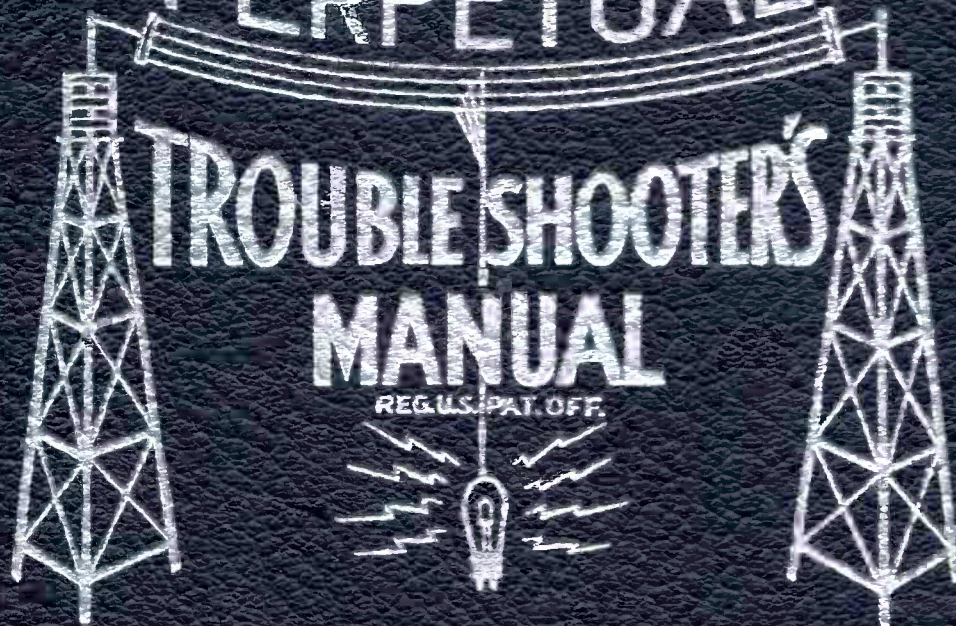


VOLUME IX

PERPETUAL



TROUBLE SHOOTER'S  
MANUAL

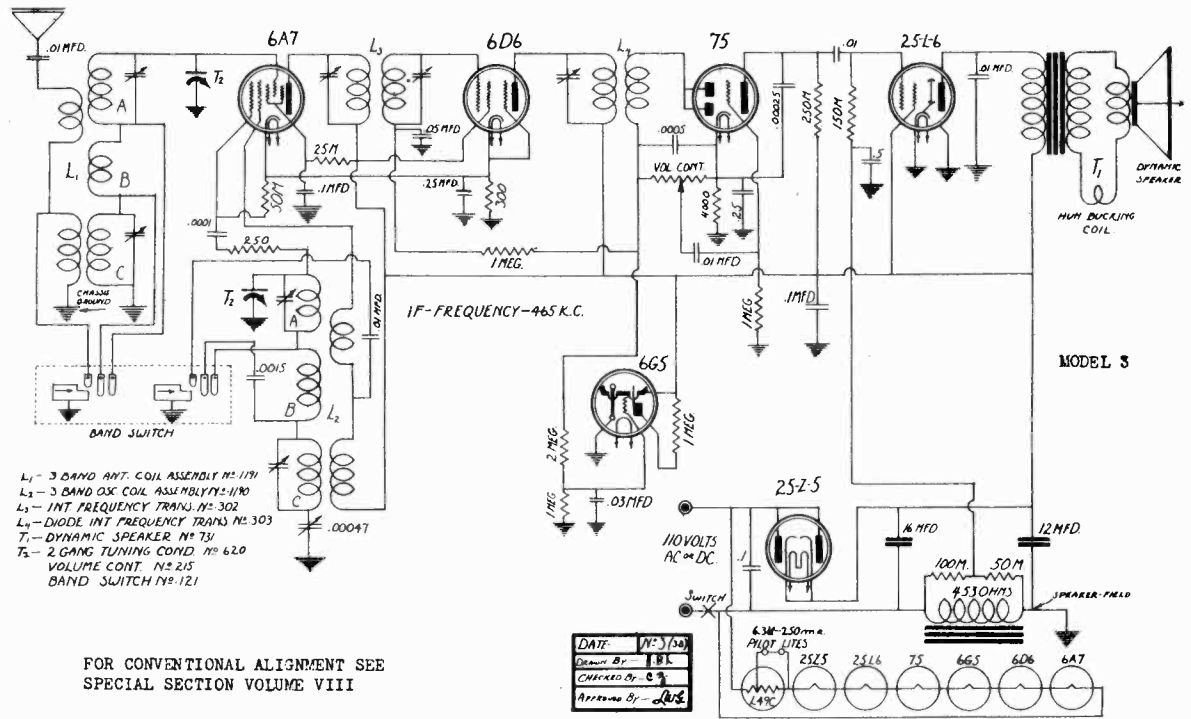
REG. U.S. PAT. OFF.

JOHN F. RIDER



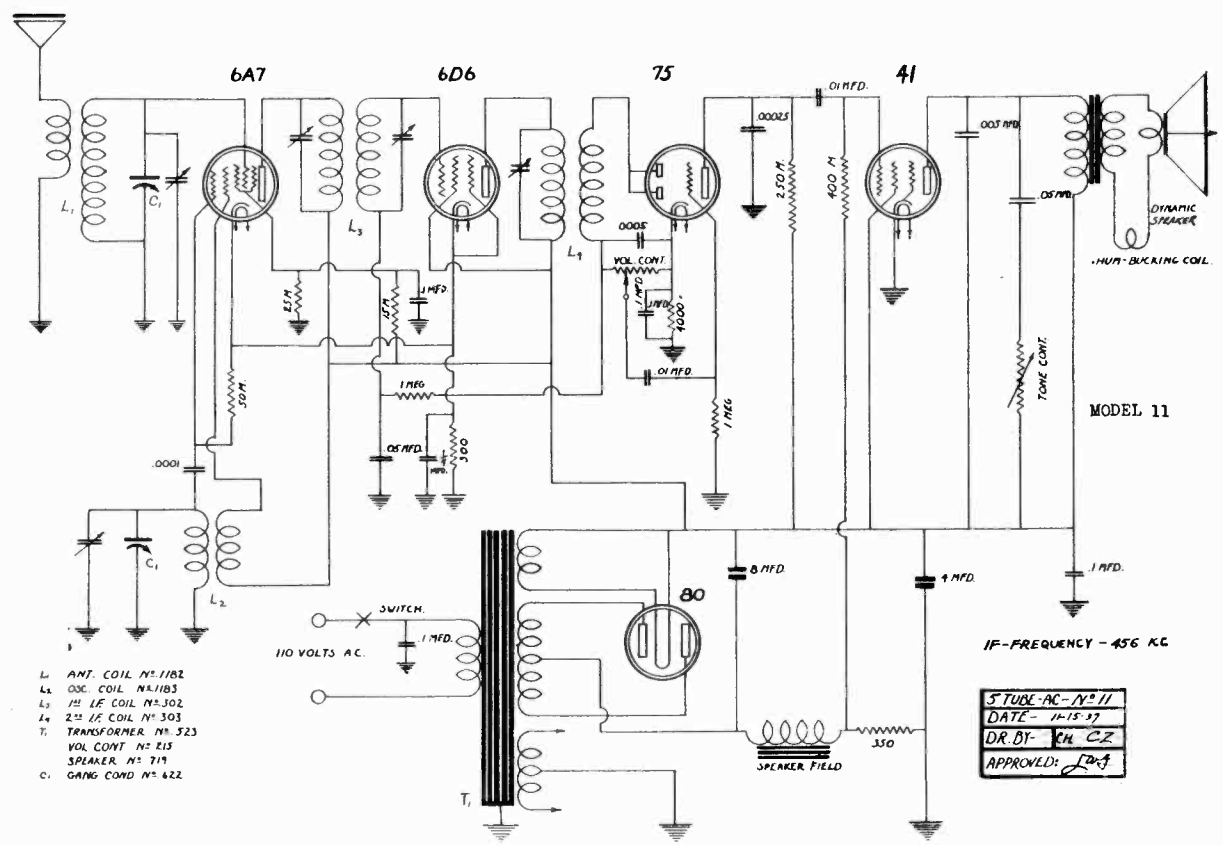
PACIFIC RADIO CORP.

MODEL 3  
MODEL 11  
Schematics



- L<sub>1</sub> - 3 BAND ANT. COIL ASSEMBLY N° 171
- L<sub>2</sub> - 3 BAND OSC. COIL ASSEMBLY N° 170
- L<sub>3</sub> - INT. FREQUENCY TRANS. N° 302
- L<sub>4</sub> - DIODE INT. FREQUENCY TRANS. N° 303
- T<sub>1</sub> - DYNAMIC SPEAKER N° 73
- T<sub>2</sub> - 2 GANG TUNING COND. N° 620
- VOLUME CONT. N° 215
- BAND SWITCH N° 121

FOR CONVENTIONAL ALIGNMENT SEE  
SPECIAL SECTION VOLUME VIII



- L<sub>1</sub> ANT. COIL N° 1182
- L<sub>2</sub> OSC. COIL N° 1183
- L<sub>3</sub> 1<sup>st</sup> IF COIL N° 302
- L<sub>4</sub> 2<sup>nd</sup> IF COIL N° 303
- T<sub>1</sub> TRANSFORMER N° 523
- VOL CONT. N° 215
- SPEAKER N° 719
- C<sub>1</sub> GANG COND N° 622

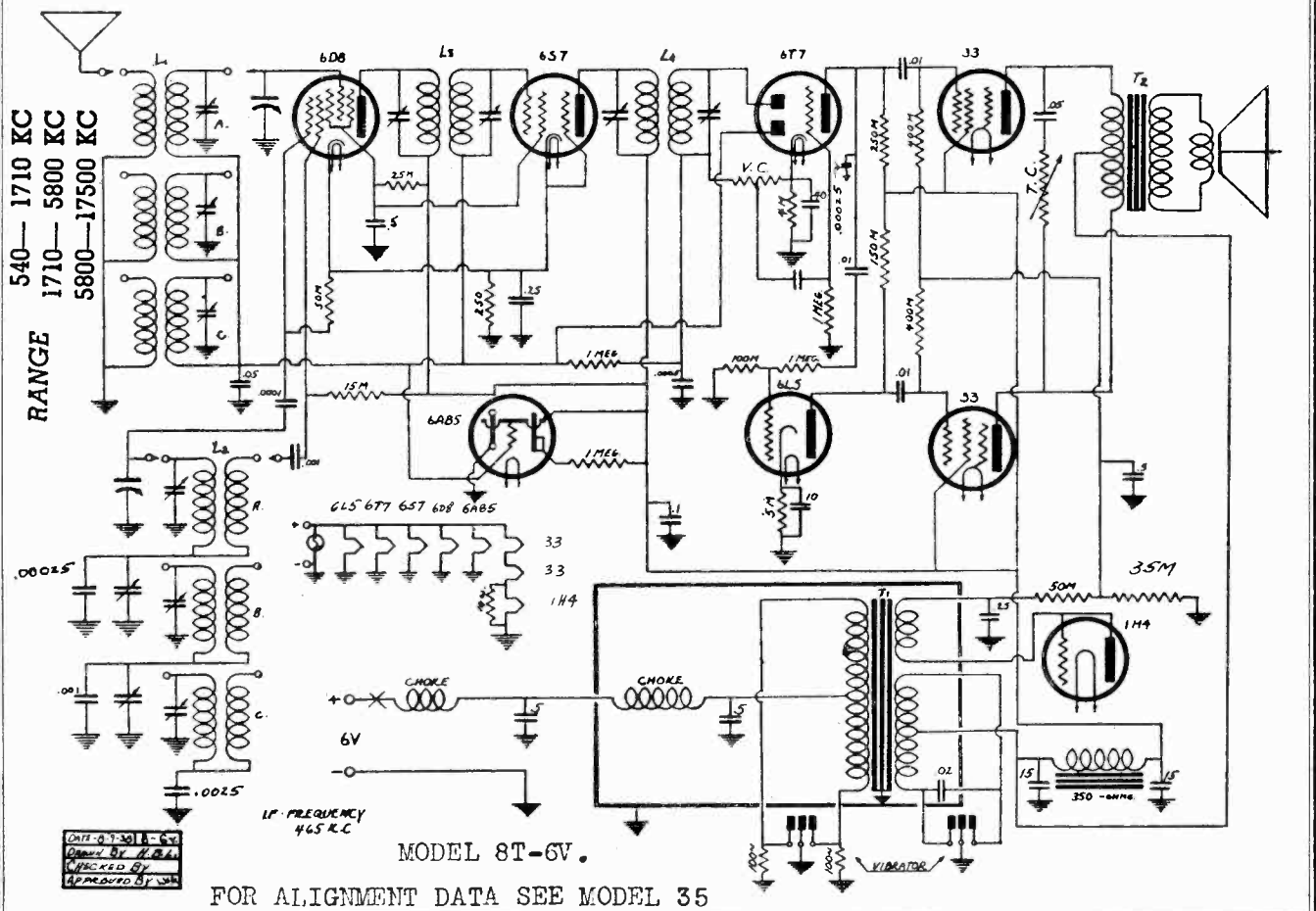
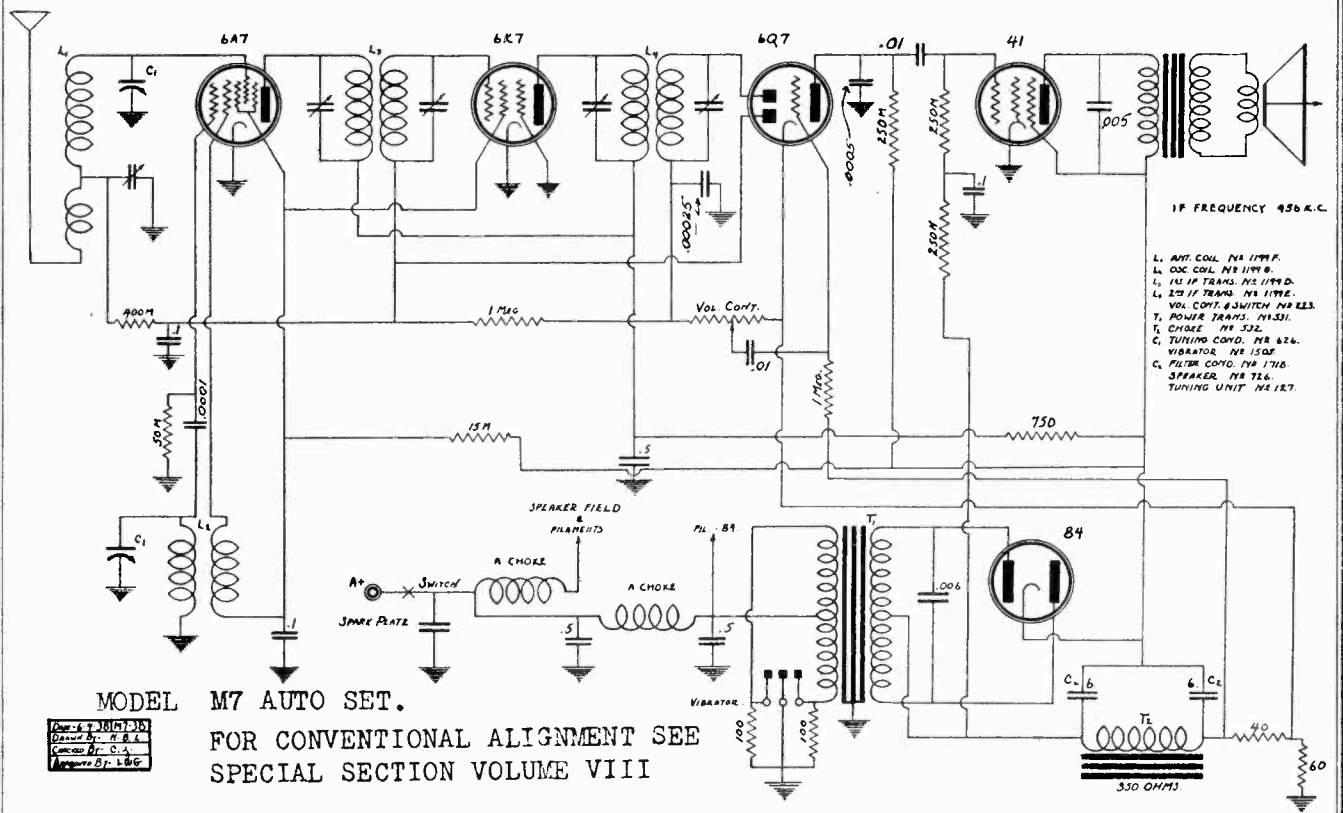






PACIFIC RADIO CORP.

MODEL M7  
MODEL 8T-6V  
Schematics

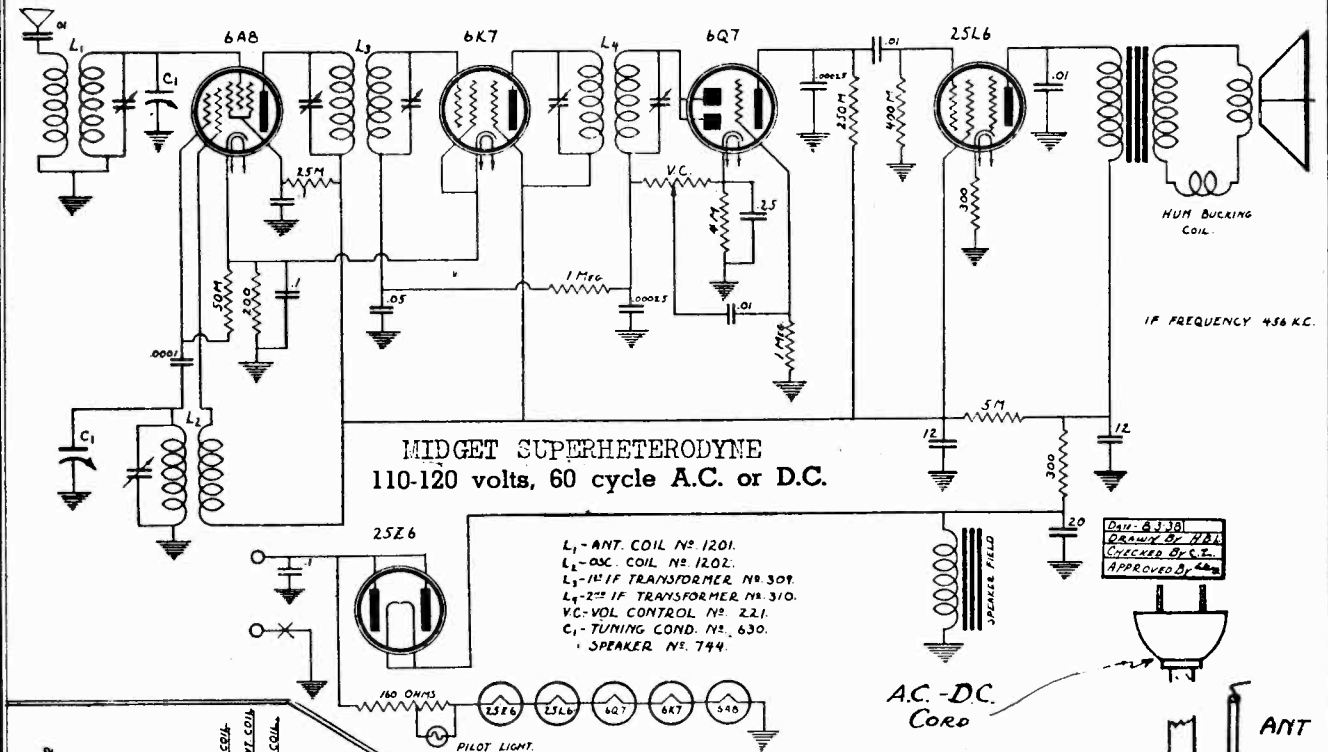




MODEL Midget Super.  
Schematic, Socket  
Alignment

PACIFIC RADIO CORP.

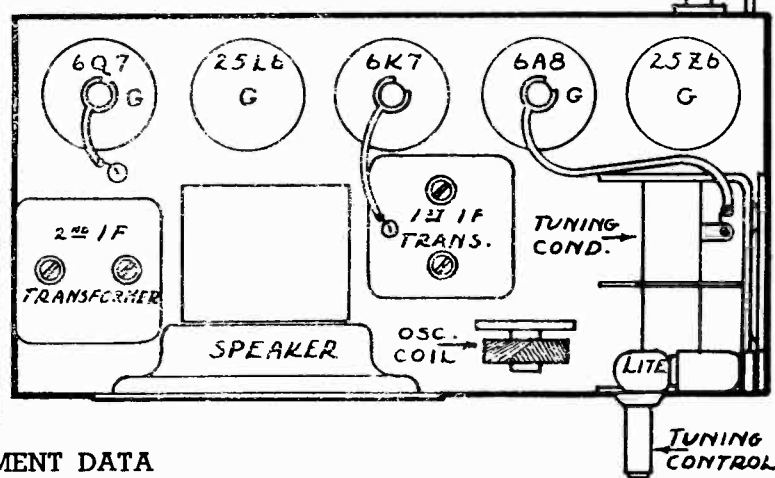
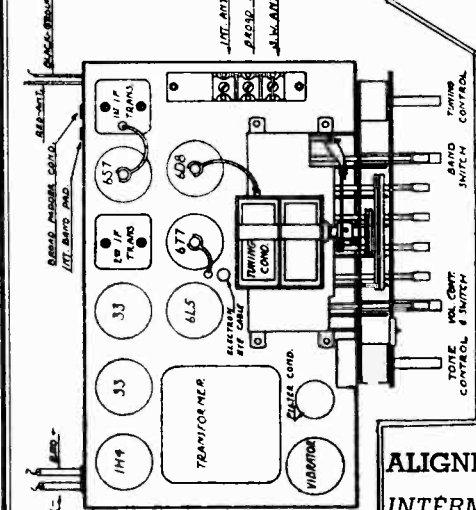
MODEL 8T-6V  
Socket, Trimmers, Parts



MIDGET SUPERHETERODYNE  
110-120 volts, 60 cycle A.C. or D.C.

- L<sub>1</sub> - ANT. COIL NO. 1201.
- L<sub>2</sub> - OSC. COIL NO. 1202.
- L<sub>3</sub> - 1<sup>st</sup> IF TRANSFORMER NO. 309.
- L<sub>4</sub> - 2<sup>nd</sup> IF TRANSFORMER NO. 310.
- VC - VOL. CONTROL NO. 221.
- C<sub>1</sub> - TUNING COND. NO. 630.
- SPEAKER NO. 744.

Drawn by H.B.L.  
Checked by C.S.T.  
Approved by G.M.



ALIGNMENT DATA

**INTERMEDIATE FREQUENCY:** Set oscillator to 456 KC. Feed this to the grid of the pentagrid (648) converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer.

**BROADCAST BAND:** Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the antenna and oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC and check for alignment.

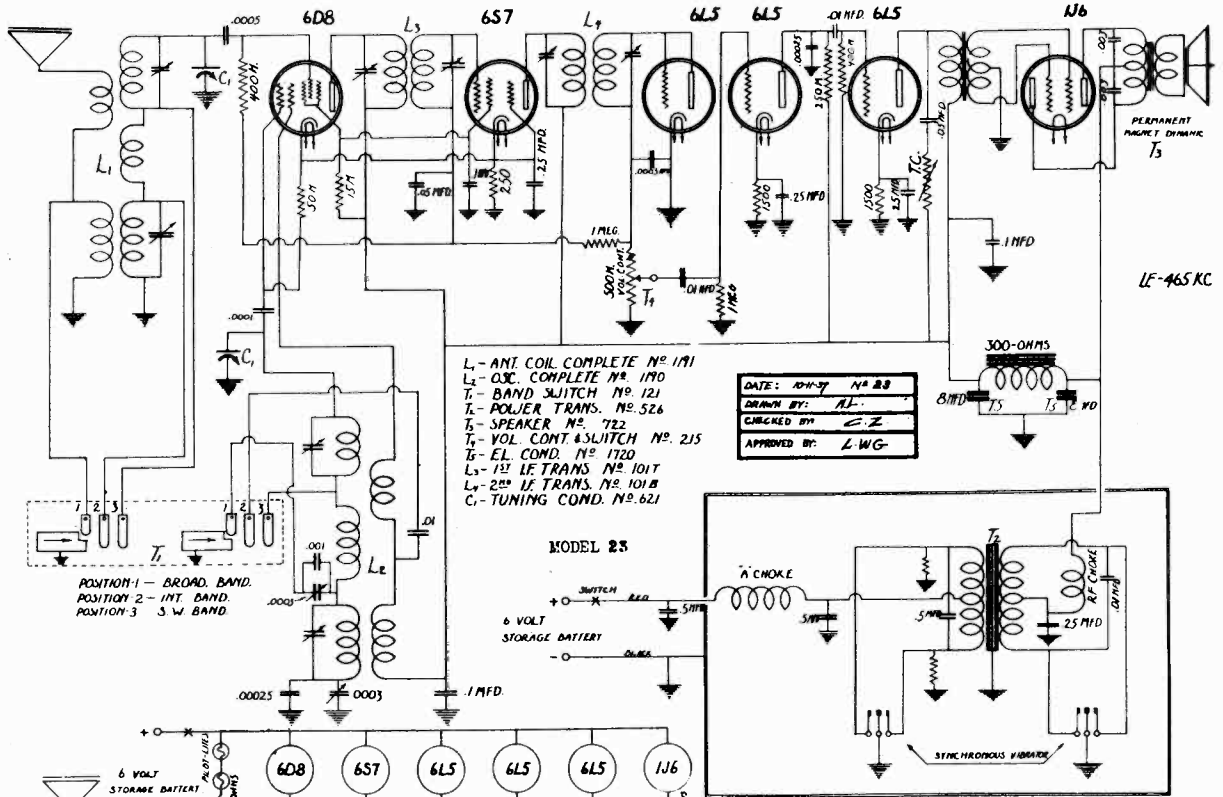
CHASSIS AND PARTS  
FOR MODEL 8T-6V.

- 1194 L1—3 Band Antenna Coil
- 1195 L2—3 Band Oscillator Coil
- 101T L3—1st I.F. Transformer
- 101B L4—2nd I.F. Transformer
- 629 Variable Tuning Condenser
- 536 T1—Vibrator Transformer
- 535 T2—Output Transformer
- 722 P.M.—Speaker 6½"
- 723 P.M.—Speaker 8"
- 221 Volume Control and Switch
- 305 Tone Control
- 123 Band Switch
- 1506 Vibrator
- 130 Automatic Tuner



PACIFIC RADIO CORP.

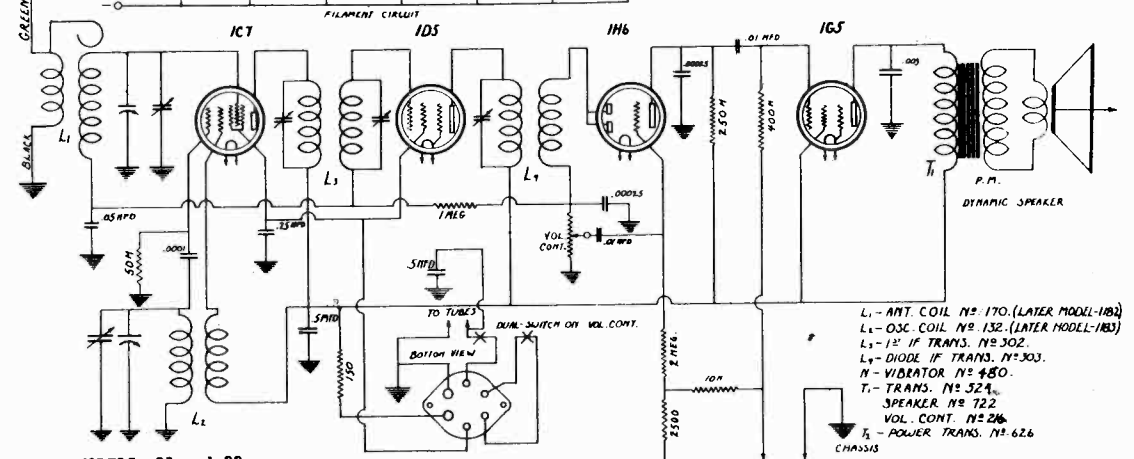
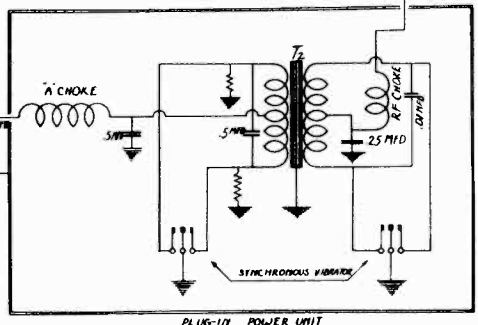
MODELS 21,22  
MODEL 23  
Schematics



- L<sub>1</sub> - ANT. COIL COMPLETE N<sup>o</sup> 171
- L<sub>2</sub> - OSC. COMPLETE N<sup>o</sup> 170
- T<sub>1</sub> - BAND SWITCH N<sup>o</sup> 121
- T<sub>2</sub> - POWER TRANS. N<sup>o</sup> 526
- T<sub>3</sub> - SPEAKER N<sup>o</sup> 722
- T<sub>4</sub> - VOL. CONT. & SWITCH N<sup>o</sup> 215
- T<sub>5</sub> - EL. COND. N<sup>o</sup> 1720
- L<sub>3</sub> - 1<sup>st</sup> IF TRANS. N<sup>o</sup> 1017
- L<sub>4</sub> - 2<sup>nd</sup> IF TRANS. N<sup>o</sup> 1018
- C<sub>1</sub> - TUNING COND. N<sup>o</sup> 621

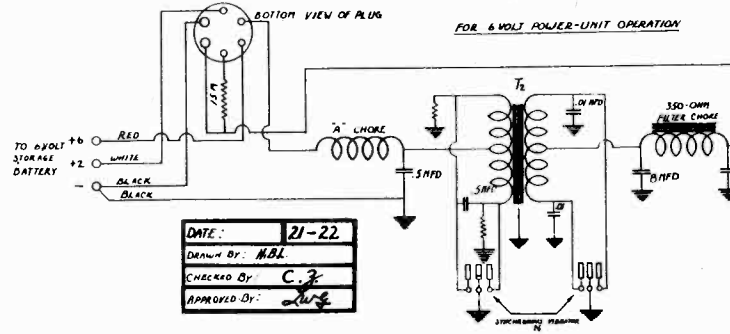
DATE: 10-17	NO. 23
DRAWN BY: AL.	
CHECKED BY: C.Z.	
APPROVED BY: L.W.G.	

POSITION 1 - BROAD. BAND.  
POSITION 2 - INT. BAND.  
POSITION 3 - 3 W. BAND.



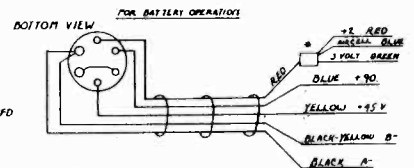
MODELS 21 and 22  
IP FREQUENCY 456 K.C.

- L<sub>1</sub> - ANT. COIL N<sup>o</sup> 170. (LATER MODEL-182)
- L<sub>2</sub> - OSC. COIL N<sup>o</sup> 132. (LATER MODEL-183)
- L<sub>3</sub> - 1<sup>st</sup> IF TRANS. N<sup>o</sup> 302.
- L<sub>4</sub> - DIODE IF TRANS. N<sup>o</sup> 303.
- N - VIBRATOR N<sup>o</sup> 480.
- T<sub>1</sub> - TRANS. N<sup>o</sup> 524.
- T<sub>2</sub> - SPEAKER N<sup>o</sup> 722.
- T<sub>3</sub> - VOL. CONT. N<sup>o</sup> 216.
- T<sub>4</sub> - POWER TRANS. N<sup>o</sup> 626.



DATE: 21-22
DRAWN BY: M.B.L.
CHECKED BY: C.Z.
APPROVED BY: [Signature]

FOR CONVENTIONAL ALIGNMENT SEE SPECIAL SECTION VOLUME VIII



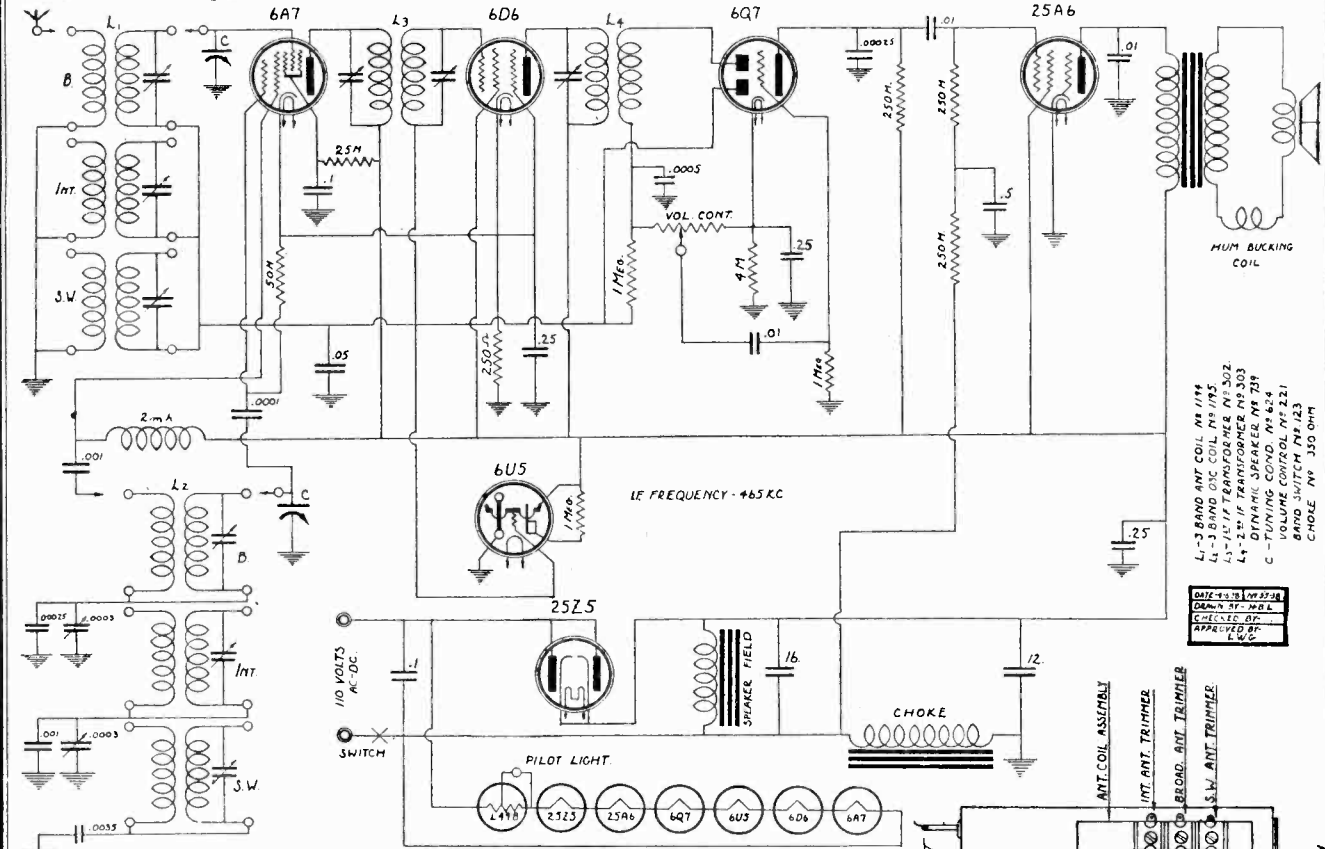
NOTE: -9  
ONLY ONE LEAD IS USED-  
DEPENDENT ON WHICH TYPE  
OF BATTERY IS USED



**MODEL 35**  
Schematic, Socket  
Trimmers, Alignment

**PACIFIC RADIO CORP.**

**MODELS 43, 302, 601**  
**8T-6V**  
Alignment



- L1-3 BAND ANT. COIL. NO. 1184
- L2-3 BAND OSC. COIL. NO. 1185
- L3-11/12 IF TRANSFORMER. NO. 302
- L4-2-2-1/2 IF TRANSFORMER. NO. 303
- L5-DYNAMIC SPEAKER. NO. 739
- C-TUNING COND. NO. 424
- VOLUME CONTROL. NO. 421
- BAND SWITCH. NO. 123
- CHOKE. NO. 350 OHM

DATE: 4-15-35 BY: JF:R  
 DRAWN BY: M.B.L.  
 CHECKED BY:  
 APPROVED BY:  
 E.W.C.

**SWITCH POSITION**

- Left
- Center
- Right

**MODEL 35**

BAND	RANGE IN KILOCYCLES
Broadcast	540—1710 KC
Intermediate	1710—5800 KC
Short Wave (foreign)	5800—17500 KC

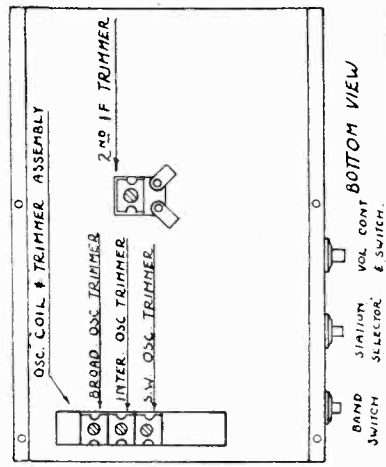
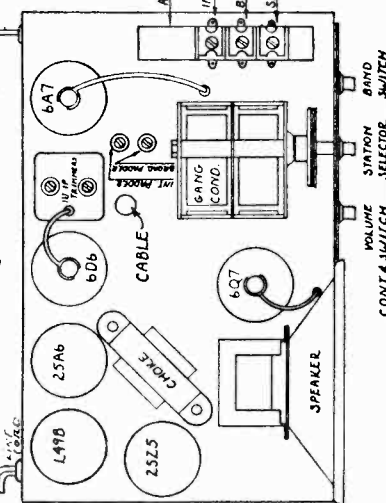
**ALIGNMENT DATA FOR MODELS 35, 43, 302, 601, AND 8T-6V**

**INTERMEDIATE FREQUENCY:** Set oscillator to 465 KC. Feed this to the grid of the pentagrid converter tube. Adjust trimmers on the intermediate frequency transformers for peak readings as indicated on the output meter which is to be placed across the output transformer. **BROADCAST BAND:** Set the band switch for broadcast reception. Adjust oscillator to 1400 KC and connect the output of the generator to the antenna connection at the rear of the chassis through a .0002 mfd. mica condenser. Set the pointer on the dial to 1400 KC making sure that the volume control is set at its maximum position. Adjust the broadcast antenna and broadcast oscillator trimmers for maximum signal (as indicated on the output meter). Re-set the dial pointer on the receiver and on the test oscillator to 600 KC. Slowly increase or decrease the broadcast padding condenser while tuning back and forth across the signal with the station selector knob until the maximum reading is obtained on the output meter. Re-check the 1400 KC alignment as the adjustment at 600 KC may have slightly disturbed the original 1400 KC setting.

**INTERMEDIATE BAND:** For a dummy antenna use a .0002 mfd. mica condenser in series with a 400 ohm carbon resistor. Set band switch to the intermediate band position and feed a 5100 KC signal from the oscillator. Set dial pointer at 5100 KC. Adjust intermediate antenna and intermediate oscillator trimmers for maximum output. Re-set oscillator and set dial to approximately 1800 KC. Slowly increase or decrease the intermediate padding condenser while tuning back and forth across the signal with the station selector control until the maximum reading is obtained on the output meter. Re-check the 5100 KC adjustment.

**SHORT WAVE:** Set band switch on short wave position. Connect the antenna of the radio receiver to the output of the test oscillator through a 400 ohm carbon resistor. Set oscillator and receiver dial at 15 megacycles. Adjust the short wave antenna and short wave oscillator trimming condensers for maximum output as indicated by readings on the output meter. No other adjustments are necessary for aligning this band.

It is advisable to check the sensitivity at 6000 KC to determine whether the circuits are properly aligned. Should the receiver lack sensitivity at this frequency check the .0035 mica condenser for short circuit.



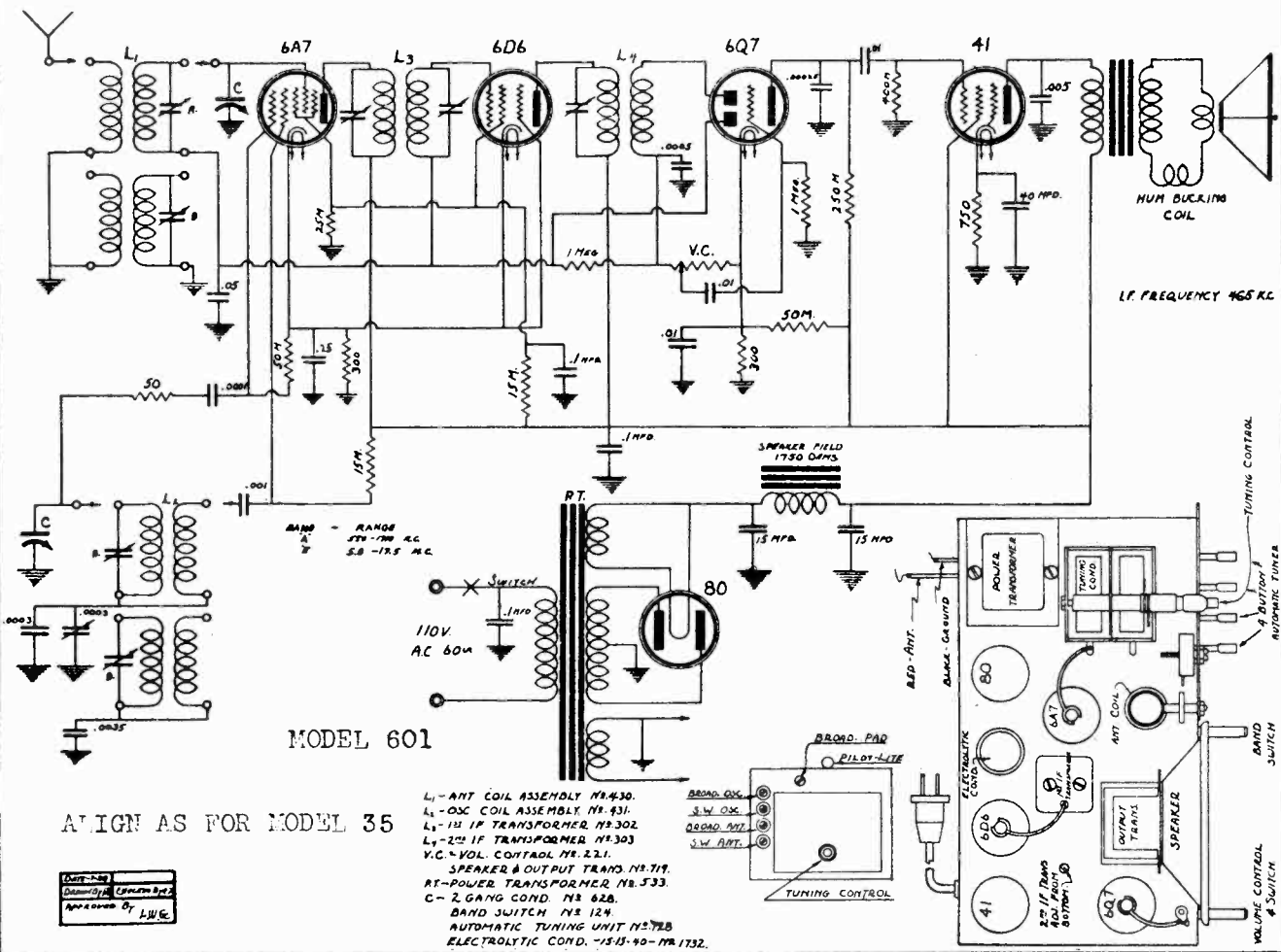
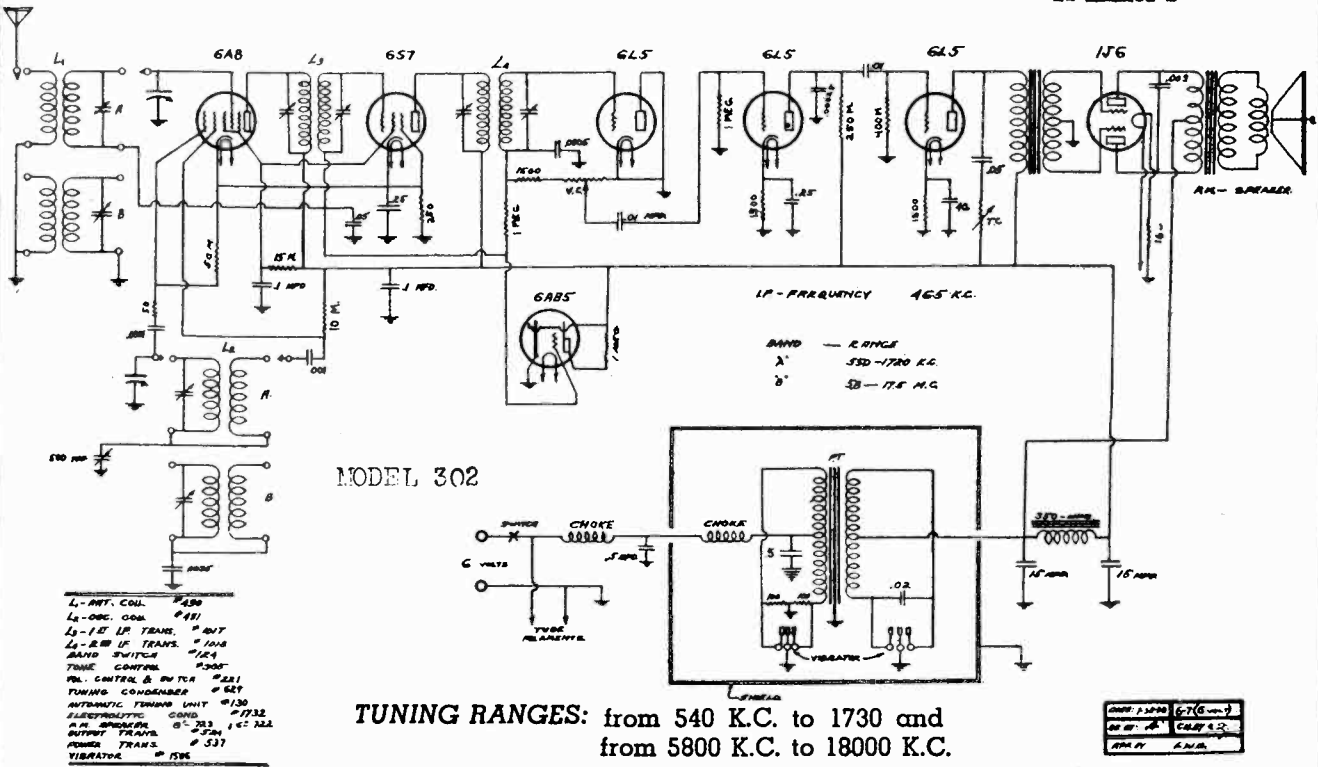




MODEL 302  
Schematic

PACIFIC RADIO CORP.

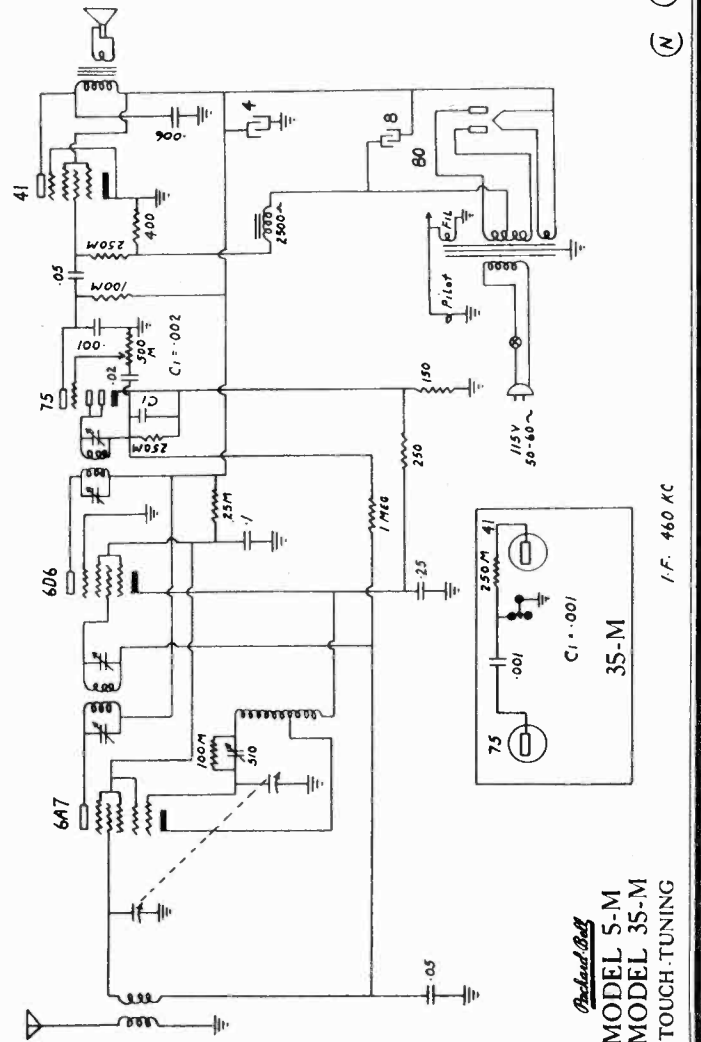
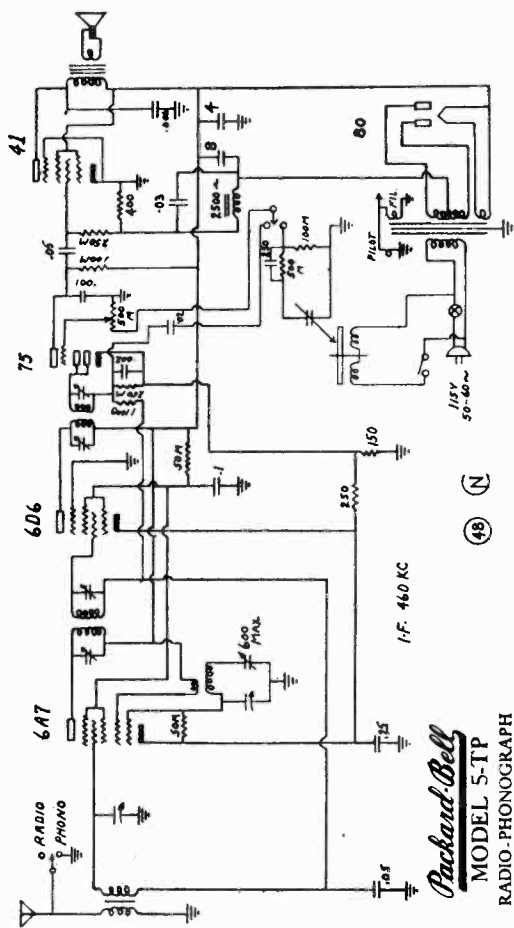
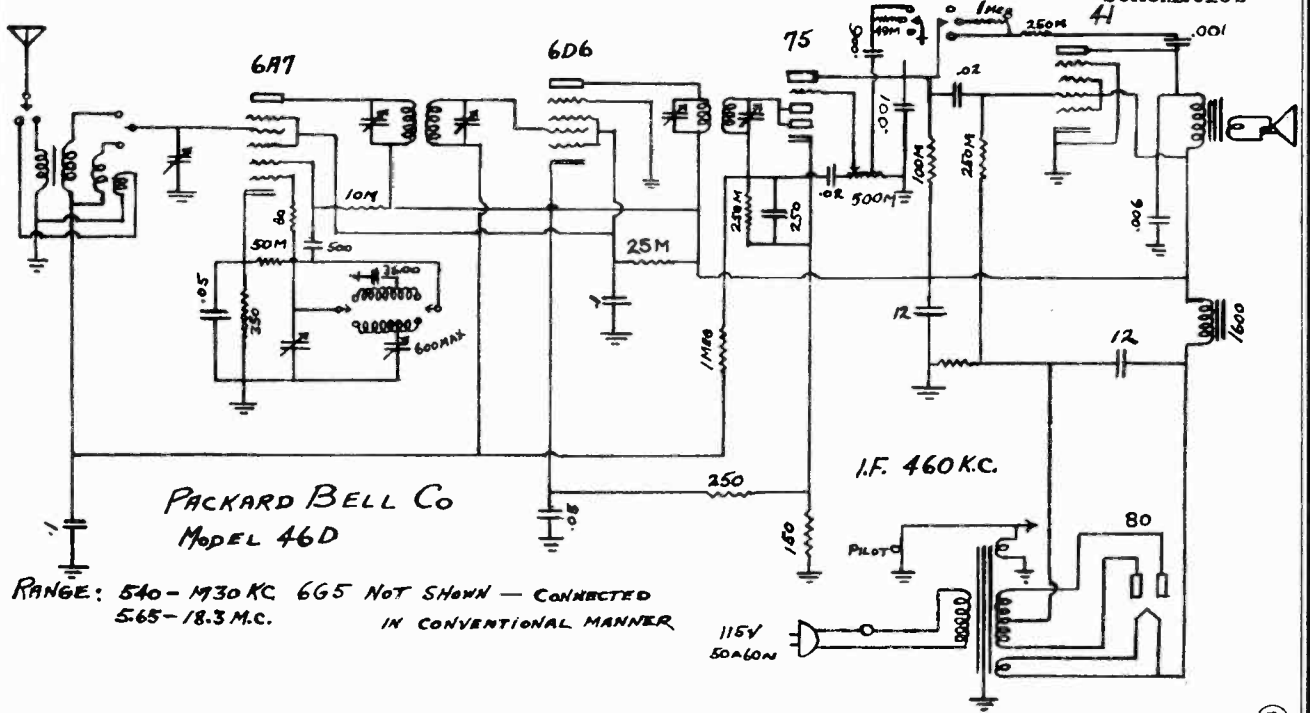
MODEL 601  
Schematic, Socket  
Trimmers





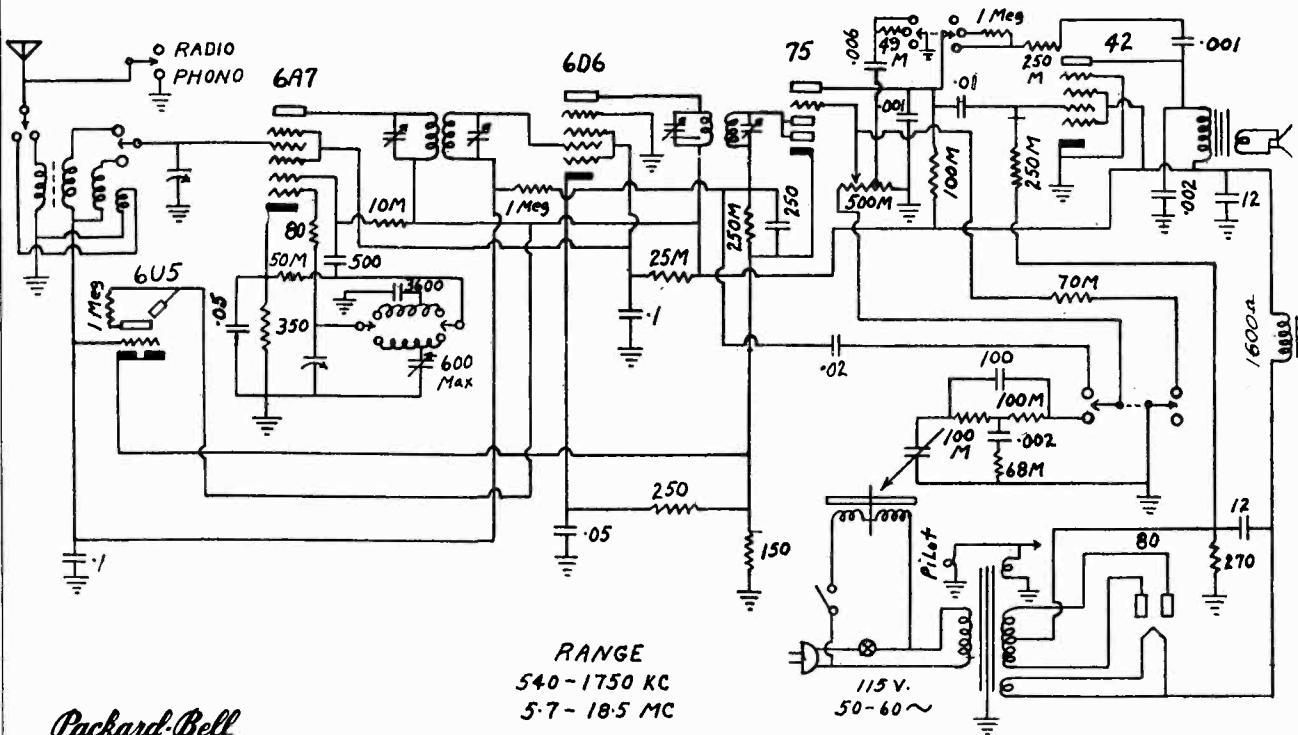
PACKARD BELL CO.

MODELS 5M, 35M  
 MODEL 5TP  
 MODEL 46D  
 Schematics



MODEL 46DP  
MODEL 48B  
Schematics

PACKARD BELL CO.



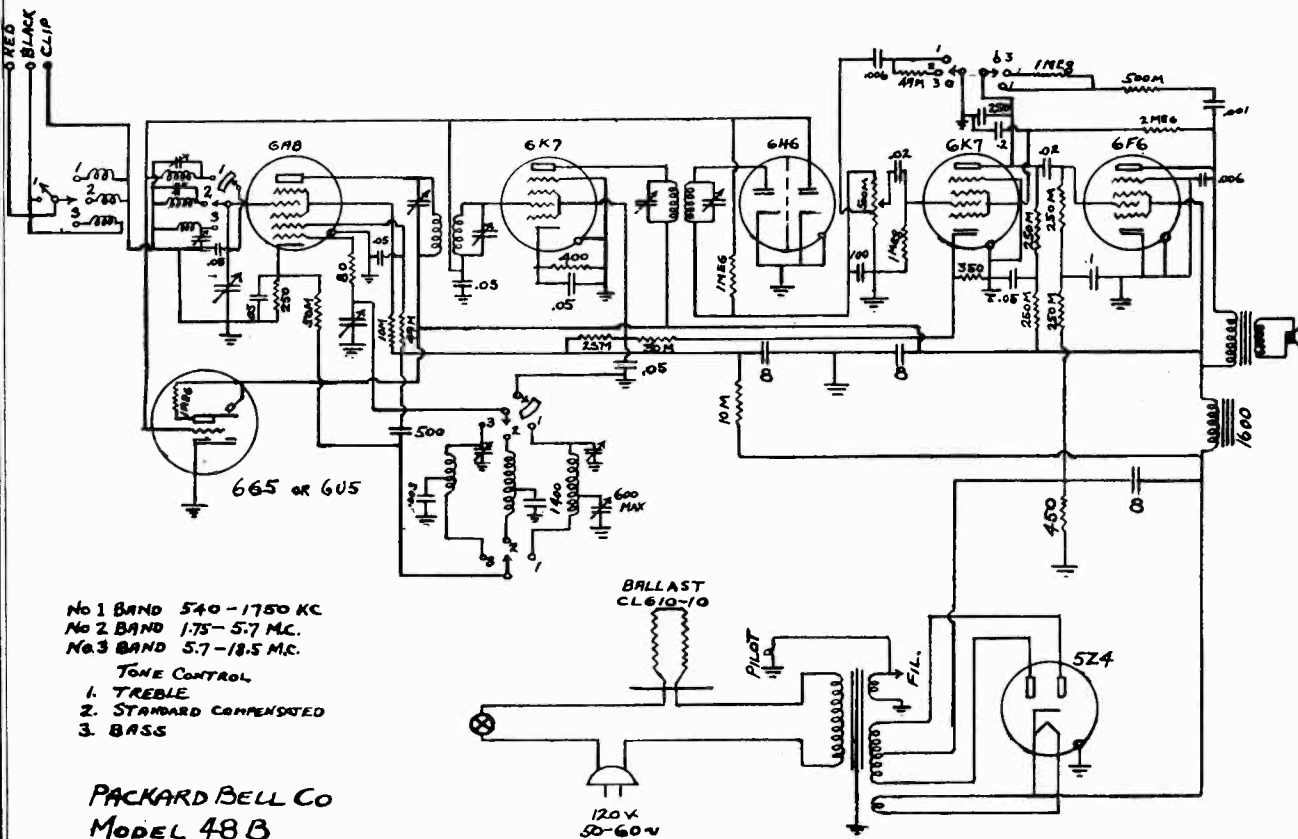
RANGE  
540-1750 KC  
5.7-18.5 MC

**Packard-Bell**

MODEL 46-DP  
RADIO-PHONOGRAPH

I.F. 460 KC

(48) (N)



No 1 BAND 540-1750 KC  
No 2 BAND 1.75-5.7 MC.  
No 3 BAND 5.7-18.5 MC.

TONE CONTROL

1. TREBLE
2. STANDARD COMPENSATED
3. BASS

PACKARD BELL CO  
MODEL 48 B

LE 460KC.



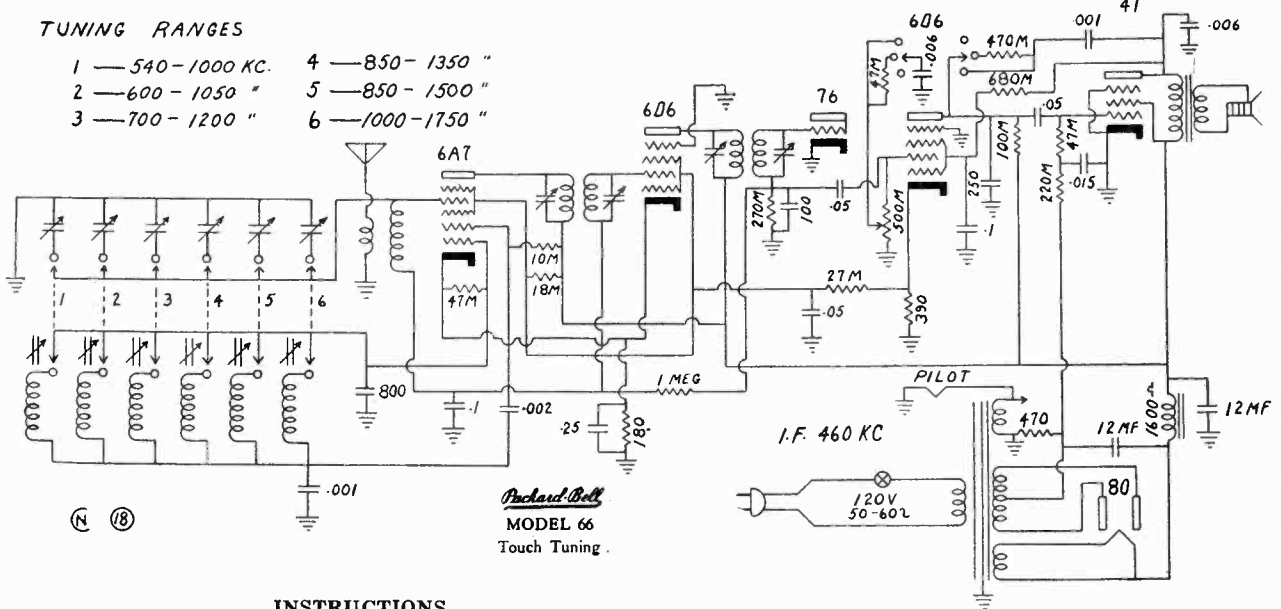
MODEL 120-AB  
Schematic

PACKARD BELL CO.

MODEL 66  
Schematic, Socket  
Tuner

TUNING RANGES

- 1 — 540-1000 KC.
- 2 — 600-1050 "
- 3 — 700-1200 "
- 4 — 850-1350 "
- 5 — 850-1500 "
- 6 — 1000-1750 "



INSTRUCTIONS

Selector buttons are numbered from 1 to 5, reading from left to right. Stations selected should be placed in numerical order with respect to frequency. Lowest frequency should appear on Selector No. 1. Next lowest on Selector No. 2, and so on up to Selector No. 5 for station with highest frequency. For frequency, see above.

RECEIVERS LEAVE FACTORY ADJUSTED AS FOLLOWS: No. 1 button—600 K. C., No. 2—800 K. C., No. 3—1000 K. C., No. 4—1200 K. C., No. 5—1400 K. C.

PROCEDURE: Five stations should first be selected and considered in numerical order according to kilocycles. The station with the lowest frequency number should be assigned to the first push button—and so on.

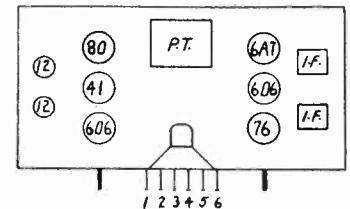
Push button No. 1 to "IN" position, then select station assigned this button by turning Oscillator (Station selector) screw No. 1 until station is heard best, then further adjust by turning Antenna Trimmer screw No. 1 until station is heard with maximum volume and clarity. Remember, you can check your accuracy in setting the stations on the buttons by tuning the receiver manually to the station and then pushing the station button and comparing the results. (If the station desired has a lower kilocycle frequency than the button has been

set at the factory, turn the oscillator screw clockwise to find the station, or, if higher, turn counter-clockwise.) After the first station is set, repeat this procedure with the second station, pushing button No. 2 and adjusting oscillator screw No. 2 and antenna screw No. 2, in order to set for the station desired. Repeat this procedure until all five stations are set.

Antenna adjustment should be made after oscillator screw has been set. When volume is at maximum and interference noises at a minimum, an-

tenna adjustment is correct.

The push button marked "dial" is for the sole purpose of changing to manual tuning. However, do not use this button to change from manual to push button tuning—simply push button desired and the receiver will be on push button tuning until the button marked "dial" is used.

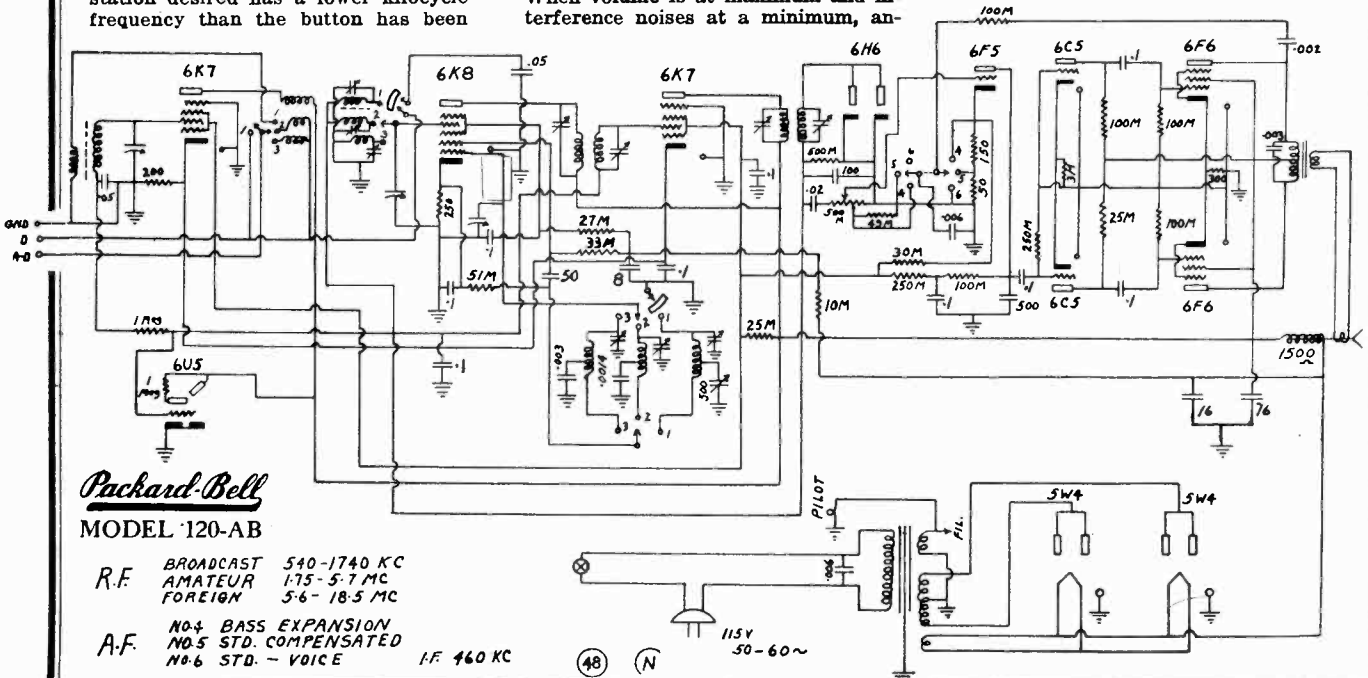


Packard-Bell  
MODEL 120-AB

R.F. BROADCAST 540-1740 KC  
AMATEUR 1.75-5.7 MC  
FOREIGN 5.6-18.5 MC

A.F. NO. 4 BASS EXPANSION  
NO. 5 STD. COMPENSATED  
NO. 6 STD. - VOICE

I.F. 460 KC













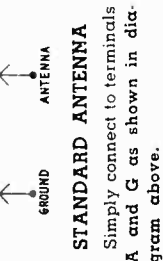


PATTERSON RADIO CO.

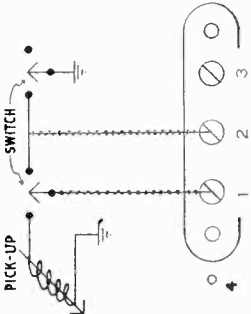
MODELS 208, 308, 408  
 MODELS 212, 312, 412  
 Schematics, Notes

Stations Located on Each Band

- BAND No. 1**  
 530-1750 kcs. (171-550 meters)  
 STANDARD BROADCAST, domestic, foreign and police stations.  
 POLICE CALLS, 1600 kcs. to 1750 kcs.
- BAND No. 2**  
 1.7 megacycles to 6.2 megacycles (49 to 171 meters)  
 AMATEUR PHONE (voice), 1.8-2 megacycles.  
 POLICE CALLS, 2.4-2.5 megacycles.  
 AIRCRAFT (night) signals, 3.2-3.5 megacycles.  
 AMATEUR PHONE (voice), 3.9-4.0 megacycles.  
 AIRCRAFT (day) signals, 4.0-4.5 megacycles.
- BAND No. 3**  
 6 megacycles to 18 megacycles (16 to 50 meters)  
 SHORT WAVE BROADCAST, 49 meter band, 6.0-6.2 megacycles.  
 AMATEUR (voice and code), 40 meter band, 7.0-7.3 megacycles.  
 SHORT WAVE BROADCAST, 31 meter band, 9.4-10 megacycles.  
 SHORT WAVE BROADCAST, 25 meter band, 11.4-11.9 megacycles.  
 AMATEUR (voice and code), 20 meter band, 14.0-14.4 megacycles.  
 SHORT WAVE BROADCAST, 19 meter band, 15.1-15.35 megacycles.  
 SHORT WAVE BROADCAST, 16 meter band, 17.1-17.8 megacycles.

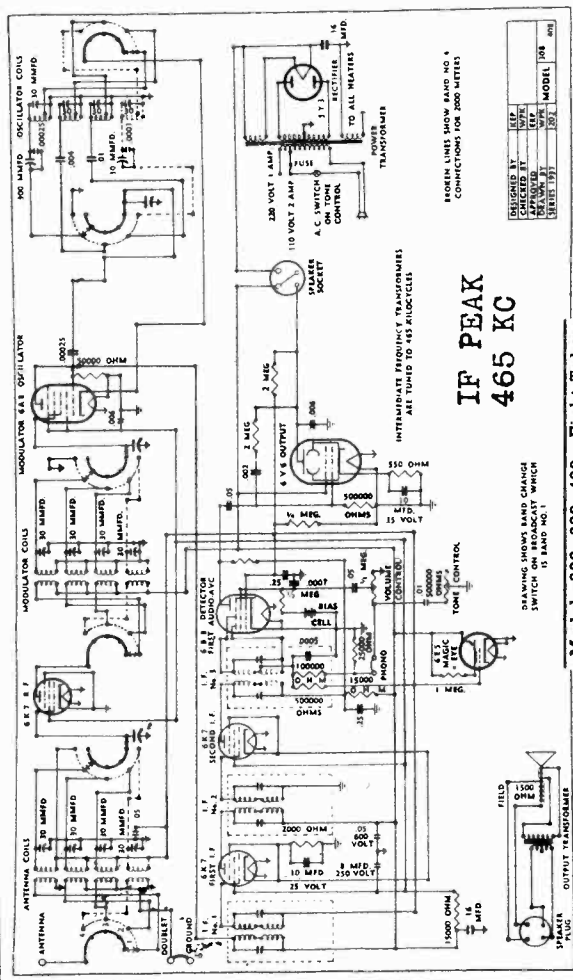
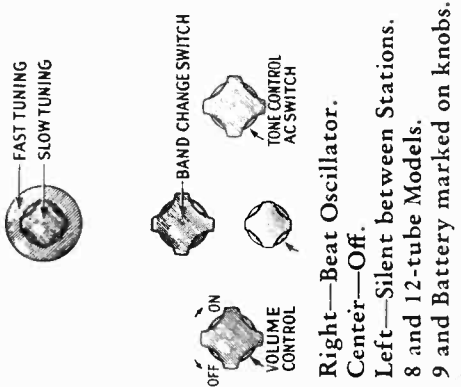


**STANDARD ANTENNA**  
 Simply connect to terminals A and G as shown in diagram above.



**PHONO-PICKUP**  
 Remove jumper which connects terminals No. 1 and No. 2. Standard High Impedance pickup must be used. It is essential that leads from terminals No. 1 and No. 2 be shielded and the shielding grounded to chassis at No. 4 which hole is provided in all chassis for this purpose. One side of pickup unit must also be grounded.

AC MODEL ONLY



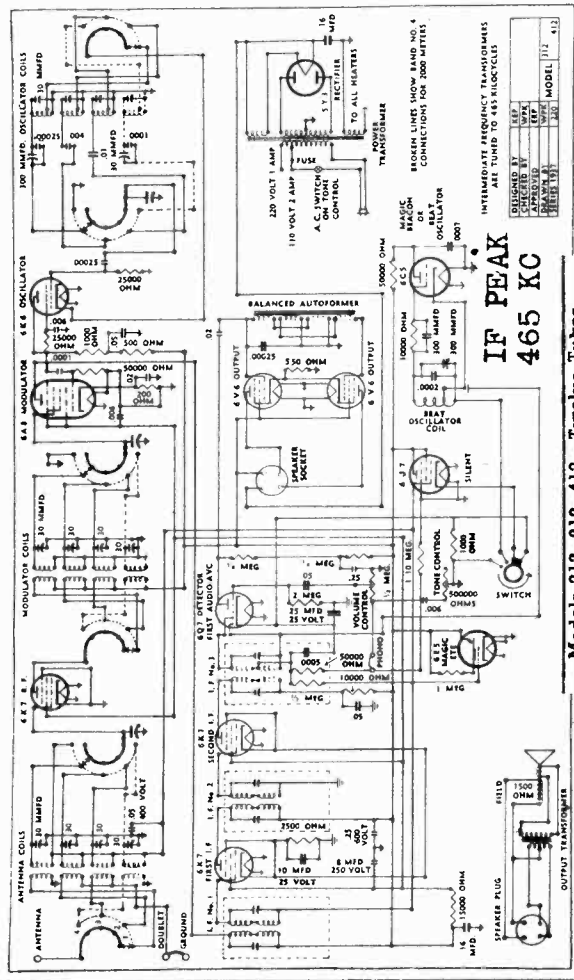
**THREE BAND RECEIVER**  
 \*550 Kilocycles to 18 Megacycles (16 to 550 Meters)  
 1937-1938 SERIES

**IF PEAK 465 KC**

**FOR ALIGNMENT AND VOLTAGE SEE INDEX.**

**\* Range 1937 Series - 530KC-18MC**

Models 208, 308, 408—Eight Tubes



**THREE BAND RECEIVER**  
 \*550 Kilocycles to 18 Megacycles (16 to 550 Meters)  
 1937-1938 SERIES

**IF PEAK 465 KC**

**FOR ALIGNMENT AND VOLTAGE SEE INDEX.**

**\* Range 1937 Series - 530KC-18MC**

Models 212, 312, 412—Twelve Tubes

MODELS 212,312,412  
Alignment

PATTERSON RADIO CO.

MODEL 128  
MODELS 168,268  
MODELS 198,298  
MODELS 208,308,408

## Alignment and Calibration Procedure

### 8-10-12-Tube Models

#### I. F. ALIGNMENT—ALL MODELS

In the following instructions for alignment the term V. T. V. M. shall be understood to mean Vacuum Tube Voltmeter or eye tube, and the term "resonance" means that the meter shows the greatest swing toward zero, or that the eye tube shows the narrowest dark section. Turn band selector switch to band "a" or No. 1. Place service oscillator in operation on 465 Kc. Connect grid of voltmeter to A. V. C. buss and ground of voltmeter to chassis. A convenient place to connect the voltmeter grid is on the terminal for the eye cable. This is located underneath on the floating R. F. section and between the back end of wave change switch and first R. F. tube socket. Connect to the terminal to which the green lead in the eye cable is connected. In lieu of a V. T. V. M. the eye tube itself may be used as a resonance indicator (adjusting for the narrowest dark section) although this method is seldom as accurate as when using a V. T. V. M. Another method which is by far the most accurate of all and which we strongly advise wherever possible is the use of the cathode ray oscilloscope and rotary sweep generator. This method will be discussed later in these notes.

Note: Refer to sketches in Figures 9, 10 and 11 for position of various tubes, coils and other components on all models.

CAUTION: Before making any adjustments on 12 tube model, be sure that the high fidelity switch is in the off position and remains there during adjustments. See tuning reference first page. Do not attempt to bend any of variable condenser plate flaps during alignment, particularly on the 12 tube models. The variable condensers are all carefully calibrated during the original alignment and should not require any further calibration during the life of the radio.

Remove grid cap from second I. F. tube (6K7) and apply oscillator output lead to grid of this tube and adjust trimmers on No. 3 I. F. transformer until resonance is indicated on V. T. V. M. The service oscillator output should be set for a quite high output when making this adjustment. Next remove oscillator lead and replace the cap on this tube. Then remove grid cap of first I. F. tube (6K7) and apply service oscillator output lead to grid of this tube and repeat adjustment as before this time adjusting trimmers on No. 2 I. F. transformer until V. T. V. M. indicates resonance. Reducing service oscillator output as necessary to obtain an easily readable indication. Next remove service oscillator lead and replace cap on first I. F. tube. Then remove cap from the Modulator tube 6A8 or 6L7 (as the case may be) and apply service oscillator output lead to grid of this tube, this time adjusting trimmers on No. 1 I. F. transformer, reducing service oscillator output as required and adjusting for resonance. Now without making any further changes go over all I. F. trimmers one by one carefully readjusting for exact resonance. This completes the alignment of the I. F. amplifier.

#### CALIBRATION OF VARIOUS BANDS—8-10 TUBE MODELS ONLY

Note: Refer to Figures 6, 9 and 10 for location of various coils and trimmers. (Refer to Fig. 5) for location of padding condensers.

#### BAND "A" (OR—No. 1) BROADCAST

Connect V. T. V. M. to A. V. C. buss and chassis ground, as described above for I. F. alignment. Turn band selector switch to band "A" (or No. 1). Place service oscillator in operation on 1400 Kc. and connect service oscillator output lead to antenna terminal of radio through a .0001 condenser or less or through standard dummy antenna. It will be necessary to keep the service oscillator output control well reduced during the following adjustments.

Set main tuning dial of radio to 1400 Kc. and adjust trimmer "A" in side of oscillator coil, Figure 4, to resonance. Next adjust trimmers "A" on the antenna and modulator coil to resonance. Next set service oscillator to 600 Kc. and set radio dial to 600 Kc. adjust padding condensers, "AP" to resonance. (Only a solid bakelite or other insulating screw driver will be satisfactory for adjusting any of the padding condensers as well as No. 3 I. F., an ordinary screw driver will be satisfactory for all other adjustments.) Now reset both service oscillator and radio dial to 1400 Kc. and retouch trimmer "A" on oscillator coil to resonance.

It may be well at this time also to recheck trimmers "A" on the antenna and modulator coils. This completes calibration and alignment of Band "A."

#### BAND "B" (OR NO. 2) SHORT WAVE BAND

Turn band selector switch to Band B, leaving all connections made as before for "A" band set service oscillator at 6 M. C. also set radio dial at 6 M. C. and adjust trimmer "B" on oscillator coil to resonance as indicated on V. T. V. M. Next adjust trimmers "B" on antenna and modulator coils to resonance. Change both service oscillator and radio dial to 2 M. C. and adjust "BP" padding condenser to resonance. Reset both radio dial and service oscillator to 6 M. C. and recheck trimmer "B" on oscillator coil for resonance. This completes calibration and alignment of Band "B."

#### BAND "C" (OR NO. 3) SHORT WAVE BAND

Turn band selector switch to Band "C." Set radio dial and service oscillator to 17 M. C. and adjust trimmer "C" on oscillator coil to resonance, it may be well to turn trimmers "C" on both antenna and modulator coils in about one turn before making above adjustment. Then after oscillator trimmer has been set retune trimmers "C" on modulate coil to resonance slowly turning main tuning dial back and forth slightly as adjustment is being made until resonance is indicated on V. T. V. M., retouching oscillator trimmer "C" as necessary to keep it on the desired spot on tuning dial. Next adjust trimmer "C" on antenna coil to resonance without rocking main dial next set service oscillator and radio dial to 6 M. C. (Band "C") and adjust padding condenser "CP" to resonance, reset radio dial and service oscillator to 17 M. C. and recheck oscillator trimmer "C" for resonance. This completes adjustment of Band "C."

Note: When making adjustments of modulator trimmers on all models and particularly the highest frequency bands, loosening of the modulator trimmer too far may cause a false resonance indication caused by the oscillator curve being "crossed over" removing oscillator lead or changing oscillator frequency, will readily show if this has occurred as no change in resonance indication will be apparent, also the set will be quite dead at the high frequency end of the band the true resonance point is with the modulator screwed in about one turn or less from the point where blocking occurs. The true resonant point will be quite apparent on resonance indicating devices.

#### X BAND (OR NO. 4)

(For models equipped with long wave weather or European band only.) Change wave band switch to "X" band. Set service oscillator and radio dial to 400 Kc., adjust oscillator trimmer "XOT" to resonance. Then adjust trimmers "XMT" and "XAT" to resonance. Then set both radio dial and service oscillator to 150 Kc. and adjust padding condenser "XP" to resonance. Reset both service oscillator and radio dial again to 400 Kc. and recheck trimmer "XOT" for resonance. This completes the calibration and alignment of all bands.

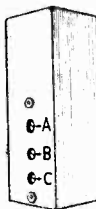


FIG. 6

## Calibration of Various Bands 12-Tube Model Only

#### BAND "A" (OR NO. 1) BROADCAST

Note: Refer to Figures 8 and 11 for location of various coils and trimmers. Refer to Figure 7 for location of padding condensers.

Connect V. T. V. M. and A. V. C. buss and chassis ground as described above for I. F. alignment. Turn band selector switch to Band "A" (or No. 1). Place service oscillator in operation on 1400 Kc. and connect service oscillator output lead to antenna terminal through a .0001 condenser or less or through a standard dummy antenna. It will be necessary to keep service oscillator output control well reduced during the following adjustments. Set main tuning dial of radio to 1400 Kc. and adjust trimmer "A" on oscillator coil, Figure 6. Next recheck trimmer "A" on antenna, R. F. and modulator coils to resonance, this completes alignment of band "A."

#### BAND "B" (OR NO. 2)

Change band switch to band "B" or No. 2, set both service oscillator and radio dial to 4 M. C. and adjust trimmer "B" on oscillator coil to resonance. Next adjust trimmers "B" on antenna, R. F. and modulator coils each in turn to resonance. Now change both service oscillator and radio dial to 1.5 M. C. (1500 Kc.), and adjust padding condenser "BP" to resonance. Reset both service oscillator and radio dial to 4 M. C. and recheck trimmer "B" on oscillator coil to resonance. This completes alignment of Band "B."

MODEL 128  
 MODELS 168,268  
 MODELS 198,298

PATTERSON RADIO CO.

MODELS 208,308,408  
 MODELS 212,312,412  
 Alignment, Part 2

BAND "C" OR NO. 3 ALIGNMENT continued:

Change band switch to band "C" or No. 3. Set service oscillator and radio dial to 12 M. C. and adjust trimmer "C" to resonance. Next adjust trimmers "C" on modulator coil rocking radio tuning dial slowly back and forth as adjustment is being made, resetting oscillator trimmer if and as necessary to keep calibration correct at this point after resonance has been reached trimmer "C" on antenna and R. F. coils may be adjusted to resonance without touching any other controls. Next set both radio dial and service oscillator to 5 M. C. and adjust padding condenser "CP" to resonance. Then reset both radio dial and service oscillator to 12 M. C. and recheck trimmer "C" on oscillator coil to resonance. This completes alignment of band "C" or No. 3.

BAND "D" OR NO. 4

Change band change switch to Band "D" set service oscillator and radio dial to 20 M. C. and adjust trimmer "D" on modulate coil slowly rocking main tuning dial to 9 M. C. (Band D or No. 3) and adjust padding condensers "DP" to resonance. Then reset both service oscillator and radio dial to 20 M. C. and recheck to resonance, this completes alignment of Band D.

Note: When making adjustments of modulator trimmers on all models and particularly the highest frequency bands, loosening of the modulator trimmer too far may cause a false resonance indication caused by the oscillator curve being "crossed over" removing oscillator lead or changing oscillator frequency will readily show if this has occurred as no change in resonance indication will be apparent also the set will be quite dead at the high frequency end of the band, the true resonance point is with the modulator screwed in about one turn or less from the point where blocking occurs. The true resonant point will be quite apparent on resonance indicating devices.

"X" BAND OR NO. 5

(For models equipped with long wave weather band only.)

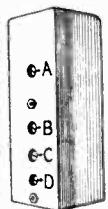


FIG. 8

Set band change switch to "X" band. Set both service oscillator and radio dial to 400 Kc., adjust trimmer "XOT" to resonance. Then adjust trimmers "XAT," "XRT," and "XMT" each in turn to resonance. Then set both service oscillator and radio dial to 150 Kc. and adjust padding condenser "XP" (very slowly) to resonance. Reset both service oscillator and radio dial to 400 Kc. and recheck trimmer "XOT" to resonance. This completes all alignment.

Cathode Ray Oscilloscope Alignment

For the service man who is equipped with a cathode ray oscilloscope and rotary sweep circuit, a very accurate alignment of the intermediate amplifier is possible. Owners of such equipment are usually familiar with the necessary procedure as this point is usually covered thoroughly in the instructions furnished with the equipment. More detailed information than that usually furnished with cathode ray equipment may be found in John Rider's book, "The Cathode Ray Tube at Work." An I. F. output connection intended for cathode ray alignment is incorporated in all Patterson 37 models. With chassis upside down and facing back of chassis it will be found in the lower left hand corner of chassis adjacent to the phono terminals and rubber corner rest. In the 8 and 10 tube models the adjustments should be made on the second stage first, then the first stage, then through the modulator and first I. F. transformer or practically the same procedure as when aligning by any other method. The curve on the 8 and 10 should be round nosed and about 10 Kc. wide at the summit. The high fidelity switch having no effect on the resonant curve in these models. In the 12 tube model the above procedure should be followed out with the exception that the high fidelity switch must be in the "off" position during alignment.

In this model the I. F. curve will be very sharp and not round nosed, after alignment has been completed the high fidelity switch may be turned on for a check, in which position the curve will remain symmetrical but become very broad with possibly a very slight shift in the I. F. frequency in some cases. If this is not the case, a misadjustment has been made in the alignment procedure and the high fidelity switch should be turned off and alignment rechecked as before.

OPERATION OF PHONO COMBINATION MODELS

The following instructions are for models equipped with phonopickup and motor. To place phonograph in operation turn radio on in usual manner with top cover raised. Turn toggle switch on top panel to position marked "Phono." Start motor by pulling lever extending from under turn table on right hand side forward. Lift pick up and pass over turn table toward the center of turn table, adjusting stop lever located between turn table and pickup hinge until motor turns off at a point just past when the last grooves in record stop, not including the stop grooves, which are elliptical. This point may vary with individual records while some records have no stop grooves at all. The best position for stop lever can easily be determined, however, after a few records have been tried. The speed control is located on the left hand side extending from under the turn table and is clearly marked. Use that speed which gives the best or most natural results. This speed is ordinarily 78 revolutions per minute for fast records, stroboscopes for various speeds and line frequency may be purchased for very small cost, which make it possible to obtain the exact speed. These stroboscopes are self explanatory. On those models equipped with two speed motors a third lever extends from under the turn table on which speeds are plainly marked, one being 78 R.P.M., the other 33 1/2 R.P.M. for slow speed records. The usual volume and tone controls are still in service and may be used at will while playing records.

VOLTAGES

The following tables show characteristic voltages at various points through a normal chassis.

All Voltages Measurable Under The Following Conditions:

Transformer line tap in 110-115 V. position line voltage 115 V. 60 cycles. Band change switch set on Band No. 2. No antenna. No signal being received sensitivity adjustment set at maximum position. All voltages listed measured from point indicated to chassis (ground), all readings taken on standard 1000 ohm per volt. Voltmeter.

8 TUBE CHASSIS

	Plate	Screen	Cathode	Suppressor
RF	6K7 200 V. App.	90 V. App.	2 V. App.	Tied to Cathode
Osc.	6A8 90 V. App.		2.5 V. App.	
Mod.	6A8 200 V. App.	90 V. App.		
1 IF	6K7 200 V. App.	90 V. App.	2 V. App.	Tied to Cathode
2 IF	6K7 200 V. App.	90 V. App.	2 V. App.	Tied to Cathode
Det.	6Q7			
Audio	*50 V. App.		0 V. App.	
Output	6F6 200 V. App.	200 V. App.	15 V. App.	
EYE	6G5 Target-200 V.		0 V. App.	
Rect.	5x3G	**Plate No. 1—350 V. AC	AC Plate No. 2—350 V. AC	
		**Measurable with AC Voltmeter only.		
		*Not actual, (measured through 500,000 ohms).		
1st filter	360 V. App.			
2nd filter	200 V. App.			

10 TUBE CHASSIS

	Plate	Screen	Cathode	Suppressor
RF	6K7 235 V. App.	90 V. App.	2.5 V. App.	Tied to Cathode
Osc.	6K7 80 V. App.	235 V. App.	0 V. App.	Tied to Cathode
Mod.	6L7 235 V. App.	90 V. App.	3 V. App.	Tied to Cathode
1 IF	6K7 235 V. App.	90 V. App.	2.5 V. App.	Tied to Cathode
2 IF	6K7 235 V. App.	90 V. App.	2.5 V. App.	Tied to Cathode
Det.	6Q7 55 V. App.		0 V. App.	
Audio	6Q7 55 V. App.			
Output	6F6 235 V. App.	235 V. App.	18 V. App.	
Output	6F6 235 V. App.	235 V. App.	18 V. App.	
EYE	6G5 235 V. App.		0 V. App.	
Rect.	5x3G	Plate No. 1—350 V. AC	Plate No. 2—350 V. AC.	
		*Not actual, (measured through 500,000 ohms).		
		**Measured only with AC Voltmeter.		
1st Filter Cond.	325 V. DC			
2nd Filter Cond.	250 V. DC			

12 TUBE CHASSIS

	Plate	Screen	Cathode	Suppressor
RF	6K7 250 V. App.	110 V. App.	2.5 V. App.	Tied to Cathode
RF	6K7 250 V. App.	110 V. App.	2.5 V. App.	Tied to Cathode
Osc.	6K7 250 V. App.	110 V. App.	0 V. App.	Tied to Cathode
Mod.	6L7 250 V. App.	110 V. App.	3 V. App.	Tied to Cathode
1 IF	6K7 250 V. App.	110 V. App.	2.5 V. App.	Tied to Cathode
2 IF	6K7 250 V. App.	110 V. App.	2.5 V. App.	Tied to Cathode
Det.	6Q7			
Audio	6Q7 ***90 V. App.		0 V. App.	
Output	6F6 325 V. App.	250 V. App.	20 V. App.	
Output	6F6 325 V. App.	250 V. App.	20 V. App.	
B. Osc.	6C5 *50 V. App.		0 V. App.	
EYE	6G5 Target	250 V. App.	0 V. App.	
Rect.	5x4G	**Plate No. 1—330 V. AC	Plate No. 2—330 V. AC.	
		*Measurable with beat oscillator switch turned on.		
		**Measurable only with AC Voltmeter.		
		***Not actual, (measured through 500,000 ohms).		
1st Filter Cond.	350 V. App.			
2nd Filter Cond.	235 V. App.			





MODEL 38-15(121,124)

Alignment, Specs.

PHILCO RADIO & TELEV. CORP.

Parts

**EQUIPMENT REQUIRED:** (1) Signal Generator, using a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 Signal Generator which has a fundamental frequency range from 115 to 36,000 K.C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 026 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

**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:

1. Turn the tuning condenser to maximum capacity position (plates fully meshed).
2. Holding the tuning condenser in this position, turn the pointer until it is in the position shown in Fig. 3. This is the correct position of pointer at maximum capacity of tuning condenser.

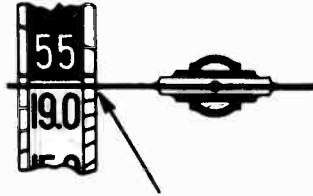


FIG. 3—Dial Pointer Calibration

**Intermediate Frequency Circuit**

Insert the signal generator shielded output lead into the "Med." jack on the panel of the generator. Connect the other end of the output lead through a .1 mfd. condenser to the grid of the 6A7 Det. Osc. tube, and the ground connection of the signal generator to the chassis. Set the Signal Generator and receiver controls, and adjust the I.F. compensators as follows:

1. Set Signal Generator at 470 K.C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
2. Turn the receiver dial to 580 K.C.
3. Receiver volume control maximum.
4. Range Switch (Broadcast)
5. Adjust compensators, (15A), (14B), (14A), for maximum output. If the output meter goes off scale when adjusting the compensators, retard the signal generator attenuator.

**Radio Frequency Circuit**

**Tuning Range 5.7 to 18.0 M.C.**

1. With one end of the shielded lead of the signal generator output lead in the "Med" jack, connect the other end through a 400 ohm resistor to the white aerial wire (rear of chassis). Connect the signal generator ground to the brown lead or to the chassis of the receiver.

2. Set the controls and adjust the R.F. compensators as follows:

Range Switch Position	Signal Generator and Receiver Dial	R. F. Compensators in Order
Short Wave	18.0 M.C.	(4B)

**Tuning Range 530 to 1720 K.C.**

1. Remove the 400 ohm resistor from aerial lead and replace with a 100 mmfd. condenser.

2. Set the controls and adjust the R.F. compensators as follows:

Range Switch Position	Signal Generator and Receiver Dial	R. F. Compensators in Order
Broadcast	1550 K.C.	(9), (4A)
	580 K.C.	(9A) Roll tuning condenser
	1550 K.C.	(9), (4A)

**Replacement Parts Model 38-15, Code 121, 124**

Schem. No.	Description	Part No.	List Price
1	Ant. Trans. (Range 2)	32-2821	
2	Ant. Trans. (Range 1)	32-2922	
3	Range Switch	42-1366	\$0.70
4	Tuning Condenser Assembly	31-2085	4.00
5	Condenser (.5µf, mica)	30-1087	.20
6	Condenser (.05 µf, tubular)	30-4519	.20
7	Resistor (51000 Ω, ½ W.)	33-351339	.20
8	Osc. Trans. (Range 1 and 2)	32-2823	.40
9	Compensator	31-5100	.40
10	Condenser (3500 µf, mica)	30-1094	.40
11	Condenser (250 µf, mica)	30-1032	.25
12	Resistor (5000 Ω, ½ W.)	33-50339	.20
13	Resistor (10,000 Ω, 1 W.)	33-310439	.20
14	1st. I. F. Trans.	32-2672	2.20
15	2nd. I. F. Trans.	32-2674	1.50
16	Resistor (51,000 Ω, ½ W.)	33-351339	.20
17	Resistor (2 Meg., ½ W.)	33-520839	.20
18	Condenser (.03 µf, tubular)	30-4449	.20
19	Resistor (32,000 Ω, ½ W.)	33-332339	.20
20	Volume Control & Power Switch	33-6230	1.45
21	Condenser (.01 mfd, tubular)	30-4514	.20
22	Resistor (4 meg., ½ W.)	33-540339	.20
23	Condenser (.01 µf, tubular)	30-4514	.20
24	Resistor (190,000 Ω, ½ W.)	33-419339	.20
25	Resistor (490,000 Ω, ½ W.)	33-449339	.20
26	Condenser (250 µf, mica)	30-1032	.25
27	Condenser (.01 µf, tubular)	30-4169	.20
28	Output Trans. Code 121 (B01 Speaker)	32-7861	
29	Output Trans. Code 124 (S19 Speaker)	32-7019	
30	Cone & Voice Coil Assembly, Code 121 (B01 Speaker)	36-3981	
31	Cone & Voice Coil Assembly, Code 124 (S19 Speaker)	36-3014	
32	Electrolytic Condenser (2-4 mfd.)	30-2265	
33	Electrolytic Condenser (10-12 µf.)	30-2263	
34	*Speaker Field Code 121 (B01) See Note		
35	Speaker Field Assembly, Code 124, (S19 Speaker)		
36	Resistor (250 Ω, 1 W.)	36-3987	
37	Resistor (70 Ω)	33-1259	
38	Pilot Lamp	34-2064	
39	Power Trans. (115 V., 50 to 60 cycle)	32-7826	
40	Condenser (.01-.01 µf, Bakelite)	3003-DG	
41	Condenser Code 124, (.01-.01 µf, Bakelite)	3903-0 DG	
42	Bezel & Glass Assembly (Code 121)	40-6158	
43	Bezel & Glass Assembly (Code 124)	40-6254	
44	Bezel Clamp	28-5153	
45	Cable (Power, Code 121)	L2778	
46	Cable (Power Code 124)	L2895	
47	Clip, Small (R. F. Trans.)	26-5002	
48	Clip, Large (R. F. Trans.)	26-5003	
49	Dial Assembly	31-2137	

\* Speaker must be replaced when field is open or shorted.

**Specifications**

**TYPE OF CIRCUIT:** A.C. operated, Superheterodyne circuit, incorporating two tuning ranges covering standard and short wave broadcasts, automatic volume control, and a pentode audio output circuit. When built into a Type "T" cabinet, the receiver is identified as Code 121. In the Chairside Cabinet, Type "CS", the speaker is removed from the receiver chassis and mounted in the cabinet. The receiver is then identified as Code 124.

POWER SUPPLY:	Voltage	Frequency Cycles	Power Consumption
	115	50 to 60	40 watts

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

**R.F. TUNING RANGES:** 540 to 1720 K.C.  
5.7 to 18.0 M.C.

**AUDIO OUTPUT:** 2 watts

**PHILCO TUBES USED:** Five: One 6A7, Det. Osc.; One 78, I.F.; One 75, 2nd Det., 1st Audio; One 41, Output, and One 84, Rectifier.

**TUNING MECHANISM:** 8 to 1 Ratio using Pulley and Cord.

**CABINET:** Type "T" and "CS"

**OUTPUT METER:** The 026 Output Meter is connected to the plate and cathode terminals of the 4I tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

Schem. No.	Description	Part No.	List Price
	Dial Pointer	28-5201	\$0.20
	Dial Drive Cord	31-2066	.10
	Dial Drive Shaft	38-9001	
	Knob	27-4604	.10
	Mtg. Rubber (Dial)	27-4150	.01
	Mtg. Rubber (Tuning Condenser)	27-4596	.30
	Pulley (Tuning Condenser)	31-1283	.05
	Shield (Tube)	26-5059	
	Speaker (B01, Code 121)	36-1366	
	Speaker (S19, Code 124)	36-1382	
	Socket Assembly (Pilot Lamp)	38-9041	.35
	Socket (6 Prong)	27-6036	.11
	Socket (7 Prong)	27-6037	.11
	Socket (5 Prong)	27-6035	.11

PHILCO RADIO & TELEV. CORP.

MODEL 38-33(121)  
Schematic, Parts  
Chassis Layout

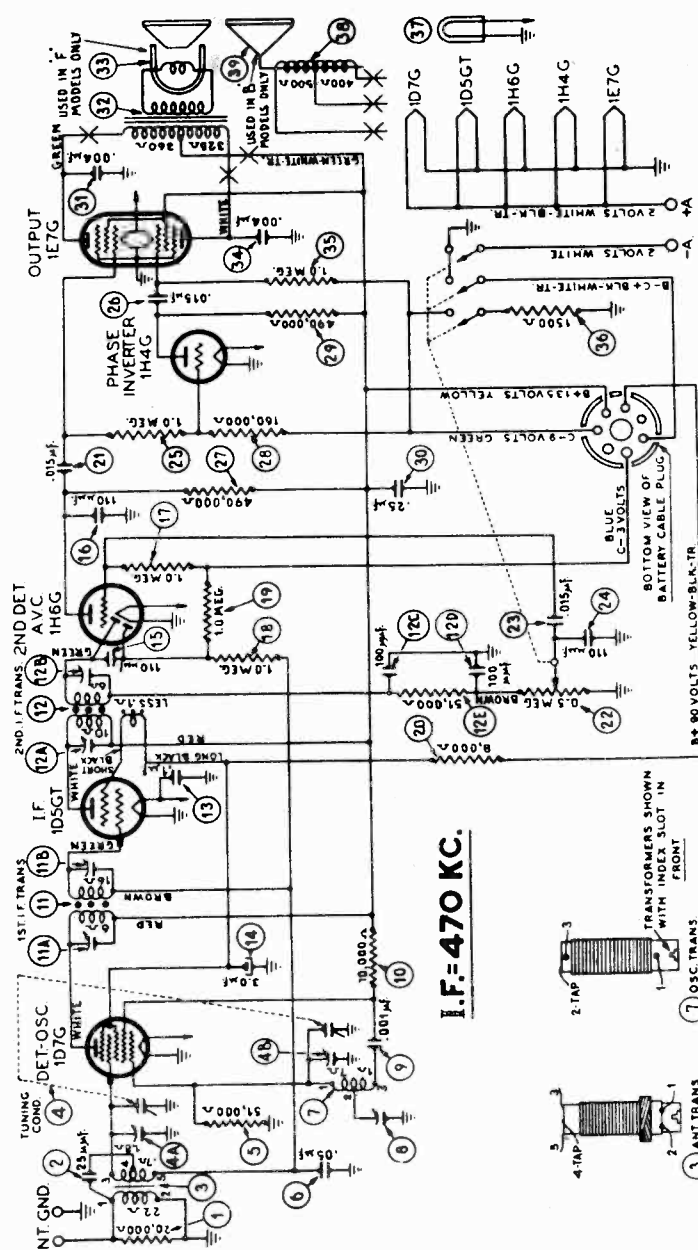


Fig. 4. Schematic Diagram, Model 38-33, Code 121

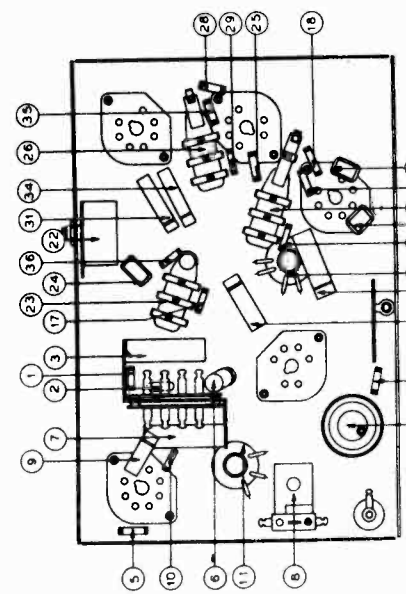
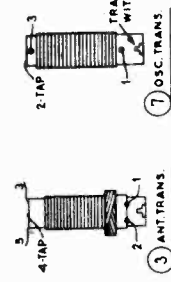


Fig. 5. Part locations, Underside of Chassis

Replacement Parts

Schem. No.	Part No.	Description	List Price
1	33-320339	Resistor (20,000 ohms, 1/4 watt)	\$0.20
2	30-1067	Condenser (25 mmf mica)	.20
3	32-2212	Ant. Transformer	1.60
4	31-2100	Tuning Condenser Assembly	.20
5	33-351339	Resistor (51,000 ohms, 1/4 watt)	.20
6	30-4444	Condenser .05 mf tubular	.20
7	32-2213	Osc. Transformer	.70
8	31-6186	Low Frequency Padler	.30
9	30-4453	Condenser (.001 mf tubular)	.20
10	33-310339	Resistor (10,000 ohms, 1/4 watt)	.20
11	32-2841	1st I. F. Transformer	.20
12	32-2785	2nd I. F. Transformer	.90
13	30-4489	Condenser (.1 mf tubular)	.20
14	30-2158	Condenser (Electrolytic 3.0 mf.)	.20
15	30-1031	Condenser (.10 mf mica)	.20
16	30-1061	Condenser (.10 mf mica)	.20
17	30-510339	Resistor (1.0 meg. 1/2 watt)	.20
18	30-510339	Resistor (1.0 meg. 1/2 watt)	.20
19	30-510339	Resistor (1.0 meg. 1/2 watt)	.20
20	30-280339	Resistor (9000 ohms, 1/2 watt)	.35
21	3793SU	Condenser (.015 mf Bakelite)	.35
22	33-5249	Volume Control—Power Switch	.35
23	3793SU	Condenser (.015 mf Bakelite)	.20
24	30-1031	Condenser (.10 mf mica)	.20
25	33-510339	Resistor (1.0 meg. 1/2 watt)	.20
26	3793SU	Condenser (.015 mf Bakelite)	.35
27	33-449339	Resistor (490,000 ohms, 1/2 watt)	.20
28	33-410339	Resistor (180,000 ohms, 1/2 watt)	.20
29	33-449339	Resistor (490,000 ohms, 1/2 watt)	.25
30	30-4456	Condenser (.25 mf tubular)	.20
31	30-4456	Condenser (.004 mf tubular)	.20
32	32-7758	Output transformer (KR26 speaker)	.20
33	36-3540	Cone & Voice Coil Assembly (KR26 Speaker)	.20
34	30-4456	Condenser (.004 mf tubular)	.20
35	33-510339	Resistor (1.0 meg. 1/2 watt)	.20
36	33-215339	Resistor (1500 ohm, 1/2 watt)	.22
37	34-2150	Pilot Lamp	.50
38	36-1359	Speaker L3 "B" Cabinets	.20
39	45-2554-1	Cone Assembly L3 Speaker	.20
	27-5348	Bezel Window	
	27-5248	Bezel Window	
	41-3203	Cable (Battery)	
	41-3228	Cable (Speaker)	
	31-2107	Dial Assembly	
	28-5201	Dial Pointer	
	28-5201	Dial Bracket	
	31-2086	Dial Drive Cord	
	28-8751	Dial Drive Spring	

I.F. = 470 KC.



Schem. No.	Part No.	Description	List Price
	28-6662	Dial Drive Drum	\$0.10
	38-9107	Dial Drive Tuning Shaft	.10
	27-4321	Knob	.11
	38-9121	Pilot Lamp Assembly	.11
	28-2726	Shield (Tube)	.11
	28-2725	Shield Base (Tube)	.11
	27-6086	Socket 6 prong	.11
	27-6087	Terminal Strip (R. F. Coils)	.11
	38-7963	Speaker, L3 (B Cabinet)	10.00
	36-1359-1	Speaker (F Cabinet, KR26)	

PRICES SUBJECT TO CHANGE  
WITHOUT NOTICE



PHILCO RADIO & TELEV. CORP.

MODEL 38-34(125)  
Schematic, Parts  
Chassis Layout

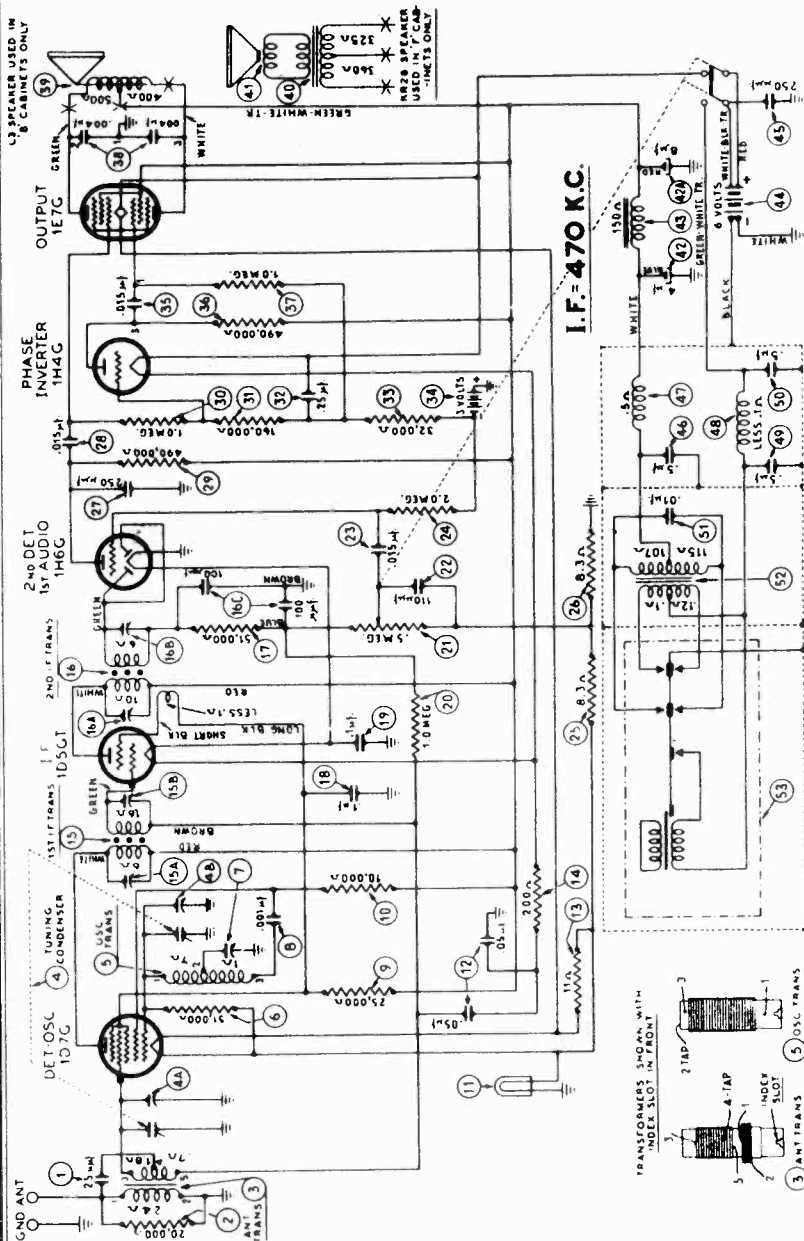


Fig. 4. Schematic Diagram—Model 38-34, Code 125

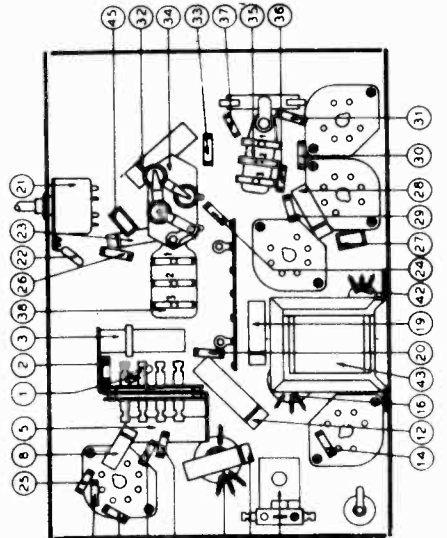


Fig. 6. Part Locations Underside of Chassis

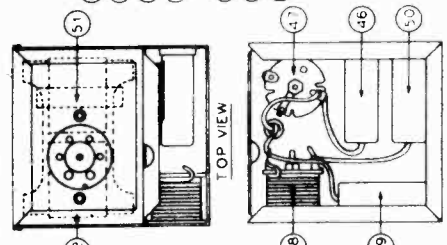


Fig. 5. Vibrator Part Locations

Replacement Parts  
Model 38-34, Code 125

Schem. No.	Description	Part No.	List Price
1	Condenser (25 mmf. mica)	30-1067	\$0.20
2	Resistor (20,000 ohms, 1/2 watt)	33-320339	\$0.20
3	Ant. Transformer	32-2212	1.60
4	Tuning Condenser Assembly	31-2100	70
5	Osc. Transformer	32-2213	30
6	Osc. Transformer (51,000 ohms, 1/2 watt)	33-551239	30
7	Compensator	31-0186	30
8	Resistor (.001 mf. tubular)	30-4465	20
9	Resistor (25,000 ohms, 1/2 watt)	33-325539	20
10	Resistor (10,000 ohms, 1/2 watt)	33-310539	22
11	Pilot Lamp Bulb	34-2180	.35
12	Condenser (.05 mf., .05 mf. tubular)	30-4522	20
13	Resistor (11 ohms, 1/2 watt, wire wound)	33-1264	20
14	Resistor (200 ohms, 1 watt wire wound)	33-1244	2.20
15	1st I. F. Transformer	32-2841	3.00
16	2nd I. F. Transformer	32-2795	2.00
17	Resistor (51,000 ohms, 1/2 watt, Part of 16)	33-351339	20
18	Condenser (.1 mf. tubular)	30-4499	20
19	Condenser (.1 mf. tubular)	30-4499	20
20	Resistor (1.0 meg., 1/2 watt)	30-510339	20
21	Power Switch & Volume Control	33-5237	20
22	Condenser (110 mf. mica)	30-1031	20
23	Condenser (.015 mf. tubular)	30-4358	20
24	Resistor (2.0 meg., 1/2 watt)	33-520339	20
25	Resistor (.83 ohms, 1/2 watt, wire wound)	33-1268	20
26	Resistor (.83 ohms, 1/2 watt, wire wound)	33-1268	20
27	Condenser (250 mmf. mica)	30-1032	25
28	Condenser (.015 mf. tubular)	30-4515	20
29	Resistor (600,000 ohms, 1/2 watt)	33-448339	20
30	Resistor (1.0 meg., 3 watt)	33-510339	20
31	Resistor (160,000 ohms, 3 watt)	33-416339	25
32	Condenser (.25 mf. tubular)	30-4446	20
33	Resistor (32,000 ohms, 1/2 watt)	33-332339	20
34	Bias Cell (3 used)	41-8009	35
35	Condenser (.018 mf. bakelite)	3793SU	30
36	Resistor (600,000 ohms, 1/2 watt)	33-448339	20
37	Resistor (1.0 meg., 1/2 watt)	33-510339	20
38	Cone Assembly (L3 Speaker)	8321DU	20
39	Cone Assembly (L3 Speaker)	85-2554-1	20
40	Output Transformer (KR26 Speaker)	32-7758	1.50
41	Cone & Voice Coil Assembly (KR26 Speaker)	36-3540	1.00
42	Condenser (4 mf.—8 mf.—Electrolytic)	30-2150	2.00
43	Choke	32-7543	1.35
44	6 volt Storage Battery	110R	2.25
45	Condenser (250 mmf. mica)	30-1032	.60
46	Condenser (.5 mf.)	30-4296	.25
47	Choke "B"	32-1932	.25
48	Choke "A"	32-1954	.40
49	Condenser (.5 mf.)	30-4296	.25
50	Condenser (.5 mf.)	30-4296	.25
51	Condenser (.01 mf. tubular)	30-4381	2.20
52	Power Transformer	32-7682	5.25
53	Vibrator	41-3222	40
54	Bias Cell Panel Assy	38-9104	1.20
55	Cable (Speaker)	41-3326	.20
56	Cable (Battery)	31-3204	.20
57	Dial Assembly	31-2107	.08
58	Dial Drive Cord	31-2086	.08
59	Drum	29-6662	\$0.20
60	Mtg. Rubber—Small (Vibrator Assembly)	27-4307	C 1.20
61	Mtg. Rubber—Large (Vibrator Assembly)	27-3914	.02
62	Mtg. Rubber—Square (Vibrator)	27-4287	.05
63	Pointer (Dial)	28-5201	.20
64	Shaft Assembly (Tuning)	38-9107	.15
65	Shield Assembly (Vibrator)	38-8022	.25
66	Socket (6 prong)	27-6086	.11
67	Socket (7 prong)	27-6087	.11
68	Socket Assembly (Pilot Lamp)	38-9120	.11
69	Socket (Vibrator)	27-8036	.05
70	Spring (Drive Cord)	28-8751	10.00
71	Speaker (L3)	36-1359	6.50
72	Washer & Spacer (Mtg. Vibrator Assembly)	40-6298	.11
73	Washer (Mtg. Vibrator unit)	5189	.03
74	Best Window	27-5348	.20
75	Best Throat	28-5248	.20



MODEL 38-34(125)

Socket, Trimmers  
Alignment, Specs.  
Voltage

PHILCO RADIO & TELEV. CORP.

SPECIFICATIONS

The receiver is designed to operate from a standard "L" type aerial Philco part No. 45-7428. This aerial system should be used to obtain the maximum performance from the receiver.

POWER SUPPLY: 6 volt storage battery-Philco type 116R

Current drain: 1.2 amps.

INTERMEDIATE FREQUENCY: 470 K. C.

TUNING RANGE: 530 to 1720 K. C.

OUTPUT: 1 watt

SPEAKERS USED: "B" Cabinet L-3.  
"F" Cabinet KR26.

TYPE OF CIRCUIT: A Five tube superheterodyne circuit covering standard broadcast and state police frequencies is used in this model. The receiver is operated by a 6 volt storage battery and uses a synchronous vibrator for supplying "B" voltage. The vibrator power unit in the type "B" cabinet is mounted on the chassis. In the type "F" cabinet the vibrator power unit is mounted under the chassis shelf and connected to the receiver through a cable and plug. Additional design features included in this model are: Automatic Volume Control; two point, tone control and Pushpull Pentode Audio Output Circuit.

**Alignment of Compensators**  
Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.  
**OUTPUT METER:** The 026 Output Meter is connected to the plate terminals of the 1E7G tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

Operations In Order	Signal Generator		Receiver		Special Instructions
	Output Connections To Receiver	Dummy Antenna (Note B)	Dial Setting	Control Settings	
1	Grid Cap 1D7G Det. Osc.	.1 mfd.	470 K. C.	Vol. Cont. (max.)	(15B), (15A) (16B), (16A)
2	Ant. Ter.	200 mmfd.	1500 K. C.	-	(4B), (4A)
3	Ant. Ter.	200 mmfd.	580 K. C.	-	(7)
4	Ant. Ter.	200 mmfd.	1500 K. C.	-	(4B), (4A)



Fig. 3. Dial Calibration. Set pointer as shown.

NOTE "A"—First adjust compensator for maximum output, then vary the tuning condenser for maximum output. Now turn the compensator slightly to the right or left and again adjust 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 the output meter reading.

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

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

1. Turn the tuning condenser to maximum capacity position (plates fully meshed)
2. Holding the tuning condenser in this position, turn the dial pointer until it is parallel with the INDEX LINE. See Fig. (3). This is the correct position of pointer at the maximum capacity position.

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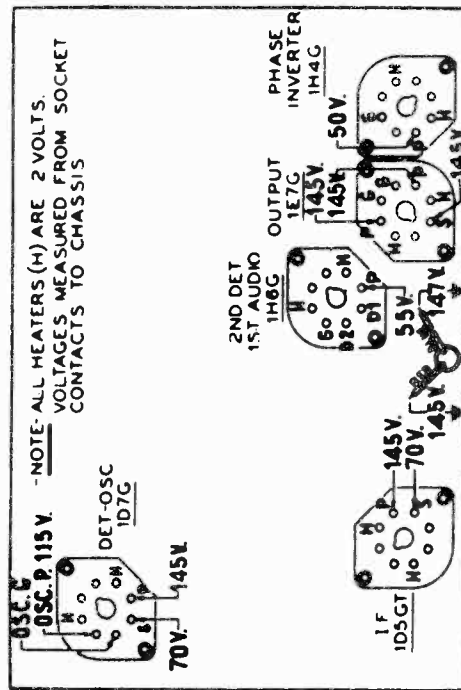


Fig. 1. Socket Voltages, Underside of Chassis. The voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains a sensitive voltmeter. Volume control at minimum.

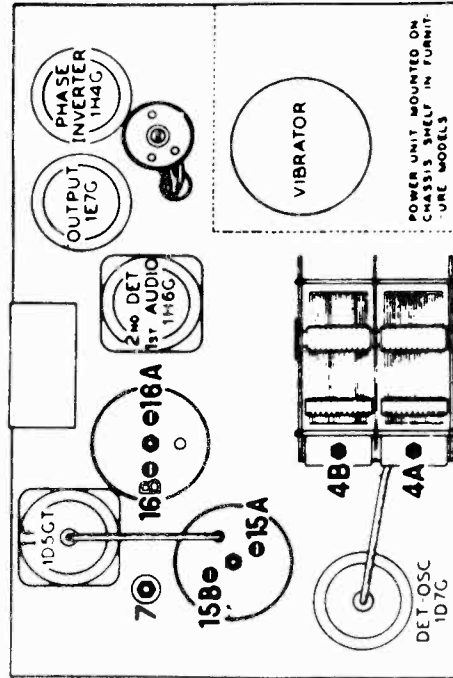


Fig. 2. Locations of Compensators

PHILCO RADIO & TELEV. CORP.

MODEL 38-35(121)  
Schematic, Parts  
Chassis Layout

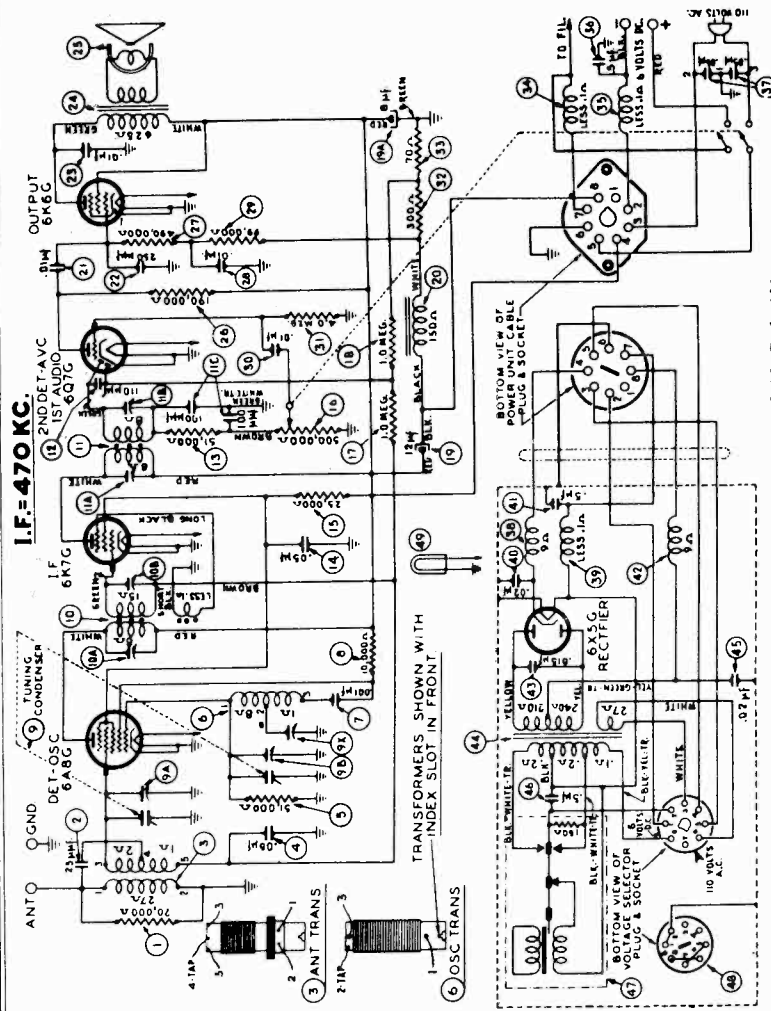


Fig. 4. Schematic Diagram—Model 38-35, Code 121

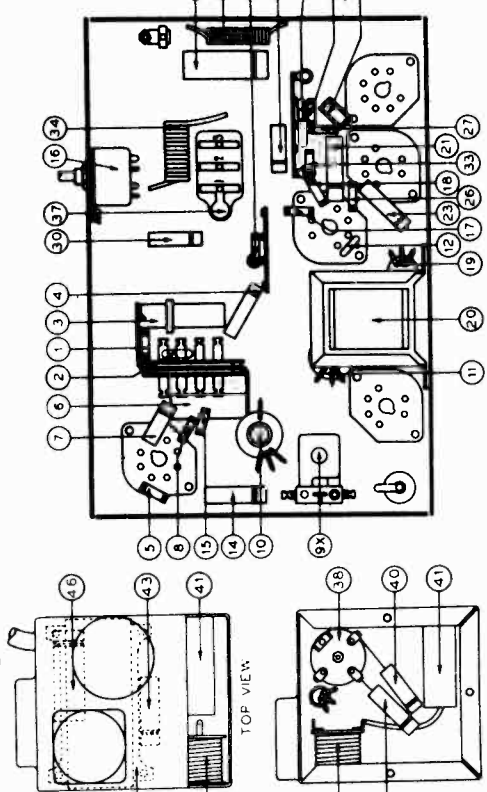


Fig. 6. Part Locations Underside of Chassis

Fig. 5. Vibrator Part Locations

Replacement Parts  
Model 38-35, Code 121

Schem. No.	Part No.	Description	List Price
1	33-320339	Resistor (20,000 Ω ½ watt)	\$0.20
2	30-1067	Condenser (25 μf, mica)	.20
3	32-2212	Ant. Transformer	1.60
4	30-4518	Condenser (50 μf, tubular)	.20
5	33-351339	Resistor (51,000 Ω ½ watt)	.20
6	32-2213	Osc. Transformer	.70
7	30-4453	Condenser (.001 μf, tubular)	.20
8	33-310339	Resistor (10,000 Ω ½ watt)	.20
9	31-2100	Tuning Condenser	.30
9X	32-2852	Compensator	
10	32-2852	1st. I. F. Transformer	
11	32-2854	2nd. I. F. Transformer	
12	30-1051	Condenser (110 μf, mica)	.20
13	33-351339	Resistor (51,000 Ω ½ watt) (Part of 11)	.20
14	30-4444	Condenser (.05 μf, tubular)	.20
15	33-325339	Resistor (25,000 Ω ½ watt)	.20
16	33-5253	Power Switch & Volume Control	.20
17	33-510339	Resistor (1.0 Meg. ½ watt)	.20
18	33-510339	Resistor (1.0 Meg. ½ watt)	.20
19	30-2270	Choke Coil	1.15
20	32-7038	Condenser (.01 μf, tubular)	.20
21	30-4514	Condenser (250 μf, mica)	.25
22	30-1032	Condenser (.01 μf, tubular)	.20
23	30-4169	Output Transformer	
24	32-7936	Cone & Voice Coil Assembly	1.00
25	33-419339	Resistor (190,000 Ω ½ watt)	.20
26	33-419339	Resistor (490,000 Ω ½ watt)	.20
27	30-4479	Condenser (.01 μf, tubular)	.20
28	33-398339	Resistor (99,000 Ω ½ watt)	.20
29	30-4479	Condenser (.01 μf, tubular)	.20
30	33-540339	Resistor (4.0 meg. ½ watt)	.20
31	33-1214	Resistor (300 Ω, 1 watt)	.20
32	33-070339	Resistor (70 Ω, ½ watt)	.20
33	32-2269	"A" Choke	.20
34	32-2269	"A" Choke	.20
35	30-4229	Condenser (5 mfd., tubular)	.80
36	32-7934	Condenser (.05-05 μf, Bakelite)	.40
37	32-2836	"B" Choke	.90
38	32-1984	"B" Choke	.90
39	30-4481	"A" Choke	.20
40	32-2836	Condenser (.02 μf, tubular)	.60
41	30-4296	Choke (Part of 38)	
42	30-4552	Condenser (.019 μf, tubular)	
43	32-7934	Condenser (.019 μf, tubular)	
44	30-4481	Power Transformer	
45	30-4551	Condenser (.02 μf, tubular)	
46	4V-3367	Condenser (.5 mfd., tubular)	
47	38-0927	Vibrator	
48	38-9068	Voltage Selector Plug	
49	34-1376	Pilot Lamp Bulb	
	36-1376	Speaker KR-29	
	28-5245	Bezel Window	
	28-5245	Bezel Window	
	28-5225	Bracket (Dial Ass'y)	
	41-3394	Cable (Battery & Vibrator)	
	41-3371	Cable (Speaker)	
	L-2778	Cable (Power, A. C.)	
	41-3369	Cable (Vibrator, F. Cabinet)	
	41-3368	Cable (Vibrator, B. Cabinet)	
	31-2086	Cable & Frame Ass'y	
	31-2107	Dial Drive Spring	
	28-8751	Dial Drive Spring	
	28-6662	Dial Drive Drum	
	27-4321	Knob (Tuning)	
	27-4332	Knob (Volume)	
	W-490	Mtg. Bolt (Chassis)	
	30-4552	Mtg. Washer-Rubber (Vibrator "B" Cabinet)	.3914
	5189	Mtg. Washer-Rubber (Vibrator "F" Cabinet)	.1589
	27-4307C	Mtg. Washer-Rubber (Vibrator "B" Cabinet)	\$1.20
	27-4585	Mtg. Washer-Rubber (Vibrator "F" Cabinet)	.28-6142
	28-6772	Mtg. Sleeve (Vibrator "B" Cabinet)	.12
	28-6772	Mtg. Sleeve (Vibrator "F" Cabinet)	.12
	38-9270	Pilot Lamp Ass'y	.20
	28-5201	Pointer (Dial)	.20
	27-4637	Rubber Sleeve (Mtg. Vibrator)	.15
	38-9107	Shaft Tuning	
	38-9245	Shield (Vibrator)	
	36-1379	Speaker (KR29)	
	27-6054	Socket (Voltage selector)	.11
	27-6086	Socket (6 prong)	.11
	27-6087	Socket (7 prong)	.11
	27-6058	Socket (Rectifier)	
	W-1400	Screw (Dial Drum)	.08
	W-1400	Screw (Mtg. Vibrator, B. Cabinet)	.08
	W-410	Screw (Mtg. Vibrator, F. Cabinet)	.20
	W-767	Screw (Mtg. Vibrator, F. Cabinet)	.10



PHILCO RADIO & TELEV. CORP.

MODEL 38-40(121)  
Schematic, Parts  
Chassis Layout

Replacement Parts  
Model 38-40, Code 121

Schem. No.	Part No.	Description	List Price
1	32-2558	Antenna Transformer (Range 2)	\$0.70
2	32-2667	Antenna Transformer (Range 1)	1.60
3	30-4319	Condenser (.68 mf. tubular)	.20
4	31-2068	Tuning Condenser	5.00
5	32-2668	Osc. Transformer (Range 2)	1.25
6	32-2589	Osc. Transformer (Range 1)	.50
7	31-6188	Compensator (2 sections)	.50
8	33-41239	Resistor (120,000 ohms, 1/2 W)	.20
9	30-1094	Condenser (3500 mmf.)	.40
10	32-250339	Resistor (5,000 ohms, 1/2 W)	.20
11	32-2580	1st I.F. Transformer	2.20
12	32-2582	2nd I.F. Transformer	2.20
13	33-351439	Resistor (51,000 ohms, 1 W)	.20
14	33-351439	Electrolytic Condenser (8-8 mf)	.20
15	30-4455	Condenser (.1 mf)	.25
16	33-310439	Resistor (10,000 ohms, 1W)	.20
17	33-510339	Resistor (1.0 meg. 1/2 W)	.20
18	30-1031	Condenser (110 mmf. mica)	.20
19	33-351339	Resistor (51,000 ohms, 1/2 W part (12)	.20
20	33-5215	Volume Control	1.00
21	30-4358	Condenser (.015 mf. tubular)	.20
22	33-510339	Resistor (1.0 meg. 1/2 W)	.20
23	33-510339	Resistor (1.0 meg. 1/2 W)	.20
24	30-4499	Condenser (.1 mf. tubular)	.20
25	30-310539	Resistor (10,000 ohms, 2 W)	1.35
26	32-7543	Filter Choke	.20
27	33-510339	Resistor (1.0 meg. 1/2 W)	.20
28	30-4444	Condenser (.05 mf. tubular)	.20
29	30-4191	Condenser (.15 mf. tubular)	.25
30	33-240339	Resistor (4,000 ohms, 1/2 W)	.20
31	30-2219	Electrolytic Condenser (.25 mf)	1.50
32	33-402339	Resistor (40,000 ohms, 1/2 W)	.20
33	33-3310	Resistor (40,000 ohms, 202-8-35 ohms)	.35
34	30-1032	Condenser (.250 mmf. mica)	.20
35	30-4515	Condenser (.015 mf. tubular)	.20
36	33-435339	Resistor (330,000 ohms, 1/2 W)	.20
37	33-449339	Resistor (490,000 ohms, 1/2 W)	.20
38	30-4447	Condenser (.03 mf. tubular)	.20
39	32-7936	Output Transformer	1.00
40	36-3540	Cone & Voice Coil Assembly (KR29)	.20
41	33-399339	Resistor (99,000 ohms, 1/2 W)	.20
42	30-4444	Condenser (.05 mf. tubular)	.20
43	30-4112	Condenser (.008 mf. tubular)	.20
44	42-1393	Tone and Power Switch	.12
45	34-2068	Pilot Lamp bulb	.15
46	32-2866	"A" Choke	.40
47	32-2038	"B" Choke	.40
48	3615DG	Condenser (.05-.05 mf bakelite)	.40
49	30-4551	Condenser (.5 mf. tubular)	.20
50	30-4481	Condenser (.02 mf. tubular)	.20
51	32-2836	"B" Choke	.20
52	30-4481	Condenser (.02 mf. tubular)	.20
53	32-1954	"A" Choke (Part of 51)	.40
54	30-4296	Condenser (.5 mf metal housing)	.60
55	30-4552	Condenser (.015 mf. tubular)	.20
56	30-4551	Condenser (.5 mf. tubular)	.20
57	32-7934	Power Transformer	.75
58	41-3367	Vibrator	.40
59	42-1358	Range Switch	.40
60	L-2778	Cable (C.C.)	.03
61	41-3364	Cable (Battery)	.03
62	41-3360	Cable (Vibrator ("K" and "X" Cabinet))	.10
63	41-3368	Cable (Vibrator ("T" cabinet))	.10
64	28-2498	Clip Dial (Dial)	.02
65	28-5090	Clip Mtg. (R.F. Coil)	.60
66	27-5333	Dial Washer—Rubber	.03
67	27-4998	Dial Clamp	.03
68	28-5089	Knob (Tuning)	.10
69	27-4330	Knob (Vernier)	.10
70	27-4331	Knob (Volume)	.10
71	27-4332	Mtg. Foot (Tuning Condenser)	.70
72	28-5022	Mtg. Foot (Rubber)	.06
73	27-4999	Mtg. Rubber (Tuning Condenser)	.04

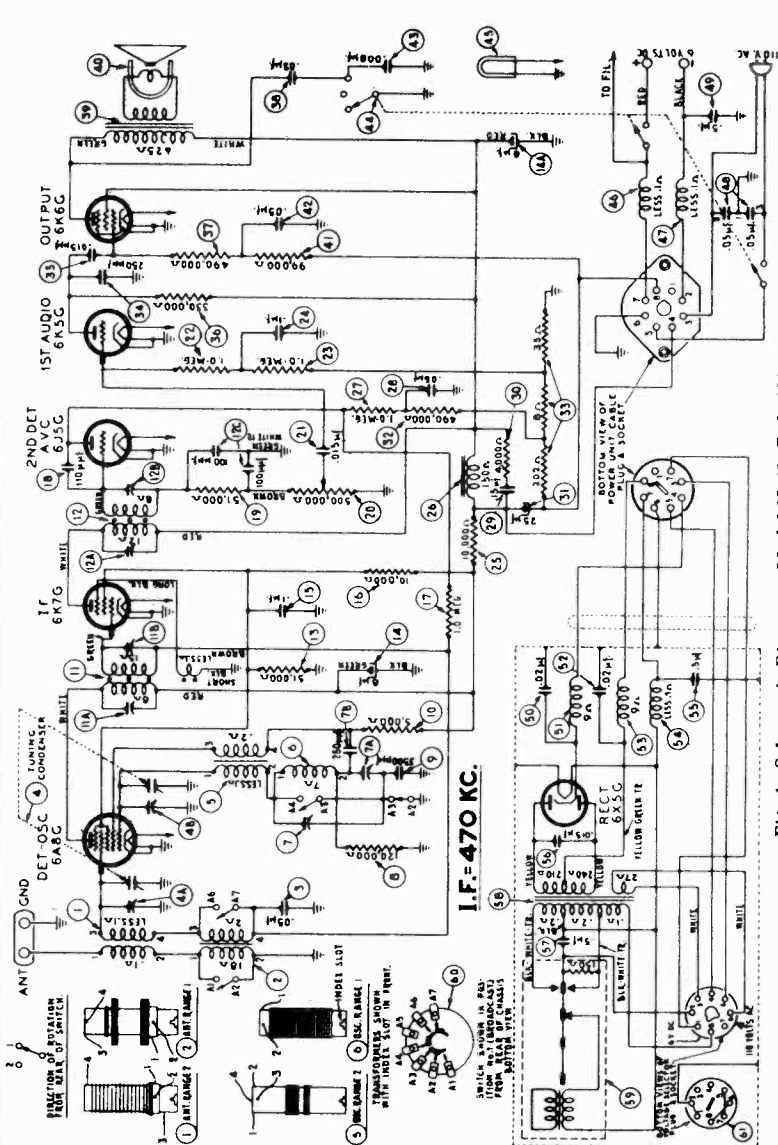


Fig. 4. Schematic Diagram—Model 38-40, Code 121

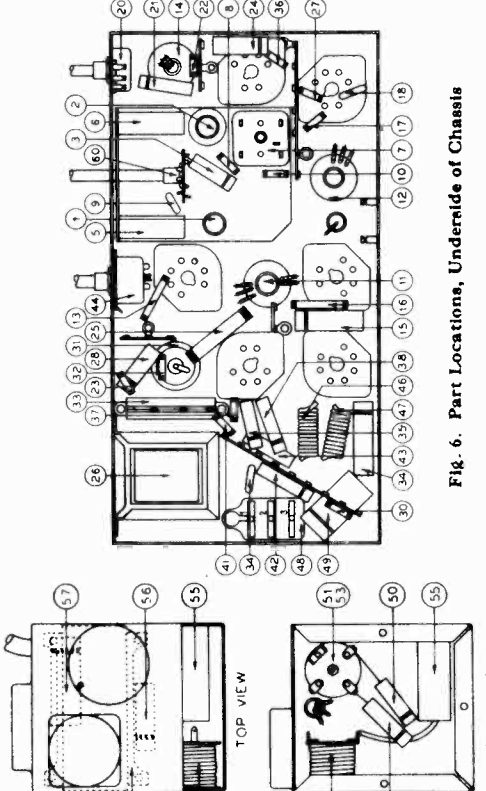


Fig. 6. Part Locations, Underside of Chassis

Fig. 5. Vibrator Unit Part Locations



MODEL 38-40(121)  
 Socket, Trimmers  
 Voltage, Alignment  
 Specs., Notes

PHILCO RADIO & TELEV. CORP.

To obtain maximum performance from the receiver, a Philco Aerial, part number 45-2428 should be used.  
**POWER SUPPLY:** 6 volt storage battery Philco type 116R or a 115 volt 60 cycle A.C. power supply.  
**INTERMEDIATE FREQUENCY:** 470 K.C.  
**TUNING RANGES:** 530 to 1720 K. C.—5.7 to 18.0 M. C.  
**POWER OUTPUT:** 1.5 watts  
**PHILCO TUBES USED:** 6A8G, converter and oscillator; 6K7G, I.F.; 6I5G, 2nd detector; 6K5G, 1st audio; 6K6G output; 6X5G, rectifier.  
**SPEAKER USED:** HR-23 KR29

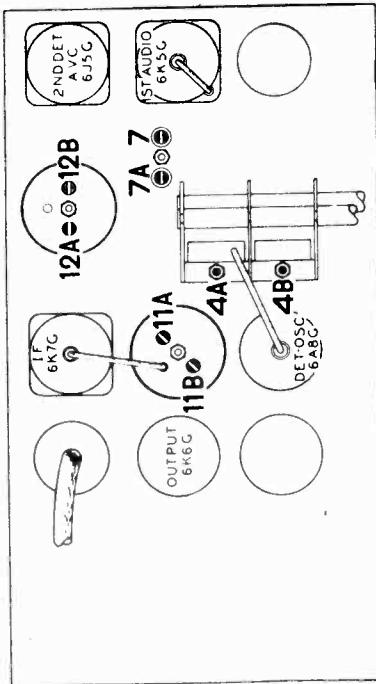


Fig. 2. Locations of Compensators

**TYPE OF CIRCUIT:** 6 tube superheterodyne circuit covering standard and shortwave broadcasts with automatic volume control; and a pentode output circuit. The receiver is designed to operate from either a 6 volt storage battery or a 115 volt 60 cycle A.C. supply. A Plug-Switch is provided on the power unit for selection of either voltage supply. Place the plug with arrow pointing toward voltage being used. With a 6 volt storage battery supply, a vibrator in conjunction with a 6X5G tube is used for supplying "B" voltage to the receiver. When using a 115 volt supply, the vibrator is removed from the circuit. (See schematic diagram page 2).

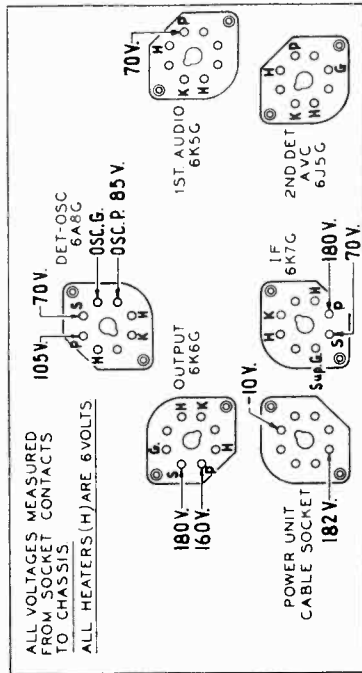


Fig. 1. Socket Voltages, Underside of Chassis  
 The voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains a sensitive voltmeter. Volume Control minimum. Storage Battery fully charged or 115 V. A.C. Power Supply.

**Alignment of Compensators**

Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench, part No. 3104.  
**OUTPUT METER:** The 026 output meter is connected to the plate and cathode terminals of the 6K6G tube. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied.

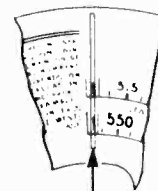
**EQUIPMENT REQUIRED:** (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 077 A.C. operated Signal Generator or Model 088 Battery operated, Signal Generator, which have the required frequency range are the correct instruments for this purpose; (2) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (3) Philco

Operations in Order	SIGNAL GENERATOR			RECEIVER			NOTES
	Cable Connections	Dummy Antenna Note A	Dial Freq.	Control Positions	Dial Freq.	Adjust Compensators In Order	
1	6A8G Grid	.1 mfd.	470 K. C.	Vol. Control Max. Range Switch (1)	580 K. C.	(12B), (12A) (11B), (11A)	Adjust all compensators for "Max." output
2	Antenna and ground of receivers	400 ohms	18.0 M. C.	Range Switch (2)	18.0 M. C.	(4B)	Check image at 17,060 M. C.
3	Antenna and ground of receivers	200 mmfd.	1550 K. C.	Range Switch (1)	1550 K. C.	(7), (4A)	
4	Antenna and ground of receivers	200 mmfd.	580 K. C.	Range Switch (1)	580 K. C.	(7A)	
5	Antenna and ground of receivers	200 mmfd.	1550 K. C.	Range Switch (1)	1550 K. C.	(7), (4A)	

**NOTE "A"**—The Dummy Antenna is a condenser connected in series with the signal generator output lead. 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:

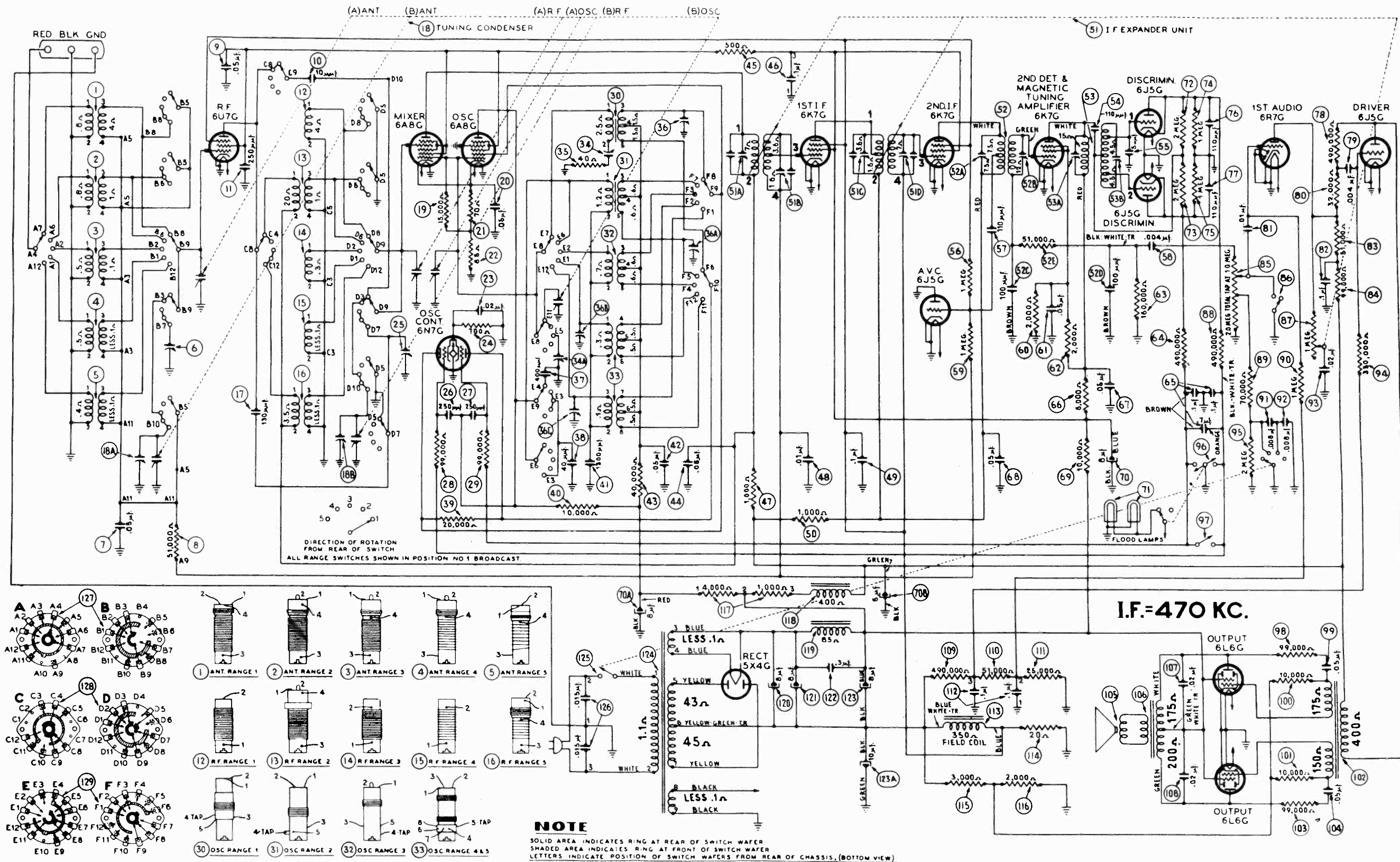
1. Turn the tuning condenser to maximum capacity position (plate fully meshed).
2. Holding the tuning condenser in this position, loosen the dial clamp; then turn the dial until the indicator is centered on the middle index line (See Fig. 3). Tighten clamp in this position.



GLOWING BEAM INDICATOR

Fig. 3. Dial Calibration

PHILCO RADIO & TELEV. CORP.



**NOTE**  
SOLID AREA INDICATES RING AT REAR OF SWITCH WAFER  
SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER  
LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, (BOTTOM VIEW)

Fig. 5. Schematic Diagram Model 38-116, Code 125



PHILCO RADIO &amp; TELEV. CORP.

MODEL 38-116(125)  
Alignment, Tuner

## Model 38-116, Code 125

### Alignment of Compensators

**EQUIPMENT REQUIRED:** (1) Signal Generator, having a fundamental frequency range covering the tuning and intermediate frequencies of the receiver. Philco Model 677 Signal Generator which has a fundamental frequency range from 115 to 36000 K. C. is the correct instrument for this purpose; (2) Output Meter, Philco Model 626 Circuit Tester incorporates a sensitive output meter and is recommended; (3) Philco Fibre Handle Screw Driver, Part No. 27-7059 and Fibre Wrench, Part No. 3164.

**OUTPUT METER:** The 626 Output Meter is connected to the plate and cathode terminals of one of the 6L6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter after signal is applied to stage being adjusted.

**DIAL CALIBRATION:** In order to adjust the compensators of this receiver correctly the dial must be aligned to track properly with the tuning condenser. To do this proceed as follows:

- Loosen the set screws on the shaft coupling of the tuning condenser. Then turn the tuning condenser until the plates are in the maximum capacity position. Now turn the dial until the glowing beam indicator is on the Index Line at the low frequency end of range 3. (See Fig. 8). With the dial and tuning condenser in this position tighten set screws.
- Turn the tuning condenser control until the indicator is on the 4.71 M. C. mark of range 3. (See Fig. 8.)
- With the dial in this position, loosen the shaft coupling set screws. Then turn the dial until the indicator is again on the Index Line. Tighten the set screws. Be careful when turning the dial that the position of the tuning condenser is not disturbed.

### INTERMEDIATE FREQUENCY CIRCUIT

1. Viewing each instrument from the front, set the receiver and Signal Generator controls as follows:

- Selectivity-fidelity control (clockwise)
- Volume Control at maximum (clockwise)
- Magnetic Tuning Switch (off)
- Bass Compensation Switch first position from "Off"
- Range Switch position one (broadcast)
- Receiver dial 580 K. C.
- Signal Generator indicator set at 470 K. C. and the "Attenuator" control for maximum output.

2. Connect the Signal Generator output cable through a .1 mfd. condenser to the grid of the second 6K7G I. F. tube. Then adjust the I. F. compensators as follows:

- Close compensator (52B) by turning to the extreme clockwise position, then pad compensator (52A) for maximum output. Now readjust compensator (52B) for maximum output.
- Connect the Signal Generator output lead through the .1 mfd. condenser to the grid of the 6A8G Mixer tube, and adjust the following compensators for maximum output: (51D), (51C), (51B), (51A).
- Repad (52A), See Note. A Check for two equal peaks. Treble-Selectivity control in expanded position (counter-clockwise).

### RADIO FREQUENCY CIRCUIT

1. Connect the Signal Generator output cable to the "Red" and "Blk" terminals on the aerial panel (rear of chassis). The ground connection of the cable should be connected to the "Blk" terminal. Set the controls as given under "Intermediate Frequency Circuit" (a-b-c-d) and set the Range Switch, Signal Generator and Receiver Dials as given in the following procedure.

2. Set the controls and adjust the compensators for maximum output as follows:

Range Switch Position	Signal Generator and Receiver Dials	Compensators in Order
1	1550 K. C.	(36), (18B), (18A)
1	580 K. C.	(34)
1	1550 K. C.	(36), (18B), (18A)
5	18 M. C.	(36C) See Note C
5	18 M. C.	(25), (6) Roll Tuning Condenser. See Note B
4	11 M. C.	(36B)
3	7 M. C.	(34A)
2	4.5 M. C.	(36A)
5	18 M. C.	(36C) See Note C
5	18 M. C.	(25), (6), Roll Tuning Condenser. See Note B

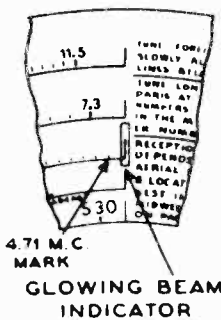


Fig. 8. Dial Calibration

**NOTE "A":**—Slowly shift signal generator indicator between 460 and 480 K. C. As the indicator is turned, two peaks will be noted on the Output Meter; one about 465 K. C. and the other about 475 K. C. These peaks should give the same deflection or reading on the output meter. If the peaks are unequal, Compensator (52A) must be slightly readjusted to the right or left (not more than 1/8 of a turn) until the peaks are equalized. Each time the compensator is set in another position, rotate the signal generator through the 460 or 480 K. C. range and note the reading of each peak. This adjustment is used to compensate for slight differences between peaks. If the compensator must be turned more than 1/8 of a turn in either direction to equalize the peaks, all padders should be carefully readjusted as given under "Intermediate Frequency Circuit" adjustment procedure.

**NOTE "B":**—When adjusting the low frequency compensator of Range 1 (Broadcast) or the antenna and R. F. compensators 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 about the frequency dial mark being used. Now turn the compensator slightly to the right or left and vary the receiver tuning condenser for maximum output. If the out reading increases, turn the compensator in the same direction a trifle more, and again vary the tuning condenser for maximum output. If the output decreases, set the compensator in the opposite direction. 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 "C":**—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity position (clockwise). From this position slowly turn the compensator counter clockwise until a second maximum peak is obtained on the output meter. Adjust the compensator for maximum output using this second peak. The first peak from the maximum capacity position of the compensator is the image signal and must not be used in adjusting the compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on the high frequency range.

### MAGNETIC TUNING CIRCUIT ADJUSTMENT

- Set the Magnetic Tuning switch in the "out" position (counter-clockwise).
- Volume control maximum (extreme clockwise).
- Turn Treble-Selectivity control to the Selective position (extreme clockwise).
- Now turn the signal generator indicator to the 1000 K. C. mark and adjust the "Attenuator" control for a weak signal. Then adjust the receiver dial for maximum output at this frequency.

**NOTE:** The receiver dial **MUST** be tuned very accurately to the 1000 K. C. signal in order to make the following adjustments correctly.

- After adjusting the receiver dial, turn the Magnetic Tuning Switch "on".
- Now, turn compensator (53B) slightly to the right or left (about 1/4 turn) and proceed with adjustment "g."
- Adjust compensator (53A) primary of the discriminator transformer for **minimum** output; then readjust compensator (53B) secondary of discriminator transformer for **maximum** output.

The above adjustments are now checked for accuracy as follows:

### Frequency Test:

With the 1000 K. C. signal tuned for maximum output turn the Magnetic Tuning control back and forth; that is, from the "out" to "in" position. The reading of the output meter should not change in either position. If the output meter reading changes, the above magnetic tuning circuit adjustments should be repeated.

A further check on the magnetic tuning adjustment is to very carefully tune in a broadcasting station and then turn the magnetic tuning switch from the "out" to the "in" position. With the switch in either position, the tone of the station should not change. If a change of tone or hiss develops repeat the above Magnetic Tuning Adjustments.

### Sensitivity Test:

1. To check the magnetic tuning circuit for sensitivity, turn the magnetic tuning switch to the "off" position, and tune in the 1000 K. C. signal. Then adjust the "attenuator" control of the signal generator for a good audible signal,—approximately 20 volts on the output meter.

2. Now detune the signal (first above and then below the 1000 K. C. mark) to a point at which the signal is weakly heard. At each point turn the magnetic tuning control "ON". When the control is turned "ON" the signal should return to normal output strength. If the magnetic tuning circuit does not pull the signal into resonance, the primary compensator (53A) should be carefully readjusted.



MODEL 38-116(125)  
Trimmers, Parts

PHILCO RADIO & TELEVISION CORP.

REPLACEMENT PARTS—Model 38-116, Code 125

Schem. No.	Description	Part No.	List Price
1	Ant. Transformer (Range 1)	32-2615	80.70
2	Ant. Transformer (Range 2)	32-2616	.70
3	Ant. Transformer (Range 3)	32-2617	.70
4	Ant. Transformer (Range 4)	32-2618	.70
5	Ant. Transformer (Range 5)	32-2619	.70
6	Compensator (R. F.)	31-6084	.18
7	Condenser (.05 $\mu$ f tubular)	30-4819	.20
8	Resistor (51,000 $\Omega$ , $\frac{1}{2}$ watt)	33-351339	.30
9	Condenser (.05 $\mu$ f tubular)	30-4123	.20
10	Condenser (10 $\mu$ f mica)	30-1066	.20
11	Condenser (250 $\mu$ f mica)	30-1032	.25
12	R. F. Transformer (Range 1)	32-2620	.70
13	R. F. Transformer (Range 2)	32-2621	1.00
14	R. F. Transformer (Range 3)	32-2622	.50
15	R. F. Transformer (Range 4)	32-2623	.50
16	R. F. Transformer (Range 5)	32-2624	.70
17	Condenser (130 $\mu$ f mica)	30-1066	.20
18	Tuning Condenser Assembly	31-2026	.20
19	Resistor (15,000 $\Omega$ , $\frac{1}{2}$ watt)	33-314330	.30
20	Condenser (.06 $\mu$ f tubular)	30-4444	.20
21	Resistor (70 $\Omega$ , $\frac{1}{2}$ watt)	33-070339	.20
22	Resistor (85 $\Omega$ , $\frac{1}{2}$ watt)	33-068339	.20
23	Condenser (.02 $\mu$ f tubular)	30-4123	.20
24	Resistor (700 $\Omega$ , $\frac{1}{2}$ watt)	33-070339	.20
25	Compensator (1 $\mu$ f Bakelite)	31-6084	.18
26	Condenser (250 $\mu$ f mica)	30-1032	.25
27	Condenser (250 $\mu$ f mica)	30-1032	.25
28	Resistor (99,000 $\Omega$ , $\frac{1}{2}$ watt)	33-399339	.20
29	Resistor (99,000 $\Omega$ , $\frac{1}{2}$ watt)	33-399339	.20
30	Ons. Transformer (Range 1)	32-2625	1.00
31	Ons. Transformer (Range 2)	32-2626	1.00
32	Ons. Transformer (Range 3)	32-2627	1.00
33	Ons. Transformer (Ranges 4 & 5)	32-2628	1.00
34	Compensator (2 sections)	31-6100	.40
35	Resistor (40 $\Omega$ , $\frac{1}{2}$ watt)	33-040339	.20
36	Compensator (4 sections)	31-6200	.80
37	Condenser (400 $\mu$ f mica)	30-1088	.20
38	Condenser (40 $\mu$ f mica)	30-1086	.20
39	Resistor (20,000 $\Omega$ , $\frac{1}{2}$ watt)	33-230339	.20
40	Resistor (10,000 $\Omega$ , $\frac{1}{2}$ watt)	33-310339	.20
41	Condenser (1300 $\mu$ f mica)	31-6206	.40
42	Condenser (.06 $\mu$ f tubular)	30-4123	.20
43	Resistor (40,000 $\Omega$ , 1 watt)	33-340439	.20
44	Condenser (.06 $\mu$ f tubular)	30-4123	.20
45	Resistor (500 $\Omega$ , $\frac{1}{2}$ watt)	33-180339	.20
46	Condenser (.1 $\mu$ f Bakelite)	30-899339	.15
47	Resistor (1,000 $\Omega$ , $\frac{1}{2}$ watt)	33-210339	.20
48	Condenser (.01 $\mu$ f tubular)	30-4518	.20
49	Condenser (.1 $\mu$ f tubular)	30-4490	.20
50	Resistor (1,000 $\Omega$ , $\frac{1}{2}$ watt)	33-210339	.20
51	I. F. Expander Unit Assembly (See Note for 1st and 2nd I. F. Transformers)	38-8912	10.00
52	3rd I. F. Transformer	32-2660	2.20
53	Discrimin. Transformer	32-2661	4.00
54	Condenser (110 $\mu$ f mica) (Part of 53)	30-1031	.20
55	Resistor (8 meg., $\frac{1}{2}$ watt)	33-1007	.20
56	Resistor (1.0 meg., $\frac{1}{2}$ watt)	33-510339	.20
57	Condenser (110 $\mu$ f mica)	30-1031	.20
58	Condenser (.004 $\mu$ f tubular)	30-4456	.20
59	Resistor (1.0 meg., $\frac{1}{2}$ watt)	33-510339	.20
60	Resistor (2,000 $\Omega$ , $\frac{1}{2}$ watt)	33-220339	.20
61	Condenser (.06 $\mu$ f tubular)	30-4444	.20
62	Resistor (2,000 $\Omega$ , $\frac{1}{2}$ watt)	33-220339	.20
63	Resistor (160,000 $\Omega$ , $\frac{1}{2}$ watt)	33-416339	.20
64	Resistor (490,000 $\Omega$ , $\frac{1}{2}$ watt)	33-449339	.20
65	Condenser (.1 $\mu$ f Bakelite)	30-4537	.20
66	Resistor (5,000 $\Omega$ , 1 watt)	33-290439	.20
67	Condenser (.06 $\mu$ f tubular)	30-4444	.20
68	Condenser (.05 $\mu$ f tubular)	30-4518	.20
69	Resistor (10,000 $\Omega$ , $\frac{1}{2}$ watt)	33-310339	.20
70	Electrolytic Condenser (8-8-6 $\mu$ f)	30-2232	2.50
71	Flood Lamp Bulb	34-2064	.09
72	Resistor (2.0 meg., $\frac{1}{2}$ watt)	33-520339	.20
73	Resistor (2.0 meg., $\frac{1}{2}$ watt)	33-520339	.20
74	Resistor (1.0 meg., $\frac{1}{2}$ watt)	33-510339	.20
75	Resistor (1.0 meg., $\frac{1}{2}$ watt)	33-510339	.20
76	Condenser (110 $\mu$ f mica)	30-1031	.20
77	Condenser (110 $\mu$ f mica)	30-1031	.20
78	Resistor (490,000 $\Omega$ , $\frac{1}{2}$ watt)	33-449339	.20
79	Condenser (.004 $\mu$ f tubular)	30-4456	.20
80	Resistor (32,000 $\Omega$ , $\frac{1}{2}$ watt)	33-332339	.20
81	Condenser (.01 $\mu$ f tubular)	30-4160	.20
82	Condenser (.1 $\mu$ f tubular)	30-4456	.25
83	Resistor (51,000 $\Omega$ , $\frac{1}{2}$ watt)	33-351339	.20
84	Resistor (99,000 $\Omega$ , $\frac{1}{2}$ watt)	33-399339	.20
85	Volume Control	33-5158	1.00
86	Audio Shorting Switch (Part of Auto. Tuner—See parts (8) and (18) Bulletin 273)		
87	Potentiometer	33-5235	1.00
88	Resistor (490,000 $\Omega$ , $\frac{1}{2}$ watt)	33-449339	.20
89	Resistor (70,000 $\Omega$ , $\frac{1}{2}$ watt)	33-370339	.20
90	Resistor (1.0 meg., $\frac{1}{2}$ watt)	33-510339	.20
91	Condenser (.008 $\mu$ f tubular)	30-4112	.20
92	Condenser (.008 $\mu$ f tubular)	30-4112	.20
93	Condenser (.02 $\mu$ f tubular)	30-4481	.20
94	Resistor (330,000 $\Omega$ , $\frac{1}{2}$ watt)	33-433339	.20
95	Resistor (490,000 $\Omega$ , $\frac{1}{2}$ watt)	33-449339	.20
96	A. F. C. Switch	42-1216	.75
97	A. F. C. Shorting Switch (Part of Auto. Tuner—Bulletin 273)		
98	Resistor (99,000 $\Omega$ , $\frac{1}{2}$ watt)	33-399339	.20
99	Condenser (.06 $\mu$ f tubular)	30-4618	.20
100	Resistor (10,000 $\Omega$ , $\frac{1}{2}$ watt)	33-310339	.20
101	Resistor (10,000 $\Omega$ , $\frac{1}{2}$ watt)	33-310339	.20

Schem. No.	Description	Part No.	List Price
102	Input Transformer	32-7865	12.50
103	Resistor (99,000 $\Omega$ , $\frac{1}{2}$ watt)	33-399339	.20
104	Condenser (.06 $\mu$ f tubular)	30-4618	.20
105	Cone & Voice Coil Assembly	36-3647	2.80
106	Output Transformer	32-7751	2.00
107	Condenser (.02 $\mu$ f tubular)	30-4481	.20
108	Condenser (.02 $\mu$ f tubular)	30-4481	.20
109	Resistor (490,000 $\Omega$ , $\frac{1}{2}$ watt)	33-449339	.20
110	Resistor (51,000 $\Omega$ , $\frac{1}{2}$ watt)	33-351339	.20
111	Resistor (26,000 $\Omega$ , $\frac{1}{2}$ watt)	33-325339	.20
112	Condenser (.1 $\mu$ f Bakelite)	4989DG	.40
113	Field & Pot Assembly	46-3756	15.00
114	Resistor (20 $\Omega$ , $\frac{1}{2}$ watt)	33-020339	.20
115	Resistor (8,000 $\Omega$ , $\frac{1}{2}$ watt)	33-230339	.20
116	Resistor (2,000 $\Omega$ , $\frac{1}{2}$ watt)	33-230339	.20
117	Resistor, wire-wound (4,000 $\Omega$ -1,000 $\Omega$ )	33-3289	.50
118	Choke	32-7723	1.20
119	Choke	32-7066	2.20
120	Electrolytic Condenser	30-2026	1.06
121	Electrolytic Condenser	30-2026	1.06
122	Condenser (.3 $\mu$ f tubular)	30-4456	.25
123	Electrolytic Condenser (8-10 $\mu$ f)	30-2201	1.75
124	Power Transformer		
	118 V.-50-60 cycles	32-7699	7.50
	115 V.-25-60 cycles	32-7700	12.00
	115-220 V.-60-90 cycles	32-7701	10.00
125	Power & Beam Tone Speaker	42-1196	.75
126	Condenser (.018-.018 of Bakelite)	3793DG	.40
127	Wave Switch (Ant. Section)	42-1354	1.50
128	Wave Switch (R. F. Section)	42-1355	1.50
129	Wave Switch (Ons. Section)	42-1356	1.50
	Acoustic Clarifier	36-1156	1.25
	Automatic Tuning Mech. Complete	31-2063	
	Base Assembly (Cabinet)	28-8933	
	Trace (Dial Mechanism)	28-4119	
	Cable and Plug (Footlights)	41-3253	.25
	Cable (Power)	L-2183	.40
	Cable and Plug (Speaker)	41-3338	
	Clamp (R. F. Unit Rear Mtg.)	28-3900	.03
	Clamp Locking Plate (R. F. Unit)	28-3982	.01
	Clamp (I. F. Cord)	28-4147	.01
	Cord (I. F. Expander Drive)	27-8411	.04
	Coupling (Range Switch and Mask)	38-8493	
	Coupling (Tuning Condenser and Dial Mechanism)	31-2063	
	*Cover (Handle of Automatic Mech.)	28-8092	.80
	*Dial	37-4340	
	*Dial Screen and Lens Holder Assy	31-2063	
	*Excitron Assembly (Station Tabs)	46-2472	
	Knob (Range Switch)	27-4326	.10
	Knob (Tuning)	27-4330	.10
	Knob (Vernier)	27-4331	.10
	Knob (Beam. Volume. Expander Magnetic)	27-4332	.10
	Mask Guide (Tuning Mechanism)	28-4118	.25
	Pilot Lamp Socket Assembly (3 Sockets)	38-8487	
	Shaft and Index Plate (Range Switch)	43-1208	.50

Schem. No.	Description	Part No.	List Price
	Shaft (I. F. Expander)	28-6496	80.30
	Shaft (Volume Control)	38-8061	.13
	Shield (Tube, Square)	29-2726	.10
	Shield (Round 6N7G)	8006	.10
	Shield 3rd (I. F.)	38-1962	
	Shield (I. F. Expander)	38-9025	
	Shield Base (Square)	28-2725	.20
	Shield Base (Round 6N7G)	8004	.08
	Speaker (W5)	36-1363	
	Socket (7 prong, Power tubes)	27-6067	.11
	Socket (7 prong)	27-6087	.11
	Socket (6 prong)	27-6086	.11
	Socket (Power Transformer)	27-6082	.11
	Terminal Panel (Ant.)	38-8746	

MISCELLANEOUS MOUNTING PARTS

	Ret. (Mtg. Speaker)	W-862	
	Bushing (Mtg. R. F. Unit)	28-2257	.01
	Clip (Volume Shaft Front Section)	28-4394	.01
	Cover (Back of Cabinet)	27-8866	
	Felt (Mtg. Speaker)	27-8498	.15
	Rubber Grommet (Mtg. R. F. Unit)	27-4317	.04
	Rubber Bushing (Mtg. Chassis)	27-4202	.08
	Rubber Bushing (Mtg. Chassis)	27-4360	
	Rubber Cushion (Mtg. Chassis)	3556	
	Pin (I. F. Shaft)	3014	
	Screw (Mtg. R. F. Unit Rear Section)	W-729	
	Screw (I. F. Cord Clamp)	W-1321	
	Snap Fastener (Range Switch Coupling)	28-4279	
	Spacer (Mtg. R. F. Unit)	27-7807	
	Spring (Retaining I. F. Shaft Front Section)	28-8610	
	Spring Clip (I. F. Shaft, Rear Section)	28-4117	per C. 40
	Washer—Flat—(I. F. Shaft)	W-174	
	Washer (Mtg. R. F. Unit)	28-3927	.01
	Washer—Spring—(Mtg. I. F. Shaft)	28-4186	per C. 78

\*These Automatic Tuning Mechanism Parts differ from those shown in Service Bulletin 273.

1st I. F. Transformer Section 32-2727

2nd I. F. Transformer Section 32-2728

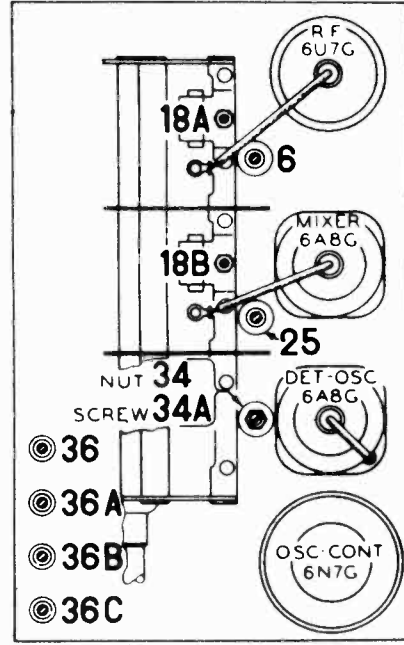


Fig. 6. Top View of R. F. Unit Showing Compensator Locations

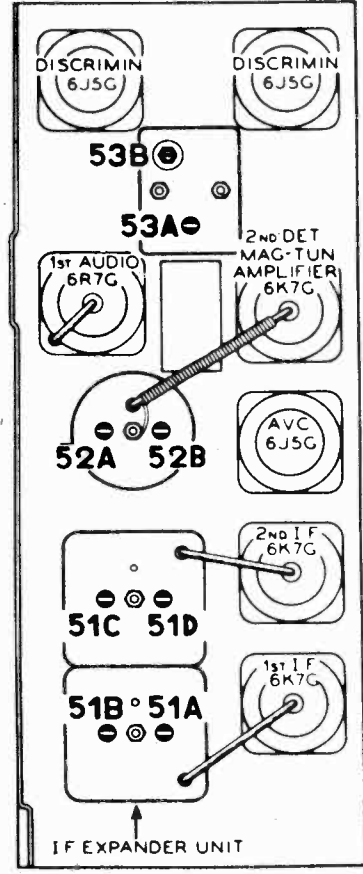
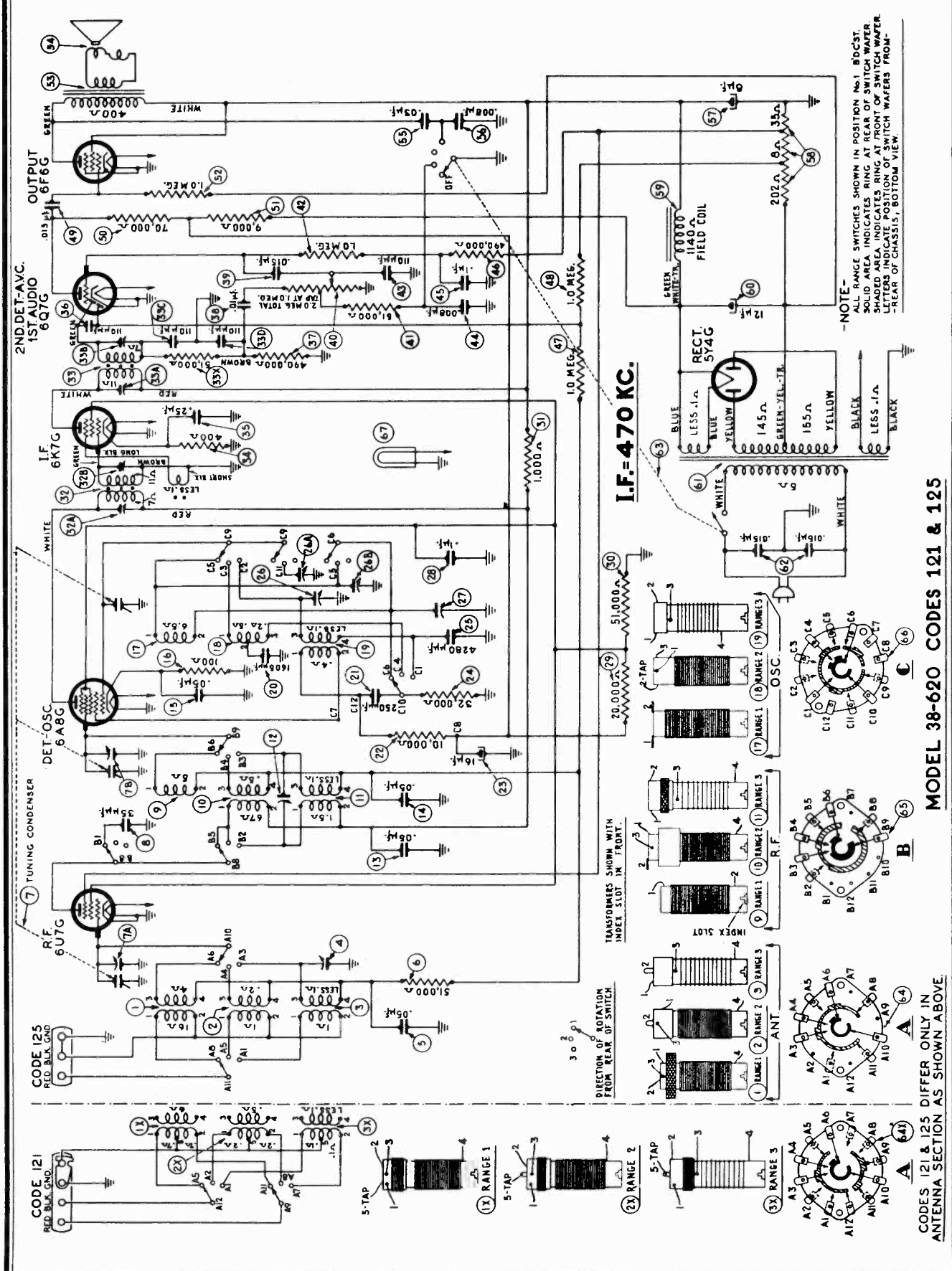


Fig. 7. Top View of I. F. Unit Showing Compensator Locations

Prices Subject to Change without Notice

PHILCO RADIO & TELEV. CORP.



**NOTE-**  
 ALL RANGE SWITCHES SHOWN IN POSITION No.1 'BDCST'.  
 SOLID AREA INDICATES RING AT REAR OF SWITCH WAFER.  
 SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.  
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM-  
 REAR OF CHASSIS, BOTTOM VIEW.

MODEL 38-620 CODES 121 & 125

CODES 121 & 125 DIFFER ONLY IN  
 ANTENNA SECTION AS SHOWN ABOVE

MODEL 38-620(121,125)

Parts

MODEL 38-690(125)

Alignment, Tuner

PHILCO RADIO & TELEV. CORP.

Model 38-690—Code 125  
Alignment of Compensators

Viewing each instrument from the front, set the receiver and signal generator controls as follows:

1. Volume Control (Maximum)
2. Bass Control (Counter-clockwise)
3. Magnetic Tuning Switch (Off)
4. Selectivity-fidelity control (Clockwise)
5. Set the remaining controls and adjust the compensators for maximum output as follows:

RANGE SWITCH POSITION	RECEIVER DIAL	SIGNAL GENERATOR DIAL	SIGNAL GENERATOR CONNECTION	ADJUST COMPENSATORS IN ORDER	NOTES
1	600 K.C.	470 K.C.	Grid 1st 6K7G-I.F.	(70B), (70A), (49B), (49A), (48B), (48A)	Insert .1 mfd. cond. in series with generator output lead
1	600 K.C.	470 K.C.	Grid 6A8G-Det.	(47B), (47A)	
1	600 K.C.	470 K.C.	"	Turn Selectivity-fidelity control counter-clockwise and check for two equal peaks (Note "A")	
1	1550 K.C.	1550 K.C.	Red & Black Terminals Ant.	(40), (22B), (22A)	Remove .1 mfd. cond. from generator output lead
1	580 K.C.	580 K.C.	"	(39)	Roll Tuning Condenser (Note "B")
1	1550 K.C.	1550 K.C.	"	(40), (22B), (22A)	Note B. Check image at 17.060
5	18 M.C.	18 M.C.	"	(40B), (20), (6)	
4	11 M.C.	11 M.C.	"	(40B)	
3	7.0 M.C.	7.0 M.C.	"	(39A)	
2	4.5 M.C.	4.5 M.C.	"	(40A)	
5	18 M.C.	18 M.C.	"	(40C), (20), (6)	Roll Tuning Condenser (Note "B")

MAGNETIC TUNING CIRCUIT ADJUSTMENT

- Set the Magnetic Tuning switch in the "out" position (counter-clockwise).
  - Volume control maximum (extreme clockwise).
  - Turn Treble Selectivity control to the selective position (extreme clockwise).
  - Now turn the signal generator indicator to the 1000 K. C. mark and adjust the "Attenuator" control for a weak signal. Then adjust the receiver dial for maximum output at this frequency.
- NOTE: The receiver dial MUST be tuned very accurately to the 1000 K. C. signal in order to make the following adjustments correctly.
- After adjusting the receiver dial, turn the Magnetic Tuning Switch "on". Advance the "Attenuator" and "Multiplier" controls of the signal generator for a strong signal.
  - Now turn compensator 85B slightly to the right or left (about 1/4 turn) and proceed with adjustment "a".
  - Adjust compensator 77A and 85A for minimum output. Now set the "Attenuator" and "Multiplier" controls for a weak signal; then re-adjust compensator 85B for maximum output.
  - The above adjustments are now checked for accuracy as follows:

Frequency Test:

With the 1000 K. C. signal tuned for maximum output turn the Magnetic Tuning control back and forth; that is, from the "out" to the "in" position. Reading the output meter should not change in either position. If the output meter does change, the above magnetic tuning circuit adjustments should be repeated.

A further check on the magnetic tuning adjustment is to very carefully tune in a broadcasting station and then turn the magnetic tuning switch from the "out" to the "in" position. With the switch in the "in" position, the station should be heard with a change of tone or his develops repeat the above Magnetic Tuning Adjustments.

Sensitivity Test:

- To check the magnetic tuning circuit for sensitivity, turn the magnetic tuning switch to the "off" position, and tune in the 1000 K. C. signal. Then adjust the "attenuator" control of the signal generator for a good audible signal—approximately 20 volts on the output meter.
- Now detune the signal first above and then below the 1000 K. C. mark to a point at which the signal is weakly heard. At each point turn the magnetic tuning control "ON". When the control is in the "in" position, the station should be heard with a change of tone or his develops repeat the above Magnetic Tuning Adjustments. If the magnetic tuning circuit does not pull the signal into resonance, compensation 77A and 85A should be carefully readjusted.

