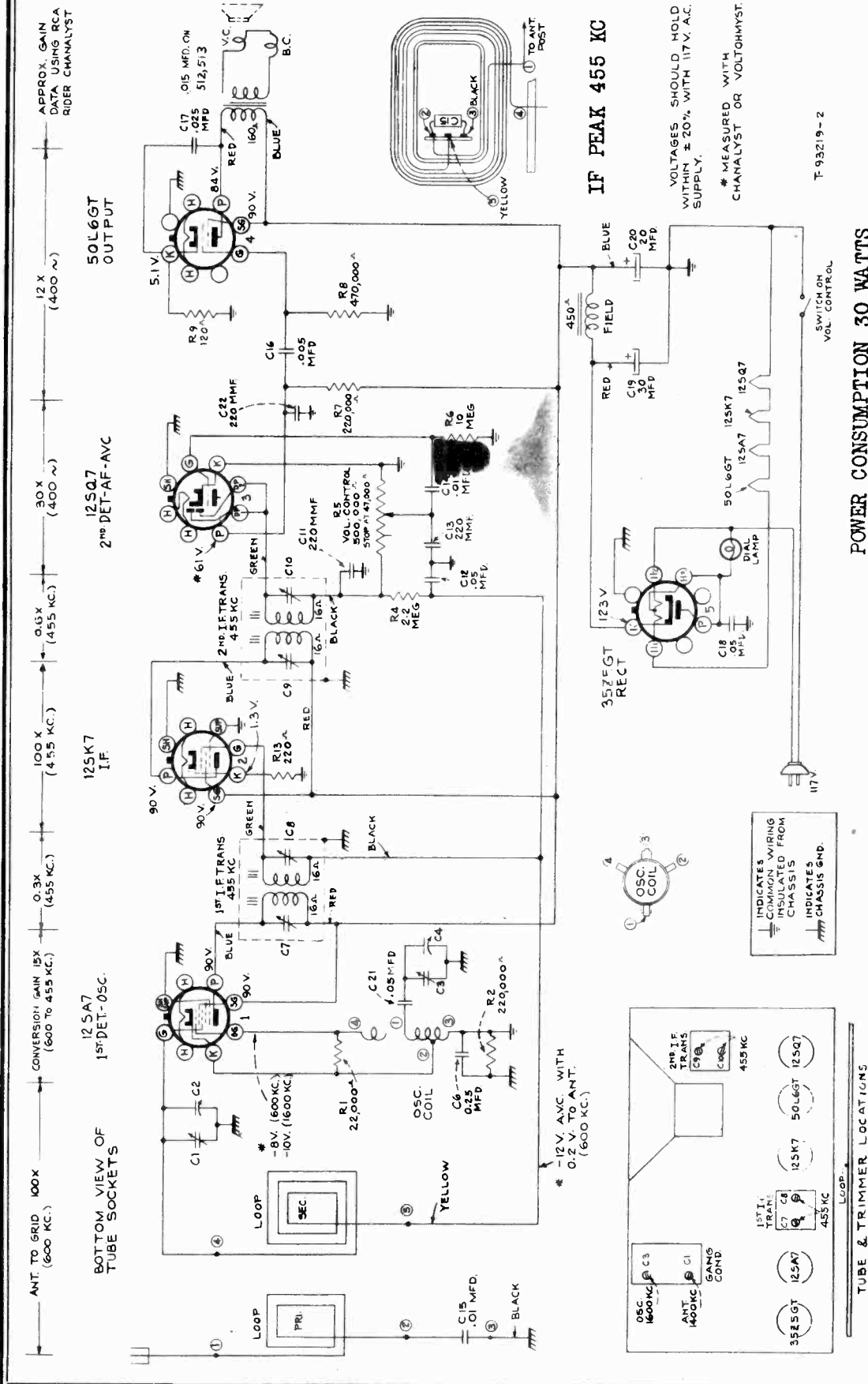
**Using Tuning Dial**—

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. Turn the glass dial until the pointer indicates the extreme left scale graduation coinciding with the pointer. Use Scotch tape to hold the glass dial in this position.



Steps	Connect the high tune test-tone 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.	455 kc	L17 and L18* (3rd I-F Trans.) L15 and L16* (2nd I-F Trans.) L13 and L14* (1st I-F Trans.)
2	2nd I-F grid, in series with .01 mid.	455 kc	L17 and L18* (3rd I-F Trans.) L15 and L16* (2nd I-F Trans.) L13 and L14* (1st I-F Trans.)
3	1st I-F grid, in series with .01 mid.	455 kc	L17 and L18* (3rd I-F Trans.) L15 and L16* (2nd I-F Trans.) L13 and L14* (1st I-F Trans.)
4	1st-Det. grid, in series with .01 mid.	455 kc	L17 and L18* (3rd I-F Trans.) L15 and L16* (2nd I-F Trans.) L13 and L14* (1st I-F Trans.)
5	Turn Treble Tone Control full clockwise to "Broad" position. Turn "Sharp" control clockwise to "Sharp" position. Turn "Sharp" control slightly (so as not to disturb the "Sharp" curve appreciably). Leave control in sharp position for the following steps.	455 kc	L17 and L18* (3rd I-F Trans.) L15 and L16* (2nd I-F Trans.) L13 and L14* (1st I-F Trans.)
6	Ant. terminal, in series with link closed)	15.0 mc	C1 (ant.)*** C1 (ant.)***
7	"31M" Band (link closed)	9.5 mc	C8 (ant.)*** C13 (ant.)*** C5 (ant.)***
8	Reg. stat. of band, in series with .01 mid.	2.44 mc	C25 (ant.)*** C15 (det.) C16 (det.)
9	Reg. stat. of band, in series with .01 mid.	800 kc	L10 (osc.) "A" Band C24 (det.) C18 (det.)
10	Reg. stat. of band, in series with .01 mid.	1,500 kc	"A" Band C24 (det.) C18 (det.)
11	Repeat steps 9 and 10.		
12	Inser all 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 1,500 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 correct signal should be received.)  
 \*\*\* Rock in.



MODELS RP-152, -A, -B, -C, -D, -J  
MODEL RP-153

TECHNICAL INFORMATION AND SERVICE DATA

—1940 No. 38—

ADJUSTMENTS

A. Main Lever.—This lever is basically important in that it initiates 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 "12" by the trip lever "11" which is slightly accelerated or becomes irregular due to swinging in the eccentric groove, the trip finger "7" moves the trip pawl "12" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "3" occurs when movement of the tone arm toward the center of the record is stopped by means of the clutch on trip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "8". 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 cable "17". The cable is attached to the pickup lever "18" and the changer "recycle" at the point where pickup is raised to the maximum height above turntable plate, and has not moved outward; at this point adjust locknut "C" to obtain 1 inch spacing between needle point and turntable top surface.

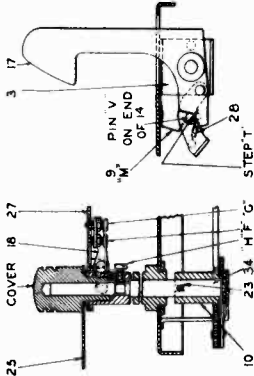
D. & E. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "10" determines the landing position of the needle on a 10-inch record. Position of the needle on a 12-inch record, however, is dependent on the proper 10-inch adjustment.

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 "13" is tilted fully downward. Turn tone arm until the needle is in the correct position; adjust just ready to land on the record, then see that pin "14" on lever "14" is in contact with "Step T" on lever "17". The correct point of landing is 4 1/8 inches from the nearest side of the turntable spindle, loosen the two screws "D" and adjust horizontal position of tone arm to place "D" approximately 1/32-inch and 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, reject mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5 1/4 inches from nearest side of spindle. If the landing is incorrect, turn stud "14" until the eccentric and adjust lever "14" to give correct needle landing. The eccentric end of the stud must be in contact with the roller "10" of the turntable, otherwise incorrect landing may occur with 10-inch records.

F. & G. Record Separating Knife.—The upper plate (knife) "15" on each of the record noses 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 .038 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 "16" to give .038-.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 against the upper plate "15", the record shelf "27" is in its correct 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 10-inch record on the turntable, rotate the tone arm until the record is released 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 edge of the shelves are uniformly spaced and parallel to the center of the record. 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 jangling of mechanism will occur.

I. Tone Arm Rest Support (not shown).—When the change cycle is over, the tone arm rests on the front lower edge of the pickup chair which is 5/16 inch above surface of motorboard. This 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 in relation to the main lever "15" governs the position of the trip pawl "12" on the record. 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.—Perroleum 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.

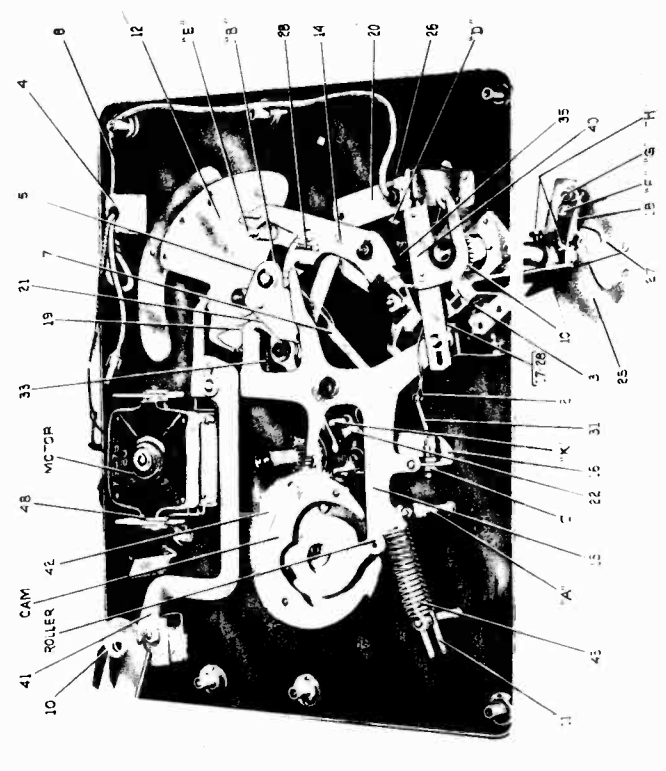
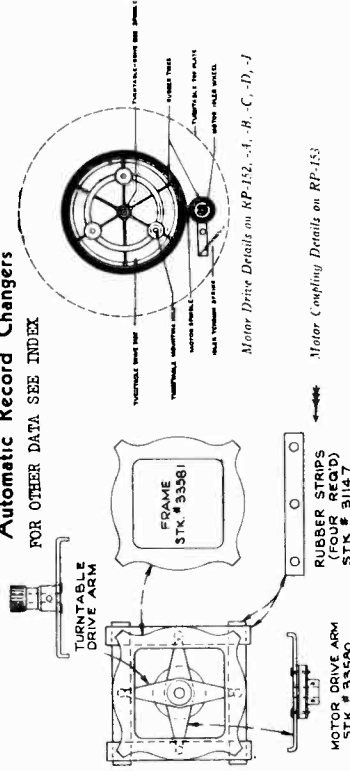
MOTOR SERVICE DATA

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 combining 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 motor field coils should be removed to prevent the field springing when the bolts which hold the assembly together are loosened.

RP-152, -A, -B, -C, -D, -J and RP-153

Automatic Record Changers

FOR OTHER DATA SEE INDEX



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.  
Note: Numbers refer to parts—letters refer to adjustments.



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)

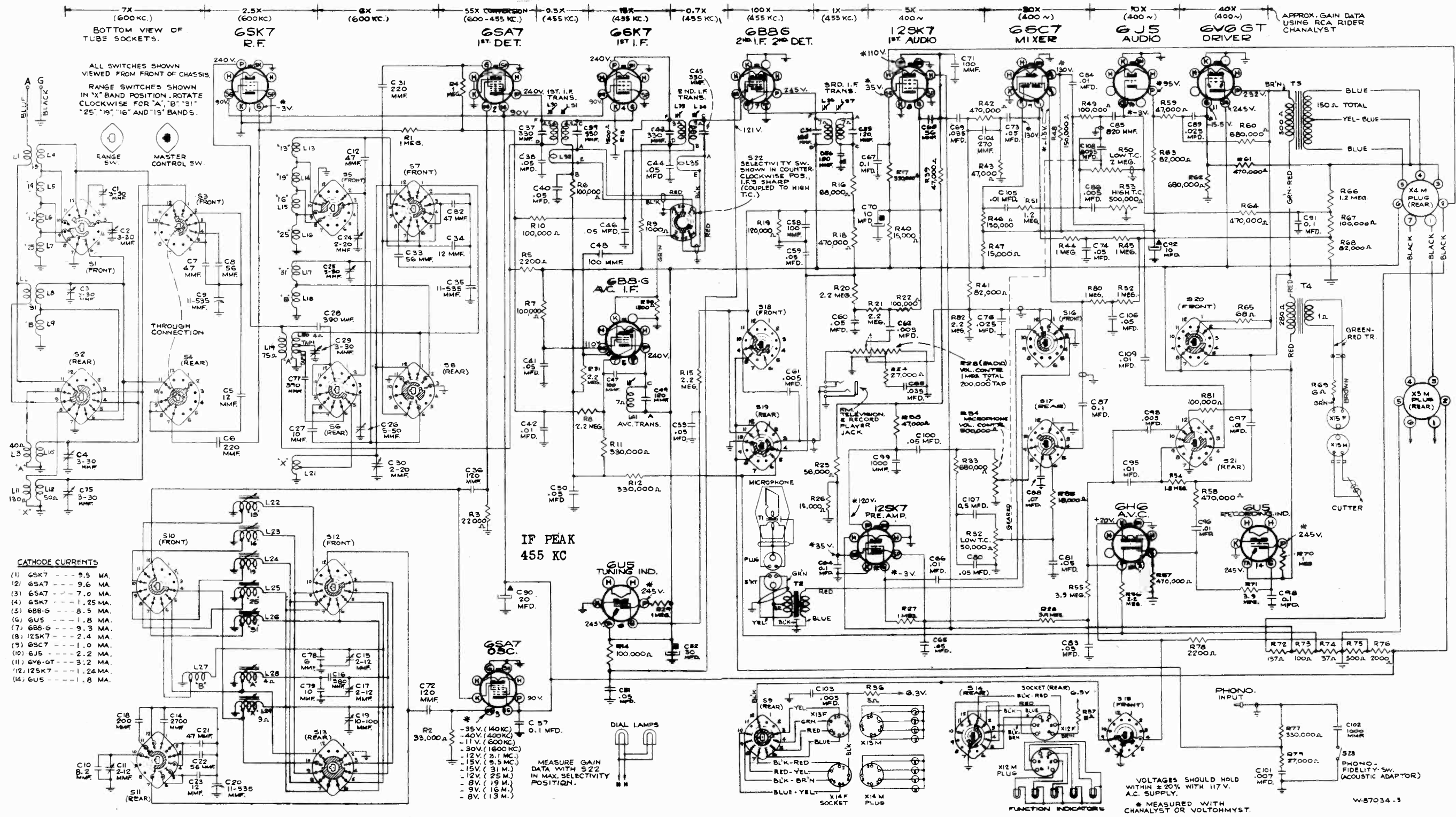
STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
36266	Clutch—Trip lever clutch—less adjusting stud (5)	.25	14186	Screw—No. 10-32x7 16 set screw for motor coupling	.06
36265	Finger—Trip lever friction finger (7)	.50	4563	Screw—Pickup lift cable adjusting screw	.04
33581	Frame—Motor 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)	.16	36527	Shell—Record separator rotating shell (27)	1.40
31151	Guide—Pickup lift cable guide (spring) (2)	.10	36524	Spindle—Turntable spindle	1.05
36390	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	14875	Switch—Pickup shorting switch	.45
36513	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.

RCA MFG. CO., INC.

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- CATHODE CURRENTS**
- (1) 6SK7 --- 9.5 MA.
  - (2) 6SA7 --- 9.6 MA.
  - (3) 6SA7 --- 7.0 MA.
  - (4) 6SK7 --- 1.25 MA.
  - (5) 6BB-6 --- 8.5 MA.
  - (6) 6J5 --- 1.8 MA.
  - (7) 6BB-6 --- 9.3 MA.
  - (8) 12SK7 --- 2.4 MA.
  - (9) 6SC7 --- 1.0 MA.
  - (10) 6J5 --- 2.2 MA.
  - (11) 6V6-GT --- 3.2 MA.
  - (12) 12SK7 --- 1.24 MA.
  - (13) 6J5 --- 1.8 MA.

IF PEAK  
455 KC

- 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





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, 35.
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 Separator Lever does not work properly.	Section 25, 23, 18.

\* Make sure record is not warped or clipped 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.

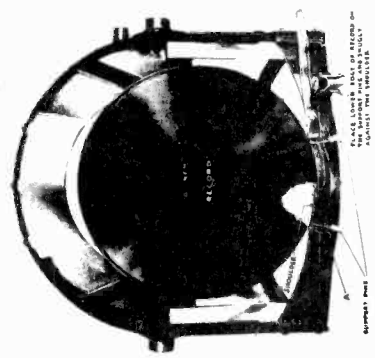
Note—When mechanism jams upon first being played after being lined up as stated in Adjustment 7. Also check to see if the Record Reverse Arm Lock No. 46 Fig. 2 is on top of the Record Reverse Arm Lock Stop No. 48 Fig. 2.

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



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 1/8" 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 the 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 3/8" 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 3/8" 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 8 1/2" 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 3/8" and 1/2" 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 3/8" or 1/2" 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 (35) (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 3/8" from the end of the pin; if it does not hit 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 pins, which extend down-

ward 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 3/8" from the edge of the record reverse arm fork (part of 4, Fig. 2) which is furthestest from the magazine, when the record reverse guide is in front of the magazine, that is, in the reversing position.

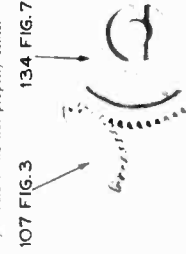
9. TO LOCATE AND ADJUST THE RECORD TRAY (29) (Fig. 2).

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 felt 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 turntable felt (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 re-etch records will not be centered over the turntable spindle. If the record tray is too low, the re-etch records will slide out over the turntable tray shoulder and not properly center.



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). That 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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### 25. TO ADJUST RECORD REPEAT CLUTCH LEVER (81) (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  $\frac{1}{16}$ ". After replacing the trip arm (37) (Fig. 8) in the switch, after the switch cover has been removed, set the turntable on the spindle, push stop trip arm (143) (Fig. 8) slowly about  $\frac{1}{4}$ " 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 movable arm of the switch should be  $\frac{1}{16}$ ". The distance between the trip arm and the switch trip guard finger should also be  $\frac{1}{16}$ ".

To adjust the clearance between the trip arm hook (37) (Fig. 8) and the movable switch arm, loosen the screw in the handle switch base, at the end nearest the tone arm. Move the switch until  $\frac{1}{16}$ " clearance is secured between the trip arm hook and the movable 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 (37) (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 re-assembly, 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

engaged 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  $\frac{1}{32}$ ".

To adjust the switch loosen the screw through the bakelite switch base at the rear of the switch assembly. After 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  $0.020$ " (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  $\frac{3}{16}$ " 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  $\frac{1}{16}$ " when moving under it.

### 24. TO ADJUST RECORD REPEAT THROW-OUT LEVER (119) (Fig. 7).

No adjustment of this part is necessary.

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 (23) (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 passes 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 at 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. 5). 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, and the needle mass 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  $\frac{1}{32}$ ". While the clutch moves from the dis-

lower part of the vertical bumper, which extends into the 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

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

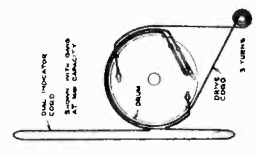
(frequencies) by zero-beating the test-oscillator against short-wave stations by known frequency.

2. Use harmonics of the standard-broadcast range of a test-oscillator, first checking the frequency setting on the 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 magneti-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 Reciprocity Lead Leads."

- Precautionary Lead Leads—**
- (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 coil, away from coil windings.
  - (3) Lead from No. 9 on S1 must be held to 3 in. length from coil windings and the bottom end of coil, away from coil windings.
  - (4) Lead from No. 8 on S2 must be held to 5 in. length.
  - (5) Lead from No. 8 on S5 must be held to 4 1/4 in. length.
  - (6) Lead from Det. coil L17 to trimmer must be held to 1 1/2 in. length.
  - (7) Lead from coil L18 to No. 2 on S8 must be held to 3 1/2 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 tube side must be positively shielded and the lead to the tube side must be positively shielded and the lead to the side of the chassis away from the R. F. coils.
  - (10) The leads to the selectivity switch must be dressed along the side of the chassis as far as possible away from oscillator 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.
  - (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 lug.
  - (15) C-14 (150 ohm) and C-72 (130 mmf) must be dressed toward A sec. trimmer, C-17.



Tuning Drive Cord Assembly

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 Duxet bushing 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.

### Alignment Procedure

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

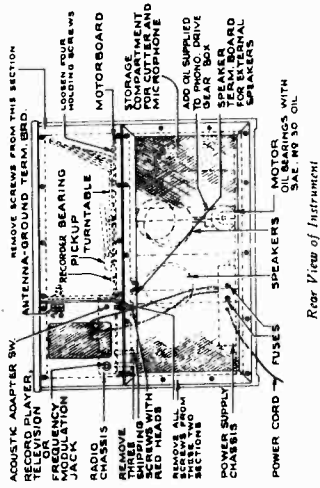
**Output Meter Alignment**—If this method is used, connect the meter across the speaker voice coil, and turn the receiver volume control to maximum.

**Tone-Oscillator**—For all alignment operations, connect the low side of the test-oscillator to the receiver chassis, and keep the test-oscillator output as low as possible to avoid a active 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 tuning condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang is determined for each alignment.

As the first step in rf 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 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**—Improve a pointer for the calibration scale by fastening a piece of wire to the gang condenser drum with a screw. The wire should be bent into a "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 magneti-core oscillator coil for each band so that the stations come in at the correct points on the dial. In exceptional cases, when 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 ranges. The accuracy of the test-oscillator may be checked by one or both of the following methods:
1. Determine the exact dial setting of the test-oscillator (for frequencies at or close to the specified alignment



Rear View of Instrument

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 marking 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 engaged punch marks or scriber, so that the same teeth can be picked 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 Duxet 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 Duxet 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 bushing, but do not tighten 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.

taken when replacing this bushing so as not to tighten the bolt enough to crush the bushing, a snug fit only is required.

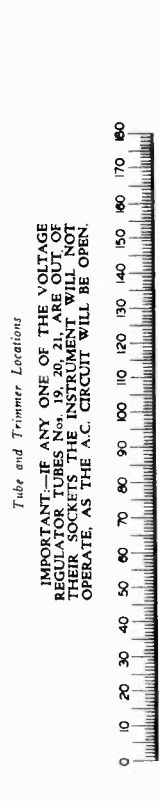
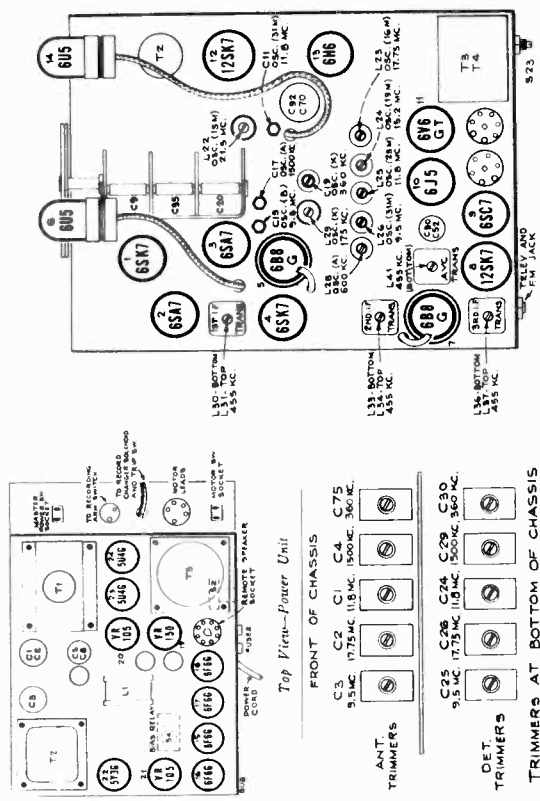
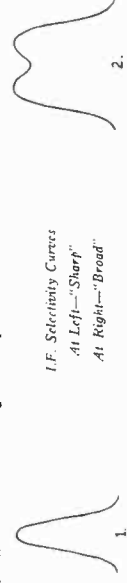
4. Remove lower half of bearing and Duxet bushing from the other end of the main cam shaft, and work the cam shaft out of the record changer. The same precaution against crushing this bushing should be taken with this one as with the one in the preceding section.
5. Remove taper pin from gear and loosen 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 burrs from the edges of the holes in the reverse cam shaft. Slide the shaft through its Duxet 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 remove 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 Duxet 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 driven gear (93) (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

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 clockwise for maximum selectivity.			
2	6B8C 2nd I-F grid in series with .01 mfd.			L37, L38 Third I-F Transformer
3	6SK7 1st I-F grid in series with .01 mfd.	455 kc	"A" Band quiet point between 550-750 kc	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 mfd.	360 kc	"X" Band 360 kc (148")	C19 (osc.)** C30 (det.) C75 (ant.)
8	Repeat steps 7 and 8.	175 kc	"Y" Band 175 kc (61")	L29 (osc.) (Rock-in)
9	Antenna Terminal in series with 200 mfd.	1,500 kc	"A" Band 1,500 kc (150.5")	C17 (osc.) C28 (det.) C4 (ant.)
10	Repeat steps 7 and 8.	600 kc	"A" Band 600 kc (28")	L28 (osc.) (Rock-in)
11	Antenna Terminal in series with 300 ohms	9.5 mc	"31M" Band 9.5 mc (21.5")	L26 (osc.)*** C26 (det.) C3 (ant.)
12	Repeat steps 10 and 11.	11.8 mc	"31M" Band 11.8 mc (168.5")	C11 (osc.)***
13	Antenna Terminal in series with 300 ohms	9.5 mc	"B" Band 9.5 mc (172.5")	C15 (osc.)***
14	Repeat steps 13 and 14 until dial tracks correctly.	11.8 mc	"25M" Band 11.8 mc (36")	L25 (osc.)*** C24 (det.) C1 (ant.)
15	Antenna Terminal in series with 300 ohms	15.2 mc	"19M" Band 15.2 mc (37")	L24 (osc.)***
16	Antenna Terminal in series with 300 ohms	17.75 mc	"16M" Band 17.75 mc (28")	L23 (osc.)*** C23 (det.) C2 (ant.)
17	Antenna Terminal in series with 300 ohms	21.5 mc	"13M" Band 21.5 mc (56")	L22 (osc.)***

NOTE 1: Connect oscilloscope to junction of R8 and C14. Also short junction of R11 and R12 to ground. Core of L29 should be approximately 3-inch out before adjusting C19.  
 \*\*\* Use minimum capacity or inductance peak.  
 \*\*\*\* Oscillator tracks above all signals except on 16 and 13 meter bands.



Tube and Trimmer Locations

IMPORTANT—IF ANY ONE OF THE VOLTAGE REGULATOR TUBES (6B8, 6B6, 6B5) OR THE THERMION TUBE INSTRUMENT WILL NOT OPERATE, AS THE A.C. CIRCUIT WILL BE OPEN.

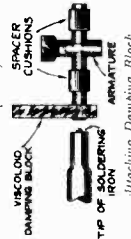
Frequency (KC)	Frequency (MC)	Tube	Trimmer
145	3.2	6B8	C26
160	3.6	6B8	C25
180	4.2	6B8	C24
225	6.0	6B8	C29
275	6.9	6B8	C30
325	7.3	6B8	C28
375	8.6	6B8	C27
400	9.0	6B8	C23
425	9.4	6B8	C22
450	9.8	6B8	C21
475	10.2	6B8	C20
500	10.6	6B8	C19
525	11.0	6B8	C18
550	11.4	6B8	C17
575	11.8	6B8	C16
600	12.2	6B8	C15
625	12.6	6B8	C14
650	13.0	6B8	C13
675	13.4	6B8	C12
700	13.8	6B8	C11
725	14.2	6B8	C10
750	14.6	6B8	C9
775	15.0	6B8	C8
800	15.4	6B8	C7
825	15.8	6B8	C6
850	16.2	6B8	C5
875	16.6	6B8	C4
900	17.0	6B8	C3
925	17.4	6B8	C2
950	17.8	6B8	C1
975	18.2	6B8	C0
1000	18.6	6B8	C-1
1025	19.0	6B8	C-2
1050	19.4	6B8	C-3
1075	19.8	6B8	C-4
1100	20.2	6B8	C-5
1125	20.6	6B8	C-6
1150	21.0	6B8	C-7
1175	21.4	6B8	C-8
1200	21.8	6B8	C-9
1225	22.2	6B8	C-10
1250	22.6	6B8	C-11
1275	23.0	6B8	C-12
1300	23.4	6B8	C-13
1325	23.8	6B8	C-14
1350	24.2	6B8	C-15
1375	24.6	6B8	C-16
1400	25.0	6B8	C-17
1425	25.4	6B8	C-18
1450	25.8	6B8	C-19
1475	26.2	6B8	C-20
1500	26.6	6B8	C-21
1525	27.0	6B8	C-22
1550	27.4	6B8	C-23
1575	27.8	6B8	C-24
1600	28.2	6B8	C-25
1625	28.6	6B8	C-26
1650	29.0	6B8	C-27
1675	29.4	6B8	C-28
1700	29.8	6B8	C-29
1725	30.2	6B8	C-30
1750	30.6	6B8	C-31
1775	31.0	6B8	C-32
1800	31.4	6B8	C-33



**Automatic Phonograph Service**

should be used when necessary for soldering the centering spring to the armature.