PHILCO MODEL 38-620, CODE 121 and 125  
Replacement Parts and Schematic Diagram

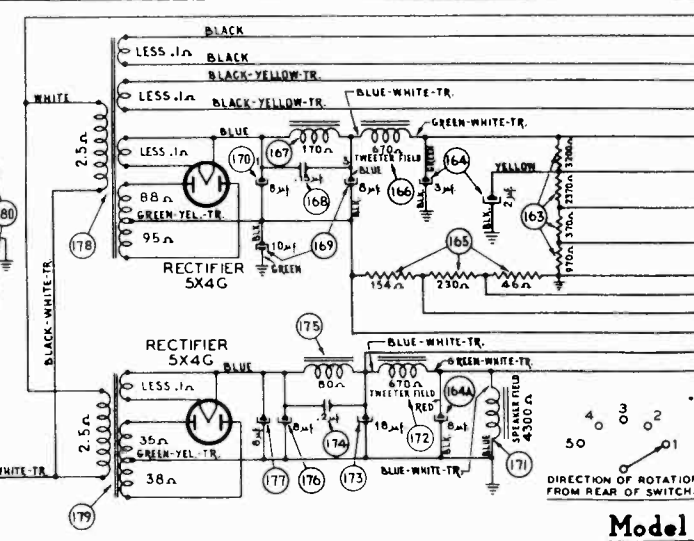
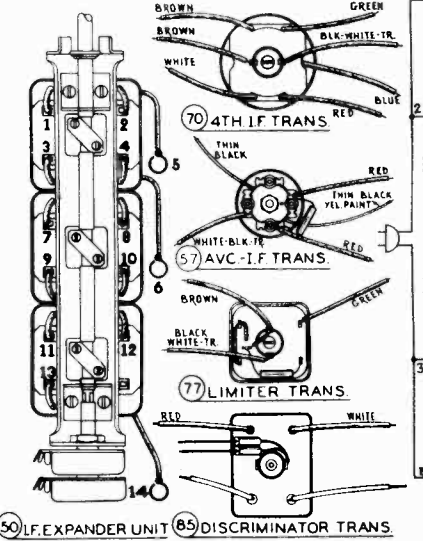
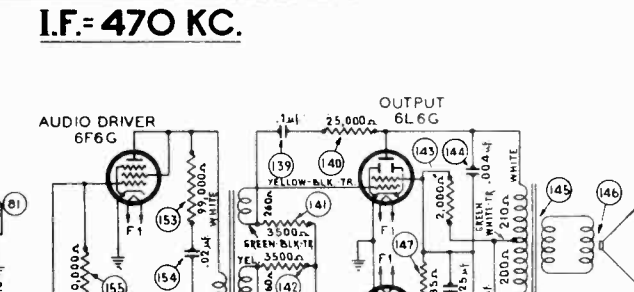
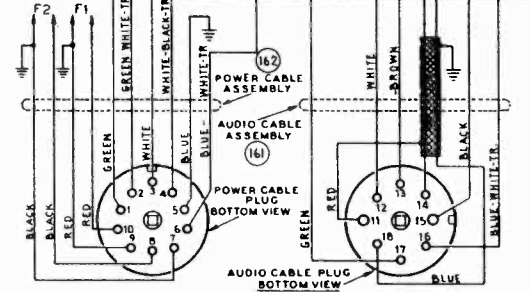
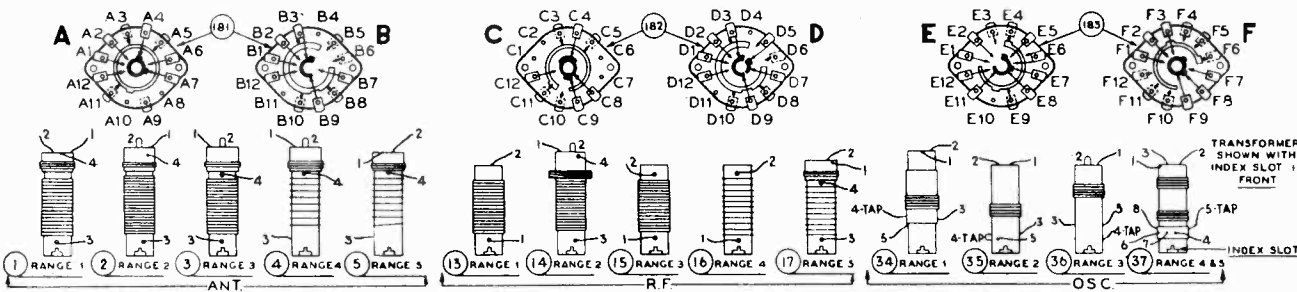
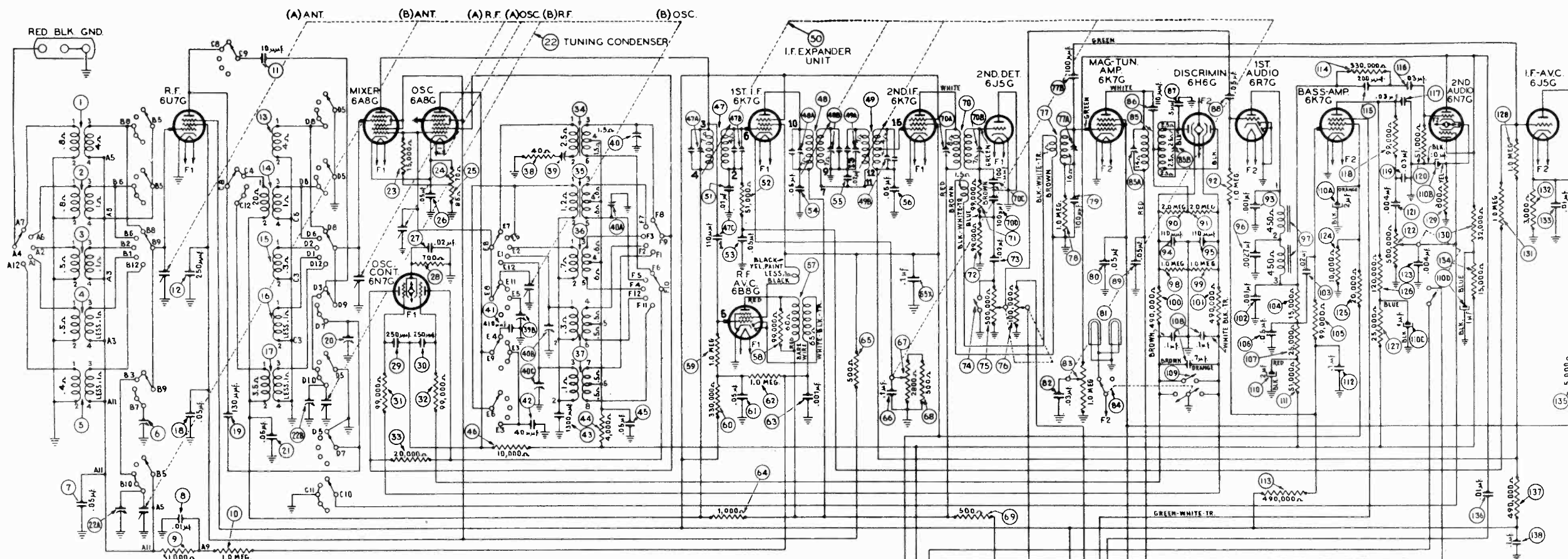
Codes 121 and 125 Receivers differ only in the Antenna tuning section of the R. F. Unit. See Schematic Diagram.

All part numbers are for Codes 121 and 125 unless otherwise stated.

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Antenna trans. Range 1 Code 121	32-2575	\$0.70	37	Resistor 600,000 ohms, 1/2 watt	33-46039	.20
1A	Antenna trans. Range 1 Code 125	32-2376	1.60	38	Condenser .01 mid. tubular	30-4479	.20
2	Antenna trans. Range 2 Code 121	32-2576	.70	39	Condenser .015 mid. tubular	30-4358	.20
2A	Antenna trans. Range 2 Code 125	32-2381	1.20	40	Volume control	33-5158	1.00
3	Antenna trans. Range 3 Code 121	32-2384	1.20	41	Resistor 51,000 ohms, 1/2 watt	33-51039	.20
3A	Antenna trans. Range 3 Code 125	32-2384	1.20	42	Resistor 1.0 meg., 1/2 watt	33-51039	.20
4	Compensator	31-6161	.30	43	Condenser 110 mmfd. mica	30-1031	.20
5	Condenser .05 mid. tubular	30-4444	.20	44	Condenser .008 mid. tubular	30-4112	.20
6	Resistor 51,000 ohms, 1/2 watt	33-51039	.20	45	Condenser .1 mid. tubular	30-4122	.20
7	Tuning condenser	31-1966	4.75	46	Resistor 490,000 ohms, 1/2 watt	33-46039	.20
8	Condenser 35 mmfd. mica	30-1044	.20	47	Resistor 1.0 meg.	33-51039	.20
9	R. F. trans. Range 1	32-2379	1.00	48	Resistor 1.0 meg.	33-51039	.20
10	R. F. trans. Range 2	32-2382	1.00	49	Condenser .015 mid. tubular	30-4226	.20
11	R. F. trans. Range 3	32-2385	1.20	50	Resistor 70,000 ohms, 1/2 watt	33-51039	.20
12	Compensator	31-6204	.20	51	Resistor 9000 ohms, 2 watts	33-29059	.30
13	Condenser .05 mid. tubular	30-4123	.20	52	Resistor 1.0 meg., 1/2 watt	33-51039	.20
14	Condenser .05 mid. tubular	30-4020	.20	53	Output trans. (S7 speaker)	32-7019	.85
15	Condenser .05 mid. tubular	30-4030	.20	54	Cone and voice coil	30-3157	1.00
16	Resistor 10,000 ohms, 1/2 watt	33-11039	.20	55	Condenser .03 mid. tubular	30-4317	.25
17	Osc. trans. Range 1	32-2380	.50	56	Condenser .008 mid. tubular	30-4317	.25
18	Osc. trans. Range 2	32-2383	.70	57	Condenser 8 mid. electrolytic	30-2211	1.00
19	Osc. trans. Range 3	32-2386	.70	58	Resistor 200-8-35 ohms	33-3316	.35
20	Condenser 1605 mmfd. mica	31-6155	.40	59	Field coil assembly (S7)	30-3341	1.20
21	Condenser 250 mmfd. mica	30-1032	.25	60	Condenser 12 mid. electrolytic	30-2210	1.20
22	Resistor 10,000 ohms, 1/2 watt	33-11039	.20	61	Power trans. (115v, 50-60 cyc.)	32-7583	4.50
23	Condenser 16 mid. electrolytic	30-2212	1.05		Power trans. (115v, 25-40 cyc.)	32-7584	6.50
24	Resistor 32,000 ohms, 1/2 watt	33-13239	.20		Power trans. (110v-230v) 50-60 cycles	32-7585	6.50
25	Condenser 4200 mid. mica	31-6156	.60	62	Condenser .015 - 015 mid.	3793 DG	.40
26	Compensator (3 sections)	31-6171	.75	63	Power and tone switch	42-1182	.75
27	Compensator	31-6056	.55	64A	Ant. wave switch, Code 121	42-1170	1.10
28	Resistor 20,000 ohms, 1 watt	33-12049	.20	64	Ant. wave switch, Code 125	42-1374	1.10
29	Resistor 51,000 ohms, 1 watt	33-51039	.20	65	R. F. wave switch	42-1314	.75
30	Resistor 1000 ohms, 1/2 watt	33-21039	.20	66	Osc. wave switch	42-1290	.75
31	Resistor 1000 ohms, 1/2 watt	33-21039	.20	67	Pilot lamp	34-2039	.09
32	1st I. F. transformer	32-2580	2.20		Bezel (Dial)	40-6118	.....
33	2nd I. F. transformer	32-2582	2.20		Bezel Gasket	27-4311	.....
33A	Resistor 51,000 ohms, 1/2 watt	33-51039	.20		Bezel Glass	27-4306	.....
34	Resistor 490 ohms, 1/2 watt	33-1211	.20		Bezel Ring	28-5028	.....
35	Condenser .25 mid. tubular	30-4446	.25		Dial Scale (Codes 121 & 125)	27-5285	.....
36	Condenser 110 mmfd. mica	30-1031	.20				

PHILCO RADIO & TELEV. CORP.

MODEL 38-690(125)  
Schematic, Coils



**NOTE:**  
 SOLID AREA INDICATES RING AT REAR OF SWITCH WAFER.  
 SHADED AREA INDICATES RING AT FRONT OF SWITCH WAFER.  
 ALL RANGE SWITCHES SHOWN IN POSITION NO. 1 (BROADCAST).  
 LETTERS INDICATE POSITION OF SWITCH WAFERS FROM REAR OF CHASSIS, (BOTTOM VIEW)

Model 38-690 Code 125



PHILCO RADIO & TELEV. CORP.

MODEL 38-690(125)
Chassis Layouts
Socket, Trimmers

NOTE "A"—Slowly shift signal generator indicator between 460 and 480 K. C. As the indicator is turned, two peaks will be noted on the Output Meter...

NOTE "B"—When adjusting the low frequency compensator of Range 1 (Broadcast) or the antenna and R. F. compensators of the high frequency tuning range, the receiver Tuning Condenser must be adjusted (rolled) as follows...

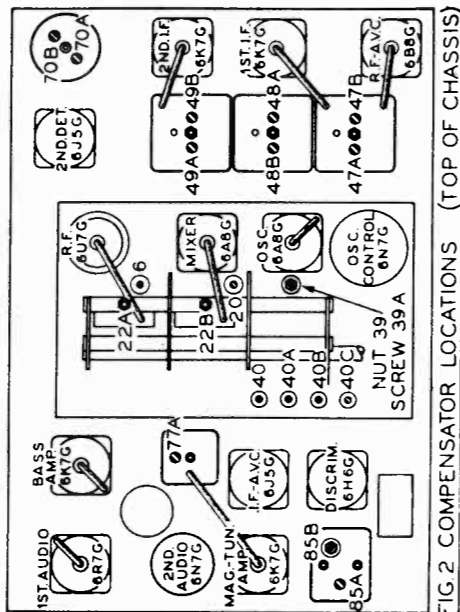
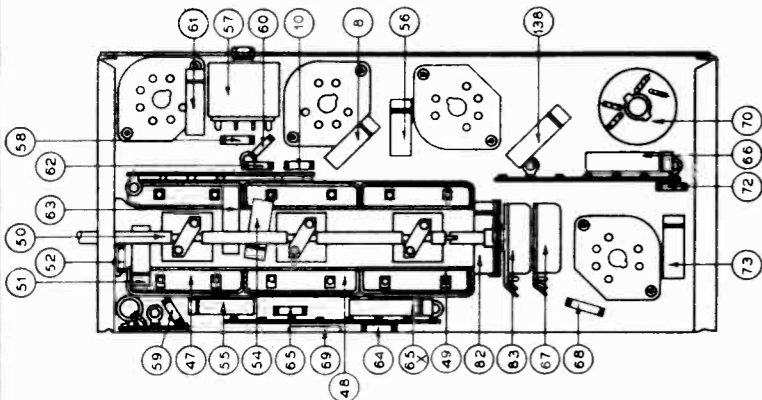


FIG. 2 COMPENSATOR LOCATIONS (TOP OF CHASSIS)

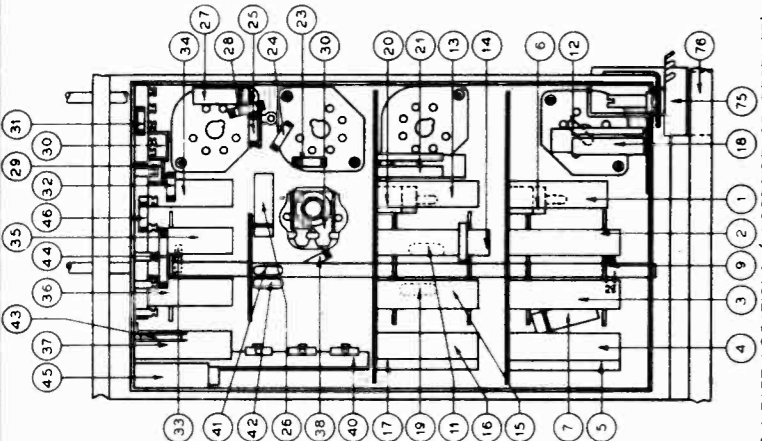


FIG. 3 PART LOCATIONS (UNDERSIDE OF RECEIVER)

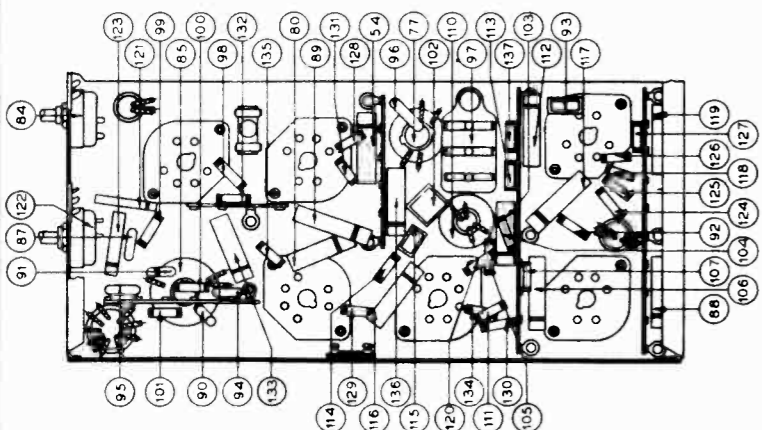


FIG. 4 PART LOCATIONS (UNDERSIDE OF POWER UNIT)

MODEL 38-690(125)
Parts List

PHILCO RADIO & TELEV. CORP.

Model 38-690—Code 125
REPLACEMENT PARTS

Table with 3 columns: Schem. No., Description, Part No. It lists 183 replacement parts for the Model 38-690 radio, including various resistors, capacitors, transformers, and control components.

\* I.F. Expander Unit Assembly contains (47), (48), (49), (67), (82) and (85).

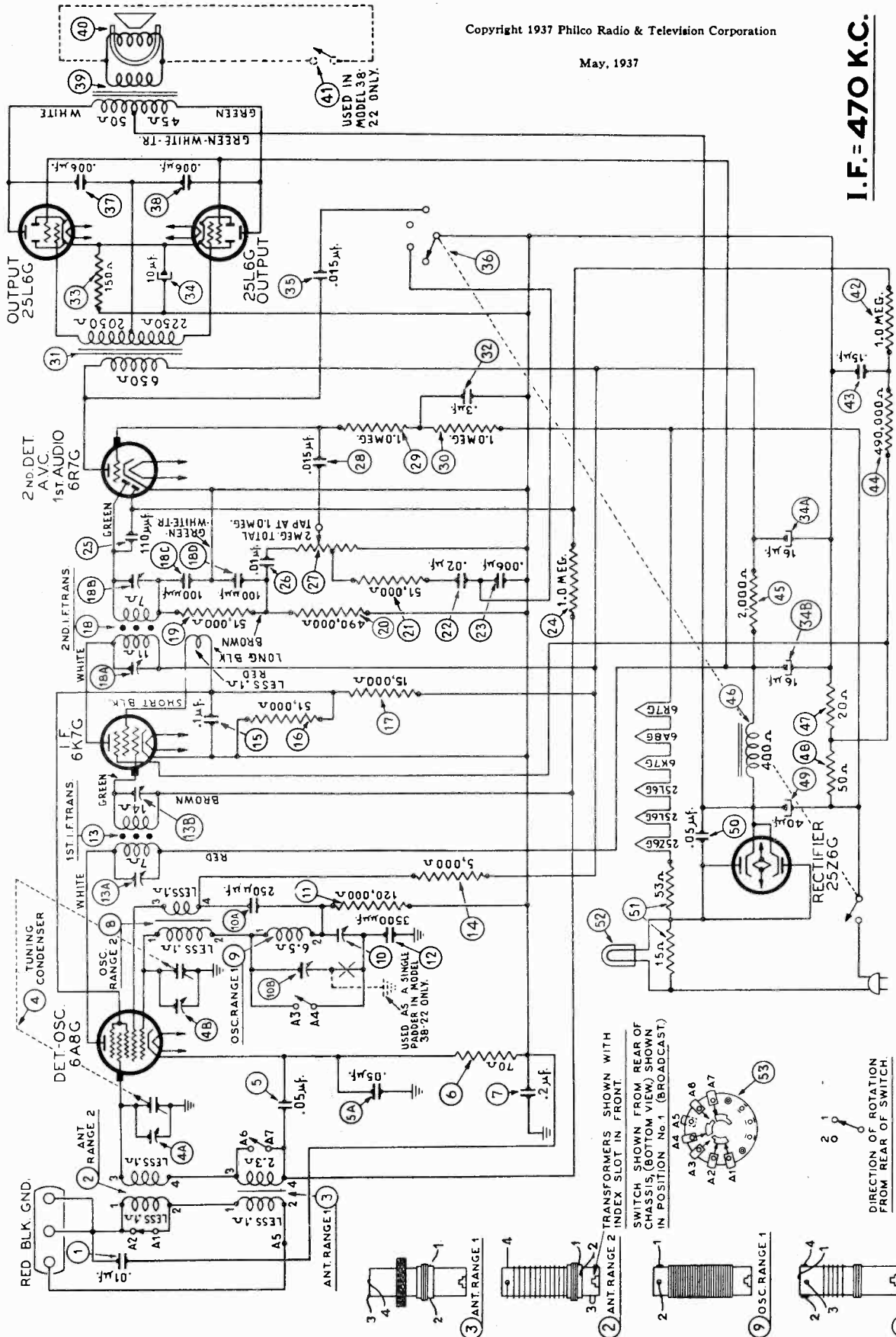
PHILCO RADIO & TELEV. CORP.

MODELS 38-22, 38-23 (121)  
Schematic, Coils

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May, 1937

I.F. = 470 K.C.



MODELS 38-22, 38-23 (121)

Chassis, Trimmers, Alignment  
PHILCO RADIO & TELEV. CORP.

CABINETS & SPEAKERS:

Cabinet Type	Speaker Used	Model
X	HR-21	38-23
T	KR-28	38-22
X	KR-27	38-23
X	HR-21	38-23
XX	HR-22	38-22
CS	KR-28	38-22

FOR CONE-CENTRIC TUNING MECHANISM—MODEL 22

Complete information for setting the stations on the cone-centric tuning mechanism of Model 38-22 is covered in the instruction Part No. (39-5533B) which is supplied with each set.

A few major assemblies of the automatic cone-centric tuning mechanism are listed on page 3 of this bulletin. A complete list of replacement parts, however, and detailed service data for the automatic mechanism, will be found in bulletin 282.

**Range Switch**  
Tuning Range: 530 to 1770 K. C.  
18 M. C.

**Signal Generator and Receiver Dial**  
18 M. C.

**Compensators in Order**  
(4B) See Note A

**Range Switch**  
1 1550 K. C.  
1 580 K. C.  
1 1550 K. C.

**Compensators in Order**  
(10B), (4A)  
(10)  
(10B)

Set the controls and adjust the R. F. compensators as follows:

**NOTE A**—To accurately adjust the high frequency oscillator compensator to the fundamental instead of the image signal, turn the oscillator compensator to the maximum capacity (clockwise) and the second maximum peak is obtained on the output meter. The second peak in the fundamental signal, and must be used in adjusting the receiver for maximum output. The first peak from maximum capacity position of the compensator is the image signal and must not be used in adjusting this compensator.

If the above procedure is correctly performed, the image signal will be found (much weaker) by turning the receiver dial 940 K. C. below the frequency being used on any high frequency range.

**TYPE OF CIRCUIT**: A six tube AC-DC operated superheterodyne circuit is incorporated in these receivers with features such as two tuning ranges; automatic volume control; bass compensation; and a push-pull pentode audio output circuit using beam power tubes.

The same circuit is used in both models. The features, however, such as the tuning mechanism, speakers and cabinets differ in each model.

**Model 38-22**, Code 121 employs the Philco Cone-Centric Automatic Tuning Mechanism and is assembled in cabinets types "XX" and "T". Model 38-22 assembled in a "CS" cabinet is identified as Code 124. A few parts of the Code 124 chassis differ from those of Code 121. These parts are listed on the parts list.

**Model 38-23** tuning mechanism is of the manually operated type with vernier control. This receiver is assembled in cabinets types "T", "X" and "K" with KR27 and HR21 speakers.

**POWER SUPPLY**: 115 volts AC or DC.

For operation on a 220 volt power supply the line resistor must be changed. See parts list for part number.

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

**TUNING RANGE FREQUENCIES**: Range 1—530 to 1770 K. C. Range 2—5.7 to 18.0 M. C.

**UNDISTORTED OUTPUT**: 3.5 watts.

**PHILCO TUBES USED**: One 6A8G, Osc. 1st Det.; one 6K7G, I. F. Amp.; one 6R7G, 2nd Det. 1st Audio.; two 25L6G, Output, and one 25Z6G, Rectifier.

**TO NE CONTROL**: Three positions.

**Aerial Connections**

To obtain the full advantage of the sensitivity of these receivers, the Philco High Efficiency Aerial Part No. 40-6112 must be used. For attaching the aerial to the receiver a terminal panel is provided at the rear of the chassis. This panel contains three screw terminals marked "Red", "Blk" and "Gnd". Connect the red and black wires of the Philco High Efficiency Aerial transmission line to the "Red" and "Blk" terminals respectively.

If you use a temporary aerial, connect it to the "Red" terminal. A good ground connection is necessary for best reception. The terminal marked "Gnd" should be connected to a water pipe or any other good ground source.

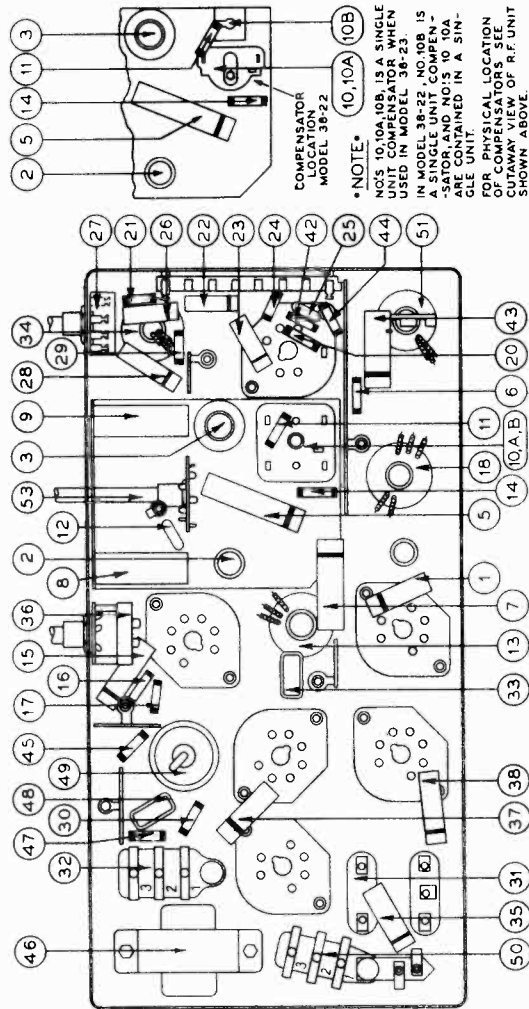


Fig. 4—Part Locations, Underside of Chassis

**Alignment of Compensators**

**EQUIPMENT REQUIRED**: (1) Signal Generator, using a fundamental frequency covering the tuning range; (2) Signal Generator which has a fundamental frequency range from 115 to 3600 K. C. in the 026 circuit tester for this purpose; (3) Output meter, Philco Model 026 circuit tester incorporates a sensitive output meter and is recommended; (4) Philco Fibre Handle Screw Driver, part No. 27-7059 and Fibre Wrench Part No. 3164; (5) Philco Set Transformer, Part No. 32-2763.

**OUTPUT METER**: The 026 Output Meter is connected to the plate and cathode terminals of one of the 25L6G tubes. Adjust the meter to use the (0-30) volt scale and advance the attenuator control of the generator until a readable indication is noted on the output meter.

**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 of each model proceed as follows:

1. Loosen the shaft coupling set screws, using Wrench, Part No. 45-2481, then turn the tuning condenser to the maximum capacity position (plate fully meshed). Now turn the selector knob until the dial pointer is on the small black dot at the low frequency end of the Range One scale. With condenser at and pointer set in this position, tighten set screws.
2. Now turn the selector knob (clockwise) until the dial pointer moves 1/4 of an inch from the small black dot (clockwise). See Fig. 5. Leave pointer in this position and loosen coupling set screws.
3. After loosening set screws, turn the selector knob until pointer is again on the small black dot at the low frequency end of Range One scale. Be careful when turning the selector knob that the position of tuning condenser is not disturbed. Tighten coupling set screws with condenser and dial pointer in this position.

**Model 38-23:**

1. Turn the tuning condenser to maximum capacity position (plates fully meshed).

2. Loosen the clamp of dial, then turn the dial—being careful that position of tuning condenser is not disturbed—until the glowing indicator is centered on the middle index line at the low frequency end of Range One scale. See Fig. 6. Tighten the dial clamp in this position.

**INTERMEDIATE FREQUENCY CIRCUIT**

**Note**: Before the following adjustments are performed, the receiver must be turned on and allowed to heat for 15 minutes. When adjusting the following compensators, a Philco Set Transformer Part No. 32-2763 must be connected in the signal generator output circuit as follows: Insert the signal generator output lead into the "Med" jack and the ground lead into the "Gnd" terminal of the signal generator. Connect the other end of the output lead to terminal No. 1 on the Set Transformer and the cable ground to terminal No. 2. Terminals No. 3 and 4 of the Set Transformer are then connected to the chassis ground terminal and 6A8G grid respectively of the receiver with short pieces of wire. Insert a 0.1 mfd. in series with the No. 4 lead which connects to the grid.

1. Set Signal Generator at 470 K. C. Turn "Multiplier" Control to 1000 and the "Attenuator" for maximum output.
2. Turn the receiver dial to 580 K. C.
3. Receiver Volume Control maximum.
4. Range Switch Broadcast Position.
5. Adjust compensators (18B), (18A), (13B) and (13A) for maximum output.

If the output meter goes off scale when adjusting the compensators retard signal generator attenuator.

**RADIO FREQUENCY CIRCUIT**

**Tuning Range: 5.7 to 18 M. C.**

1. Remove terminal No. 4 lead of set transformer from the 6A8G grid and connect to the red terminal of the aerial panel of the receiver through a .1 mfd. condenser.
2. Leave the receiver volume control at maximum. Then set the controls and adjust the R. F. compensators as follows:

PHILCO RADIO & TELEV. CORP.

MODELS 38-22, 38-23 (12L)  
Voltage, Socket, Trimmers  
Tuner, Parts

REPLACEMENT PARTS—Models 38-22 & 38-23, Code 12L

Schem. No.	Description	Part No.	List Price	Schem. No.	Description	Part No.	List Price
1	Condenser 0.01 mf. (tubular)	30-4470	\$0.20	40	Coils and Voice Coil Assembly HR21, HR22	36-3707	
2	Antenna Transformer (Range 2)	32-3714	70	41	Audio Shorting Switch (Model 38-22)	33-510339	\$0.20
3	Antenna Transformer (Range 1)	32-2557	1.25	42	Part of Concentric Tuner	30-4191	
4	Tuning Condenser (38-23)	31-2026	5.00	43	Resistor 1 meg. (1/2 watt)	33-449338	.20
5	Condenser 0.05 mf.—0.05 mf. (tubular)	30-4522	3.35	44	Resistor 100,000 ohms (1/2 watt)	33-270339	.20
6	Resistor 0.2 ohms (1/2 watt)	30-4522	1.25	45	Resistor 2000 ohms (1/2 watt)	32-054539	.20
7	Condenser 0.2 mf. (tubular)	30-4526	50	46	Resistor 50 ohms (1/2 watt)	33-1200	1.00
8	Oct. Transformer (Range 2)	32-2868	40	47	Condenser 40 mf. (wet electrolytic 38-23)	30-2237	
9	Oct. Transformer (Range 1)	31-6188	40	48	Condenser 40 mf. (dry electrolytic 38-22)	30-2237	
10	Compensator (Model 38-22)	31-6210		49	Condenser (0.05 mf. Bakelite)	36-2256	
10a	Compensator (250 mmfd.) Part of 10	31-6206		50	Condenser (.05 mid. 38-22, Code 124)	3615-SU	
11	Resistor 120,000 ohms (1/2 watt)	33-412339	.40	51	Line Resistor, 110 Volt operation	33-3334	.35
12	Condenser (Model 38-22) 3500 mmf.	30-1084		52	Line Resistor, 110/220 Volt operation	33-3334	.35
13	1st I. F. Transformer (1/2 watt)	30-1084	45	53	Wire Wound (38-22, 38-23)	43-1234	15
14	Resistor 5000 ohms (1/2 watt)	33-250330	2.20	54	Wire Wound (38-22, 38-23)	43-1234	15
15	Condenser 0.1 mf. (tubular)	30-4490	2.00	55	Wire Wound (38-22, 38-23)	43-1234	15
16	Resistor 51,000 ohms (1/2 watt)	33-315339	.20				
17	Resistor 15,000 ohms (1/2 watt)	33-315339	.20				
18	2nd I. F. Transformer	32-2876	2.00				
19	Resistor 51,000 ohms (1/2 watt)	33-351339	.20				
20	Resistor 490,000 ohms (1/2 watt)	33-449339	.20				
21	Resistor 51,000 ohms (1/2 watt)	33-351339	.20				
22	Condenser 0.006 mf. (tubular)	30-4477	2.00				
23	Resistor 100 ohms (1/2 watt)	33-510330	.20				
24	Resistor 100 ohms (1/2 watt)	33-510330	.20				
25	Condenser 0.01 mf. (tubular)	30-4478	2.00				
26	Volume Control	30-4479	2.00				
27	Condenser 0.015 mf. (tubular)	33-5228	.20				
28	Resistor 1 meg. (1/2 watt)	30-4358	2.00				
29	Resistor 1 meg. (1/2 watt)	33-510339	.20				
30	Input Transformer	32-2949	3.00				
31	Electrolytic Condenser 16, 10, 10 mf.	33-1270	4.00				
32	Electrolytic Condenser 16, 10, 10 mf.	33-1270	4.00				
33	Electrolytic Condenser 16, 10, 10 mf.	33-1270	4.00				
34	Electrolytic Condenser 16, 10, 10 mf.	33-1270	4.00				
35	Electrolytic Condenser 16, 10, 10 mf.	33-1270	4.00				
36	Tone Control & Off-On Switch	42-1361	2.00				
37	Condenser 0.006 mf. (tubular)	30-4445	.20				
38	Output Transformer KR28, KR27	30-4445	1.60				
39	Compensator (Model 38-22)	32-7963	1.00				
40	Compensator (Model 38-22)	38-3840	1.00				

Prices subject to change without notice.

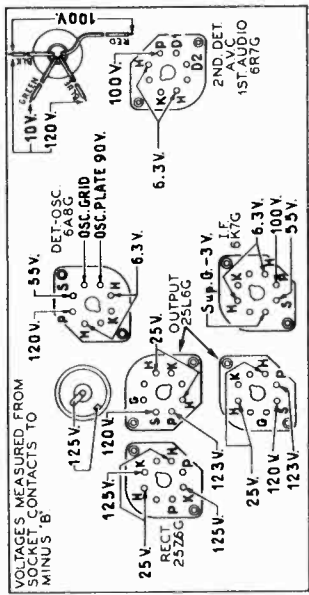


Fig. 1—Socket Voltages, Underside of Chassis  
The voltages indicated by arrows were measured with a Philco 026 Circuit Tester which contains a sensitive voltmeter. Volume Control at minimum, range switch in broadcast position, line voltage 115 A. C.

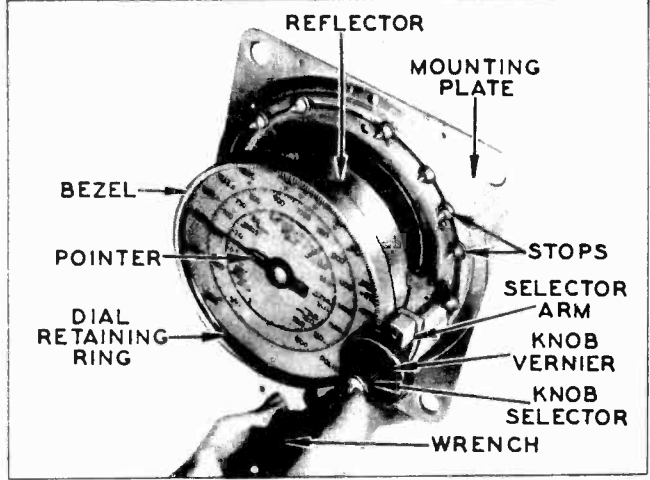


Fig. 2—Cone-Centric Automatic Tuning Mechanism

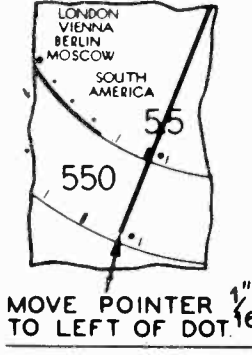


Fig. 5—Dial Calibration Model 38-22

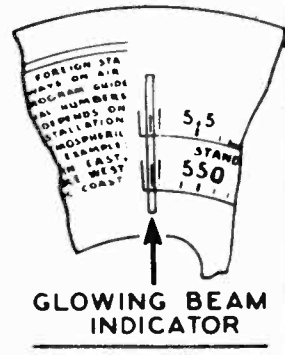


Fig. 6—Dial Calibration Model 38-23

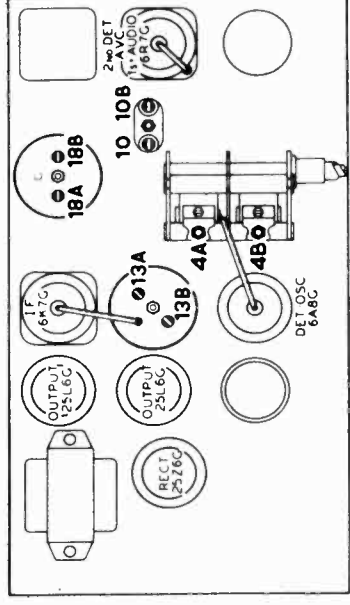


Fig. 7—Locations of Compensators



MODEL 920  
Schematic, Parts  
Chassis Layout

PHILCO RADIO & TELEV. CORP.

FEBRUARY 15, 1938

PHILCO MODEL 920

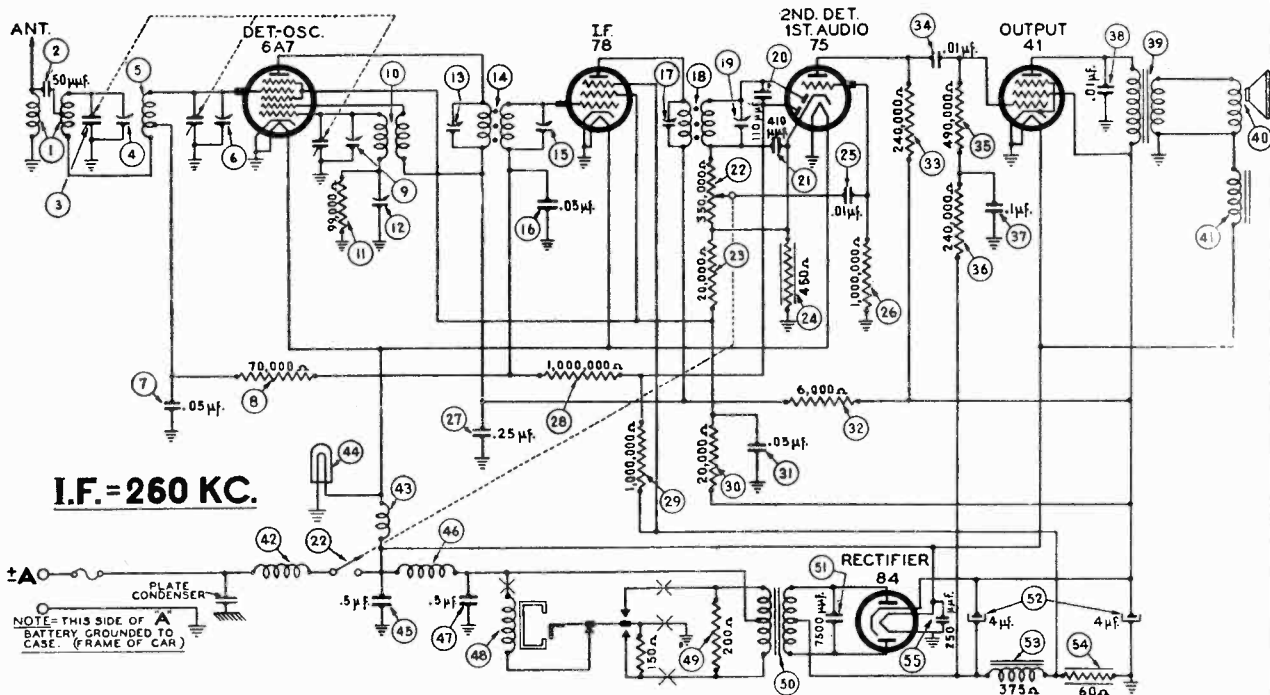


FIGURE 1

MODEL 920 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Transformer	32-2988	38	Output Transformer	32-7961
2	Condenser (50 mmfd.)	30-1101	39	Cone & Voice Coil Assembly	45-1344
3	Tuning Condenser	31-2224	40	Field Coil	32-9484
4	First Padder (on Tun. Cond.)		41	"A" Choke	32-1644
5	R. F. Transformer	32-2986	42	Filament Choke	32-1644
6	Second Padder (on Tun. Cond.)		43	Pilot Lamp	34-2061
7	Condenser (.05 mfd.)	30-4020	44	Condenser (.5 mfd.)	30-4551
8	Resistor (70,000 ohms)	33-370344	45	Vibrator Choke	32-3003
9	Third Padder (on Tun. Cond.)		46	Condenser (.5 mfd.)	30-4565
10	Oscillator Transformer	32-2987	47	Vibrator	41-3398
11	Resistor (99,000 ohms)	33-399344	48	Resistor (200 ohms)	33-120344
12	Low Frequency Padder	31-6252	49	Power Transformer	32-7962
13	Padder (Pri. 1st I. F. Trans.)		50	Condenser (7,500 mmfd.)	30-4567
14	First I. F. Transformer	32-2994	51	Filter Condenser (4-4 mfd.)	30-2311
15	Padder (Sec. 1st I. F. Trans.)		52	Filter Choke	32-7960
16	Condenser (.05 mfd.)	30-4020	53	Resistor (60 ohms)	33-060331
17	Padder (Pri. 2nd I. F. Trans.)		54	Condenser (250 mmfd.)	30-1032
18	Second I. F. Transformer	32-2995	55	Tuning & Volume Knob	27-4737
19	Padder (Sec. 2nd I. F. Trans.)		56	Pointer	28-5781
20	Condenser (110 mmfd.)	30-1031	57	Dial & Bracket Assembly	42-5844
21	Condenser (410 mmfd.)	30-1089	58	Glass	27-9107
22	Volume Control & Switch Assem.		59	Bezel	28-5764
23	Resistor (350,000 ohms)	33-5269	60	Housing Cover	38-9505
24	Resistor (20,000 ohms)	33-320344	61	Four Prong Socket	27-6044
25	Resistor (450 ohms)	33-145341	62	Five Prong Socket	27-6035
26	Condenser (.01 mfd.)	30-4470	63	Six Prong Socket	27-6036
27	Resistor (1,000,000 ohms)	33-510344	64	Seven Prong Socket	27-6037
28	Condenser (.25 mfd.)	30-4448	65	Fuse	7227
29	Resistor (1,000,000 ohms)	33-510344	66	Fuse Insulator	27-7729
30	Resistor (1,000,000 ohms)	33-510344	67	Carriage Bolt	W-1983
31	Resistor (20,000 ohms)	33-320447	68	Radio Mtg. Bolt	W-1984
32	Condenser (.05 mfd.)	30-4569	69	Radio Mtg. Nut	W-55
33	Resistor (6,000 ohms)	33-260344	70	Radio Mtg. Nut	W-1687
34	Resistor (240,000 ohms)	33-424344	71	Distributor Resistor	33-1196
35	Condenser (.01 mfd.)	30-4145	72	Interference Condenser	30-4007
36	Resistor (490,000 ohms)	33-449344	73	Set Mounting Bracket (short)	28-5853
37	Resistor (240,000 ohms)	33-424344	74	Set Mounting Bracket (long)	28-5744
38	Condenser (.01 mfd.)	30-4381			

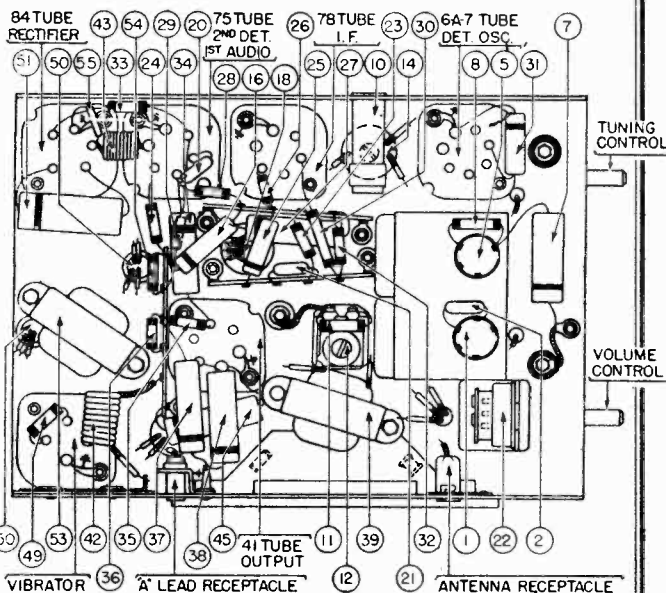


FIGURE 2

# PHILCO RADIO & TELEV. CORP. MODELS 921, 922 (Run 2)

## MODEL 920 Trimmers, Alignment

### MODEL 920

#### I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.

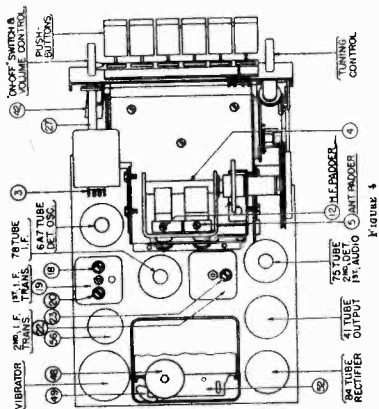


FIGURE 3

If replacements are ever necessary, replace the entire coil assembly, 32-2984 for the first I. F. stage and 32-2985 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

#### ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

**Equipment** — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 3164 Padding wrench, 27-7169 Padding screw driver.

**General** — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Radio housing.

### 921 & 922 (Run No. 2)

#### I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.

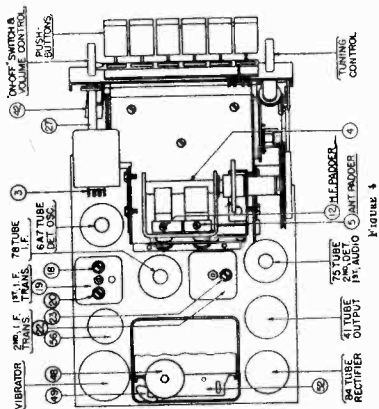


FIGURE 4

If replacements are ever necessary, replace the entire coil assembly, 32-3074 for the first I. F. stage and 32-3076 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

#### ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

**Equipment** — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 3164 Padding wrench, 27-7169 Padding screw driver.

**General** — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Radio housing.

### MODEL 920 ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

**Equipment** — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 3164 Padding wrench, 27-7169 Padding screw driver.

**General** — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Radio housing.

OPERATION	SIGNAL GENERATOR CONNECTION		DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
	FREQUENCY	CONNECTION			
1	240 K. C.	To grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	Ⓜ Ⓝ
2	1550 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	Ⓜ Ⓝ
3	580 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Set Tuning Condenser at 580 K. C. of Mesh as Far as They Will Go.	Ⓜ Ⓝ
4	1550 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	Ⓜ Ⓝ
5	1400 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Set Tuning Condenser at 1400 K. C.	Ⓜ Ⓝ

Make all adjustments for maximum reading on the output meter.

**NOTE 1** — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 50 Mmfd. Condenser in series between the signal generator and the antenna lead.

**NOTE 2** — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

**NOTE 3** — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

MODELS 921, 922 (Run 2)  
Schematic, Parts  
Chassis Layout

PHILCO RADIO & TELEV. CORP.

MODELS 921 and 922 (Run No. 2)

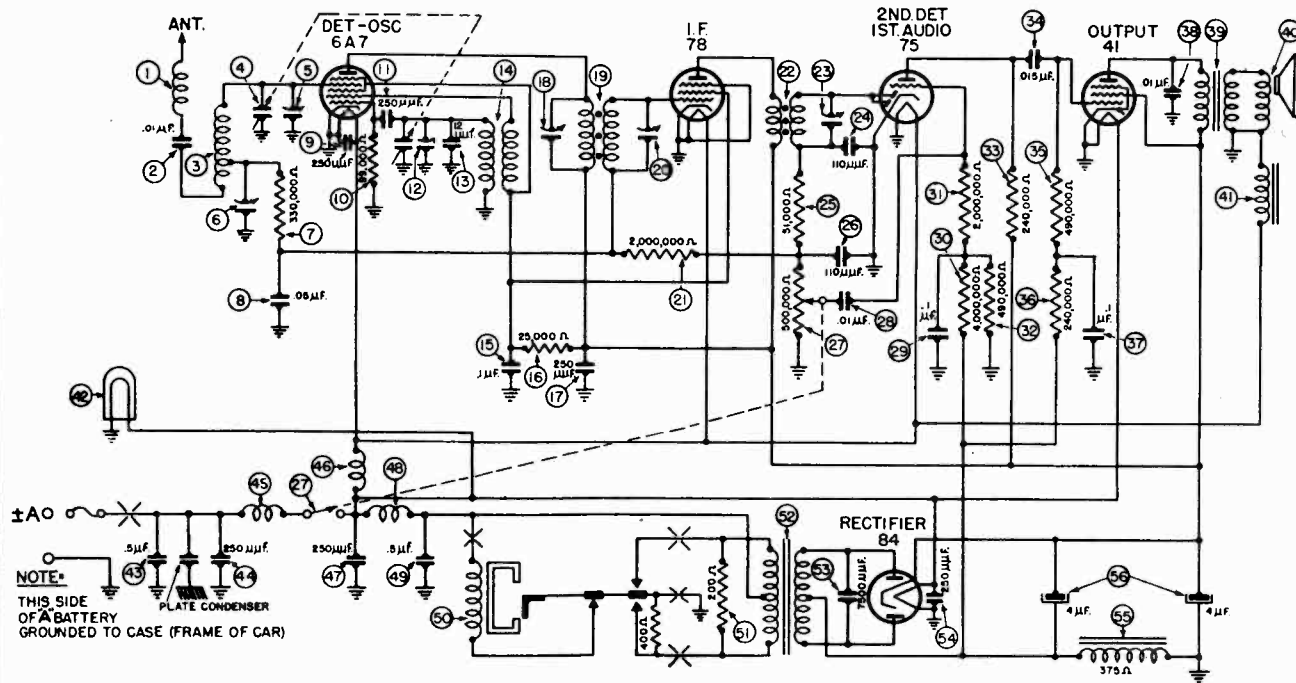


FIGURE 1

PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	77-0050	20	Resistor (2,000,000 ohms)	33-520344
2	Condenser (.01 Mfd.)	30-4479	21	Resistor (490,000 ohms)	33-449344
3	Antenna Transformer	32-3037	22	Resistor (240,000 ohms)	33-424344
4	Tuning Condenser	31-2288	23	Condenser (.015 mfd.)	30-4226
5	First Padder (on Tun. Cond.)	30-1032	24	Resistor (490,000 ohms)	33-449344
6	Antenna Compensator	31-8260	25	Resistor (240,000 ohms)	33-424344
7	Resistor (330,000 ohms)	33-433344	26	Condenser (.1 mfd.)	30-4499
8	Condenser (.05 mfd.)	30-4519	27	Resistor (51,000 ohms)	33-351344
9	Condenser (250 mmfd.)	30-1032	28	Condenser (250 mmfd.)	30-1032
10	Resistor (99,000 ohms)	33-399344	29	Output Transformer	32-8000
11	Condenser (250 mmfd.)	30-1032	30	Cone and Voice Coil	45-2707
12	Second Padder (on Tun. Cond.)	30-1007	31	Field Coil	Not replacable
13	Oscillator Transformer	32-3025	32	Pilot Lamp	34-2064
14	Condenser (.1 mfd.)	30-4455	33	Condenser (.5 mfd.)	30-4491
15	Resistor (25,000 ohms)	33-325544	34	Condenser (250 mmfd.)	30-1032
16	Condenser (250 mmfd.)	30-1032	35	"A" Choke	32-1644
17	Padder (Pri. 1st I.F. Trans.)	30-3074	36	Filament Choke	32-1644
18	First I.F. Transformer	32-3074	37	Condenser (250 mmfd.)	30-1032
19	Padder (Sec. 1st I.F. Trans.)	38-520344	38	Vibrator Choke	32-3003
20	Resistor (2,000,000 ohms)	33-520344	39	Condenser (.5 mfd.)	30-4565
21	Second I.F. Transformer	32-3078	40	Vibrator	41-3398
22	Padder (Sec. 2nd I.F. Trans.)	30-1031	41	Resistor (200 ohms)	33-120344
23	Condenser (110 mmfd.)	30-1031	42	Power Transformer	32-7962
24	Resistor (51,000 ohms)	33-351344	43	Condenser (7500 mmfd.)	30-4567
25	Condenser (110 mmfd.)	30-1031	44	Condenser (250 mmfd.)	30-1032
26	Volume Control (500,000 ohms)	33-5278	45	Filter Choke	32-7960
27	and On-Off Switch	33-5278	46	Filter Condenser (4-4 mmfd.)	30-2329
28	Condenser (.01 mfd.)	30-4479	47	Tuning and Volume Knob	27-4761
29	Condenser (.1 mfd.)	30-4499	48	Pointer	28-5969
30	Resistor (4,000,000 ohms)	33-540344	49	Fuse	7227
			50	Fuse Insulator	27-7729
			51	Glass	55-0020

I.F. = 470 K.C.

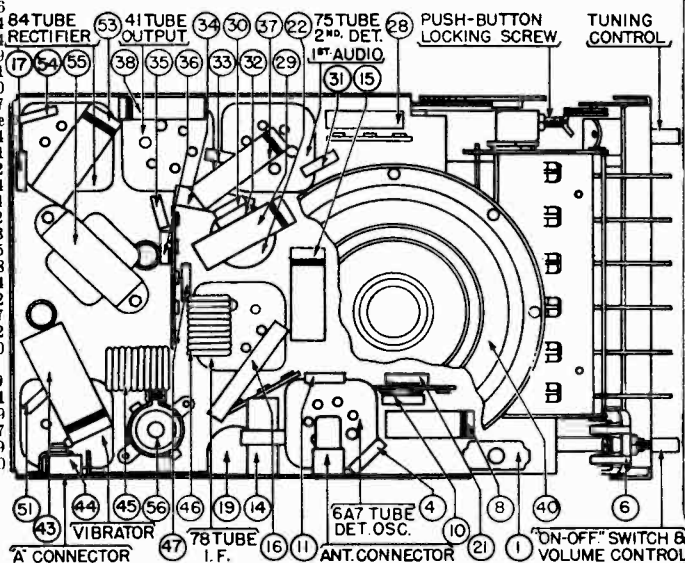


FIGURE 2

BASE VIEW OF MODEL 922  
Model 921 similar except there is no provision for automatic tuning

JUNE 1938

PHILCO RADIO & TELEV. CORP.

MODEL 926  
Schematic  
Chassis, Parts

MARCH 1, 1938

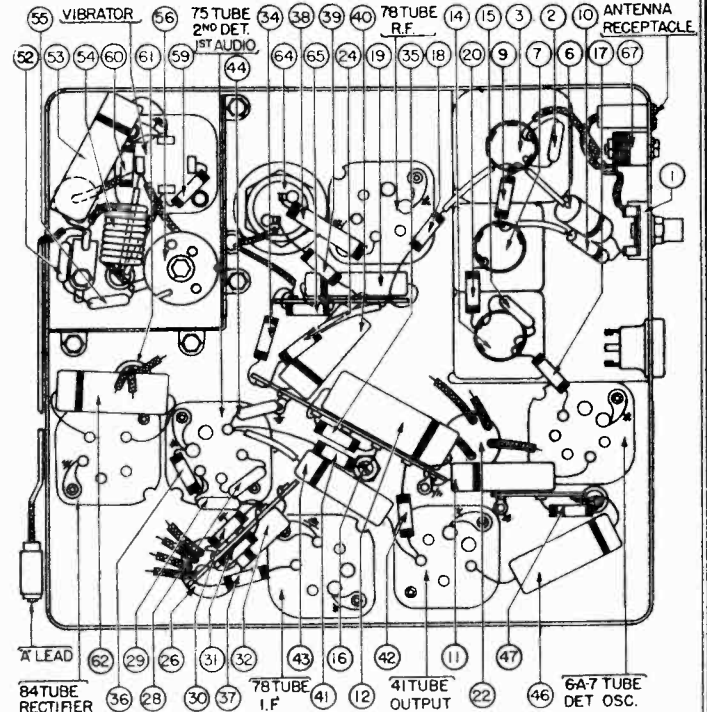
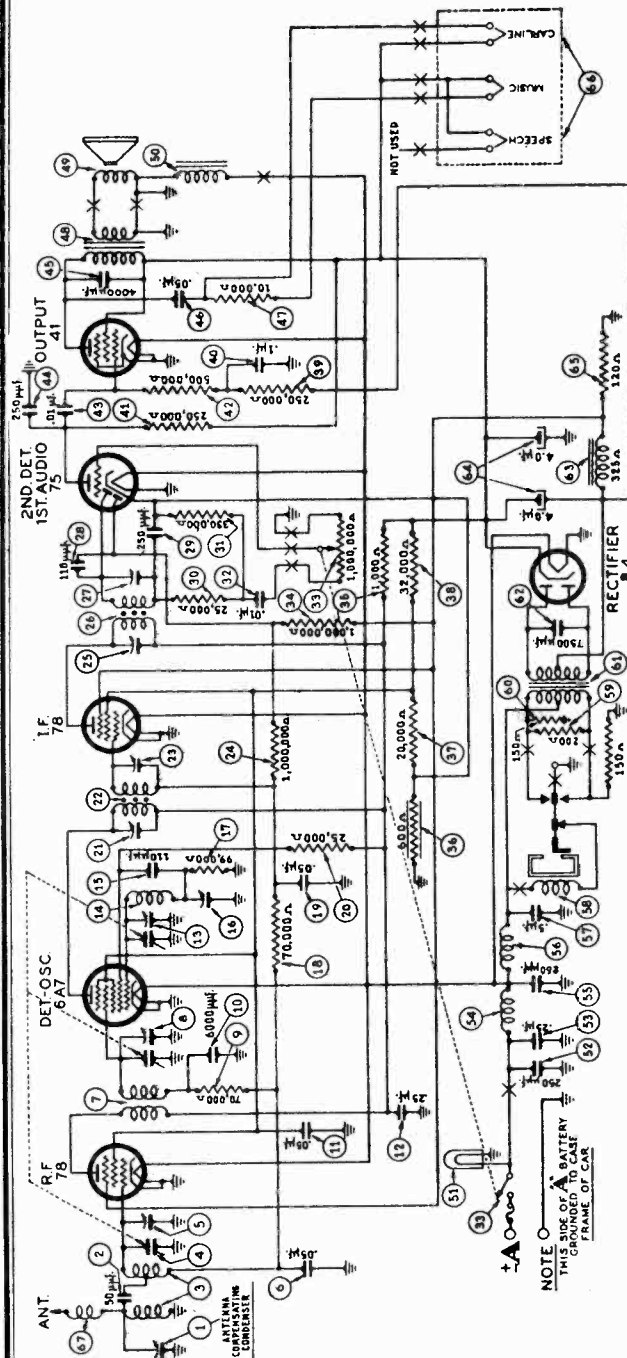


FIGURE 2

I.F. = 260 K.C.

MODEL 926 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Compensating Condenser (50 mmfd.)	31-6248	41	Resistor (250,000 ohms)	33-424344
2	Antenna Transformer	32-2945	42	Resistor (500,000 ohms)	33-449344
3	First Padder (on Tun. Cond.)	30-4444	43	Condenser (.01 mfd.)	30-4145
4	Condenser (.05 mfd.)	30-4444	44	Condensers (250 mmfd.)	30-1032
5	R. F. Transformer	32-2946	45	Condensers (4,000 mmfd.)	30-4185
6	Second Padder (on Tun. Cond.)	30-4467	46	Condensers (.05 mfd.)	30-4454
7	Resistor (70,000 ohms)	33-370344	47	Resistor (10,000 ohms)	33-310344
8	Condenser (6000 mmfd.)	30-4467	48	Output Transformer	32-7956
9	Condenser (.05 mfd.)	30-4020	49	Cone and Voice Coil	45-2608
10	Condenser (.25 mfd.)	30-4448	50	Pield Coil Assembly	32-9283
11	Third Padder (on Tun. Con.)	30-4479	51	Pilot Lamp	34-2040
12	Oscillator Transformer	32-2947	52	Condenser (250 mmfd.)	30-1032
13	Condenser (110 mmfd.)	30-1031	53	Condenser (.25 mfd.)	30-4446
14	Low Frequency Padder	31-6229	54	"A" Choke	32-1374
15	Resistor (99,000 ohms)	33-399344	55	Condenser (250 mmfd.)	30-1032
16	Resistor (70,000 ohms)	33-370344	56	Vibrator Choke	32-2911
17	Condenser (.05 mfd.)	30-4020	57	Condenser (.5 mfd.)	30-4474
18	Resistor (25,000 ohms)	33-325344	58	Vibrator	41-3170-3
19	Padder (Pri. 1st. I. F. Trans.)	32-3013	59	Resistor (200 ohm)	33-120344
20	Resistor (1,000,000 ohms)	33-510344	60	Resistor (150 ohms)	33-115344
21	Padder (Pri. 2nd I. F. Trans.)	32-3014	61	Power Transformer	32-7958
22	Resistor (1,000,000 ohms)	33-510344	62	Condenser (7500 mmfd.)	30-4587
23	Padder (Sec. 2nd I. F. Tans.)	30-1031	63	Filter Choke	32-7959
24	Condenser (250 mmfd.)	30-1032	64	Filter Condenser (4-4 mfd.)	30-2315
25	Resistor (25,000 ohms)	33-325344	65	Resistor (120 ohms)	33-112326
26	Resistor (330,000 ohms)	33-433344	66	Reception Control	42-5850
27	Condenser (.01 mfd.)	30-4479	67	Antenna Choke	32-1958
28	Volume Control (1,000,000 ohms) and "On-Off" Switch	33-5268	68	Complete Control	42-5840
29	Resistor (1,000,000 ohms)	33-510344	69	Tuning Shaft	28-8871
30	Resistor (1,000 ohms)	33-210344	70	Tuning and Volume Knob	27-4725
31	Resistor (600 ohms)	33-160331	71	"Carline" Knob	27-4731
32	Resistor (20,000 ohms)	33-320344	72	"Music" Knob	27-4732
33	Resistor (32,000 ohms)	33-332444	73	"Speech" Knob	27-4733
34	Resistor (250,000 ohms)	33-424344	74	Dial	27-5399
35	Condenser (.1 mfd.)	30-4122	75	Fuse	7227
36			76	Fuse Insulator	27-7720
37			77	Distributor Resistor	33-1196
38			78	Interference Condenser	30-4007
39			79	"T" Bolt	28-6161
40			80	Washer	W-2606
41			81	Nut	W518

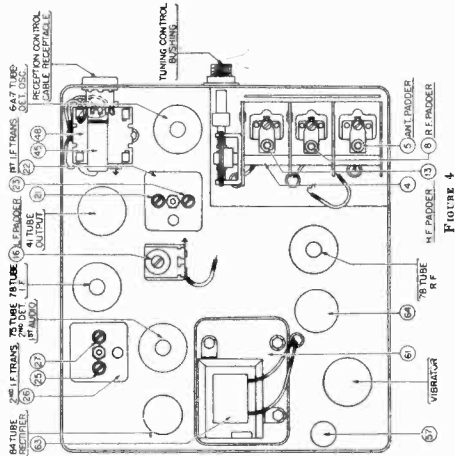


MODEL 926  
Socket, Trimmers  
Alignment

PHILCO RADIO & TELEV. CORP.

MODELS 926, 927, 928K  
Standard Controls  
Details, Parts

STANDARD CONTROL MODELS 926 - 927 - 928K

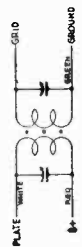


I. F. TRANSFORMERS AND PADDEES

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.



If replacements are ever necessary, replace the entire coil assembly, 32-3013, for the first I. F. stage and 32-3014 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

MODEL 926 ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

**Equipment** — Fully charged heavy duty storage battery or 6-volt power pack, 048A or 089 Philco Set Tester, 3164 Paddling wrench, 27-7159 Paddling screw driver.

**General** — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the Radio chassis.

With the Radio and signal generator set up for operation at the prescribed frequency, turn the Radio volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Radio housing.

OPERATION	FREQUENCY	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDERS
1	240 K. C.	To grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	(1) (2) (3) (4)
2	1550 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	(5) (6) (7) (8)
3	580 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Set Tuning Condenser at 580 K. C.	(9) (10) (11) (12)
4	1550 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Turn Tuning Condenser Plates Out of Mesh as Far as They Will Go.	(13) (14) (15) (16)
5	1400 K. C.	To Antenna Receptacle on Radio	50 Mmfd. See Note 1	Set Tuning Condenser at 1400 K. C.	(17) (18) (19) (20)
6	600 K. C.	Note 4	Note 4	Note 4	(21) (22) (23) (24)

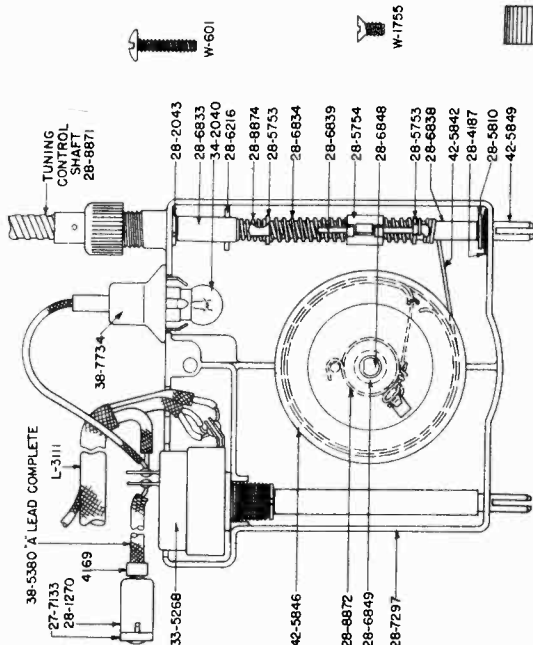
Make all adjustments for maximum reading on this output meter.

**NOTE 1** — Connect the antenna lead, Part No. 41-3191, to the antenna receptacle in the radio. Connect a 50 Mmfd. Condenser in series between the signal generator and the antenna lead.

**NOTE 2** — Rock the tuning condenser while adjusting the low frequency padder. Tune the condenser to the signal and adjust the padder for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then re-adjust the padder for maximum output. Repeat this procedure until no further improvement is noticed.

**NOTE 3** — When the antenna stage adjustment is made with the Radio installed in the car, the Radio antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

**NOTE 4** — When installing the Radio in a car, follow the installation instructions carefully. Tune in a weak broadcast signal at approximately 60 on the control scale. With a small screw driver adjust the antenna compensating condenser (1) for the maximum signal.



PHILCO RADIO & TELEV. CORP.

MODEL 927  
Schematic, Parts  
Chassis Layout

MARCH 2, 1938

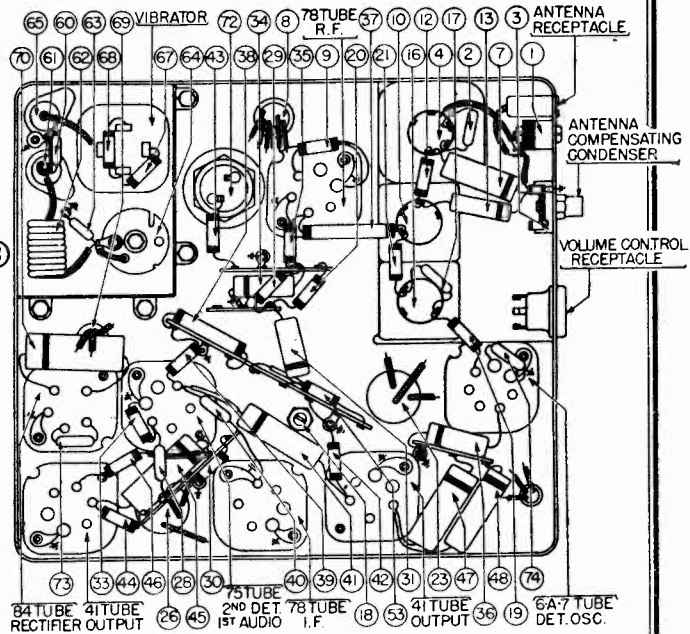
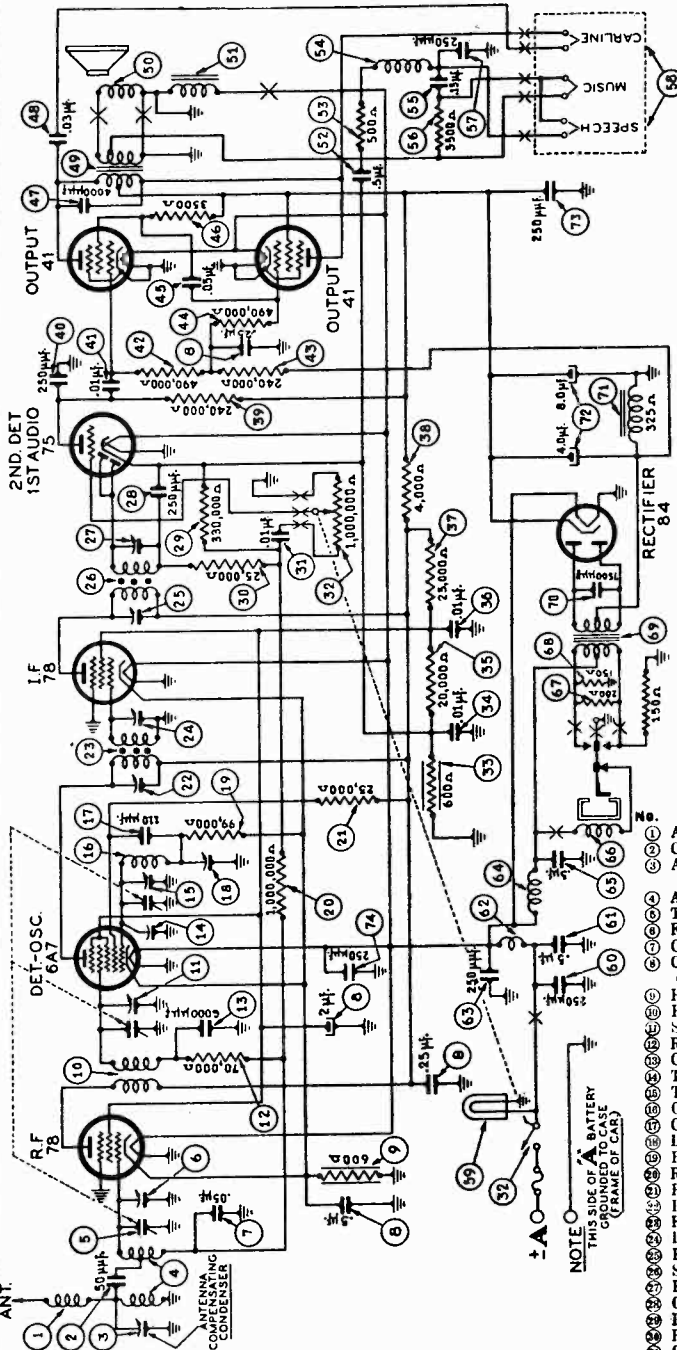


FIGURE 2

- |                      |               |                        |               |
|----------------------|---------------|------------------------|---------------|
| "Speech" Knob        | ..... 27-4733 | Interference Condenser | ..... 30-4007 |
| Dial                 | ..... 27-5399 | "T" Bolt               | ..... 28-6161 |
| Fuse                 | ..... 7227    | Washer                 | ..... 28-2606 |
| Fuse Insulator       | ..... 27-7729 | Nut                    | ..... W-518   |
| Distributor Resistor | ..... 33-1196 |                        |               |

I.F. = 260 K.C.

MODEL 927 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-1956	38	Resistor (240,000 ohms)	33-424344
2	Condenser (50 mmfd.)	30-1101	39	Condenser (250 mmfd.)	30-1032
3	Antenna Compensating		40	Condenser (.01 mfd.)	30-4145
4	Condenser	31-6248	41	Resistor (490,000 ohms)	33-449344
5	Antenna Transformer	32-2945	42	Resistor (240,000 ohms)	33-424344
6	Tuning Condenser	31-2241	43	Resistor (490,000 ohms)	33-449344
7	First Padder (on Tun. Cond.)		44	Condenser (.05 mfd.)	30-4454
8	Condenser (.05 mfd.)	30-4444	45	Resistor (3,500 ohms)	33-235344
9	Condenser (25, .25, .5, 5, 2 mfd.)	30-4568	46	Condenser (4,000 mmfd.)	30-4185
10	Resistor (600 ohms)	33-160431	47	Condenser (.03 mfd.)	30-4560
11	R. F. Transformer	32-2946	48	Output Transformer	32-7967
12	Second Padder (on Tun. Cond.)		49	Cone & Voice Coil	45-2653
13	Resistor (70,000 ohms)	33-370344	50	Field Coil	32-9193
14	Condenser (6,000 mmfd.)	30-4467	51	Condenser (.5 mfd.)	Part of 30-4474
15	Thermol Comp. Condenser	31-6253	52	Resistor (500 ohms)	33-150344
16	Third Padder (on Tun. Cond.)		53	Choke	32-1372
17	Oscillator Transformer	32-2947	54	Condenser (.15 mfd.)	30-4571
18	Condenser (110 mmfd.)	30-1031	55	Resistor (3,500 ohms)	33-235344
19	Low Frequency Padder	31-6230	56	Condenser (250 mmfd.)	30-1032
20	Resistor (99,000 ohms)	33-399344	57	Reception Control	42-5850
21	Resistor (1,000,000 ohms)	33-510344	58	Pilot Lamp	34-2040
22	Resistor (25,000 ohms)	33-325344	59	Condenser (250 mmfd.)	30-1032
23	Padder (Pri. 1st I. F. Trans.)		60	Condenser (.5 mfd.)	30-4474
24	First I. F. Transformer	32-3013	61	"A" Choke	32-1374
25	Padder (Sec. 1st I. F. Trans.)		62	Condenser (250 mmfd.)	30-1032
26	Padder (Pri. 2nd I. F. Trans.)		63	Vibrator Choke	32-2537
27	Second I. F. Transformer	32-3014	64	Condenser (.5 mfd.)	30-4474
28	Padder (Sec. 2nd I. F. Trans.)		65	Vibrator	41-3170-3
29	Condenser (250 mmfd.)	30-1032	66	Resistor (200 ohms)	33-120344
30	Resistor (330,000 ohms)	33-433344	67	Resistor (150 ohms)	33-115344
31	Resistor (25,000 ohms)	33-325344	68	Power Transformer	32-7951
32	Condenser (.01 mfd.)	30-4479	69	Condenser (7,500 mmfd.)	30-4567
33	Volume Control (1,000,000 ohms)		70	Filter Choke	32-7822
34	& On-Off Switch	33-5268	71	Filter Condenser (4-8 mfd.)	30-2316
35	Resistor (600 ohms)	33-160431	72	Condenser (250 mmfd.)	30-1032
36	Condenser (.01 mfd.)	30-4479	73	Condenser (250 mmfd.)	30-1032
37	Resistor (20,000 ohms)	33-320344	74	Complete Control	42-5840
38	Condenser (.01 mfd.)	30-4479		Tuning Shaft	28-8871
39	Resistor (25,000 ohms)	33-325444		Tuning & Volume Knob	27-4725
40	Resistor (4,000 ohms)	33-240444		"Car-line" Knob	27-4731
				"Music" Knob	27-4732

PHILCO MODEL 927

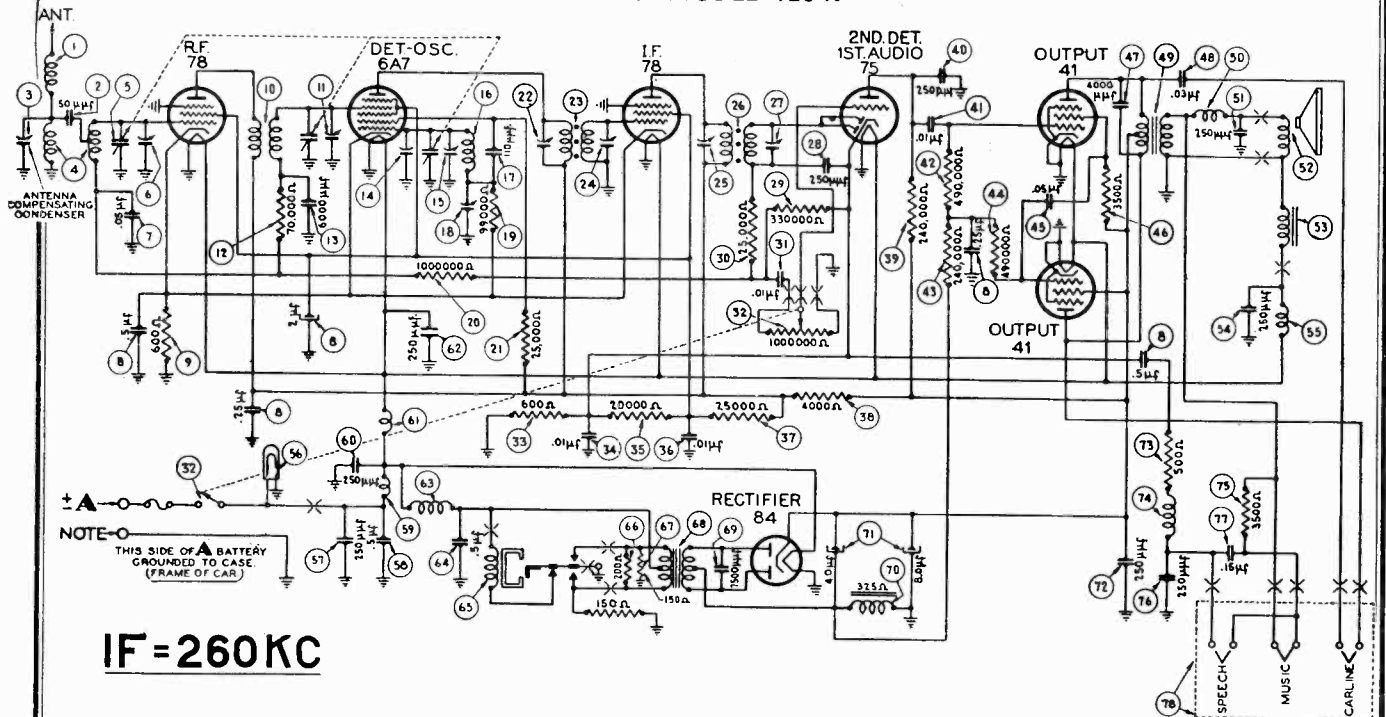


PHILCO RADIO & TELEV. CORP.

MODEL 928K  
Schematic, Parts  
Chassis Layout

MARCH 3, 1938

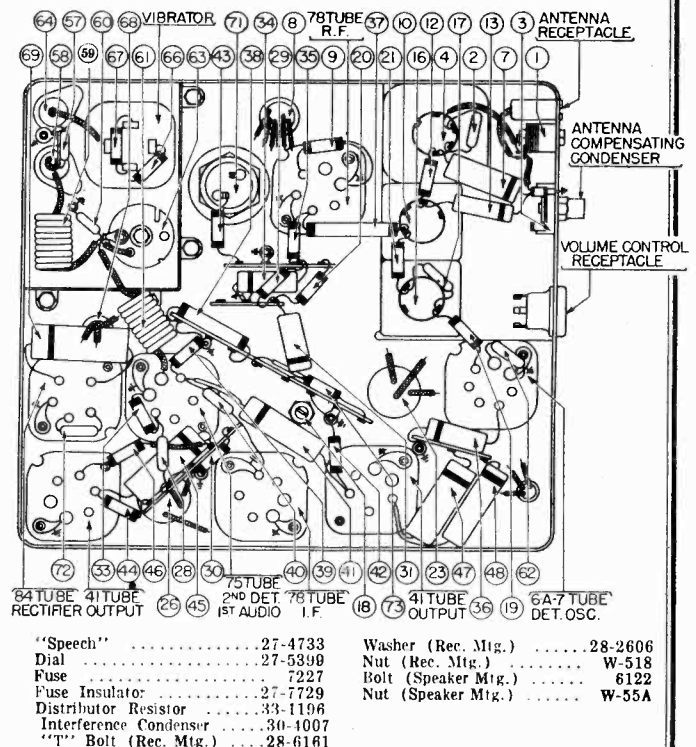
PHILCO MODEL 928-K



IF = 260KC

MODEL 928-K PARTS LIST

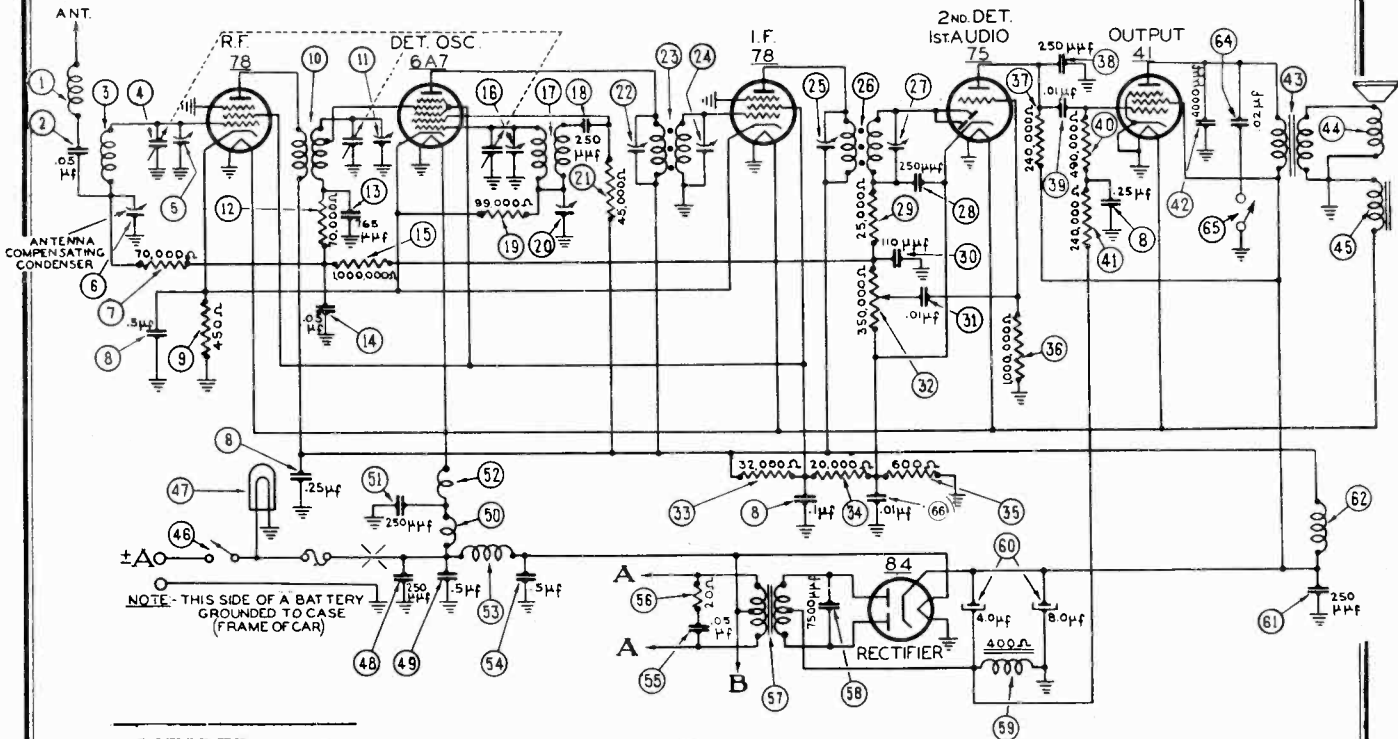
No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-1956	11	Condenser (.01 mfd.)	30-4145
2	Condenser (50 mmfd.)	30-1101	12	Resistor (490,000 ohms)	33-449344
3	Antenna Compensating Condenser	31-6248	13	Resistor (240,000 ohms)	33-424344
4	Antenna Transformer	32-2945	14	Resistor (490,000 ohms)	33-449344
5	Tuning Condenser	31-2242	15	Condenser (.05 mfd.)	30-4454
6	First Padder (on Tun. Cond.)	32-2945	16	Resistor (3,500 ohms)	33-235344
7	Condenser (.05 mfd.)	30-4444	17	Condenser (4,000 mmfd.)	30-4185
8	Condenser (.25-.25-.5-.5-2 mfd.)	30-4568	18	Condenser (.03 mfd.)	30-4560
9	Resistor (600 ohms)	33-160331	19	Output Transformer	32-7968
10	R. F. Transformer	32-2946	20	Choke	32-1374
11	Second Padder (on Tun. Cond.)	33-370344	21	Condenser (250 mmfd.)	30-1032
12	Resistor (70,000 ohms)	30-4467	22	Cone & Voice Coil	45-2664
13	Condenser (6,000 mmfd.)	32-6232	23	Field Coil	32-9493
14	Thermal Comp. Condenser	32-6232	24	Condenser (250 mmfd.)	30-1032
15	Third Padder (on Tun. Cond.)	32-2947	25	Choke	32-2535
16	Oscillator Transformer	30-1031	26	Pilot Lamp	34-2040
17	Condenser (110 mmfd.)	31-6230	27	Condenser (250 mmfd.)	30-1032
18	Low Frequency Padder	33-399344	28	Condenser (.5 mfd.)	30-4474
19	Resistor (99,000 ohms)	33-510344	29	"A" Choke	32-1374
20	Resistor (1,000,000 ohms)	33-325344	30	Condenser (250 mmfd.)	30-1032
21	Resistor (25,000 ohms)	33-325344	31	Vibrator Choke	32-2537
22	Padder (Pri. 1st I. F. Trans.)	32-3013	32	Condenser (.5 mfd.)	30-4474
23	First I. F. Transformer	32-3013	33	Vibrator	41-3170-3
24	Padder (Sec. 1st I. F. Trans.)	33-120344	34	Resistor (200 ohms)	33-120344
25	Padder (Pri. 2nd I. F. Trans.)	33-115344	35	Resistor (150 ohms)	33-115344
26	Second I. F. Transformer	32-3014	36	Power Transformer	32-7951
27	Padder (Sec. 2nd I. F. Trans.)	33-433444	37	Condenser (7,500 mmfd.)	30-4567
28	Condenser (250 mmfd.)	33-325344	38	Filter Choke	32-7959
29	Resistor (330,000 ohms)	33-325344	39	Filter Condenser (4-8 mfd.)	30-2316
30	Resistor (25,000 ohms)	33-325344	40	Condenser (250 mmfd.)	30-1032
31	Condenser (.01 mfd.)	30-4479	41	Resistor (500 ohms)	33-150331
32	Volume Control (1,000,000 ohms & On-Off Switch)	33-5268	42	Choke	32-1372
33	Resistor (600 ohms)	30-4479	43	Resistor (3,500 ohms)	33-235344
34	Condenser (.01 mfd.)	33-320344	44	Condenser (250 mmfd.)	30-1032
35	Resistor (20,000 ohms)	30-4479	45	Condenser (.15 mfd.)	30-1571
36	Condenser (.01 mfd.)	33-325344	46	Reception Control	42-5850
37	Resistor (25,000 ohms)	33-240444	47	Complete Control	42-5810
38	Resistor (4,000 ohms)	33-424344	48	Tuning Shaft	25-8871
39	Resistor (240,000 ohms)	33-424344	49	Tuning & Volume Knob	27-4725
40	Condenser (250 mmfd.)	30-1032	50	"Car Line" Knob	27-4731
			51	"Music"	27-4732





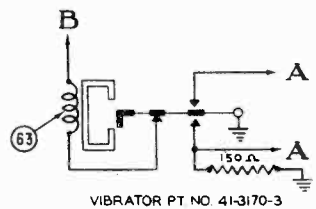
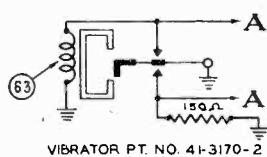
MODEL N1514 (Nash)  
Schematic, Parts  
Chassis Layout

PHILCO RADIO & TELEV. CORP.  
NASH - PHILCO MODEL - N-1514 SINGLE UNIT RECEIVER



OCTOBER 20, 1937

FOR ALIGNMENT,  
SEE INDEX



I.F. = 260 KC

FIGURE 1

MODEL N-1514 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-1956	21	6A7 TUBE DET. OSC.	78 TUBE R.F.
2	Condenser (.05 mfd.)	30-4444	22	6A7 TUBE DET. OSC.	78 TUBE R.F.
3	Antenna Transformer	32-2516	23	6A7 TUBE DET. OSC.	78 TUBE R.F.
4	Tuning Condenser	31-1930	24	6A7 TUBE DET. OSC.	78 TUBE R.F.
5	First Padder (on Tun. Cond.)	31-6082	25	78 TUBE I.F.	41 TUBE OUTPUT
6	Antenna Compensator	31-6082	26	78 TUBE I.F.	41 TUBE OUTPUT
7	Resistor (70,000 ohms)	33-370344	27	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
8	Condenser (.01-.1-.25-.5 mfd.)	30-4511	28	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
9	Resistor (450 ohms)	33-1218	29	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
10	R. F. Transformer	32-2307	30	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
11	Second Padder (on Tun. Cond.)	31-6102	31	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
12	Resistor (70,000 ohms)	33-370344	32	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
13	Condenser (765 mmfd.)	30-1069	33	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
14	Condenser (.05 mfd.)	3615-0SG	34	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
15	Resistor (1,000,000 ohms)	33-510344	35	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
16	Third Padder (on Tun. Cond.)	31-6102	36	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
17	Oscillator Transformer	32-2308	37	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
18	Condenser (250 mmfd.)	30-1032	38	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
19	Resistor (99,000 ohms)	33-399344	39	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
20	Low Frequency Padder	31-6102	40	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
21	Resistor (45,000 ohms)	33-345344	41	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
22	Padder (Pri. 1st I. F. Trans.)	32-2026	42	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
23	First I. F. Transformer	32-2026	43	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
24	Padder (Sec. 1st I. F. Trans.)	32-2027	44	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
25	Padder (Pri. 2nd I. F. Trans.)	32-2027	45	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
26	Second I. F. Transformer	32-2027	46	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
27	Padder (Sec. 2nd I. F. Trans.)	32-2027	47	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
28	Condenser (250 mmfd.)	30-1032	48	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
29	Resistor (25,000 ohms)	33-325344	49	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
30	Condenser (110 mmfd.)	30-1031	50	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
31	Condenser (.01 mfd.)	3903-0SU	51	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
32	Volume Control (350,000 ohms)	33-5129	52	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
33	Resistor (32,000 ohms)	33-332434	53	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
34	Resistor (20,000 ohms)	33-320344	54	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
35	Resistor (600 ohms)	33-1212	55	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
36	Resistor (1,000,000 ohms)	33-510344	56	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
37	Resistor (210,000 ohms)	33-424344	57	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
38	Condenser (250 mmfd.)	30-1032	58	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
39	Condenser (.01 mfd.)	3903-0SU	59	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
40	Resistor (490,000 ohms)	33-449344	60	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
41	Resistor (240,000 ohms)	33-424344	61	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
42	Condenser (4,000 mmfd.)	30-4185	62	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
43	Output Transformer	32-7495	63	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
44	Cone & Voice Coil	36-3586	64	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
45	Cone & Voice Coil	36-3586	65	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
46	Cone & Voice Coil	36-3586	66	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
47	Cone & Voice Coil	36-3586	67	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
48	Cone & Voice Coil	36-3586	68	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
49	Cone & Voice Coil	36-3586	69	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
50	Cone & Voice Coil	36-3586	70	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
51	Cone & Voice Coil	36-3586	71	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
52	Cone & Voice Coil	36-3586	72	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
53	Cone & Voice Coil	36-3586	73	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
54	Cone & Voice Coil	36-3586	74	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
55	Cone & Voice Coil	36-3586	75	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
56	Cone & Voice Coil	36-3586	76	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
57	Cone & Voice Coil	36-3586	77	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
58	Cone & Voice Coil	36-3586	78	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
59	Cone & Voice Coil	36-3586	79	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
60	Cone & Voice Coil	36-3586	80	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
61	Cone & Voice Coil	36-3586	81	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
62	Cone & Voice Coil	36-3586	82	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
63	Cone & Voice Coil	36-3586	83	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
64	Cone & Voice Coil	36-3586	84	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
65	Cone & Voice Coil	36-3586	85	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
66	Cone & Voice Coil	36-3586	86	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
67	Cone & Voice Coil	36-3586	87	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
68	Cone & Voice Coil	36-3586	88	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
69	Cone & Voice Coil	36-3586	89	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
70	Cone & Voice Coil	36-3586	90	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
71	Cone & Voice Coil	36-3586	91	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
72	Cone & Voice Coil	36-3586	92	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
73	Cone & Voice Coil	36-3586	93	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
74	Cone & Voice Coil	36-3586	94	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
75	Cone & Voice Coil	36-3586	95	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
76	Cone & Voice Coil	36-3586	96	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
77	Cone & Voice Coil	36-3586	97	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
78	Cone & Voice Coil	36-3586	98	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
79	Cone & Voice Coil	36-3586	99	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT
80	Cone & Voice Coil	36-3586	100	75 TUBE 2ND DET. 1ST AUDIO	41 TUBE OUTPUT

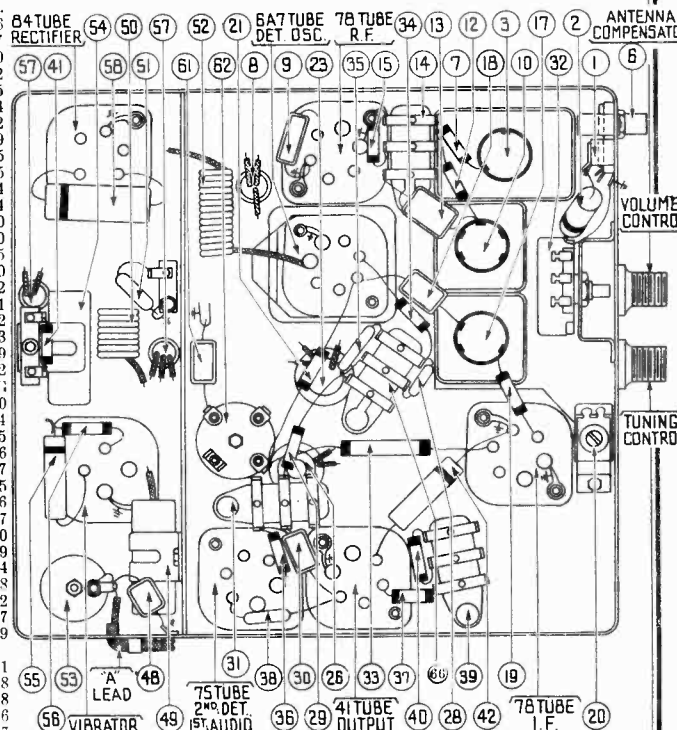
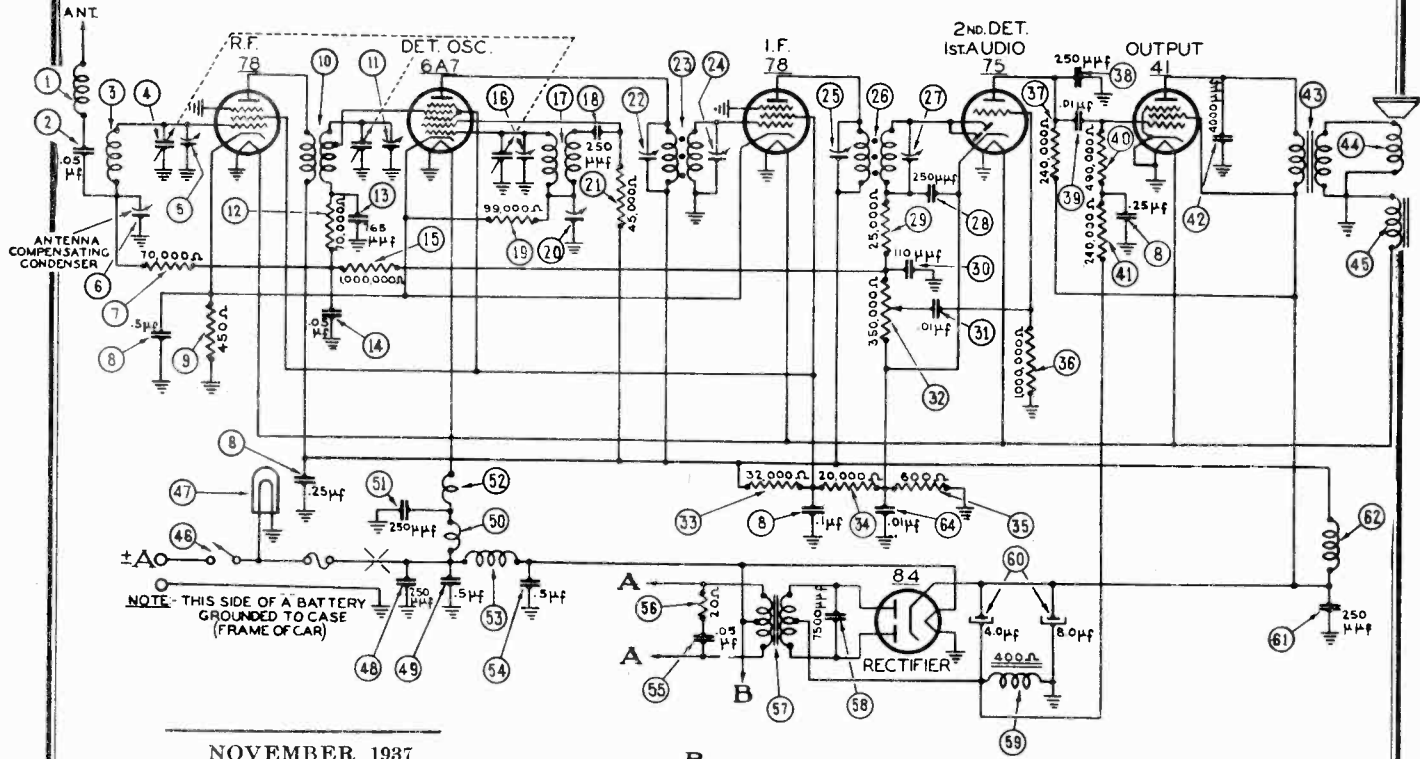


FIGURE 2

PHILCO RADIO & TELEV. CORP. MODEL S1516 (Studebaker)  
Schematic, Parts  
Chassis Layout

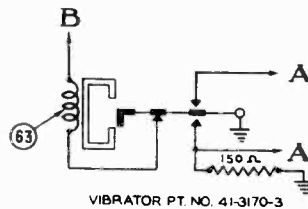
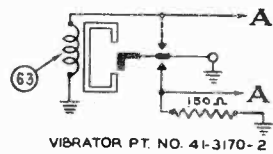
STUDEBAKER - PHILCO MODEL - S-1516 SINGLE UNIT RECEIVER



NOVEMBER 1937

IF. = 260 KC

FIGURE 1



MODEL S-1516 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-2344	40	Resistor (490,000 ohms)	33-149344
2	Condenser (.05 mfd.)	30-4444	41	Resistor (240,000 ohms)	33-424344
3	Antenna Transformer	32-2516	42	Condenser (4,000 mmfd.)	30-4185
4	Tuning Condenser	31-1930	43	Output Transformer	32-7495
5	First Padder (on Tun. Cond.)		44	Cone & Voice Coil	36-3586
6	Antenna Compensator	31-6082	45	Field Coil	32-9236
7	Resistor (70,000 ohms)	33-370344	46	On & Off Switch	42-1368
8	Condenser (.01-.1-.25-.5 mfd.)	30-4511	47	Pilot Lamp	34-2040
9	Resistor (450 ohms)	33-1218	48	Condenser (250 mmfd.)	30-1032
10	R. F. Transformer	32-2307	49	Condenser (.5 mfd.)	30-4015
11	Second Padder (on Tun. Cond.)		50	"A" Choke	32-1604
12	Resistor (70,000 ohms)	33-370344	51	Condenser (250 mmfd.)	30-1032
13	Condenser (765 mmfd.)	30-1069	52	Filament Choke	32-2039
14	Condenser (.05 mfd.)	3615-08G	53	Vibrator Choke	32-2535
15	Resistor (1,000,000 ohms)	33-510344	54	Condenser (.5 mfd.)	30-4015
16	Third Padder (on Tun. Cond.)		55	Condenser (.05 mfd.)	30-4444
17	Oscillator Transformer	32-2308	56	Resistor (20 ohms)	33-020344
18	Condenser (250 mmfd.)	30-1032	57	Power Transformer	32-7550
19	Resistor (99,000 ohms)	33-399344	58	Condenser (7,500 mmfd.)	30-4420
20	Low Frequency Padder	31-6102	59	Filter Choke	32-7545
21	Resistor (45,000 ohms)	33-345344	60	Filter Condenser (4-9 mfd.)	30-2150
22	Padder (Pri. 1st I. F. Trans.)		61	Condenser (250 mmfd.)	30-1032
23	First I. F. Transformer	32-2026	62	"B" Choke	32-1281
24	Padder (Sec. 1st I. F. Trans.)		63	Vibrator (OPTIONAL)	41-3170-2
25	Padder (Pri. 2nd I. F. Trans.)		64	Vibrator (OPTIONAL)	41-3170-3
26	Second I. F. Transformer	32-2027	65	Corngenser (.01 mfd.)	3903-08G
27	Padder (Sec. 2nd I. F. Trans.)		66	Receiver Housing	38-2103
28	Condenser (250 mmfd.)	30-1032	67	Four Prong Socket	27-6044
29	Resistor (25,000 ohms)	33-325344	68	Five Prong Socket	27-6035
30	Condenser (110 mmfd.)	30-1031	69	Six Prong Socket	27-6036
31	Condenser (.01 mfd.)	3903-08U	70	Seven Prong Socket	27-6037
32	Volume Control (350,000 ohms)	33-5139	71	Tuning Control Shaft	28-8852
33	Resistor (32,000 ohms)	33-332434	72	Volume Control Shaft	28-8853
34	Resistor (20,000 ohms)	33-320344	73	Tuning & Volume Knob	27-4689
35	Resistor (600 ohms)	33-1212	74	Scale Assembly	42-5781
36	Resistor (1,000,000 ohms)	33-510344	75	Fuse	7227
37	Resistor (240,000 ohms)	33-424344	76	Fuse Insulator	27-7729
38	Condenser (250 mmfd.)	30-1032	77	Inductive Sunpressor	32-2250
39	Condenser (.01 mfd.)	3903-08U	78	Interference Condenser	30-4307
40	Resistor (450,000 ohms)	33-149344	79	Distributor Condenser	30-1087

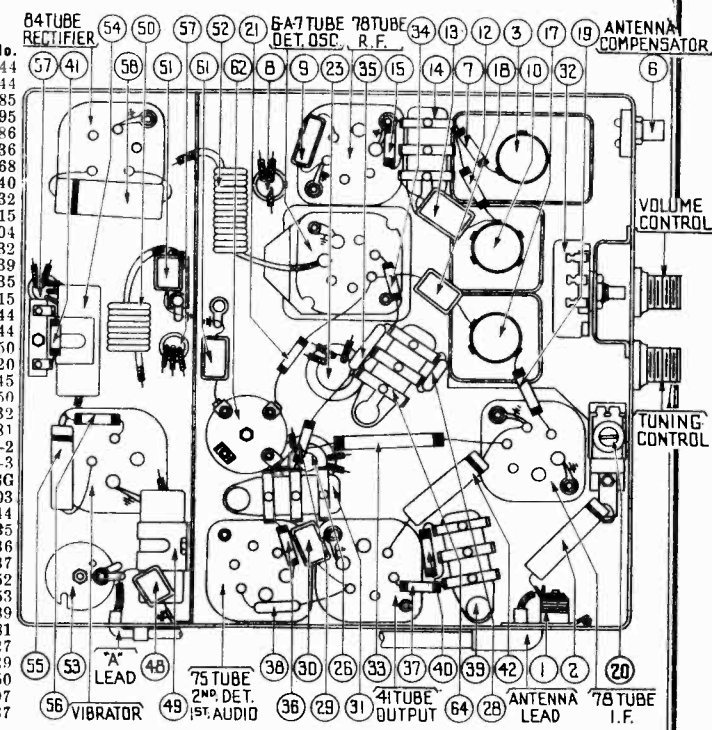


FIGURE 2

# PHILCO RADIO & TELEV. CORP. MODEL S1516 (Studebaker) Socket, Trimmers, Controls Alignment, Parts

## I. F. TRANSFORMERS AND PADDERS

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 8).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 7.

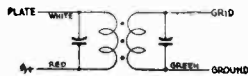


FIGURE 7

If replacements are ever necessary, replace the entire coil assembly, 32-2026 for the first I. F. stage and 32-2027 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above numbers.

## MODEL S-1516 ADJUSTMENTS

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

### Equipment

Fully charged heavy duty storage battery or 6-volt power pack, 048A or 099 Philco Set Tester, 3104 Padding wrench, 27-7159 Padding screw driver.

### General

**OUTPUT METER** — The output meter must be connected by means of an adapter to the plate of the type H output tube and to the Receiver chassis.

**SIGNAL GENERATOR** — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

### Procedure

**I. F.** — Set the signal generator at exactly 260 K. C.

Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust the padders 26, 27 and 28 on the first and second I. F. transformer for maximum reading on the output meter. (See Figure 8 for location of padders).

**HIGH FREQUENCY AND R. F.** — After padding the I. F. stages remove the generator lead from the 6A7 tube.

Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid clip).

Turn the tuning condenser plates out of mesh as far as they will go.

With the tuning condenser in this position, adjust the high frequency padder 29 and the R. F. padder 30 until the maxi-

imum reading is obtained on the output meter. This is the true setting for 1550 K. C. on the dial scale.

**LOW FREQUENCY** — Turn the tuning condenser plates in mesh to approximately 580 K. C. 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw 31 for maximum reading on the output meter.

**HIGH FREQUENCY READJUSTMENT** — Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency padder 29 again for maximum reading on the output meter.

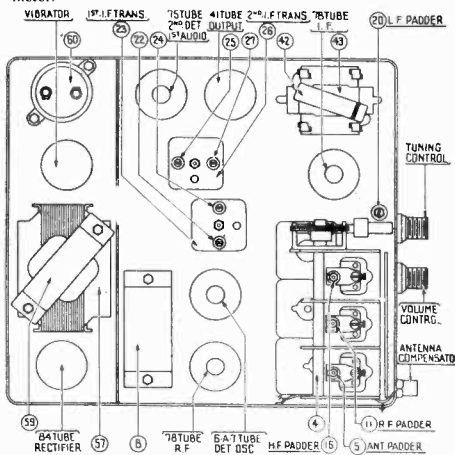


FIGURE 8

Remove the generator lead from the 78 R. F. tube. **ANTENNA** — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

Connect the signal generator lead to the antenna connector on the Receiver using an antenna lead, Part No. L-2665, and a 25 mfd. condenser in series between the two leads.

Turn the tuning condenser in mesh to 600 K. C. and adjust the signal generator 600 K. C. Adjust the antenna compensating condenser 32 for maximum reading.

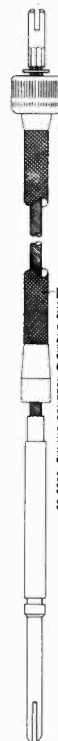
Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders 33 and 34 for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

When installing the Radio in a car, follow the installation instructions carefully. Tune in a weak broadcast signal at approximately 60 on the control scale. With a small screw driver adjust the antenna compensating condenser 32 for the maximum signal.

## STUDEBAKER MODEL S-1516 CONTROL UNIT

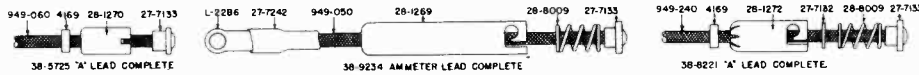
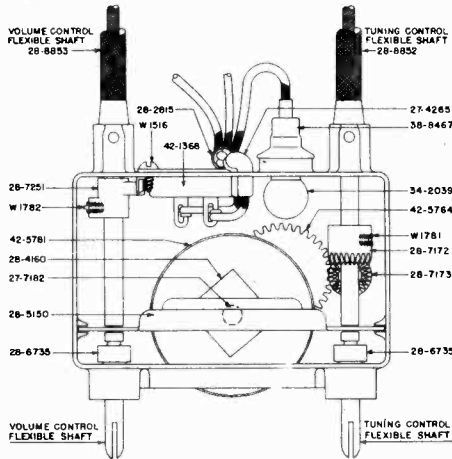
28-8858 Spring	per 100	1.25
28-8852 Tuning Shaft	per 100	.15
28-8853 Volume Shaft	per 100	.10
34-2039 Pilot Lamp	per 100	.01
38-5725 "A" Lead	per 100	.30
38-8221 "A" Lead	per 100	.40
38-8467 Pilot Lamp Assembly	per 100	.01
38-9234 Ammeter Lead	per 100	.85
42-5772 In-off Switch	per 100	.30
42-5771 Drum Shaft	per 100	.02
42-5773 Housing and Stud Assembly	per 100	.15
42-5781 Dial Assembly	per 100	.85



28-8852 TUNING CONTROL FLEXIBLE SHAFT  
28-8853 VOLUME CONTROL FLEXIBLE SHAFT

## PARTS LIST AND PRICES (Prices Subject to Change Without Notice)

PART NUMBER	DESCRIPTION	LIST PRICE
28-8852	Tuning Control Flexible Shaft	per 100 .15
28-8853	Volume Control Flexible Shaft	per 100 .10
34-2039	Pilot Lamp	per 100 .01
38-5725	"A" Lead	per 100 .30
38-8221	"A" Lead	per 100 .40
38-8467	Pilot Lamp Assembly	per 100 .01
38-9234	Ammeter Lead	per 100 .85
42-5772	In-off Switch	per 100 .30
42-5771	Drum Shaft	per 100 .02
42-5773	Housing and Stud Assembly	per 100 .15
42-5781	Dial Assembly	per 100 .85



PHILCO RADIO & TELEV. CORP. MODEL P1517(Packard)

Schematic, Parts  
Chassis Layout

PACKARD - PHILCO MODEL P - 1517 SINGLE UNIT RECEIVER

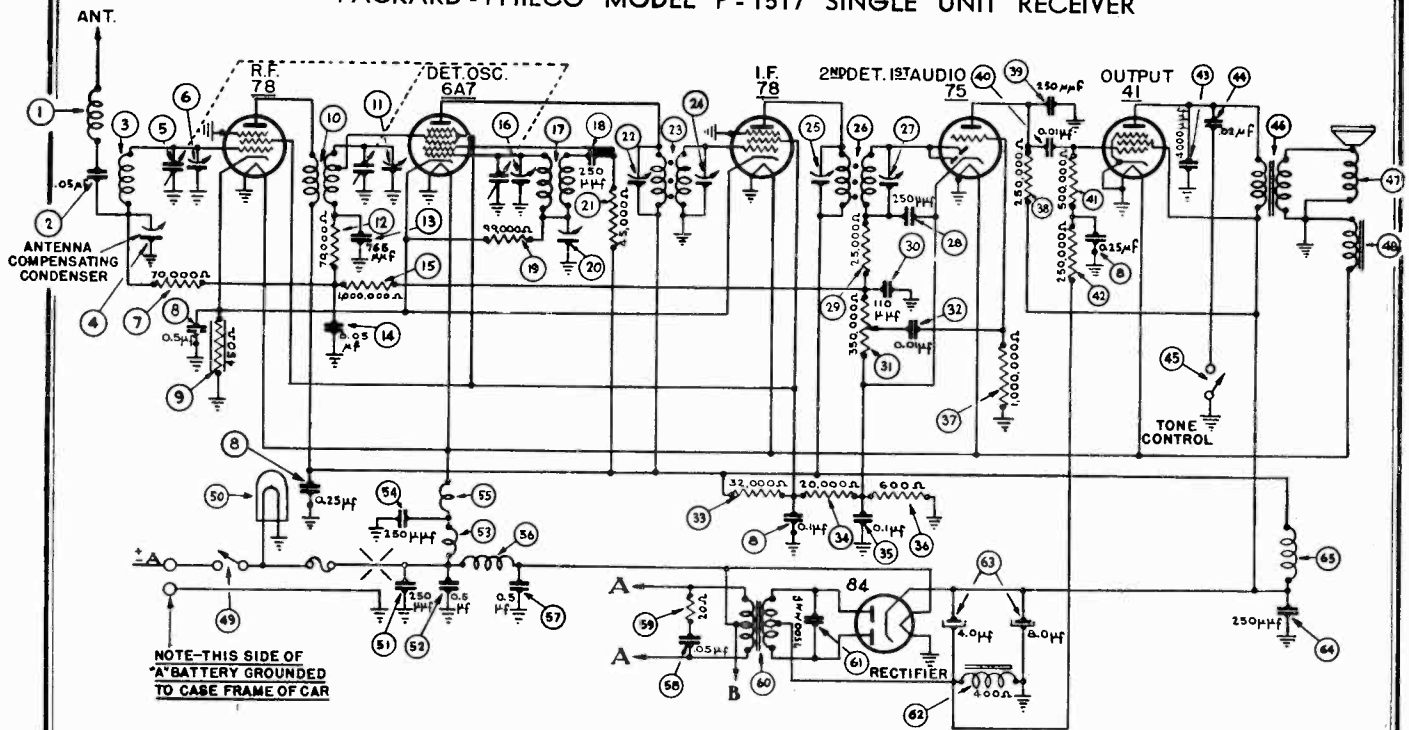
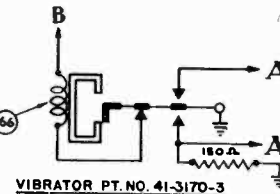
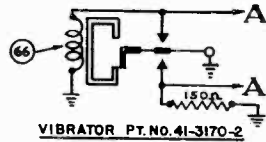


FIGURE 1



IF = 260 KC

OCTOBER 15, 1937

PARTS LIST — MODEL P-1517

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	32-2344	Condenser (4,000 mmfd.)	30-4185
2	Condenser (.05 mfd.)	30-4444	Condenser (.02 mfd.)	30-4419
3	Antenna Transformer	32-2516	Tone Control Switch	42-1383
4	Antenna Compensating Condenser	31-6082	Output Transformer	32-7495
5	Tuning Condenser (on Tun. Cond.)	31-1930	Cone & Voice Coil	36-3586
6	First Padder (on Tun. Cond.)	33-370344	Field Coil Assembly	36-3597
7	Resistor (70,000 ohms)	33-370344	On & Off Switch	42-1368
8	Condenser (.1-25-.5 mfd.)	30-4415	Pilot Lamp	34-2039
9	Resistor (450 ohms)	33-1218	Condenser (250 mmfd.)	30-1032
10	R. F. Transformer	32-2307	Condenser (.5 mfd.)	30-4015
11	Second Padder (on Tun. Cond.)	33-370344	"A" Choke	32-2535
12	Resistor (70,000 ohms)	33-370344	Condenser (250 mmfd.)	30-1032
13	Condenser (765 mmfd.)	30-1069	Filament Choke	32-1604
14	Condenser (.05 mfd.)	3615-08G	Vibrator Choke	32-2039
15	Resistor (1,000,000 ohms)	33-510344	Condenser (.5 mfd.)	30-4015
16	Third Padder (on Tun. Cond.)	33-370344	Condenser (.05 mfd.)	30-4444
17	Oscillator Transformer	32-2308	Resistor (20 ohms)	33-020344
18	Condenser (250 mmfd.)	30-1032	Power Transformer	32-7550
19	Resistor (99,000 ohms)	33-399344	Condenser (7,500 mmfd.)	30-4420
20	Low Frequency Padder	31-6102	"B" Filter Choke	32-7545
21	Resistor (45,000 ohms)	33-345344	Filter Condenser (4-8 mfd.)	30-2150
22	Padder (Pri. 1st. I. F. Trans.)	32-2026	Condenser (250 mmfd.)	30-1032
23	First I. F. Transformer	32-2026	"B" Choke	32-1281
24	Padder (Sec. 1st. I. F. Trans.)	33-332434	Vibrator (OPTIONAL)	41-3170-2
25	Padder (Pri. 2nd I. F. Trans.)	33-320344	Receiver Housing	38-9150
26	Second I. F. Transformer	32-2027	Pilot Lamp Assembly	38-8467
27	Padder (Sec. 2nd I. F. Trans.)	33-342434	Tuning Shaft	28-8783
28	Condenser (250 mmfd.)	30-1032	Volume Shaft	28-8784
29	Resistor (25,000 ohms)	33-325344	Scale Assembly	42-5776
30	Condenser (110 mmfd.)	30-1031	Gland Nut	28-6773
31	Volume Control (350,000 ohms)	33-5139	Four Prong Socket	27-6044
32	Condenser (.01 mfd.)	3903-0SU	Five Prong Socket	27-6035
33	Resistor (32,000 ohms)	33-332434	Six Prong Socket	27-6036
34	Resistor (20,000 ohms)	33-320344	Seven Prong Socket	27-6037
35	Condenser (.01 mfd.)	3903-0SG	Interference Condenser (Dome Light)	30-4007
36	Resistor (600 ohms)	33-1212	Interference Condenser (Generator)	30-4475
37	Resistor (1,000,000 ohms)	33-510344	Distributor Resistor	4851
38	Resistor (250,000 ohms)	33-424344	Fuse	7227
39	Condenser (250 mmfd.)	30-1032	Fuse Insulator	27-7729
40	Condenser (.01 mfd.)	3903-0SU	Tee Bolt (Rec. Mtg.)	28-6268
41	Resistor (500,000 ohms)	33-449344	Nut (Rec. Mtg.)	W-518A
42	Resistor (250,000 ohms)	33-424344		

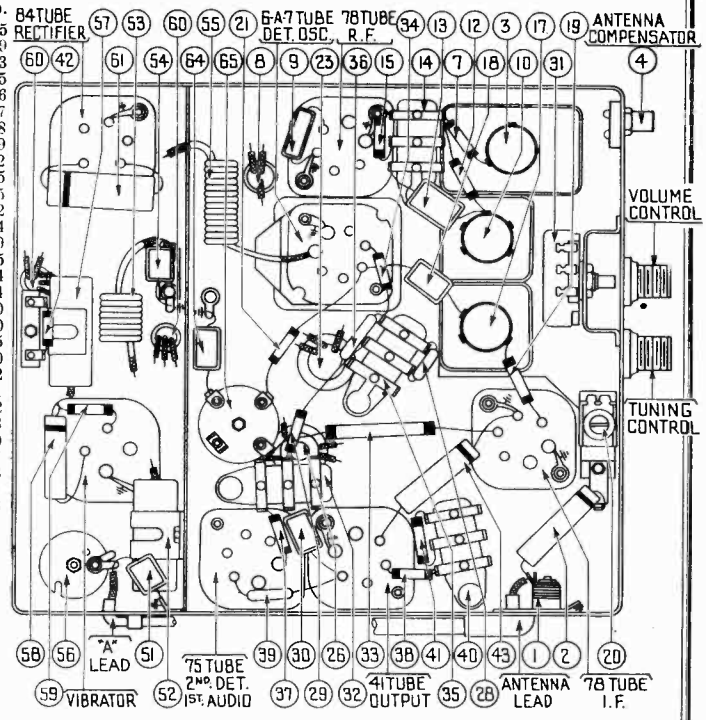


FIGURE 2



MODEL P1517 (Packard)

MODEL P1530 " "

Socket, Trimmers

Alignment

the high frequency padder ⑤ and the R. F. padder ⑩ until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 155 on the dial scale.

**LOW FREQUENCY** — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw ② for maximum reading on the output meter.

**HIGH FREQUENCY READJUSTMENT** — Turn the tuning condenser plates out of mesh as far as they will go and set the signal generator at 1550 K. C. Then adjust the high frequency padder ⑤ again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.

**ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE USED.**

Connect the signal generator lead to the antenna socket on the Receiver using an antenna lead, Part No. L-2665 and a 30 mmfd. condenser in series between the two leads.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders ④ and ⑥ for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

**LOW FREQUENCY** — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw ② for maximum reading on the output meter.

**HIGH FREQUENCY READJUSTMENT** — Turn the tuning condenser plates out of mesh to 1500 K. C. and set the signal generator at 1500 K. C. Then adjust the high frequency padder ⑤ again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.

**ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE USED.**

Connect the signal generator lead to the antenna socket on the Receiver using an antenna lead, Part No. L-2665 and a 30 mmfd. condenser in series between the two leads.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders ④ and ⑥ for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

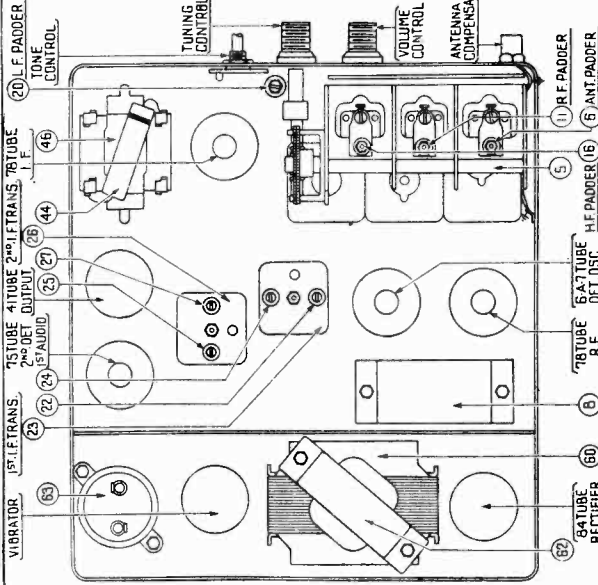


FIGURE 8

Turn the tuning condenser plates out of mesh as far as they will go. With the tuning condenser in this position, adjust

**I. F. TRANSFORMERS AND PADDERS**

The I. F. transformers are assembled complete with padding condensers.

Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield.

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure



**MODEL P-1517 Procedure**

**I. F.** — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the padders ②, ③, ④ and ⑦ on the first and second I. F. transformers, for maximum reading on the output meter. (See Figure 8 for location of padders).

**HIGH FREQUENCY AND R. F.** — After padding the I. F. stages, remove the generator lead from the 6A7 tube. Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

**MODEL P-1530 Procedure**

**I. F.** — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid cap). Adjust the padders ②, ③, ④ and ⑦ on the first and second I. F. transformers for maximum reading on the output meter. (See Figure 6 for location of padders).

**HIGH FREQUENCY AND R. F.** — After padding the I. F. stages, remove the generator lead from the 6A7 tube. Set the signal generator at 1500 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid cap).

Place a piece of paper approximately .006" thick as a gauge between the heel of the rotor plates and the stator plates on the oscillator section of the tuning condenser. Turn the rotor plates in mesh until they strike against the paper.

With the tuning condenser in this position adjust the high frequency padder ⑤ and the R. F. padder ⑩ until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 150 on the dial scale.

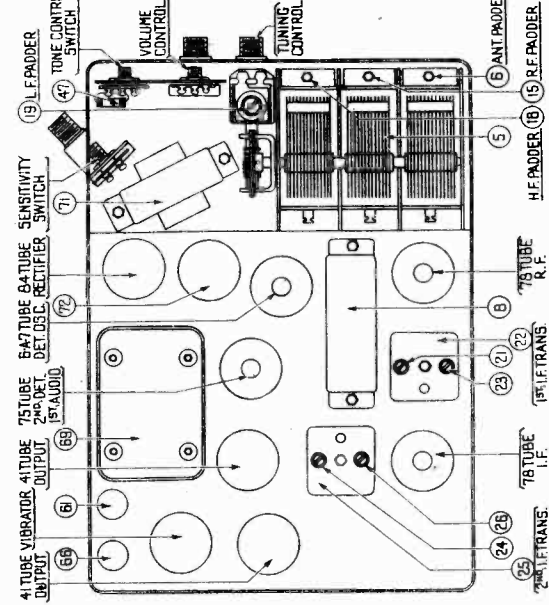
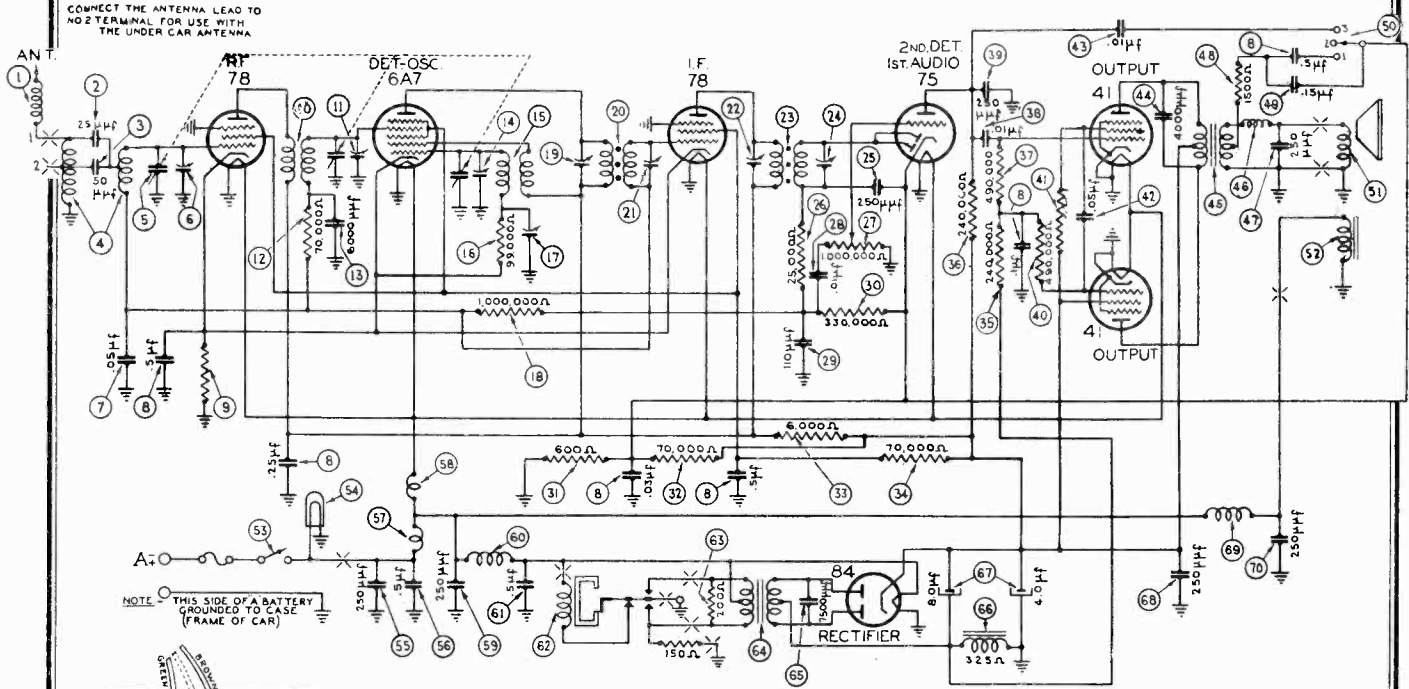


FIGURE 6

PHILCO RADIO & TELEV. CORP.

MODEL N1524 (Nash)  
Schematic, Parts  
Chassis Layout

NASH - PHILCO MODEL — N-1524 TWO UNIT RECEIVER

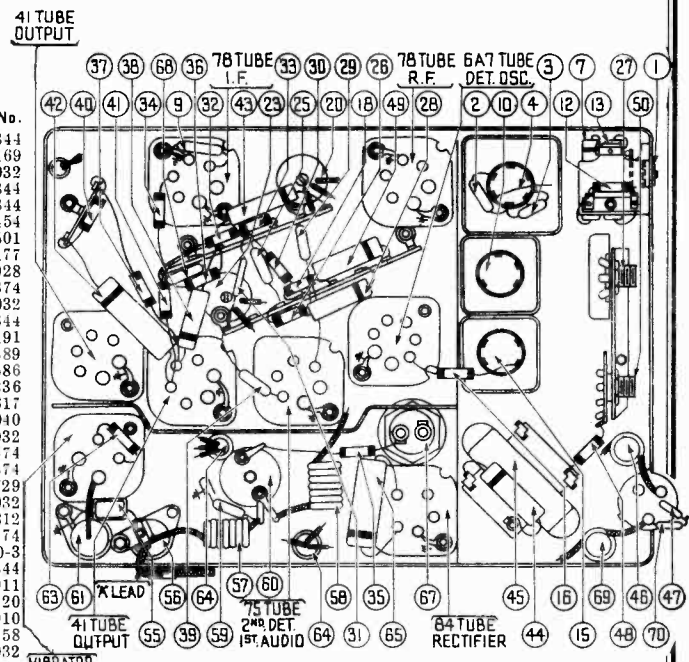


IF.=260KC

OCTOBER 1937

MODEL N-1524 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-1926	37	Resistor (490,000 ohms)	33-449344
2	Condenser (25 mmfd.)	30-1067	38	Condenser (.01 mfd.)	30-4169
3	Condenser (50 mmfd.)	30-1029	39	Condenser (250 mmfd.)	30-1032
4	Antenna Transformer	32-2895	40	Resistor (490,000 ohms)	33-449344
5	Tuning Condenser	31-2161	41	Resistor (3,500 ohms)	33-285344
6	First Padder (on Tun. Cond.)		42	Condenser (.05 mfd.)	30-4454
7	Condenser (.05 mfd.)	30-4444	43	Condenser (.01 mfd.)	30-4501
8	Condenser (.03-.1-25-5-.5-5 mfd.)	30-4554	44	Condenser (2,000 mmfd.)	30-4177
9	Resistor (550 ohms)	33-1280	45	Output Transformer	32-7928
10	R. F. Transformer	32-2830	46	Choke	32-1374
11	Second Padder (on Tun. Cond.)		47	Condenser (250 mmfd.)	30-1032
12	Resistor (70,000 ohms)	33-370344	48	Resistor (1,500 ohms)	33-215344
13	Condenser (6,000 mmfd.)	30-4467	49	Condenser (.15 mfd.)	30-4191
14	Third Padder (on Tun. Cond.)		50	Tone Control Switch	42-1389
15	Oscillator Transformer	32-2828	51	Cone & Voice Coil	36-3586
16	Resistor (99,000 ohms)	33-399344	52	Field Coil	32-9236
17	Low Frequency Padder	31-6230	53	On & Off Switch	42-5617
18	Resistor (1,000,000 ohms)	33-510344	54	Pilot Lamp	34-3040
19	Padder (Pri. 1st I. F. Trans.)		55	Condenser (250 mmfd.)	30-1032
20	First I. F. Transformer	32-2791	56	Condenser (.5 mfd.)	30-4474
21	Padder (Sec. 1st I. F. Trans.)		57	"A" Choke	32-1374
22	Padder (Pri. 2nd I. F. Trans.)	32-2793	58	Filament Choke	32-2729
23	Second I. F. Transformer	32-2793	59	Condenser (250 mmfd.)	30-1032
24	Padder (Sec. 2nd I. F. Trans.)		60	Vibrator Choke	32-2812
25	Condenser (250 mmfd.)	30-1032	61	Condenser (.5 mfd.)	30-4474
26	Resistor (25,000 ohms)	33-325344	62	Vibrator	41-3170-3
27	Volume Control (1,000,000 ohms)	33-5245	63	Resistor (200 ohms)	33-120344
28	Condenser (.01 mfd.)	30-4479	64	Power Transformer	32-7911
29	Condenser (110 mmfd.)	30-1031	65	Condenser (7,500 mmfd.)	30-4420
30	Resistor (330,000 ohms)	33-433344	66	Filter Choke	32-7910
31	Resistor (600 ohms)	33-1212	67	Filter Condenser (4-8 mfd.)	30-2258
32	Resistor (70,000 ohms)	33-370444	68	Condenser (250 mmfd.)	30-1032
33	Resistor (6,000 ohms)	33-260344	69	Choke	32-2657
34	Resistor (70,000 ohms)	33-370344	70	Condenser (250 mmfd.)	30-1032
35	Resistor (240,000 ohms)	33-424344			
36	Resistor (240,000 ohms)	33-424344			



MODEL N1514(Nash)  
 MODEL N1524 "  
 Socket, Trimmers  
 Alignment

PHILCO RADIO & TELEV. CORP.

MODEL N-1524

MODEL N-1514

**HIGH FREQUENCY READJUSTMENT** — Turn the tuning condenser plates out of mesh to 1500 K. C. and set the signal generator at 1500 K. C. Then adjust the high frequency paddler ⑤ again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube. **ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.**

When a COWL ANTENNA is used, the green lead on the antenna transformer MUST be connected to the No. 1 terminal as shown on the label on the bottom cover of the Receiver. Connect the signal generator lead to the antenna connector on the Receiver, using an antenna lead, Part No. L-2865, and a 30 mmfd. condenser in series between the two leads.

When the UNDER-CAR ANTENNA is used, the green lead on the antenna transformer MUST be connected to the No. 2 terminal as shown on the label on the bottom cover of the Receiver. Connect the signal generator lead to the antenna connector on the Receiver, using an antenna lead, Part No. L-2865, and a 200 mmfd. condenser in series between the two leads. Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the paddlers ③ and ④ for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

**HIGH FREQUENCY READJUSTMENT** — Turn the tuning condenser plates out of mesh to 1550 K. C. and set the signal generator at 1550 K. C. Then adjust the high frequency paddler ⑤ again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube. **ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.**

Connect the signal generator lead to the antenna connector on the Receiver using an antenna lead, Part No. L-2865, and a 25 mmfd. condenser in series between the two leads.

Turn the tuning condenser in mesh to 600 K. C. and adjust the signal generator 600 K. C. Adjust the antenna compensating condenser ⑥ for maximum reading.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the paddlers ③ and ④ for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

When installing the Radio in a car, follow the installation instructions carefully. Tune in a weak broadcast signal at approximately 60 on the control scale. With a small screw driver adjust the antenna compensating condenser ⑥ for the maximum signal.

With the tuning condenser in this position, adjust the high frequency paddler ⑤ and the R. F. paddler ③ until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 140 on the dial scale.

**LOW FREQUENCY** — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency paddler screw ⑦ for maximum reading on the output meter.

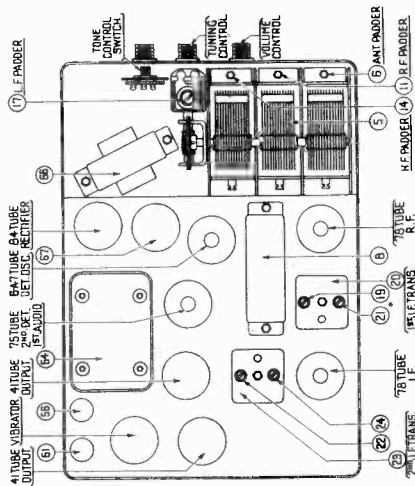


FIGURE 6

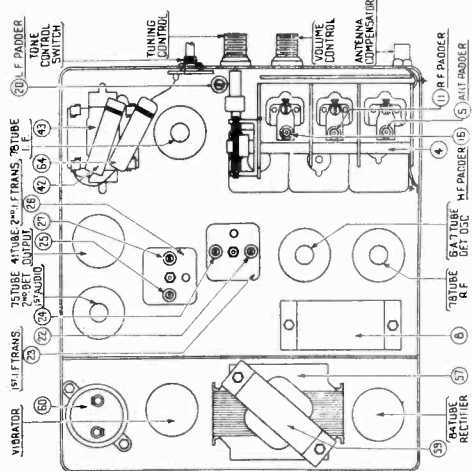


FIGURE 8

**I. F. TRANSFORMERS AND PADDERS**

The I. F. transformers are assembled complete with padding condensers. Both the primary and the secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield.

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure



**Procedure**

**I. F. —** Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust the padders ③, ④, and ⑤ on the first and second I. F. transformers for maximum reading on the output meter. (See Figure 6 for location of padders).

**HIGH FREQUENCY AND R. F. —** After padding the I. F. stages, remove the generator lead from the 6A7 tube. Set the signal generator at 1500 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid clip).

Place a piece of paper approximately .006" thick as a gage between the heel of the rotor plates and the stator plates on the oscillator section of the tuning condenser. Turn the rotor plates in mesh until they strike against the paper.

**Procedure**

**I. P. —** Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust padders ③, ④, and ⑤ on the first and second I. F. transformers for maximum reading on the output meter. (See Figure 8 for location of padders).

**HIGH FREQUENCY AND R. F. —** After padding the I. F. stages remove the generator lead from the 6A7 tube.

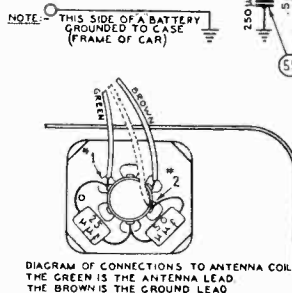
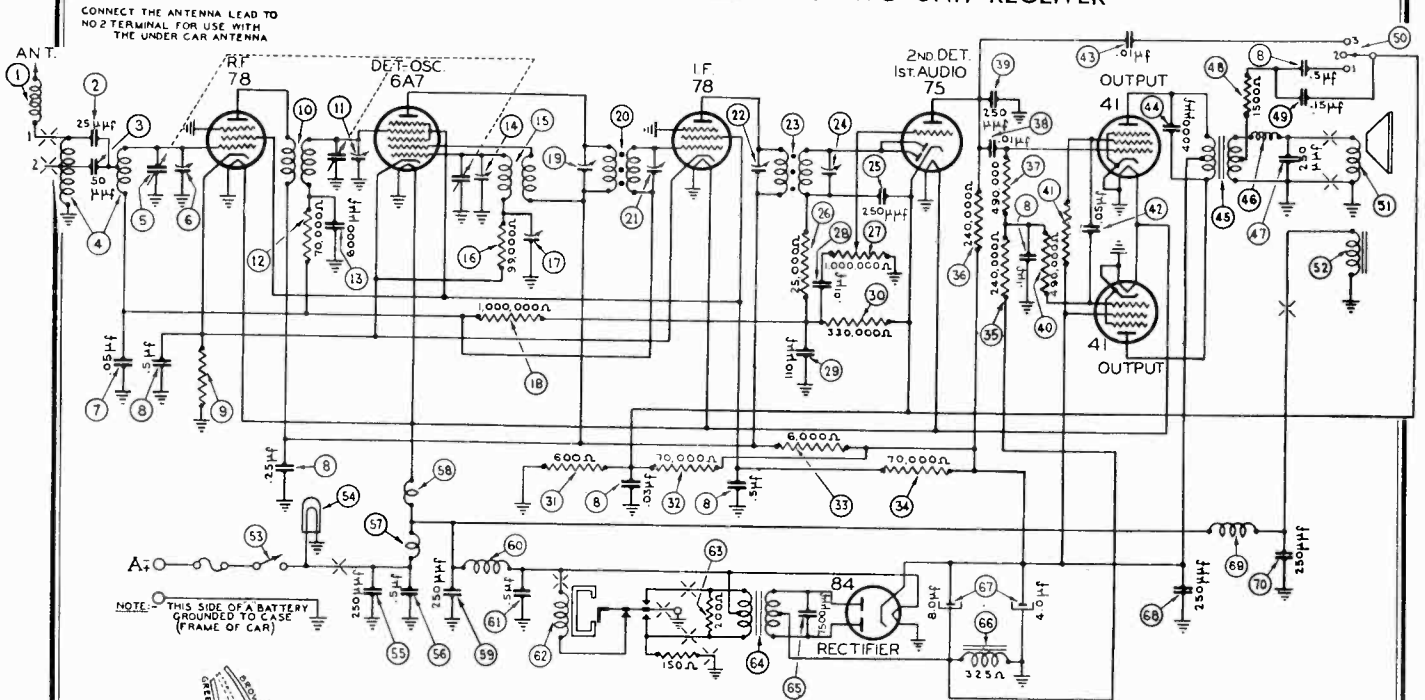
Set the signal generator at 1550 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid clip). Turn the tuning condenser plates out of mesh as far as they will go.

With the tuning condenser in this position, adjust the high frequency paddler ⑤ and the R. F. paddler ③ until the maximum reading is obtained on the output meter. This is the true setting for the 1550 K. C., 155 on the dial scale.

**LOW FREQUENCY** — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency paddler screw ⑦ for maximum reading on the output meter.

PHILCO RADIO & TELEV. CORP MODEL S1526 (Studebaker)  
Schematic, Parts  
Chassis Layout

STUDEBAKER - PHILCO MODEL — S-1526 TWO UNIT RECEIVER



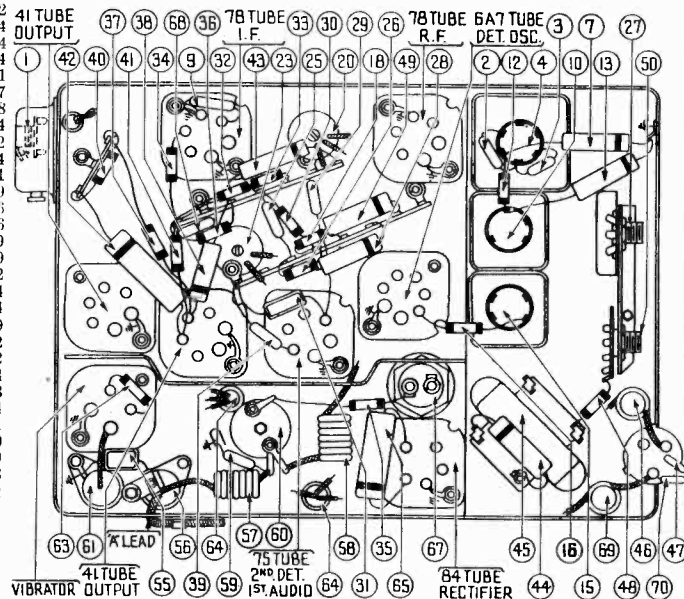
IF = 260 KC

NOVEMBER 1937

MODEL S-1526 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
	Fuse Insulator	27-7729		Scale Assembly	42-5779
	Tuning Control Shaft	28-8790		Speaker Cable	41-3231
	Volume Control Shaft	28-8791		Tuning & Volume Knob	27-4689
	Tone Control Shaft	28-8792		Tone & "On-Off" Knob	27-4618

No.	Description	Part No.	Description	Part No.	
1	Antenna Choke	32-2063	30	Condenser (250 mmfd.)	30-1032
2	Condenser (25 mmfd.)	30-1067	31	Resistor (490,000 ohms)	33-419344
3	Condenser (60 mmfd.)	30-1029	32	Resistor (3,500 ohms)	33-235344
4	Antenna Transformer	32-2855	33	Condenser (.05 mfd.)	30-4454
5	Tuning Condenser	31-2161	34	Condenser (.01 mfd.)	30-4501
6	First Padder (on Tun. Cond.)	30-4177	35	Condenser (2,000 mmfd.)	30-4177
7	Condenser (.05 mfd.)	30-4444	36	Output Transformer	32-7923
8	Choke	32-1374	37	Choke	32-1374
9	Condenser (.03-.1-.25-.5-.5-.5 mfd.)	30-4554	38	Condenser (250 mmfd.)	30-1032
10	Resistor (550 ohms)	33-1280	39	Resistor (1,500 ohms)	33-215344
11	R. F. Transformer	32-2830	40	Condenser (.15 mfd.)	30-4101
12	Second Padder (on Tun. Cond.)	30-4167	41	Tone Control Switch	42-1389
13	Resistor (70,000 ohms)	33-370344	42	Cone & Voice Coil	36-3526
14	Condenser (6,000 mmfd.)	30-4467	43	Field Coil	32-9236
15	Third Padder (on Tun. Cond.)	30-4167	44	On & Off Switch	42-1369
16	Oscillator Transformer	32-2828	45	Pilot Lamp	34-2039
17	Resistor (99,000 ohms)	33-399341	46	Condenser (250 mmfd.)	30-1032
18	Low Frequency Padder	31-6230	47	Condenser (.5 mfd.)	30-4474
19	Resistor (1,000,000 ohms)	33-510344	48	"A" Choke	32-1374
20	Padder (Pri. 1st I. F. Trans.)	30-4177	49	Flament Choke	32-2729
21	First I. F. Transformer	32-2791	50	Condenser (250 mmfd.)	30-1032
22	Padder (Sec. 1st I. F. Trans.)	30-4177	51	Vibrator Choke	32-2812
23	Padder (Pri. 2nd I. F. Trans.)	30-4177	52	Condenser (.5 mfd.)	30-4177
24	Second I. F. Transformer	32-2793	53	Vibrator	41-3170-3
25	Padder (Sec. 2nd I. F. Trans.)	30-4177	54	Resistor (200 ohms)	33-120344
26	Condenser (250 mmfd.)	30-1032	55	Power Transformer	32-7941
27	Resistor (25,000 ohms)	33-325344	56	Condenser (7,500 mmfd.)	30-4420
28	Volume Control	33-5251	57	Filter Choke	32-7910
29	Condenser (.01 mfd.)	30-4479	58	Filter Condenser (4-8 mfd.)	30-2258
30	Condenser (110 mmfd.)	30-1031	59	Condenser (250 mmfd.)	30-1032
31	Resistor (330,000 ohms)	33-433344	60	Choke	32-2657
32	Resistor (600 ohms)	33-1212	61	Condenser (250 mmfd.)	30-1032
33	Resistor (70,000 ohms)	33-370444	62	Receiver Housing	38-2058
34	Resistor (6,000 ohms)	33-260344	63	Four Prong Socket	27-6044
35	Resistor (70,000 ohms)	33-370344	64	Five Prong Socket	27-6035
36	Resistor (240,000 ohms)	33-424344	65	Six Prong Socket	27-6036
37	Resistor (210,000 ohms)	33-424344	66	Seven Prong Socket	27-6037
38	Resistor (490,000 ohms)	33-449344	67	Inductive Suppressor	32-2250
39	Condenser (.01 mfd.)	30-4514	68	Interference Condenser	30-4007
40			69	Fuse	7227





MODEL S1526 (Studebaker) PHILCO RADIO & TELEV. CORP.  
 Socket, Trimmers, Controls  
 Alignment, Parts

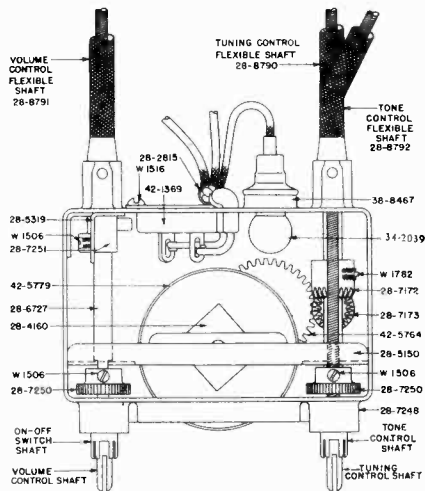


FIGURE 5

**I. F. TRANSFORMERS AND PADDERS**  
 The I. F. Transformers are assembled complete with padding condensers.

Both the primary and secondary paddlers are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 6).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 5.

If replacements are ever necessary, replace the entire coil assembly, 82-2791 for the first I. F. stage and 82-2798 for the second I. F. stage. Neither the coil nor the paddlers will be furnished separately. Order only by the above numbers.

**MODEL S-1526 ADJUSTMENTS**

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

**Equipment**

Fully charged heavy duty storage battery or 6-volt power pack, 045A or 069 Philco Set Tester, 3164 Padding wrench, 27-7189 Padding screw driver.

**General**

**OUTPUT METER** — The output meter must be connected by means of an adapter to the plate of the Type 81 output tube and to the Receiver chassis.

**SIGNAL GENERATOR** — With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

**Procedure**

1. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust the padders (A), (B) and (C) on the first and second I. F. transformer for maximum reading on the output meter. (See Figure 6 for location of padders).

**HIGH FREQUENCY AND R. F.** — After padding the I. F. stages remove the generator lead from the 6A7 tube.

Set the signal generator at 1500 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid clip).

Place a piece of paper approximately .008" thick as a gauge between the heel of the rotor plates and the stator plates on the oscillator section of the tuning condenser. Turn the rotor plates in mesh until they strike against the paper.

With the tuning condenser in this position, adjust the high frequency padder (A) and the R. F. padder (B) until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 150 on the dial scale.

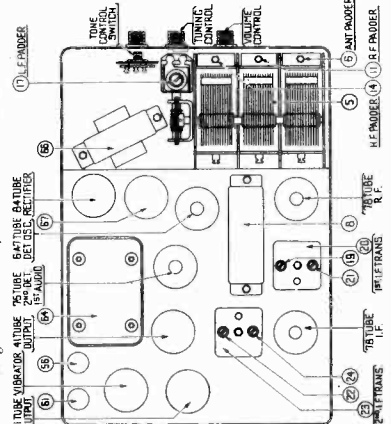


FIGURE 6

**LOW FREQUENCY** — Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale, and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency padder screw (D) for maximum reading on the output meter.

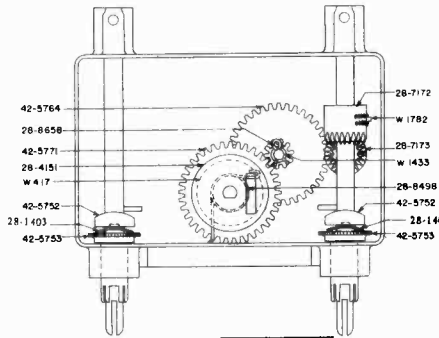
**HIGH FREQUENCY READJUSTMENT** — Turn the tuning condenser plates out of mesh to 1500 K. C. and set the signal generator at 1500 K. C. Then adjust the high frequency padder (E) again for maximum reading on the output meter.

When the generator lead from the 78 R. F. tube, antenna transformer **MUST** be connected to the No. 1 terminal as shown on the label on the bottom cover of the Receiver. Connect the signal generator lead to the antenna connector on the Receiver, using an antenna lead, Part No. L-2865, and a .30 mfd. condenser in series between the two leads.

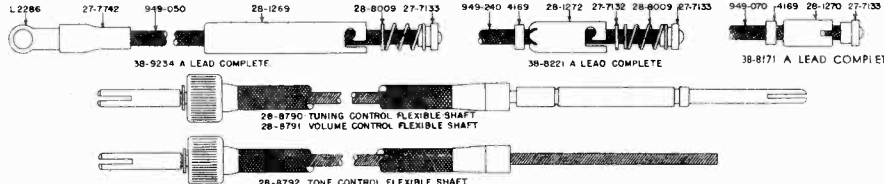
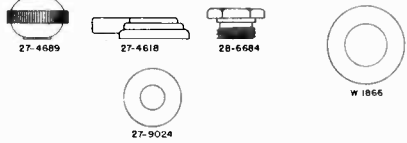
When the **UNDER-CAR ANTENNA** is used, the green lead on the antenna transformer **MUST** be connected to the No. 2 terminal as shown on the label on the bottom cover of the Receiver. Connect the signal generator lead to the antenna connector on the Receiver, using an antenna lead, Part No. L-2865, and a .30 mfd. condenser in series between the two leads.

When the tuning condenser is at 1400 K. C. and set the generator at 1400 K. C. Adjust the padders (C) and (D) for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.



FEBRUARY 1938



PARTS LIST AND PRICES (Prices Subject to Change Without Notice)

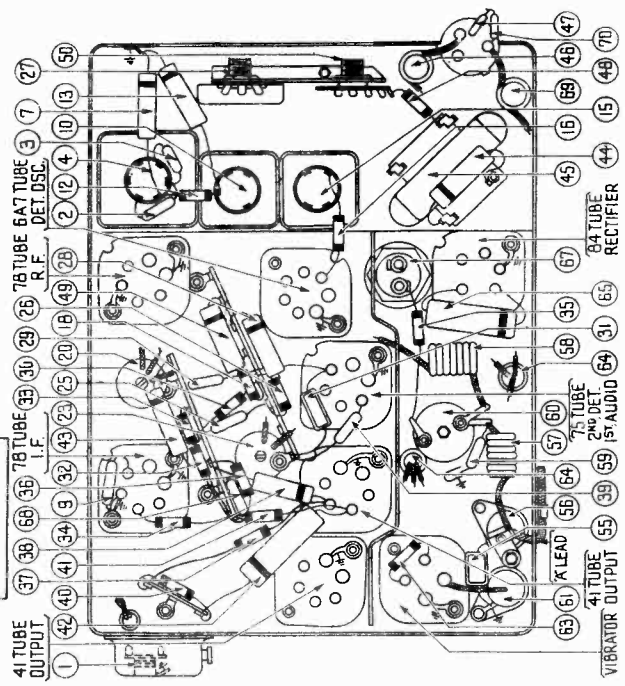
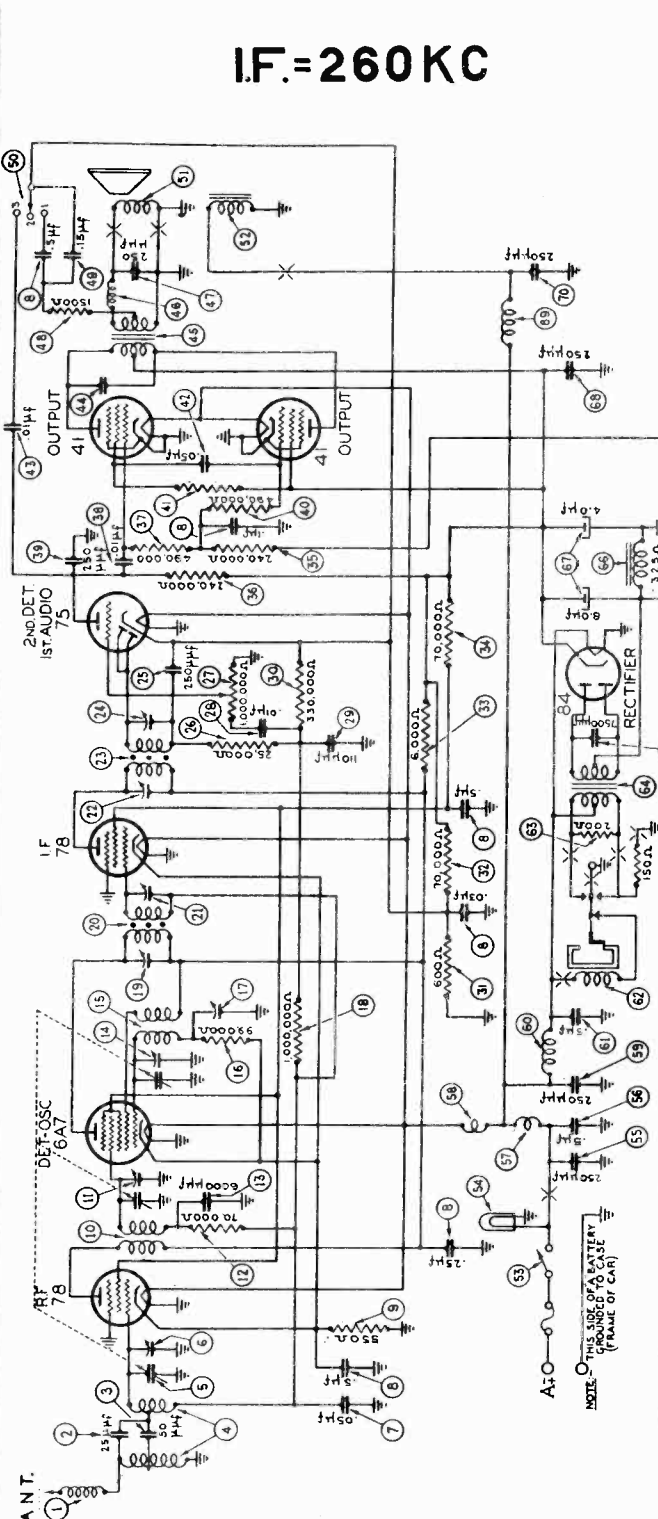
PART NUMBER	DESCRIPTION	LIST PRICE
L-2238	Lead	\$.00
W-417	Washer	per 100 .50
W-1508	Washer	per 100 1.00
W-1516	Screw	per 100 1.00
W-1888	Washer	per 100 2.00
4189	Rubber Washer	per 100 1.20
27-4689	Tuning Control Flexible Shaft	per 100 .15
27-7132	Washer	per 100 .40
27-7182	Pin	per 100 .01
27-7183	Pin	per 100 .01
27-7184	Pin	per 100 .01
28-1255	Pin	per 100 .01
28-1270	Pin	per 100 .01
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28-1491	Pin	per 100 .01
28-1492	Pin	per 100

PHILCO RADIO & TELEV. CORP.

MODEL G1528 (Graham)  
Schematic, Parts  
Chassis Layout

GRAHAM - PHILCO MODEL - G-1528 TWO UNIT RECEIVER

I.F. = 260 KC



MODEL G-1528 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-2063	36	Condenser (250 mmfd.)	30-1032
2	Condenser (25 mfd.)	30-1067	40	Resistor (490,000 ohms)	33-449344
3	Condenser (50 mmfd.)	30-1029	41	Resistor (3,500 ohms)	33-235344
4	Antenna Transformer	32-2935	42	Condenser (.05 mfd.)	30-4454
5	Tuning Condenser	31-2161	43	Condenser (.01 mfd.)	30-4501
6	First Padder (on Tun. Cond.)		44	Condenser (4000 mmfd.)	30-4185
7	Condenser (.05 mfd.)	30-4444	45	Output Transformer	32-7928
8	Condenser (.03-.1-.25-.5-.5-.5 mfd.)	30-4554	46	Choke	32-1374
9	Resistor (550 ohms)	33-155331	47	Condenser (250 mmfd.)	30-1032
10	R. F. Transformer	32-2830	48	Resistor (1,500 ohms)	33-215344
11	Second Padder (on Tun. Cond.)		49	Condenser (.15 mfd.)	30-4471
12	Resistor (70,000 ohms)	33-370344	50	Tone Control Switch	42-1389
13	Condenser (6,000 mmfd.)	30-4467	51	Cone and Voice Coil	45-2608
14	Third Padder (on Tun. Cond.)		52	Field Coil	32-9263
15	Oscillator Transformer	32-2828	53	On and Off Switch	42-5617-3
16	Resistor (99,000 ohms)	33-399344	54	Pilot Lamp	34-2039
17	Low Frequency Padder	31-6230	55	Condenser (250 mmfd.)	30-1032
18	Resistor (1,000,000 ohms)	33-510344	56	Condenser (.5 mfd.)	30-4474
19	Padder (Pri. 1st I. F. Trans.)	32-2791	57	"A" Choke	32-1374
20	Padder (Sec. 1st I. F. Trans.)		58	Filament Choke	32-2729
21	Padder (Pri. 2nd I. F. Trans.)	32-2793	59	Condenser (250 mmfd.)	30-1032
22	Second I. F. Transformer	32-2793	60	Vibrator Choke	32-2812
23	Padder (Pri. 2nd I. F. Trans.)		61	Condenser (.5 mfd.)	30-1474
24	Condenser (250 mmfd.)	30-1032	62	Vibrator	11-3170-5
25	Resistor (25,000 ohms)	33-325344	63	Resistor (200 ohms)	33-120344
26	Volume Control		64	Power Transformer	32-7911
27	(1,000,000 ohms)	33-5245	65	Condenser (7,500 mmfd.)	30-4420
28	Condenser (.01 mfd.)	30-4479	66	Filter Choke	32-7910
29	Condenser (110 mmfd.)	30-1031	67	Filter Condenser (4-8 mfd.)	30-2258
30	Resistor (330,000 ohms)	33-433344	68	Condenser (250 mmfd.)	30-1032
31	Resistor (600 ohms)	33-160331	69	Choke	32-2657
32	Resistor (70,000 ohms)	33-370444	70	Condenser (250 mmfd.)	30-1032
33	Resistor (6,000 ohms)	33-260344	71	Receiver Housing	38-2179
34	Resistor (70,000 ohms)	33-370344	72	Four Prong Socket	27-6044
35	Resistor (240,000 ohms)	33-424344	73	Five Prong Socket	27-6035
36	Resistor (490,000 ohms)	33-449344	74	Six Prong Socket	27-6036
37	Condenser (.01 mfd.)	30-4514	75	Seven Prong Socket	27-6037
38			76	Inductive Suppressor	32-2250
39			77	Interference Condenser	30-4007
40			78	Fuse	7227

No.	Description	Part No.	No.	Description	Part No.
79	Fuse Insulator	27-7729	81	Speaker Cable	36-4034
80	Tuning Control Shaft	28-8813	82	Speaker Mtg. Plate	38-9463
81	Volume Control Shaft	28-8864	83	Tuning & Volume Knob	27-4705
82	Tone Control Shaft	28-8798	84	Tone Knob	28-7212
83	Scale Assembly	42-5829	85	Knob Base	28-4184

DECEMBER 1937

MODEL G1528(Graham)

Socket, Trimmers  
Alignment, Controls, Parts

PHILCO RADIO & TELEV. CORP.

MAY 5, 1938

GRAHAM CONTROL — MODEL G-1528

MODEL G-1528  
ALIGNMENT

I. F. TRANSFORMERS AND PADDERS

The I. F. Transformers are assembled complete with padding condensers.

Both the primary and secondary padders are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 4).

The coil windings terminate in leads instead of terminals or lugs. The coil scheme of the leads is given in Figure 3.

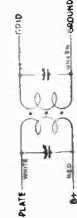


FIGURE 3

If replacements are ever necessary, replace the entire coil assembly, 22-2731 for the first I. F. stage and 32-2593 for the second I. F. stage. Neither the coil nor the padders will be furnished separately. Order only by the above number.

MODEL G-1528 ADJUSTMENTS

All padding adjustments are carefully made at the factory and should not be changed. If adjustments are necessary, when readjustments are required, the procedure given below must be followed in detail.

Equipment

Fully charged heavy duty storage battery or de-volt power pack, 048X or 049 Philco Set Tester, 3164. Padding wrench, 27-1139 Padding screw driver.

General

OUTPUT METER — The output meter must be connected by means of an adapter to the plate of the type 41 output tube and to the receiver chassis.

SIGNAL GENERATOR — With the receiver and signal generator set up for operation at the prescribed frequency, turn the receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the receiver housing.

Procedure

I. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6AV tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust the padders ②, ③ and ④ on the first and second I. F. transformers for maximum reading on the output meter. (See Figure 4 for location of padders).

HIGH FREQUENCY AND R. F. — After padding the I. F. stages remove the generator lead from the 6AV tube. Set the signal generator at 1500 K. C. and then connect the generator lead to the grid cap of the 7B R. F. tube in series with a .1 mfd. condenser (without removing the grid clip).

Place a piece of paper approximately .002" thick as a gage between the head of the rotor plates and the stator plates on the oscillator section of the tuning condenser. Turn the rotor plates in mesh until they strike against the paper.

With the tuning condenser in this position, adjust the high frequency padder ② and the R. F. padder ④ until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 150 on the dial scale.

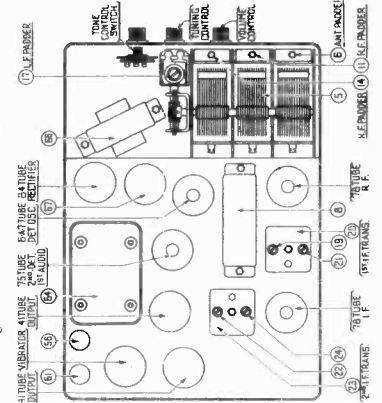


FIGURE 4

LOW FREQUENCY — Turn the tuning condenser plates in mesh to approximately 560 K. C. on the dial scale, and adjust the low frequency padder screw ⑤ for maximum reading on the output meter.

HIGH FREQUENCY READJUSTMENT — Turn the tuning condenser plates out of mesh to 1600 K. C. and set the signal generator at 1500 K. C. Then adjust the high frequency padder ② again for maximum reading on the output meter.

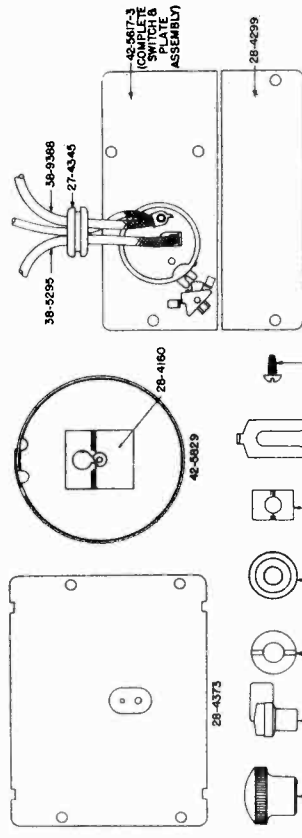
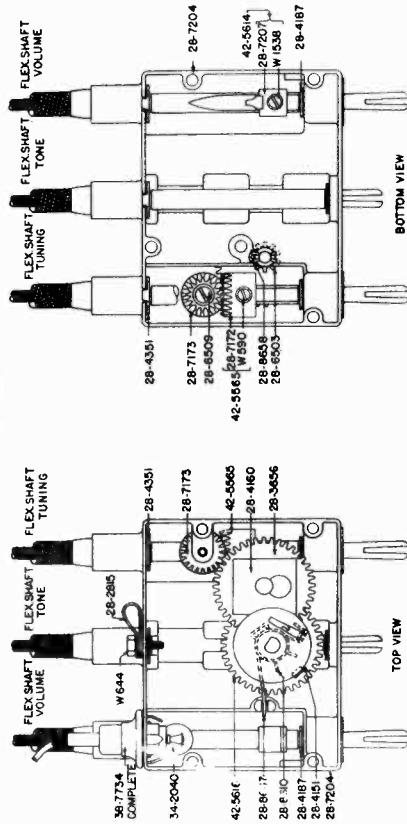
Remove the generator lead from the 7B R. F. tube.

ANTENNA WINDING PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

Connect the signal generator lead to the antenna connector on the Receiver, using an antenna lead, Part No. 1-2664, and a .25 mfd. condenser in series between the two leads.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the padders ⑥ and ⑦ for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.



28-6993 TUNING CONTROL SHAFT

Part No.	Description	List Price
W-300	Screw	per 100 \$2.00
W-1316	Screw	per 100 1.50
W-1318	Screw	per 100 1.80
W-1319	Screw	per 100 1.20
21-4545	Unimul	per 100 .40
27-1139	Wrench & Volume Knob	per 100 .40
27-1135	Terminal	per 100 .01
27-1133	Terminal	per 100 .01
28-1272	Washer	per 100 .05
28-1273	Washer	per 100 .05
28-1274	Washer	per 100 .05
28-1275	Washer	per 100 .05
28-1276	Washer	per 100 .05
28-1277	Washer	per 100 .05
28-1278	Washer	per 100 .05
28-1279	Washer	per 100 .05
28-1280	Washer	per 100 .05
28-1281	Washer	per 100 .05
28-1282	Washer	per 100 .05
28-1283	Washer	per 100 .05
28-1284	Washer	per 100 .05
28-1285	Washer	per 100 .05
28-1286	Washer	per 100 .05
28-1287	Washer	per 100 .05
28-1288	Washer	per 100 .05
28-1289	Washer	per 100 .05
28-1290	Washer	per 100 .05
28-1291	Washer	per 100 .05
28-1292	Washer	per 100 .05
28-1293	Washer	per 100 .05
28-1294	Washer	per 100 .05
28-1295	Washer	per 100 .05
28-1296	Washer	per 100 .05
28-1297	Washer	per 100 .05
28-1298	Washer	per 100 .05
28-1299	Washer	per 100 .05
28-1300	Washer	per 100 .05

• Prices on available at this time.

28-6994 VOLUME CONTROL SHAFT

Part No.	Description	List Price
01	Spring	.03
02	Spring	.03
03	Spring	.03
04	Spring	.03
05	Spring	.03
06	Spring	.03
07	Spring	.03
08	Spring	.03
09	Spring	.03
10	Spring	.03
11	Spring	.03
12	Spring	.03
13	Spring	.03
14	Spring	.03
15	Spring	.03
16	Spring	.03
17	Spring	.03
18	Spring	.03
19	Spring	.03
20	Spring	.03
21	Spring	.03
22	Spring	.03
23	Spring	.03
24	Spring	.03
25	Spring	.03
26	Spring	.03
27	Spring	.03
28	Spring	.03
29	Spring	.03
30	Spring	.03

• Prices on available at this time.

28-6998 VOLUME CONTROL SHAFT

Part No.	Description	List Price
28-4180	Spring	.03
28-4181	Spring	.03
28-4182	Spring	.03
28-4183	Spring	.03
28-4184	Spring	.03
28-4185	Spring	.03
28-4186	Spring	.03
28-4187	Spring	.03
28-4188	Spring	.03
28-4189	Spring	.03
28-4190	Spring	.03
28-4191	Spring	.03
28-4192	Spring	.03
28-4193	Spring	.03
28-4194	Spring	.03
28-4195	Spring	.03
28-4196	Spring	.03
28-4197	Spring	.03
28-4198	Spring	.03
28-4199	Spring	.03
28-4200	Spring	.03
28-4201	Spring	.03
28-4202	Spring	.03
28-4203	Spring	.03
28-4204	Spring	.03
28-4205	Spring	.03
28-4206	Spring	.03
28-4207	Spring	.03
28-4208	Spring	.03
28-4209	Spring	.03
28-4210	Spring	.03
28-4211	Spring	.03
28-4212	Spring	.03
28-4213	Spring	.03
28-4214	Spring	.03
28-4215	Spring	.03
28-4216	Spring	.03
28-4217	Spring	.03
28-4218	Spring	.03
28-4219	Spring	.03
28-4220	Spring	.03
28-4221	Spring	.03
28-4222	Spring	.03
28-4223	Spring	.03
28-4224	Spring	.03
28-4225	Spring	.03
28-4226	Spring	.03
28-4227	Spring	.03
28-4228	Spring	.03
28-4229	Spring	.03
28-4230	Spring	.03
28-4231	Spring	.03
28-4232	Spring	.03
28-4233	Spring	.03
28-4234	Spring	.03
28-4235	Spring	.03
28-4236	Spring	.03
28-4237	Spring	.03
28-4238	Spring	.03
28-4239	Spring	.03
28-4240	Spring	.03
28-4241	Spring	.03
28-4242	Spring	.03
28-4243	Spring	.03
28-4244	Spring	.03
28-4245	Spring	.03
28-4246	Spring	.03
28-4247	Spring	.03
28-4248	Spring	.03
28-4249	Spring	.03
28-4250	Spring	.03

• Prices on available at this time.

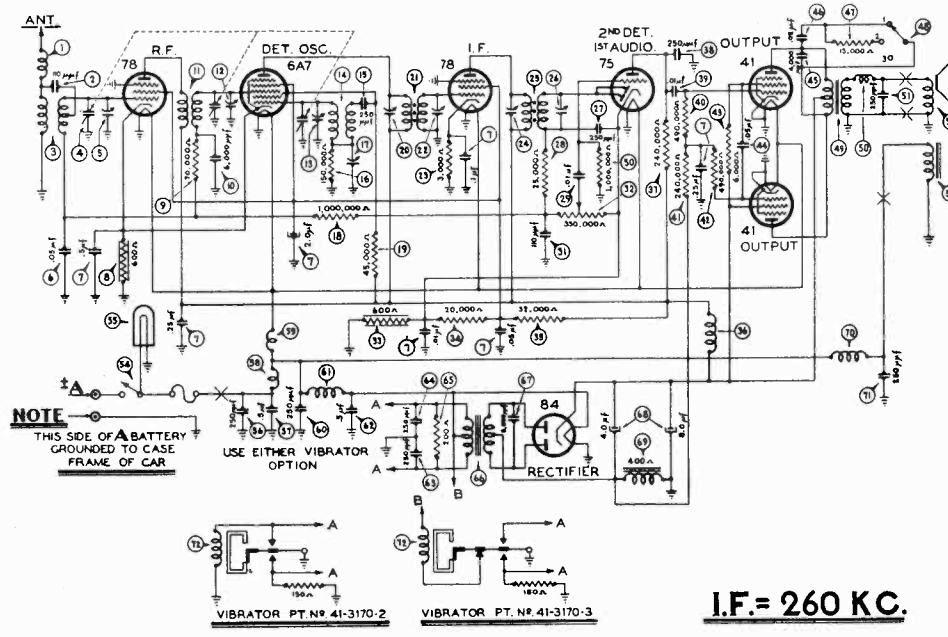
28-6998 VOLUME CONTROL SHAFT

Part No.	Description	List Price
949-140	4169	28-4270 27-1133
38-9385	X LEAD COMPLETE	
28-4705	Washer	per 100 1.50
28-4373	Washer	per 100 1.80
28-7212	Washer	per 100 1.20
28-6556	Washer	per 100 1.00
28-4184	Washer	per 100 .40
28-4187	Washer	per 100 .40
28-6009	Washer	per 100 .40
28-4351	Washer	per 100 .40
W 1316	Washer	per 100 .05
28-4180	Washer	per 100 .05
28-4181	Washer	per 100 .05
28-4182	Washer	per 100 .05
28-4183	Washer	per 100 .05
28-4184	Washer	per 100 .05
28-4185	Washer	per 100 .05
28-4186	Washer	per 100 .05
28-4187	Washer	per 100 .05
28-4188	Washer	per 100 .05
28-4189	Washer	per 100 .05
28-4190	Washer	per 100 .05
28-4191	Washer	per 100 .05
28-4192	Washer	per 100 .05
28-4193	Washer	per 100 .05
28-4194	Washer	per 100 .05
28-4195	Washer	per 100 .05
28-4196	Washer	per 100 .05
28-4197	Washer	per 100 .05
28-4198	Washer	per 100 .05
28-4199	Washer	per 100 .05
28-4200	Washer	per 100 .05
28-4201	Washer	per 100 .05
28-4202	Washer	per 100 .05
28-4203	Washer	per 100 .05
28-4204	Washer	per 100 .05
28-4205	Washer	per 100 .05
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28-4213	Washer	per 100 .05
28-4214	Washer	per 100 .05
28-4215	Washer	per 100 .05
28-4216	Washer	per 100 .05
28-4217	Washer	per 100 .05
28-4218	Washer	per 100 .05
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28-4224	Washer	per 100 .05
28-4225	Washer	per 100 .05
28-4226	Washer	per 100 .05
28-4227	Washer	per 100 .05
28-4228	Washer	per 100 .05
28-4229	Washer	per 100 .05
28-4230	Washer	per 100 .05
28-4231	Washer	per 100 .05
28-4232	Washer	per 100 .05
28-4233	Washer	per 100 .05
28-4234	Washer	per 100 .05
28-4235	Washer	per 100 .05
28-4236	Washer	per 100 .05
28-4237	Washer	per 100 .05
28-4238	Washer	per 100 .05
28-4239	Washer	per 100 .05
28-4240	Washer	per 100 .05

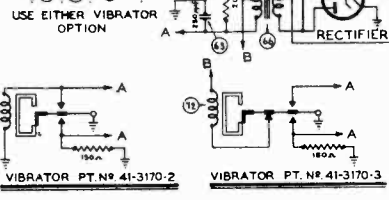
• Prices on available at this time.

# PHILCO RADIO & TELEV. CORP. Schematic, Socket, Trimmers Layout, Alignment, Parts

MODEL C1423(Chrysler)



**NOTE**  
THIS SIDE OF A BATTERY  
GROUNDED TO CASE  
FRAME OF CAR



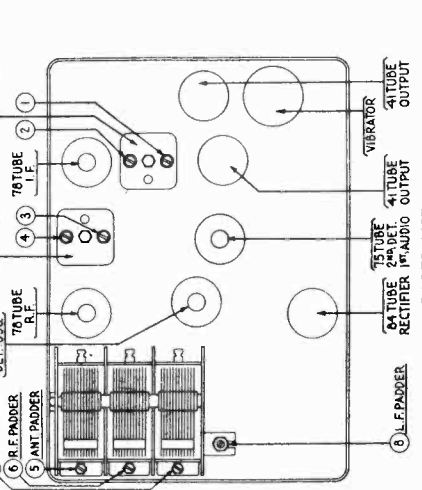
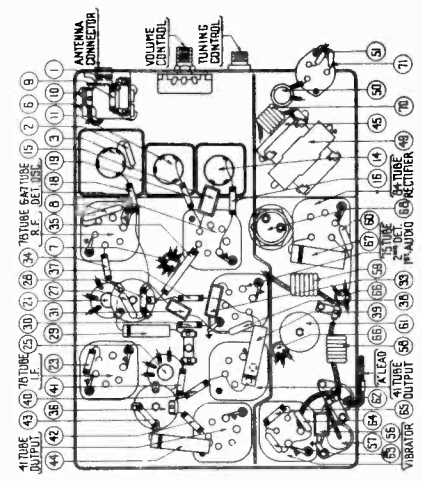
**I.F. = 260 KC.**

The Model C-1423 is a Special Custom-Built Receiver used exclusively by the Chrysler Corporation in the 1937 Chrysler Airflow car.

Part No. Description  
 19-5413 Tune knob  
 21-7227 Tuning & volume knob  
 27-4279 Tone knob  
 27-4279 Stud (speaker mtg.)  
 28-5392 Nut (speaker mtg.)  
 30-4454 W-35  
 33-1113 Interference condenser  
 30-4481 Interference condenser  
 30-007 Resistor (500 ohms)  
 30-2151 Resistor (500 ohms)

OPERATION	SIGNAL GENERATOR CONNECTION	DUMMY CAPACITY	SPECIAL INSTRUCTIONS	ADJUST PADDER
1	260 K.C. To Grid of 78 Tube—I.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	1-2
2	260 K.C. To Grid of 6A7 Tube	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection	3-4
3	1550 K.C. To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Note 1	1-2
4	580 K.C. To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 500 K.C.	7-6
5	1550 K.C. To Grid of 78 Tube—R.F. Stage	.1 Mfd. Condenser in Series with Generator Lead	No Antenna Connection Set Tuning Condensers at 1550 K.C.	8 Note 2
6	1400 K.C. Connect Antenna Lead to Cowl Antenna Receptacle	Note 4	Set Tuning Condensers at 1400 K.C.	7 6-5

Adjust for maximum reading on the output meter.  
 NOTE 1—Turn the condenser rotor plates completely out of mesh. Use a piece of bond letterhead paper as a gauge between the heel of the rotor plates and the stator plates and turn the condenser plates in mesh until they strike against the paper.  
 NOTE 2—Rock the tuning condenser while adjusting the low frequency paddler. Tune the condenser to the signal and adjust the paddler for maximum output. Rotate the tuning condenser back and forth slightly for maximum output. Then readjust the paddler for maximum output. Repeat this procedure until no further improvement is noticed.  
 NOTE 4—Connect the antenna lead, Part No. 41-3171, to the antenna receptacle on the Receiver in series with the correct dummy capacity condenser.  
 For the L-1427, L-1429 and L-1440 use a 30 mmfd. condenser, for the C-1423 use a 1700 mmfd. condenser.



- PARTS LIST**
- | No. | Description                  | Part No. |
|-----|------------------------------|----------|
| 1   | Antenna choke                | 32-2286  |
| 2   | 78 Tube (R.F. Det. Osc.)     | 38-8317  |
| 3   | 75 Tube (2nd Det. 1st Audio) | 38-2331  |
| 4   | 41 Tube (Output)             | 38-2331  |
| 5   | Vibrator                     | 31-1985  |
| 6   | Rectifier                    | 30-4414  |
| 7   | 100,000 ohm. Resistor        | 30-4175  |
| 8   | 500,000 ohm. Resistor        | 30-4419  |
| 9   | 1,000,000 ohm. Resistor      | 30-4420  |
| 10  | 20,000 ohm. Resistor         | 30-2119  |
| 11  | 50,000 ohm. Resistor         | 30-2120  |
| 12  | 100,000 ohm. Resistor        | 30-2121  |
| 13  | 200,000 ohm. Resistor        | 30-2122  |
| 14  | 500,000 ohm. Resistor        | 30-2123  |
| 15  | 1,000,000 ohm. Resistor      | 30-2124  |
| 16  | 20,000 ohm. Resistor         | 30-2125  |
| 17  | 50,000 ohm. Resistor         | 30-2126  |
| 18  | 100,000 ohm. Resistor        | 30-2127  |
| 19  | 200,000 ohm. Resistor        | 30-2128  |
| 20  | 500,000 ohm. Resistor        | 30-2129  |
| 21  | 1,000,000 ohm. Resistor      | 30-2130  |
| 22  | 10,000 ohm. Resistor         | 30-2131  |
| 23  | 50,000 ohm. Resistor         | 30-2132  |
| 24  | 100,000 ohm. Resistor        | 30-2133  |
| 25  | 200,000 ohm. Resistor        | 30-2134  |
| 26  | 500,000 ohm. Resistor        | 30-2135  |
| 27  | 1,000,000 ohm. Resistor      | 30-2136  |
| 28  | 10,000 ohm. Resistor         | 30-2137  |
| 29  | 50,000 ohm. Resistor         | 30-2138  |
| 30  | 100,000 ohm. Resistor        | 30-2139  |
| 31  | 200,000 ohm. Resistor        | 30-2140  |
| 32  | 500,000 ohm. Resistor        | 30-2141  |
| 33  | 1,000,000 ohm. Resistor      | 30-2142  |
| 34  | 10,000 ohm. Resistor         | 30-2143  |
| 35  | 50,000 ohm. Resistor         | 30-2144  |
| 36  | 100,000 ohm. Resistor        | 30-2145  |
| 37  | 200,000 ohm. Resistor        | 30-2146  |
| 38  | 500,000 ohm. Resistor        | 30-2147  |
| 39  | 1,000,000 ohm. Resistor      | 30-2148  |
| 40  | 10,000 ohm. Resistor         | 30-2149  |
| 41  | 50,000 ohm. Resistor         | 30-2150  |
| 42  | 100,000 ohm. Resistor        | 30-2151  |
| 43  | 200,000 ohm. Resistor        | 30-2152  |
| 44  | 500,000 ohm. Resistor        | 30-2153  |
| 45  | 1,000,000 ohm. Resistor      | 30-2154  |
| 46  | 10,000 ohm. Resistor         | 30-2155  |
| 47  | 50,000 ohm. Resistor         | 30-2156  |
| 48  | 100,000 ohm. Resistor        | 30-2157  |
| 49  | 200,000 ohm. Resistor        | 30-2158  |
| 50  | 500,000 ohm. Resistor        | 30-2159  |
| 51  | 1,000,000 ohm. Resistor      | 30-2160  |
| 52  | 10,000 ohm. Resistor         | 30-2161  |
| 53  | 50,000 ohm. Resistor         | 30-2162  |
| 54  | 100,000 ohm. Resistor        | 30-2163  |
| 55  | 200,000 ohm. Resistor        | 30-2164  |
| 56  | 500,000 ohm. Resistor        | 30-2165  |
| 57  | 1,000,000 ohm. Resistor      | 30-2166  |
| 58  | 10,000 ohm. Resistor         | 30-2167  |
| 59  | 50,000 ohm. Resistor         | 30-2168  |
| 60  | 100,000 ohm. Resistor        | 30-2169  |
| 61  | 200,000 ohm. Resistor        | 30-2170  |
| 62  | 500,000 ohm. Resistor        | 30-2171  |
| 63  | 1,000,000 ohm. Resistor      | 30-2172  |
| 64  | 10,000 ohm. Resistor         | 30-2173  |
| 65  | 50,000 ohm. Resistor         | 30-2174  |
| 66  | 100,000 ohm. Resistor        | 30-2175  |
| 67  | 200,000 ohm. Resistor        | 30-2176  |
| 68  | 500,000 ohm. Resistor        | 30-2177  |
| 69  | 1,000,000 ohm. Resistor      | 30-2178  |
| 70  | 10,000 ohm. Resistor         | 30-2179  |
| 71  | 50,000 ohm. Resistor         | 30-2180  |



MODEL P1530 (Packard)  
Schematic, Parts  
Chassis Layout

PHILCO RADIO & TELEV. CORP.