**Magnetizing**—Loss of magnetization will not usually occur while the pickup has received normal care because the magnet and pole pieces are held in place by the permanent magnets 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 pickup mechanism from the tone arm, and then remove the permanent magnets. Place the pickup on a flat surface and use a standard pickup magnetizer such as the RCA Stock No. 949 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 dampen the pickup armature. It is 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 shift of the armature which contacts the viscoloid is clean. Then insert the new damping block so that it occupies the same position with the original block. The hole in the viscoloid should be 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. Hear should be applied to the armature (viscoloid side) so that the damping block will fuse at the point of contact and the pickup mechanism will be held in place. A special soldering iron connected to the armature will be found 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.

**RECORD SIZE LIMIT.**

The record changer will play any 10" or 12" record of standard size. The minimum size for 12" records is 11 1/4". The minimum size for 10" records is 9 7/8". Records smaller than these limits are very apt to miss centering over the turntable spindle and in most cases are broken.

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

Always inspect the records to find 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.

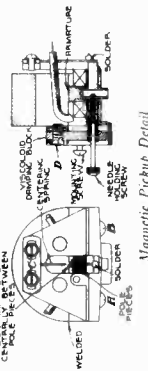
**DRIVE CLUTCH**

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 two nuts above the clutch on the drive shaft, 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.

**Magnetic Pickup**—The magnetic pickup used is of an improved design. The horseshoe magnet is rigidly welded to the pole pieces and is attached to the tone arm by means of a spring mechanism. The armature to maintain proper adjustment and 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 position to the magnet pole pieces. It is necessary to adjust the armature to maintain proper adjustment and provide a limiting effect on the movement of the armature. Service operations which may be necessary on the pickup are as follows:

**Replacing Armature**—When the armature has been disturbed, it will be necessary to remove the pickup mechanism from the tone arm for readjustment. Unsolder the two leads from the small red or nail into the armature needle hole and tighten the needle holding screw to hold the rod securely. If the armature clamping screw A and B have not been disturbed, they may be used as a guide. 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 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.



**Replacing Coil**—Whenever there is defective operation due to a shorted or open coil, it is necessary to replace the coil. Remove the pickup mechanism and terminal board. Remove screws A and B and the magnet assembly. Remove the 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 room core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder to the pickup terminal board.

**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 7.5% vaseline and 2.5% SAE 40 motor oil.

**Public Address**

**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 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 and as far from it as possible without destroying the illusion 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.

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, MI-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 (30 watt coaxial 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	16 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.







MODEL QUB  
Ch. RC-551

RCA MFG. CO., INC.

## 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.

## 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.

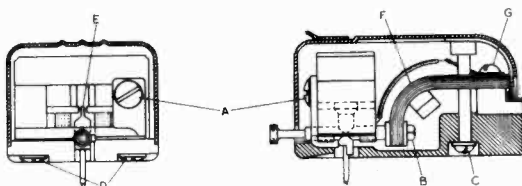
**Equalizing Groove Width:**—In order to keep the groove width cut at the inside and outside of record equal, it may be necessary to adjust the spindle bearing into which the swivel spindle of the recording arm is placed, and which is located at the right hand center of the phono board. To adjust this 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  $\frac{1}{32}$  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 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 type 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.

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.

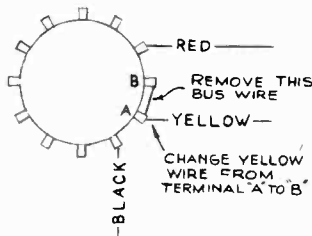
RCA MFG. CO., INC.

CHANGES  
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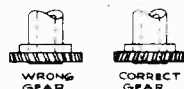
**QU5**

**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-phonograph 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-phonograph switch as shown in accompanying illustration.



Model QU5 Revision to Prevent Radio Break-Through on Phono



Winding Gear in VV2-35 and VV2-55

**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.

**7QB**

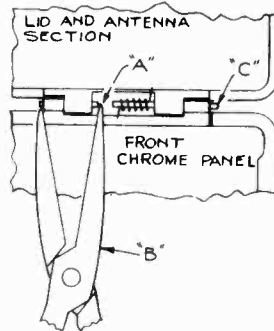
**Transformer Polarity:**

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.



Replacing Lid or Chrome Panel on Model BP-10

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.

**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.

- (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

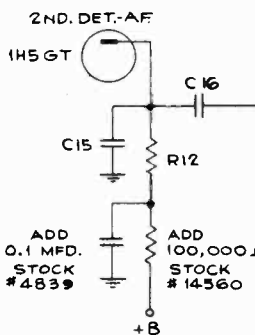
**SPEAKER ASSEMBLIES (RL-81-B1)**

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.)



"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

**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 possibility of cross-modulation.

**CHANGES  
NOTES & DATA**

**RCA MFG. CO., INC.**

**BT-40 and 94BP1 SERIES**

**Loudspeakers:**

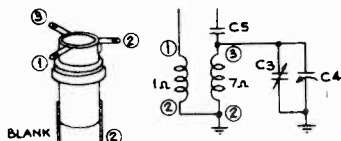
Three types of loudspeakers have been employed in Models BT-40 and 94BP1. Though of different design and using non-interchangeable cones, unfortunately, two of these speakers were identically marked. As a consequence, there has been considerable misunderstanding in ordering and in filling orders for 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.

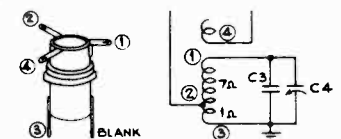
**45X-11, -12, -13**

**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. 35578 OSC. COIL  
USED IN SECOND PRODUCTION 45X11, 12, 13  
(RC 459 D AND 459 E)

*Oscillator Coil Connections in 1st and  
2nd Production 45X11, -12, -13*

**45X11, 12, 13 (2nd Prod.)**

**Circuit Revisions:**

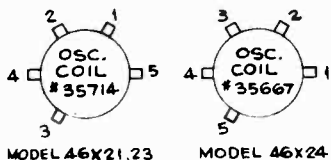
Schematic diagram for 2nd prod. 45X11, 12, and 13, given on page 233 of the 1939 RCA-Victor Service Notes Bound Volume has later revisions as follows:

- (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.



*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.	Knob—
33471	Tuning knob
33553	Tone control knob
33470	Range selector knob
33505	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.

**TOPE 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.

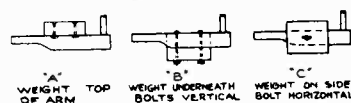
**DEPTH OF CUT**—During recording, the shavings should be directed towards the spindle and prevented from obstructing the cutter path. The thickness of these shavings should be about that of human hair, or approximately .003 inches. An additional check on depth of cut is to inspect the recording under 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.



*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 chassis with a voltmeter and not with a screwdriver.

**V-300, V-301, V-302**

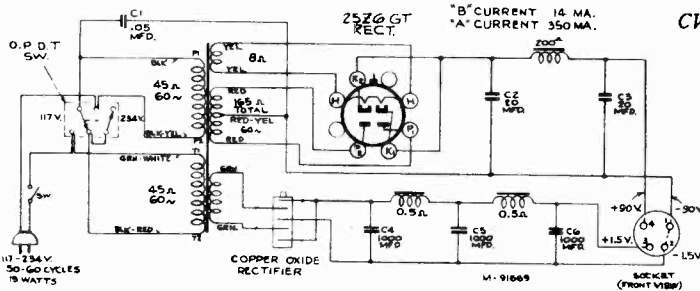
**Increasing Phono Gain:**

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 mnfd.
- The above changes have been incorporated in 2nd production.

RCA MFG. CO., INC.

CHANGES  
NOTES & DATA



**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 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.

**MODELS 16T2, 16T3, 16T4**

**2nd Production (RC-509J, H, F):**

In the 1st Production of these models, "A" hand 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, 30483. 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**

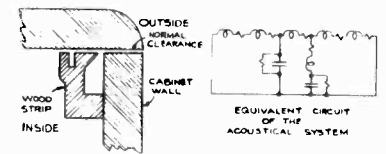
**Radio Break-Through on Phono:**

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.

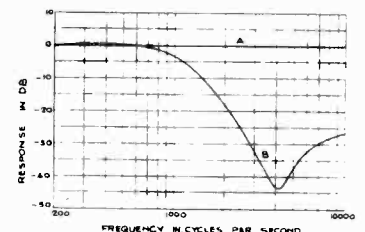
**RCA TONE GUARD**

The RCA Tone Guard is an acoustic 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

**PRICES SUBJECT TO CHANGE WITHOUT NOTICE**

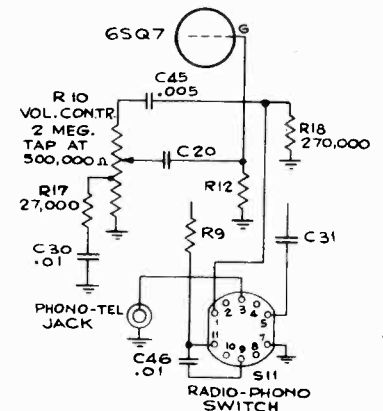
**MODEL 16T4 (2nd Prod., RC-509F)**

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
87955	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
26149	Marker—Push button markers	.25

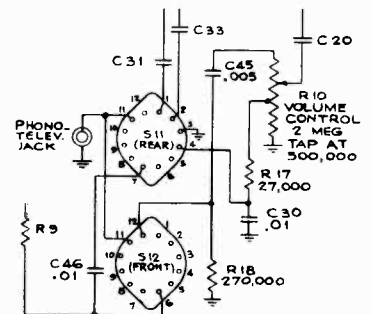
**MODEL 16T2 (2nd Prod., RC-509J)**

**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, 1/2 watt	.20
30651	Resistor—270,000 ohm, 1/2 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



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

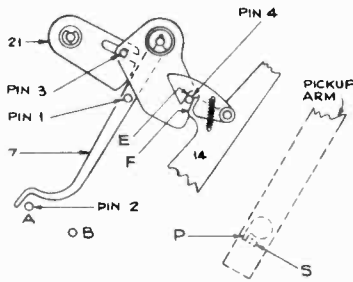
- V-100..... Change Stock No. 4109 cup to Stock No. 37933.
- V-170..... Change Stock No. 33444 output transformer to No. 31301.
- VHR-202, 207, 407... Add under "Home Recording" Assemblies:  
37969 Spring—"U" shaped spring for recorder-arm fulcrum  
37970 Screw—Slotted, hex-head, cup-point, set screw 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:

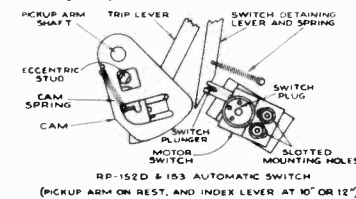
Model No.	Mech. No.	Model No.	Mech. No.
VA-15	RP152	V-300	RP-152J
V-170	RP-152	V-301	RP-153
V-200	RP-152A	V-302	RP-153
V-201	RP-152A	V-405	RP-152J
V-205	RP-152B		

RP155 mechanism is used in the home-recording models VHR-202, 207, 307, and 407.

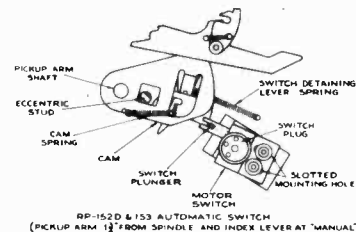
RP-152D AND RP-153

Automatic Switch Adjustment:

In RP-152D and RP-153, an automatic motor switch is mounted under the motorboard, near the pickup arm shaft.



(PICKUP ARM ON REST, AND INDEX LEVER AT 10° OR 12°)



(PICKUP ARM 1 1/2" 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 1 1/2 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 1 1/2 inches from the centerline of the turntable spindle.

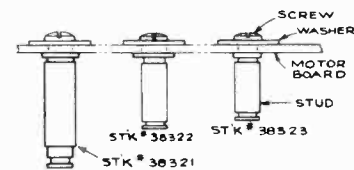
REPLACEMENT STUDS

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.



MODEL Q33  
Ch. RC-539

RCA MFG. CO., INC.

FREQUENCY RANGES

Standard Broadcast ("A" Band).....	540-1,720 kc (556-173.3)
Medium Wave ("B" Band).....	3,095.5 mc (100-31.6 m)
3 Meter Spread Band.....	9,395.7 mc (31.6-10.0)
25 Meter Spread Band.....	11,715.7 mc (25.6-19.6)
19-13 Meter Spread Band.....	15,122.5 mc (19.9-13.3 m)

INTERMEDIATE FREQUENCY..... 4.55 kc

PILOT LAMPS.....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.....	22 ohms at 400 cycles
Identification 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 1/4 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 1/4 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 1/4 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.

**Calibration Scale on Indicator-Drive-Card Drum.**—The tuning dial is fastened in the cabinet and cannot be used for reference. The tuning dial is mounted on a drum which is attached to the rear of the indicator drive-card drum. The drum 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.

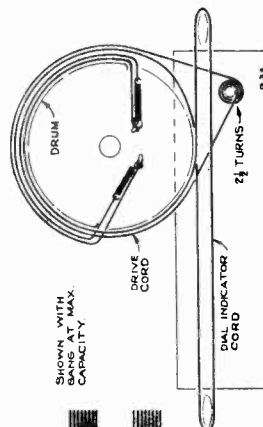
**Pointer for Calibration Scale.**—Improve a pointer for the calibration scale by fastening a piece of wire to the gang condenser frame, and bend the wire so that it points to the "0" mark on the calibration scale when the plates are fully meshed.

**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 magnet-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 factor which will produce considerable inaccuracy on the spread-band dial. 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 test oscillator by means of a crystal calibrator (RCA Stock No. 9372) or by zero-beating against standard broadcast stations.

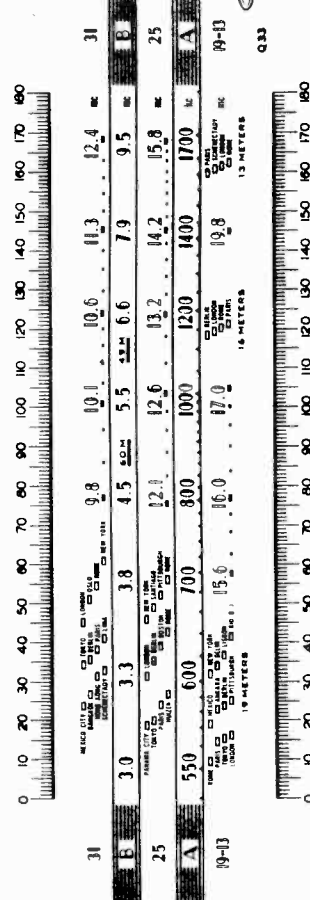
When a test oscillator is employed for spread-band alignment, a final check should be made on actual reception of short-wave stations of known frequency, and the magnet-core oscillator coil for each band should be readjusted so that the stations come in at the correct points on the dial.