PACKARD-PHILCO MODEL P-1530 TWO UNIT RECEIVER

NOTE: CONNECT THE ANTENNA TO NO. 1 TERMINAL FOR USE WITH COWL ANTENNA  
CONNECT THE ANTENNA TO NO. 2 TERMINAL FOR USE WITH ROOF OR UNDERCAR ANTENNA

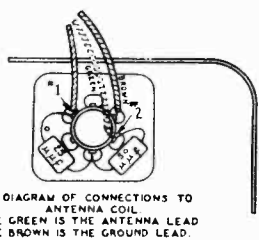
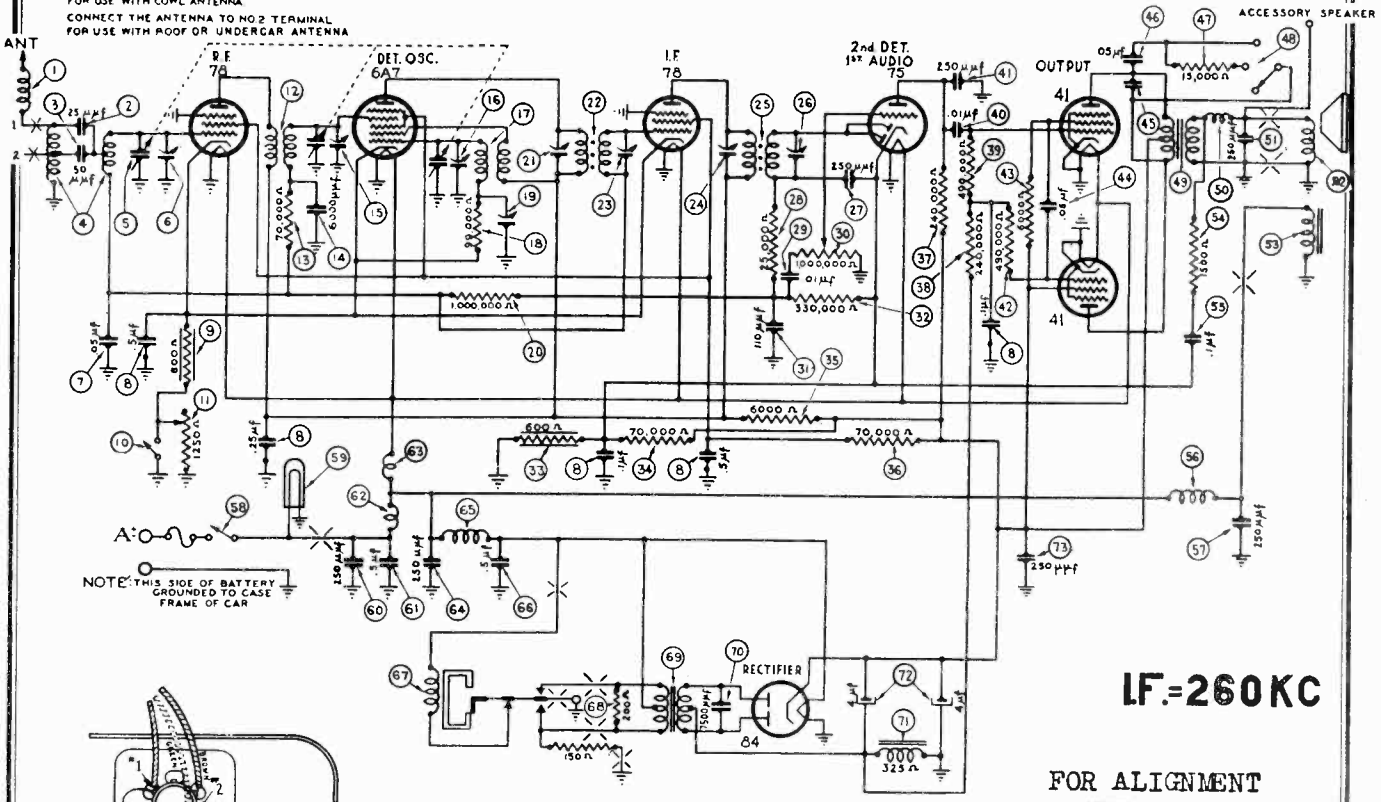


DIAGRAM OF CONNECTIONS TO ANTENNA COIL  
THE GREEN IS THE ANTENNA LEAD  
THE BROWN IS THE GROUND LEAD

IF=260KC

FOR ALIGNMENT  
SEE INDEX

FIGURE 3

PARTS LIST — MODEL P-1530

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-2063	41	Condenser (250 mmfd.)	30-1032
2	Condenser (25 mmfd.)	30-1067	42	Resistor (490,000 ohms)	33-449344
3	Condenser (50 mmfd.)	30-1029	43	Resistor (6,000 ohms)	33-260344
4	Antenna Transformer	32-2833	44	Condenser (.05 mfd.)	30-4454
5	Tuning Condenser	31-2111	45	Condenser (4,000 mmfd.)	30-4185
6	First Padder (on Tun. Cond.)	30-4444	46	Condenser (.05 mfd.)	30-4405
7	Condenser (.05 mfd.)	30-4444	47	Resistor (15,000 ohms)	33-315344
8	Condenser	30-4547	48	Tone Control Switch	42-1377
9	(.1-1-25-.5-5 mfd.)	30-4547	49	Output Transformer	32-7909
10	Resistor (600 ohms)	33-1212	50	Choke	32-1374
11	Sensitivity Switch	42-1378	51	Condenser (250 mmfd.)	30-1032
12	Sensitivity Control	33-5248	52	Cone & Voice Coil	36-3159
13	R. F. Transformer	32-2830	53	Complete Speaker (A50)	36-1371
14	Resistor (70,000 ohms)	33-370344	54	Field Coil Assembly	36-3513
15	Condenser (6,000 mmfd.)	30-4445	55	Resistor (1,500 ohms)	33-215344
16	Second Padder (on Tun. Cond.)	30-4445	56	Condenser (.1 mfd.)	30-4499
17	Third Padder (on Tun. Cond.)	30-4445	57	"B" Choke	32-2812
18	Oscillator Transformer	32-2828	58	Condenser (250 mmfd.)	30-1032
19	Resistor (99,000 ohms)	33-399344	59	On & Off Switch	42-1368
20	Low Frequency Padder	31-6230	60	Pilot Lamp	34-2039
21	Resistor (1,000,000 ohms)	33-510344	61	Condenser (250 mmfd.)	30-1032
22	Padder (Pri. 1st I. F. Trans.)	30-4474	62	Condenser (.5 mfd.)	30-4474
23	First I. F. Transformer	32-2791	63	"A" Choke	32-1614
24	Padder (Sec. 1st I. F. Trans.)	30-4474	64	Filament Choke	32-2729
25	Padder (Pri. 2nd I. F. Trans.)	30-4474	65	Condenser (250 mmfd.)	30-1032
26	Second I. F. Transformer	32-2793	66	Vibrator Choke	32-2812
27	Padder (Sec. 2nd I. F. Trans.)	30-4474	67	Condenser (.5 mfd.)	30-4474
28	Condenser (250 mmfd.)	30-1032	68	Vibrator	41-3170-3
29	Resistor (25,000 ohms)	33-325344	69	Resistor (200 ohms)	33-120344
30	Condenser (.01 mfd.)	30-4479	70	Power Transformer	32-7911
31	Volume Control	33-5245	71	Condenser (7,500 mmfd.)	30-4420
32	(1,000,000 ohms)	33-5245	72	"R" Filter Choke	32-7910
33	Condenser (110 mmfd.)	30-1031	73	Filter Condenser (4-4 mfd.)	30-2257
34	Resistor (330,000 ohms)	33-433344	74	Condenser (250 mmfd.)	30-1032
35	Resistor (600 ohms)	33-1212	75	Receiver Housing	38-2056
36	Resistor (70,000 ohms)	33-370344	76	Pilot Lamp Assembly	38-8467
37	Resistor (6,000 ohms)	33-260344	77	Tuning Shaft	28-8779
38	Resistor (70,000 ohms)	33-370344	78	Volume Shaft	28-8780
39	Resistor (240,000 ohms)	33-424344	79	Tone Shaft	28-8781
40	Resistor (240,000 ohms)	33-424344	80	Local Distance Shaft	28-8782
41	Resistor (490,000 ohms)	33-449344	81	Accessory Speaker Socket	38-8803
42	Condenser (.01 mfd.)	30-4514	82	Speaker Socket	27-6030

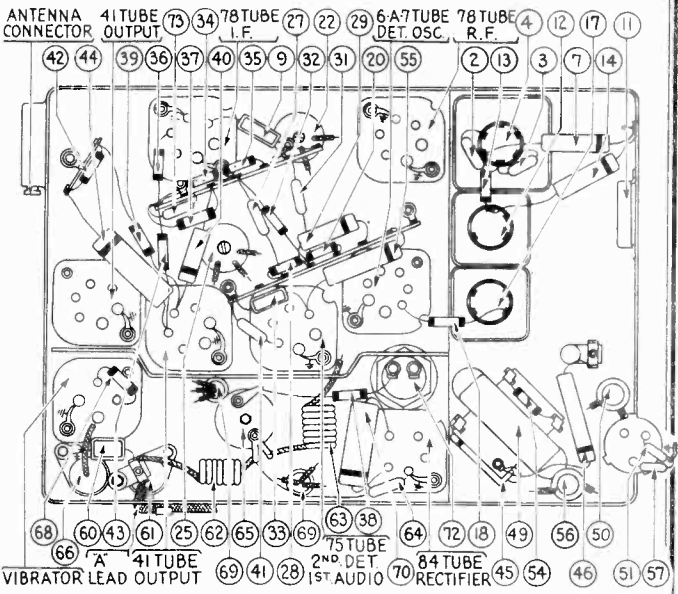
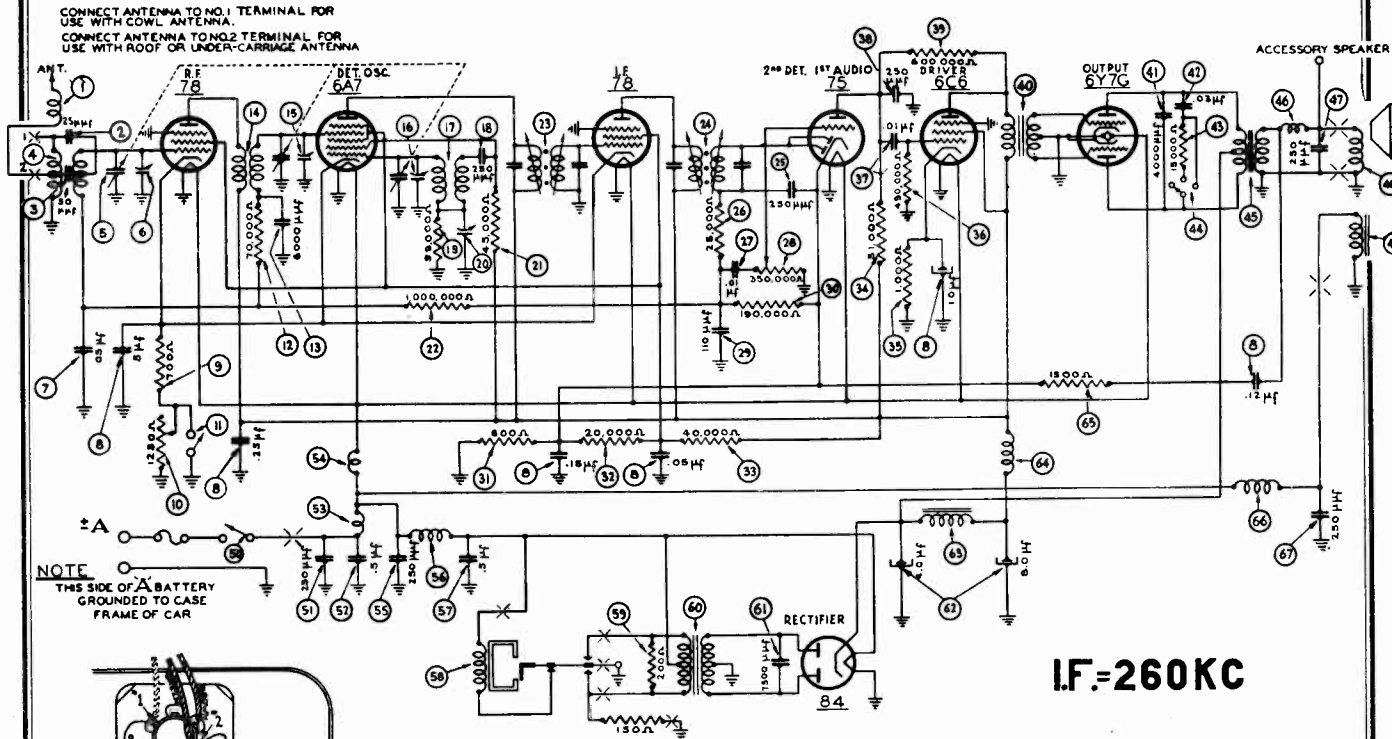


FIGURE 4

Description	Part No.	No.	Description	Part No.
Four Prong Socket	27-6044	7227	Fuse	7227
Five Prong Socket	27-6035	27-7727	Fuse Insulator	27-7727
Six Prong Socket	27-6036	28-6088	Stud (Speaker Mtg.)	28-6088
Seven Prong Socket	27-6037	W-55A	Nut (Speaker Mtg.)	W-55A
Interference Condenser	30-4007	28-6268	Tec Bolt (Rec. Mtg.)	28-6268
Interference Condenser	30-4475	W-518A	Nut (Rec. Mtg.)	W-518A
Distributor Resistor	4851	41-3217	Switch & Lead Assembly	41-3217

PHILCO RADIO & TELEV. CORP. MODEL P1535(Packard) Schematic, Parts Chassis Layout

PACKARD — PHILCO MODEL P-1535, TWO UNIT RECEIVER



CONNECT ANTENNA TO NO. 1 TERMINAL FOR USE WITH COWL ANTENNA.  
CONNECT ANTENNA TO NO. 2 TERMINAL FOR USE WITH ROOF OR UNDER-CARRIAGE ANTENNA

NOTE  
THIS SIDE OF A BATTERY GROUNDED TO CASE FRAME OF CAR

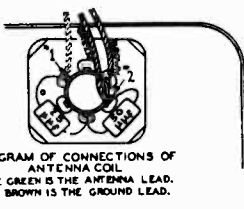


DIAGRAM OF CONNECTIONS OF ANTENNA COIL  
THE GREEN IS THE ANTENNA LEAD.  
THE BROWN IS THE GROUND LEAD.

I.F. = 260 KC

FIGURE 1

OCTOBER, 1937

PARTS LIST — MODEL P-1535

No.	Description	Part No.	Description	Part No.
1	Antenna Choke	32-2063	Input Transformer	32-7779
2	Condenser (25 mmfd.)	30-1067	Condenser (4,000 mmfd.)	30-4185
3	Condenser (50 mmfd.)	30-1029	Condenser (.03 mfd.)	30-4447
4	Antenna Transformer	32-2833	Resistor (15,000 ohms)	33-315344
5	Tuning Condenser	31-2111	Tone Control Switch	42-1377
6	First Padder (on Tun. Cond.)	31-2111	Output Transformer	32-7778
7	Condenser (.05 mfd.)	30-4444	Choke	32-1374
8	Condenser (.05-12-15-25-5-10 mfd.)	30-4545	Condenser (250 mmfd.)	30-1032
9	Resistor (700 ohms)	33-1220	Cone & Voice Coil	36-3159
10	Sensitivity Control (1,250 ohms)	33-5248	Complete Speaker (A49)	36-1370
11	Sensitivity Control Switch	42-1378	Field Coil Assembly	36-3513
12	Resistor (70,000 ohms)	33-370344	On-Off Switch	42-1374
13	Condenser (6,000 mmfd.)	30-4467	Condenser (250 mmfd.)	30-1032
14	R. F. Transformer	32-2830	Condenser (.5 mfd.)	30-4474
15	Second Padder (on Tun. Cond.)	32-2829	"A" Choke	32-1374
16	Third Padder (on Tun. Cond.)	32-2829	Filament Choke	32-1604
17	Oscillator Transformer	32-2829	Condenser (250 mmfd.)	30-1032
18	Condenser (250 mmfd.)	30-1032	Vibrator Choke	32-2537
19	Resistor (99,000 ohms)	33-399344	Condenser (.5 mfd.)	30-4474
20	Low Frequency Padder	31-6230	Vibrator	41-3170-3
21	Resistor (45,000 ohms)	33-345344	Resistor (200 ohms)	33-120344
22	Resistor (1,000,000 ohms)	33-510344	Power Transformer	32-7720
23	First I. F. Transformer	32-2554	Condenser (7,500 mmfd.)	30-4420
24	Second I. F. Transformer	32-2556	Filter Condenser (4-8 mfd.)	30-2167
25	Resistor (250 mmfd.)	30-1032	Filter Choke	32-7811
26	Resistor (25,000 ohms)	33-325344	"B" Choke	32-1281
27	Condenser (.01 mfd.)	30-4479	Resistor (1,500 ohms)	33-215344
28	Volume Control (350,000 ohms)	33-5246	Choke	32-2657
29	Condenser (110 mmfd.)	30-1031	Condenser (250 mmfd.)	30-1032
30	Resistor (190,000 ohms)	33-419344	Receiver Housing	38-2050
31	Resistor (600 ohms)	33-1212	Tuning Shaft	28-8762
32	Resistor (20,000 ohms)	33-320344	Volume Shaft	28-8763
33	Resistor (40,000 ohms)	33-340444	Tone Shaft	28-8764
34	Resistor (51,000 ohms)	33-351344	Local Distance Shaft	28-8765
35	Resistor (1,000 ohms)	33-210344	Tuning and Volume Knob	27-4687
36	Resistor (490,000 ohms)	33-449344	Switch Knobs	28-7255
37	Condenser (.01 mfd.)	30-4501	Accessory Speaker Socket	38-8803
38	Condenser (250 mmfd.)	30-1032	Speaker Socket	27-6030
39	Resistor (600,000 ohms)	33-459334	Four Prong Socket	27-6044
			Five Prong Socket	27-6035
			Six Prong Socket	27-6036
			Seven Prong Socket	27-6037

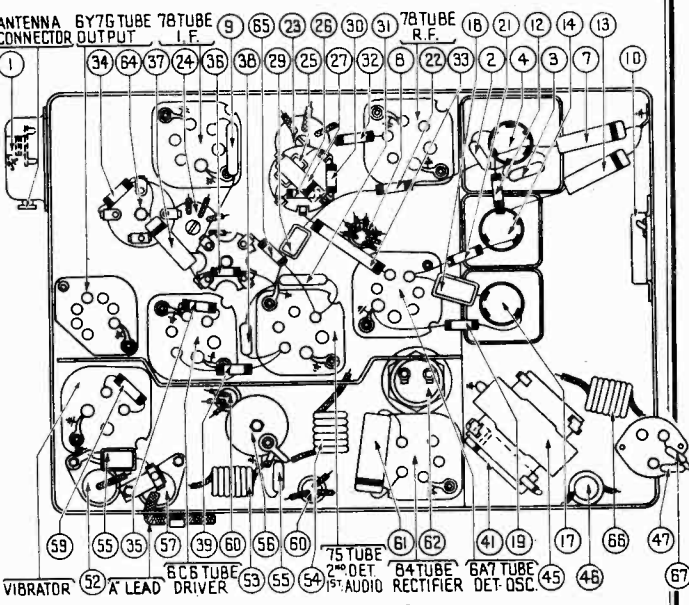


FIGURE 2

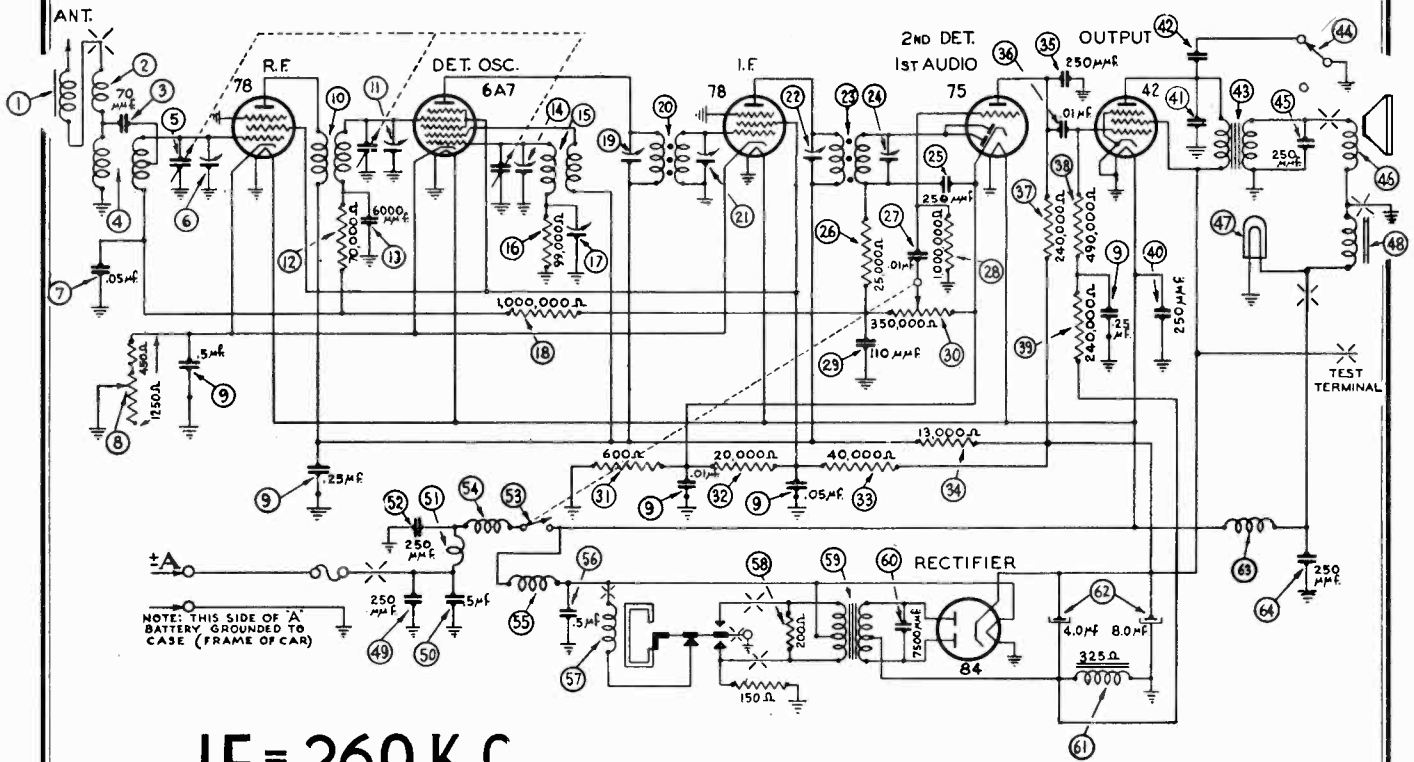
Description	Part No.	Description	Part No.
Eight Prong Socket	27-6058	Tree Bolt (Rec. Mtg.)	28-6268
Interference Condenser	30-4007	Nut (Rec. Mtg.)	W-518
Interference Condenser	30-4475	Mtg. Bracket and Stud (Speaker Mtg.)	28-1546
Inductive Suppressor	32-2950	Nut (Speaker Mtg.)	W-55
Fuse	7297	Switch & Lead Assembly	41-3217
Fuse Insulator	27-7729		



PHILCO RADIO & TELEV. CORP.

MODEL F1540(Ford)  
Schematic, Parts  
Chassis Layout

FORD - PHILCO MODEL — F-1540 SINGLE UNIT RECEIVER



I.F. = 260 K.C.

FOR ALIGNMENT  
SEE INDEX

DECEMBER 15, 1937

MODEL F-1540 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Lead	41-3386	57	Resistor (210,000 ohms)	33-421344
2	Antenna Choke	32-1372	58	Resistor (490,000 ohms)	33-449344
3	Condenser (.00 mfd.)	30-1105	59	Resistor (240,000 ohms)	33-424344
4	Antenna Transformer	32-2912	60	Condenser (250 mmfd.)	30-1032
5	Tuning Condenser	31-2181	61	Condenser (.02 mfd.)	30-4495
6	First Padder (on Tun. Cond.)	30-4444	62	Condenser (.02 mfd.)	30-4495
7	Condenser (.05 mfd.)	33-5239	63	Output Transformer	32-7946
8	Sensitivity Control	33-5239	64	Tone Control Switch	42-1406
9	Condenser (.01-.05-25-.5 mfd.)	30-4561	65	Condenser (250 mmfd.)	30-1032
10	R. F. Transformer	32-2830	66	Cone & Voice Coil	45-2608
11	Second Padder (on Tun. Cond.)	32-2830	67	Pilot Lamp	34-2039
12	Resistor (70,000 ohms)	33-370314	68	Field Coil Assembly	32-9263
13	Condenser (6,000 mmfd.)	30-4467	69	Condenser (250 mmfd.)	30-1032
14	Third Padder (on Tun. Cond.)	30-4467	70	Condenser (.5 mfd.)	30-4474
15	Oscillator Transformer	32-2828	71	"A" Choke	32-1374
16	Resistor (99,000 ohms)	33-309344	72	Condenser (250 mmfd.)	30-1032
17	Low Frequency Padder	31-6230	73	On-Off Switch	33-5260
18	Resistor (1,000,000 ohms)	33-510344	74	Filament Choke	32-1644
19	Padder (Pri. 1st I. F. Trans.)	32-2286	75	Vibrator Choke	32-2911
20	First I. F. Transformer	32-2286	76	Condenser (.5 mfd.)	30-4474
21	Padder (Sec. 1st I. F. Trans.)	32-2286	77	Vibrator	41-3170-3
22	Second I. F. Transformer	32-2908	78	Resistor (200 ohms)	33-120344
23	Padder (Sec. 2nd I. F. Trans.)	32-2908	79	Power Transformer	32-7944
24	Condenser (250 mmfd.)	30-1032	80	Condenser (7,500 mmfd.)	30-4420
25	Resistor (25,000 ohms)	33-325344	81	"B" Filter Choke	32-7943
26	Condenser (.01 mfd.)	30-4479	82	Filter Condenser (4-8 mfd.)	30-2295
27	Resistor (1,000,000 ohms)	33-510344	83	Choke	32-1591
28	Condenser (110 mmfd.)	30-1031	84	Condenser (250 mmfd.)	30-1032
29	Volume Control	33-5260	85	Four Prong Socket	27-6044
30	Resistor (600 ohms)	33-160331	86	Five Prong Socket	27-6035
31	Resistor (20,000 ohms)	33-320344	87	Six Prong Socket	27-6036
32	Resistor (40,000 ohms)	33-340444	88	Seven Prong Socket	27-6037
33	Resistor (13,000 ohms)	33-313344	89	Speaker Socket	27-6030
34	Condenser (250 mmfd.)	30-1032	90	Receiver Housing	38-9384
35	Condenser (.01 mfd.)	30-4501	91	Tuning & Volume Knob	27-4697
36			92	Dial Assembly	42-5826
37			93	Tuning Shaft	28-6795
38			94	Volume Shaft	28-8837

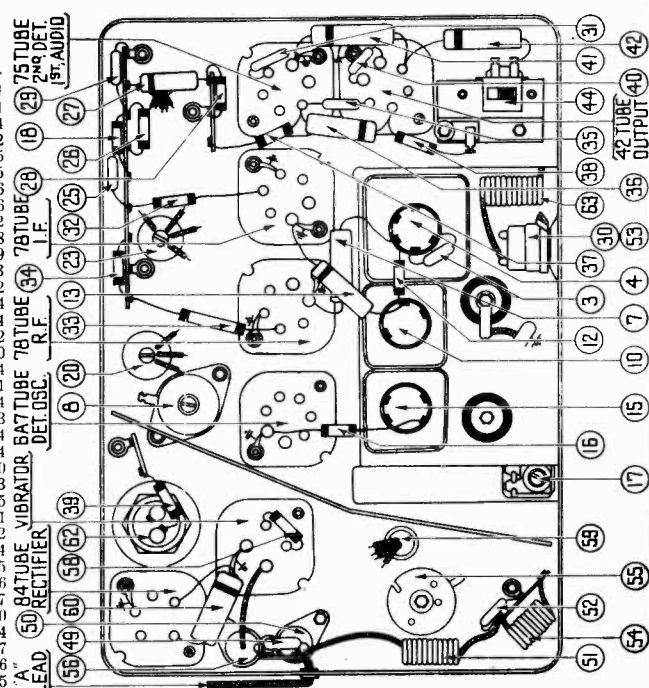


FIGURE 2





PHILCO RADIO & TELEV. CORP.

MODEL L1560  
(Lincoln Zephyr)  
Schematic, Parts  
Chassis Layout

LINCOLN ZEPHYR - PHILCO MODEL - L-1560 TWO UNIT RECEIVER

MODEL L-1560 PARTS LIST

DECEMBER 16, 1937

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-8106	44	Condenser (.03 mfd.)	30-4447
2	Antenna Choke	38-8106	45	Resistor (15,000 ohms)	33-315344
3	Condenser (50 mmfd.)	30-1029	46	Tone Control Switch	42-1377
4	Antenna Transformer	32-2914	47	Condenser (2,000 mmfd.)	30-4177
5	Tuning Condenser	31-2161	48	Output Transformer	32-7778
6	First Padder (on Tun. Cond.)	30-4444	49	Choke	32-1374
7	Condenser (.05 mfd.)	30-4444	50	Condenser (250 mmfd.)	30-1032
8	Condenser (.01-.05-.25-.5-2 mfd.)	30-4493	51	Cone & Voice Coil	36-3159
9	Resistor (600 ohms)	33-1212	52	Field Coil Assembly	36-3513
10	R. F. Transformer	32-2830	53	On & Off Switch	42-1369
11	Second Padder (on Tun. Cond.)	33-370344	54	Pilot Lamp	34-2039
12	Resistor (70,000 ohms)	33-370344	55	Condenser (250 mmfd.)	30-1032
13	Condenser (6,000 mmfd.)	30-4467	56	Condenser (.5 mfd.)	30-4474
14	Third Padder (on Tun. Cond.)	30-4467	57	"A" Choke	32-1374
15	Oscillator Transformer	32-2829	58	Filament Choke	32-2729
16	Condenser (250 mmfd.)	30-1032	59	Condenser (250 mmfd.)	30-1032
17	Resistor (99,000 ohms)	33-399344	60	Vibrator Choke	32-2537
18	Low Frequency Padder	31-6230	61	Condenser (.5 mfd.)	30-4474
19	Resistor (45,000 ohms)	33-345344	62	Vibrator	41-3170-3
20	Resistor (1,000,000 ohms)	33-510344	63	Resistor (200 ohms)	33-120344
21	Condenser (250 mmfd.)	30-1032	64	Power Transformer	32-7720
22	Padder (Pri. 1st I. F. Trans.)	32-2791	65	Condenser (7,500 mmfd.)	30-4420
23	First I. F. Transformer	32-2791	66	Filter Condenser (4-8 mid.)	30-2167
24	Padder (Sec. 1st I. F. Trans.)	32-2791	67	Filter Choke	32-7811
25	Padder (Pri. 2nd I. F. Trans.)	32-2793	68	"B" Choke	32-1281
26	Second I. F. Transformer	32-2793	69	Condenser (250 mmfd.)	30-1032
27	Padder (Sec. 2nd I. F. Trans.)	30-1032	70	Condenser (250 mmfd.)	30-1032
28	Condenser (250 mmfd.)	30-1032	71	Choke	32-2657
29	Resistor (25,000 ohms)	33-325344		Receiver Housing	38-9340
30	Condenser (.01 mfd.)	30-4479		Four Prong Socket	27-6044
31	Resistor (1,000,000 ohms)	33-510344		Five Prong Socket	27-6035
32	Volume Control (350,000 ohms)	33-5246		Six Prong Socket	27-6036
33	Condenser (110 mmfd.)	30-1031		Seven Prong Socket	27-6037
34	Resistor (600 ohms)	33-160331		Octal Base	27-6087
35	Resistor (20,000 ohms)	33-320344		Fuse	7227
36	Resistor (40,000 ohms)	33-340444		Fuse Insulator	27-7729
37	Resistor (240,000 ohms)	33-424344		Tuning Shaft	28-8821
38	Resistor (3,000 ohms)	33-230344		Volume Shaft	28-8822
39	Resistor (490,000 ohms)	33-449344		Tone Shaft	28-8823
40	Condenser (.01 mfd.)	30-4145		Scale Assembly	12-5803
41	Condenser (250 mmfd.)	30-1032		Tuning & Volume Knob	27-4691
42	Input Transformer	32-7779		Knob Base	28-7284
				Switch Lever	28-7255

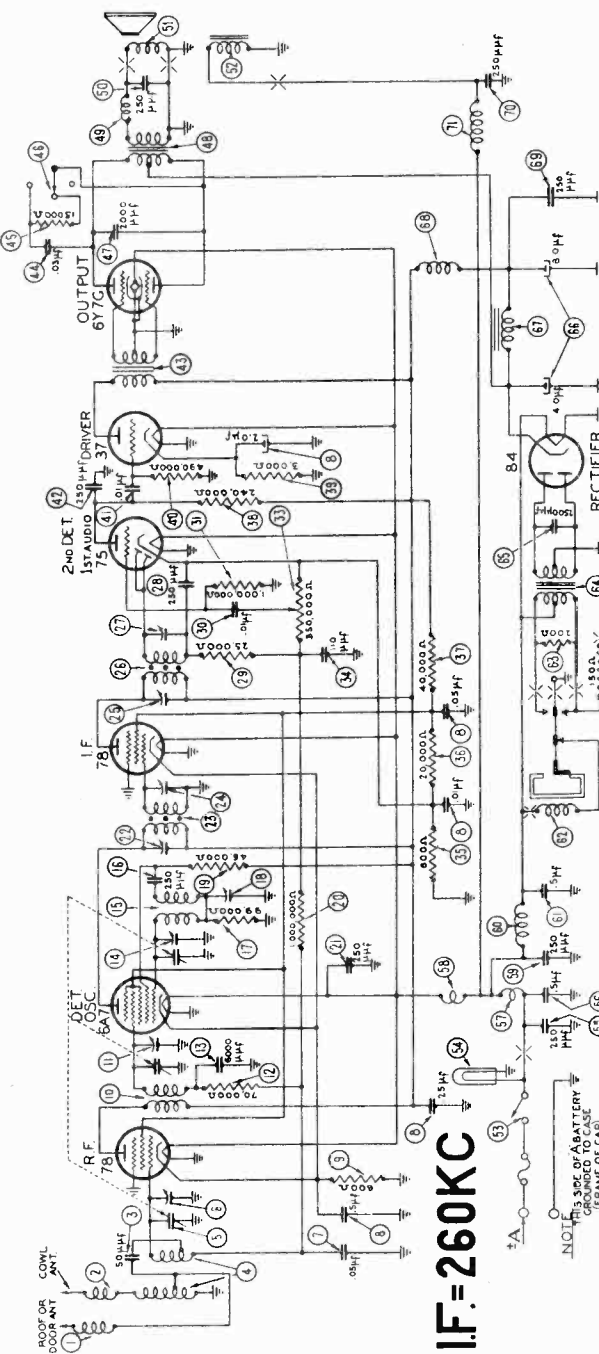


FIGURE 1

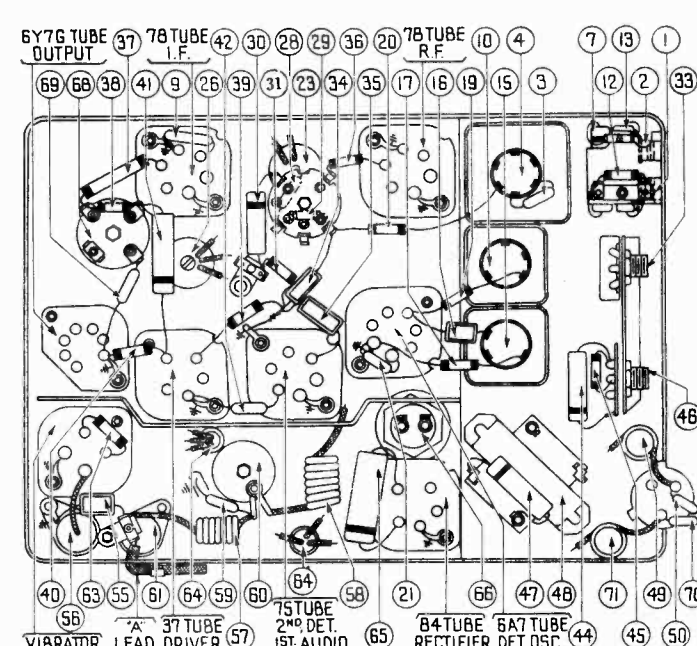


FIGURE 2

MODEL F1540  
MODEL L1560  
Socket, Trimmers  
Alignment

PHILCO RADIO & TELEV. CORP.

MODEL F - 1540

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

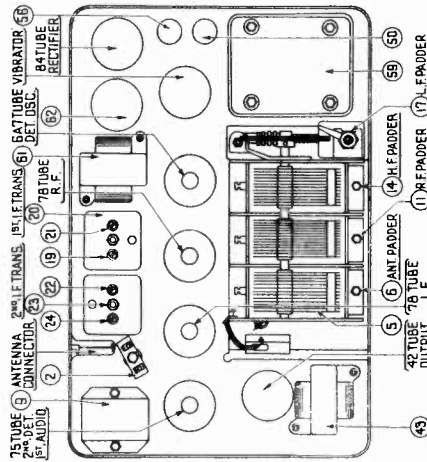


FIGURE 1

**Procedure**

Adjust the sensitivity control until the resistance between the lug on the control and the Receiver chassis is 850 ohms.

1. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust the paddlers (2), (3), (4) and (5) on the first and second I. F. transformers for maximum reading on the output meter. (See Figure 1 for location of paddlers).

**HIGH FREQUENCY AND R. F. —** After padding the I. F. stages, remove the generator lead from the 6A7 tube. Set the signal generator at 1500 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid clip). Place a piece of paper approximately .006" thick as a gage between the heel of the rotor plates and the stator plates on the oscillator section of the tuning condenser. Turn the rotor plates in mesh until they strike against the paper.

With the tuning condenser in this position, adjust the high frequency paddler (6) and the R. F. paddler (7) until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 150 on the dial scale.

**LOW FREQUENCY —** Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency paddler screw (8) for maximum reading on the output meter.

**HIGH FREQUENCY READJUSTMENT —** Turn the tuning condenser plates out of mesh to 1500 K. C. and set the signal generator at 1500 K. C. Then adjust the high frequency paddler (6) again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube. **ANTENNA WHEN PADDING THE ANTENNA STAGE IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.**

Connect the signal generator lead to the antenna connector on the Receiver as shown in Figure 5.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the paddlers (9) and (10) for the maximum reading on the output meter.

Turn the tuning condenser to 1400 K. C. and set the generator at 1400 K. C. Adjust the paddlers (9) and (10) for the maximum reading on the output meter.

When the antenna stage adjustment is made with the Receiver installed in the car, the Receiver antenna lead must be connected to the car antenna in the usual manner. Connect the signal generator output lead to a wire placed near the car antenna but not connected to it.

With the tuning condenser in this position, adjust the high frequency paddler (9) and the R. F. paddler (10) until the maximum reading is obtained on the output meter. This is the true setting for 1500 K. C., 150 on the dial scale.

**LOW FREQUENCY —** Turn the tuning condenser plates in mesh to approximately 580 K. C., 58 on the dial scale and set the signal generator at 580 K. C. Roll the tuning condenser and adjust the low frequency paddler screw (8) for maximum reading on the output meter.

**HIGH FREQUENCY READJUSTMENT —** Turn the tuning condenser plates out of mesh to 1500 K. C. and set the signal generator at 1500 K. C. Then adjust the high frequency paddler (6) again for maximum reading on the output meter.

Remove the generator lead from the 78 R. F. tube.

**I. F. TRANSFORMERS AND PADDERS**

The I. F. transformers are assembled complete with padding condensers.

Both the primary and secondary paddlers are placed side by side in the top of the transformer shield can. The adjusting screws are accessible thru the holes in the top of the shield. (See Figure 1).

The coil windings terminate in leads instead of terminals or lugs. The color scheme of the leads is given in Figure 3.

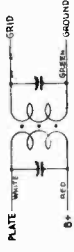


FIGURE 3

If replacements are ever necessary, replace the entire coil assembly, 32-2285 for the first I. F. stage and 32-2508 for the second I. F. stage. Neither the coil nor the paddlers will be furnished separately. Order only by the above numbers.

**ADJUSTMENTS**

All padding adjustments are carefully made at the factory and ordinarily no readjustments are necessary. However, when readjustments are required, the procedure given below must be followed in detail.

**Equipment**

Fully charged heavy duty storage battery or 6-volt power pack, 048A or 089 Philco Set Tester, 3164 Padding wrench, 27-7189 Padding screw driver.

**General**

**OUTPUT METER —** The output meter must be connected by means of an adapter to the plate of the type 42 output tube and to the Receiver chassis.

**SIGNAL GENERATOR —** With the Receiver and signal generator set up for operation at the prescribed frequency, turn the Receiver volume control on full and set the signal generator attenuator so that a half scale reading is obtained on the output meter. The signal in the speaker should be audible but not loud.

The shielding on the signal generator output lead must be connected to the Receiver housing.

**Procedure**

1. F. — Set the signal generator at exactly 260 K. C. Connect the generator lead to the grid cap of the 6A7 tube in series with a .1 mfd. condenser (without removing the grid clip). Adjust the paddlers (2), (3) and (4) on the first and second I. F. transformers for maximum reading on the output meter. (See Figure 1 for location of paddlers).

**HIGH FREQUENCY AND R. F. —** After padding the I. F. stages, remove the generator lead from the 6A7 tube. Set the signal generator at 1500 K. C. and then connect the generator lead to the grid cap of the 78 R. F. tube in series with a .1 mfd. condenser (without removing the grid clip).

Place a piece of paper approximately .006" thick as a gage between the heel of the rotor plates and the stator plates on the oscillator section of the tuning condenser. Turn the rotor plates in mesh until they strike against the paper.

When the OWL ANTENNA is used, connect the signal generator lead to the cow antenna connector on the Receiver, using an antenna lead, Part No. L-2665, and a .1 mfd. condenser in series between the two leads.

When the ROOF or DOOR ANTENNA is used, connect the signal generator lead to the antenna connector on the Receiver, using an antenna lead, Part No. L-2665, and a .1 mfd. condenser in series between the two leads.

MODEL L - 1560

ANTENNA — WHEN PADDING THE ANTENNA STAGE IT IS EXTREMELY IMPORTANT THAT THE PROPER DUMMY ANTENNA BE CONSTRUCTED AND USED.

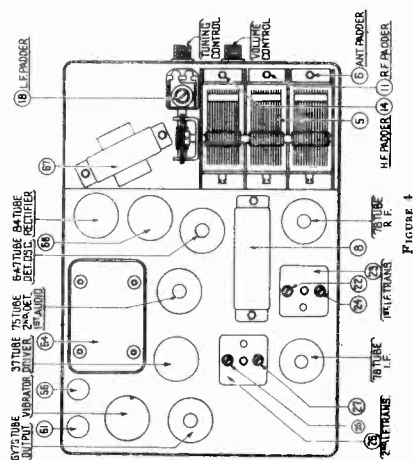


FIGURE 4

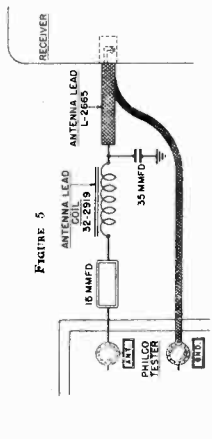


FIGURE 5

MODEL C1550(Chrysler)  
 PHILCO RADIO & TELEV. CORP Schematic, Parts  
 Chassis Layout

CHRYSLER - PHILCO MODEL C - 1550

THE MODEL C-1550 HAS BEEN DESIGNED FOR INSTALLATION IN THE CHRYSLER CORPORATION BUILT CARS FOR USE WITH A CHRYSLER "ROADWAY DUAL" OR A "SKYWAY" ANTENNA

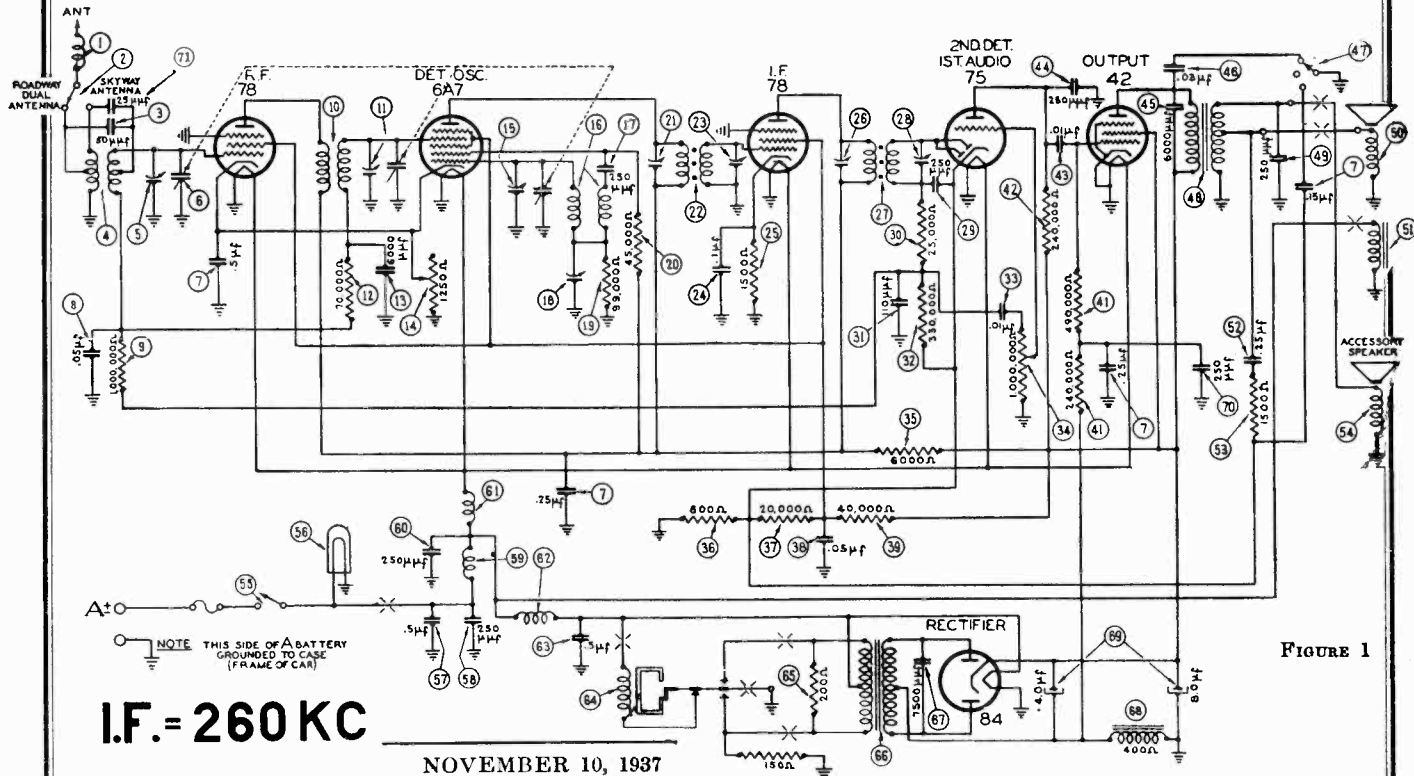


FIGURE 1

I.F. = 260 KC

NOVEMBER 10, 1937

MODEL C - 1550 PARTS LIST

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	32-2063	42	Tone Control Switch	42-1399
2	Antenna Switch	42-1259	43	Output Transformer	32-7942
3	Condenser (50 mmfd.)	30-1029	44	Condenser (250 mmfd.)	30-1032
4	Antenna Transformer	32-2433	45	Cone & Voice Coil	45-2607
5	First Padder (on Tun. Cond.)		46	Field Coil Assembly	36-4012
6	Tuning Condenser	31-2169	47	Complete Speaker (K-50)	36-1376
7	Condenser (.15-.25-.25-.25-.5 mfd.)	30-4557	48	Condenser (.25 mfd.)	30-4557
8	Condenser (.05 mfd.)	30-4414	49	Resistor (1,500 ohms)	33-215344
9	Resistor (1,000,000 ohms)	33-510344	50	Accessory Speaker	36-1281
10	R. F. Transformer	32-2231	51	On-Off Switch	42-1368
11	Second Padder (on Tun. Cond.)		52	Pilot Lamp	34-2040
12	Resistor (70,000 ohms)	33-370344	53	Condenser (.5 mfd.)	30-4474
13	Condenser (6,000 mmfd.)	30-4467	54	Condenser (250 mmfd.)	30-1032
14	Sensitivity Control	33-5261	55	"A" Choke	32-1374
15	Third Padder (on Tun. Cond.)		56	Condenser (250 mmfd.)	30-1032
16	Oscillator Transformer	32-2232	57	Filament Choke	32-2729
17	Condenser (250 mmfd.)	30-1032	58	Vibrator Choke	32-2812
18	Resistor (1,000,000 ohms)	33-510344	59	Condenser (.5 mfd.)	30-4474
19	Low Frequency Padder	31-6056	60	Vibrator	41-3170-3
20	Resistor (99,000 ohms)	33-390344	61	Resistor (200 ohms)	33-120344
21	Resistor (15,000 ohms)	33-345344	62	Power Transformer	32-7911
22	Padder (Pri. 1st I. F. Trans.)		63	Condenser (7,500 mmfd.)	30-4420
23	First I. F. Transformer	32-2286	64	Filter Choke	32-7722
24	Padder (Sec. 1st I. F. Trans.)		65	Filter Condenser (4-8 mfd.)	30-2179
25	Condenser (.1 mfd.)	30-4499	66	Condenser (250 mmfd.)	30-1032
26	Resistor (1,500 ohms)	33-215344	67	Condenser (25 mfd.)	30-1067
27	Padder (Pri. 2nd I. F. Trans.)		68	Receiver Housing	38-2123
28	Second I. F. Transformer	32-2167	69	Accessory Speaker Socket	27-6025
29	Padder (Sec. 2nd I. F. Trans.)		70	Four Prong Base Socket	27-6044
30	Condenser (250 mmfd.)	30-1032	71	Five Prong Base Socket	27-6035
31	Resistor (25,000 ohms)	33-325344	72	Six Prong Base Socket	27-6036
32	Condenser (110 mmfd.)	30-1031	73	Seven Prong Base Socket	27-6037
33	Resistor (330,000 ohms)	33-433344	74	Receiver Mtg. Plate	28-4650
34	Condenser (.01 mfd.)	30-4479	75	Fuse	45-2359
35	Volume Control (1,000,000 ohms)	33-5257	76	Tuning Shaft (P-6, D-8)	28-8842
36	Resistor (6,000 ohms)	33-260344	77	Tuning Shaft (S-5, C-18, C-19)	28-8845
37	Resistor (600 ohms)	33-1212	78	Tuning Shaft (C-20)	28-8848
38	Resistor (20,000 ohms)	33-320344	79	Volume Shaft (P-6, D-8)	28-8843
39	Condenser (.05 mfd.)	30-4444	80	Volume Shaft (S-5, C-18, C-19)	28-8846
40	Resistor (10,000 ohms)	33-340444	81	Volume Shaft (C-20)	23-8849
41	Resistor (240,000 ohms)	33-424344	82	Tone Shaft (P-6, D-8)	28-8844
42	Resistor (490,000 ohms)	33-449344	83	Tone Shaft (S-5, C-18, C-19)	28-8847
43	Resistor (240,000 ohms)	33-424344	84	Tone Shaft (C-20)	28-8850
44	Resistor (240,000 ohms)	33-424344	85	Tuning & Volume Knob (P-6)	27-4659
45	Condenser (.01 mfd.)	30-4501	86	Tuning & Volume Knob (D-8)	27-4660
46	Condenser (250 mmfd.)	30-1032			
47	Condenser (6,000 mmfd.)	30-4024			
48	Condenser (.03 mfd.)	30-4560			

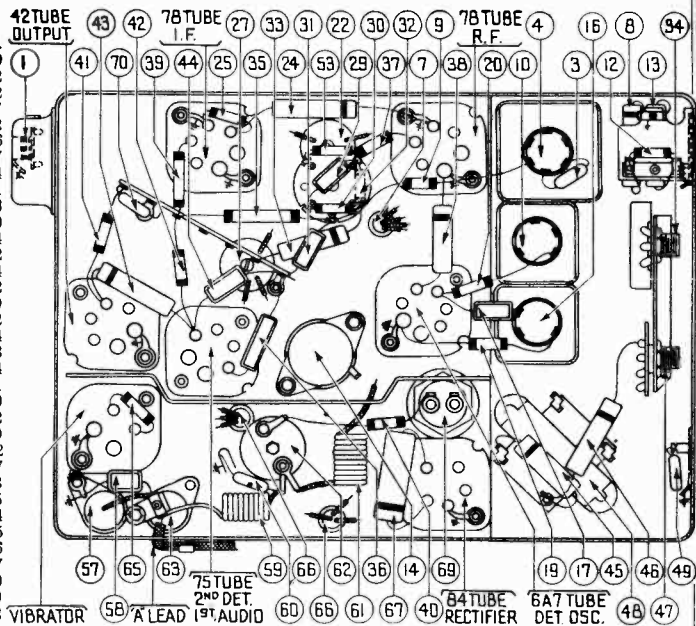


FIGURE 2









PHILCO RADIO & TELEVISION CORP.

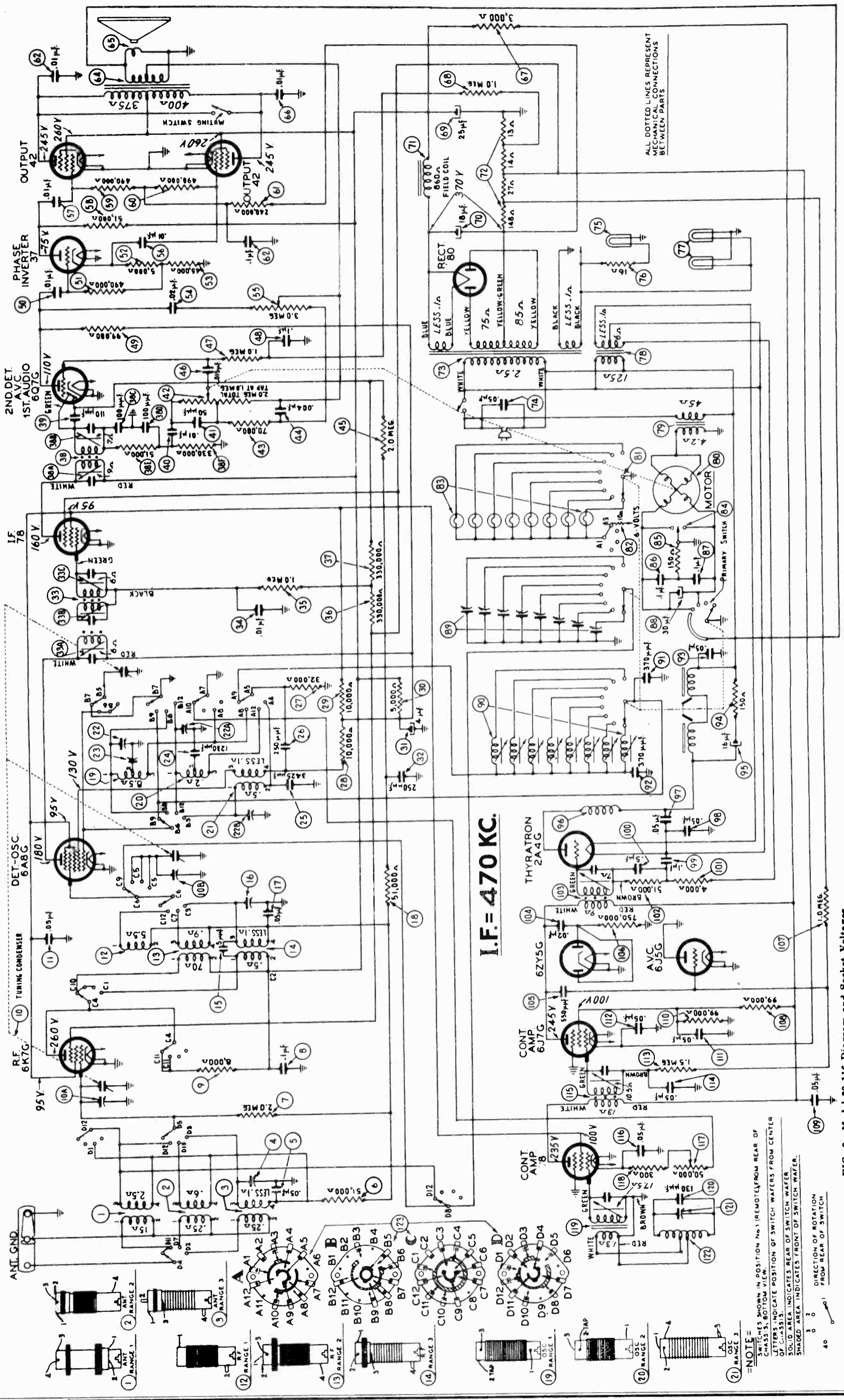


FIG. 2—Model 39-116 Diagram and Socket Voltages  
See Bulletin 310 A for 39-55 Schematic and Parts List.

Socket Voltage Measured for Socket Contacts to Chassis, Line Voltage 115 VAC, Volume Minimum, Range Selector (Broadcast)



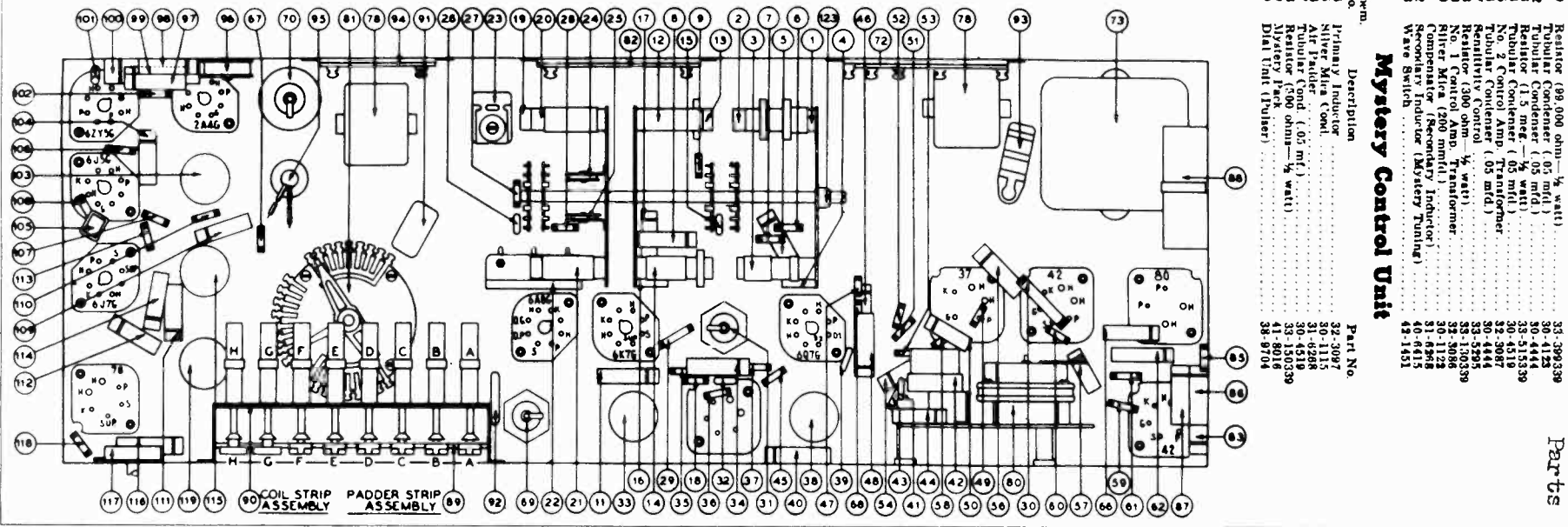
MODEL 39-116  
Chassis Layout  
Parts

Part No.	Description	Part No.	Description
101	Resistor (89,000 ohm—1/2 watt)	33-399339	
102	Tubular Condenser (.05 mfd.)	30-4144	
103	Resistor (1.5 meg.—1/2 watt)	33-515339	
104	Tubular Condenser (.05 mfd.)	30-4519	
105	No. 2 Control Amp. Transformer	32-3087	
106	Resistor (500 ohm—1/2 watt)	30-4444	
107	Resistor (300 ohm—1/2 watt)	33-329339	
108	No. 1 Control Amp. Transformer	32-3041	
109	Resistor (200 ohm—1/2 watt)	30-4444	
110	Resistor (100 ohm—1/2 watt)	33-329339	
111	Resistor (500 ohm—1/2 watt)	30-4444	
112	Resistor (200 ohm—1/2 watt)	32-3041	
113	Resistor (100 ohm—1/2 watt)	30-4444	
114	Resistor (500 ohm—1/2 watt)	33-329339	
115	Resistor (200 ohm—1/2 watt)	30-4444	
116	Resistor (100 ohm—1/2 watt)	32-3041	
117	Resistor (500 ohm—1/2 watt)	30-4444	
118	Resistor (200 ohm—1/2 watt)	32-3041	
119	Resistor (100 ohm—1/2 watt)	30-4444	
120	Resistor (500 ohm—1/2 watt)	33-329339	
121	Resistor (200 ohm—1/2 watt)	30-4444	
122	Resistor (100 ohm—1/2 watt)	32-3041	
123	Resistor (500 ohm—1/2 watt)	30-4444	
124	Resistor (200 ohm—1/2 watt)	32-3041	
125	Resistor (100 ohm—1/2 watt)	30-4444	
126	Resistor (500 ohm—1/2 watt)	33-329339	
127	Resistor (200 ohm—1/2 watt)	30-4444	
128	Resistor (100 ohm—1/2 watt)	32-3041	
129	Resistor (500 ohm—1/2 watt)	30-4444	
130	Resistor (200 ohm—1/2 watt)	32-3041	
131	Resistor (100 ohm—1/2 watt)	30-4444	
132	Resistor (500 ohm—1/2 watt)	33-329339	
133	Resistor (200 ohm—1/2 watt)	30-4444	
134	Resistor (100 ohm—1/2 watt)	32-3041	
135	Resistor (500 ohm—1/2 watt)	30-4444	
136	Resistor (200 ohm—1/2 watt)	32-3041	
137	Resistor (100 ohm—1/2 watt)	30-4444	
138	Resistor (500 ohm—1/2 watt)	33-329339	
139	Resistor (200 ohm—1/2 watt)	30-4444	
140	Resistor (100 ohm—1/2 watt)	32-3041	
141	Resistor (500 ohm—1/2 watt)	30-4444	
142	Resistor (200 ohm—1/2 watt)	32-3041	
143	Resistor (100 ohm—1/2 watt)	30-4444	
144	Resistor (500 ohm—1/2 watt)	33-329339	
145	Resistor (200 ohm—1/2 watt)	30-4444	
146	Resistor (100 ohm—1/2 watt)	32-3041	
147	Resistor (500 ohm—1/2 watt)	30-4444	
148	Resistor (200 ohm—1/2 watt)	32-3041	
149	Resistor (100 ohm—1/2 watt)	30-4444	
150	Resistor (500 ohm—1/2 watt)	33-329339	

Part No.	Description	Part No.	Description
1	Antenna Transformer (100V)	32-3038	
2	Antenna Transformer (100V)	32-3038	
3	Antenna Transformer (100V)	32-3038	
4	Antenna Transformer (100V)	32-3038	
5	Antenna Transformer (100V)	32-3038	
6	Antenna Transformer (100V)	32-3038	
7	Antenna Transformer (100V)	32-3038	
8	Antenna Transformer (100V)	32-3038	
9	Antenna Transformer (100V)	32-3038	
10	Antenna Transformer (100V)	32-3038	
11	Antenna Transformer (100V)	32-3038	
12	Antenna Transformer (100V)	32-3038	
13	Antenna Transformer (100V)	32-3038	
14	Antenna Transformer (100V)	32-3038	
15	Antenna Transformer (100V)	32-3038	
16	Antenna Transformer (100V)	32-3038	
17	Antenna Transformer (100V)	32-3038	
18	Antenna Transformer (100V)	32-3038	
19	Antenna Transformer (100V)	32-3038	
20	Antenna Transformer (100V)	32-3038	
21	Antenna Transformer (100V)	32-3038	
22	Antenna Transformer (100V)	32-3038	
23	Antenna Transformer (100V)	32-3038	
24	Antenna Transformer (100V)	32-3038	
25	Antenna Transformer (100V)	32-3038	
26	Antenna Transformer (100V)	32-3038	
27	Antenna Transformer (100V)	32-3038	
28	Antenna Transformer (100V)	32-3038	
29	Antenna Transformer (100V)	32-3038	
30	Antenna Transformer (100V)	32-3038	
31	Antenna Transformer (100V)	32-3038	
32	Antenna Transformer (100V)	32-3038	
33	Antenna Transformer (100V)	32-3038	
34	Antenna Transformer (100V)	32-3038	
35	Antenna Transformer (100V)	32-3038	
36	Antenna Transformer (100V)	32-3038	
37	Antenna Transformer (100V)	32-3038	
38	Antenna Transformer (100V)	32-3038	
39	Antenna Transformer (100V)	32-3038	
40	Antenna Transformer (100V)	32-3038	
41	Antenna Transformer (100V)	32-3038	
42	Antenna Transformer (100V)	32-3038	
43	Antenna Transformer (100V)	32-3038	
44	Antenna Transformer (100V)	32-3038	
45	Antenna Transformer (100V)	32-3038	
46	Antenna Transformer (100V)	32-3038	
47	Antenna Transformer (100V)	32-3038	
48	Antenna Transformer (100V)	32-3038	
49	Antenna Transformer (100V)	32-3038	
50	Antenna Transformer (100V)	32-3038	
51	Antenna Transformer (100V)	32-3038	
52	Antenna Transformer (100V)	32-3038	
53	Antenna Transformer (100V)	32-3038	
54	Antenna Transformer (100V)	32-3038	
55	Antenna Transformer (100V)	32-3038	
56	Antenna Transformer (100V)	32-3038	
57	Antenna Transformer (100V)	32-3038	
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59	Antenna Transformer (100V)	32-3038	
60	Antenna Transformer (100V)	32-3038	
61	Antenna Transformer (100V)	32-3038	
62	Antenna Transformer (100V)	32-3038	
63	Antenna Transformer (100V)	32-3038	
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65	Antenna Transformer (100V)	32-3038	
66	Antenna Transformer (100V)	32-3038	
67	Antenna Transformer (100V)	32-3038	
68	Antenna Transformer (100V)	32-3038	
69	Antenna Transformer (100V)	32-3038	
70	Antenna Transformer (100V)	32-3038	
71	Antenna Transformer (100V)	32-3038	
72	Antenna Transformer (100V)	32-3038	
73	Antenna Transformer (100V)	32-3038	
74	Antenna Transformer (100V)	32-3038	
75	Antenna Transformer (100V)	32-3038	
76	Antenna Transformer (100V)	32-3038	
77	Antenna Transformer (100V)	32-3038	
78	Antenna Transformer (100V)	32-3038	
79	Antenna Transformer (100V)	32-3038	
80	Antenna Transformer (100V)	32-3038	
81	Antenna Transformer (100V)	32-3038	
82	Antenna Transformer (100V)	32-3038	
83	Antenna Transformer (100V)	32-3038	
84	Antenna Transformer (100V)	32-3038	
85	Antenna Transformer (100V)	32-3038	
86	Antenna Transformer (100V)	32-3038	
87	Antenna Transformer (100V)	32-3038	
88	Antenna Transformer (100V)	32-3038	
89	Antenna Transformer (100V)	32-3038	
90	Antenna Transformer (100V)	32-3038	
91	Antenna Transformer (100V)	32-3038	
92	Antenna Transformer (100V)	32-3038	
93	Antenna Transformer (100V)	32-3038	
94	Antenna Transformer (100V)	32-3038	
95	Antenna Transformer (100V)	32-3038	
96	Antenna Transformer (100V)	32-3038	
97	Antenna Transformer (100V)	32-3038	
98	Antenna Transformer (100V)	32-3038	
99	Antenna Transformer (100V)	32-3038	
100	Antenna Transformer (100V)	32-3038	

Miscellaneous Parts		Mystery Control Unit	
Bezel Assembly (Cabinet)	38-9732	Bezel	56-1240
Bezel Screws	W-1855	Bezel Screws	W-2138
Cable (Tuning Drum)	31-2315	Cap Tuning Disc	27-4793
Cable (Pointer)	31-2320	Disc (Tuning)	27-4792
Dial	27-5428	Pulser Assembly	38-9704
Dial Pointer	36-1537	Stop (Tuning Disc)	27-4792
Disc (Tuning)	36-1450	Spring (Tuning Disc)	27-4792
Disc (Volume)	27-4765	Spring (Tuning Cables)	28-8913
Disc (Range Switch)	27-4767	Washer (Keyed Tuning Disc)	56-1029
Disc (Tone Control)	27-4764	Washer (Spring Washer Tuning Disc)	6717
Philo Lamp Assembly	38-9694		
Pilot Lamp Assembly (Dial)	38-9711		
Pilot Lamp Assembly (Tabs)	38-9712		

FIG. 1—Model 39-116 Part Locations Underside of Chassis



MODEL 39-55, 39-116  
Specifications  
"Mystery Control"  
Adjustments

PHILCO RADIO & TELEVISION CORP.

SPECIFICATIONS

Model 39-55

**TYPE CIRCUIT:** Philco Model 39-55, code 121, is an 11-tube receiver employing a superheterodyne circuit for reception of standard broadcast stations with Philco Mystery Control for Electric Automatic Tuning of eight (8) stations. The Philco Mystery Control also controls Volume and turns off set without any connections between receiver and Control Unit. In addition, other features of design are—Automatic Volume Control; Continuously Variable Tone Control; Bass Compensations; Degenerated Push-pull Pentode Audio Output Circuit; and Compensators selected for minimum drift.

**POWER SUPPLY:** 115 volts, 50 to 60 cycles, A.C.

**POWER CONSUMPTION:** 180 watts.

**TUNING RANGES:** 540 to 1720 K.C.

**I.F. FREQUENCY:** 470 K.C.

**PHILCO TUBES USED:** Receiver—6J8G, First Detector Oscillator; 78, I.F. Amplifier; 6Q7G, Second Detector, A.V.C. and first Audio; two (2) 42 Audio Output, and one 80 Rectifier.

**Mystery Tuning Control Amplifier—78, First Control Amplifier; 6J7G, Second Control Amplifier; A.V.C.; 6Z5Y5G, A.V.C. and a 2A4G Thyatron Rectifier.**

**Mystery Control Unit—One type 30.**

**AUDIO OUTPUT:** 10 watts.

**CABINET DIMENSIONS:**

Console	Height	Width	Depth
Mystery Control	38 1/2"	29 1/2"	14 3/4"
	5 1/2"	7 1/4"	9 3/4"

Note: The Schematic Diagram and Replacement Parts List for Model 39-55 will be found in Bulletin 310 A.

Model 39-116

**TYPE CIRCUIT:** Philco Model 39-116, code 121, is a 14-tube receiver employing a superheterodyne circuit with three tuning ranges for reception of standard and short wave broadcast stations and Philco Mystery Control for Electric Automatic Tuning of eight (8) standard broadcast stations. The Philco Mystery Control also controls the volume and turns the set

off without any connections between the receiver and control unit. In addition, other features of design are—Automatic Volume Control; Continuously Variable Tone Control; Bass Compensation; Degenerated Push-pull Pentode Audio Output Circuit; and Compensators selected for minimum drift.

**POWER SUPPLY:** 115 volts, 50 to 60 cycles, A.C.

**POWER CONSUMPTION:** 190 watts.

**TUNING RANGES:** 540 to 1720 K.C.; 17 to 58 M.C.; 58 to 18 M.C.

**I.F. FREQUENCY:** 470 K.C.

**PHILCO TUBES USED:** Receiver—6K7G, R.F. Amplifier; 6A8G, First Detector Oscillator; 78, I.F. Amplifier; 6Q7G, Second Detector, A.V.C. and first Audio; 37, Phase Inverter; two (2) 42, Audio Output, and one 80, Rectifier.

**Mystery Control Amplifier—78, First Control Amplifier; 6J7G, Second Control Amplifier; A.V.C.; 6Z5Y5G, and a 2A4G, Thyatron Rectifier.**

**Mystery Control Unit—One type 30.**

**AUDIO OUTPUT:** 10 watts.

Adjusting Mystery Control for Reception of Stations

The procedure for setting up stations on the Mystery Control receiver is similar to the procedure followed in setting up Philco Electric Automatic Tuning Models. The eight (8) stations, however, are automatically dialed by the remote control unit instead of by pushing buttons.

To set up stations on Mystery Tuning, proceed as follows:

- Select and remove the desired eight (8) station call letters from the station tab card supplied with the receiver. Insert the station tabs in the apertures (windows) of the bezel. The lowest frequency station is placed in the first window on the left, and the remaining station tabs in the order of increasing frequency.
- Connect a Model 077 Signal Generator to the "Ant" and "Grid" terminals of the receiver, set the Signal Generator with modulation "On". Turn the range selector switch to "Broadcast" and tune in the lowest frequency station. This should be between 540 and 1030 K.C. Then adjust the Signal Generator to the frequency of the station until a beat note is heard.
- Leaving the Signal Generator connected, turn the Range Selector Dial of the receiver to "Automatic". Now, using a padding screw driver, adjust the first 540 to 1030 K.C. oscillator paddler (bottom row of holes) at the rear of the chassis, until the station
- identified by the modulated signal of the generator is tuned in to maximum signal. Next, adjust the first 540 to 1030 K.C. Antenna Padder (top row of holes) for maximum signal.
- Turn the Signal Generator off the station frequency and readjust the "Ant" and "Osc" Padders for maximum output. This should be done with the volume control adjusted for low volume. This procedure is repeated for each of the remaining stations. The next station, of course, will be the next highest in frequency, that is within the 540 to 1030 K.C. range of the second set of padders. The Third Station is adjusted by the third set of padders under 670 to 1160 K.C. and the remaining stations in the order of increasing frequency.
- Now, insert the small call letter tab of the first station in the third aperture of the bezel on the remote Mystery Control unit. Call letter tabs are also supplied to be placed over each call letter. The remaining call letter tabs are then placed in the order of increasing frequency around the bezel from right to left (counter clockwise). Insert the "loud" and "soft" tabs in the first and second apertures on the right hand side of the bezel. See instructions supplied with each model for dialing stations and controlling volume.

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PIERSON-DE LANE CO.

MODELS PR15M, PR15R, PR15X  
PR15C, PR15UH

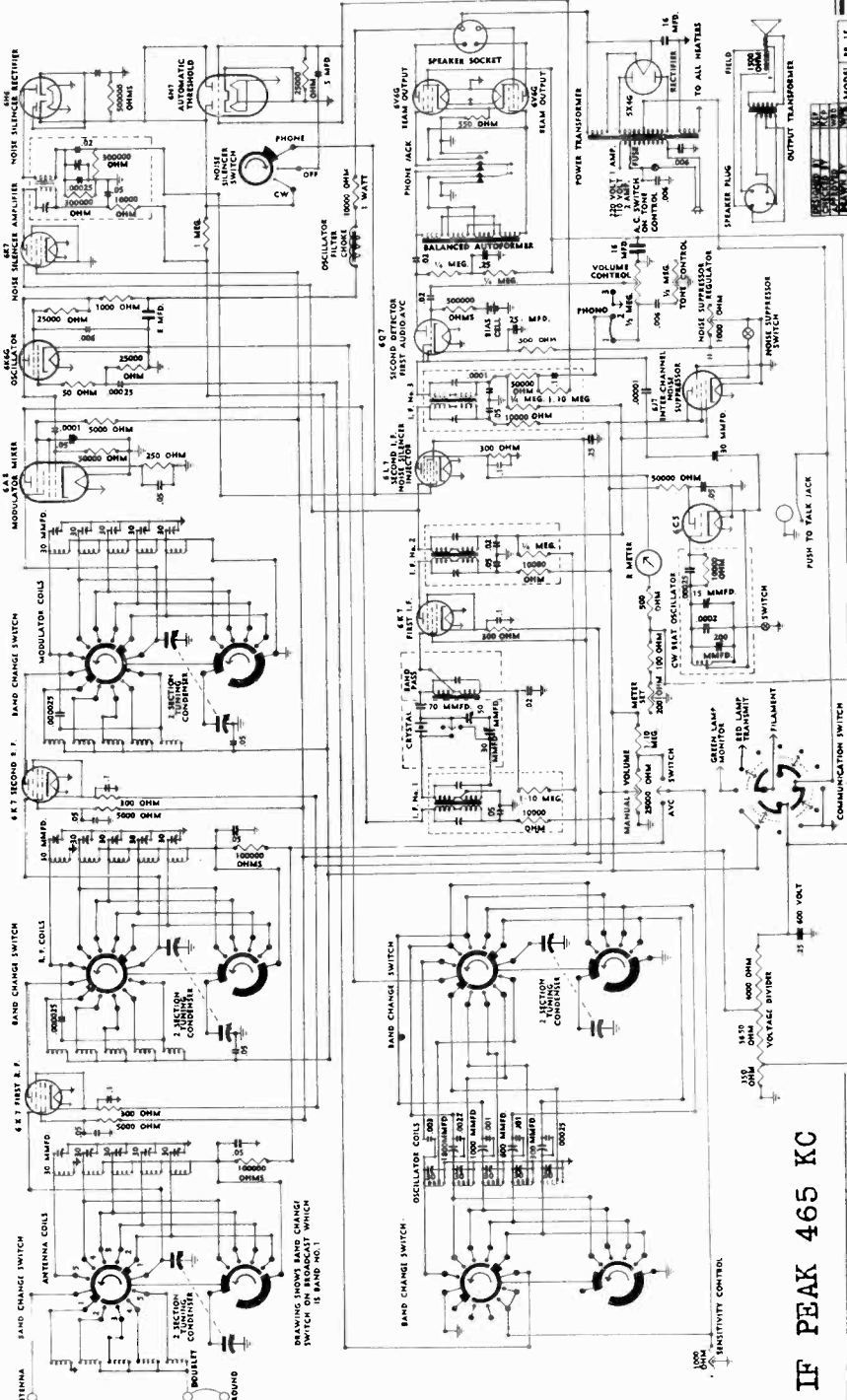
Schematic Data

**Circuit Diagram and Operating Instructions for PR-15**

**CAUTION:** Before connecting receiver, read the following instructions:  
**FIRST:** Be sure voltage frequency indicated on the back panel of receiver corresponds to the power supply to be used. If in doubt, call your local power company.  
**SECOND:** Be sure the speaker is plugged into the socket on rear panel. Connection may now be made to the power line.  
 Connect antenna to terminal marked "A" on panel. If a doublet antenna is used, connections of the two leads should be made to terminals "A" and "D". The jumper wire between terminals "D" and "G" may be either removed or left on, depending on which connection gives the best results on all bands in your particular location or your particular antenna.  
 If a ground wire is used, in many cases it may improve performance; in others it will be unnecessary. If a ground is used in conjunction with doublet an-

tenna, in practically all cases, the jumper wire between "D" and "G" should be removed for best results.  
 To place in operation, set the front panel controls as follows:  
 Set crystal switch to "off" or center position.  
 Set phasing control at "1." It should always be left at this position when crystal is not in use.  
 Set communication switch to "receive" position (clockwise). Turn volume control to counter clockwise position.  
 Set band-change switch to number corresponding to number and frequency range on main dial face of band in which reception is desired.  
 Set manual control to extreme counter clockwise position. A distinct click will be heard as this control drops into the proper position.  
 Set beat oscillator switch to "off" position counter clockwise.  
 Set silencer switch to "off" position.  
 Set toggle switch, located on extreme right hand side of panel, with handle pointing up.

Next, turn tone control to extreme clockwise position, thus connecting the power to the receiver.  
 Receiver is now adjusted for normal broadcast, short wave broadcast, or voice reception with automatic volume control in action. Volume control may now be turned in clockwise direction to set volume at desired level.  
 Tuning of the broadcast band (1) will be best accomplished by use of the large center tuning control knob. The use of the handle on the large knob permits skipping from point to point on main dial with greatest ease. Accurate tuning is then accomplished by using the Vernier control. This control should always be used while tuning over small areas on any band either while searching for weak or distant stations or for tuning in stations of known frequency. Always tuning to exact center of carrier by tuning for the highest reading of "R" meter for a given station. Be sure at any change of the crystal setting to re-tune main dial owing to extreme selectivity.



**BAND COVERAGE**

BAND 1	550 KC to 1700 KC
BAND 2	1.7 MC to 5.5 MC
BAND 3	5.5 MC to 12 MC
BAND 4	11. MC to 22 MC
BAND 5	18. MC to 40 MC

**AVERAGE KC'S PER BAND SPREAD DEGREE**

BAND 1	3 KC
BAND 2	2.5 KC
BAND 3	5 KC
BAND 4	10 KC
BAND 5	20 KC

**AVERAGE IMAGE RATIO**

BAND 1	Above 6000 to 1
BAND 2	Above 3000 to 1
BAND 3	Above 2000 to 1
BAND 4	Above 1000 to 1
BAND 5	Above 600 to 1

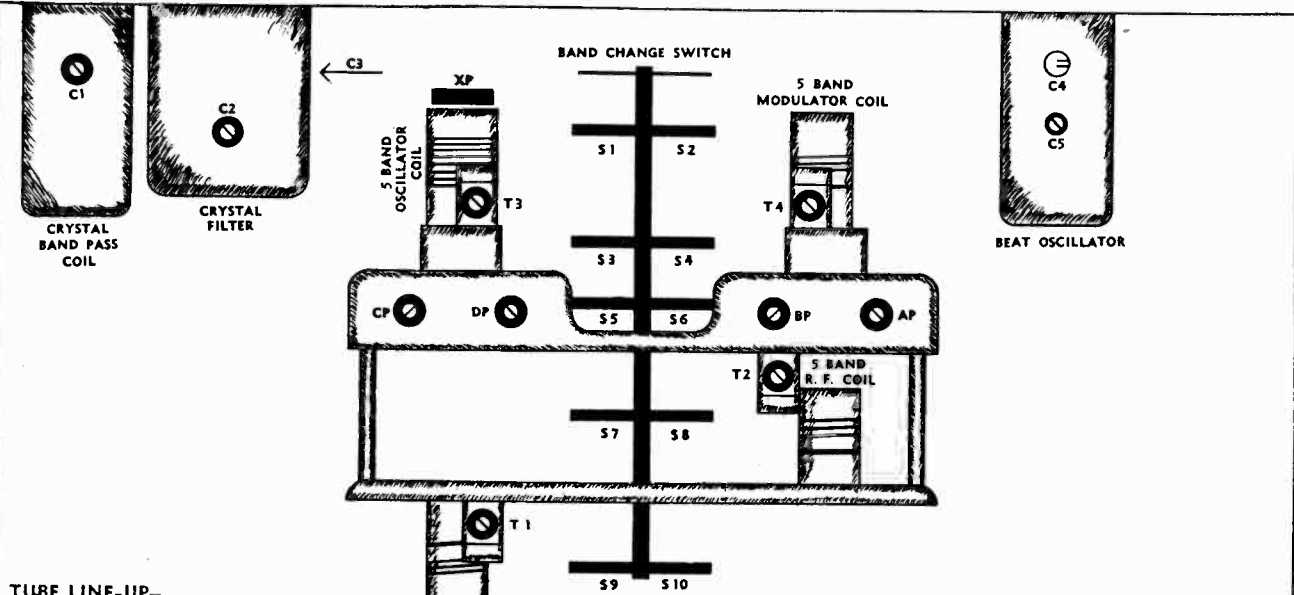
- PR-15 Models**
- PR-15-M
  - PR-15-R
  - PR-15-X
  - PR-15-C
  - PR-15-UH

IF PEAK 465 KC



MODELS PR15M, PR15R, PR15X  
PR15C, PR15UH  
Trimmers, Socket

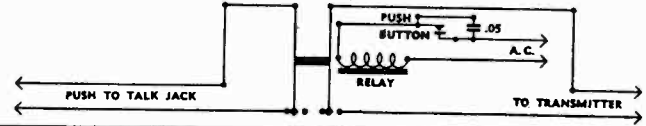
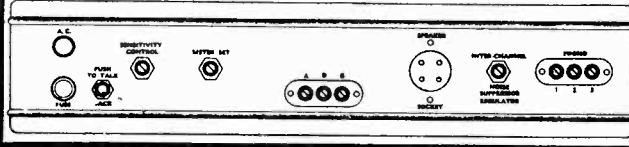
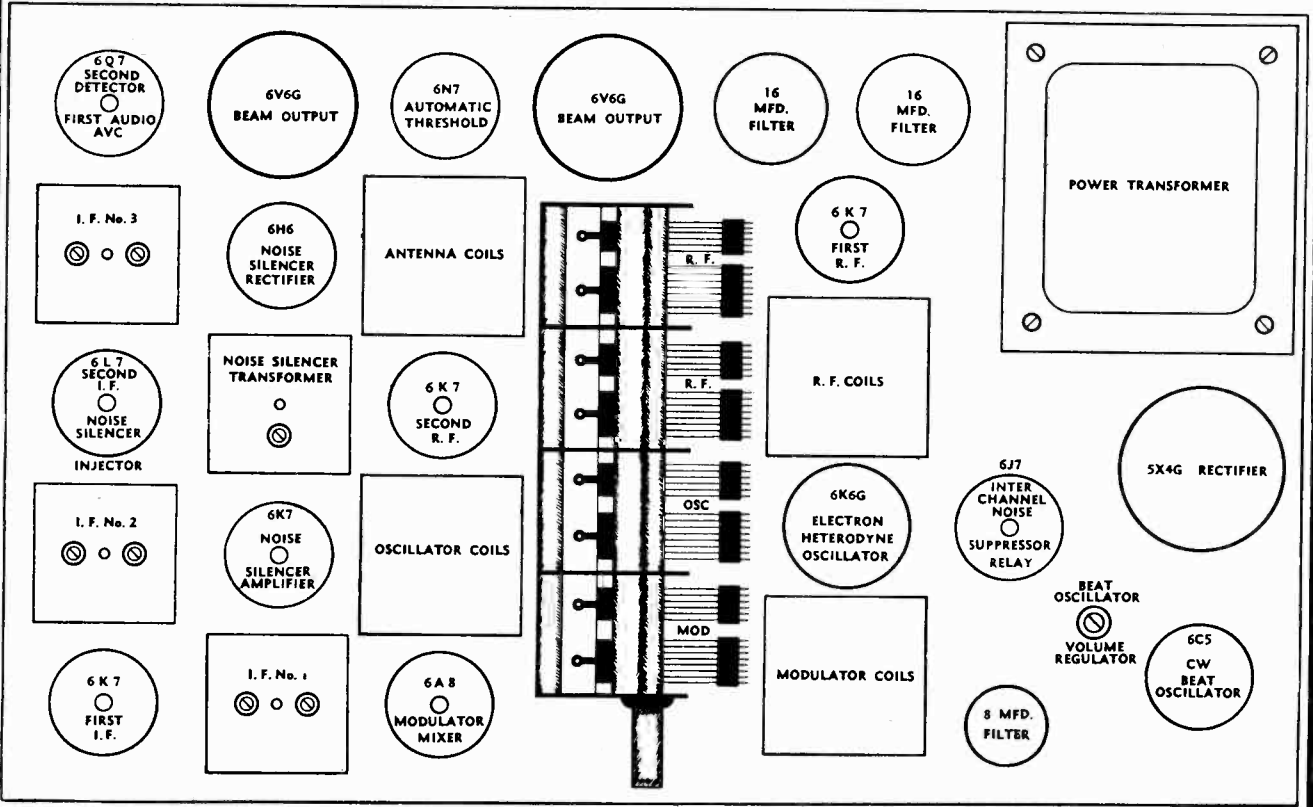
PIERSON-DELANE CO.



**TUBE LINE-UP-**

from antenna or input stage, is as follows:

- |  |  |
|--|--|
| 1—6K7 tube, first RF stage.                                | 8—6K7 tube, noise silencer amplifier.                      |
| 2—6K7 tube, second RF stage.                               | 9—6H6 tube, noise silencer rectifier.                      |
| 3—6A8 tube, modulator or mixer tube.                       | 10—6N7 tube, automatic threshold tube                      |
| 4—6K6G tube, electron heterodyne oscillator.               | 11—6V6G tube, output tube (push-pull)                      |
| 5—6K7 tube, 1st IF stage.                                  | 12—6V6G tube, output tube (push-pull)                      |
| 6—6L7 tube, 2nd IF stage and noise silencer injector tube. | 13—6J7 tube, inter-channel noise suppression or relay tube |
| 7—6Q7 tube, 2nd detector, AVC and 1st audio stage.         | 14—6C5 tube, CW beat oscillator tube.                      |
|  | 15—5X4G tube, rectifier tube.                              |



## PIERSON-DE LANE CO.

MODELS PR15M, PR15R, PR15X  
PR15C, PR15UH  
Alignment, Oscillograms  
Filter Data

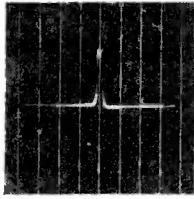


Fig. 1

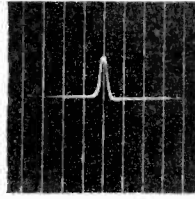


Fig. 2

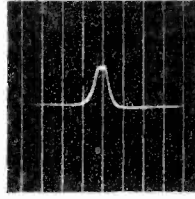


Fig. 3

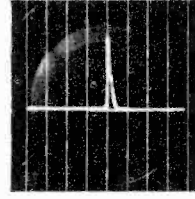


Fig. 4

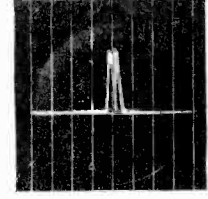


Fig. 5

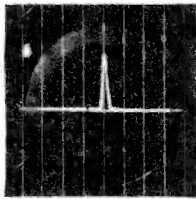


Fig. 6

**BAND PASS FILTER**—The band pass feature is equipped with variable selectivity control, which permits continuously variable band width from approximately 10 KC to 2 KC. Un-retouched oscillograms are shown above. Fig. 1 shows the minimum band width, while Figures 2 and 3 both show maximum band widths, but with different width screen sweep. The variable selectivity control permits setting of band width at any spot between these two points or widths; also the band pass feature has a rejection position, the oscillogram of which, is shown in Fig. 5. The vertical lines drawn over charts, except Fig. 3, indicate 10 KC per line. (On Fig. 3 the lines indicate 5 KC each to show flat top more plainly.) We highly recommend this filter to the phone man who must operate in the crowded amateur bands, and also to those DX'ers who require a high degree of selectivity plus high-fidelity. This type of filter also gives excellent single signal response for code work.

**CRYSTAL FILTER**—Two distinctly different types of crystal filters are built into the PR-15—one the **band pass type** intended primarily for use in phone work; the other the usual **series parallel** filter, which gives ideal performance for code work, but may also be used for phone reception.

**SERIES PARALLEL FILTER**—The series parallel filter is of the usual type with a high degree of efficiency. Fig. 4 shows the series position set at maximum selectivity. The selectivity shown may be decreased considerably by use of the phasing control. The Series Filter gives the ideal condition of noise reduction and selectivity for code reception. Fig. 5 and Fig. 6 show the selectivity when crystal is not in use.

**IF ALIGNMENT:**  
Place receiver in normal operation on broadcast band as described on schematic page. Tune in a signal of about R6 strength with crystal filter placed in series position, preferably main dial set near 12 or 1300 KC. Set phasing control at 1, then tune station, using vernier drive to exact resonance, as indicated on R meter. Then carefully go over trimmers on IF transformers #1, 2 and 3, adjusting for highest reading on R meter. Go over them several times carefully checking to see that main tuning dial remains on exact resonance. Next adjust trimmer C1 as indicated in block diagram #1 for exact resonance, carefully rechecking trimmers on IF #1 (block diagram #2). C-1 is actually selectivity control for the crystal filter.

With careful adjustment practically any degree of selectivity may be obtained without loss of gain.

The injector control is included in the receiver, as indicated in marked circle. The tuning of this adjustment in clockwise direction will increase beat oscillator strength and vice versa.

Low reading of your R meter is caused by misalignment or poor alignment of IF's.

Do not attempt to adjust the noise silencer until after the IF alignment has been checked.

#### PARALLEL FILTER INSTRUCTIONS:

The parallel filter position may be somewhat deceptive in that when it is first placed in operation there is no immediate apparent change.

It does not in any way affect the over-all selectivity nor does the phasing control have any apparent effect. However, for best operation it should be left at 1.

The crystal filter is intended for the separation or elimination of heterodyne where two carriers are involved. If more than two carriers are involved the series position should be used.

When two carriers are quite close together, producing a bad heterodyne, making either or both signals unreadable, it is quite possible to eliminate the heterodyne as well as either interfering station by placing the crystal switch to parallel position and tuning very, very slowly across the interfering frequencies.

Too much care cannot be used when tuning. As this is done two spots will be found in which one or the other of the interfering stations disappears almost completely; one spot for either station. However, a small amount of modulation hash may be still present from the average station.

MODELS PR15M, PR15R, PR15X  
PR15C, PR15UH

## PIERSON-DE LANE CO.

## Noise Suppressor Notes

ceases, with volume control about three fourths open (clockwise). If it is found the adjustment of this control does not seem effective, or does not quite remove all noise when adjusted to the extreme end, it will then be necessary to reduce sensitivity adjustment to the point where noise ceases. This should be necessary only in locations where the noise level is extremely high. Next turn off noise silencer. A small amount of noise should be heard with the noise silencer in off position. The receiver is now in proper adjustment for inter-channel noise suppression. It may be operated without noise silencer if desired. The receiver will now play any station which is above the normal noise level. However, the noise level varies from hour to hour and from day to day in some locations. It may be necessary to check over a period of them to determine the best adjustment, or if desired a few preliminary checks as indicated by R meter readings between stations may be made, noting the time and position on dial at which the noise level is highest, then making the original adjustment for this location. Any change of antenna or location will very probably necessitate rechecking all adjustments.

Inter-Channel noise suppression is intended for use only on the broadcast band or for air craft or police stand-by work. It will be found unsatisfactory for use in short wave broadcast reception due to the great amount of fading encountered in practically all short wave stations. (Do not attempt to use inter-channel noise suppression with the manual control beyond the "off" counter-clockwise position.) Failure to get results as indicated above may be caused either by a faulty 6J7 or 6J7 tubes. See chassis layout for position of these tubes as well as adjustments indicated above.

## MONITOR:

In placing the monitor in operation it should be borne in mind that it is no different than the usual monitor with which every amateur is familiar, consisting primarily of the usual signal rectifier and in the case of the PR-15 the addition of the audio amplifier. In handling diode rectifier for this purpose it is necessary to obtain the right amount of RF voltage input; too little produces no signal while too much may result in blocking of the rectifier. The amount of RF which may be fed into the receiver may vary greatly with different transmitter installations. While the circuit will ordinarily handle a wide variation in input voltage in many cases, the voltage may either be too small or far in excess of the necessary amount, consequently failure of the monitor can be caused only by one of two things, either too much RF or not enough RF. If the case is too much RF it can usually be readily determined by the R meter. If the quality is bad or no signal is heard at all the R meter may show a reading of anywhere from R1 to R9 plus plus when the transmitter is turned on. Inasmuch as the R meter reading is produced purely by rectified RF it is a direct indication.

If such is the case the operator should first look to his line filtering. It may be that a large quantity of RF is coming in on the AC line or that it is being directly picked up by the receiving antenna. A short direct ground wire should first be connected to chassis ground on receiver; if this fails to bring the R meter down it may then be necessary to disconnect or ground the receiving antenna while monitoring. If both of the above fail to bring the R meter down and produce good monitoring it may then be necessary to install a good line filter well grounded in the AC line to the receiver.

If no R meter reading is obtained when transmitter is turned on and no signal is heard it is probable that the case is too little RF. This will apply particularly to low powered transmitters. If such is the case it probably will be necessary to connect one end of a 25 or 30 microfarad condenser to either terminal numbers one or two of phone terminals on back chassis panel. The other end of the condenser should be connected to a small antenna. This may be only three or four feet long and should be just long enough to give good monitoring. In the case of a very low powered transmitter it may be necessary to run this lead close to the transmitting antenna lead-in or final plate tank to get sufficient pick-up.

## NOISE SILENCER ADJUSTMENT: PR 15 Communications Receiver.

Refer to the three noise silencer tubes on the chassis layout 6L6, 6L7, 6H7, and silencer transformer. Any one of these three tubes may be defective, which would cause poor silencer operation, or it may be that the adjustment screw in the top of the noise silencer transformer has been knocked out in shipping.

The following is instruction for its proper adjustment: On the top of this can are two screw heads. However, if you will note carefully, one of the screw heads is soldered over so that a screw driver cannot be inserted. This screw should be disregarded. The one in which the screw driver may be placed is the actual adjustment screw. In making adjustments on this screw be sure to use a solid bakelite screw driver, preferably one without even a metal point. To adjust, place hand switch on broadcast band, turn manual control to extreme counter-clockwise position to point which snaps to AVC. Next tune in a station whose strength does not exceed R6 on the meter, preferably one which registers around R6. The difficulties encountered in finding such a signal can be arrived at by using a very short antenna to control input. Next screw the adjustment screw mentioned above all the way down clockwise (do not force.) Next set the silencer switch to CW position, then very slowly unscrew the silencer adjustment screw (using bakelite screwdriver) until a point is reached where the quality of reception becomes very bad. Then throw silencer switch to phone position and continue to unscrew the silencer adjustment, a fraction of a turn at a time, to the point where quality becomes bad, then set screw back in just far enough to clear up quality. Next, watching the R meter, throw the silencer switch rapidly back and forth from off to phone position. The meter should show about one-fourth of an R drop when the silencer is thrown to phone position. This will complete the silencer adjustment.

Failure to get results as indicated above will undoubtedly indicate a faulty tube. In that case change the silencer tubes indicated on the chassis layout, one by one, rechecking adjustments after each tube has been changed.

The silencer amplifier, for proper operation, must be set at approximately 5 KC lower frequency than the IF channel frequency. Care should be exercised not to get the noise amplifier crossed over to the other side of the IF frequency as this would produce erratic operation.

In making all future adjustments be sure to screw the adjustment screw all the way down when starting, then back up slowly while adjusting to avoid the possibility of cross-over.

## INTER-CHANNEL NOISE SUPPRESSION:

To properly adjust inter-channel noise suppression for your particular antenna and location the following procedure should be followed carefully:

First: Place all controls in position for normal broadcast reception band switch on band 1, described in our operating instructions. Place silencer switch in tone position, being sure the manual control is in the extreme counter-clockwise position. Next tune slowly across the broadcast band, noting particularly the spot at which the R meter reads the highest between stations.

When this spot has been located, set the main tuning dial in this series at this point and leave in this position during the remainder of the adjustment.

Next place inter-channel noise switch to "on" position - down.

Next set sensitivity control adjustment to point of highest R meter reading (maximum) and then adjust inter-channel noise suppression adjustment to point where noise of speaker

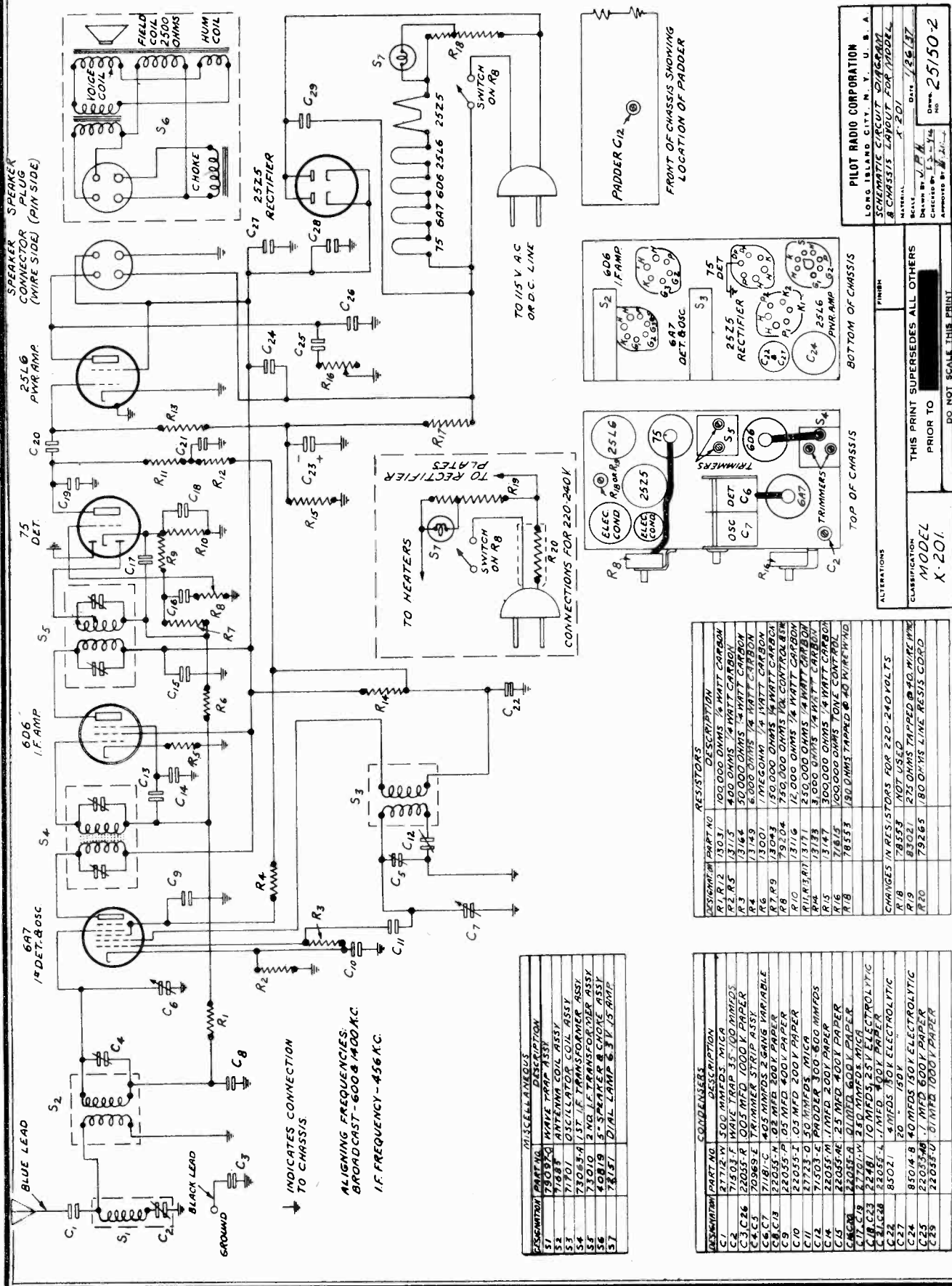






PILOT RADIO CORP.

MODEL X 201  
Schematic, Socket  
Trimmers, Chassis  
Parts



SPEAKER  
CONNECTOR  
(WIRE SIDE)

25L6  
PWR AMP

75  
DET.

6D6  
I.F. AMP

6A7  
1<sup>st</sup> DET. & OSC

VOICER  
COIL  
2500  
OHMS

HUM  
COIL

CHOK  
0.000

INDICATES CONNECTION  
TO CHASSIS

ALIGNING FREQUENCIES:  
BROADCAST-600 & 1400 KC.  
I.F. FREQUENCY-456 KC.

MISCELLANEOUS

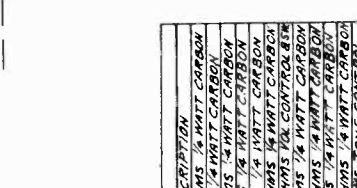
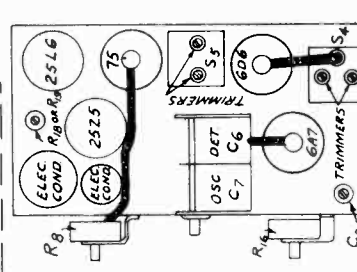
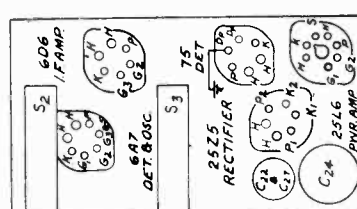
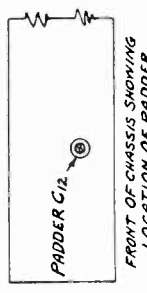
DESCRIPTION	PART NO.	DESCRIPTION
S1	7108-A	WAVE TRAP ASSY
S2	7108-B	ANTENNA COIL ASSY
S3	7170	OSCILLATOR COIL ASSY
S4	730-3-A	1ST I.F. TRANSFORMER ASSY
S5	730-10	2ND I.F. TRANSFORMER ASSY
S6	40819	5-SPEAKER & CHOK ASSY
S7	78137	DIAL LAMP & 3V. 15 AMP

RESISTORS

DESCRIPTION	PART NO.	DESCRIPTION
R1	130-3	100,000 OHMS 1/4 WATT CARBON
R2	131-3	400 OHMS 1/4 WATT CARBON
R3	131-6	50,000 OHMS 1/4 WATT CARBON
R4	131-9	6,000 OHMS 1/4 WATT CARBON
R5	130-1	1 MEG OHM 1/4 WATT CARBON
R6	130-3	150,000 OHMS 1/4 WATT CARBON
R7	752-4	750,000 OHMS 1/4 WATT CARBON
R8	131-6	12,000 OHMS 1/4 WATT CARBON
R9	131-9	25,000 OHMS 1/4 WATT CARBON
R10	131-7	300,000 OHMS 1/4 WATT CARBON
R11	131-4	100,000 OHMS 1/4 WATT CARBON
R12	131-5	180,000 OHMS 1/4 WATT CARBON
R13	78553	180 OHMS TAPPED @ 20 WIRE WIND

CONDENSERS

DESCRIPTION	PART NO.	DESCRIPTION
C1	217-20	500 MMFDS MICA
C2	7150-F	WAVE TRAP 35-100 MMFDS
C3	22055-R	0.05 MFD 1000 V PAPER
C4	70985-E	TRIMMER STRIP ASSY
C5	71781-C	405 MMFDS 2 GANG VARIABLE
C6	22055-P	0.02 MFD 200 V PAPER
C7	22055-Q	0.05 MFD 400 V PAPER
C8	22055-T	0.05 MFD 200 V PAPER
C9	22055-U	0.50 MMFDS 25 V ELECTROLYTIC
C10	22055-V	1.0 MFD 200 V PAPER
C11	22055-W	1.0 MFD 200 V PAPER
C12	22055-X	1.0 MFD 200 V PAPER
C13	22055-Y	1.0 MFD 200 V PAPER
C14	22055-Z	1.0 MFD 200 V PAPER
C15	22055-AA	1.0 MFD 200 V PAPER
C16	22055-AB	1.0 MFD 200 V PAPER
C17	22055-AC	1.0 MFD 200 V PAPER
C18	22055-AD	1.0 MFD 200 V PAPER
C19	22055-AE	1.0 MFD 200 V PAPER
C20	22055-AF	1.0 MFD 200 V PAPER
C21	22055-AG	1.0 MFD 200 V PAPER
C22	22055-AH	1.0 MFD 200 V PAPER
C23	22055-AI	1.0 MFD 200 V PAPER
C24	22055-AJ	1.0 MFD 200 V PAPER
C25	22055-AL	1.0 MFD 200 V PAPER
C26	22055-AM	1.0 MFD 200 V PAPER
C27	22055-AN	1.0 MFD 200 V PAPER
C28	22055-AO	1.0 MFD 200 V PAPER
C29	22055-AP	1.0 MFD 200 V PAPER



PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y. U. S. A.  
SCHEMATIC CIRCUIT DIAGRAM  
& CHASSIS LAYOUT FOR MODEL  
X-201  
SCALE: 1/8" = 1" DATE: 1/26/37  
DESIGNED BY: J. F. RIDER  
CHECKED BY: L. S. WILSON  
APPROVED BY: J. F. RIDER

ALTERNATIONS

FINISH

CLASSIFICATION  
MODEL  
X-201

THIS PRINT SUPERSEDES ALL OTHERS

PRIOR TO

DO NOT SCALE THIS PRINT

CHANGES IN RESISTORS FOR 220-240 VOLTS

RESISTOR	CHANGE
R8	78553 NOT USED
R9	83021 275 OHMS TAPPED @ 20 WIRE WIND
R20	79265 180 OHMS LINE RESISTOR

CHANGES IN CONDENSERS FOR 220-240 VOLTS

CONDENSER	CHANGE
C2	7150-F NOT USED
C3	22055-R NOT USED
C4	70985-E NOT USED
C5	22055-P NOT USED
C6	22055-Q NOT USED
C7	22055-T NOT USED
C8	22055-U NOT USED
C9	22055-V NOT USED
C10	22055-W NOT USED
C11	22055-X NOT USED
C12	22055-Y NOT USED
C13	22055-Z NOT USED
C14	22055-AA NOT USED
C15	22055-AB NOT USED
C16	22055-AC NOT USED
C17	22055-AD NOT USED
C18	22055-AE NOT USED
C19	22055-AF NOT USED
C20	22055-AG NOT USED
C21	22055-AH NOT USED
C22	22055-AI NOT USED
C23	22055-AJ NOT USED
C24	22055-AL NOT USED
C25	22055-AM NOT USED
C26	22055-AN NOT USED
C27	22055-AO NOT USED
C28	22055-AP NOT USED

## MODEL X 201

Voltage, Alignment

MODELS G352, G353

Voltage, Alignment

## PILOT RADIO CORP.

## MODEL X-201 SUPERHETERODYNE

Range: 176-557 Meters (1,710-538 kc.)

Line Voltage: 115-125 volts, A.C. or D.C.

Power Consumption: 45 watts.

Undistorted Power Output: 2 watt.

Intermediate Frequency: 456 kc.

Tube Functions: 6A7 electron emission control, oscillator-detector.

6D6 I.F. amplifier.

75 amplifier detector.

25L6 Class A power pentode.

25Z5 rectifier

Voltages: Read tube socket voltages with meter having resistance of at least 1,000 ohms per volt. All voltages measured to chassis.

Type	6A7	6D6	75	25L6	25Z5
Plate	100	100	—*	90	—
Cathode	3	3.8	1.	0	100
Screen	64	100	—	100	—
Heater	6.3	6.3	6.3	25	25

\*Voltage measured through plate resistor.

Speaker field voltage, 115 volts.

Anode grid of 6A7, 85 volts.

**REALIGNMENT:** Should the receiver require realignment, the procedure outlined below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the speaker.

**I. F. ALIGNMENT:** When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I.F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I.F. alignment capacitors are located at the top of the shielded I.F. Transformers. Rotate the adjusting screw of each capacitor on I.F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6D6 I.F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I.F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I.F. Amplifier, it is essential to repeat the alignment process in both I.F. units with the external oscillator leads connected across the control grid of the 6A7 tube.

**WAVE TRAP ADJUSTMENT:** With the oscillator still set at 456 kc., connect the oscillator to the antenna through a 200 mmfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

**BROADCAST ALIGNMENT:** After the wave trap is adjusted, place the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the detector trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

Connect the blue wire at the rear of the chassis to your antenna and the black wire to the ground. If you are not experienced in erecting antennas, we strongly advise having this done by your radio service man. If you use an ordinary single-wire antenna, put up a single wire 50 to 100 ft. long, and as high above surrounding objects as possible, bringing a lead from the nearer end down to your set. For best reception, however, use a Pilot DX10 Antenna.

## MODEL G-352 SUPERHETERODYNE

Range: 16-52 Meters (18,800-5,700 kc.)

178-550 Meters (1,680-545 kc.)

## MODEL G-353 SUPERHETERODYNE

Range: 178-550 Meters (1,680-545 kc.)

789-2,142 Meters (380-140 kc.)

(Available for sale outside of North America)

Line Voltage: 115-125 volts, A.C. or D.C.

Power Consumption: 45 watts.

Undistorted Power Output: 2 watt.

Intermediate Frequency: 456 kc.

Tube Functions: 6A7 electron emission control, oscillator-detector.

6D6 I.F. amplifier.

75 amplifier detector.

25L6 Class A power pentode.

25Z5 rectifier

Voltages: Read tube socket voltages with meter having resistance of at least 1,000 ohms per volt. All voltages measured to chassis.

Type	6A7	6D6	75	25L6	25Z5
Plate	100	100	—*	90	—
Cathode	3	3.8	1.	0	100
Screen	64	100	—	100	—
Heater	6.3	6.3	6.3	25	25

\*Voltage measured through plate resistor.

Speaker field voltage, 115 volts.

Anode grid of 6A7, 85 volts.

**REALIGNMENT:** Should the receiver require realignment, the outlined procedure below should be followed. In the service information sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the speaker.

**I. F. ALIGNMENT:** When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6D6 tube in the I.F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I.F. alignment capacitors are located at the top of the shielded I.F. Transformers. Rotate the adjusting screw of each capacitor on I.F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator leads from the type 6D6 I.F. Amplifier tube and connect it in the same manner to the control grid at the top of the type 6A7 tube.

Now rotate each adjustment screw on I.F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I.F. Amplifier, it is essential to repeat the alignment process in both I.F. units with the external oscillator leads connected across the control grid of the 6A7 tube.

**WAVE TRAP ADJUSTMENT:** With the oscillator still set at 456 kc., connect the oscillator to the antenna through a 200 mmfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

**BROADCAST ALIGNMENT:** After the I.F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads with a .0002 mfd. condenser in the antenna lead. Set the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1400 kc. mark. Adjust the broadcast band oscillator trimmer to maximum response. Adjust the signal section trimmer in the same manner.

Next adjust the 600 kc. padder condenser. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1400 kc. trimmer adjustment, following in every detail the procedure previously described.

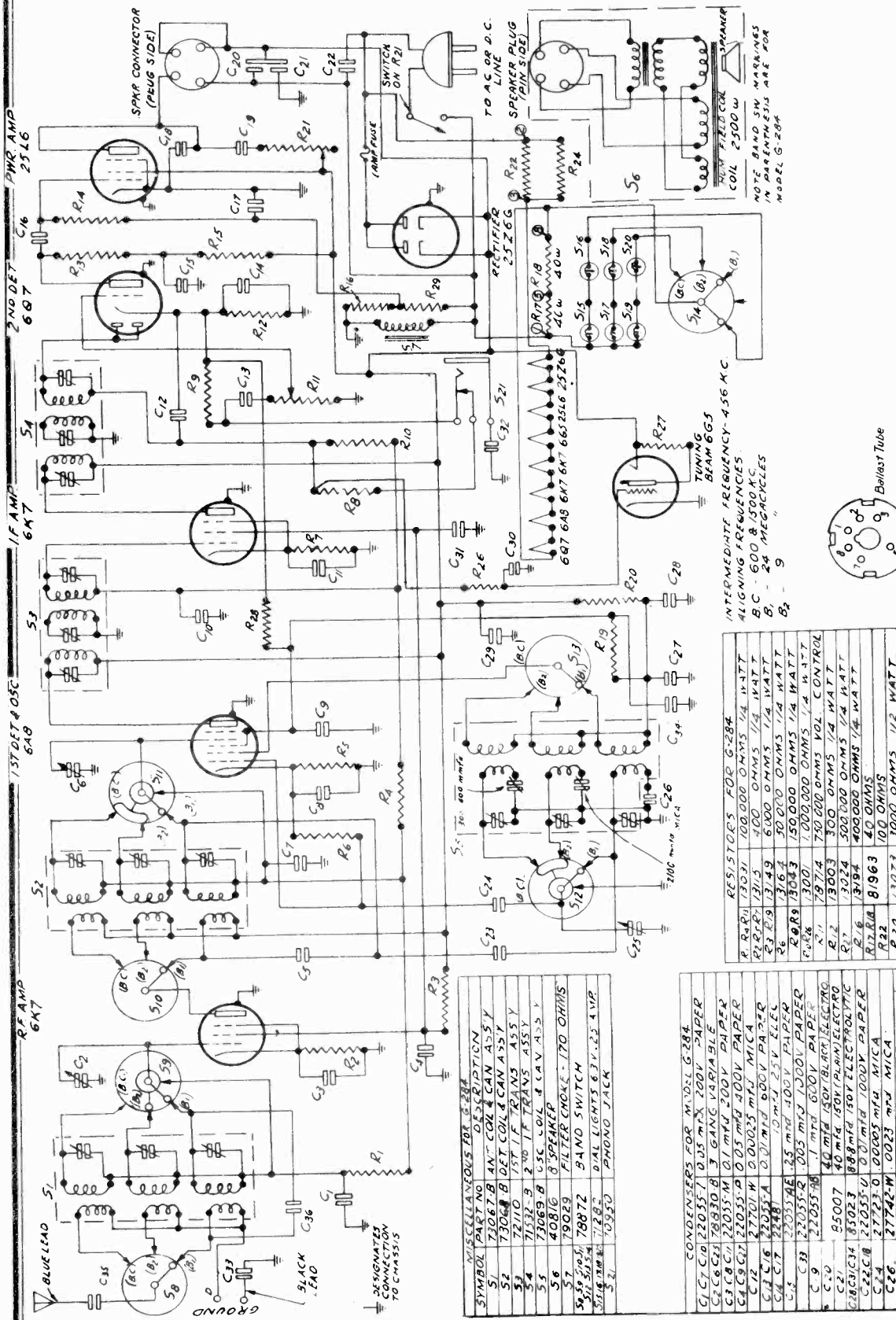
**SHORT-WAVE ALIGNMENT:** The procedure in aligning the short-wave bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. The alignment frequency is 16.8 Meters—(17,800 kc.) Turn the Band Switch to the right. Tune the external oscillator to 16.8 meters. Tune the receiver so that the dial pointer is in a position coincidental with the 16.8 meter indication on the dial scale. Adjust the short wave oscillator trimmer for maximum response. Next adjust the signal circuit trimmer for maximum resonance. Repeat all adjustments to assure correct alignment, rocking the gang condenser to right or left for maximum gain.

**THE LONG WAVE ALIGNMENT:** Procedure in the Model is similar to the Broadcast section of that receiver. Align at 875 kc. Adjust the padder at 160 kc.

Should it be necessary to remove the band switch assembly, it is advisable to realign the receiver after reinstalling.

PILOT RADIO CORP.

MODEL G 284  
Schematic, Parts



INTERMEDIATE FREQUENCY-456 KC  
ALIGNING FREQUENCIES:  
A.C. - 600 & 1500 KC.  
B. - 24 MEGACYCLES  
B<sub>1</sub> - 9



Ballast Tube  
PART # 81963 (BOTTOM)  
NOTE: FIGURES IN CIRCLES REFER TO PIN #.

RESISTORS FOR G-284

R 1	100K	100,000 OHMS 1/4 WATT
R 2	100K	100,000 OHMS 1/4 WATT
R 3	100K	100,000 OHMS 1/4 WATT
R 4	100K	100,000 OHMS 1/4 WATT
R 5	100K	100,000 OHMS 1/4 WATT
R 6	100K	100,000 OHMS 1/4 WATT
R 7	100K	100,000 OHMS 1/4 WATT
R 8	100K	100,000 OHMS 1/4 WATT
R 9	100K	100,000 OHMS 1/4 WATT
R 10	100K	100,000 OHMS 1/4 WATT
R 11	100K	100,000 OHMS 1/4 WATT
R 12	100K	100,000 OHMS 1/4 WATT
R 13	100K	100,000 OHMS 1/4 WATT
R 14	100K	100,000 OHMS 1/4 WATT
R 15	100K	100,000 OHMS 1/4 WATT
R 16	100K	100,000 OHMS 1/4 WATT
R 17	100K	100,000 OHMS 1/4 WATT
R 18	100K	100,000 OHMS 1/4 WATT
R 19	100K	100,000 OHMS 1/4 WATT
R 20	100K	100,000 OHMS 1/4 WATT
R 21	100K	100,000 OHMS 1/4 WATT
R 22	100K	100,000 OHMS 1/4 WATT
R 23	100K	100,000 OHMS 1/4 WATT
R 24	100K	100,000 OHMS 1/4 WATT
R 25	100K	100,000 OHMS 1/4 WATT
R 26	100K	100,000 OHMS 1/4 WATT
R 27	100K	100,000 OHMS 1/4 WATT
R 28	100K	100,000 OHMS 1/4 WATT
R 29	100K	100,000 OHMS 1/4 WATT
R 30	100K	100,000 OHMS 1/4 WATT
R 31	100K	100,000 OHMS 1/4 WATT
R 32	100K	100,000 OHMS 1/4 WATT
R 33	100K	100,000 OHMS 1/4 WATT
R 34	100K	100,000 OHMS 1/4 WATT
R 35	100K	100,000 OHMS 1/4 WATT
R 36	100K	100,000 OHMS 1/4 WATT
R 37	100K	100,000 OHMS 1/4 WATT
R 38	100K	100,000 OHMS 1/4 WATT
R 39	100K	100,000 OHMS 1/4 WATT
R 40	100K	100,000 OHMS 1/4 WATT
R 41	100K	100,000 OHMS 1/4 WATT
R 42	100K	100,000 OHMS 1/4 WATT
R 43	100K	100,000 OHMS 1/4 WATT
R 44	100K	100,000 OHMS 1/4 WATT
R 45	100K	100,000 OHMS 1/4 WATT
R 46	100K	100,000 OHMS 1/4 WATT
R 47	100K	100,000 OHMS 1/4 WATT
R 48	100K	100,000 OHMS 1/4 WATT
R 49	100K	100,000 OHMS 1/4 WATT
R 50	100K	100,000 OHMS 1/4 WATT

MISCELLANEOUS FOR G-284

S 1	100K	100,000 OHMS 1/4 WATT
S 2	100K	100,000 OHMS 1/4 WATT
S 3	100K	100,000 OHMS 1/4 WATT
S 4	100K	100,000 OHMS 1/4 WATT
S 5	100K	100,000 OHMS 1/4 WATT
S 6	100K	100,000 OHMS 1/4 WATT
S 7	100K	100,000 OHMS 1/4 WATT
S 8	100K	100,000 OHMS 1/4 WATT
S 9	100K	100,000 OHMS 1/4 WATT
S 10	100K	100,000 OHMS 1/4 WATT
S 11	100K	100,000 OHMS 1/4 WATT
S 12	100K	100,000 OHMS 1/4 WATT
S 13	100K	100,000 OHMS 1/4 WATT
S 14	100K	100,000 OHMS 1/4 WATT
S 15	100K	100,000 OHMS 1/4 WATT
S 16	100K	100,000 OHMS 1/4 WATT
S 17	100K	100,000 OHMS 1/4 WATT
S 18	100K	100,000 OHMS 1/4 WATT
S 19	100K	100,000 OHMS 1/4 WATT
S 20	100K	100,000 OHMS 1/4 WATT
S 21	100K	100,000 OHMS 1/4 WATT
S 22	100K	100,000 OHMS 1/4 WATT
S 23	100K	100,000 OHMS 1/4 WATT
S 24	100K	100,000 OHMS 1/4 WATT
S 25	100K	100,000 OHMS 1/4 WATT
S 26	100K	100,000 OHMS 1/4 WATT
S 27	100K	100,000 OHMS 1/4 WATT
S 28	100K	100,000 OHMS 1/4 WATT
S 29	100K	100,000 OHMS 1/4 WATT
S 30	100K	100,000 OHMS 1/4 WATT
S 31	100K	100,000 OHMS 1/4 WATT
S 32	100K	100,000 OHMS 1/4 WATT
S 33	100K	100,000 OHMS 1/4 WATT
S 34	100K	100,000 OHMS 1/4 WATT
S 35	100K	100,000 OHMS 1/4 WATT
S 36	100K	100,000 OHMS 1/4 WATT
S 37	100K	100,000 OHMS 1/4 WATT
S 38	100K	100,000 OHMS 1/4 WATT
S 39	100K	100,000 OHMS 1/4 WATT
S 40	100K	100,000 OHMS 1/4 WATT

CONDENSERS FOR MODEL G-284

C 1	100K	100,000 OHMS 1/4 WATT
C 2	100K	100,000 OHMS 1/4 WATT
C 3	100K	100,000 OHMS 1/4 WATT
C 4	100K	100,000 OHMS 1/4 WATT
C 5	100K	100,000 OHMS 1/4 WATT
C 6	100K	100,000 OHMS 1/4 WATT
C 7	100K	100,000 OHMS 1/4 WATT
C 8	100K	100,000 OHMS 1/4 WATT
C 9	100K	100,000 OHMS 1/4 WATT
C 10	100K	100,000 OHMS 1/4 WATT
C 11	100K	100,000 OHMS 1/4 WATT
C 12	100K	100,000 OHMS 1/4 WATT
C 13	100K	100,000 OHMS 1/4 WATT
C 14	100K	100,000 OHMS 1/4 WATT
C 15	100K	100,000 OHMS 1/4 WATT
C 16	100K	100,000 OHMS 1/4 WATT
C 17	100K	100,000 OHMS 1/4 WATT
C 18	100K	100,000 OHMS 1/4 WATT
C 19	100K	100,000 OHMS 1/4 WATT
C 20	100K	100,000 OHMS 1/4 WATT
C 21	100K	100,000 OHMS 1/4 WATT
C 22	100K	100,000 OHMS 1/4 WATT
C 23	100K	100,000 OHMS 1/4 WATT
C 24	100K	100,000 OHMS 1/4 WATT
C 25	100K	100,000 OHMS 1/4 WATT
C 26	100K	100,000 OHMS 1/4 WATT
C 27	100K	100,000 OHMS 1/4 WATT
C 28	100K	100,000 OHMS 1/4 WATT
C 29	100K	100,000 OHMS 1/4 WATT
C 30	100K	100,000 OHMS 1/4 WATT
C 31	100K	100,000 OHMS 1/4 WATT
C 32	100K	100,000 OHMS 1/4 WATT
C 33	100K	100,000 OHMS 1/4 WATT
C 34	100K	100,000 OHMS 1/4 WATT
C 35	100K	100,000 OHMS 1/4 WATT
C 36	100K	100,000 OHMS 1/4 WATT
C 37	100K	100,000 OHMS 1/4 WATT
C 38	100K	100,000 OHMS 1/4 WATT
C 39	100K	100,000 OHMS 1/4 WATT
C 40	100K	100,000 OHMS 1/4 WATT

PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y. U. S. A.  
SCHEMATIC CIRCUIT  
2-403-107 FOR MODEL G-284

CLASSIFICATION  
MODEL  
G-284

THIS PRINT SUPERSEDES ALL OTHERS  
PRIOR TO  
DO NOT SCALE THIS PRINT

DATE: 4/29/37  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]  
PART NO. 25163



MODEL G 284

Alignment

Notes

## PILOT RADIO CO.

## Tranex AC-DC Model G-284, for 110-125 V. (50-60 Cycles)

**Three tuning bands covering 12-94 m. (25,000-3,200 kc.) and 187-560 m. (1,600-535 kc.)**

**REMOVAL OF CHASSIS FROM CABINET:**

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.

Remove the speaker plug from its socket.

Remove the four mounting screws, located underneath the cabinet.

Remove the tuning beam plug from the socket at the front of the chassis.

**REALIGNMENT:** Should the receiver require re-alignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

**Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.**

The R. F. alignment trimmer condensers are mounted on the side of the coil shields.

**I. F. ALIGNMENT:** When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the "antenna" lead of the external oscillator to the control grid of the type 6K7 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the "ground" lead of the external oscillator to the receiver ground lead. The I. F. alignment capacitors are located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

**CAUTION:** When making repairs on the receiver, use only **ROSIN CORE SOLDER**. NEVER USE **SOLDERING PASTE OR ACID FLUXES OF ANY TYPE**.

**BROADCAST ALIGNMENT:** After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mmf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located on the top of the oscillator coil. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

**ALIGNMENT OF THE SHORT WAVE-BANDS:—**

The procedure in aligning the short wave-bands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. Insert a 400 ohm non-inductive resistor in series with the antenna lead. The alignment frequencies are as follows:

Band 2: 31.6 Meters—( 9,500 kc.)

Band 1: 12.5 Meters—(24,000 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Band 2". Set the tuning control pointer at 9,500 kc. meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

To align Band 1, set the Band Selector Switch in the position marked "Band 1". Set the tuning control pointer at the 24,000 kc. meter mark. Set the external oscillator at 24,000 kc. meters. Adjust the oscillator section alignment capacitor on Band 1 for maximum output.

Proceed next to align the interstage section of Band 1. In doing this, it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak. Next align the antenna section for maximum sensitivity.

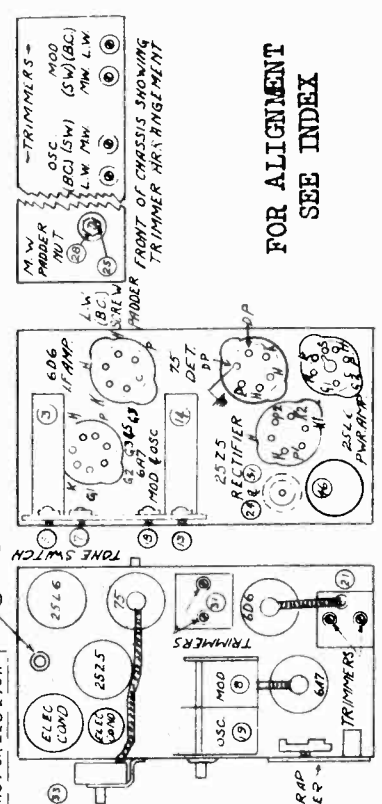
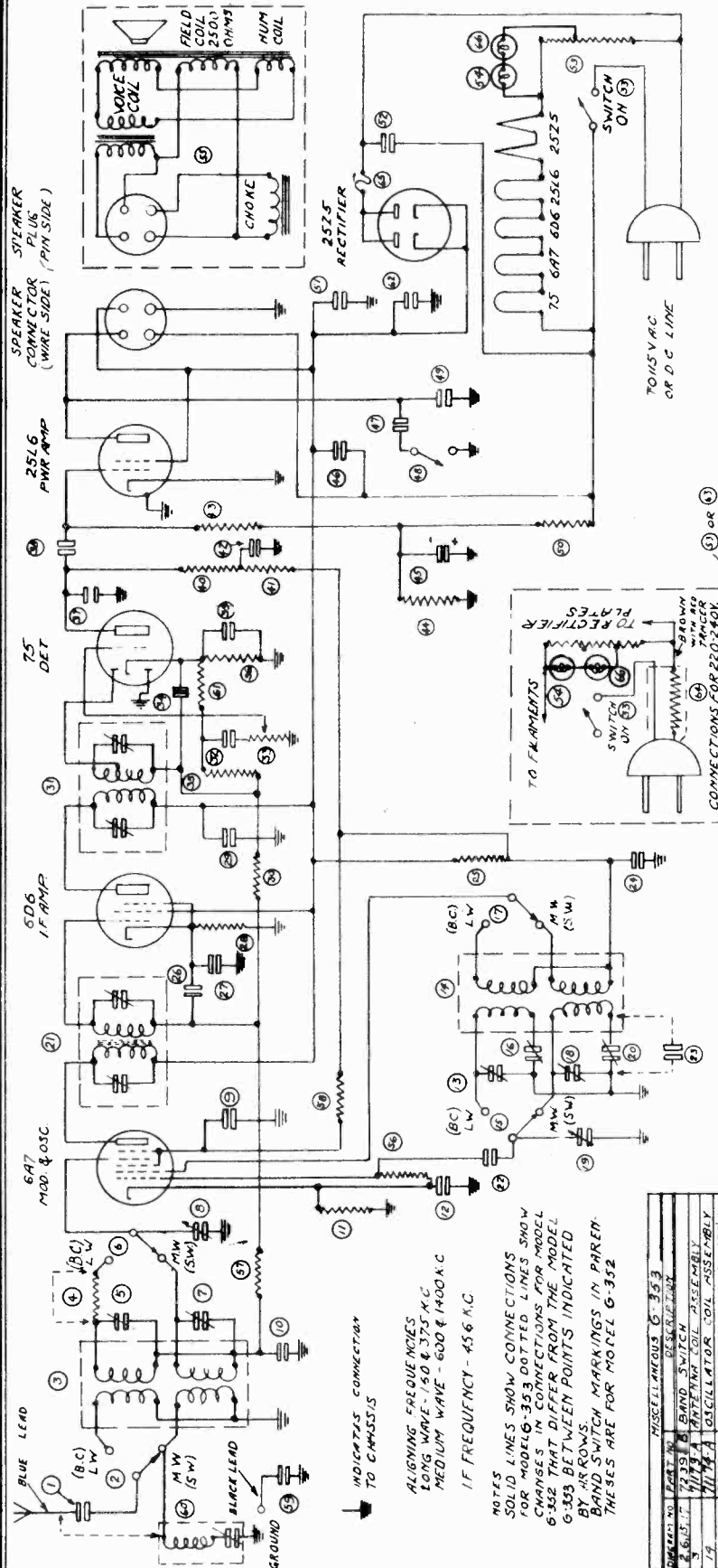
**ANTENNA**

If you use an ordinary single-wire antenna, connect the antenna to the blue lead on the set. Connect both the black and yellow leads to the ground, or connect the yellow lead to the ground and leave the black lead free—which ever gives better reception.

**PHONOGRAPH PICK-UP:** A jack is provided at the rear of the chassis for plugging in an electric phonograph pick-up, in order that records can be reproduced by the loudspeaker, through the high-quality amplifier with which this set is equipped. The pick-up should be of the high-impedance type.

PILOT RADIO CORP.

MODELS G352, G353  
Schematic, Socket  
Trimmers, Parts



FOR ALIGNMENT  
SEE INDEX

PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y., U. S. A.  
SCHEMATIC CIRCUIT DRAWING  
& CHASSIS LAYOUT FOR MODEL G-352  
MATERIAL AND MODEL G-353  
DATE 6-10-37  
Checked by: A.  
Drawn by: B.  
Amount of Stock: 4  
Part No. 25/68

RESISTORS G-353

1	15080	50 OHMS	1/4 WATT
2	18168	50,000 OHMS	1/4 WATT
3	18000	18000	1/4 WATT
4	40340	40,340	1/4 WATT
5	1817	850,000 OHMS	1/4 WATT
6	1817	300,000 OHMS	1/4 WATT
7	1817	300,000 OHMS	1/4 WATT
8	3153	300,000 OHMS	1/4 WATT
9	3153	300,000 OHMS	1/4 WATT
10	3153	300,000 OHMS	1/4 WATT
11	1503	40,000 OHMS	1/4 WATT
12	1503	40,000 OHMS	1/4 WATT
13	1503	40,000 OHMS	1/4 WATT
14	1503	40,000 OHMS	1/4 WATT
15	1503	40,000 OHMS	1/4 WATT
16	1503	40,000 OHMS	1/4 WATT
17	1503	40,000 OHMS	1/4 WATT
18	1503	40,000 OHMS	1/4 WATT
19	1503	40,000 OHMS	1/4 WATT
20	1503	40,000 OHMS	1/4 WATT
21	1503	40,000 OHMS	1/4 WATT
22	1503	40,000 OHMS	1/4 WATT
23	1503	40,000 OHMS	1/4 WATT
24	1503	40,000 OHMS	1/4 WATT
25	1503	40,000 OHMS	1/4 WATT
26	1503	40,000 OHMS	1/4 WATT
27	1503	40,000 OHMS	1/4 WATT
28	1503	40,000 OHMS	1/4 WATT
29	1503	40,000 OHMS	1/4 WATT
30	1503	40,000 OHMS	1/4 WATT
31	1503	40,000 OHMS	1/4 WATT
32	1503	40,000 OHMS	1/4 WATT
33	1503	40,000 OHMS	1/4 WATT
34	1503	40,000 OHMS	1/4 WATT
35	1503	40,000 OHMS	1/4 WATT
36	1503	40,000 OHMS	1/4 WATT
37	1503	40,000 OHMS	1/4 WATT
38	1503	40,000 OHMS	1/4 WATT
39	1503	40,000 OHMS	1/4 WATT
40	1503	40,000 OHMS	1/4 WATT
41	1503	40,000 OHMS	1/4 WATT
42	1503	40,000 OHMS	1/4 WATT
43	1503	40,000 OHMS	1/4 WATT
44	1503	40,000 OHMS	1/4 WATT
45	1503	40,000 OHMS	1/4 WATT
46	1503	40,000 OHMS	1/4 WATT
47	1503	40,000 OHMS	1/4 WATT
48	1503	40,000 OHMS	1/4 WATT
49	1503	40,000 OHMS	1/4 WATT
50	1503	40,000 OHMS	1/4 WATT

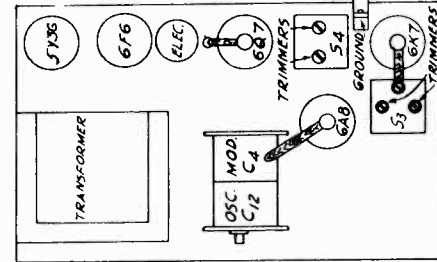
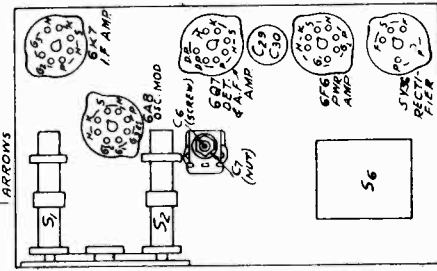
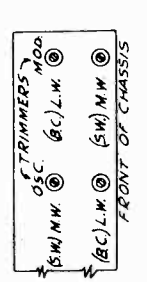
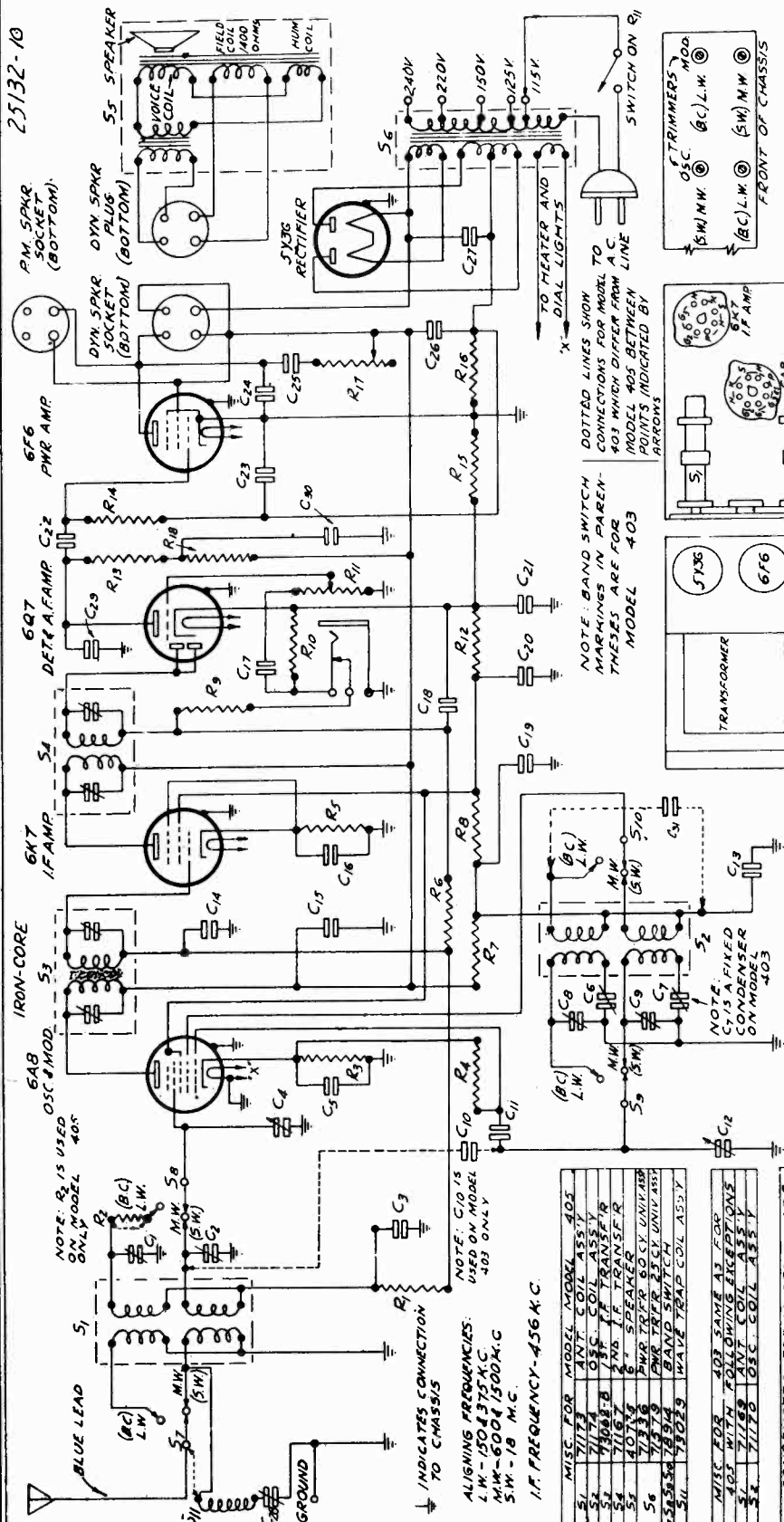
NOTES  
SOLID LINES SHOW CONNECTIONS  
FOR MODEL G-353 DOTTED LINES SHOW  
CHANGES IN CONNECTIONS FOR MODEL  
G-352 THAT DIFFER FROM THE MODEL  
G-353 BETWEEN POINTS INDICATED  
BY ARROWS.  
BAND SWITCH MARKINGS IN PAREN-  
THESES ARE FOR MODEL G-352

MISCELLANEOUS G-353

1	300	300	300
2	300	300	300
3	300	300	300
4	300	300	300
5	300	300	300
6	300	300	300
7	300	300	300
8	300	300	300
9	300	300	300
10	300	300	300
11	300	300	300
12	300	300	300
13	300	300	300
14	300	300	300
15	300	300	300
16	300	300	300
17	300	300	300
18	300	300	300
19	300	300	300
20	300	300	300
21	300	300	300
22	300	300	300
23	300	300	300
24	300	300	300
25	300	300	300
26	300	300	300
27	300	300	300
28	300	300	300
29	300	300	300
30	300	300	300
31	300	300	300
32	300	300	300
33	300	300	300
34	300	300	300
35	300	300	300
36	300	300	300
37	300	300	300
38	300	300	300
39	300	300	300
40	300	300	300
41	300	300	300
42	300	300	300
43	300	300	300
44	300	300	300
45	300	300	300
46	300	300	300
47	300	300	300
48	300	300	300
49	300	300	300
50	300	300	300

MODELS 403, 405  
Schematic, Socket  
Trimmers, Parts

PILOT RADIO CORP.



RESISTORS FOR MODEL 403

R1	100K	1/2 WATT
R2	100K	1/2 WATT
R3	100K	1/2 WATT
R4	100K	1/2 WATT
R5	100K	1/2 WATT
R6	100K	1/2 WATT
R7	100K	1/2 WATT
R8	100K	1/2 WATT
R9	100K	1/2 WATT
R10	100K	1/2 WATT
R11	100K	1/2 WATT
R12	100K	1/2 WATT
R13	100K	1/2 WATT
R14	100K	1/2 WATT
R15	100K	1/2 WATT
R16	100K	1/2 WATT
R17	100K	1/2 WATT
R18	100K	1/2 WATT

MISC. FOR MODEL 403

S1	OSC MOD
S2	IF AMP
S3	DETRAFAMP
S4	PMR AMP
S5	RECTIFIER
S6	HEATER AND DIAL LIGHTS

CONDENSERS FOR MODEL 403

C1	OSC MOD
C2	IF AMP
C3	DETRAFAMP
C4	PMR AMP
C5	RECTIFIER
C6	HEATER AND DIAL LIGHTS

CONDENSERS FOR MODEL 405

C1	OSC MOD
C2	IF AMP
C3	DETRAFAMP
C4	PMR AMP
C5	RECTIFIER
C6	HEATER AND DIAL LIGHTS

25132-10

PM SPKR SOCKET (BOTTOM)

DYN SPKR SOCKET (BOTTOM)

6F6 PMR AMP

6Q7 DETRAFAMP

6K7 IF AMP

6AB OSC MOD

IRON-CORE

5S SPEAKER

5Y3G RECTIFIER

TO HEATER AND DIAL LIGHTS

SWITCH ON S1

TRIMMERS MOD

FRONT OF CHASSIS

PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y., U. S. A.  
SCHEMATIC CIRCUIT DIAGRAM  
CHASSIS LAYOUT FOR  
MODELS 403 & 405  
Scale: 1/8" = 1"

ALTERNATIONS: MODEL 403...  
MODEL 405...  
THIS PRINT SUPERSEDES ALL OTHERS  
CUMMUNICATION  
400  
JEARLES  
DO NOT SCALE THIS PRINT

RESISTORS FOR MODEL 403  
FOR 405 WITH FOLLOWING EXCEPTIONS  
R1 100K  
R2 100K  
R3 100K  
R4 100K  
R5 100K  
R6 100K  
R7 100K  
R8 100K  
R9 100K  
R10 100K  
R11 100K  
R12 100K  
R13 100K  
R14 100K  
R15 100K  
R16 100K  
R17 100K  
R18 100K

CONDENSERS FOR MODEL 403  
FOR 405 WITH FOLLOWING EXCEPTIONS  
C1 100K  
C2 100K  
C3 100K  
C4 100K  
C5 100K  
C6 100K  
C7 100K  
C8 100K  
C9 100K  
C10 100K  
C11 100K  
C12 100K  
C13 100K  
C14 100K  
C15 100K  
C16 100K  
C17 100K  
C18 100K  
C19 100K  
C20 100K  
C21 100K  
C22 100K  
C23 100K  
C24 100K  
C25 100K  
C26 100K  
C27 100K  
C28 100K  
C29 100K  
C30 100K

FOR ALIGNMENT  
SEE INDEX



MODELS 403,405  
Voltage, Alignment  
MODELS 423,425  
Alignment

PILOT RADIO CORP.

Range, Model 425

16 - 555 m. (18,800 - 540 kc)  
731 - 2140 m. (410 - 140 kc.)

(MODEL 425 IS SOLD OUTSIDE THE U. S. A. ONLY)

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located on the top of the chassis coil. Set the external oscillator at 600 kc. Rotate the receiver tuning control until resonance is indicated. Then rock the tuning control back and forth about this resonance position, and at the same time adjust the padder condenser for the highest resonance peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

**ALIGNMENT OF THE SHORT WAVE BANDS**—The procedure in aligning the short wavebands is identical with that for the broadcast with the exception of the adjustment of the padder condenser. Insert a 400 ohm non-inductive resistor in series with the antenna lead. The alignment frequencies are as follows:

Band 2: 70 Meters—(6,000 kc.)  
Band 1: 16.6 Meters—(18,000 kc.)

When aligning Band 2, set the Band Selector Switch in the position marked "Bd 2". Set the external oscillator at 30 meters. Adjust the oscillator alignment capacitor on Band 2 for maximum output. Next adjust the interstage and antenna section alignment capacitors for maximum output.

To align Band 1, set the Band Selector Switch in the position marked "Bd 1". Set the external oscillator at the 16.6 meter mark. Set the external oscillator at 16.6 meters. Adjust the oscillator section alignment capacitor on Band 1 for maximum output. Proceed next to align the interstage section of Band 1. In doing this, it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak. Next align the antenna section for maximum sensitivity.

LONG WAVE MODEL 425

The above alignment positions refer to the Model 423 only, which is calibrated in frequency. The alignment positions for the Model 425, which is calibrated in meters only, is as follows:

Long Wave Align at 710 meters  
Fid at 2,000 meters.  
Broadcast Align at 900 meters.  
Band 1 Align at 17 meters.

The Long Wave alignment procedure is similar to that for the Broadcast. A 200 mmf. condenser should be used in series with the antenna lead in aligning this band.

**CAUTION:** When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

Range, Model 423

16 - 555 m. (18,800 - 540 kc)

(MODEL 423 IS SOLD OUTSIDE THE U. S. A. ONLY)

Remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the "slip-on" knobs and felt washers from the controls and loosen the set screw on the tuning knob.

Remove the speaker plug from the cable socket.

Remove the four mounting screws, located underneath the cabinet.

**REALIGNMENT:** Should the receiver require realignment, the procedure outlined below should be followed. For best results an external modulated oscillator with adequate frequency range, and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket.

The R. F. alignment trimmer condensers are mounted on the side of the R. F. shield.

**I. F. ALIGNMENT:** When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Selector Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. Connect the antenna lead of the external oscillator to the control grid of the type 6K7 tube in the I. F. Amplifier stage through a .1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the ground lead. The I. F. alignment trimmer is located at the side of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. On completion of this operation, remove the external oscillator lead from the type 6K7 I. F. amplifier tube and connect it in the same manner to the control grid at the top of the type 6A8 tube.

Now rotate each adjustment screw on I. F. Unit No. 1 for maximum output. During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in both I. F. Units.

**BROADCAST ALIGNMENT:** After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground leads. Insert a 200 mmf. condenser in series with the antenna lead. Set the Band Selector Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Adjust the broadcast band oscillator trimmer.

SERVICE INFORMATION FOR PILOT MODELS 403 AND 405

**BROADCAST ALIGNMENT:** After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground through a .0002 mfd. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Tune the external oscillator to 1500 kc. Adjust the broadcast band oscillator trimmer to maximum response.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the center of the chassis on the under side. Set the external oscillator at 600 kc. Rock the receiver tuning control around the resonance position, and at the same time adjust the padder condenser for the highest peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

The alignment frequencies are as follows:  
Longwave Band — 800 meters (375 kc.)  
Broadcast Band 1—200 meters (1,500 kc.)  
Broadcast Band 1—16.7 meters (18,000 kc.)

**BAND 1:** Align Band 1 in a similar manner using a 400-ohm non-inductive resistor in place of the .0002 mfd. condenser. The alignment frequency is 18,000 kc. (16.7 meters).

The alignment of Band 1 requires greater care due to the higher frequencies covered by this band. Rotate the tuning condenser of the receiver until the dial pointer is coincidental with the 18,000 kc. indication on the dial scale. Adjust the oscillator trimmer condenser for maximum sensitivity. Proceed next to align the detector section. In doing this it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak.

**THE LONG WAVE ALIGNMENT** procedure in the Model 405 is similar to that of the broadcast. Turn the Band Switch to the Long Wave position. The alignment frequency is 17.5 meters. Adjust the padder condenser at 150 kc. Use .0002 mfd. condenser in the antenna lead from the external oscillator.

**REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY:** Should it be necessary to remove the switch assembly, it is advisable to realign the receiver after reinstallation it.

**CAUTION:** When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

RECEIVER DESCRIPTION

Intermediate Frequency—456 kc.

Tube Functions—

Type 6A8: Electron emission control oscillator-detector.  
Type 6K7: I. F. amplifier.  
Type 6Q7: Duo-diode detector amplifier.  
Type 6F6: Class "A" power pentode.  
Type 5W4: Full-wave rectifier for power supply.

V O L T A G E S

The D. C. Voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

OSC. DET.	I. F.	DET.	PENTODE RECTIFIER	Type 6Q7	Type 6F6	Type 5W4
Plate	230	230	105 <sup>1</sup>	205	205	320
Cathode	4	3.5	1.5	1.5	230	320
Screen	85	85	6.3	6.3	6.3	5
Filament	6.5	6.5	6.3	6.3	6.3	5

<sup>1</sup>Voltages measured through 250,000 ohm plate resistor.  
<sup>2</sup>All plate voltages 90 volts. All plate voltages measured to cathode.  
<sup>3</sup>All cathode voltages measured to chassis frame.

REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:  
Be certain that the line cord is removed from the power outlet socket.

Remove the knobs and felt washers from the controls on the front panel, and loosen the set screw on the tuning knob.

Remove the speaker plug from the socket at the rear of the chassis.

Remove the four mounting screws, located underneath the cabinet and pull chassis out.

**REALIGNMENT:** If the receiver requires alignment, the procedure outlined below should be followed. In the schematic diagram sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

**I. F. ALIGNMENT:** When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast". Set the tuning condenser at all positions, the volume control, and the tone control should be turned to the maximum clockwise position. Connect the antenna lead of the external oscillator to the control grid of the 6K7 tube in the I. F. Amplifier through a .1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the chassis. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. Following this, connect the external oscillator leads to the control grid of the 6A8 tube. Adjust each trimmer on I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected to the control grid of the 6A8 tube.

**WAVE TRAP ADJUSTMENT:** With the oscillator still set at 456 kc., connect the oscillator to the antenna through a 200 mmfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

**Operating Voltages**—115, 125, 150, 220, 240 volts, Alternating Current.

**Frequency Rating**—50 to 60 cycles.

**Power Consumption**—60 watts.

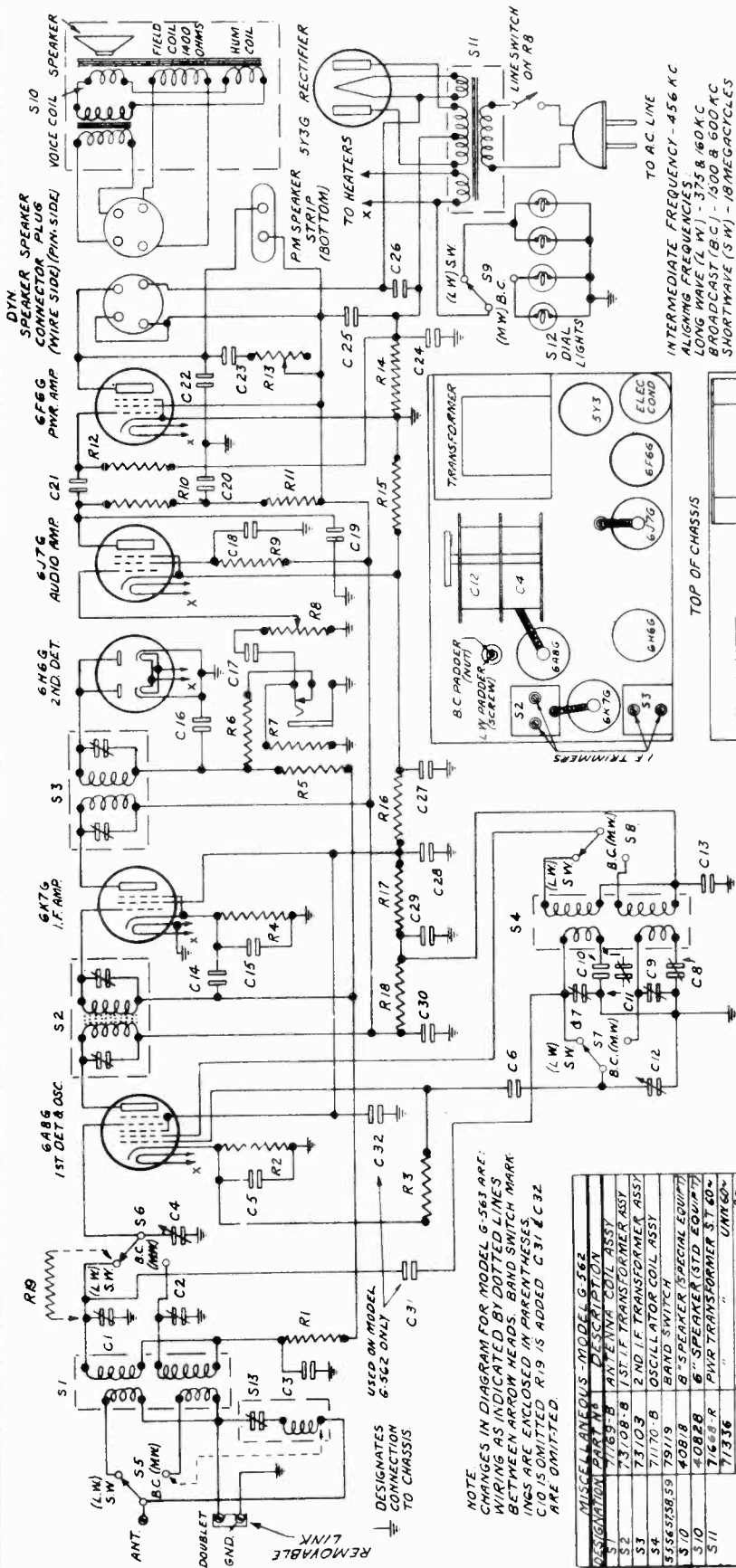
**Tubes**—1 type 6A8, 1 type 6K7, 1 type 6Q7, 1 type 6F6, 1 type 5W4.

**Undistorted Power Output**—3 watts.

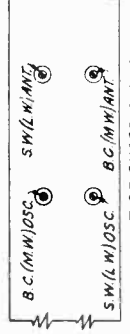


PILOT RADIO CORP.

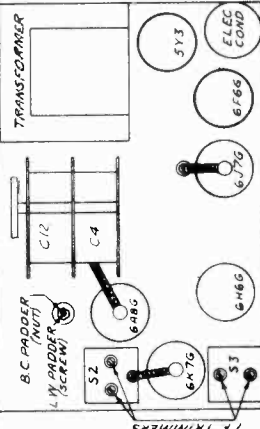
MODELS BG 562, BG 563  
Schematic, Socket  
Trimmers, Parts



INTERMEDIATE FREQUENCY - 456 KC  
ALIGNING FREQUENCIES  
LONG WAVE (LW) - 375 & 60 KC  
BROADCAST (BC) - 1500 & 600 KC  
SHORTWAVE (SW) - 18 MEGACYCLES



FRONT OF CHASSIS SHOWING TRIMMER ARRANGEMENT



BOTTOM OF CHASSIS AND ARRANGEMENT OF SOCKETS  
 \* R14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

RESISTORS - MODEL G-562

DESIGNATION	PART NO.	DESCRIPTION
R1	13031	100,000 OHMS 1/4 WATT
R2	13203	200 OHMS 1/4 WATT
R3	13164	50,000 OHMS 1/4 WATT
R4	13175	400 OHMS 1/4 WATT
R5	13001	1 MEGOHM 1/4 WATT
R6	13174	200,000 OHMS 1/4 WATT
R7	13073	3,000 OHMS 1/4 WATT
R8	13073	3,000 OHMS 1/4 WATT
R9	13073	3,000 OHMS 1/4 WATT
R10	13071	250,000 OHMS 1/4 WATT
R11	13024	500,000 OHMS 1/4 WATT
R12	13059	100,000 OHMS TONE CON
R13	13059	250 OHMS 1/4 WATT
R14	13059	250 OHMS 1/4 WATT
R15	13059	250 OHMS 1/4 WATT
R16	13202	35,000 OHMS 1/4 WATT
R17	13053	10,000 OHMS 1/4 WATT
R18	13073	3,000 OHMS 1/4 WATT
R19	13080	500 OHMS 1/4 WATT

MISCELLANEOUS - MODEL G-562

DESIGNATION	PART NO.	DESCRIPTION
S1	7169-B	ANTENNA COIL ASSY
S2	7370-B	1ST I.F. TRANSFORMER ASSY
S3	7370-B	2ND I.F. TRANSFORMER ASSY
S4	71170-B	OSCILLATOR COIL ASSY
S5	5556258-S9	BAND SWITCH
S6	40818	B-SPEAKER (SPECIAL EQUIP)
S7	40828	6" SPEAKER (STD EQUIP)
S8	71668-R	PWR TRANSFORMER S.T. 60-250-25W
S9	71579	DIAL LAMPS 6-BY 2 AMP
S10	79097-A	WAVE TRAP ASSY
S11	71173-B	CHANGES FOR MODEL G-563
S12	71174-B	ANTENNA COIL ASSY

SOCKETS - MODEL G-562

DESIGNATION	PART NO.	DESCRIPTION
C1, C2, C3, C4	7231-B	TRIMMER STRIP ASSY
C5, C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C27, C28, C29, C30, C31, C32	22055-I	.05 MFD. 200V PAPER
C33, C34, C35, C36, C37, C38, C39, C40, C41, C42, C43, C44, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C59, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C77, C78, C79, C80, C81, C82, C83, C84, C85, C86, C87, C88, C89, C90, C91, C92, C93, C94, C95, C96, C97, C98, C99, C100, C101, C102, C103, C104, C105, C106, C107, C108, C109, C110, C111, C112, C113, C114, C115, C116, C117, C118, C119, C120, C121, C122, C123, C124, C125, C126, C127, C128, C129, C130, C131, C132, C133, C134, C135, C136, C137, C138, C139, C140, C141, C142, C143, C144, C145, C146, C147, C148, C149, C150, C151, C152, C153, C154, C155, C156, C157, C158, C159, C160, C161, C162, C163, C164, C165, C166, C167, C168, C169, C170, C171, C172, C173, C174, C175, C176, C177, C178, C179, C180, C181, C182, C183, C184, C185, C186, C187, C188, C189, C190, C191, C192, C193, C194, C195, C196, C197, C198, C199, C200, C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, 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MODELS BG 562, BG563  
Voltage, Alignment

## PILOT RADIO CORP.

## SERVICE INFORMATION FOR PILOT MODELS BG-562 AND BG-563

## REMOVAL OF CHASSIS FROM CABINET:

To remove the chassis from the cabinet proceed as follows:

Be certain that the line cord is removed from the power outlet socket.

Remove the knobs and felt washers from the controls on the front panel, and loosen the set screw on the tuning knob.

Remove the speaker socket from the plug mounted on the speaker.

Remove the four mounting screws, located underneath the cabinet and pull chassis out.

**REALIGNMENT:** If the receiver requires alignment, the procedure outlined below should be followed. In the schematic diagram sheet, the location and function of the various alignment capacitors are clearly illustrated. For best results, an external modulated oscillator with adequate frequency range and a visual output meter, should be used.

Before connecting the chassis to the power line, reconnect the speaker cable in its socket at the rear of the chassis.

**I. F. ALIGNMENT:** When aligning the Intermediate Frequency Amplifier, the external oscillator must be set at 456 kc. The Band Switch should be in the position marked "Broadcast", and the tuning condenser should be set at maximum capacity. When aligning the receiver on all positions, the volume control and the tone control should be turned to the maximum clockwise position. Connect the antenna lead of the external oscillator to the control grid of the 6K7G tube in the I. F. Amplifier through a .1 mfd. fixed condenser. Connect the ground lead of the external oscillator to the chassis. The I. F. alignment trimmers are located at the top of the shielded I. F. Transformers. Rotate the adjusting screw of each capacitor on I. F. Unit No. 2 slowly until maximum output is noted. Following this, connect the external oscillator leads to the control grid of the 6A8G tube. Adjust each trimmer on I. F. Unit No. 1 for maximum gain.

During these operations, use the least possible input to prevent broadening of the resonance peaks.

In order to obtain the most accurate realignment of the I. F. amplifier, it is essential to repeat the alignment process in all I. F. Units, with the external oscillator leads connected to the control grid of the 6A8G tube.

**WAVE TRAP ADJUSTMENT:** With the oscillator still set at 456 kc., connect the oscillator to the antenna through a .0002 mfd. condenser. Then adjust the wave trap condenser for minimum deflection on the output meter.

**BROADCAST ALIGNMENT:** After the I. F. amplifier is completely realigned, connect the external oscillator leads to the receiver antenna and ground through a .0002 mfd. condenser. Leave the Band Switch in the "Broadcast" position and place the tuning control pointer at the 1500 kc. mark. Tune the external oscillator to 1500 kc. Adjust the broadcast band oscillator trimmer to maximum response.

Next adjust the interstage alignment trimmer for maximum response. Finally adjust the antenna section trimmer in the same manner.

Next adjust the 600 kc. padder condenser, located in the center of the chassis on the under side. Set the external oscillator at 600 kc. Rock the receiver tuning control around the resonance position, and at the same time adjust the padder condenser for the highest peak.

Now repeat the 1500 kc. trimmer adjustment, following in every detail the procedure previously described.

The alignment frequencies are as follows:

Longwave Band — 800 meters (375 kc.)

Broadcast Band — 200 meters (1,500 kc.)

Band 1—16.7 meters (18,000 kc.)

**BAND 1:** Align Band 1 in a similar manner using a 400-ohm non-inductive resistor in place of the .0002 mfd. condenser. The alignment frequency is 18,000 kc. (16.7 meters).

The alignment of Band 1 requires greater care due to the higher frequencies covered by this band. Rotate the tuning condenser of the receiver until the dial pointer is co-incidental with the 18,000 kc. indication on the dial scale. Adjust the oscillator trimmer condenser for maximum sensitivity. Proceed next to align the detector section. In doing this it is essential to rock the tuning control back and forth about the resonance position and at the same time to adjust the trimmer for the highest resonance peak.

**THE LONG WAVE ALIGNMENT** procedure in the Model BG-563 is similar to that of the broadcast. Turn the Band Switch to the Long Wave position. The alignment frequency is 375 kc. Adjust the padder condenser at 150 kc. Use a .0002 mfd. condenser in the antenna lead from the external oscillator.

**REMOVAL OF BAND SELECTOR SWITCH ASSEMBLY:** Should it be necessary to remove the switch assembly, it is advisable to realign the receiver after reinstalling it.

**CAUTION:** When making repairs on the receiver, use only ROSIN CORE SOLDER. NEVER USE SOLDERING PASTE OR ACID FLUXES OF ANY TYPE.

## RECEIVER DESCRIPTION

Operating Voltages—115, 125, 150, 220, 240 volts, Alternating Current.

Frequency Rating—50 to 60 cycles.

Power Consumption—60 watts.

Tubes—1 type 6A8G, 1 type 6K7G, 1 type 6H6G, 1 type 6J7G, 1 type 6F6G, 1 type 5Y3.

Undistorted Power Output—3 watts.

Intermediate Frequency—456 kc.

Tube Functions—

Type 6A8G: Electron emission control oscillator-detector.

Type 6K7G: I. F. amplifier.

Type 6H6G: Duo-diode detector.

Type 6J7G: A. F. amplifier.

Type 6F6G: Class "A" power pentode.

Type 5Y3: Full-wave rectifier for power supply.

## VOLTAGES

The D. C. Voltages measured at the tube sockets of the set should be read with a high resistance voltmeter of at least 1000 ohms per volt.

	OSC. DET. Type 6A8G	I. F. Type 6K7G	DIODE DET. Type 6H6G	A. F. AMP. Type 6J7G	POWER PENTODE Type 6F6G	RECTIFIER Type 5Y3
Plate	240	240		60*	220	
Cathode	2.6	2.6		5		310
Screen	70	70		23*	240	
Filament	6.3	6.3	6.3	6.3	6.3	5.
Osc. Anode	180					

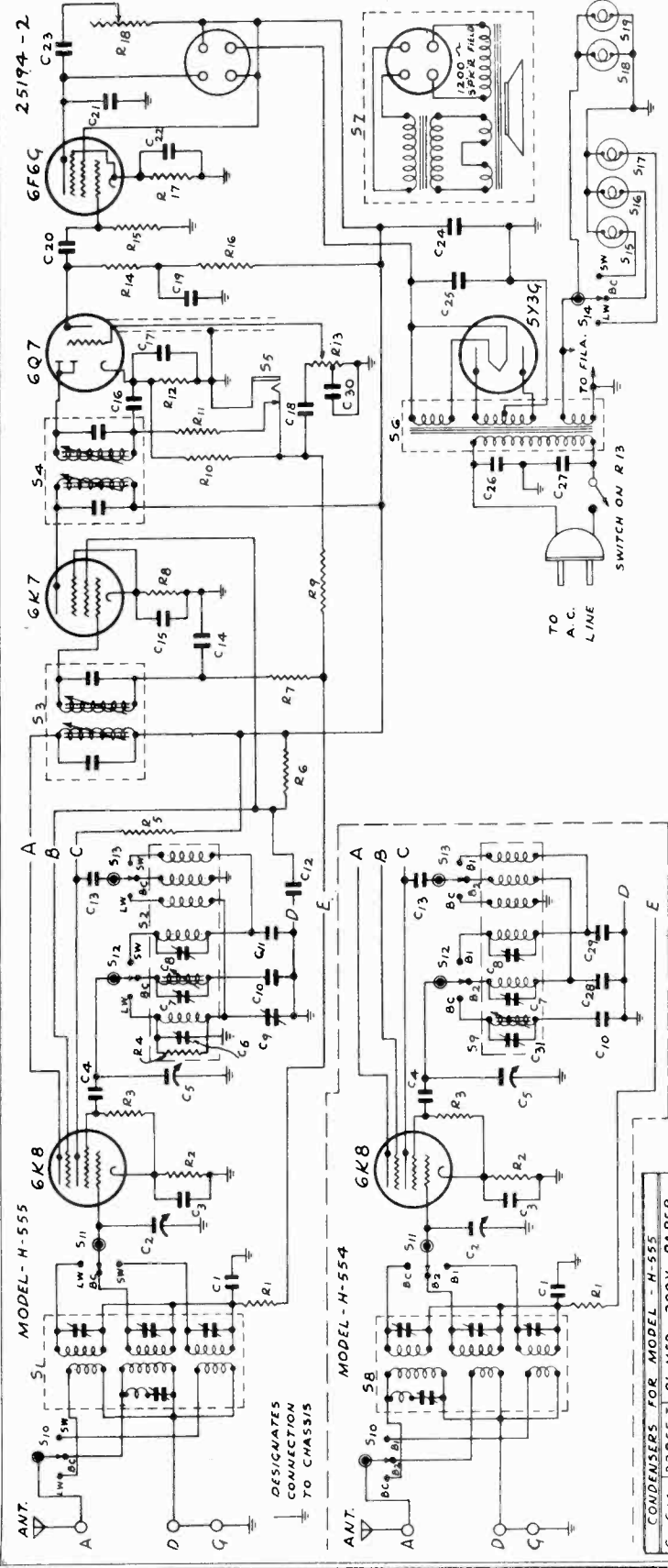
\*Voltages measured through high resistance.

Speaker field voltage 90 volts. All plate voltages measured to cathode.

All voltages measured to chassis frame.

MODELS H554, H555  
Schematic, Parts

PILOT RADIO CO.



INTERMEDIATE FREQUENCY - 455 K.C.  
ALIGNING FREQUENCIES:  
SW - 18 MEGACYCLES  
A.C. - 1500 & 600 K.C.  
LONG-WAVE { L.W. - 300 & 175 K.C.  
H-555 {  
DOMESTIC { B1 - 2.4 MEGACYCLES  
H-554 { B.C. - 1500 & 600 K.C.

MISCELLANEOUS FOR MODEL H-555

S1	73172	ANTENNA COILS & CAN ASSY.
S2	73179-B	OSCILLATOR COILS ASSY.
S3	73192-C	1ST I.F. TRANSFORMER ASSY.
S4	73193	2ND I.F.
S5	70950	PHONO JACK
S6	83412-R	POWER TRANSF. 117V.-50-60CY
	83412-AB	230V.
	83412-FA	115-230V.
	83412-L	150 V.
S7	40850	8" SPEAKER-1200~FIELD
	40784	1/2" SPEAKER-1400~FIELD
S10 TO S14	B3414-B	BAND SWITCH
S15 TO S19	78889	DIAL LAMPS

MISCELLANEOUS FOR MODEL H-554 - SAME AS FOR MODEL H-555 EXCEPT FOLLOWING:  
S1, S2 NOT USED  
S8 73177 ANTENNA COILS & CAN ASSY.  
S9 73178-B OSCILLATOR COILS ASSY.  
ALTERATIONS: C30, WAS .002 MFD. 200V PAPER. R-8, R-10 38.

RESISTORS FOR MODEL H-555

R1, R18	13031	100,000 OHMS 1/4 WATT
R2	13018	150 OHMS 1/4 WATT
R3, R11	13164	50,000 OHMS 1/4 WATT
R4	13230	35,000 OHMS 1/4 WATT
R5	13202	18,000 OHMS 1/4 WATT
R6	13179	18,000 OHMS 2 WATT
R8	13115	4,000 OHMS 1/4 WATT
R9	13001	1 MEG OHM 1/4 WATT
R10, R15	3024	500,000 OHMS 1/4 WATT
R12	13133	3,000 OHMS 1/4 WATT
R13	83329-C	1 MEG OHM VOL. CONT. & SW.
R14	13147	300,000 OHMS 1/4 WATT
R17	13108	410 OHMS 1 WATT
R18	83447-C	100,000 OHMS TONE CONT.

RESISTORS FOR MODEL H-554 - SAME AS FOR MODEL H-555 EXCEPT FOLLOWING:  
R4 NOT USED

CONDENSERS FOR MODEL H-555

C1, C14	22055-T	.01 MFD. 200V. PAPER
C2, C5	83628	CAN. CONDENSER
C3, C15	22055-M	1 MFD. 200V. PAPER
C4	22056-D	.0051 MFD. MICA
C6, C9	83416	.005 TRIMMER BASE
C7	83415	.005 TRIMMER
C8	22583-A	TRIMMER ASSY.
C10	72000-D	.400 MFD. SILVER CAP
C11	28106	.00325 MFD. MICA
C12, C19	22055-AB	.1 MFD. 600V. PAPER
C13	27704-W	.002 MFD. MICA
C16	27701-O	.00025 MFD. MICA
C17, C22	22481	10 MFD. 25 V. ELECTRO.
C18, C20	22055-W	.01 MFD. 400 V. PAPER
C21	22055-V	.03 MFD. 1000 V. PAPER
C23	22055-AR	.003 MFD. 1000 V. PAPER
C24, C25	85024	16-B MFD. 450 V. ELECTRO.
C26, C27	78503	.01-.01 MFD. 1000V (SHIELDED)
C30	22055-AT	.001 MFD. 200V. PAPER

CONDENSERS FOR MODEL H-554 - SAME AS FOR MODEL H-555 EXCEPT FOLLOWING:  
C9, C10, C6 NOT USED  
C28 27704-W .002 MFD. MICA  
C29 28106 .00325 MFD. MICA  
C31 72283-A TRIMMER ASSY.

PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y. U. S. A.  
SCHEMATIC CIRCUIT DIAGRAM  
FOR MODEL H-554 & MODEL H-555

SCALE: 1" = 10"

DATE: 6-8-38

NO: 25194-2

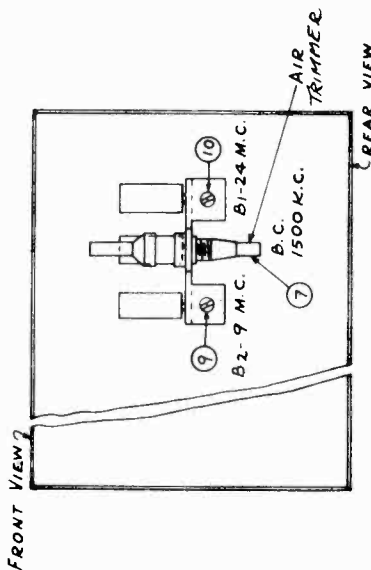
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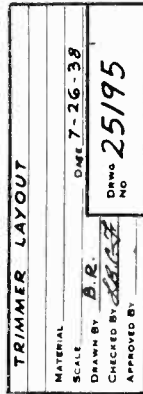
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MODELS H554, H555  
Socket, Trimmers  
Specifications

PILOT RADIO CO.



BOTTOM VIEW OF CHASSIS  
DOMESTIC - H-554



- PILOTUBES Required
- One 6X8 1st detector-oscillator
  - One 6K7 IF amplifier
  - One 6Q7 2nd detector-AVC-1st audio amplifier
  - One 6B6-G output tube
  - One 5Y3-G power supply rectifier
- Total 5 tubes

Panel Controls Volumes with On-Off switch, Tone, Band Selector Switch, Dual ratio, planetary drive, tuning control

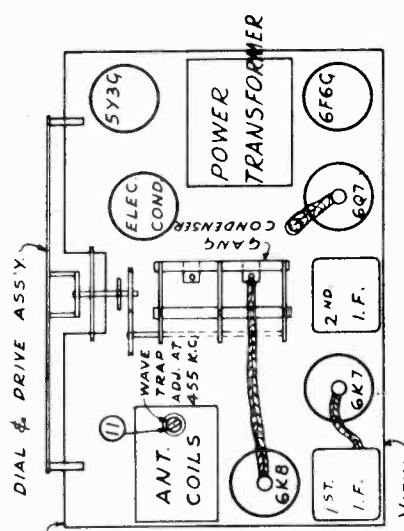
Maximum Power Output 4.8 watts

Tuning Ranges The model H-554 chassis has the following tuning ranges:

Band	1	2	3
Frequency	24.8 to 8.5 mc	9.7 to 2.9 mc	1725 to 530 kc
Wavelength	12.09 to 36.12 meters	30.9 to 103.4 meters	174 to 566 meters

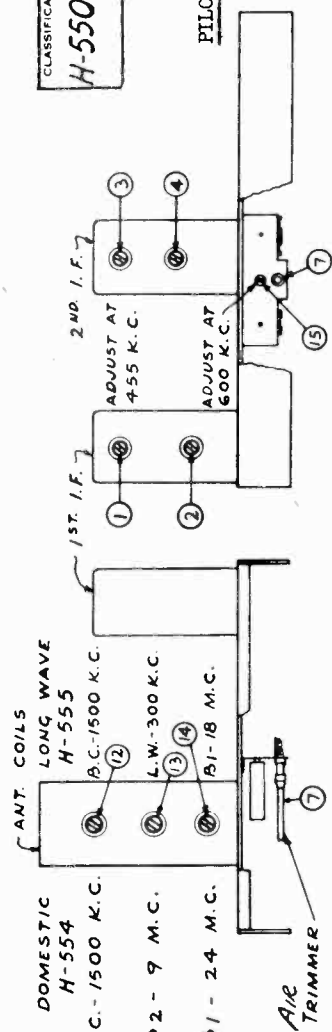
The model H-555 Chassis has the following tuning ranges:

Band	1	2	3
Frequency	18.8 to 5.35 mc	1725 to 530 kc	375 to 145 kc
Wavelength	15.9 to 56.04 meters	174 to 566 meters	800 to 2069 meters



TOP VIEW OF CHASSIS  
25195

CLASSIFICATION  
H-550-SERIES



LEFT SIDE OF CHASSIS REAR VIEW OF CHASSIS

GENERAL SPECIFICATIONS.

Circuit Super-Heterodyne, with Class A output stage. Three tuning ranges as listed below. Permeability tuned IF transformers. Tone compensated volume control, Continuously variable tone control, Automatic Volume Control and Cathode Ray Tuning Beacon.

Power Supply	Voltage	Frequency	Watts
110 to 125 volts	60	60	60
150 volts	60	60	60
220 to 240 volts	60	60	60
110 to 125 or 220 to 240 volts	455 kilocycles		

Intermediate Frequency 455 kilocycles

MODELS H664, H665  
Alignment

PILOT RADIO CO.

MODELS H554, H555  
Voltage, Alignment

PILOT RECEIVERS OF THE H-550 SERIES.

SERVICE DATA

Removal of the chassis from the cabinet, when necessary, is done as follows:-

1. Remove the power supply cord from the supply outlet.
2. Remove the knobs and felt washers from all shafts on the front of the cabinet. These knobs are of the "push-on" type.
3. Remove the speaker cord from the socket on the speaker.
4. Remove the four mounting screws located under the cabinet and carefully slide the chassis out of the cabinet.

Receiver Alignment

Equipment Required.

1. Signal Generator. One using fundamental frequencies for all the frequencies used in the receiver is preferred.
2. Output Meter. Generally a copper oxide rectifier meter is the most convenient.
3. Dummy Antennas. .1 mfd. condenser  
.0002 mfd mica condenser  
400 ohm, non-inductive resistor

**Alignment Connections** There are three wires with connectors on the ends, extending from the chassis to the rear of the cabinet. Their colors and uses are:  
Blue - Antenna  
Yellow - Doublet Connector  
Black - Ground

Connect the black and yellow wires together and to the ground post of the signal generator.

Connect the "hot" post of the generator through the correct dummy antenna or condenser to the appropriate point as noted hereafter.

In all the measurements to follow, the output meter should be connected to the plate and screen grid terminals of the 6P6-G tube, through .1 mfd condensers, in any convenient manner.

**Procedure** The volume and tone controls should all be turned to the extreme clockwise positions, before starting.

The location of all trimmers is shown in the accompanying figure. Always keep the output from the signal generator at the lowest value which will give a readable deflection on the output meter.

**IF Amplifier Alignment** Turn the Band Selector Switch to Band 3 and turn the receiver dial pointer to the low frequency end.

Connect the output meter as described under "Connections", and connect the "hot" post of the signal generator to the grid of the 6K8 tube through the .1 mfd condenser. Then proceed with the alignment as follows:-

1. Adjust the signal generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.

2. Adjust the screws 1, 2, 3, and 4 (see figure), for maximum reading of output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the IF amplifier. Of course, if the amplifier adjustment screws have been tampered with, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the amplifier. In this case, connect the generator to the grid of the IF amplifier tube, and align the last IF transformer. Always finish the alignment with the signal input to the 6K8 tube.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

**Wave Trap Alignment** With the Band Selector Switch set on the Broadcast Band, replace the .1 mfd dummy antenna with the .0002 mfd dummy antenna. Set the generator frequency at 455 kc and tune trimmer #11 for minimum reading of the output meter. There must be sufficient output from the signal generator to always have a reading on the output meter, do not allow the meter to go to zero and call that the correct adjustment point.

R.F. Alignment

**Band 3 (Model 555 Long-Wave)** Connect the "hot" terminal of the generator to the blue wire and clip through the .0002 mfd condenser.

Set the generator frequency to 300 kc., and with the Band Selector Switch set to Band 3, turn the receiver dial pointer to 300 kc. Adjust trimmer #5 for maximum reading of the output meter. Do likewise with trimmer #13. Then set the generator frequency to 175 kc and the receiver dial pointer to approximately the same. Adjust trimmer #6 for maximum reading of the output meter, while "rocking" the gang condenser carefully back and forth. Then go back and repeat the 300 kc alignment.

**Band 2 (Model 555) Band 3 (Model 554) (Standard Broadcast)** Connections are the same for the alignment of this band as they are for the long-wave band.