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.	11.8 mc	25 meter band	11.8 mc (31.5°)	L21-L20 1st I-F transformer
3	Antenna terminal in series with 300 ohms	15.2 mc	"B" band	15.2 mc (161.7°)	L11 (osc.) C1 (ant.) C20 (det.)
4	Repeat steps 3 and 4 until aligned.	15.2 mc	19-13 meter band	15.2 mc (24°)	C15 (osc.)††
5	Antenna terminal in series with 300 ohms	9.5 mc	"A" band	9.5 mc (23.8°)	L12 (osc.)**
6	Antenna terminal in series with 300 ohms	9.5 mc	"B" band	9.5 mc (168.5°)	L10 (osc.)** C2 (ant.) C25 (det.)***
7	Antenna terminal in series with 200 mmmfd.	1,500 kc	"A" band	1,500 kc (153°)	C10 (osc.)*
8	Antenna terminal in series with 200 mmmfd.	600 kc		600 kc (30.5°)	C12 (osc.) C3 (ant.) C24 (det.)
9	Repeat steps 9 and 10.				L8 (osc.) Rock-in
10					
11					

\* 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.

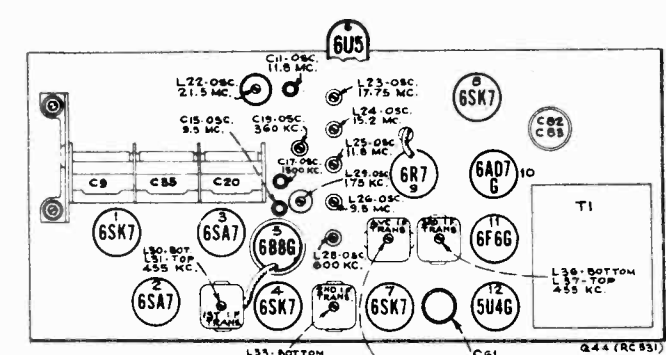
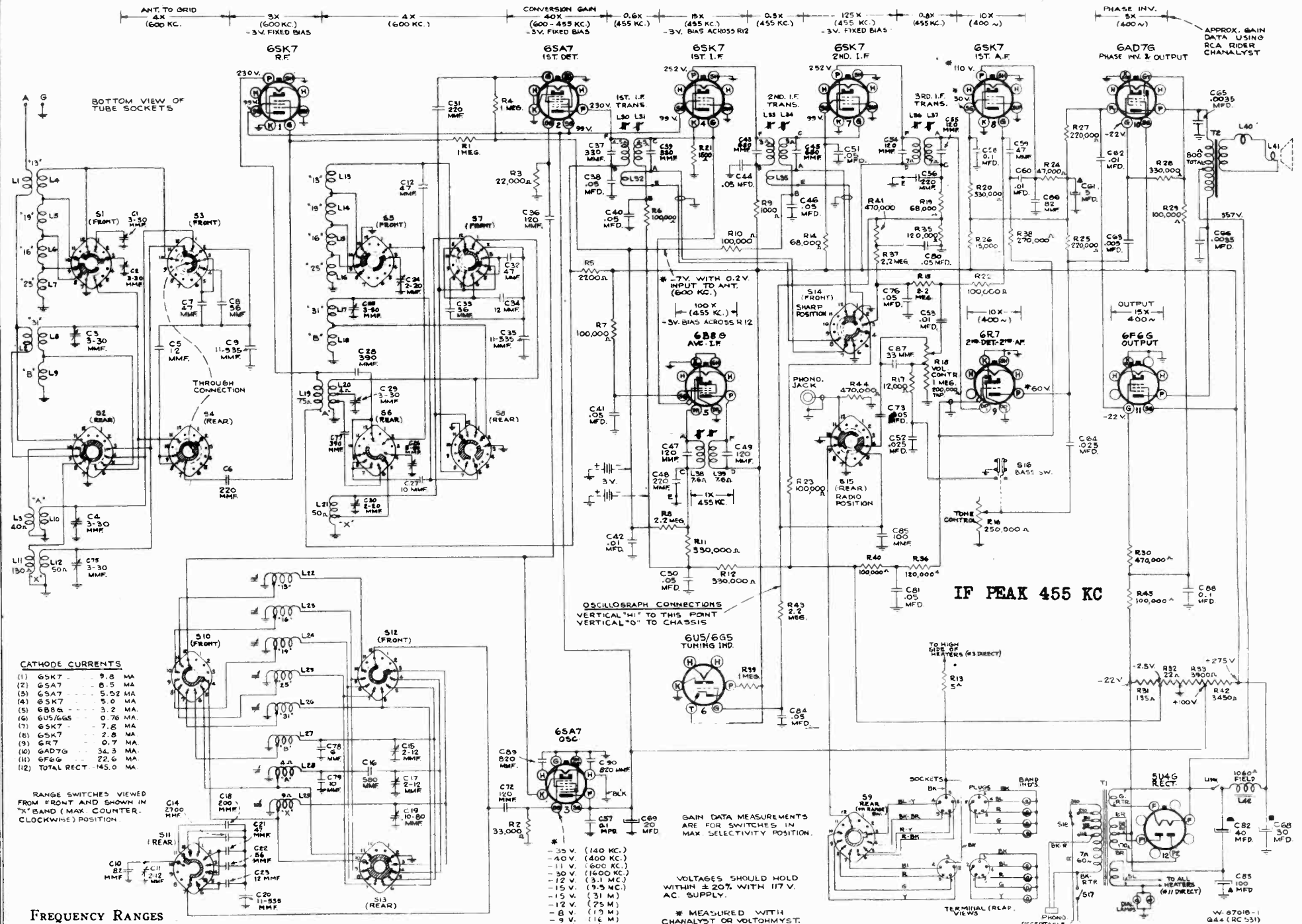


Calibration Scale

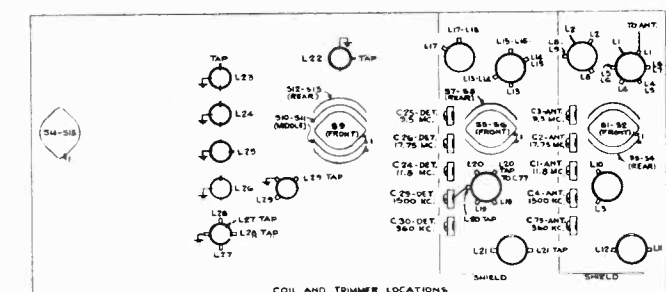
Reduced Reproduction of Receiver Dial and Corresponding 0-180° Calibration Scales  
 The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from the 300° on the calibration scale corresponds to approximately 600 kc on "A" band, etc. Read instructions under "Alignment Procedure."

RCA MFG. CO., INC.

MODEL Q44  
Ch. RC-531



Tube and Trimmer Locations (Top View)



Coil and Trimmer Locations (Bottom View)

**CATHODE CURRENTS**

(1) 6SK7	9.8 MA
(2) 6SA7	8.5 MA
(3) 6SA7	5.52 MA
(4) 6SK7	5.0 MA
(5) 6B8B	3.2 MA
(6) 6U5/6G5	0.78 MA
(7) 6SK7	0.78 MA
(8) 6SK7	2.8 MA
(9) 6GR7	0.7 MA
(10) 6AD7G	34.3 MA
(11) 6F6G	22.6 MA
(12) TOTAL RECT.	145.0 MA

RANGE SWITCHES VIEWED FROM FRONT AND SHOWN IN "X" BAND (MAX. COUNTER, CLOCKWISE) POSITION.

**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 m)

INTERMEDIATE FREQUENCY ..... 455 kc

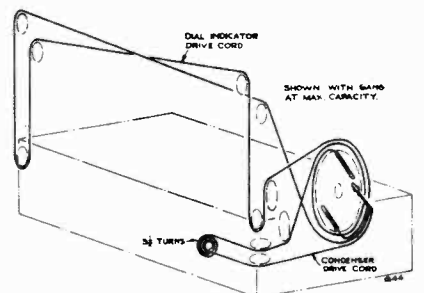
PILOT LAMPS ..... 10 Type No. 51 6-8 volts, 0.2 amps.

**POWER SUPPLY RATING**

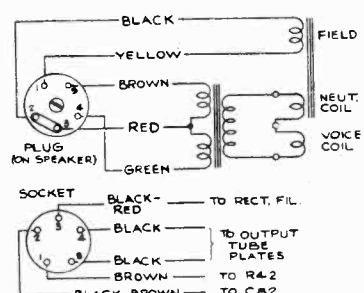
105-125 volts, 50-60 cycles	125 watts
105-125 volts, 25-60 cycles	125 watts
100-130, 140-160, 195-250 volts, 40-60 cycles	125 watts

**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



**Precautionary Lead Dress:—**

- All oscillator leads should be kept as short as possible.
- 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.
- 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.
- The following leads should be held to length  
from No. 8 on S1  
from No. 5 on S2  
from No. 8 on S5
- Lead from No. 4 on S15 must be dressed along the chassis away from all heater leads.
- Lead from No. 5 on S15: well away from all heater leads.
- The diode lead and the ground lead from the third I-F must be twisted.
- The diode lead and the ground lead from A.V.C. I-F transformer must be twisted.
- The lead on No. 9 of S15 should be away from the volume control and first audio tube.
- 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.
- Green, blue and double enamel leads from the oscillator coil nearest the rear apron must bear tightly against each other.
- The oscillator grid coupling condenser must bear tightly against the styrol; the sprayed mica must likewise bear on the styrol from the opposite side.
- The long ground lead from the oscillator heater must be kept away from all condensers, resistors, and leads to R-F tubes.



RCA MFG. CO., INC

MODEL Q44  
Ch. RC-531

**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.**—Improve 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.

MC	MC	MC	MC	MC	MC	MC	MC	MC	MC
400	1700	9.4	11.8	15.0	18.7	18.6	22.6		
350	1400	7.9	11.0	14.0	17.5	18.2	22.1		
300	1200	6.8	10.5	13.1	16.6	18.0	21.8		
250	1000	5.6	10.1	12.6	16.0	17.9	21.6		
200	800	4.5	9.6	12.1	15.5	17.4	21.4		
175	700	3.9	9.1	11.6	15.0	16.9	21.2		
150	600	3.1	8.6	11.1	14.5	16.4	21.0		
140	550	3.1	8.1	10.6	14.0	15.9	20.8		

**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 magnetic-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:



I.F. Selectivity Curves  
At Left—"Sharp"  
At Right—"Broad"

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.		"A" Band Quiet point between 360-750 kc	L37, L38 Third I-F Transformer	
3	6SK7 1st I-F grid in series with .01 mfd.	465 kc		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, L38 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 560-750 kc	L39, L38 AVC Transformer*	
7	Antenna Terminal in series with 200 mmfd.	360 kc	"X" Band 360 kc (149°)	C18 (osc.)** C30 (det.) C75 (ant.)	
8	Repeat steps 7 and 8.	175 kc	"X" Band 175 kc (61°)	L29 (osc.) (Rock-in)	
10	Antenna Terminal in series with 200 mmfd.	1,600 kc	"A" Band 1,500 kc (150.5°)	C17 (osc.) C29 (det.) C4 (ant.)	
11	Repeat steps 10 and 11.	600 kc	"A" Band 600 kc (28°)	L28 (osc.) (Rock-in)	
13	Antenna Terminal in series with 300 ohms	9.5 mc	"91M" Band 9.5 mc (21.5°)	L29 (osc.)*** C28 (det.) C3 (ant.)	
14		11.8 mc	"91M" Band 11.8 mc (188.5°)	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.)*** C23 (det.) C2 (ant.)	
20		21.5 mc	"13M" Band 21.5 mc (26°)	L22 (osc.)****	

\* Connect oscilloscope to lug C of A.V.C. transformer.

\*\* Core of L29 should be approximately 1/8 inch out before adjusting C10.

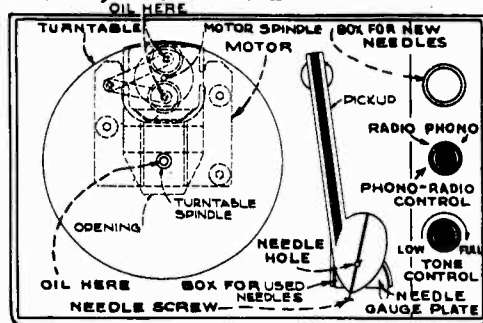
\*\*\* Use minimum capacity or inductance peak.

\*\*\*\* Use maximum inductance peak.

NOTE: Oscillator tracks above all signals except on 16 and 13 meter bands.

MODEL Q26, Ch. RC-507J  
MODEL QU3C, Ch. RC-507F  
MODEL QU3M, Ch. RC-507H

RCA MFG. CO., INC.



Top View Model QU3C

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.

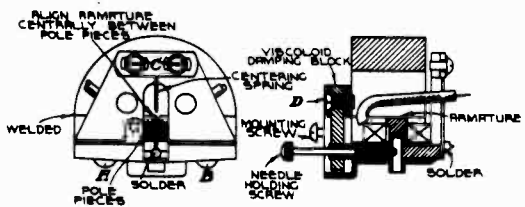
**Crystal Pickup:**

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.

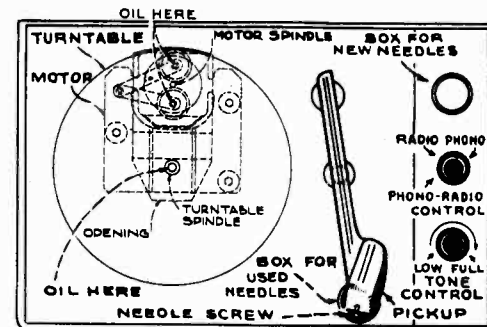
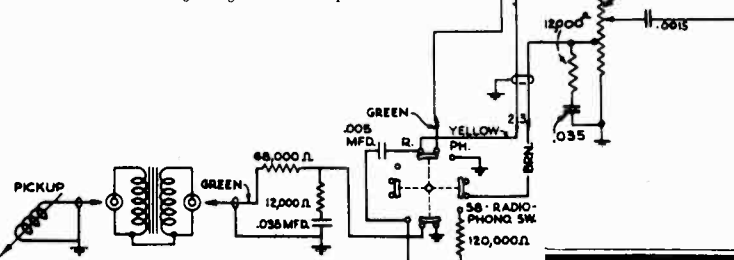


Magnetic Pickup Detail

**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

Note: 180,000 ohm resistor substituted for 270,000 ohm crystal filter resistor on some models.

Schematic Showing Magnetic Pickup Connections

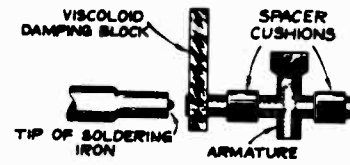


Top View Model QU3M

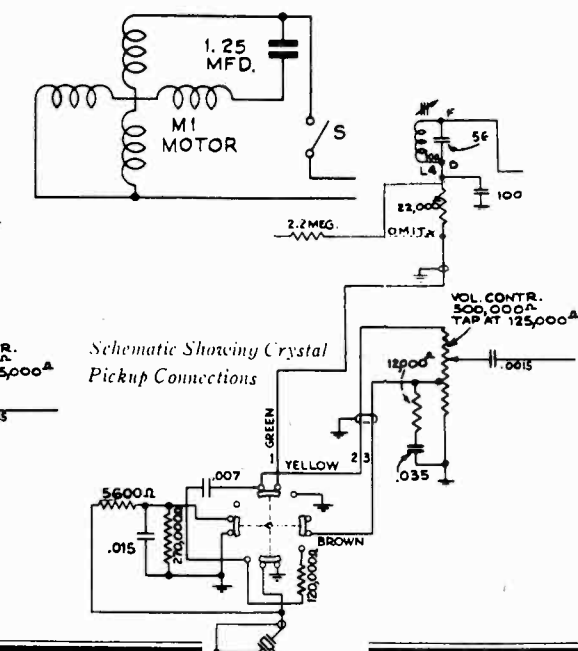
described above, then re-assemble the remainder of the unit. Only rosin core solder should be used for soldering the coil leads and pickup leads to the pickup terminal board. This same type of solder should be used when necessary for soldering the centering spring to the armature.

**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 re-magnetize 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



Schematic Showing Crystal Pickup Connections

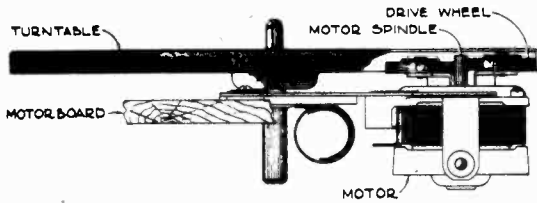


MODEL Q26, Ch. RC-507J  
 MODEL QU3C, Ch. RC-507F  
 MODEL QU3M, Ch. RC-507H

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.

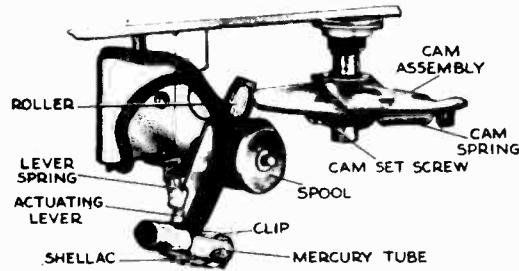
To determine the corresponding frequency for any setting of the calibration scales, refer to the accompanying drawing which shows the dial with 0-180° calibration scales drawn at top and bottom.

**Pointer for Calibration Scale.—**Improve 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.

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 1 1/2 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 loud-speaker cement.

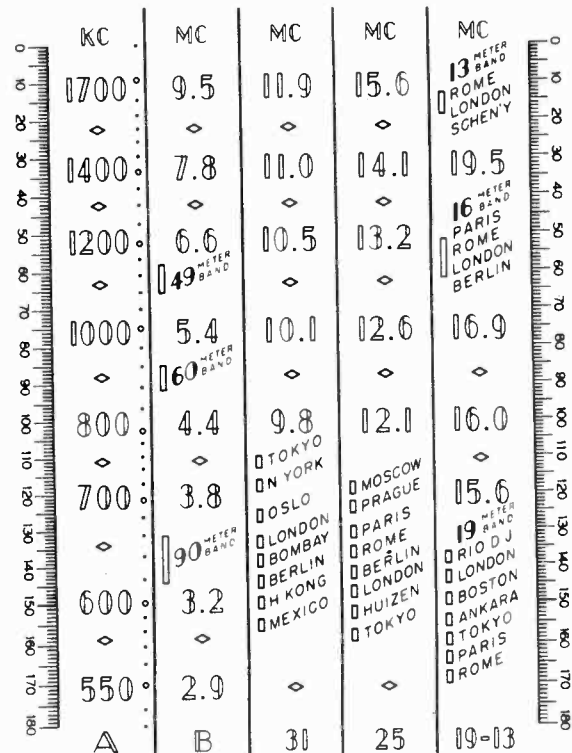
Steps	Connect the high side of the test-osc. to—	Tune test-osc. to—	Range switch	Turn radio dial to—	Adjust the following for max. peak output
1	I-F grid in series with .01 mfd.	455 kc	A	Quiet Point near 180°	L3 and L4 2nd I-F Trans.
2	1st Det. grid in series with .01 mfd.				L1 and L2 1st I-F Trans.
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	10-13M	156°	L6 (osc.)**
7	9.5 mc	31M	156°	L7 (osc.)**	C3 (ant.)
8					9.5 mc
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 1429 mc (29°) where a weaker signal should be received.

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

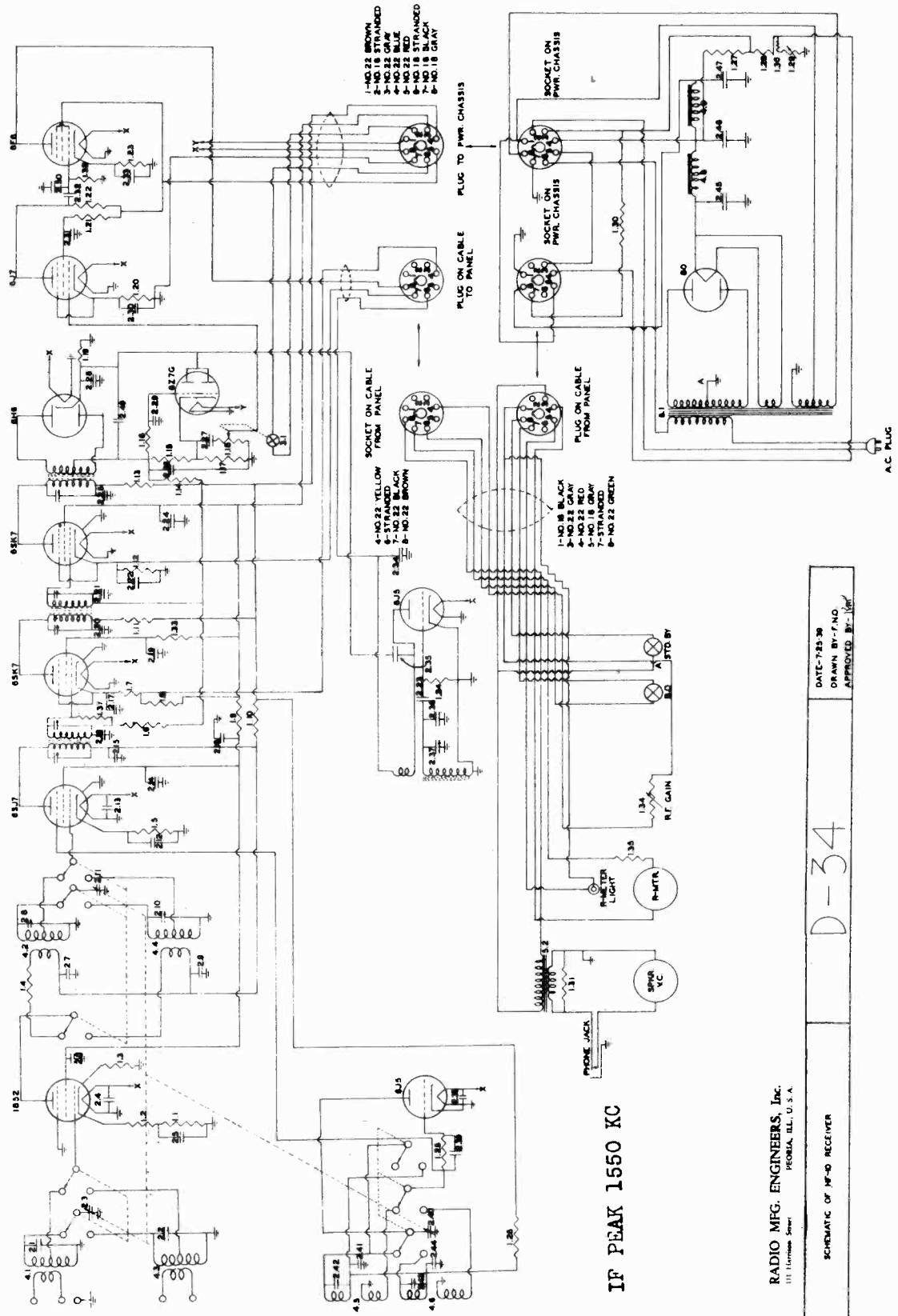
\*\*\* Peak at minimum capacity if two peaks can be obtained.

NOTE: Oscillator tracks above signal on all bands.



RADIO MFG. ENGINEERS, INC.

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.

DATE-7-25-38  
DRAWN BY-F.N.O.  
APPROVED BY-J.H.P.

D-34

SCHEMATIC OF HF-10 RECEIVER

RADIO MFG. ENGINEERS, INC.  
111 Harrison Street  
PEORIA, ILL., U. S. A.

MODELS HF-10  
HF-30X

RADIO MFG. ENGINEERS, INC.

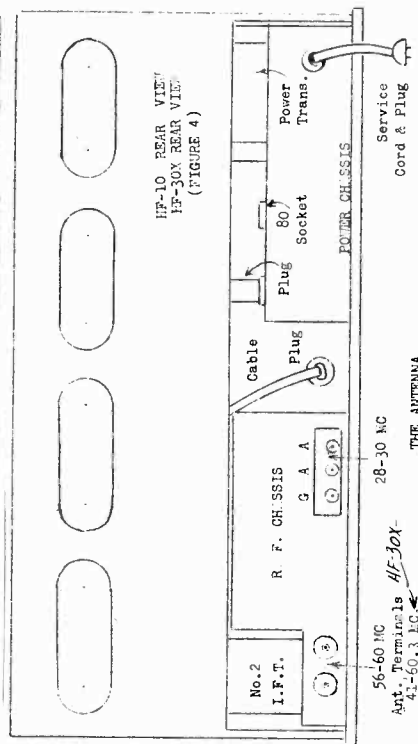
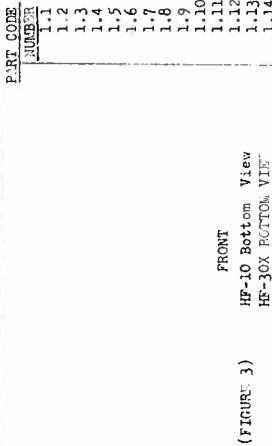
PART SPECIFICATION

- |      |   |     |   |
|------|---|-----|---|
| 2.14 | 400mfd mica condenser                     | 3.1 | Line switch   |
| 2.15 | .01mfd paper condenser                    | 3.2 | AVC-OFF switch in tandem with manual gain control           |
| 2.16 | .01mfd paper condenser                    | 3.3 | Combination beat oscillator and stand-by switch             |
| 2.17 | .01mfd paper condenser                    | nd  | 3.4   |
| 2.18 | .01mfd paper condenser                    | 4.1 | 10 meter RF coil  |
| 2.19 | .01mfd paper condenser                    | 4.2 | 10 meter detector grid coil                                 |
| 2.20 | .01mfd paper condenser                    | 4.3 | 5 meter RF coil   |
| 2.21 | .01mfd paper condenser                    | 4.4 | 5 meter detector grid coil                                  |
| 2.22 | .01mfd paper condenser                    | 4.5 | 10 meter oscillator coil                                    |
| 2.23 | .01mfd paper condenser                    | 4.6 | 5 meter oscillator plate and grid coil                      |
| 2.24 | 100mfd mica condenser                     | 4.7 | Beat oscillator grid coil                                   |
| 2.25 | .01mfd paper condenser                    | 4.8 | 25 henry filter choke                                       |
| 2.26 | .01mfd paper condenser                    | 4.9 | .30 henry filter choke                                      |
| 2.27 | 50mfd mica condenser                      |     | I. F. T. Intermediate frequency transformer tuned to 1550KC |
| 2.28 | 100mfd mica condenser                     |     |   |
| 2.29 | .01mfd paper condenser                    |     |   |
| 2.30 | 20mfd 25 volt electrolytic                |     |   |
| 2.31 | .01mfd paper condenser                    |     |   |
| 2.32 | .01mfd paper condenser                    |     |   |
| 2.33 | 20mfd 25 volt electrolytic                |     |   |
| 2.34 | .002mfd paper condenser                   |     |   |
| 2.35 | 15mfd coupling condenser                  |     |   |
| 2.36 | 100mfd mica condenser                     |     |   |
| 2.37 | 70mfd adjustable mica condenser           |     |   |
| 2.38 | 400mfd mica condenser                     |     |   |
| 2.39 | 100mfd ceramic condenser                  |     |   |
| 2.40 | Rear section of 3 gang variable condenser |     |   |
| 2.41 | 1500mfd ceramic condenser                 |     |   |
| 2.42 | 15mfd adjustable air condenser            |     |   |
| 2.43 | 15mfd adjustable air condenser            |     |   |
| 2.44 | 500mfd ceramic condenser                  |     |   |
| 2.45 | 10mfd 450 volt electrolytic               |     |   |
| 2.46 | 15mfd 450 volt electrolytic               |     |   |
| 2.47 | 15mfd 450 volt electrolytic               |     |   |
| 2.48 | 250mfd mica condenser                     |     |   |
| 2.49 | 400mfd mica condenser                     |     |   |
| 2.50 | 400mfd mica condenser                     |     |   |

- |      |   |      |  |
|------|---|------|--|
| 1.1  | 200 ohm, 1/3 watt insulated resistor    | 2.1  | 20mfd adjustable mica padding cond     |
| 1.2  | 35 ohm, 1/3 watt insulated resistor     | 2.2  | 20mfd adjustable padding condenser     |
| 1.3  | 35 ohm 1/3 watt insulated resistor      | 2.3  | Number one section of 3 gang variable  |
| 1.4  | 5000 ohm 1/3 watt insulated resistor    | 2.4  | 400mfd mica condenser                  |
| 1.5  | 5000 ohm 1/3 watt insulated resistor    | 2.5  | 400mfd mica condenser                  |
| 1.6  | 250,000 ohm 1/3 watt insulated resistor | 2.6  | 400mfd mica condenser                  |
| 1.7  | 300 ohm 1/3 watt insulated resistor     | 2.7  | 400mfd mica condenser                  |
| 1.8  | 20,000 ohm 1 watt resistor              | 2.8  | 20mfd adjustable mica padding cond     |
| 1.9  | 2,000 ohm 1/3 watt insulated resistor   | 2.9  | 400mfd mica condenser                  |
| 1.10 | 2,000 ohm 1/3 watt insulated resistor   | 2.10 | 20mfd adjustable mica padding cond     |
| 1.11 | 2,000 ohm 1/3 watt insulated resistor   | 2.11 | 20mfd adjustable padding condenser     |
| 1.12 | 300 ohm 1/3 watt insulated resistor     | 2.12 | Center section of 3 gang variable cond |
| 1.13 | 2,000 ohm 1/3 watt insulated resistor   | 2.13 | 400mfd mica condenser                  |
| 1.14 | 1 Megohm 1/3 watt insulated resistor    | 2.14 | 400mfd mica condenser                  |
| 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   |      |  |

FOR MODEL HF-10 ONLY - SEE SCHEMATIC  
OF MODEL HF-30X FOR HF-30X PARTS.

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 horizontal and the local noise level. 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 smaller types of radiation.



Antennas 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 antennas 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.