Set the generator frequency to 1500 kc., and the receiver dial pointer to the same frequency, with the band selector switch set appropriately. Adjust trimmer #7 for maximum reading of the output meter. (This trimmer is adjusted by moving the brass rod in or out, with a hooked wire, and with

a twisting motion. First loosen the lock nut). Then without touching any tuning controls adjust trimmer #12 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc., and accurately set the receiver dial pointer to the 600 kc. mark. Then adjust trimmer #15 for maximum reading of the output meter. Do not move the tuning control while making this adjustment. Finally return and repeat the 1500 kc. adjustments and then tighten the lock nut on trimmer #7.

Band 1 (Model 555 Short-Wave)

Remove the .0002 mfd dummy antenna used in aligning the lower frequency bands and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator frequency to 18 mc. and also set the receiver dial pointer to this frequency. Carefully adjust trimmer #8 for maximum reading of the output meter, be careful you do not tune in at the Image Frequency.

Then adjust trimmer #14 for maximum output meter reading, while slightly "rocking" the gang condenser. Readjust trimmer #8 if necessary to keep the calibration correct. These are the only adjustments on this band.

Band 2 (Model 554 Short-Wave)

Connections and dummy antenna same as on Band 1 above.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator, and the receiver dial pointer to 9 mc. Adjust trimmer #9 for maximum reading of the output meter, be careful you do not tune in at the Image Frequency.

Then adjust trimmer #13 for maximum reading of the output meter, while slightly "rocking" the gang condenser. Re-adjust trimmer #9 if necessary to correct the calibration.

Band 1 Alignment (Model 554 Short-Wave)

Connections and dummy antenna are the same as on Band 2 of model 554.

Before aligning this band, refer to the paragraph headed "Image Frequency".

Set the generator frequency to 24 mc. and the receiver dial pointer to 24 mc. Adjust trimmer #10 to 24 mc. for maximum reading of the output meter. Be careful that the receiver is not adjusted to the Image Frequency. Then adjust trimmer #14 while "rocking" the gang condenser, for maximum reading of the output meter. Reset trimmer #10 so that calibration is correct if necessary.

Image Frequency

All bands in these two models must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in doing this on the Long-Wave and Broadcast Bands. However, on the higher frequency bands it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the generator to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver, separated by twice the Intermediate Frequency, set the receiver dial pointer to that one which comes in at the higher frequency marking on the receiver dial pointer.

D.C. SOCKET VOLTAGES

All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohm per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

Make sure that the A.C. supply voltage is correct for the transformer tap being used at the time of measurement.

	Socket Terminals							
Tube	1	2	3	4	5	6	7	8
6K8	-	-	240	95	-	110	-	2.9
6K7	-	-	240	95	3.5	-	-	3.5
6Q7	-	-	105*	-	-	-	-	1.4
6P6-G	-	-	225	245	-	-	-	16
5Y3-G	-	-	-	-	-	-	340	340

\*Not true voltage, but as measured with voltmeter

Miscellaneous Service Notes

If a howling noise (sometimes referred to as Microphonic howl) is heard, it is very probably because the four red screws under the cabinet have not been removed, along with the two narrow metal strips between the chassis and the bottom of the cabinet. These strips and screws are only intended as additional bracing during shipment and must be removed before the receiver is put in operation.

The howl can also be caused by a defective tube, or when some part of the receiver which is rigidly fastened to the chassis rubs against the cabinet. The remedy is obvious.



MODELS H594, H597  
Voltage, Alignment

PILOT RADIO CO.

Set the generator, and the ROTOR dial to 24 mc. Adjust trimmer #1 for maximum reading of the output meter, when the lower frequency peak of the two which can be located, coincides with the 24 mc. calibration point on the dial. Then adjust trimmer #12, while "rooking" the gang condenser, until the maximum reading is obtained on the output meter, resetting trimmer #11 if necessary to keep the calibration correct.

These are the only adjustments on this band.

**Image Frequency**  
All bands in this receiver, except Band 1 must be aligned with the oscillator frequency higher than the signal frequency. There can be no error in aligning Bands 3 and 4. However, on the two high frequency bands it is possible to incorrectly adjust the alignment in this respect, and end up with the receiver aligned on what should be the Image Frequency.

The chances of doing this may be eliminated by adjusting the rotor dial to the correct aligning frequency, and with sufficient output from the generator to pick up two signals with the receiver. Instead of twice the intermediate frequency, set the dial on Band 3 to obtain one which comes in at the higher frequency marking of the ROTOR dial. That is, on Band 2 the two frequencies which will be picked up when the generator is set at 9 mc., will be at 9 mc. and at 8 mc., on the ROTOR dial. Adjust the oscillator trimmer so that the 9 mc. frequency one coincides with 9 mc., on the dial. Exactly the reverse is true on Band 1.

D.C. SOCKET VOLTAGES

All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohm per volt voltmeter. Make measurements with no signal input to the receiver. Voltage control set at minimum volume, and sensitivity control set at maximum sensitivity. Make sure the AC supply voltage is correct for the transformer tap being used when measuring these voltages.

Tube	Socket Terminals							
	1	2	3	4	5	6	7	8
6E8	-	-	+250	+90	-1.5	+100	-	+2.5
6J7	-	-	+250	+90	+5.0	-	-	+5.
6E7	-	-	+250	+90	+2.4	-	-	+2.4
6E7	-	-	+250	+90	+3.5	-	-	+3.5
6E6	-	-	+25	-	-25	-	-	-
6Q7	-	-	+58	-	-	-	-	+1.6
6F6	-	-	+225	+250	-	-	-	+15
5Y3G	-	-	+580	-	-	-	-	+580

In replacing the 6J7 frequency control tube, it will be found convenient to remove the two screws, holding the ROTOR dial shield, and move the shield so that the tube may be handled easier.

Miscellaneous Service Notes

If a howling noise (sometimes referred to as Microphonic howl) is heard, it is very probably because the four red screws under the cabinet have not been removed, along with the two narrow metal strips between the chassis and the bottom of the cabinet. These strips and screws are only intended as additional bracing during shipment and must be removed before the receiver is put in operation. When some part of the receiver is caused by a defective tube, or when the chassis rubs against the cabinet. The remedy is obvious.

**Discriminator Alignment** CAUTION: The discriminator component (19) has been accurately adjusted during manufacture. It will probably never need adjustment, even when tubes are replaced, and for these reasons should never be touched unless there is no doubt about its being out of adjustment, in which case, the following procedure should be followed carefully. The adjustment is quite critical and cannot be done correctly in a hasty manner.

1. Set component (19) at its minimum position. This is the setting when the screw slot is vertical and when the red half of the tuning screw is to the left.

2. Turn the IF amplifier alignment screw to 455 kc as described under IF Amplifier Alignment.

3. With the signal generator connected to the grid of the 6E8 tube and with the output of the generator at a low value, note the reading of the output meter. Then vary carefully turn component (19) until the output meter reading reaches a minimum value. That is the correct setting of this component.

It will be necessary to use a screw driver made from some insulating material in making this adjustment. If a metal tool is used, the adjustment will not be correct.

If the adjustment is not correctly made, the oscillator control tube will not function properly. It may even detune the oscillator instead of tuning it.

IF Alignment

Band 4 (Long-Wave) Connect the "hot" terminal of the generator to the post marked "A" on the rear of the chassis, through the .0002 mfd condenser.

Set the generator frequency to 500 kc., and with the Band Selector Switch set to Band 4, turn the ROTOR dial to 500 kc. Adjust trimmer #1 for maximum reading of the output meter. Do likewise with trimmers #2 and #3. Then set the generator frequency to 175 kc., and the ROTOR dial to 175 kc. Adjust the long-wave trimmer #4 for maximum reading of the output meter, while "rooking" the gang condenser carefully back and forth. Then go back and repeat the 500 kc. alignment.

Use a loop generator output as low as possible, and see that none of the PLANO keys are down.

Band 5 (Standard Broadcast)

Connections to the generator are the same for the alignment of this band as they are for Band 4, also the same dummy antenna is used.

Set the generator frequency to 1500 kc., and the ROTOR dial to the same frequency, with the band selector switch set to Band 5. Adjust trimmer #5 for maximum reading of the output meter. (This trimmer is adjusted by drawing the brass rod up or pushing it down with a hooked wire, and with a twisting motion. First loosen the lock nut). Then, without touching the tuning controls, adjust first trimmer #6 and then trimmer #7 for maximum reading of the output meter.

Next, set the generator frequency to 600 kc., and the ROTOR dial to approximately the same. Adjust trimmer #8 for maximum output reading while "rooking" the gang condenser. Then back and repeat the 1500 kc. adjustment, and tighten the lock nut on trimmer #6.

Band 2 (Short-Wave) Remove the .0002 mfd dummy antenna used in aligning Bands 3 and 4 and substitute the 400 ohm resistor.

Before aligning this band refer to the paragraph headed "Image Frequency".

Set the generator frequency to 9,000 kc. (9 mc) and also set the ROTOR dial to this frequency. Carefully adjust the oscillator trimmer #9 for maximum reading of the output meter. Be very careful that the trimmer is not set on the Image Frequency.

After the oscillator is set, trimmer #10 is adjusted, while slightly "rooking" the gang condenser, for correct reading of the output meter, resetting trimmer #9 if necessary. The adjustment in this band are more critical than the similar ones on the lower frequency bands and must be more carefully made.

The above adjustments, at the high frequency end of the band, are the only ones to be made on this band.

Band 1 (Short-Wave) Connect the dummy antenna and the same as on Band 2.

PILOT RECEIVERS OF THE H-590 SERIES.  
SERVICE DATA

Removal of the chassis from the cabinet, when necessary, is done as follows:-

1. Remove the power supply cord from the supply outlet.
2. Remove the knobs and felt washers from all shafts on the front of the cabinet. These knobs are all of the push-on type.
3. Remove the speaker cord from the socket on the cabinet.
4. Remove the four mounting screws located under the chassis and carefully slide the chassis out of the cabinet.

Receiver Alignment

1. Signal Generator. Equipment Required. One using fundamental frequencies for all the frequencies used in the receiver is preferred.
2. Output Meter. Generally a copper-oxide rectifier meter is the most convenient.
3. Dummy Antenna. .1 mfd condenser  
400 mfd condenser

Alignment Connections The posts marked D and G on the rear of the chassis should, in all following operations, be connected to the ground post of the signal generator.

Connect the "hot" part of the generator through the correct dummy antenna or condenser to the appropriate point as noted hereafter.

In all the measurements to follow, the output meter should be connected to the plate and screen grid terminals of the 6E8-0 tube, through .1 mfd condensers, in any convenient manner.

Procedure The Volume, Sensitivity and Tune Controls should all be turned to the extreme clockwise positions, before starting.

The location of all trimmers is shown in the accompanying figures.

IF Amplifier Alignment

Turn the Band Selector Switch to Band 3 and turn the ROTOR dial to the low frequency end.

Connect the output meter as described under "Connections", and connect the "hot" part of the generator to the grid of the 6E8 tube through the .1 mfd condenser. See that none of the PLANO KEYS is down. Then proceed with the alignment as follows:-

1. Adjust the Signal Generator frequency to 455 kilocycles, and adjust the generator output to the lowest value which will give a readable signal on the output meter.
2. Adjust the output meter, 13, 14, 15, 16, 17 and 18, (see Figure) for maximum reading of the output meter. Keep reducing the output from the generator if the output meter reading increases too much.

If the output of the generator to the receiver is too great, the alignment of the receiver will not be correct, as the AVC action will become too great, and the amplifier will appear broad in tuning.

It will seldom, if ever, be found necessary to more than touch up the alignment of the IF amplifier. Of course, if the amplifier adjustment screws have been tampered with, it will probably be necessary to completely realign the IF amplifier.

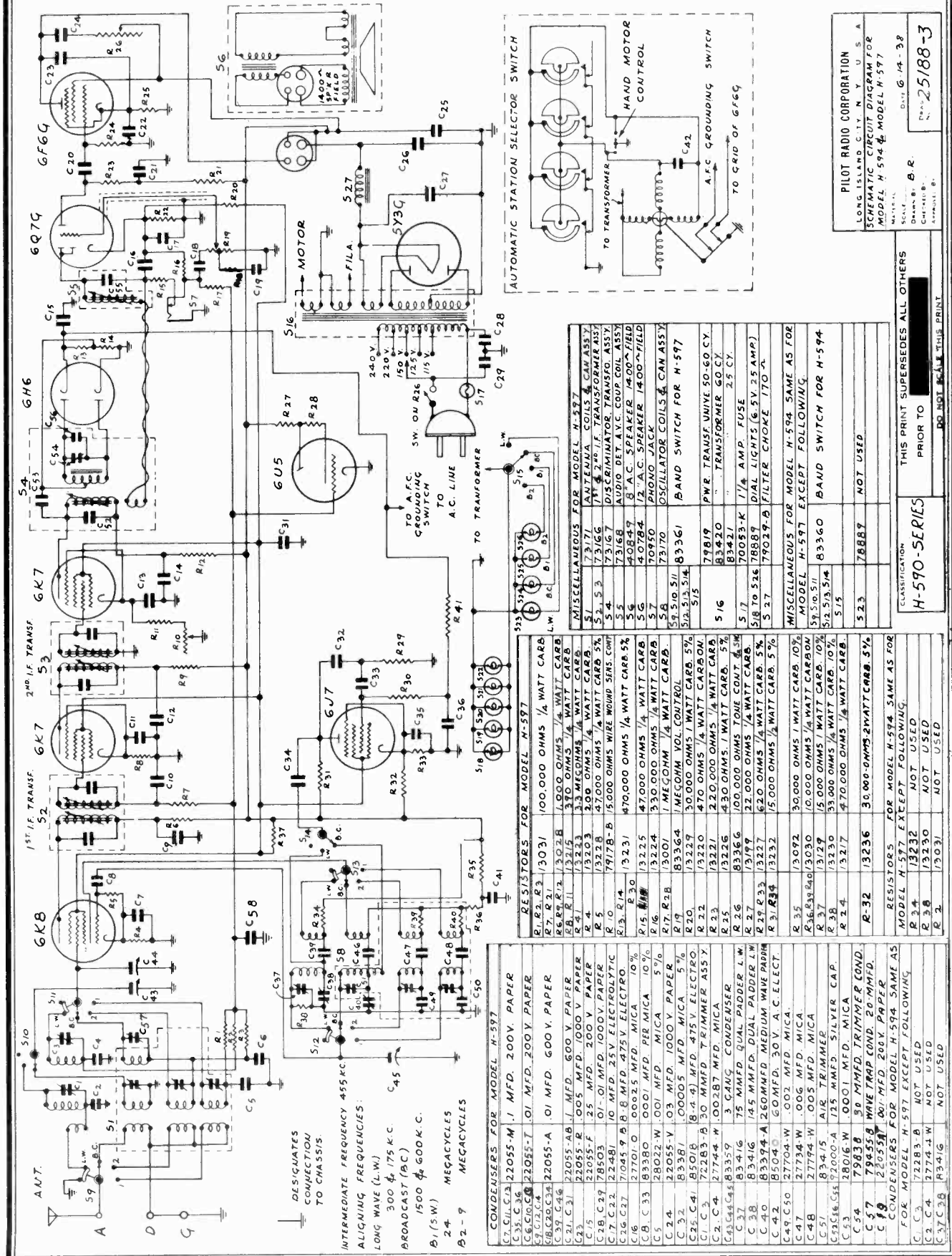
Connect the dummy antenna to the grid of the 6E8 tube, while aligning the transformers following these tubes. Always finish the alignment with the signal input to the 6E8 tube and, with this connection, readjust all screws in the IF amplifier, except the Discriminator trimmer #19.

A cathode ray oscilloscope is not necessary in making the above adjustments. One may be used, however, if desired.

If the receiver is placed in a noisy location when the above adjustments are being made, it may be convenient to reduce the sensitivity of the amplifier by means of the sensitivity control.

PILOT RADIO CO.

MODELS H594, H597  
Schematic, Tuner  
Parts



CONDENSERS FOR MODEL H-597

C1, C11, C13	22055-M	1 MFD. 200V. PAPER
C2, C3, C6	22055-T	01 MFD. 200V. PAPER
C4, C10, C14	22055-A	01 MFD. 600V. PAPER
C12, C15	22055-AB	1 MFD. 600V. PAPER
C16, C17	22055-F	25 MFD. 200V. PAPER
C18, C19	78503	01-01 MFD. 1000V. PAPER
C20, C21	22481	10 MFD. 25V. ELECTROLYTIC
C22, C23	71045	9 B. 8 MFD. 475V. ELECTRO.
C24, C25	27701-O	0002.5 MFD. MICA 10%
C26, C27	83380	001 MFD. PER MICA 10%
C28, C29	28022-W	001 MFD. MICA 5%
C30, C31	22055-V	03 MFD. 1000V. PAPER
C32, C33	83381	00005 MFD. MICA 5%
C34, C35	85018	8-4-4 MFD. 475V. ELECTRO.
C36, C37	72283-B	30 MMFD. TRIMMER ASSY
C38, C39	27744-W	00287 MFD. MICA
C40, C41	83348	3 GANG CONDENSER
C42, C43	83416	75 MMFD. DUAL PADDER L.W.
C44, C45	83394-A	145 MMFD. DUAL PADDER L.W.
C46, C47	85045	260MMFD. MEDIUM WAVE PADRM
C48, C49	85045	60MFD. 30V. A. C. ELECT.
C50, C51	27704-W	002 MFD. MICA
C52, C53	27734-W	006 MFD. MICA
C54, C55	27744-W	005 MFD. MICA
C56, C57	83416	175 MMFD. TRIMMER
C58, C59	28016-W	0001 MFD. MICA
C60, C61	78536	50 MMFD. TRIMMER COND.
C62, C63	78536	50 MMFD. TRIMMER COND.
C64, C65	26055H	1001 MFD. 200V. PAPER

CONDENSERS FOR MODEL H-594 SAME AS FOR MODEL H-597 EXCEPT FOLLOWING:

C1, C2	72283-B	NOT USED
C3, C4	27744-W	NOT USED
C5, C6	83416	NOT USED

RESISTORS FOR MODEL H-597

R1, R2, R3	13031	100,000 OHMS 1/4 WATT CARB.
R4, R5, R6	13028	1,000 OHMS 1/4 WATT CARB.
R7, R8, R9	13215	330 OHMS 1/4 WATT CARB.
R10, R11	13223	3.3 MEGOHMS 1/4 WATT CARB.
R12, R13	13203	200 OHMS 1/4 WATT CARB.
R14, R15	13228	47,000 OHMS 1/4 WATT CARB. 5%
R16, R17	79178-B	15,000 OHMS WIRE WOUND SENS. CONT.
R18, R19	13214	470,000 OHMS 1/4 WATT CARB. 5%
R20, R21	13225	47,000 OHMS 1/4 WATT CARB.
R22, R23	13224	330,000 OHMS 1/4 WATT CARB.
R24, R25	13001	1 MEGOHM 1/4 WATT CARB.
R26, R27	13227	30,000 OHMS 1/4 WATT CARB. 5%
R28, R29	13221	470 OHMS 1/4 WATT CARB.
R30, R31	13226	430 OHMS 1/4 WATT CARB. 5%
R32, R33	83366	100,000 OHMS TONE CONT. 4.5M
R34, R35	13199	22,000 OHMS 1/4 WATT CARB. 5%
R36, R37	13227	620 OHMS 1/4 WATT CARB. 5%
R38, R39	13232	15,000 OHMS 1/4 WATT CARB. 5%
R40, R41	13092	30,000 OHMS 1/4 WATT CARB. 10%
R42, R43	83366	10,000 OHMS 1/4 WATT CARBON
R44, R45	13129	15,000 OHMS 1/4 WATT CARB. 10%
R46, R47	13230	33,000 OHMS 1/4 WATT CARB. 10%
R48, R49	13217	470,000 OHMS 1/4 WATT CARB.
R50, R51	13236	30,000 OHMS 2 WATT CARB. 5%

RESISTORS FOR MODEL H-594 SAME AS FOR MODEL H-597 EXCEPT FOLLOWING:

R24	13232	NOT USED
R25	13230	NOT USED
R26	13031	NOT USED

MISCELLANEOUS FOR MODEL H-597

S1	73171	ANTENNA COILS & CAP ASSY.
S2, S3	73166	171 & 240 V. TRANSFORMERS
S4	73167	DISCRIMINATOR TRANSFORMER
S5	73168	AUDIO DELAY COIL
S6	40849	A. C. SPEAKER 1400 OHM FIELD
S7	70960	1000 OHM 30 CY.
S8, S9	73170	OSCILLATOR COILS & CAP ASSY.
S10, S11	83356	BAND SWITCH FOR H-597
S12	79819	PWR. TRANSFORMER 50-60 CY.
S13	83420	TRANSFORMER 60 CY.
S14	83421	1 1/2 AMP. FUSE 2.5 CY.
S15	70053-K	1 1/2 AMP. FUSE
S16, S17	78889	DIAL LIGHTS (6.5V. 25 AMP)
S18, S19	77029-B	FILTER CHOKE 170 A.

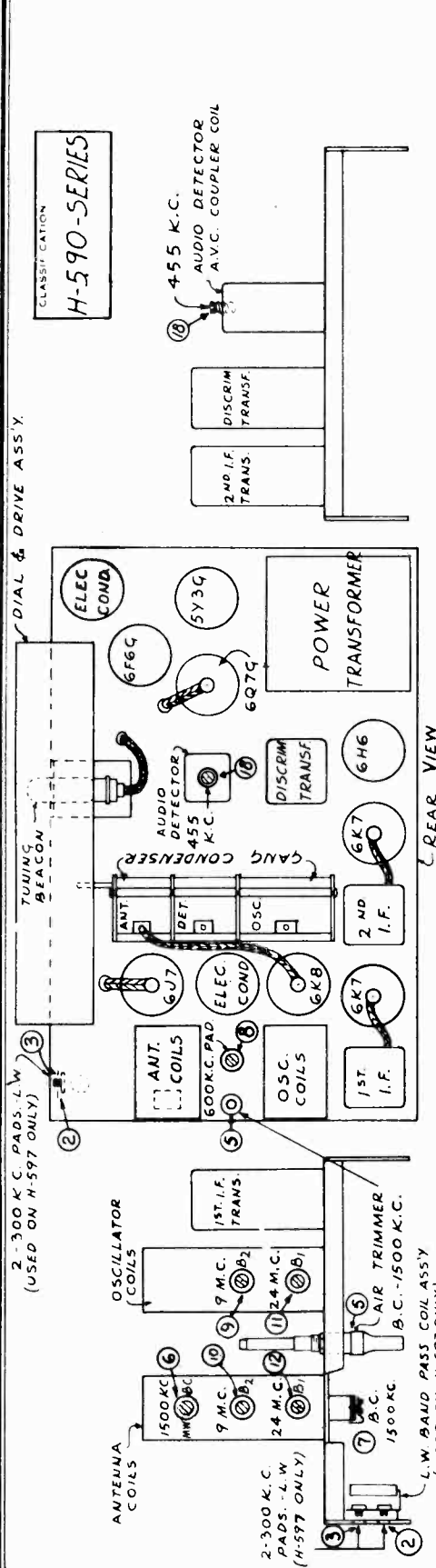
MISCELLANEOUS FOR MODEL H-594 SAME AS FOR MODEL H-597 EXCEPT FOLLOWING:

S10, S11	83360	BAND SWITCH FOR H-594
S12	78887	NOT USED
S13	523	NOT USED

PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y., U. S. A.  
SCHEMATIC CIRCUIT DIAGRAM FOR  
MODEL H 594 & MODEL H 597  
DATE: 6-14-38  
SCALE: 1" = 6"  
DRAWN BY: B. R.  
CHECKED BY:  
APPROVED BY:  
PART NO. 25188-3

MODELS H594, H597  
Socket, Trimmers  
Specifications

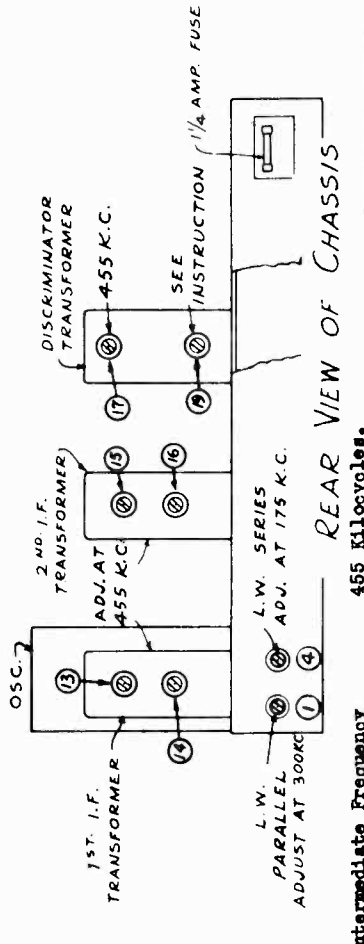
PILOT RADIO CO.



RIGHT SIDE OF CHASSIS

TOP VIEW OF CHASSIS

LEFT SIDE OF CHASSIS



PILOT RADIO CORPORATION  
LONG ISLAND CITY N Y U S A  
TRIMMER LAYOUT

MATERIAL  
SCALE  
DRAWN BY D. R.  
CHECKED BY  
DATE 6-16-38  
25189

**Circuit** Super-Heterodyne, with class A output stage, and with Automatic Frequency Control of the oscillator on the Standard Broadcast Band and on the Long-Wave Band where this band is incorporated. An R.F. Pre-selector is incorporated in the Broadcast and Long-Wave Bands. Iron Core, Permeability Tuned IF and Discriminator Transformers, which use, in addition, Silver-Mica Condensers.

Other features of the Receiver are:  
Continuously variable Tone Control, Tone Compensated Volume Control, Visible Indicators on all controls, Motor operated PLANO-TUNING on the Broadcast and Long-Wave bands. Manual Tuning is instantly available without extra switching. Motor tuning, without the keys is also available on all bands. These receivers are supplied with a fuse in the power supply circuit, and a jack is provided for plugging in a high impedance phonograph pick-up.

**PILOTUBES Required** 9 in all as follows  
One 6K8 1st detector-oscillator.  
One 6J7 Oscillator frequency control.  
Two 6K7 IF amplifiers.  
One 6H6 Discriminator.  
One 6Q7 2nd Detector - AVC - 1st Audio Amplifier.  
One 6P6-G Output Tube.  
One 6U5 Cathode Ray Tuning Beacon.  
One 5Y3-G Power supply rectifier.

**Power Supply**

Voltage	Frequency	Watts
115, 125, 150, 220, 240 *	60 cycles	90
Universal transformer	60 cycles	90

\* (Not supplied in the United States).

**Panel Controls** 12 PLANO-TUNING Keys, Volume Control, Tone Control with On-Off switch, Band Selector Switch, and Motor and Manual Tuning Controls.

**Tuning Ranges H-594 Chassis**

Band	1	2	3
Frequency	24.8 to 9.6 mc	or 12.09 to 31.23 meters	
Frequency	9.9 to 2.9 mc	or 30.8 to 103.4 meters	
Frequency	1725 to 510. kc	or 178. to 588. meters	

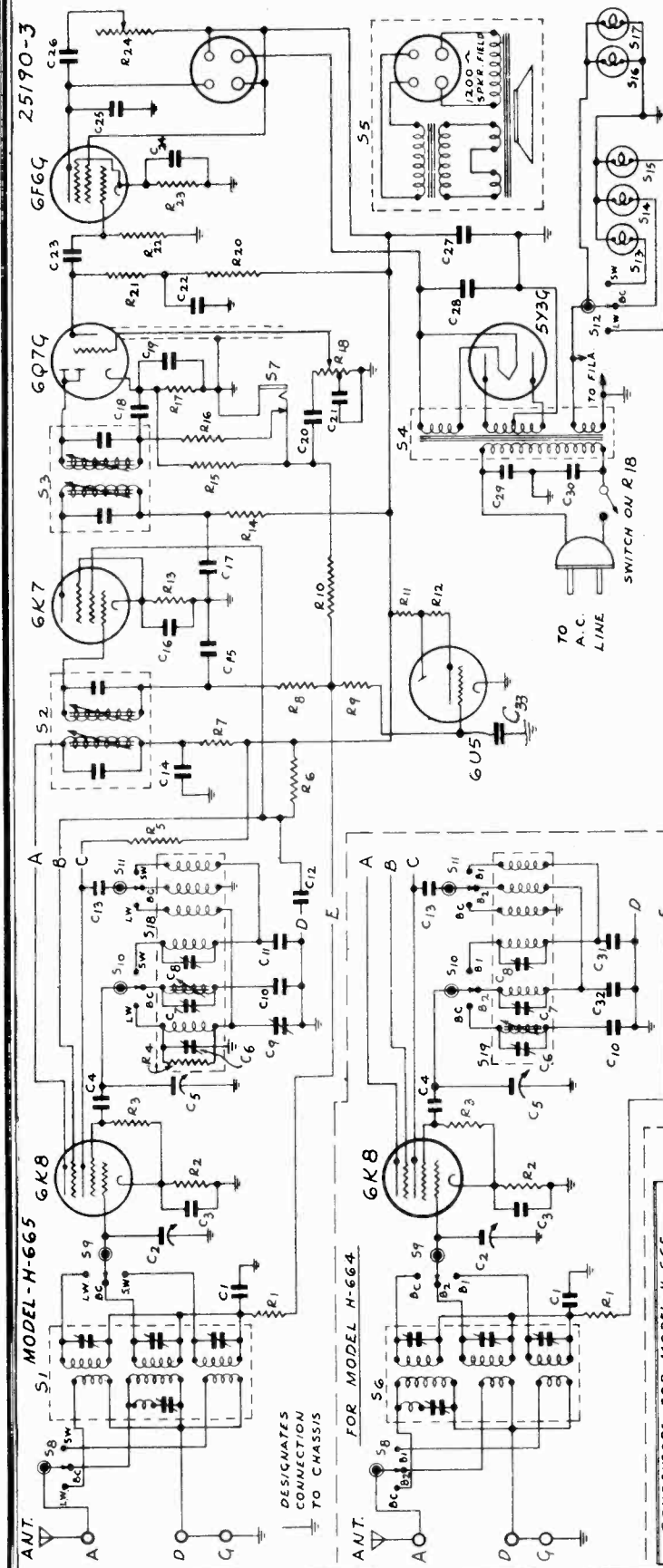
In addition to the above ranges the H-597 chassis, which is not sold in the United States, has the following Long-Wave Band.

Band	4	Maximum Power Output
Frequency	575 to 145 kc	or 800 to 2069 meters
Power		5.8 watts

**Intermediate Frequency** 455 Kilocycles.

PILOT RADIO CO.

MODELS H664, H665  
Schematic, Parts



INTERMEDIATE FREQUENCY - 455 K.C.  
ALIGNING FREQUENCIES:  
LONG-WAVE { S.W. - 18 & 6 MEGACYCLES.  
H-665 { D.C. - 1500 & 600 K.C.  
DOMESTIC { L.W. - 300 & 175 K.C.  
H-664 { B1 - 24 MEGACYCLES.  
{ B2 - 9 MEGACYCLES.  
{ B.C. - 1500 & 600 K.C.

MISCELLANEOUS FOR MODEL H-665

S1	73172	ANTENNA COIL & CAN ASSY
S2	73192	1.40 I.F. TRANSFORMER ASSY
S3	73193	2.40 I.F. TRANSFORMER ASSY
S4	83412-AB	POWER TRANSF. 117V. 50/60CY
	83412-B	" " " " 230V
	83412-L	" " " " 115-230V
S5	4-0850	B SPEAKER - 1200 OHMS
S6	4-0784	1/2 SPEAKER - 1400 OHMS
S7	70950	PHONO JACK
S8	59-510	BAND SWITCH
S9	511, 512	DIAL LAMPS
S10	514, 515	OSCELLATOR COILS ASSY
S11	516, 517	" " " " " " " "
S12	518	OSCELLATOR COILS ASSY

RESISTORS FOR MODEL H-665

R1, R8	13031	100,000 OHMS 1/4 WATT
R2	13203	200 OHMS 1/4 WATT
R3, R16	13225	47,000 OHMS 1/4 WATT
R4	13230	33,000 OHMS 1/4 WATT
R5	13092	30,000 OHMS 1 WATT
R6	13197	20,000 OHMS 2 WATT
R7, R14	13028	1,000 OHMS 1/4 WATT
R7, R10, R12	13001	1 MEG OHM 1/4 WATT
R11	13197	22,000 OHMS 1/4 WATT
R13	13215	390 OHMS 1/4 WATT
R15, R22	13217	470,000 OHMS 1/4 WATT
R17	13131	4,000 OHMS 1/4 WATT
R18	83529-B	1 MEG OHM VOL. CONT. 5W
R21	13221	220,000 OHMS 1/4 WATT
R23	13108	410 OHMS 1 WATT
R24	83447-B	100,000 OHMS TONE CONT.

CONDENSERS FOR MODEL H-665

C1, C15	22055-T	01 MFD. 200V. PAPER
C2, C5	83448	GANG CONDENSER
C3, C16	22055-M	1 MFD. 200V. PAPER
C4	28016-0	0001 MFD. MICA
C6, C9	83416	DOUBLE TRIMMER BASE
C7	83415	AIR TRIMMER
C8	72283-A	TRIMMER ASSY
C10	92000-E	375 MMFD. SILVER CAP
C11	28106	00325 MFD. MICA
C12, C22	22055-AB	1 MFD. 600V. PAPER
C13	27704-W	002 MFD. MICA
C14, C17	22055-A	01 MFD. 600V. PAPER
C18	27701-0	00025 MFD. MICA
C19, C24	22481	10 MFD. 25V. ELECTRO
C20, C23	22055-W	01 MFD. 400V. PAPER
C21	22055-AR	003 MFD. 1000V. PAPER
C25	22055-V	03 MFD. 1000V. PAPER
C26	22055-V	03 MFD. 1000V. PAPER
C27, C28	85024	16-B MFD. 450 V. ELECTRO.
C29, C30	18503	01-01 MFD. 1000V. (SHIELDED)
C33	22055-T	01 MFD. 200V. PAPER

RESISTORS FOR MODEL H-664 SAME AS FOR MODEL H-665 EXCEPT FOLLOWING.

R4	13230	NOT USED
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CONDENSERS FOR MODEL H-664 SAME AS FOR MODEL H-665 EXCEPT FOLLOWING.

C31	21705-W	003 MFD. MICA
C7	83416	NOT USED
C9	27706	NOT USED
C32	2776-W	0015 MFD. MICA

PILOT RADIO CORPORATION  
LONG ISLAND CITY, N. Y. U. S. A.  
SCHEMATIC CIRCUIT DIAGRAM  
FOR MODEL H-664 & H-665  
DATE 6-23-38  
DRAWN BY B.P.  
CHECKED BY  
APPROVED BY

FINISH  
THIS PRINT SUPERSEDES ALL OTHERS  
PRIOR TO  
H-660 SERIES  
LAWYER'S SIGNATURE  
NO. 25190-3  
SCALE 1/8" = 1"

MODELS H664, H665  
 Socket, Trimmer  
 Voltage, Specs.

PILOT RADIO CO.

D.C. SOCKET VOLTAGES

All voltages are those between the indicated tube terminal and the chassis, and are made with a 1000 ohm per volt voltmeter. Make measurements with no signal input to the receiver and with the volume control set at minimum volume.

Make sure that the A.C. supply voltage is correct for the transformer tap being used at the time of measurement.

SOCKET TERMINALS

Tube	1	2	3	4	5	6	7	8
6K8	-	-	240	95	-	110	-	2.8
6K7	-	-	240	95	3.3	-	-	3.3
6Q7	-	-	105*	-	-	-	-	1.4
6F6-G	-	-	225	245	-	-	-	16
5Y3-G	-	-	-	-	-	340	-	340

\*Not true voltage but as measured with voltmeter

CLASSIFICATION  
**H-660-SERIES**

TRIMMER LAYOUT

MATERIAL: \_\_\_\_\_  
 SCALE: \_\_\_\_\_ DATE: 6-24-33  
 DRAWN BY: B. R.  
 CHECKED BY: \_\_\_\_\_  
 APPROVED BY: \_\_\_\_\_  
 Dwg No: 25191

Panel Controls Volumes with On-Off Switch, Tone, Band Select- or Switch, Manual Tuning Control, and an 8 key mechanically oper- ated PIANO TUNING mechanism, with key locking knob.

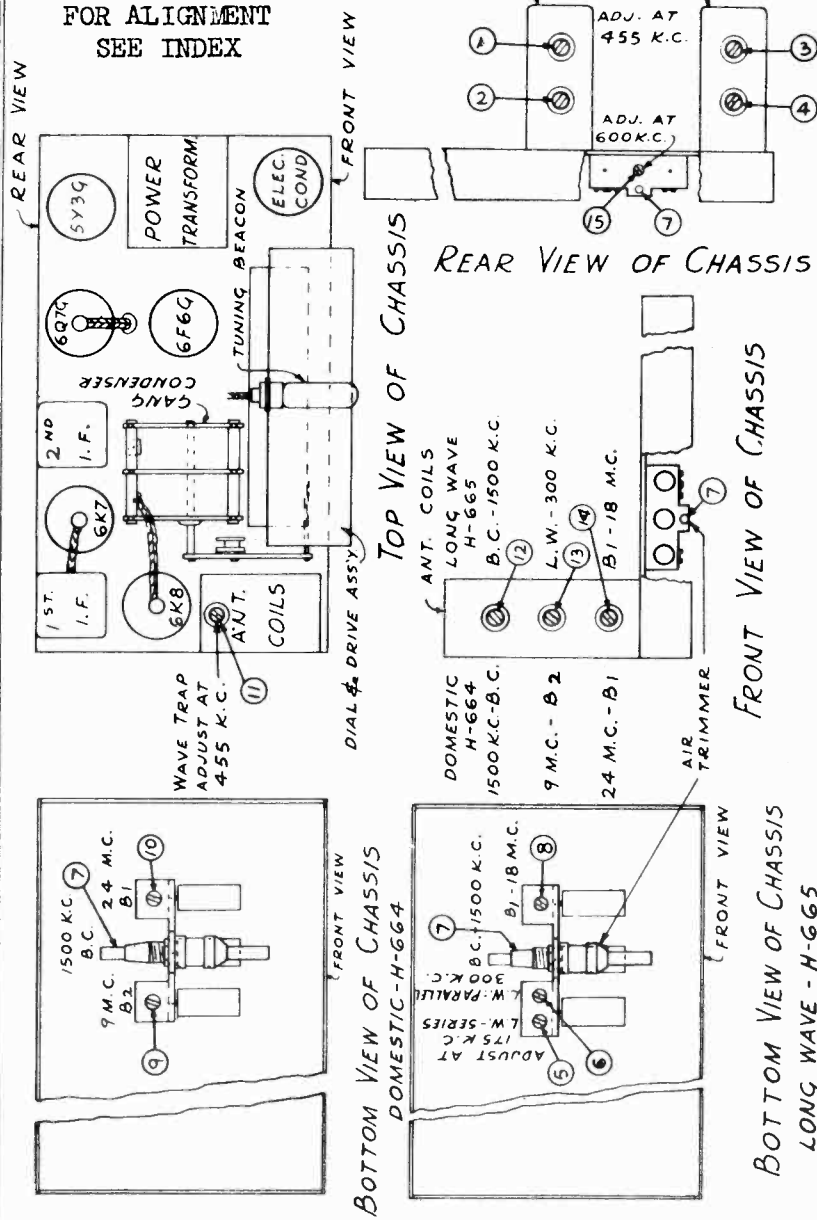
Maximum Power Output 4.8 watts.

Tuning Ranges The model H-664 Chassis has the following tuning ranges:

Band	1	2	3
24.8 to 8.3 mc	or	12.09 to 36.12 meters	
9.7 to 2.9 mc	or	30.9 to 103.4 meters	
17.25 to 530 kc	or	174 to 566 meters	

The model H-665 Chassis has the following tuning ranges:

Band	1	2	3
18.8 to 5.35 mc	or	15.9 to 56.04 meters	
17.25 to 530 kc	or	174 to 566 meters	
375 to 145 kc	or	800 to 2069 meters	



GENERAL SPECIFICATIONS.  
 Circuit Super-Heterodyne, with Class A output stage. Three tuning ranges as listed below. Permeability tuned IF trans- formers. Tone compensated volume control, Continuously variable tone control, Automatic Volume Control and Cathode Ray Tuning Beam.

PILOTUBES Required One 6K8 1st detector-oscillator, one 6K7 IF amplifier, one 6Q7 2nd detector-AVC-1st audio amplifier, one 6F6-G output tube, one 6U5 cathode ray tuning beam, one 5Y3-G power supply rectifier. Total 6 tubes.

Power Supply Voltage	Frequency	Watts
110 to 125 volts	60	50
150 volts	60	60
220 to 240 volts	60	60
110 to 125 or 220 to 240 volts	60	60

Intermediate Frequency 455 Kilocycles



RCA MFG. CO., INC.

MODEL HF-1  
Schematic  
Fidelity Switch Data

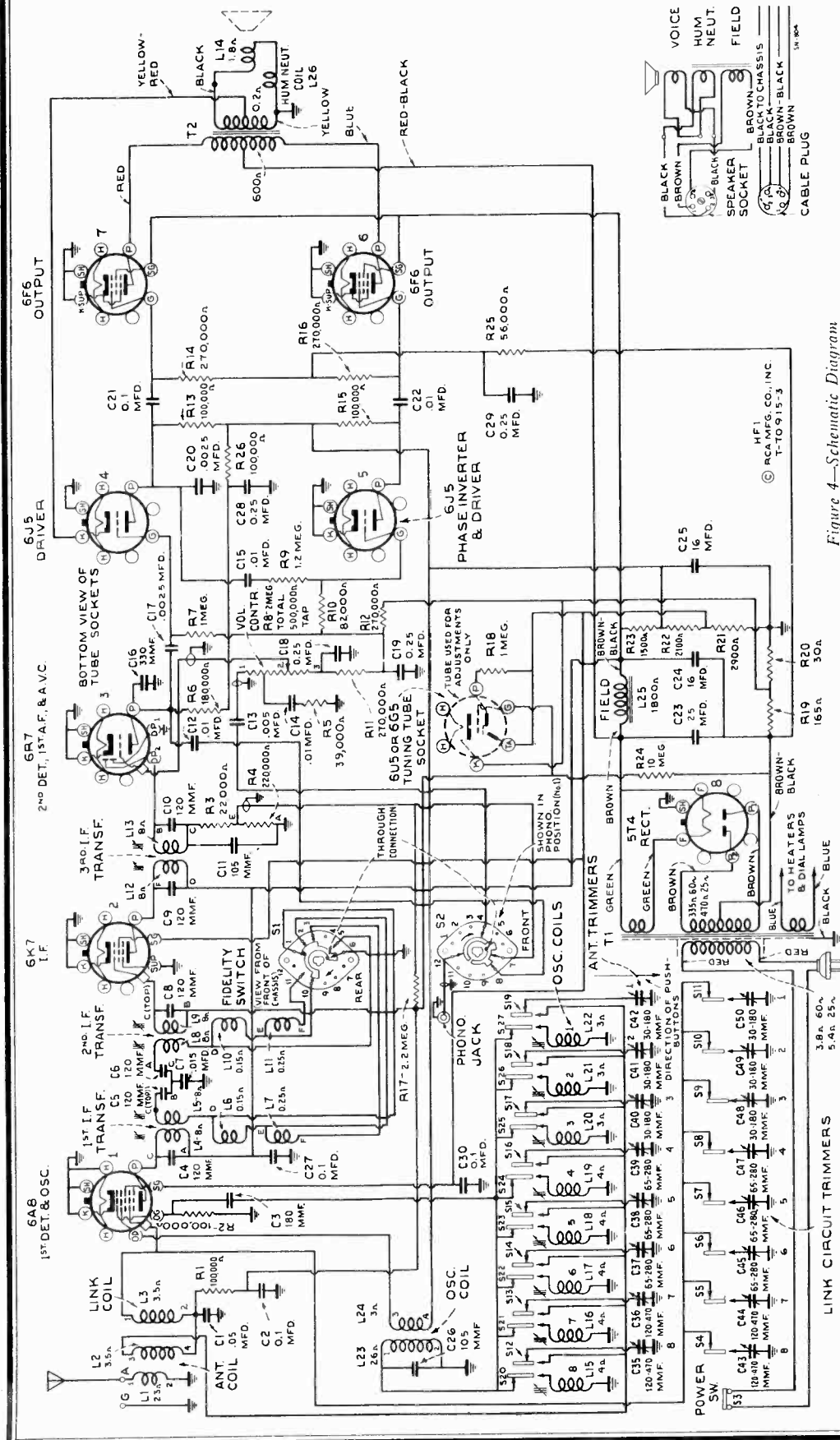


Figure 4—Schematic Diagram

No.	Purpose and Function of the Six Positions on Fidelity Switch
No. 1	Phono operation, with minimum high-frequency response.
No. 2	Phono operation, with maximum high-frequency response.
No. 3	Radio operation, with maximum selectivity, minimum high-frequency response and minimum fidelity.
No. 4	Radio operation, with maximum selectivity and medium fidelity.
No. 5	Radio operation, with minimum selectivity and medium fidelity.
No. 6	Radio operation, with minimum selectivity and full-range fidelity.

IF PEAK 455 KC

Purpose and Function of the Six Positions on Fidelity Switch

**MODEL HF-1**

**Socket, Trimmers, Voltage  
Chassis Wiring, Specs. Notes**

RCA MFG. CO., INC.

Frequency Range..... 540-1,550 kc  
 2 Stations between approx. 540-1,160 kc (buttons 7 and 8)  
 3 Stations between approx. 630-1,230 kc (buttons 4, 5, and 6)  
 3 Stations between approx. 780-1,550 kc (buttons 1, 2, and 3)  
 Intermediate Frequency..... 455 kc

A socket is provided for an RCA-6U5 or 6G5 "Magic Eye" Tuning Tube, to facilitate adjustments for electric tuning.  
 Pilot Lamp..... Mazda No. 46, 6.3 volts, 0.25 amps.

**POWER SUPPLY RATINGS**

Rating A..... 105-125 volts, 50-60 cycles, 115 watts  
 Rating B..... 105-125 volts, 25-60 cycles, 115 watts

**POWER OUTPUT**

Undistorted..... 10 watts  
 Maximum..... 12 watts

**LOUDSPEAKER**

Type..... 12-inch Electrodynamic  
 Impedance (v.c.)..... 2.25 ohms at 400 cycles

**Precautionary Lead Dress and  
Replacement of Parts**

1. The green lead from the antenna coil to the switch, and the green lead from the link coil to the switch, should be dressed away from the oscillator coils, and free of other leads, chassis, and parts.
2. When replacing a dual trimmer, it must be installed so that the top plate (to which the adjustment screws make contact) is the ground side. This is particularly important on C39-C40, and C47-C48, because the sections of these trimmers are of different capacity range and must be correctly oriented in the receiver. Grounding the top plate takes care of this.
3. Maintain color coding on output transformer (T2) as shown in the schematic diagram. This is necessary in order to obtain correct inverse-feedback action.

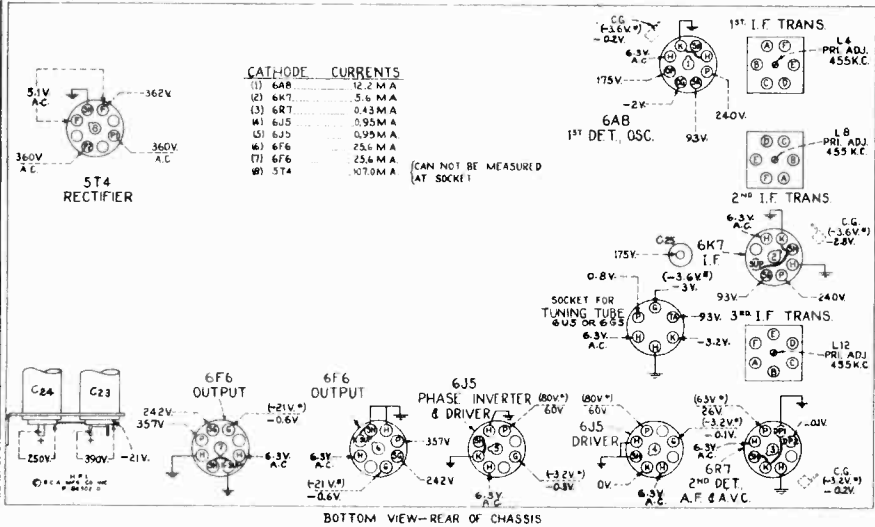


Figure 5—Radiotron Socket Voltages

\* Note: Values with star (\*) are operating voltages. Values not starred are actual measured voltages. Measurements made to chassis unless otherwise indicated with Magic Eye in socket. Measurements made with all push buttons out, volume control

turned to minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, 250, and 500 volts. (Use range above the specified measured voltage.) Values should hold within approximately ± 20% for 117-volt, 60-cycle supply.

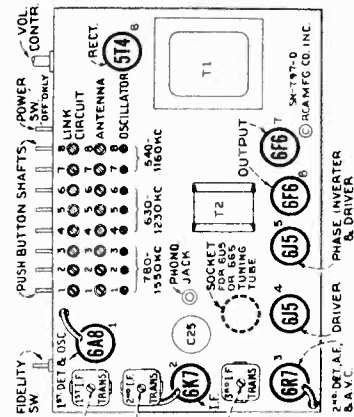


Figure 2—Radiotron and Trimmer Locations

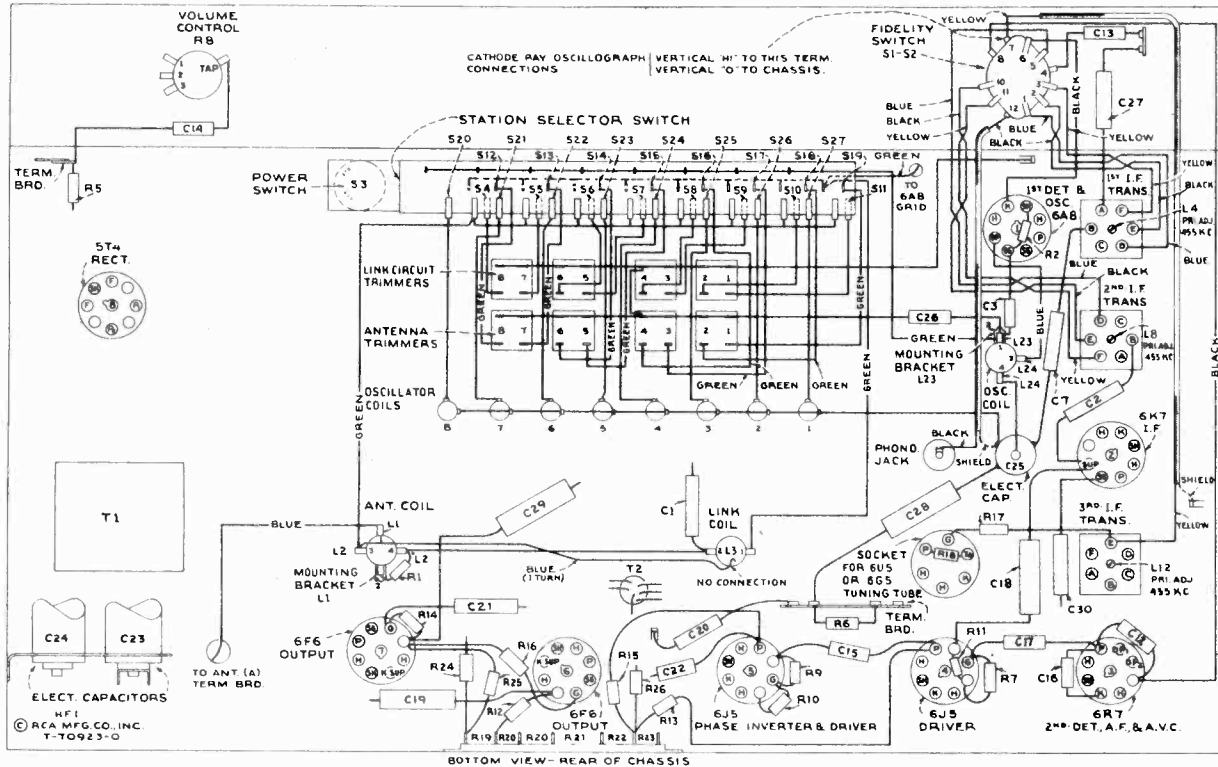


Figure 3—Component Parts Location and R-F Wiring Diagram

### I-F Alignment Procedure

Cathode-ray Alignment is the recommended method for Model HF1. Connections for the oscillograph are shown in the chassis drawing.

**Output Meter Alignment.**—If an output meter is used, connect it 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.

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

Push in button 8, and adjust the No. 8 trimmers and core to a quiet point near 800 kc. Leave the button pushed in for the following operations:

Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn Fidelity switch to—	Adjust the following for max. peak and symmetry—
No. 1	6K7 I-F grid cap. in series with .001 mfd.	455 kc (20 kc sweep)	---	L12 and L13 (3rd I-F transf.) (Refer to curve "A")
No. 2	6A8 1st-det. grid cap. in series with .001 mfd.	455 kc (20 kc sweep)	Position 4 (from left)	Turn L4 and L5 (1st I-F) out as far as possible. Peak L8 and L9 (2nd I-F), and then L5 and L4. Readjust L8 and L9 slightly if necessary. (Refer to curve "B")
No. 3	Turn selectivity switch to position 5. Response should be like curve "C".			
No. 4	Turn selectivity switch to position 6 (full clockwise). Response should be like curve "D".			
No. 5	Follow "Adjustments for Electric Tuning".			

The No. 6 position (knob turned full clockwise) on the fidelity switch provides minimum selectivity and maximum fidelity. This position of the switch may be used for full-range reproduction of the majority of local stations, but occasionally (due to the present 10 kc station spacing), an adjacent channel signal will cause a 10 kc beat or "monkey chatter." Turning back the fidelity switch to position 5, 4, or 3 will eliminate this condition, at the expense of high-fidelity reproduction. (An example of possible "monkey chatter" is found in the case of WOR at 710 kc. and WLW at 700 kc.)

### Adjustments for Electric Tuning

1. Make a list of the desired eight stations, arranged in order from high to low frequencies. It is preferable to select strong local high-quality stations within a radius of 100 miles.

2. Insert an RCA 6U5 or 6G5 Magic Eye tube in the six-prong socket on the chassis. Use an insulated screwdriver or alignment tool (such as RCA Stock No. 31031) for all adjustments. LEAVE THE FIDELITY SWITCH IN POSITION 3 OR 4 WHILE MAKING ADJUSTMENTS FOR ELECTRIC TUNING.

3. Remove the antenna lead-in from the "A" terminal and wrap it once around the green lead to the top cap of the 6A8 tube. (This provides capacity coupling between the antenna and the 6A8 grid.)

4. Push in button No. 1 and turn oscillator core No. 1 to bring in the first station on the list. Adjust the core carefully for peak output as indicated by the Magic Eye. Adjust link trimmer No. 1 for max output.

5. Remove the antenna lead-in from the 6A8 grid lead and connect the lead-in to the "A" terminal. Adjust antenna trimmer No. 1 and link trimmer No. 1 for peak output as indicated by the Magic Eye.

(Clockwise rotation of cores and trimmers tunes the circuits to lower frequencies, and counter-clockwise adjustment tunes the circuits to higher frequencies.)

6. Push in button No. 2. Adjust oscillator core No. 2, antenna trimmer No. 2, and link trimmer No. 2 for the second station in the same manner.

7. Follow the same procedure for the remaining stations.

8. After tuning in eight stations as specified above, leave the antenna lead-in connected to the "A" terminal, and carefully readjust each of the oscillator cores for peak output on the respective stations.

9. After the set is installed and connected to the customer's antenna, make a final readjustment of the antenna and link trimmers.

10. The Magic Eye should be removed from the chassis after completion of the electric-tuning adjustments.

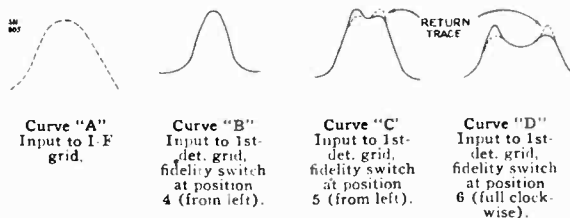


Figure 1—Approximate I-F Response Curves

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>					
13216	Board—Antenna and ground terminal board...	.25	13730	Resistor—1 meg., 1/2 watt (R18)	.20
30314	Cap—Grid contact cap.	.03	12013	Resistor—1 meg., 1/10 watt (R7)	.15
12581	Cap—Shield cap for first or third I.F. transformers	.25	31056	Resistor—1.2 meg., 1/10 watt (R9)	.15
12607	Cap—Shield cap for second I.F. transformers	.20	12679	Resistor—2.2 meg., 1/2 watt (R17)	.20
30750	Capacitor—Adjustable dual trimmer 30-180 Mmfd. (C41, C42, C49, C50)	.45	13601	Resistor—10 meg., 1/2 watt (R24)	.20
31066	Capacitor—Adjustable dual trimmer 30-180 Mmfd. and 65-280 Mmfd. (C39, C40, C47, C48)	.45	12007	Spring—Retaining spring for core Stock Nos. 12006 and 30846	.15
30764	Capacitor—Adjustable dual trimmer 65-280 Mmfd. (C37, C38, C45, C46)	.45	12110	Shield—Radiotron shield cap.	.14
30765	Capacitor—Adjustable dual trimmer 120-470 Mmfd. (C35, C36, C43, C44)	.50	14278	Socket—Phonograph socket	.25
30769	Capacitor—105 Mmfd. (C26)	.40	14171	Socket—Pilot lamp socket	.40
30904	Capacitor—105 Mmfd. (C11)	.25	4786	Socket—Adjustment eye socket	.25
12404	Capacitor—120 Mmfd. (C4, C5, C6, C8, C9, C10)	.30	11196	Socket—Radiotron socket (8-contact)	.25
13003	Capacitor—180 Mmfd. (C3)	.25	31061	Switch—Selectivity and tone control switch (S1, S2)	.95
12952	Capacitor—330 Mmfd. (C16)	.25	31070	Switch—Station selector and on-off switch—less push buttons (S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S13, S14, S15, S16, S17, S18, S19, S20, S21, S22, S23, S24, S25, S26, S27)	4.60
5107	Capacitor—.0025 Mfd. (C17, C20)	.20	31063	Transformer—First I.F. transformer (L4, L5, L6, L7, C5, C4)	2.25
4838	Capacitor—.005 Mfd. (C13)	.25	31064	Transformer—Second I.F. transformer (L8, L9, L10, L11, C6, C8)	2.25
14393	Capacitor—.01 Mfd. (C12, C14, C15, C22)	.30	31065	Transformer—Third I.F. transformer (L12, L13, C9, C10, C11, R3, R4)	2.50
11315	Capacitor—.015 Mfd. (C7)	.20	31062	Transformer—Output transformer (T2)	2.30
4886	Capacitor—.05 Mfd. (C1)	.20	11211	Transformer—Power transformer 105-120 volts, 50-60 cycle (T1)	8.00
4839	Capacitor—.1 Mfd. (C2, C21, C27, C30)	.30	11212	Transformer—Power transformer 105-120 volts, 25-60 cycle (T1)	11.65
12484	Capacitor—.25 Mfd. (C18, C19, C28, C29)	.30	31060	Volume Control (R8)	1.50
30105	Capacitor—.16 Mfd. (C25)	1.55	<b>REPRODUCER ASSEMBLIES</b>		
5212	Capacitor—.16 Mfd. (C24)	1.35	(Speaker RL70E-4)		
14531	Capacitor—.25 Mfd. (C23)	1.55	13868	Cap—Dust cap for cone center	.03
31068	Coil—Link coil (L3)	.60	11234	Coil—Field coil (L25)	3.85
31069	Coil—Antenna coil (L1, L2)	.85	11469	Coil—Neutralizing coil (L26)	.30
30749	Coil—Oscillator coil (L15, L16)	.60	12667	Cone—Reproducer cone, voice coil, center suspension, and dust cap (L14)	1.95
30748	Coil—Oscillator coil (L17, L18, L19)	.60	5039	Plug—4-contact male plug for reproducer	.30
30747	Coil—Oscillator coil (L20, L21, L22)	.60	31072	Reproducer complete	10.35
31067	Coil—Oscillator coil (L23, L24)	.85	14357	Washer—Spring washer to hold field coil securely	.06
5040	Connector—4-contact female speaker connector	.30	<b>MISCELLANEOUS ASSEMBLIES</b>		
30846	Core—Adjustable core and stud for oscillator coils	.30	31074	Button—Push button for on-off switch	.07
12006	Core—Adjustable core and stud for I.F. transformers	.15	30981	Button—Push button for station selector switch	.10
5226	Lamp—Pilot lamp	.17	13103	Cap—Pilot lamp cap	.15
30865	Resistor—Voltage divider comprising one 1,500 ohm, one 2,100 ohm, one 2,900 ohm, two 15 ohm, and one 165 ohm sections (R19, R20, R21, R22, R23)	1.10	31095	Discs—10 celluloid protector discs for call-letter markers	.10
14284	Resistor—22,000 ohms, 1/10 watt (R3)	.15	31073	Escutcheon—Push button escutcheon	.85
12266	Resistor—39,000 ohms, 1/2 watt (R5)	.20	14289	Knob—Volume control or selectivity and tone switch knob	.20
12286	Resistor—56,000 ohms, 1/2 watt (R25)	.20	31028	Marker—Station call letter markers for push buttons	.40
12719	Resistor—82,000 ohms, 1/10 watt (R10)	.15	31048	Plug—2-contact male plug for phono jack	.15
14560	Resistor—100,000 ohms, 1/2 watt (R1, R2, R13, R15, R26)	.20	14270	Spring—Retaining spring for knob Stock No. 14269	.05
13698	Resistor—180,000 ohms, 1/2 watt (R6)	.20			
11398	Resistor—220,000 ohms, 1/10 watt (R4)	.15			
12199	Resistor—270,000 ohms, 1/2 watt (R11, R12, R14, R16)	.20			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

MODELS HF-2, HF-4, U130

Tuner Adjustments

RCA MFG. CO., INC.

Specs.

Pilot Lamps: (4).....3—6.3 V., 0.25 Amp. Mazda No. 44; 1—6.3 V., 0.15 Amp. Mazda No. 47

POWER SUPPLY RATINGS (Model U-130)

		Radio Only	Total
Rating A6.....	105-125 volts,	60 cycles, 125 watts	150 watts
Rating A.....	105-125 volts,	50-60 cycles, 125 watts	150 watts
Rating B2.....	105-125 volts,	25 cycles, 125 watts	150 watts
Rating C6.....	105-130/140-160/200-250 volts,	60 cycles, 125 watts	150 watts
Rating C.....	105-130/140-160/200-250 volts,	50-60 cycles, 125 watts	150 watts

POWER SUPPLY RATINGS (Models HF-2 and HF-4)

Rating A.....	105-125 volts, 50-60 cycles, 125 watts
Rating B.....	105-125 volts, 25 cycles, 125 watts
Rating C.....	100-130/140-160/195-250 volts, 50-60 cycles, 125 watts

POWER OUTPUT

Undistorted.....	10 watts
Maximum.....	12 watts

## ADJUSTMENTS FOR ELECTRIC TUNING

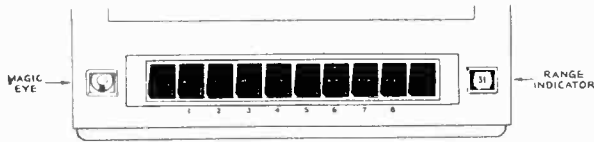


Figure 1—Location of Controls

3. Turn Fidelity Control maximum counter-clockwise.
4. Press down the "dial-tuning" (right-hand) button.
5. Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.
6. Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down, central dial lamp will light brightly or dully, depending on which side of disc, contact is. Move station-setting contact No. 1 to the insulating line on the disc at rear of gang. When the contact is correctly centered on the insulating line, the central dial lamp will go out.
7. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
8. Repeat this process for the remaining stations.

The left-hand push-button is a Victrola-Attachment switch. The right-hand push-button is for dial tuning.

1. Make a list of the desired eight stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.

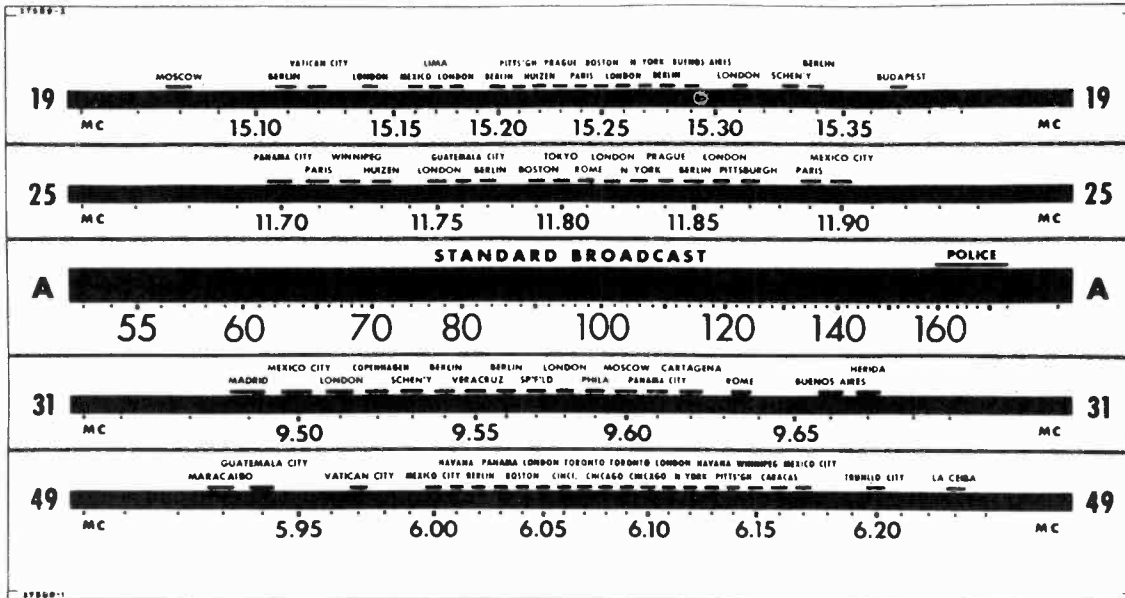
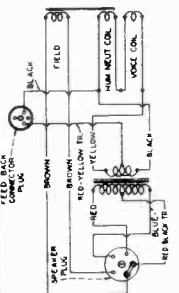
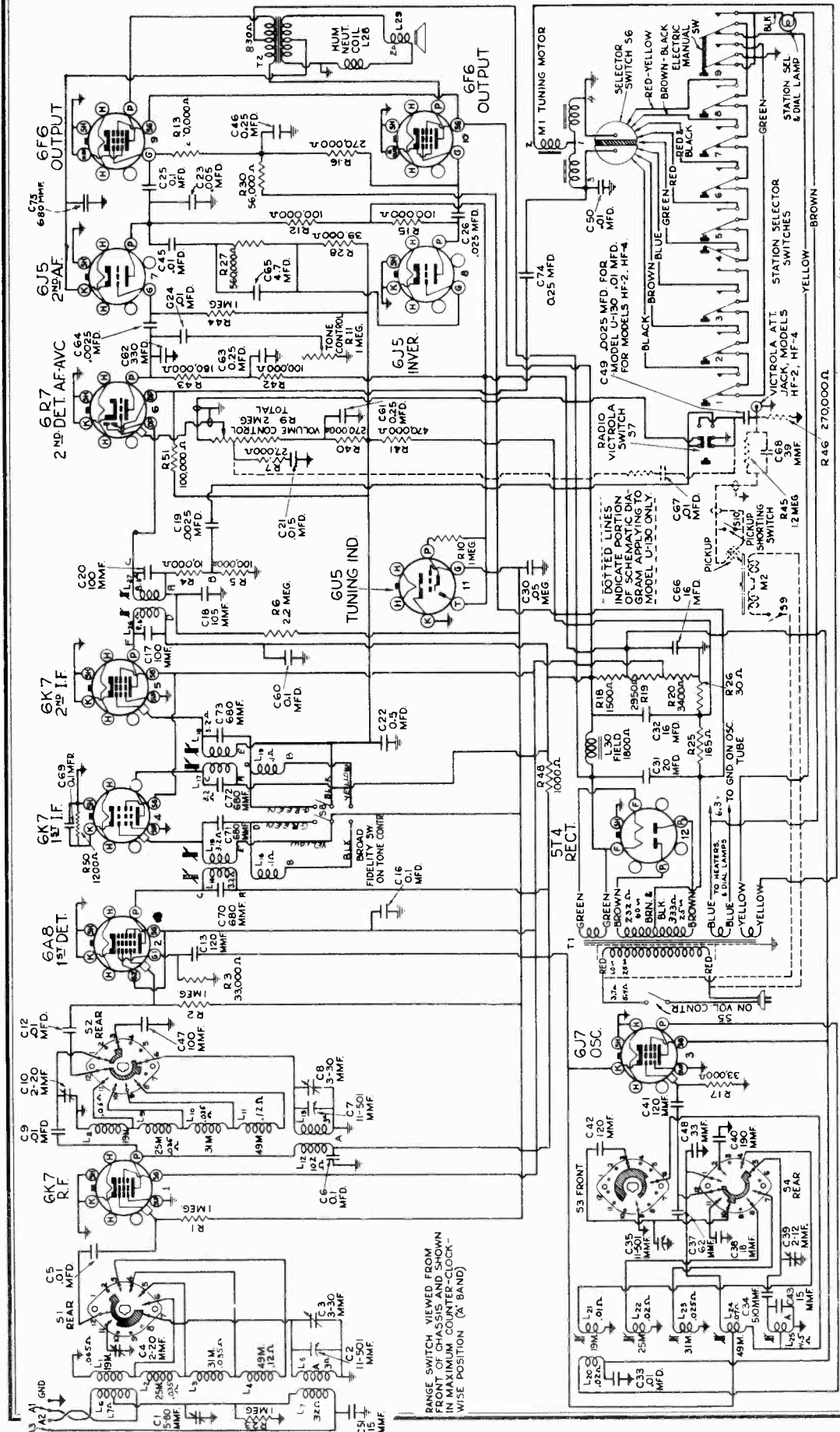


Figure 2—Reduced Reproduction of Receiver Dial, and Corresponding 0-180° Calibration Scales

The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example 90° on the calibration scale corresponds approximately to 11.8 mc on the 25-meter band, and 940 kc on "A" band, etc. Read instructions under "Alignment Procedure."



Above—Connections and Colors of Loudspeaker Wiring.

Figure 4—Schematic Circuit Diagram

R-F ALIGNMENT FREQUENCIES

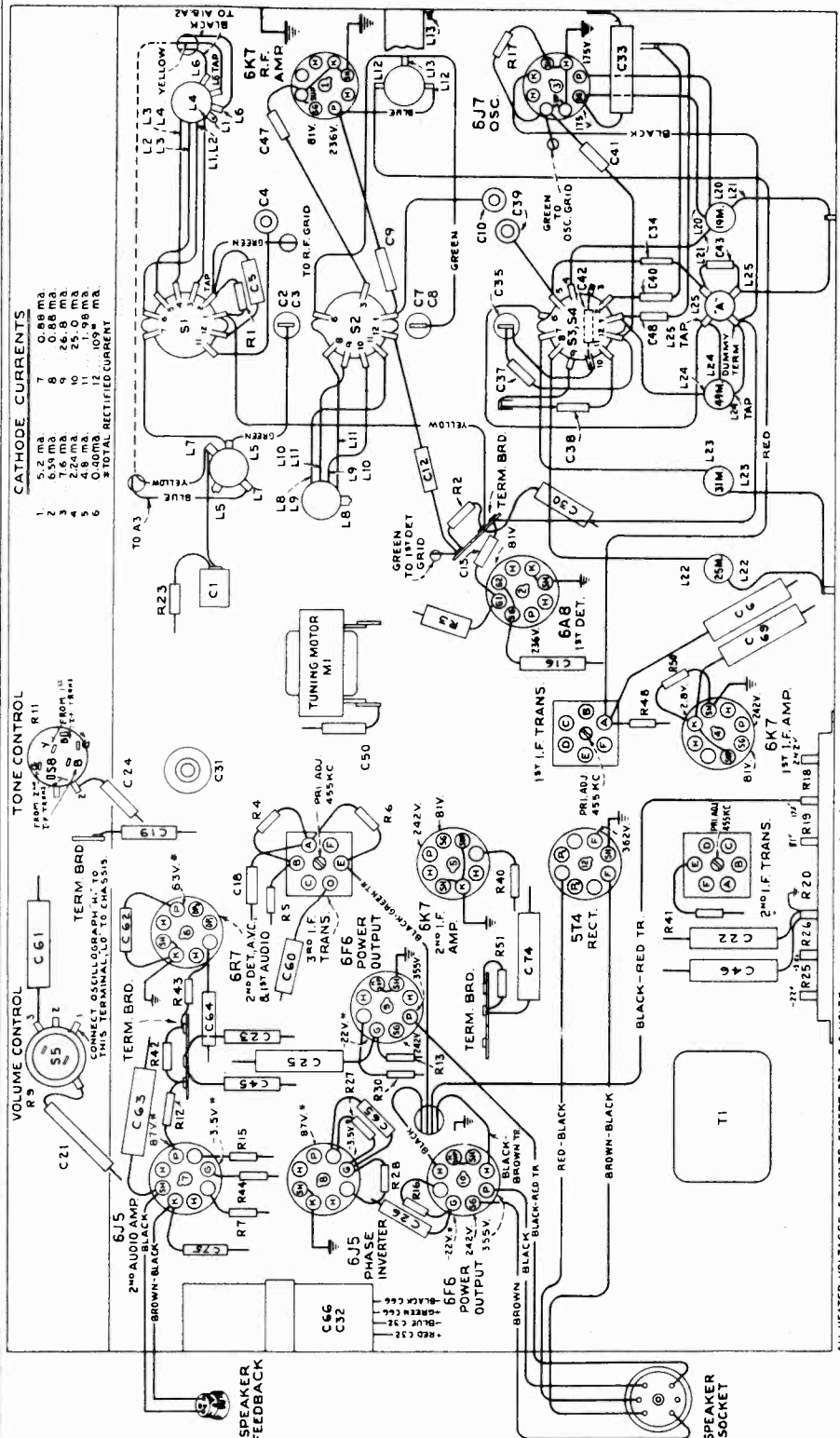
"A" Band	600 kc (osc.)	1,500 kc (osc, det, ant.)
"49" Meter Band	540-1,720 kc	5.92-6.23 mc
"31" Meter Band	5.92-6.23 mc	9.48-9.69 mc
"25" Meter Band	9.48-9.69 mc	11.68-11.94 mc
"19" Meter Band	11.68-11.94 mc	15.08-15.39 mc
Intermediate Frequency	455 kc	

FREQUENCY RANGES

"Standard Broadcast" (A)	540-1,720 kc
"49" Meter Band	5.92-6.23 mc
"31" Meter Band	9.48-9.69 mc
"25" Meter Band	11.68-11.94 mc
"19" Meter Band	15.08-15.39 mc

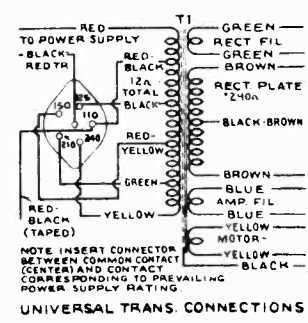


Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately  $\pm 20\%$  with 117-volt a-c supply.



**CATHODE CURRENTS**

1	5.2 ma.
2	7.4 ma.
3	26.8 ma.
4	22.4 ma.
5	4.8 ma.
6	11.9 ma.
7	0.88 ma.
8	26.8 ma.
9	25.0 ma.
10	25.0 ma.
11	16.98 ma.
12	16.98 ma.
13	2.00 ma.
14	2.00 ma.
15	2.00 ma.
16	2.00 ma.
17	2.00 ma.
18	2.00 ma.
19	2.00 ma.
20	2.00 ma.
21	2.00 ma.
22	2.00 ma.
23	2.00 ma.
24	2.00 ma.
25	2.00 ma.
26	2.00 ma.
27	2.00 ma.
28	2.00 ma.
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30	2.00 ma.
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88	2.00 ma.
89	2.00 ma.
90	2.00 ma.
91	2.00 ma.
92	2.00 ma.
93	2.00 ma.
94	2.00 ma.
95	2.00 ma.
96	2.00 ma.
97	2.00 ma.
98	2.00 ma.
99	2.00 ma.
100	2.00 ma.



Above — Universal Power Transformer Connections. (110-volt supply for a Victrola Attachment may be obtained by connecting the motor to the red and the black leads.)

Figure 5—R-F Wiring Diagram and Socket Voltages

- Precautionary Lead Dress.**
- (1) Keep tuning tube cable and the lead from the left pilot light away from the 6F5 grid cap.
  - (2) Leads on spread-band antenna and r-f coils and trimming capacitors should be kept short as possible.
  - (3) Keep black lead from L25 away from C38 and L24.
  - (4) Keep black lead from L25 to cathode lug on 6J7 away from R17.
  - (5) The power cord lead and the primary lead of the power transformer which connect to the power switch should be twisted together, and kept away from Volume Control.
  - (6) Keep C13 away from the 6A8 control grid lead and from the chassis.
  - (7) Shielded leads to Victrola jack must be dressed away from switch terminals and jack.

- (8) Blue and black leads from antenna board to coils must be twisted.
  - (9) Black lead and condenser which connect to 6F6 plate should be kept away from inverter grid lead and resistors which connect to it.
- \* 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.



MODELS HF-2, HF-4, U130  
Alignment, Tuner Data  
Antenna

RCA MFG. CO., INC.

Steps	Connect the high side of test-oscillator to—	Tune Test-Oscillator to—	Range Selector	Set Tuning Gang to—	Adjust the following for max. peak output
No. 1	Turn Fidelity Control to Maximum	Counter-clockwise		position.	
No. 2	6K7 2nd I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L26, L27 (1st I-F transformer)
No. 3	6K7 1st I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L17, L18 (2nd I-F transformer)
No. 4	6A8 1st-det. grid cap in series with .01 mfd.	455 kc	"A"	Quiet Point between 550-750 kc	L14, L15 (1st I-F transformer)
No. 5	A2 in series with 100 mmf. A3 to Chassis.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.) C3 (ant.) C8 (det.)
No. 6	A2 in series with 100 mmf. A3 to Chassis.	600 kc	"A"	600 kc (30.0°)	L25 (osc.)
No. 7	A2 in series with 100 mmf. A3 to Chassis.	1,500 kc	"A"	1,500 kc (151.5°)	C39 (osc.)
No. 8	A2 Connect A1 to chassis.	6,100 kc	"49M"	6,100 kc (106°)	L24 (osc.)*
No. 9	A2 Connect A1 to chassis.	9,800 kc	"31M"	9,800 kc (192°)	L23 (osc.)* C4 (ant.) C10 (det.)*
No. 10	A2 Connect A1 to chassis.	11,800 kc	"25M"	11,800 kc (90.0°)	L22 (osc.)*
No. 11	A2 Connect A1 to chassis.	15,200 kc	"19M"	15,200 kc (78.0°)	L21 (osc.)*

\* Use maximum inductance peak (plunger in) if two peaks can be obtained.  
\*\* Use minimum inductance peak (plunger out) if two peaks can be obtained.  
Note that oscillator tracks above signal frequency on all bands except "49M" where it tracks below.

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

At 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 180° calibration scales drawn at top and bottom.

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

**Dial-Indicator Adjustment**—After fastening the dial 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.

**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 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:

- 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.
- 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 magnet-core oscillator coil for each band should be re-adjusted so that the stations come in at the correct points on the dial.

For additional information, refer to booklet "RCA Victor Receiver Alignment."  
**Using RCA Stock No. 150 Test Oscillator**—When using this oscillator for spread-band alignment, insert an open-circuit plug in the "EXT. MOD." jack, and set the test-oscillator dial 800 kc lower than the desired frequency for the four lower frequency ranges, and 800 kc higher than the desired frequency for the two high ranges. This provides an unmodulated signal of the desired frequency and the Magic Eye may be used as an output indicator for this unmodulated signal.

**Armchair Control Unit**

When a Model G8A Armchair Control is connected to the receiver as shown in figure 7 it duplicates the action of the push-buttons on the front panel when No. 1 button is pressed down. The black lead from push-button No. 1 is unsoldered from No. 1 station-setting contact and soldered to a terminal board which is to be mounted on the frame of selector mechanism. In some cases one of the other seven station buttons on the set may be used in place of No. 1 button for the operation of the Armchair Control.

This arrangement allows the use of only seven of the eight buttons when tuning in stations at the set, but allows the use of the entire eight buttons on the Model G8A Armchair Control. In operating the G8A Armchair Control the push-button must be held down until the station has been tuned in. Care must be taken not to hold two of the station-buttons down at one time as both windings of the motor may be engaged simultaneously causing the motor to be inoperative and overheated.

**Antenna Connections**

**RCA Victor Master Antenna Kit**—Connect the twisted-pair transmission line to terminals A1 and A2 on the terminal board at rear of chassis. Connect the counter-pole to A3. Terminal G may be connected to ground, but this connection is not necessary for correct operation.

**Noise-Reducing Adjustment**—After the RCA Victor Master Antenna Kit is connected to the receiver, tune the receiver to a point near 900 kc where no station is heard. Turn volume control clockwise until noise is heard. If no noise of a regular character is audible, start any brush-type motor-driven appliance, such as a vacuum cleaner, electric razor, refrigerator, etc., but do not bring it too near the receiver. This will generate noise as a continuous crackling, or buzz. Adjust C1 to a point where this noise is reduced to a minimum.

Adjustment of the noise reducing trimmer C1 should be made in the customer's home, with the RCA Victor Master Antenna connected to the receiver.

This adjustment is effective only when the RCA Victor Master Antenna is used. For all other types of antenna, the noise-adjustment trimmer should be screwed all the way down.

**Other Antennas**—Use terminals A1 and A3 on the receiver terminal board as antenna and ground connecting points respectively. Terminal A3 may be connected to terminal G, unless this causes interference, in which case this connection should be omitted.

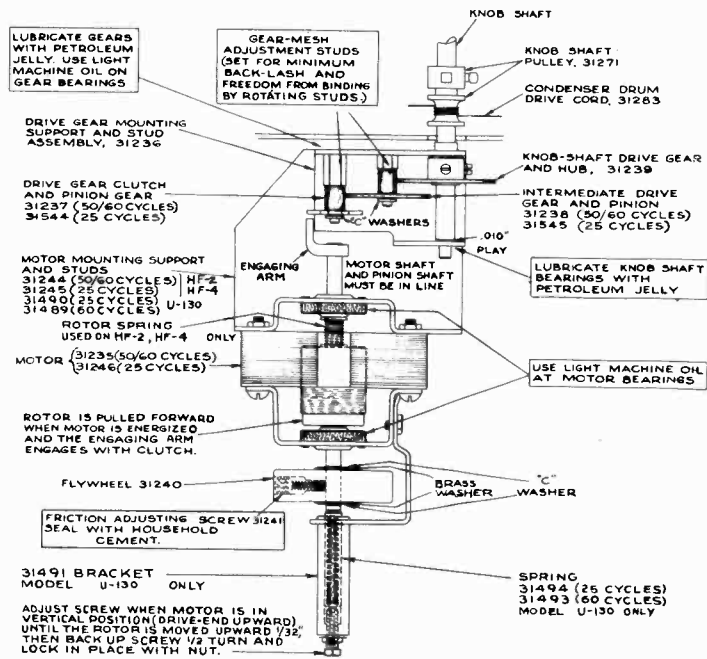


Figure 8—Motor and Gear Mechanism

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position.

**Electric Tuning Mechanism**

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated below.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken. Inertia carries the insulation line past the station-setting contact which then makes contact to the other half of the disc. This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the station-setting contact, when the circuit is broken and the mechanism stops.

**Adjustment of Flywheel Friction**

In normal operation, the motor drives the tuning condenser and selector disc until the insulation line just passes the particular station-setting contact. The motor then reverses and moves the disc slowly in the opposite direction until the insulation line is under the contact, and the mechanism stops.

In some cases, particularly with high line-voltage, the disc may make two or three reversals before stopping. The flywheel friction adjustment screw should be set so that the disc gives the least number of reversals with the chassis in normal horizontal position.

**Adjustment of Selector Disc**

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the operating-end at the left (viewed from rear). The operating-end has dark insulating material and the brass is beveled at this end. The selector disc should be set so that the contact-tip plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

**Muting Circuit**

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high-bias to the 1-F first-audio and second-audio tubes. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

MODELS 910KG,U126  
U128  
Automatic Record Changer

RCA MFG. CO., INC.

MODELS HF-2, HF-4, U130  
MODELS HF-6, HF-8,  
U132, U134

Automatic Record Changer

GENERAL INFORMATION  
Before servicing the automatic record changer, inspect the assembly to see that all gears, springs, etc. are clean and properly 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 pulling the hand. Six turntable revolutions are required for one change cycle. The turntable, spindle, and pinion gear are assembled by means of a 3/32 inch straight pin. This pin may be removed by gently driving it a standard pin punch. The pin should be replaced with a new one that is not perfectly level. Normal operation is likely to be affected. The 10 and 12 inch records must be absolutely flat for smooth operation when using a mixture of the two sizes. A shoring switch, located in the pickup mechanism, is used to pressure when the pickup is placed on the pickup rest.

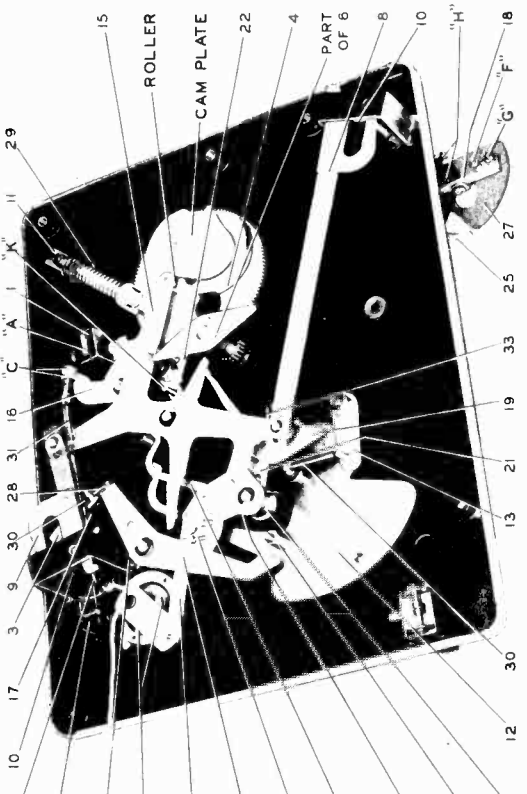
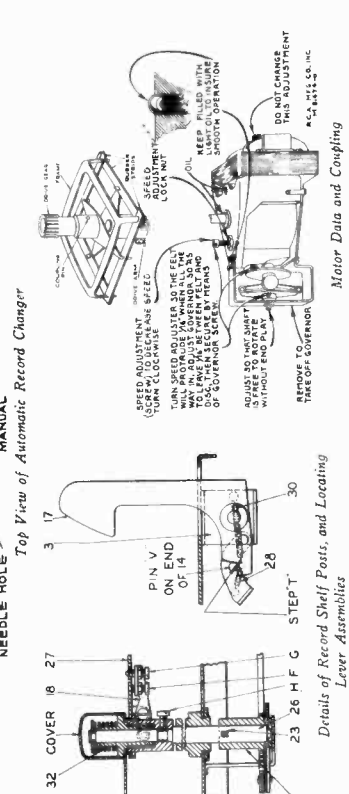
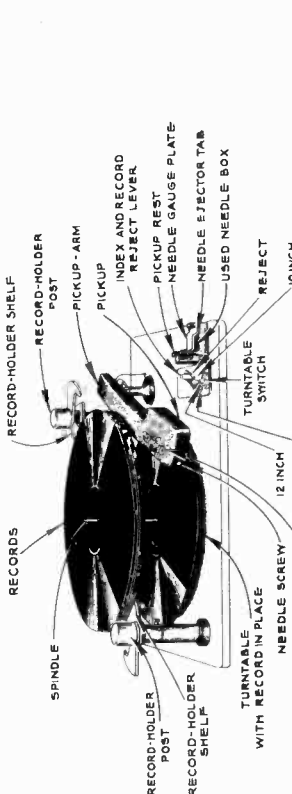
ADJUSTMENTS

A. Main Lever.—The main lever is the key component in that it interlocks the various individual mechanisms which control needle landing, tripping, record separation, etc. One adjustment is provided for the main lever. Rotate the turntable until the changer is out-of-cycle; and adjust rubber bumper block by 1/16 inch so that the roller clears the nose of the cam. B. Friction Clutch.—The motion of the tone arm toward the center of the record is transmitted to the trip pawl "22" by the trip lever "21" through a friction clutch "3". If the roller does not swing in the eccentric groove, the trip lever "21" moves the trip pawl "22" into engagement with the pawl on the main gear, and the change cycle is started. Proper adjustment of the friction clutch "3" occurs when movement "23" without tendency of the clutch to slip. The friction should be just enough to prevent slippage, and is adjustable by means of screw "B". If adjustment is too tight, the needle will repeat grooves; if too loose, tripping will not occur. C. Pickup Lift Cable Screw.—During the record change cycle, lever "16" is actuated by the record pin "15" so as to raise the tone arm clear of the record by means of the pickup lift cable. To adjust pickup for proper tripping, stop the turntable at the end of the change cycle. The tone arm has not moved outward; at this point adjust locknuts "C" to obtain 1 inch spacing between needle point and turntable top surface. D. Needle Landing on Record.—The relation of coupling between the tone arm vertical shaft and lever "20" determines the landing position of the needle on a 10 inch record. Position of eccentric stud "E" governs the landing of the needle on a 12 inch record; this, however, is dependent on "D". To adjust for needle landing, place 10 inch record on turntable; push index lever to rest position and return to the 10 inch position; see that pickup locating lever "17" is tilted fully toward turntable; rotate mechanism through cycle until "D" and adjust horizontal position of tone arm "16". Leave approximately 1/32 inch end play between hub of lever "20" and pickup base bearing, and tighten the blunt nose screw "D". Turn mechanism through several cycles as a check, then tighten cone pointed screw "B" 10 inch record, and return to 12 inch record on turntable; push index lever to rest position and return to 12 inch position; rotate mechanism through cycle until needle is just ready to land on the record; the correct point of landing is 5-11/16 inches from pickup side of record. Eccentric stud "E" is adjusted to give correct needle landing. The eccentric end of the stud must always be toward the rear of the motor board, otherwise incorrect landing may occur with 10 inch records. E. Upper Plate (knife) "25" on each of the record posts serves to separate the lower record from the stack and to support the remaining records during the change cycle. It is essential that the spacing between the knife and the turntable top for 10 inch record is nominally .053 inch, and for the 12 inch record is .075 inch. To adjust, rotate the knife to the point of minimum

vertical separation from the record shelf and turn screw and adjust eccentric stud "E" .053 inch separation. Screw "C" must not be depressed during this adjustment. After setting screw "F" adjust screw "G" so that when in up position depressed flush with top of record shelf, the vertical spacing between top knife and lower rotational position, and the shelf. 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. To adjust, place a 12 inch record on the turntable, rotate mechanism into cycle to the point where tone arm is at maximum distance outward from turntable; lift record upward until it is just ready to drop; rotate mechanism through cycle to the point where record shelves are uniformly spaced at least 1/16 inch from record edge. Tighten the blunt nose screw "H". Run mechanism through cycle several times to check action, then tighten cone pointed screw "I". If record shelves or knives are bent, or not perfectly horizontal, improper operation and jamming of mechanism will occur. J. Tone Arm Rest Support (not shown).—When the change cycle is over, the tone arm rests on the rest support. This should be 5/16 inch above surface of motor board. This may be adjusted by bending the tone arm support bracket, which is associated with the tone arm mounting base, in the required direction. K. Trip Pawl.—The position of the trip pawl stop pin "K" in relation to the main lever "15" governs the point at which the roller enters the cam. By bending the pin support, either toward or away from trip pawl bearing stop, the roller can be made to enter the cam at the desired point. The roller should be made so that the roller definitely clears the cam outer guide as well as the nose of the cam plate. Lubrication.—Petroleum or petroleum jelly should be applied to cam, main gear, spindle pinion gear, and gears of the tone arm. Light machine oil should be used in the tone arm vertical bearings, record post bearings, and all other bearings of various levers on underside of motor board. This oil should be applied by means of a fine spray nozzle. The oil should be applied to the roller where it meets the tone arm support, or as required for proper operation. Do not allow oil or grease to come in contact with, rubber mounting of tone arm base, rubber bumper, or flexible coupling of drive motor.

MISCELLANEOUS SERVICE HINTS

Incorrect adjustment of a particular mechanism of the changer is generally exhibited in a specific mode of improper operation. The following relations between effects on operation and mis-adjustments will enable ready adjustment in most cases. 1. For any irregularity of operation, the adjustment of the main lever "15" should be checked first as in "A". 2. Needle does not land properly on both "D" and "E" inch records. "D" and "E" are not adjusted properly. 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 "3" friction by means of screw "3". Also, see that lever "17" and "12" are free to move without touching each other. 5. Pickup strikes lower record or drags across top record on turntable.—Adjust lift cable per adjustment "C". 6. "H" does not track after landing.—Friction clutch arm vertical bearing levers "21" and "12" pulled, or arm vertical bearing levers "21" and "12" pulled, or pickup output cable twisted. 7. Cycle commences before record is complete.—Record is not level. 8. "B" or adjustment "B" of friction clutch "3" is too tight. 9. Worn in record reproduction.—Record is defective; flexible coupling between motor and changer mechanism not correctly assembled; or inner mechanism (G5 P) not correctly assembled; or inner mechanism (G5 P) record knives strike edge of record.—Records warped; record edges are rough, or knife adjustments "F" and "G" are incorrect. 10. Record not released properly.—Adjust record shelf as in "H". 11. Needle lands in 10 inch position on 12 inch record or misses record when playing both types mixed.—Increase tension of pickup locating lever spring "30".



NOTE: Numbers refer to parts—letters refer to adjustments.

MODELS HF-2, HF-4, U130  
Parts List

RCA MFG. CO., INC.

Table with columns: STOCK No., Unit Price, Description, Unit Price, Stock No., Description, Unit Price, Stock No., Description, Unit Price. Includes sections for MOTORBOARD ASSEMBLIES and OPERATING MECHANISM.

Table with columns: STOCK No., Unit Price, Description, Unit Price, Stock No., Description, Unit Price, Stock No., Description, Unit Price. Includes sections for RECEIVER ASSEMBLIES and PICKUP AND ARM ASSEMBLIES.

Table with columns: STOCK No., Unit Price, Description, Unit Price, Stock No., Description, Unit Price, Stock No., Description, Unit Price. Includes sections for SPEAKER ASSEMBLIES, MISCELLANEOUS ASSEMBLIES, and ANTENNA ASSEMBLIES.

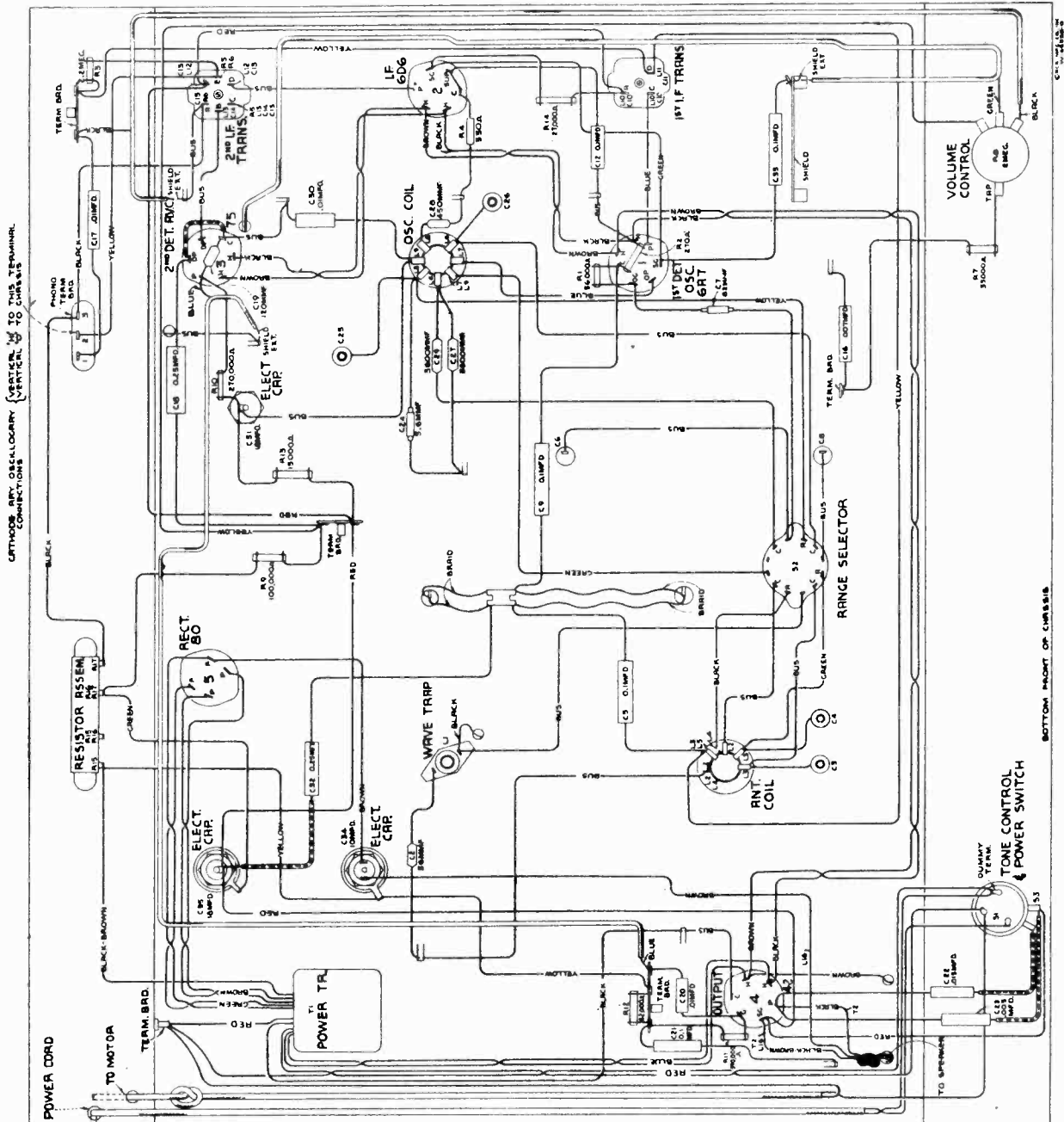
ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.





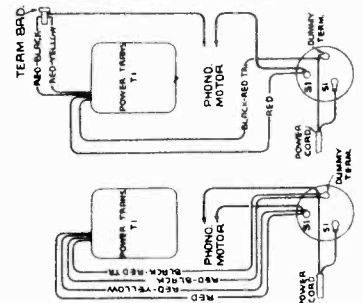
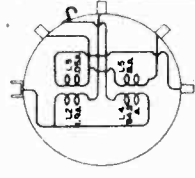
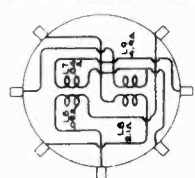
MODEL 5U  
Chassis Wiring  
Coils

RCA MFG. CO., INC.



UPHOLD ANY OSCALOGARY (VERTICAL) TO THIS TERMINAL CONNECTIONS

TOP POINT OF CHASSIS  
BOTTOM POINT OF CHASSIS



220V TRANS. CONNECTION FOR TELEVISION OPERATION



MODEL 5U  
Socket, Trimmers  
Pick-up, Motor Details  
Phono Assembly Wiring

RCA MFG. CO., INC.

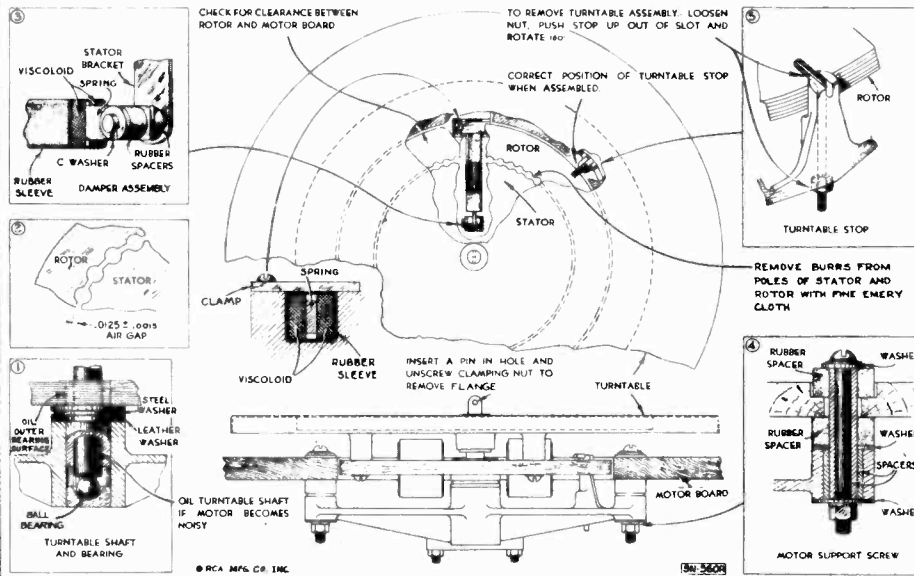


Figure 7—Details of Motor

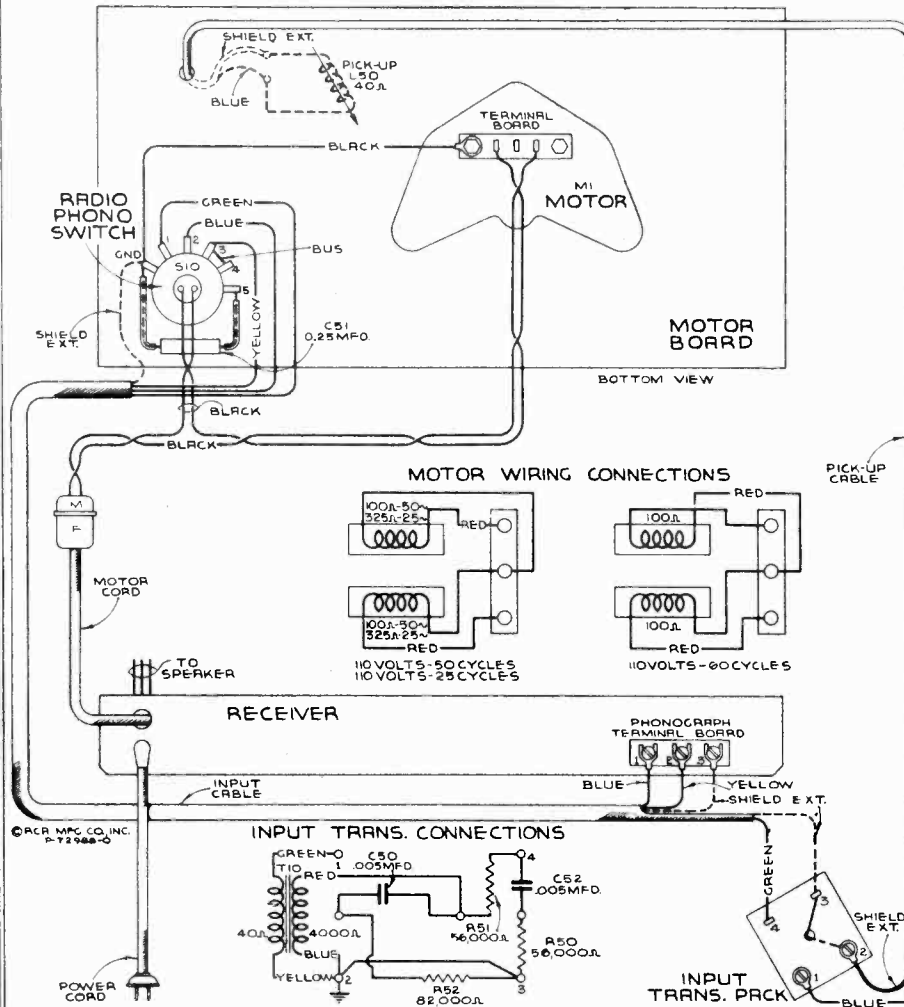


Figure 8—Assembly Wiring

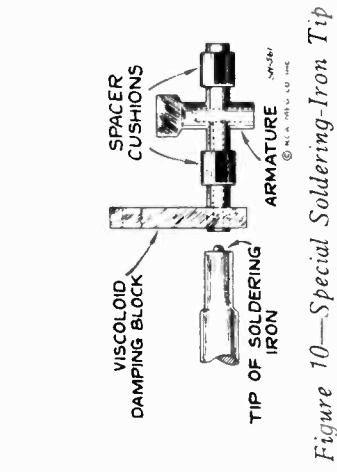


Figure 9—Details of Pickup

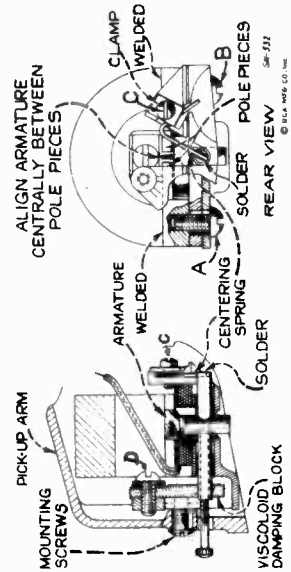


Figure 10—Special Soldering-Iron Tip

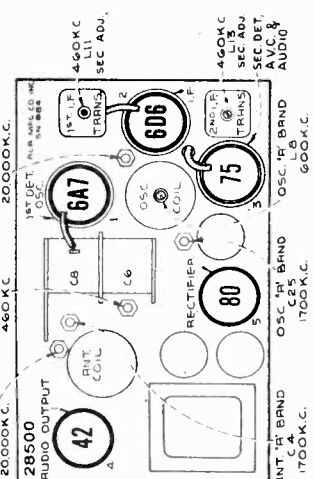


Figure 3—Radiotron, Coil, and Trimmer Locations





MODEL 5U

Alignment, Phono, Data Parts

RCA MFG. CO., INC.

Centering Armature

Refer to figure 9 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 by removing the needle holding screw and the two mounting screws from the front of the tone arm, holding the pickup assembly to keep it from dropping. Unsolder the two leads from the pickup leads on the terminal board at the rear of the pickup. Insert a small rod or nail into the armature, needle hole and replace the needle holding screw, tightening

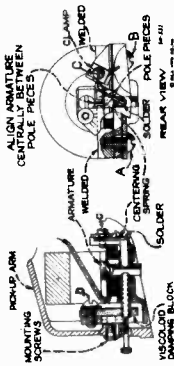


Figure 9—Details of Pickup

to hold the rod securely. If the armature clamping screws A and B have not been disturbed, screw 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 moved to the extreme position on each side (the movement being limited by the armature striking the pole pieces) and then brought to the mid position between these two extremes. Screw C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. With a little practice, the correct adjustment of the armature will be obtained. 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.

Damping Block

The viscoloid damping block which is attached to the front end of the armature shank serves as a mechanical filter to eliminate 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 as explained above. Unsolder the pickup coil leads from the two lugs on the pickup terminal board and remove the terminal board mounting screw and the damping block. Then remove screw D and the damping block from the pickup assembly. Make sure that the shaft of the armature which contracts 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

Wave-Trap Adjustment

Attach the output of the test oscillator to the receiver "Antenna" terminal through a 200 mfd. (important) capacitor. The ground connections remain connected together. Leave the test oscillator tuned to 460 kc. Adjust range selector to "Short wave" (C) position. Then adjust the wave-trap screw to the point which causes maximum suppression (minimum received) of the 460 kc signal.

"Standard Broadcast" Band

(a) Adjust range selector to "Standard broadcast" (A) position. Reduce output of test oscillator to a minimum. Tune the test oscillator to 600 kc and set receiver dial pointer to 600 kc. Adjust output of test oscillator until a slight indication of output is visible.

(b) Adjust the oscillator magnetic core screw L8 (top of oscillator coil) so that maximum (peak) indicated output results.

(c) Set receiver dial pointer to 1,700 kc. Carefully adjust the test oscillator to 1,700 kc. Carefully adjust the oscillator and antenna trimmers C25 and C4 respectively so that each brings about maximum (peak) indicated output.

(d) Tune the test oscillator to 600 kc. Adjust the receiver to pick up this signal disregarding the dial reading at which it is best received. Adjust oscillator magnetic core screw L8 (top of oscillator coil) for maximum (peak) output while rocking gang tuning condenser. After completing this adjustment, the trimmers C25 and C4 should be re-adjusted as in (c) to correct for any change in the oscillator high-frequency tuning which has been caused by the preceding adjustment.

"Short-Wave" Band

(e) Connect the "Ant." output of the test oscillator to the "Antenna" terminal through a 300-ohm resistor, leaving the "Gnd." of the oscillator connected to the receiver chassis.

(f) Adjust range selector to its "Short wave" (C) position. Set receiver dial pointer to 20,000 kc. Tune test oscillator to 20,000 kc. Set oscillator trimmer C26 to minimum capacity (plunger full out) and antenna trimmer C3 to maximum capacity (plunger full in). Slowly push in oscillator trimmer C26 until maximum (peak) output is reached. Two peaks may be found. Adjust C26 to the peak with minimum capacity (plunger near out) for maximum indication. Tighten lock nut. Slowly pull out plunger of antenna trimmer C3 until maximum (peak) indicated output is reached while slightly rocking the gang tuning condenser back and forth through the signal. Two peaks may be found with this circuit. The peak with maximum capacity (plunger near in) should be used. Tighten lock nut.

Phonograph Mechanism

The phonograph motor is of the synchronous type and designed to be simple and foolproof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. These adjustments are illustrated and explained in figure 7.

Alignment Procedure

There are five alignment trimmers provided in the antenna transformer and oscillator coil tuned circuits. The i-f transformer and wave-trap adjustments are made by means of screws attached to molded magnetic cores. All of these circuits have been accurately adjusted during manufacture and should remain properly aligned unless affected by abnormal conditions or altered during servicing. Loss of sensitivity, improper tone quality, and poor selectivity are the usual indications of improper alignment.

The correct performance of this receiver can only be obtained when the aligning has been done with adequate and reliable apparatus. The manufacturer of this receiver has available for sale, through its distributors and dealers, a complete assortment of such service equipment as may be needed for the alignment operation.

A test oscillator, such as the RCA Stock No. 9595, is required as a source of the specified alignment frequencies. Visual indication of receiver output during the adjustment is necessary and should be accomplished by the use of an indicator such as the RCA Stock No. 4317 Neon Output Indicator.

During alignment, the Radio-Phono control should be thrown to "Radio" position. The procedure outlined below should be followed in adjusting the various trimmer capacitors and molded cores:

I-F Adjustments

The four adjustment screws (attached to molded magnetic cores) of the two i-f transformers (one on top and one on bottom of each i-f transformer) are located as shown by figures 3 and 6. Each circuit must be aligned to a basic frequency of 460 kc. To do this, attach the output indicator across the loudspeaker voice coil.

Connect the output of the test oscillator to the control grid of the RCA-6A7 through a .001 mfd. capacitor. Connect the test oscillator "Gnd" terminal to the ground terminal of the receiver chassis. Tune the oscillator to 460 kc. Advance the receiver volume control to its full-on position and adjust the receiver tuning control to a point, within its range, where no interference is encountered from local broadcast stations or from the local (heterodyne) oscillator. To eliminate signals from the local oscillator short stator of C6 to chassis-ground. Increase the output of the test oscillator until a slight indication is present on the output indicator. Adjust the two magnetic core screws of the second i-f transformer L13 and L12 to produce maximum (peak) indicated receiver output. Then adjust the two magnetic core screws L11 and L10 of the first i-f transformer for maximum (peak) receiver output as shown by the indicating device. During these adjustments, regulate the test oscillator output so that the indication is always as low as possible. By doing so, broadness of tuning due to a v.c. action will be avoided. It is advisable to repeat the adjustment of all i-f magnetic core screws to assure that the interaction between them has not disturbed the original adjustment. Remove temporary chassis-ground jumper from stator of C6.

R-F Adjustments

Calibrate the tuning dial by adjusting the scale pointer to the extreme end calibration mark (beyond 55 on dial) while the two-gang tuning condenser plates are in full mesh.

Loudspeaker

Centering of the loudspeaker voice coil is made in the usual manner with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone, using care not to allow the acetone to flow down into the air gap. The dust cover may be cemented back in place with ambrond upon completion of adjustment.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
13216	RECEIVER ASSEMBLIES	
13217	Board—Antenna and ground terminal	\$0.25
5237	Board—Phonograph terminal board	.22
5237	Bushing—Variable condenser mounting	.43
12118	Cap—Grid contact cap—Package of 5	.15
12714	Capacitor—Adjustable trimmer (C3, C4, C25)	.38
12927	Capacitor—Adjustable trimmer (C26)	.35
12923	Capacitor—5.6 Mfd. (C24)	.20
12629	Capacitor—56 Mfd. (C2)	.20
13394	Capacitor—56 Mfd. (C11)	.20
12724	Capacitor—82 Mfd. (C7)	.20
12404	Capacitor—120 Mfd. (C10, C13, C14)	.26
12812	Capacitor—120 Mfd. (C16)	.26
12812	Capacitor—450 Mfd. (C28)	.25
12811	Capacitor—3,600 Mfd. (C27, C29)	.35
4868	Capacitor—.005 Mfd. (C23)	.20
5148	Capacitor—.007 Mfd. (C16)	.20
11315	Capacitor—.015 Mfd. (C22)	.25
4858	Capacitor—.01 Mfd. (C17, C20, C30)	.30
5170	Capacitor—.025 Mfd. (C18)	.25
4841	Capacitor—.025 Mfd. (C32)	.25
11240	Capacitor—.01 Mfd. (C5, C9, C12, C21, C14, L5)	.22
5212	Capacitor—18 Mfd. (C31, C35)	1.08
12797	Coil—Antenna coil and shield (L2, L3, L4, L5)	\$1.36
12798	Coil—Oscillator coil and shield (L6, L7, L8, L9)	1.65
12701	Condenser—2-gang variable tuning condenser (C6, C8)	4.00
5119	Connector—Contact female connector for speaker coil	.25
12006	Core—Adjustable core and stud for Stock Nos. 12653 and 12801	.22
12664	Core—Adjustable core and stud for Stock No. 12654	.22
13313	Dial—Station selector dial	.45
12702	Driver—Vernier drive for variable condenser	.68
13314	Indicator—Station selector indicator pointer	.15
5226	Lamp—Dial lamp, 6.3 volt—Package of 5	.70
13310	Resistor—Voltage divider comprising one 210 ohm, one 100 ohm and one 22 ohm resistor (R15, R16, R17)	.55
6135	Resistor—270 ohms, carbon type, 1/4 watt	1.00
11296	Resistor—330 ohms, carbon type, 1/4 watt	1.00
12759	Resistor—15,000 ohms, carbon type, 1/4 watt	1.00
12011	Resistor—27,000 ohms, carbon type, 1/4 watt—Package of 5 (R14)	1.10

## RCA MFG. CO., INC.

MODEL 5U

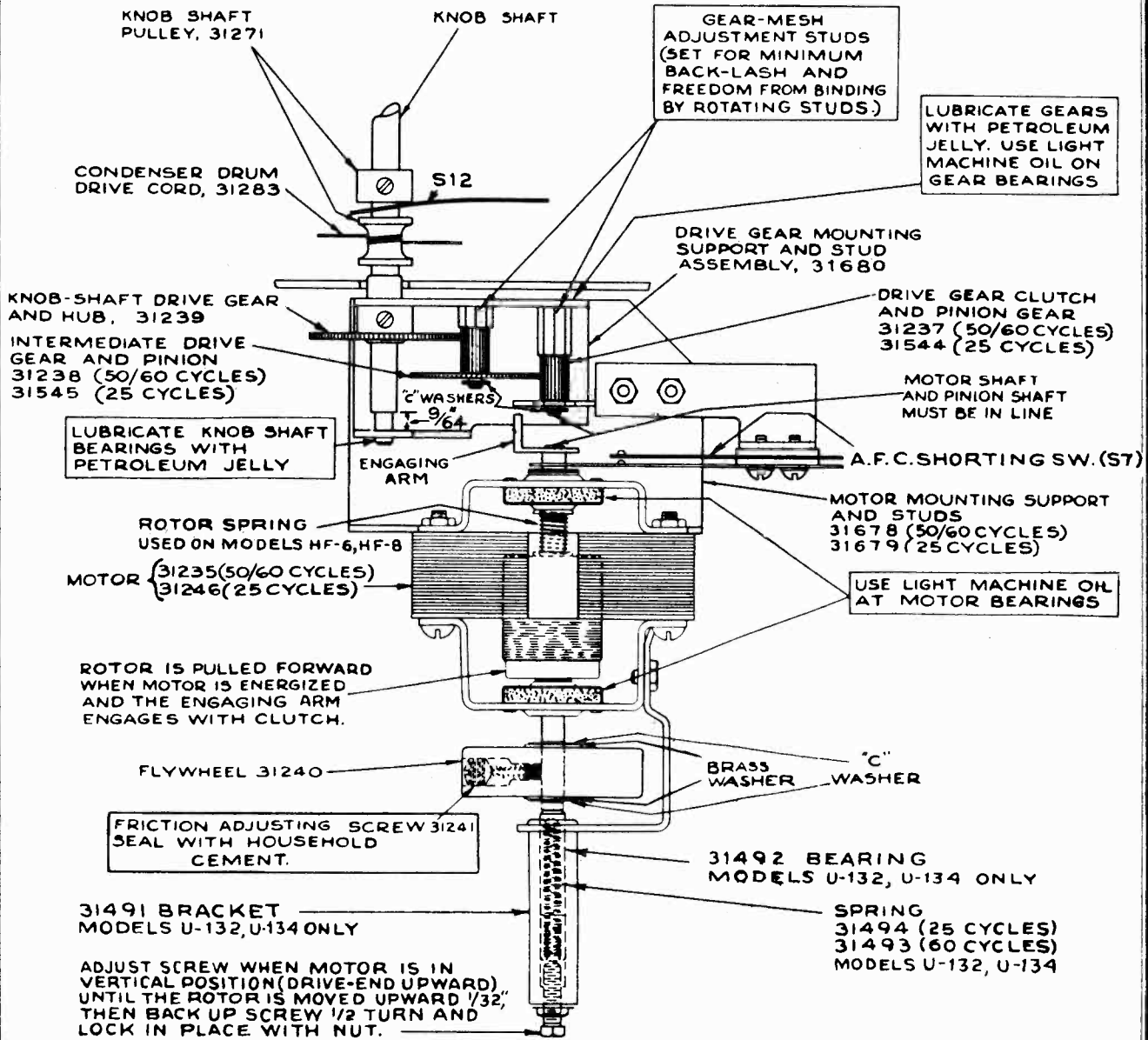
Parts List, Part 2

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
11364	Resistor—33,000 ohms, carbon type, ¼ watt—Package of 5 (R7)	\$1.00	12083	Motor—105-125-volt, 50-cycle motor (M1)	\$11.10
5029	Resistor—56,000 ohms, carbon type, ¼ watt—Package of 5 (R1)	1.00	9733	Motor—105-125-volt, 25-cycle motor (M1)	11.00
11282	Resistor—56,000 ohms, carbon type, 1/10 watt—Package of 5 (R5)	.75	9734	Motor—200-250-volt, 50-cycle motor (M1)	10.50
11365	Resistor—82,000 ohms, carbon type, ¼ watt—Package of 5 (R12)	1.00	4456	Motor accessories—Comprising three nuts, one shield and one screw	.10
5145	Resistor—100,000 ohms, carbon type, ¼ watt—Package of 5 (R9)	1.00	12048	Turntable—Turntable assembly complete with rotor laminations, 60-cycle operation	4.80
11398	Resistor—220,000 ohms, carbon type, 1/10 watt—Package of 5 (R6)	.75	13084	Turntable—Turntable assembly complete with rotor laminations—25-cycle operation	5.45
11323	Resistor—270,000 ohms, carbon type, ¼ watt—Package of 5 (R10)	1.00	12049	Turntable—Turntable assembly complete with rotor laminations, 50-cycle operation	4.80
11847	Resistor—390,000 ohms, carbon type, ¼ watt—Package of 5 (R11)	1.00	4083	Washer—Leather washer—Package of 10	.20
11626	Resistor—2.2 meg., carbon type, ¼ watt—Package of 5 (R3)	1.00	4084	Washer—Metal washer—Package of 10	.26
12651	Shield—Antenna coil shield	.22	<b>PICKUP AND ARM ASSEMBLIES</b>		
13311	Shield—Chassis end shield and rubber mounting foot assembly—Package of 2	.80	3812	Armature—Pickup armature (L50)	.32
12607	Shield—First I. F. transformer shield top	.30	13568	Coil—Pickup coil	.60
12008	Shield—I. F. transformer shield	.28	4543	Damper—Damper block complete with damper clamp, washer	.10
12799	Shield—Oscillator coil shield	.15	13567	Pickup and arm assembly complete	7.10
12581	Shield—Second I. F. transformer shield top	.36	3811	Screw—Needle holding screw—Package of 10	.46
3682	Shield—6A7 or 75 Radiotron shield	.22	<b>REPRODUCER ASSEMBLIES</b>		
3950	Shield—6D6 Radiotron shield	.26	12641	Board—3-contact reproducer terminal board	.15
4794	Socket—4-contact 80 Radiotron socket	.15	12640	Bracket—Output transformer mounting bracket	.18
4786	Socket—6-contact 6D6, 42 or 75 Radiotron socket	.15	12012	Coil—Field coil (L16)	1.85
4787	Socket—7-contact 6A7 Radiotron socket	.15	11469	Coil—Neutralizing coil (L14)	.20
11199	Socket—Dial lamp socket	.14	12642	Cone—Reproducer cone and dust cap (L15)	.94
12007	Spring—Retaining spring for Stock Nos. 12006 and 12664—Package of 10	.36	5118	Connector—3-contact male speaker cable connector	.25
12796	Switch—Range switch (S2)	1.00	9699	Reproducer—Complete	6.38
13309	Switch—Tone control and power switch (S1, S3)	.55	11253	Transformer—Output transformer (T2)	1.56
12801	Transformer—First I. F. transformer complete (L10, L11, C10, C11)	1.70	11886	Washer—Spring washer to hold field coil securely—Package of 5	.20
12653	Transformer—Second I. F. transformer complete (L12, L13, C13, C14, C15, R5, R6)	2.06	<b>MISCELLANEOUS ASSEMBLIES</b>		
13392	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1)	4.95	13564	Cable—3-conductor shielded input cable, approximately 32½ inches long, connects receiver to radio-record switch	.50
13566	Transformer—Power transformer, 105-125 volts, 25-50 cycles (T1)	4.80	4840	Capacitor—0.25 Mfd. (C51)	.30
13393	Transformer—Power transformer, 110 and 220 volts, 50-60 cycles (T1)	4.95	12785	Crystal—Station selector escutcheon and crystal	1.00
12654	Trap—Wave-trap complete (L1)	.75	12699	Knob—Large station selector knob—Package of 5	.68
13144	Volume control (R8)	1.00	12700	Knob—Small (vernier) station selector knob—Package of 5	.58
<b>MOTOR ASSEMBLIES</b>					
10194	Ball—Steel ball bearing—Package of 20	.25	11347	Knob—Volume control, tone control, range switch or radio-record switch knob—Package of 5	.75
11740	Base—Motor base and bearing assembly	1.45	11377	Screw—Chassis mounting screw assembly, comprising one screw, one washer and one lockwasher—Package of 4	.12
11733	Coil—Stator assembly, comprising coil and laminations, 105-125-volt, 60-cycle operation	2.96	11869	Screw—Motor mounting screw assembly, comprising one screw, three metal washers, two rubber washers, one lockwasher, two spacers and one nut—Package of 3	.32
11734	Coil—Stator assembly, comprising coil and laminations, 105-125-volt, 50-cycle operation	3.08	11349	Spring—Retaining spring for knob, Stock Nos. 11347 and 12700—Package of 5	.25
11735	Coil—Stator assembly, comprising coil and laminations, 105-125-volt, 25-cycle operation	3.08	4982	Spring—Retaining spring for knob, Stock No. 12699—Package of 10	.50
13081	Coil—Stator coil assembly, comprising coil and laminations, 200-250-volt, 50-cycle operation	4.60	13563	Switch—Radio-record switch (S10)	1.05
11748	Damper—Motor damper assembly, comprising one damper, one damper plate, one screw, two rubber washers and one "C" washer	.20	13565	Transformer—Phonograph input transformer (T10, C50, C52, R50, R51, R52)	2.95
12082	Motor—105-125-volt, 60-cycle motor (M1)	11.10			

Prices quoted above are subject to change without notice.

MODELS HF-6, HF-8,  
U132, U134  
Motor, Gear Mechanism

RCA MFG. CO., INC.



Motor and Gear Mechanism

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position.

### Lubrication

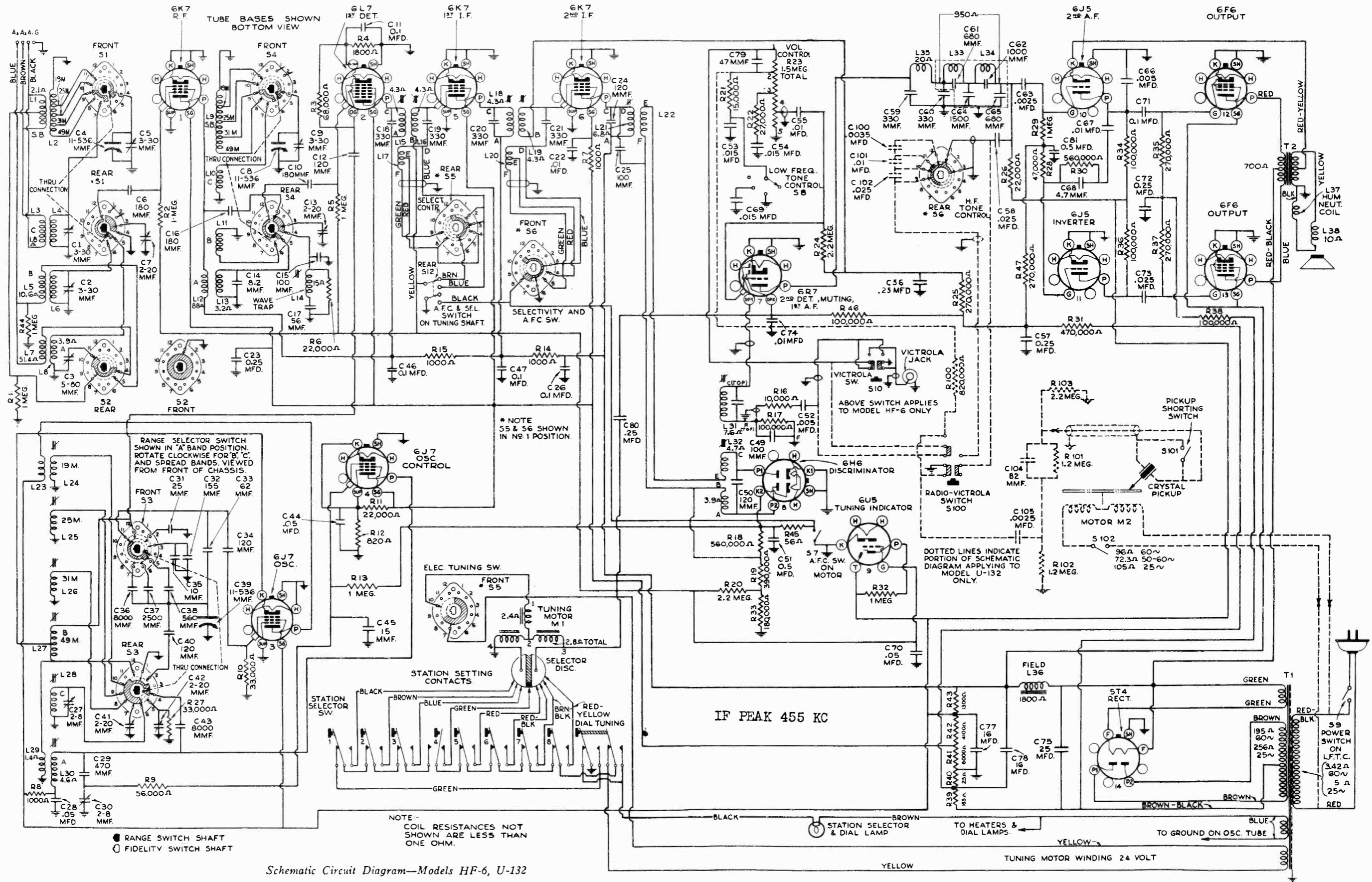
Motor bearings and gear bearings; use light machine oil.  
 Gear faces; use "Pure Oil No. 611" or petroleum jelly.  
 Dial-indicator pulleys and rails; use "Castordag" or petroleum jelly.  
 Selector disc; apply *thin* film of petroleum jelly.  
 Friction leather on flywheel; apply "neats-foot" oil. When replacing leather, soak it for at least 24 hours in neats-foot oil, and insert in flywheel while dripping.

### Adjustments

To adjust S12, loosen knob shaft pulley, and adjust it so that when shaft is pushed all the way in, the ends of the leaves of S12 will be deflected 1/32-inch from their original position. When tuning shaft is released, distance between contacts of S12 should be 1/32-inch.

S7 should be adjusted so that when motor is in its full forward or upward position, the ends of the leaves should be deflected 1/32-inch from their original position.

RCA MFG. CO., INC.



Schematic Circuit Diagram—Models HF-6, U-132

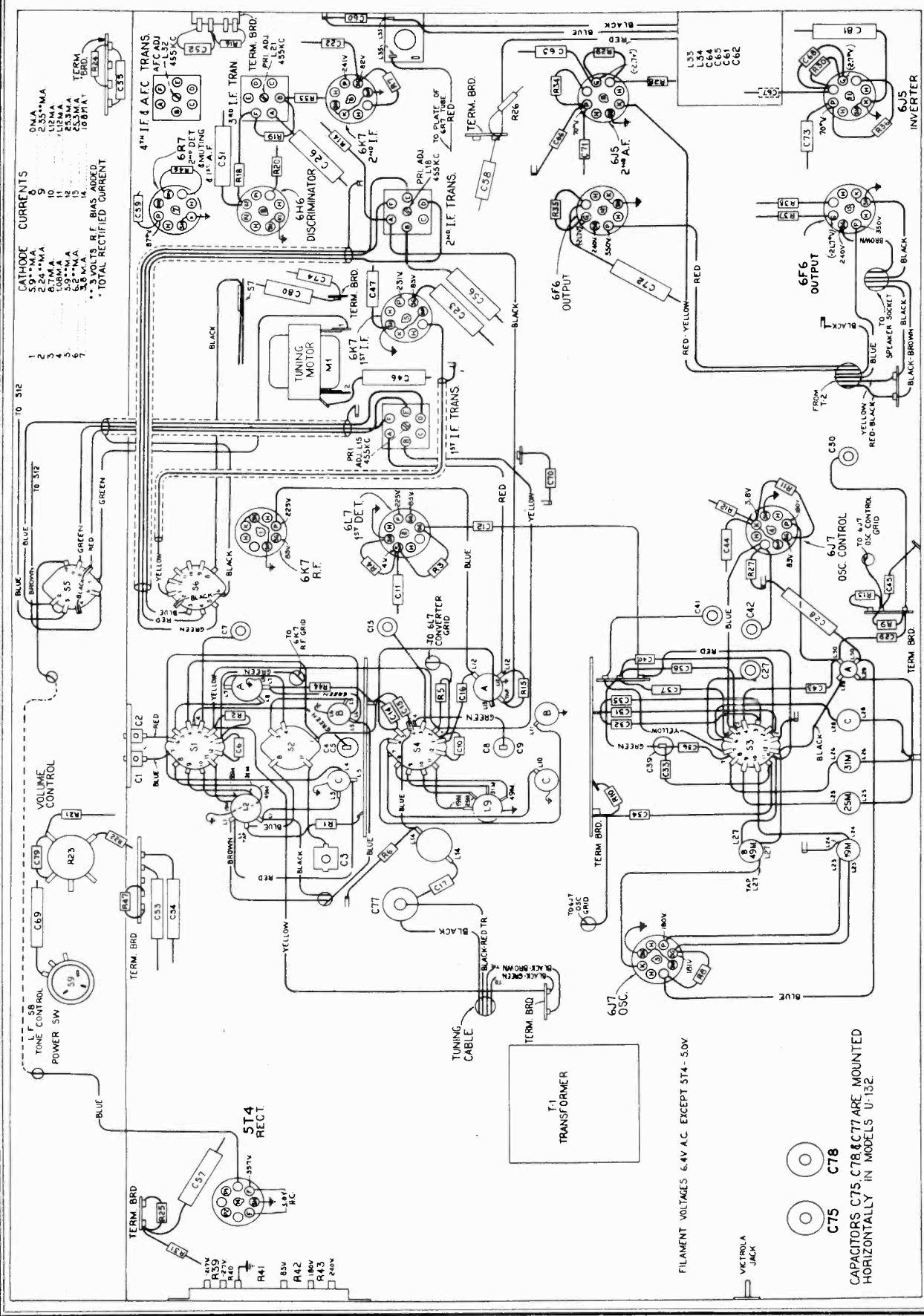






RCA MFG. CO., INC.

MODELS HF-6, U132  
Chassis Wiring  
Voltage



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

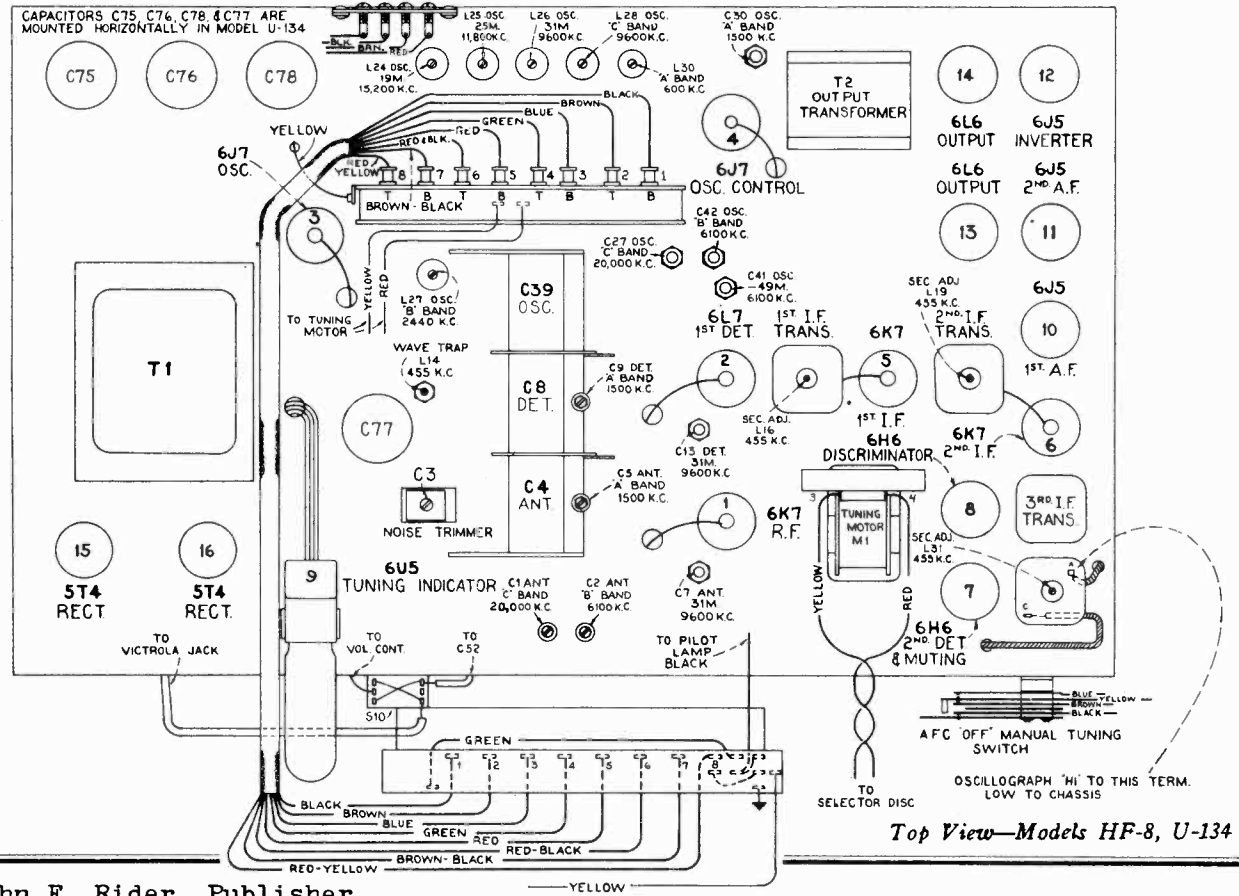
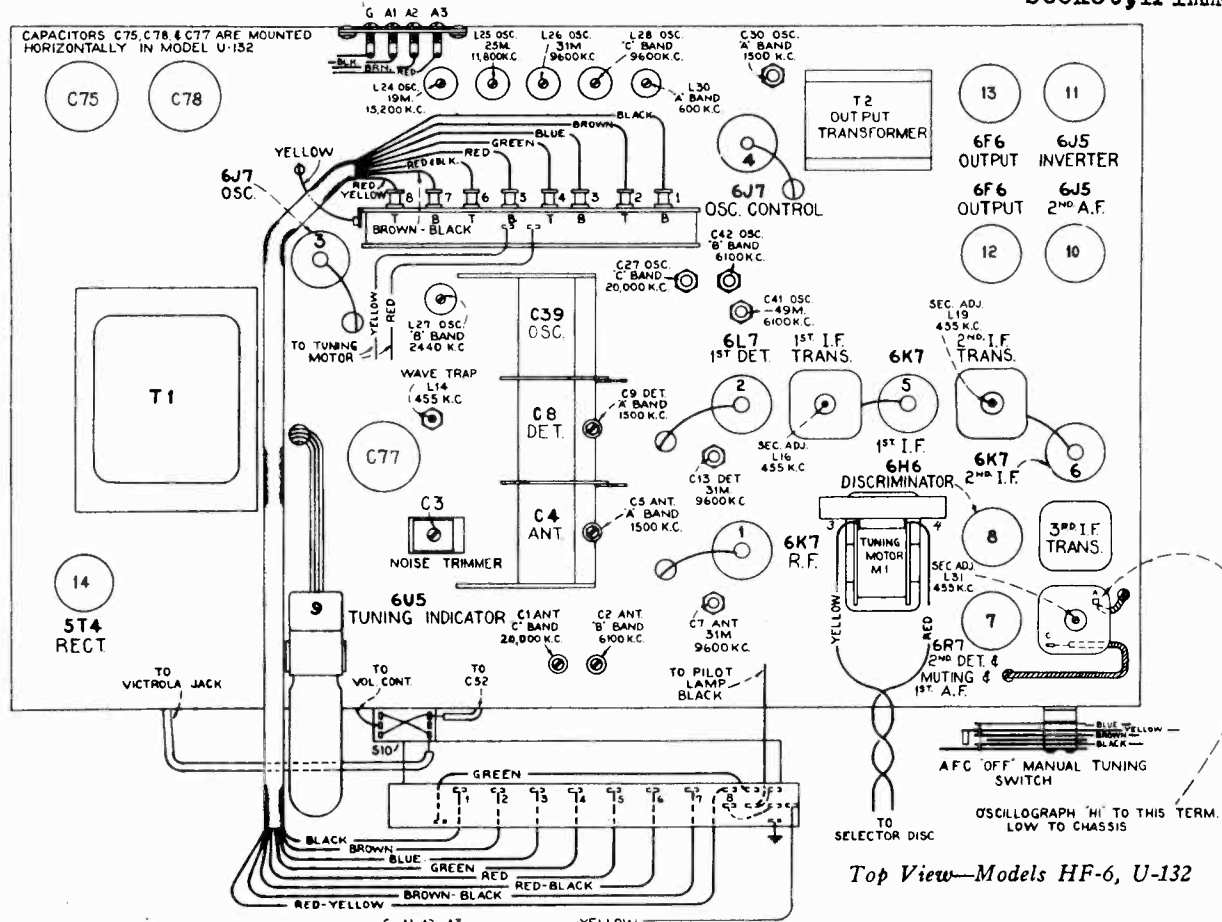


RCA MFG. CO., INC.

MODELS HF-6, U132

HF-8, U134

Socket, Trimmers



MODELS HF-6, U132  
HF-8, U134

Specs., Circuit Data  
Tuner Data, Notes

RCA MFG. CO., INC.

General Description

The radio receiver is the same as that of Model HF-6, and the turnable mechanism is the same as in Model U-134. With the unusual characteristics of the instrument described above, naturally, as with other high quality, high fidelity instruments, proper operation of the pickup and tuning mechanism is important. The pickup mechanism and tuning mechanism are the same as in Model HF-6. The fidelity control has seven positions, the purpose of which is fully explained in the table. In the full range position the reproduction is faithful from 40 to 7,500 cycles. A special filter is employed in the plate circuit of the first audio amplifier to reduce the effect of the high fidelity positions of the fidelity control. In some cases, the high fidelity positions of the fidelity control, positions 5, 6, and 7, may be used on local stations to give true response of the broadcast program. However, on distant broadcast, or short wave station, the receiver should be operated with the fidelity control in 1, 3, 4, or 4 position to eliminate cross talk, monkey chatter, and any other objectionable noise. The tuning control has a special function used in conjunction with the fidelity control. When the tuning knob is pushed in, and the fidelity control is in position No. 2, the response of the receiver will return to its maximum selectivity position. Releasing the tuning knob will broaden the fidelity control as shown in the table. When the pickup is pushed in, the fidelity control will be, and the tuning control will be, in position No. 3, 6, or 7, respectively, inoperative. With the fidelity control in No. 3, 6, or 7 position, pushing in Tuning control returns it to a sharp selectivity position, and renders AFC system inoperative. This function of the tuning control should be used when tuning in local, or medium-distant stations, manually. For distant stations, fidelity control should be in No. 1 or No. 2 positions.

On Models U-132, U-134, the Fidelity control is also inoperative while records are being played—thus giving full fidelity control, as desired, by changing response of audio amplifying system.

Electric Specifications

FREQUENCY RANGES		R-F ALIGNMENT FREQUENCIES	
"Medium Broadcast" (A)	540-1,720 kc	"A" Band	600 kc (osc.) 1,100 kc (osc. ant. det.)
"Standard Broadcast" (B)	540-1,720 kc	"B" Band	900 kc (osc.) 1,500 kc (osc. ant.)
"Short Wave" (C)	7,000-21,000 kc	"C" Band	9,600 kc (osc.) 20,000 kc (osc. ant.)
"Short Wave" (D)	7,000-21,000 kc	31.3M	9,600 kc (osc.) 20,000 kc (osc. ant.)
"31 Meter" Band	9,480-9,700 kc	49M	6,100 kc (osc.)
"25 Meter" Band	11,680-11,940 kc	23M	11,800 kc (osc.)
"19 Meter" Band	15,080-15,300 kc	19M	15,200 kc (osc.)
Intermediate Frequency..... 495 kc			
RCA TUBE COMPLEMENT (Models HF-6, U-132)			
(1) 6K7..... R-F Amplifier	(1) 6K7..... R-F Amplifier	(1) 6K7..... R-F Amplifier	(1) 6K7..... R-F Amplifier
(2) 6L7..... First Detector	(2) 6L7..... First Detector	(2) 6L7..... First Detector	(2) 6L7..... First Detector
(3) 6V6..... Oscillator	(3) 6V6..... Oscillator	(3) 6V6..... Oscillator	(3) 6V6..... Oscillator
(4) 6V6..... Oscillator	(4) 6V6..... Oscillator	(4) 6V6..... Oscillator	(4) 6V6..... Oscillator
(5) 6K7..... First I.F.	(5) 6K7..... First I.F.	(5) 6K7..... First I.F.	(5) 6K7..... First I.F.
(6) 6K7..... Second I.F.	(6) 6K7..... Second I.F.	(6) 6K7..... Second I.F.	(6) 6K7..... Second I.F.
(7) 6R7..... Discriminator and AVC	(7) 6R7..... Discriminator and AVC	(7) 6R7..... Discriminator and AVC	(7) 6R7..... Discriminator and AVC
(8) 6H6..... Tuning Tube	(8) 6H6..... Tuning Tube	(8) 6H6..... Tuning Tube	(8) 6H6..... Tuning Tube
(9) 6U5..... First Audio	(9) 6U5..... First Audio	(9) 6U5..... First Audio	(9) 6U5..... First Audio
(10) 6J5..... Second Audio	(10) 6J5..... Second Audio	(10) 6J5..... Second Audio	(10) 6J5..... Second Audio
(11) 6V5..... Inverter	(11) 6V5..... Inverter	(11) 6V5..... Inverter	(11) 6V5..... Inverter
(12) 6F6..... Power Output	(12) 6F6..... Power Output	(12) 6F6..... Power Output	(12) 6F6..... Power Output
(13) 6V6..... Rectifier	(13) 6V6..... Rectifier	(13) 6V6..... Rectifier	(13) 6V6..... Rectifier
(14) 5Y4..... Output	(14) 5Y4..... Output	(14) 5Y4..... Output	(14) 5Y4..... Output
(15) 5Y4..... Output	(15) 5Y4..... Output	(15) 5Y4..... Output	(15) 5Y4..... Output
Pilot Lamps (L)..... Radio: (1) 6.3 volts, 0.15 ampere Mazda No. 44; (2) 6.3 volts, 0.15 ampere Mazda No. 47; (3) 6.3 volts, 0.15 ampere Mazda No. 44			
POWER SUPPLY RATINGS			
Rating A—105-125 volts, 50-60 cycles	Rating A—105-125 volts, 50-60 cycles	Rating A—105-125 volts, 50-60 cycles	Rating A—105-125 volts, 50-60 cycles
Rating B—105-125 volts, 25 cycles	Rating B—105-125 volts, 25 cycles	Rating B—105-125 volts, 25 cycles	Rating B—105-125 volts, 25 cycles
Rating C—105-130/140-160/200-250 volts, 50-60 cycles	Rating C—105-130/140-160/200-250 volts, 50-60 cycles	Rating C—105-130/140-160/200-250 volts, 50-60 cycles	Rating C—105-130/140-160/200-250 volts, 50-60 cycles
Rating D—105-130/140-160/200-250 volts, 60 cycles	Rating D—105-130/140-160/200-250 volts, 60 cycles	Rating D—105-130/140-160/200-250 volts, 60 cycles	Rating D—105-130/140-160/200-250 volts, 60 cycles
Pilot Lamp (L)..... Radio: (1) 6.3 volts, 0.15 ampere Mazda No. 44; (2) 6.3 volts, 0.15 ampere Mazda No. 47; (3) 6.3 volts, 0.15 ampere Mazda No. 44			
Underscored..... 20 watts			
Maximum..... 24 watts			
Loudspeaker..... 12-inch Electrodynamic (Triple Cone)			
Type..... Voice Coil Impedance..... 11.3 ohms at 400 cycles			
PHONOGRAPH (Models U-132, U-134 Only)			
Type..... Automatic	Type..... Automatic	Type..... Automatic	Type..... Automatic
Record Capacity..... Eight 10-inch or seven 12-inch	Record Capacity..... Eight 10-inch or seven 12-inch	Record Capacity..... Eight 10-inch or seven 12-inch	Record Capacity..... Eight 10-inch or seven 12-inch
Turntable Speed..... 78 r.p.m. (adjustable)	Turntable Speed..... 78 r.p.m. (adjustable)	Turntable Speed..... 78 r.p.m. (adjustable)	Turntable Speed..... 78 r.p.m. (adjustable)
Type Pick-up..... Crystal	Type Pick-up..... Crystal	Type Pick-up..... Crystal	Type Pick-up..... Crystal
Pickup Impedance..... 80,000 ohms at 1,000 cycles	Pickup Impedance..... 80,000 ohms at 1,000 cycles	Pickup Impedance..... 80,000 ohms at 1,000 cycles	Pickup Impedance..... 80,000 ohms at 1,000 cycles

Mechanical Specifications

MECHANICAL SPECIFICATIONS	
Height (inches)..... 36	Height (inches)..... 36
Width (inches)..... 36 1/2	Width (inches)..... 36 1/2
Depth (inches)..... 17 1/2	Depth (inches)..... 17 1/2
Weight (Shetland lbs.)..... 176	Weight (Shetland lbs.)..... 176
Chassis dimensions (inches)..... 4 x 12 1/2 x 2 1/2	Chassis dimensions (inches)..... 4 x 12 1/2 x 2 1/2
Maximum chassis height (inches)..... 11 1/2	Maximum chassis height (inches)..... 11 1/2
Tuning drive ratio..... 18 to 1	Tuning drive ratio..... 18 to 1
Loudspeaker.—No attempt should be made to remove the aluminum cone cap of the loudspeaker. This is securely fastened to the frame and is not to be removed. The cone must be centered by moving the cone in and out and getting the "feet" of the cone to find where it is rubbing against the pole pieces. The two screws holding the spider support are accessible from the rear of the speaker. By loosening these screws and moving the cone by hand, it is possible to center the speaker to the cone. It is possible to center the speaker to connect speaker to receiver, feed a low frequency note of from 40-60 cycles into the audio input of the set, and turning up the volume control—move the spider support until no rattle is heard in speaker, with about 10 watts output. Replacement cones will have to be centered in the same manner as above. The speaker will be supplied with cone cap fastened securely in position.	
NOTE.—Due to inverse feedback used on these models, it is very important to connect output transformers exactly as shown in the schematic diagram.	
Victrola Attachment.—A jack located on one side of the chassis is provided for connecting Models HF-6, HF-8, and HF-8. This cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.	

Miscellaneous Service Data

Antenna Connections  
RCA Victor Master Antenna Kit.—Connect the twisted pair transmission line to terminals A1 and A3. Connect the counter-poise to A3. Terminal G may be connected to ground, but that connection is not necessary for correct operation.

Noise-Reducing Adjustment.—After the RCA Victor Master Antenna Kit is connected to the receiver, tune the receiver to a point near 900 kc where no station is heard. Turn the volume control to maximum. If heard, the noise has a regular character, is audible, and any brush-type motor refrigerator appliance, such as a vacuum cleaner, electric razor, defroster, etc., but do not bring it too near the receiver. This will generate noise as a continuous crackling, or buzz. Adjust G3 to a point where this noise is reduced to a minimum.

Adjustment of the noise reducing trimmer G3 should be made in the customer's home, with the RCA Victor Master Antenna connected to the receiver.

Antenna attachment is effective only when the RCA Victor Master Antenna is used. For other types of antenna, the noise reducing trimmer G3 should be adjusted in the customer's home. Other Antennas.—Use terminals A1 and A3 on the receiver terminal board as antenna and ground connecting points respectively. Terminal A3 may be connected to terminal G, unless this causes interference, in which case this connection should be omitted.

Electric Tuning Mechanism

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated below.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24 volt circuit through the contact of the tuning selector contact on the side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact line past the circuit is broken, which then makes contact to the other half of the disc. This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement. As the insulation line passes the station-setting contact, when the circuit is broken and the mechanism stops.

Adjustment of Selector Disc

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the operating end of the disc (viewed from rear) to the right. The disc should be adjusted (by means of the set screws) so that the end of the insulation line is horizontal when the selector disc should be set so that the contact plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

Armchair Control Unit

When a Model G8A Armchair Control is connected to the receiver as shown, it duplicates the action of the push buttons on the front panel, when "Dial or Remote" button is pushed in. The center lead of the remote control cable is connected to the terminal on the frame of the selector mechanism. The other leads are connected to corresponding station-setting contacts on the G8A Armchair Control. The push button must be held down until the station has been tuned in. Care must be taken not to hold two of the station buttons down at one time as both windings of the motor may be engaged simultaneously causing the motor to be inoperative and over-heated.

Muting Circuit

When the electric tuning mechanism is in action, the motor-supplying blower fan is in operation. The blower fan is in operation until the motor is stopped. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

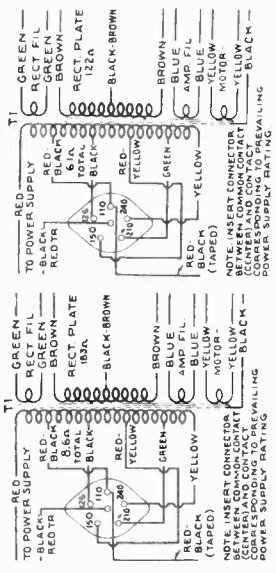
Adjustment of Flywheel Friction

In normal operation, the motor drives the tuning condenser and selector disc until the insulation line just passes the particular station-setting contact. The motor then reverses.

FOR AUTOMATIC RECORD CHANGER,  
SEE INDEX

RCA MFG. CO., INC.

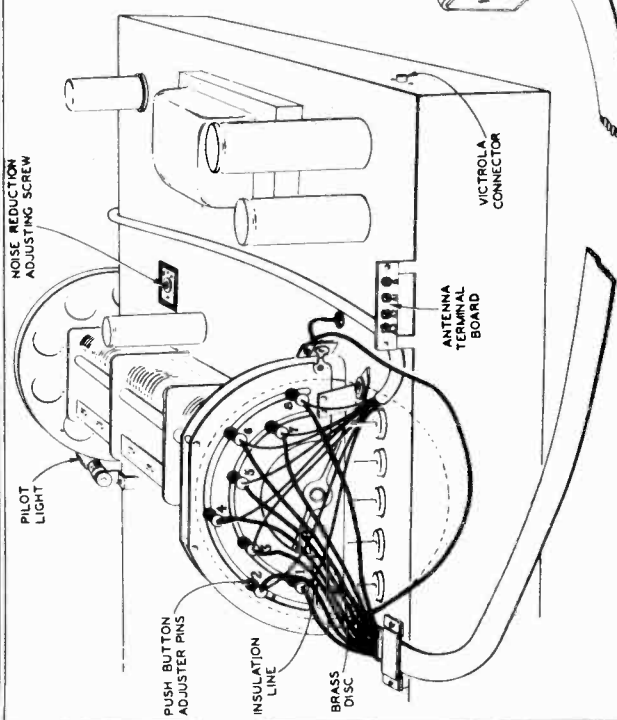
MODELS HF-6, U132  
HF-8, U134  
Tuner Mechanism  
Transformer Data  
Tuner Data



Models HF-6, U-132  
Universal Power Transformer Connections  
Models HF-8, U-134

### ADJUSTMENTS FOR ELECTRIC TUNING

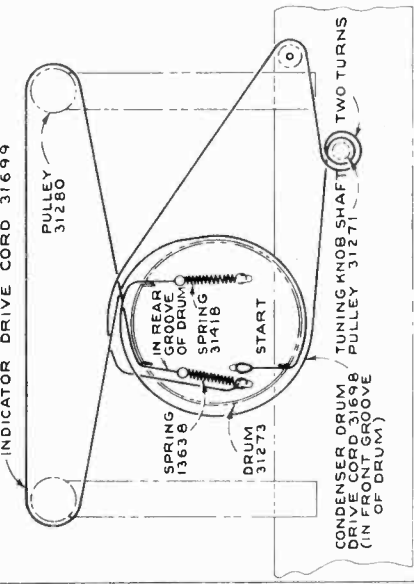
(110-volt supply for a Victrola motor is obtained by connecting the motor to the red and the red-black leads.)



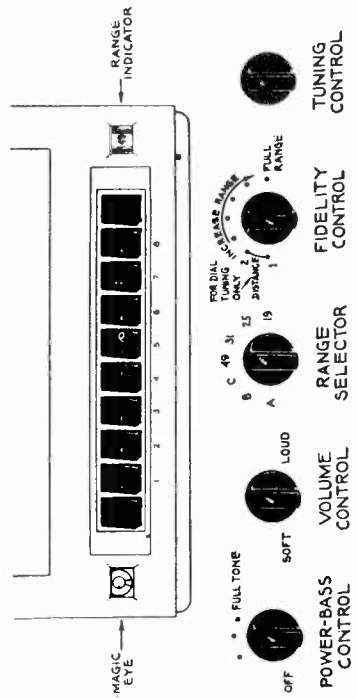
Armchair Control Connections



Component Parts of Station Setting Contacts



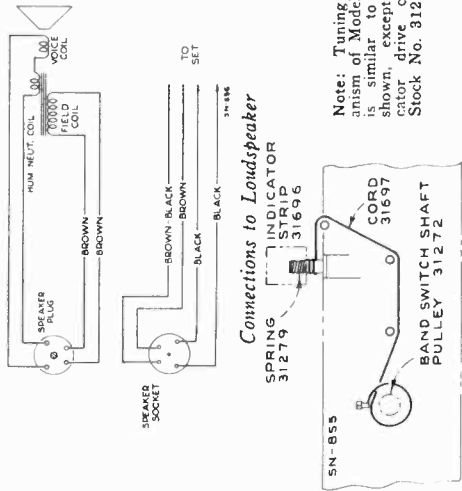
TUNING CONDENSER IN FULL MESH POSITION  
Details of Tuning Mechanism Models HF-8, U-132, U-134



Location of Controls

The left-hand push-button is a Victrola-Attachment switch.  
The right-hand push-button is for dial tuning.

1. Make a list of the desired eight stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
3. Turn Fidelity Control maximum counter-clockwise.
4. Press down the "dial-tuning" (right hand) button.
5. Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.
6. Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down, central dial lamp will light brightly or dimly, depending on which side of disc, the contact is. Move station-setting contact No. 1 to the insulating line on the disc at rear of gang. When the contact is correctly centered on the insulating line, the central dial lamp will go out.
7. Press down any other button in order to release the dial-tuning button and station button No. 1. Then press down station button No. 1 again. The electric tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
8. Repeat this process for the remaining stations.



Note: Tuning Mechanism of Model HF-6 is similar to this shown, except Indicator drive cord is Stock No. 31281.





RCA MFG. CO., INC.

MODELS HF-6, U132 HF-8, U134 Parts List

Table with columns: STOCK No., DESCRIPTION, Unit Price, Unit Price, STOCK No., DESCRIPTION, Unit Price, Unit Price. The table lists various electronic components and assemblies for models HF-6, U132, HF-8, and U134, including receiver assemblies, capacitors, resistors, transformers, and mechanical parts.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

**MODEL 9X**  
Schematic, Socket  
Voltage, Specs.

RCA MFG. CO., INC.

**Lead Dress, Notes**  
Chassis Wiring

Dial Lamp ..... Mazda No. 40, 6.3 volts, .15 amps.

**POWER SUPPLY RATINGS**

A-C Rating ..... 105-125 volts, 50-60 cycles, 50 watts  
D-C Rating ..... 105-125 volts, 50 watts

**CAUTION:** The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing.

Reel up the antenna wire, and keep it away from chassis during alignment. Connect the high side of test-oscillator through an 80 mmfd. capacitor to the antenna terminal. Connect low side of oscillator to receiver chassis through a 0.1 mfd. capacitor. Turn gang condenser to minimum (full out), tune oscillator to 1,760 kc, con-

**POWER OUTPUT (125-volt, 60-cycle supply)**  
Undistorted ..... 1.0 watt  
Maximum ..... 1.5 watts

**LOUDSPEAKER**

Type ..... 3-inch Electrodynamic  
Voice-Coil Impedance ..... 3 ohms at 400 cycles

nect an output meter across the voice coil, and turn volume control to maximum.

Adjust the two trimmers (C3 and C6) on side of gang condenser for maximum output, using lowest possible output from test-oscillator.

**Pre-setting Dial.**—With gang condenser rotor plates turned full in for maximum capacity, loosen dial-drum set-screw, and turn drum so that the top edge of dial (low-frequency end) is approximately 1/16-in. below level of gang frame, and tighten set-screw.

**Precautionary Lead Dress**

1. Dress detector grid lead close to top of speaker chassis.
2. Dress lead from grid of 6K7 to gang condenser away from detector section of gang, and clear of rotor plates.
3. Dress speaker leads close to, but not touching, cone.
4. Dress pilot lamp leads close to top of chassis, and clear of rotor.

**25-Cycle Operation**

For 25-cycle operation, connect a 16 mfd., 150-volt dry electrolytic capacitor (Stock No. 31323) in parallel to C13.

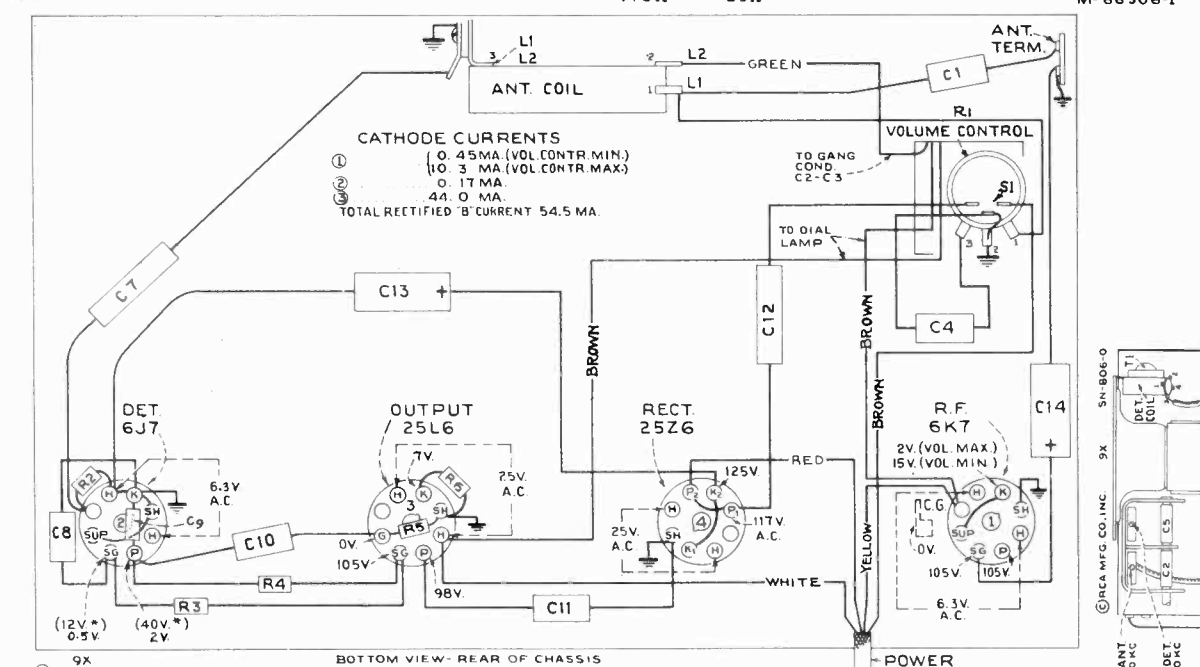
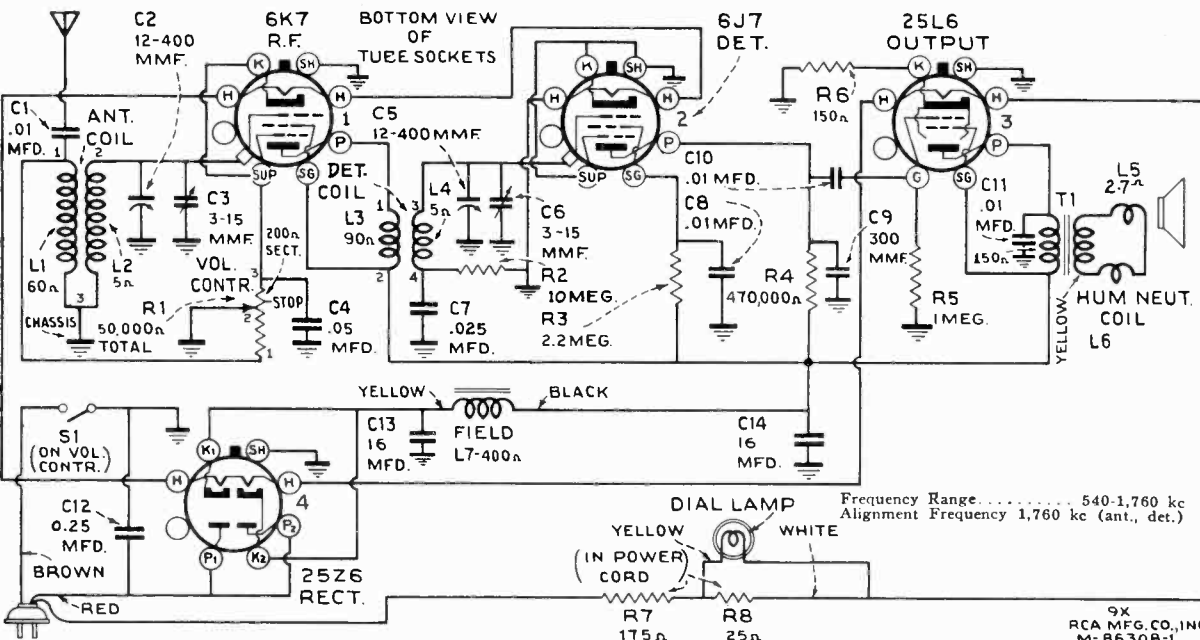


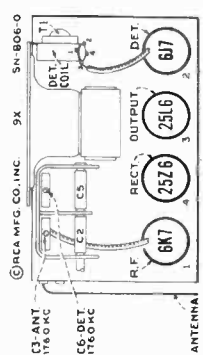
Figure 3—Radiotron Socket Voltages, and Location of Parts

\* Note: Values with (\*) are operating voltages. Values not starred are actual measured voltages. Measurements made to chassis unless otherwise indicated. Measurements made with set tuned to quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having ranges of 10,

50, and 250 volts. (Use nearest range above the specified measured voltage.) Values should hold within approximately ± 20% for 117-volt 60-cycle a-c supply. On d-c, voltages are approximately 10% lower, except heaters, which remain the same.

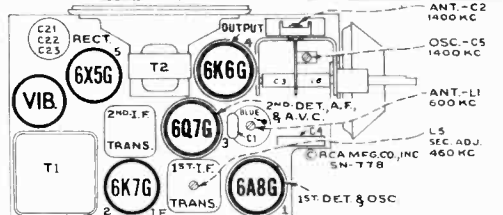
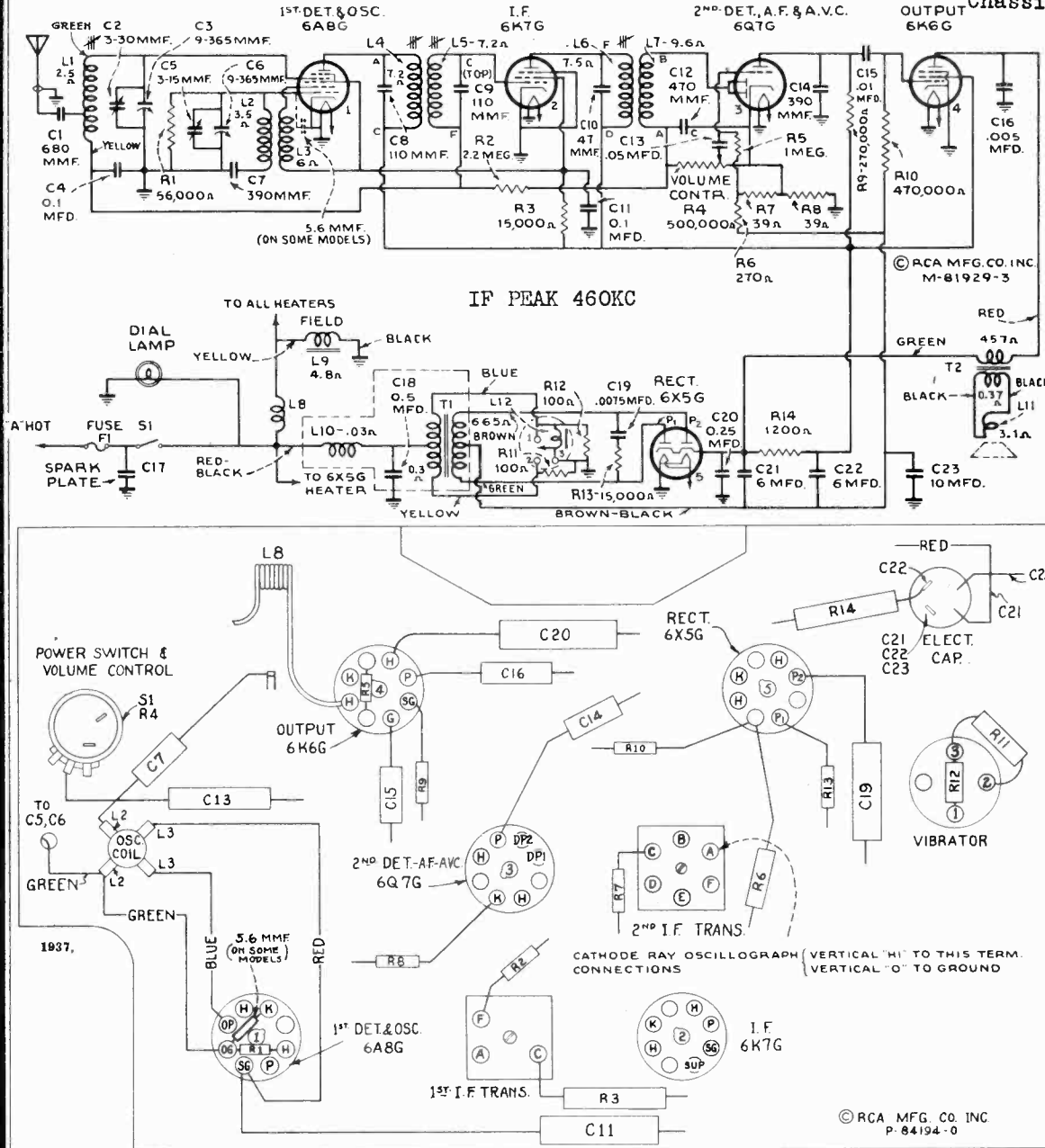
**MISCELLANEOUS ASSEMBLIES**  
Escutcheon—Station selector dial escutcheon : 31326  
Knob—Station selector, or volume control knob : 31204  
Spring—Retaining spring for knob, Stock No. : 30900  
31204  
31204  
31204

9X  
RCA MFG. CO., INC.  
M-86308-1

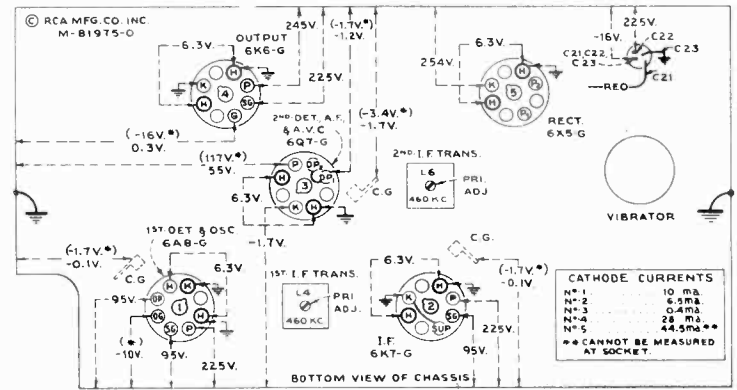


RCA MFG. CO., INC.

MODEL 8M  
Schematic, Socket  
Voltage, Trimmers  
Chassis Wiring



BOTTOM VIEW OF CHASSIS



**Note:** Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

Figure 4—Radiotron Socket Voltages and Trimmer Locations  
 (Measured at 6.3 volts battery supply—Volume control minimum—No signal input)

MODEL 8M  
Alignment, Specs.  
Data, Parts

RCA MFG. CO., INC.

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
<b>RECEIVER ASSEMBLIES</b>					
11350	Cap—Grid contact cap—Package of 5	\$0.25	12679	Resistor—2.2 Megohm, insulated, 1/2 watt (R2)—Package of 5	1.00
30637	Capacitor—Adjustable trimmer (C2)	.30	5129	Ring—Retaining ring for Radiotron shield—Package of 5	.15
12405	Capacitor—47 Mmfd. (C10)	.25	12418	Screw—No. 8-32 x 3/16-in. slab-head set screw for drum, Stock No. 30630—Package of 10	.25
14262	Capacitor—110 Mmfd. (C8, C9)	.30	30638	Shield—Radiotron shield	.25
13894	Capacitor—390 Mmfd. (C14)—Package of 5	1.25	13688	Socket—4-contact vibrator socket	.20
30625	Capacitor—390 Mmfd. (C7)	.30	11196	Socket—8-contact Radiotron socket	.25
30673	Capacitor—470 Mmfd. (C12)	.25	30631	Spring—Tension spring for drive cord—Package of 10	.35
14498	Capacitor—680 Mmfd. (C1)—Package of 5	1.50	14376	Transformer—First I.F. transformer (L4, L5, C8, C9)	2.45
4838	Capacitor—.005 Mfd. (C16)	.25	30672	Transformer—Second I.F. transformer (L8, L7, C10, C12)	2.10
30626	Capacitor—.0075 Mfd. (C19)	.30	30633	Transformer—Vibrator power transformer (T1, L10, C18)	5.00
14393	Capacitor—.01 Mfd. (C15)	.30	13688	Vibrator—Plug-in vibrator (L12)	3.35
4886	Capacitor—.05 Mfd. (C13)	.20	30628	Volume Control and "ON-OFF" switch (R4, S1)	1.50
4839	Capacitor—.01 Mfd. (C4, C11)	.30	<b>REPRODUCER ASSEMBLIES (84147-2)</b>		
12484	Capacitor—.25 Mfd. (C20)	.30	30782	Cone—Reproducer cone and voice coil (L11)	1.20
30634	Capacitor Pack—Comprising two 6 Mfd. and one 10 Mfd. sections (C21, C22, C23)	1.50	30781	Reproducer, complete (L9, L11, T2)	4.40
4358	Clamp—Mounting clamp for capacitor pack, Stock No. 30634	.15	30783	Transformer—Output transformer (T2)	1.45
30639	Coil—Antenna coil—less shield (L1)	1.00	<b>MISCELLANEOUS ASSEMBLIES</b>		
30636	Coil—Oscillator coil (L2, L3)	.60	5025	Capacitor—Generator capacitor	.45
30627	Condenser 2-gang variable tuning condenser (C3, C5, C6)	2.30	5023	Fuse—15 amp.—Package of 5	.40
30632	Cord—Drive cord—Package of 5	.25	30640	Housing—Receiver case only	3.60
30629	Dial—Dial scale and holder	.70	4290	Insulator—Fuse-holder insulating sleeve—Package of 10	.20
30630	Drum—Dial drive drum, complete with set screws	.70	30642	Knob—Tuning or volume control knob—Package of 5	.65
12415	Resistor—39 ohms, insulated, 1/2 watt (R7, R8)—Package of 5	1.00	11765	Lamp—Dial lamp—Package of 5	1.15
30540	Resistor—100 ohms, insulated, 1/2 watt (R1, R12)—Package of 5	1.00	7766	Lead—"A" lead (ammeter end), complete with female section of fuse holder	.40
13744	Resistor—270 ohms, carbon type, 1/2 watt (R6)—Package of 5	1.00	30641	Lead—"A" lead (chassis end), complete with male section of fuse holder	.30
6134	Resistor—1,200 ohms, carbon type, 1 watt (R14)—Package of 5	1.10	30643	Lead—Shielded antenna lead (chassis end), complete with female section of connector	.30
12695	Resistor—15,000 ohms, insulated, 1/2 watt (R13)—Package of 5	1.00	30645	Mounting—Complete set of brackets, nuts, washers, and screws for mounting receiver	.45
14166	Resistor—15,000 ohms, carbon type, 2 watt (R3)	.25	30644	Socket—Dial lamp socket and lead	.30
12286	Resistor—56,000 ohms, insulated, 1/2 watt (R1)—Package of 5	1.00	5024	Suppressor—Distributor suppressor	.40
12199	Resistor—270,000 ohms, insulated, 1/2 watt (R9)—Package of 5	1.00			
12285	Resistor—470,000 ohms, insulated, 1/2 watt (R10)—Package of 5	1.00			
13730	Resistor—1 Megohm, insulated, 1/2 watt (R5)—Package of 5	1.00			

ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Service Data

**Loudspeaker**—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place with ambroid upon completion of adjustment.

**Vibrator**—The mechanical vibrator used in the power system has a plug-in base for easy removal from the receiver. Its adjustment has been set during manufacture by means of Tuning Range.

**POWER OUTPUT RATING**  
Maximum . . . . . 3.3 watts  
Undistorted . . . . . 1.75 watts

**POWER SUPPLY RATING**  
Supply Voltage . . . . . 6.3 volts  
Current Drain . . . . . 6 amp.  
Fuse Protection . . . . . 15 amp.

**PILOT LAMP** . . . . . Mazda No. 51, 7.5 volts, 0.2 amp.

**ALIGNMENT FREQUENCIES** . . . . . I.F., 460 kc; Oscillator Coil, 1,400 kc; Antenna Coil, 600 kc and 1,400 kc

Alignment Procedure

Remove all external screws to remove the chassis from the case. Hold the condenser gang in full-mesh position while rotating the dial scale so the low frequency (end) calibration mark is in line with the pointer. Loosen the three nuts in the front of the scale assembly for this adjustment. When referring to scale settings hold the front panel in place.

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4. Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position. Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

special equipment. In cases of faulty operation a replacement unit should be installed.

**Antenna Compensating Capacitor**—Trimmer C2 is accessible from the bottom of the receiver case (near speaker opening) and should be readjusted to give maximum signal output on a weak station or oscillator signal at approximately 1,400 kc, after the instrument is installed. The antenna should be connected to the receiver during this adjustment. Refer to Alignment Table operation number 6.

**LOUDSPEAKER**  
Type . . . . . 5-inch Electrodynamic  
Voice-Coil Impedance . . . . . 3.2 ohms at 400 cycles  
Supply Voltage . . . . . 6.3 volts  
Current Drain . . . . . 6 amp.  
Fuse Protection . . . . . 15 amp.  
Mazda No. 51, 7.5 volts, 0.2 amp.

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Ant. Cable" means test oscillator signal should be applied to the receiver at the connector on the antenna cable extending from the receiver chassis. "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal is received from a station or the local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment"

Order of Alignment	Test Oscillator		Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna				
1	I-F Grid Cap	.001 Mfd.	No Signal 550-750 kc	2nd I-F Trans.	L6	Max. (peak)
2	6A8-G Det. Osc. Grid Cap	.001 Mfd.	No Signal 550-750 kc	1st I-F Trans.	L4 and L5	Max. (peak)
3	Ant. Cable	100 Mmfd.	1,400 kc	Osc.	C5	Max. (peak)
4	Ant. Cable	100 Mmfd.	1,400 kc	H-F Ant.	C2	Max. (peak)
5	Ant. Cable	100 Mmfd.	600 kc	L-F Ant.	L1	Max. (peak)†
6	Ant. Cable	100 Mmfd.	1,400 kc	H-F Ant.	C2	Max. (peak)

\* Adjust dial for maximum output at or near 600 kc setting.

† The same inductance may be obtained for two different settings of L1. Use either setting.





MODEL 8M2  
Schematic, Changes  
Power Unit Changes

RCA MFG. CO., INC.

IF PEAK 260 KC

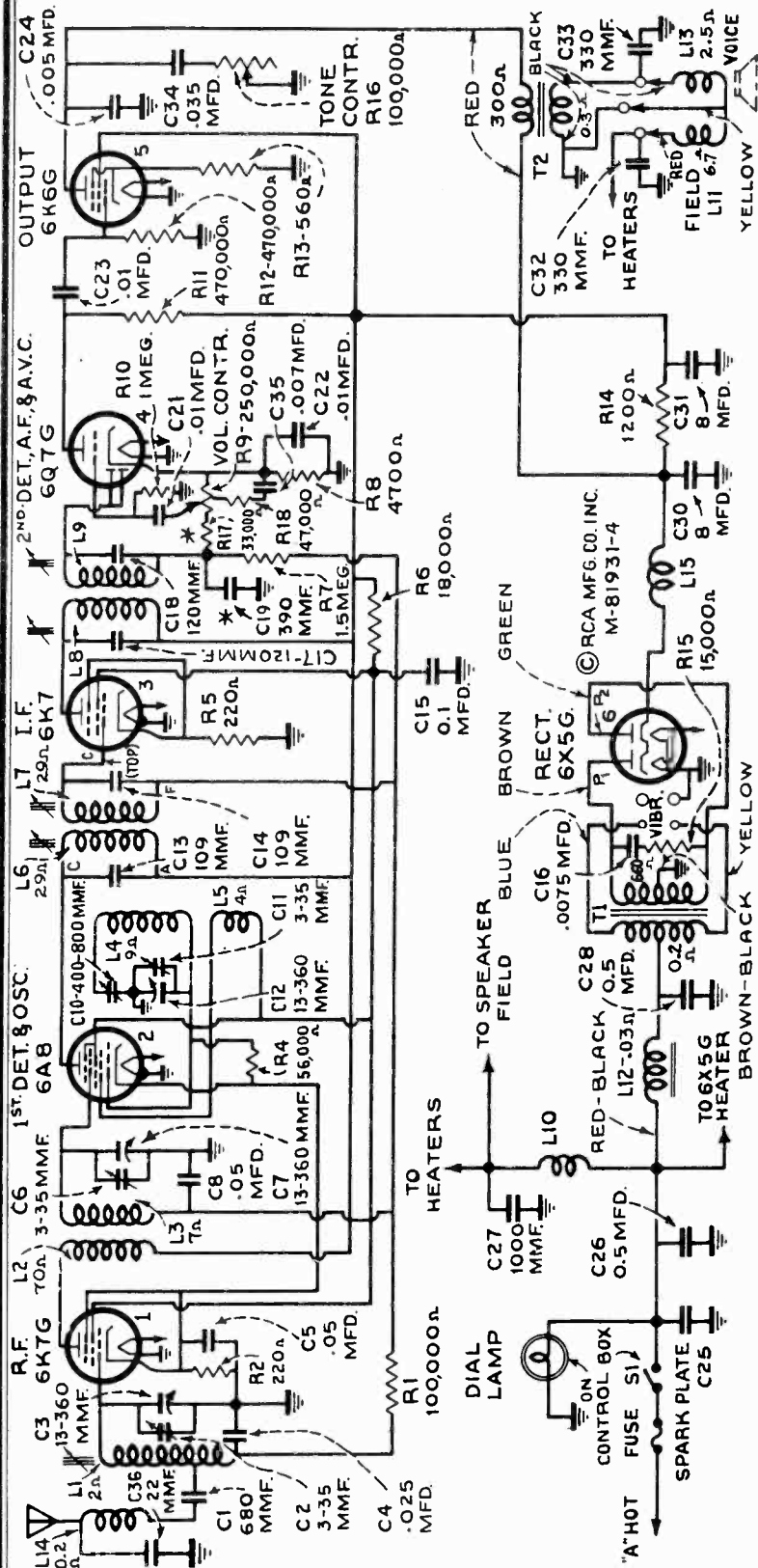


Figure 2—Schematic Circuit Diagram (Model 8M2)

Refer to Figures 4, 5, and 6 and Notes No. 2, 3, and 4 in Replacement Parts list before servicing these receivers.  
\* R17 is 47,000 ohms and C19 is 265 mmfd. on Model 8M2. Run "B."