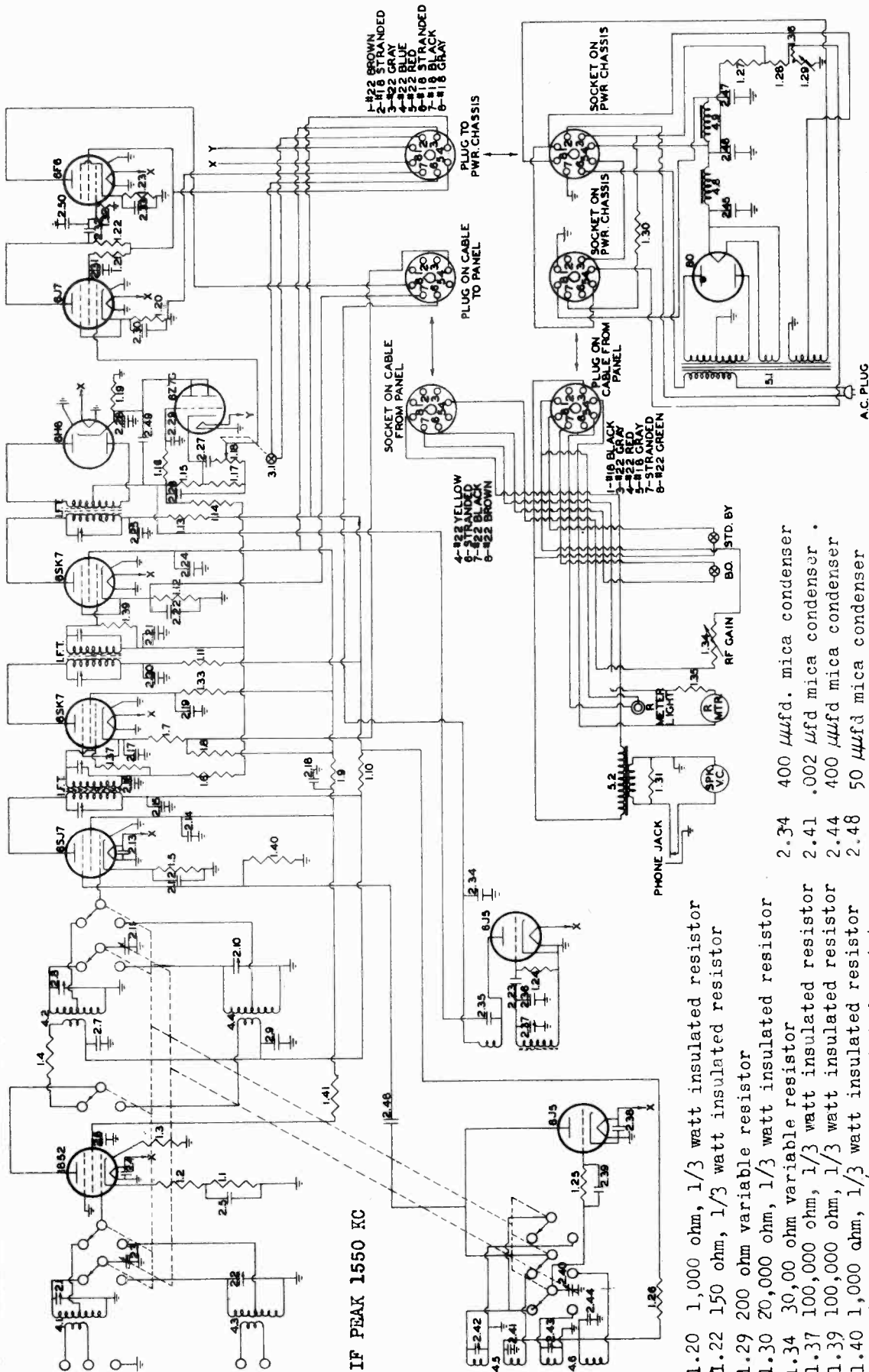
The simplest type of antenna is what is called a half-wave doublet, which is an antenna suspended either vertically or horizontally, having an over-all length of approximately one-half wave length--the wave length being the middle wave length of the frequency range to which the tuning is adjusted. This means that the antenna for the 5 meter band will be approximately 6 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 KC".

RADIO MFG. ENGINEERS, INC.

MODEL HF-30X



1-#22 BROWN  
 2-#18 STRANDED  
 3-#22 GRAY  
 4-#22 BLUE  
 5-#22 RED  
 6-#18 STRANDED  
 7-#18 BLACK  
 8-#18 GRAY

4-#22 YELLOW  
 7-#22 BLACK  
 8-#22 BROWN

1-#18 BLACK  
 3-#22 GRAY  
 4-#22 RED  
 7-STRANDED  
 8-#22 GREEN

- 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  $\mu$ fd. mica condenser
- 2.41 .002  $\mu$ fd mica condenser
- 2.44 400  $\mu$ fd mica condenser
- 2.48 50  $\mu$ fd 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

DATE-11-2-39  
 DRAWN BY-F.N.O.  
 APPROVED BY-

MODELS HF-10  
HF-30X

RADIO MFG. ENGINEERS, INC.

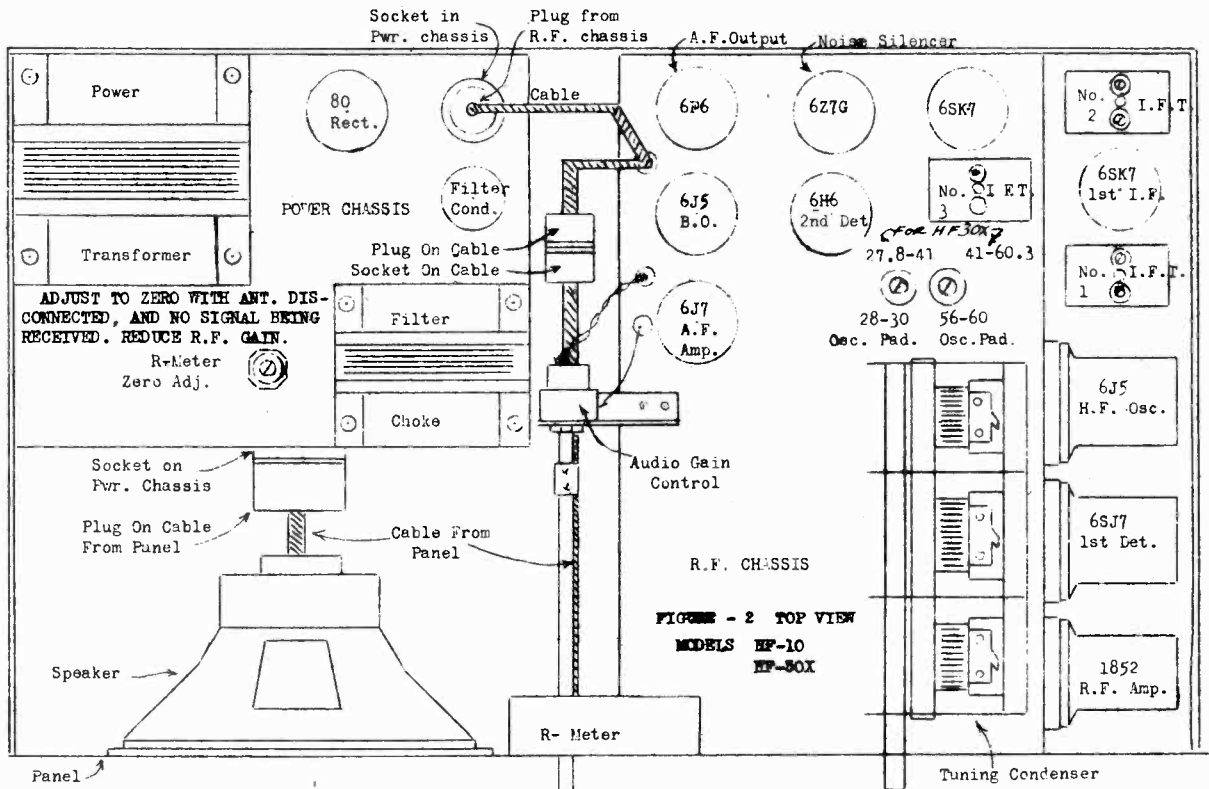


FIGURE - 2 TOP VIEW  
MODELS HF-10  
HF-30X

**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 chassis are easily removed from the bottom of the housing, permitting removal of each of the chassis. 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 accessible through the bottom of the cabinet of the receiver.

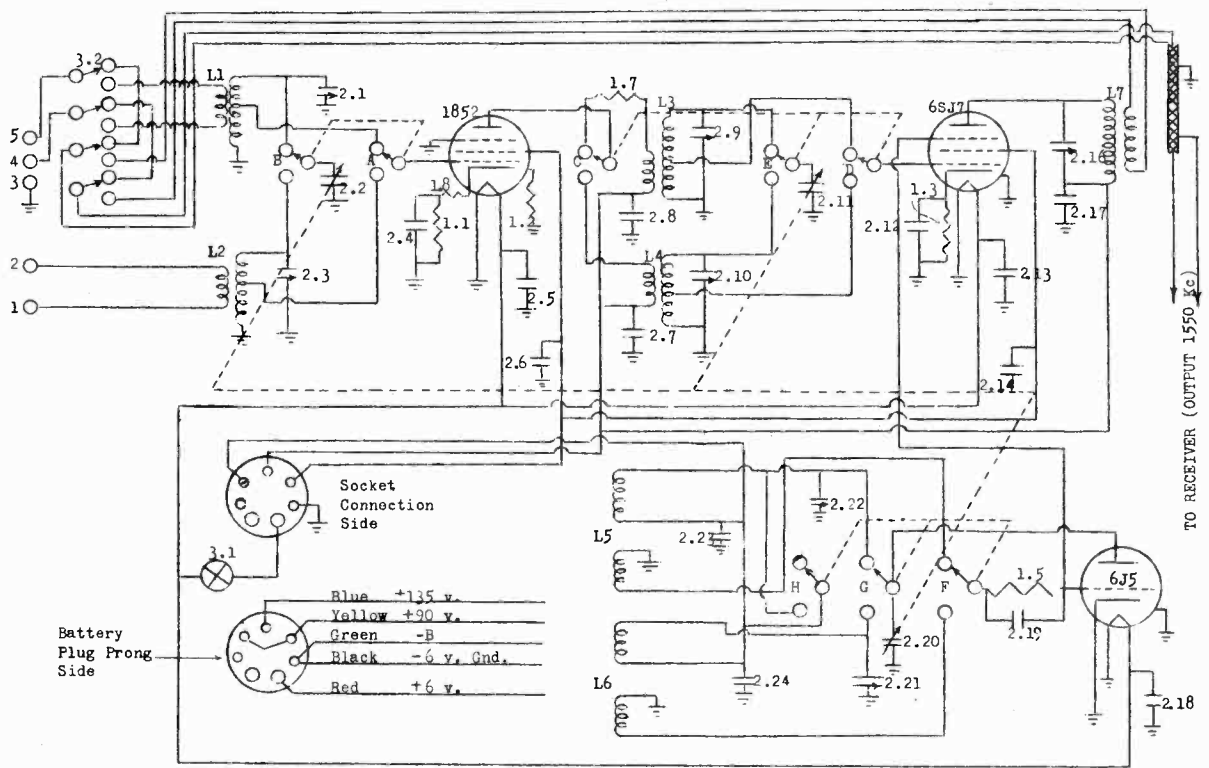
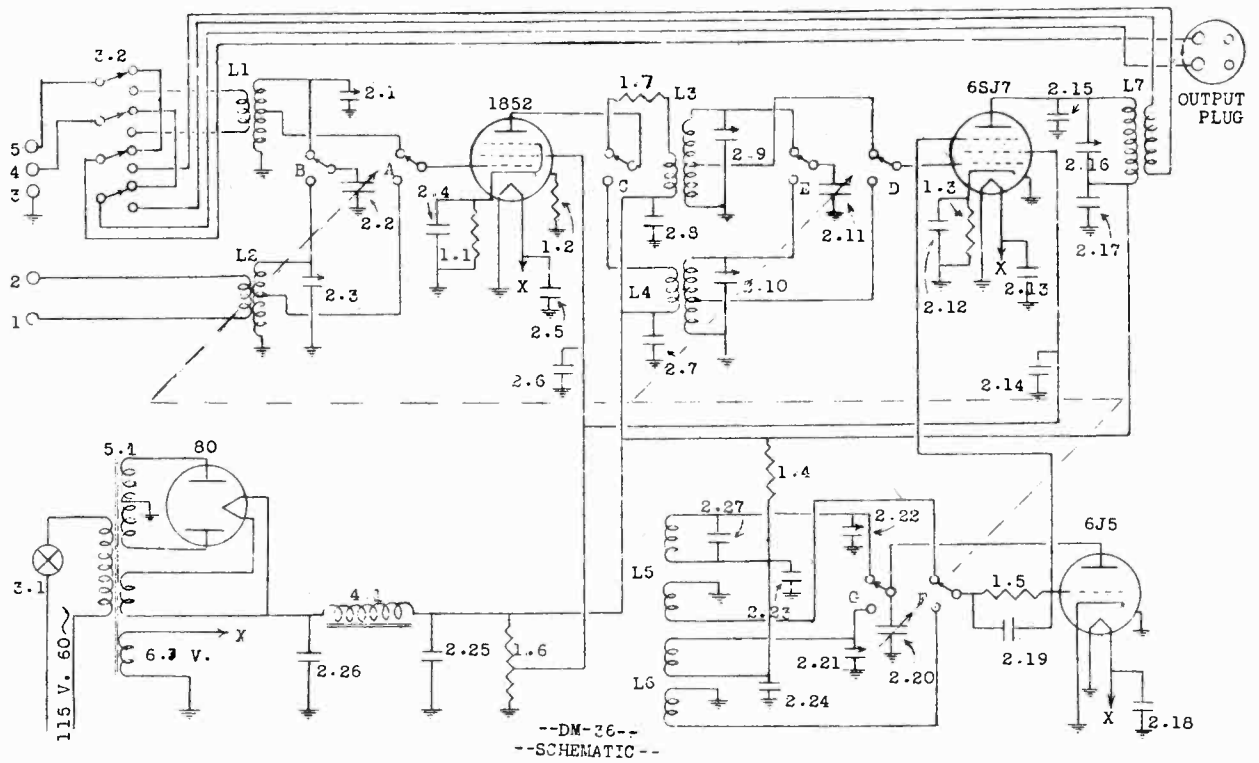
For best alignment of the beat oscillator, tune in a station without the beat oscillator on--that is, with the Stand-by Control Switch thrown to the "PHONE" position until the meter reading is an absolute maximum. Under these conditions, place the Stand-by Switch in the "C.W." position and adjust the beat oscillator, through the access hole in the bottom of the cabinet, to any pitch desired.

RADIO MFG. ENGINEERS, INC.

MODELS DM-36 (Late)

DM-36A

Band Expanders





MODEL DM-30X  
 MODELS DM-36 (Late)  
 DM-36A

RADIO MFG. ENGINEERS, INC.

PARTS LIST FOR THE RME MODEL DM-36 BAND EXI

PART CODE	NUM.B.R	SPECIFICATION
1.1		200 ohms, 1/3 watt resistor
1.2		35 ohms, 1/3 watt resistor
1.3		5000 ohms, 1/3 watt resistor
*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		70 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
1, B, C, D		Band Switch
E, F, G, †(†)		
*4.1		Choke, 30 henries
*5.1		Power transformer
L1		10 M. R.F. coil
L2		5 M. R.F. coil
L3		10 M. Det. coil
L4		5 M. Det. coil
L5		10 M. Osc. coil
L6		5 M. Osc. coil
†L7		Output Coupling Transformer (10 M.C.)
		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.

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.

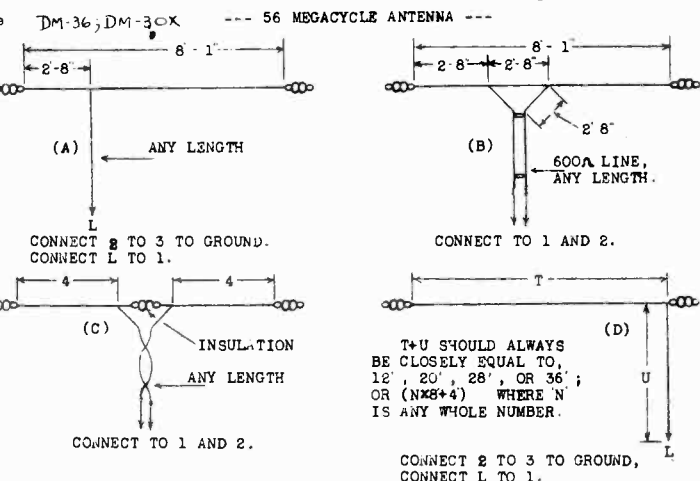
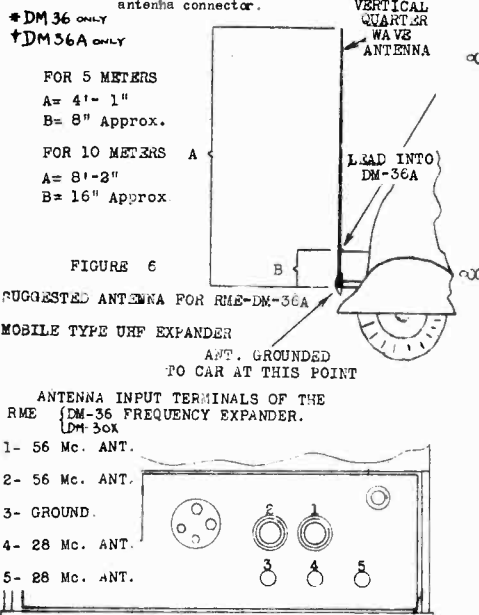
ANTENNAE

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.

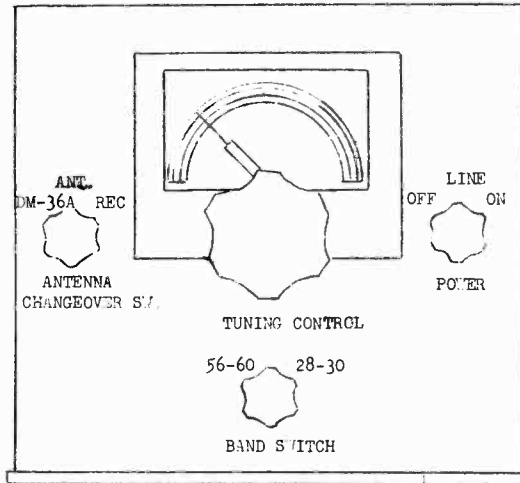
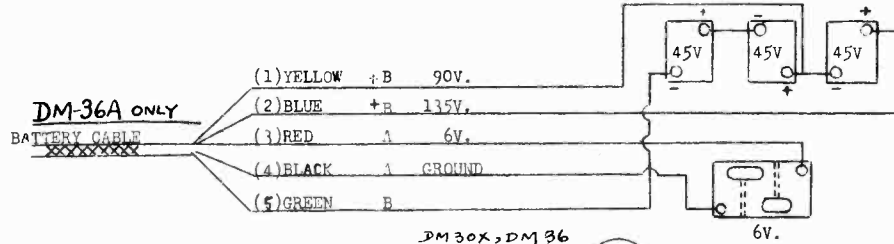
An antenna changeover switch is provided on the DM-36 for connecting the antenna used on the triple terminal strip (See Fig. 2) to either the DM-36 in combination with the associated receiver or directly to the receiver with which the instrument is associated. This is accomplished by setting the switch 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 (preferably horizontally) in space and fed to the receiver by connection to antenna terminal #2, 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).

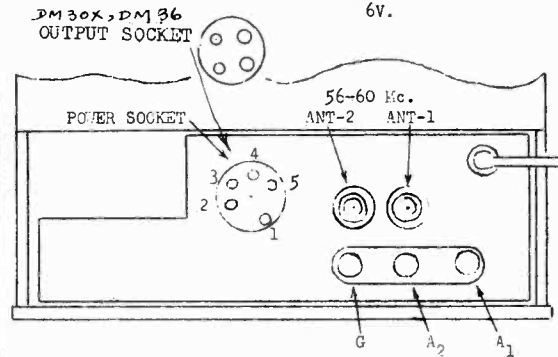


RADIO MFG. ENGINEERS, INC.

MODELS DM-30X  
MODELS DM-36 (Late)  
DM-36A



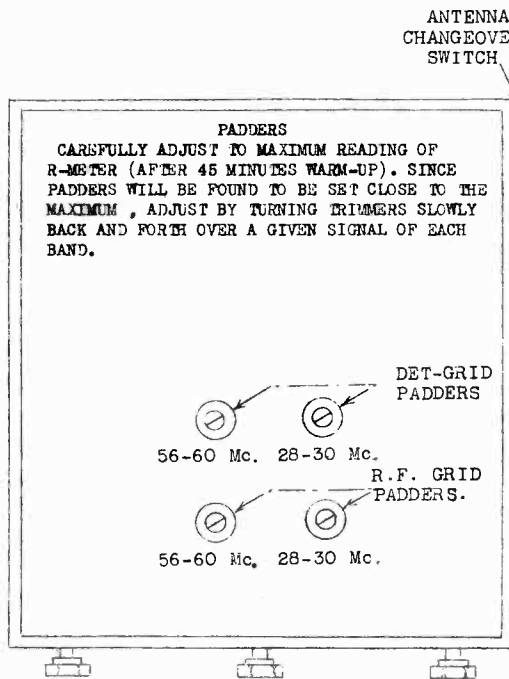
FRONT VIEW  
--FIG. 1--



IF SINGLE WIRE IS USED ON BAND 28-30 Mc. CONNECT ANTENNA LEAD TO A<sub>1</sub>, AND GROUND A<sub>2</sub> TO TERMINAL G.

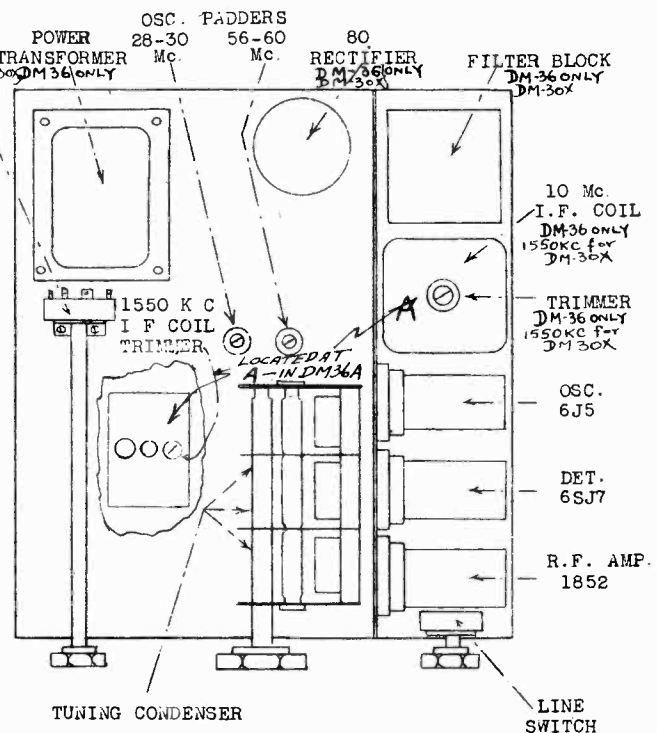
IF SINGLE WIRE IS USED ON BAND 56-60 Mc. CONNECT ANTENNA LEAD TO ANT-1, AND GROUND ANT-2 TO TERMINAL 'G' DIRECTLY BELOW IT.

REAR VIEW  
--FIG. 2--



---FIG. 3---  
BOTTOM VIEW

--DM-36A  
--DM-36--



--FIG. 4--  
TOP VIEW

#### 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 to 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, 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 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 sequence 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

#### 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 high 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

## RADIO MFG. ENGINEERS, INC.

MODEL RME-70

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 counter-clockwise 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 band-spread 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 2.60. 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 2.45, 2.43, 2.47, 2.4, 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 2.45, 2.49, 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,   |
| Band 5: | 13 megacycles, 15 megacycles, 17 megacycles. |
| Band 6: | 14 megacycles, 15 megacycles, 17 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

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 readings, 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 counter-clockwise 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.

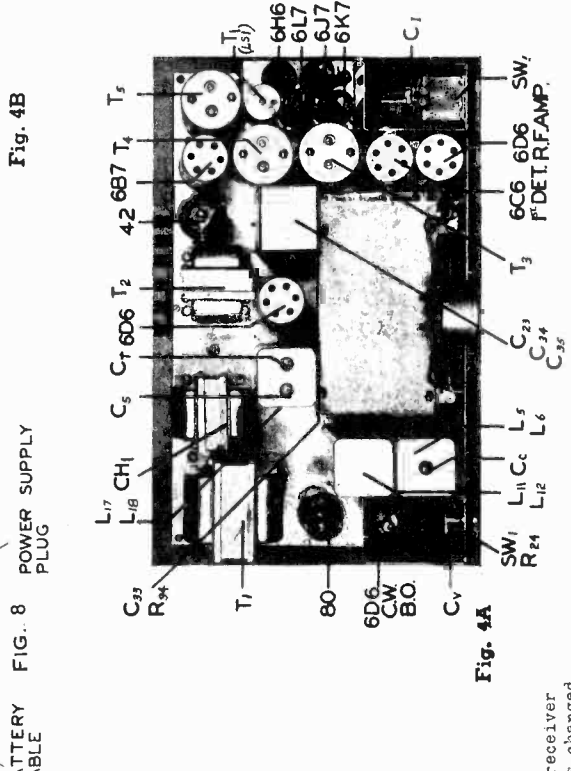
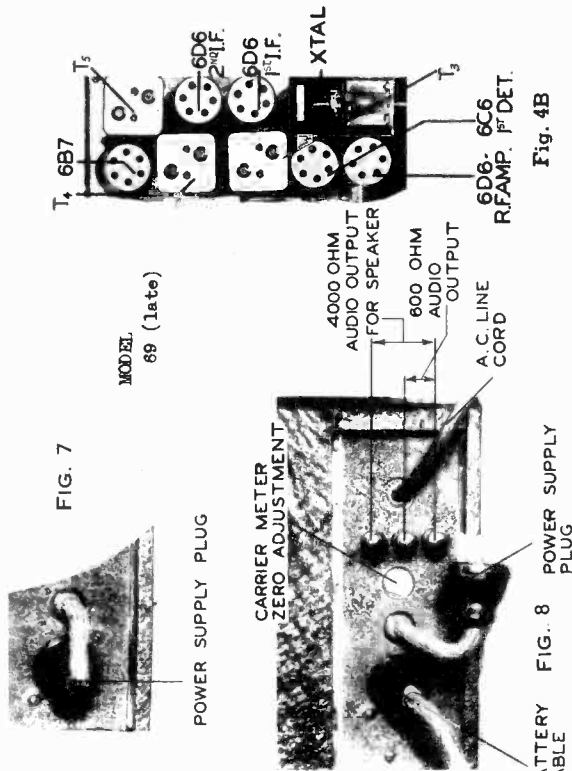
When the crystal filter is being used the phasing function is provided by the variation in capacity of a phasing condenser controlled by the crystal phasing knob. Usually this is indicated by minimum noise or background response when the receiver is tuned off of the signal and the crystal is being used. 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 F.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 in calibration can be made by following the suggestions outlined.

MODEL RME-69 (Late) RADIO MFG. ENGINEERS, INC.  
 MODEL RME-69 (All Models)  
 MODEL RME-70



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.

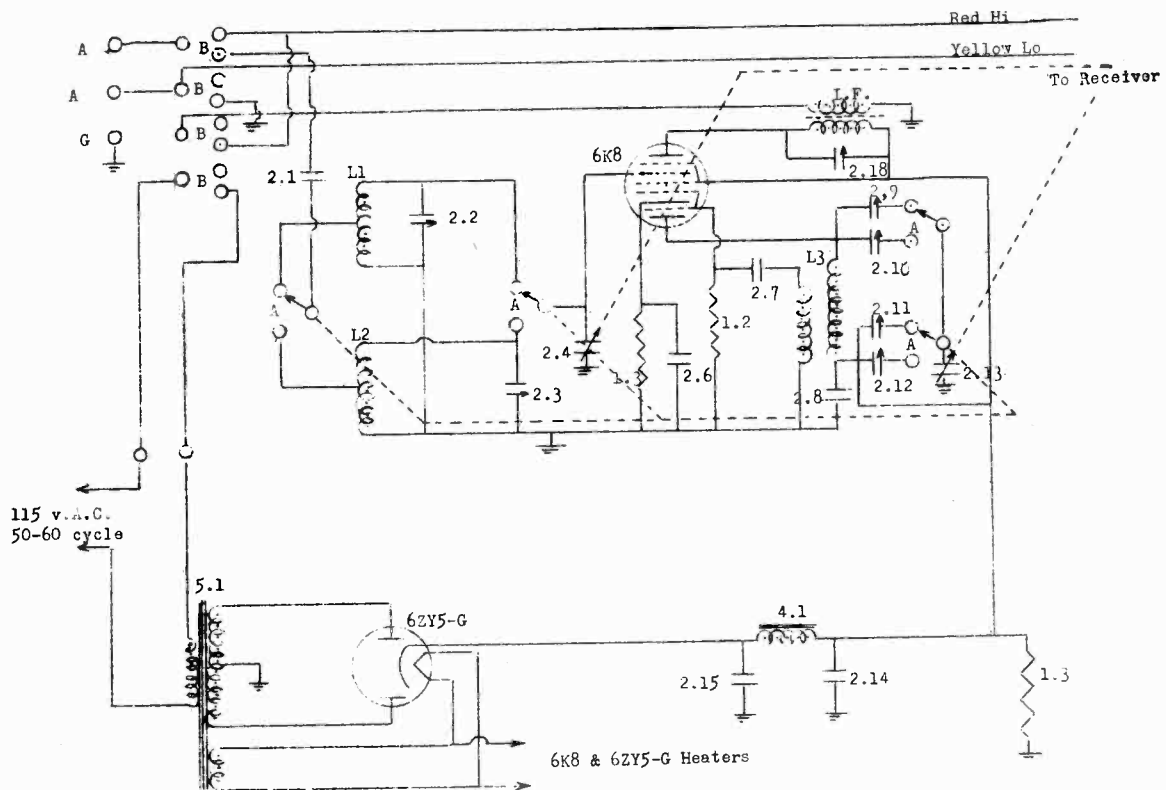
Then by making certain that the condenser 2.59 is set to 50% mesh, the condenser 2.60 (Figure 4) located in the beat oscillator compartment just below 2.59 (Figure 4) near the top plate of the chassis in front of the beat oscillator tube should be adjusted by means of a screw-driver so that zero beat 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.