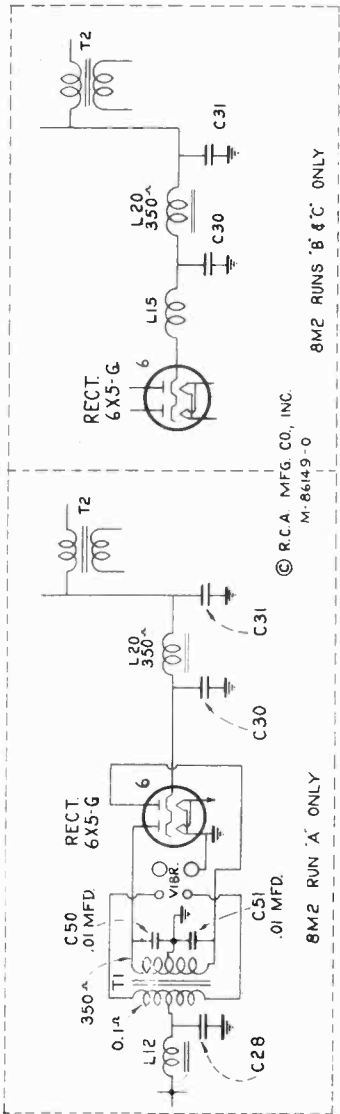


Figure 5—Schematic Circuit Diagram of Power Unit Modifications (Model 8M2)

Refer to Notes No. 2, 3, and 4 in Replacement Parts list.

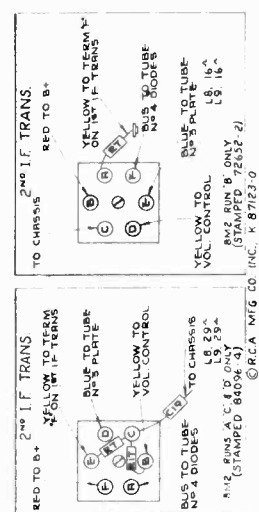


Figure 4—Second I-F Transformer Connections (Model 8M2)

Refer to Note No. 3 in Replacement Parts list.

RCA MFG. CO., INC.

MODELS 8M1, 8M2  
R-F Chassis Wiring  
Parts Layout  
MODEL 8M2  
Power Unit Layout

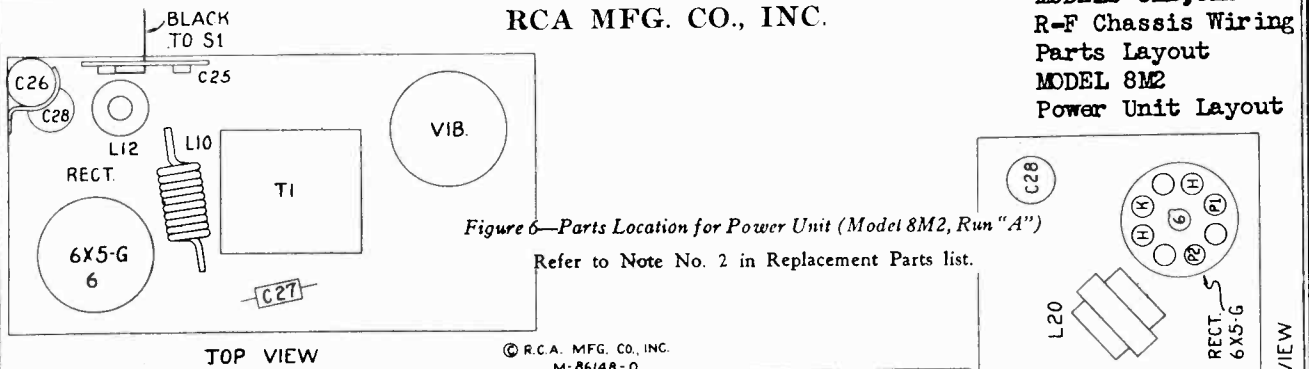
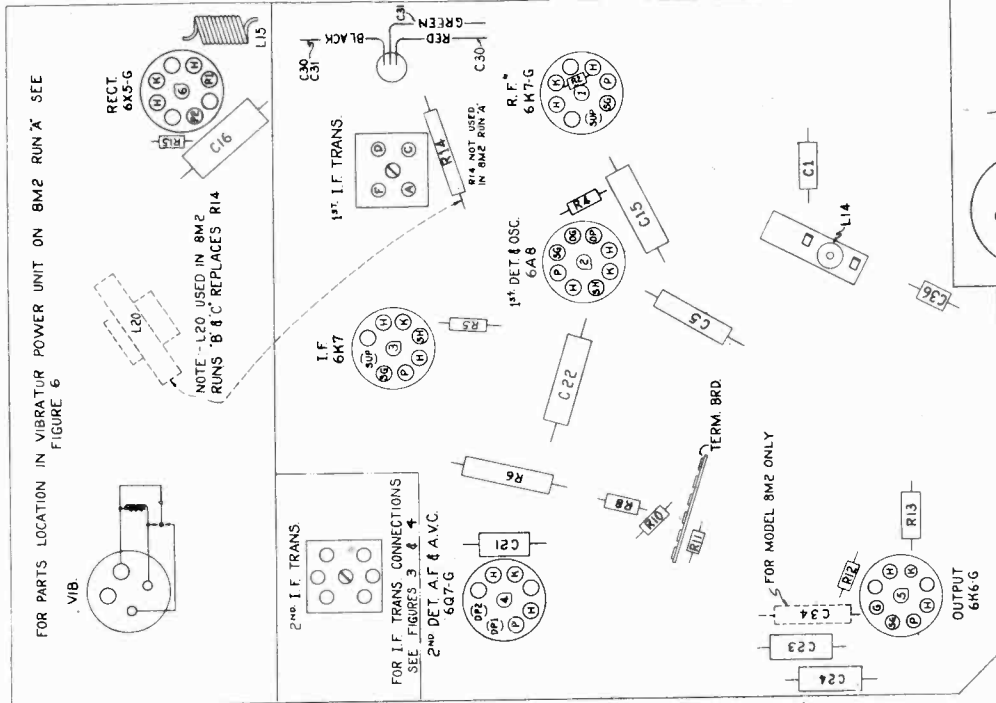


Figure 6—Parts Location for Power Unit (Model 8M2, Run "A")

Refer to Note No. 2 in Replacement Parts list.

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M-86148-0



FOR PARTS LOCATION IN VIBRATOR POWER UNIT ON 8M2 RUN 'A' SEE FIGURE 6

NOTE—L20 USED IN 8M2 RUNS 'B' & 'C' REPLACES R14

FOR I.F. TRANS. CONNECTIONS SEE FIGURES 3 & 4

FOR MODEL 8M2 ONLY

TO SPEAKER 8M1 ONLY  
RED  
GREEN  
BLACK  
TO T1  
TO HEATER  
TO C34  
GREEN  
RED  
BLACK

Figure 7—Component Parts Location and R-F Wiring Diagram (Models 8M1 and 8M2)

Refer to Figures 3, 4, and 6 for changes.

Model 8M1 is a six-tube superheterodyne receiver and a 5-inch electrodynamic loudspeaker in the same case. Model 8M2 employs a similar receiver to Model 8M1 but with an 8-inch electrodynamic loudspeaker separately contained in a cylindrical housing. Other features of design include an rf amplifier stage; magnetic-core if and antenna transformers; automatic volume control; and ignition-suppression filters in both the antenna and power-input circuits. In addition, Model 8M2 has an aural-compensated volume control and continuously variable tone control.

TUNING RANGE..... 550 to 1,550 kc

MODELS 8M1, 8M2  
Alignment, Parts  
Specifications, Data

RCA MFG. CO., INC.

Stock No.	DESCRIPTION	Unit Price	Stock No.	DESCRIPTION	Unit Price
15643	Brace—Chassis mounting bottom bracket and capacitor (C10)	0.05	14593	Capacitor—0.1 Mfd. (C21)	0.30
15644	Capacitor—0.05 Mfd. (C11)	0.20	4888	Capacitor—0.1 Mfd. (C22, C23)	0.25
15645	Capacitor—0.02 Mfd. (C12)	0.20	4889	Capacitor—0.05 Mfd. (C24)	0.20
15646	Capacitor—0.01 Mfd. (C13)	0.20	4890	Capacitor—0.05 Mfd. (C25)	0.20
15647	Capacitor—0.005 Mfd. (C14)	0.20	4891	Capacitor—0.05 Mfd. (C26)	0.20
15648	Capacitor—0.002 Mfd. (C15)	0.20	4892	Capacitor—0.05 Mfd. (C27)	0.20
15649	Capacitor—0.001 Mfd. (C16)	0.20	4893	Capacitor—0.05 Mfd. (C28)	0.20
15650	Capacitor—0.0005 Mfd. (C17)	0.20	4894	Capacitor—0.05 Mfd. (C29)	0.20
15651	Capacitor—0.0002 Mfd. (C18)	0.20	4895	Capacitor—0.05 Mfd. (C30)	0.20
15652	Capacitor—0.0001 Mfd. (C19)	0.20	4896	Capacitor—0.05 Mfd. (C31)	0.20
15653	Capacitor—0.00005 Mfd. (C20)	0.20	4897	Capacitor—0.05 Mfd. (C32)	0.20
15654	Capacitor—0.00002 Mfd. (C21)	0.20	4898	Capacitor—0.05 Mfd. (C33)	0.20
15655	Capacitor—0.00001 Mfd. (C22)	0.20	4899	Capacitor—0.05 Mfd. (C34)	0.20
15656	Capacitor—0.000005 Mfd. (C23)	0.20	4900	Capacitor—0.05 Mfd. (C35)	0.20
15657	Capacitor—0.000002 Mfd. (C24)	0.20	4901	Capacitor—0.05 Mfd. (C36)	0.20
15658	Capacitor—0.000001 Mfd. (C25)	0.20	4902	Capacitor—0.05 Mfd. (C37)	0.20
15659	Capacitor—0.0000005 Mfd. (C26)	0.20	4903	Capacitor—0.05 Mfd. (C38)	0.20
15660	Capacitor—0.0000002 Mfd. (C27)	0.20	4904	Capacitor—0.05 Mfd. (C39)	0.20
15661	Capacitor—0.0000001 Mfd. (C28)	0.20	4905	Capacitor—0.05 Mfd. (C40)	0.20
15662	Capacitor—0.00000005 Mfd. (C29)	0.20	4906	Capacitor—0.05 Mfd. (C41)	0.20
15663	Capacitor—0.00000002 Mfd. (C30)	0.20	4907	Capacitor—0.05 Mfd. (C42)	0.20
15664	Capacitor—0.00000001 Mfd. (C31)	0.20	4908	Capacitor—0.05 Mfd. (C43)	0.20
15665	Capacitor—0.000000005 Mfd. (C32)	0.20	4909	Capacitor—0.05 Mfd. (C44)	0.20
15666	Capacitor—0.000000002 Mfd. (C33)	0.20	4910	Capacitor—0.05 Mfd. (C45)	0.20
15667	Capacitor—0.000000001 Mfd. (C34)	0.20	4911	Capacitor—0.05 Mfd. (C46)	0.20
15668	Capacitor—0.0000000005 Mfd. (C35)	0.20	4912	Capacitor—0.05 Mfd. (C47)	0.20
15669	Capacitor—0.0000000002 Mfd. (C36)	0.20	4913	Capacitor—0.05 Mfd. (C48)	0.20
15670	Capacitor—0.0000000001 Mfd. (C37)	0.20	4914	Capacitor—0.05 Mfd. (C49)	0.20
15671	Capacitor—0.00000000005 Mfd. (C38)	0.20	4915	Capacitor—0.05 Mfd. (C50)	0.20
15672	Capacitor—0.00000000002 Mfd. (C39)	0.20	4916	Capacitor—0.05 Mfd. (C51)	0.20
15673	Capacitor—0.00000000001 Mfd. (C40)	0.20	4917	Capacitor—0.05 Mfd. (C52)	0.20
15674	Capacitor—0.000000000005 Mfd. (C41)	0.20	4918	Capacitor—0.05 Mfd. (C53)	0.20
15675	Capacitor—0.000000000002 Mfd. (C42)	0.20	4919	Capacitor—0.05 Mfd. (C54)	0.20
15676	Capacitor—0.000000000001 Mfd. (C43)	0.20	4920	Capacitor—0.05 Mfd. (C55)	0.20
15677	Capacitor—0.0000000000005 Mfd. (C44)	0.20	4921	Capacitor—0.05 Mfd. (C56)	0.20
15678	Capacitor—0.0000000000002 Mfd. (C45)	0.20	4922	Capacitor—0.05 Mfd. (C57)	0.20
15679	Capacitor—0.0000000000001 Mfd. (C46)	0.20	4923	Capacitor—0.05 Mfd. (C58)	0.20
15680	Capacitor—0.00000000000005 Mfd. (C47)	0.20	4924	Capacitor—0.05 Mfd. (C59)	0.20
15681	Capacitor—0.00000000000002 Mfd. (C48)	0.20	4925	Capacitor—0.05 Mfd. (C60)	0.20
15682	Capacitor—0.00000000000001 Mfd. (C49)	0.20	4926	Capacitor—0.05 Mfd. (C61)	0.20
15683	Capacitor—0.000000000000005 Mfd. (C50)	0.20	4927	Capacitor—0.05 Mfd. (C62)	0.20
15684	Capacitor—0.000000000000002 Mfd. (C51)	0.20	4928	Capacitor—0.05 Mfd. (C63)	0.20
15685	Capacitor—0.000000000000001 Mfd. (C52)	0.20	4929	Capacitor—0.05 Mfd. (C64)	0.20
15686	Capacitor—0.0000000000000005 Mfd. (C53)	0.20	4930	Capacitor—0.05 Mfd. (C65)	0.20
15687	Capacitor—0.0000000000000002 Mfd. (C54)	0.20	4931	Capacitor—0.05 Mfd. (C66)	0.20
15688	Capacitor—0.0000000000000001 Mfd. (C55)	0.20	4932	Capacitor—0.05 Mfd. (C67)	0.20
15689	Capacitor—0.00000000000000005 Mfd. (C56)	0.20	4933	Capacitor—0.05 Mfd. (C68)	0.20
15690	Capacitor—0.00000000000000002 Mfd. (C57)	0.20	4934	Capacitor—0.05 Mfd. (C69)	0.20
15691	Capacitor—0.00000000000000001 Mfd. (C58)	0.20	4935	Capacitor—0.05 Mfd. (C70)	0.20
15692	Capacitor—0.000000000000000005 Mfd. (C59)	0.20	4936	Capacitor—0.05 Mfd. (C71)	0.20
15693	Capacitor—0.000000000000000002 Mfd. (C60)	0.20	4937	Capacitor—0.05 Mfd. (C72)	0.20
15694	Capacitor—0.000000000000000001 Mfd. (C61)	0.20	4938	Capacitor—0.05 Mfd. (C73)	0.20
15695	Capacitor—0.0000000000000000005 Mfd. (C62)	0.20	4939	Capacitor—0.05 Mfd. (C74)	0.20
15696	Capacitor—0.0000000000000000002 Mfd. (C63)	0.20	4940	Capacitor—0.05 Mfd. (C75)	0.20
15697	Capacitor—0.0000000000000000001 Mfd. (C64)	0.20	4941	Capacitor—0.05 Mfd. (C76)	0.20
15698	Capacitor—0.00000000000000000005 Mfd. (C65)	0.20	4942	Capacitor—0.05 Mfd. (C77)	0.20
15699	Capacitor—0.00000000000000000002 Mfd. (C66)	0.20	4943	Capacitor—0.05 Mfd. (C78)	0.20
15700	Capacitor—0.00000000000000000001 Mfd. (C67)	0.20	4944	Capacitor—0.05 Mfd. (C79)	0.20
15701	Capacitor—0.000000000000000000005 Mfd. (C68)	0.20	4945	Capacitor—0.05 Mfd. (C80)	0.20
15702	Capacitor—0.000000000000000000002 Mfd. (C69)	0.20	4946	Capacitor—0.05 Mfd. (C81)	0.20
15703	Capacitor—0.000000000000000000001 Mfd. (C70)	0.20	4947	Capacitor—0.05 Mfd. (C82)	0.20
15704	Capacitor—0.0000000000000000000005 Mfd. (C71)	0.20	4948	Capacitor—0.05 Mfd. (C83)	0.20
15705	Capacitor—0.0000000000000000000002 Mfd. (C72)	0.20	4949	Capacitor—0.05 Mfd. (C84)	0.20
15706	Capacitor—0.0000000000000000000001 Mfd. (C73)	0.20	4950	Capacitor—0.05 Mfd. (C85)	0.20
15707	Capacitor—0.00000000000000000000005 Mfd. (C74)	0.20	4951	Capacitor—0.05 Mfd. (C86)	0.20
15708	Capacitor—0.00000000000000000000002 Mfd. (C75)	0.20	4952	Capacitor—0.05 Mfd. (C87)	0.20
15709	Capacitor—0.00000000000000000000001 Mfd. (C76)	0.20	4953	Capacitor—0.05 Mfd. (C88)	0.20
15710	Capacitor—0.000000000000000000000005 Mfd. (C77)	0.20	4954	Capacitor—0.05 Mfd. (C89)	0.20
15711	Capacitor—0.000000000000000000000002 Mfd. (C78)	0.20	4955	Capacitor—0.05 Mfd. (C90)	0.20
15712	Capacitor—0.000000000000000000000001 Mfd. (C79)	0.20	4956	Capacitor—0.05 Mfd. (C91)	0.20
15713	Capacitor—0.0000000000000000000000005 Mfd. (C80)	0.20	4957	Capacitor—0.05 Mfd. (C92)	0.20
15714	Capacitor—0.0000000000000000000000002 Mfd. (C81)	0.20	4958	Capacitor—0.05 Mfd. (C93)	0.20
15715	Capacitor—0.0000000000000000000000001 Mfd. (C82)	0.20	4959	Capacitor—0.05 Mfd. (C94)	0.20
15716	Capacitor—0.00000000000000000000000005 Mfd. (C83)	0.20	4960	Capacitor—0.05 Mfd. (C95)	0.20
15717	Capacitor—0.00000000000000000000000002 Mfd. (C84)	0.20	4961	Capacitor—0.05 Mfd. (C96)	0.20
15718	Capacitor—0.00000000000000000000000001 Mfd. (C85)	0.20	4962	Capacitor—0.05 Mfd. (C97)	0.20
15719	Capacitor—0.000000000000000000000000005 Mfd. (C86)	0.20	4963	Capacitor—0.05 Mfd. (C98)	0.20
15720	Capacitor—0.000000000000000000000000002 Mfd. (C87)	0.20	4964	Capacitor—0.05 Mfd. (C99)	0.20
15721	Capacitor—0.000000000000000000000000001 Mfd. (C88)	0.20	4965	Capacitor—0.05 Mfd. (C100)	0.20
15722	Capacitor—0.0000000000000000000000000005 Mfd. (C89)	0.20	4966	Capacitor—0.05 Mfd. (C101)	0.20
15723	Capacitor—0.0000000000000000000000000002 Mfd. (C90)	0.20	4967	Capacitor—0.05 Mfd. (C102)	0.20
15724	Capacitor—0.0000000000000000000000000001 Mfd. (C91)	0.20	4968	Capacitor—0.05 Mfd. (C103)	0.20
15725	Capacitor—0.00000000000000000000000000005 Mfd. (C92)	0.20	4969	Capacitor—0.05 Mfd. (C104)	0.20
15726	Capacitor—0.00000000000000000000000000002 Mfd. (C93)	0.20	4970	Capacitor—0.05 Mfd. (C105)	0.20
15727	Capacitor—0.00000000000000000000000000001 Mfd. (C94)	0.20	4971	Capacitor—0.05 Mfd. (C106)	0.20
15728	Capacitor—0.000000000000000000000000000005 Mfd. (C95)	0.20	4972	Capacitor—0.05 Mfd. (C107)	0.20
15729	Capacitor—0.000000000000000000000000000002 Mfd. (C96)	0.20	4973	Capacitor—0.05 Mfd. (C108)	0.20
15730	Capacitor—0.000000000000000000000000000001 Mfd. (C97)	0.20	4974	Capacitor—0.05 Mfd. (C109)	0.20
15731	Capacitor—0.0000000000000000000000000000005 Mfd. (C98)	0.20	4975	Capacitor—0.05 Mfd. (C110)	0.20
15732	Capacitor—0.0000000000000000000000000000002 Mfd. (C99)	0.20	4976	Capacitor—0.05 Mfd. (C111)	0.20
15733	Capacitor—0.0000000000000000000000000000001 Mfd. (C100)	0.20	4977	Capacitor—0.05 Mfd. (C112)	0.20
15734	Capacitor—0.00000000000000000000000000000005 Mfd. (C101)	0.20	4978	Capacitor—0.05 Mfd. (C113)	0.20
15735	Capacitor—0.00000000000000000000000000000002 Mfd. (C102)	0.20	4979	Capacitor—0.05 Mfd. (C114)	0.20
15736	Capacitor—0.00000000000000000000000000000001 Mfd. (C103)	0.20	4980	Capacitor—0.05 Mfd. (C115)	0.20
15737	Capacitor—0.000000000000000000000000000000005 Mfd. (C104)	0.20	4981	Capacitor—0.05 Mfd. (C116)	0.20
15738	Capacitor—0.000000000000000000000000000000002 Mfd. (C105)	0.20	4982	Capacitor—0.05 Mfd. (C117)	0.20
15739	Capacitor—0.000000000000000000000000000000001 Mfd. (C106)	0.20	4983	Capacitor—0.05 Mfd. (C118)	0.20
15740	Capacitor—0.0000000000000000000000000000000005 Mfd. (C107)	0.20	4984	Capacitor—0.05 Mfd. (C119)	0.20
15741	Capacitor—0.0000000000000000000000000000000002 Mfd. (C108)	0.20	4985	Capacitor—0.05 Mfd. (C120)	0.20
15742	Capacitor—0.0000000000000000000000000000000001 Mfd. (C109)	0.20	4986	Capacitor—0.05 Mfd. (C121)	0.20
15743	Capacitor—0.00000000000000000000000000000000005 Mfd. (C110)	0.20	4987	Capacitor—0.05 Mfd. (C122)	0.20
15744	Capacitor—0.00000000000000000000000000000000002 Mfd. (C111)	0.20	4988	Capacitor—0.05 Mfd. (C123)	0.20
15745	Capacitor—0.00000000000000000000000000000000001 Mfd. (C112)	0.20	4989	Capacitor—0.05 Mfd. (C124)	0.20
15746	Capacitor—0.000000000000000000000000000000000005 Mfd. (C113)	0.20	4990	Capacitor—0.05 Mfd. (C125)	0.20
15747	Capacitor—0.000000000000000000000000000000000002 Mfd. (C114)	0.20	4991	Capacitor—0.05 Mfd. (C126)	0.20
15748	Capacitor—0.000000000000000000000000000000000001 Mfd. (C115)	0.20	4992	Capacitor—0.05 Mfd. (C127)	0.20
15749	Capacitor—0.0000000000000000000000000000000000005 Mfd. (C116)	0.20	4993	Capacitor—0.05 Mfd. (C128)	0.20
15750	Capacitor—0.0000000000000000000000000000000000002 Mfd. (C117)	0.20	4994	Capacitor—0.05 Mfd. (C129)	0.20
15751	Capacitor—0.0000000000000000000000000000000000001 Mfd. (C118)	0.20	4995	Capacitor—0.05 Mfd. (C130)	0.20
15752	Capacitor—0.00000000000000000000000000000000000005 Mfd. (C119)	0.20	4996	Capacitor—0.05 Mfd. (C131)	0.20
15753	Capacitor—0.00000000000000000000000000000000000002 Mfd. (C120)	0.20	4997	Capacitor—0.05 Mfd. (C132)	0.20
15754	Capacitor—0.00000000000000000000000000000000000001 Mfd. (C121)	0.20	4998	Capacitor—0.05 Mfd. (C133)	0.20

RCA MFG. CO., INC.

MODELS 8M3, 8M4  
Schematics, Socket  
Trimmers, Specs.

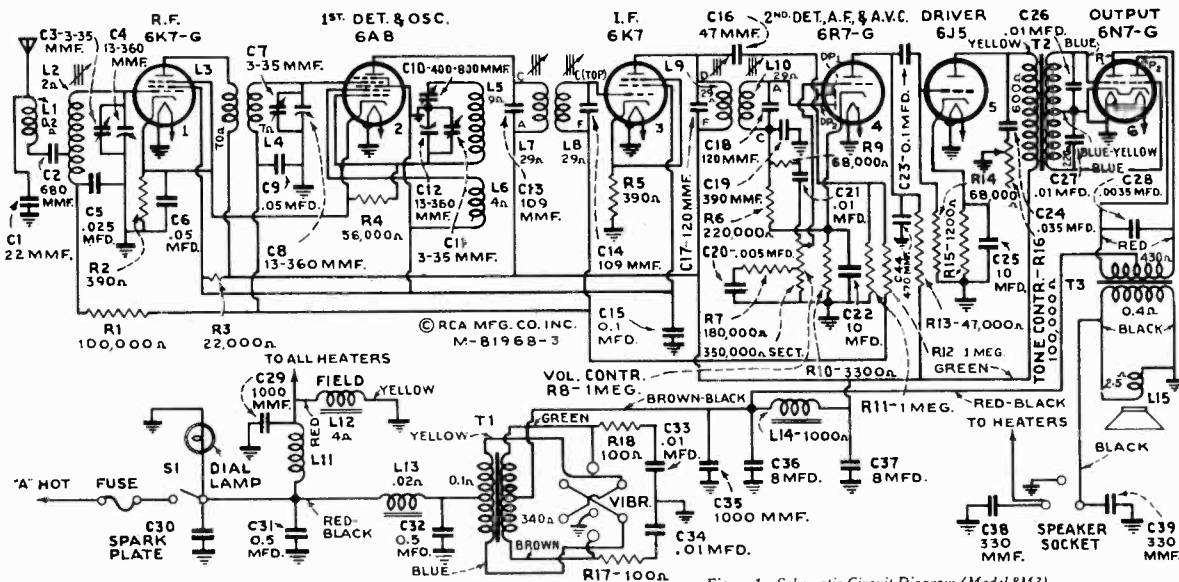


Figure 1—Schematic Circuit Diagram (Model 8M3)

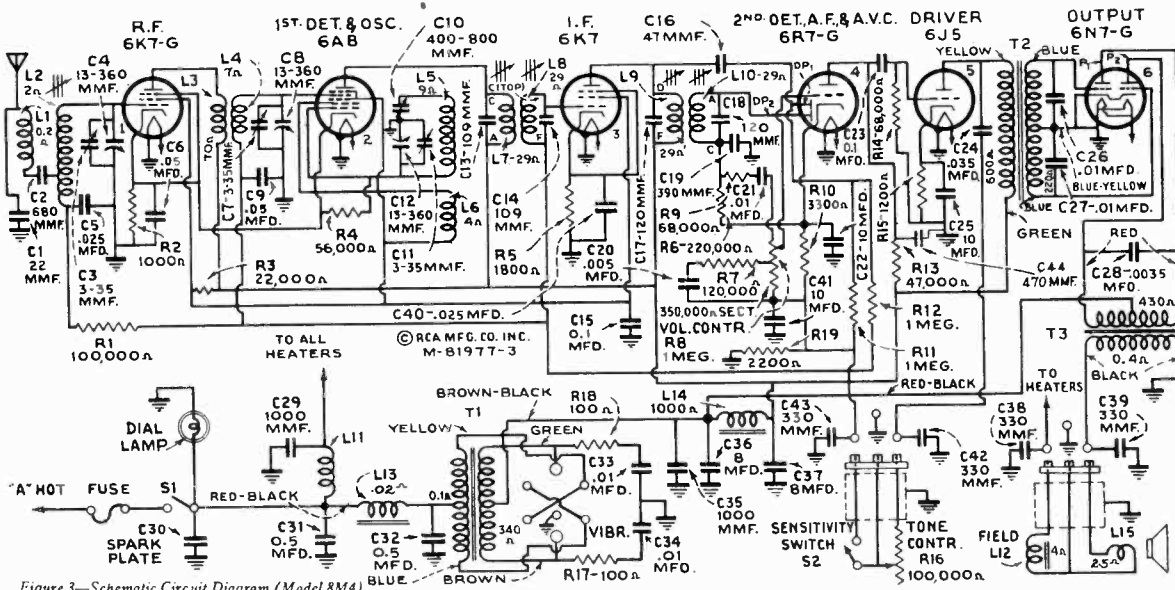


Figure 3—Schematic Circuit Diagram (Model 8M4)

General Description

Model 8M3 consists of a six-tube, superheterodyne automobile receiver and a six-inch electrodynamic loudspeaker contained in the same housing. Design features include an r-f amplifier stage; magnetite core i-f and antenna transformers; automatic volume control; continuously variable high-frequency tune control; aural-compensated volume control; ignition-suppression filters in both the antenna and power-input circuits; and a resistance-capacitance coupled

audio-driver stage feeding into a push-pull, class-B, power-output stage.

Model 8M4 employs a similar chassis to Model 8M3 but with an eight-inch electrodynamic loudspeaker separately contained in a cylindrical housing. In addition, a sensitivity control is incorporated which permits the listener to alter the receiver sensitivity to suit reception conditions. Model 8M3 has a socket on the receiver case for plugging-in an auxiliary speaker, if desired.

TUNING RANGE.....	550 to 1,550 kc
POWER OUTPUT RATINGS	
Maximum.....	9 watts
Undistorted.....	6 watts
POWER SUPPLY RATING	
Supply Voltage.....	6.3 volts
Current Drain.....	7.5 amperes
Fuse Protection.....	15 ampere
PILOT LAMP.....	Mazda No. 51, 7.5 volts, 0.2 ampere
ALIGNMENT FREQUENCIES.....	I.F., 260 kc; Oscillator, 600 kc and 1,400 kc; Detector, 1,400 kc; Antenna, 1,400 kc
LOUDSPEAKER	
Type.....	Electrodynamic
Voice-Coil Impedance.....	3 ohms at 400 cycles

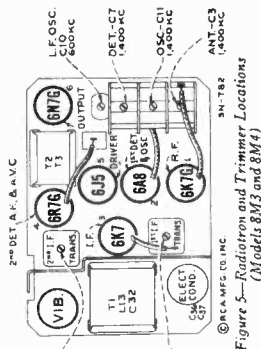


Figure 5—Radiotron and Trimmer Locations (Models 8M3 and 8M4)



MODELS 8M3, 8M4  
Parts Layouts  
R-F Chassis Wiring

RCA MFG. CO., INC.

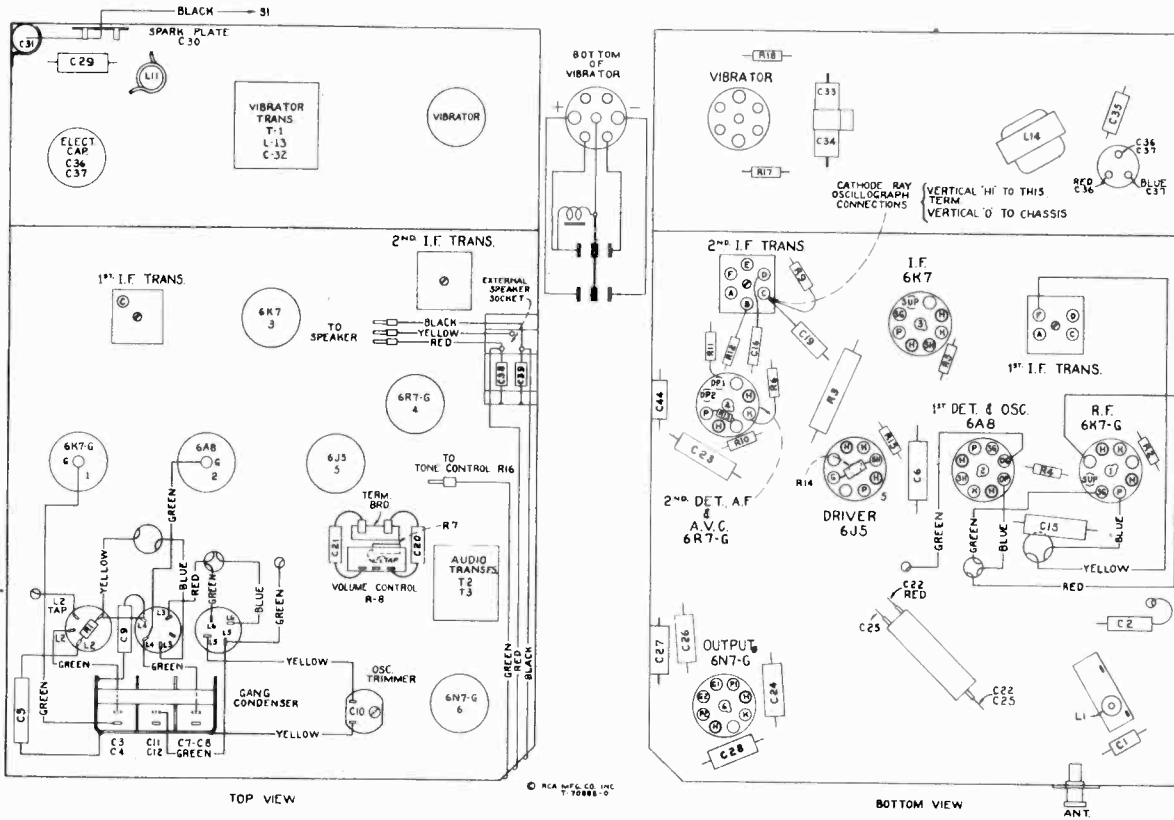


Figure 2—Component Parts Location and R-F Wiring Diagram (Model 8M3)

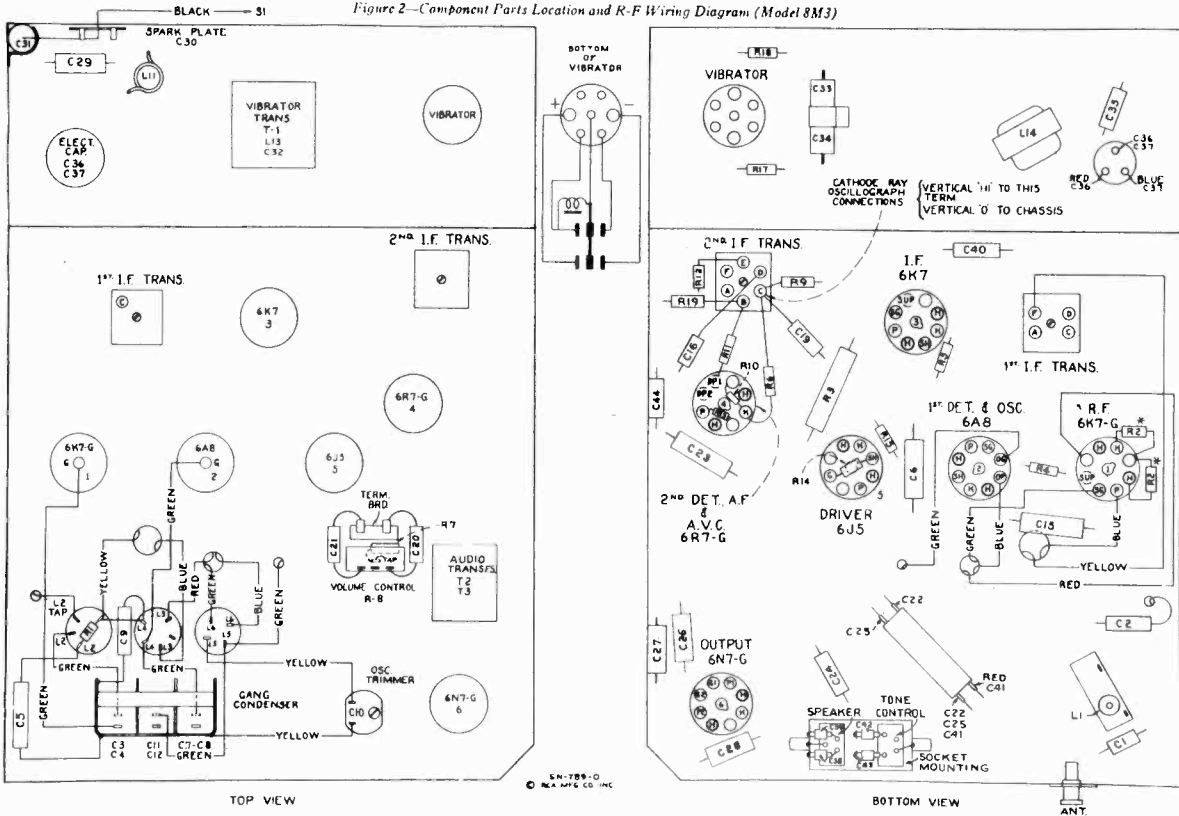
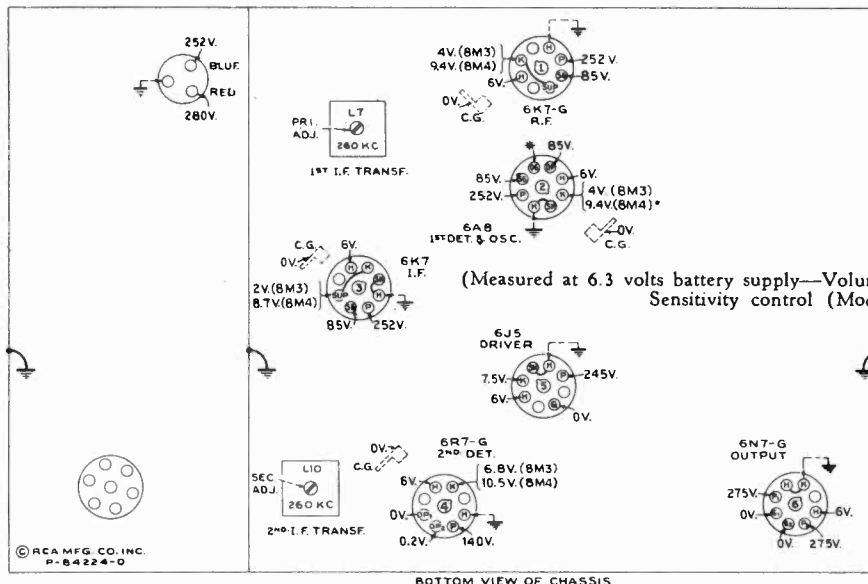


Figure 4—Component Parts Location and R-F Wiring Diagram (Model 8M4)

\* R2 may consist of two resistors connected in series having a total value of 1,000 ohms or a single 1,000 ohm resistor. Make replacements with Stock No. 14720.

RCA MFG. CO., INC.

MODELS 8M3, 8M4  
Alignment, Trimmers  
Voltage, Data



(Measured at 6.3 volts battery supply—Volume control minimum—No signal input—Sensitivity control (Model 8M4) clockwise)

Figure 6—Radiotron Socket Voltages and Trimmer Locations (Models 8M3 and 8M4)

### Service Data

**Antenna Compensating Capacitor.**—Trimmer C3 is accessible by removing the plug button from the front cover of the receiver case. This trimmer must be adjusted for maximum signal output on a weak station around 1,400 kc after installation and with the antenna properly connected.

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three, narrow, celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented in place with ambroid upon completion of adjustment.

**Vibrator.**—The mechanical vibrator has a plug-in base for easy removal. Its adjustments have been accurately set during manufacture by means of special equipment. In cases of faulty operation, a replacement unit should be installed. The symmetrical plug-in base provides correct output-voltage polarity on automobiles with either positive or negative "A" battery ground. When positive (+) side of battery is

grounded, insert vibrator so positive (+) symbol is nearest label on vibrator-compartment partition; for negative (-) ground, insert with negative (-) symbol nearest label.

**Dial Pointer Adjustment.**—With receiver and control unit properly installed in car, rotate "Tuning" knob to its extreme clockwise position and then to its extreme counterclockwise position, irrespective of location of pointer on dial. Pull out dial-lamp socket from control unit, locate the pointer adjusting screw at bottom of hole and turn with a small screwdriver until the pointer on dial is at the end calibration mark beyond "55" on the dial scale. Final adjustment may be made, if desired, by tuning in a station of known frequency and adjusting dial pointer to the frequency of the station.

**Power Switch and Volume Control Adjustment.**—Rotate the "Off-On-Volume" control knob to its extreme clockwise position and then back to its extreme counterclockwise position. This sets the friction-clutch mechanism in proper alignment.

### Alignment Procedure

output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Ant. Conn." means that the test-oscillator signal should be applied to the receiver at the antenna connector on side of case. "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal is received from a station or the local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Calibrate the tuning-dial pointer to the low-frequency calibration mark as outlined under "Dial Pointer Adjustment."

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 5 and 6.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figures 2 and 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

On Model 8M4, the sensitivity control should be placed in its clockwise (maximum sensitivity) position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the

Order of Alignment	Test Oscillator		Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna Frequency Setting				
1	6K7 I-F Grid Cap	.001 Mfd. 260 kc	No Signal 550-750 kc	2nd I-F Trans.	L9 and L10	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd. 260 kc	No Signal 550-750 kc	1st I-F Trans.	L7 and L8	Max. (peak)
3	Ant. Conn.	150 Mmfd. 600 kc	600 kc	L-F Osc.	C10	Max. (peak)
4	Ant. Conn.	150 Mmfd. 1,400 kc	1,400 kc	H-F Osc.	C11	Max. (peak)
5	Ant. Conn.	150 Mmfd. 600 kc	Rock Thru 600 kc	L-F Osc.	C10	Max. (peak)
6	Ant. Conn.	150 Mmfd. 1,400 kc	1,400 kc	H-F Osc.	C11	Max. (peak)
7	Ant. Conn.	150 Mmfd. 1,400 kc	1,400 kc	Det.	C7	Max. (peak)
8	Ant. Conn.	150 Mmfd. 1,400 kc	1,400 kc	Ant.	C3*	Max. (peak)

\* Re-adjust C3 after installation as outlined under "Antenna Compensating Capacitor."

MODELS 8M3, 8M4

Parts

RCA MFG. CO., INC.

# REPLACEMENT PARTS

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

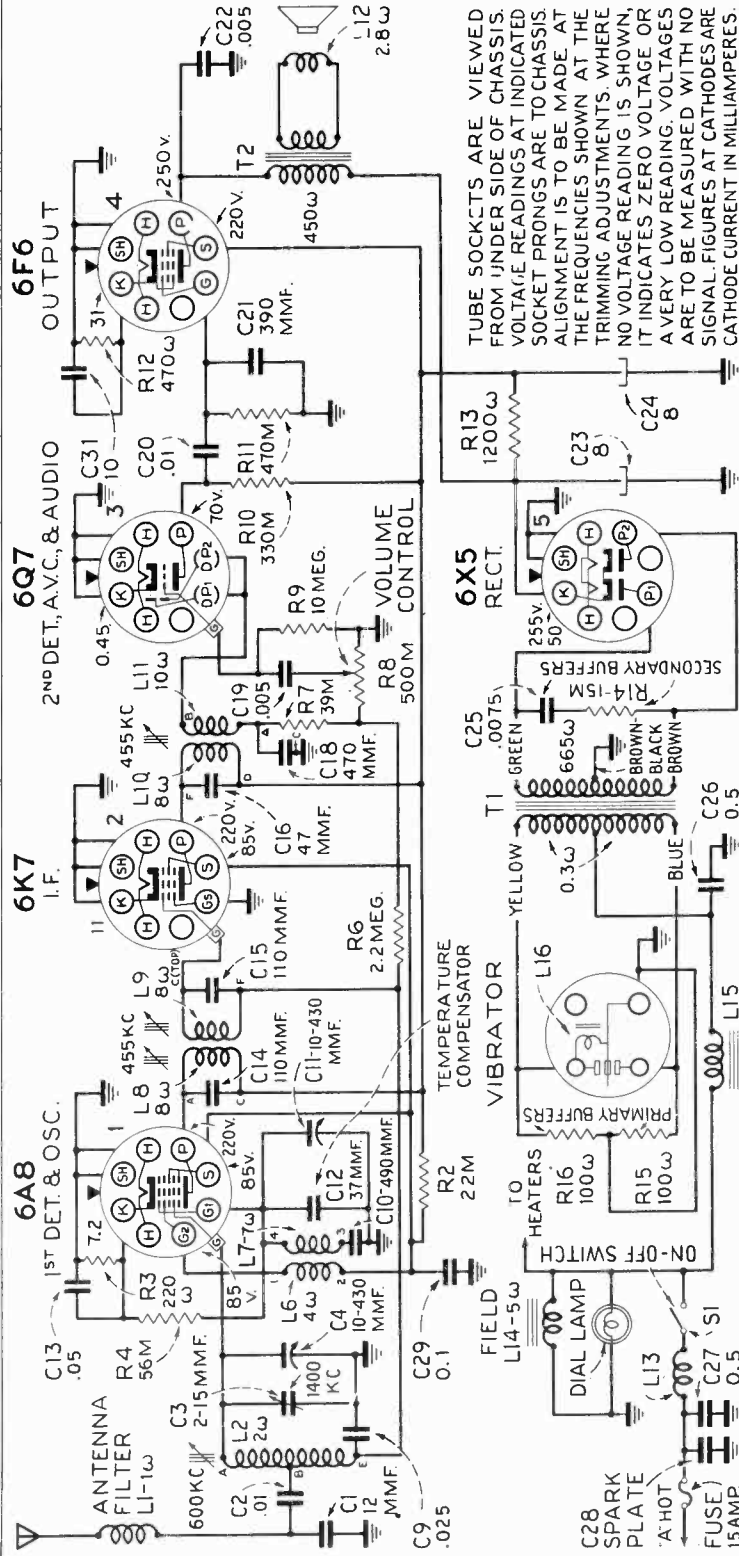
STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>					
13789	Bracket—Chassis mounting bracket and stud assembly—Model 8M4 only	.75	30800	Capacitor—1,000 Mmfd. (C29, C35)	.30
13543	Bracket—Chassis mounting bracket and stud assembly—Model 8M3 only	.65	30303	Capacitor—.0035 Mfd. (C28)	.40
30802	Capacitor—22 Mmfd. (C1)	.20	4838	Capacitor—.005 Mfd. (C20)	.25
13141	Capacitor—47 Mmfd. (C16)	.25	4858	Capacitor—.01 Mfd. (C21, C26, C27)	.25
14262	Capacitor—109 Mmfd. (C13, C14)	.30	13695	Capacitor—Two sections each .01 Mfd. (C33, C34)	.80
12404	Capacitor—120 Mmfd. (C17, C18)	.30	4870	Capacitor—.025 Mfd. (C5, C40) — (C40 in Model 8M4 only)	.20
30832	Capacitor—330 Mmfd. (C38, C39, C42, C43) — (C42, C43 in Model 8M4 only)	.20	5196	Capacitor—.035 Mfd. (C24)	.20
13894	Capacitor—390 Mmfd. (C19)	.25	4886	Capacitor—.05 Mfd. (C6, C9)	.20
11978	Capacitor—Adjustable—400-800 Mmfd. (C10)	.50	4839	Capacitor—.01 Mfd. (C15, C23)	.30
30433	Capacitor—470 Mmfd. (C44)	.50	30828	Capacitor—Two sections each 8 Mfd. (C36, C37)	1.60
14498	Capacitor—680 Mmfd. (C2)	.30	14902	Capacitor—Comprising two sections, each 10 Mfd. (C22, C25) Model 8M3 only	1.10
			30829	Capacitor—Comprising three sections, each 10 Mfd. (C22, C25, C41) Model 8M4 only	1.30
30793	Coil—Antenna coil and shield (L2)	1.80	30833	Housing—Reproducer housing complete—less speaker unit and cable	4.00
30792	Coil—Oscillator coil—less shield (L5, L6)	1.15	9774	Reproducer—Speaker unit only—less case, cable, and mounting parts	7.65
30794	Coil—R.F. coil—less shield (L3, L4)	1.45	13797	Screw—Reproducer housing screw	.06
30823	Condenser—3-gang variable tuning condenser (C3, C4, C7, C8, C11, C12)	5.25	<b>CONTROL BOX ASSEMBLIES</b> Model 8M3		
12882	Core—Adjustable core and stud for antenna coil	.20	30817	Cord—Dial drive cord—25 ft. length only	1.25
12006	Core—Adjustable core and stud for I.F. transformer	.15	30820	Cover—Cover shell and spring used on control shafts, beneath knobs	.15
13996	Coupling—Insulated coupling for tuning condenser shaft	.75	30822	Dial—Oblong etched glass dial	.50
13691	Filter—Antenna filter (L1)	.75	30818	Dial—Round etched glass dial	.50
30824	Gear—Large gear for condenser rotor shaft	1.25	30813	Dial Unit—Comprising round dial, escutcheon, pointer disc, spring barrel, and cord assembled—less dial lamp and dial lamp socket	2.50
30825	Gear—Small worm gear for condenser	1.25	30821	Dial Unit—Comprising oblong dial, escutcheon, pointer disc, spring barrel, and cord assembled—less dial lamp and dial lamp socket	2.50
13694	Guide—Volume control shaft guide	.25	30819	Indicator—Indicator pointer disc	.45
13111	Reactor—Filter reactor (L14)	1.75	11765	Lamp—Dial lamp	.23
30540	Resistor—100 ohms, insulated, 1/2 watt (R17, R18)	.20	30816	Socket—Dial lamp socket and lead	.70
12261	Resistor—390 ohms, insulated, 1/2 watt (R2, R5) — Model 8M3 only	.20	30814	Tuning Unit—Comprising knob shaft, bearing, and gear case—less knob	2.00
14720	Resistor—1,000 ohms, insulated, 1/2 watt (R2) — Model 8M4 only	.20	30815	Volume Unit—Comprising knob shaft, bearing, and on-off switch—less knob	1.30
12267	Resistor—1,200 ohms, insulated, 1/2 watt (R15)	.20	<b>CONTROL BOX ASSEMBLIES</b> Model 8M4		
12194	Resistor—1,800 ohms, insulated, 1/2 watt (R5) — Model 8M4 only	.20	13792	Cable—3-conductor shielded tone and sensitivity cable complete with 4-prong plug	1.25
13716	Resistor—2,200 ohms, insulated, 1/2 watt (R19) — Model 8M4 only	.20	30817	Cord—Dial drive cord—25 ft. length only	1.25
12312	Resistor—3,300 ohms, insulated, 1/2 watt (R10)	.20	30822	Dial—Oblong etched glass dial	.50
13669	Resistor—22,000 ohms, carbon type, 2 watt (R3)	.25	30818	Dial—Round etched glass dial	.50
11646	Resistor—47,000 ohms, insulated, 1/2 watt (R13)	.20	30821	Dial Unit—Comprising oblong dial, escutcheon, pointer disc, spring barrel and cord assembled—less dial lamp and dial lamp socket	2.50
12286	Resistor—56,000 ohms, insulated, 1/2 watt (R4)	.20	30813	Dial Unit—Comprising round dial, escutcheon, pointer disc, spring barrel and cord assembled—less dial lamp and dial lamp socket	2.50
13715	Resistor—68,000 ohms, insulated, 1/2 watt (R9, R14)	.20	30819	Indicator—Indicator pointer disc	.45
11281	Resistor—100,000 ohms, carbon type, 1/10 watt (R1)	.15	30837	Knob—Wing knob	.30
13734	Resistor—120,000 ohms, insulated, 1/2 watt (R7) — Model 8M4 only	.20	11765	Lamp—Dial lamp	.23
13698	Resistor—180,000 ohms, insulated, 1/2 watt (R7) — Model 8M3 only	.20	30816	Socket—Dial lamp socket and lead	.70
12264	Resistor—220,000 ohms, insulated, 1/2 watt (R6)	.20	30835	Tuning Unit—Comprising knob shafts, bearing, gear case and sensitivity switch—less knobs	2.95
13730	Resistor—1 meg., insulated, 1/2 watt (R11, R12)	.20	30836	Volume Unit—Comprising knob shafts, bearing, tone control and on-off switch—less knobs	3.15
3584	Ring—Retaining ring for R.F. coil shield	.03	<b>MISCELLANEOUS ASSEMBLIES</b>		
13472	Ring—Retaining ring for oscillator coil shield	.03	30839	Case—Receiver case complete—less speaker grille — Model 8M3 only	6.25
13471	Ring—Retaining ring for antenna coil shield	.03	30840	Case—Receiver case complete—Model 8M4 only	6.25
5129	Ring—Tube-shield ring	.03	13109	Capacitor—.05 Mfd. (C31)	.70
3623	Shield—R.F. or oscillator coil shield	.20	4293	Capacitor—Ammeter capacitor	.60
14491	Shield—Antenna coil shield	.40	5025	Capacitor—Generator capacitor	.45
12008	Shield—I.F. transformer shield can	.40	5023	Fuse—15 ampere	.08
12218	Shield—Tube shield and ring	.20	30838	Grille—Speaker grille and cloth—Model 8M3 only	1.15
11196	Socket—Radiotron socket	.25	4290	Insulator—Fuse holder insulator	.02
12241	Socket—Vibrator socket	.30	30642	Knob—Tone control knob—Model 8M3 only	.13
12007	Spring—Retaining spring for core, Stock Nos. 12882 and 12006	.02	7766	Lead—"A" lead (ammeter end) complete with clip	.40
30796	Transformer—First I.F. transformer (L7, L8, C13, C14)	2.25	12445	Lead—"A" lead (set end) complete with male section of connector	.26
30483	Transformer—Second I.F. transformer (L9, L10, C17, C18)	2.25	13806	Ring—Soft rubber ring for speaker mounting—Model 8M4 only	.60
12230	Transformer—Audio transformer (T2, T3)	5.65	30811	Shaft—Tuning control flexible shaft—approx. 25 1/2-in. long	1.20
30827	Transformer—Vibrator power transformer (T1, L13, C32)	3.10	13926	Shaft—Volume control flexible shaft—approx. 25 1/2-in. long	1.20
12236	Vibrator	4.00	12248	Socket—Bracket and socket for speaker cable—Model 8M3 only	.25
13711	Volume Control (R8)	1.50	12502	Socket—Bracket and socket for tone control lead — Model 8M3 only	.30
<b>REPRODUCER ASSEMBLIES (72684-1)</b> Model 8M3					
12482	Board—Reproducer terminal board	.50	13804	Socket—Bracket and socket for speaker and control box cables—Model 8M4 only	.45
12450	Coil—Field coil (L12)	2.00	12254	Stud—Speaker mounting stud, spacer, and washer assembly—Model 8M4 only	.45
12451	Cone—Reproducer cone complete (L15)	2.00	12448	Stud—Receiver mounting stud, washer, and nut assembly	.45
9687	Reproducer—Complete	5.65	5024	Suppressor—Distributor suppressor	.40
<b>REPRODUCER ASSEMBLIES</b> Model 8M4					
13794	Cable—3-conductor shielded reproducer cable, approx. 18-in. long, complete with 3-contact male connector	1.10	12249	Tone Control—(R16)—Model 8M3 only	1.00
13795	Coil—Reproducer field coil (L12) for speaker marked 72947-1	2.25			
13796	Cone—Reproducer cone and dust cap (L15) for speaker marked 72947-1	3.30			
30834	Cone—Reproducer cone and dust cap for speaker marked 72947-22 (L15)	3.30			
11984	Connector—3-contact male connector for reproducer cable	.35			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODEL 9M1  
Schematic, Voltage  
Specs. Tuner Views

FREQUENCY RANGE..... 550-1,550 kc  
 POWER OUTPUT  
 Type..... Pentode  
 Undistorted..... 2.1 watts  
 Maximum..... 4.1 watts  
 POWER SUPPLY  
 "A"..... 6.3 volt Auto Storage Battery  
 "B"..... Non-Synchronous Vibrator  
 Current Drain..... 6.75 amps.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS AT INDICATED SOCKET PRONGS ARE TO CHASSIS ALIGNMENT IS TO BE MADE AT THE FREQUENCIES SHOWN AT THE TRIMMING ADJUSTMENTS. WHERE NO VOLTAGE READING IS SHOWN, IT INDICATES ZERO VOLTAGE OR A VERY LOW READING. VOLTAGES ARE TO BE MEASURED WITH NO SIGNAL. FIGURES AT CATHODES ARE CATHODE CURRENT IN MILLIAMPERES.

ALIGNMENT FREQUENCIES  
 I.F..... 455 kc  
 Ant..... 600 and 1,400 kc  
 Oscl..... No Adjustment

LOUDSPEAKER  
 Type..... Electrodynamic  
 Size..... 5 inches  
 V.C. Impedance..... 5 ohms at 400 cycles  
 Field Coil Resistance..... 5 ohms  
 App. Field Coil Voltage Drop..... 6 volts

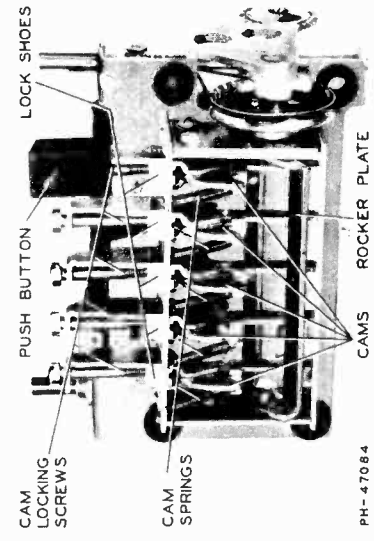
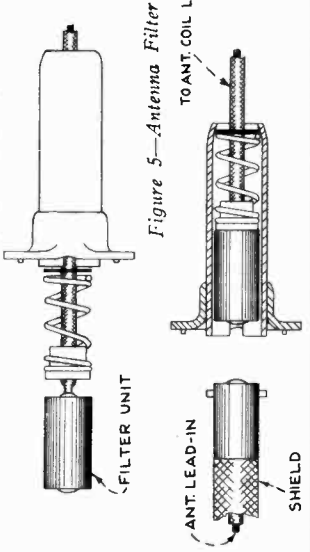


Figure 2—Bottom View of Push Button Mechanism

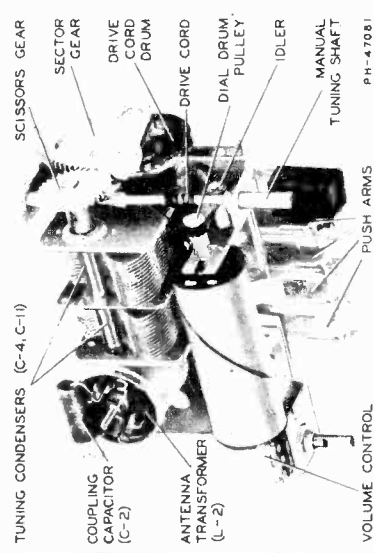


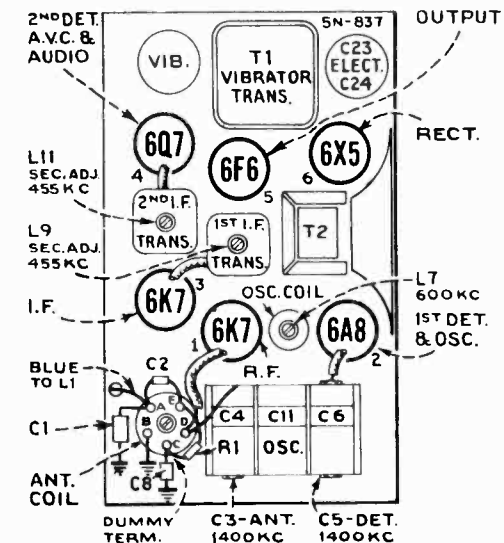
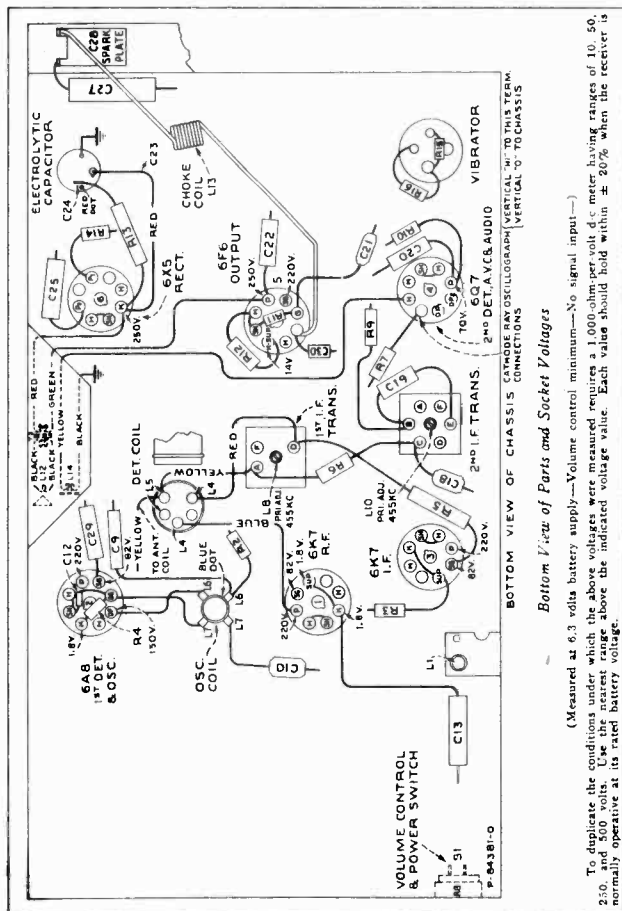
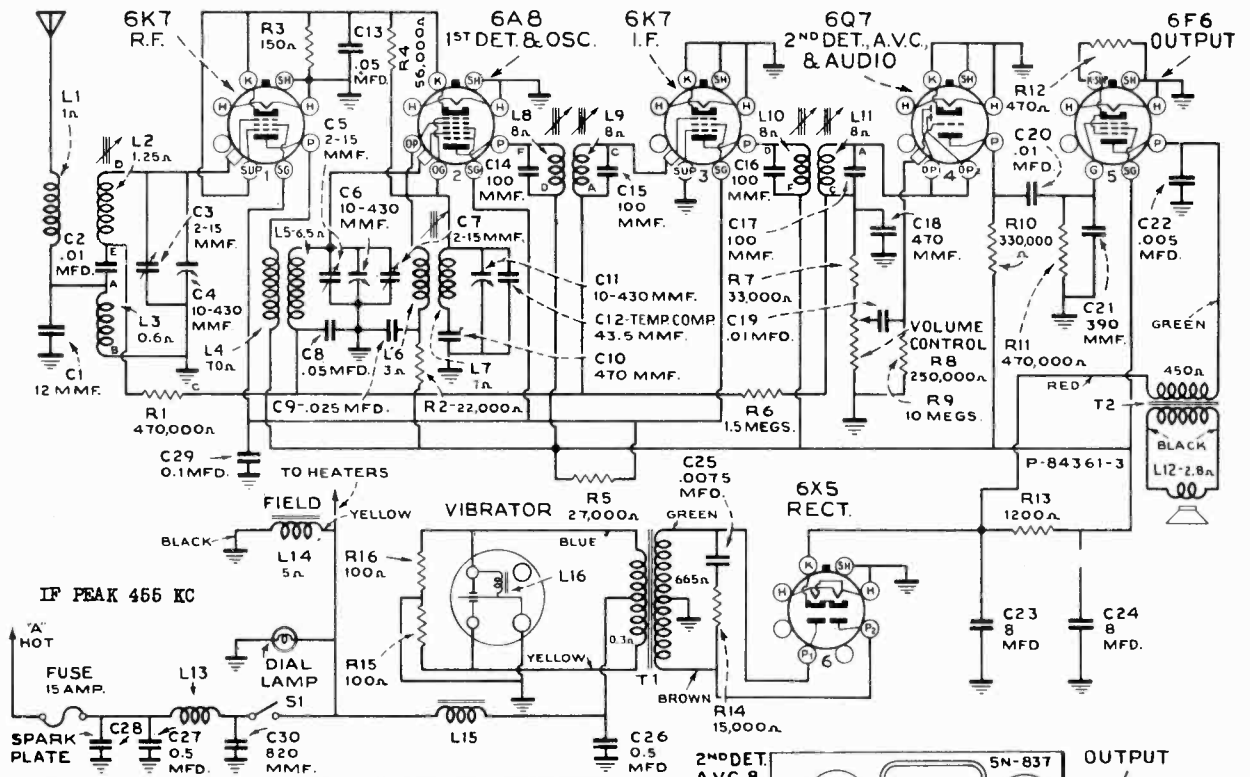
Figure 1—Push Button and Manual Tuning Assembly



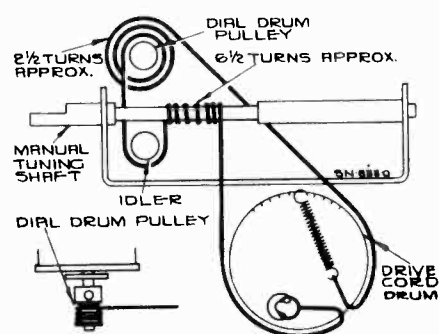


RCA MFG. CO., INC.

MODEL 9M2, Chassis RC357A  
Schematic, Voltage, Socket  
Trimmer, Chassis Wiring



Top View of Chassis



Drive Cord Hookup

(Measured at 6.3 volts battery supply—Volume control minimum—No signal input—)  
To duplicate the conditions under which the above voltages were measured requires a 1,000-ohm-per-volt d-c meter having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the indicated voltage value. Each value should hold within  $\pm 20\%$  when the receiver is normally operative at its rated battery voltage.

MODEL 9M2, Chassis RC357A  
Data, Tuner, Alignment  
Parts, Specs.

RCA MFG. CO., INC.

Alignment Procedure

**PRELIMINARY:**  
Output meter connections..... Across speaker voice coil  
Generator ground lead connections..... To chassis  
Common antenna value to be in series with generator output..... See Chart Below  
Connection of generator output lead..... See Chart Below  
Generator impedance..... 30 $\Omega$ , 400 cycles  
Position of Volume Control..... Fully clockwise

Position of Dial Pointer	Generator Frequency	Dummy Antenna	Generator Connection	Adjustment Symbol	Circuit Adjusted
No Signal 550-750 kc	455 kc	.001 mfd.	6K7 I.F. Grid	L-10, L-11	2nd I.F. Trans.
No Signal 550-750 kc	455 kc	.001 mfd.	6A8 Grid	L-8, L-9	1st I.F. Trans.
Rock Through 600 kc	600 kc	.0001 mfd.†	Ant. Lead	L-7	Osc.
1,400 kc **	1,400 kc	.0001 mfd.†	Ant. Lead	C-5	Det.
1,400 kc **	1,400 kc	.0001 mfd.†	Ant. Lead	C-3	Ant.
1,400 kc **	600 kc	.0001 mfd.†	Ant. Lead	L-7	Osc.
1,400 kc **	1,400 kc	.0001 mfd.†	Ant. Lead	C-5	Det.
1,400 kc **	1,400 kc	.0001 mfd.†	Ant. Lead	C-3*	Ant.

IMPORTANT ALIGNMENT NOTES

† Make the generator connection to the receiver through a shielded lead-in having not more than 50 mmf. (.00005) capacity with a male connector attached for connection to antenna socket. If a capacitor has been added in series with the lead from antenna filter L-1 to the antenna coil, as outlined under "Antenna Circuit," for reason of a high capacity antenna, the dummy antenna should be the same value as the antenna coil. Do not use a capacitor for the antenna coil.  
\* See "Service Hints."  
Each step of the alignment should be repeated in its original order for greater accuracy. Always keep the output from the generator at its lowest possible value, to prevent the A.V.C. action of the receiver from interfering with accurate alignment.  
Alignment adjustment locations are shown on the top and bottom parts location views of chassis.  
Only the dummy antenna indicated in the chart for any particular frequency should be used. Grid cap leads should remain in place during alignment.

\*\* OSCILLATOR CIRCUIT

With A magnetic core is used to provide temperature stability. The conventional high frequency trimmer has been replaced with a variable capacitor compensating capacitor which determines the high frequency for the oscillator. The frequency of L-7 is adjustable, the conventional trimmer has been replaced with a variable capacitor (C-10) C-10 is used for alignment having zero temperature coefficient to provide for oscillator stability in the low frequency range. Aligning the receiver for 600 kc is accomplished by adjusting L-7 to the antenna and det. circuits (tank condenser must be rocked while making this adjustment). The 1,400 kc alignment is accomplished by adjusting the antenna and the det. trimmers (C-3 and C-5) to the oscillator.

RECEIVER ASSEMBLIES

31580	Capacitor—45 mfd. (C1, C2)	35
31581	Capacitor—50 mfd. (C1, C2)	35
31582	Capacitor—60 mfd. (C1, C2)	35
31583	Capacitor—70 mfd. (C1, C2)	35
31584	Capacitor—80 mfd. (C1, C2)	35
31585	Capacitor—90 mfd. (C1, C2)	35
31586	Capacitor—100 mfd. (C1, C2)	35
31587	Capacitor—110 mfd. (C1, C2)	35
31588	Capacitor—120 mfd. (C1, C2)	35
31589	Capacitor—130 mfd. (C1, C2)	35
31590	Capacitor—140 mfd. (C1, C2)	35
31591	Capacitor—150 mfd. (C1, C2)	35
31592	Capacitor—160 mfd. (C1, C2)	35
31593	Capacitor—170 mfd. (C1, C2)	35
31594	Capacitor—180 mfd. (C1, C2)	35
31595	Capacitor—190 mfd. (C1, C2)	35
31596	Capacitor—200 mfd. (C1, C2)	35
31597	Capacitor—210 mfd. (C1, C2)	35
31598	Capacitor—220 mfd. (C1, C2)	35
31599	Capacitor—230 mfd. (C1, C2)	35
31600	Capacitor—240 mfd. (C1, C2)	35
31601	Capacitor—250 mfd. (C1, C2)	35
31602	Capacitor—260 mfd. (C1, C2)	35
31603	Capacitor—270 mfd. (C1, C2)	35
31604	Capacitor—280 mfd. (C1, C2)	35
31605	Capacitor—290 mfd. (C1, C2)	35
31606	Capacitor—300 mfd. (C1, C2)	35
31607	Capacitor—310 mfd. (C1, C2)	35
31608	Capacitor—320 mfd. (C1, C2)	35
31609	Capacitor—330 mfd. (C1, C2)	35
31610	Capacitor—340 mfd. (C1, C2)	35
31611	Capacitor—350 mfd. (C1, C2)	35
31612	Capacitor—360 mfd. (C1, C2)	35
31613	Capacitor—370 mfd. (C1, C2)	35
31614	Capacitor—380 mfd. (C1, C2)	35
31615	Capacitor—390 mfd. (C1, C2)	35
31616	Capacitor—400 mfd. (C1, C2)	35
31617	Capacitor—410 mfd. (C1, C2)	35
31618	Capacitor—420 mfd. (C1, C2)	35
31619	Capacitor—430 mfd. (C1, C2)	35
31620	Capacitor—440 mfd. (C1, C2)	35
31621	Capacitor—450 mfd. (C1, C2)	35
31622	Capacitor—460 mfd. (C1, C2)	35
31623	Capacitor—470 mfd. (C1, C2)	35
31624	Capacitor—480 mfd. (C1, C2)	35
31625	Capacitor—490 mfd. (C1, C2)	35
31626	Capacitor—500 mfd. (C1, C2)	35
31627	Capacitor—510 mfd. (C1, C2)	35
31628	Capacitor—520 mfd. (C1, C2)	35
31629	Capacitor—530 mfd. (C1, C2)	35
31630	Capacitor—540 mfd. (C1, C2)	35
31631	Capacitor—550 mfd. (C1, C2)	35
31632	Capacitor—560 mfd. (C1, C2)	35
31633	Capacitor—570 mfd. (C1, C2)	35
31634	Capacitor—580 mfd. (C1, C2)	35
31635	Capacitor—590 mfd. (C1, C2)	35
31636	Capacitor—600 mfd. (C1, C2)	35
31637	Capacitor—610 mfd. (C1, C2)	35
31638	Capacitor—620 mfd. (C1, C2)	35
31639	Capacitor—630 mfd. (C1, C2)	35
31640	Capacitor—640 mfd. (C1, C2)	35
31641	Capacitor—650 mfd. (C1, C2)	35
31642	Capacitor—660 mfd. (C1, C2)	35
31643	Capacitor—670 mfd. (C1, C2)	35
31644	Capacitor—680 mfd. (C1, C2)	35
31645	Capacitor—690 mfd. (C1, C2)	35
31646	Capacitor—700 mfd. (C1, C2)	35
31647	Capacitor—710 mfd. (C1, C2)	35
31648	Capacitor—720 mfd. (C1, C2)	35
31649	Capacitor—730 mfd. (C1, C2)	35
31650	Capacitor—740 mfd. (C1, C2)	35
31651	Capacitor—750 mfd. (C1, C2)	35
31652	Capacitor—760 mfd. (C1, C2)	35
31653	Capacitor—770 mfd. (C1, C2)	35
31654	Capacitor—780 mfd. (C1, C2)	35
31655	Capacitor—790 mfd. (C1, C2)	35
31656	Capacitor—800 mfd. (C1, C2)	35
31657	Capacitor—810 mfd. (C1, C2)	35
31658	Capacitor—820 mfd. (C1, C2)	35
31659	Capacitor—830 mfd. (C1, C2)	35
31660	Capacitor—840 mfd. (C1, C2)	35
31661	Capacitor—850 mfd. (C1, C2)	35
31662	Capacitor—860 mfd. (C1, C2)	35
31663	Capacitor—870 mfd. (C1, C2)	35
31664	Capacitor—880 mfd. (C1, C2)	35
31665	Capacitor—890 mfd. (C1, C2)	35
31666	Capacitor—900 mfd. (C1, C2)	35
31667	Capacitor—910 mfd. (C1, C2)	35
31668	Capacitor—920 mfd. (C1, C2)	35
31669	Capacitor—930 mfd. (C1, C2)	35
31670	Capacitor—940 mfd. (C1, C2)	35
31671	Capacitor—950 mfd. (C1, C2)	35
31672	Capacitor—960 mfd. (C1, C2)	35
31673	Capacitor—970 mfd. (C1, C2)	35
31674	Capacitor—980 mfd. (C1, C2)	35
31675	Capacitor—990 mfd. (C1, C2)	35
31676	Capacitor—1000 mfd. (C1, C2)	35
31677	Capacitor—1010 mfd. (C1, C2)	35
31678	Capacitor—1020 mfd. (C1, C2)	35
31679	Capacitor—1030 mfd. (C1, C2)	35
31680	Capacitor—1040 mfd. (C1, C2)	35
31681	Capacitor—1050 mfd. (C1, C2)	35
31682	Capacitor—1060 mfd. (C1, C2)	35
31683	Capacitor—1070 mfd. (C1, C2)	35
31684	Capacitor—1080 mfd. (C1, C2)	35
31685	Capacitor—1090 mfd. (C1, C2)	35
31686	Capacitor—1100 mfd. (C1, C2)	35
31687	Capacitor—1110 mfd. (C1, C2)	35
31688	Capacitor—1120 mfd. (C1, C2)	35
31689	Capacitor—1130 mfd. (C1, C2)	35
31690	Capacitor—1140 mfd. (C1, C2)	35
31691	Capacitor—1150 mfd. (C1, C2)	35
31692	Capacitor—1160 mfd. (C1, C2)	35
31693	Capacitor—1170 mfd. (C1, C2)	35
31694	Capacitor—1180 mfd. (C1, C2)	35
31695	Capacitor—1190 mfd. (C1, C2)	35
31696	Capacitor—1200 mfd. (C1, C2)	35
31697	Capacitor—1210 mfd. (C1, C2)	35
31698	Capacitor—1220 mfd. (C1, C2)	35
31699	Capacitor—1230 mfd. (C1, C2)	35
31700	Capacitor—1240 mfd. (C1, C2)	35
31701	Capacitor—1250 mfd. (C1, C2)	35
31702	Capacitor—1260 mfd. (C1, C2)	35
31703	Capacitor—1270 mfd. (C1, C2)	35
31704	Capacitor—1280 mfd. (C1, C2)	35
31705	Capacitor—1290 mfd. (C1, C2)	35
31706	Capacitor—1300 mfd. (C1, C2)	35
31707	Capacitor—1310 mfd. (C1, C2)	35
31708	Capacitor—1320 mfd. (C1, C2)	35
31709	Capacitor—1330 mfd. (C1, C2)	35
31710	Capacitor—1340 mfd. (C1, C2)	35
31711	Capacitor—1350 mfd. (C1, C2)	35
31712	Capacitor—1360 mfd. (C1, C2)	35
31713	Capacitor—1370 mfd. (C1, C2)	35
31714	Capacitor—1380 mfd. (C1, C2)	35
31715	Capacitor—1390 mfd. (C1, C2)	35
31716	Capacitor—1400 mfd. (C1, C2)	35
31717	Capacitor—1410 mfd. (C1, C2)	35
31718	Capacitor—1420 mfd. (C1, C2)	35
31719	Capacitor—1430 mfd. (C1, C2)	35
31720	Capacitor—1440 mfd. (C1, C2)	35
31721	Capacitor—1450 mfd. (C1, C2)	35
31722	Capacitor—1460 mfd. (C1, C2)	35
31723	Capacitor—1470 mfd. (C1, C2)	35
31724	Capacitor—1480 mfd. (C1, C2)	35
31725	Capacitor—1490 mfd. (C1, C2)	35
31726	Capacitor—1500 mfd. (C1, C2)	35
31727	Capacitor—1510 mfd. (C1, C2)	35
31728	Capacitor—1520 mfd. (C1, C2)	35
31729	Capacitor—1530 mfd. (C1, C2)	35
31730	Capacitor—1540 mfd. (C1, C2)	35
31731	Capacitor—1550 mfd. (C1, C2)	35
31732	Capacitor—1560 mfd. (C1, C2)	35
31733	Capacitor—1570 mfd. (C1, C2)	35
31734	Capacitor—1580 mfd. (C1, C2)	35
31735	Capacitor—1590 mfd. (C1, C2)	35
31736	Capacitor—1600 mfd. (C1, C2)	35
31737	Capacitor—1610 mfd. (C1, C2)	35
31738	Capacitor—1620 mfd. (C1, C2)	35
31739	Capacitor—1630 mfd. (C1, C2)	35
31740	Capacitor—1640 mfd. (C1, C2)	35
31741	Capacitor—1650 mfd. (C1, C2)	35
31742	Capacitor—1660 mfd. (C1, C2)	35
31743	Capacitor—1670 mfd. (C1, C2)	35
31744	Capacitor—1680 mfd. (C1, C2)	35
31745	Capacitor—1690 mfd. (C1, C2)	35
31746	Capacitor—1700 mfd. (C1, C2)	35
31747	Capacitor—1710 mfd. (C1, C2)	35
31748	Capacitor—1720 mfd. (C1, C2)	35
31749	Capacitor—1730 mfd. (C1, C2)	35
31750	Capacitor—1740 mfd. (C1, C2)	35
31751	Capacitor—1750 mfd. (C1, C2)	35
31752	Capacitor—1760 mfd. (C1, C2)	35
31753	Capacitor—1770 mfd. (C1, C2)	35
31754	Capacitor—1780 mfd. (C1, C2)	35
31755	Capacitor—1790 mfd. (C1, C2)	35
31756	Capacitor—1800 mfd. (C1, C2)	35
31757	Capacitor—1810 mfd. (C1, C2)	35
31758	Capacitor—1820 mfd. (C1, C2)	35
31759	Capacitor—1830 mfd. (C1, C2)	35
31760	Capacitor—1840 mfd. (C1, C2)	35
31761	Capacitor—1850 mfd. (C1, C2)	35
31762	Capacitor—1860 mfd. (C1, C2)	35
31763	Capacitor—1870 mfd. (C1, C2)	35
31764	Capacitor—1880 mfd. (C1, C2)	35
31765	Capacitor—1890 mfd. (C1, C2)	35
31766	Capacitor—1900 mfd. (C1, C2)	35
31767	Capacitor—1910 mfd. (C1, C2)	35
31768	Capacitor—1920 mfd. (C1, C2)	35
31769	Capacitor—1930 mfd. (C1, C2)	35
31770	Capacitor—1940 mfd. (C1, C2)	35
31771	Capacitor—1950 mfd. (C1, C2)	35
31772	Capacitor—1960 mfd. (C1, C2)	35
31773	Capacitor—1970 mfd. (C1, C2)	35
31774	Capacitor—1980 mfd. (C1, C2)	35
31775	Capacitor—1990 mfd. (C1, C2)	35
31776	Capacitor—2000 mfd. (C1, C2)	35
31777	Capacitor—2010 mfd. (C1, C2)	35
31778	Capacitor—2020 mfd. (C1, C2)	35
31779	Capacitor—2030 mfd. (C1, C2)	35
31780	Capacitor—2040 mfd. (C1, C2)	35
31781	Capacitor—2050 mfd. (C1, C2)	35
31782	Capacitor—2060 mfd. (C1, C2)	35
31783	Capacitor—2070 mfd. (C1, C2)	35
31784	Capacitor—2080 mfd. (C1, C2)	35
31785	Capacitor—2090 mfd. (C1, C2)	35
31786	Capacitor—2100 mfd. (C1, C2)	35
31787	Capacitor—2110 mfd. (C1, C2)	35
31788	Capacitor—2120 mfd. (C1, C2)	35
31789	Capacitor—2130 mfd. (C1, C2)	35
31790	Capacitor—2140 mfd. (C1, C2)	35
31791	Capacitor—2150 mfd. (C1, C2)	35
31792	Capacitor—2160 mfd. (C1, C2)	35
31793	Capacitor—2170 mfd. (C1, C2)	35
31794	Capacitor—2180 mfd. (C1, C2)	35
31795	Capacitor—2190 mfd. (C1, C2)	35
31796	Capacitor—2200 mfd. (C1, C2)	35
31797	Capacitor—2210 mfd. (C1, C2)	35
31798	Capacitor—2220 mfd. (C1, C2)	35
31799	Capacitor—2230 mfd. (C1, C2)	35
31800	Capacitor—2240 mfd. (C1, C2)	35
31801	Capacitor—2250 mfd. (C1, C2)	35
31802	Capacitor—2260 mfd. (C1, C2)	35
31803	Capacitor—2270 mfd. (C1, C2)	35
31804	Capacitor—2280 mfd. (C1, C2)	35
31805	Capacitor—2290 mfd. (C1, C2)	35
31806	Capacitor—2300 mfd. (C1, C2)	35
31807	Capacitor—2310 mfd. (C1, C2)	35
31808	Capacitor—2320 mfd. (C1, C2)	35
31809	Capacitor—2330 mfd. (C1, C2)	35
31810	Capacitor—2340 mfd. (C1, C2)	35
31811	Capacitor—2350 mfd. (C1, C2)	35
31812	Capacitor—2360 mfd. (C1, C2)	35
31813	Capacitor—2370 mfd. (C1, C2)	35
31814	Capacitor—2380 mfd. (C1, C2)	35
31815	Capacitor—2390 mfd. (C1, C2)	35
31816	Capacitor—2400 mfd. (C1, C2)	35
31817	Capacitor—2410 mfd. (C1, C2)	35
31818	Capacitor—2420 mfd. (C1, C2)	35
31819	Capacitor—2430 mfd. (C1, C2)	35
31820	Capacitor—2440 mfd. (C1, C2)	35
31821	Capacitor—2450 mfd. (C1, C2)	35
31822	Capacitor—2460 mfd. (C1, C2)	35
31823	Capacitor—2470 mfd. (C1, C2)	35
31824	Capacitor—2480 mfd. (C1, C2)	35
31825	Capacitor—2490 mfd. (C1, C2)	35
31826	Capacitor—2500 mfd. (C1, C2)	35
31		

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MODEL D9-19 Late Schematic, Changes

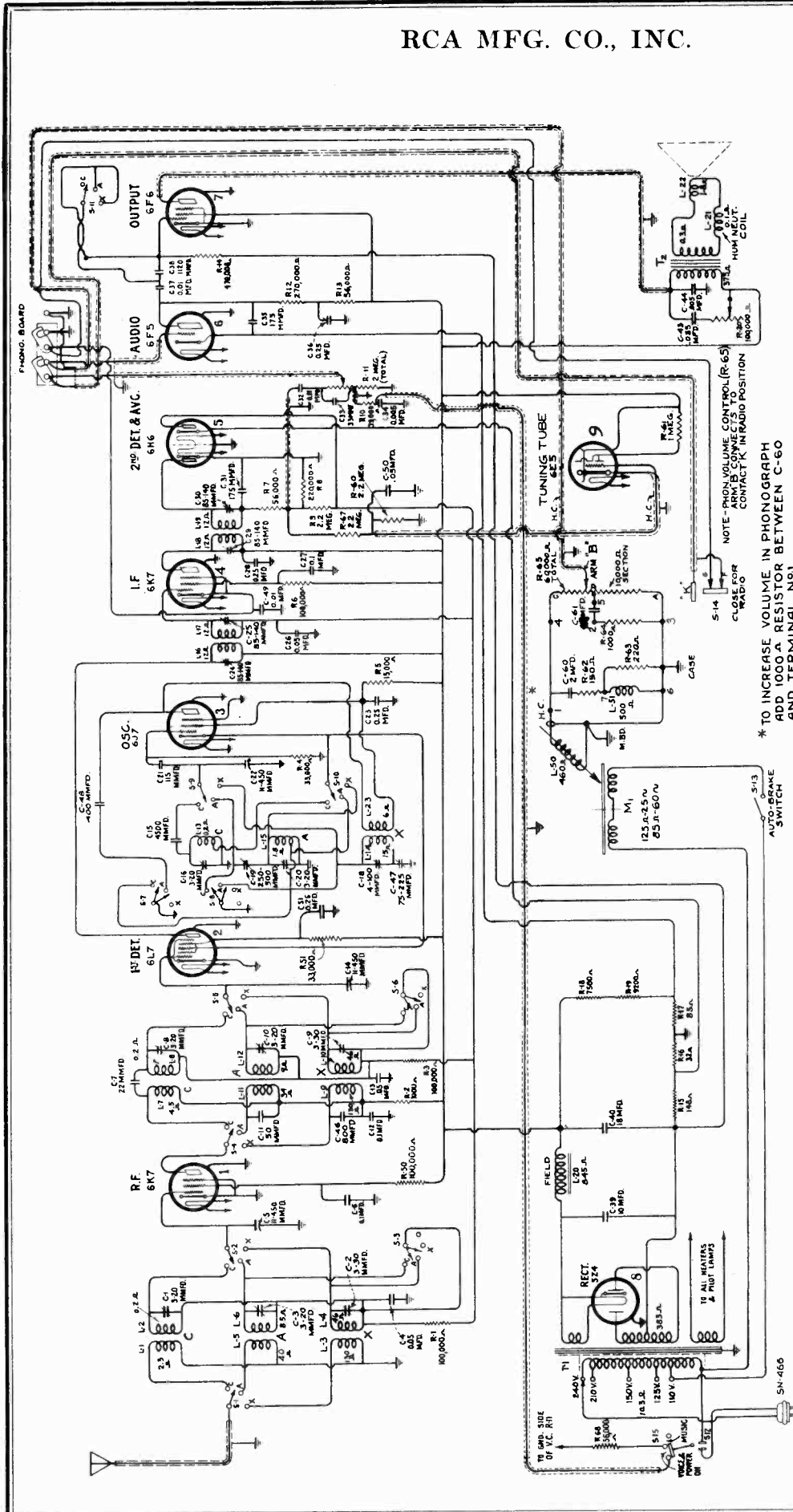


Figure 6—Schematic Circuit Diagram (Model D9-19 with metal rectifier and low-frequency tone control)

**Model D9-19 (with low-frequency tone control and metal Rectifier)**

Service Data for Model D9-19 are directly applicable to these instruments except as follows:

- (1) The schematic and wiring diagrams for Model D9-19 (with low-frequency tone control and metal rectifier) are shown by figures 6 and 7.
- (2) Washer Stock No. 11886 should be used for replacement instead of Stock No. 11230 in all Models D9-19. See parts list herein for description and price.

- (3) Bracket Stock No. 13615 should be used for replacement instead of Stock Nos. 11191 and 11192 in all Models D9-19. See parts list herein for description and price.
- (4) Refer to Substitute and Additional Replacements Parts contained herein for other parts changes.

\* TO INCREASE VOLUME IN PHONOGRAPH ARMED, CONNECTS TO C-60 AND TERMINAL N°1

NOTE - PHON. VOLUME CONTROL (R-65) CLOSE FOR RADIO

MODEL D9-19 Late  
Chassis Wiring  
Parts

RCA MFG. CO., INC.

Model D9-19 (with metal rectifier)

5170	Capacitor—0.25 mfd. (C51).....	.25	11804	Transformer—Power transformer—105-125 volts—25-60 cycles.....	6.02
11329	Resistor—Voltage divider resistor, comprising one 148-ohm, one 32-ohm, and one 85-ohm section (R15, R16, R17).....	.52	11805	Transformer—Power transformer—100-130/140-160/195-250 volts—40-60 cycles—(T1).....	7.95
5033	Resistor—33,000 ohms—Carbon type—1 watt—(R51)—Package of 5.....	1.10	11886	Washer—Spring washer used to hold field coil securely—Package of 5.....	.20
5029	Resistor—56,000 ohms—Carbon type—1/4 watt—(R68)—Package of 5.....	1.00	13615	Bracket—Tuning tube mounting bracket and clamp assembly.....	.25
3118	Resistor—100,000 ohms—Carbon type—1/4 watt—(R50)—Package of 5.....	1.00		Stock Nos. 4858 (C50*), 11248, 4748, 11245, 11273, 4794, 11133, 11242, 11243, 11230, 11191, and 11192 are not used in chassis having metal rectifier.	
11195	Socket—Five-contact rectifier Radiotron socket.....	.15			
5224	Switch—Low-frequency tone control and power switch (S12, S15).....	1.00			

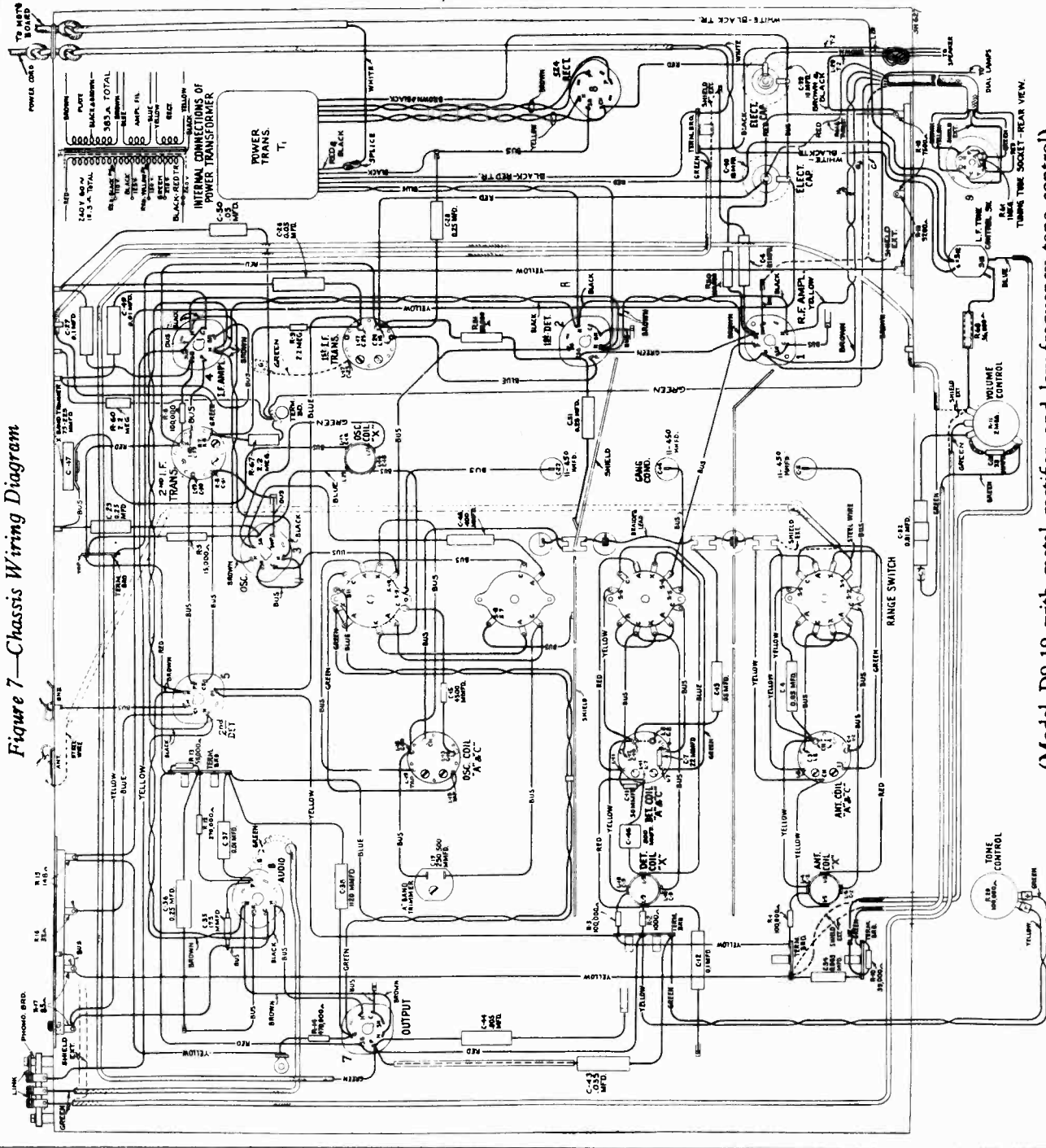


Figure 7—Chassis Wiring Diagram

(Model D9-19 with metal rectifier and low-frequency tone control)

RCA MFG. CO., INC.

MODEL 67M  
Schematic  
Socket, Trimmer  
Speaker and Transf.  
Connections

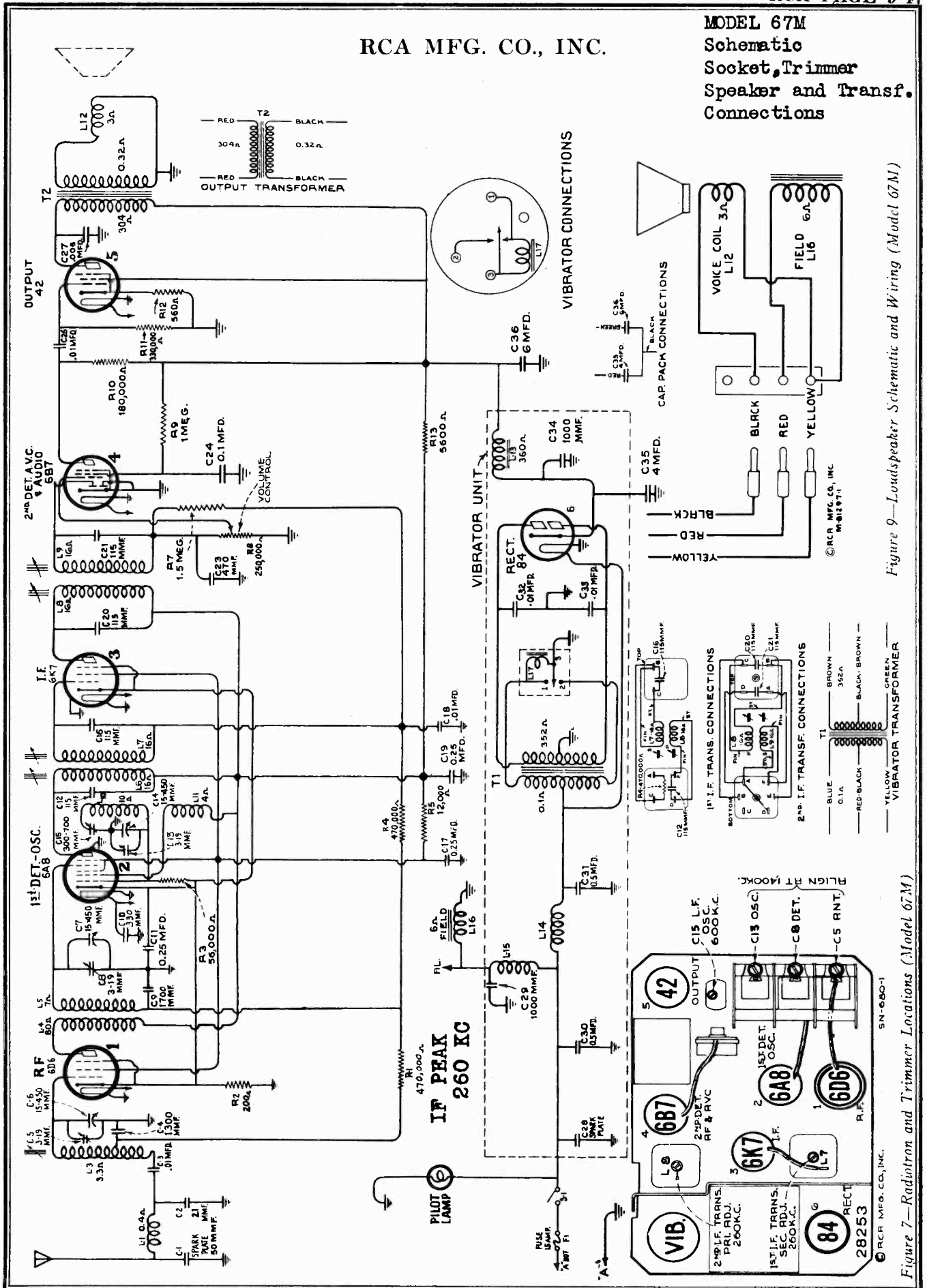


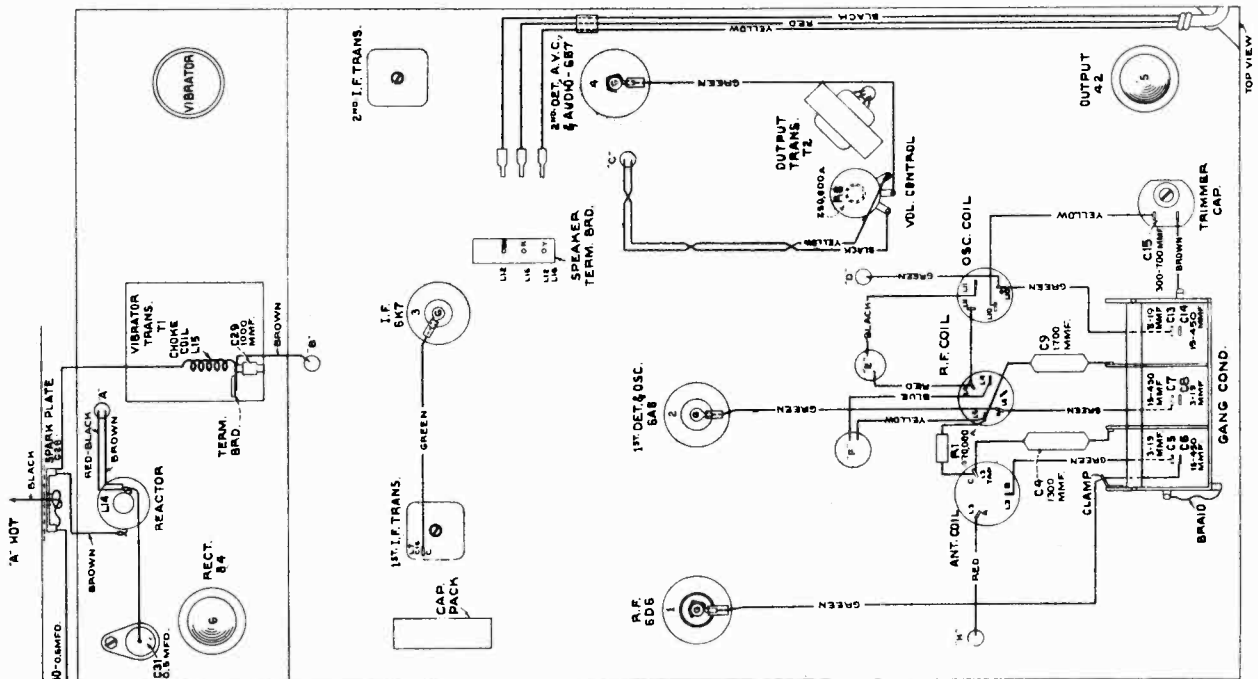
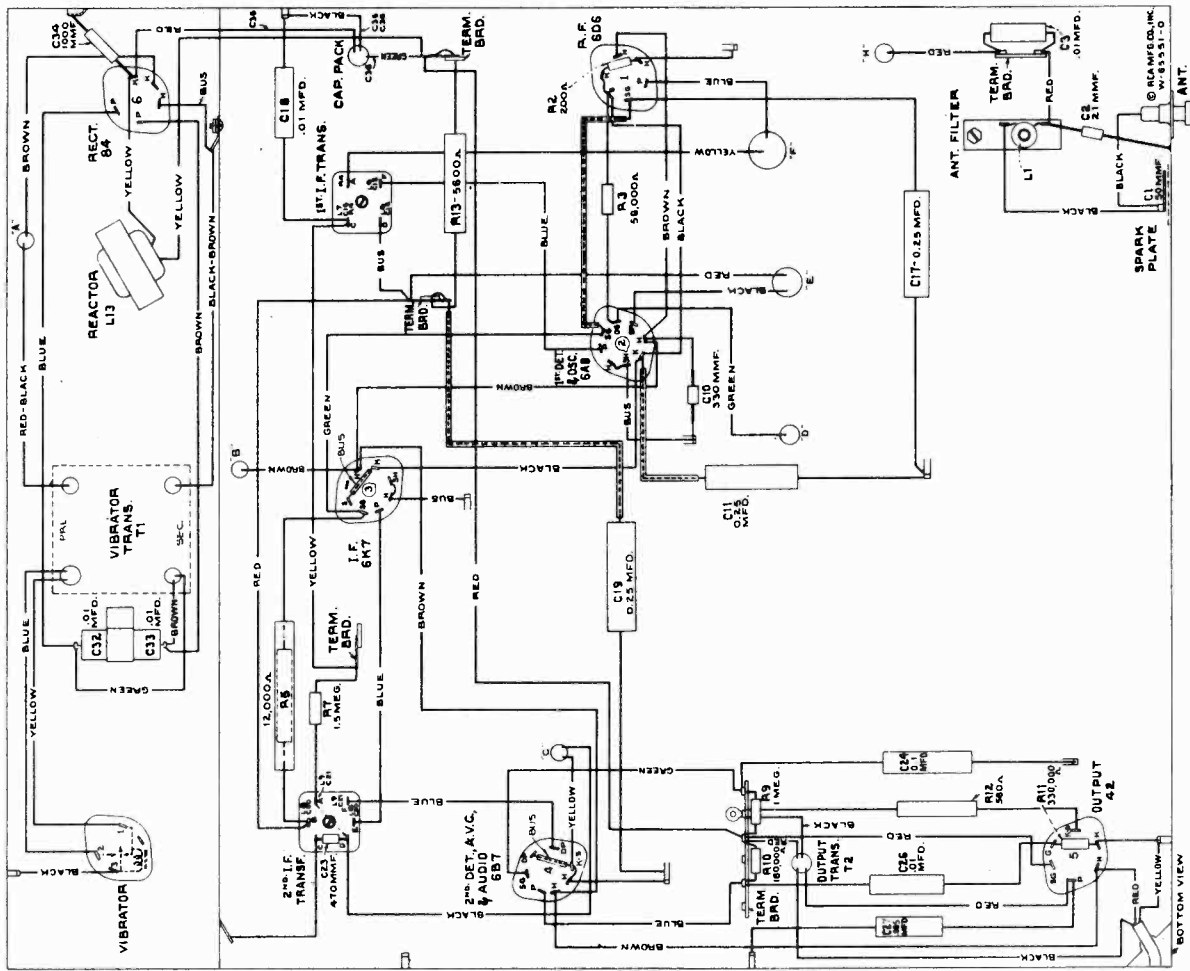
Figure 9—Loudspeaker Schematic and Wiring (Model 67M)

Figure 7—Radiotron and Trimmer Locations (Model 67M)



MODEL 67M  
Chassis Wiring

RCA MFG. CO., INC.













RCA MFG. CO., INC.

MODEL 84BT  
Schematic, Socket  
Trimmers, Chassis Wiring

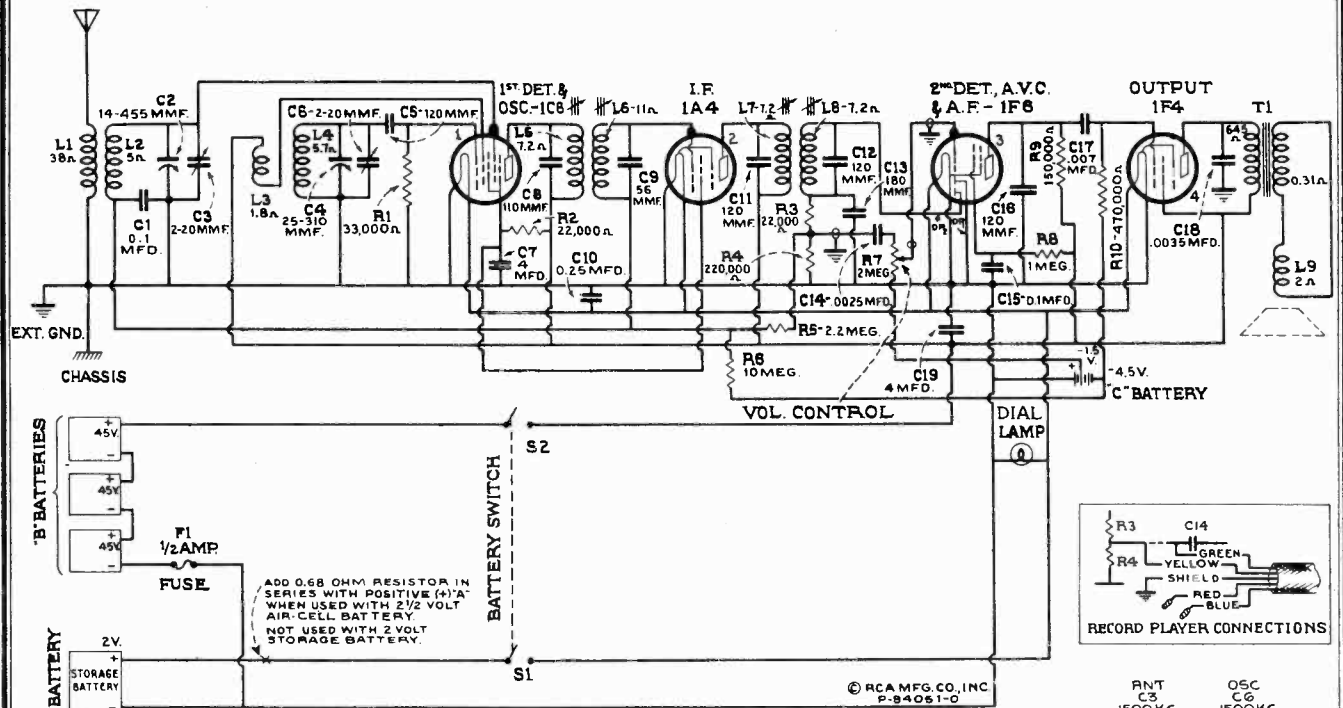
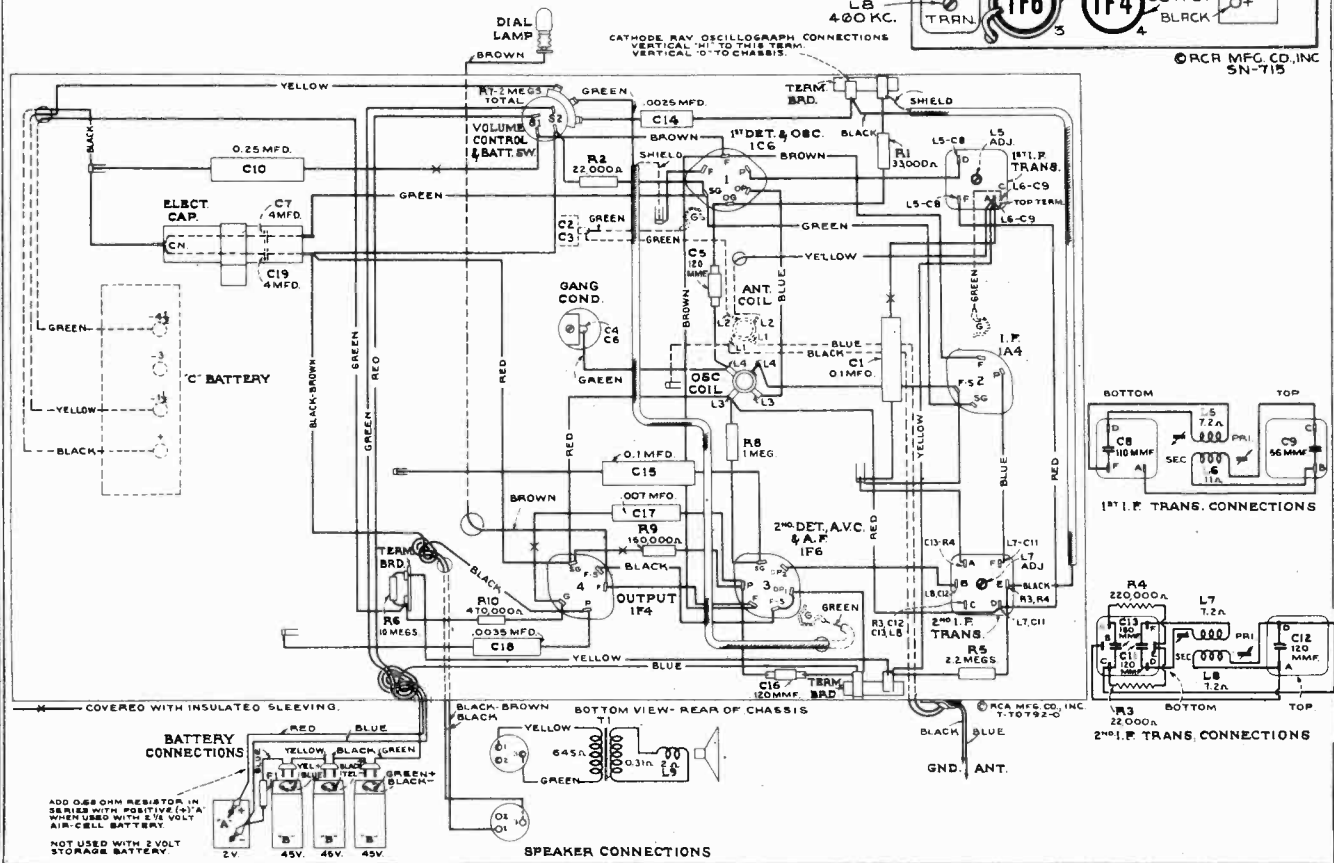
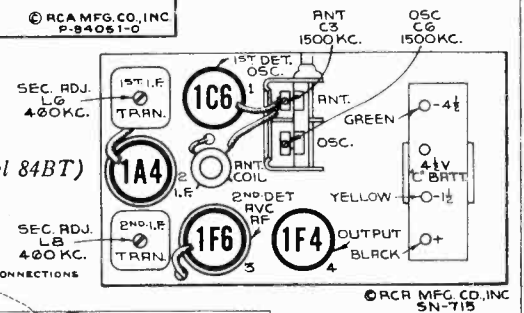


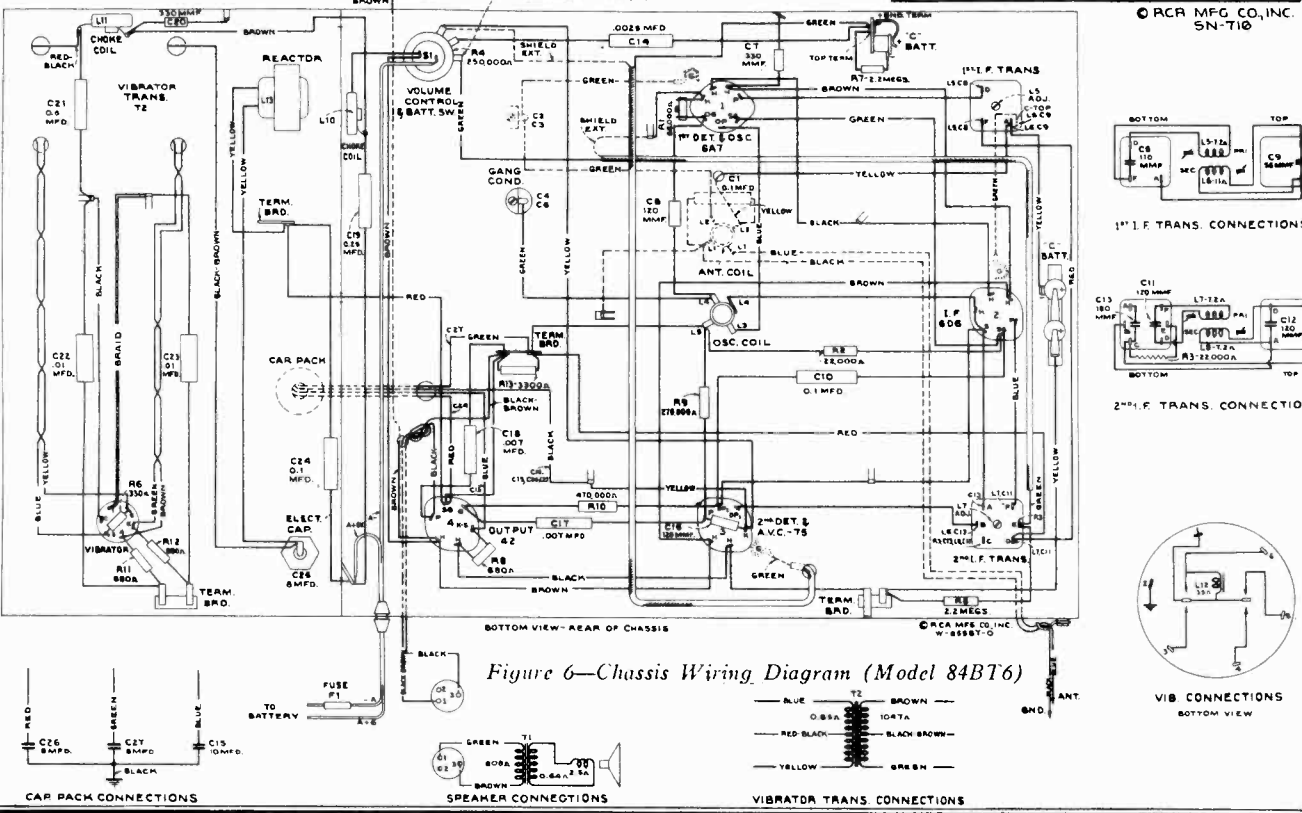
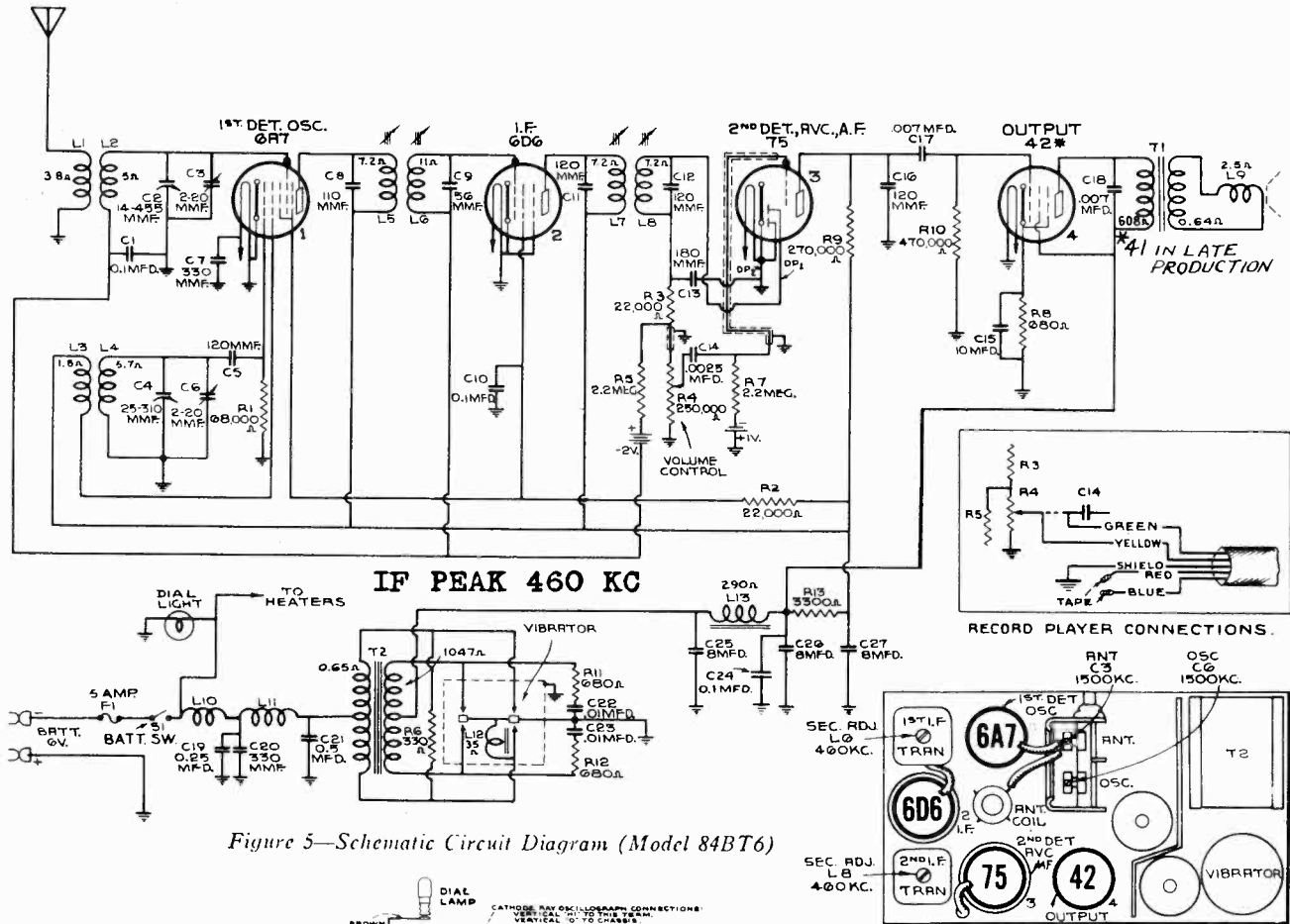
Figure 3—Schematic Circuit Diagram (Model 84BT)

IF PEAK 460 KC Figure 1—Radiotron and Trimmer Locations (Model 84BT)



MODEL 84BT6  
Schematic, Socket  
Trimmers, Chassis Wiring

RCA MFG. CO., INC.





**MODELS 84BT, 84BT6**  
**Specifications, Parts**

RCA MFG. CO., INC.

Frequency Range..... 530—1,720 kc Alignment Frequency..... 1,500 kc (osc., ant.)  
 Intermediate Frequency..... 460 kc

RADIOTRON COMPLEMENT (MODEL 84BT) (MODEL 84BT6)  
 (1) RCA-1C6..... First Detector—Oscillator (1) RCA-6A7..... First Detector—Oscillator  
 (2) RCA-1A4..... Intermediate Amplifier (2) RCA-6D6..... Intermediate Amplifier  
 (3) RCA-1F6..... Second Det., A-F Amp., and A.V.C. (3) RCA-75..... Second Det., A-F Amp., and A.V.C.  
 (4) RCA-1F4..... Power Output (4) RCA-42..... Power Output

Pilot Lamp..... 84BT, (1) Mazda 2.0 volts, .06 amp.; 84BT6, (1) Mazda No. 40, 6.3 volts, 0.15 amp.

**BATTERIES REQUIRED**

84BT..... "A", one plug-in, 2½-volt Air Cell, or one 2-volt storage battery; "B", three 45-volt, heavy-duty, plug-in type B batteries; "C", one 4½-volt C battery tapped at 1½ volts.  
 84BT6..... "A", one 6-volt storage battery; "B", none required; "C", three bias cells (Stock No. 12681).

**CURRENT CONSUMPTION MODEL 84BT MODEL 84BT6**

"A" at 2 volts..... 0.42 ampere.....  
 "A" at 6 volts..... 2.95 amperes.....  
 "B" at 135 volts..... 25 ma. (Supplied from vibrator)  
 Fuse Rating..... ½ amp..... 5 amps.

**POWER OUTPUT**

Undistorted..... 0.3 watt..... 0.5 watt  
 Maximum..... 0.5 watt..... 0.8 watt

**LOUDSPEAKER**

Type: permanent-magnet dynamic Diameter: 6 inches Voice coil impedance: 2¼ ohms at 400 cycles.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
4289	Body—Fuse connector body (Model 84BT6 only)	4829	Cap—Radiotron shield cap
14286	Bracket—Dial lamp bracket	12629	Capacitor—68 Mmfd. (C8)
14288	Cable—3-conductor battery cable approximately 60 inches long, complete with fuse and battery clips (Model 84BT only)	14282	Capacitor—110 Mmfd. (C8)
12607	Cap—First I-F transformer shield cap	12404	Capacitor—120 Mmfd. (C11, C12)
12581	Cap—Second I-F transformer shield cap	12724	Capacitor—120 Mmfd. (C5, C16)
12118	Cap—Grid contact cap	12408	Capacitor—180 Mmfd. (C13)
4228	Cap—Fuse connector male cap (Model 84BT6 only)	14320	Capacitor—330 Mmfd. (C7, C20) (Model 84BT6 only)
11654	Capacitor—.01 Mfd. (C22, C23) (Model 84BT6 only)	5107	Capacitor—.0025 Mfd. (C14)
4841	Capacitor—.01 Mfd. (Model 84BT, C1, C15) (Model 84BT6, C1, C10, C24)	5005	Capacitor—.0035 Mfd. (C18) (Model 84BT only)
4840	Capacitor—.025 Mfd. (Model 84BT, C10) (Model 84BT6, C19)	5148	Capacitor—.007 Mfd. (C17) (Model 84BT only)
12741	Capacitor—.05 Mfd. (C21) (Model 84BT6 only)	5198	Capacitor—.007 Mfd. (C17, C18) (Model 84BT6 only)
14287	Capacitor—Pack comprising two sections each 4 Mfd. (C7, C19) (Model 84BT only)	13673	Resistor—10 megohms, carbon type, ½ watt (R6) (Model 84BT only)
13046	Capacitor—8 Mfd. (C25) (Model 84BT6 only)	14315	Shield—Chassis end shield complete with bias cell holder—For end opposite vibrator (Model 84BT6 only)
14310	Capacitor Pack—Comprising one 10 Mfd. and two 8 Mfd. sections (C15, C26, C27) (Model 84BT6 only)	14318	Shield—Chassis end and bottom shield for vibrator end of chassis (Model 84BT6 only)
12681	Cell—Bias cell (Model 84BT6 only)	12008	Shield—First or second I-F transformer shield can
14289	Clip—2 battery clips, one marked "+" and one unmarked	14317	Shield—Vibrator shield can (Model 84BT6 only)
14285	Coil—Antenna coil (L1, L2)	3682	Shield—1A4, 1F6, 6D6, or 75 Radiotron shield
14257	Coil—Oscillator coil (L3, L4)	14114	Socket—Dial lamp socket
12179	Coil—Vibrator choke coil (L10, L11) (Model 84BT6 only)	4794	Socket—4-contact 1A4 Radiotron socket (Model 84BT only)
14256	Condenser—2-gang variable tuning condenser (C2, C3, C4, C6)	4814	Socket—5-contact 1F4 Radiotron socket (Model 84BT only)
5119	Connector—3-contact female connector for speaker cable	4786	Socket—6-contact 1C6, 1F6, 6D6, 42, or 75 Radiotron socket
14314	Cord—Power cord complete with fuse and clips (Model 84BT6 only)	14312	Socket—6-contact vibrator socket, less rubber mounting (Model 84BT6 only)
12006	Core—Adjustable core and stud for first or second I-F transformers	4787	Socket—7-contact 6A7 Radiotron socket (Model 84BT6 only)
14264	Dial—Station selector dial and holder assembly	4284	Spring—Fuse connector spring (Model 84BT6 only)
4286	Ferrule—Fuse connector ferrule and bushing (Model 84BT6 only)	12007	Spring—Retaining spring for core Stock No. 12008
3748	Fuse—½ ampere (F1) (Model 84BT only)	14261	Transformer—First I-F transformer (L5, L6, C8, C9)
5140	Fuse—5 ampere (F1) (Model 84BT6 only)	14283	Transformer—Second I-F transformer (L7, L8, C11, C12, C13, R3, R4) (Model 84BT only)
14316	Holder—Bias cell holder (2 cells) (Model 84BT6 only)	14308	Transformer—Second I-F transformer (L7, L8, C11, C12, C13, R4) (Model 84BT6 only)
14319	Holder—Bias cell holder (1 cell) (Model 84BT6 only)	14311	Transformer—Vibrator transformer (T2) (Model 84BT6 only)
14263	Indicator—Station selector indicator pointer	14309	Vibrator complete (L12) (Model 84BT6 only)
4290	Insulator—Fuse connector body insulator (Model 84BT6 only)	14282	Volume control and power switch (R7, S1) (Model 84BT only)
4348	Lamp—Dial lamp (Model 84BT only)	14307	Volume control and power switch (R4, S1) (Model 84BT6 only)
4340	Lamp—Dial lamp (Model 84BT6 only)	4285	Washer—Fuse connector insulating washer (Model 84BT6 only)
14313	Mounting—Vibrator socket mounting comprising 2 rubber washers, 2 screws, 2 eyelets, 2 washers, 2 lock-washers, and 2 nuts (Model 84BT6 only)	<b>REPRODUCER ASSEMBLIES (76474-3)</b> (Model 84BT only)	
12818	Reactor—Filter reactor (L13) (Model 84BT6 only)	14303	Cone—Reproducer cone centered in metal housing complete with dust cap, less output transformer and plug (L9)
8065	Resistor—330 ohms, carbon type, ½ watt (R6) (Model 84BT6 only)	5118	Plug—3-contact male plug for reproducer
5031	Resistor—680 ohms, carbon type, ½ watt (R8, R11, R12) (Model 84BT6 only)	9802	Reproducer complete
12330	Resistor—3,300 ohms, carbon type, ½ watt (R13) (Model 84BT6 only)	14304	Transformer—Output transformer (T1)
11305	Resistor—22,000 ohms, carbon type, ½ watt (R2)	<b>REPRODUCER ASSEMBLIES (76494-2)</b> (Model 84BT6 only)	
14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R3)	14305	Cone—Reproducer cone complete with dust cap (L9)
11364	Resistor—33,000 ohms, carbon type, ½ watt (R1) (Model 84BT only)	5118	Plug—3-contact male plug for reproducer
12333	Resistor—68,000 ohms, carbon type, ½ watt (R1) (Model 84BT6 only)	9803	Reproducer complete
5023	Resistor—160,000 ohms, carbon type, ½ watt (R9) (Model 84BT only)	14306	Transformer—Output transformer (T1)
11398	Resistor—220,000 ohms, carbon type, 1/10 watt (R4) (Model 84BT only)	<b>MISCELLANEOUS ASSEMBLIES</b>	
11323	Resistor—270,000 ohms, carbon type, ½ watt (R9)	14268	Crystal—Station selector crystal
11172	Resistor—470,000 ohms, carbon type, ½ watt (R10)	14269	Knob—Station selector or volume control knob
3033	Resistor—1 megohm, carbon type, ½ watt (R8) (Model 84BT only)	14299	Resistor—0.88 ohm flexible wire wound ballast resistor (Model 84BT only)
11626	Resistor—2.2 megohms, carbon type, ½ watt (Model 84BT, R5) (Model 84BT6, R5, R7)	14298	Screw—Chassis mounting screw and washer assembly
		14270	Spring—Retaining spring for knob Stock No. 14269

NOTE: On later production Model 84BT6, an RCA-41 output tube is used in place of the RCA-42. All circuit and specification data remain the same except the "A" current consumption at 6 volts which is 2.65 amperes.

RCA MFG. CO., INC.

MODEL 85BT6  
Schematic, Socket  
Trimmers, Specs.

POWER OUTPUT Undistorted ..... 0.85 watt ..... 1.2 watts  
Maximum ..... 1.5 watts ..... 2.0 watts

FREQUENCY RANGES  
"Broadcast" (A) ..... 540-1,720 kc  
"Short Wave" (C) ..... 5,800-18,000 kc  
Intermediate Frequency ..... 460 kc

LOUDSPEAKER  
Type ..... 6-inch Permanent-magnet Dynamic  
Voice coil impedance ..... 2.6 ohms at 400 cycles

R-F ALIGNMENT FREQUENCIES  
"Short Wave" (C) ..... 15,000 kc (osc., ant.)  
"Broadcast" (A) ..... 600 kc (osc.), 1,500 kc (osc.)  
..... 460 kc

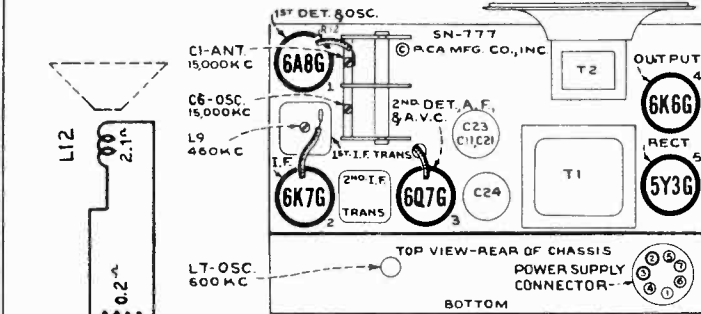
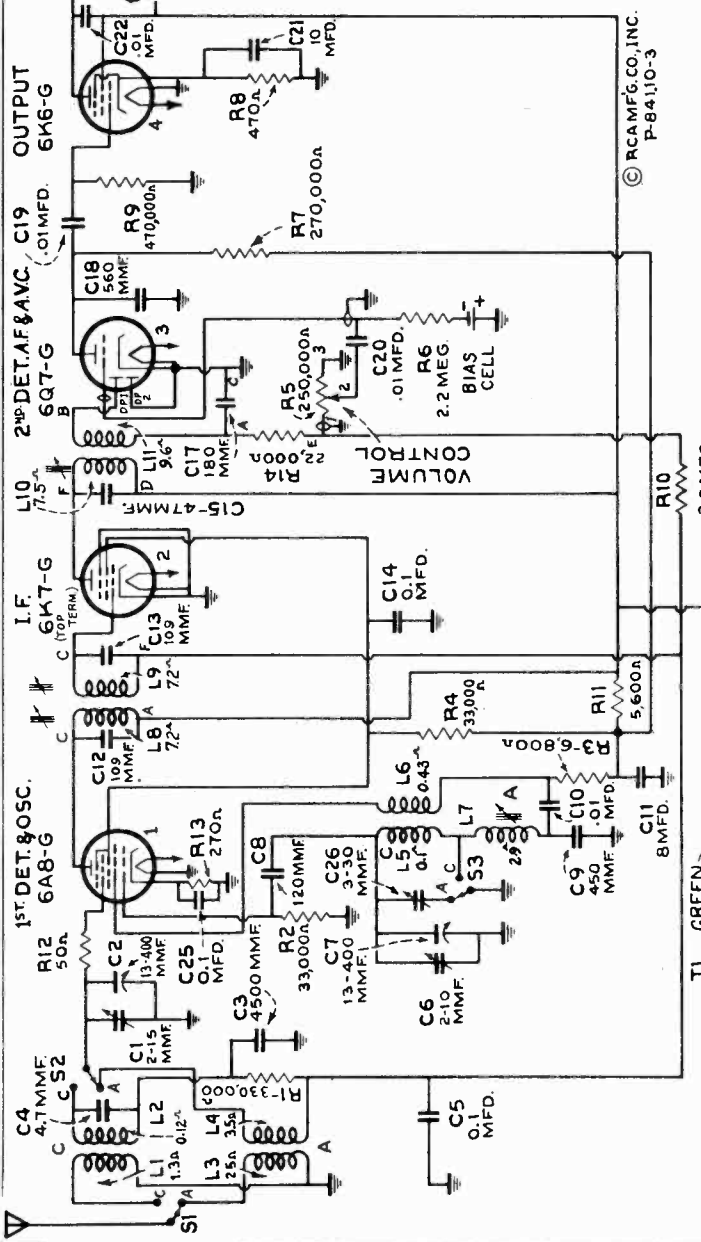
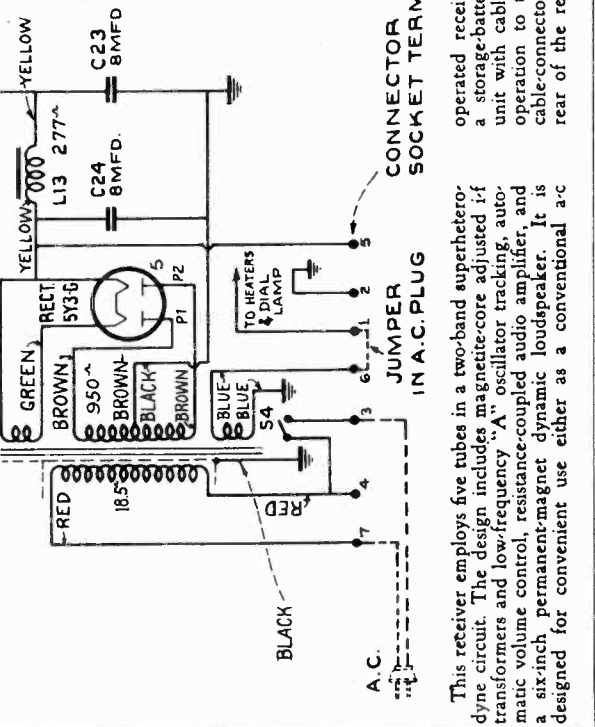
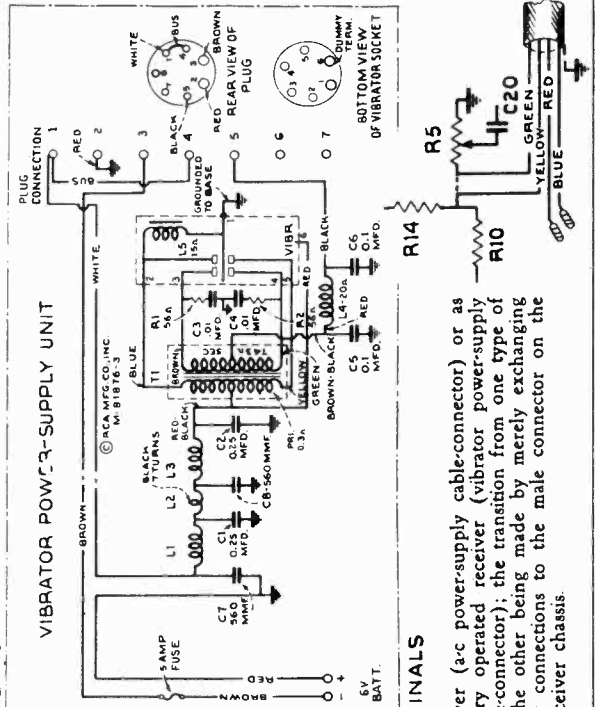


Figure 1—Radiotron and Trimmer Locations



Pilot Lamp (1) ..... Mazda No. 40, 6.3 volts, 0.15 ampere

POWER SUPPLY RATINGS  
Rating A ..... 105-125 volts, 50-60 cycles, 45 watts  
Storage Battery ..... 6 volts, 2.95 amperes  
Fuse Rating (Vibrator) ..... 5 amperes



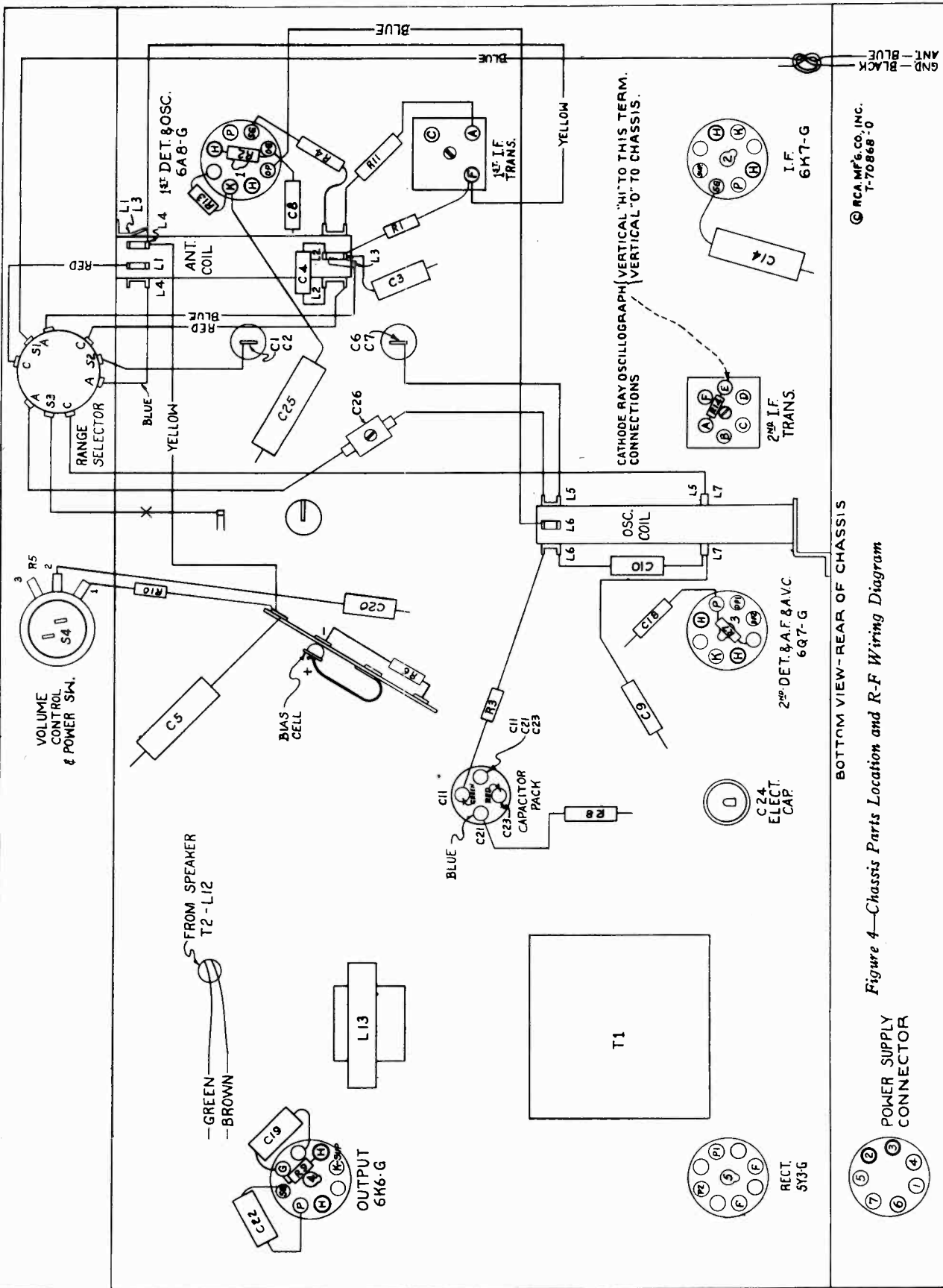
operated receiver (a-c power-supply cable-connector) or as a storage-battery operated receiver (vibrator power-supply unit with cable-connector); the transition from one type of operation to the other being made by merely exchanging cable-connector connections to the male connector on the rear of the receiver chassis.

This receiver employs five tubes in a two-band superheterodyne circuit. The design includes magnetic-core adjusted i-f transformers and low-frequency "A" oscillator tracking, automatic volume control, resistance-coupled audio amplifier, and a six-inch permanent-magnet dynamic loudspeaker. It is designed for convenient use either as a conventional a-c



MODEL 85BT6  
R-F Chassis Wiring

RCA MFG. CO., INC.



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T-70868-0

BOTTOM VIEW-REAR OF CHASSIS  
Figure 4—Chassis Parts Location and R-F Wiring Diagram

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MODEL 85BT6  
Lead Dress, Notes  
Trimmers, Voltage

**Precautionary Lead Dress.**—(1) Dress brown twisted leads to power switch away from bias cell and a-f leads to volume control. (2) Dress light-blue lead, connected from 6A8-G socket to oscillator coil, away from all other leads and chassis. (3) Dress 6A8-G grid-cap lead (R12) to prevent shorts and keep flexible. (4) Dress all leads to antenna coil away from trimming capacitor C26 and from bus lead, connected from oscillator coil to gang condenser. (5) Dress blue antenna lead through the loop of C4 which is mounted on end of antenna coil. Do not change length of the following leads: (6) C9 to chassis; (7) Blue lead from L3 to range selector; (8) Bus lead from oscillator coil to gang condenser. Keep the following as short as possible: (9) Leads to C26; (10) Bus lead from oscillator coil to range selector. In the vibrator power-supply unit: (11) Dress small leads from transformer to vibrator socket terminals 3 and 4 close to base and twist twice. (12) Twist large leads from transformer to vibrator socket terminals 2 and 5. (13) Dress C2 as near to bottom cover as possible.

**Phonograph Attachment.**—See Schematic Circuit Diagram, figure 3.

**CAUTION.**—Disconnect plug from a-c power source, or battery clips from storage battery, before attaching either cable-connector to the male connector on the rear of the chassis.

**110-Volt A-C Operation.**—When the a-c power-supply cable-connector is attached to the male connector on the rear of the chassis, a-c power is supplied to the primary circuit of transformer T1 through terms. 3 and 7. Terms. 1 and 6 are jumpered together, in cable-connector, thereby connecting the tube heaters and dial lamp to the heater winding of T1. Terms. 2, 4, and 5 are not used.

**6-Volt Battery Operation.**—When the vibrator power-supply unit cable-connector is attached to the male connector on the rear of the chassis, the high side of the battery (-) is connected to receiver "On-Off" switch S4 through term. 3. The other side of S4 connects to term. 4 which in turn is jumpered to term. 1, in cable connector, thereby supplying battery power to the vibrator circuit and to the tube heaters and dial lamp through term. 1. Battery ground return (+) connection is made through term. 2. "B+" voltage from vibrator is connected to the receiver filter input through term. 5. The 5Y3-G rectifier tube circuit is inoperative for this type of operation. Terms. 6 and 7 are not used.

**Bias Cell.**—The bias cell is used only for the purpose of supplying bias potential to the triode section of the 6Q7-G tube. This cell should never be measured with an ordinary voltmeter, or other device, which draws any current. A simple check on this cell may be made by temporarily shunting the 270,000-ohm plate resistor R7 (mounted on 6Q7-G socket) with a 20,000-ohm resistor, connecting a milliammeter in the plate circuit of the 6Q7-G tube, and noting the plate current reading. Then carefully remove the bias cell and substitute a battery potential of 0.9-volt in its place and note the new reading of the milliammeter. If the first reading obtained (with bias cell) differs from the latter reading (with 0.9-volt battery supply) by more than 20% of the latter reading, the bias cell should be replaced. This 20% is equivalent to a change of approximately 25% battery voltage.

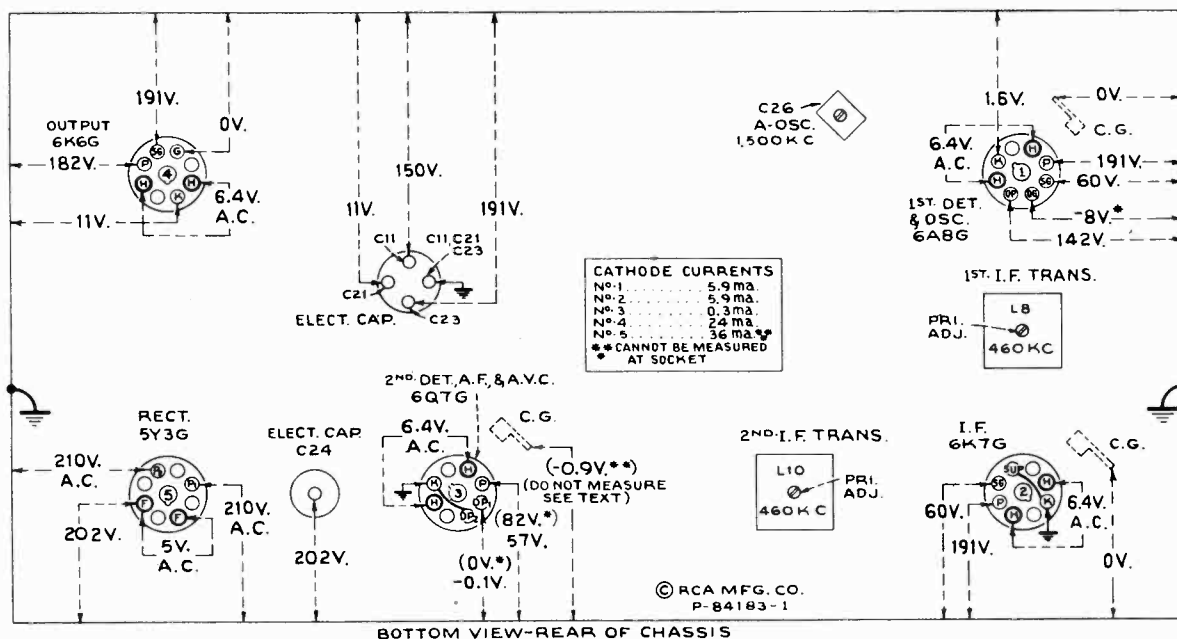


Figure 2—Radiotron Socket Voltages and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Values approximately 5% lower when vibrator power-supply unit is used—Tuned to approximately 1,000 kc ("Broadcast")—No signal being received—Volume control minimum

**\*\* CAUTION:** Do not attempt to measure voltage on control grid of the 6Q7-G with any conventional voltmeter due to presence of bias cell.

Note: Two voltage values are shown for some readings. The higher value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The lower value is the actual measured voltage and differs from the higher value because of the additional loading of the voltmeter.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODEL 85BT6

Alignment  
Parts

RCA MFG. CO., INC.

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the center horizontal line with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate

the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7-G I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L10	Max. (peak)
2	6A8-G Det. Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	1st I-F Trans.	L8 and L9	Max. (peak)
3	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	15,000 kc	"C" Osc.	C6	Max. (peak)†
4	Ant. Lead (blue)	300 Ohms	15,000 kc	"C" Right	Rock Thru 15,000 kc	"C" Ant.	C1	Max. (peak)*‡
5	Ant. Lead (blue)	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L7	Max. (peak)
6	Ant. Lead (blue)	200 Mmfd.	1,500 kc	"A" Left	1,500 kc	"A" H-F Osc.	C26	Max. (peak)
7	Ant. Lead (blue)	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L7	Max. (peak)
8	Ant. Lead (blue)	200 Mmfd.	1,500 kc	"A" Left	1,500 kc	"A" H-F Osc.	C26	Max. (peak)

† Use maximum capacity peak if two peaks can be obtained.

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

‡ After this adjustment, check for image signal by shifting receiver dial to 15,920 kc.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
14034	Belt—Variable condenser drive belt	12879	Resistor—2.2 megohms, insulated, ¼ watt (R6, R10)
14032	Bracket—Dial mounting bracket	5129	Ring—Radiotron shield ring
5237	Bushing—Variable condenser rubber mounting bushing	4389	Screw—No. 6-32 x 3/16-inch headless set-screw for drive pulley, Stock No. 14639
11360	Cap—Grid contact cap	14638	Shaft—Station selector knob shaft and pulley
30661	Capacitor—Adjustable trimmer (3-30 Mmfd.) (C26)	5037	Shield—Radiotron shield
14392	Capacitor—4.7 Mmfd. (C4)	14658	Socket—Dial lamp socket
12405	Capacitor—47 Mmfd. (C15)	11196	Socket—Radiotron socket
14262	Capacitor—110 Mmfd. (C12, C13)	14637	Spring—Idler pulley tension spring
12724	Capacitor—120 Mmfd. (C8)	30655	Switch—Range switch (S1, S2, S3)
12812	Capacitor—450 Mmfd. (C9)	14376	Transformer—First I.F. transformer (L8, L9, C12, C13)
13699	Capacitor—470 Mmfd. (C17)	14642	Transformer—Second I.F. transformer (L10, L11, C15, C17)
12537	Capacitor—560 Mmfd. (C18)	30656	Transformer—Power transformer, 105-125 volts, 50-60 cycles (T1)
12728	Capacitor—4,500 Mmfd. (C3)	30658	Volume control and power switch (R25, S4)
14393	Capacitor—.01 Mfd. (C10, C19, C20, C22)	<b>REPRODUCER ASSEMBLIES</b>	
4839	Capacitor—.01 Mfd. (C5, C14, C25)	(84140-1)	
11203	Capacitor—.8 Mfd. (C11)	30664	Cone—Reproducer cone and voice coil mounted and centered in metal housing (L12)
30657	Capacitor Pack—Comprising two sections each 8 Mfd. and one section 10 Mfd. (C21, C23, C24)	30662	Reproducer, complete
12681	Cell—Bias cell	30663	Transformer—Output transformer (T2)
4358	Clamp—Capacitor pack mounting clamp for Stock No. 30657	<b>VIBRATOR POWER UNIT ASSEMBLIES</b>	
30659	Coil—Antenna coil (L1, L2, L3, L4)	14724	Capacitor—560 Mmfd. (C7, C8)
14647	Coil—Oscillator coil (L5, L6, L7)	11654	Capacitor—.01 Mfd. (C3, C4)
14633	Condenser—2-gang variable tuning condenser (C1, C2, C6, C7)	4839	Capacitor—.01 Mfd. (C5, C6)
14631	Dial—Station selector dial and holder	12484	Capacitor—0.25 Mfd. (C1, C2)
14651	Drive—Variable condenser vernier drive and pinion gear	14289	Clip—Battery clips for vibrator battery cable
30660	Holder—Bias cell holder	12179	Coil—Choke coil (L1, L3)
14635	Indicator—Station selector indicator pointer	12819	Coil—Choke coil and terminal board assembly (L4)
4340	Lamp—Dial lamp	5140	Fuse—5-amp. (F1)
14404	Plug—7-contact male plug for rear apron of chassis	13220	Resistor—56 ohms, carbon type, ¼ watt (R1, R2)
14636	Pulley—Idler pulley—less spring	30667	Socket—7-contact female socket for vibrator to chassis power cable
14639	Pulley—Variable condenser drive pulley—located on condenser shaft	30665	Transformer—Vibrator power transformer (T1)
12818	Reactor—Filter reactor (L13)	30666	Vibrator (L5)
14653	Resistor—50 ohms, flexible type (R12)	<b>MISCELLANEOUS ASSEMBLIES</b>	
13454	Resistor—270 ohms, carbon type, ¼ watt (R13)	14654	Escutcheon—Station selector escutcheon and crystal
30499	Resistor—470 ohms, insulated, ¼ watt (R8)	30668	Cord—A.C. power cord and plug for 110-volt operation
5175	Resistor—3,600 ohms, carbon type, ¼ watt (R11)	12673	Knob—Station selector, range switch, or volume control knob
12265	Resistor—6,900 ohms, insulated, ¼ watt (R3)	4119	Screw—No. 8-32 x ¼-inch headless cup-pointed set-screw for knob, Stock No. 12673
13958	Resistor—22,000 ohms, insulated, ¼ watt (R14)		
8072	Resistor—33,000 ohms, carbon type, ¼ watt (R4)		
12454	Resistor—33,000 ohms, insulated, ¼ watt (R2)		
12199	Resistor—270,000 ohms, insulated, ¼ watt (R7)		
13733	Resistor—330,000 ohms, carbon type, ¼ watt (R1)		
12285	Resistor—470,000 ohms, insulated, ¼ watt (R9)		

RCA MFG. CO., INC.

MODELS 85E, U102E  
Schematic  
Chassis Wiring  
Transformers

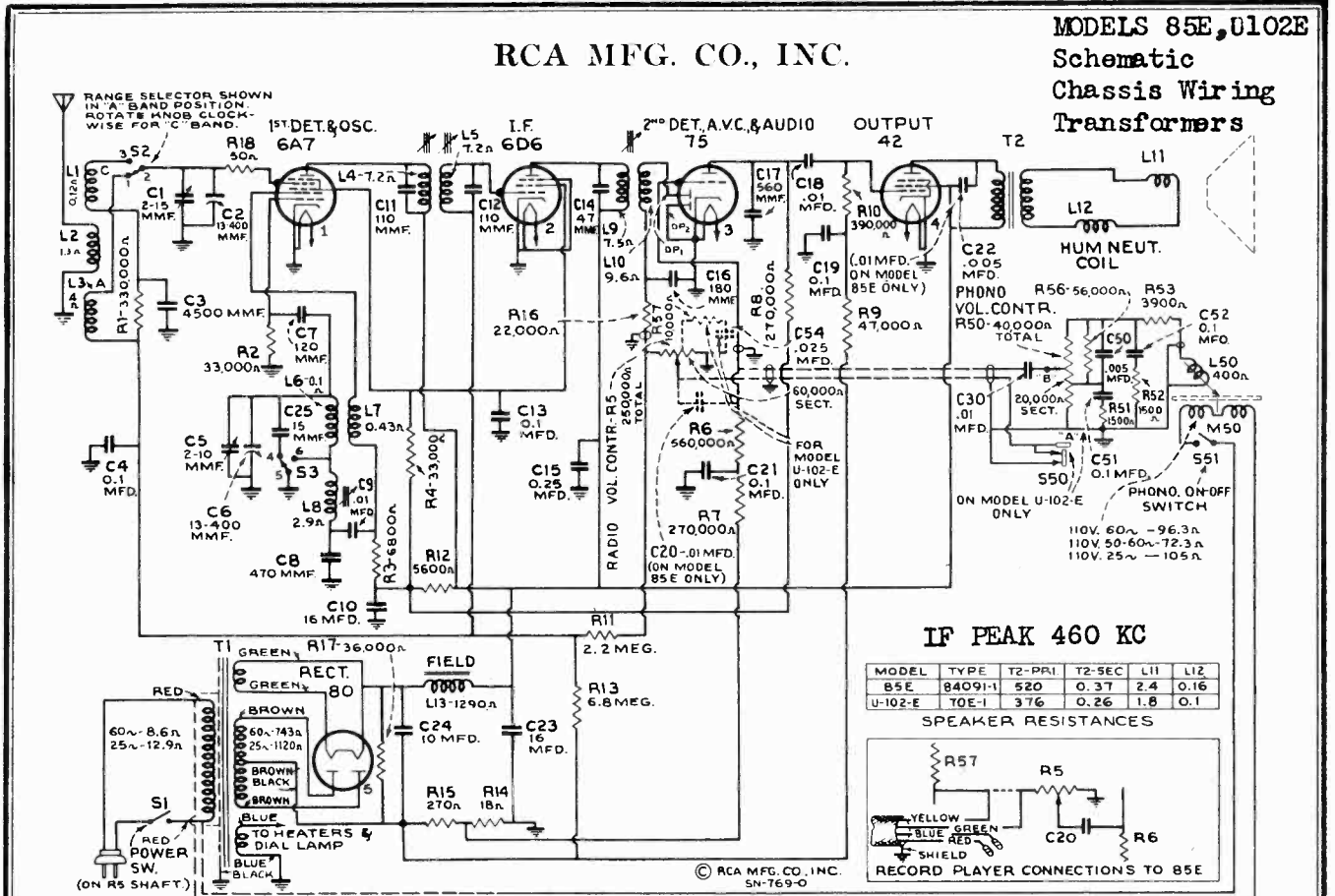


Figure 2—Schematic Circuit Diagram

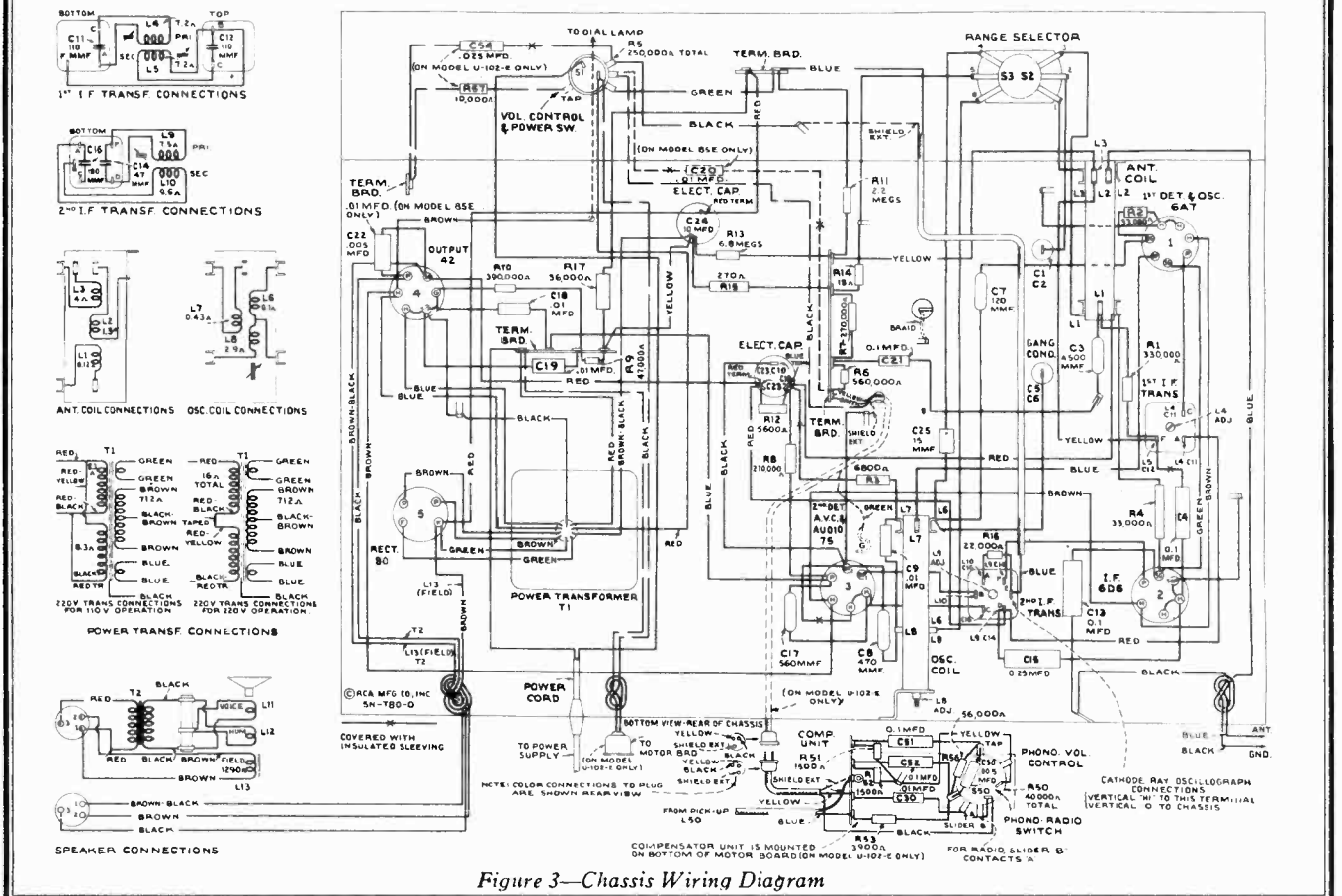


Figure 3—Chassis Wiring Diagram

MODELS 85E, U102E

Socket, Trimmers

Voltage, Specs.

Pick-up, Motor Details

LOUDSPEAKER

85E

U-102E

Type, Electrodynamic..... 6-inch..... 12-inch  
 Impedance (v.c.) at 400 cycles..... 2.6 ohms.. 2.2 ohms

Type of Pickup..... High-impedance magnetic  
 Pickup Impedance..... 1,400 ohms at 1,000 cycles

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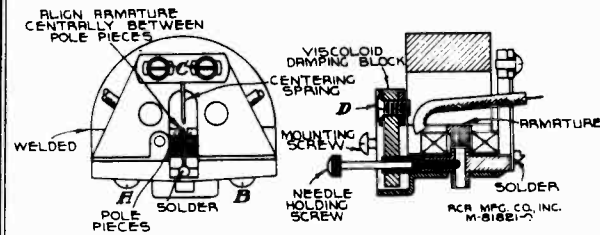


Figure 1—Details of Pickup

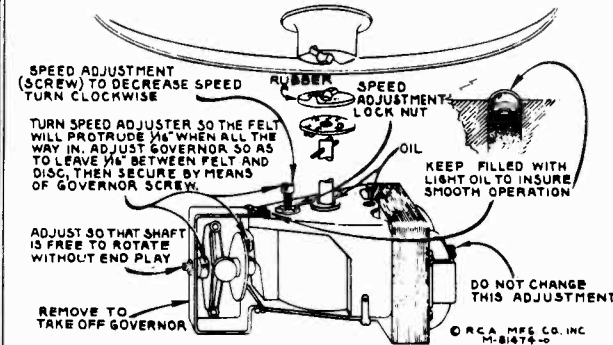


Figure 6—Details of Motor

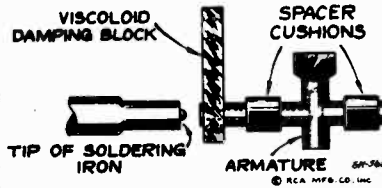


Figure 4—Special Soldering-Iron Tip

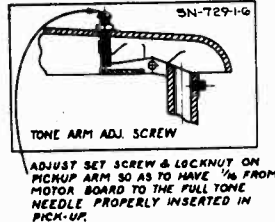


Figure 5—Tone Arm and Motor Switch Adjustments

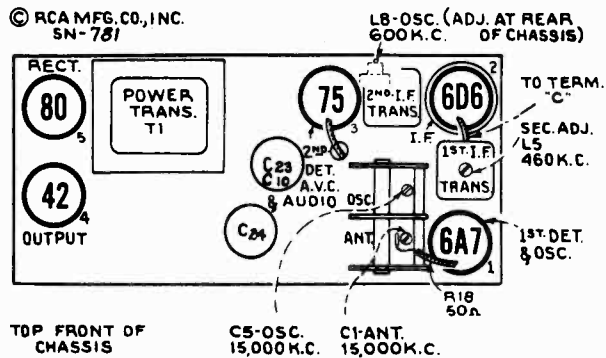


Figure 7—Radiotron, Coil, and Trimmer Locations

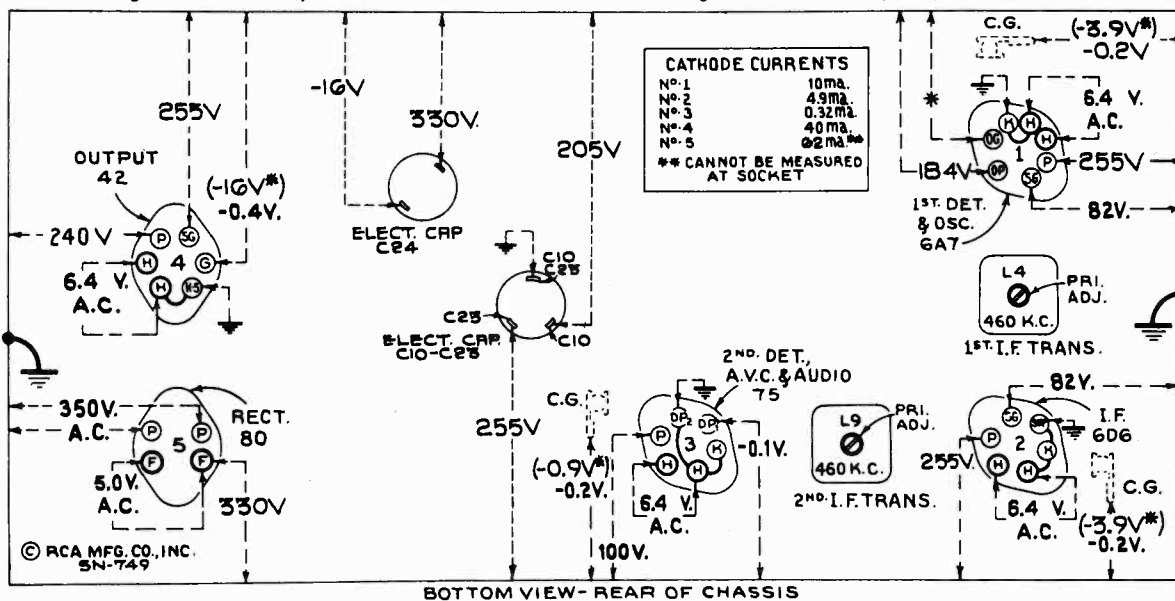


Figure 8—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Broadcast")—  
 No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.





MODELS 86T3, 87T1  
Alignment, Parts

RCA MFG. CO., INC.

### Alignment Procedure

With the gang tuning-condenser plates in full-mesh position, adjust the pointer to the low-frequency (end) calibration mark on the dial scale. The pointer is soldered in place on the drive cable.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment opera-

tions. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L12 and L13	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L10 and L11	Max. (peak)
3	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C11	Max. (peak)*
4	Ant. Term.	300 Ohms	6,000 kc	"B"	6,000 kc	"B" Ant.	C2	Max. (peak)†
5	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C7	Max. (peak)‡
6	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L8	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L8	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)

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

† After this adjustment, check for image signal by shifting receiver dial to 5,080 kc.

‡ Use maximum capacity peak if two peaks can be obtained. After this adjustment, check for image signal by shifting receiver dial to 20,920 kc.

Note that the heterodyne oscillator tracks above the signal frequency on bands "A" and "B," and below the signal frequency on band "C."

R-F ALIGNMENT FREQUENCIES  
 "Medium Wave" (B)..... 6,000 kc (osc. ant.)  
 "Short Wave" (C)..... 20,000 kc (osc.)  
 "Standard Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)

FREQUENCY RANGES  
 "Standard Broadcast" (A)..... 540-1,740 kc  
 "Medium Wave" (B)..... 2,300-7,000 kc  
 "Short Wave" (C)..... 7,000-22,000 kc  
 Intermediate Frequency..... 460 kc

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
14380	Arm—Hub and arm for operating band indicator shutter—fastens on range switch shaft	13005	Resistor—390,000 ohms, carbon type, 1/10 watt (R11)
14352	Belt—Station selector drive belt	11452	Resistor—470,000 ohms, carbon type, 1/10 watt (R2)
15216	Board—Antenna and ground terminal board	12013	Resistor—1 meg., carbon type, 1/10 watt (R31) (Model 87T1 only)
12717	Board—Phonograph terminal board	12679	Resistor—2.2 meg., insulated, 1/2 watt (R4, R9)
12607	Cap—Top shield cap for first I.F. transformer	11626	Resistor—2.2 meg., carbon type, 1/2 watt (R30) (Model 87T1 only)
12581	Cap—Top shield cap for second I.F. transformer	30582	Retainer—Band-indicator disc retainer
11350	Cap—Grid contact cap	14343	Ring—Retaining ring for range switch shaft
12723	Capacitor—56 Mmfd. (C5)	14350	Screw—No. 8-32 x 3/16 in. square-head set screw for drum, Stock No. 30584, arm, Stock No. 14380, and pulley, Stock No. 30587
14262	Capacitor—110 Mmfd. (C14, C15)	14340	Shaft—Drive pulley and knob shaft—fastens on range switch shaft
12404	Capacitor—120 Mmfd. (C27, C28)	12008	Shield—I.F. transformer shield can
12406	Capacitor—180 Mmfd. (C19)	11196	Socket—8-contact Radiotron socket
12488	Capacitor—270 Mmfd. (C21)	14114	Socket—Dial-lamp socket
30433	Capacitor—470 Mmfd. (C4, C9)	13871	Socket—Tuning-tube socket complete—less cable (Model 87T1 only)
30592	Capacitor—1,600 Mmfd. (C8)	12007	Spring—Retaining spring for core, Stock No. 12006
30303	Capacitor—.0035 Mfd. (C1)	30585	Spring—Tension spring for pointer cord
4838	Capacitor—.005 Mfd. (C23, C31)	30588	Spring—Tension spring for idler pulley
14393	Capacitor—.01 Mfd. (C20, C22)	30576	Switch—Range switch (S1, S2)
4870	Capacitor—.025 Mfd. (C30, C40) (C40—Model 87T1 only)	30574	Tone control and power switch (R18, S4)
4839	Capacitor—0.1 Mfd. (C16, C17)	14376	Transformer—First I.F. transformer (L10, L11, C14, C15)
12484	Capacitor—0.25 Mfd. (C13)	14308	Transformer—Second I.F. transformer (L12, L13, C19, C27, C28, R7)
11203	Capacitor—10 Mfd. (C12)	30571	Transformer—Power transformer, 105-125 volts, 25-80 cycle (T1)
30577	Capacitor Pack—Comprising two sections each 10 Mfd. (C24, C26)	30617	Transformer—Power transformer, 105-125 and 200-250 volts, 50-60 cycle (T1)
5212	Capacitor—16 Mfd. (C25)	30575	Volume Control (R8)
4358	Clamp—Mounting clamp for capacitor pack, Stock No. 30577	<b>REPRODUCER ASSEMBLIES</b>	
30578	Coil—Antenna coil (L1, L2, L3)	14614	Cone—Reproducer cone and dust cap (for speaker marked 84091-1 or 84001-3) (L14)
30579	Coil—Oscillator coil (L4, L5, L6, L7, L8, L9)	14934	Cone—Reproducer cone and dust cap (for speaker marked 84091-2 or 84001-6) (L14)
30573	Condenser—2-gang variable tuning condenser (C2, C3, C6)	14613	Reproducer complete (marked 84001-3 or 8 but interchangeable with speaker marked 84091-1 or 2)
30580	Condenser—3-gang mica trimmer—two sections each 2-10 Mmfd., one section 3-30 Mmfd. (C7, C10, C11)	14615	Transformer—Output transformer (for speaker marked 84091-1 or 84001-3) (T2)
30586	Cord—Station-selector indicator pointer cord	14935	Transformer—Output transformer (for speaker marked 84091-2 or 84001-6) (T2)
12800	Core—Adjustable core and stud for oscillator coil	<b>MISCELLANEOUS ASSEMBLIES</b>	
12006	Core—Adjustable core and stud for I.F. transformer	30595	Bracket—Tuning-tube mounting bracket and clip (Model 87T1 only)
30589	Dial—Station-selector dial scale	30593	Escutcheon—Dial escutcheon and crystal (Model 86T3 only)
30581	Disc—Band indicator disc with celluloid window	30594	Escutcheon—Dial and tuning-tube escutcheon and crystal (Model 87T1 only)
30572	Drive—Vernier drive shaft and pinion gear for variable condenser	14359	Knob—Station selector knob
30584	Drum—Station-selector drive-cord drum with set screws	14269	Knob—Tone control, volume control, or range switch knob
30583	Indicator—Station-selector indicator pointer and holder assembly	14267	Screw—Chassis-mounting screw and washer assembly
5226	Lamp—Dial lamp	14270	Spring—Retaining spring for knob, Stock No. 14269
30587	Pulley—Drive-belt pulley for condenser shaft	4982	Spring—Retaining spring for knob, Stock No. 14359
14636	Pulley—Drive-belt idler pulley		
14525	Resistor—22 ohms, carbon type, 1/2 watt (R13)		
30590	Resistor—39 ohms, carbon type, 1/2 watt (R19)		
14653	Resistor—50 ohms, flexible type, 1/10 watt (R20)		
30591	Resistor—220 ohms, insulated wire wound, 1.1 watt (R12)		
11298	Resistor—5,600 ohms, carbon type, 1 watt (R5)		
14559	Resistor—10,000 ohms, insulated, 1/2 watt (R17)		
30151	Resistor—18,000 ohms, insulated, 1 watt (R3, R32) (R32—Model 87T1 only)		
14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R7)		
12454	Resistor—33,000 ohms, insulated, 1/2 watt (R1)		
11323	Resistor—270,000 ohms, carbon type, 1/2 watt (R10)		

Pilot Lamps (2)..... Mazda No. 46, 6.3 volts, 0.25 amp.  
 POWER SUPPLY RATINGS  
 Rating A..... 105-125 volts, 50-60 cycles, 75 watts  
 Rating B..... 105-125 volts, 25-60 cycles, 75 watts  
 Rating C..... 105-125/200-250 volts, 50-60 cycles, 75 watts

RCA MFG. CO., INC.

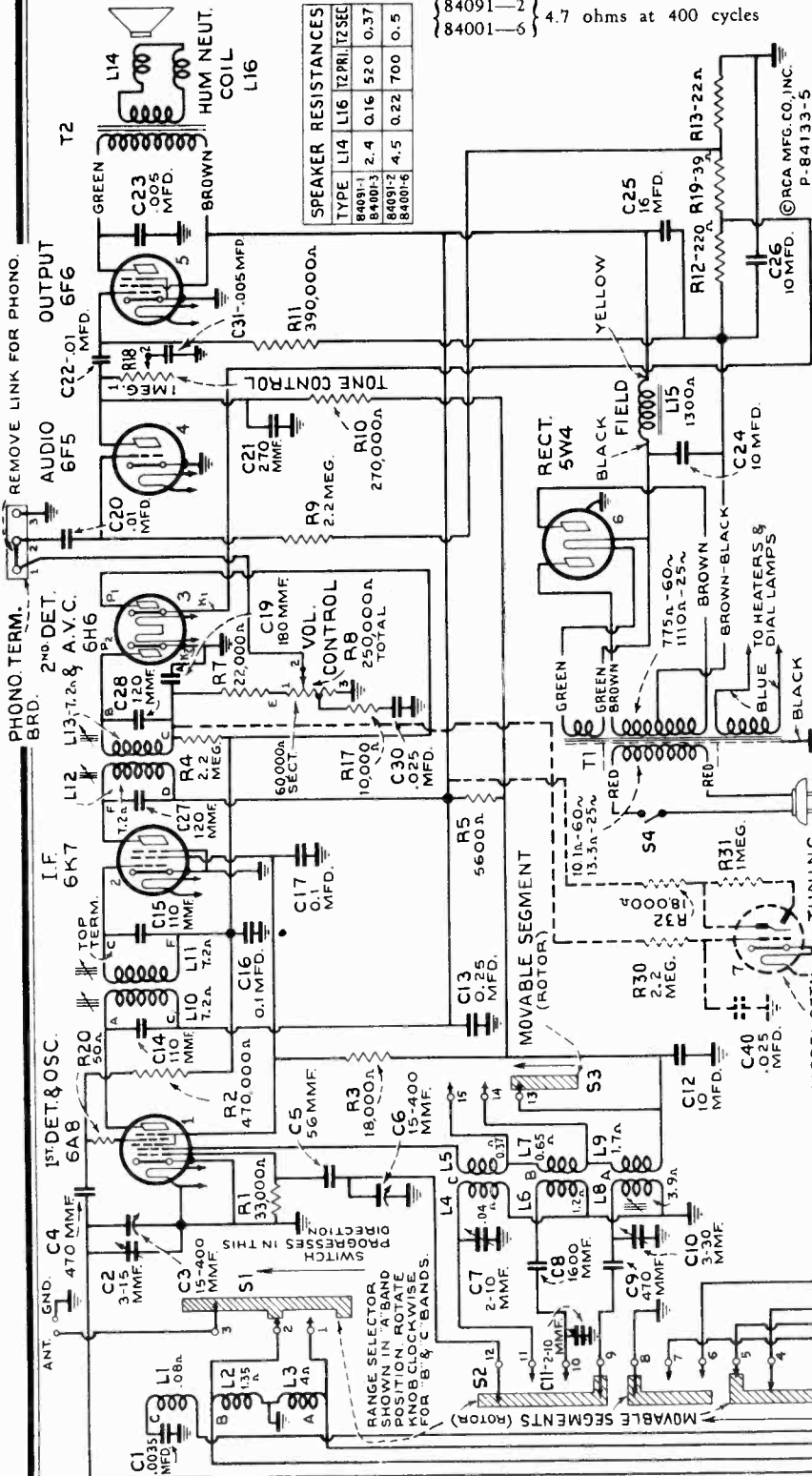
MODELS 86T3, 87T1  
Schematic, Socket  
Trimmers, Notes

POWER OUTPUT  
Undistorted..... 2.2 watts  
Maximum..... 4.5 watts

LOUDSPEAKER  
Type..... 6-inch Electrodynamic

V.C. Impedance.....  
 { 84091-1 } 2.6 ohms at 400 cycles  
 { 84001-3 }  
 { 84091-2 } 4.7 ohms at 400 cycles  
 { 84001-6 }

IF PEAK 460 KC



Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place with ambroid upon completion of adjustment.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Open link between terminals 1 and 2 on terminal board. Connect yellow wire in Radio-Record switch cable to terminal 1, green to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

Precautionary Lead Dress.—(1) Keep leads from C1 as short as possible. (2) Dress yellow and green leads from range selector to oscillator coil between front apron and range selector. Maintain original length and size of the following: (3) bus lead from antenna coil L1 to range selector and (4) lead from oscillator coil to chassis.

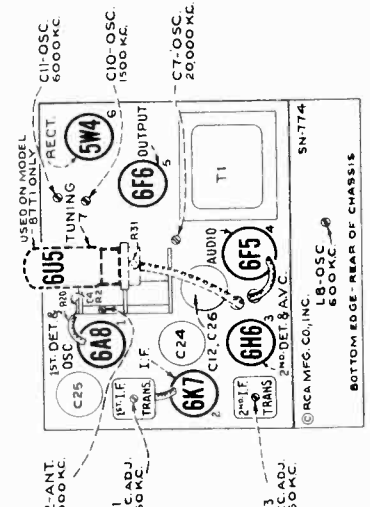


Figure 1—Radiotron, Component Part, and Trimmer Locations

**Radiotron Cathode Current Readings**

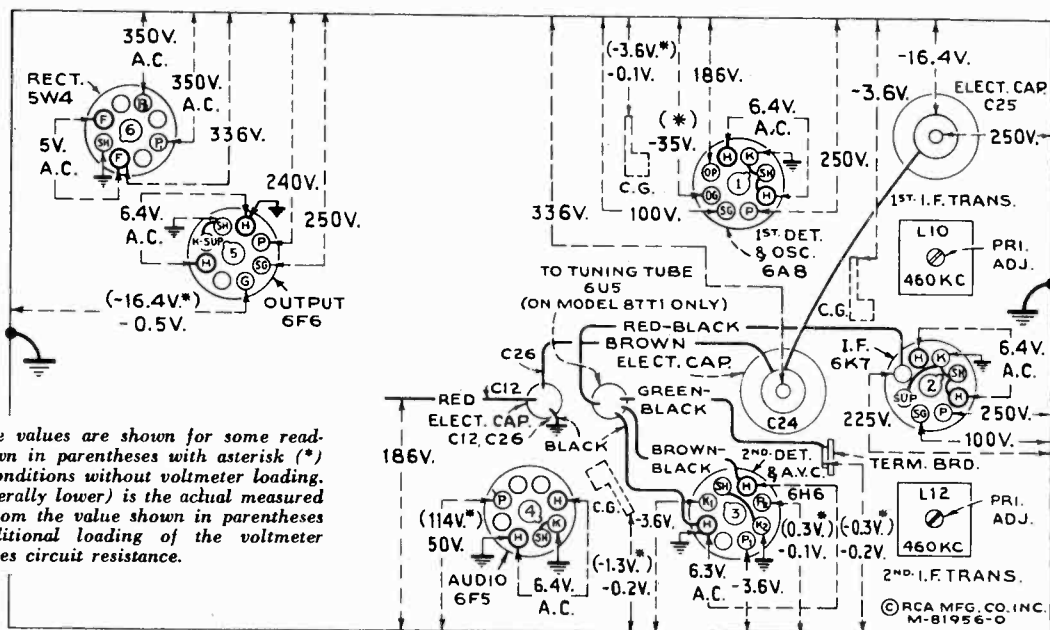
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

- (1) RCA-6A8—1st Det.—Osc..... 12.5 ma.
- (2) RCA-6K7—1-F Amp..... 7.2 ma.
- (3) RCA-6H6—2nd Det. and A.V.C..... 0.27 ma.
- (4) RCA-6F5—A-F Amp..... 38.5 ma.
- (5) RCA-6F6—Output..... 59 ma.
- (6) RCA-5W4—Rectifier..... 1.2 ma.
- (7) RCA-6U5—Tuning Tube..... 1.2 ma.

\*\* Cannot be measured at socket.

**MODELS 86T3, 87T1**  
**Chassis Wiring**  
**Voltage, Trimmers**

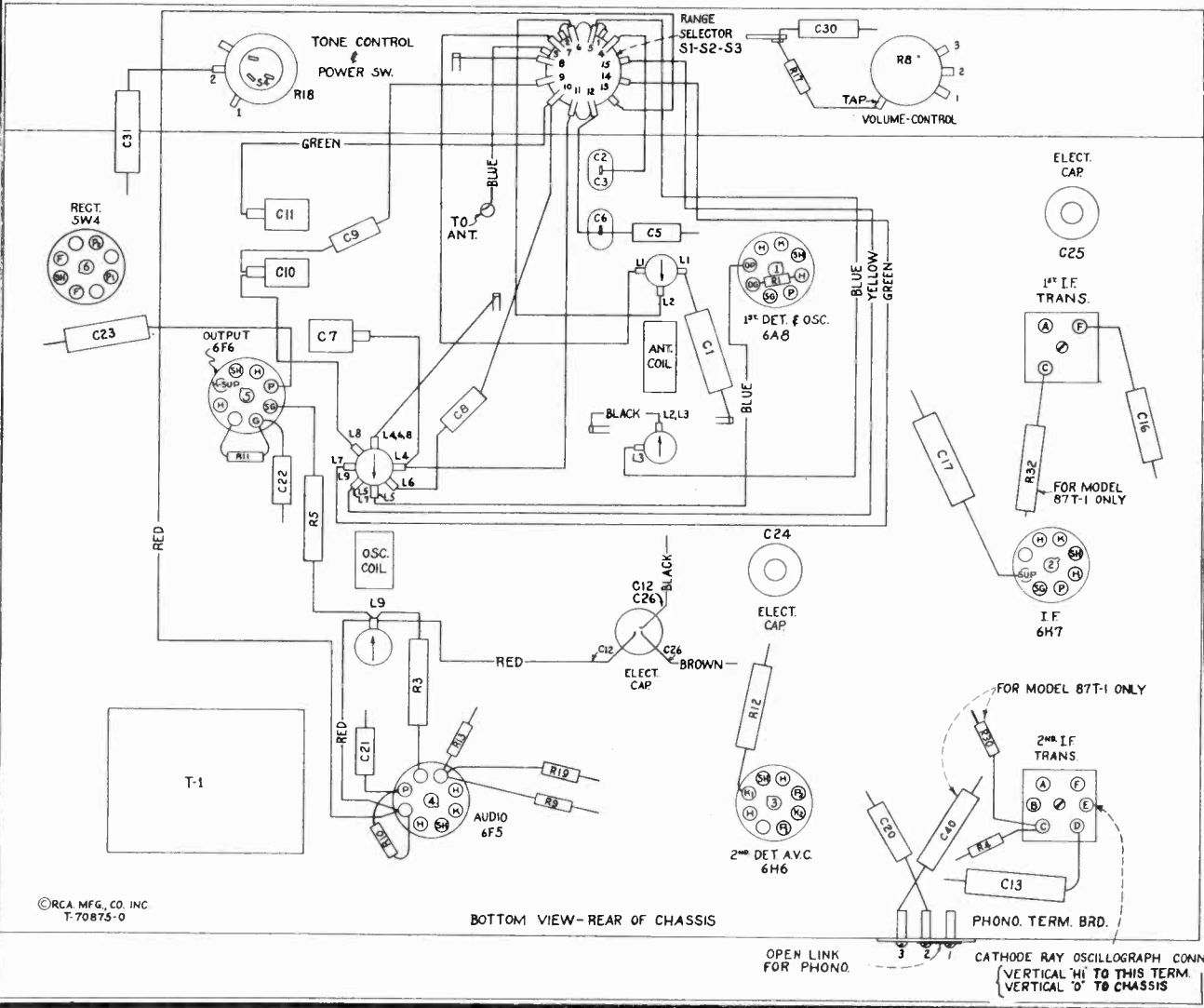
RCA MFG. CO., INC.



Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

BOTTOM VIEW-REAR OF CHASSIS

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—  
 No signal being received—Volume control minimum—Tone control optional



BOTTOM VIEW-REAR OF CHASSIS

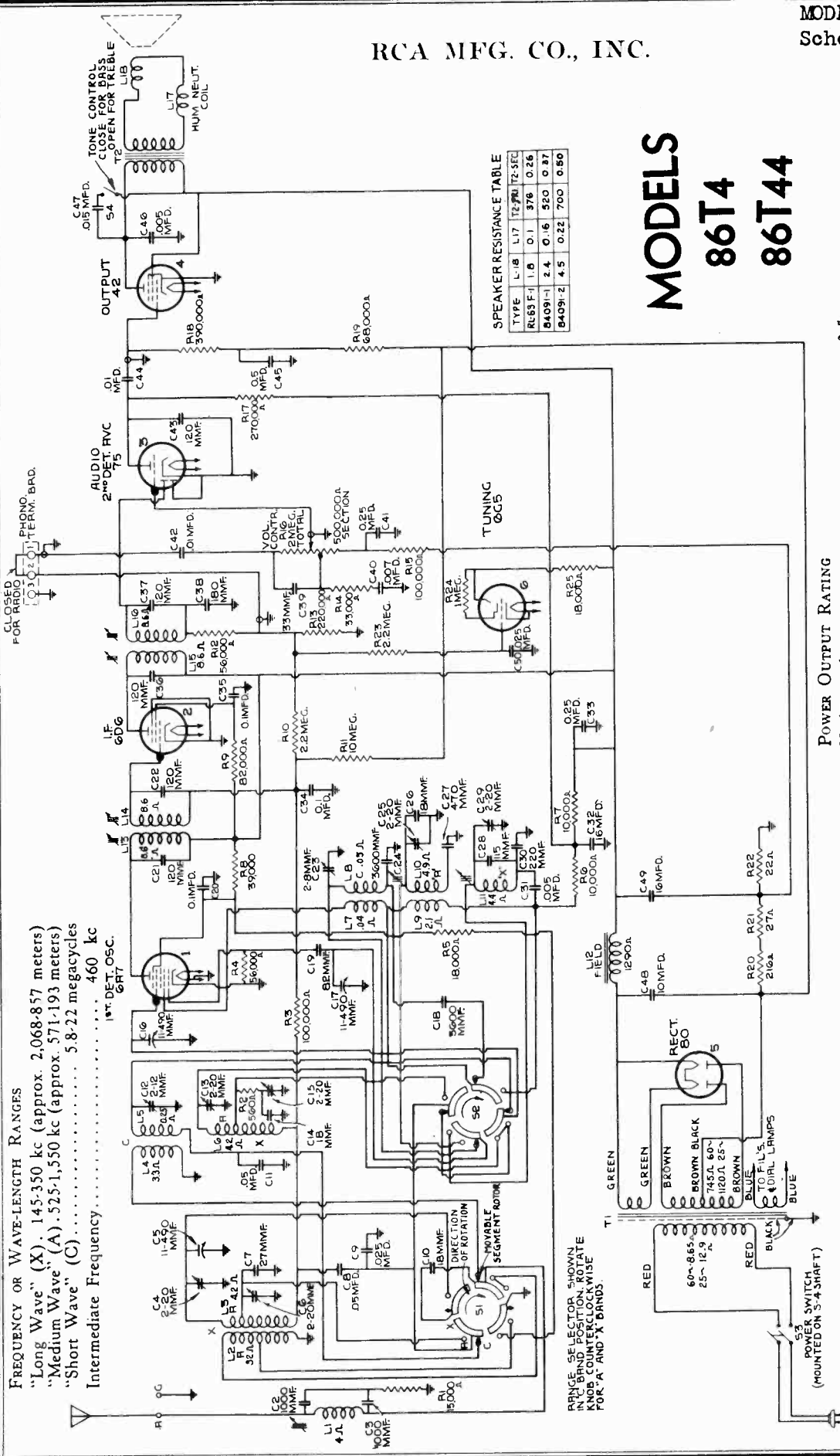
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OPEN LINK FOR PHONO. CATHODE RAY OSCILLOGRAPH CONN. (VERTICAL 'H' TO THIS TERM. VERTICAL 'O' TO CHASSIS)

MODELS 86T4, 86T44  
Schematic, Specs.

RCA MFG. CO., INC.

MODELS  
86T4  
86T44



SPEAKER RESISTANCE TABLE

TYPE	L-18	L-17	T2-7M	T2-5C
RL83 F-1	1.8	0.1	376	0.25
84091-1	2.4	0.16	520	0.37
84091-2	4.5	0.22	700	0.50

FREQUENCY OR WAVELENGTH RANGES  
 "Long Wave" (X) . . . . . 145-350 kc (approx. 2,068-857 meters)  
 "Medium Wave" (A) . . . . . 525-1,550 kc (approx. 571-193 meters)  
 "Short Wave" (C) . . . . . 5.8-22 megacycles  
 Intermediate Frequency . . . . . 460 kc  
 1st DET. OSC. GRT

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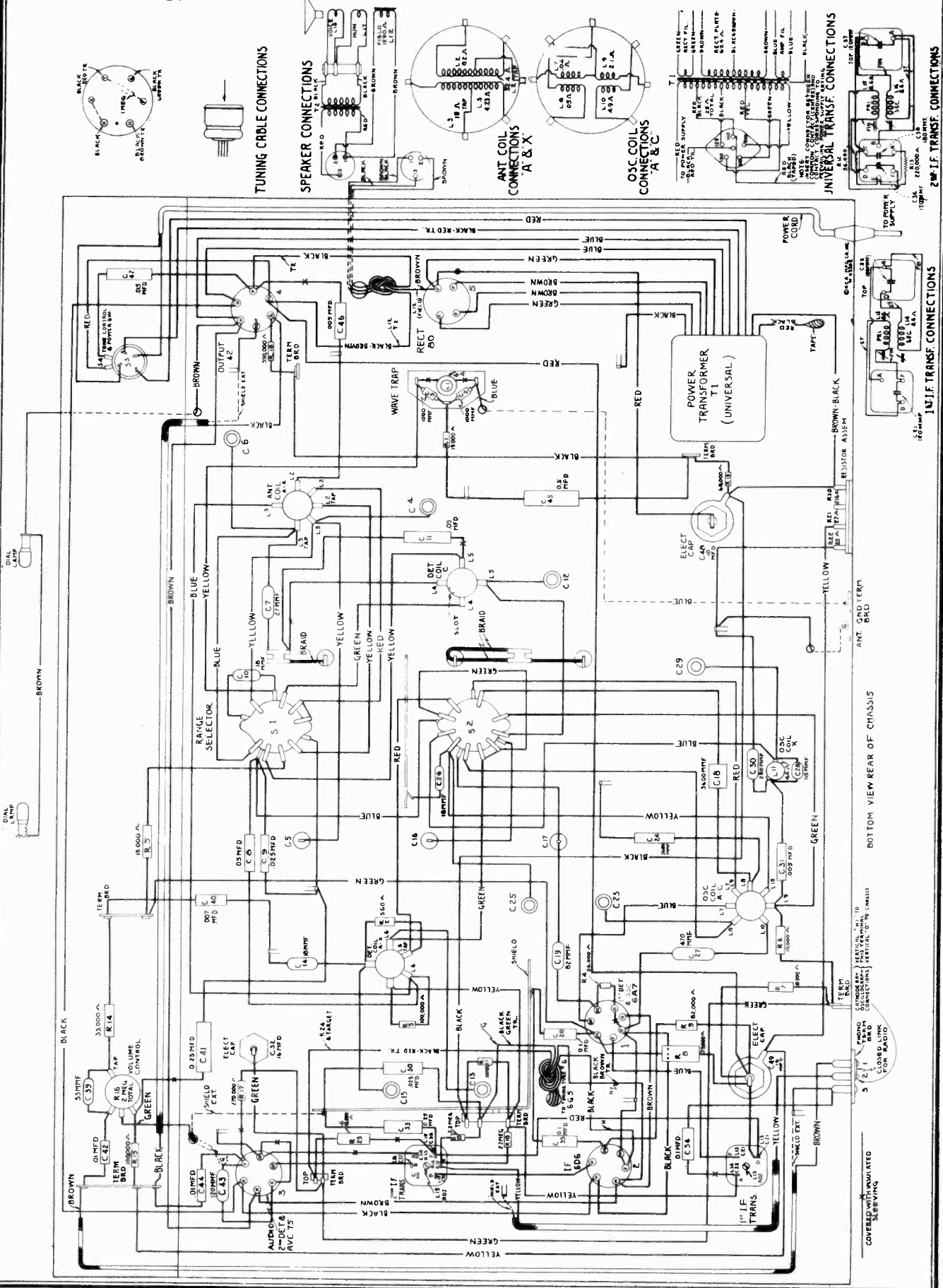
POWER OUTPUT RATING  
 Undistorted . . . . . 2.5 watts  
 Maximum . . . . . 4.5 watts  
 LOUDSPEAKER  
 Type . . . . . Electrodynamic  
 V.C. Impedance . . . . . { (RL-63F-1) 2.2 ohms at 400 cycles  
 { (84091-1) 2.6 ohms at 400 cycles  
 { (84091-2) 4.7 ohms at 400 cycles  
 Pilot Lamps (2) . . . Mazda No. 46, 6.3 volts, 0.25 ampere  
 Tuning Drive Ratio . . . . . 20 to 1

R-F ALIGNMENT FREQUENCIES  
 "Short Wave" (C) . . . . . 20,000 kc (osc., det.)  
 "Medium Wave" (A) . . . . . 600 kc (osc.), 1,500 kc (osc., det., ant.)  
 "Long Wave" (X) . . . . . 175 kc (osc.), 350 kc (osc., det., ant.)  
 POWER SUPPLY RATINGS  
 Rating A . . . . . 105-125 volts, 50-60 cycles, 75 watts  
 Rating B . . . . . 105-125 volts, 25-60 cycles, 75 watts  
 Rating C . . . . . 00-130/140-160/195-250 volts, 40-60 cycles, 75 watts



MODELS 86T4, 86T44  
Chassis Wiring, Coils

RCA MFG. CO., INC.



RCA MFG. CO., INC.

MODELS 86T4, 86T44  
Socket, Trimmers  
Lead Dress, Voltage  
Notes

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

**Precautionary Lead Dress.**—Keep the following leads as short as possible: (1) Bus lead from C16 to S2, (2) bus lead from L8 to S2, (3) leads from C24 to L8 and to chassis. (4) Bus lead from L5 to S2 should be 2 1/2 inches long between lugs and dressed away from S2, (5) bus lead from C17 to S2 should be dressed away from adjacent parts, (6) leads should be dressed away from grid lug of 42 tube, (7) C11 lead to L5 should be 1 inch long and dressed between L5 and C4, C11 lead to ground should be short, (8) green lead between opposite lugs on S2 should be dressed away from S2, (9) excess antenna lead should be dressed above chassis, (10) blue lead from L7 to 6A7 oscillator plate lug should be dressed down and away from L8 lug and away from oscillator grid of 6A7, (11) green lead from L6 to S2 should be dressed away from bus connected between C17 and S2, (12) red lead from L6 tap to S2 should be dressed away from bus connected between C17 and S2. When necessary to replace bus leads, use only wire having same diameter as original.

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted

cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care that the acetone does not flow into the air gap. Speakers RL-63F-1 and 84091-1 have screws for the centering adjustment, while on speaker 84091-2, it is necessary to separate the glued centering disc from the housing, insert paper feelers in air gap, then apply cement to the centering disc, press down firmly, and leave the feelers in place until the cement dries. The dust cover should be cemented back in place with ambroid after completion of the adjustment.

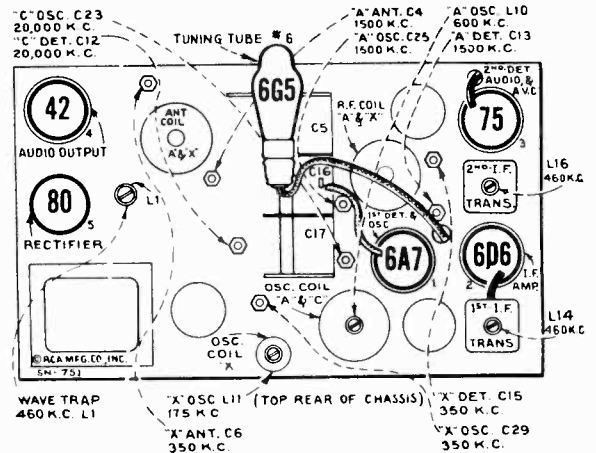


Figure 1—Radiotron, Coil, and Trimmer Locations

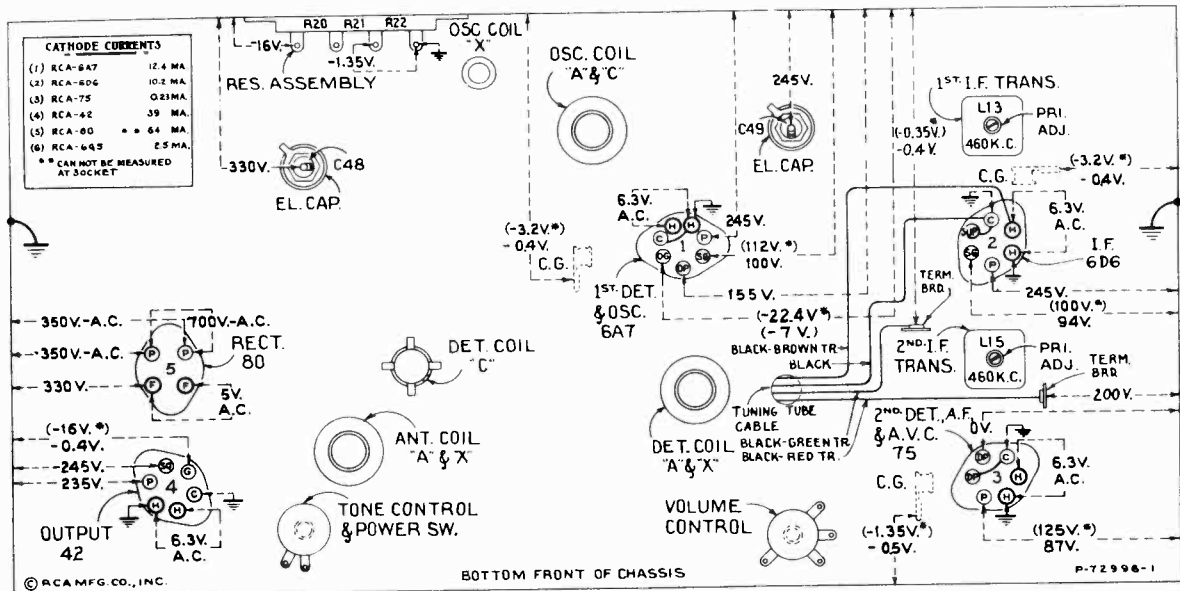


Figure 2—Radiotron Socket Voltages, Coil, and Trimmer Locations  
Measured at 115 volts, 60 cycle supply—Tuned to approximately 1,000 kc or 300 meters "A" band—  
No signal being received—Volume control minimum

**Note:** Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

**Alignment Procedure**

Calibrate the tuning dial by adjusting main dial pointer to the (ground) terminal for all alignment operations. Use tuning capacitor plates in full-mesh position; then adjust the small (vernier) pointer to figure 0. These are frequency adjustments.

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2. Cathode-ray alignment is highly preferable; the connections to the chassis should be made if the oscilloscope indicator is used, connect it across the loudspeaker voice coil and advance the receiver volume control to full-volume position.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Receiver Dial Setting	Range Selector	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6D6 I-F Grid Cap	.001 Mfd.	460 kc	No Signal (400-550 meters)	"A" Center	Std I-F Trans.	L16 and L18	Max. (peak)
2	6A7 Det. Grid Cap	.001 Mfd.	460 kc	No Signal (400-550 meters)	"A"	1st I-F Trans.	L19 and L14	Max. (peak)
3	Ant. Term.	200 Mmfd.	460 kc	No Signal (400-550 meters)	"A"	Wave-trap	L1	Minimum Output
4	Ant. Term.	300 Ohms	20,000 kc	20 mc	"C" Right	"C" Osc.	C28	Max. (peak)*
5	Ant. Term.	300 Ohms	20,000 kc	20 mc	"C"	"C" Det.	C12	Max. (peak)†
6	Ant. Term.	200 Mmfd.	600 kc	600 kc (500 meters)	"A" Center	"A" L-F Osc.	L10	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc (200 meters)	"A"	"A" H-F Osc.	C25	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	600 kc (500 meters)	"A"	"A" L-F Osc.	L10	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc (200 meters)	"A"	"A" H-F Osc.	C25	Max. (peak)
10	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc (200 meters)	"A"	"A" Det.	C13	Max. (peak)
11	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc (200 meters)	"A"	"A" Ant.	C4	Max. (peak)
12	Ant. Term.	200 Mmfd.	175 kc	175 kc (1715 meters)	"X" Left	"X" L-F Osc.	L11	Max. (peak)
13	Ant. Term.	200 Mmfd.	350 kc	350 kc (857 meters)	"X"	"X" H-F Osc.	C29	Max. (peak)
14	Ant. Term.	200 Mmfd.	175 kc	175 kc (1715 meters)	"X"	"X" L-F Osc.	L11	Max. (peak)
15	Ant. Term.	200 Mmfd.	350 kc	350 kc (857 meters)	"X"	"X" H-F Osc.	C29	Max. (peak)
16	Ant. Term.	200 Mmfd.	350 kc	350 kc (857 meters)	"X"	"X" Det.	C15	Max. (peak)
17	Ant. Term.	200 Mmfd.	350 kc	350 kc (857 meters)	"X"	"X" Ant.	C8	Max. (peak)

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

† Use maximum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,060 kc.

**REPLACEMENT PARTS**  
In list on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

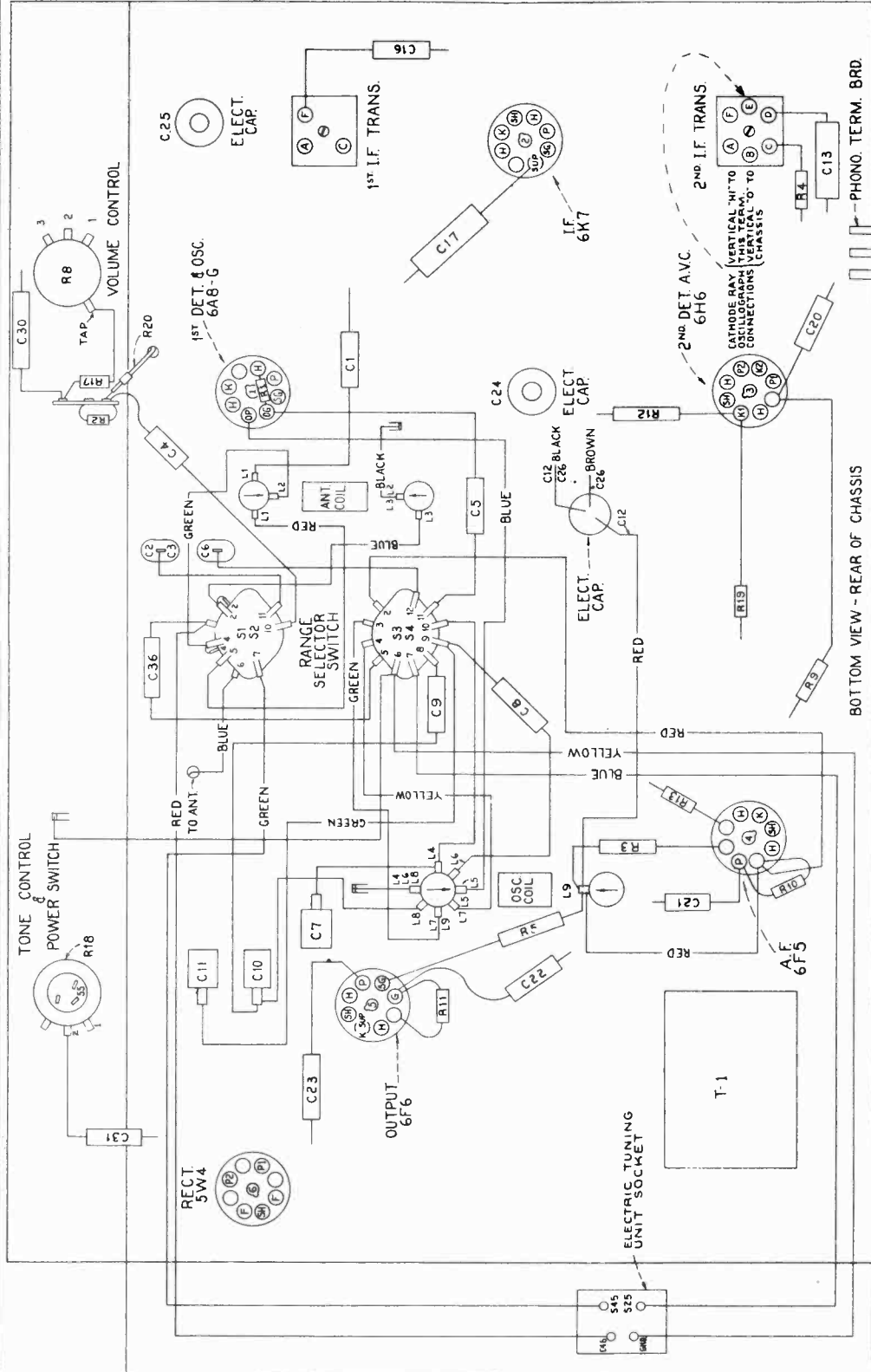
STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
14542	Arm—Band indicator operating arm and hub—less set	13594	Resistor—15,000 Ohms—Carbon type, 1/10 watt (R1)
14543	Band—Rubber band, 1/32" wide	13595	Resistor—18,000 Ohms—Carbon type, 1/10 watt (R6)
14544	Band—Variable condenser tuning tube	13596	Resistor—22,000 Ohms—Carbon type, 1/10 watt (R2)
14545	Band—Variable condenser drive belt	13597	Resistor—33,000 Ohms—Carbon type, 1/10 watt (R3)
14546	Board—Phonograph ground terminal board	13598	Resistor—39,000 Ohms—Carbon type, 1/10 watt (R4)
14547	Board—Phonograph mounting bushing and screw	13599	Resistor—47,000 Ohms—Carbon type, 1/10 watt (R5)
14548	Cap—Tuning tube cable and socket	13600	Resistor—56,000 Ohms—Carbon type, 1/10 watt (R12)
14549	Cap—First I-F transformer shield top	13601	Resistor—68,000 Ohms—Carbon type, 1/10 watt (R18)
14550	Cap—Grid contact transformer shield top	13602	Resistor—82,000 Ohms—Carbon type, 1/10 watt (R15)
14551	Cap—Grid contact transformer shield top	13603	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R13)
14552	Cap—Grid contact transformer shield top	13604	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R24)
14553	Cap—Grid contact transformer shield top	13605	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R21)
14554	Cap—Grid contact transformer shield top	13606	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R22)
14555	Cap—Grid contact transformer shield top	13607	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R23)
14556	Cap—Grid contact transformer shield top	13608	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R25)
14557	Cap—Grid contact transformer shield top	13609	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R26)
14558	Cap—Grid contact transformer shield top	13610	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R27)
14559	Cap—Grid contact transformer shield top	13611	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R28)
14560	Cap—Grid contact transformer shield top	13612	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R29)
14561	Cap—Grid contact transformer shield top	13613	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R30)
14562	Cap—Grid contact transformer shield top	13614	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R31)
14563	Cap—Grid contact transformer shield top	13615	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R32)
14564	Cap—Grid contact transformer shield top	13616	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R33)
14565	Cap—Grid contact transformer shield top	13617	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R34)
14566	Cap—Grid contact transformer shield top	13618	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R35)
14567	Cap—Grid contact transformer shield top	13619	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R36)
14568	Cap—Grid contact transformer shield top	13620	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R37)
14569	Cap—Grid contact transformer shield top	13621	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R38)
14570	Cap—Grid contact transformer shield top	13622	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R39)
14571	Cap—Grid contact transformer shield top	13623	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R40)
14572	Cap—Grid contact transformer shield top	13624	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R41)
14573	Cap—Grid contact transformer shield top	13625	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R42)
14574	Cap—Grid contact transformer shield top	13626	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R43)
14575	Cap—Grid contact transformer shield top	13627	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R44)
14576	Cap—Grid contact transformer shield top	13628	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R45)
14577	Cap—Grid contact transformer shield top	13629	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R46)
14578	Cap—Grid contact transformer shield top	13630	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R47)
14579	Cap—Grid contact transformer shield top	13631	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R48)
14580	Cap—Grid contact transformer shield top	13632	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R49)
14581	Cap—Grid contact transformer shield top	13633	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R50)
14582	Cap—Grid contact transformer shield top	13634	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R51)
14583	Cap—Grid contact transformer shield top	13635	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R52)
14584	Cap—Grid contact transformer shield top	13636	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R53)
14585	Cap—Grid contact transformer shield top	13637	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R54)
14586	Cap—Grid contact transformer shield top	13638	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R55)
14587	Cap—Grid contact transformer shield top	13639	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R56)
14588	Cap—Grid contact transformer shield top	13640	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R57)
14589	Cap—Grid contact transformer shield top	13641	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R58)
14590	Cap—Grid contact transformer shield top	13642	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R59)
14591	Cap—Grid contact transformer shield top	13643	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R60)
14592	Cap—Grid contact transformer shield top	13644	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R61)
14593	Cap—Grid contact transformer shield top	13645	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R62)
14594	Cap—Grid contact transformer shield top	13646	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R63)
14595	Cap—Grid contact transformer shield top	13647	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R64)
14596	Cap—Grid contact transformer shield top	13648	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R65)
14597	Cap—Grid contact transformer shield top	13649	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R66)
14598	Cap—Grid contact transformer shield top	13650	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R67)
14599	Cap—Grid contact transformer shield top	13651	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R68)
14600	Cap—Grid contact transformer shield top	13652	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R69)
14601	Cap—Grid contact transformer shield top	13653	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R70)
14602	Cap—Grid contact transformer shield top	13654	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R71)
14603	Cap—Grid contact transformer shield top	13655	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R72)
14604	Cap—Grid contact transformer shield top	13656	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R73)
14605	Cap—Grid contact transformer shield top	13657	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R74)
14606	Cap—Grid contact transformer shield top	13658	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R75)
14607	Cap—Grid contact transformer shield top	13659	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R76)
14608	Cap—Grid contact transformer shield top	13660	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R77)
14609	Cap—Grid contact transformer shield top	13661	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R78)
14610	Cap—Grid contact transformer shield top	13662	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R79)
14611	Cap—Grid contact transformer shield top	13663	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R80)
14612	Cap—Grid contact transformer shield top	13664	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R81)
14613	Cap—Grid contact transformer shield top	13665	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R82)
14614	Cap—Grid contact transformer shield top	13666	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R83)
14615	Cap—Grid contact transformer shield top	13667	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R84)
14616	Cap—Grid contact transformer shield top	13668	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R85)
14617	Cap—Grid contact transformer shield top	13669	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R86)
14618	Cap—Grid contact transformer shield top	13670	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R87)
14619	Cap—Grid contact transformer shield top	13671	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R88)
14620	Cap—Grid contact transformer shield top	13672	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R89)
14621	Cap—Grid contact transformer shield top	13673	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R90)
14622	Cap—Grid contact transformer shield top	13674	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R91)
14623	Cap—Grid contact transformer shield top	13675	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R92)
14624	Cap—Grid contact transformer shield top	13676	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R93)
14625	Cap—Grid contact transformer shield top	13677	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R94)
14626	Cap—Grid contact transformer shield top	13678	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R95)
14627	Cap—Grid contact transformer shield top	13679	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R96)
14628	Cap—Grid contact transformer shield top	13680	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R97)
14629	Cap—Grid contact transformer shield top	13681	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R98)
14630	Cap—Grid contact transformer shield top	13682	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R99)
14631	Cap—Grid contact transformer shield top	13683	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R100)
14632	Cap—Grid contact transformer shield top	13684	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R101)
14633	Cap—Grid contact transformer shield top	13685	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R102)
14634	Cap—Grid contact transformer shield top	13686	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R103)
14635	Cap—Grid contact transformer shield top	13687	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R104)
14636	Cap—Grid contact transformer shield top	13688	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R105)
14637	Cap—Grid contact transformer shield top	13689	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R106)
14638	Cap—Grid contact transformer shield top	13690	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R107)
14639	Cap—Grid contact transformer shield top	13691	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R108)
14640	Cap—Grid contact transformer shield top	13692	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R109)
14641	Cap—Grid contact transformer shield top	13693	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R110)
14642	Cap—Grid contact transformer shield top	13694	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R111)
14643	Cap—Grid contact transformer shield top	13695	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R112)
14644	Cap—Grid contact transformer shield top	13696	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R113)
14645	Cap—Grid contact transformer shield top	13697	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R114)
14646	Cap—Grid contact transformer shield top	13698	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R115)
14647	Cap—Grid contact transformer shield top	13699	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R116)
14648	Cap—Grid contact transformer shield top	13700	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R117)
14649	Cap—Grid contact transformer shield top	13701	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R118)
14650	Cap—Grid contact transformer shield top	13702	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R119)
14651	Cap—Grid contact transformer shield top	13703	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R120)
14652	Cap—Grid contact transformer shield top	13704	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R121)
14653	Cap—Grid contact transformer shield top	13705	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R122)
14654	Cap—Grid contact transformer shield top	13706	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R123)
14655	Cap—Grid contact transformer shield top	13707	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R124)
14656	Cap—Grid contact transformer shield top	13708	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R125)
14657	Cap—Grid contact transformer shield top	13709	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R126)
14658	Cap—Grid contact transformer shield top	13710	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R127)
14659	Cap—Grid contact transformer shield top	13711	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R128)
14660	Cap—Grid contact transformer shield top	13712	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R129)
14661	Cap—Grid contact transformer shield top	13713	Resistor—150,000 Ohms—Carbon type, 1/10 watt (R130)
14662	Cap—Grid contact transformer shield top	13714	Resistor—180,000 Ohms—Carbon type, 1/10 watt (R131)
14663	Cap—Grid contact transformer shield top	13715	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R132)
14664	Cap—Grid contact transformer shield top	13716	Resistor—270,000 Ohms—Carbon type, 1/10 watt (R133)
14665	Cap—Grid contact transformer shield top	13717	Resistor—330,000 Ohms—Carbon type, 1/10 watt (R134)
14666	Cap—Grid contact transformer shield top	13718	Resistor—390,000 Ohms—Carbon type, 1/10 watt (R135)
14667	Cap—Grid contact transformer shield top	13719	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R136)
14668	Cap—Grid contact transformer shield top	13720	Resistor—560,000 Ohms—Carbon type, 1/10 watt (R137)
14669	Cap—Grid contact transformer shield top	13721	Resistor—680,000 Ohms—Carbon type, 1/10 watt (R138)
14670	Cap—Grid contact transformer shield top	13722	Resistor—820,000 Ohms—Carbon type, 1/10 watt (R139)
14671	Cap—Grid contact transformer shield top	13723	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R140)
14672	Cap—Grid contact transformer shield top	13724	Resistor—120,000 Ohms—Carbon type, 1/10 watt (R141)
14673	Cap—Grid contact transformer		



**MODEL 86T6**  
**Chassis Wiring**  
**Lead Dress, Phono.**

RCA MFG. CO., INC.

Pilot Lamps (2) ..... Mazda No. 46, 6.3 volts, 0.25 amp.  
 POWER SUPPLY RATINGS  
 Rating A—105-125 volts, 50-60 cycles..... 75 watts  
 Rating B—105-125 volts, 25-60 cycles..... 75 watts  
 Rating C—100-130/200-250 volts, 50-60 cycles..... 75 watts



**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Open link between terminals 1 and 2 on terminal board. Connect yellow wire in Radio-Record switch cable to terminal 1, green to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

**Precautionary Lead Dress.**—(1) 6F5 grid lead should be dressed away from adjacent electrolytic, C-12. (2) Leads from push-button socket on side apron must be twisted and dressed away from chassis. Maintain original length, size, and position of: (3) C-band antenna lead; (4) Antenna series condenser, C-1, lead; (5) C-band oscillator leads to range switch and chassis; (6) Oscillator plate lead to range switch.  
**LOUDSPEAKER**  
 Type..... { 6-inch Electrodynamic  
 { 2.5 ohms—84091—1  
 { 4.7 ohms—84091—2  
 Voice coil impedance at 400 cycles..



## Adjustments for Electric Tuning

Each push-button connects a particular oscillator coil and antenna trimmer condenser. The tuning of this coil and this condenser selects a station. Clockwise rotation of cores or trimmer screws lowers frequency.

The frequency ranges for various push-buttons are:

- No. 1 540 to 1,160 kc — Adjust L-20 and C-40.
- No. 2 540 to 1,160 kc — Adjust L-21 and C-41.
- No. 3 600 to 1,265 kc — Adjust L-22 and C-42.
- No. 4 600 to 1,265 kc — Adjust L-23 and C-43.
- No. 5 785 to 1,550 kc — Adjust L-24 and C-44.
- No. 6 785 to 1,550 kc — Adjust L-25 and C-45.

The following are the steps in aligning a push-button selector:

Begin at low-frequency end of band, and tune selected stations in the order that they would come on dial. Use one or two feet of wire as an antenna to ensure sharp peaking.

- (1) Manually tune to desired station, then turn range selector to "Electric Tuning."
- (2) Press a push-button whose frequency range includes the station.
- (3) Adjust oscillator coil corresponding to that push-button, to receive the desired station. Screw core all

the way in, to lowest frequency, then unscrew slowly until station is found.

- (4) Adjust antenna condenser for that push-button, to receive the desired station with maximum volume.
- (5) Check alignment by switching to manual tuning: Reception will not change appreciably if alignment is correct.
- (6) Make a final careful adjustment of all magnetite cores and trimmers.

*Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.*

With the gang tuning-condenser plates in full-mesh position, adjust the pointer to the low-frequency (end) calibration mark on the dial scale. The pointer is soldered in place on the drive cable.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil. Advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

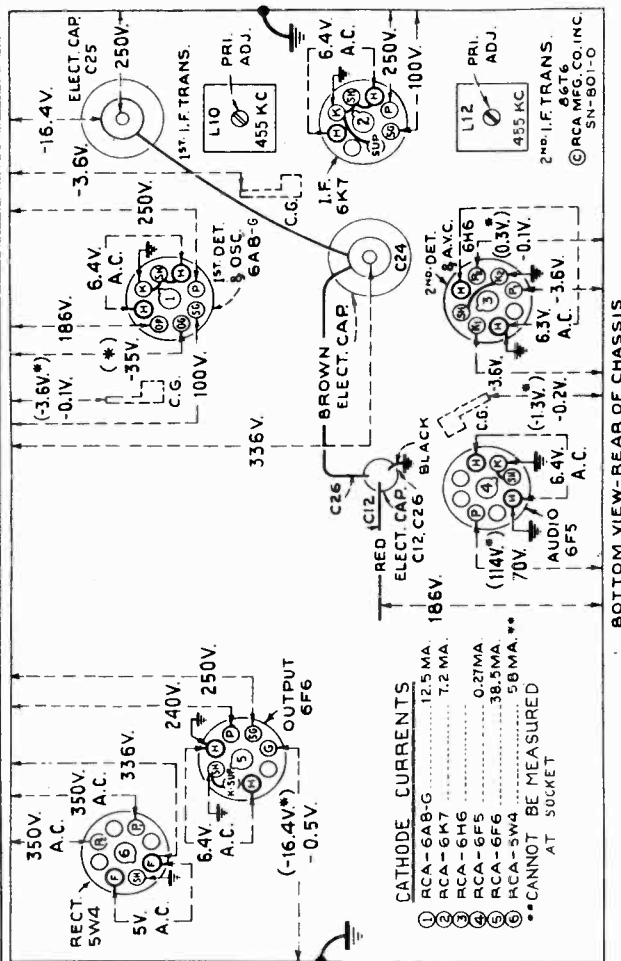


Figure 1—Radiotron Socket Voltages and Trimmer Locations

Measured at 117 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—No signal being received—Volume control minimum—Tone control optional

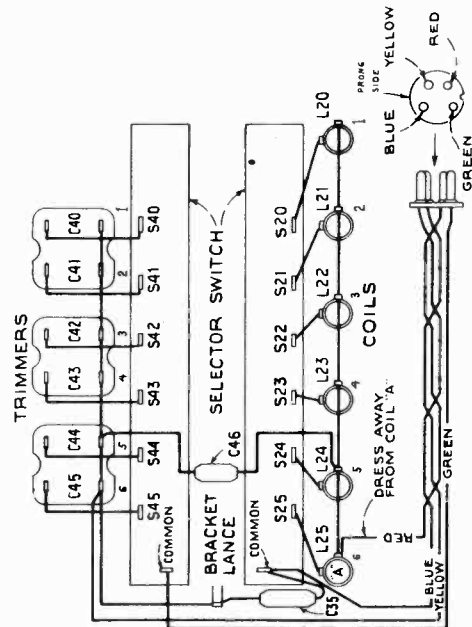


Figure 3—Wiring Diagram of Electric Tuning Unit

MODEL 86T6  
Alignment  
Parts

RCA MFG. CO., INC.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	455 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L12 and L13	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	455 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L10 and L11	Max. (peak)
3	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6.0 mc	"B" Osc.	C11	Max. (peak)*
4	Ant. Term.	300 Ohms	6,000 kc	"B"	6.0 mc	"B" Ant.	C2	Max. (peak)†
5	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20.0 mc	"C" Osc.	C7	Max. (peak)‡
6	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L8	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L8	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C10	Max. (peak)
10	Set up electric tuning as outlined under "Adjustments for Electric Tuning."							

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

† After this adjustment, check for image signal by shifting receiver dial to 5.00 mc.

‡ Use maximum capacity peak if two peaks can be obtained. After this adjustment, check for image signal by shifting receiver dial to 20.91 mc.

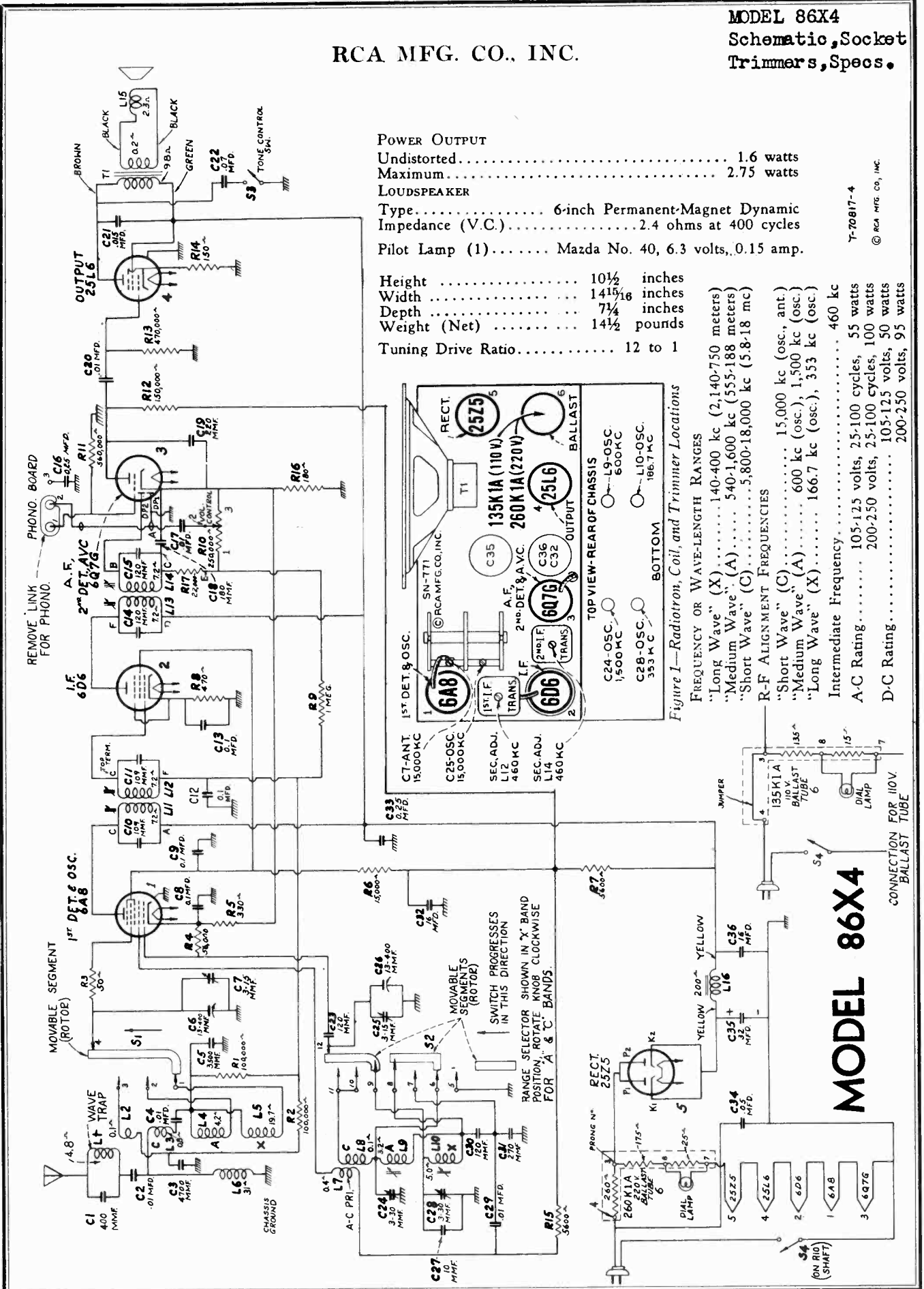
Note that the heterodyne oscillator tracks above the signal frequency on bands "A" and "B," and below the signal frequency on band "C."

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
14380	RECEIVER ASSEMBLIES		14340	Shaft—Drive pulley and knob shaft—fastens on range switch shaft	.40
14352	Arm—Hub and arm for operating band indicator shutter—fastens on range switch shaft	.30	12008	Shield—I.F. transformer shield can	.40
13216	Belt—Station selector drive belt	.14	11196	Socket—8-contact Radiotron socket	.25
12717	Board—Antenna and ground terminal board	.22	31027	Socket—4-contact female socket for electric tuning unit cable plug	.20
12607	Cap—Phonograph terminal board	.25	14114	Socket—Dial-lamp socket	.25
12581	Cap—Top shield cap for first I.F. transformer	.20	12007	Spring—Retaining spring for core, Stock No. 12006	.02
11350	Cap—Grid contact cap	.25	30585	Spring—Tension spring for pointer cord	.06
12752	Capacitor—56 Mmfd. (C5)	.25	30588	Spring—Tension spring for idler pulley	.07
14204	Capacitor—110 Mmfd. (C14, C15)	.30	31025	Switch—Range switch (S1, S2, S3, S4)	1.40
14104	Capacitor—120 Mmfd. (C17, C28)	.30	30574	Tone control and power switch (R18, S5)	1.50
12488	Capacitor—250 Mmfd. (C19)	.25	14376	Transformer—First I.F. transformer (L10, L11, C14, C15)	2.45
30433	Capacitor—170 Mmfd. (C10)	.30	14308	Transformer—Second I.F. transformer (L12, L13, C16, C17, C28, R7)	2.90
30592	Capacitor—1,600 Mmfd. (C8)	.35	30571	T-25-60 ohm-imp. Power transformer, 105-125 volts, 25-60 cycle (T1)	9.50
30303	Capacitor—0.035 Mfd. (C1)	.25	30677	Transformer—Power transformer, 105-125 and 200-250 volts, 50-60 cycle (T1)	7.25
4838	Capacitor—0.05 Mfd. (C23, C31)	.25	30575	Volume Control (R8)	1.00
14393	Capacitor—0.1 Mfd. (C20, C32)	.30		REPRODUCER ASSEMBLIES	
4858	Capacitor—0.1 Mfd. (C36)	.25	13677	Cone—Reproducer cone and dust cap (for speaker marked 84091-3) (L14)	1.75
4870	Capacitor—0.025 Mfd. (C30)	.20	14934	Cone—Reproducer cone and dust cap (for speaker marked 84091-2 or 84001-6) (L14)	2.00
4839	Capacitor—0.1 Mfd. (C16, C17)	.30	14613	Reproducer complete (marked 84001-3 or 6 but interchangeable with speaker marked 84091-1 or 2)	5.75
12484	Capacitor—0.25 Mfd. (C13)	.30	14615	Transformer—Output transformer (for speaker marked 84091-1 or 84001-3) (T2)	1.90
11203	Capacitor—10 Mfd. (C24)	1.15	14935	Transformer—Output transformer (for speaker marked 84091-2 or 84001-6) (T2)	1.75
30577	Capacitor Pack—Comprising two sections each 10 Mfd. (C12, C26)	1.60		MISCELLANEOUS ASSEMBLIES	
5212	Capacitor—18 Mfd. (C25)	1.35	30981	Button—Push button for electric tuning switch (C44, C45)	.10
4358	Clamp—Mounting clamp for capacitor pack, Stock No. 30577	.15	31029	Capacitor—Adjustable trimmer 15-150 Mmfd. (C42, C43)	.40
30578	Coil—Antenna coil (L1, L2, L3)	1.35	30764	Capacitor—Adjustable trimmer 65-280 Mmfd. (C40, C41)	.45
30576	Coil—Oscillator coil (L4, L5, L6, L7, L8, L9)	1.40	31032	Capacitor—105 Mmfd. (C35)	.50
30573	Condenser—gang variable tuning, condenser (C2, C3, C6)	3.90	13762	Capacitor—1,500 Mmfd. (C46)	.80
30580	Condenser—10 gang mica trimmer—two sections (C7, C10, C11), one section 3-30 Mmfd. (C1)	5.55	30747	Coil—Electric tuning oscillator coil (L24, L25)	.35
30586	Core—Adjustable core and stud for oscillator coil	.37	30748	Coil—Electric tuning oscillator coil (L22, L23)	.60
12800	Core—Adjustable core and stud for oscillator coil	.35	30749	Coil—Electric tuning oscillator coil (L20, L21)	.60
12006	Core—Adjustable core and stud for I.F. transformer	.65	30646	Core—Adjustable core and stud for electric tuning oscillator coils	.30
30588	Dial—Station-selector dial scale	.15	31095	Discs—10 celluloid protector discs for call letter markers	.10
31028	Disc—Band indicator disc, complete with operating hub and arm, and connecting link	1.15	30593	Equip. Station selector knob	1.25
30572	Drive—Vernier drive shaft and pinion gear for variable condenser	.75	14359	Knob—Station selector knob	.20
30584	Drum—Station-selector drive-cord drum with set screws	.60	14269	Knob—Tone control, volume control, or range switch knob	.20
30583	Indicator—Station-selector indicator pointer and holder assembly	.15	31028	Marker—Station call letter markers for electric tuning push buttons	.40
5296	Lamp—Dial lamp	.17	30550	Plug—4-prong male plug for electric tuning unit cable	.20
10826	Pulley—Drive-belt pulley for condenser shaft	.45	14267	Screw—Chassis-mounting screw and washer assembly	.07
14525	Resistor—22 ohms, carbon type, ½ watt (R13)	.20	14270	Spring—Retaining spring for knob, Stock No. 14269	.05
30550	Resistor—28 ohms, carbon type, ½ watt (R19)	.20	4982	Spring—Retaining spring for knob, Stock No. 14359	.05
30771	Resistor—50 ohms, flexible type, 1/10 watt (R20)	.20	12007	Spring—Retaining spring for core, Stock No. 30846	.02
30591	Resistor—220 ohms, insulated wire wound, 1/1 watt (R12)	.20	31030	Switch—Electric tuning station selector switch with push buttons (S20, S21, S22, S23, S24, S25, S30, S31, S32, S33, S34, S35)	3.00
11298	Resistor—6,600 ohms, carbon type, 1 watt (R5)	.22			
14559	Resistor—10,000 ohms, insulated, ½ watt (R17)	.20			
30151	Resistor—18,000 ohms, insulated, 1 watt (R3)	.22			
14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R7)	.15			
12454	Resistor—33,000 ohms, insulated, ½ watt (R1)	.20			
11323	Resistor—370,000 ohms, carbon type, 1 watt (R10)	.20			
13005	Resistor—390,000 ohms, carbon type, 1/10 watt (R11)	.15			
11452	Resistor—470,000 ohms, carbon type, 1/10 watt (R2)	.15			
12670	Resistor—2.2 meg., insulated, ½ watt (R4, R9)	.20			
14887	Retainer—Band-indicator disc retainer	.01			
14343	Ring—Retaining ring on range switch shaft	.01			
14350	Screw—No. 8-32 ring on square-head set screw for drum, Stock No. 30587	.03			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODEL 86X4  
Schematic, Socket  
Trimmers, Specs.



POWER OUTPUT

Undistorted..... 1.6 watts  
Maximum..... 2.75 watts

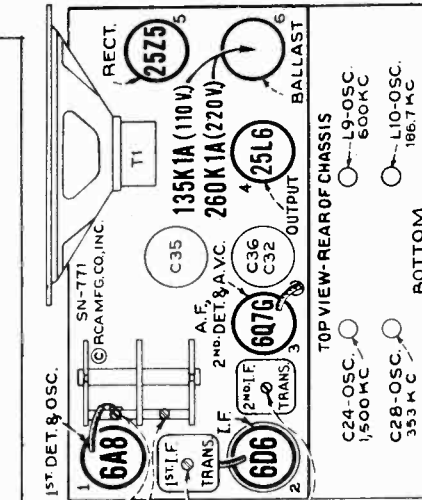
LOUDSPEAKER

Type..... 6-inch Permanent-Magnet Dynamic  
Impedance (V.C.)..... 2.4 ohms at 400 cycles  
Pilot Lamp (1)..... Mazda No. 40, 6.3 volts, .015 amp.

Height..... 10 1/2 inches  
Width..... 14 1/2 inches  
Depth..... 7 1/4 inches  
Weight (Net)..... 14 1/2 pounds  
Tuning Drive Ratio..... 12 to 1

FREQUENCY OR WAVE-LENGTH RANGES  
"Long Wave" (X)..... 140-400 kc (2,140-750 meters)  
"Medium Wave" (A)..... 540-1,600 kc (555-188 meters)  
"Short Wave" (C)..... 5,800-18,000 kc (5.8-18 mc)  
R-F ALIGNMENT FREQUENCIES  
"Short Wave" (C)..... 15,000 kc (osc., ant.)  
"Medium Wave" (A)..... 600 kc (osc.), 1,500 kc (osc.)  
"Long Wave" (X)..... 166.7 kc (osc.), 353 kc (osc.)  
Intermediate Frequency..... 460 kc  
A-C Rating..... 105-125 volts, 25-100 cycles, 55 watts  
200-250 volts, 25-100 cycles, 100 watts  
D-C Rating..... 105-125 volts, 50 watts  
200-250 volts, 95 watts

Figure 1—Rotator, Coil, and Trimmer Locations

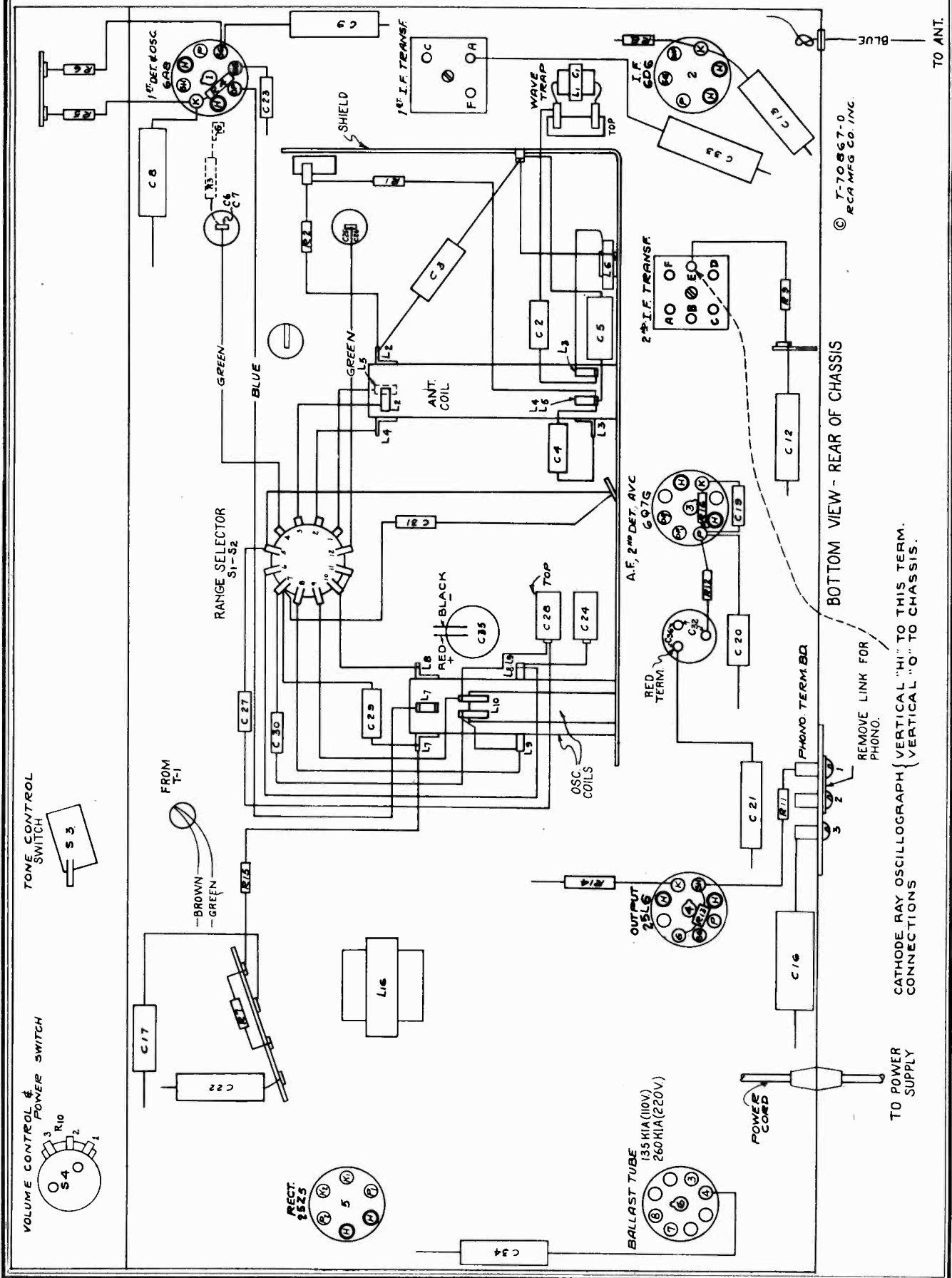


MODEL 86X4

CONNECTION FOR 110V. BALLAST TUBE

MODEL 86X4  
Chassis Wiring

RCA MFG. CO., INC.



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BOTTOM VIEW - REAR OF CHASSIS

REMOVE LINK FOR  
PHONO.

CATHODE RAY OSCILLOGRAPH  
CONNECTIONS  
{ VERTICAL "HI" TO THIS TERM.  
VERTICAL "O" TO CHASSIS.

Phono. Attachment  
Data

RCA MFG. CO., INC.

MODEL 86X4  
Alignment  
Lead Dress

## Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the center horizontal line with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc (400-550 meters) where no signal or interference is received from a station or local (heterodyne) oscillator.

Conversion of kilocycles (kc) to meters for alignment frequencies is as follows: 15,000 kc (20 mc) = 20 meters; 1,500 kc = 200 meters; 600 kc = 500 meters; 460 kc = 652 meters; 353 kc = 850 meters; and 166.7 kc = 1,800 meters.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6D6 I-F Grid Cap	.001 Mfd.	460 kc	"A" Center	No Signal 550-750 kc (400-550 meters)	2nd I-F Trans.	L13 and L14	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	"A" Center	No Signal 550-750 kc (400-550 meters)	1st I-F Trans.	L11 and L12	Max. (peak)
3	Ant. Lead (blue)	300 Ohms	15,000 kc (20 meters)	"C" Right	15 mc	"C" Osc.	C25	Max. (peak)†
4	Ant. Lead (blue)	300 Ohms	15,000 kc (20 meters)	"C" Right	Rock Through 15 mc	"C" Ant.	C7	Max. (peak)*
5	Ant. Lead (blue)	200 Mmfd.	600 kc (500 meters)	"A" Center	600 kc (500 meters)	"A" L-F Osc.	L9	Max. (peak)‡
6	Ant. Lead (blue)	200 Mmfd.	1,500 kc (200 meters)	"A" Center	1,500 kc (200 meters)	"A" H-F Osc.	C24	Max. (peak)
7	Ant. Lead (blue)	200 Mmfd.	600 kc (500 meters)	"A" Center	600 kc (500 meters)	"A" L-F Osc.	L9	Max. (peak)
8	Ant. Lead (blue)	200 Mmfd.	1,500 kc (200 meters)	"A" Center	1,500 kc (200 meters)	"A" H-F Osc.	C24	Max. (peak)
9	Ant. Lead (blue)	200 Mmfd.	166.7 kc (1,800 meters)	"X" Left	166.7 kc (1,800 meters)	"X" L-F Osc.	L10	Max. (peak)
10	Ant. Lead (blue)	200 Mmfd.	353 kc (850 meters)	"X" Left	353 kc (850 meters)	"X" H-F Osc.	C28	Max. (peak)
11	Ant. Lead (blue)	200 Mmfd.	166.7 kc (1,800 meters)	"X" Left	166.7 kc (1,800 meters)	"X" L-F Osc.	L10	Max. (peak)
12	Ant. Lead (blue)	200 Mmfd.	353 kc (850 meters)	"X" Left	353 kc (850 meters)	"X" H-F Osc.	C28	Max. (peak)

† Use maximum capacity peak if two peaks can be obtained.

\* Use minimum capacity peak if two peaks can be obtained. After this adjustment, check for image signal by shifting receiver dial to 15,920 kc.

‡ "X" H-F Osc. trimmer C28 must be at least three turns out during this adjustment.

**Precautionary Lead Dress.**—(1) All bus leads in r-f assembly should be kept as short as possible. When necessary to replace bus leads, use only wire having same diameter. (2) Dress capacitor, connected from tone-control switch to terminal board, away from capacitor, connected to center terminal of volume control, and away from exposed green shielded lead running to phono. term. board. (3) Dress green lead, connected from volume control to 2nd i-f transformer, as close to chassis as possible. (4) Dress capacitor, connected from 25L6 socket to red lug on electrolytic-capacitor, away from phono. term. board. (5) Brown and green leads from speaker must be twisted, dressed along chassis and away from exposed green shielded lead and lug running to phono. term. board. (6) Dress green lead, connected between 6A8 and 6D6 sockets, away from pin No. 5 of 6A8 socket.

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Open link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch.

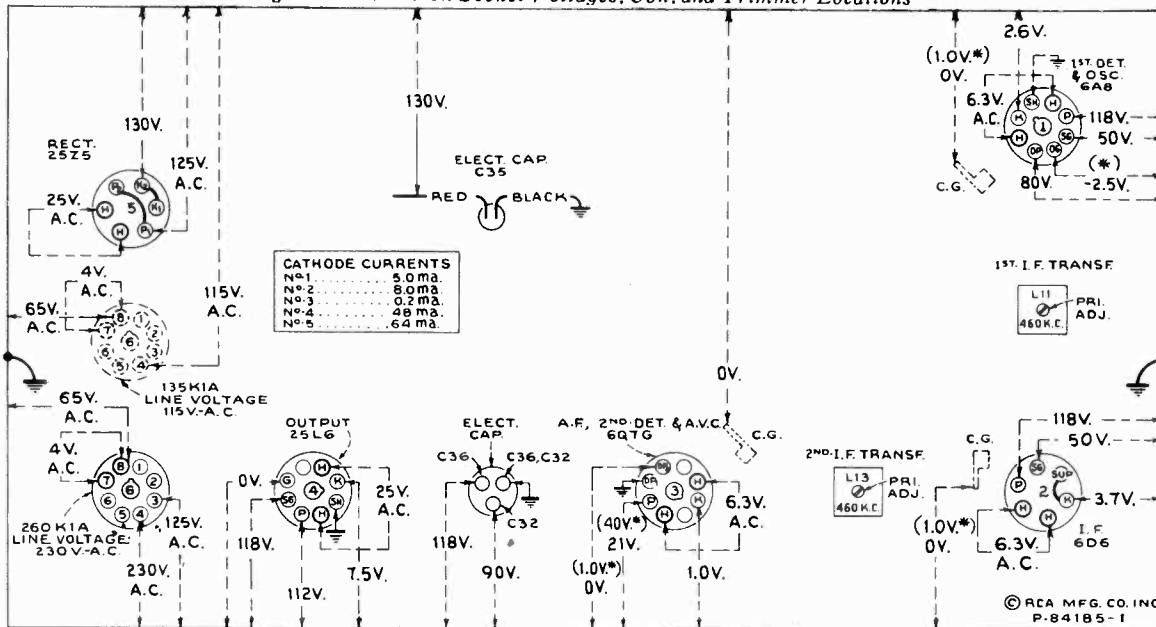
**CAUTION:** Disconnect receiver power cord before making phonograph connections. Tape shield extension on Radio-Record cable so it cannot make metallic connection with receiver chassis ground.



MODEL 86X4  
Voltage, Trimmers  
Parts

RCA MFG. CO., INC.

Figure 2—Radiotron Socket Voltages, Coil, and Trimmer Locations



Measured at 230 volts, 60 cycle supply; or 115 volts, 60 cycle supply—For 230 volts d-c, voltages are same—For 115 volts d-c, all voltages except line and heaters about 20% lower—Tuned to approximately 1,000 kc (300 meters) "Medium Wave"—No signal being received—Volume control minimum—Tone control optional.

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

RECEIVER ASSEMBLIES

- 14634 Belt—Variable condenser drive belt
- 14632 Bracket—Dial mounting bracket
- 5237 Bushing—Variable condenser rubber mounting
- 11350 Cap—Small grid-contact cap
- 30295 Capacitor—Adjustable dual trimmer (C24, C28)
- 13200 Capacitor—10 Mmfd. (C27)
- 14262 Capacitor—109 Mmfd. (C10, C11)
- 12404 Capacitor—120 Mmfd. (C14, C15)
- 12724 Capacitor—120 Mmfd. (C23, C30)
- 12406 Capacitor—180 Mmfd. (C18)
- 12694 Capacitor—220 Mmfd. (C19)
- 30302 Capacitor—270 Mmfd. (C31)
- 30303 Capacitor—0035 Mfd. (C5)
- 30304 Capacitor—0047 Mfd. (C3)
- 4858 Capacitor—01 Mfd. (C2)
- 14393 Capacitor—01 Mfd. (C4, C17, C20, C29)
- 11315 Capacitor—015 Mfd. (C21)
- 4886 Capacitor—05 Mfd. (C34)
- 14626 Capacitor—07 Mfd. (C22)
- 4839 Capacitor—0.1 Mfd. (C8, C9, C12, C13)
- 12484 Capacitor—0.25 Mfd. (C16)
- 4840 Capacitor—0.25 Mfd. (C33)
- 30298 Capacitor Pack—Comprising 2 sections each 16 Mfd. (C32, C36)
- 30297 Capacitor—32 Mfd. (C35)
- 30292 Coil—Antenna coil—X, A, and C bands (L2, L3, L4, L5)
- 30293 Coil—Oscillator coil—A and C Bands only (L7, L8, L9)
- 30294 Coil—Oscillator coil—X band only (L10)
- 30296 Coil—Choke coil (L6)
- 14633 Condenser—2-gang variable tuning condenser (C6, C7, C25, C26)
- 14648 Core—Adjustable core and stud for coil, Stock No. 30293
- 12664 Core—Adjustable core and stud for coil, Stock No. 30294
- 12006 Core—Adjustable core and stud for i-f transformers
- 30289 Dial—Station selector dial scale and holder (for European use only)
- 30397 Dial—Station selector dial scale and holder (for other than European use)
- 14651 Drive—Variable condenser vernier drive and pinion gear
- 30290 Indicator—Station selector indicator pointer
- 4340 Lamp—Dial lamp
- 14636 Pulley—Drive belt idler pulley—less spring
- 14639 Pulley—Variable condenser drive pulley—located on condenser shaft
- 14641 Reactor—Filter reactor (L16)
- 30300 Resistor—Ballast resistor tube, type 260K-1A, for 220-volt operation
- MI-8115 Resistor—Ballast resistor tube, type 135K-1A, for 110-volt operation

- 14653 Resistor—50 ohms, flexible type, 1/10 watt (R3)
- 30301 Resistor—150 ohms, carbon type, 1/2 watt (R14)
- 30545 Resistor—180 ohms, insulated, 1/2 watt (R16)
- 13250 Resistor—330 ohms, carbon type, 1/2 watt (R5)
- 30546 Resistor—470 ohms, insulated, 1/2 watt (R8)
- 13714 Resistor—5,600 ohms, insulated, 1/2 watt (R7, R15)
- 3998 Resistor—15,000 ohms, carbon type, 1/2 watt (R6)
- 14284 Resistor—22,000 ohms, carbon type, 1/10 watt (R17)
- 12286 Resistor—56,000 ohms, insulated, 1/2 watt (R4)
- 5145 Resistor—100,000 ohms, carbon type, 1/2 watt (R1, R2)
- 5027 Resistor—150,000 ohms, carbon type, 1/2 watt (R12)
- 12285 Resistor—470,000 ohms, insulated, 1/2 watt (R13)
- 0035 Resistor—560,000 ohms, carbon type, 1/2 watt (R11)
- 13730 Resistor—1 megohm, carbon type, 1/2 watt (R9)
- 4389 Screw—No. 6-32 x 3/16-inch headless set-screw for drive pulley, Stock No. 14639
- 14638 Shaft—Station selector knob shaft and pulley
- 12008 Shield—I-F transformer shield can
- 12581 Shield—I-F transformer shield cap
- 11265 Shield—Radiotron shield
- 4786 Socket—6-contact 6D6 or 25Z5 Radiotron socket
- 11196 Socket—8-contact 6AB, 6Q7G, 25L6 Radiotron or ballast resistor tube socket
- 14650 Socket—Dial lamp socket
- 14637 Spring—Idler pulley tension spring
- 12007 Spring—Retaining spring for core, Stock Nos. 14648, 12664 and 12006
- 30291 Switch—Range switch (S1, S2)
- 30299 Switch—Tone control switch (S3)
- 14376 Transformer—First I-F transformer (L11, L12, C10, C11)
- 14308 Transformer—Second I-F transformer (L13, L14, C14, C15, C18, R17)
- 13838 Trap—Wave trap (L1, C1)
- 14645 Volume control and power switch (R10, S4)

REPRODUCER ASSEMBLIES  
(Speaker No. 84106-1)

- 30306 Cone—Reproducer cone, complete, centered in metal cone housing—less transformer (L15)
- 30305 Reproducer, complete
- 30307 Transformer—Output transformer (T1)

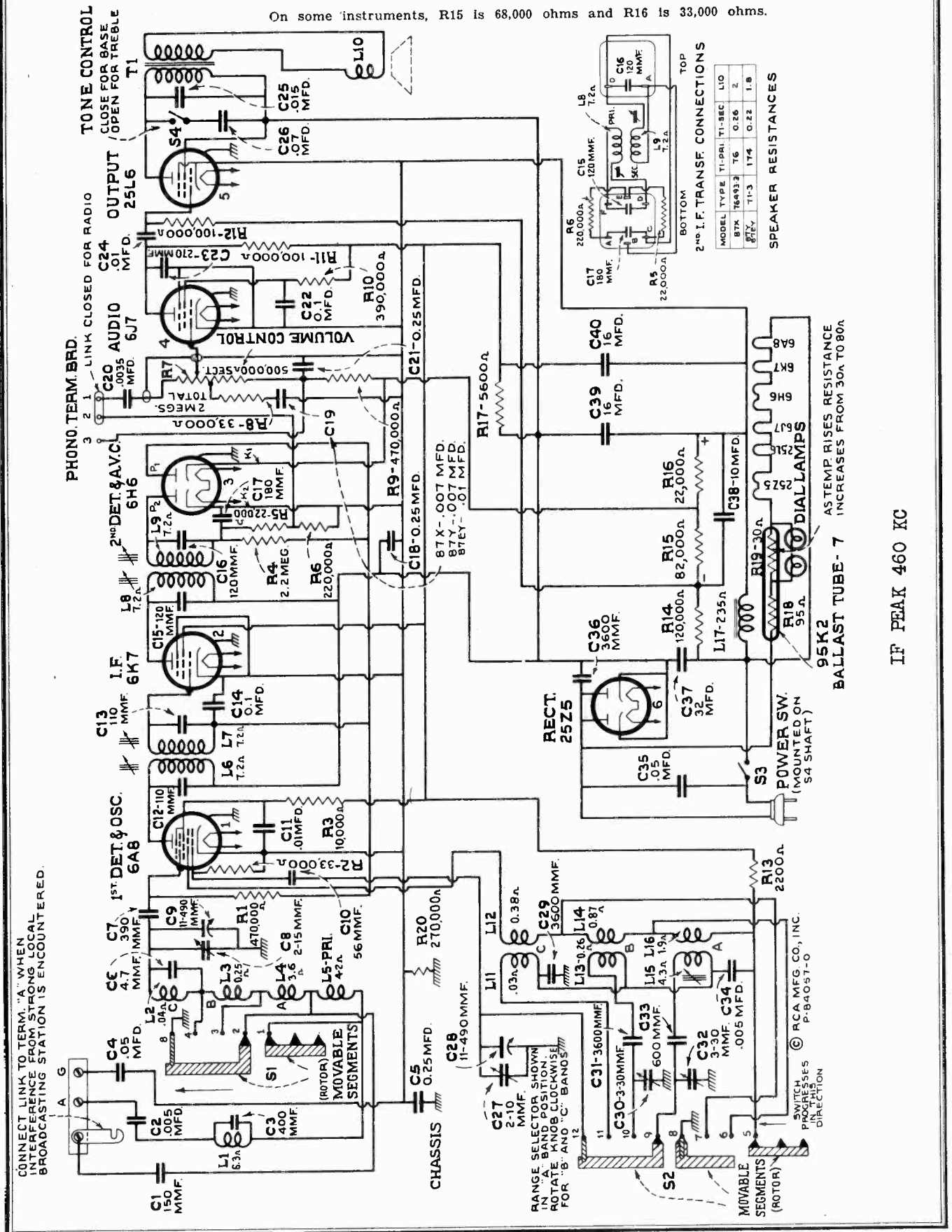
MISCELLANEOUS ASSEMBLIES

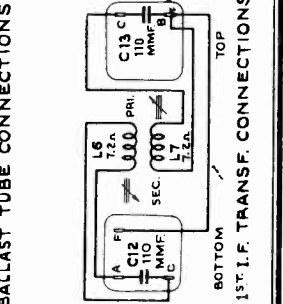
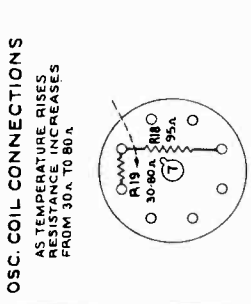
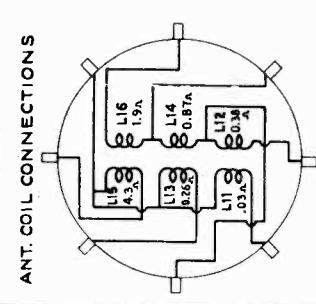
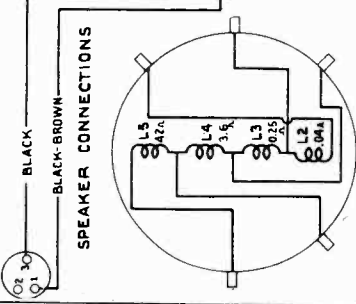
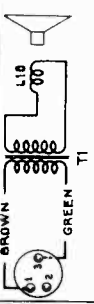
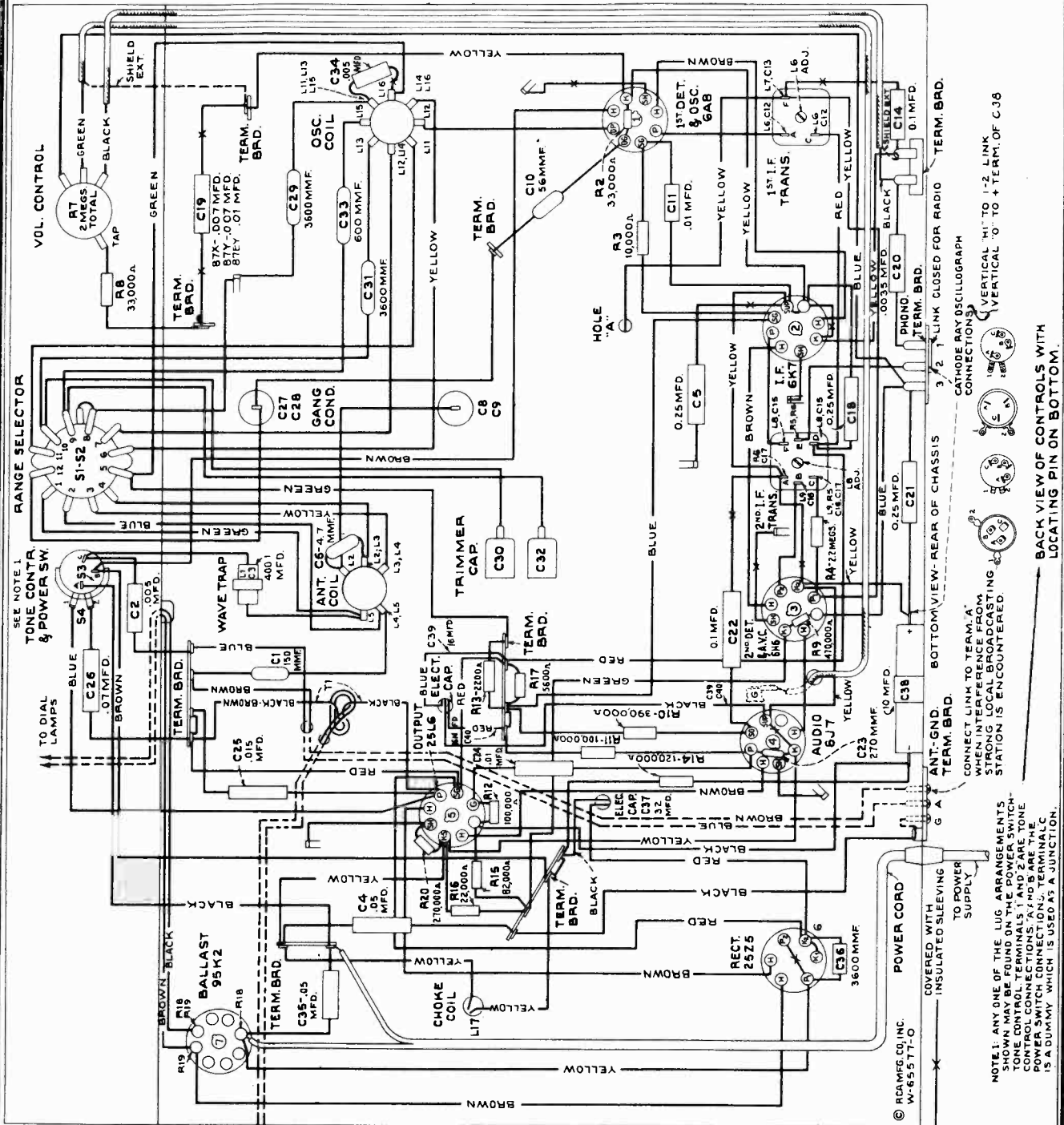
- 14654 Escutcheon—Station selector escutcheon and crystal
- 30373 Knob—Range switch knob
- 12673 Knob—Station selector, volume control or tone control knob
- 30308 Screw—Chassis mounting screw and washer assembly
- 4119 Screw—No. 8-32 x 1/4-inch headless cup-point set-screw for knob, Stock Nos. 12673 and 30373

RCA MFG. CO., INC.

MODELS 87EY, 87X, 87Y  
Schematic

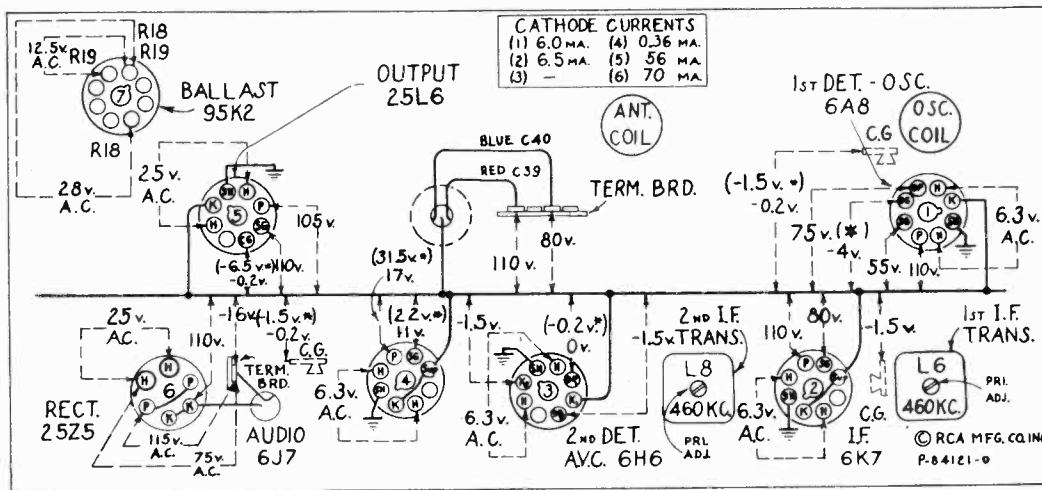
On some instruments, R15 is 68,000 ohms and R16 is 33,000 ohms.





RCA MFG. CO., INC.

MODELS 87EY, 87X, 87Y  
Socket, Trimmers  
Voltage, Alignment  
Lead Dress



BOTTOM VIEW - REAR OF CHASSIS

**Precautionary Lead Dress.**—(1) Dress power cord away from audio circuits. (2) Keep filament leads away from C24. (3) Keep bus lead from term. 8 of S1-S2 to ground lance as short as possible. (4) Bus lead from term. 12 of S1-S2 to C27-C28 thence to C10 should be 4 7/8 inches long. (5) Bus lead from term. 4 of S1-S2 to L2-L3 should be 2 1/2 inches long. (6) Bus lead from L2 to C8-C9 should be 3 7/8 inches long and dressed over bus lead from antenna coil to range switch. (7) Bus lead from term. 7 of S1-S2 to L12-L14 should be 2 3/4 inches long. (8) Keep bus lead from term. E of 2nd i-f trans. to term. 2 on phono. board as short as possible. (9) Keep leads of C10, C29, and C34 as short as possible. When replacing bus leads, use only wire having same diameter as original.

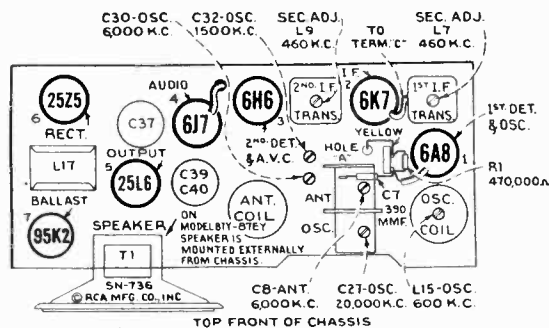


Figure 1—Radiotron, Coil, and Trimmer Locations

### Alignment Procedure

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is highly preferable; the connections to the receiver circuits are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the positive (+) side of C38 (same point as "low" vertical input to cathode-ray oscillograph) for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L8 and L9	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L6 and L7	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C27	Max. (peak)* ‡
4	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C30	Max. (peak)*
5	Ant. Term.	300 Ohms	6,000 kc	"B"	6,000 kc	"B" Ant.	C8	Max. (peak)
6	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L15	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C32	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L15	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C32	Max. (peak)

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

‡After this adjustment, check for image signal by shifting receiver dial to 19.080 kc.

Measured at 115 volts, 60-cycle supply—For 115-volt d-c supply approximately 10% lower, except heater voltage which remains the same—Tuned to approximately 1,000 kc ("Standard Broadcast")—No signal being received—Volume control minimum.

MODELS 87EY, 87X, 87Y  
Specs., Phono., Parts

RCA MFG. CO., INC.

## Electrical Specifications

### FREQUENCY RANGES

"Broadcast" (A)..... 530-1,720 kc  
"Medium Wave" (B)..... 2,100-6,800 kc  
"Short Wave" (C)..... 6,800-22,000 kc  
Intermediate Frequency .....

### R-F ALIGNMENT FREQUENCIES

"Short Wave" (C)..... 20,000 kc (osc.)  
"Medium Wave" (B)..... 6,000 kc (osc., ant.)  
"Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)  
..... 460 kc

### RADIOTRON COMPLEMENT

(1) RCA-6A8..... First Detector—Oscillator  
(2) RCA-6K7..... Intermediate Amplifier  
(3) RCA-6H6..... Second Detector and A.V.C.  
(4) RCA-6J7..... Audio Voltage Amplifier  
Pilot Lamps (2).....

(5) RCA-25L6..... Audio Power Output  
(6) RCA-25Z5..... Half-Wave Rectifier  
(7) RCA-95K2..... Ballast

Mazda No. 40, 6.3 volts, 0.15 amp.

### POWER SUPPLY RATINGS

A-C Rating..... 105-125 volts, 25-100 cycles, 55 watts  
D-C Rating..... 105-125 volts, 50 watts

### POWER OUTPUT (125-volt, a-c supply)

87EY, 87Y..... 87X  
Undistorted ..... 1.9 watts..... 1.7 watts  
Maximum ..... 3.0 watts..... 2.8 watts

### POWER OUTPUT (125-volt, d-c supply)

87EY, 87Y..... 87X  
Undistorted ..... 1.3 watts..... 1.2 watts  
Maximum ..... 2.1 watts..... 1.9 watts

Loudspeaker (Permanent-Magnet Dynamic)..... Impedance (v.c.) 2.2 ohms at 400 cycles

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-S, R-93-2, or R-94 Record Players should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal

1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch. When employing the R-93-S, the 0.1 mfd. capacitor contained in the R-93-S should be shorted out.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
14380	Arm—Band indicator operating arm and hub—less set screw Stock No. 14350	13718	Resistor—2,200 Ohms—Insulated, 1/2 watt (R13)
14388	Belt—Variable condenser drive belt	11647	Resistor—5,800 Ohms—Carbon type, 1/2 watt (R17)
14623	Board—Antenna and ground terminal board	13736	Resistor—10,000 Ohms—Carbon type, 1/2 watt (R3)
12717	Board—Phonograph terminal board	14284	Resistor—22,000 Ohms—Carbon type, 1/10 watt (R5)
14338	Bushing—Variable condenser mounting bushing and screw assembly	11305	Resistor—22,000 Ohms—Carbon type, 1/2 watt (R16)
12607	Cap—First I-F transformer shield top	12454	Resistor—33,000 Ohms—Insulated, 1/2 watt (R2)
12581	Cap—Second I-F transformer shield top	11300	Resistor—33,000 Ohms—Carbon type, 1/10 watt (R8)
11350	Cap—Grid contact cap	14023	Resistor—82,000 Ohms—Insulated, 1/2 watt (R15)
12110	Cap—Radiotron shield cap	11281	Resistor—100,000 Ohms—Carbon type, 1/10 watt (R12)
14383	Capacitor—Adjustable dual trimmer (C30, C32)	14560	Resistor—100,000 Ohms—Insulated, 1/2 watt (R11)
14392	Capacitor—4.7 Mmfd. (C6)	13734	Resistor—120,000 Ohms—Carbon type, 1/2 watt (R14)
12723	Capacitor—56 Mmfd. (C10)	11398	Resistor—220,000 Ohms—Carbon type, 1/10 watt (R6)
14262	Capacitor—110 Mmfd. (C12, C13)	11323	Resistor—270,000 Ohms—Carbon type, 1/2 watt (R20)
12404	Capacitor—120 Mmfd. (C15, C16)	13479	Resistor—390,000 Ohms—Carbon type, 1/2 watt (R10)
12725	Capacitor—150 Mmfd. (C1)	11452	Resistor—470,000 Ohms—Carbon type, 1/10 watt (R1)
12406	Capacitor—180 Mmfd. (C17)	12285	Resistor—470,000 Ohms—Insulated, 1/2 watt (R9)
14625	Capacitor—270 Mmfd. (C23)	12679	Resistor—2.2 Megohm—Insulated, 1/2 watt (R4)
13894	Capacitor—390 Mmfd. (C7)	30284	Resistor—Ballast resistor tube type No. 95K2 (R18, R19)
14391	Capacitor—600 Mmfd. (C33)	14350	Screw—No. 8-32x3/16 square head set screw for gear Stock No. 30085 and drum Stock No. 14345 and arm Stock No. 14380
12811	Capacitor—3,600 Mmfd. (C29, C31, C36)	14374	Shield—Antenna coil shield
5005	Capacitor—.0035 Mfd. (C20)	12008	Shield—First or Second I.F. transformer shield
4838	Capacitor—.005 Mfd. (C2, C34)	14375	Shield—Oscillator coil shield
5148	Capacitor—.007 Mfd. (C19) (Models 87X and 87Y only)	14171	Socket—Dial lamp socket
13138	Capacitor—.01 Mfd. (C11)	4786	Socket—6-contact 25Z5 Radiotron socket
14393	Capacitor—.01 Mfd. (C19, C24) (C19, .01 Mfd. used in Model 87EY only)	11196	Socket—8-contact 6A8, 6K7, 6J7, 6H6, or 25L6 Radiotron socket
11315	Capacitor—.015 Mfd. (C25)	12007	Spring—Retaining spring for core Stock No. 12006 and Stock No. 12800
4886	Capacitor—.05 Mfd. (C4, C35)	12907	Spring—Tension spring for indicator drive gear Stock No. 30085
14626	Capacitor—.07 Mfd. (C26)	14342	Spring—Tension spring for idler Stock No. 14341
4839	Capacitor—.1 Mfd. (C14, C22)	14370	Switch—Range switch (S1, S2)
12484	Capacitor—.25 Mfd. (C5, C18, C21)	14371	Switch—Tone control switch and power switch (S3, S4)
14624	Capacitor—.10 Mfd. (C38)	14378	Transformer—First I.F. transformer (L6, L7, C12, C13)
14621	Capacitor—.32 Mfd. (C37)	14283	Transformer—Second I.F. transformer (L8, L9, C15, C16, C17, R5, R6)
14622	Capacitor Pack—2 sections each 16 Mfd. (C39, C40)	13838	Trap—Wave trap complete (L1, C3)
14372	Coil—Antenna coil and shield (L2, L3, L4, L5)	14335	Volume Control (R7)
14373	Coil—Oscillator coil and shield (L11, L12, L13, L14, L15, L16)	14379	Washer—Felt washer for indicator pointer
14363	Condenser—2 gang variable tuning condenser (C8, C9, C27, C28)	<b>REPRODUCER ASSEMBLIES</b> MODEL 87X (76493-3)	
5119	Connector—3-contact female connector for reproducer cable	14685	Cone—Reproducer cone (L10)
12800	Core—Adjustable core and stud assembly for coil Stock No. 14373	5118	Plug—3-contact male plug for reproducer
12006	Core—Adjustable core and stud for Stock No. 14378 and Stock No. 14283	14684	Reproducer—Complete
14381	Dial—Station selector dial scale	14686	Transformer—Output transformer (T1)
14389	Dial—Band indicator dial and mounting bracket assembly (Models 87X and 87Y only)	<b>REPRODUCER ASSEMBLIES (RL-71-3)</b> MODEL 87Y and 87EY	
30127	Dial—Band indicator dial and mounting bracket assembly (Model 87EY only)	12667	Cone—Reproducer cone and dust cap
14364	Drive—Variable condenser vernier pinion gear and shaft	5118	Plug—3-contact male plug for reproducer
14345	Drum—Variable condenser drive belt drum complete with set screws	14627	Reproducer—Complete
11982	Fastener—Station selector dial scale fastener	14628	Transformer—Output transformer (T1)
30085	Gear—Indicator drive gear and hub assembly and indicator pointer stem and gear assembly complete	<b>MISCELLANEOUS ASSEMBLIES</b>	
14341	Idler—Station selector drive belt idler	14396	Escutcheon—Station selector escutcheon and crystal
14344	Indicator—Station selector indicator pointer	14359	Knob—Station selector knob
14382	Indicator—Vernier indicator pointer	14259	Knob—Volume control, tone control or range switch knob
4340	Lamp—Dial lamp	4560	Screw—Chassis mounting screw and washer assembly (Model 87EY only)
14340	Pulley—Station selector drive belt pulley and knob shaft	11210	Screw—Chassis mounting screw and washer assembly (Model 87Y only)
14620	Reactor—Filter reactor (L17)	11377	Screw—Chassis mounting screw and washer assembly (Model 87X only)
14361	Reflector—Dial reflector and lamp bracket assembly	4982	Spring—Retaining spring for knob Stock No. 14359
14343	Retainer—Drive shaft and pulley retainer—holds tuning knob shaft and pulley on range switch shaft	14270	Spring—Retaining spring for knob Stock No. 14269



RCA MFG. CO., INC.

MODEL 87K1 Schematic

Pilot Lamps (3)..... Mazda No. 46, 6.3 volts, 0.25 ampere

POWER SUPPLY RATINGS

Rating A..... 105-125 volts, 50-60 cycles, 80 watts
Rating B..... 105-125 volts, 25-60 cycles, 80 watts
Rating C..... 105-125/200-250 volts, 50-60 cycles, 80 watts

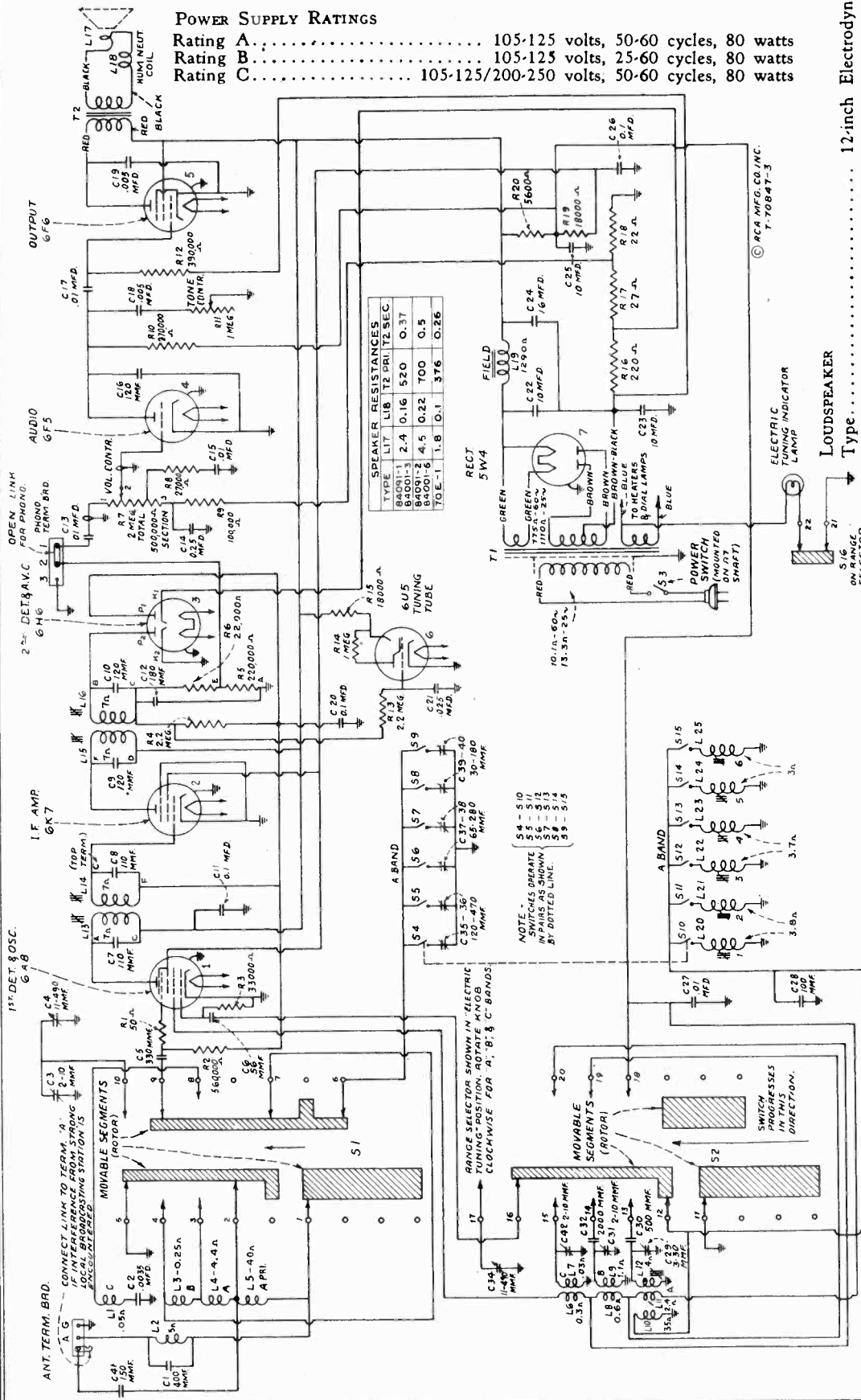


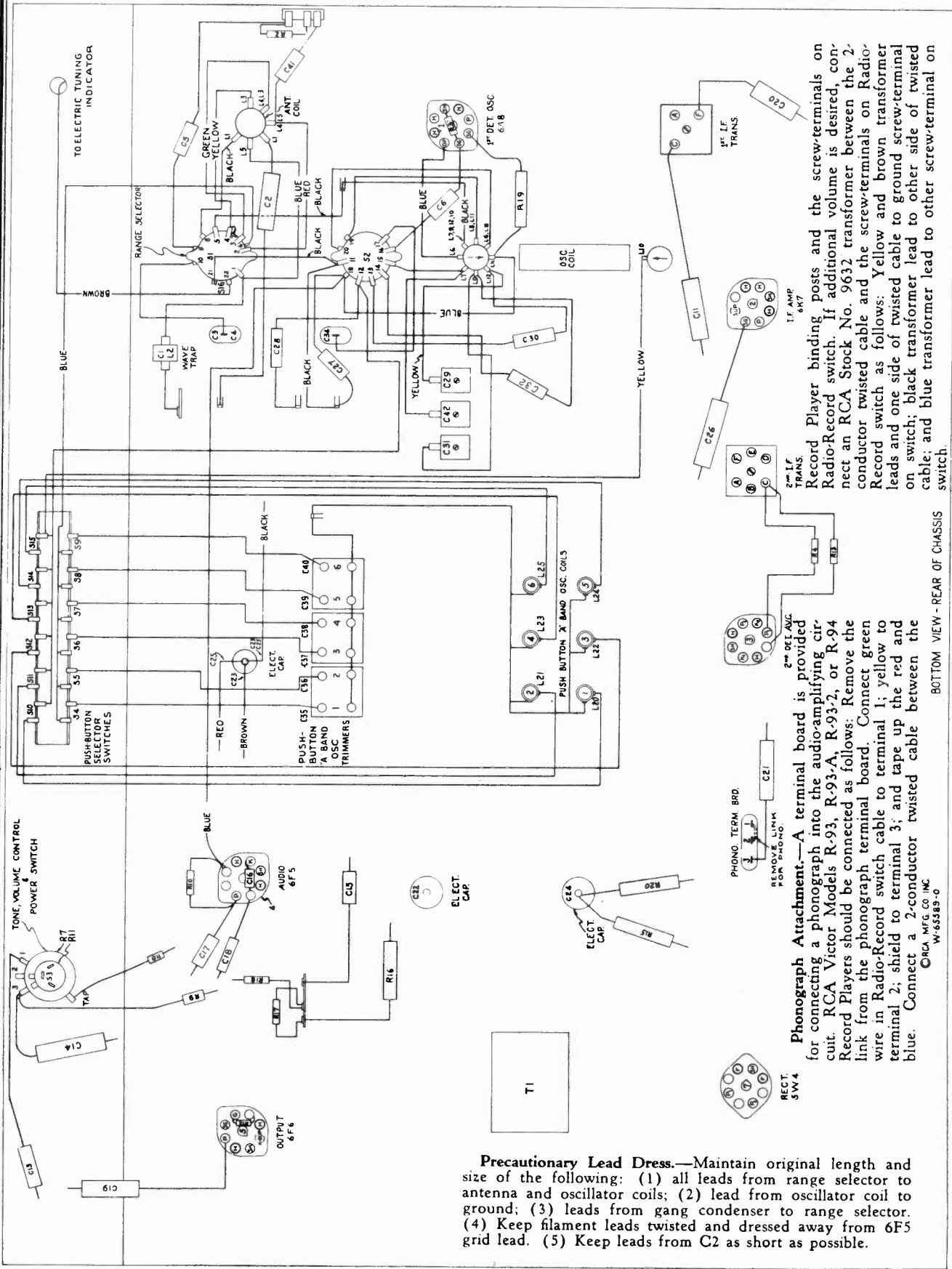
Table with 4 columns: TYPE, LIT, T2 PRITS/SEC, and values for various tube types like 84091-1, 84091-2, 84001-6, and TOE-1.

Figure 3—Schematic Circuit Diagram
Stock No. 13477 Resistor, 27,000 ohms replaces R19 on later production.

- Frequency Ranges: Standard Broadcast (A) 540-1,720 kc, Medium Wave (B) 2,300-7,500 kc, Short Wave (C) 7,500-22,000 kc.
R-F Alignment Frequencies: Medium Wave (B) 6,000 kc, Short Wave (C) 20,000 kc, Standard Broadcast (A) 600 kc.
Intermediate Frequency: 460 kc.

MODEL 87K1  
Chassis Wiring  
Lead Dress, Phono.

RCA MFG. CO., INC.



Record Player binding posts and the screw-terminals on Radio-Record switch. If additional volume is desired, connect an RCA Stock No. 9632 transformer between the 2-conductor twisted cable and the screw-terminals on Radio-Record switch as follows: Yellow and brown transformer leads and one side of twisted cable to ground screw-terminal on switch; black transformer lead to other side of twisted cable; and blue transformer lead to other screw-terminal on switch.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove the link from the phonograph terminal board. Connect green wire in Radio-Record switch cable to terminal 1; yellow to terminal 2; shield to terminal 3; and tape up the red and blue. Connect a 2-conductor twisted cable between the

**Precautionary Lead Dress.**—Maintain original length and size of the following: (1) all leads from range selector to antenna and oscillator coils; (2) lead from oscillator coil to ground; (3) leads from gang condenser to range selector. (4) Keep filament leads twisted and dressed away from 6F5 grid lead. (5) Keep leads from C2 as short as possible.



MODEL 87K1

Alignment  
Parts

RCA MFG. CO., INC.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency-Setting					
1	8K7 I-F Grid Cap	.001 Mfd.	460 kc	"Standard Broadcast"	No Signal 550-750 kc	2nd I-F Trans.	L15 and L16	Max. (peak)
2	6A8 Det. Grid Cap	.001 Mfd.	460 kc	"Standard Broadcast"	No Signal 550-750 kc	1st I-F Trans.	L13 and L14	Max. (peak)
3	Ant. Term. A	300 Ohms	6,000 kc	"Medium Wave"	6 mc	"B" Osc.	C31	Max. (peak)
4	Ant. Term. A	300 Ohms	6,000 kc	"Medium Wave"	6 mc	"B" Ant.	C3	Max. (peak)
5	Ant. Term. A	300 Ohms	20,000 kc	"Short Wave"	20 mc	"C" Osc.	C42	Max. (peak)*
6	Ant. Term. A	200 Mmfd.	600 kc	"Standard Broadcast"	600 kc	"A" L-F Osc.	L12	Max. (peak)
7	Ant. Term. A	200 Mmfd.	1,500 kc	"Standard Broadcast"	1,500 kc	"A" H-F Osc.	C29	Max. (peak)
8	Ant. Term. A	200 Mmfd.	600 kc	"Standard Broadcast"	600 kc	"A" L-F Osc.	L10	Max. (peak)
9	Ant. Term. A	200 Mmfd.	1,500 kc	"Standard Broadcast"	1,500 kc	"A" H-F Osc.	C29	Max. (peak)
10	Connect an antenna to receiver Ant. Term. A. See Electric Tuning Alignment described below.		540-1,160 kc	"Electric Tuning"	540-1,160 kc	"A" Osc. 1 & Ant. 1	L20 and C35	Min. Eye
11			540-1,160 kc	"Electric Tuning"	540-1,160 kc	"A" Osc. 2 & Ant. 2	L21 and C36	Min. Eye
12			600-1,260 kc	"Electric Tuning"	600-1,260 kc	"A" Osc. 3 & Ant. 3	L22 and C37	Min. Eye
13			600-1,260 kc	"Electric Tuning"	600-1,260 kc	"A" Osc. 4 & Ant. 4	L23 and C38	Min. Eye
14			770-1,550 kc	"Electric Tuning"	770-1,550 kc	"A" Osc. 5 & Ant. 5	L24 and C39	Min. Eye
15			770-1,550 kc	"Electric Tuning"	770-1,550 kc	"A" Osc. 6 & Ant. 6	L25 and C40	Min. Eye

\* Use maximum capacity peak if two peaks can be obtained. Check for image signal by shifting receiver dial to 20.92 mc.

Service Data

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambrod upon completion of adjustment.

Electric tuning is accomplished in a simple, trouble-free manner without the use of rotating parts. There are six trimmers for tuning the single antenna coil and six magnetic-core adjusted oscillator coils. A desired station is tuned accurately, quickly, and silently by pressing a push-button which puts the pre-adjusted coil and trimmer into use. Oscillator frequency drift is reduced to a negligible amount by use of a temperature-compensating capacitor across the oscillator coils.

tions. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator. "Min. Eye" means minimum width of dark sector of "Magic Eye" or greatest deflection. For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

REPLACEMENT PARTS

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

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
12233	Resistor—220 ohms, carbon type, 1/2 watt (R16)	12233	Resistor—220 ohms, carbon type, 1/2 watt (R16)
12234	Resistor—18,000 ohms, carbon type, 1/10 watt (R6)	12234	Resistor—18,000 ohms, carbon type, 1/10 watt (R6)
12235	Resistor—22,000 ohms, carbon type, 1/10 watt (R6)	12235	Resistor—22,000 ohms, carbon type, 1/10 watt (R6)
12236	Resistor—37,000 ohms, carbon type, 1/10 watt (R6)	12236	Resistor—37,000 ohms, carbon type, 1/10 watt (R6)
12237	Resistor—100,000 ohms, insulated, 1/2 watt (R9)	12237	Resistor—100,000 ohms, insulated, 1/2 watt (R9)
12238	Resistor—220,000 ohms, carbon type, 1/10 watt (R8)	12238	Resistor—220,000 ohms, carbon type, 1/10 watt (R8)
12239	Resistor—350,000 ohms, insulated, 1/2 watt (R12)	12239	Resistor—350,000 ohms, insulated, 1/2 watt (R12)
12240	Resistor—500,000 ohms, carbon type, 1/10 watt (R2)	12240	Resistor—500,000 ohms, carbon type, 1/10 watt (R2)
12241	Resistor—1 Megohm, carbon type, 1/10 watt (R14)	12241	Resistor—1 Megohm, carbon type, 1/10 watt (R14)
12242	Resistor—2.2 Megohm, insulation coil, 1/2 watt (R4, R15)	12242	Resistor—2.2 Megohm, insulation coil, 1/2 watt (R4, R15)
12243	Socket—3-contact socket for speaker cable	12243	Socket—3-contact socket for speaker cable
12244	Socket—6-contact tuning tube socket	12244	Socket—6-contact tuning tube socket
12245	Socket—Dial lamp socket type	12245	Socket—Dial lamp socket type
12246	Socket—Dial lamp socket—shell type	12246	Socket—Dial lamp socket—shell type
12247	Spring—Band indicator tension spring	12247	Spring—Band indicator tension spring
12248	Spring—Indicator cord tension spring	12248	Spring—Indicator cord tension spring
12249	Switch—Range switch (S1, S2, S16)	12249	Switch—Range switch (S1, S2, S16)
12250	Switch—Tuning push button switch (S4, S5, S6, S7, S8)	12250	Switch—Tuning push button switch (S4, S5, S6, S7, S8)
12251	Transformer—First I-F transformer (L13, L14, C7, C8)	12251	Transformer—First I-F transformer (L13, L14, C7, C8)
12252	Transformer—Second I-F transformer (L15, L16, C9, C10, C12, R5, R9)	12252	Transformer—Second I-F transformer (L15, L16, C9, C10, C12, R5, R9)
12253	Transformer—Power transformer 105-125 volts and 200-cycles (T1)	12253	Transformer—Power transformer 105-125 volts and 200-cycles (T1)
12254	Transformer—Power transformer 105-125 volts, 25-60 cycle (T2)	12254	Transformer—Power transformer 105-125 volts, 25-60 cycle (T2)
12255	Trap—Wave trap (L2, C1)	12255	Trap—Wave trap (L2, C1)
13886	Cap—Dust cap for cone center	13886	Cap—Dust cap for cone center
14354	Coil—Field coil (L19)	14354	Coil—Field coil (L19)
14355	Coil—Antenna coil (L18)	14355	Coil—Antenna coil (L18)
14356	Coil—Reproducer cone and dust cap (L17)	14356	Coil—Reproducer cone and dust cap (L17)
14357	Plug—3 contact male plug for reproducer	14357	Plug—3 contact male plug for reproducer
14358	Reproducer—complete	14358	Reproducer—complete
14359	Transformer—Output transformer (T2)	14359	Transformer—Output transformer (T2)
14360	Washer—Spring washer to hold field coil	14360	Washer—Spring washer to hold field coil
14361	Capacitor—18 Mfd. (C24)	14361	Capacitor—18 Mfd. (C24)
14362	Capacitor—10 Mfd. (C22)	14362	Capacitor—10 Mfd. (C22)
14363	Capacitor—10 Mfd. (C23)	14363	Capacitor—10 Mfd. (C23)
14364	Capacitor—10 Mfd. (C25)	14364	Capacitor—10 Mfd. (C25)
14365	Capacitor—10 Mfd. (C26)	14365	Capacitor—10 Mfd. (C26)
14366	Capacitor—10 Mfd. (C27)	14366	Capacitor—10 Mfd. (C27)
14367	Capacitor—10 Mfd. (C28)	14367	Capacitor—10 Mfd. (C28)
14368	Capacitor—10 Mfd. (C29)	14368	Capacitor—10 Mfd. (C29)
14369	Capacitor—10 Mfd. (C30)	14369	Capacitor—10 Mfd. (C30)
14370	Capacitor—10 Mfd. (C31)	14370	Capacitor—10 Mfd. (C31)
14371	Capacitor—10 Mfd. (C32)	14371	Capacitor—10 Mfd. (C32)
14372	Capacitor—10 Mfd. (C33)	14372	Capacitor—10 Mfd. (C33)
14373	Capacitor—10 Mfd. (C34)	14373	Capacitor—10 Mfd. (C34)
14374	Capacitor—10 Mfd. (C35)	14374	Capacitor—10 Mfd. (C35)
14375	Capacitor—10 Mfd. (C36)	14375	Capacitor—10 Mfd. (C36)
14376	Capacitor—10 Mfd. (C37)	14376	Capacitor—10 Mfd. (C37)
14377	Capacitor—10 Mfd. (C38)	14377	Capacitor—10 Mfd. (C38)
14378	Capacitor—10 Mfd. (C39)	14378	Capacitor—10 Mfd. (C39)
14379	Capacitor—10 Mfd. (C40)	14379	Capacitor—10 Mfd. (C40)
14380	Capacitor—10 Mfd. (C41)	14380	Capacitor—10 Mfd. (C41)
14381	Capacitor—10 Mfd. (C42)	14381	Capacitor—10 Mfd. (C42)
14382	Capacitor—10 Mfd. (C43)	14382	Capacitor—10 Mfd. (C43)
14383	Capacitor—10 Mfd. (C44)	14383	Capacitor—10 Mfd. (C44)
14384	Capacitor—10 Mfd. (C45)	14384	Capacitor—10 Mfd. (C45)
14385	Capacitor—10 Mfd. (C46)	14385	Capacitor—10 Mfd. (C46)
14386	Capacitor—10 Mfd. (C47)	14386	Capacitor—10 Mfd. (C47)
14387	Capacitor—10 Mfd. (C48)	14387	Capacitor—10 Mfd. (C48)
14388	Capacitor—10 Mfd. (C49)	14388	Capacitor—10 Mfd. (C49)
14389	Capacitor—10 Mfd. (C50)	14389	Capacitor—10 Mfd. (C50)
14390	Capacitor—10 Mfd. (C51)	14390	Capacitor—10 Mfd. (C51)
14391	Capacitor—10 Mfd. (C52)	14391	Capacitor—10 Mfd. (C52)
14392	Capacitor—10 Mfd. (C53)	14392	Capacitor—10 Mfd. (C53)
14393	Capacitor—10 Mfd. (C54)	14393	Capacitor—10 Mfd. (C54)
14394	Capacitor—10 Mfd. (C55)	14394	Capacitor—10 Mfd. (C55)
14395	Capacitor—10 Mfd. (C56)	14395	Capacitor—10 Mfd. (C56)
14396	Capacitor—10 Mfd. (C57)	14396	Capacitor—10 Mfd. (C57)
14397	Capacitor—10 Mfd. (C58)	14397	Capacitor—10 Mfd. (C58)
14398	Capacitor—10 Mfd. (C59)	14398	Capacitor—10 Mfd. (C59)
14399	Capacitor—10 Mfd. (C60)	14399	Capacitor—10 Mfd. (C60)
14400	Capacitor—10 Mfd. (C61)	14400	Capacitor—10 Mfd. (C61)
14401	Capacitor—10 Mfd. (C62)	14401	Capacitor—10 Mfd. (C62)
14402	Capacitor—10 Mfd. (C63)	14402	Capacitor—10 Mfd. (C63)
14403	Capacitor—10 Mfd. (C64)	14403	Capacitor—10 Mfd. (C64)
14404	Capacitor—10 Mfd. (C65)	14404	Capacitor—10 Mfd. (C65)
14405	Capacitor—10 Mfd. (C66)	14405	Capacitor—10 Mfd. (C66)
14406	Capacitor—10 Mfd. (C67)	14406	Capacitor—10 Mfd. (C67)
14407	Capacitor—10 Mfd. (C68)	14407	Capacitor—10 Mfd. (C68)
14408	Capacitor—10 Mfd. (C69)	14408	Capacitor—10 Mfd. (C69)
14409	Capacitor—10 Mfd. (C70)	14409	Capacitor—10 Mfd. (C70)
14410	Capacitor—10 Mfd. (C71)	14410	Capacitor—10 Mfd. (C71)
14411	Capacitor—10 Mfd. (C72)	14411	Capacitor—10 Mfd. (C72)
14412	Capacitor—10 Mfd. (C73)	14412	Capacitor—10 Mfd. (C73)
14413	Capacitor—10 Mfd. (C74)	14413	Capacitor—10 Mfd. (C74)
14414	Capacitor—10 Mfd. (C75)	14414	Capacitor—10 Mfd. (C75)
14415	Capacitor—10 Mfd. (C76)	14415	Capacitor—10 Mfd. (C76)
14416	Capacitor—10 Mfd. (C77)	14416	Capacitor—10 Mfd. (C77)
14417	Capacitor—10 Mfd. (C78)	14417	Capacitor—10 Mfd. (C78)
14418	Capacitor—10 Mfd. (C79)	14418	Capacitor—10 Mfd. (C79)
14419	Capacitor—10 Mfd. (C80)	14419	Capacitor—10 Mfd. (C80)
14420	Capacitor—10 Mfd. (C81)	14420	Capacitor—10 Mfd. (C81)
14421	Capacitor—10 Mfd. (C82)	14421	Capacitor—10 Mfd. (C82)
14422	Capacitor—10 Mfd. (C83)	14422	Capacitor—10 Mfd. (C83)
14423	Capacitor—10 Mfd. (C84)	14423	Capacitor—10 Mfd. (C84)
14424	Capacitor—10 Mfd. (C85)	14424	Capacitor—10 Mfd. (C85)
14425	Capacitor—10 Mfd. (C86)	14425	Capacitor—10 Mfd. (C86)
14426	Capacitor—10 Mfd. (C87)	14426	Capacitor—10 Mfd. (C87)
14427	Capacitor—10 Mfd. (C88)	14427	Capacitor—10 Mfd. (C88)
14428	Capacitor—10 Mfd. (C89)	14428	Capacitor—10 Mfd. (C89)
14429	Capacitor—10 Mfd. (C90)	14429	Capacitor—10 Mfd. (C90)
14430	Capacitor—10 Mfd. (C91)	14430	Capacitor—10 Mfd. (C91)
14431	Capacitor—10 Mfd. (C92)	14431	Capacitor—10 Mfd. (C92)
14432	Capacitor—10 Mfd. (C93)	14432	Capacitor—10 Mfd. (C93)
14433	Capacitor—10 Mfd. (C94)	14433	Capacitor—10 Mfd. (C94)
14434	Capacitor—10 Mfd. (C95)	14434	Capacitor—10 Mfd. (C95)
14435	Capacitor—10 Mfd. (C96)	14435	Capacitor—10 Mfd. (C96)
14436	Capacitor—10 Mfd. (C97)	14436	Capacitor—10 Mfd. (C97)
14437	Capacitor—10 Mfd. (C98)	14437	Capacitor—10 Mfd. (C98)
14438	Capacitor—10 Mfd. (C99)	14438	Capacitor—10 Mfd. (C99)
14439	Capacitor—10 Mfd. (C100)	14439	Capacitor—10 Mfd. (C100)
14440	Capacitor—10 Mfd. (C101)	14440	Capacitor—10 Mfd. (C101)
14441	Capacitor—10 Mfd. (C102)	14441	Capacitor—10 Mfd. (C102)
14442	Capacitor—10 Mfd. (C103)	14442	Capacitor—10 Mfd. (C103)
14443	Capacitor—10 Mfd. (C104)	14443	Capacitor—10 Mfd. (C104)
14444	Capacitor—10 Mfd. (C105)	14444	Capacitor—10 Mfd. (C105)
14445	Capacitor—10 Mfd. (C106)	14445	Capacitor—10 Mfd. (C106)
14446	Capacitor—10 Mfd. (C107)	14446	Capacitor—10 Mfd. (C107)
14447	Capacitor—10 Mfd. (C108)	14447	Capacitor—10 Mfd. (C108)
14448	Capacitor—10 Mfd. (C109)	14448	Capacitor—10 Mfd. (C109)
14449	Capacitor—10 Mfd. (C110)	14449	Capacitor—10 Mfd. (C110)
14450	Capacitor—10 Mfd. (C111)	14450	Capacitor—10 Mfd. (C111)
14451	Capacitor—10 Mfd. (C112)	14451	Capacitor—10 Mfd. (C112)
14452	Capacitor—10 Mfd. (C113)	14452	Capacitor—10 Mfd. (C113)
14453	Capacitor—10 Mfd. (C114)	14453	Capacitor—10 Mfd. (C114)
14454	Capacitor—10 Mfd. (C115)	14454	Capacitor—10 Mfd. (C115)
14455	Capacitor—10 Mfd. (C116)	14455	Capacitor—10 Mfd. (C116)
14456	Capacitor—10 Mfd. (C117)	14456	Capacitor—10 Mfd. (C117)
14457	Capacitor—10 Mfd. (C118)	14457	Capacitor—10 Mfd. (C118)
14458	Capacitor—10 Mfd. (C119)	14458	Capacitor—10 Mfd. (C119)
14459	Capacitor—10 Mfd. (C120)	14459	Capacitor—10 Mfd. (C120)
14460	Capacitor—10 Mfd. (C121)	14460	Capacitor—10 Mfd. (C121)
14461	Capacitor—10 Mfd. (C122)	14461	Capacitor—10 Mfd. (C122)
14462	Capacitor—10 Mfd. (C123)	14462	Capacitor—10 Mfd. (C123)
14463	Capacitor—10 Mfd. (C124)	14463	Capacitor—10 Mfd. (C124)
14464	Capacitor—10 Mfd. (C125)	14464	Capacitor—10 Mfd. (C125)
14465	Capacitor—10 Mfd. (C126)	14465	Capacitor—10 Mfd. (C126)
14466	Capacitor—10 Mfd. (C127)	14466	Capacitor—10 Mfd. (C127)
14467	Capacitor—10 Mfd. (C128)	14467	Capacitor—10 Mfd. (C128)
14468	Capacitor—10 Mfd. (C129)	14468	Capacitor—10 Mfd. (C129)
14469	Capacitor—10 Mfd. (C130)	14469	Capacitor—10 Mfd. (C130)
14470	Capacitor—10 Mfd. (C131)	14470	Capacitor—10 Mfd. (C131)
14471	Capacitor—10 Mfd. (C132)	14471	Capacitor—10 Mfd. (C132)
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RCA MFG. CO., INC.

MODEL R89  
Specifications  
Installation Data

Electrical and Mechanical Specifications

RCA TUBE COMPLEMENT

- (1) RCA-6F5..... Audio Voltage Amplifier
- (2) RCA-25L6..... Audio Power Output
- (3) RCA-25Z6..... Rectifier

LOUDSPEAKER

- Type..... Electrodynamic
- Voice Coil Impedance..... 4.5 ohms at 400 cycles
- Undistorted..... 1.0 watts
- Maximum..... 2.0 watts

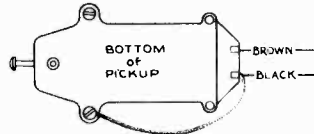
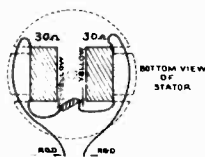
- Cabinet Dimensions..... Height 5 inches..... Width 12 1/2 inches..... Depth 10 inches
- Chassis Base Dimensions (with speaker)..... Height 3 inches..... Width 7 1/2 inches..... Depth 5 1/2 inches
- Weight (Shipping)..... 8 pounds..... Weight (Net)..... 6 pounds

POWER SUPPLY RATING

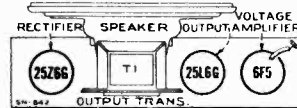
- A-5..... 105-125 volts, 50 cycles, 45 watts
- A-6..... 105-125 volts, 60 cycles, 45 watts

VICTROLA MECHANISM

- Motor..... Manual Starting Synchronous
- Turntable Speed..... 78 r.p.m.
- Pickup..... Crystal
- Impedance..... 30,000 ohms at 1,000 cycles

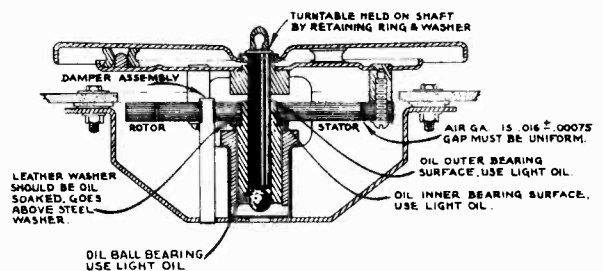


Wiring Details



R-89

Tube Locations



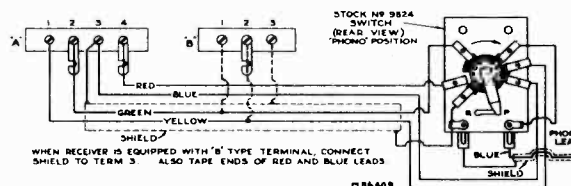
Motor Details

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

CONNECTING VICTROLA TO:

1939 RCA RADIO RECEIVERS OF "90" SERIES:  
Plug male jack on end of Victrola cable into female receptacle on receiver chassis. Push or turn "Phono" switch to "Phono" position, and operate Victrola according to instructions.

RADIO RECEIVERS HAVING "PHONO" TERMINAL BOARDS.



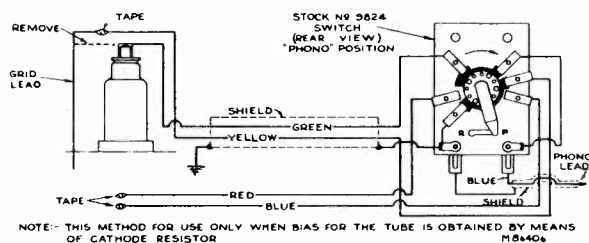
RCA Radio Receivers to which the above illustration applies: 5T1, 5T4, 5T5, 5T6, 5T7, 5T8, 6T5, 8T2, 8T11, 8K11, 85T5, 86E, 86K, 86T, 86T1, 86T4, 86K7, 86T44, 87K, 87T, 87K1, 87K2, 87T2, 88K, 810K, 810K1, 810T, 810T4, 811K, 812K, 813K, 816K, 811T.

For following Receivers, Yellow lead should go on Terminal No. 1. Green lead on Terminal No. 2: 6K2, 6T2, 6K3, 6K10, 6T10, 7T1, 7K1, 85T8, 86T3, 86T2, 86T6, 87T1.

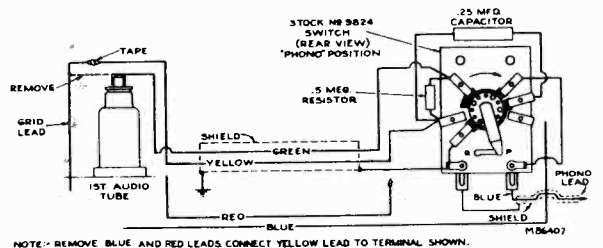
Insulate shield of switch wires from chassis, on following RCA Receivers: 5T, 6T, 6K, 6K1, 7T, 7K, 7X, 7X1, 8T, 8T10, 8K, 8K1, 86X4, 87EY, 87X, 87Y.

Receivers having a Four Terminal Board: 9K, 9T, 9K1, 9K2, 9K3, 9K10, 10T, 10K, 10K1, 13K, 15K. Reverse Red and Blue leads to Terminal Board of C9-6, T9-9, T8-16, C8-17.

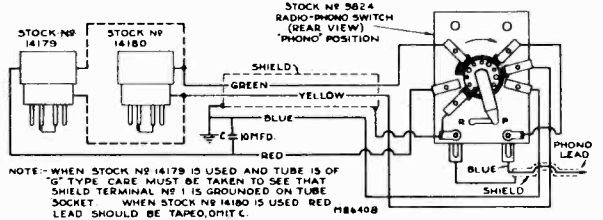
RADIO RECEIVERS WHOSE FIRST AUDIO AMPLIFIER TUBE IS OF THE GRID CAP TYPE.



RCA Receivers for which above method applies: 125, 128, 128E, 224E, 225, 226, T6-1, C6-2, T6-9, T7-5, C7-6, T7-12, C7-14, T8-14, C8-15, T8-18, C8-19, C8-20, C9-4, T9-10.



RADIO RECEIVERS USING 6C5 OR 6J5, 6C5G OR 6J5G, TUBE FOR FIRST AUDIO AMPLIFIER.

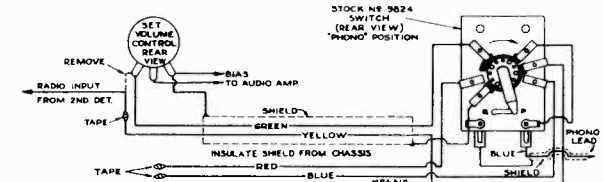


Stock No. 14179 Adaptor opens grid circuit, and inserts 2,700 ohm resistor in cathode of 6C5 or 6J5 tubes, for bias on Phono reproduction.

Stock No. 14180 Adaptor opens grid circuit of 6C5 or 6J5 tube.  
Stock No. 14180 Adaptor necessary for RCA: C11-1, C13-2, T10-1, C11-3, C13-3.

Stock No. 14179 Adaptor necessary for RCA: C15-3, C15-4.

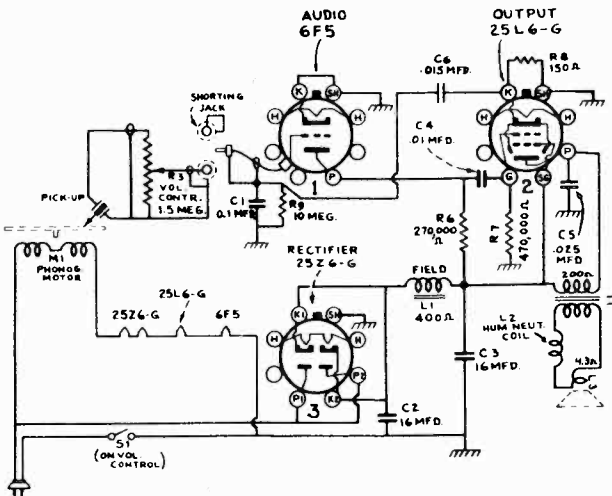
RADIO RECEIVERS WHERE RECEIVER VOLUME CONTROL IS TO BE USED TO ALSO CONTROL "PHONO" VOLUME.



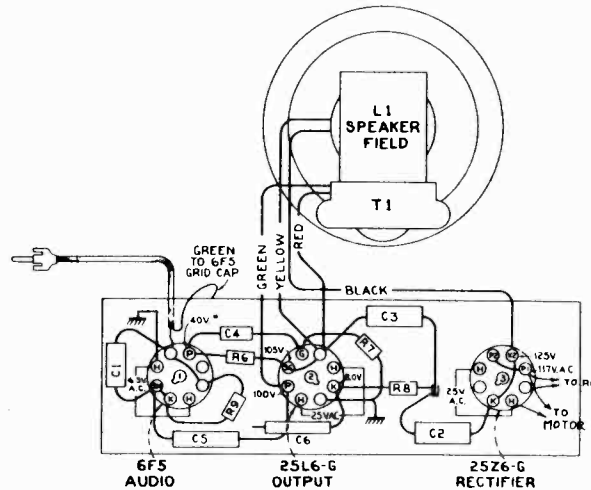


MODEL R89  
Schematic, Voltage  
Chassis Wiring, Notes  
Parts

RCA MFG. CO., INC.



Schematic Circuit Diagram



Wiring and Socket Voltages

\*NOTE: Values with star (\*) are operating voltages in circuits with high series-resistance, and when measured will read lower depending on the voltmeter loading.  
Measurements made to chassis unless otherwise indicated. Values should hold within approximately  $\pm 20\%$  with 117-volt a-c supply.

General Description and Service Data

The model R-89 Electric Victrola consists of a crystal pickup, a three tube audio amplifier, a dynamic speaker, and motor turntable mechanism in a table type walnut veneer cabinet. Any record, up to and including the 12-inch size, may be played on this instrument. The crystal pickup unit is securely sealed in a metal casing against extreme changes of climate. If failure occurs due to a defective crystal unit, no attempt should be made to repair it, but a new replacement crystal unit should be installed. This instrument may also be used to play records through a radio receiver, if so desired. To do this remove shielded lead at rear of cabinet from pickup jack, and plug into shorting jack, and plug lead from radio receiver into pickup jack. Methods of connecting mechanism to various receivers, are shown on next page.

Phonograph Motor

The synchronous motor used in this instrument is designed to be simple and foolproof. The parts that may require attention are plainly shown. 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 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.
5. Stator should be free to rotate between limits of damping assembly.

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.

Do not remove Turntable while set is turned on, as damage to tubes will result.

Replacement Parts

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>AMPLIFIER ASSEMBLIES</b>					
31886	Cable—Shielded amplifier input cable complete with plug.....	.25	31040	Mountings—Turntable rubber mountings sufficient for one turntable.....	.25
14393	Capacitor—.01 mfd. (C4).....	.30	32023	Rotor—Turntable and rotor laminations for 50 cycle motor.....	5.20
11315	Capacitor—.015 mfd. (C8).....	.20	31926	Rotor—Turntable and rotor laminations for 60 cycle motor.....	5.20
4870	Capacitor—.025 mfd. (C5).....	.20	32022	Stator—Stator assembly complete with coils and laminations for 110 volts, for 50 cycle motor.....	2.95
30899	Capacitor—.01 mfd. (C1).....	.30	31925	Stator—Stator assembly complete with coils and laminations for 110 volts, for 60 cycle motor.....	2.60
31323	Capacitor—.18 mfd. (C2, C3).....	.65	31039	Turntable—Finished turntable top plate only—less rubber mountings.....	.95
13428	Resistor—150 ohms, $\frac{1}{4}$ watt (R8).....	.20	14231	Washer—Bearing shim washers.....	.02
12199	Resistor—270,000 ohms, $\frac{1}{4}$ watt (R6).....	.20	4083	Washer—Leather washer.....	.02
12885	Resistor—470,000 ohms, $\frac{1}{4}$ watt (R7).....	.20	<b>SPEAKER ASSEMBLIES</b>		
13601	Resistor—10 meg. $\frac{1}{4}$ watt (R9).....	.20	(84202-3)		
31319	Socket—Tube socket.....	.25	31202	Cone—Speaker cone and voice coil (L3).....	1.30
<b>PICKUP AND ARM ASSEMBLIES</b>					
31888	Base—Pickup arm base and pivot shaft.....	.95	31201	Speaker Complete.....	3.95
31050	Crystal—Pickup crystal and needle screw.....	3.75	31203	Transformer—Output transformer (T1).....	1.00
31887	Pickup arm and crystal complete.....	6.75	<b>MISCELLANEOUS ASSEMBLIES</b>		
31745	Ring—Retaining ring for pickup arm base.....	.02	31986	Cable—Pickup-to-receiver interconnecting cable required when instrument is used as record player only.....	.55
12539	Screw—Pickup needle screw.....	.22	3961	Knob—Volume control knob.....	.10
<b>MOTOR ASSEMBLIES</b>					
31045	Base—Motor support, damper, and bearing cup assembly.....	.60	13053	Screw—Motor mounting screws, cushions and nuts, sufficient for one motor.....	.30
31046	Bearing—Bearing assembly.....	.70	14278	Socket—Amplifier shorting socket or pickup output socket.....	.25
31041	Cap—Rubber spindle cap.....	.05	31889	Volume control and switch (R3, S1).....	1.50
31047	Cushion—Rubber cushion for bearing.....	.15			
31924	Motor—105-125 volts, 50 cycle (M1).....	8.90			
31923	Motor—105-125 volts, 60 cycle (M1).....	8.60			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

RCA MFG. CO., INC.

MODELS 94BK, 94BT  
Schematic, Socket  
Trimmers, Voltage  
Alignment, Lead Dress

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.

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

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

Re-sealing I.F. Adjustment Screws.—After completion of alignment, seal the I.F. magnetite-core adjustment screws with a few drops of household cement.

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	1D5-G I-F grid cap, in series with .001 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F transformer)
No. 2	1C7-G 1st-det. grid cap, in series with .001 mfd.	455 kc		L5 and L6 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C5* (oscillator) C2 (antenna)

\* Trimmer C6 on gang condenser should be unscrewed one complete turn from tight, before adjusting C5.

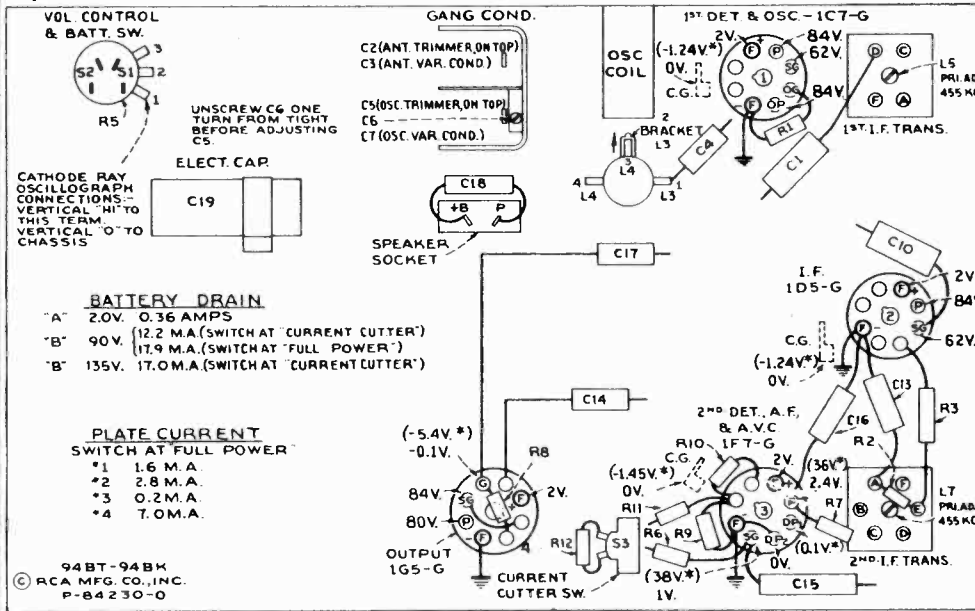
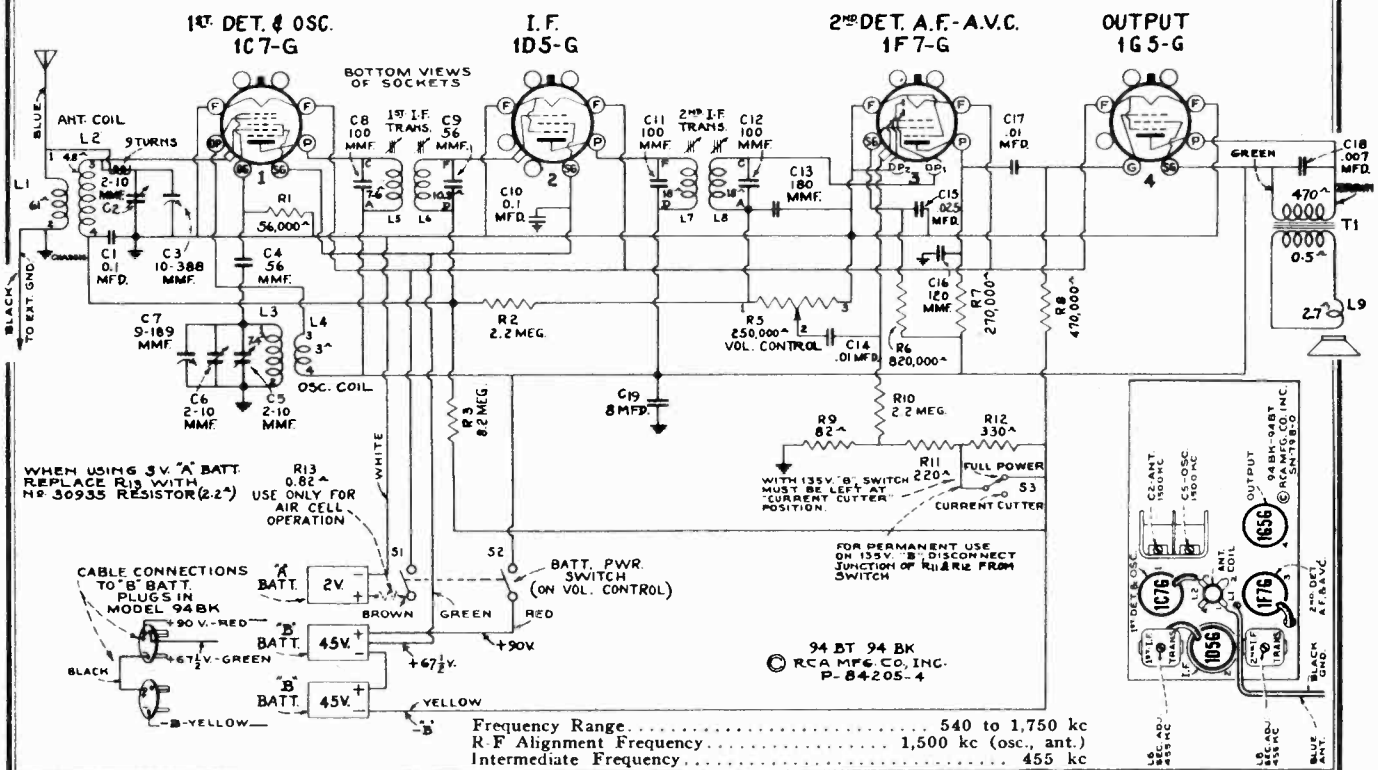


Figure 2—Radiotron Socket Voltages, and Location of Parts



MODELS 94BK, 94BT  
 MODEL 94BT6  
 Parts Lists

RCA MFG. CO., INC.

**94BK Replacement Parts 94BT**

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>RECEIVER ASSEMBLIES</b>					
30954	Cable—Battery cable complete.....	1.35	30952	Shaft—Station selector knob shaft.....	.25
30949	Capacitor—56 Mmfd. (C9).....	.25	3682	Shield—Radiotron shield.....	.22
12723	Capacitor—56 Mmfd. (C4).....	.25	11196	Socket—Radiotron socket.....	.25
30904	Capacitor—100 Mmfd. (C8, C11, C12).....	.25	30956	Socket—Speaker socket.....	.30
12724	Capacitor—120 Mmfd. (C16).....	.25	14191	Spring—Drive cord tension spring.....	.04
13003	Capacitor—180 Mmfd. (C13).....	.25	30953	Switch—Current-cutter switch (S3).....	.45
5148	Capacitor—.007 Mfd. (C18).....	.20	30948	Transformer—First I.F. (L5, L6, C8, C9).....	2.00
14393	Capacitor—.01 Mfd. (C14, C17).....	.30	30903	Transformer—Second I.F. (L7, L8, C11, C12).....	1.80
4870	Capacitor—.025 Mfd. (C15).....	.20	30947	Volume control and on-off switch (R5, S1, S2).....	1.50
30899	Capacitor—0.1 Mfd. (C1, C10).....	.30	<b>REPRODUCER ASSEMBLIES</b>		
13610	Capacitor—8 Mfd. (C19).....	1.00	Model 94BT (Speaker 84226-1)		
30950	Coil—Antenna coil (L1, L2).....	1.10	30970	Cone—Reproducer cone and voice coil (L9)...	1.25
30895	Coil—Oscillator coil (L3, L4).....	1.05	30969	Reproducer complete.....	5.65
30945	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C7).....	2.70	30971	Transformer—Output transformer (T1).....	1.25
30877	Cord—Drive cord.....	.20	Model 94BK (Speaker 84145-2)		
30905	Core—Adjustable core for I.F. transformers.....	.35	30973	Cone—Reproducer cone and voice coil (L9)...	2.25
30951	Dial—Dial scale and dial scale holder and bracket assembly.....	.70	30972	Reproducer complete.....	6.30
30701	Drum—Tuning condenser drive cord drum with set screw.....	.40	30974	Transformer—Output transformer (T1).....	1.90
14635	Indicator—Station selector indicator pointer.....	.20	<b>MISCELLANEOUS ASSEMBLIES</b>		
30955	Resistor—0.82 ohm, flexible type (R13).....	.30	30975	Crystal—Station selector celluloid crystal.....	.45
14074	Resistor—82 ohms, 1/2 watt (R9).....	.20	14269	Knob—Station selector or volume control knob.....	.20
14561	Resistor—220 ohms, 1/2 watt (R11).....	.20	12827	Plug—3-contact male plug for battery cable—94BK only.....	.20
30538	Resistor—330 ohms, 1/2 watt (R12).....	.20	30935	Resistor—2.2 ohms, flexible type to replace Stock No. 30955 when using 3-volt battery.....	.30
5029	Resistor—56,000 ohms, 1/2 watt (R1).....	.20	30308	Screw—Chassis mounting screw and washer—94BT only—Package of 4.....	.25
12199	Resistor—270,000 ohms, 1/2 watt (R7).....	.20	30467	Screw—Chassis mounting screw and washer—94BK only—Package of 4.....	.25
11172	Resistor—470,000 ohms, 1/2 watt (R8).....	.20	14270	Spring—Retaining spring for knob.....	.05
30963	Resistor—820,000 ohms, 1/2 watt (R6).....	.20			
12679	Resistor—2.2 meg., 1/2 watt (R2, R10).....	.20			
30962	Resistor—8.2 meg., 1/2 watt (R3).....	.20			
14887	Retainer—Retainer for knob shaft.....	.01			

**BATTERY REQUIRED**      **CURRENT CONSUMPTION**  
 6-volt Storage "A" Battery.      At 6 volts, 2.8 amperes.

**POWER OUTPUT (6 volts "A")**  
 Undistorted..... 0.45 watts      Operating Controls..... (1) Power Switch—Volume; (2) Tuning  
 Maximum..... 0.7 watts      Tuning Drive Ratio..... 8 to 1

**Replacement Parts 94BT6**

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

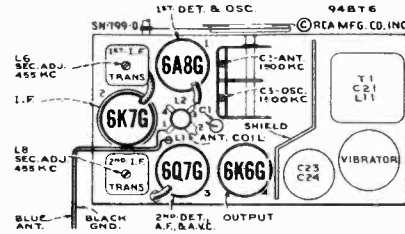
STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>					
30959	Cable—Battery cable complete.....	1.35	11353	Resistor—680 ohms, 1/2 watt (R10).....	.20
30967	Cable—Shielded volume control cable.....	.45	5175	Resistor—5,600 ohms, 1/2 watt (R17).....	.20
12723	Capacitor—56 Mmfd. (C8).....	.25	12759	Resistor—15,000 ohms, 1/2 watt (R3).....	.20
30904	Capacitor—100 Mmfd. (C9, C10, C12, C13).....	.25	14284	Resistor—22,000 ohms, 1/10 watt (R15).....	.15
12724	Capacitor—120 Mmfd. (C17).....	.25	5029	Resistor—56,000 ohms, 1/2 watt (R1).....	.20
13003	Capacitor—180 Mmfd. (C14).....	.25	11172	Resistor—470,000 ohms, 1/2 watt (R7, R11).....	.20
30964	Capacitor—330 Mmfd. (C4).....	.25	12679	Resistor—2.2 meg., 1/2 watt (R4, R6).....	.20
30966	Capacitor—1,000 Mmfd. (C22).....	.30	30271	Resistor—4.7 meg., 1/2 watt (R2).....	.20
14393	Capacitor—.01 Mfd. (C15, C18, C19).....	.30	14887	Retainer—Retainer for knob shaft.....	.01
4937	Capacitor—.01 Mfd. (C27).....	.25	30952	Shaft—Station selector knob shaft.....	.25
4886	Capacitor—.05 Mfd. (C11).....	.20	3682	Shield—Radiotron shield.....	.22
4839	Capacitor—0.1 Mfd. (C16).....	.30	11196	Socket—Radiotron socket.....	.25
30899	Capacitor—0.1 Mfd. (C1).....	.30	30956	Socket—Speaker socket.....	.30
30965	Capacitor—0.25 Mfd. (C20).....	.30	14312	Socket—Vibrator socket.....	.25
30961	Capacitor—Comprising 2 sections each 16 Mfd. (C23, C24).....	2.10	14191	Spring—Drive cord tension spring.....	.04
30968	Coil—"A" filter choke coil (L10).....	.55	30957	Transformer—First I.F. transformer (L5, L6, C9, C10).....	1.90
30950	Coil—Antenna coil (L1, L2).....	1.10	30903	Transformer—Second I.F. transformer (L7, L8, C12, C13).....	1.80
30895	Coil—Oscillator coil (L3, L4).....	1.05	30960	Transformer—Vibrator transformer (T1, C21, L11).....	5.25
30945	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C7).....	2.70	14309	Vibrator—Plug in vibrator (L12).....	4.25
30877	Cord—Drive cord.....	.20	30958	Volume control and on-off switch (R5, S1).....	1.50
30905	Core—Adjustable core for I.F. transformers.....	.35	<b>REPRODUCER ASSEMBLIES (Speaker 84226-1)</b>		
14289	Clips—Battery clips—1 marked "+" and 1 unmarked.....	.30	30970	Cone—Reproducer cone and voice coil (L9)...	1.25
30951	Dial—Dial scale and dial scale holder and bracket assembly.....	.70	30969	Reproducer complete.....	5.65
30701	Drum—Tuning condenser drive cord drum with set screw.....	.40	30971	Transformer—Output transformer (T2).....	1.25
5140	Fuse—Battery cable fuse (F1).....	.10	<b>MISCELLANEOUS ASSEMBLIES</b>		
14635	Indicator—Station selector indicator pointer.....	.20	30975	Crystal—Station selector celluloid crystal.....	.45
13220	Resistor—56 ohms, 1/2 watt (R16).....	.20	14269	Knob—Station selector or volume control knob.....	.20
14074	Resistor—82 ohms, 1/2 watt (R9).....	.20	30308	Screw—Chassis mounting screw and washer—Package of 4.....	.25
30498	Resistor—390 ohms, 1/2 watt (R18).....	.20	14270	Spring—Retaining spring for knob.....	.05
30681	Resistor—470 ohms, 1 watt (R12).....	.22			

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Trimmers, Voltage Alignment, Lead Dress

RCA MFG. CO., INC.

MODEL 94BT6 Schematic, Socket

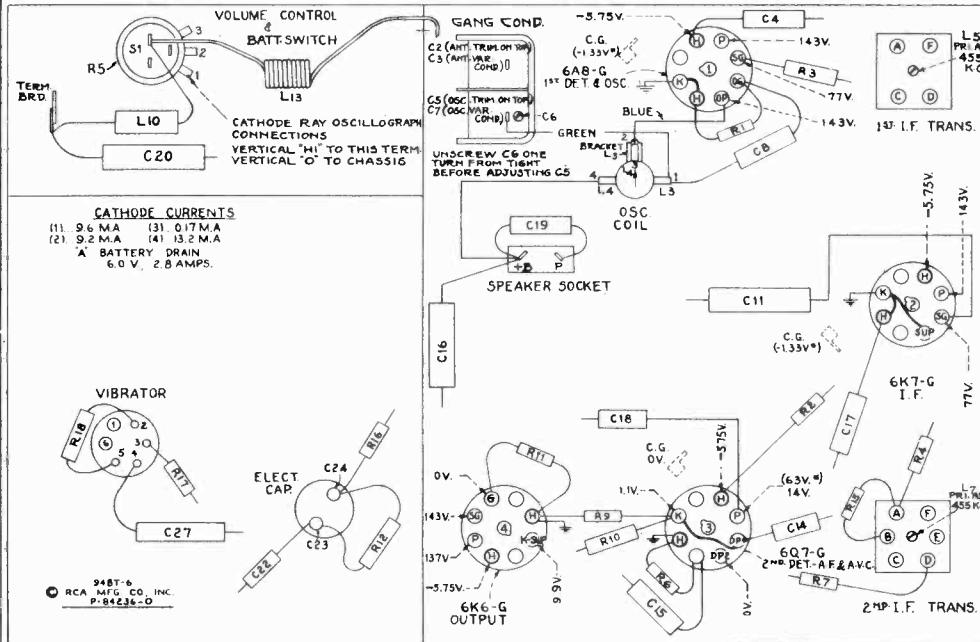


Steps	Connect the high side of test-oscillator to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
No. 1	6K7-G I-F grid cap, in series with .001 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F transformer)
No. 2	6A8-G 1st-det. grid cap, in series with .001 mfd.	455 kc		L5 and L6 (1st I-F transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C5* (oscillator) C2 (antenna)

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

Re-sealing I.F. Adjustment Screws.—After completion of alignment, seal the I.F. magnetite-core adjustment screws with a few drops of household cement.

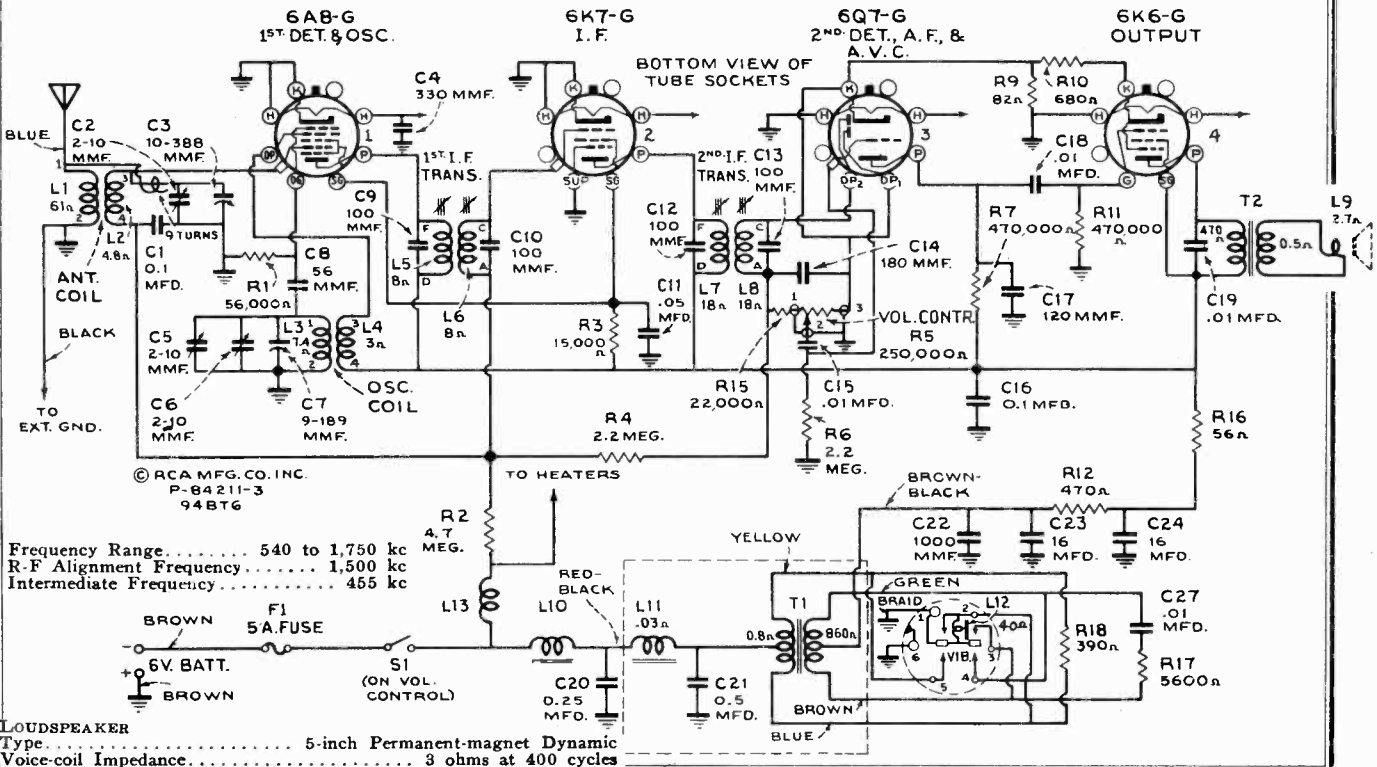
\* Adjust C6 on gang condenser to one complete turn from tight, before adjusting C5.



BOTTOM VIEW - REAR OF CHASSIS

Precautinary Lead Dress

1. Leads on C16 and C20, and lead from R16 to terminal board, must be short. C22 and C4 are soldered direct (no leads).
  2. Dress L10 away from chassis. Dress T1 secondary leads (brown and green) away from base and free of other leads (same applies to R17 and C27). Dress T1 secondary midtap (brown-black) free of other leads and close to chassis.
  3. Maintain original ground points.
  4. Antenna and ground leads 36 inches long, twisted, and arranged as shown in top view.
  5. I.F. plate lead (blue) dressed close to and along edge of chassis.
- Battery Charger Connections.—The positive side of the 6-volt "A" circuit is connected to the receiver chassis, and the chassis is normally grounded. If the charger has a ground on the negative side, the ground should be removed, or changed to the positive side. Do not change the length of leads from the receiver to the battery.



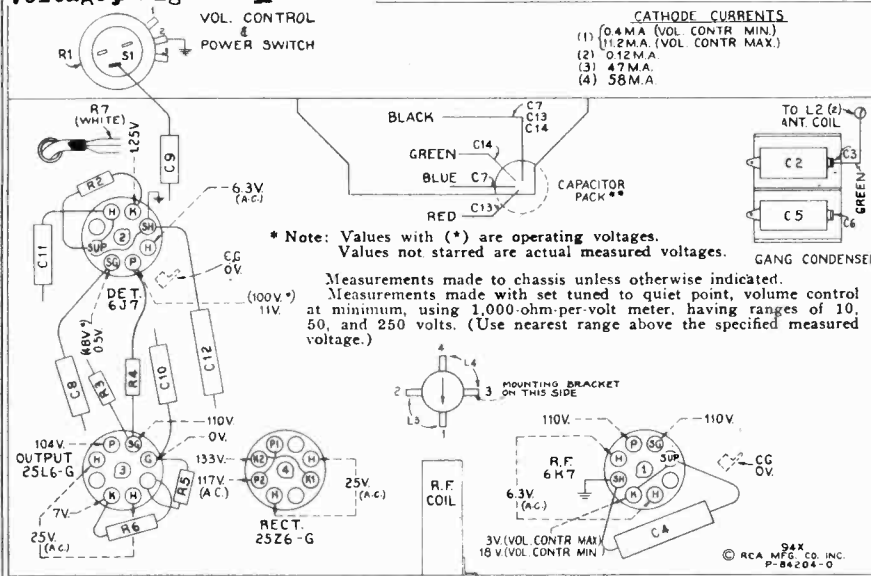
Frequency Range..... 540 to 1,750 kc  
R-F Alignment Frequency..... 1,500 kc  
Intermediate Frequency..... 455 kc

LOUDSPEAKER  
Type..... 5-inch Permanent-magnet Dynamic  
Voice-coil Impedance..... 3 ohms at 400 cycles

MODEL 94X

Schematic, Socket, Trimmers  
Voltage, Alignment, Parts

RCA MFG. CO., INC.



BOTTOM VIEW - REAR OF CHASSIS

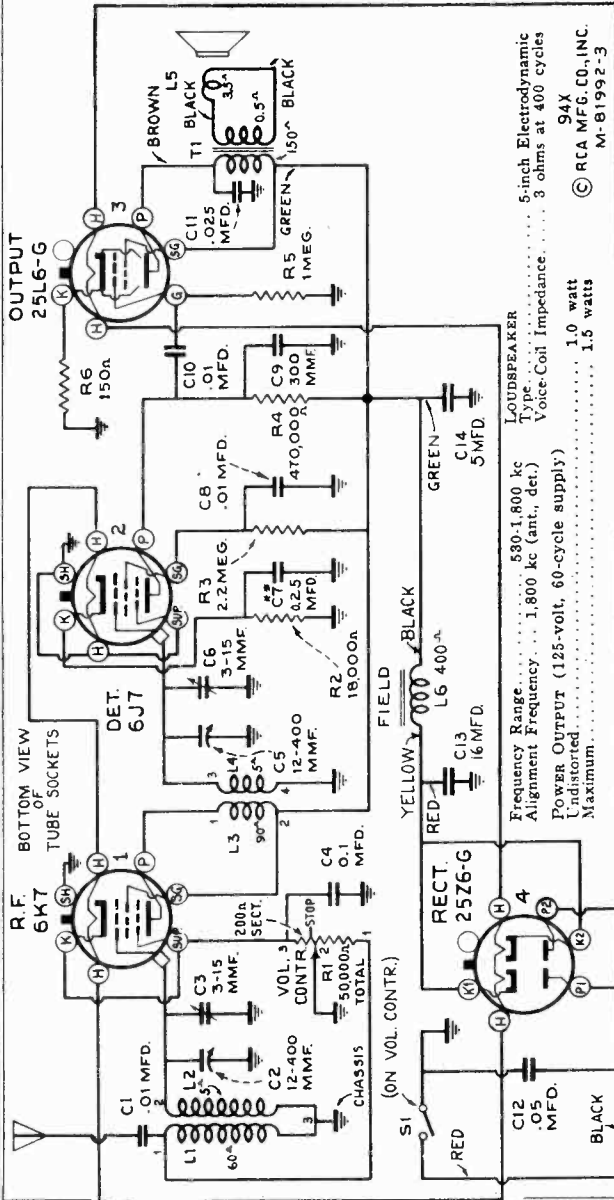


Figure 2—Schematic Circuit Diagram

Some sets have a three-section capacitor pack (C7, C13, C14). In other sets, this pack contains only two capacitors (C13, C14). A separate 0.25 mfd. capacitor (C14) is provided. The pack furnished with this set (No. 30873) is a two-section pack and does not include C7. Therefore, when an original three-section pack is replaced

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
11350	RECEIVER ASSEMBLIES		12985	Resistor—170,000 ohms, 1/2 watt (R4)	.20
30883	Cap—Grid contact cap (C9)	.05	13420	Resistor—1 Mfg., 1/2 watt (R5)	.20
14393	Capacitor—300 Mmid (C8)	.30	11428	Resistor—2 Mfg., 1/2 watt (R3)	.20
30938	Capacitor—01 Mfd. (C1, C8, C10)	.30	30879	Socket—Indicator drive shaft	.40
30882	Capacitor—025 Mfd. (C11)	.20	11196	Socket—Indicator sockets	.25
30889	Capacitor—05 Mfd. (C12)	.20	30631	Spring—Indicator drive cord tension spring	.04
30965	Capacitor—01 Mfd. (C4)	.30	30874	Volume Control and power switch (R1, S1)	1.60
30873	Capacitor—0.25 Mfd. (C7)	.30		REPRODUCER ASSEMBLIES	
30875	Capacitor—0.25 Mfd. (C13, C14)	1.65	30843	Cone—Reproducer cone and voice coil (L5)	1.00
30876	Coil—Antenna coil (L1, L2)	1.10	30842	Reproducer complete	4.60
30871	Coil—R.F. coil (L3, L4)	1.10	30844	Transformer—Output transformer (T1)	.85
30877	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6)	2.50			
30878	Cord—Indicator drive cord	.20			
13199	Cord—Resistance power cord complete with plug	1.10			
30880	Lead—Antenna lead—approx. 15 ft. long	.50			
13045	Resistor—150 ohms, 1/2 watt (R6)	.20			
	Resistor—15,000 ohms, 1/2 watt (R2)	.20			

Alignment Procedure

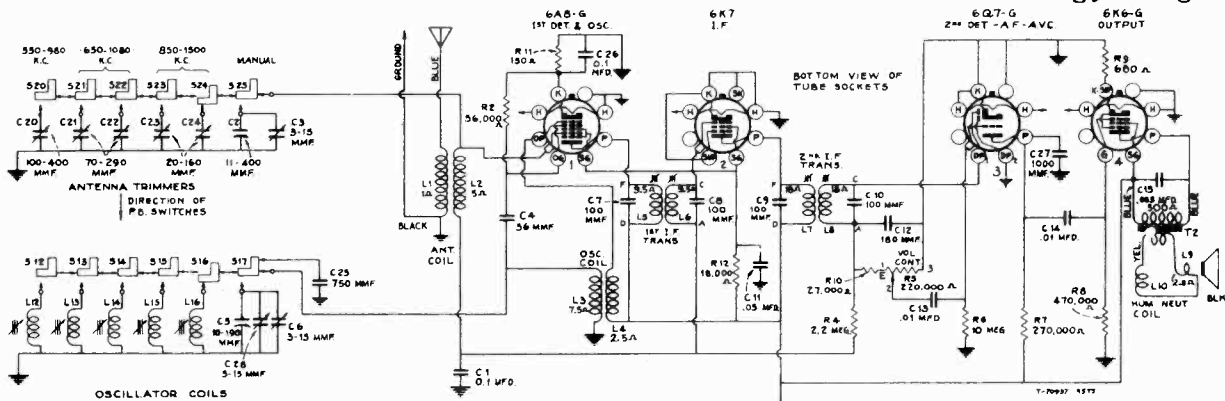
Remove dial pointer by pulling it carefully off the pointer shaft. Remove chassis from cabinet. CAUTION: The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing. Reel up the antenna wire, and connect the high side of test-oscillator through an 80 mmfd. capacitor to the antenna terminal on the antenna transformer. Connect low side of oscillator to receiver chassis through a 0.1 mfd. capacitor. Turn gang condenser to minimum (full out), tune oscillator to 1,800 kc, connect an output meter across the voice coil, and turn volume control to maximum. Adjust the two trimmers (C3 and C6) on side of gang condenser for maximum output, using lowest possible output from test-oscillator. Assemble chassis in cabinet and press the pointer on the shaft. Turn pointer, while holding tuning knob, so that the pointer is horizontal and pointing to low-frequency end when the gang condenser is at maximum. Check pointer adjustment on a station.

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RCA MFG. CO., INC.

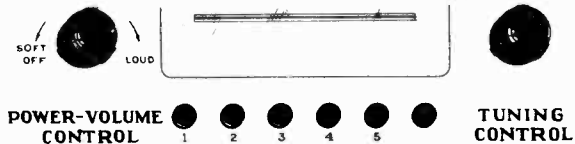
MODEL 95T5  
Schematic, Socket, Trimmers  
Chassis Wiring, Voltage



Model 95T5 Schematic Circuit Diagram

IF PEAK 455 KC

FOR OTHER DATA  
SEE INDEX

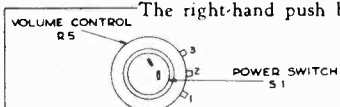


POWER-VOLUME CONTROL

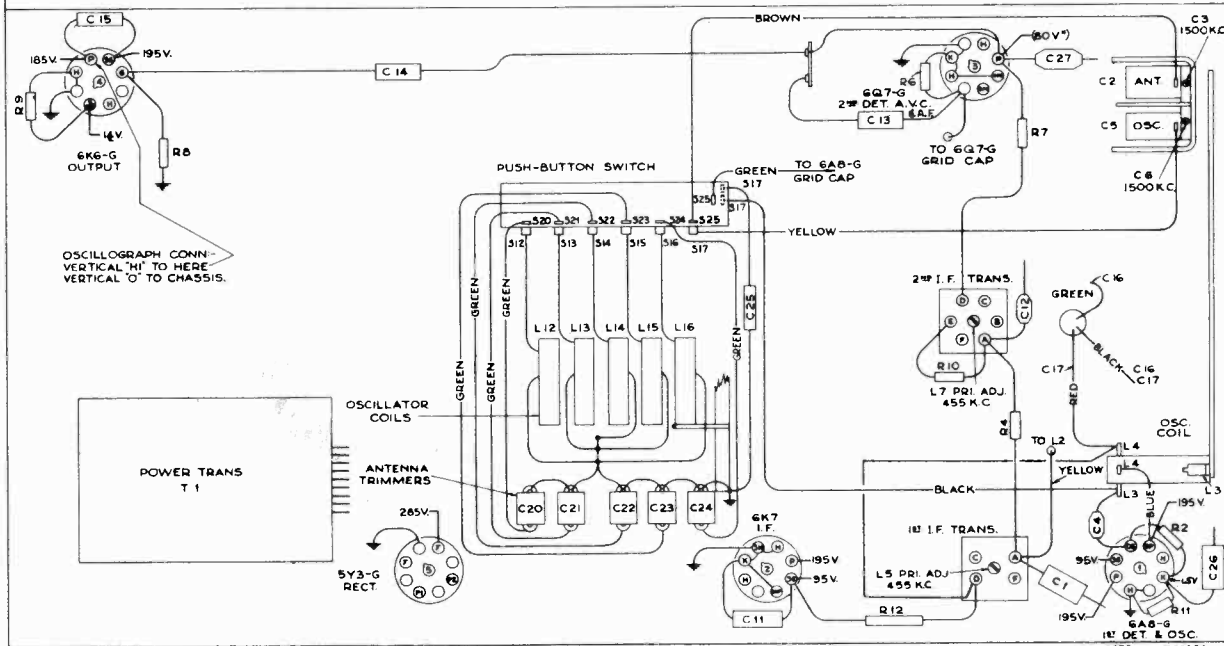
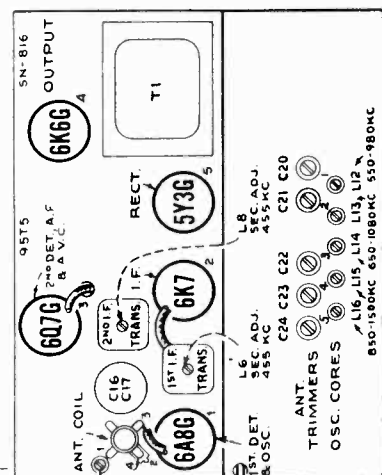
TUNING CONTROL

Location of Controls, Model 95T5

The right-hand push button is for dial tuning



- CATHODE CURRENTS
- (1) 6A8-G ----- 9 M.A.
  - (2) 6K7 ----- 12.1 M.A.
  - (3) 6Q7-G ----- 0.48M.A.
  - (4) 6K6-G ----- 22 M.A.
- TOTAL RECTIFIED "B" CURRENT 44 M.A.



Model 95T5 R-F Wiring Diagram and Socket Voltages

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately  $\pm 20\%$  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. MODELS 95T5, 96E, 96T, 96T1 Alignment, Tuner, Specs.

Alignment Procedure

**Cathode-Ray Alignment** is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

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

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

**Calibration Marks.**—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

**Drum and Dial Indicator Adjustment.**—As the first step in r-f alignment, check the position of the drum on the front

shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing directly down as shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand line as shown. The indicator is held to the drive cord by means of spring clips.

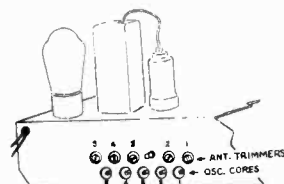
After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw (which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

After completion of alignment, seal the i-f core-adjustment screws with household cement.

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

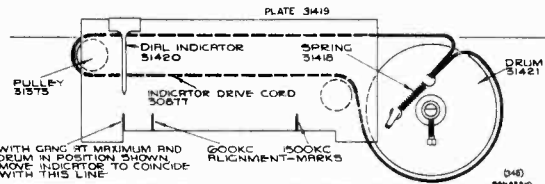
Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 560-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L8 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark.	C6 (osc.)* C3 (ant.)
4	Follow "Adjustments for Electric Tuning."			

\* The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.



Push-Button Adjustments

- No. 1—Approximately 550-980 kc.
- Nos. 2, 3—Approximately 650-1,080 kc.
- Nos. 4, 5—Approximately 850-1,500 kc.



DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

**Dial-Indicator and Drive Mechanism**  
Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

Adjustments for Electric Tuning

These models have six push buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations in the standard-broadcast range. The station buttons connect to separate 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. Use a regular antenna for the preliminary adjustments.

- The procedure is as follows:
- Make a list of the five desired stations, arranged in order from low to high frequencies.
  - Push in the dial-tuning (right-hand) button, and manually tune in the first station on the list.

Precautionary Lead Dress.—

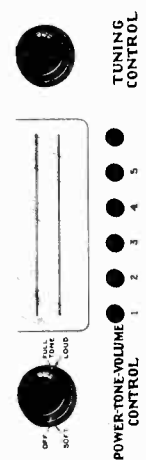
- Dress green lead from antenna coil to switch away from the chassis and gang.
- Dress green leads from oscillator coils away from the adjustment screws.

General Description

Model 95T5 is a five-tube superheterodyne. Models 96E, 96T, and 96T1 are six-tube superheterodynes. All of these models have push-buttons for electric-tuning of five stations in the standard-broadcast range, and one push-button for dial-tuning over the entire range of 540 to 1,720 kc. Features of design include magnetite-core i-f transformers,

and magnetite-core electric-tuning oscillator coils; temperature-stabilized capacitor in the oscillator circuit; automatic volume control; electrodynamic loudspeaker, and edge-illuminated straight-line dial. The six-tube models have continuously-variable high-frequency tone control.

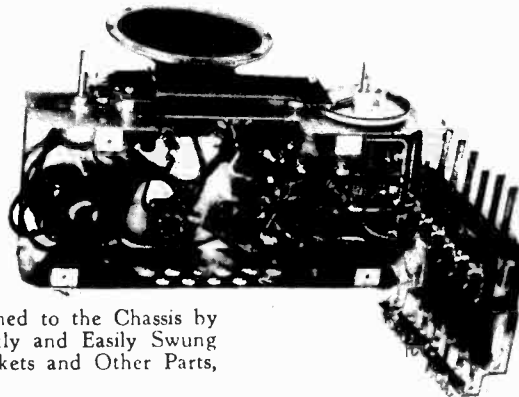
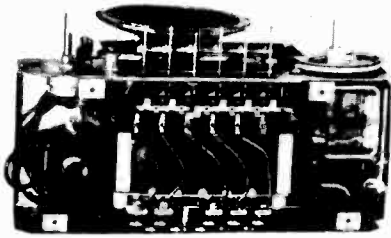
	Model 95T5	Models 96E, 96T, 96T1
<b>POWER OUTPUT</b>		
Undistorted.....	1.0 watts	2 watts
Maximum.....	1.5 watts	4 watts
<b>POWER SUPPLY RATINGS</b>		
Rating A.....	105-125 volts, 50-60 cycles	75 watts
Rating B.....	105-125 volts, 25-60 cycles	75 watts
Rating C.....	105-125/200-250 volts, 50-60 cycles	75 watts
<b>LOUDSPEAKER (ELECTRODYNAMIC)</b>	95T5	96E 96T 96T1
Diameter (inches).....	5	6 5 6
V. C. Impedance at 400 cycles (ohms).....	3.1	2.6 5.0 2.6



Location of Controls, Models 96E, 96T, and 96T1  
The right-hand push button is for dial tuning

Frequency Range.....	540-1,720 kc	1,500 kc (osc., ant.)	455 kc
One Station between approximately 550-980 kc (Button No. 1—left)			
Two Stations between approximately 650-1,080 kc (Buttons 2 and 3)			
Two Stations between approximately 850-1,500 kc (Buttons 4 and 5)			
R-F Alignment Frequency.....			
Intermediate Frequency.....			
<b>RCA TUBE COMPLEMENT</b>			
Model 95T5.....			
(1) RCA-6A8-G.....	First Detector—Oscillator		
(2) RCA-6K7.....	I-F Amplifier		
(3) RCA-6Q7-G.....	Second Det., A.V.C., and A.F. Amp.		
(4) RCA-6K6-G.....	Power Output		
(5) RCA-3Y3-G.....	Full-Wave Rectifier		
Pilot Lamp (1).....			
Models 96E, 96T, and 96T1.....			
(1) RCA-6A8-G.....	First Detector—Oscillator		
(2) RCA-6K7.....	I-F Amplifier		
(3) RCA-6Q7-G.....	Second Det., A.V.C., and A.F. Amp.		
(4) RCA-6K6-G.....	Power Output		
(5) RCA-3Y3-G.....	Full-Wave Rectifier		
Mazda 44, 6.3 volts, .25 amp.			

MODELS 95T5, 96E, 96T, 96T1  
 Push Button Assembly, Parts RCA MFG. CO., INC.



The Push-Button Assembly is Fastened to the Chassis by Only Two Screws, and may be Quickly and Easily Swung out for Convenient Access to the Sockets and Other Parts, as shown in the above Illustrations.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>					
31416	Capacitor—Oscillator coils trimmer capacitor bank (C20, C21, C22, C23, C24)	1.20	31414	Switch—Push button station selector switch (S12, S13, S14, S15, S16, S17, S20, S21, S22, S23, S24, S25)	3.05
12723	Capacitor—56 mmfd. (C4)	.35	31412	Volume control and power switch (R5, S1)—Model 95T5 only	1.50
30904	Capacitor—100 mmfd. (C7, C8, C9, C10)	.25	30957	Transformer—First i-f transformer (L5, L6, C7, C8)	1.90
13003	Capacitor—180 mmfd. (C12)	.35	30903	Transformer—Second i-f transformer (L7, L8, C9, C10)	1.80
12488	Capacitor—270 mmfd. (C32)—Models 96T, 96T1 and 96E only	.35	31409	Transformer—Power transformer 100-120 volts, 25-60 cycle (T1)—Model 95T5 only	7.25
31435	Capacitor—750 mmfd. (C25)	.40	31574	Transformer—Power transformer 100-120 volts, 25-60 cycle (T1)—Models 96T, 96T1 and 96E only	9.20
12635	Capacitor—1,000 mmfd. (C27)—Model 95T5 only	.50	31408	Transformer—Power transformer 100-120 volts, 50-60 cycle (T1)—Model 95T5 only	5.30
4838	Capacitor—.005 mfd. (C15, C26, C30) (C26, C30—Models 96T, 96T1 and 96E only)	.25	31380	Transformer—Power transformer 100-120 volts, 50-60 cycle (T1)—Models 96T, 96T1 and 96E only	6.35
14393	Capacitor—.01 mfd. (C13, C14)	.30	31410	Transformer—Power transformer 100-120 and 200-240 volts, 50-60 cycle (T1)—Model 95T5 only	5.80
4886	Capacitor—.05 mfd. (C11)	.20	31575	Transformer—Power transformer 100-120 and 200-240 volts, 50-60 cycle (T1)—Models 96T, 96T1 and 96E only	8.35
30899	Capacitor—.01 mfd. (C11, C26, C31) (C26 Model 95T5 only) (C31 Models 96T, 96T1 and 96E only)	.30	<b>SPEAKER ASSEMBLIES</b>		
31423	Capacitor—Comprising 2 sections 5 mfd. each (C16, C17)—Model 95T5 only	1.40	Model 95T5 (Speaker 84326-2)		
31424	Capacitor—Comprising 2 sections 8 mfd. each (C16, C17)—Models 96T, 96T1 and 96E only	1.65	31473	Cone—Speaker cone and voice coil (L9)	1.70
31382	Clip—Oscillator coil and core mounting clip	.04	31472	Speaker—Complete	4.05
30894	Coil—Antenna coil (L1, L2)	.85	31474	Transformer—Output transformer (T2)	1.65
31098	Coil—Oscillator coil (L3, L4)	.85	<b>SPEAKER ASSEMBLIES</b>		
31383	Coil—Oscillator coil (L15, L16)	.30	Model 96T (Speaker 84326-1)		
31384	Coil—Oscillator coil (L13, L14)	.30	31478	Cone—Speaker cone and voice coil (L9)	1.35
31415	Coil—Oscillator coil (L12)	.30	31475	Speaker—Complete	4.45
31097	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C28)—Model 95T5 only	2.70	31477	Transformer—Output transformer (T2)	1.00
31422	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C33)—Models 96T, 96T1 and 96E only	2.70	<b>SPEAKER ASSEMBLIES</b>		
31413	Control—Volume control, tone control, and power switch (R5, R14, S1)—Models 96T, 96T1 and 96E only	3.00	Model 96E (Speaker 84308-1)		
30877	Cord—Indicator drive cord	.20	31443	Cone—Speaker cone and voice coil (L9)	1.40
30905	Core—Adjustable core and stud for i-f transformers	.35	31442	Speaker—Complete	4.90
31386	Core—Adjustable core and stud for oscillator coils	.15	31444	Transformer—Output transformer (T2)	1.95
31421	Drum—Variable condenser drive cord drum	.45	<b>SPEAKER ASSEMBLIES</b>		
31420	Indicator—Station selector indicator pointer	.10	Model 96T1 (Speaker 84327-1)		
11891	Lamp—Dial lamp	.17	31443	Cone—Speaker cone and voice coil (L9)	1.40
31419	Plate—Dial color plate	.12	31683	Speaker—Complete	4.95
5040	Plug—4-contact female plug for speaker cable—Model 96E only	.30	31477	Transformer—Output transformer (T2)	1.00
31373	Pulley—Indicator drive cord pulley	.08	<b>SPEAKER ASSEMBLIES</b>		
31425	Resistor—Voltage divider comprising one 22 ohm, one 18,000 ohm, one 8,200 ohm, and one 3,900 ohm sections (R3, R11, R12, R15)—Models 96T, 96T1 and 96E only	.90	Model 96E (Speaker 84308-1)		
13428	Resistor—150 ohms, 1/2 watt (R11)—Model 95T5 only	.20	31443	Cone—Speaker cone and voice coil (L9)	1.40
31388	Resistor—390 ohms, 1 watt (R9)—Models 96T, 96T1 and 96E only	.22	31442	Speaker—Complete	4.90
31024	Resistor—880 ohms, 1/2 watt (R9)—Model 95T5 only	.20	31444	Transformer—Output transformer (T2)	1.95
30151	Resistor—18,000 ohms, 1 watt (R12)—Model 95T5 only	.22	<b>MISCELLANEOUS ASSEMBLIES</b>		
12738	Resistor—27,000 ohms, 1/2 watt (R10)	.20	31428	Button—Station selector switch push button	.08
12286	Resistor—56,000 ohms, 1/2 watt (R2)	.20	31429	Dial—Station selector dial scale	.40
13734	Resistor—120,000 ohms, 1/2 watt (R16)—Models 96T, 96T1 and 96E only	.20	31095	Discs—10 celluloid protector discs for call letter markers	.10
12199	Resistor—270,000 ohms, 1/2 watt (R7)	.20	31687	Escutcheon—Dial escutcheon—Model 96T1 only	.55
12285	Resistor—470,000 ohms, 1/2 watt (R8)—Model 95T5 only	.20	30773	Knob—Volume control or tuning condenser large knob—Models 96T, 96T1 and 96E only	.15
12679	Resistor—2.2 meg., 1/2 watt (R4)	.20	31355	Knob—Tuning condenser small knob—Models 96T, 96T1 and 96E only	.12
13601	Resistor—10 meg., 1/2 watt (R6)	.20	30883	Knob—Volume control and power switch, or tuning condenser knob—Model 95T5 only	.15
14887	Retainer—Pulley retainer	.01	31391	Knob—Tone control and power switch knob—Models 96T, 96T1 and 96E only	.15
14350	Screw—No. 8-32 square head set screw for drum Stock No. 31421	.03	30991	Marker—Station call letter markers	.40
31364	Socket—Dial lamp socket	.20	14270	Spring—Retaining spring for knob Stock Nos. 30773 and 31355	.05
31251	Socket—Radiotron socket	.25	30330	Spring—Retaining spring for knob Stock No. 31391	.03
31418	Spring—Indicator drive cord tension spring	.05	30900	Spring—Retaining spring for knob Stock No. 30863	.05

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RCA MFG. CO., INC.