FOR ALIGNMENT AND FIGS. 3, 6, 11A, and 11B  
 SEE RME 69 VOLUME X Pages 3 through 6.

RADIO MFG. ENGINEERS, INC.

MODEL LF-90



PART CODE NUMBER

PART SPECIFICATION

2.1	100 mmfd mica condenser
2.2	50 mmfd adjustable pad
2.3	50 mmfd adjustable pad
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
2.15	10 mfd, 450 volt, electrolytic
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

L1	Band 1 r.f. grid coil
L2	Band 2 r.f. grid coil
L3	Common oscillator coil for Band 1 and 2

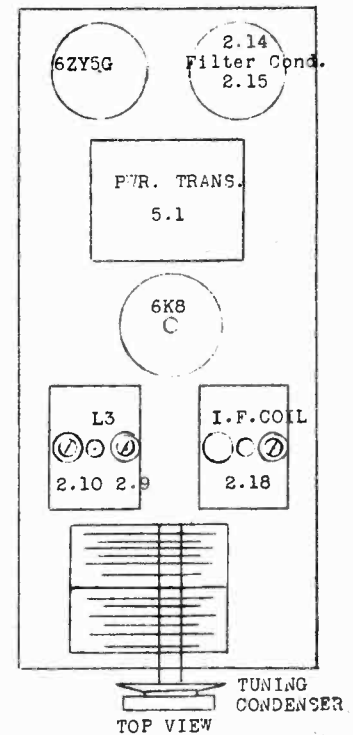
I.F. Transformer tuned to 1550 KC with low impedance output.

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



TOP VIEW

-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.

CAUTION: DO NOT REMOVE TOP OR BOTTOM COVER PLATES BEFORE REMOVING SERVICE CORD PLUG FROM LINE RECEPTACLE.

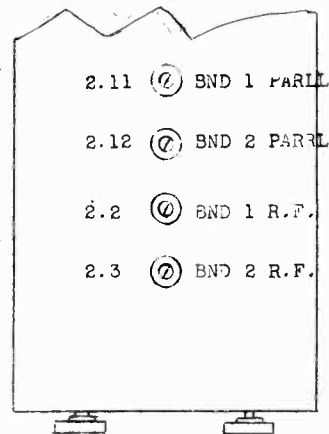
GENERAL INSTALLATION INSTRUCTIONS

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.

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.

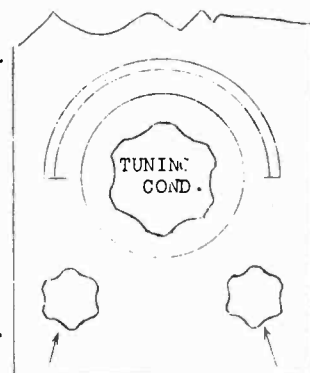
After the unit has been connected up, as described, and plugged into the receptacle (make sure that the line voltage does not exceed 125 volts), the receiver with which the LF-90 is to be used should be connected up and adjusted to an operating condition. The intermediate frequency developed by the LF-90 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.



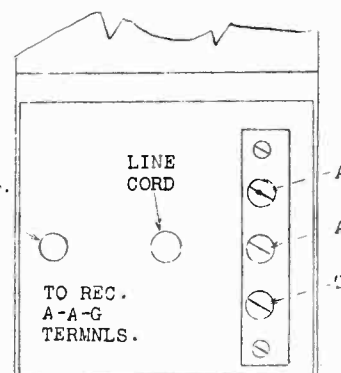
BOTTOM VIEW

-FIG. 1 -



FRONT VIEW

-FIG. 3 -



REAR VIEW

-FIG. 4 -





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.

CORRECT VOLTAGE

PLACE TEST PRODS BETWEEN

- Radio frequency amplifier plate and ground..... 210 volts
Radio frequency amplifier screen and ground..... 130 volts
Radio frequency amplifier cathode and ground..... 250 volts
First detector cathode and ground..... 250 volts
First detector plate 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..... 130 volts
(These 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..... 230 volts
705 plate and ground..... 230 volts
705 screen and ground..... 230 volts
705 cathode and ground..... 12 volts
80 rectifier filament and ground..... 320 volts
Oscillator plate and ground..... 120 volts
Voltage regulator plate and ground..... 150 volts
(With stand-by switch on C1)
B. 0. plate and ground..... 11 volts

These voltages are subject to a fluctuation of plus or minus 15% without indication of material difficulties.

CONTINUITY CHECKS

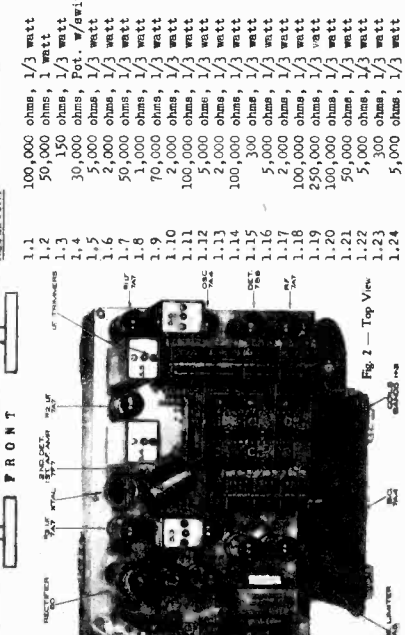
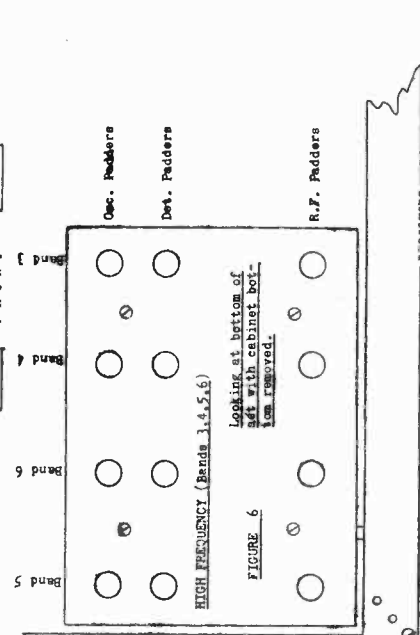
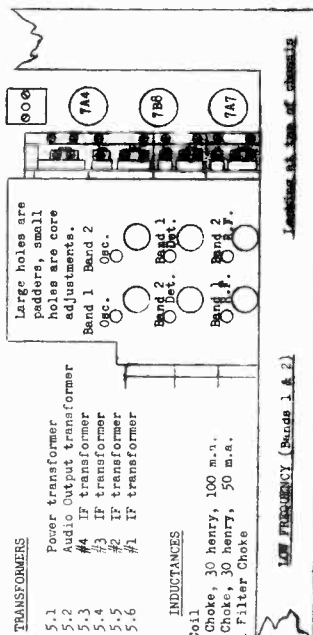
(Receiver turned off. No jumper between A-2 and ground on antenna terminal strip.)

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 1.5 Ohms
Band 2 1.5 Ohms
Band 3 1.5 Ohms
Band 4 2 Ohm
Band 5 1 Ohm
Band 6 1 Ohm
First I.F. grid to ground..... 1.5 Ohms x20%
Second I.F. grid to ground..... 1.5 Ohms x20%
Third I.F. grid to ground..... 1.5 Ohms x20%
Oscillator grid to ground..... 50,000 ohms x20%
Best Oscillator grid to ground..... 100 Megohms to 0 ohm.
First Audio grid and ground..... 250 Megohms to 0 ohm.
(As audio gain control is rotated.)
250 Megohms x20%
Oscillator section of main tuning condenser and ground..... Bands 1,2,3,4, and 5 Infinite
Band 6 .1 ohm
200 ohms, Potentiometer
10,000 ohms, 5 watt
2,000 ohms, 10 watt
1,41 2,000 ohms, 1/3 watt
1,41 5,000 ohms, 1/3 watt
1,43 1 Megohm, 1/3 watt
1,44 100,000 ohms, 1/3 watt
1,45 50,000 ohms, 1/3 watt
1,46 2,000 ohms, 1/3 watt
1,48 100,000 ohms, 1/3 watt
1,49 100,000 ohms, 1/3 watt

PLACE TEST PRODS BETWEEN

- 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 1.5 Ohms
Band 2 1.5 Ohms
Band 3 1.5 Ohms
Band 4 2 Ohm
Band 5 1 Ohm
Band 6 1 Ohm
First I.F. grid to ground..... 1.5 Ohms x20%
Second I.F. grid to ground..... 1.5 Ohms x20%
Third I.F. grid to ground..... 1.5 Ohms x20%
Oscillator grid to ground..... 50,000 ohms x20%
Best Oscillator grid to ground..... 100,000 ohms, 1/3 watt
First Audio grid and ground..... 250,000 ohms, 1/3 watt
705 grid and ground..... 5,000 ohms, 1/3 watt
Oscillator section of main tuning condenser and ground..... 1.25 2,000 ohms, 1/3 watt
1.27 50,000 ohms, Pot. w/switch
1.28 50,000 ohms, 1/3 watt
1.29 1 Megohm, 1/3 watt
1.30 250,000 ohms, Pot. w/switch
1.31 1 Megohm, 1/3 watt
1.32 1,000 ohms, 1/3 watt
1.33 50,000 ohms, 1/3 watt
1.34 250,000 ohms, 1/3 watt
1.35 240 ohms, 1 watt
1.36 5,000 ohms, 1/3 watt
1.37 150 ohms, 1/3 watt



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

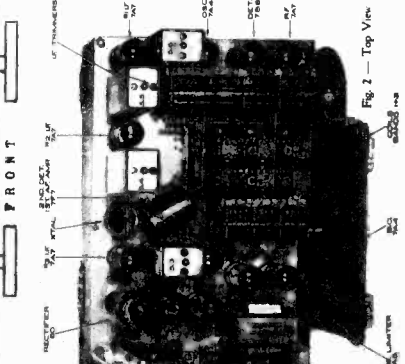
INDUCTANCES

- 4-1 R. 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

CONDENSERS

- 2.1 Main Tuning Condenser, Large RF section
2.2 Main Tuning Condenser, Small RF section
2.3 Main Spread Condenser, RF section
2.4 Main Tuning Condenser, Large Det. section
2.5 Main Tuning Condenser, Small Det. section
2.6 Main 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 Mfd. 400 volt paper
2.11 50 Mfd. 1/2 Silver Mica
2.12 50 Mfd. 1/2 Silver Mica
2.13 .01 Mfd. 400 volt paper
2.14 .01 Mfd. 400 volt paper
2.15 50 Mfd. 1/2 Silver Mica
2.16 50 Mfd. 1/2 Silver Mica
2.17 50 Mfd. 5% Mica
2.18 .01 Mfd. 400 volt paper
2.19 .01 Mfd. 400 volt paper
2.20 .01 Mfd. 400 volt paper
2.21 .01 Mfd. 400 volt paper
2.22 .01 Mfd. 400 volt paper
2.23 .01 Mfd. 400 volt paper
2.24 .01 Mfd. 400 volt paper
2.25 .01 Mfd. 400 volt paper
2.26 .01 Mfd. 400 volt paper
2.27 .01 Mfd. 400 volt paper
2.28 .01 Mfd. 400 volt paper
2.29 50 Mfd. 5% Mica
2.30 50 Mfd. 5% Mica
2.31 30 Mfd. Variable
2.32 .01 Mfd. 400 volt paper
2.33 .01 Mfd. 400 volt paper
2.34 .01 Mfd. 400 volt paper
2.35 .01 Mfd. 400 volt paper
2.36 100 Mfd. Mica
2.37 250 Mfd. Mica
2.38 1 Mfd. 400 volt paper
2.39 1 Mfd. 400 volt paper
2.40 15 Mfd. 450 v. electrolytic
2.41 20 Mfd. 25 v. electrolytic
2.42 15 Mfd. 450 v. electrolytic
2.43 10 Mfd. 450 v. electrolytic
2.44 .01 Mfd. 400 volt paper
2.45 100 Mfd. Mica
2.46 250 Mfd. Mica
2.47 50 Mfd. Variable
2.48 70 Mfd. Mica Padder
2.49 .01 Mfd. 400 volt paper
2.50 100 Mfd. Germanic
2.51 50 Mfd. Silver Mica
2.52 50 Mfd. Silver Mica
2.53 1 Mfd. 400 volt paper
2.54 550 Mfd. Mica
2.55 600 Mfd. Mica
2.56 1300 Mfd. Mica
2.57 1700 Mfd. Mica
2.58 3900 Mfd. Mica
2.59 100 Mfd. Mica
2.60 100 Mfd. Mica
2.61 .01 Mfd. 400 volt paper
2.62 .01 Mfd. 400 volt paper
2.63 20 Mfd. 25 v. electrolytic
2.64 20 Mfd. 25 v. electrolytic
2.65 250 Mfd. Mica
2.66 .01 Mfd. 400 volt paper
2.67 .01 Mfd. 400 volt paper
All osc. and detector varialler padders 10 Mfd.
All RF Parallel padders 30 Mfd.
All IF Trimmers 100 Mfd.

- 100,000 ohms, 1/3 watt
50,000 ohms, 1/3 watt
150 ohms, 1/3 watt
30,000 ohms, Pot. w/switch
5,000 ohms, 1/3 watt
2,000 ohms, 1/3 watt
50,000 ohms, 1/3 watt
1,000 ohms, 1/3 watt
70,000 ohms, 1/3 watt
2,000 ohms, 1/3 watt
100,000 ohms, 1/3 watt
2,000 ohms, 1/3 watt
100,000 ohms, 1/3 watt
300 ohms, 1/3 watt
5,000 ohms, 1/3 watt
2,000 ohms, 1/3 watt
100,000 ohms, 1/3 watt
250,000 ohms, 1/3 watt
100,000 ohms, 1/3 watt
50,000 ohms, 1/3 watt
5,000 ohms, 1/3 watt
300 ohms, 1/3 watt
5,000 ohms, 1/3 watt
1.24



## RADIO MFG. ENGINEERS, INC.

MODEL RME-99

One of the first evidences of misalignment in a receiver is low over-all 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 90 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 90. 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 oscillator 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 Band 2 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 KC.
Band 5	17 MC.
Band 6	30 KC.

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 misalignment 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 B0 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 will rise when the control is turned either to the right or left.

MODEL LS-1  
Noise Silencer

RADIO MFG. ENGINEERS, INC.