MODELS 96T2, 96K  
Schematic, Drive Data  
Specifications

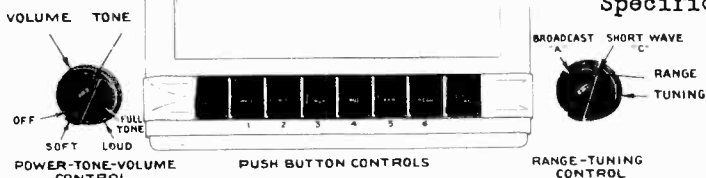
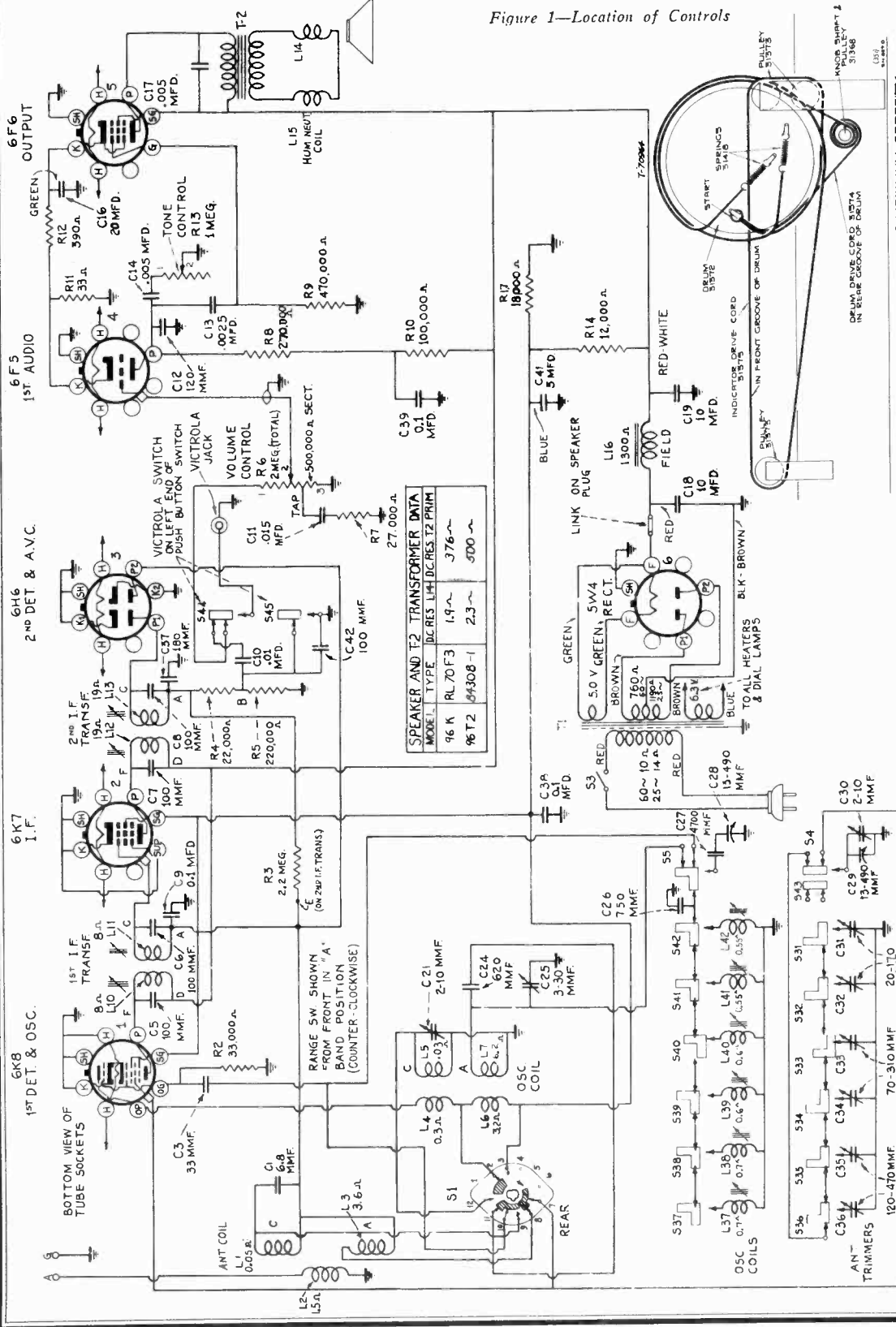


Figure 1—Location of Controls



**SPEAKER AND T2 TRANSFORMER DATA**

MODEL	T	TYPE	DC RES.	I.H. DC RES.	T2 PRIM.
96 K	RL70	F3	1.9~	376~	~
96 T2	66308-1		2.3~	300~	~

DRUM SHOWN WITH GRING AT MAXIMUM CAPACITY

Figure 6—Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

- Pilot Lamps (2) ..... Mazda No. 47, 6.3 volts, 0.15 amp.
- Power Supply Ratings
- Rating A ..... 105-125 volts, 50-60 cycles, 75 watts
- Rating B ..... 105-125 volts, 25-60 cycles, 75 watts
- Rating C ..... 100-130/140-160/195-250 volts, 40-60 cycles, 75 watts

R-F ALIGNMENT FREQUENCIES

- "Short Wave" (C) ..... 15.2 mc (osc., ant.)
- Standard Broadcast (A) ..... 1,500 kc (osc.)
- ..... 550 to 1,500 kc

SIX ELECTRIC TUNING POSITIONS

- Two stations between approximately 550-950 kc
- Two stations between approximately 680-1,180 kc
- Two stations between approximately 890-1,500 kc

FREQUENCY RANGES

- "Standard Broadcast" (A) ..... 540-1,720 kc
- "Short Wave" (C) ..... 5.6-18.0 mc

Intermediate Frequency .....

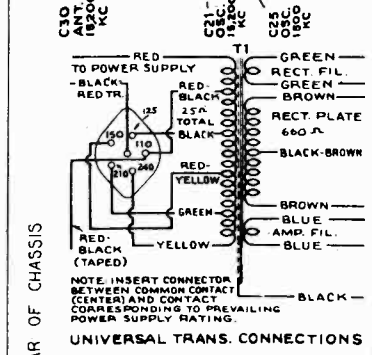
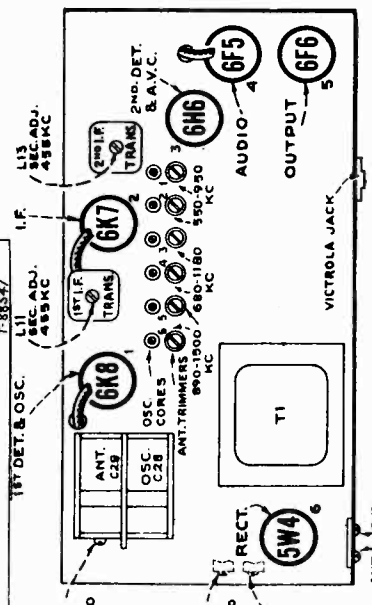
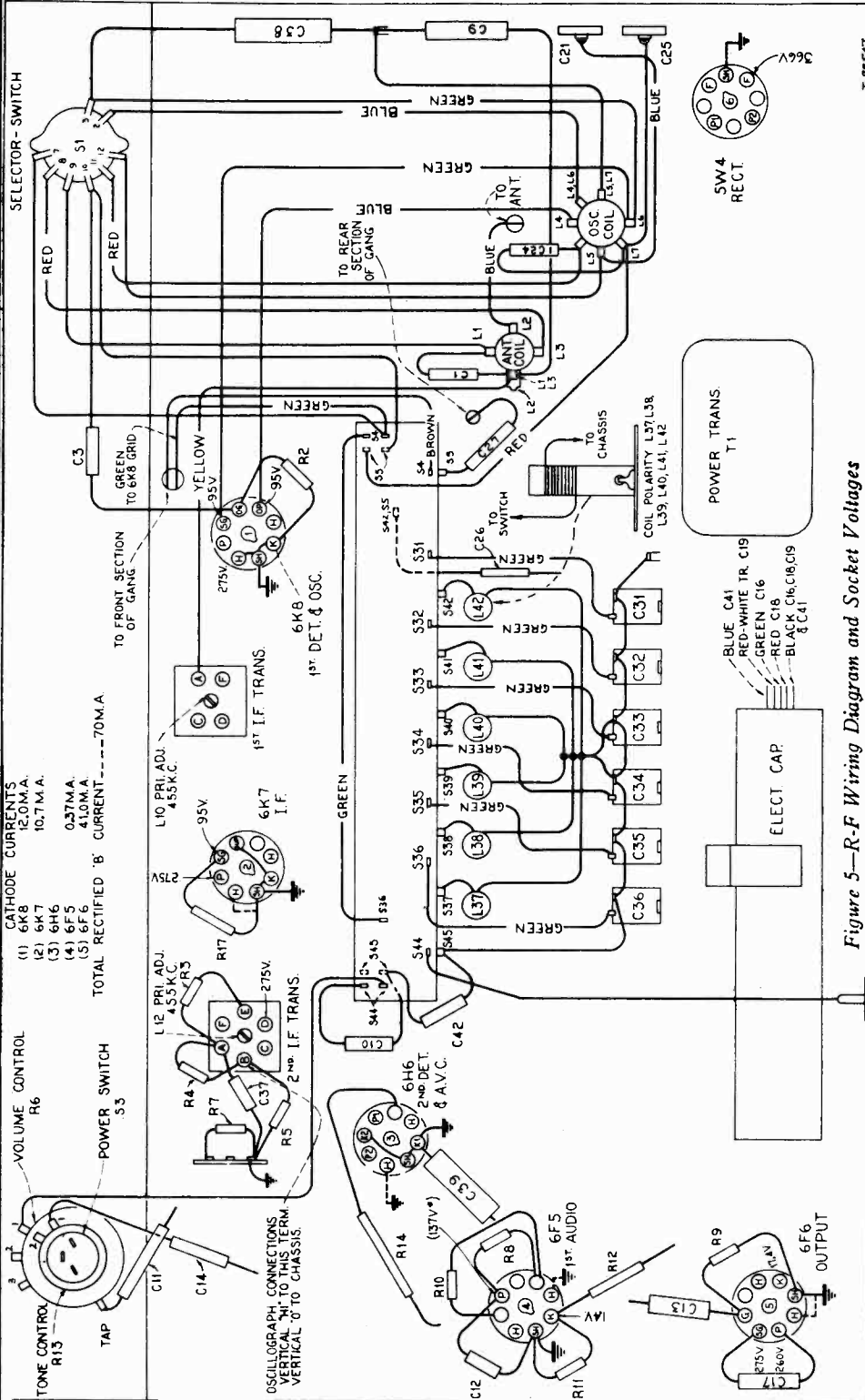


**MODELS 96T2, 96K**  
**Voltage, Chassis Wiring**  
**Socket, Trimmers**  
**Transformer Data**

RCA MFG. CO., INC.

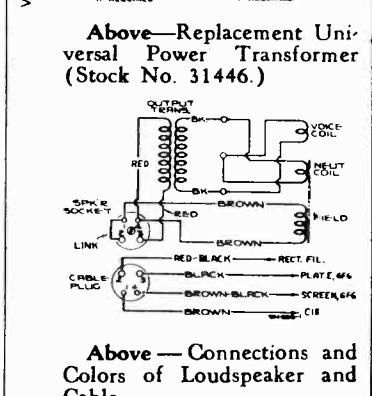
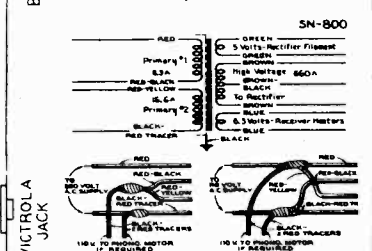
\*NOTE: Values with star (\*) are operating voltages in circuits with high series resistance. The actual measured voltages will be lower, depending on the voltmeter loading.

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



**Figure 5—R-F Wiring Diagram and Socket Voltages**

Below — Replacement Universal Power Transformer (Stock No. 31446.)





MODELS 94X1, 94X2

Schematic, Socket, Trimmers  
Chassis Wiring, Voltage  
Tuner, Notes

RCA MFG. CO., INC.

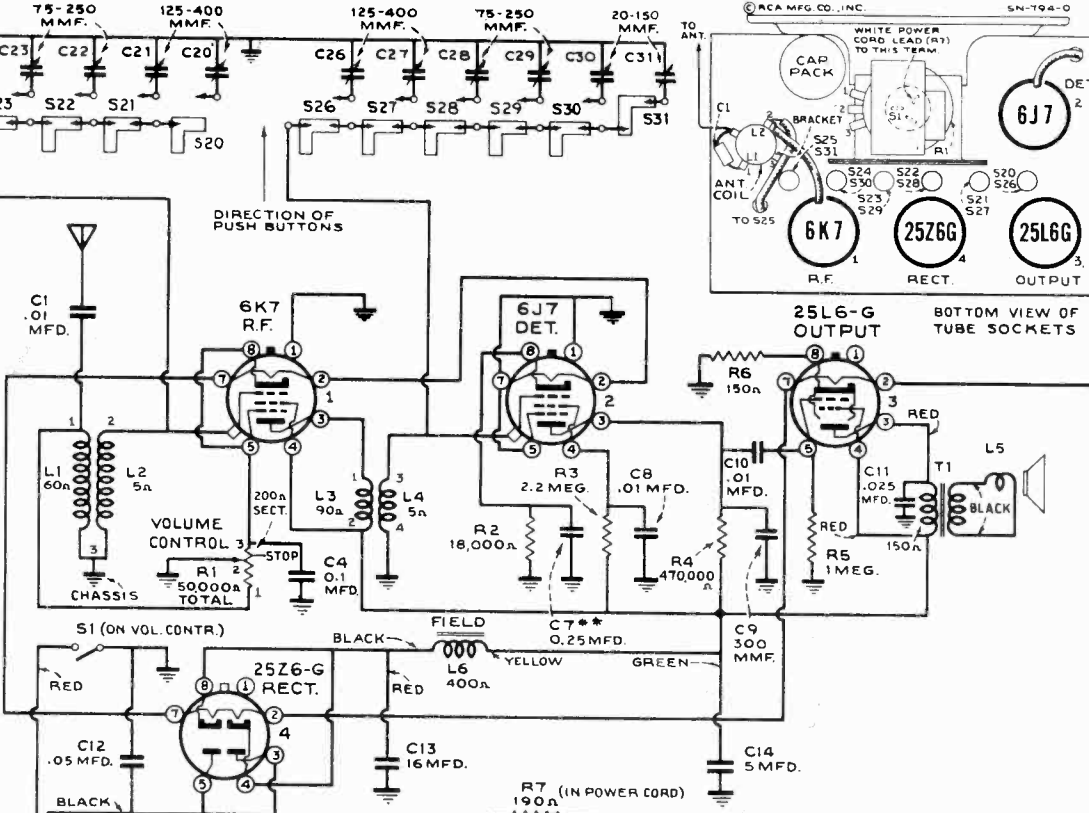
POWER OUTPUT (125-volt, 60-cycle supply)	1.0 watt
Undistorted	1.5 watts
Maximum	
LOUDSPEAKER	
Type	5-inch Electrodynamic
Voice-Coil Impedance	3 ohms at 400 cycles

In re-assembling, dress the leads to prevent rubbing against the push button shafts.  
**CAUTION:** The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing.

Adjustment of Tuning Capacitors

- The preferable and quickest method of adjusting the tuning capacitors for six different stations, is to employ a test-oscillator, as described below:
1. Make a list of the desired six stations, arranged in order from low to high frequencies.
  2. Determine the correct settings of the test-oscillator for these six frequencies. This is accomplished as follows: Tune in each of the six stations on any standard receiver; zero-beat the test-oscillator against each station, and note the exact setting of the oscillator in each case.
  3. Reel up the antenna wire. Connect the high side of test-oscillator through a 60 mmfd. fixed capacitor to the end of the antenna wire. Clip the low side of the oscillator through a 0.1 mfd. capacitor to one of the chassis-mounting screws on the bottom of the cabinet. Tune the oscillator to the previously-determined point for the lowest-frequency station, and adjust for a strong output.
  4. Turn the volume control of the push-button receiver full clockwise, and push in the left-hand end button. Using an insulated screw-driver, peak capacitors C20 and C26, at the same time reducing the output of the oscillator in order to secure a sharp peak. (Clockwise adjustment of the capacitors tunes the circuits to lower frequencies, and counter-clockwise adjustment tunes the circuits to higher frequencies. The range of each trimmer is three full counter-clockwise turns from the tight position. Do not unscrew more than three turns.)
  5. Push in the second button from left, and adjust C21 and C27 for peak output with the oscillator tuned to the frequency of the second station.
  6. Proceed in this manner to adjust each pair of capacitors for the desired frequencies.
  7. Final adjustment may be made in actual reception of the stations.

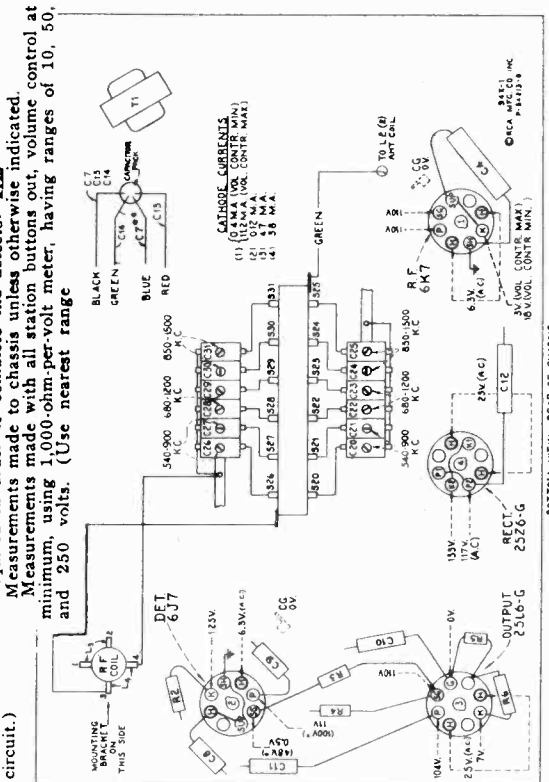
Removing chassis from cabinet.—Remove back plate and volume-control knob. Pull the push-button knobs off their shafts. Remove the 25L6-G output tube. Remove the four chassis screws (bottom of cabinet). Lift the chassis and slide it out at an angle to clear the shaft holes in the top of cabinet.  
Removing trimmer-and-switch assembly.—For convenient access to the sockets and parts, it is advisable to remove the trimmer-and-switch assembly. This is a simple operation, accomplished as follows: Remove the two brackets from bottom of chassis, unsolder the three leads that connect to the assembly, remove the two nuts that hold the assembly to the chassis, and lift out the assembly.



FREQUENCY RANGE

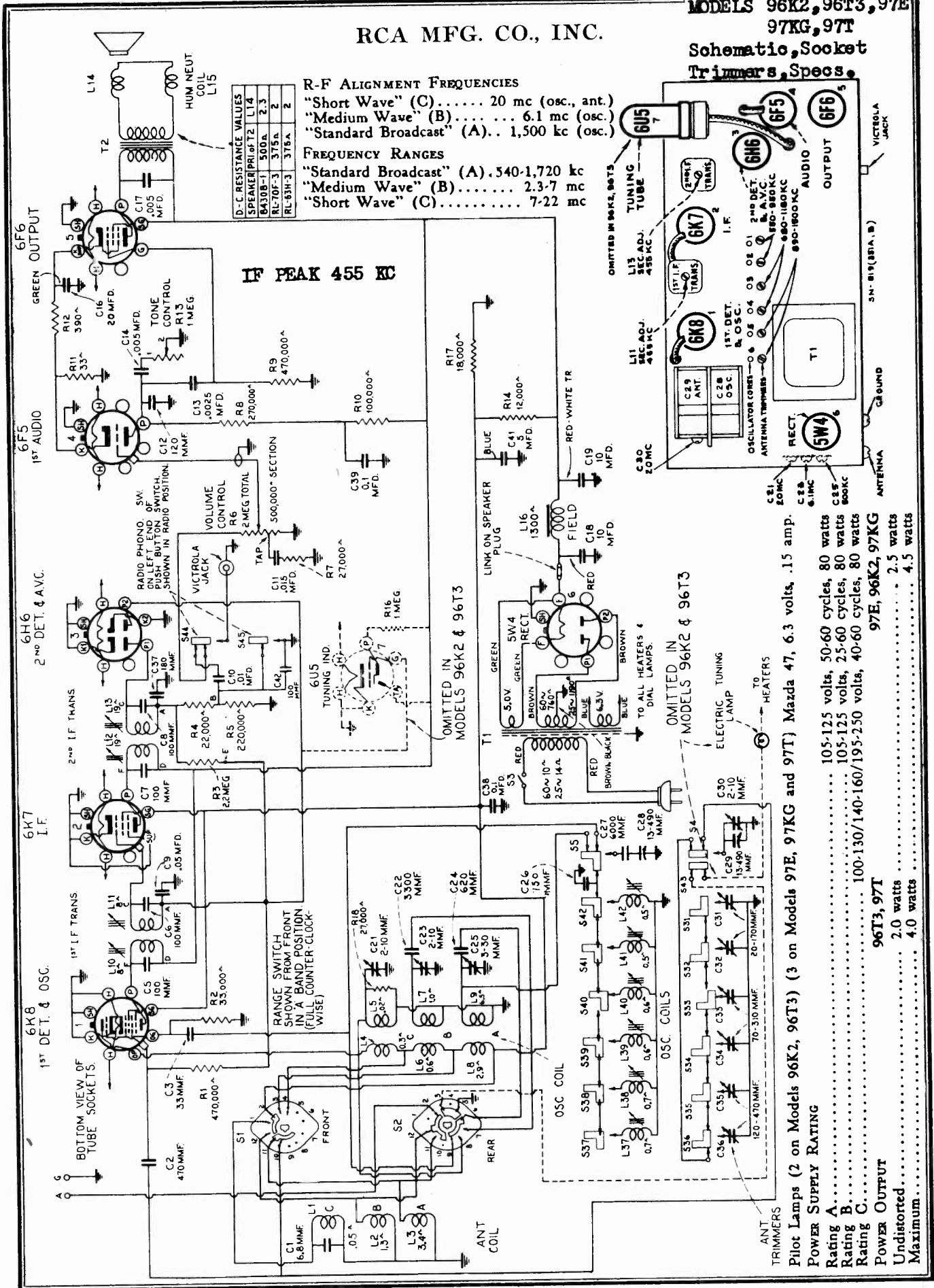
Two stations between 540-900 kc
Two stations between 680-1,200 kc
Two stations between 850-1,500 kc

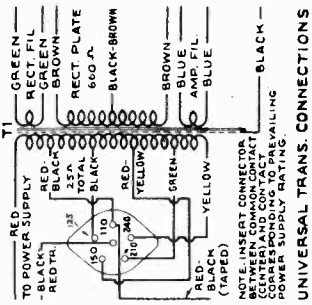
(L5 is 3.5 ohms, and the sec. of T1 is 0.5 ohms)  
\*\* Some sets have a three-section capacitor pack (C7, C13, C14). In other sets, the pack contains only two capacitors (C13, C14); a separate 0.25 mfd. capacitor being used as C7. The pack furnished for replacement (No. 30873) is a two-section pack and does not include C7. Therefore, when an original three-section pack is replaced by No. 30873, it is necessary to connect a No. 30965 200-volt 0.25 mfd. capacitor from the cathode of the 6J7 to the ground lug at the output transformer. This capacitor should be dressed close to the front of chassis.



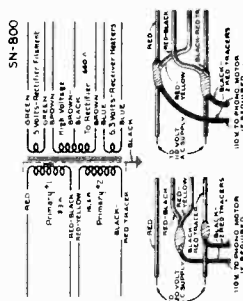
BOTTOM VIEW - REAR OF CHASSIS

RCA MFG. CO., INC.

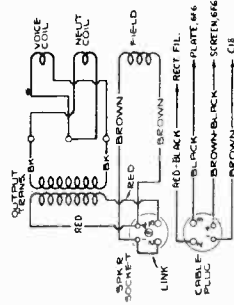




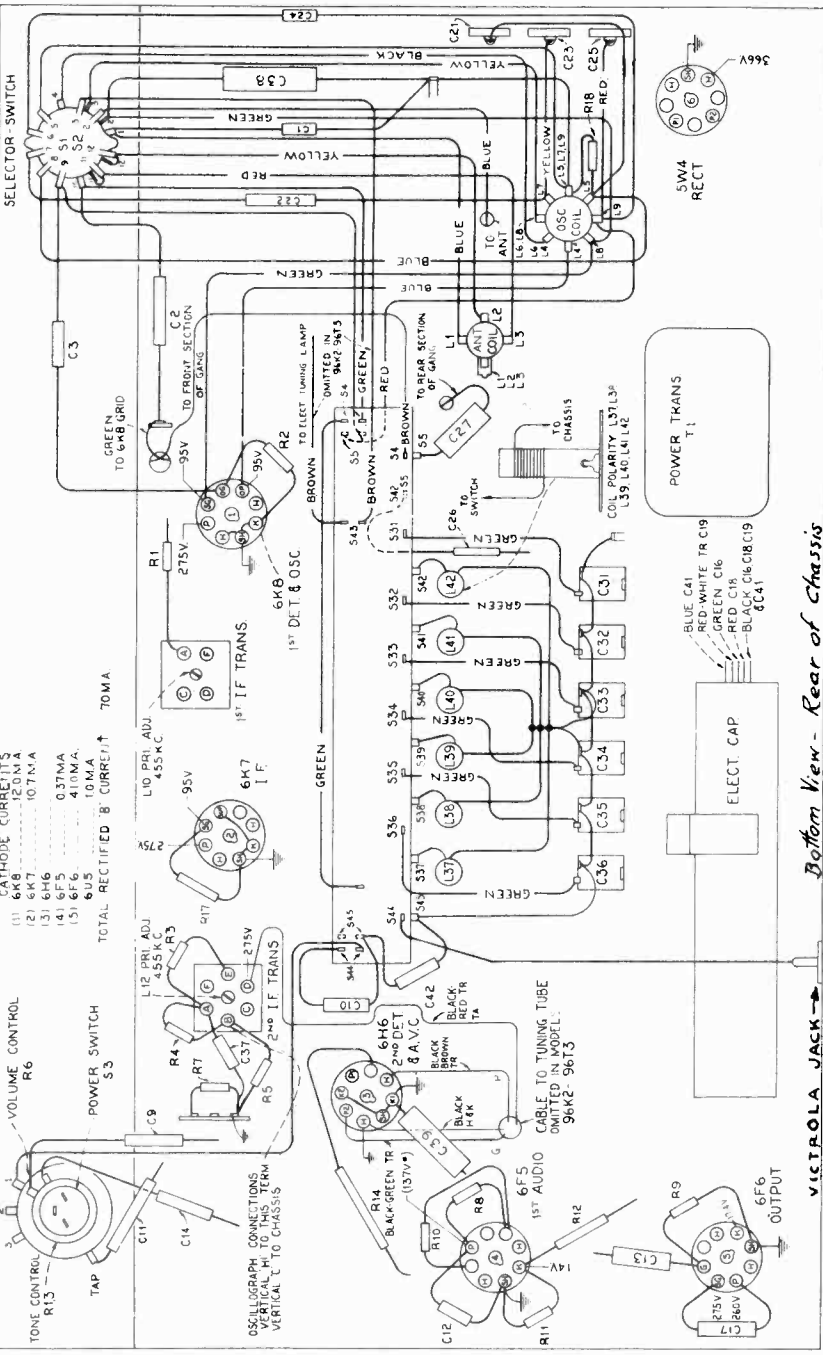
**UNIVERSAL TRANS. CONNECTIONS**  
**Above—Universal Power Transformer Connections.** (110-volt supply for a Victrola Attachment may be obtained by connecting the motor to the red and the red-black leads.)



**Above—Replacement Universal Power Transformer** (Stock No. 31446.)



**Above—Connections and Colors of Loudspeaker and Cable.**



**Victrola Jack—Rear View—Rear of Chassis**

Measurements made to chassis unless otherwise indicated. \* NOTE: Values with star (\*) are operating voltages in mini-circuits with high series resistance. The actual measured voltage. Values should hold within  $\pm 20\%$  with 117-volt a-c ages will be lower, depending on the voltmeter loading.  
**Precautionary Lead Dress—**

1. Dress power-switch leads against left apron, to prevent hum pickup.
2. Dress R1 away from front of chassis.
3. Electric-tuning lamp leads must be dressed in front of range switch.
4. Dress lead from L5 to range switch away from other leads.
5. Dress leads away from antenna coil.
6. Dress other parts and leads away from R14, as it becomes heated.
7. Leads across back of chassis should be dressed under electrolytic to prevent approaching Victrola jack.

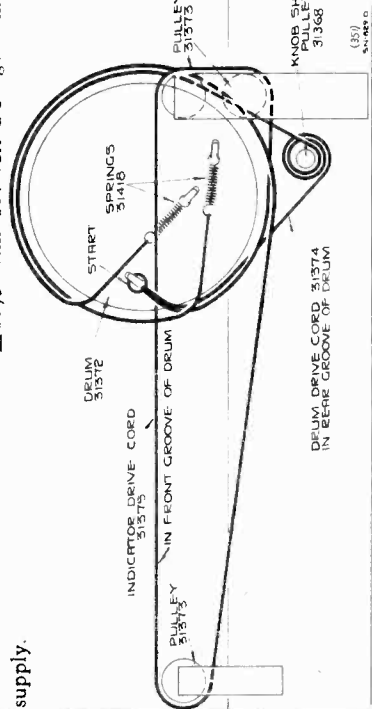


Figure 6—(At Left) Arrangement of Drive Cords for Timing Condenser and Dial Indicator

DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY





MODEL 95T

Schematic, Socket, Trimmers

Voltage, Chassis Wiring

Alignment, Parts, Specs.

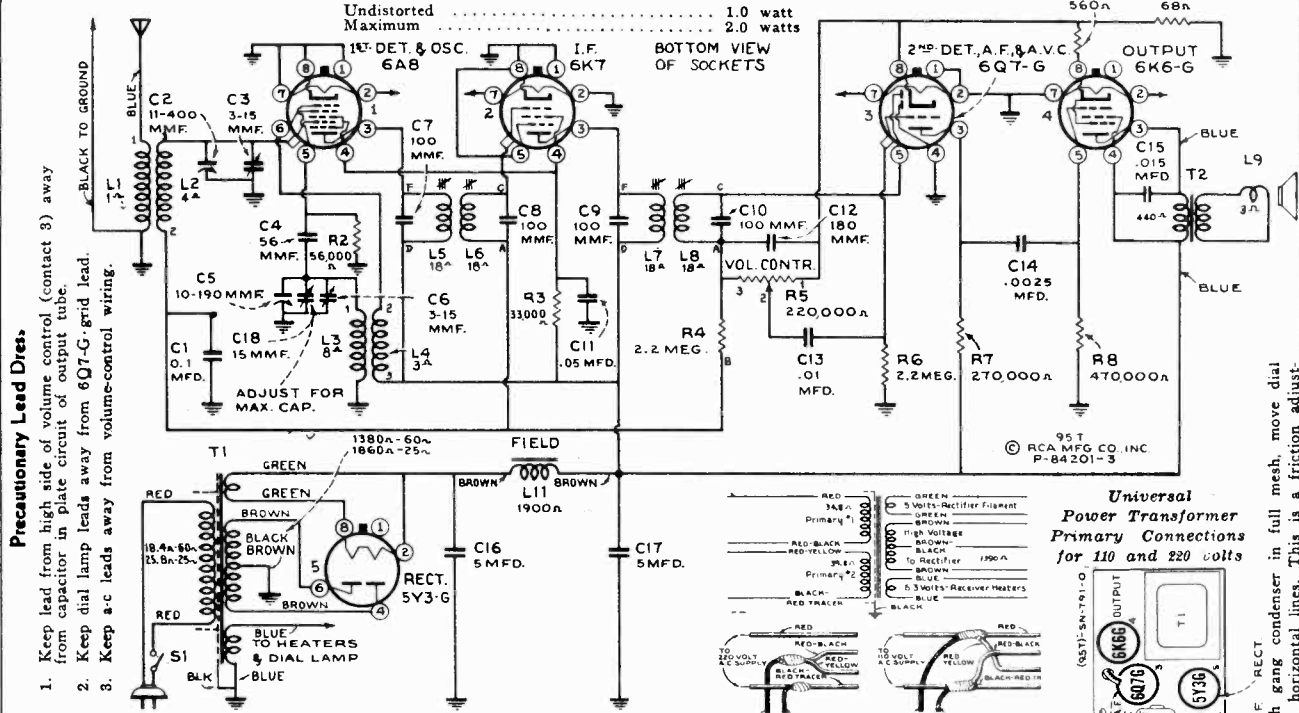
RCA MFG. CO., INC.

Dial lamp..... Mazda No. 46, 6.3 volts, 0.25 amps.

Power OUTPUT (125-volt, a-c supply)

Undistorted Maximum..... 1.0 watt

..... 2.0 watts

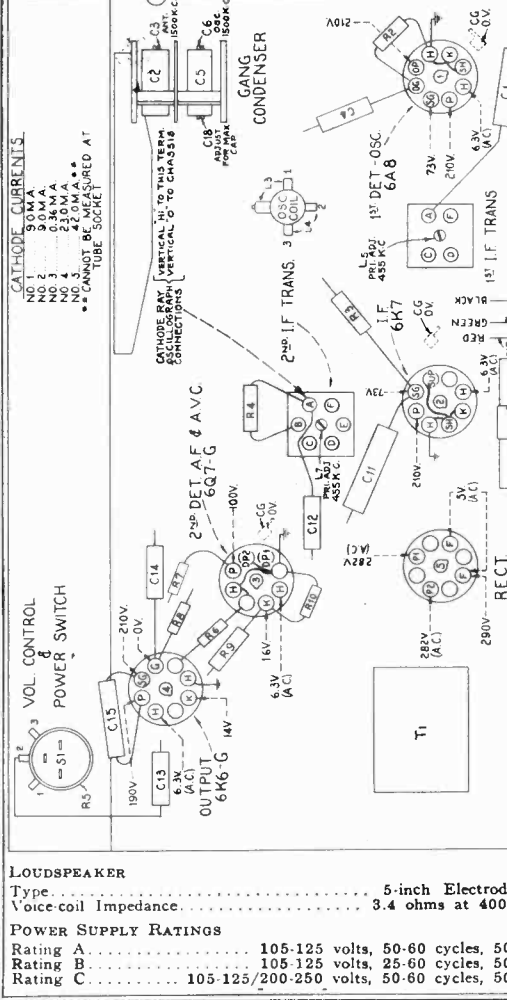


Frequency Range..... 540 to 1,750 kc  
 R-F Alignment Frequency..... 1,500 kc (osc., ant.)  
 Intermediate Frequency..... 455 kc

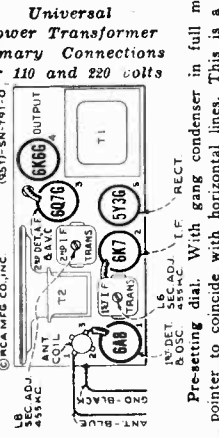
Figure 3—Schematic Circuit Diagram

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	6K7 I-F grid cap. in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Transformer)
No. 2	6A8 1st-det. grid cap. in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc (Top of "1" in 150)	C6* (oscillator) C3 (antenna)

\* Trimmer C18 on gang condenser should be screwed clockwise for maximum capacity before adjusting C6.



STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>		
30892	Bracket—Station selector dial scale holder with indicator shaft and drive bearing assembly...	.55
11350	Cap—Grid connector cap.....	.05
12723	Capacitor—58 Mmfd. (C4).....	.25
30904	Capacitor—100 Mmfd. (C7, C8, C9, C10).....	.25
13003	Capacitor—180 Mmfd. (C12).....	.25
5107	Capacitor—.0025 Mfd. (C14).....	.20
4858	Capacitor—.01 Mfd. (C13).....	.25
11315	Capacitor—.015 Mfd. (C15).....	.20
4886	Capacitor—.05 Mfd. (C11).....	.20
30899	Capacitor—.01 Mfd. (C1).....	.30
30898	Capacitor—Comprises two 5 Mfd. sections (C16, C17).....	1.45
30894	Coil—Antenna coil (L1, L2).....	.85
30895	Coil—Oscillator coil (L3, L4).....	1.05
30890	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C8).....	2.55
30877	Cord—Indicator drive cord.....	.20
30905	Core—Adjustable core and stud for I.F. transformers.....	.35
30893	Dial—Station selector dial scale and lamp bracket assembly.....	.60
30896	Indicator—Station selector indicator pointer.....	.40
5226	Lamp—Dial lamp.....	.17
11361	Resistor—88 ohms, 1/2 watt (R10).....	.20
5164	Resistor—560 ohms, 1/2 watt (R9).....	.20
8072	Resistor—33,000 ohms, 1/2 watt (R3).....	.20
5029	Resistor—56,000 ohms, 1/2 watt (R2).....	.20
12199	Resistor—270,000 ohms, 1/2 watt (R7).....	.20
11172	Resistor—470,000 ohms, 1/2 watt (R8).....	.20
13998	Resistor—2.2 Meg., 1/2 watt (R4, R6).....	.20
14114	Socket—Dial lamp socket assembly.....	.25
11196	Socket—Radiotron socket.....	.25
30831	Spring—Indicator drive cord tension spring.....	.03
30802	Transformer—First I.F. transformer (L5, L6, C7, C8).....	1.80
30803	Transformer—Second I.F. transformer (L7, L8, C9, C10).....	1.80
30889	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1).....	7.65
30888	Transformer—Power transformer 110 and 220 volts, 50-60 cycle (T1).....	6.00
30891	Volume Control and power switch (R5, S1).....	1.50



REPRODUCER ASSEMBLIES (Speaker 84202-2)	Unit List Price
30940 Cone—Reproducer cone and voice coil (L9).....	1.00
30939 Reproducer complete.....	4.50
30941 Transformer—Output transformer (T2).....	.85

Pre-setting dial. With gang condenser in full mesh, move dial pointer to coincide with horizontal lines. This is a friction adjust-ment.

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RCA MFG. CO., INC.

MODEL 97X  
Schematic, Specs.  
Lead Dress, Notes

Frequency Range..... 540-1,720 kc  
 One Station between approximately 550-980 kc (Button No. 1—left)  
 Two Stations between approximately 650-1,080 kc (Buttons 2 and 3)  
 Two Stations between approximately 850-1,500 kc (Buttons 4 and 5)  
 R-F Alignment Frequency..... 1,500 kc (osc., ant.)  
 Intermediate Frequency..... 455 kc

RCA TUBE COMPLEMENT

- (1) RCA-6A8-G..... First Detector—Oscillator
- (2) RCA-6K7..... I-F Amplifier
- (3) RCA-6H6..... Second Det., and A.V.C.
- (4) RCA-6F5..... Audio Voltage Amplifier
- (5) RCA-25L6-G..... Power Output
- (6) RCA-25Z6-G..... Half-Wave Rectifier

POWER OUTPUT

Undistorted..... 1.0 watts  
 Maximum..... 1.5 watts

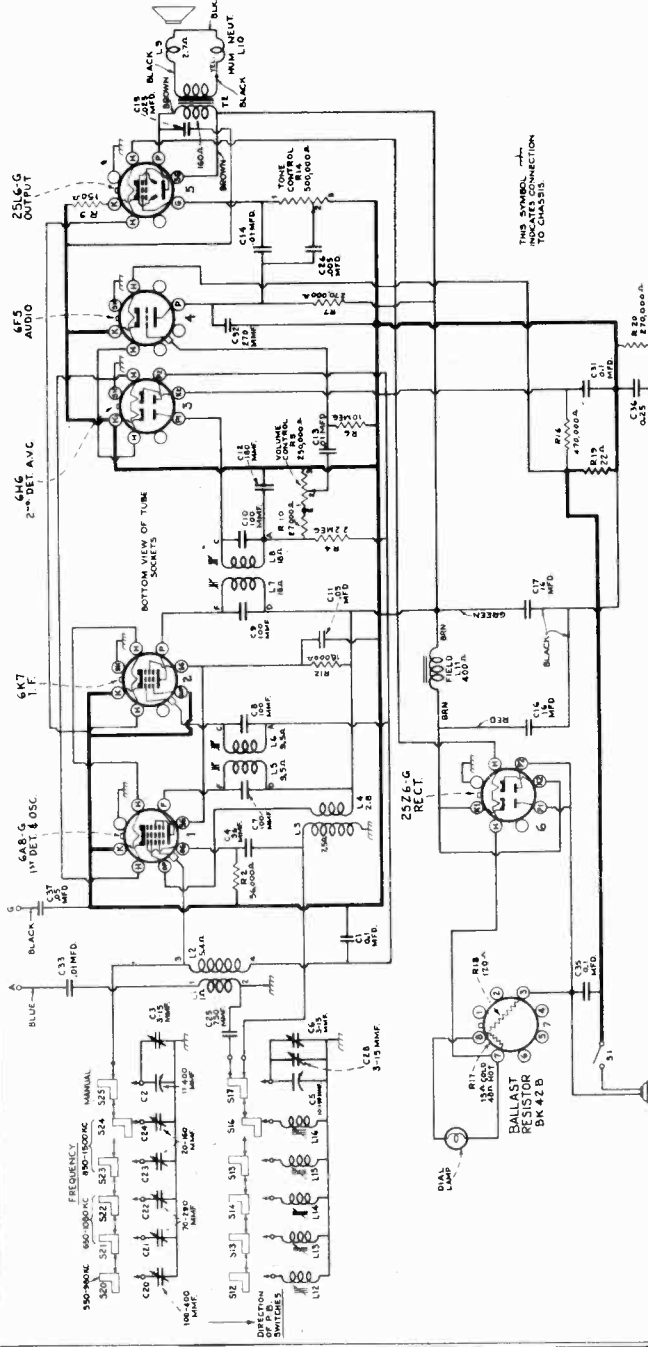
POWER SUPPLY RATING

A-C Rating..... 105-125 volts, 50-60 cycles, 55 watts  
 D-C Rating..... 105-125 volts, 55 watts

Pilot Lamp (1)..... Mazda 47, 6.3 volts, .15 amp.

LOUDSPEAKER (ELECTRODYNAMIC)

Diameter (inches)..... 5. V. C. Impedance at 400 cycles..... 3.0 ohms



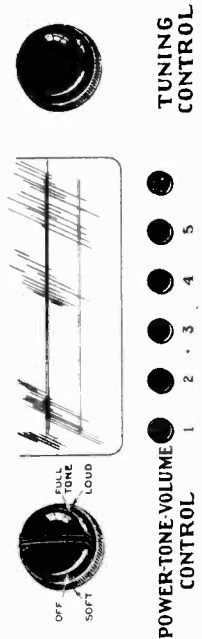
Miscellaneous Service Data

To center the loudspeaker voice coil, first remove the front dust cover by applying acetone sparingly, then loosen the spider screws, insert three narrow feelers in the gap, and tighten the spider screws. Remove the feelers and fasten a dust cover in place with loudspeaker cement.

Removing Push-Button Assembly.—The push-button assembly is held to the chassis by two nuts on the front apron, and may be quickly and easily swung out for convenient access to the sockets and other parts. No unsoldering is required, as flexible leads are used for all connections from the chassis to the assembly.

Precautionary Lead Dress.—

1. Dress green lead from antenna coil to switch away from the chassis and gang.
2. Dress green leads from trimmer bank away from the oscillator-core adjustment screws.
3. Dress heater lead from 6H6 to 6A8-G away from the 2nd I.F. transformer.
4. Dress black lead from electrolytic to volume control against front apron.



Location of Controls

The right-hand push button is for dial tuning

MODEL 97X  
Socket, Trimmer's  
Alignment, Tuner

RCA MFG. CO., INC.

### ALIGNMENT PROCEDURE

**Cathode-Ray Alignment** is the preferable method. Connections for the oscillograph are shown in the chassis drawing. Turn the receiver volume control to maximum.

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

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

**Calibration Marks.**—The tuning dial is fastened in the cabinet and can not be used for reference during alignment. Therefore calibration marks corresponding to dial readings of 600 kc and 1,500 kc have been stamped in the plate on the front of the chassis, as shown in the accompanying drawing. These marks are used for reference during alignment.

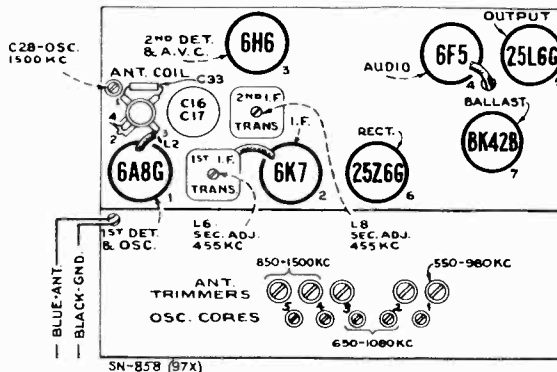
**Drum and Dial Indicator Adjustment.**—As the first step in r-f alignment, check the position of the drum on the front shaft of the gang condenser. With the gang at maximum (full mesh) the drum set-screw should be pointing directly down as shown in the drawing. With the drum in this position, and the gang at maximum, move the dial indicator along the drive cord to coincide with the left-hand end mark as shown. The indicator is held to the drive cord by means of spring clips.

After completion of alignment, and after the chassis has been fastened in the cabinet, turn the gang to maximum and note whether the dial indicator is at the left-hand end mark on the dial; if it is not, loosen the drum set-screw

(which is accessible through a slot in the bottom of the cabinet), turn the drum slightly so that the indicator is at this mark, and then tighten the set-screw.

After completion of alignment, seal the i-f core-adjustment screws with household cement.

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

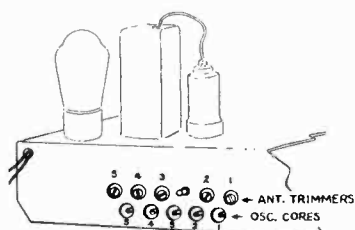


Tube and Trimmer Locations

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I-F Trans.)
2	6A8-G grid cap, in series with .01 mfd.	455 kc		L5 and L6 (1st I-F Trans.)
3	Antenna lead (blue) in series with 200 mmf.	1,500 kc	1,500 kc calibration mark.	C6 (osc.)* C3 (ant.)
4	Follow "Adjustments for Electric Tuning."			

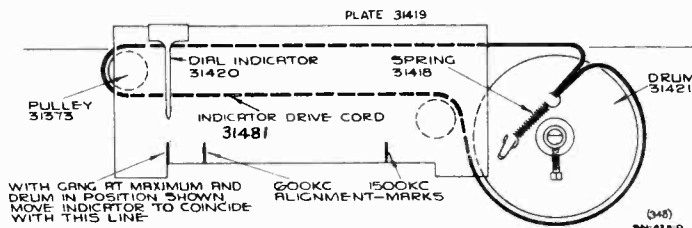
\* Use minimum capacity peak if two peaks can be obtained.

The oscillator section of the gang condenser has two trimmers, one on top, accessible through a hole in the chassis, and the other on bottom. It may be necessary to adjust both of these trimmers to secure a peak on 1,500 kc.



Push-Button Adjustments

No. 1—Approximately 550-980 kc.  
Nos. 2, 3—Approximately 650-1,080 kc.  
Nos. 4, 5—Approximately 850-1,500 kc.



DRUM SHOWN WITH GANG AT MAXIMUM CAPACITY

#### Dial-Indicator and Drive Mechanism

Refer to "Alignment Procedure" for explanation of the "calibration marks" shown in this drawing

### Adjustments for Electric Tuning

These models have six push buttons. The right-hand button connects the gang condenser for dial tuning. The other five buttons are for electric tuning of five different stations in the standard-broadcast range. The station buttons connect to separate 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. Use a regular antenna for the preliminary adjustments.

The procedure is as follows:

1. Make a list of the five desired stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning (right-hand) button, and manually tune in the first station on the list.

3. Push in station-button No. 1 (left-hand) and adjust No. 1 oscillator core (L12) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until the station is received.

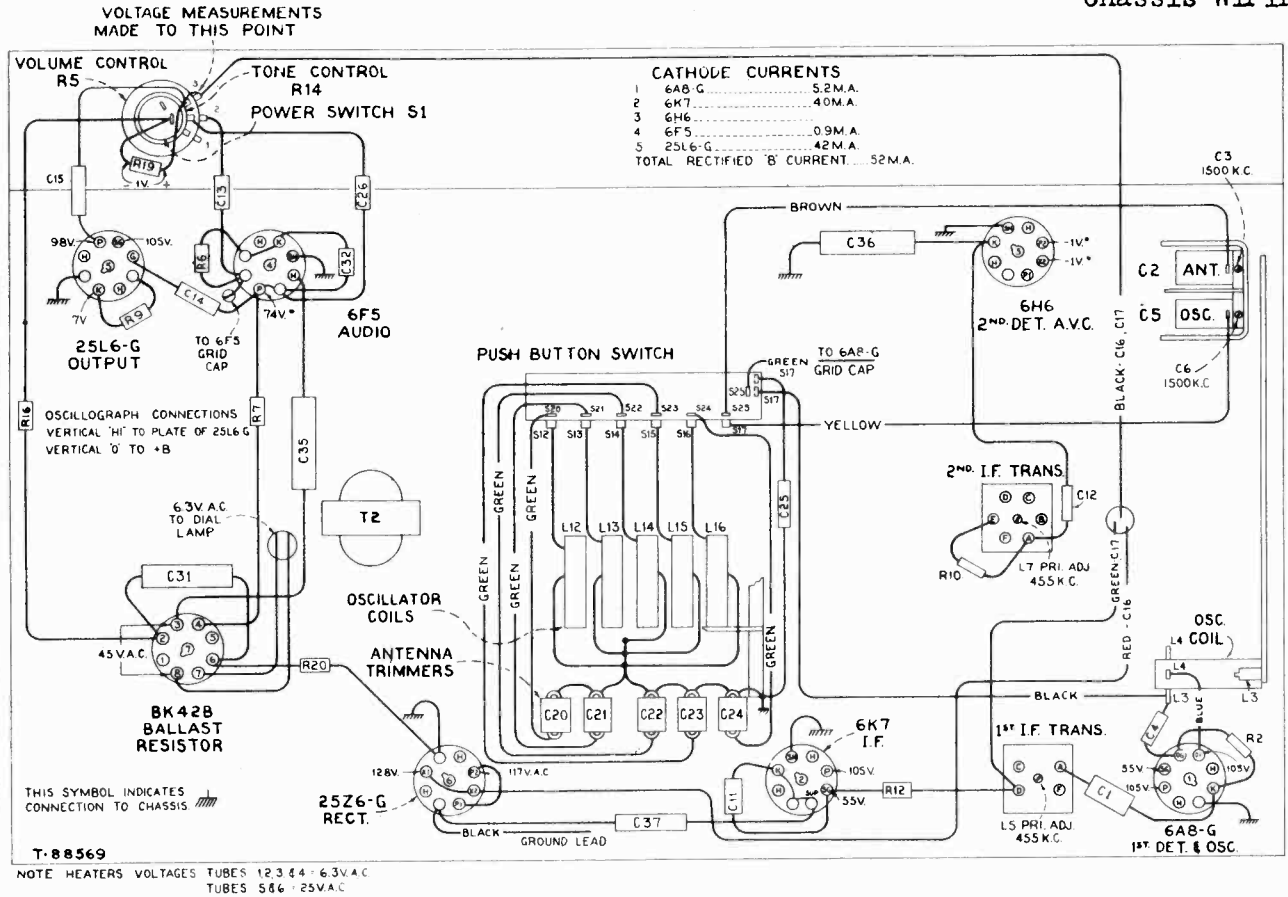
4. Adjust No. 1 antenna trimmer (C20) for maximum output on this station.

5. Adjust for each of the remaining four stations in the same manner.

(Clockwise adjustment of oscillator cores and antenna trimmers tunes the circuits to lower frequencies.)

6. Make a final careful adjustment of the oscillator cores and antenna trimmers, using one or two feet of wire as an antenna to ensure sharp peaking.

RCA MFG. CO., INC.



R-F Wiring Diagram and Socket Voltages

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
31483	Ballast—Ballast resistor tube type BK42-B (R17, R18)	.80	13045	Resistor—18,000 ohms, 1/4 watt (R12)	.20
14338	Bushing—Variable tuning condenser mounting bushing and hardware	.08	12738	Resistor—27,000 ohms, 1/4 watt (R10)	.20
31416	Capacitor—Antenna coil trimmer capacitor bank (C20, C21, C22, C23, C24)	1.20	12286	Resistor—56,000 ohms, 1/4 watt (R2)	.20
12723	Capacitor—56 mmfd. (C4)	.35	12199	Resistor—270,000 ohms, 1/4 watt (R7, R20)	.20
30904	Capacitor—100 mmfd. (C7, C8, C9, C10)	.25	12285	Resistor—470,000 ohms, 1/4 watt (R16)	.20
13003	Capacitor—180 mmfd. (C12)	.35	12679	Resistor—2.2 megohm, 1/4 watt (R4)	.20
12488	Capacitor—270 mmfd. (C32)	.35	13601	Resistor—10 megohm, 1/4 watt (R6)	.20
31435	Capacitor—750 mmfd. (C25)	.40	14887	Retainer—Indicator drive cord pulley retainer	.01
4838	Capacitor—.005 mfd. (C26)	.25	31482	Screw—No. 8 square head set screw for drum Stock No. 31421	.03
4870	Capacitor—.025 mfd. (C15)	.20	31365	Socket—Dial lamp socket	.30
14393	Capacitor—.01 mfd. (C13, C14, C33)	.30	31251	Socket—Tube socket	.25
4886	Capacitor—.05 mfd. (C37)	.20	31418	Spring—Indicator drive cord tension spring	.05
30882	Capacitor—.05 mfd. (C11)	.20	31414	Switch—Selector switch (S12, S13, S14, S15, S16, S17, S20, S21, S22, S23, S24, S25)	3.05
4839	Capacitor—.01 mfd. (C1, C31, C35)	.30	30957	Transformer—1st i.f. transformer (L5, L6, C7, C8)	1.90
12484	Capacitor—.025 mfd. (C36)	.30	30903	Transformer—2nd i.f. transformer (L7, L8, C9, C10)	1.80
31479	Capacitor—Comprising two sections of 16 mfd. each (C16, C17)	1.55	31484	Transformer—Output transformer (T2)	1.30
30894	Coil—Antenna coil (L1, L2)	.85	31483	Tube—Ballast resistor tube type BK42-B (R17, R18)	.80
31098	Coil—Oscillator coil (L3, L4)	.85	<b>SPEAKER ASSEMBLIES (Speaker No. 84326-3)</b>		
31383	Coil—Push button oscillator coil (L15, L16)	.30	31486	Cone—Speaker cone and voice coil (L9)	1.35
31384	Coil—Push button oscillator coil (L13, L14)	.30	31485	Speaker—Speaker complete	4.35
31385	Coil—Push button oscillator coil (L12)	.30	<b>MISCELLANEOUS ASSEMBLIES</b>		
31422	Condenser—2-gang variable tuning condenser (C2, C3, C5, C6, C28)	2.70	31428	Button—Station selector push button	.06
31413	Control—Volume control, tone control and on-off switch (R5, R14, S1)	3.00	31487	Clip—Spring clip and washers to hold dial scale	.12
31481	Cord—Drive cord—36-in. long silk cord	.20	31429	Dial—Station selector dial scale	.40
30905	Core—Adjustable core and stud assembly for i.f. transformer	.35	31095	Disc—10 protector discs for call letter markers	.10
31386	Core—Adjustable core and stud for oscillator coils	.15	31355	Knob—Station selector knob	.12
31421	Drum—Indicator drive drum and hub	.45	30773	Knob—Tone control or dummy knob	.15
31420	Indicator—Station selector indicator pointer	.10	31391	Knob—Volume control knob	.15
31480	Lamp—Dial lamp	.20	30991	Marker—Station call letter push button markers	.40
31419	Plate—Colored dial plate comprising plate, spacers and screws	.12	31488	Mounting—Chassis mounting screw and washer	.15
31373	Pulley—Indicator drive cord pulley	.08	14270	Spring—Retaining spring for knob Stock No. 30773 and 31355	.05
31483	Resistor—Ballast resistor tube type BK42-B (R17, R18)	.80	30330	Spring—Retaining spring for knob Stock No. 31391	.03
14525	Resistor—22 ohms, 1/4 watt (R19)	.20			
30880	Resistor—150 ohms, 1/4 watt (R9)	.20			

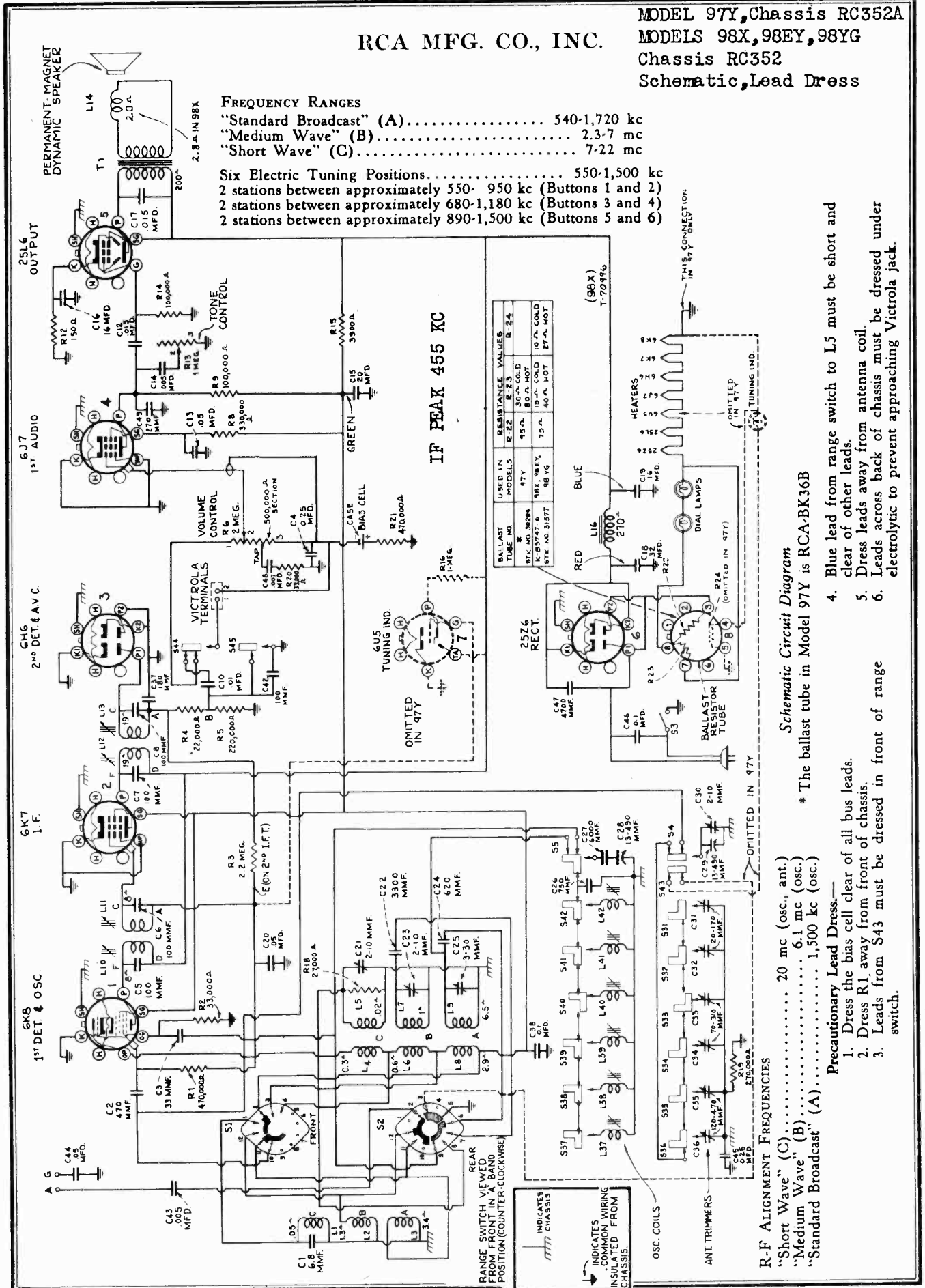
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RCA MFG. CO., INC.

MODEL 97Y, Chassis RC352A  
 MODELS 98X, 98EY, 98YG  
 Chassis RC352  
 Schematic, Lead Dress



MODEL 97Y  
 MODELS 98X, 98EY, 98YG  
 Voltage, Chassis Wiring

RCA MFG. CO., INC.

Drive Cord Data, Notes  
 Specifications

Pilot Lamps (2 on Model 97Y) (3 on Models 98X, 98EY, 98YG)..... Mazda 47, 6.3 volts, .15 amp.

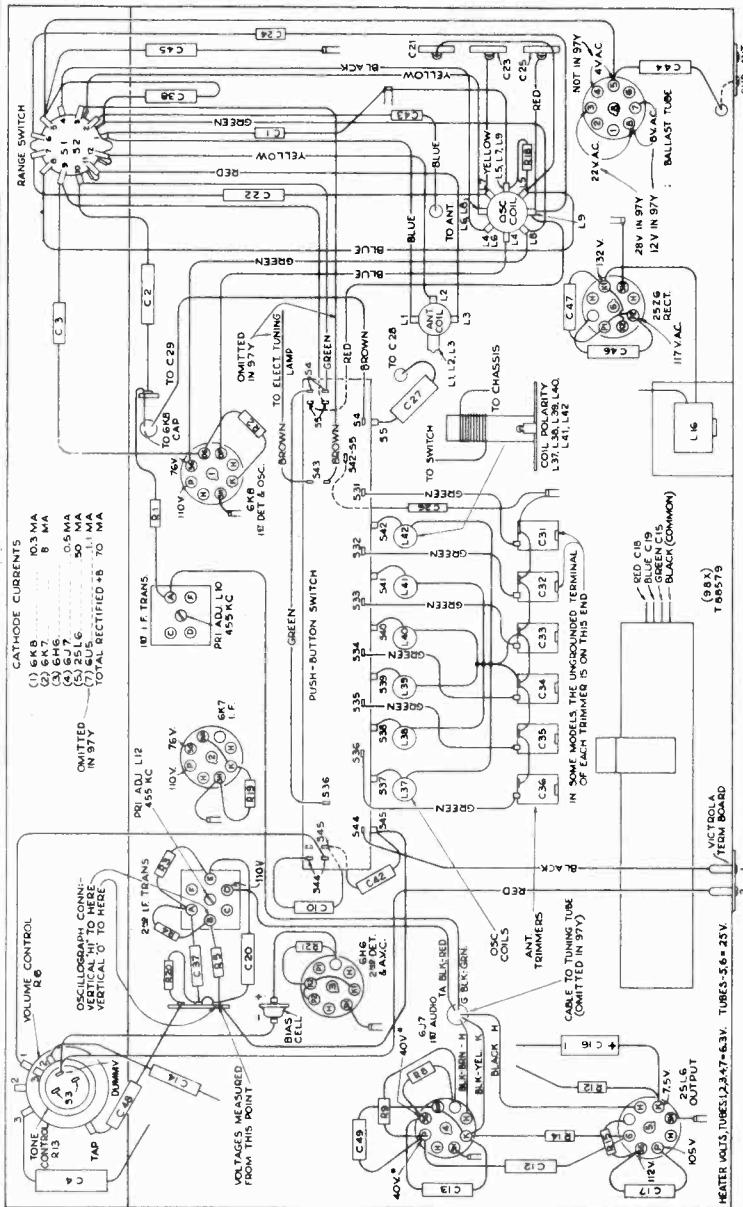
POWER OUTPUT  
 Undistorted..... 1.5 watts  
 Maximum..... 2.5 watts  
 POWER SUPPLY RATING  
 A-C Rating..... 105-125 volts, 25-60 cycles, 55 watts  
 D-C Rating..... 105-125 volts, 55 watts

LOUDSPEAKER (PERMANENT-MAGNET DYNAMIC)  
 97Y 98X 98EY 98YG  
 Diameter..... 12 inches..... 6 inches..... 8 inches..... 12 inches  
 V. C. Impedance at 400 cycles..... 2.2 ohms..... 3 ohms..... 2.2 ohms..... 2.2 ohms

**Miscellaneous Service Notes**  
**Bias Cell.**—The bias cell provides approximately 1-volt bias for the 1st-audio grid. The cell should never be shorted, not measured with an ordinary voltmeter or other device that draws current. The cell may be checked by measuring the 1st-audio cathode current with a new tested 6J7 tube in this socket. The current should be approximately 1/2 milliamper. If it is appreciably greater than 1/2 ml., install a new bias cell.  
**Victrola Attachment.**—Two screw type terminals, numbered 1 and 2, are provided on the rear apron of the chassis for connection to a Victrola Attachment, such as the R-93, R-93-B, etc. (When A-C supply is available.)  
 Care must be taken that these terminals are never connected in any way to the chassis, otherwise injury will result to the bias cell. To safeguard against this possibility, the following precautions should be observed in connecting the Victrola Attachment to the receiver.  
**Victrola Attachment with shielded cable.**—If the shielded cable has a plug connector, remove the plug, connect the shielding to terminal 1, and connect the lead (inside the shielding) to terminal 2. Tape the shielding for a sufficient distance to prevent the possibility of it shorting against the chassis.  
**Victrola Attachment with twisted pair cable.**—Connect the low-side of the Attachment to terminal No. 1, and the high-side of the Attachment to terminal No. 2. (In some Attachments, the lead from the low-side is black, and the lead from the high-side is black-brown.)

**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 position of the plug. For operation on a-c, a similar reversal of the plug may reduce hum.  
**Loudspeaker.**—To center the loudspeaker voice coil, first remove the front dust cover by applying acetone sparingly, then loosen the spider screws, insert three narrow feelers at equal distances in the gap, and tighten the spider screws. Remove the feelers, and fasten a dust cover in place with loudspeaker cement.

**Half-Wave Rectifier RCA-6U5 (Models 98X, 98EY, 98YG).**..... Tuning Tube  
**RCA Stock No. 31577 (Models 98X, 98EY, 98YG).**..... Ballast Tube  
**RCA-BK36B (Model 97Y)**..... Ballast Tube



RCA MFG. CO., INC.

MODEL 97Y  
MODELS 98X, 98EY, 98YG  
Socket, Trimmers, Parts  
Alignment, Tuner

MODELS 97Y, 98X, 98EY, 98YG  
Chassis No. RC-352A RC-352 RC-352A RC-352

REPLACEMENT PARTS

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

STOCK No.	DESCRIPTION	Unit Price	STOCK No.	DESCRIPTION	Unit Price
31577	Ballast resistor tube (R22, R23, R24)	.01	14887	Retainer for drive cord pulley	.01
30974	Bullheads 98X, 98EY and 98YG (R22, R23, R24) Model 97Y	.30	4689	Stock No. 31377 wire head set screw for drum	.05
31797	Board—intensity-ground terminal board	.80	31268	Shaft—Station selector knob shaft and pulley	.30
30792	Bracket—Bracket for holding Magic Eye tube	.20	12110	Shield—Radio lamp shield	.04
14538	Blank—Mod. 98X, 98EY and 98YG bushing	.25	31265	Socket—Dial lamp socket	.30
31400	Capacitor—Adjustable trimmer capacitor, two mfd. (C1, C2, C3, C4)	.08	13971	Socket—Magic Eye socket—Model 98X, 98EY and 98YG	.45
14079	Capacitor—4.8 mfd. (C1)	.35	31251	Socket—Tube socket	.25
31397	Capacitor—100 mfd. (C2)	1.30	31253	Spring—Tension spring for station selector push button	.06
12645	Capacitor—100 mfd. (C3)	.35	31418	Spring—Indicator or drum drive cord tension spring	.06
13029	Capacitor—180 mfd. (C37)	.35	31370	Spring—Push button selector switch (S4, S5, S6, S7, S8, S9, S10, S41, S42, S43, S44, S45)	3.85
13025	Capacitor—180 mfd. (C38)	.35	31090	Transformer—Print of transformer (L10, L11, L12, L13)	1.80
30435	Capacitor—170 mfd. (C3)	.35	30993	Tube—Ballast resistor tube (R22, R23, R24)—Model 97Y	1.80
31381	Capacitor—620 mfd. (C24)	.45	31577	Tube—Ballast resistor tube (R22, R23, R24)—Model 97Y	1.80
31382	Capacitor—620 mfd. (C25)	.45	30284	Tube—Ballast resistor tube (R22, R23)—Model 97Y	1.80
12897	Capacitor—3700 mfd. (C27)	.48			
4828	Capacitor—600 mfd. (C27)	.70			
11375	Capacitor—205 mfd. (C14, C15)	.25			
11375	Capacitor—1 mfd. (C16)	.30			
4886	Capacitor—35 mfd. (C13, C20, C41)	.30			
10939	Capacitor—0.1 mfd. (C13, C20, C41)	.30			
31383	Capacitor—18 mfd. (C16)	.45			
31384	Capacitor—18 mfd. (C16)	.45			
31578	Capacitor—Comprising one 32 mfd., one 20 mfd., one 10 mfd. (C1, C2, C3, C4)	2.15			
30804	Cell—Bis cell	.45			
31382	Cell—Bis cell	.45			
31402	Coil—Antenna coil (L1, L2, L3)	1.15			
31385	Coil—Push button oscillator coil (L37, L38)	.30			
31386	Coil—Push button oscillator coil (L41, L42)	.30			
31389	Condenser—2-425 variable tuning condenser (C28, C29, C30)	2.85			
5119	Control (shunt coil) tone control, on and off	.25			
31386	Control (shunt coil) tone control, on and off	.25			
31374	Cord—Indicator pointer drive cord	.30			
31375	Cord—Indicator pointer drive cord	.30			
31380	Core—Adjustable core and stud assembly for oscillator bank condenser drive cord drum and vibrator	.15			
31372	Holder—Bis cell holder	.65			
31373	Holder—Bis cell holder	.65			
5086	Indicator—Station selector indicator pointer	1.15			
5086	Indicator—Station selector indicator pointer	1.15			
30284	Indicator—Station selector indicator pointer	1.15			
30880	Indicator—Station selector indicator pointer	1.15			
30894	Indicator—Station selector indicator pointer	1.15			
12844	Indicator—Station selector indicator pointer	1.15			
12845	Indicator—Station selector indicator pointer	1.15			
10680	Indicator—Station selector indicator pointer	1.15			
10681	Indicator—Station selector indicator pointer	1.15			
12819	Indicator—Station selector indicator pointer	1.15			
10682	Indicator—Station selector indicator pointer	1.15			
12013	Indicator—Station selector indicator pointer	1.15			
10683	Indicator—Station selector indicator pointer	1.15			
14343	Indicator—Station selector indicator pointer	1.15			
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30773	Indicator—Station selector indicator pointer	1.15			
31457	Indicator—Station selector indicator pointer	1.15			
31589	Indicator—Station selector indicator pointer	1.15			
4882	Indicator—Station selector indicator pointer	1.15			
30330	Indicator—Station selector indicator pointer	1.15			
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31541	Indicator—Station selector indicator pointer	1.15			

MODEL 95X1

Schematic, Socket  
Voltage, Alignment  
Chassis Wiring, Specs.  
Lead Dress, Tuner

RCA MFG. CO., INC.

**Removing chassis from cabinet.**—Remove back plate and control knobs. Pull the push-button knobs off their shafts. Remove the four chassis screws (bottom of cabinet). Lift the chassis and slide it out at an angle to clear the shaft holes in the top of cabinet.

**Removing trimmer-and-switch assembly.**—For convenient access to the sockets and parts, it is advisable to remove the trimmer-and-switch assembly. This is a simple operation, accomplished as follows: Unsolder the four leads that connect to the assembly, remove the two nuts that hold the assembly to the chassis, and lift out the assembly. In re-assembling, dress the leads to prevent rubbing against the push-button shafts.

**CAUTION:** The chassis is connected to one side of the power supply. Avoid contact of chassis or parts to external ground when servicing.

**FREQUENCY RANGE**..... 540-1,560 kc  
**Alignment Frequency**..... 1,560 kc (ant., det.)  
**One station between approximately 540-860 kc**  
**Two stations between approximately 860-1,200 kc**  
**Two stations between approximately 850-1,500 kc**

**5-inch Electrodynamic Loudspeaker**  
Type..... 3 ohms at 400 cycles  
Voice-Coil Impedance.....

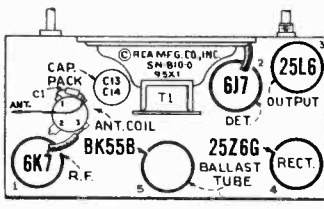
**Dial Lamp**..... Mazda 40, 6.3 volts, .15 ampere  
**POWER SUPPLY RATINGS**  
105-125 volts, 50-60 cycles, 50 watts  
105-125 volts, 50 watts  
A-C Rating  
D-C Rating

**Alignment Procedure**

Remove chassis from cabinet. Reel up the antenna wire, and connect the high side of test-oscillator through an 80-mmf. capacitor to the antenna terminal on the antenna transformer. Connect low side of oscillator to receiver chassis through an .01-mfd. capacitor. Turn gang condenser to minimum (full out), push in the manual-tuning (right-hand) button, tune oscillator to 1,560 kc, connect an output meter across the voice coil, and turn volume control to maximum. Keep antenna roll and lead clear of chassis during all adjustments. Adjust the two trimmers (C3 and C6) on side of gang condenser for maximum output, using lowest possible output from test-oscillator. Turn pointer, so that it is horizontal and pointing to low-frequency end when the gang condenser is at maximum. Check pointer adjustment on a station.

The preferable and quickest method of adjusting the tuning capacitors for five different stations, is to employ a test-oscillator, as described below:

1. Make a list of the desired five stations, arranged in order from low to high frequencies.
2. Determine the correct settings of the test-oscillator for these five frequencies. This is accomplished as follows: Tune in each of the five stations on any standard receiver; zero-beat the test-oscillator against each station, and note the exact setting of the oscillator in each case.
3. Reel up the antenna wire. Connect the high side of test-oscillator through an 80-mmf. fixed capacitor to the end of the antenna wire. Clip the low side of the oscillator through a 0.1-mfd. capacitor to one of the chassis-mounting screws on the bottom of the cabinet. Tune the oscillator to the previously-determined point for the lowest-frequency station, and adjust for a strong output.
4. Turn the volume control of the push-button receiver full clockwise, and push in the left-hand end button. Using an insulated screw-driver, peak capacitors C20 and C26, at the same time reducing the output of the oscillator in order to secure a sharp peak. (Clockwise adjustment of the capacitors tunes the circuits to lower frequencies, and counter-clockwise adjustment tunes the circuits to higher frequencies. The range of each trimmer is three full counter-clockwise turns from the tight position. Do not unscrew more than three turns.)
5. Push in the second button from left, and adjust C21 and C27 for peak output with the oscillator tuned to the frequency of the second station.
6. Proceed in this manner to adjust each pair of capacitors for the desired frequencies.
7. Final adjustment may be made in actual reception of the stations.



**Figure 2—Radiotron Location**  
\*Note: Values with star (\*) are operating voltages. Values not starred are actual measured voltages. Measurements made to chassis unless otherwise indicated. Measurements made with manual-tuning button (right-hand) pushed in, and set tuned to a quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having ranges of 10, 50, and 250 volts. (Use nearest range above the specified measured voltage.) Values should hold within ± 20% for 117-volt 60-cycle a-c supply. On d-c, voltages are approximately 10% lower, except heaters, which remain the same.

**Precautionary Lead Dress**

1. Dress Power cord away from detector coil, heater leads close to base, leads from electrolytic close to base and free of grid leads.
2. Dress blue lead from r-f plate to detector coil along front edge of push-button shaft holes. Dress all leads to prevent rubbing against push button shafts.

**POWER OUTPUT (125-volt, 60-cycle supply)**  
Undistorted..... 1.0 watt  
Maximum..... 1.5 watts

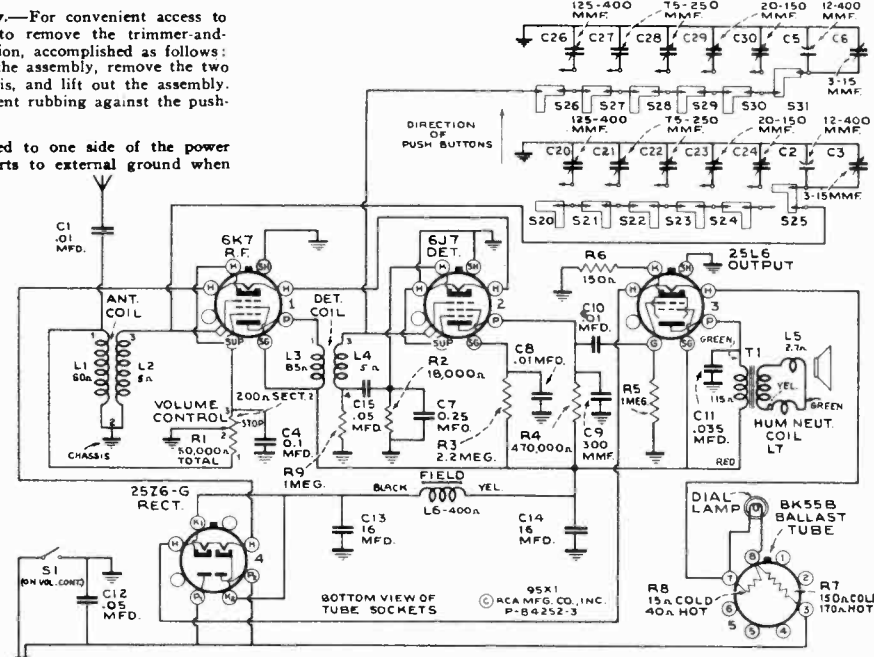


Figure 1—Schematic Circuit Diagram  
The line by-pass, C12, is changed to .25 mfd. (Stock No. 12484) in some sets.

**Adjustment of Tuning Capacitors**

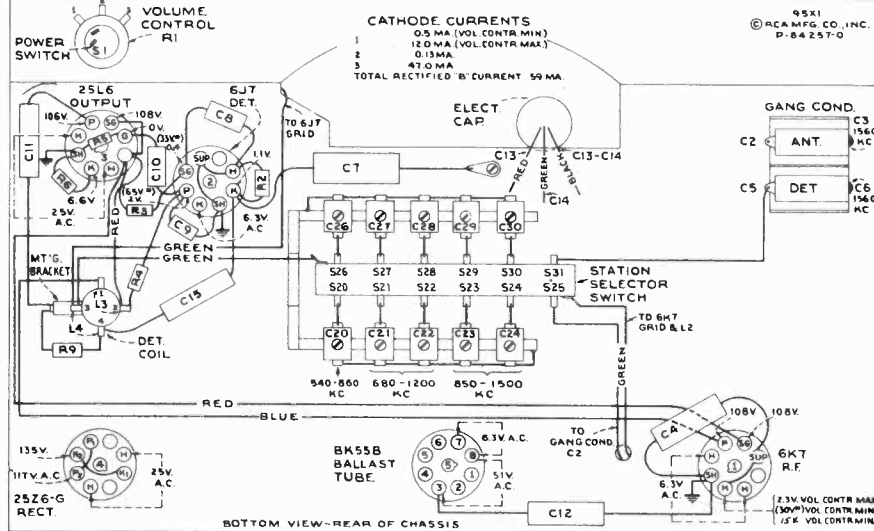


Figure 3—Radiotron Socket Voltages, and Location of Parts

**25-Cycle Operation**

For 25-cycle operation, connect a 16 mfd., 150-volt dry electrolytic capacitor (Stock No. 31323) from the cathode of the rectifier tube to chassis. (Positive to contact K1 of 25Z6-G, and negative to shell contact of 6K7 r-f socket.)





MODEL 98K

Voltage, Lead Dress  
Chassis Wiring, Notes  
Transformers

RCA MFG. CO., INC.

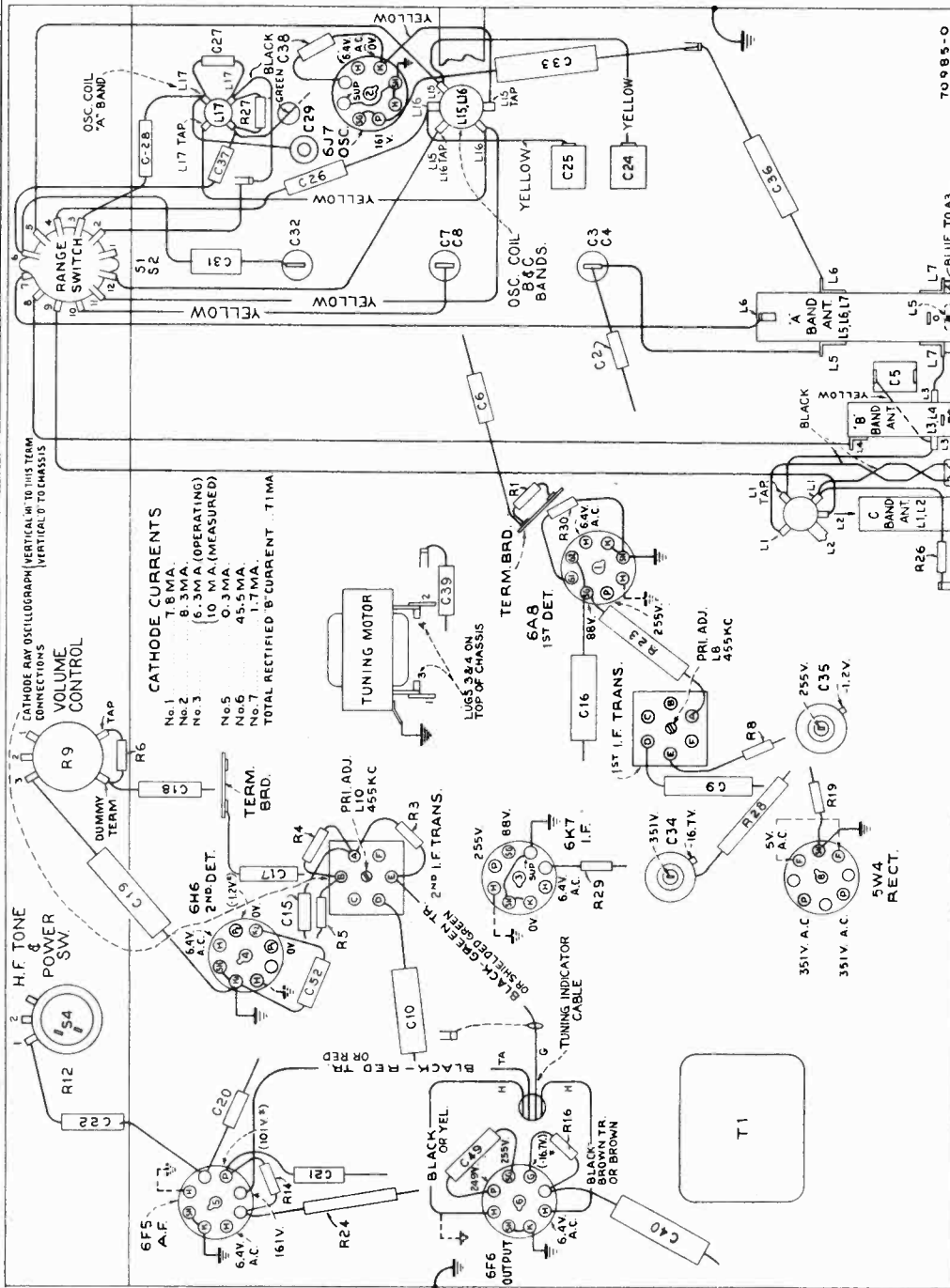
Service Data

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place upon completion of adjustment.

**Precautionary Lead Dress.**—(1) The lead from the left pilot light should be kept behind the bulb and toward the "Magic Eye," to keep it away from the 6F5 grid cap, (2) leads from mica trimmers to coil should be kept away from the coil and other parts, (3) leads on oscillator coil which are an extended part of the coil winding should be as short

as possible, (4) "C" band series capacitor C31 must have leads as short as possible, (5) all leads from antenna board to antenna coils should be dressed toward back apron, (6) the one lead of the line cord and the primary lead of the power transformer which run to the power switch should be twisted together, (7) shielding on leads to Victrola switch should be kept from the switch terminals and jack.

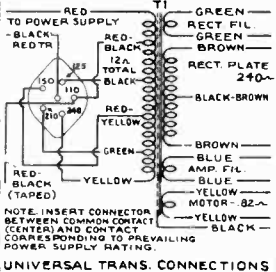
**Victrola Attachment.**—A jack located near the "Magic Eye" tube is provided for connecting a Victrola Attachment into the audio-amplifying circuit. The cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.



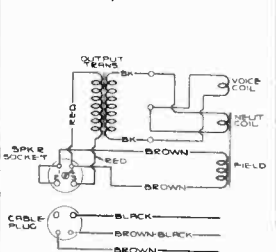
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point, volume control at minimum. Values should hold within approximately  $\pm 20\%$  with 117-volt a-c supply.

\*NOTE: Values with star (\*) are operating voltages in circuits with high series-resistance, and when measured will read lower depending on the voltmeter loading.

Figure 8—Component Parts of Station-Setting Contact



**Above — Universal Power Transformer Connections.** (110-volt supply for a Victrola Attachment may be obtained by connecting the motor to the red and the red-black leads.)



**Above — Connections and Colors of Loudspeaker and Cable.**

- CONTACT 3-231
- TIP 3-132
- BODY 3-225
- FIBRE WASHER
- BRASS SPRING 3-130
- METAL WASHER

**Electric Tuning Mechanism**

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated below.

The action can be understood by following a cycle of operation:

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the motor circuit is broken. Inertia carries the insulation line past the station-setting contact which then makes contact to the other half of the disc. This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the station-setting contact, when the circuit is broken and the mechanism stops.

**Adjustment of Flywheel Friction**

In normal operation, the motor drives the tuning condenser and selector disc until the flywheel just passes the particular station-setting contact. The motor then stops and moves the disc slowly in the opposite direction until the insulation line is under the contact, and the mechanism stops.

In some cases, particularly with high line-voltage, the disc may make two or three reversals before stopping.

The flywheel friction adjustment screw should be set to give the least number of reversals with the chassis in normal horizontal position.

**Adjustment of Selector Disc**

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two screws. When the flywheel is in its normal position (the mechanism is in the left view from rear), the insulation line should be horizontal with the left (viewed from rear). The operating end has dark insulating material and the brass is beveled at this end.

The selector disc should be set so that the contact-plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

**ADJUSTMENTS FOR ELECTRIC TUNING**

1. Make a list of the desired eight stations, arranged in order from low to high frequencies.
2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.
3. Press down the "dial-tuning" (right-hand) button.
4. Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.
5. Hold down the "dial-tuning" button, and press down station button No. 1 (second from left). Both buttons will stay down. Move adjusting pin No. 1 to the insulation line on the disc at rear of gang. When the pin is in contact on the insulation line, the central dial lamp will go out.
6. Press down any other button in order to release the dial-tuning button and station button No. 1. Then the tuning mechanism will function to tune in the station, and the central dial lamp will stay on.
7. Repeat this process for the remaining stations.

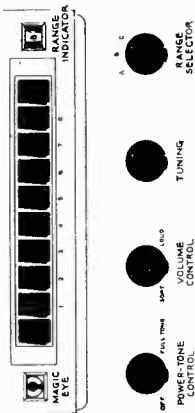


Figure 3—Location of Controls

The left-hand push-button is a Victoria-Attachment switch. The right-hand push-button is for dial tuning.

**STATION SETTING CONTACTS**

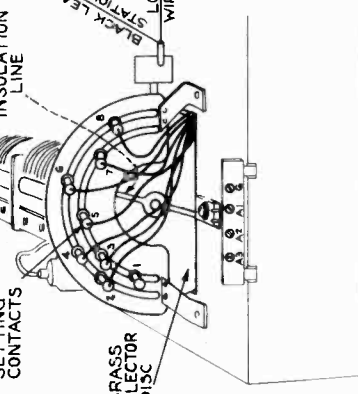
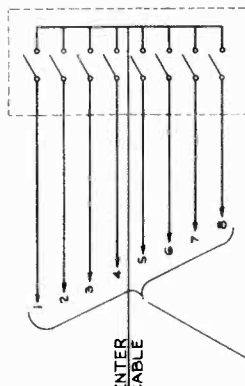


Figure 7—Station-Setting Contacts and Selector Disc

This illustration shows connections for a G8A Armchair Control Unit. This unit is not supplied with the receiver but may be added as an accessory.



7-8564-B

**Colors of Leads from Push Buttons to Station-Setting Contacts**

Station Button No.	Color of Lead To Station-Setting Contact
No. 1	Black
No. 2	White
No. 3	Blue
No. 4	Green
No. 5	Red
No. 6	Brown
No. 7	Black
No. 8	Red-yellow

**Muting Circuit**

When the electric tuning mechanism is in action, the micro-supply voltage is fed into a diode rectifier circuit which applies a high voltage to the pre-audio amplifier. This prevents the dial-indicator pulleys and rails, use "Castrol" or petroleum jelly.

**Lubrication**

Motor bearings and gear bearings use light machine oil. Gear faces use "Pen Oil No. 61" or petroleum jelly. Dial-indicator pulleys and rails, use "Castrol" or petroleum jelly.

Selector disc; apply thin film of petroleum jelly. Friction leather on flywheel; apply "near-foot" oil. When replacing leather, check it for at least 24 hours in near-foot oil, and insert in flywheel while dripping.

**Armchair Control Unit**

When a Model G8A Armchair Control is connected to the receiver as shown in figure 7, it duplicates the action of the station-setting contacts. The "dial-tuning" button is pressed down. The black lead from push-button No. 1 is unsoldered from No. 1 station-setting contact and soldered to a terminal board which is to be mounted on the frame of selector mechanism. In some cases one of the other seven station buttons on the set may be used in place of No. 1 button for the operation of the Armchair Control. The eight buttons when tuning in stations at any set, but allows the use of the entire eight buttons on the Model G8A Armchair Control. In operating the G8A Armchair Control the push-button must be held down until the station has been tuned in. Care must be taken not to hold two of the station buttons down at one time as both windings of the motor may be engaged inadvertently causing the motor to be overpowered and overheated.

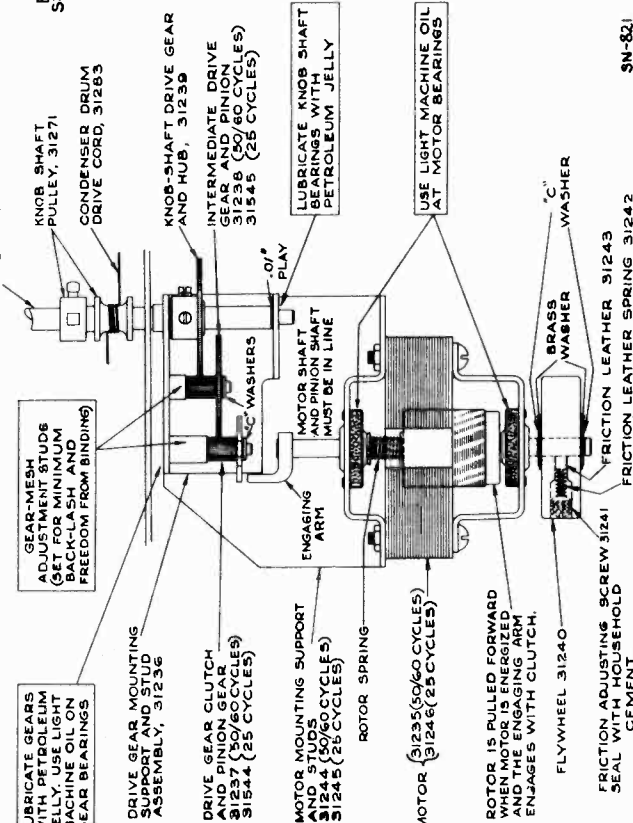


Figure 6—Motor and Gear Mechanism

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position.

MODEL 98K  
Alignment, Parts  
Antenna Data

RCA MFG. CO., INC.

Steps	Connect the high side of test-oscillator to —	Tune test-oscillator to —	Range Selector	Set tuning gang to —	Adjust the following for max. peak output
No. 1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet point between 550-750 kc	L10, L11 (2nd I-F Transformer)
No. 2	6A8 Det. grid cap in series with .01 mfd.	456 kc	"A"		L8, L9 (1st I-F Transformer)
No. 3	A2 Connect A1 to chassis.	20 mc	"C"	20 mc (147.5')	C24 (osc.)* C8 (det.)†
No. 4	A2, in series with 100 mmfd. Connect A3 to chassis.	6,100 kc	"B"	6,100 kc (145.5')	C25 (osc.)*
No. 5	A2, in series with 100 mmfd. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (151.5')	C29 (osc.) C3 (ant.)
No. 6	A2, in series with 100 mmfd. Connect A3 to chassis.	800 kc	"A"	800 kc (29.5')	L17 (osc.)
No. 7	A2, in series with 100 mmfd. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (151.5')	C29 (osc.)

\* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 141.5° (19,900 kc), at which point a weaker signal should be received.  
 † Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 124° (5,190 kc), at which point a weaker signal should be received.  
 ‡ Rock gang condenser and use maximum capacity peak if two peaks can be obtained with C8.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>					
31253	Board—Antenna and ground terminal board	.25	31364	Socket—Dial lamp socket	.20
31229	Body—Station-setting contact body, less contact tip, and tip spring	.18	13971	Socket—"Magic Eye" socket	.45
12714	Capacitor—Adjustable trimmer, 2-12 mmfd. (C29)	.50	31251	Socket—Radio-lamp socket	.25
31292	Capacitor—Dual adjustable trimmer, 3-30 mmfd. each section (C23, C25)	.40	31365	Socket—Tuning indicator lamp insulated socket	.30
31282	Capacitor—Adjustable trimmer, 5-80 mmfd. (C6)	.25	31242	Spring—Station-setting contact tip spring	.01
12996	Capacitor—15 mmfd. (C2, C64)	.35	12007	Spring—Retaining spring for core, Stock No. 31249	.02
31432	Capacitor—20 mmfd. (C27)	.40	31292	Spring—Tension spring for core, Stock No. 31290	.01
12948	Capacitor—33 mmfd. (C1)	.35	31242	Spring—Tension spring for flywheel	.01
12720	Capacitor—100 mmfd. (C20)	.35	31242	Support—Variable condenser motor mounting support and studs—for 50-60 cycle models only	.45
31270	Capacitor—100 mmfd. (C11, C12, C13, C14)	.35	31245	Support—Variable condenser motor mounting support and studs—for 25-cycle models only	.70
12724	Capacitor—120 mmfd. (C37, C38)	.40	31236	Support—Variable condenser drive gear mounting support and studs assembly	.65
12725	Capacitor—150 mmfd. (C18)	.35	31291	Switch—Range switch (S1, S2)	.85
31433	Capacitor—260 mmfd. (C28)	.75	31248	Switch—Variable condenser motor control and power switch (R12, S4)	1.60
31033	Capacitor—1.5 mfd. (C96)	.35	31267	Transformer—First of transformer (L8, L9, C11, C12)	2.20
31405	Capacitor—4,000 mmfd. (C31)	.75	31268	Transformer—Second of transformer (L10, L11, C13, C14)	2.05
4838	Capacitor—.008 mfd. (C17, C22, C49)	.25	31299	Transformer—Power transformer, 105-120 volts, 25-60 cycle (T1)	10.85
5148	Capacitor—.007 mfd. (C18)	.20	31298	Transformer—Power transformer, 105-120 volts, 50-80 cycle (T1)	7.45
14393	Capacitor—.01 mfd. (C6, C21, C39, C52, C53)	.30	31454	Volume Control (R9)	1.50
11315	Capacitor—.015 mfd. (C36)	.30	<b>SPEAKER ASSEMBLIES</b>		
4886	Capacitor—.05 mfd. (C9)	.20	13866	Cap—Dust cap for cone center	.25
4839	Capacitor—.1 mfd. (C19, C16)	.30	12012	Coil—Field coil (L12)	2.90
12494	Capacitor—.25 mfd. (C33, C40)	.30	11469	Coil—Hum neutralizing coil (L14)	1.75
30867	Capacitor—.5 mfd. (C19)	.30	31273	Cone—Speaker cone and voice coil (L13)	1.75
11203	Capacitor—1 mfd. (C34)	1.15	31302	Plug—Contact male plug	.25
5212	Capacitor—1.5 mfd. (C35)	1.35	31300	Speaker—Speaker complete	10.95
31237	Clutch—Variable condenser drive gear clutch and pinion gear—engages pin on motor shaft (50-60 cycle models only)	.35	14358	Screw—Screw, washer, and lockwasher to hold core in yoke (R1, 70, F3)	.04
31544	Clutch—Variable condenser drive gear clutch and pinion gear—engages pin on motor shaft (25-cycle models only)	.45	31301	Transformer—Output transformer (T2)	1.70
31293	Coil—"A" band antenna coil (L5, L6, L7)	1.30	14357	Washer—Spring washer to hold field coil	.06
31290	Coil—"A" band oscillator coil (L17)	1.05	<b>MISCELLANEOUS ASSEMBLIES</b>		
31294	Coil—"B" band antenna coil (L3, L4)	.80	31303	Bracket—Band indicator mounting bracket complete except less band indicating strip, cord, and tension spring	.40
31295	Coil—"B" and "C" band oscillator coil (L15, L18)	.85	31282	Bracket—"Magic Eye" bracket and holder	.22
31297	Coil—"C" band antenna coil (L1, L2)	.90	31358	Button—Station selector switch push button	.15
31290	Condenser—2-gang variable condenser (C3, C4, C5, C6)	6.50	31345	Contact—Push button switch contacts—comprising 10 contacts riveted on insulating strip	1.20
31269	Core—Adjustable core and stud for i-f transformers	.15	31344	Contact—Push button switch contacts—comprising 13 contacts riveted on insulating strip	1.20
31273	Drive—Indicator drive cord drum	.80	31278	Cord—Band indicator drive cord	.15
31240	Flywheel—Variable condenser drive motor flywheel	.25	31281	Cord—Indicator pointer drive cord	.50
31238	Gear—Variable condenser intermediate drive gear and pinion gear (50-60 cycle models only)	.50	31283	Cord—Variable condenser drum drive cord	.20
31545	Gear—Variable condenser intermediate drive gear and pinion gear (25-cycle models only)	.40	31456	Cover—Eight protective covers for push button markers	.08
31239	Gear—Variable condenser knob shaft drive gear and hub	.65	31359	Cushion—Station selector push button rubber cushion	.08
11861	Lamp—Dial lamp	.17	31451	Dial—Station selector dial and crystal	.95
31480	Lamp—Electric tuning adjustment indicator lamp	.20	31356	Escutcheon—Station selector dial escutcheon only—less dial and push buttons	2.85
31245	Leather—Friction leather for flywheel	.04	31306	Indicator—Band indicator strip	.15
31246	Motor—Variable condenser drive motor (M1)—25-cycle models only	6.50	31356	Indicator—Station selector indicator pointer and slide	.40
31235	Motor—Variable condenser drive motor (M1)—50-60 cycle models only	4.85	31356	Knob—Range switch, volume control, tone control, or station selector knob	.12
31228	Plate—Station-setting contact plate—less contacts	.45	31346	Lock—Push button switch lock plate—comprising 10 contact locks in one strip	.80
31227	Plate—Station-setting contact mounting plate—mounts on rear of variable condenser	.50	31456	Marker—"Dial Tuning" push button marker	.01
6040	Plug—4-contact female plug for speaker cable	.30	31457	Marker—"Record Player" push button marker	.01
31271	Pulley—Range selector pulley	.25	31589	Markers—Station call letter markers	.35
31272	Pulley—Range selector pulley	.20	31280	Pulley—Indicator pointer drive cord pulley	.10
14660	Resistor—18 ohms, 1/2 watt (R19)	.20	14897	Retainer—Indicator pointer drive cord pulley retainer	.01
31451	Resistor—220 ohms, wire wound, 1.5 watts (R24)	.18	31306	Screen—Station selector dial color screen and light diffuser	.45
31430	Resistor—8,200 ohms, wire wound, 1.5 watts (R24)	.22	3993	Screw—No. 8-32 square head set screw for pointer slide stop	.05
14284	Resistor—25,000 ohms, 1/10 watt (R4)	.15	11210	Screw—Chassis mounting screws, washers, and lockwashers for one chassis	.05
14167	Resistor—27,000 ohms, 2 watts (R23)	.25	31287	Shaft—Indicator pointer slide shaft	.15
11300	Resistor—33,000 ohms, 1/10 watt (R6, R27, R30)	.15	31347	Socket—Pickup socket and bracket	.30
12010	Resistor—100,000 ohms, 1/10 watt (R29)	.15	13638	Spring—Indicator pointer drive cord tension spring	.08
11398	Resistor—220,000 ohms, 1/10 watt (R14)	.15	31418	Spring—Variable condenser drive cord tension spring	.08
12264	Resistor—220,000 ohms, 1/2 watt (R5)	.20	14270	Spring—Retaining spring for knob, Stock No. 31355	.05
11297	Resistor—330,000 ohms, 1/10 watt (R16)	.15	31279	Spring—Tension spring for band indicator	.03
11452	Resistor—470,000 ohms, 1/10 watt (R1, R8)	.15	31313	Spring—Tension spring for push button switch latch bar	.08
12013	Resistor—1 meg., 1/10 watt (R7, R26)	.15	31307	Stop—Indicator pointer slide stop	.30
5131	Resistor 2.2 meg., 1/10 watt (R3)	.15	31380	Switch—Pickup switch for mounting on push button switch assembly (S3)	2.70
31233	Rotor—Station-setting contact plate—mounts on rear of variable condenser shaft	1.18	31312	Switch—Station selector push button switch and bracket complete	4.25
31241	Screw—1 x 20 headless, cone point set screw for flywheel	.02			
14350	Screw—No. 8-32 square head set screw for selector rotor disc	.03			
4119	Screw—No. 8-32 headless set screw for gear, Stock No. 31239	.02			
4869	Screw—No. 8-32 square head set screw for pulley, Stock Nos. 31271 and 31272, and drum, Stock No. 31273	.03			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE

Antenna Connections

Adjustment of the noise-reducing trimmer should be made by turning to 141.5° (19,900 kc), at which point a weaker signal should be received.  
 \*\* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 124° (5,190 kc), at which point a weaker signal should be received.  
 † Rock gang condenser and use maximum capacity peak if two peaks can be obtained with C8.

Antenna Connections

RCA Victor Master Antenna Kit—Connect the twisted pair transmission line to terminals A1 and A2 on the terminal board at rear of chassis. Connect the counter-poise to A3. Terminal G may be connected to ground, but this connection is not necessary for correct operation.  
 Noise-Reducing Adjustment—Alter the RCA Victor Master Antenna Kit is connected to the receiver, tune the receiver control clockwise until noise is heard. If no noise of a regular character is audible, start any brush-type motor drivers appliance, such as a vacuum cleaner, electric razor, refrigerator, etc., but do not bring it too near the receiver. This will generate noise as a continuous crackling, or buzz sound. Adjust C5, which is mounted behind the antenna terminal board, to a point where this noise is reduced to a minimum.

ALIGNMENT PROCEDURE

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 dial. The plate fully screwed, 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.  
 Dial Indicator Adjustment—After fastening the chassis in the vise, adjust the dial indicator to the drive cable with the indicator at the 530. This will generate noise as a continuous crackling, or buzz sound. Adjust C5, which is mounted behind the antenna terminal board, to a point where this noise is reduced to a minimum.

ALIGNMENT PROCEDURE

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 to the chassis, and the calibration scale is attached during alignment. Therefore, a calibration scale is mounted on the front shaft of the indicator-drive cord drum which is attached to the rear of the indicator-drive cord drum. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

RCA MFG. CO., INC.

MODELS 99K, 99T  
Schematic, Socket  
Trimmers, Transformer

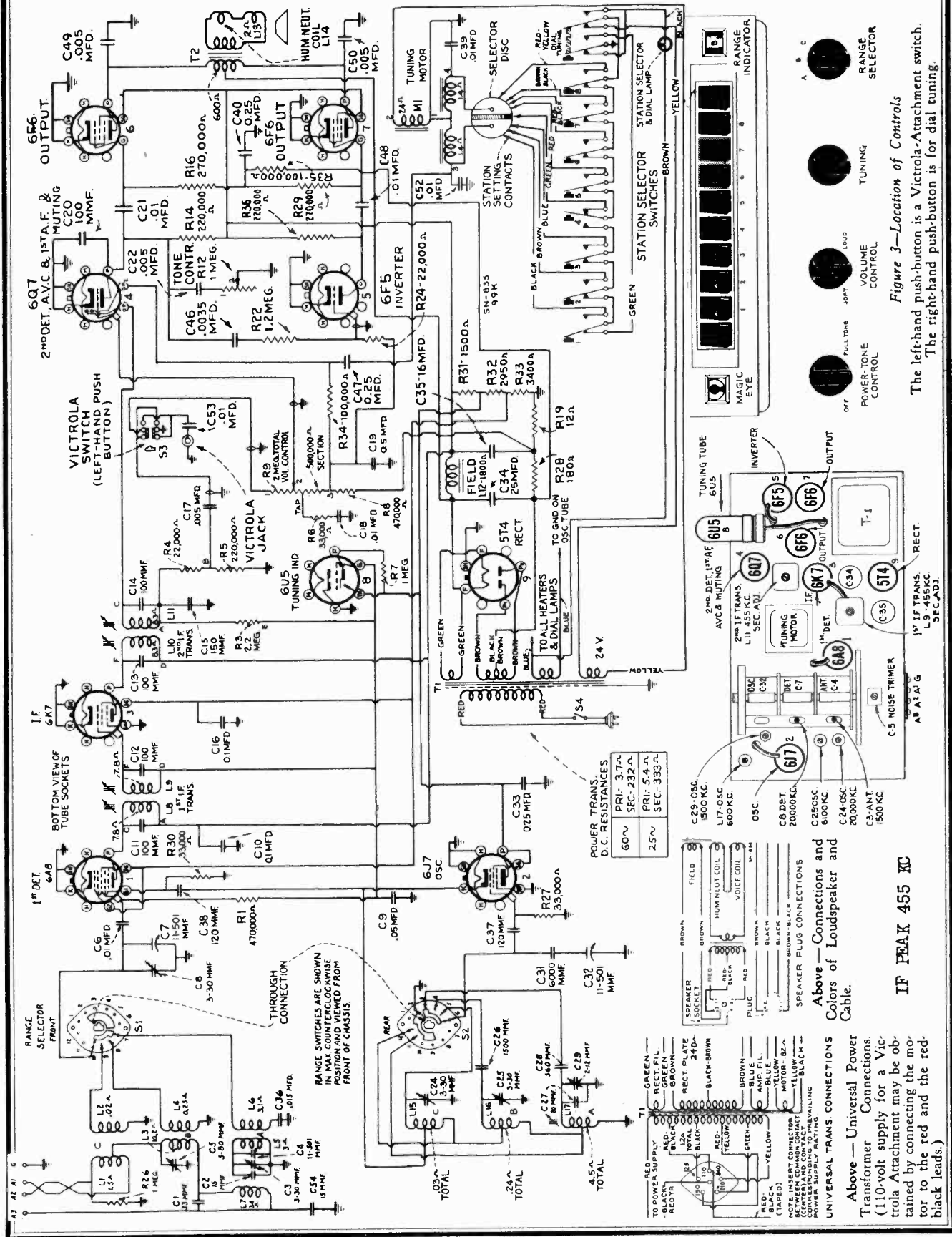


Figure 3—Location of Controls  
The left-hand push-button is a Victrola-Attachment switch.  
The right-hand push-button is for dial tuning.

Above — Connections and Colors of Loudspeaker and Cable.  
IF PEAK 455 KC

Above — Universal Power Transformer Connections. (110-volt supply for a Victrola Attachment may be obtained by connecting the motor to the red and the red-black leads.)



MODELS 99K, 99T  
Voltage, Chassis Wiring  
Tuner

RCA MFG. CO., INC.

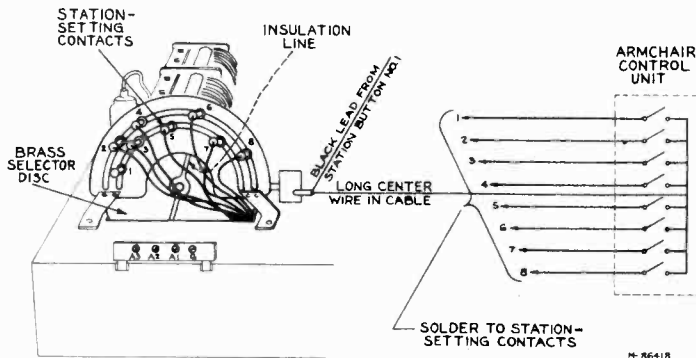
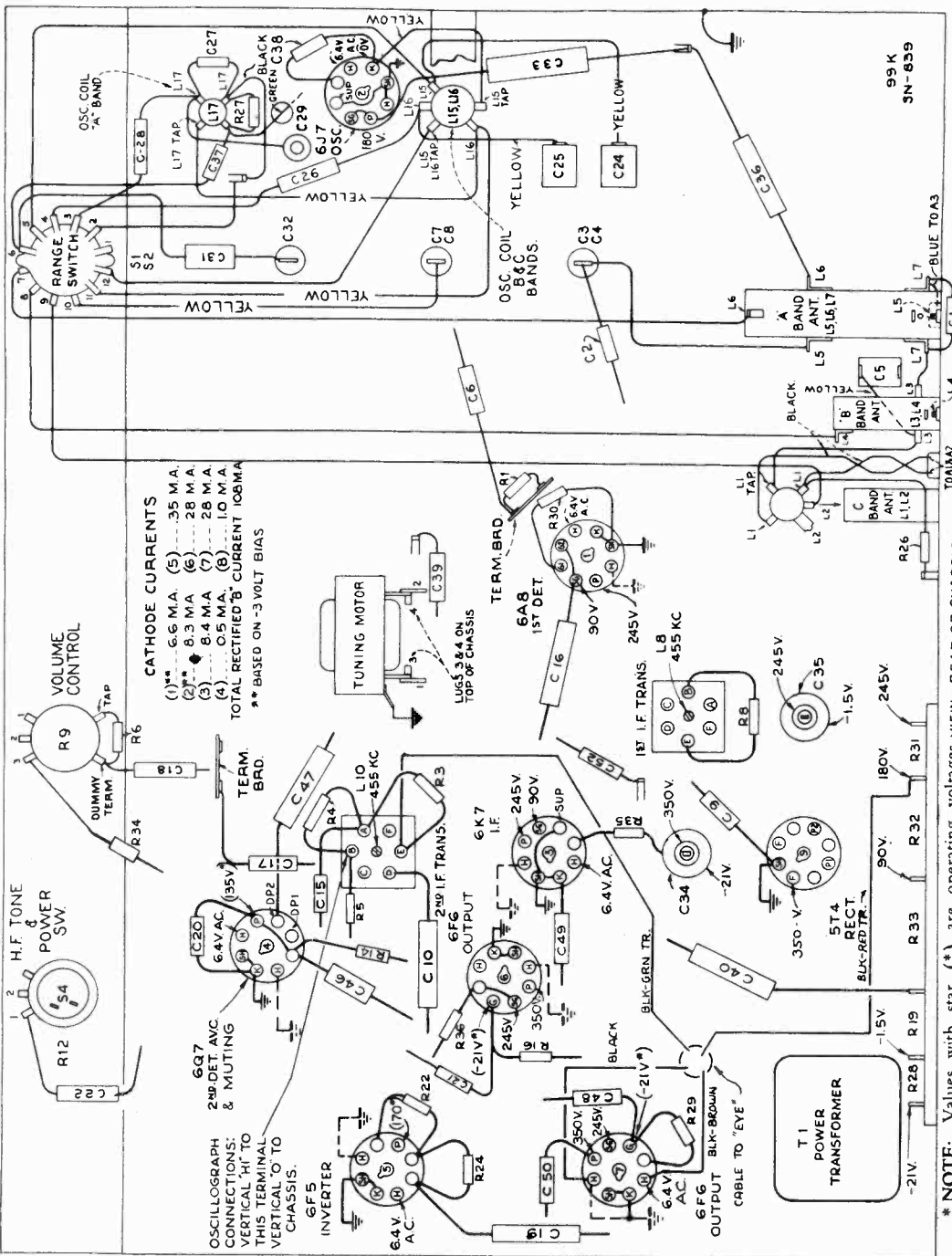


Figure 7—Station-Setting Contacts and Selector Disc

This illustration shows connections for a G8A Armchair Control Unit. This unit is not supplied with the receiver but may be added as an accessory.

Station Button	Color of Lead To Station-Setting Contact
No. 1	Black
No. 2	Brown
No. 3	Blue
No. 4	Green
No. 5	Red
No. 6	Red-black
No. 7	Brown-black
No. 8	Red-yellow



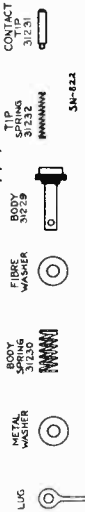
Muting Circuit

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the first-audio tubes. This prevents audio amplification and makes the set quiet or "mute" while the mechanism is operating.

Figure 4—R-F Wiring Diagram.

\* NOTE: Values with star (\*) are operating voltages view—rear of chassis in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading. Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately  $\pm 20\%$  with 117-volt a-c supply.

Figure 8—Component Parts of Station-Setting Contact





MODELS 99K, 99T  
Drive Data, Parts  
Notes

RCA MFG. CO., INC.

Service Data

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place upon completion of adjustment.

**Victrola Attachment.**—A jack located near the "Magic Eye" tube is provided for connecting a Victrola Attachment into the audio-amplifying circuit. The cable running from the Victrola Attachment should be terminated in a Stock No. 31048 plug to fit the jack.

Lubrication

Motor bearings and gear bearings; use light machine oil.

Gear faces; use "Pure Oil No. 611" or petroleum jelly.

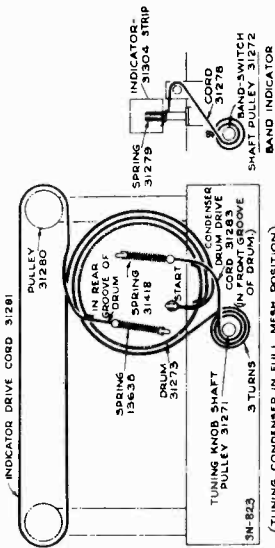
Dial-indicator pulleys and rails; use "Castorad" or petroleum jelly.

Selector disc; apply thin film of petroleum jelly.

Friction leather on flywheel; apply "neats-foot" oil. When replacing leather, soak it for at least 24 hours in neats-foot oil, and insert in flywheel while dripping.

STOCK No.	DESCRIPTION	Unit List Price	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>					
31253	Board—Antenna and ground terminal board	.25	12724	Capacitor—120 mmfd. (C37, C38)	.35
31229	Body—Station-setting contact body, less contact tip and tip spring	.18	12725	Capacitor—150 mmfd. (C15)	.35
12714	Capacitor—Adjustable trimmer 2-12 mmfd. (C49)	1.50	31433	Capacitor—560 mmfd. (C28)	.35
31292	Capacitor—Dust adjustable trimmer 3-30 mmfd. each section (C24, C25)	.40	31035	Capacitor—6,000 mmfd. (C31)	.75
31252	Capacitor—Adjustable trimmer 5-80 mmfd. (C5)	.25	30303	Capacitor—.0035 mfd. (C46)	.40
12896	Capacitor—15 mmfd. (C2, C54)	.35	4838	Capacitor—.008 mfd. (C17, C22, C49, C50)	.25
12916	Capacitor—33 mmfd. (C21)	.35	14393	Capacitor—.01 mfd. (C6, C18, C21, C39, C48, C52, C53)	.30
31432	Capacitor—20 mmfd. (C27)	.40	11315	Capacitor—.015 mfd. (C36)	.20
12720	Capacitor—100 mmfd. (C30)	.35	30882	Capacitor—.05 mfd. (C1)	.20
31270	Capacitor—100 mmfd. (C11, C12, C13, C14)	.35	4839	Capacitor—.1 mfd. (C10, C16)	.30
			30965	Capacitor—.25 mfd. (C33, C40, C47)	.30
			30867	Capacitor—.5 mfd. (C19)	.30
5212	Capacitor—18 mfd. (C35)	1.35	<b>SPEAKER ASSEMBLIES</b>		
14531	Capacitor—25 mfd. (C34)	1.55	(Speaker RL-63-H6)		
31237	Clutch—Variable condenser drive gear clutch and pinion gear—engages pin on motor shaft (50/60 cycle models only)	.35	14356	Board—3-contact reproducer terminal board	.15
31544	Clutch—Variable condenser drive gear clutch and pinion gear—engages pin on motor shaft (25 cycle models only)	.45	13866	Cap—Cone center dust cap	.25
31293	Coil—"A" band antenna coil (L5, L6, L7)	1.30	11234	Coil—Field coil (L12)	3.85
31296	Coil—"A" band oscillator coil (L17)	1.05	11469	Coil—Hum neutralizing coil (L14)	.30
31294	Coil—"B" band antenna coil (L3, L4)	.80	31310	Cone—Speaker cone and voice coil (L13)	1.75
31295	Coil—"B" band oscillator coil (L15, L16)	.85	6039	Plug—4-contact male plug for speaker	.30
31297	Coil—"C" band antenna coil (L1, L2)	.90	31530	Speaker—Complete	11.20
31290	Condenser—3-gang variable condenser (C3, C4, C5)	6.50	14398	Screw—Screw washers and lockwashers to hold core in yoke	.04
31231	Contact—Contact tip for station-setting contact	.08	14534	Transformer—Output transformer (T2)	3.85
31269	Core—Adjustable core and stud for i-f transformers	.16	14357	Washer—Spring washer to hold field coil	.08
31260	Core—Adjustable core and stud for "A" band oscillator coil	.35	13866	Cap—Dust cap for cone center	.03
31273	Drum—Indicator drive cord drum	.80	11234	Coil—Field coil (L12)	3.85
31240	Flywheel—Variable condenser drive motor flywheel	.25	11469	Coil—Neutralizing coil (L14)	1.85
31239	Gear—Variable condenser knob shaft drive gear and hub	.65	31275	Cone—Speaker cone and voice coil (L13)	1.75
31238	Gear—Variable condenser intermediate drive gear and pinion gear (50/60 cycle models only)	.50	6039	Plug—4-contact male plug for speaker	.30
31545	Gear—Variable condenser intermediate drive gear and pinion gear (25 cycle models only)	.40	31530	Speaker—Complete	12.35
11891	Lamp—Dial lamp	.17	14534	Transformer—Output transformer (T2)	3.85
31480	Lamp—Electric tuning adjustment indicator lamp	.20	14357	Washer—Spring washer to hold field coil securely	.08
31243	Motor—Variable condenser drive motor (M1)—25 cycle models only	6.50	<b>SPEAKER ASSEMBLIES</b>		
31246	Motor—Variable condenser drive motor (M1)—50/60 cycle models only	4.85	(Speaker RL-70-H12)		
31228	Plate—Station-setting contact plate—less contacts	.45	13866	Cap—Dust cap for cone center	.03
31227	Plate—Station-setting contact mounting plate—mounts on rear of variable condenser	.50	11234	Coil—Field coil (L12)	3.85
6040	Plug—4-contact female plug for speaker cable	.30	11469	Coil—Neutralizing coil (L14)	1.85
31271	Pulley—Motor pulley	.25	31275	Cone—Speaker cone and voice coil (L13)	1.75
31272	Pulley—Range switch pulley	.20	6039	Plug—4-contact male plug for speaker	.30
31250	Resistor—Voltage divider comprising one 1,500 ohm, one 2,400 ohm, one 12 ohm, and one 180 ohm sections (R19, R28, R31, R32, R33)	.90	31530	Speaker—Complete	12.90
14284	Resistor—22,000 ohms, 1/10 watt (R24)	.15	14534	Screw—Screw washers and lockwashers to hold core in yoke	.04
13998	Resistor—22,000 ohms, 1/10 watt (R24)	.15	14357	Transformer—Output transformer (T2)	3.85
11300	Resistor—33,000 ohms, 1/10 watt (R27, R30)	.15	14357	Washer—Spring washer to hold field coil	.08
12454	Resistor—33,000 ohms, 1/10 watt (R6)	.20	31303	Bracket—Band indicator mounting bracket complete less indicator strip, cord, and tension spring—Model 99K	.40
11281	Resistor—100,000 ohms, 1/10 watt (R34)	.15	31276	Bracket—Band indicator mounting bracket complete less indicator strip, cord, and tension spring—Model 99T	.40
14560	Resistor—100,000 ohms, 1/10 watt (R35)	.20	31358	Button—Station selector push button	.15
11398	Resistor—220,000 ohms, 1/10 watt (R14, R36)	.15	31344	Contact—Push button switch contacts—comprising 10 contacts riveted on insulating strip	.70
12264	Resistor—220,000 ohms, 1/10 watt (R5)	.20	31278	Contact—Push button switch contacts—comprising 13 contacts riveted on insulating strip	1.20
11453	Resistor—270,000 ohms, 1/10 watt (R16, R29)	.15	31281	Cord—Band indicator drive cord	.12
11452	Resistor—470,000 ohms, 1/10 watt (R1)	.15	31282	Cord—Indicator pointer drive cord	.20
12285	Resistor—470,000 ohms, 1/10 watt (R8)	.20	31456	Cover—8 protective covers for push button markers	.08
12013	Resistor—1 meg., 1/10 watt (R7, R26)	.15	31359	Cushion—Station selector push button rubber cushion	.08
31056	Resistor—2 meg., 1/10 watt (R22)	.15	31451	Dial—Station selector dial scale and crystal	.95
5131	Resistor—2.2 meg., 1/10 watt (R3)	.15	31356	Escutcheon—Station selector dial escutcheon—less dial scale and push buttons—Model 99K	2.65
31233	Rotor—Selector rotor disc—mounts on rear of variable condenser shaft	1.18	31361	Escutcheon—Station selector dial escutcheon—less dial scale and push buttons—Model 99T	2.20
31241	Screw—1 x 20 headless cone point set screw for flywheel	.02	31304	Indicator—Station selector indicator pointer	.15
4119	Screw—No. 8-32 headless set screw for gear Stock No. 31239	.02	31305	Indicator—Station selector indicator pointer	.40
14360	Screw—No. 8-32 square head set screw for selector rotor disc	.03	31355	Knob—Range switch, volume control, tone control, or station selector knob	.12
4669	Screw—No. 8-32 square head set screw for pulley Stock Nos. 31271 and 31272, and drum Stock No. 31273	.03	31346	Lock—Push button switch lock plate—comprising 10 contact locks in one strip	.80
31384	Socket—Dial lamp socket	.20	31589	Markers—Station call letter markers for push buttons	.35
13871	Socket—Magic Eye socket	.45	31457	Marker—"Record Player" marker for push button	.01
31251	Socket—Radiotron socket	.25	31458	Marker—"Dial Tuning" marker for push button	.01
31365	Socket—Tuning indicator lamp insulated socket	.30	31280	Pulley—Indicator pointer drive cord pulley	.10
31232	Spring—Contact tip spring for station-setting contact	.01	14887	Retainer—Indicator pointer drive cord pulley retainer	.01
12007	Spring—Retaining spring for core Stock No. 31269	.02	31306	Screen—Station selector dial color screen and light diffuser	.45
31262	Spring—Tension spring for core Stock No. 31260	.01	11210	Screw—Chassis mounting screws, washers, and lockwashers for one chassis	.05
31230	Spring—Station-setting contact body spring	.01	3903	Screw—No. 8-32 square head set screw for pointer slide stop	.05
31242	Spring—Tension spring for flywheel	.01	31287	Shaft—Indicator pointer slide shaft	.15
31236	Support—Variable condenser drive gear mounting support and studs assembly	.65	31279	Socket—Pickup socket and bracket	.30
31244	Support—Variable condenser motor mounting support and studs for 50/60 cycle models only	.45	13638	Spring—Indicator pointer drive cord tension spring	.08
31245	Support—Variable condenser motor mounting support and studs for 25 cycle models only	.70	31418	Spring—Variable condenser drum drive-cord tension spring	.05
31291	Switch—Range switch (S1, S2)	.95	14270	Spring—Retaining spring for knob Stock No. 31355	.05
31248	Tone Control—H.F. tone control and power switch (R12, S4)	1.50	31313	Spring—Tension spring for push button switch latch bar	.06
31267	Transformer—First i-f transformer (L8, L9, C11, C12)	2.20	31307	Stop—Indicator pointer slide stop	.30
31268	Transformer—Second i-f transformer (L10, L11, C13, C14)	2.05	31312	Switch—Station selector push button switch and bracket complete	4.25
31308	Transformer—Power transformer 105-130, 140-180, 200-250 volts, 50-60 cycle (T1)	13.85	31360	Switch—Pickup switch for mounting on push button switch assembly (S3)	2.70
31226	Transformer—Power transformer 110 volts, 25-80 cycle (T1)	13.00			
31225	Transformer—Power transformer 110 volts, 50-60 cycle (T1)	8.50			
31450	Volume Control (R9)	1.50			

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.



Adjustment of the noise-reducing trimmer should be made in the customer's home, with the Master Antenna connected to receiver.

This adjustment is effective only when the RCA Victor Master Antenna is used. For all other types of antenna, the noise-adjustment trimmer C5 should be screwed all the way down.

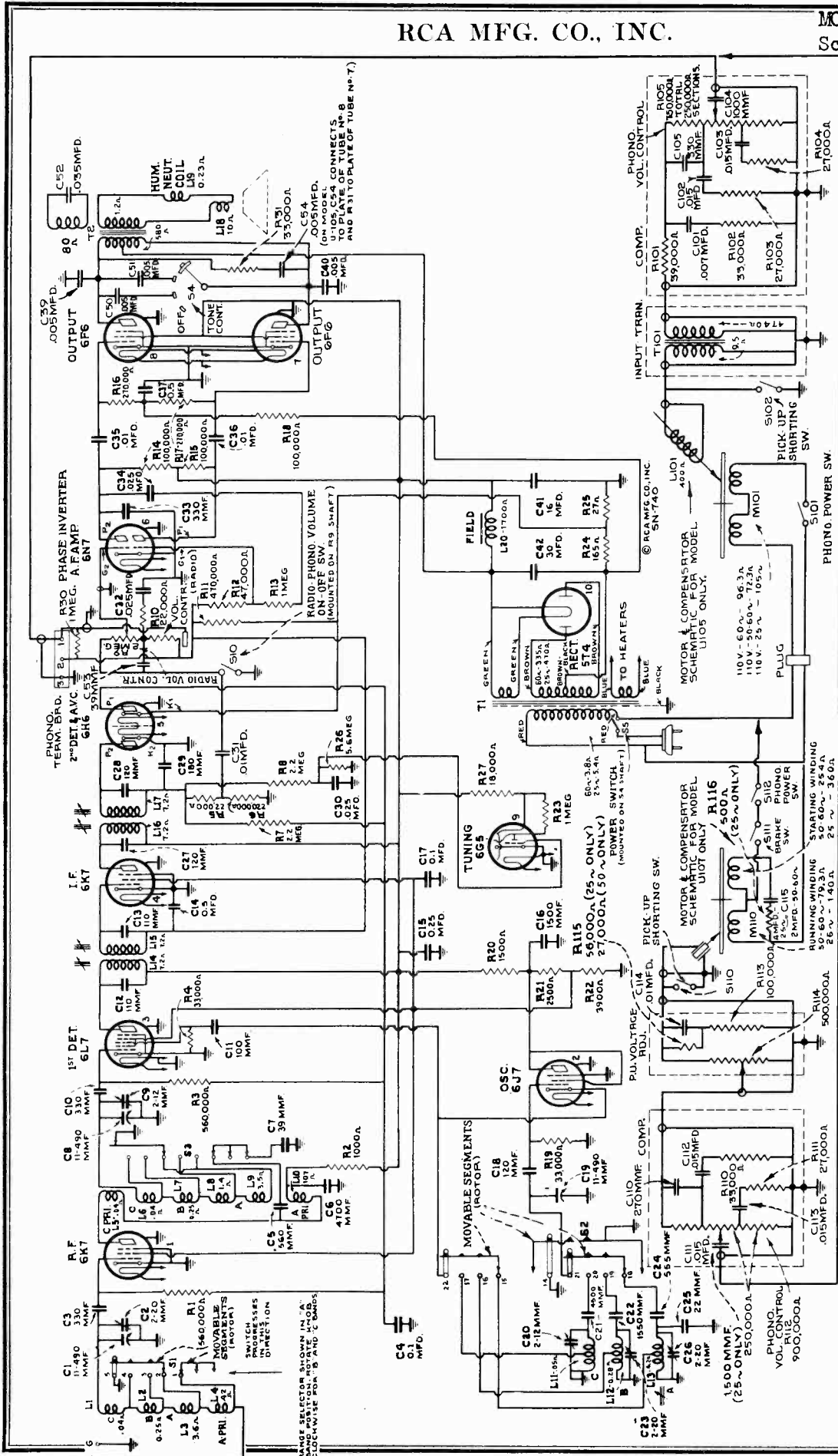
**Other Antennas.**—Use terminals A1 and A3 on the receiver terminal board as antenna and ground connecting points respectively. Terminal A3 may be connected to terminal G, unless this causes interference, in which case this connection should be omitted.

Figure 9—(At Right) Drive Cord Arrangement for Tuning Condenser, Dial Indicator, and Band Switch

Antenna Connections

**RCA Victor Master Antenna Kit.**—Connect the twisted-pair transmission line to terminals A1 and A3 on the terminal board at rear of chassis. Connect the counter-poise to A3. Terminal G may be connected to ground, but this connection is not necessary for correct operation.

**Noise-Reducing Adjustment.**—After the RCA Victor Master Antenna Kit is connected to the receiver, tune the receiver to a point that is 900 kc. where no station is heard. Turn the noise-reducing trimmer clockwise until the noise of a regular character is heard, such as voice, piano, electric motor-driven apparatus, such as vacuum cleaner, electric razor, refrigerator, etc., but do not bring it too close to the receiver. This will generate noise as a continuous crackling or buzz. Adjust C5, which is mounted behind the antenna terminal board, to a point where this noise is reduced to a minimum.



FREQUENCY RANGES

"Broadcast" (A)..... 530-1,720 kc

"Medium Wave" (B)..... 2,100-6,800 kc

"Short Wave" (C)..... 6,800-22,000 kc

Intermediate Frequency..... 460 kc

R-F ALIGNMENT FREQUENCIES

"Short Wave" (C)..... 20,000 kc (osc. det., ant.)

"Medium Wave" (B)..... 6,000 kc (osc.)

"Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)

MODELS U105, U107  
Circuit Data, Lead Dress  
Pick-up Data, Specs.

RCA MFG. CO., INC.

General Description

The Model U-107 combination instrument consists of a ten-tube, three-band, "Magic Brain," superheterodyne receiver and an automatically operated phonograph combined in a console-type cabinet. Features of design include an r-f amplifier stage, "cumulative-wound" antenna and r-f transformers for high signal-to-noise ratio in "A" Band; magnetite-core adjusted i-f transformers and low-frequency "A" oscillator tracking, automatic volume control; plunger-type, air-dielectric trimming capacitors; "Magic Eye" tuning tube; aural-compensated radio and phonograph audio-volume controls; three-point tone control; audio phase-inverter voltage

amplifier; push-pull power-output stage; crystal pickup; improved super-sensitive dust-proof electrodynamic loudspeaker; and the "Sonic-Arc" Magic Voice. The record changer may be operated automatically or manually on both 10-inch and 12-inch records.

The Model U-105 combination instrument consists of a similar radio receiver combined with a smaller automatically operated phonograph. This record changer will change seven 10-inch records or repeat 12-inch records automatically. It may be operated manually if desired.

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

**Loudspeaker.**—Two types of loudspeakers are used which will be referred to as types 1 and 2. In type 1 the cone centering diaphragm is cemented to a fixed ring, while in type 2 the centering diaphragm is cemented to an adjustable ring. Replacement of cone for either type is identical. Centering of cone for "type 1" loudspeaker is made with three narrow celluloid or paper feelers after first removing the front dust cover and cutting free the cone centering diaphragm. The dust cover may be removed by a light application of acetone, using care not to allow the acetone to flow into the air gap. The centering diaphragm should be cemented in place after placement of feelers. Sufficient time should be allowed for the ambroid to set before removing feelers. Use ambroid to replace dust cover. Centering of cone for "type 2" loudspeaker differs only in that it is not necessary to cut free the centering diaphragm, adjustment being made in the usual manner by means of screws on the adjustable cone centering ring.

**Precautionary Lead Dress.**—(1) Keep leads to a-c switch dressed away from antenna coil and trimmer C2. (2) Keep all filament leads twisted. (3) Dress shield lead from term. E of 2nd i-f transformer to term. board against side of chassis and away from 6L7 socket. (4) Dress shielded lead from 6N7 socket to volume control against side of chassis and away from 6L7 socket. (5) Shielded lead from phono. term. board to volume control must be dressed under bus connected between 6L7 and term. A of first i-f transformer. (6) Keep leads of C21 as short as possible. (7) Yellow lead

from 6J7 oscillator cathode to dummy terminal on 6L7 socket must be dressed away from chassis base and from brown filament lead. (8) All molded capacitors should be dressed so that flat side is perpendicular to chassis base. (9) Yellow lead from cathode of 6J7 socket to term. 22 of S2 must be dressed under spaghetti on 6J7 socket jumper and pulled tight away from chassis. The following bus leads should be kept as short as possible and, when necessary, replaced only with wire having same diameter as original: (10) Lead from L11-L12-L13 to ground lance; (11) Lead from term. 13 of S3 to ground lance; (12) Lead from term. 9 of S3 to L6-L7; (13) Lead from L6 to C8; (14) Lead from C9 to C8; (15) Lead from term. 5 of S1 to ground lance; (16) Lead from L1-L2 to term. 4 of S1; (17) Lead from L1 to C1; (18) Lead from term. 21 of S2 to C19. (19) Keep filament leads dressed away from grid prongs of 6N7. (20) Keep blue and green leads from plate prongs of output tubes twisted their entire length.

Pickup (Model U-107)

An adjustment is provided to compensate for possible reduced sensitivity of the crystal pickup with age. Adjustment requires the use of a 1,000-ohm-per-volt a-c voltmeter (rectifier type, 10-volt range), a 1-meg. resistor, and an RCA Victor Technical Purpose frequency record (Cat. No. 84519-A or 84505-B). Disconnect the green lead from terminal "1" (terminal board marked "1," "2," and "3" located on top right-hand side of chassis), connect the 1-meg. resistor between green lead and terminal "1," connect the voltmeter across loudspeaker voice coil, turn "Phonograph Volume" and "Power-Tone" controls extreme clockwise, turn "Phono-Volume" (radio) control extreme counter-clockwise, and adjust R114 ("Pickup Voltage Adjuster," mounted under right-hand end of motor-board) until either of the above-mentioned frequency records gives a voltage reading of 6.8 volts using 400-cycle section of record. R114 should also be adjusted if pickup is replaced.

POWER SUPPLY RATINGS

Model	Radio only	Total
A-6	105-125 volts, 60 cycles	135 watts
A	105-125 volts, 50-60 cycles	135 watts
B-2	105-125 volts, 25 cycles	135 watts
C-6	105-130/140-160/200-250 volts, 60 cycles	135 watts
C	105-130/140-160/200-250 volts, 50-60 cycles	135 watts

Model	Radio only	Total
A-6	105-125 volts, 60 cycles	135 watts
A-5	105-125 volts, 50 cycles	135 watts
B-2	105-125 volts, 25 cycles	135 watts
C-6	105-130/140-160/200-250 volts, 60 cycles	135 watts
C-5	105-130/140-160/200-250 volts, 50 cycles	135 watts

POWER OUTPUT

Undistorted	10 watts
Maximum	12.5 watts

LOUDSPEAKER

Type	Electrodynamic
Impedance (v.c.)	11.5 ohms at 400 cycles

PHONOGRAPH

Type	Model U-105	Model U-107
Type	Automatic-Manual	Automatic-Manual
Record Capacity	Eight 10-inch	Eight 10-inch or Seven 12-inch
Turntable Speed	78 R.P.M.	78 R.P.M.
Type of Pickup	High-impedance magnetic	Crystal
Pickup Impedance	1,400 ohms at 1,000 cycles	80,000 ohms at 1,000 cycles

Mechanical Specifications

	Model U-105	Model U-107
Height	34 inches	43 inches
Width	36 3/4 inches	31 1/8 inches
Depth	15 7/8 inches	19 7/8 inches
Weight (net)	96 pounds	136 pounds
Weight (shipping)	122 pounds	199 pounds
Chassis Base Dimensions	14 7/8 inches x 9 3/4 inches x 3 1/4 inches	
Over-all Chassis Height	9 3/4 inches	

OPERATING CONTROLS

Radio Panel	(1) Tone—Power (switch), (2) Tuning (large inner knob), (3) Range Selector (small outer knob, left to right "A," "B," "C"), (4) Phono.—Volume (radio).
Phono. Compartment	{ (U-105) (1) Turntable Switch, (2) Index Lever, (3) Record Ejector, (4) Phono. Volume { (U-107) (1) Turntable Switch, (2) Index Lever, (3) Phono. Volume
Tuning Drive Ratio	20 to 1

Mazda No. 46, 6.3 volts, 0.25 amp.  
 Mazda No. 40, 6.3 volts, 0.15 amp.  
 Mazda No. 40, 6.3 volts, 0.15 amp.  
 Pilot Lamps (4) Radio (1) Front Cabinet (U-105 only), (1) Phono Compartment (U-107 only)



RCA MFG. CO., INC.

MODEL U105  
Chassis Wiring  
Coils

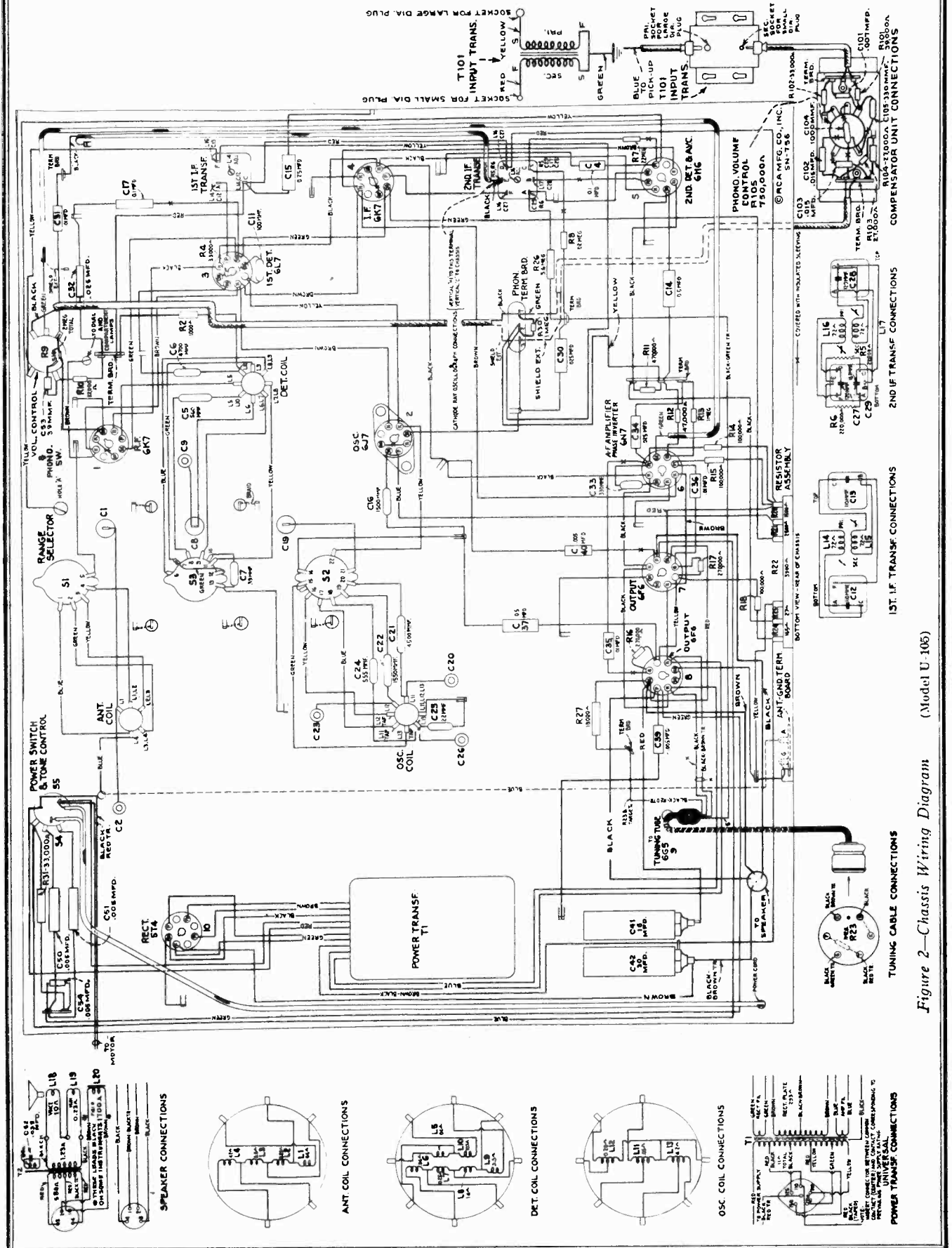


Figure 2—Chassis Wiring Diagram (Model U-105)

MODEL U105

Automatic Record Changer

RCA MFG. CO., INC.

Details, Adjustments

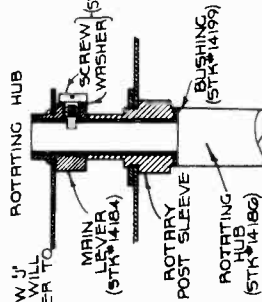
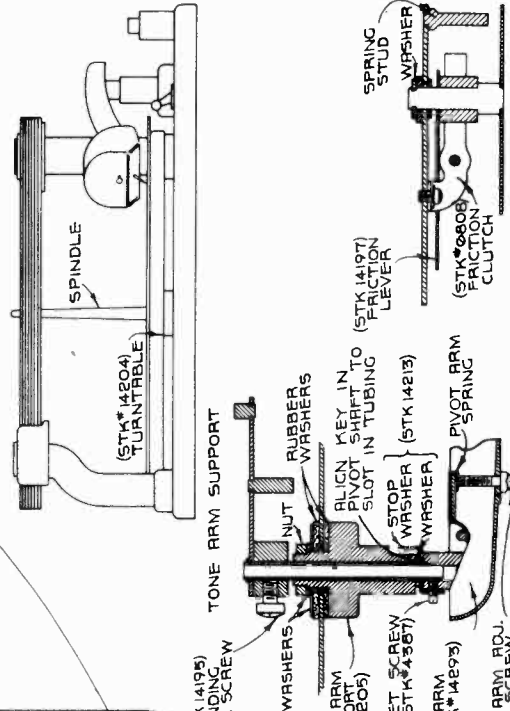
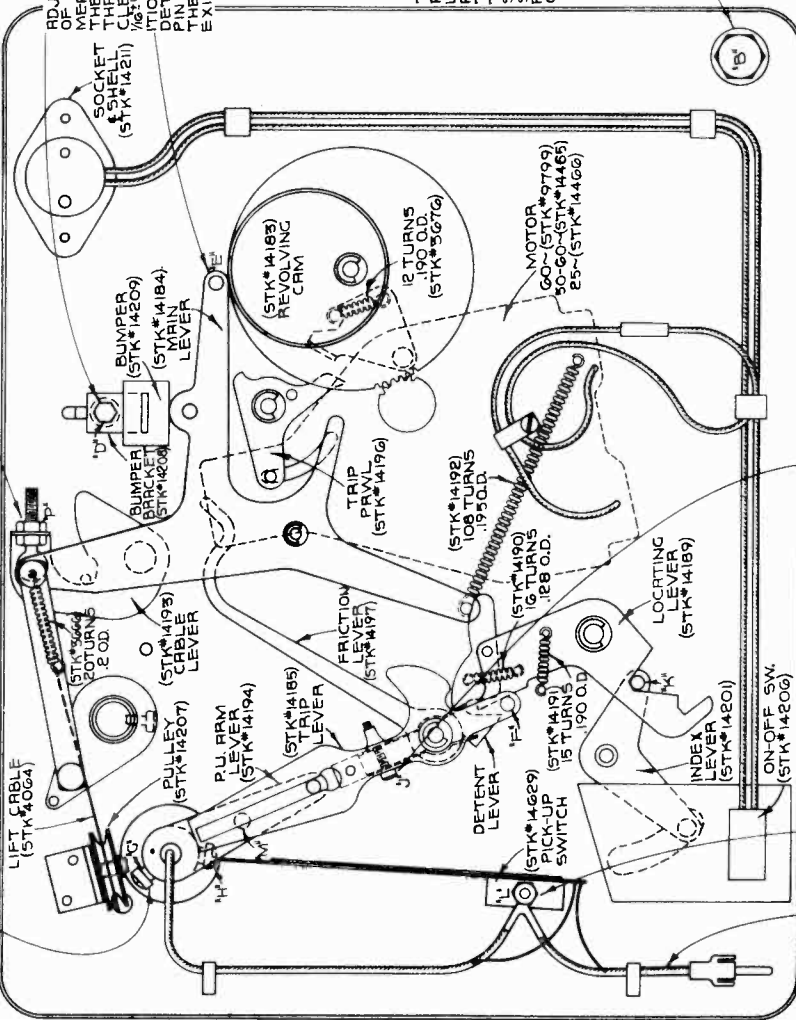
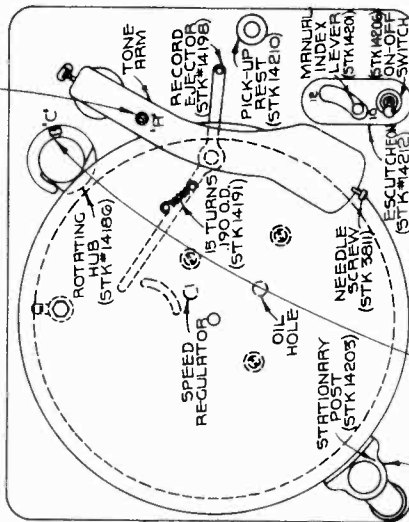
ADJUST THE LOWERMOST REST POSITION OF THE TONE ARM SO THAT THE POINT RESTS IN A PLANE 1/16" BELOW THE PLANE OF THE TOP OF THE TURNTABLE BY MEANS OF SCREW "H".

ADJUST THE RISE OF THE TONE ARM SO THAT THE NEEDLE POINT RISES 1/16" ABOVE THE TOP OF THE TURNTABLE DURING CYCLE. THIS ADJUSTMENT IS MADE BY MEANS OF THE SCREW AND LOCK NUTS "P" (STK\*4563) ON THE CABLE LEVER.

TO ADJUST THE LANDING POSITION OF THE NEEDLE FIRST LOCATE NEEDLE 4 1/2" FROM CENTER OF THE TURNABLE SPINDLE. THEN WITH THE LOCATING LEVER AGAINST THE STOP PIN "K" AND THE PIN "O" ON THE TRIP LEVER CONTACTING THE LOCATING LEVER TIGHTEN THE BLUNT SCREW "G" ON TONE ARM SUPPORT AND RUN DEVICE THROUGH CYCLE AS A CHECK WHEN CORRECT ADJUSTMENT IS OBTAINED TIGHTEN CONE POINTED SCREW "H" (STK\*14195) ON TONE ARM SUPPORT.

ADJUST THE REST POSITION OF THE MAIN LEVER BY MEANS OF THE NUT "D" ON THE BUMPER BRACKET SO THAT THE CAM ROLLING CRM CLEARS THE NEAREST POSITIONAL SO NOTE THAT THE MAIN LEVER MUST CLEAR THE TRIP LEVER AT ALL TIMES WHEN THE ABOVE CONDITIONS EXIST.

TO ADJUST RECORD IN POSITION OVER SPINDLE SO THAT IT RESTS ON THE LOWER SHELF OF THE ROT. HUB. MOVE STATIONARY RECORD POST TO POSITION FOR THE BEVELS WHEN RECORD IS CONN. RECORD UNDER THE TURNABLE AND THE BEVELS UNDER THE RECORD. TIGHTEN HEAVY SCREW "I" OF ROTATED UNDER RECORD. WITH RECORD STILL ON LOWER SHELF OF ROTATED UNDER RECORD. WITH RECORD SO THAT THE BEVELED TONGUE ON THE SEPARATING CRM CLEARS THE RECORD BY 1/8". THESE ADJUSTMENTS SHOULD BE MADE ONLY WHEN THE COMPLETE UNIT IS RESTING ON THE FOUR MOTOR BOARD BUSHINGS.



ADJUST TRIP LEVER SCREW "J" (STK\*4052) UNTIL FRICTION LEVER TO TRIP LEVER WILL MOVE TRIP PAWL.

TO ADJUST PICK-UP SHORTING SWITCH SET PICK-UP NEEDLE G NUT "L" FROM CENTER OF SPINDLE. PICK-UP SWITCH IS JUST CONTACTING PIN "M".

Figure 10—Automatic Record Changer Adjustments (Model U-106)

RCA MFG. CO., INC. T-70827-C





**Pickup (Model U-105)**

The pickup used in the phonograph unit 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. The frequency response is substantially uniform over a wide range. Service operations which may be necessary on the pickup are as follows:

**Centering Armature.**—Refer to figure 5 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 by removing the needle holding screw and the two mounting screws from the front of the tone arm, holding the pickup assembly to keep it from dropping. 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 replace the needle holding screw, tightening it 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 moved to the extreme position on each side (the movement being limited by the armature striking the pole pieces) and then brought to the mid position between these two extremes. Screws C should then be tightened. The armature position should then be central between the pole pieces and at right angles to them. With a little practice, the correct adjustment of the armature will be obtained. 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.

**Damping Block.**—The viscoloid damping block which is attached to the front end of the armature shank serves as a mechanical filter to eliminate 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 as explained above.

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 in figure 7 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.

**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 as described above. Remove screws A and B and the magnet assembly. Remove the bakelite coil support (with coil attached) and insert the new coil support assembly in its place, after which replace the magnet assembly and center the armature as described above, then re-assemble the remainder of the unit.

**Automatic Record Mechanism  
(Model U-105)**

This record changing mechanism is designed to be simple and fool-proof. Certain adjustments may be required occasionally. The adjustments are illustrated and explained in figures 8 and 10.

It is important, when servicing the automatic mechanism, to have it placed on a level support. It is also important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possible broken parts may result.

**CAUTION.**—Do not leave records stacked on the record holder posts, when not in use, as they are liable to warp, particularly so in warm climates.

**Alignment Procedure**

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "0." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 6 and 9.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figures 2 and 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L16 and L17	Max. (peak)
2	6L7 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L14 and L15	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C20	Max. (peak) *
4	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Det.	C9	Max. (peak) †
5	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Ant.	C2	Max. (peak) ‡
6	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C23	Max. (peak) *
7	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L13	Max. (peak)
8	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)
9	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L13	Max. (peak)
10	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)

† Use maximum capacity peak if two peaks can be obtained. \* Use minimum capacity peak if two peaks can be obtained. ‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

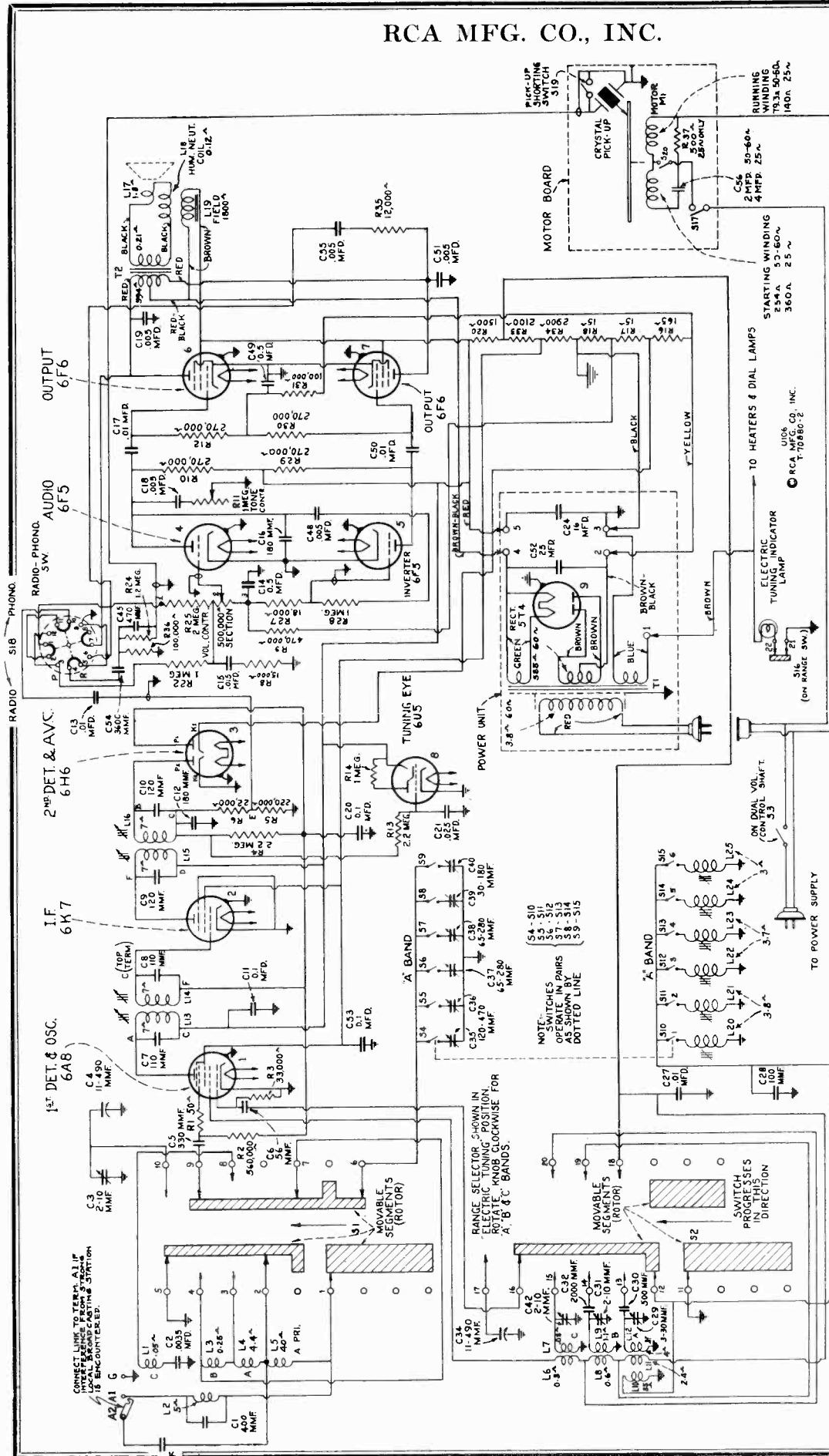
FOR RECORD CHANGER DATA, SEE MODEL U106





RCA MFG. CO., INC.

MODEL U106  
Schematic  
Specifications



<b>FREQUENCY RANGES</b>	"Standard Broadcast" (A)..... 540-1,720 kc	"Medium Wave" (B)..... 6,000 kc (osc. ant.)	"Short Wave" (C)..... 20,000 kc (osc.)	"Standard Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)	Desired Station (osc., ant.)	Maximum..... 10 watts	Undistorted..... 12 watts
<b>SIX "ELECTRIC TUNING" POSITIONS</b>	Positions..... 540-1,550 kc	Radio Only	Total	PHONOGRAPH	Type..... Automatic or Manual	Record Capacity..... Eight 10-inch or Seven 12-inch	Turntable Speed..... 78 R.P.M.
<b>POWER SUPPLY RATINGS</b>	A-6..... 105-125 volts, 60 cycles..... 120 watts	A-5..... 105-125 volts, 50 cycles..... 125 watts	B-2..... 105-125 volts, 25 cycles..... 120 watts	C-6..... 105-125/200-250 volts, 60 cycles..... 120 watts	C-5..... 105-125/200-250 volts, 50 cycles..... 125 watts	Turntable Pickup..... Crystal	Pickup Impedance..... 80,000 ohms at 1,000 cycles

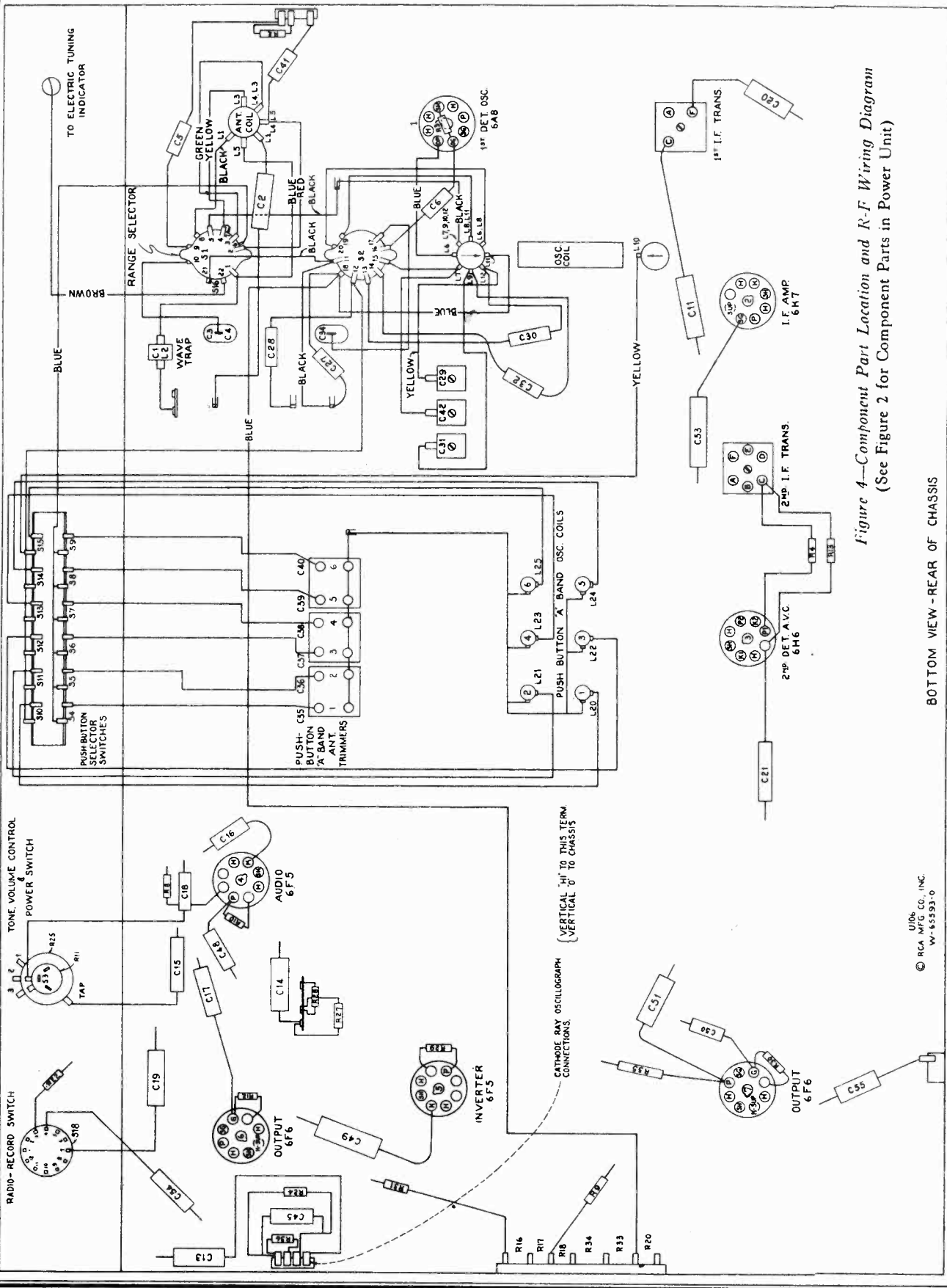


Figure 4—Component Part Location and R-F Wiring Diagram (See Figure 2 for Component Parts in Power Unit)

BOTTOM VIEW - REAR OF CHASSIS

U106  
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W-65593-0

RCA MFG. CO., INC.

MODEL U106  
 Socket, Trimmers  
 Chassis Wiring  
 Circuit Data, Notes  
**Service Data**

**Circuit Arrangement**

The circuit consists of a combined first-detector and oscillator stage; i-f amplifier stage; diode-detector and automatic-volume-control stage; a-f amplifier stage; a-f amplifier, phase-inverter stage; push-pull power-amplifier stage; tuning indicator "Magic Eye"; and a full-wave rectifier. The antenna coil is constructed with a special type winding ("cumulative") to provide increased sensitivity and selectivity on the "Standard broadcast" band. A fixed-tuned wave trap reduces i-f interference entering the antenna circuit.

Electric tuning is accomplished in a simple manner. There are six trimmers for tuning the single antenna coil and six magnetite-core adjusted oscillator coils. A desired station is tuned accurately, quickly, and silently by pressing a push-button which instantly puts the pre-adjusted coil and trimmer into use. Oscillator frequency drift is reduced to a minimum by use of a temperature-compensating capacitor (C28) in the oscillator circuit along with magnetite-core adjusted oscillator coils.

**Loudspeaker.**—Centering the loudspeaker voice-coil is made in the usual manner with three, narrow, paper or celluloid feelers after first removing the front dust-cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust-cover should be cemented back in place with ambroid upon completion of the adjustment.

**Precautionary Lead Dress.**—(1) Filament leads should be dressed away from audio grids. (2) Output plate leads should be dressed away from radio-phonograph switch. Maintain original size, length, and position of: (3) All leads from range switch to antenna and oscillator coils. They should be as short, rigid, and separated as far as possible from other leads and chassis. (4) Lead from oscillator coil to ground. (5) Leads from gang condenser to range selector. (6) Leads of "C"-band antenna series condenser, C2. If the r-f and i-f wiring is altered during servicing the receiver must be re-aligned.

**Radiotron Cathode Current Readings**  
 Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6A8—1st Det. and Osc.	11	ma.
(2) RCA-6K7—I-F Amp.	8	ma.
(3) RCA-6H6—2nd Det. and A.V.C.		
(4) RCA-6F5—Audio Amplifier	0.29	ma.
(5) RCA-6F5—Inverter	0.29	ma.
(6) RCA-6F6—Output	28.5	ma.
(7) RCA-6F6—Output	28.5	ma.
(8) RCA-6U5—Tuning	1.5	ma.
(9) RCA-5T4—Rectifier	110	ma.**

(\*\* Cannot be measured at socket)

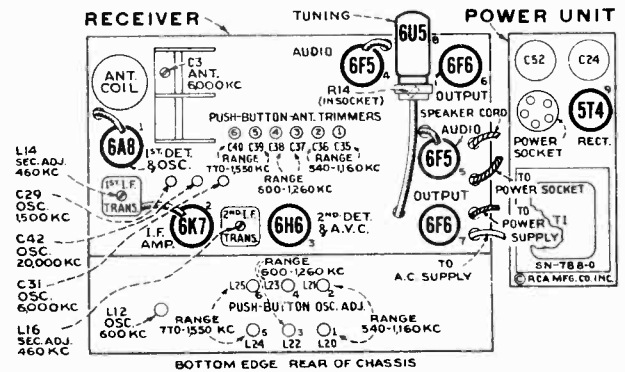


Figure 1—Radiotron and Trimmer Locations

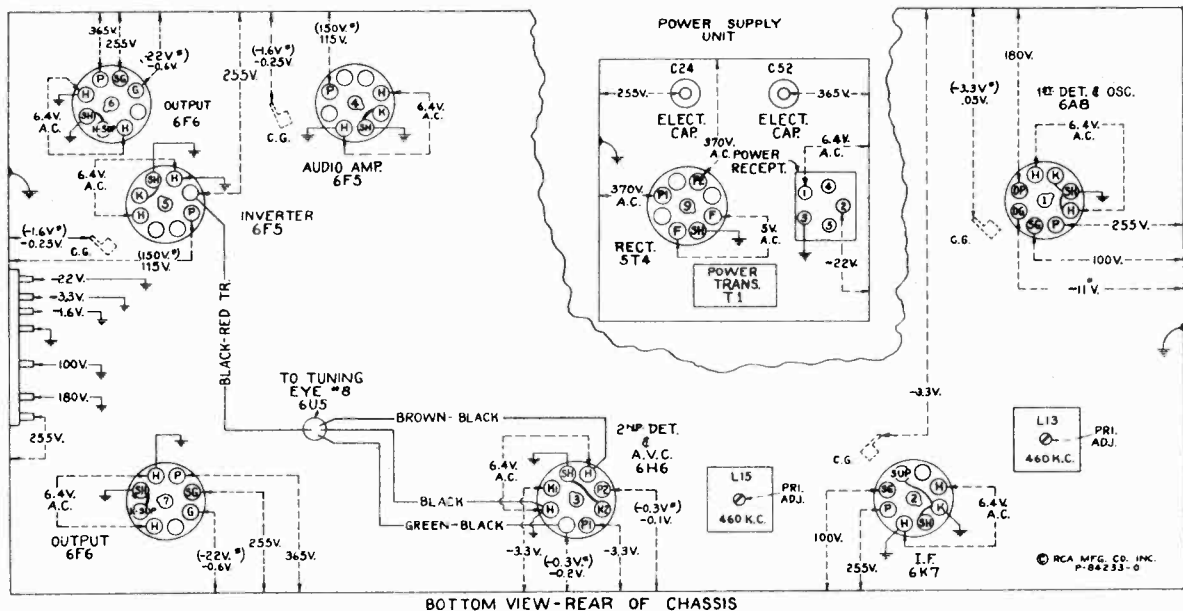


Figure 2—Radiotron Socket Voltages and Trimmer Locations

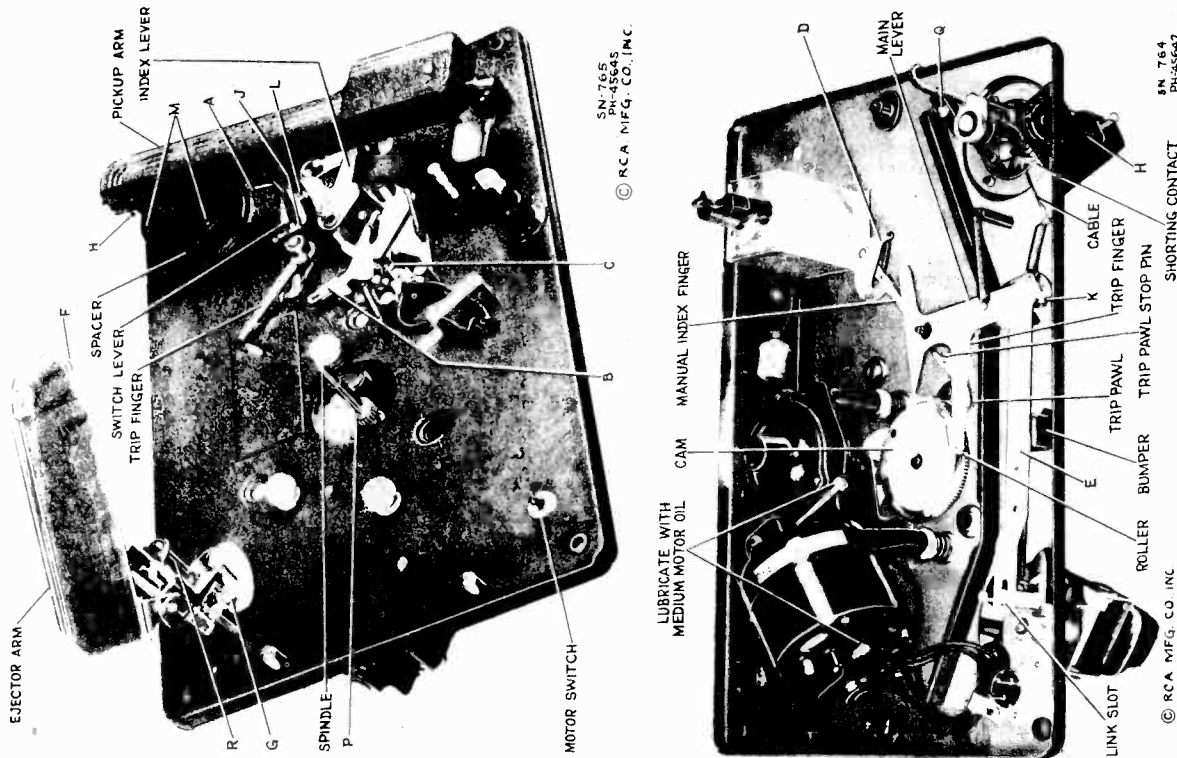
Measured at 117 volts, 60-cycle supply. Measurements made with set tuned to quiet point near 1,000 kc; volume control at minimum; Radio-Phonograph switch to "Radio"; using a 1,000-ohm-per-volt meter having ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified

measured voltage.) Measurements made to chassis unless otherwise indicated.

Note.—Values with star (\*) are operating voltages. Values not starred are actual measured voltages.

MODELS U106, U107  
Automatic Record Changer  
Adjustments, Views, Tuner

RCA MFG. CO., INC.



- 3—Eject records properly down to second from bottom of pile. Raise turntable by placing thrust washers at top.
  - 4—Eject cycle does not start after needle reaches eccentric groove. Adjust "J" (turn screw clockwise).
  - 5—Eject cycle starts before eccentric record groove is reached. Adjust "J" (turn screw counter-clockwise).
  - 6—Index Lever to 1/12 inch or 1/10 inch position during play record. Do not jar motor-board during tuning of "Pickup Arm".
  - 7—Lateral movement of "Pickup Arm" has no control over starting and stopping. Adjust cleat in slot of "Switch Lever".
  - 8—Pickup strikes record during eject cycle. Adjust "K" and "H".
  - 9—Spindle playing record several grooves in from beginning. Needle misses record entirely. Adjust "L" (turn screw clockwise).
  - 10—Needle falls into groove at start of record but does not move smoothly through groove. Adjust "M". Check to see that motor-board is level.
  - 11—Automatic stop does not operate after needle reaches eccentric groove. Adjust "B" and "C".
  - 12—Motor does not re-start when "Pickup" is returned to rest position. Adjust "C". See that switch mechanism parts move freely and springs are functioning.
  - 13—Starts eject cycle although set for "Manual" operation. Adjust "D".
  - 14—Noise in loudspeaker while changing needles. Clean "Shorting Contact" and adjust "Q".
  - 15—"Wow" in record reproduction.—Instrument should be warmed to about 65° F. Ejector tip should be "C" and free to rotate (adjustments "F" and "G"). There should be no solid particles on gear teeth or in mechanism to bind "Spindle" plate should be in "Spindle" hole. "Spindle" should be straight. Proper lubrication is important.
- Lubrication.**—Clean motor gear-box thoroughly before greasing. Apply less than a tablespoonful of a grease, such as "Cities Service No. 7035-A1" or "Koolmotor Universal Trojan No. 1," directly on gears, taking care to get none in the oil holes. Cover main gear and cam of automatic mechanism with a light grease such as "Socomey-Vacuum No. 1." Any good household oil, such as "3-IN-ONE" is suitable for the ejector-tip "P" bearing.

"Electric Tuning" Alignment

Each push button connects a particular oscillator coil and antenna trimmer condenser. The tuning of this coil and this condenser selects a station.

The frequency ranges for various push-buttons are:

- (1) 540 to 1,160 kilocycles—Adjust L-20 and C-35
- (2) 600 to 1,160 kilocycles—Adjust L-21 and C-36
- (3) 690 to 1,260 kilocycles—Adjust L-22 and C-37
- (4) 690 to 1,260 kilocycles—Adjust L-23 and C-38
- (5) 770 to 1,550 kilocycles—Adjust L-24 and C-39
- (6) 770 to 1,550 kilocycles—Adjust L-25 and C-40

The following are the steps in aligning a push-button selector:

- (1) Manually tune to desired station, then switch range selector to "Electric Tuning" position.
- (2) Press a push-button whose frequency range includes the station.
- (3) Adjust oscillator coil corresponding to that push-button, to receive the desired station.
- (4) Adjust antenna condenser for that push-button to receive the desired station.
- (5) Check alignment by switching to manual tuning. "Magic Eye" will not change appreciably if alignment is correct.
- (6) After receiver has warmed, repeat above adjustments.

Automatic Record Changer

Under normal operating conditions, service requirements on this mechanism should be negligible. Occasionally, however, certain adjustments may be necessary. It is important to refrain from forcing the mechanism if there is a tendency to bind or jam, when operating or adjusting, since bent levers and possibly broken parts may result.

**Record Changer Adjustments.**—Mount motor-board on a light support. Remove turntable and cover at right of turntable. Connections are designated on figure 5 as A, B, etc. The adjustments are grouped under corresponding symbols below. Perform adjustments in the following order:

- A.—Trip rod "A" should be engaged in "Switch Lever" slot. Adjust trip rod "A" to obtain about 1/8 of an inch clearance from motor-board.
  - B.—Adjust "B" to the position shown.
  - C.—With "Index Lever" in "Manual" position, "Pickup Arm" rotated to extreme left, and switch tripped to open contact "C," adjust contact points "C" by bending the stiff contact arm until points are opened 10 to 30 thousandths of an inch.
  - D.—With "Index Lever" in "Manual" position, release set screw "D" and force "Manual Index Finger" as far as it will go towards "Trip Pawl Stop Pin." Tighten set screw.
  - E.—Adjust at "E" to provide approximately 1/32 of an inch between outer end of "Link Slot" and screw when "Rubber Bumper" is in contact with stop bracket.
  - F.—Remove rubber silencer at "F" and adjust "F" and "G" with "F" in line with "Spindle." Longer radial movement with "F" in line with "F" in "Arm" may be effected by loosening hex head "F" in "Arm" movement of "Ejector Arm" may be effected by adjustment "G" raised 3/16 inches above motor-board.
  - H.—Adjust "H" so under side of pickup head can be raised 3/16 inches above motor-board.
  - J.—Adjust screw "J" until friction will just force "Trip Finger" to move "Trip Pawl" when "Index Lever" is in "12" inch position.
  - N.—Adjust needle pressure by turning screws (25 centers) of "Pickup Arm" so that a force of 72 grams (2 1/2 ounces) is required to lift needle from record. Hook scale under needle screw to measure force.
  - K.—Adjustment "N" must be performed prior to this adjustment. With a 12-inch record, on turntable, turn on "Motor Switch," place "Index Lever" to "12" position and adjust "K" so that "Cable" tension will allow needle to lower to start of record at completion of eject cycle. Turn "Motor Switch" after eject cycle is completed and check to see that "Cable" does not lose tension when "Pickup Arm" is moved against "Spindle." Replace turntable and put a needle in "Pickup."
  - L.—Adjust "L" so needle will drop into center of smooth portion at the start of a 12-inch record when "Index Lever" is in "12" inch position and "Pickup Arm" is to extreme right.
  - M.—Loosen three screws "M" and rotate "Spacer" until pointer on "Spacer" is in line with screw to right of "Pickup Arm."
  - P.—Adjust turntable height by insertion or removal of thrust washers at "P" so ejector tip "F" will not eject bottom 12-inch record but will eject second from bottom record.
  - Q.—Adjust position of shorting switch at "Q" so switch closes when needle is just outside a 12-inch record.
  - R.—Adjust screw "R" upward just enough so that with one record on turntable and ejector tip "F" resting on record, the "Ejector Arm" is 1/16 of an inch clearance between screw "R" and "Ejector Arm."
- Record Changer Service Hint.**—A general perusal of the following possible trouble spots, as experienced with this mechanism, together with the adjustments mentioned, will be applied for same, will enable one to ascertain that which pertains to the instrument at hand:
- 1.—"Ejector Arm" goes through normal cycle but does not eject records. Adjust "F" and "G." See that "Spindle" slides freely.
  - 2.—Ejects bottom record. Lower turntable by removing thrust washers at "P."

Figure 5—Automatic Record Changer Adjustments



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MODEL U106 Alignment, Parts Transformer Data

REPLACEMENT PARTS

Table with columns: STOCK No., DESCRIPTION, Unit List Price, and Unit List Price. It lists various mechanical and electrical components such as shafts, sockets, springs, and washers.

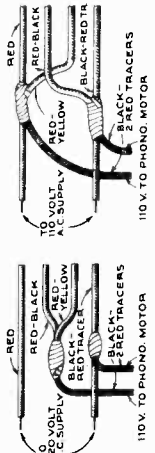


Figure 6—Schematic and Primary Lead Connections for 110-220 volt Power Transformer (Stock No. 30869) Resistance of each primary winding, 6.3 ohms. High voltage secondary winding, 260 ohms total.

ions. Regulate the output of the test oscillator to that frequency... The term "dummy antenna" means the device which must be connected to the "high" reticulator output and must be connected to the "low" antenna terminal.

Table with columns: Order of Alignment, Connection to Receiver, Frequency Setting, Range Selector, Receiver Dial Setting, Circuit to Adjust, Adjustment Symbols, and Adjust to Obtain. It provides alignment instructions for various components.

\* Use maximum capacity peak if two peaks can be obtained. Check for image signal by shifting receiver dial to 26.92 mc.

Table with columns: Stock No., Description, and Unit List Price. It lists various electronic components like capacitors, resistors, and tubes.

MODEL U109  
Circuit DataRCA MFG. CO., INC.  
Circuit Arrangement

The radio receiver circuit consists of an r-f amplifier stage, first-detector (converter) stage, separate heterodyne-oscillator stage, oscillator control stage, two i-f amplifier stages, diode-detector—automatic volume and frequency control stage, audio voltage-amplifier stage, tuning indicator "Magic Eye," audio driver stage, push-pull triode power-amplifier stage, and a full-wave rectifier. The phonograph circuit consists of a volume expander stage, expander amplifier stage, expander rectifier, audio driver stage, push-pull power amplifier stage, and full-wave rectifier.

The antenna and detector coils are constructed with a special type of winding ("cumulative") to provide increased sensitivity and selectivity on the "A" band. The "A," "B," and "C" sections on both coils are wound on single forms and are series connected. The range selector operates in such a manner that the correct portions are selected for the primary and secondary windings on each band. The "A," "B," and "C" oscillator sections are likewise wound on a single form but are connected so they operate separately. Undesirable interaction of unused windings with the tuned circuits is prevented by shorting out the proper sections with the range selector.

The intermediate-frequency amplifier consists of two RCA-6K7 tubes in a two-stage transformer-coupled circuit. The windings of all i-f transformers are resonated by fixed capacitors and are adjusted by molded magnetite cores to tune to 460 kc. A third winding, L17, in the first i-f transformer, closely coupled to the primary, L15, is placed in series with the main secondary L16 when the fidelity control switch S5 is thrown to "broad" position (see figure 1), thereby increasing the coupling between the primary and secondary windings with a consequent broadening of the band width of the i-f amplifier, permitting higher fidelity reception.

The function of the automatic-frequency-control circuit is to automatically change the frequency of the heterodyne oscillator so that the correct i-f frequency is formed for the i-f amplifier. The circuit consists essentially of an i-f discriminator which, as the name implies, discriminates or furnishes control voltage of the correct polarity to an oscillator frequency-control tube for generated i-f carrier frequencies slightly above and below 460 kc, or the frequency to which the i-f amplifier is tuned.

The plate circuit of the RCA-6J7 oscillator control tube is caused to act as an apparent variable inductance in parallel with the "A" band oscillator tuned circuit of which coil L14 is a part. The series combination of resistor R41 and the oscillator control-tube grid to cathode capacitance is also in parallel with the oscillator tuned circuit. Since the resistance of R41 is many times greater than the reactance of the grid-cathode capacitance, at the oscillator frequency, the r-f current through the combination will be practically in phase with the r-f voltage across the oscillator tuned circuit. However, the r-f voltage impressed across the grid-cathode capacitance section of the combination will lag the r-f voltage across the combination, or the tuned circuit, approximately 90 degrees. The grid-cathode r-f voltage will be amplified by the control tube but will be shifted an additional 180 degrees (grid and plate voltages of all tubes are always opposite in phase) so that the amplified r-f voltage appearing across the plate circuit will now lead the voltage across the combination or the tuned circuit by 90 degrees, or, in other words, the control tube is acting as an equivalent shunt inductance. The amount of this action is determined by the amplification of the tube, which in turn is governed by the grid-cathode bias voltage. In operation a residual bias is developed across the cathode resistor R43. The d-c control grid voltage is fed to the control grid from the discriminator circuit through resistor R44. If this voltage is negative with respect to ground, the amplification of the control tube will be decreased, which will lower the frequency of the oscillator tube. The converse will occur when the grid voltage is positive with respect to ground.

The action of the discriminator circuit depends upon the fact that a 90-degree phase difference exists between the primary and secondary potentials of a double-tuned loosely-coupled transformer when the resonant frequency is applied and that this phase difference varies as the applied frequency varies; i.e., the maximum resultant response voltage across

the primary and secondary windings connected in series will occur at a frequency either lower or higher in frequency than the frequency to which the individual windings are resonated, respectively depending on whether the windings are connected series aiding or opposing.

The discriminator, or fourth i-f transformer, consists of the primary winding, L24, which is a part of the third i-f transformer secondary tuned circuit (tuned to 460 kc) and the center-tapped secondary, L22. The upper and lower halves of L22 may be considered as two secondary coils, the upper series opposing and the lower series aiding the primary, L24. The magnetite core in L22 is inserted to inductively balance the two halves. The function of coil L23 (magnetite core adjusted), in parallel with L22, is to tune the secondary to 460 kc. Therefore, the maximum voltage will be applied to diode circuit P<sub>2</sub>K<sub>2</sub>, R46, and R45 when the i-f signal frequency is above 460 kc and to the diode circuit P<sub>1</sub>K<sub>1</sub> and R20 when the i-f signal frequency is below 460 kc. Resistor sections R46-R45 and R20 are connected in series between ground and a point leading to the oscillator control tube grid.

D-c voltages, resulting from diode rectification, across section R46-R45 and section R20 are always in opposition, consequently the oscillator control-tube grid-bias voltage is a differential amount, depending upon the i-f signal strength and its frequency deviation from the nominal value of 460 kc. The polarity of this differential oscillator control-tube grid-bias, with respect to ground, depends on whether the i-f signal frequency is above or below 460 kc, but is always in the direction which will bring the generated i-f frequency nearer to 460 kc. A-f-c action is automatically eliminated for "manual" tuning by grounding diode cathode K<sub>1</sub> through switch S7. A-v-c voltage and audio signal components are developed across resistor section R46-R45. The audio component is taken from R46.

The dynamic volume expander is used with the phonograph so that greater volume-range reproduction may be realized from disc recordings. The gain is varied by means

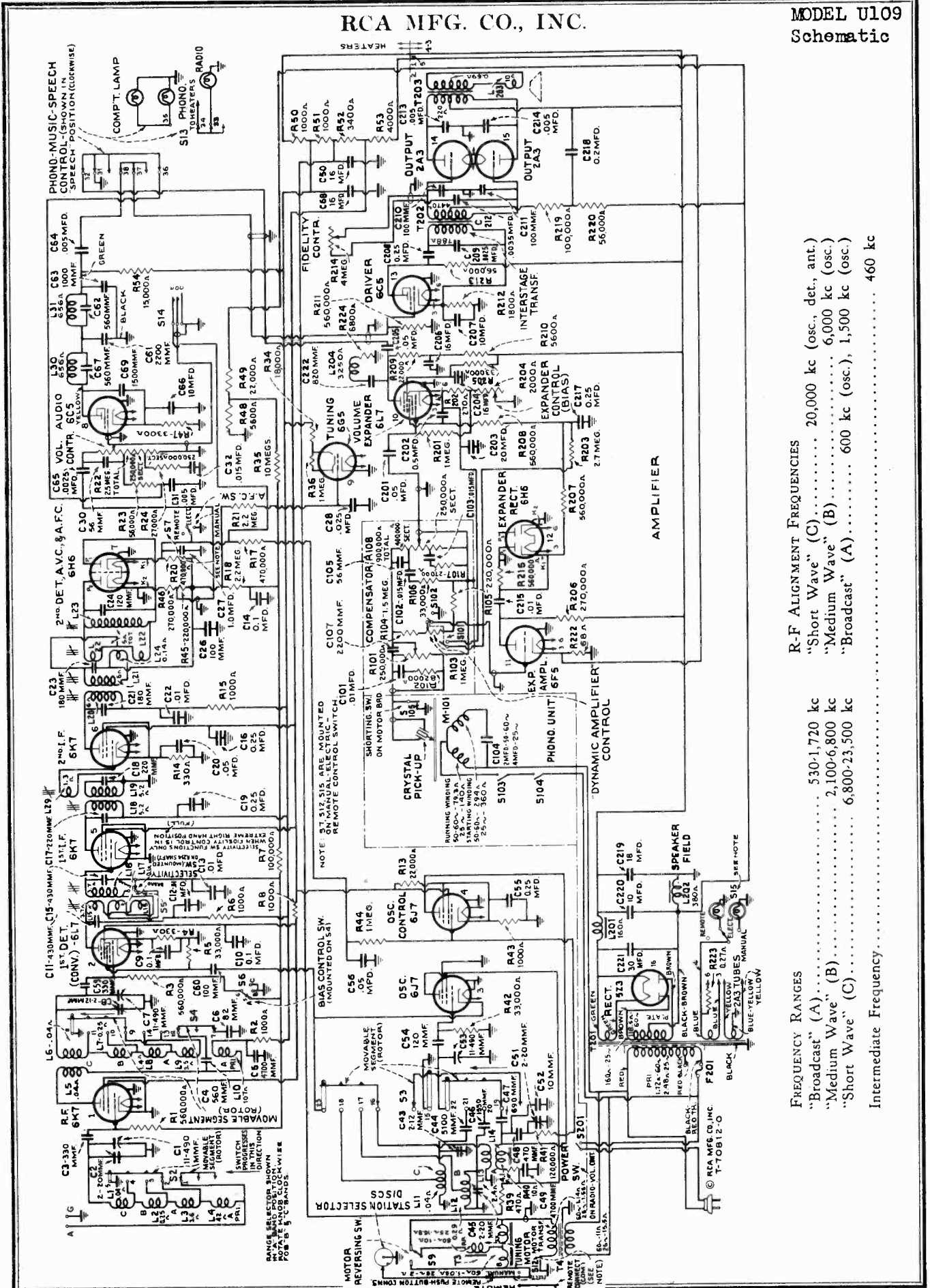
of the volume expander in direct proportion to the average intensity of the recorded sound. To accomplish this, the expander control R103 in series with R104 and R105 is placed in shunt with the phonograph volume control R108, and the arm of the expander control is connected to the control grid of the RCA-6F5 expander amplifier. The audio voltage applied to this tube is amplified and applied to diode plate P1 of the RCA-6H6 expander rectifier through capacitor C215. The rectified current develops a voltage across resistor R215 which is applied to the No. 3 grid of the RCA-6L7 volume expander and varies the amplification of this tube so that the gain will be increased for loud passages and decreased for soft passages. The volume expander circuit is arranged so that there is no appreciable change of gain, with an average record, between the minimum expansion (second dot) and "Off" positions of the "Dynamic Amplifier" control.

## General Description

The Model U-109 Radio-Phonograph Combination employs the latest developments in the art of record and radio reproduction. Features of design effected in the radio receiver include "Electric Tuning" with push-button operation; automatic frequency control; "cumulative-wound" antenna and detector coils; tuned r-f amplifier; magnetite-core adjusted i-f transformers and low-frequency "A" oscillator tracking; two-stage i-f amplifier; automatic volume control; "Magic Eye" tuning tube; plunger-type, air-dielectric trimming capacitors, two-point aural-compensated volume control; "Fidelity" control; "Music-Speech" control; and push-pull triode power output stage. Features of design pertinent to phonograph operation include a crystal pickup with top-loading needle socket; improved dynamic expander; automatic operation with either 10-inch or 12-inch records; and a separate two-point aural compensated volume control. A super-sensitive 12-inch electrodynamic loudspeaker with a high-frequency tone diffuser is used. In addition, this model has a cabinet incorporating the "Magic Voice".

RCA MFG. CO., INC.

MODEL U109  
Schematic



R-F ALIGNMENT FREQUENCIES  
 "Short Wave" (C)..... 20,000 kc (osc. det. ant.)  
 "Medium Wave" (B)..... 6,000 kc (osc.)  
 "Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)

FREQUENCY RANGES  
 "Broadcast" (A)..... 530-1,720 kc  
 "Medium Wave" (B)..... 2,100-6,800 kc  
 "Short Wave" (C)..... 6,800-23,500 kc  
 Intermediate Frequency..... 460 kc

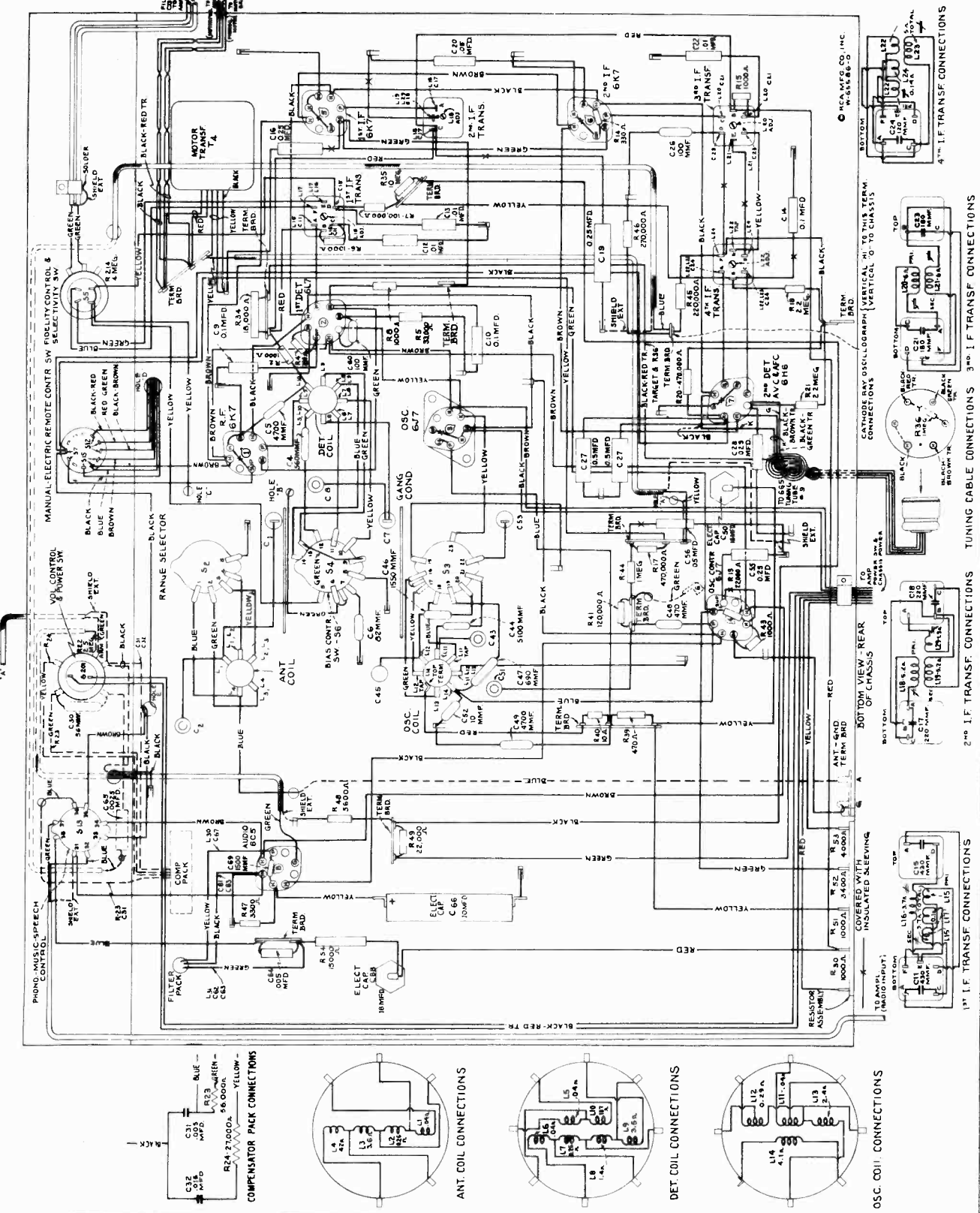
MODEL U109

R-F Chassis Wiring

RCA MFG. CO., INC.

Coils, Specs.

	Radio Only	Total	
Rating A-6.....	105-125 volts, 60 cycles.....	190 watts.....	220 watts
Rating A-5.....	105-125 volts, 50 cycles.....	190 watts.....	220 watts
Rating B-2.....	105-125 volts, 25 cycles.....	190 watts.....	220 watts
Rating C-6.....	100-130/140-160/200-250 volts, 60 cycles.....	190 watts.....	220 watts
Rating C-5.....	100-130/140-160/200-250 volts, 50 cycles.....	190 watts.....	220 watts
Fuse Rating.....			3 amperes



RCA MFG. CO., INC.

MODEL U109  
Power Amplifier  
Chassis Wiring  
Tuner Wiring

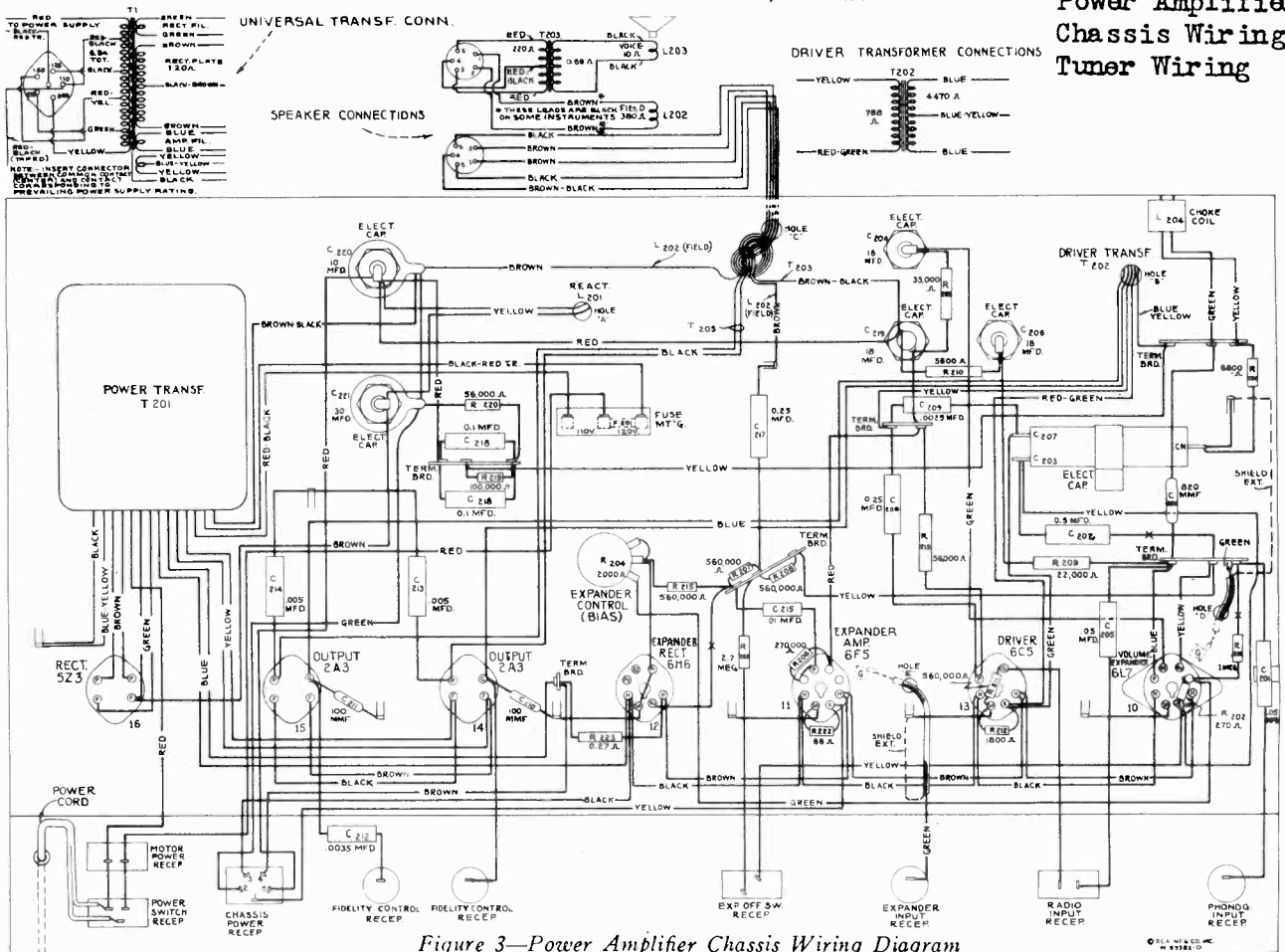
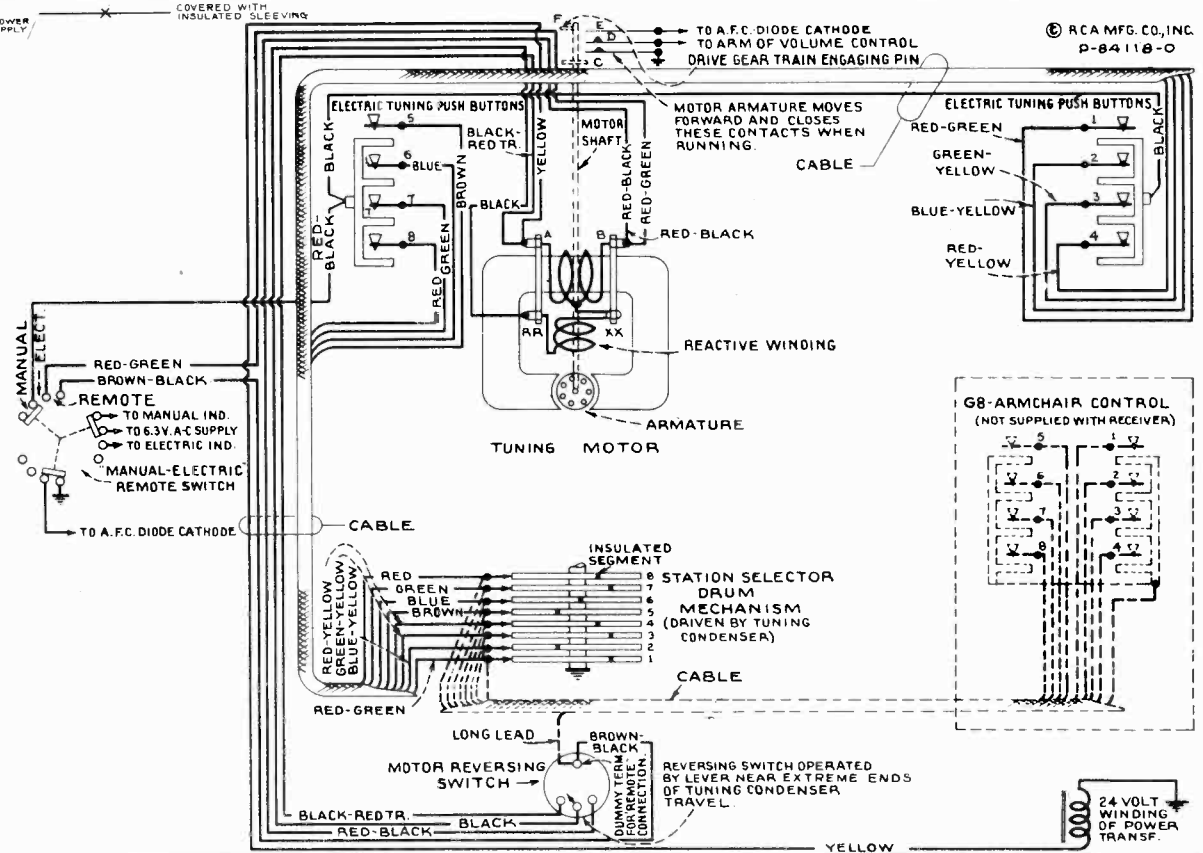


Figure 3—Power Amplifier Chassis Wiring Diagram

Figure 5—"Electric Tuning" Wiring Diagram  
(Viewed from rear of chassis)







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MODEL U109  
Socket, Trimmers  
Current Readings

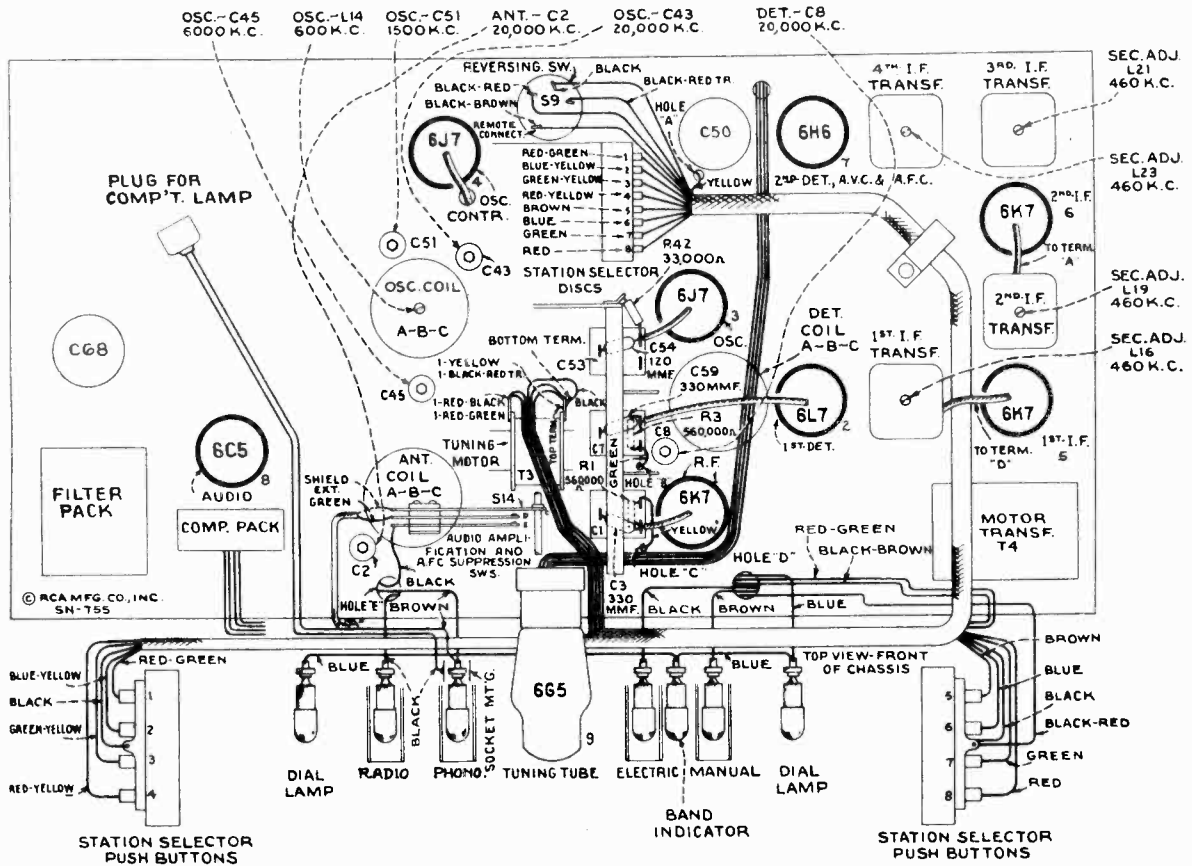


Figure 6—Radiotron, Coil, and Trimmer Locations (Receiver)

**Radiotron Cathode Current Readings**

Measured with Milliammeter Connected at Tube Socket  
Cathode Terminals Under Conditions Similar to  
Those of Voltage Measurements

( 1 ) RCA-6K7—R-F Amp. ....	5.0 ma.
( 2 ) RCA-6L7—1st Det. ....	6.0 ma.
( 3 ) RCA-6J7—Osc. ....	8.5 ma.
( 4 ) RCA-6J7—Osc. Control ....	1.2 ma.
( 5 ) RCA-6K7—1st I-F Amp. ....	6.0 ma.
( 6 ) RCA-6K7—2nd I-F Amp. ....	7.5 ma.
( 7 ) RCA-6H6—2nd Det., A.V.C. and A.F.C. ....	— ma.
( 8 ) RCA-6C5—1st A-F Amp. ....	2.5 ma.
( 9 ) RCA-6G5—Tuning Tube. ....	2.5 ma.
(10) RCA-6L7—Volume Expander ....	9.5 ma.
(11) RCA-6F5—Expander Amp. ....	0.6 ma.
(12) RCA-6H6—Expander Rectifier ....	— ma.
(13) RCA-6C5—A-F Driver. ....	2.9 ma.
(14) RCA-2A3—Output ....	43 ma.
(15) RCA-2A3—Output ....	43 ma.
(16) RCA-5Z3—Rectifier ....	168 ma.**

(\*\* Cannot be measured at socket)

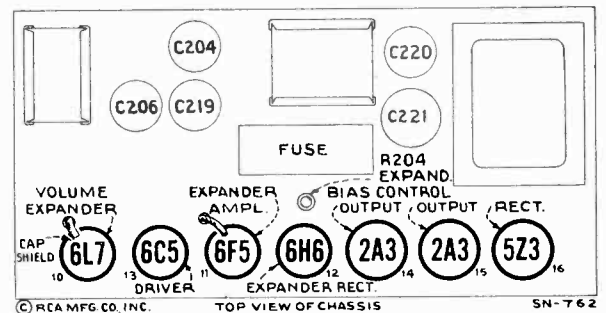


Figure 7—Radiotron Locations (Power Amplifier)

**RADIOTRON COMPLEMENT**

- (1) RCA-6K7 ..... R-F Amplifier
- (2) RCA-6L7 ..... First Detector
- (3) RCA-6J7 ..... Heterodyne Oscillator
- (4) RCA-6J7 ..... Oscillator Control
- (5) RCA-6K7 ..... First I-F Amplifier
- (6) RCA-6K7 ..... Second I-F Amplifier
- (7) RCA-6H6 ..... Second Detector, A.V.C., and A.F.C.
- (8) RCA-6C5 ..... First Audio Amplifier

Pilot Lamps.....

- ( 9 ) RCA-6G5 ..... "Magic Eye" Tuning Tube
  - (10) RCA-6L7 ..... Volume Expander
  - (11) RCA-6F5 ..... Expander Amplifier
  - (12) RCA-6H6 ..... Expander Rectifier
  - (13) RCA-6C5 ..... Audio Driver
  - (14) RCA-2A3 ..... Power Output
  - (15) RCA-2A3 ..... Power Output
  - (16) RCA-5Z3 ..... Full-Wave Rectifier
- { (7) Radio ..... Mazda No. 46, 6.3 volts, 0.25 amp.  
(1) Phono Compartment. Mazda No. 40, 6.3 volts, 0.15 amp.

MODEL U109

Lead Dress

Amplifier Adjustment

RCA MFG. CO., INC.

## Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

**Precautionary Lead Dress.**—(1) Bus lead from oscillator coil directly to ground must be as short as possible for correct alignment, (2) bus lead from range switch S3 to oscillator section C53 of variable condenser should be 1½ inches long for correct alignment, (3) bus lead from detector coil to range switch S4 must be as short as possible for correct alignment, (4) bus lead from detector coil to detector section C7 of variable condenser should be 2½ inches long for correct alignment, (5) detector trimming capacitor C8 lead should connect directly to variable condenser C7, (6) bus lead from antenna section of range switch S2 to chassis ground lance must be as short as possible, (7) bus lead from antenna coil to range switch S2 should be 2¼ inches for correct alignment, (8) bus lead from antenna coil to antenna section C1 of variable condenser must be 3⅞ inches over-all with ½ inch bend at coil end for correct alignment, (9) resistors R13, R41, R43, and R44 in the oscillator control tube circuit must be kept free of other component parts for satisfactory operation of the a-f-c circuit, (10) filament leads should all be twisted to reduce hum pickup, (11) filament leads should be dressed away from the terminal board near the 4th i-f transformer, (12) lead from the range switch S3 to the oscillator cathode socket terminal should be dressed under bus wire on socket to hold this lead down close to chassis.

**Loudspeaker.**—Two types of loudspeakers are used which will be referred to as types 1 and 2. In type 1 the cone centering diaphragm is cemented to a fixed ring, while in type 2 the centering diaphragm is cemented to an adjustable ring. Replacement of cone in either type is identical. Centering of cone for type 1 loudspeaker is made with three narrow celluloid or paper feelers after first removing the front dust cover and cutting free the cone centering diaphragm. The dust cover may be removed by a light application of acetone, using care not to allow the acetone to flow into the air gap. The centering diaphragm should be cemented in place after placement of feelers. Sufficient time should be allowed for the ambroid to set before removing feelers. Use ambroid to replace dust cover. Centering of cone for type 2 loudspeaker differs only in that it is not necessary to cut free the centering diaphragm, adjustment being made in the usual manner by means of screws on the adjustable cone centering ring.

## Dynamic Amplifier Adjustment

It is essential that correct voltages and currents exist at the RCA-6L7 volume expander stage in order that the expanding function may take place in the proper manner. A screw-driver adjustment is accordingly provided to regulate the RCA-6L7 control grid No. 3 bias to the correct operating value. Two methods of adjustment are applicable. Either method requires a normal voltage of 310 volts across the filter output (electrolytic capacitor C220 to chassis). The one to be preferred (a) requires the use of an RCA Stock

No. 9633 Beat-Frequency Oscillator or the equivalent, a 22-ohm resistor, two 120-ohm resistors, and a 1,000-ohm-per-volt a-c voltmeter (rectifier type) having ranges of 1, 5, and 10 volts. The less accurate method (b) requires the use of an RCA Stock No. 12353 Split-Plate Adapter, and a suitable d-c milliammeter. Both of these procedures are outlined below. It is necessary to turn the "Phono-Music-Speech" control to "Phono" position (clockwise) during this adjustment.

**CAUTION:** Before using either method, be sure that power-supply fuse is in proper position for the line voltage.

(a) **Preferred Method.**—Turn power switch off. Connect one 22-ohm and two 120-ohm resistors in series between the beat-frequency oscillator terminals (upper "250" and "CT") with the 22-ohm resistor connected to "CT." Calibrate the beat-frequency oscillator, adjust it to 1,000 cycles, and reduce its output. Connect the 1,000-ohm-per-volt a-c voltmeter (1-volt range) to the beat-frequency oscillator terminals (upper "250" and "CT"). Remove male plugs on "Phono Input Cable" and "Exp. Off Switch Cable" from the apron of the dynamic amplifier (see figure 10). Connect a lead

through a 0.1 mfd. capacitor from the grid cap of the RCA-6L7 (tube No. 10, grid-cap lead in place) to the junction of the 22-ohm and 120-ohm resistors. Connect beat-frequency oscillator terminal "CT" to the dynamic amplifier chassis.

Adjust beat-frequency oscillator output until the voltmeter reads exactly 1.0 volt. Remove the voltmeter leads from beat-frequency oscillator terminals without disturbing oscillator adjustments. Set the voltmeter to its 5-volt range and connect it across the loudspeaker voice coil.

Set the "Dynamic Amplifier" control to extreme counter-clockwise position and "Fidelity" control to extreme clockwise position. Turn on power switch and allow a few minutes for the instrument to become stabilized. Adjust the expander-bias control R204 (screw-driver adjustment top-center amplifier chassis, see figure 7) until the voltmeter reads 2.4 volts.

To check the operation of the volume expander, first change the voltmeter to its 10-volt range (leaving meter attached to voice coil) and then connect a lead from the junction of the two 120-ohm resistors to the grid cap of the RCA-6F5 expander amplifier (grid-cap lead removed). The voltmeter should now read from 6 to 9 volts if the expander is operating properly.

After replacing the "Exp. Off Switch Cable"—plug in amplifier, turning "Dynamic Amplifier" control to "Off" position, removing lead from junction of the two 120-ohm resistors, and replacing the grid-cap lead on the RCA-6F5 tube, the voltmeter should read approximately 4 volts.

(b) **Alternate Method.**—Turn power switch off. Place RCA Stock No. 12353 Split-Plate Adapter under the RCA-6L7 volume expander. Connect a suitable d-c milliammeter to the adapter. Turn both the "Phonograph Volume" and "Dynamic Amplifier" controls to their extreme counter-clockwise positions and remove "Exp. Off Switch Cable"—plug from apron of the dynamic amplifier (see figure 10). Turn on power switch and allow a few minutes for the instrument to become stabilized. Adjust "Expander Bias" control R204 to give one milliampere of plate current with no signal input to the dynamic amplifier.

## Mechanical Specifications

Height .....	43	inches
Width .....	35½	inches
Depth .....	22⅞	inches
Weight (net) .....	209	pounds
Weight (shipping) .....	297	pounds
Chassis Base Dimensions .....	(Amplifier) 16¼ x 7½ x 2⅞ inches	(Radio) 21 x 10½ x 3¼ inches
Over-all Chassis Height .....	(Amplifier) 8 inches	(Radio) 11½ inches
Operating Controls ..	{ Radio Panel..... (1) Phono—Music-Speech, (2) Volume—Power, (3) Tuning, (4) Range Selector, (5) Manual-Electric-Remote, (6) Fidelity { Phono Compartment.. (1) Phonograph Volume, (2) Dynamic Amplifier, (3) Motor Switch, (4) Index	
Tuning Drive Ratios (manual) .....	10 to 1 and 50 to 1	

# RCA MFG. CO., INC. ELECTRIC TUNING

MODEL U109  
Tuner Mechanism  
Principles, Adjustments

## Principle of Operation

The electric tuning mechanism consists essentially of a quick engaging and dis-engaging reversible electric motor, tuning condenser driving gear train, and eight mechanically interlocked (pushing one button releases all others) station selector push buttons respectively wired to eight adjustable station selector contactor discs (each with a motor stopping insulated segment) mounted on a drum which is direct-coupled to the gang tuning condenser shaft. The arrangement permits any one of eight pre-determined stations to be electrically tuned in by merely touching the correct push button.

The operation may be more readily understood by reference to figures 1, 5, and 8. When the motor is not energized, the armature is pushed to the rear or slightly out of the magnetic center by tension of contact spring "C" and the motor shaft is dis-engaged from the driving gear train. Pressing in any one of the eight push buttons will complete the motor circuit through a station selector contactor disc, assuming that the "Manual-Electric-Remote" switch is in "Electric" position and that the insulated segment in the contactor disc is not opposite its contactor. As the motor starts, the armature will be drawn forward, due to solenoid action, and the pin "F" on the end of its shaft will engage the arm "G" on the small main pinion gear, thereby driving the tuning mechanism. At the same time contact springs "E" and "D" will be grounded, causing suppression of audio amplification and automatic frequency control during the tuning cycle. The motor will continue to operate until the insulated segment in the selector disc breaks the motor circuit, whereupon spring "C" will instantly dis-engage the motor pin "F" from the arm "G" on the small pinion driving gear and open contacts "E" and "D." Pushing another button will cause the above mentioned cycle to be repeated except that

the motor will be interrupted by the insulated segment on a corresponding disc. The discs are individually adjustable on a drum mechanism, providing a choice of eight "Electric Tuned" "Broadcast" stations. The arrangement of the motor is such that its rotation will continue in the same direction regardless of the number of "Electric" tuning cycles until the tuning condenser approaches either full-out or full-in of mesh, whereupon lever "H" trips switch S9 which reverses the direction of rotation. A throw-out idler gear is link-coupled to the "Manual-Electric-Remote" control to disconnect the motor drive gear train when the control is thrown to "Manual" position.

## Mechanism Adjustments

The electric tuning mechanism is designed to be as simple in construction and as fool proof in operation as is possible. In order to maintain the accurate results possible with this device care must be taken in effecting any repairs or adjustments. Reference should be made to figure 8 and the following:

**A-F-C and A-F Amplification Suppression Switches.**— This switch assembly is located on the motor bracket and closes due to solenoid action of motor armature. Before attempting switch adjustment, loosen "Tilt Compensating Spring" adjusting screws (rear of tuning-motor bracket) and move spring to extreme travel away from motor armature shaft. The tension of the long contact spring "C" is important in bringing about quick dis-engagement of the motor and in permitting the motor to pull into mesh with the drive mechanism. Normal adjustment is attained when the short springs "D" and "E" are aligned exactly straight with contact points separated approximately 1/32 of an inch and with the spring "C" spaced approximately 7/32 of an inch from spring "D" at the point of contact. If necessary, in order to obtain positive pull-in

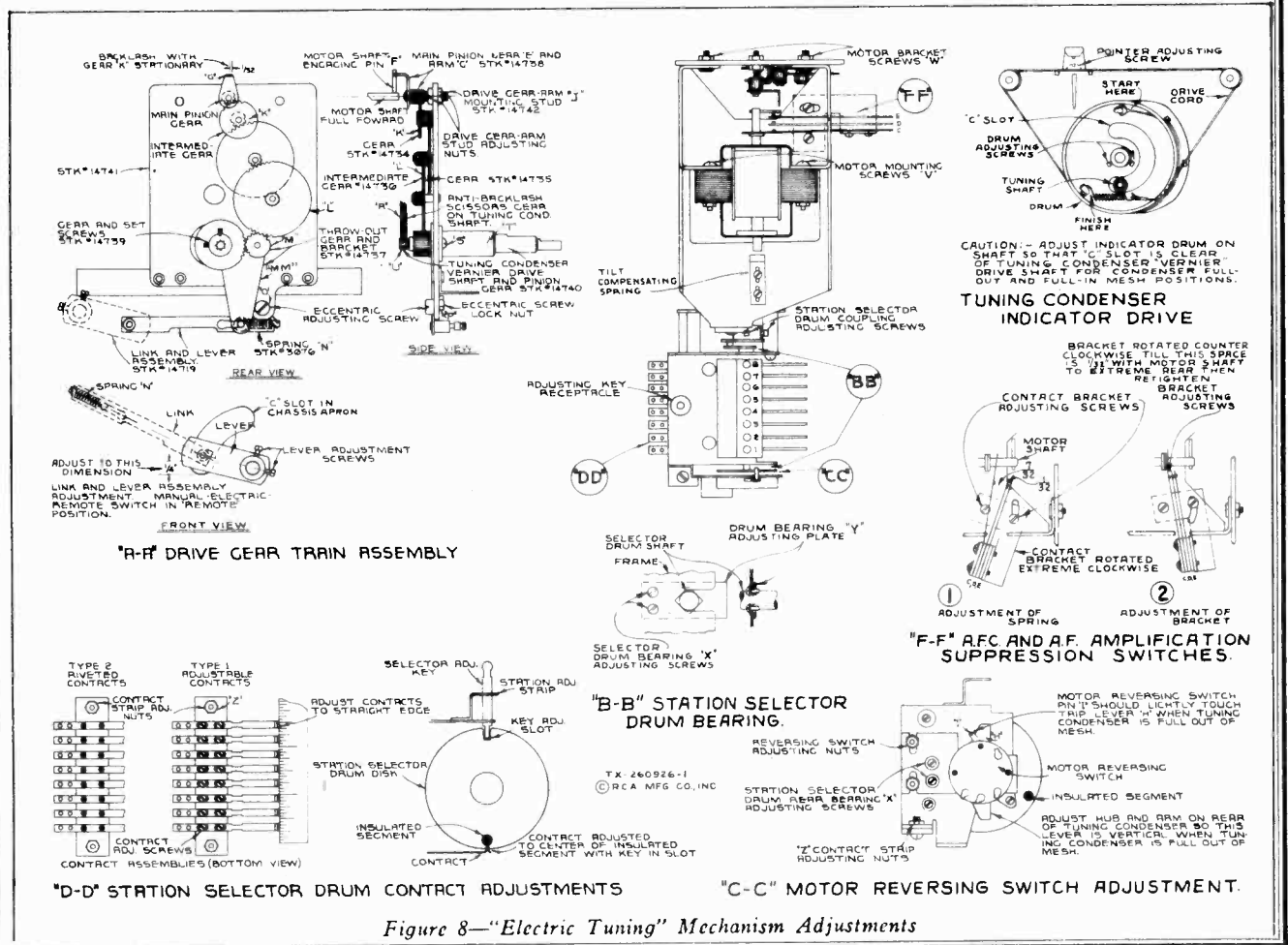


Figure 8—"Electric Tuning" Mechanism Adjustments

and quick dis-engagement of the motor, the tension of spring "C" should be increased or decreased by bending. This action should be checked with the front apron of the chassis raised two inches higher than the rear. Contacts of the switch must be kept clean. Crocus cloth or a relay burnisher may be used for this purpose.

**Tilt Compensating Spring.**—The function of this spring is to compensate for the force of gravity, acting to the rear, on the tuning motor armature when the chassis is tilted as mounted in cabinet. The "Tilt Compensating Spring" is located on the rear of the tuning-motor bracket. After completion of adjustment "A-F-C and A-F Amplification Suppression Switches," raise the front apron of chassis six inches higher than the rear, and then adjust spring by means of its elongated mounting holes until the pin "F" on the motor shaft will pull in and remain in mesh with the arm "G" on the pinion when a push button is pressed. This adjustment should be made with the lowest power-supply voltage that will be encountered at the installation.

**Motor Reversing Switch.**—It is necessary to automatically stop and reverse the drive motor before the tuning condenser reaches the ends of its travel. Approximately 175 degrees of sweep is required, and the reversal must take place above 1,700 kc and below 540 kc but not too near the limits of the scale. The coupling between the station selector drum and the tuning condenser shaft should be attached so that the reversing switch trip lever "H" is exactly vertical when the condenser is full-out of mesh. There should be 1/32 of an inch clearance between the end of the condenser shaft and the selector drum shaft. While the trip lever is in this position the reversing switch bracket should be adjusted by means of its elongated mounting holes until the switch pin "I" just lightly touches trip lever "H."

**Main Pinion Gear.**—Clearance between the small high-speed pinion gear "E" and the intermediate gear "K" determines the amount of mechanical noise produced. Correct adjustment will give approximately 1/32 of an inch movement of back lash at the end of pinion arm "G" when gear "K" is held stationary. Arm "G" must also be adjusted for correct mesh with motor shaft drive pin "F." With the motor shaft completely forward and pinion "E" tight against its front bearing, the pinion mounting stud "J" should be adjusted so that pin "F" meshes its full thickness with the rotating arm "G." An increase of this mesh will increase over travel on tuning while a decrease of mesh will decrease the over travel. The elongated hole in the front bracket allows sufficient movement of the mounting stud "J" to permit above mentioned gear mesh adjustment.

**"Manual-Electric-Remote" Changeover.**—(1) Link and lever adjustment—To properly line up the mechanical link between the switch shaft and throw-out gear bracket "MM," the set screws holding the link lever on the switch shaft must be loosened, the switch turned to the "Remote" position (extreme left) and the link lever revolved until the distance between the bottom of its link-connecting pin (extends through chassis apron) and the bottom of the "C" slot, in front apron of chassis, is exactly 1/4 of an inch. If this adjustment is not properly made, correct operation of "Electric" or "Remote" tuning will not result. (2) Throw-out Gear Adjustment—To obtain smooth operation on "Electric" or "Remote" positions it is important that the proper clearance is maintained between the throw-out gear "M" and the intermediate gear "L." With the "Manual-Electric-Remote" control thrown to "Remote" position (extreme left) adjust the mesh between these gears by means of the eccentric screw "O" and lock nut "P" on the throw-out gear bracket "MM" until there is approximately 1/64 of an inch backlash of gear "L" when gear "M" is held stationary.

**Vernier Tuning.**—In case it becomes necessary to remove tuning condenser drive shaft "T," it should be replaced by sliding anti-backlash gear "R" on condenser shaft apart so that compression amounting to one tooth on the gear is obtained in the springs. Adjust mesh of gear "R" with pinion gear "U" on vernier shaft before tightening screws "S" so that smooth tuning is obtained throughout the range.

**Motor Alignment.**—The motor shaft must be exactly aligned with the axis of the pinion gear with which it engages. This may be adjusted by loosening the mounting screws "V" of the motor and aligning shaft by sight. Correct alignment may be tested by slowly rotating motor and observing the relation between the pin "F" of the motor shaft and the arm "G" on the pinion. The relation of the two should

remain the same throughout the revolution. Additional movement for adjustment may be obtained by the motor bracket screws "W" if necessary.

**Station Selector Drum.**—(1) Bearing Adjustment—The selector drum may be removed by unscrewing the two bearing adjusting screws "X" on the front and rear bearings and sliding shaft out of slots on frame. To replace drum, the reverse procedure should be followed holding bearing adjusting plates "Y" firmly against the shaft and tightening adjusting screws. (2) Contact adjustment—Two types of contact strips are used. They are designated on figure 8, as types 1 and 2, on which the individual contacts are respectively adjustable and fixed. On type 1, the individual contacts should be adjusted by setting the end contact springs near the mid-position of their travel and aligning the remaining springs to them by means of a straight edge. Either type of contact strip should be adjusted to the selector drum by placing two selector adjusting keys in the station adjustment strip, positions 1 and 8, loosening contact strip adjusting nuts "Z" and shifting the contact strip until the end contacts are exactly centered on the respective disc insulating segments. More accurate adjustment may be made by silhouetting the point of contact with a piece of white paper held behind the contact. Adjustment will be facilitated by removing complete assembly from rear of tuning condenser by unscrewing the three mounting screws. Contacts and discs must be kept free of dirt, filings, and other extraneous matter.

**Lubrication.**—The dial pointer slide should be greased with petrolatum. This same lubrication should be applied lightly to all gear faces of the drive mechanism and sparingly with a cloth to the station selector discs. Any good household oil, such as "3-IN-ONE," is suitable for the motor shaft bearings. A light grade of engine oil should be used for all gear bearings. Medium viscosity engine oil, similar to "PYROIL" (B), should be applied between the thrust washers on the motor shaft. "CASTORDAG," a mixture of graphite and castor oil, is recommended for use at the selector drum end-bearing slots and at the bearings of cable pulleys.

### Station Adjustment

Any eight stations may be chosen for "Electric" tuning. Remove the two escutcheon plates from the side of the dial, place proper call letter labels in the celluloid windows, and replace escutcheons. Turn the power on and proceed to set up the "Electric" tuning as follows:

1. Set Range Selector to "Broadcast."
2. Turn "Manual-Electric-Remote" control to "Electric."
3. Turn Fidelity control counter-clockwise.
4. Press push button No. 1 and wait until station pointer comes to rest.
5. Turn the "Manual-Electric-Remote" control to "Manual."
6. Remove adjusting key from receptacle on top of station selector drum mechanism.
7. Insert key in position marked, "1" in station adjustment strip and push the key all the way down to properly fit in slot in disc.
8. Tune the receiver very carefully by means of the manual tuning knob and the "Magic Eye," to station chosen for No. 1.
9. Remove key.
10. Turn the "Manual-Electric-Remote" control to "Electric."

Button No. 1 is now properly set for "Electric" tuning. Proceed similarly for the other seven push buttons, matching each station on the dial with the same number on the station adjustment strip. Repeat the above steps but place the key respectively in positions 2, 3, 4, etc., and in each case tune to the proper station. Now when you press a button the desired station will be tuned in electrically.

**Note.**—In the event that all the push-button switches are locked "in" at once, they may be released by pressing either the upper left-hand or the lower right-hand push buttons (Nos. 1 or 8) in farther than would ordinarily be required.

### Armchair Control

When a Model G-8 armchair control is attached to the receiver as shown in figure 5 it duplicates the action of the push buttons on the front panel when the "Manual-Electric-Remote" control is turned to "Remote" position.



## RCA MFG. CO., INC.

MODEL U109  
Alignment

Calibrate the tuning dial by adjusting dial pointer to the left ends of horizontal calibration lines with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

The "Manual-Electric-Remote" switch should be turned to "Manual" (clockwise) during alignment unless otherwise specified.

**CAUTION.**—The magnetite core screw L22 on the bottom of the 4th i-f transformer has been accurately adjusted, for an exact electrical balance of coil L22 to center tap, during manufacture and should not be disturbed. However, if for any reason the adjustment has been moved from its original position, it will be necessary to mechanically adjust this screw until the end of the stud protrudes exactly  $\frac{1}{8}$  of an inch (four threads exposed) above the brass bushing prior to any alignment operations.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. A-f-c discriminator adjustments should follow r-f and i-f adjustments tabulated below. Adjustment locations are shown on figures 4 and 6.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 2. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

**A-F-C Discriminator Adjustments.**—These adjustments are rather critical and should be performed with extreme care. Improper adjustment may result in complete failure of the oscillator control tube to function or else may cause it to detune the oscillator instead of tuning it to the signal. It is assumed that the magnetite core adjusting screw L23 (top of 4th i-f transformer) has been turned all the way out (ex-

treme counter-clockwise) during the preceding tabulated adjustments. Adjustments are as follows: Remove spring "N" on link and arm assembly which connects the "Manual-Electric-Remote" switch shaft to the throw-out gear bracket. Turn "Fidelity" control counter-clockwise. Connect antenna to receiver antenna "A" terminal. With the "Manual-Electric-Remote" switch in "Manual" (clockwise) position, tune in a strong local station near 600 kc or the low-frequency end of the "A" band as accurately as possible by means of the tuning tube "Magic Eye." The most accurate adjustment will be obtained by adjusting the "vernier" tuning knob mid-way between the two points where the eye just appears to start to open. This will place the generated i-f carrier signal frequency exactly in the center of the i-f amplifier response curve (should be 460 kc if i-f amplifier was properly aligned) and is the frequency to which the a-f-c discriminator (4th i-f transformer) should be tuned to resonance. Without disturbing any of the receiver adjustments, place the "high" test-oscillator lead about  $\frac{3}{4}$  of an inch from the grid cap lead of the RCA-6K7, 1st i-f amplifier tube, adjust the test-oscillator output to maximum, turn test-oscillator "Modulation" off, and carefully zero-beat the test-oscillator frequency (approximately 460 kc) with the i-f carrier signal. Avoid placing the test-oscillator lead nearer to the grid cap lead than specified above, as doing so will tend to detune the i-f amplifier. It may be necessary to reduce the local station signal, during this operation, by shortening antenna lead or grounding antenna "A" terminal to chassis in order to increase the loudness of the beat note sufficiently for accurate zero-beat adjustment.

Throw "Manual-Electric-Remote" switch to "Electric" (center) position. A high whistle or beat note will now be heard. Turn the magnetite core screw L23 (top of 4th i-f transformer) slowly clockwise. As this screw is turned, the beat note will first increase to a high audio frequency and will then decrease to a zero-beat and then increase in frequency again. The point of exact zero-beat is the position for correct adjustment of the discriminator. Zero-beat should also still exist when the "Manual-Electric-Remote" switch is thrown back to "Manual" position. The adjustment is now complete and may be checked by slightly detuning the receiver above and below the local station frequency with the "Manual-Electric-Remote" in "Manual" position, switching to "Electric" position, and noting the oscillator pull-in. Replace spring "N."

Order of Alignment	Test Oscillator			Range-Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	—	—	—	—	—	4th I-F Trans.	L23	Turn Extreme Counter-clockwise
2	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	3rd I-F Trans.	L20 and L21	Max. (peak)
3	6K7 I F Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	2nd I-F Trans.	L18 and L19	Max. (peak)
4	6L7 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L15 and L16	Max. (peak)
5	Ant.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C43	Max. (peak)*
6	Ant.	300 Ohms	20,000 kc	"C"	Rock thru 20,000 kc	"C" Det.	C8	Max. (peak)†
7	Ant.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Ant.	C2	Max. (peak)‡
8	Ant.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C45	Max. (peak)*
9	Ant.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" Osc.	L14	Max. (peak)
10	Ant.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" Osc.	C51	Max. (peak)
11	Ant.	200 Mmfd.	600 kc	"A"	600 kc	"A" Osc.	L14	Max. (peak)
12	Ant.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" Osc.	C51	Max. (peak)
13	Proceed to A-F-C Discriminator Adjustments Outlined Below							

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

† Use maximum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

MODEL U109  
 Assembly Wiring  
 Compensator  
 Connections

RCA MFG. CO., INC.

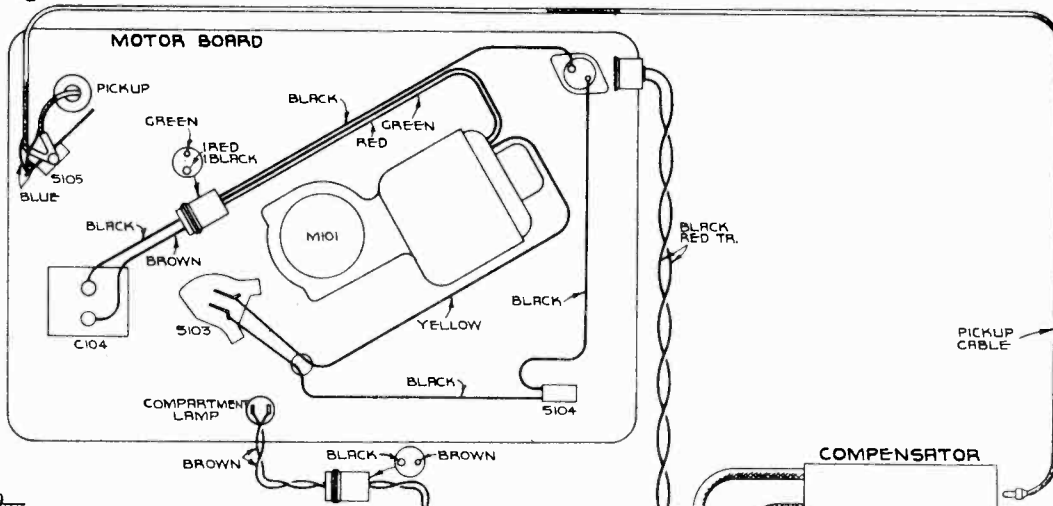
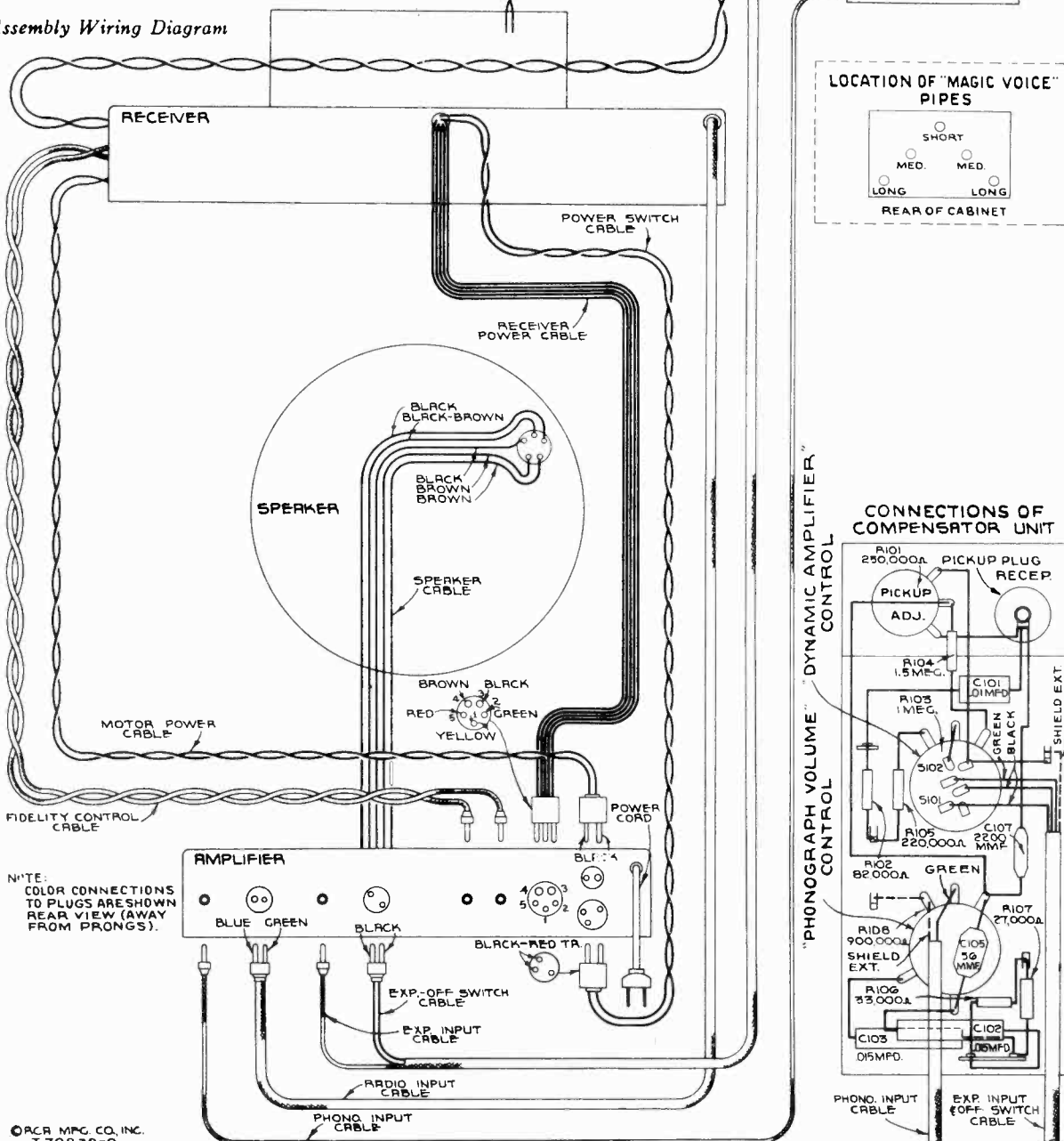


Figure 10—

Assembly Wiring Diagram



NOTE:  
 COLOR CONNECTIONS  
 TO PLUGS ARE SHOWN  
 REAR VIEW (AWAY  
 FROM PRONGS).

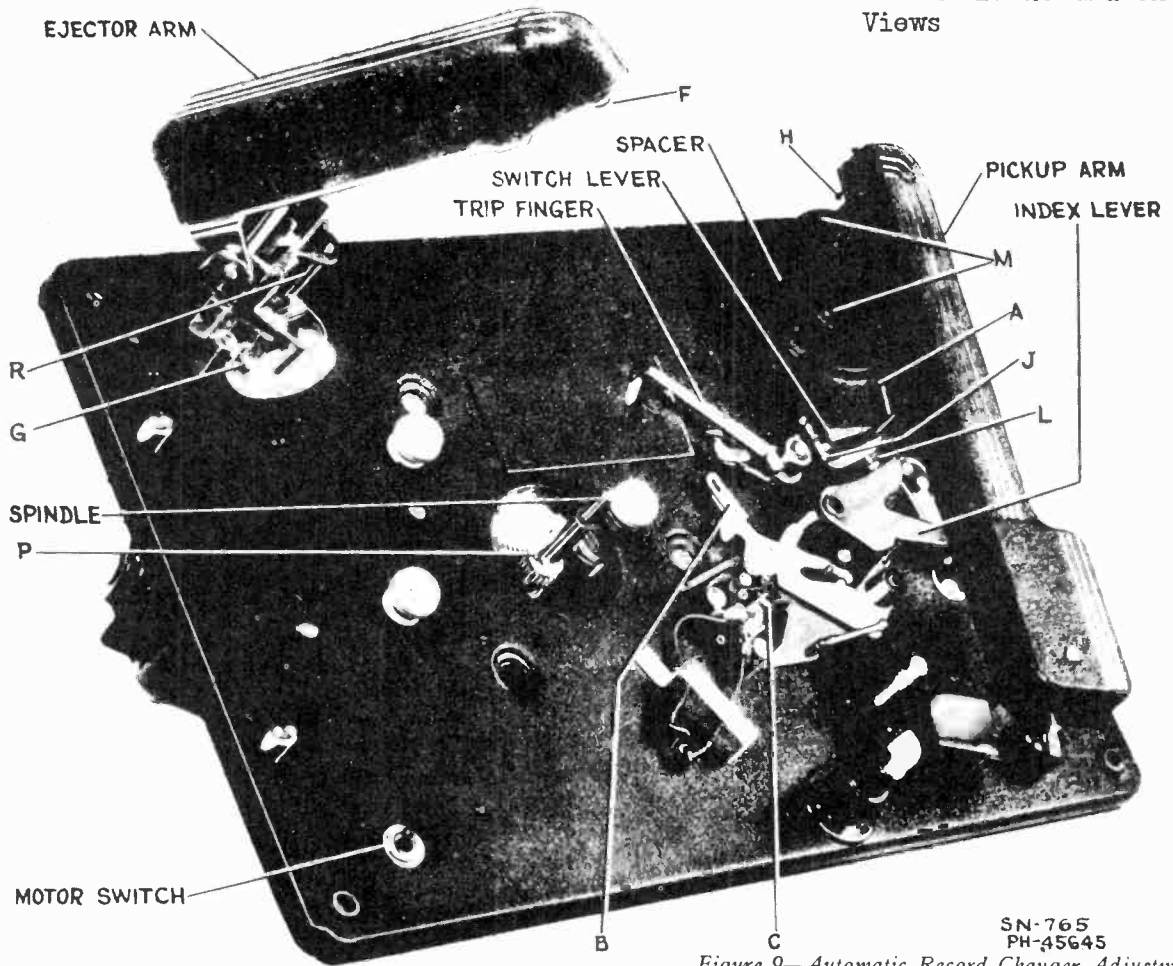
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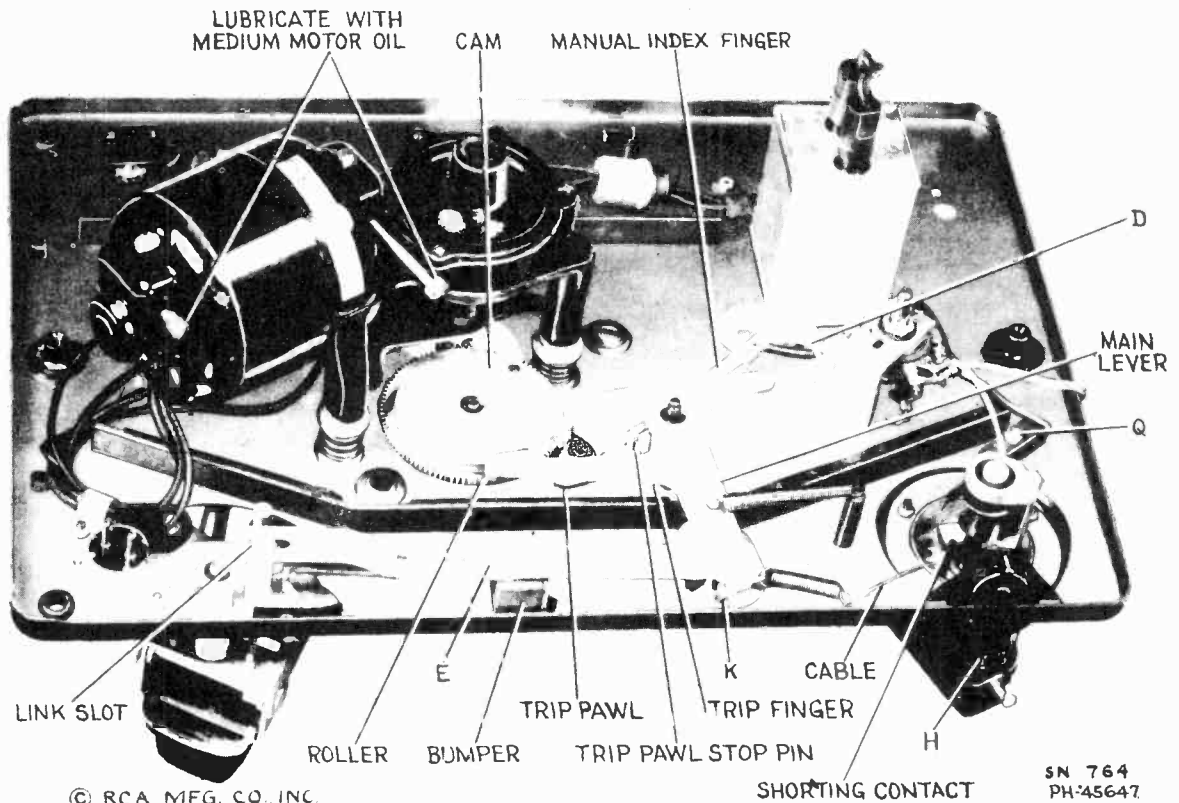
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MODEL U109  
Automatic Record Changer  
Views



SN-765  
PH-45645

Figure 9—Automatic Record Changer Adjustments  
(Top and bottom views)



SN 764  
PH-45647

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MODEL U109

RCA MFG. CO., INC.

Adjustments, Hints  
Pick-up Data

## Automatic Record Changer

The record changing mechanism is designed to be simple and fool-proof. Under normal operating conditions, service difficulties should be negligible. Occasionally, however, certain adjustments may be required. It is important to refrain from forcing the mechanism if there is a tendency to bind or jam, since bent levers and possibly broken parts may result.

## Record Changer Adjustments

Mount motor-board on a level support. Remove turntable and cover at right of turntable. Adjustment locations are designated on figure 9 as A, B, etc. The adjustments are explained under corresponding symbols below. Perform adjustments in the following order:

A.—Trip rod "A" should be engaged in "Switch Lever" slot. Adjust trip rod "A" to obtain about  $\frac{1}{8}$  of an inch clearance from motor-board.

B.—Adjust "B" to the position shown.

C.—With "Index Lever" in "Manual" position, "Pickup Arm" rotated to extreme left, and switch tripped to open contacts "C," adjust contact points "C" by bending the stiff contact arm until points are opened 10 to 30 thousandths of an inch.

D.—With "Index Lever" in "Manual" position, release set screw "D" and force "Manual Index Finger" as far as it will go towards "Trip Pawl Stop Pin." Tighten set screw.

E.—Adjust at "E" to provide approximately  $\frac{1}{32}$  of an inch between outer end of "Link Slot" and screw when rubber "Bumper" is in contact with stop bracket.

F. and G.—Remove rubber silencer at "F" and adjust "F" and "G" so ejector tip "F" is in line with "Spindle." Longitudinal movement, with respect to "Ejector Arm," may be effected by loosening hex. head at "F." Lateral movement of "Ejector Arm" may be effected by adjustment "G."

H.—Adjust "H" so under side of pickup head can be raised  $2\frac{1}{2}$  inches above motor-board.

J.—Adjust screw "J" until friction will just force "Trip Finger" to move "Trip Pawl" when "Index Lever" is in "12" inch position.

N.—Adjust needle pressure by turning screw under center of "Pickup Arm" so that a force of 72 grams (2.5 ounces) is required to lift needle from record. Hook scale under needle screw to measure force.

K.—Adjustment "N" must be performed prior to this adjustment. With a 12-inch record on turntable, turn on "Motor Switch," place "Index Lever" to "12" position and adjust "K" so that "Cable" tension will allow needle to lower slowly on start of record at completion of eject cycle. Turn "Motor Switch" off after eject cycle is completed and check to see that "Cable" is slightly loose when "Pickup Arm" is moved against "Spindle." Replace turntable and put a needle in "Pickup."

L.—Adjust "L" so needle will drop into center of smooth portion at the start of a 12-inch record when "Index Lever" is in "12" inch position and "Pickup Arm" is to extreme right.

M.—Loosen three screws "M" and rotate "Spacer" until pointer on "Spacer" is in line with screw to right of "Pickup Arm."

P.—Adjust turntable height by insertion or removal of thrust washers at "P" so ejector tip "F" will not eject bottom 12-inch record but will eject second from bottom record.

Q.—Adjust position of shorting switch at "Q" so switch closes when needle is just outside a 12-inch record.

R.—Adjust screw "R" upward just enough so that with one record on turntable and ejector tip "F" resting on record surface, there is  $\frac{1}{32}$  of an inch clearance between screw "R" and "Ejector Arm."

## Record Changer Service Hints

- 1.—"Ejector Arm" goes through normal cycle but does not eject records. Adjust "F" and "G." See that "Spindle" slides freely.

- 2.—Ejects bottom record. Lower turntable by removing thrust washers at "P."

- 3.—Ejects records properly down to second from bottom of pile. Raise turntable by placing thrust washers at "P."

- 4.—Eject cycle does not start after needle reaches eccentric groove. Adjust "J" (turn screw clockwise).

- 5.—Eject cycle starts before eccentric record groove is reached. Adjust "J" (turn screw counter-clockwise). Set "Index Lever" to "12" inch or "10" inch position after starting to play record. Do not jar motor-board during automatic operation.

- 6.—Lateral movement of "Pickup Arm" has no control over starting and stopping. Adjust clearance of rod "A." See that rod "A" engages in slot of "Switch Lever."

- 7.—Fails to eject top record of a pile because "Ejector Arm" strikes record in returning to center at end of eject cycle. Adjust screw "R" upward to provide greater incline so that roller in "Ejector Arm" will roll back during cycle.

- 8.—Pickup strikes record during eject cycle. Adjust "K" and "H."

- 9.—Starts playing record several grooves in from beginning or needle misses record entirely. Adjust "L."

- 10.—Needle falls on smooth portion at start of record but does not move into playing groove. Adjust "M." Check to see that motor-board is level.

- 11.—Automatic stop does not operate after needle reaches eccentric groove. Adjust "B" and "C."

- 12.—Motor does not re-start when "Pickup" is returned to rest position. Adjust "C." See that switch mechanism parts move freely and springs are functioning.

- 13.—Starts eject cycle although set for "Manual" operation. Adjust "D."

- 14.—Noise in loudspeaker while changing needles. Clean "Shorting Contact" and adjust "Q."

- 15.—"Wow" in record reproduction.—Instrument should be warmed to about 65° F. Ejector tip should be centered and free to rotate (adjustments "F" and "G"). There should be no solid particles on gear teeth or in grease; no tendency to bind. Turntable plate should be in dynamic balance and "Spindle" should be straight. Proper lubrication is important.

**Lubrication.**—Clean motor gear-box thoroughly before re-greasing. Apply less than a tablespoonful of a grease, such as "Cities Service No. 7035-A1" or "Koolmotor Universal Trojan No. 1," directly on gears taking care to get none in rotor bearings. Put medium motor oil (S.A.E. No. 30) in the oil holes. Cover main gear and cam of automatic mechanism with a light grease such as "Socony-Vacuum No. 2." Any good household oil, such as "3-IN-ONE" is suitable for the ejector-tip "F" bearing.

## Pickup

An adjustment is provided to compensate for reduced sensitivity of the crystal pickup with age. Adjustment requires the use of a 1,000-ohm-per-volt a-c voltmeter (rectifier type, 10-volt range) and a frequency record. With the voltmeter connected across the loudspeaker voice coil, "Phonograph Volume" and "Fidelity" controls turned extreme clockwise, "Dynamic Amplifier" control turned counter-clockwise, and "Exp. Off Switch Cable" plug pulled out from apron of dynamic amplifier (see figure 10), adjust R101 (end of compensator unit) until an RCA Victor Technical Purpose Record Cat. No. 84519-A or 84505-B gives a voltmeter reading of 5 volts on 400 cycles. Adjustment of R101 will be facilitated by removing the compensator unit from the phonograph control panel, after removing control knobs and shaft bushing nuts. R101 should also be adjusted if pickup is replaced.

## RCA MFG. CO., INC.

MODEL U109

Parts List

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

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
14701	Arm—Hub and arm for operating band indicator shutter—located on range switch shaft	11300	Resistor—33,000 ohms, carbon type, 1/10 watt (R42)
14726	Arm—Hub and arm, complete with set screws—connects station selector drum to rear of tuning condenser shaft	13735	Resistor—33,000 ohms, carbon type, 1/2 watt (R5)
14517	Board—Antenna and ground terminal board	5145	Resistor—100,000 ohms, carbon type, 1/2 watt (R7)
5237	Bushing—Variable condenser rubber mounting bushing	30552	Resistor—120,000 ohms, special, carbon type, 1/2 watt (R41)
13658	Button—Plug button for detector coil shield	5158	Resistor—220,000 ohms, carbon type, 1/2 watt (R45)
14725	Cable—Tuning tube cable and socket	11323	Resistor—270,000 ohms, carbon type, 1/2 watt (R46)
12607	Cap—Shield cap for first or second I.F. transformer	11172	Resistor—470,000 ohms, carbon type, 1/2 watt (R17, R20)
12581	Cap—Shield cap for third or fourth I.F. transformer	11397	Resistor—560,000 ohms, carbon type, 1/10 watt (R1, R3)
11350	Cap—Grid contact cap	12013	Resistor—1 megohm, carbon type, 1/10 watt (R36)
12884	Capacitor—Adjustable trimmer (long) (C2, C45, C51)	13730	Resistor—1 megohm, carbon type, 1/2 watt (R44)
12714	Capacitor—Adjustable trimmer (medium) (C8, C43)	11626	Resistor—2.2 megohms, carbon type, 1/2 watt (R18, R21)
13200	Capacitor—10 Mmfd. (C52)	13732	Resistor—10 megohms, carbon type, 1/2 watt (R35)
12723	Capacitor—82 Mmfd. (C30)	14845	Resistor—Voltage divider—comprising two 1,000 ohm, one 3,400 ohm and one 4,000 ohm sections (R50, R51, R52, R53)
12813	Capacitor—82 Mmfd. (C8)	14895	Rod—Tie rod for joining lockplate pawls on station selector push-button switches
12720	Capacitor—100 Mmfd. (C28, C80)	4669	Screw—No. 8-32 x 5/32 square head set screw for arm, Stock No. 14701, or link, Stock No. 14719, or drum, Stock No. 14693
12404	Capacitor—120 Mmfd. (C24)	12418	Screw—No. 8-32 x 3/16 milled head set-screw for gear, Stock No. 14739
12724	Capacitor—120 Mmfd. (C54)	14848	Selector—Station selector drum mechanism—comprising station-selector contactor discs, spring contacts and motor reversing switch assembled in metal frame
14712	Capacitor—180 Mmfd. (C21, C23)	14374	Shield—Antenna or detector coil shield
14711	Capacitor—220 Mmfd. (C17, C18)	14375	Shield—Oscillator coil shield
12952	Capacitor—330 Mmfd. (C3, C59)	12008	Shield—I.F. transformer shield
14710	Capacitor—430 Mmfd. (C11, C15)	14718	Shutter—Band indicating shutter and arm assembly
13052	Capacitor—470 Mmfd. (C48)	14696	Slider—Indicator pointer holder and spring
14724	Capacitor—560 Mmfd. (C4)	11488	Socket—2-contact female socket for compartment lamp power cable
14723	Capacitor—690 Mmfd. (C47)	11196	Socket—8-contact 6K7, 6L7, 6J7, 6H6 or 6C5 Radiotron socket
13762	Capacitor—1,500 Mmfd. (C69)	14114	Socket—Dial or indicating lamp socket
12729	Capacitor—1,550 Mmfd. (C46)	12007	Spring—Retaining spring for core, Stock No. 12008
12897	Capacitor—4,700 Mmfd. (C5, C49)	3676	Spring—Tension spring for link and lever, Stock No. 14719
14722	Capacitor—5,100 Mmfd. (C44)	13638	Spring—Tension spring for cord, Stock No. 14699
13608	Capacitor—.0025 Mfd. (C65)	14694	Spring—Tension spring for lockplate pawl on station selector push-button switches
4838	Capacitor—.005 Mfd. (C84)	14742	Stud—Mounting stud for gear and arm, Stock No. 14738
30103	Capacitor Pack—Comprising one .005 Mfd., one .015 Mfd. capacitors, one 27,000 ohm and one 56,000 ohm resistors (C31, C32, R23, R24)	14702	Switch—"Manual-Electric-Remote" switch (S7, S12, S15)
13138	Capacitor—.01 Mfd. (C12, C13, C22)	14844	Switch—"Phono-Music-Speech" switch (S10)
4870	Capacitor—.025 Mfd. (C28)	14732	Switch—Motor reversing switch and mounting plate for station selector (S9)
4888	Capacitor—.05 Mfd. (C20, C56)	14704	Switch—Range switch (S2, S3, S4, S6)
4839	Capacitor—.1 Mfd. (C9, C10, C14)	14728	Switch—A-F-C and A-F amplification suppression switch (S14)
12484	Capacitor—.025 Mfd. (C18, C19, C55)	14693	Switch—Station selector button switch—comprising four contacts and corresponding lockplates, completely assembled on insulating strips
12741	Capacitor—.5 Mfd. (C27, two in parallel)	14836	Tone Control—"Fidelity" control (R214, S5)
12682	Capacitor—10 Mfd. (C66)	14706	Transformer—First I.F. transformer (L15, L16, L17, C11, C15)
14773	Capacitor—16 Mfd. (C50, C68)	14707	Transformer—Second I.F. transformer (L18, L19, L29, C17, C18)
14372	Coil—Antenna coil and shield (L1, L2, L3, L4)	14708	Transformer—Third I.F. transformer (L20, L21, C21, C23)
14414	Coil—Detector coil and shield (L5, L6, L7, L8, L9, L10)	14709	Transformer—Fourth I.F. transformer (L22, L23, L24, C24)
14713	Coil—Oscillator coil and shield (L11, L12, L13, L14)	14834	Transformer—Tuning motor transformer, 105-125 volts, 50-60 cycle (T4)
14727	Condenser—3-gang variable tuning condenser, complete with gear train (C1, C7, C53)	30102	Transformer—Tuning motor transformer, 105-125 volts, 25-60 cycle (T4)
14733	Contact—Spring contact for engaging discs in station selector drum ("type 1" contact assembly)	14835	Volume Control—Radio volume control and power switch (R22, S201)
30365	Contact—Comprising eight spring contacts assembled on insulating strip for engaging discs in station selector drum ("type 2" contact assembly)	<b>AMPLIFIER ASSEMBLIES</b>	
14699	Cord—Indicator pointer drive cord	14272	Bracket—Expander control mounting bracket
12006	Core—Adjustable core and stud for I.F. transformers	12511	Cap—Grid contact cap
12800	Core—Adjustable core and stud assembly for oscillator coil	12110	Cap—Top shield cap for 6L7 Radiotron
14717	Dial—Station selector dial scale	12720	Capacitor—100 Mmfd. (C210, C211)
14740	Drive—Tuning condenser vernier drive shaft and pinion gear	14831	Capacitor—820 Mmfd. (C222)
14698	Drum—Drum for indicator drive cord—fastens on tuning condenser shaft	5107	Capacitor—.0025 Mfd. (C209)
14731	Drum—Station selector drum rotor—comprising eight station-selector contactor discs assembled on shaft	5005	Capacitor—.0035 Mfd. (C212)
13612	Filter Pack—Comprising two 0.43 Henry chokes, two 560 Mmfd., one 2,200 Mmfd. and one 1,000 Mmfd. capacitors (L30, L31, C61, C62, C63, C67)	4838	Capacitor—.005 Mfd. (C213, C214)
14738	Gear—Drive pinion gear and arm	13138	Capacitor—.01 Mfd. (C215)
14739	Gear—Drive gear and set screws—located on tuning condenser knob shaft	4888	Capacitor—.05 Mfd. (C205)
14734	Gear—Intermediate gear assembly—comprising one .749" O.D.—34 tooth-gear and one .291" O.D.—12 tooth pinion assembled	4518	Capacitor—.05 Mfd. (C201)
14735	Gear—Intermediate gear assembly—comprising one 1.541" O.D.—72 tooth-gear and one .291" O.D.—12 tooth pinion assembled	4839	Capacitor—.01 Mfd. (C218, two in parallel)
14736	Gear—Intermediate gear assembly—comprising one 1.541" O.D.—72 tooth-gear and one hub assembled	12484	Capacitor—.025 Mfd. (C208, C217)
14737	Gear—Throw-out gear and bracket	12741	Capacitor—.5 Mfd. (C202)
14716	Holder—Dial scale holder and reflector, complete with holding springs for band indicating shutter	11203	Capacitor—10 Mfd. (C220)
14715	Indicator—Station selector indicator pointer and support	5212	Capacitor—16 Mfd. (C204, C206)
5226	Lamp—Dial or indicating lamp	11496	Capacitor—18 Mfd. (C219)
14719	Link—Link and lever assembly	14273	Capacitor—Pack comprising one 20 mfd. and one 10 mfd. sections (C203, C207)
14730	Motor—Tuning drive motor for 25 cycle models only (M1)	14531	Capacitor—25 Mfd. (C221)
14729	Motor—Tuning drive motor for 60 cycle models only (M1)	11320	Coil—Choke coil (L204)
14028	Nut—Jamb nut for trimmers, Stock Nos. 12714 and 12884	5240	Cover—Fuse mounting cover
12471	Plate—Mounting plate for cushion socket—less socket	12468	Expander Control (R204)
14741	Plate—Tuning condenser front plate and studs assembled for mounting drive gears	10907	Fuse—3 amp. (F201)
14697	Pulley—Indicator pointer cable pulley	5239	Mounting—Fuse mounting—110 volt
13988	Resistor—10 ohms, carbon type, 1/2 watt (R40)	12471	Plate—6L7 socket mounting plate assembly—less socket, Stock No. 11196
11932	Resistor—330 ohms, carbon type, 1/10 watt (R4)	12466	Reactor—Filter reactor (L201)
13250	Resistor—330 ohms, carbon type, 1/2 watt (R14)	14795	Resistor—0.27 ohms, resisto-fuse, 1.2 ampere (R223)
5030	Resistor—470 ohms, carbon type, 1/2 watt (R39)	14281	Resistor—68 ohms, insulated, 1/2 watt (R222)
14837	Resistor—1,000 ohms, carbon type, 1/10 watt (R6, R15, R43)	13454	Resistor—270 ohms, insulated, 1/2 watt (R202)
14720	Resistor—1,000 ohms, carbon type, 1/2 watt (R2, R8)	12194	Resistor—1,800 ohms, insulated, 1/2 watt (R212)
18737	Resistor—3,300 ohms, carbon type, 1/2 watt (R47)	11298	Resistor—5,600 ohms, carbon type, 1 watt (R210)
11647	Resistor—5,600 ohms, carbon type, 1/2 watt (R48)	11726	Resistor—6,800 ohms, carbon type, 1 watt (R224)
5114	Resistor—15,000 ohms, carbon type, 1 watt (R54)	11332	Resistor—22,000 ohms, carbon type, 1 watt (R209)
14078	Resistor—18,000 ohms, carbon type, 1 watt (R34)	12487	Resistor—33,000 ohms, carbon type, 2 watt (R205)
14721	Resistor—22,000 ohms, carbon type, 1/2 watt (R13, R49)	12875	Resistor—56,000 ohms, carbon type, 1 watt (R213)



MODEL U109  
Parts List

## RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
5029	Resistor—58,000 ohms, carbon type, $\frac{1}{2}$ watt (R220)		
5145	Resistor—100,000 ohms, carbon type, $\frac{1}{2}$ watt (R219)		
11523	Resistor—270,000 ohms, carbon type, $\frac{1}{2}$ watt (R208)		
5035	Resistor—660,000 ohms, carbon type, $\frac{1}{2}$ watt (R211)		
12486	Resistor—660,000 ohms, insulated, $\frac{1}{2}$ watt (R207, R208, R215)		
12200	Resistor—1 megohm, insulated, $\frac{1}{2}$ watt (R201)		
14752	Resistor—2.7 megohms, insulated, $\frac{1}{2}$ watt (R203)		
14275	Socket—2-contact female socket for phonograph motor power supply		
14276	Socket—2-contact female socket for "expander-off" switch		
14280	Socket—2-contact female socket and clinching plate for radio input		
14277	Socket—3-contact female socket for power switch or tuning motor power supply		
4794	Socket—4-contact 2A3 or 5Z3 Radiotron socket		
14279	Socket—5-contact female socket for chassis power supply		
11197	Socket—6-contact 6C5 Radiotron socket		
11198	Socket—7-contact 6H6 Radiotron socket		
11196	Socket—8-contact 6L7 or 6F5 Radiotron socket		
14274	Socket—Single contact female socket and plate for phonograph or expander input		
14278	Socket—Single contact socket and plate for tone control		
13964	Transformer—Interstage driver transformer (T202)		
14271	Transformer—Power transformer, 105-125 volts, 50-60 cycle (T201)		
14846	Transformer—Power transformer, 105-125 volts, 25-60 cycle (T201)		
30130	Transformer—Power transformer, 100-130/140-160/195-250 volts, 50-60 cycle (T201)		
<b>EJECT ARM ASSEMBLIES</b>			
14753	Arm—Eject arm, complete		
11533	Ball—1/18-inch diameter steel ball		
10129	Ball—3/16-inch diameter steel ball		
11529	Bearing—Ejector tip bearing and nut		
11538	Bracket—Eject arm bracket		
11537	Collar—Eject arm shaft collar and set screw		
11536	Cushion—Counter balance roller cushion—located inside of eject arm		
4055	Post—Vertical adjustment post—located on eject arm bracket		
3729	Roller—Eject arm counter balance roller—located inside of eject arm		
4580	Screw—No. 6—32-3/16-inch square head set screw for eject arm collar		
11534	Screw—No. 8—36-7/32-inch special screw for eject arm tip center adjustment		
11535	Shaft and Collar—Eject arm vertical action shaft and collar assembly		
11528	Silencer—Ejector tip silencer		
4067	Spring—Ejector arm bracket spring		
11531	Spring—Ejector tip spring		
11530	Tip—Ejector tip with tip center, adjusting screw and cap		
11539	Yoke—Eject arm yoke assembly		
<b>PICKUP AND ARM ASSEMBLIES</b>			
10941	Ball—Steel ball for pivot shaft bearing		
3204	Cable—Pickup lift cable		
30101	Cable—Shielded pickup cable—connects pickup unit to shorting switch		
12850	Damper—Pickup arm pivot shaft damper—comprising one upper rubber damper and bearing, one lower rubber damper and one lower bearing		
14820	Mechanism—Pickup mechanism, complete with needle screw		
14818	Pickup and arm, complete		
12546	Plug—Pivot shaft bearing plug		
14823	Rod—Pickup arm brake trip rod		
14822	Screw—Needle screw		
14824	Screw—Pickup mechanism terminal		
14913	Spring—Pickup arm tension spring		
14821	Support—Pickup mechanism support		
<b>OPERATING MECHANISM</b>			
14754	Cam—Cam and gear assembly		
6808	Clutch—Trip lever friction clutch		
14756	Cover—Metal cover for trip lever and friction finger assembly		
6809	Finger—Manual index lever finger assembly		
3670	Finger—Friction finger assembly		
11554	Lever—Manual index lever—less pin		
14755	Lever—Main lever and link assembly		
14914	Lever—Pickup lift cable lever		
11555	Lever—Trip lever and friction clutch assembly		
6503	Pawl—Trip pawl assembly		
3672	Pin—Manual index lever pin		
13635	Plate—Eject arm actuating plate assembly		
4564	Screw—Manual index lever finger set screw		
4059	Screw—Trip lever clutch tension adjustment screw		
4566	Screw—Special screw used to fasten main lever and link assembly bushing		
13637	Spacer—Pickup arm mounting spacer		
13638	Spring—Actuating spring		
4565	Spring—Manual index lever finger tension spring		
4061	Spring—Main spring lever tension spring or pickup lift cable spring		
2893	Spring—Trip lever latch plate tension		
3676	Spring—Cam and gear pawl tension spring		
14916	Spring—Pickup lift lever spring		
4125	Spring—Eject arm horizontal action tension spring		
13636	Stud—Pickup arm lift cable stud and nut		
2917	Washer—Spring washer—"U" type		
<b>AUTOMATIC SWITCH ASSEMBLIES</b>			
3994	Cover—Motor switch cover		
10184	Plate—Automatic brake latch plate		
10174	Springs—Automatic brake springs		
6805	Switch Assembly—Automatic switch, complete		
3322	Switch—Motor switch (S105)		
			<b>MOTOR ASSEMBLIES</b>
		9735	Motor—105-125 volts—25 cycles (M101)
		9651	Motor—105-125 volts—50 cycles (M101)
		9650	Motor—105-125 volts—60 cycles (M101)
		12050	Suspension Spring—Motor mounting spring, washer and stud assembly—comprising six springs, six cup washers, three spring washers and three studs
			<b>MOTOR BOARD ASSEMBLIES</b>
		11881	Base—Phonograph compartment lamp socket and base
		14819	Cable—Shielded pickup cable—connects shorting switch to compensator pack
		12051	Capacitor—2 Mfd., complete with 2-contact male connector for use with motor, Stock Nos. 9650 or 9651 only (C104)
		13101	Capacitor—4 Mfd., complete with 2-contact male connector for use with motor Stock No. 9735 only (C104)
		4674	Connector—2-contact male connector for Stock Nos. 12051, 13101 or phono compartment lamp leads
		4577	Connector—2-contact male connector for motor cable
		11488	Connector—2-contact female connector for motor leads
		14760	Cup—Used-needle cup
		14762	Damper—Turntable damper
		11553	Escutcheon—Index escutcheon engraved "Manual—12—10"
		14688	Knob—Needle rest knob
		4340	Lamp—Phonograph compartment lamp—6.3 volts
		3764	Nut—Cap nut for motor board suspension
		14761	Rest—Pickup rest
		14825	Roller—Pickup arm cable guide roller—comprising bracket, roller and guide pin
		11711	Shade—Phonograph compartment lamp shade
		14758	Spacer—Pickup arm mounting spacer
		14270	Spring—Retaining spring for knob, Stock No. 14758
		4565	Spring—Tension spring for needle rest
		3763	Suspension Spring—Suspension spring, washer and bolt assembly for motor board—comprising one bolt, two cup washers, two springs, two "C" washers, and one cap nut
		30157	Switch—Pickup shorting switch (S105)
		4671	Switch—Operating switch—toggle switch (S104)
		14759	Turntable, complete
			<b>REPRODUCER ASSEMBLIES</b>
			Speaker RL76-4
		14608	Cap—Dust cap for cone center
		14785	Coil—Field coil (L202)
		14602	Cone—Reproducer cone and dust cap (L203)
		14847	Diffuser—Reproducer diffuser
		14786	Plug—5-contact male plug for reproducer
		14784	Reproducer, complete
		14358	Screw—Screw, washer and lockwasher to hold core in yoke
		12568	Transformer—Output transformer (T203)
		14357	Washer—Spring washer to hold field coil
			<b>MISCELLANEOUS ASSEMBLIES</b>
		12038	Band—Rubber band for tuning tube
		14744	Bracket—Tuning tube mounting bracket and clamp
		14745	Button—Station selector push-button
		14789	Cable—Shielded phonograph volume control cable, complete with male plug—compensation unit to amplifier
		14790	Cable—Shielded expander control cable, complete with two male plugs—compensation unit to amplifier
		12723	Capacitor—56 Mmfd. (C105)
		12951	Capacitor—2,200 Mmfd. (C107)
		14393	Capacitor—.01 Mfd. (C101)
		11315	Capacitor—.015 Mfd. (C102, C103)
		14747	Card—Call letter cards for station selector
		14840	Escutcheon—Station selector and tuning tube escutcheon, complete with crystal, indicating cards and buttons—less station indicating cards
		30570	Escutcheon—Right- and left-hand side panels for electric tuning buttons—less buttons, call letter cards, retainers, and metal front plates—for use with station selector dial escutcheon
		30569	Escutcheon—Station selector dial and tuning tube escutcheon and crystal, complete with "Radio-Phono" and "Electric-Manual" indicating screens—less right- and left-hand side panels for electric tuning buttons
		14787	Expander Control and Switch (R103, S101, S102)
		14749	Indicator—"Electric-Manual" indicator screen
		14841	Indicator—"Radio-Phono" indicator screen
		14751	Key—Key for use in setting "Electric Tuning" mechanism
		14269	Knob—Phono—Music-Speech, Volume—Power, Tuning (small), Manual-Electric-Remote, Fidelity, Phonograph Volume, and Dynamic Amplifier Control Knobs
		14688	Knob—Range selector knob
		14359	Knob—Tuning knob (large)
		14788	Pickup Control (R101)
		11807	Receptacle—Needle card holder
		12738	Resistor—27,000 ohms, insulated, $\frac{1}{2}$ watt (R107)
		12454	Resistor—33,000 ohms, insulated, $\frac{1}{2}$ watt (R106)
		14023	Resistor—82,000 ohms, insulated, $\frac{1}{2}$ watt (R102)
		12264	Resistor—220,000 ohms, insulated, $\frac{1}{2}$ watt (R105)
		12201	Resistor—1.5 megohms, insulated, $\frac{1}{2}$ watt (R104)
		11829	Roller—Record pocket slide roller—comprising one rubber roller, one metal roller and two washers
		11377	Screw—Amplifier mounting screw and washer
		5210	Screw—Chassis mounting screw and washer
		14748	Shield—Celluloid shield for station call letter cards
		14274	Socket—Pickup cable socket and plate on compensation unit
		14270	Spring—Retaining spring for knobs, Stock Nos. 14688 and 14289
		4982	Spring—Retaining spring for knob, Stock No. 14359
		3763	Suspension Spring—Motor board suspension bolt, springs, cup washers and cap nut
		14833	Volume Control—Phonograph volume control (R108)

MODEL ACR 111  
Chassis Wiring  
Coils

RCA MFG. CO., INC.

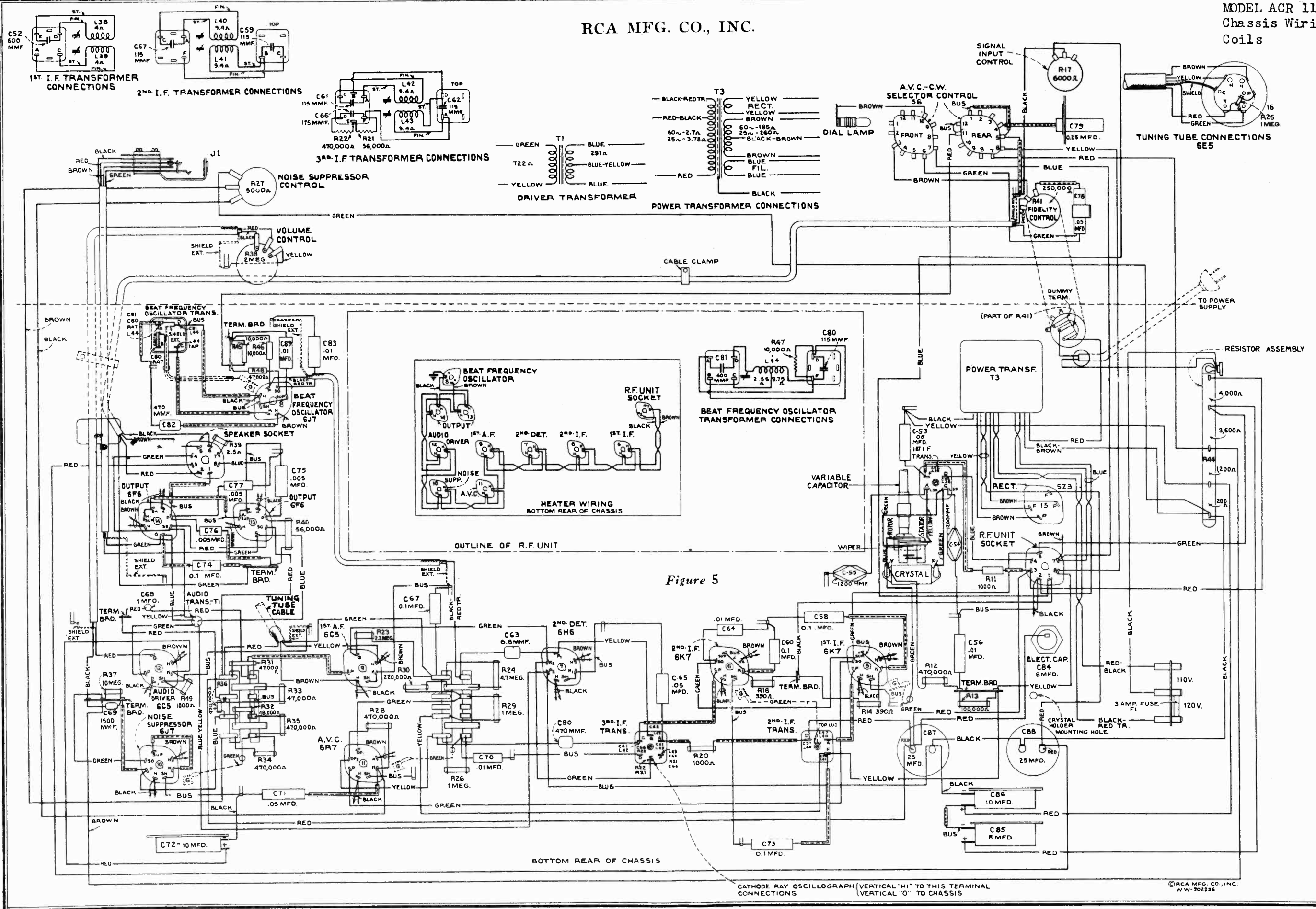
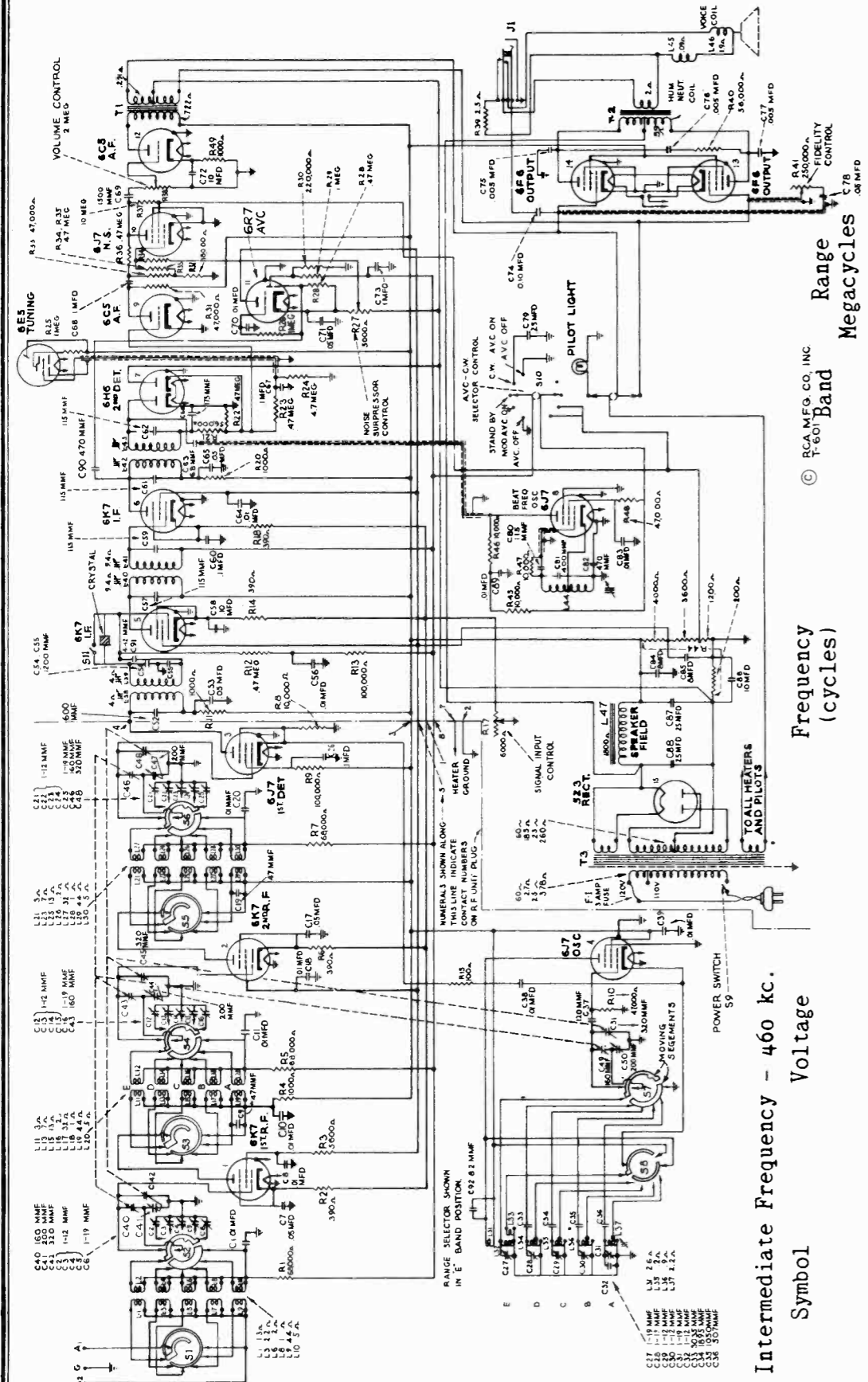


Figure 5



Intermediate Frequency - 460 kc.  
Symbol Voltage

A	105-125
B	105-125
C	100-130; 140-160; 195-250

Frequency (cycles)

50-60
25-60
40-60

Range Megacycles

A	0.54 to 1.6
B	1.6 to 4.0

Voice Coil Impedance  
2 1/2 ohms at 400 cycles

As shipped from the factory, rating C receivers are connected for 225-250 volts unless prominently specified otherwise on the chassis. Such receivers may be converted for operation at 100-117, 117-130, 140-160 or 195-225 volts when required.

© RCA MFG. CO. INC.  
T-601 Band

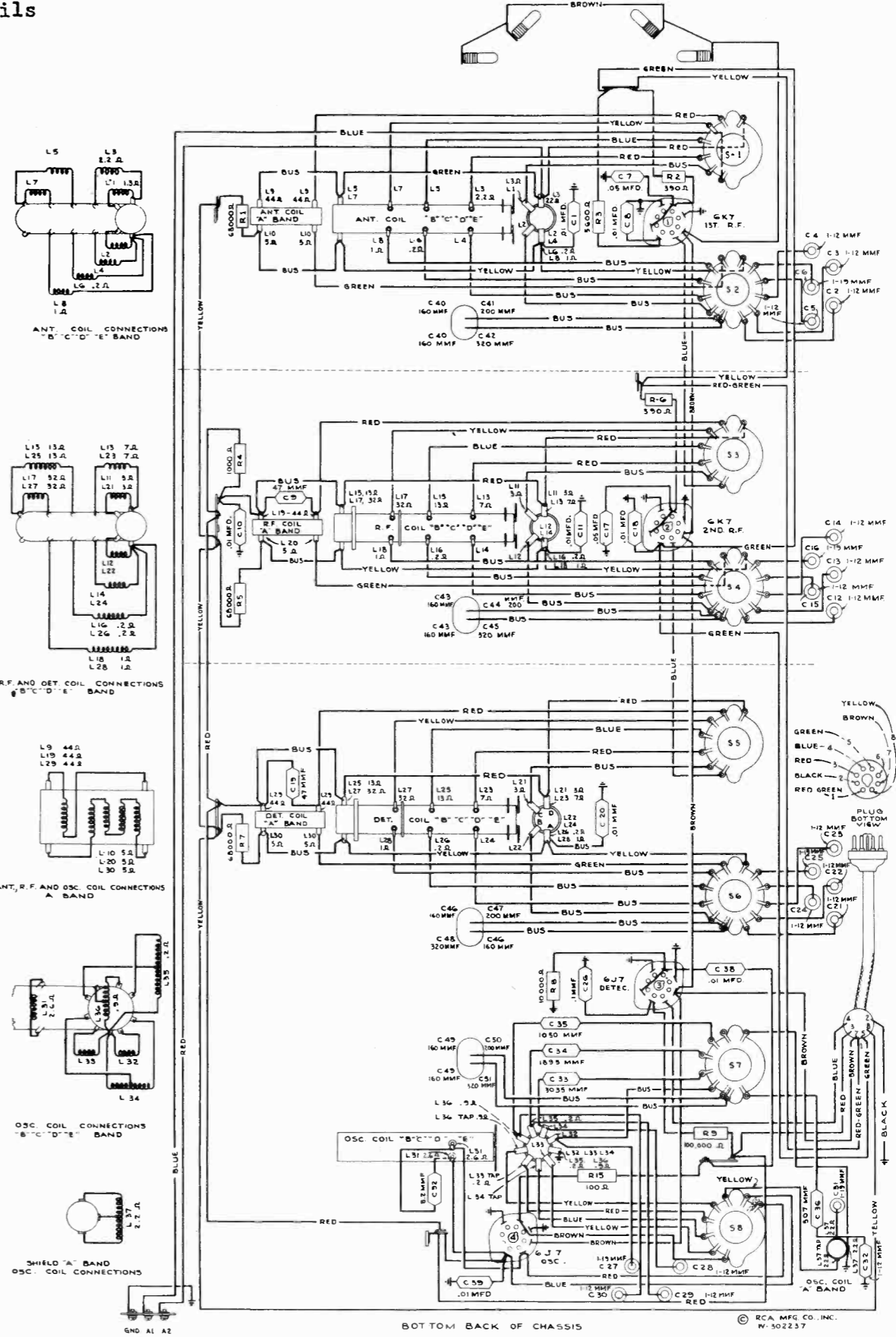


Figure 6—Tuner Unit Wiring Diagram

RCA MFG. CO., INC.

MODEL ACR 111  
 Socket, Trimmers  
 Voltage, Antenna

DOUBLE DOUBLET ANTENNA

L<sub>1</sub> = 130 feet for 160 Meter Band

L <sub>1</sub> = 65	"	"	80	"	"
L <sub>1</sub> = 33	"	"	40	"	"
L <sub>1</sub> = 16	"	"	20	"	"
L <sub>2</sub> = 65	"	"	80	"	"
L <sub>2</sub> = 33	"	"	40	"	"
L <sub>2</sub> = 16	"	"	20	"	"
L <sub>2</sub> = 8	"	"	10	"	"

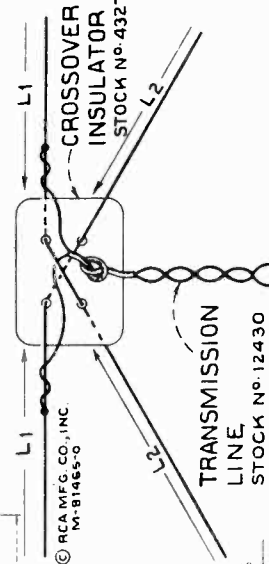


Figure 3

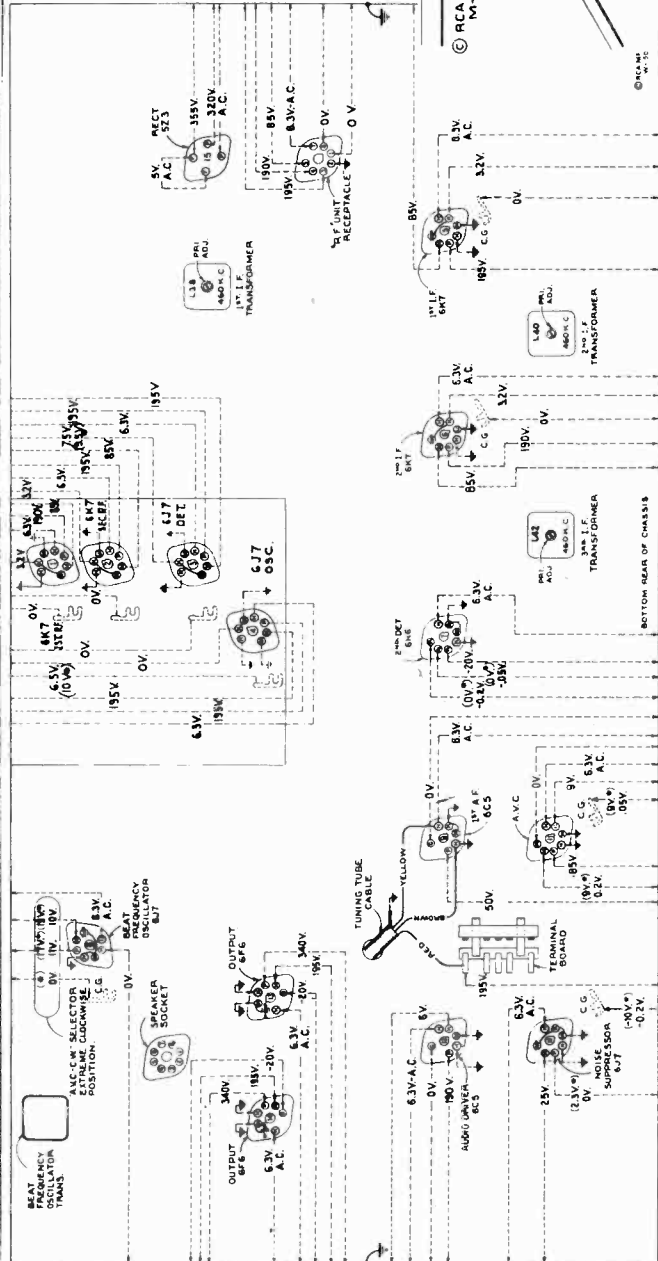


Figure 10—Radiotron Socket, Voltages, Coil and I-F Trimmer Locations

Measured at 115 volts, 60 cycle supply--Tuned to approximately 1000 kc--No signal being received--"Signal Input" control clockwise--"Noise Suppressor" control counterclockwise--"AVC Selector" to "Mod. AVC OFF"--"Volume" control counterclockwise--"Fidelity" and "Beat Frequency" controls optional.

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk(\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

The correct length (L) in feet for each arm of the doublet for maximum signal input at any particular frequency in kilocycles may be computed from the following formula:

$$L = \frac{233,700}{f}$$

where L = length of each doublet arm in feet  
 and f = frequency in kilocycles.

SINGLE DOUBLET ANTENNA

L = 130	feet for 160 Meter	(1,900 kc)	Band
L = 65	"	(3,800 kc)	"
L = 33	"	(7,150 kc)	"
L = 16	"	(14,200 kc)	"
L = 8	"	(28,000 kc)	"



MODEL ACR 111  
R-F and I-F  
Trimmers, Sockets

RCA MFG. CO., INC.

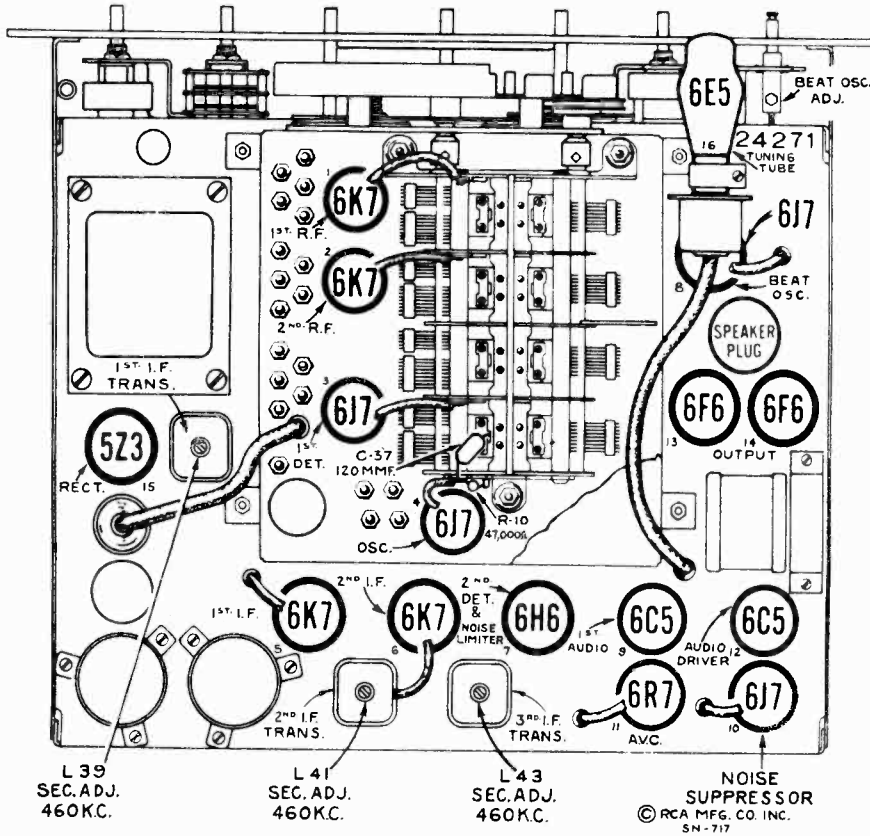


Figure 8—Radiotron and I-F Trimmer Locations

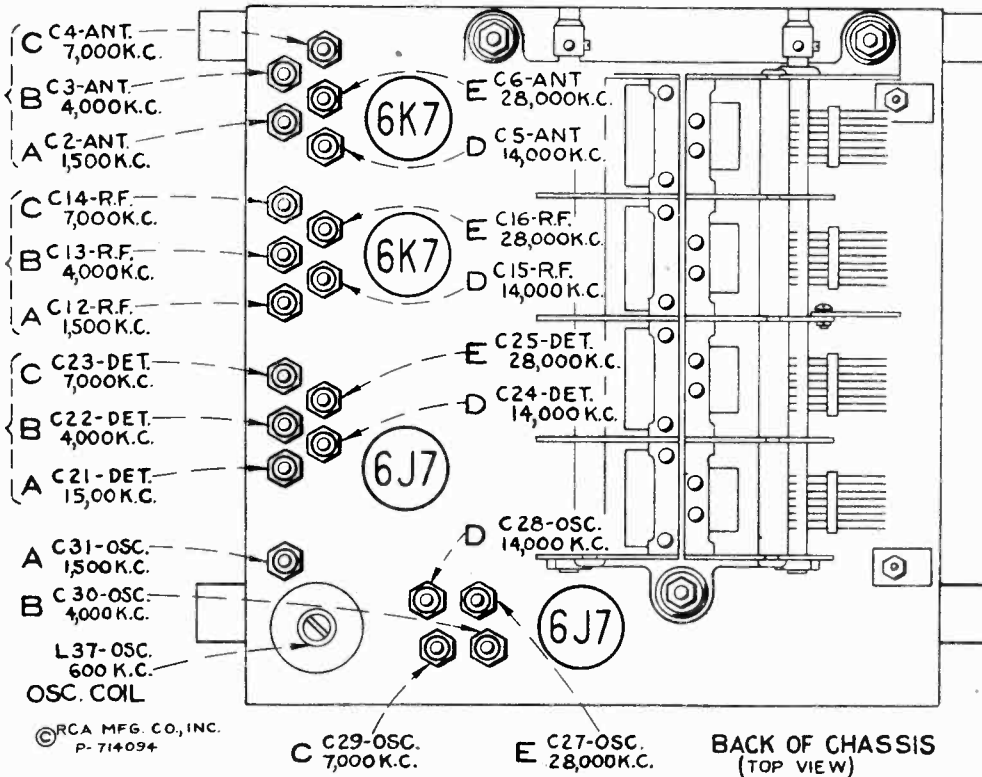


Figure 9—R-F Trimmer Locations

Before aligning the r-f circuits, make receiver dial adjustments as outlined under "Selector Dial" (Figure 11).

In performing services on the oscillator, detector, and r-f circuits, the leads should be restored to their original positions, since the lead-dress is important for proper operation and dial calibration.



MODEL ACR 111  
Alignment Table

RCA MFG. CO., INC.

Order of Alignment	Crystal Filter Control	Test Oscillator			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain	Dial Setting For Image Check
		Connection to Receiver	Dummy Antenna	Frequency Setting					
1	"OFF"	6L7 Det. Grid Cap	.001 mfd.	460 kc	No signal 550-750 kc	3rd i-f Trans.	L43 & L42	Max. (peak)	---
2	"OFF"	6L7 Det. Grid Cap	.001 mfd.	460 kc	No signal 550-750 kc	2nd i-f Trans.	L41 & L40	Max. (peak)	---
3	"OFF"	6L7 Det. Grid Cap	.001 mfd.	460 kc	No signal 550-750 kc	1st i-f Trans.	L39 & L38	Max. (peak)	---
4	"ON" Mid-Position "MAX."	6L7 Det. Grid Cap	.001 mfd.	Shift Slightly for Max. Output	No signal 550-750 kc	---	---	Max. (peak)	---
5	"	6L7 Det. Grid Cap	.001 mfd.	Final Setting of Above	No signal 550-750 kc	3rd i-f Trans.	L43 & L42	Max. (peak)	---
6	"	6L7 Det. Grid Cap	.001 mfd.	"	No signal 550-750 kc	2nd i-f Trans.	L41 & L40	Max. (peak)	---
7	"	6L7 Det. Grid Cap	.001 mfd.	"	No signal 550-750 kc	1st i-f Trans.	L39 & L38	Max. (peak)	---
8	"OFF"	6L7 Det. Grid Cap	.001 mfd.	"	No signal 550-750 kc	---	---	Check for Max. Output	---
9	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	28,000 kc	28,000 kc	"E" Osc.	C27	Max. (peak)+	---
10	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	28,000 kc	Rock Thru 28,000 kc	"E" Det.	C25	Max. (peak)*	---
11	"OFF"	"A1" Ant. Post	300 ohm	28,000 kc	Rock Thru 28,000 kc	"E" R-F	C16	Max. (peak)*	---
12	"OFF"	"A1" Ant. Post	300 ohm	28,000 kc	Rock Thru 28,000 kc	"E" Ant.	C6	Max. (peak)*	28,920 kc
13	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	14,000 kc	14,000 kc	"D" Osc.	C28	Max. (peak)*	---
14	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	14,000 kc	Rock Thru 14,000 kc	"D" Det.	C24	Max. (peak)+	---
15	"OFF"	"A1" Ant. Post	300 ohm	14,000 kc	Rock Thru 14,000 kc	"D" R-F	C15	Max. (peak)+	---
16	"OFF"	"A1" Ant. Post	300 ohm	14,000 kc	Rock Thru 14,000 kc	"D" Ant.	C5	Max. (peak)+	13,080 kc
17	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	7,000 kc	7,000 kc	"C" Osc.	C29	Max. (peak)*	---
18	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	7,000 kc	Rock Thru 7,000 kc	"C" Det.	C23	Max. (peak)+	---
19	"OFF"	"A1" Ant. Post	300 ohm	7,000 kc	Rock Thru 7,000 kc	"C" R-F	C14	Max. (peak)+	---
20	"OFF"	"A1" Ant. Post	300 ohm	7,000 kc	Rock Thru 7,000 kc	"C" Ant.	C4	Max. (peak)+	---
21	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	4,000 kc	4,000 kc	"B" Osc.	C30	Max. (peak)*	---
22	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	4,000 kc	Rock Thru 4,000 kc	"B" Det.	C22	Max. (peak)+	---
23	"OFF"	"A1" Ant. Post	300 ohm	4,000 kc	Rock Thru 4,000 kc	"B" R-F	C13	Max. (peak)+	---
24	"OFF"	"A1" Ant. Post	300 ohm	4,000 kc	Rock Thru 4,000 kc	"B" Ant.	C3	Max. (peak)+	---
25	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	600 kc	600 kc	"A" L-P Osc.	L37	Max. (peak)	---
26	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	1,500 kc	1,500 kc	"A" H-P Osc.	C31	Max. (peak)	---
27	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	1,500 kc	1,500 kc	"A" Det.	C21	Max. (peak)	---
28	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	600 kc	Rock Thru 600 kc	"A" L-P Osc.	L37	Max. (peak)	---
29	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	1,500 kc	1,500 kc	"A" H-P Osc.	C31	Max. (peak)	---
30	"OFF"	6K7 2nd r-f Grid Cap	300 ohm	1,500 kc	1,500 kc	"A" Det.	C21	Max. (peak)	---
31	"OFF"	"A1" Ant. Post	300 ohm	1,500 kc	1,500 kc	"A" R-F	C12	Max. (peak)	---
32	"OFF"	"A1" Ant. Post	300 ohm	1,500 kc	1,500 kc	"A" Ant.	C2	Max. (peak)	---

+ Use Maximum Capacity Peak If Two Peaks Can Be Found.

\* Use Minimum Capacity Peak If Two Peaks Can Be Found.

MODEL ACR 111

MODEL ACR 175

Selectivity Control Curves

RCA MFG. CO., INC.

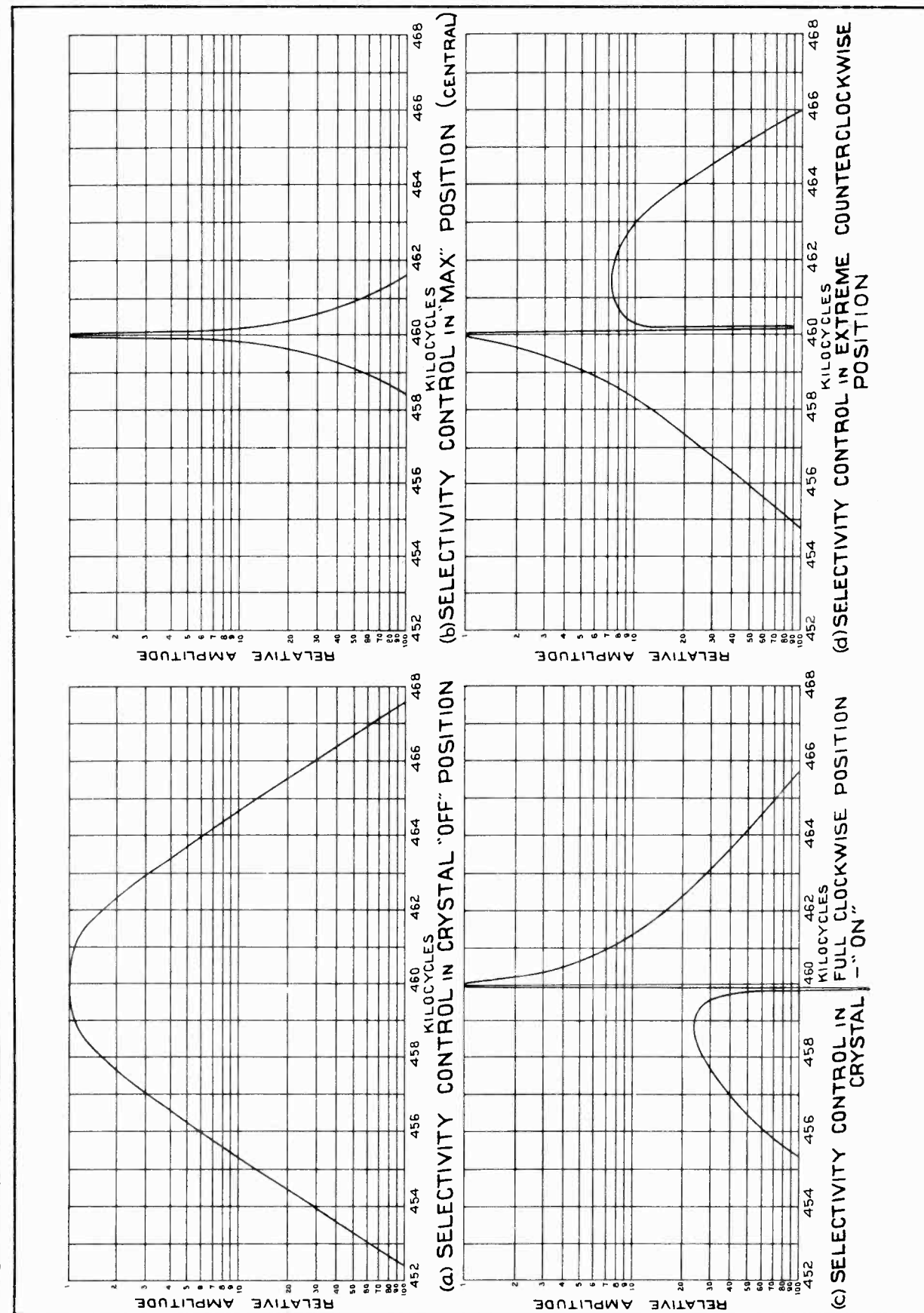


Figure 13—Selectivity Control Curves—Crystal Filter

Figure 11 illustrates the relation of the various parts of the dial mechanism when in its "B" position with the range switch likewise turned to the same range position. In re-assembling the dial after repairs, see that the gears are meshed in accordance with the diagram, at the same time noting that the range switch is in its "B" position and the lever attached to the range-switch shaft placed in the position shown.

To adjust the dial mechanism, set the range-switch to its "B" position. Place a straight-edge across the center of the dial so that its edge is even with the lower (end) marking at both the low-frequency and high-frequency ends of the dial. Under such conditions the straight-edge should be paralleled with the top of the chassis base. If the straight-edge is not parallel with the top of the chassis base, loosen the nut on the rear of the roller link pivot stud and move the stud up or down until the link roller moves the dial to the desired position so that the end calibration marks obtain the position mentioned above. Tighten the nut on the roller link pivot stud.

Set the gang-tuning condenser to its maximum capacity position. Adjust the dial pointer to the low-frequency (end) mark on the "B" range scale. This is a friction adjustment.

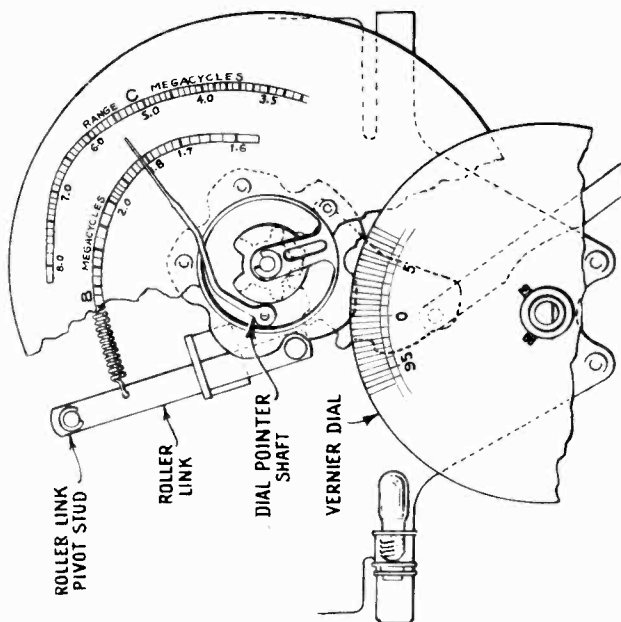


Figure 11—Selector Dial Mechanism

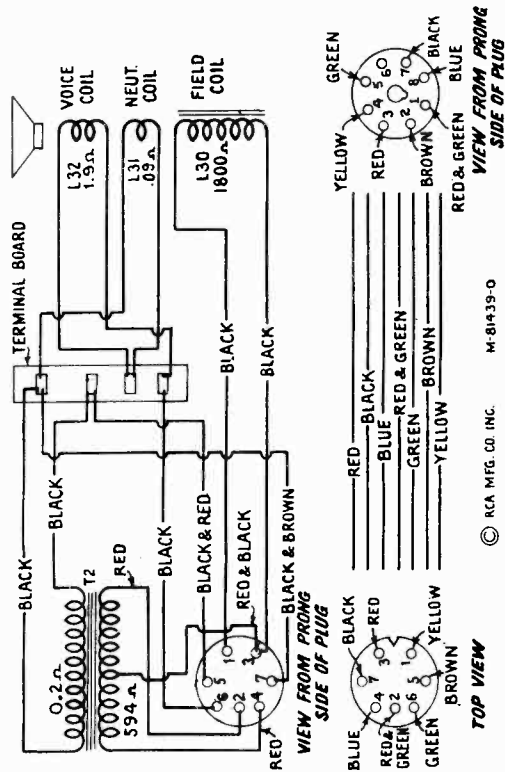
Centering of the loudspeaker voice coil is made with three narrow paper feelers after first removing the front paper dust cover. This may be removed by softening its cement with a very light application of acetone using care not to allow the acetone to flow down into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Average performance data for the ACR-111 is shown in the following table. Slight variations either above or below the values given, may be encountered due to practical manufacturing tolerances.

Noise Equivalent - (microvolts CW) - "Noise Equivalent" is a coined term to express the input in microvolts through the normal input circuit, which would be required to produce an output equal to the receiver noise output.

Selectivity - The Selectivity curve for the average ACR-111 receiver is shown in Figure 13(a).

Range	Frequency Megacycles	Noise Equivalent Microvolts (CW)	Image Ratio	Sensitivity Input Microvolts (w.output)
A	0.6	2	250,000	10
	1.5	2	100,000	10
B	1.7	1.0	150,000	5
	4.0	0.85	40,000	3.5
C	4	1.2	3,000	5
	7	0.96	2,000	3.5
D	7	1.1	3,000	4.5
	14	0.86	400	3.5
E	14	0.9	200	15
	28	1.0	10	8



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Figure 12—Loudspeaker Wiring

# MODEL ACR 111

## Notes, Operation

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### 1. General

This new, sixteen-tube, RCA Amateur Communications Receiver is built for rack and for table mounting and covers a frequency range of from 540 to 30,000 kc. It embodies the most up-to-date circuits and construction, including RCA metal tubes, electrical band spread, beat-frequency oscillator, crystal filter, noise suppressor, noise limiter, sensitivity and automatic-volume controls, standby switch, loudspeaker, and phone jack. The advanced degree of sensitivity and selectivity of the instrument together with its frequency stability and reliability open to the operator a field of reception covering all communications in the more important ranges.

This book should be studied carefully to learn how to make full use of the ACR-111 and keep it in its optimum operating condition.

### 2. Special Features

An inspection of the schematic circuit diagram and the wiring diagrams make clear the many developments incorporated in this model. See Fig. 4, 5 and 6.

Metal tubes provide effective shielding as well as minimum terminal spacing and short connecting circuits with their attendant advantages. The eleven labeled controls, including the phone jack, are all on the front panel, thus giving complete front panel operation. The two large diameter tuning knobs with crank handles are comfortable and convenient to the hand and facilitate rapidity and ease of tuning. In conjunction with the vernier drive and electrical band spread system, fine tuning adjustments are easily made. An AVC Switch allows one to dispense with the use of the Automatic-Volume-Control when desired.

The Crystal Filter in the first i-f stage provides single-signal reception with an unusually high degree of selectivity, and the adjustable Selectivity Control is a means of obtaining various degrees of selectivity with or without a rejection dip. The Electron-Ray-Tube Indicator fulfills the dual function of measuring signal input and aiding in precise tuning.

The Noise Suppressor is a valuable aid in reducing interfering noises and thus enabling the operator to obtain reception of maximum strength and fidelity and minimum interference. It is used in conjunction with the Signal Input Control. A Noise Limiter is incorporated in the circuit by means of the second diode of the second detector (RCA 6H6) tube. This device reduces peak noises due to excessive signals or bursts of static which load the anode beyond a certain bias value.

The Selector Dial brings each scale separately into the dial opening by a turn of the Range Selector knob and gives clear vision tuning calibrations for the range in use only. In addition the vernier scale beneath provides for calibration spread, and the readings of both tuning and calibration spread scales may be entered in the station log for future reference when it is again desired to receive the same station.

The Beat Oscillator is equipped with two controls, (1) an "On-Off" switch and (2) a Heterodyne Control with magnetite-core tuning which effectively governs the pitch. The shield enclosing the entire beat-oscillator circuit enables the listener to operate the set with freedom from undesirable beat notes due to harmonics.

The Loudspeaker is a separate unit attached to the chassis by means of a cable with a seven-prong plug-in connection. It is assembled on a small wooden mounting in which holes are provided for fastening to a large baffle when high-quality reproduction is required.

### 4. Circuit Data and Power Rating

Circuit - Superheterodyne with beat-frequency oscillator for CW reception, noise suppressor, noise limiter, crystal filter, automatic volume control, electron-ray tuning indicator, calibrated signal input (sensitivity) control, electrical band spread, and class A pentode output system.

Power Output - 5 watts (undistorted); 8 watts maximum.

Loudspeaker - (separate unit) - Electro-dynamic 8-inch (voice-coil impedance 2-1/4 ohms at 400 cycles).

Tubes -

- 2 RCA-6K7 - Radio Frequency Amplifiers
- 1 RCA-6J7 - First Detector
- 1 RCA-6J7 - Oscillator
- 2 RCA-6K7 - Intermediate-Frequency Amplifiers
- 1 RCA-6H6 - Second Detector and Noise Limiter
- 2 RCA-6C5 - Audio-Voltage Amplifiers
- 2 RCA-6F6 - Power Output Tubes
- 1 RCA-5Z3 - Full-Wave Rectifier
- 1 RCA-6J7 - Beat-Frequency Oscillator
- 1 RCA-6R7 - Automatic Volume Control
- 1 RCA-6J7 - Noise Suppressor
- 1 RCA-6E5 - Tuning Indicator

See diagram label on shield on chassis for locations of tubes and grid leads.

Power Supply Ratings - Check with rating symbol on chassis.

Power Consumption - 120 watts.

### 5. Antenna

A most important factor in good reception is the antenna. Both "noise reducing" and "directional" properties as well as definite "length" to suit

the signal frequency are essential antenna requirements for best reception. A three-terminal board with the terminals marked "A1", "A2", and "G" is provided on the rear of the chassis for connections to antenna and ground. The "G" terminal should always be connected to a good external ground.

For maximum performance in any one or two amateur bands, one of the antenna systems illustrated below is recommended. Essential parts, such as cross-over insulators (Stock No. 4327), transmission lines (Stock Nos. 12429 and 12430) and receiver coupling transformers (Stock No. 12424) may be purchased from your dealer.

## PART III - OPERATION

### 6. Controls

All controls are located upon the front panel and are identified by adjacent markings.

(a) Tuning and Band Spread - The two large knobs to the right and left of the dial are respectively the "Main" and "Band Spread" tuning knobs. The latter covers a range of 10 percent ( $\pm 5\%$ ) of the main dial scale reading.

(b) Volume - The Volume Control is the knob to the left below the "Band Spread" tuning knob. It is connected in the audio-frequency circuit, and the receiver output level is increased with clockwise rotation.

(c) Power and Fidelity - The Power Switch is combined with the Fidelity Control, the power being off in the counter-clockwise position.

The Fidelity Control provides attenuation of the higher frequencies. Full-range reproduction is obtained with the knob turned clockwise. Turning counter-clockwise introduces a capacitance in the secondary circuit of the driver transformer, which attenuates the high-frequency response and aids in the reduction of disturbing background noises.

(d) Range - The Range Selector in the center of the panel below the dial selects any one of the five scales of which the frequency limits are tabulated under "Part II Electrical Specifications". Turn the Range Selector knob to bring the required scale into the dial opening.

(e) Electron-Ray-Tuning Tube - The green illuminated Electron-Ray-Indicator Tube (RCA-6E5) at the left of the dial near the top of the front panel is a visible guide to precise tuning. The deflection of the electron stream by the signal voltage causes a narrowing of the darker sector. Maximum deflection, (i.e., when the area of the light sector is at a maximum) indicates that the receiver is tuned to exact resonance.

(f) Selectivity Control - This introduces the crystal filter into the i-f circuit for single-signal reception of CW telegraph or telephone transmission. Crystal phasing is performed by means of an air-trimmer capacitor. Near the midway position marked "Max." the crystal circuit is balanced and maximum selectivity is obtained. This setting is characterized by minimum background noise. In the extreme clockwise position the crystal is short-circuited by means of the crystal switch. Other positions broaden the crystal selectivity curve on one side of resonance and cause a rejection dip on the other side. They are useful for phone reception through severe interference.

(g) Beat Frequency - The Beat Frequency knob at the extreme lower left is a heterodyne control governing the Beat Oscillator output frequency. When set at its zero mid-position the Beat Oscillator frequency will approximate zero beat with the receiver tuned accurately to an incoming signal. The calibration figures on either side of the zero position indicate the approximate frequency in kilocycles of the beat produced by the combination of the Beat Frequency Oscillator and the received signal tuned to exact resonance.

(h) Signal Input - The Signal Input Control is calibrated from 1 to 10,000 on a logarithmic scale. It is used in conjunction with the Electron-Ray-Indicator to obtain the approximate value in microvolts of any signal delivered to the receiver. This is accomplished by tuning the receiver to resonance by means of the Electron-Ray-Indicator and then rotating the Signal Input knob fully counter-clockwise to reduce the voltage on the Electron-Ray tube. Then by slowly rotating this control clockwise, a point causing only a slight deflection (1/64 inch) in the dark sector in the Electron-Ray-Indicator, will be obtained. The Signal Input scale reading will then be the approximate signal input value to the receiver, in microvolts. For code reception the correct setting will be at the point where the Electron-Ray-Indicator just begins to flicker.

The absolute accuracy of Signal Input values depends upon the sensitivity of the receiver. This in turn depends on proper alignment, condition of tubes, value of line voltage and similar factors. Relative readings, however, between stations of different signal strengths give a correct comparison. Signal Input readings are also useful for reporting to the transmission station for making tests on different types of antennas, for discovering improvements in transmitters at distant locations, and for making charts of signal strength variations.

Note: Multiply the readings by 5 for obtaining values on band "E" operation.

(i) AVC - CW Selector - This is a five position switch on the right of the dial and by means of this knob the operator may set the receiver for Modulated or CW reception, either with or without Automatic Volume Control, according to requirements. On normal CW reception with the control turned to "CW AVC ON" the time constants of the AVC circuits will be such that they will hold during intervals between characters. For slow-speed CW reception, however, the time constant will not hold and the switch should be turned to "CW AVC OFF" and the Signal Input Control used for adjusting the output level. Furthermore the central point is a "Standby" position which keeps the filaments of all tubes heated ready for immediate reception. This is indicated by means of the Standby Light at the top right hand side of the front panel.

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(j) Noise Suppressor - The Noise Suppression Control is for reducing peaks of noise to a minimum. When used in conjunction with the Signal Input or Sensitivity Control and the Fidelity Control, the Noise Suppressor becomes a very important and valuable device for reducing interfering noises that may impair the intelligibility of radio reception. It is of particular value in minimizing interference caused by the ignition systems of airplanes and automobiles, dial telephones, and similar electrical apparatus. Interference from rotating electrical machinery however is not eliminated by this device.

With a station properly tuned in by the use of the Electron-Ray-Tuning-Indicator, then if the Noise Suppression knob is slowly rotated in a clockwise direction a point of noticeable distortion of the signal will eventually be reached. (If the signal is too strong it may be necessary to reduce the strength by means of the Signal Input Control in order to obtain a point of noticeable distortion on the Noise Suppression Control.) The knob should then be turned very slowly counter-clockwise until the signal becomes clear. This point is the correct setting for the Noise Suppression Control for that particular signal.

This control is also effective for inter-carrier Noise Suppression and its use in this capacity requires the following procedure in order to obtain reception with full strength, maximum fidelity and minimum interference:

- (1) Reduce Signal Input Control as low as possible, meanwhile keeping receiver output at the desired level by means of the Volume Control.
- (2) Set receiver at a point where no signal is being received.
- (3) Adjust Noise Suppression Control till background noise is just audible.
- (4) Tune in desired signal again.

This adjustment of the receiver is of particular value for intermittent signals or when it is desired to standby on a certain channel, the background output of the receiver being extremely low on "no signal" and yet allowing full volume on "signal".

(k) Phones - The Phone Jack is to the left of the front panel. When a phone plug is inserted in this jack, it simultaneously connects a resistance load across the secondary of the output transformer in place of the voice coil of the electro-dynamic loudspeaker. It also connects the phones across the plate circuit of the output tube, a blocking condenser being used to isolate the d-c voltage. The loudspeaker field which is employed as a filter for the rectifier stage, still forms an active part of the circuit when using headphones. By inserting the phone plug part way in the jack both headphone and loudspeaker signals may be obtained. The loudspeaker is connected to the chassis by means of a cable and plug.

## 7. Dial

The Selector Dial provides for each major band a single clearly calibrated scale in the upper dial opening. Each scale is clearly marked in megacycles. The small lower dial opening gives calibration spread for accurate logging. The mechanism is illustrated in Figure 11.

## 8. Tuning

The two r-f amplifiers (6K7), first detector (6J7) and oscillator (6J7) are tuned by two four-gang variable capacitors and controlled from two knobs.

The right hand knob controls the main tuning capacitor and the left hand knob the band spread capacitor. The band spread capacitor is connected in the circuit to cover a uniform percentage of band spread regardless of the frequency to which the receiver is tuned. Frequency readings on the dial scale obtained by rotation of the Main Tuning knob are only accurate when the Band Spread Control is at zero - turned fully to right.

The Tuning limits for each of the five ranges are given under "Part II - Electrical Specifications". To tune the receiver for desired reception of modulated signals proceed as follows:

- (a) Turn Power Switch "On".
- (b) Turn Range Selector to bring the desired scale into the Selector Dial opening.
- (c) Set AVC - CW Control to "MOD. AVC ON".
- (d) Advance Signal Input Control fully clockwise for maximum sensitivity.
- (e) Advance Volume Control clockwise until background noise is heard.
- (f) Set Band Spread Control at zero - fully clockwise - and then rotate Main Tuning Control to a point just below desired frequency, such as at the low end of an Amateur Band. Now tune in signal with Band Spread Control. Turn slowly counter-clockwise, observe the Calibration Spread scale to obtain station location and then watch the Electron-Ray-Tuning-Indicator for point of resonance.
- (g) Decrease volume as necessary and set Fidelity Control for preferred quality of reproduction. Full tone range reproduction is obtained with the knob set to its extreme clockwise position.
- (h) Silent Tuning may be obtained by reducing the volume until no signal is heard, and then tuning by means of the visual indications of the Electron-Ray Tube.
- (i) Weak Modulated Signals - The Beat Oscillator may be used to advantage in locating weak, modulated signals. For this purpose it should be

tuned exactly to the intermediate frequency of the receiver by turning the Beat Frequency Control to "0" so that an audio-frequency note of ascending pitch will be obtained on each side of resonance of the incoming signal when the AVC - CW Selector is turned to "CW AVC OFF". Any carrier will then be tuned to exact resonance when the Frequency Control is adjusted for "zero beat" and weak signals will be located almost as well as those of greater strength because of the heterodyne "whistle" produced while passing through resonance. After proper adjustment has been made, turn AVC - CW Selector to "MOD. AVC ON".

(j) CW Signals - For CW (code) reception, the tuning procedure is the same as for modulated signals except that the Beat Oscillator performs a definite rather than incidental function. The Beat Frequency Control is set not at zero, but slightly to either side so as to provide an audio-frequency beat note when the receiver is tuned to resonance with any carrier. Adjust the pitch with the Beat Frequency Control knob. Turn AVC - CW Selector to "CW AVC OFF" when receiving slow speed CW transmission.

(k) If the interference is objectionable during reception, the Noise Suppression Control should be adjusted, as described under "Controls" Section 6, to its "correct setting" for that signal.

(l) Selectivity - The value of the Crystal Selectivity Control is most evident on CW reception. Its importance should not be forgotten in phone reception and for identification of weak stations which are normally lost in the background noise. The curves (Figure 13) should be studied carefully before operating the Selectivity Control.

The following suggestions also may be of value:

Locate the desired frequency or station with control at "Crystal OFF," i.e., in its position of minimum selectivity, then adjust to obtain the desired degree of selectivity.

Tuning is extremely critical with control in the "Max." position and in consequence the movement of the Band Spread knob should be very slow and deliberate.

## Heterodyne Control Setting

Connect a source of unmodulated carrier of the i-f frequency from the grid of the RCA-6J7 first-detector to ground. Turn AVC off, crystal filter to maximum selectivity, sensitivity control to maximum, audio volume control partially on and beat oscillator on.

Rotate the Heterodyne Control knob to left or right until the heterodyne beat is heard.

Change the frequency of the unmodulated carrier from the test oscillator very carefully for maximum deflection on the electron-ray-tube indicator. Reduce the signal input if necessary so that the electron-ray-tube does not completely close. The test oscillator is now adjusted to the same frequency as the crystal filter.

Set the Heterodyne Control knob at its zero position and note whether the heterodyne beat is at zero frequency. If not, proceed as follows:

- (a) Rotate the Heterodyne Control knob to obtain zero beat.
- (b) Loosen the knob set screw and turn loosened knob on shaft to its "0" or vertical position.
- (c) Tighten up set screw.

The Heterodyne Control is now adjusted to zero beat at the frequency of the crystal filter.

In the event that the frequency drift is such that the zero beat position of the knob is at or beyond the figure "2" on either side, or outside field of rotation, the following adjustment is necessary:

- (a) Turn knob until the set-screw-stop on the knob control shaft, behind the front panel, is approximately vertical, then loosen stop with screw driver.
- (b) Turn core stud to obtain zero beat. Use a pair of padded long-nose pliers to rotate the core stud in order to avoid injuring thread.
- (c) Turn set-screw-stop over to left (facing front panel) to its mid-position, and adjust knob control shaft to allow 1/32 to 1/16 inch clearance between front panel and adjacent surface of knob.
- (d) Tighten set-screw-stop with pliers to grip core stud, then swing stop to vertical and tighten securely with screw driver.
- (e) Proceed as first described for setting knob accurately to zero position at zero beat.

Note: Do not pull control shaft loose from bearing bracket when adjusting core stud.

Beat Frequency Oscillator - The frequency generated by the Beat Frequency beat-oscillator (457 to 463 kc) for CW reception is applied to the No. 1 diode plate of the RCA-6H6 second-detector through capacitor C83. This frequency mixes with the incoming intermediate frequency to produce an audio-frequency note which can be readily heard in the loudspeaker or phones. The movable magnetite-core, adjusted by the Beat Frequency Control, provides a variable inductance which acts as a vernier control for adjustment of the oscillator frequency over the required a-f range on either side of the intermediate-frequency signal. The plate and screen-grid voltage supply to this oscillator is turned on and off by means of the AVC - CW selector switch.

AVC - CW Selector - A five-position switch selects the type of reception and controls the Beat Oscillator and AVC circuits. The secondary of the audio transformer T1 is short-circuited in the "Standby" position.



MODEL ACR 111

Circuit Data

Transformer

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Circuit Arrangement

A schematic diagram of the complete circuit is shown in Figure 4, a wiring diagram illustrating the wiring layout of the radio chassis and front panel controls is detailed in Figure 5, and of the r-f tuner unit in Figure 6. The loudspeaker wiring diagram and connections to chassis are shown in Figure 12, and the wiring of the Universal Transformer for rating "C" receivers in Figure 7. The circuit is based on the superheterodyne principle. It consists of two r-f amplifier stages, a first-detector (converter) stage, a separate oscillator stage, a crystal filter stage, two i-f amplifier stages, a diode-detector and noise limiter stage, an automatic-volume control stage, an audio voltage-amplifier stage, a noise suppressor stage, an audio driver stage, a power-amplifier stage, a beat frequency oscillator stage, and a full-wave rectifier.

A doublet antenna, when connected to the proper input terminals of the receiver, is coupled to the control grid of the first RCA-6K7 r-f amplifier tube through the tuned r-f transformer consisting of L<sub>1</sub>, L<sub>2</sub>, L<sub>3</sub>, L<sub>4</sub>, L<sub>5</sub>, L<sub>6</sub>, L<sub>7</sub>, L<sub>8</sub>, L<sub>9</sub>, C<sub>40</sub>, C<sub>41</sub>, and C<sub>42</sub>. C<sub>3</sub>, C<sub>4</sub>, C<sub>5</sub>, and C<sub>6</sub> are plunger type air-trimmer capacitors for the respective bands - A, B, C, D, and E. The variable tuning capacitors, C<sub>43</sub> and C<sub>44</sub>, are of the split-stator type and are controlled from the main tuning knob. The band spread capacitor, C<sub>45</sub>, is connected in series with C<sub>41</sub>, the combination being in parallel with C<sub>42</sub> - the main tuning capacitor. Thus a variable capacitance is effectively placed in series with C<sub>40</sub>, and its value bears a definite ratio to that of C<sub>42</sub>, the effective capacitance range of C<sub>40</sub> being approximately a constant percentage of that of C<sub>42</sub>, irrespective of its setting.

The range switch in the "A" position shorts out C<sub>40</sub>, effectively paralleling C<sub>41</sub> and C<sub>42</sub>.

Separate coils are used for each band, and all primary windings not in use are short-circuited, as well as all secondaries for lower frequencies.

The range switching of the r-f and detector circuits is similar to that of the antenna circuits.

Separate windings are employed in the oscillator stage for each position of the range selector. The inherent stability of this circuit provides minimum frequency drift which is especially advantageous for high-frequency reception. The locally generated signal is capacitance coupled to the cathode of the RCA-6J7 first-detector.

**I-F Amplifier** - The intermediate-frequency amplifier consists of two RCA-6K7 tubes in a two-stage, transformer-coupled circuit. The windings of all three i-f transformers are resonated by a combination of fixed capacitors, and adjustable molded-magnetite cores (both primary and secondary) tune to 450 kc. The crystal filter is introduced between the first i-f transformer secondary (L<sub>39</sub>) and the control grid of RCA-6K7 first i-f amplifier tube by means of the crystal switch S-11, Figure 4.

**Detector and Noise Limiter** - The signal, as obtained from the output of the last i-f stage, is detected by an RCA-6H6 twin-diode tube (No. 1 diode), the useful audio-frequency (a-f) and direct-current (d-c) components appearing across resistor R<sub>22</sub>. The No. 2 diode of this same Radiotron is effectively placed in shunt with R<sub>22</sub>, with its anode biased approximately 20 volts negative with respect to the cathode, by means of the bleeder resistor R<sub>24</sub>. Excessive signals, or bursts of static, of magnitude great enough to cause the voltage across R<sub>22</sub> to exceed approximately 20 volts will cause the No. 2 diode to draw current, or present a low impedance across R<sub>22</sub>, thereby acting as a noise limiter.

**Audio System** - The control grid of the RCA-6C5 first audio amplifier is connected directly to R<sub>22</sub>, the tube functioning as a diode-biased voltage-amplifier. The output of this tube is resistance-capacitance coupled to the control grid of the RCA-6C5 audio-driver, potentiometer R<sub>38</sub> functioning as the volume control. The output of the driver stage is transformer coupled, through T<sub>1</sub>, to the control grids of the RCA-6F6 push-pull, power-output tubes. The output of this stage is transformer coupled, through T<sub>2</sub>, to the voice coil of the electro-dynamic loudspeaker. Insertion of a telephone plug in the headphone jack J<sub>1</sub> disconnects the voice coil from the secondary of T<sub>2</sub> and substitutes a dummy resistor R<sub>39</sub> in its place. The tip and sleeve of the plug are connected across the input circuit of one of the RCA-6F6 power tubes, through capacitor C<sub>74</sub>, for headphone reception.

The "Fidelity" or tone control comprises the combination of capacitor C<sub>75</sub> and variable resistor R<sub>41</sub> shunting the secondary of T<sub>1</sub>.

**Automatic Volume Control** - The operation of the RCA-6R7 Automatic Volume Control Tube and associated circuits is as follows:

Under conditions of no signal, the cathode current flowing through resistor R<sub>27</sub> develops voltage across R<sub>27</sub> of approximately 29 volts. This is in opposition to the approximate 20 volts drop across the bleeder resistor R<sub>24</sub> thereby making the cathode approximately 9 volts positive with respect to chassis-ground, or to the anode DP-1. When signals are present, a portion of the i-f voltage is applied to anode DP-2, through Capacitor C<sub>90</sub>, for rectification. The d-c voltage which develops across resistor R<sub>28</sub> is applied to the control grid of the RCA-6R7 through a resistance-capacitance filter, making the grid more negative with respect to cathode, in turn reducing the cathode current or voltage drop across R<sub>27</sub>, and consequently making the cathode less positive with respect to anode DP-1 than under the condition of no signal. Sufficient signal will cause the cathode to become negative with respect to diode DP-1; current will then flow through this circuit causing a voltage drop across R<sub>30</sub>, which is applied as automatic control-grid bias to the r-f, first-detector, and i-f tubes through suitable resistance-capacitance filters.

**Noise Suppressor** - The Noise Suppressor consists of an RCA-6J7 whose plate circuit effectively shunts the input circuit of the audio-driver stage, and a means of making the shunting plate impedance very high for desired signals, and very low for undesired noise impulses of short duration and amplitude greater than the desired signal. The plate impedance will be very high for control-grid bias values sufficient to cause plate-current cut-off, and low for bias values which will permit plate current to flow. The audio signal appearing across resistor R<sub>37</sub>, and consequently across the RCA-6C5 audio driver input circuit will, therefore, depend upon the ratio of the plate impedance of the Noise Suppressor Tube to the resistance of R<sub>36</sub>, the series combination being essentially a voltage-dividing network. When the plate impedance is high, the ratio will be high, and practically the total audio voltage appearing across resistors R<sub>32</sub> and R<sub>33</sub> will appear across the plate circuit. The converse will occur with a low plate-impedance. In operation, the bias is adjusted just below the point of plate current cut-off by means of the movable arm on R<sub>27</sub>. Noise impulses of short duration, tending to make the grid more positive, will cause the plate impedance to be low during these impulses with a consequent reduction of input to the audio driver during these intervals.

**Electron-Ray-Tuning-Indicator** - An RCA-6E5 cathode-ray tuning tube is used as a means of visually indicating when the receiver is accurately tuned to the incoming signal. This tube consists of an amplifier section and a cathode-ray section built in the same glass envelope. A portion of the voltage developed across resistor R<sub>22</sub> is used to actuate the grid of the amplifier section. Maximum voltage is applied to this grid when the receiver is tuned to resonance with an incoming carrier. This condition is evidenced by minimum width of the dark sector on the fluorescent screen.

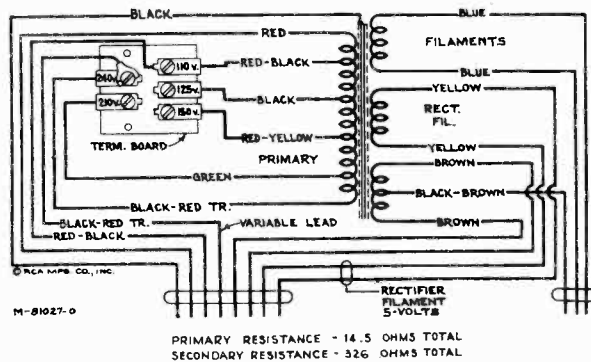


Figure 7 - Universal Transformer

Perform alignment in proper order tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown by Figures 8, 9 and 10. Holes are provided in the left side of the lower r-f unit shield to enable a tuning check with the RCA Stock No. 6679 Tuning Wand.

The RCA Stock No. 12636 Adjusting Tool has been designed for loosening and retightening lock-nut and for making the plunger adjustment on the plunger-type air-dielectric trimming capacitors.

Cathode-ray alignment is preferable; the connections to the chassis are shown on Figure 5. If an output indicator is used, connect it across the loudspeaker voice coil and advance the receiver volume control to full-volume position. Turn AVC - CW Selector to "MOD. AVC OFF"; Signal Input clockwise. Turn Noise Suppression control to extreme counter-clockwise position. Adjust Signal Input control to "100". Set AVC - CW Selector to "MOD. AVC OFF".

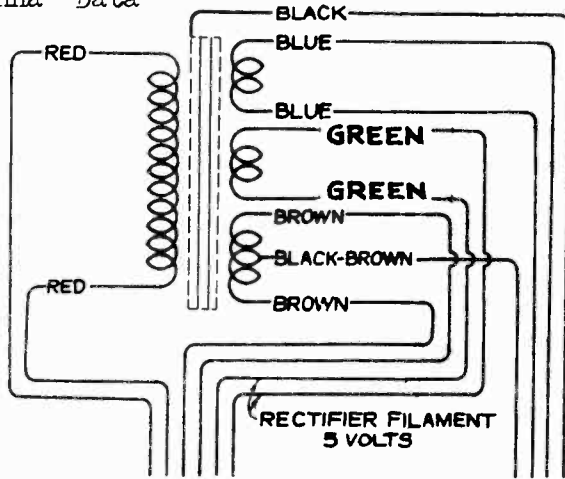
Connect the "Low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that the signal applied to the receiver is the minimum which will permit an accurate output observation.

The term "Dummy Antenna" means that device which must be connected between the "High" test oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator. "Dial setting for image check" means that after alignment is performed following across in proper sequence, the receiver dial should be shifted to the setting specified, without making any other changes, except possibly increasing test oscillator output, at which point image signal should be received. If the image is not received at this dial setting, but at a point approximately 1840 kc below this point in the case of (12) or 1840 kc above this point in the case of (16), it will indicate that the oscillator has been improperly adjusted.



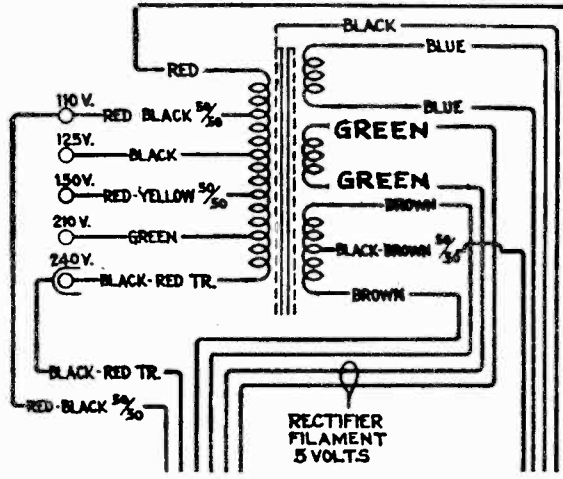
MODEL ACR 175  
Transformer and  
Antenna Data

RCA MFG. CO., INC.



Pri. Res.—5.79 ohms, total  
Sec. Res.—420 ohms, total

(a)—Standard Power Transformer



Pri. Res.—7.54 ohms, total  
Sec. Res.—268 ohms, total

(b)—Universal Transformer

Figure 8—Transformer Wiring and Connections.

Band	Length each side		Coupling Transformer	
	Meters	Feet	Type	Stock No.
160		130	Aircraft Doublet	M.I. 5782
80		65	Aircraft Doublet	M.I. 5782
40		33	Standard Doublet	4743
20		16½	Standard Doublet	4743
10		8	Standard Doublet	4743
5		4	Standard Doublet	4743

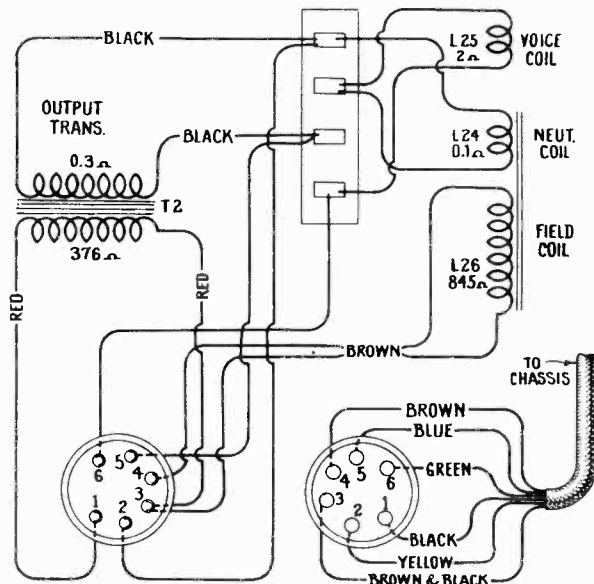
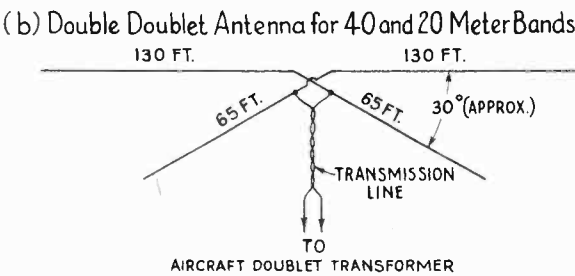
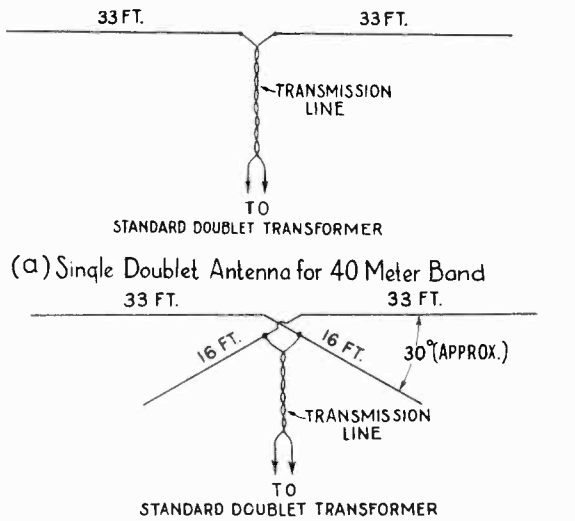


Figure 7—Loudspeaker Wiring and Connection Diagram

(c) Double Doublet Antenna for 160 and .80 Meter Bands

(d) Triple Doublet Antenna for 40, 20 & 10 Meter Bands

Figure 4—Dipole Antenna Crossover Connections.

RCA MFG. CO., INC.

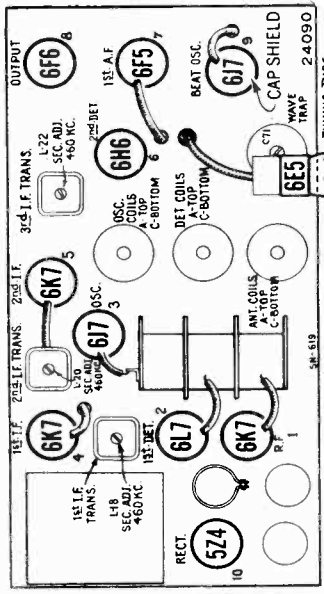
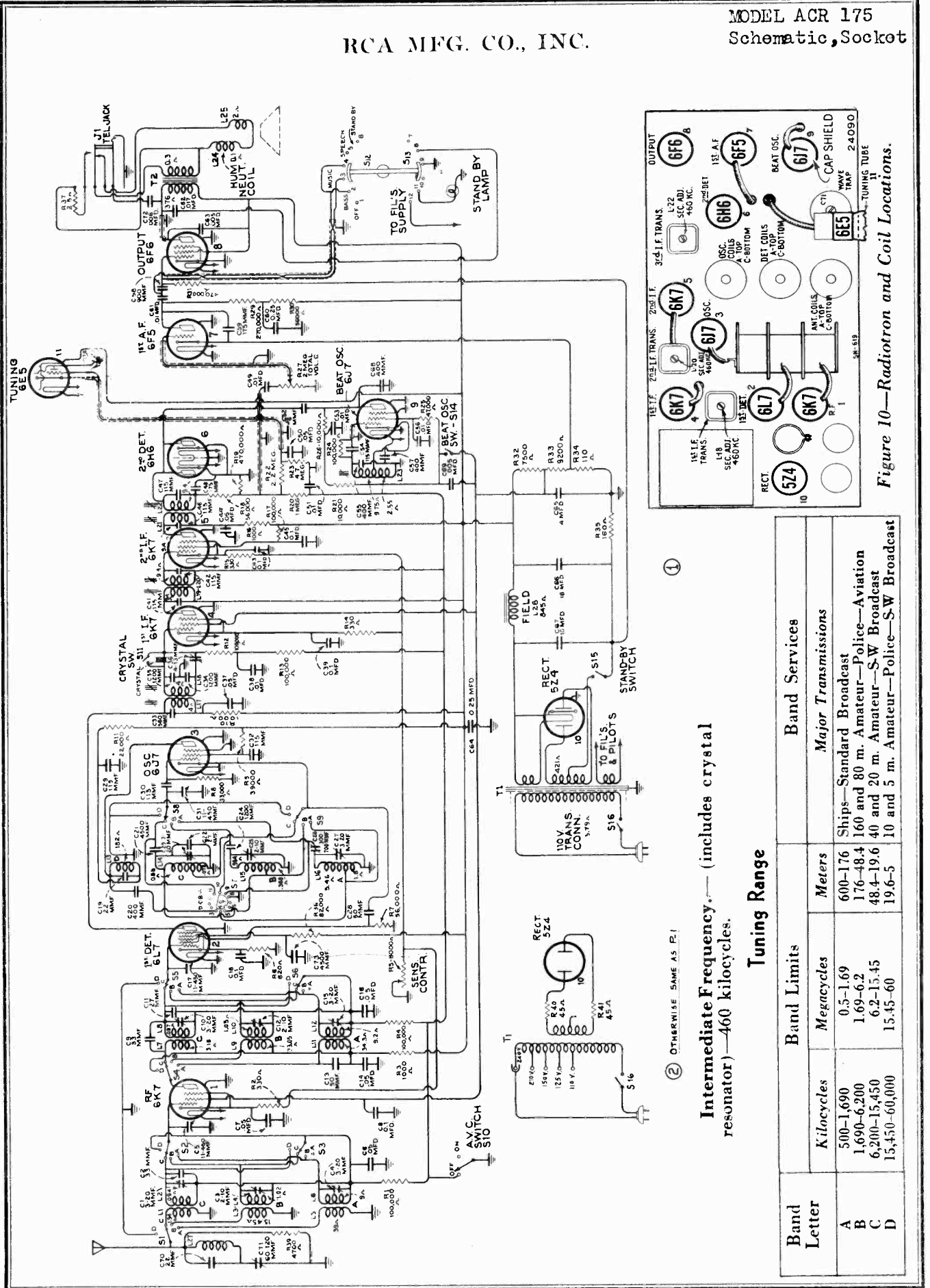


Figure 10—Radiotron and Coil Locations.

Intermediate Frequency (includes crystal resonator)—460 kilocycles.

Tuning Range

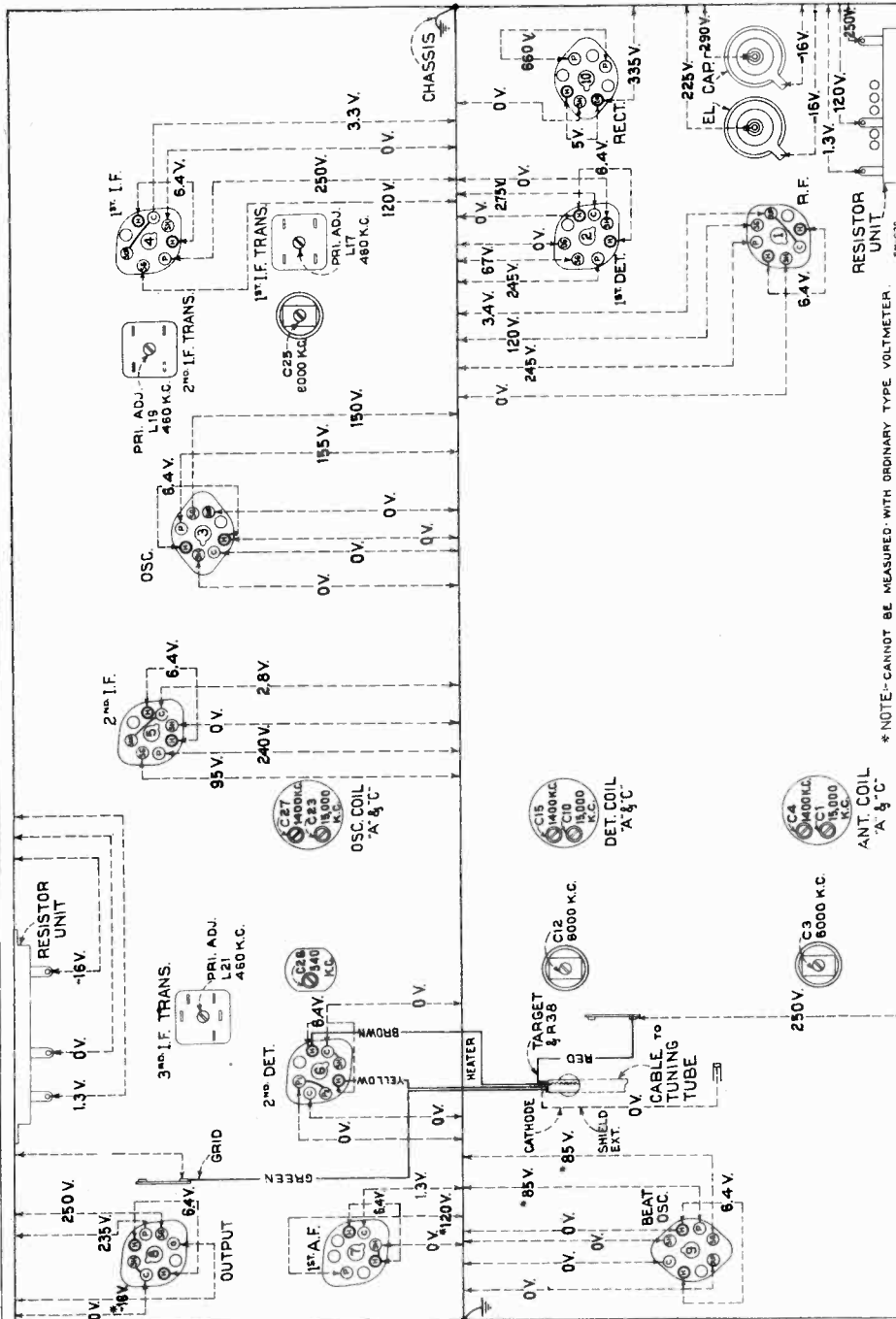
Band Letter	Band Limits		Band Services	
	Kilocycles	Megacycles	Meters	Major Transmissions
A	500-1,690	0.5-1.69	600-176	Ships—Standard Broadcast
B	1,690-6,200	1.69-6.2	176-48.4	160 and 80 m. Amateur—Police—Aviation
C	6,200-15,450	6.2-15.45	48.4-19.6	40 and 20 m. Amateur—S-W Broadcast
D	15,450-60,000	15.45-60	19.6-5	10 and 5 m. Amateur—Police—S-W Broadcast





RCA MFG. CO., INC.

MODEL ACR 175  
Voltage Trimmers  
Power Ratings  
Band Spread



All voltages are measured with the Sensitivity Control at "1" (fully clockwise), Beat-Oscillator "on," Crystal "off," AVC "on," Dial Pointer at 900 Band "A." Grid Cap voltages to ground are "zero," except for the two oscillators.

Figure 9—Radiotron Socket Voltages and Trimmer Locations.

Circuit Data

Meters	Band Spread	
	Pointer Coverage Dial Divisions	Slow Speed Knob Angle of Rotation
160	366	3590°
80	141	1380°
40	96	940°
20	55	540°
10	74	725°
5	74	725°

Circuit.—Superheterodyne with beat-frequency oscillator for c-w reception, crystal filter, automatic volume control, electron-ray indicator with calibrated signal input (sensitivity) control, and class A pentode output system.

Power-Supply Ratings.— See rating symbol on chassis.

Symbol	Voltages	Frequency (cycles)
B	105-125	25-60
C	100-130; 140-160; 195-250	40-60

As shipped from the factory, rating "C" instruments are connected for 225-250 volts unless prominently specified otherwise on instrument. Any of these, however, can be converted for operation at 100-117, 117-130 or 195-225 volts when required. Three taps are provided on the primary of the power transformer, a diagram of which is given in Figure 8. All taps are brought out to a terminal board on the top of the transformer and conversion can be made without removing chassis.

Tubes

- 1 RCA-6K7—Radio-Frequency Amplifier.
- 1 RCA-6L7—First Detector.
- 1 RCA-6J7—Oscillator.
- 2 RCA-6K7—Intermediate-Frequency Amplifiers.
- 1 RCA-6H6—Second Detector and A.V.C.
- 1 RCA-6J7—Beat-Frequency Oscillator.
- 1 RCA-6F5—Audio-Frequency Amplifier.
- 1 RCA-6F6—Power-Output Amplifier.
- 1 RCA-5Z4—Full-Wave Rectifier.
- 1 RCA-6E5—Tuning Indicator.

See diagram on label inside cabinet for locations of tubes and grid leads.



RCA MFG. CO., INC.

REPLACEMENT

Spec. No.	Description	Part No.
5371	Barking Variable tuning knob for 300 ohm band	43
12115	Cable condenser for 11.4 d reproducer plate with 6 cones; female connector	155
11150	Capacitor—15 Mfd. (C29)	46
11223	Capacitor—Adjustable capacitor (C26)	46
12061	Capacitor—32 Mfd. (C31)	26
11211	Capacitor—33 Mfd. (C1)	26
12121	Capacitor—15 Mfd. (C28, C34, C35)	24
12131	Capacitor—15 Mfd. (C28, C34, C35)	24
11988	Capacitor—15 Mfd. (C28, C34, C35)	24
11118	Capacitor—15 Mfd. (C28, C34, C35)	24
11290	Capacitor—15 Mfd. (C28, C34, C35)	24
12086	Capacitor—400 Mfd. (C33)	24
12104	Capacitor—500 Mfd. (C33)	24
11833	Capacitor—500 Mfd. (C33)	24
12071	Capacitor—500 Mfd. (C33)	24
12121	Capacitor—500 Mfd. (C33)	24
11918	Capacitor—500 Mfd. (C33)	24
11928	Capacitor—500 Mfd. (C33)	24
11938	Capacitor—500 Mfd. (C33)	24
11948	Capacitor—500 Mfd. (C33)	24
11958	Capacitor—500 Mfd. (C33)	24
11968	Capacitor—500 Mfd. (C33)	24
11978	Capacitor—500 Mfd. (C33)	24
11988	Capacitor—500 Mfd. (C33)	24
11998	Capacitor—500 Mfd. (C33)	24
12008	Capacitor—500 Mfd. (C33)	24
12018	Capacitor—500 Mfd. (C33)	24
12028	Capacitor—500 Mfd. (C33)	24
12038	Capacitor—500 Mfd. (C33)	24
12048	Capacitor—500 Mfd. (C33)	24
12058	Capacitor—500 Mfd. (C33)	24
12068	Capacitor—500 Mfd. (C33)	24
12078	Capacitor—500 Mfd. (C33)	24
12088	Capacitor—500 Mfd. (C33)	24
12098	Capacitor—500 Mfd. (C33)	24
12108	Capacitor—500 Mfd. (C33)	24
12118	Capacitor—500 Mfd. (C33)	24
12128	Capacitor—500 Mfd. (C33)	24
12138	Capacitor—500 Mfd. (C33)	24
12148	Capacitor—500 Mfd. (C33)	24
12158	Capacitor—500 Mfd. (C33)	24
12168	Capacitor—500 Mfd. (C33)	24
12178	Capacitor—500 Mfd. (C33)	24
12188	Capacitor—500 Mfd. (C33)	24
12198	Capacitor—500 Mfd. (C33)	24
12208	Capacitor—500 Mfd. (C33)	24
12218	Capacitor—500 Mfd. (C33)	24
12228	Capacitor—500 Mfd. (C33)	24
12238	Capacitor—500 Mfd. (C33)	24
12248	Capacitor—500 Mfd. (C33)	24
12258	Capacitor—500 Mfd. (C33)	24
12268	Capacitor—500 Mfd. (C33)	24
12278	Capacitor—500 Mfd. (C33)	24
12288	Capacitor—500 Mfd. (C33)	24
12298	Capacitor—500 Mfd. (C33)	24
12308	Capacitor—500 Mfd. (C33)	24
12318	Capacitor—500 Mfd. (C33)	24
12328	Capacitor—500 Mfd. (C33)	24
12338	Capacitor—500 Mfd. (C33)	24
12348	Capacitor—500 Mfd. (C33)	24
12358	Capacitor—500 Mfd. (C33)	24
12368	Capacitor—500 Mfd. (C33)	24
12378	Capacitor—500 Mfd. (C33)	24
12388	Capacitor—500 Mfd. (C33)	24
12398	Capacitor—500 Mfd. (C33)	24
12408	Capacitor—500 Mfd. (C33)	24
12418	Capacitor—500 Mfd. (C33)	24
12428	Capacitor—500 Mfd. (C33)	24
12438	Capacitor—500 Mfd. (C33)	24
12448	Capacitor—500 Mfd. (C33)	24
12458	Capacitor—500 Mfd. (C33)	24
12468	Capacitor—500 Mfd. (C33)	24
12478	Capacitor—500 Mfd. (C33)	24
12488	Capacitor—500 Mfd. (C33)	24
12498	Capacitor—500 Mfd. (C33)	24
12508	Capacitor—500 Mfd. (C33)	24
12518	Capacitor—500 Mfd. (C33)	24
12528	Capacitor—500 Mfd. (C33)	24
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12548	Capacitor—500 Mfd. (C33)	24
12558	Capacitor—500 Mfd. (C33)	24
12568	Capacitor—500 Mfd. (C33)	24
12578	Capacitor—500 Mfd. (C33)	24
12588	Capacitor—500 Mfd. (C33)	24
12598	Capacitor—500 Mfd. (C33)	24
12608	Capacitor—500 Mfd. (C33)	24
12618	Capacitor—500 Mfd. (C33)	24
12628	Capacitor—500 Mfd. (C33)	24
12638	Capacitor—500 Mfd. (C33)	24
12648	Capacitor—500 Mfd. (C33)	24
12658	Capacitor—500 Mfd. (C33)	24
12668	Capacitor—500 Mfd. (C33)	24
12678	Capacitor—500 Mfd. (C33)	24
12688	Capacitor—500 Mfd. (C33)	24
12698	Capacitor—500 Mfd. (C33)	24
12708	Capacitor—500 Mfd. (C33)	24
12718	Capacitor—500 Mfd. (C33)	24
12728	Capacitor—500 Mfd. (C33)	24
12738	Capacitor—500 Mfd. (C33)	24
12748	Capacitor—500 Mfd. (C33)	24
12758	Capacitor—500 Mfd. (C33)	24
12768	Capacitor—500 Mfd. (C33)	24
12778	Capacitor—500 Mfd. (C33)	24
12788	Capacitor—500 Mfd. (C33)	24
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12858	Capacitor—500 Mfd. (C33)	24
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12898	Capacitor—500 Mfd. (C33)	24
12908	Capacitor—500 Mfd. (C33)	24
12918	Capacitor—500 Mfd. (C33)	24
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12938	Capacitor—500 Mfd. (C33)	24
12948	Capacitor—500 Mfd. (C33)	24
12958	Capacitor—500 Mfd. (C33)	24
12968	Capacitor—500 Mfd. (C33)	24
12978	Capacitor—500 Mfd. (C33)	24
12988	Capacitor—500 Mfd. (C33)	24
12998	Capacitor—500 Mfd. (C33)	24
13008	Capacitor—500 Mfd. (C33)	24
13018	Capacitor—500 Mfd. (C33)	24
13028	Capacitor—500 Mfd. (C33)	24
13038	Capacitor—500 Mfd. (C33)	24
13048	Capacitor—500 Mfd. (C33)	24
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13088	Capacitor—500 Mfd. (C33)	24
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13438	Capacitor—500 Mfd. (C33)	24
13448	Capacitor—500 Mfd. (C33)	24
13458	Capacitor—500 Mfd. (C33)	24
13468	Capacitor—500 Mfd. (C33)	24
13478	Capacitor—500 Mfd. (C33)	24
13488	Capacitor—500 Mfd. (C33)	24
13498	Capacitor—500 Mfd. (C33)	24
13508	Capacitor—500 Mfd. (C33)	24
13518	Capacitor—500 Mfd. (C33)	24
13528	Capacitor—500 Mfd. (C33)	24
13538	Capacitor—500 Mfd. (C33)	24
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13558	Capacitor—500 Mfd. (C33)	24
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13578	Capacitor—500 Mfd. (C33)	24
13588	Capacitor—500 Mfd. (C33)	24
13598	Capacitor—500 Mfd. (C33)	24
13608	Capacitor—500 Mfd. (C33)	24
13618	Capacitor—500 Mfd. (C33)	24
13628	Capacitor—500 Mfd. (C33)	24
13638	Capacitor—500 Mfd. (C33)	24
13648	Capacitor—500 Mfd. (C33)	24
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13668	Capacitor—500 Mfd. (C33)	24
13678	Capacitor—500 Mfd. (C33)	24
13688	Capacitor—500 Mfd. (C33)	24
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13728	Capacitor—500 Mfd. (C33)	24
13738	Capacitor—500 Mfd. (C33)	24
13748	Capacitor—500 Mfd. (C33)	24
13758	Capacitor—500 Mfd. (C33)	24
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13778	Capacitor—500 Mfd. (C33)	24
13788	Capacitor—500 Mfd. (C33)	24
13798	Capacitor—500 Mfd. (C33)	24
13808	Capacitor—500 Mfd. (C33)	24
13818	Capacitor—500 Mfd. (C33)	24
13828	Capacitor—500 Mfd. (C33)	24
13838	Capacitor—500 Mfd. (C33)	24
13848	Capacitor—500 Mfd. (C33)	24
13858	Capacitor—500 Mfd. (C33)	24
13868	Capacitor—500 Mfd. (C33)	24
13878	Capacitor—500 Mfd. (C33)	24
13888	Capacitor—500 Mfd. (C33)	24
13898	Capacitor—500 Mfd. (C33)	24
13908	Capacitor—500 Mfd. (C33)	24
13918	Capacitor—500 Mfd. (C33)	24
13928	Capacitor—500 Mfd. (C33)	24
13938	Capacitor—500 Mfd. (C33)	24
13948	Capacitor—500 Mfd. (C33)	24
13958	Capacitor—500 Mfd. (C33)	24
13968	Capacitor—500 Mfd. (C33)	24
13978	Capacitor—500 Mfd. (C33)	24
13988	Capacitor—500 Mfd. (C33)	24
13998	Capacitor—500 Mfd. (C33)	24
14008	Capacitor—500 Mfd. (C33)	24

(h) Decrease volume as necessary and set Tone Control to "Bass," "Music" or "Speech" for preferred quality of reproduction. Pull tone range reproduction is obtained with the knob set to "100."

(i) Silent Tuning may be obtained by reducing the volume until no signals are heard, and then tuning by means of the visual indications of the electronic tuning indicator.

(j) Unwanted signals in the heterodyne band may be eliminated by adjusting the heterodyne beat frequency of the heterodyne circuit. For this purpose it should be tuned exactly to the intermediate frequency of the receiver by turning the Heterodyne Control to "0," which sets an audio-frequency tone of the same frequency as the heterodyne beat. An incoming signal when the Beat-Oscillator Switch is turned "on." Any other carrier will be tuned to exact resonance when the gang or tuning capacitor is adjusted for "zero beat" and weak signals will be heard. The heterodyne "whistle" produced by strength because of the heterodyne "whistle" produced while passing through resonance. After proper adjustment has been made, turn Beat-Oscillator Switch "off."

(k) C.W. Signals—For c.w. (code) reception the same procedure should be used as for modulated signals except that the Beat-Oscillator performs a definite rather than incidental function. It is set, not at the intermediate frequency, but slightly above or below so as to provide an audio-frequency heterodyne tone. The heterodyne control should be used as with any carrier. Adjust the pitch with the Heterodyne Control. Turn A.V.C. Switch "off" when receiving slow speed c.w. transmission.

(l) Selectivity—The value of the Crystal Selectivity Control should be the same for modulated signals as for c.w. signals. The Selectivity Control should be set so that the heterodyne tone is just above or below the desired station frequency. The Selectivity Control should be set so that the heterodyne tone is just above or below the desired station frequency. The Selectivity Control should be set so that the heterodyne tone is just above or below the desired station frequency.

(1) Tuning is extremely critical with control in the "Max." position and in consequence the movement of the slow speed Tuning knob should be very slow and deliberate.

(2) Feet and inches should be indicated on the minimum selectivity.

(3) Remember to set Tone Control at "Speech" for stable operation of Crystal Selectivity Control.

FOR SELECTIVITY CONTROL CURVES SEE INDEX

Antenna

A most important factor in good reception is the antenna. The antenna should be of the type having properties as well as a definite "length" to suit the signal frequency are essential antenna requirements for good reception. A special antenna requirement is the antenna of the single- or double-Dipole antenna system consists of two double antennas having different lengths and therefore different resonating characteristics. They are interconnected so that one will compensate for the setting frequency range. A Triple-Dipole antenna system consists of three antennas of lengths cut to suit individual requirements will give still better results. Be sure to obtain the latest information on RCA Antennas. Dipole lengths, as well as the antenna constants, are recommended for the receiver's antenna bands.

The triple- or double-dipole is most easily applied to those bands for which the same doubling factor can be used. For example, a doubling factor of 2 can be used for 100 and 200 meters, but not for 150 and 300 meters, or 40 and 80 meters. Proper cross connections must be made on all dipole systems as illustrated in Figure 1.

Standard RCA Transmission Line should be used for antenna connections. It is recommended that the antenna be connected to the above mentioned antenna conditions.

FOR SELECTIVITY CONTROL CURVES SEE INDEX

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Standard RCA Transmission Line should be used for antenna connections. It is recommended that the antenna be connected to the above mentioned antenna conditions.

of the output tube, a blocking condenser being used to isolate the d.c. voltage. The loudspeaker field which is employed as a filter for the rectifier stage, still forms a part of the antenna circuit. The antenna is connected to the antenna plug part of the speaker signal by means of the loudspeaker signal to be obtained. The loudspeaker is connected to the chassis by means of a cable and plug.

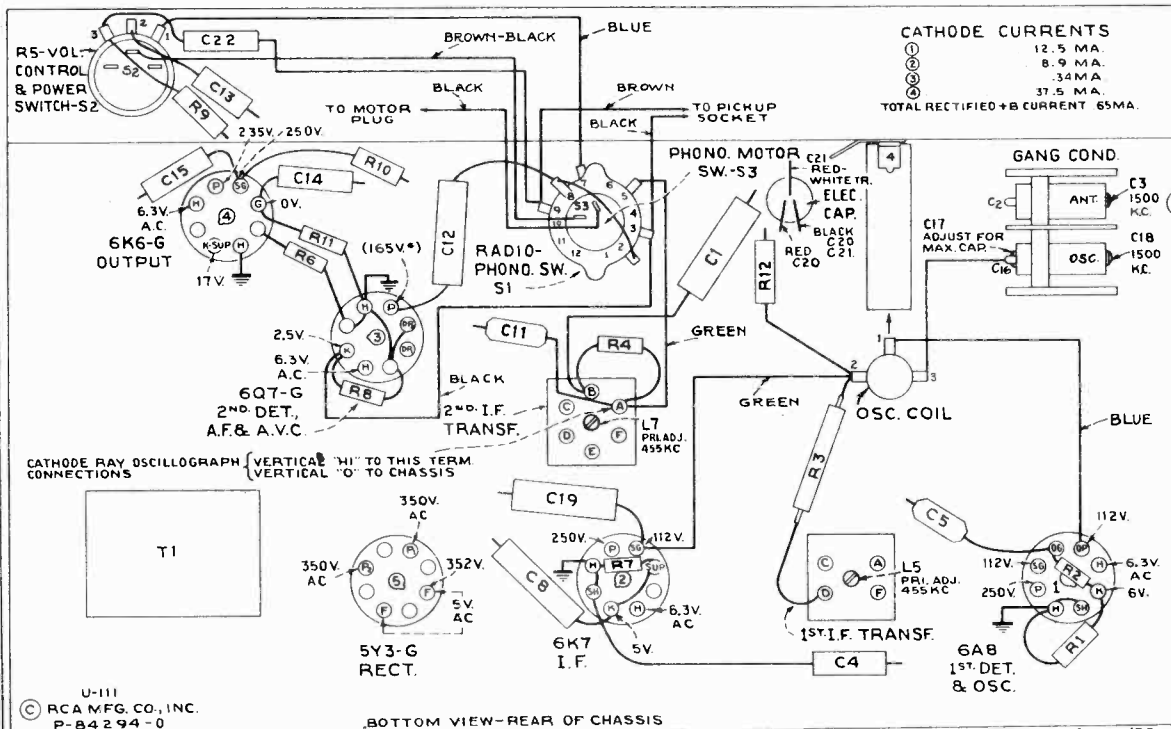
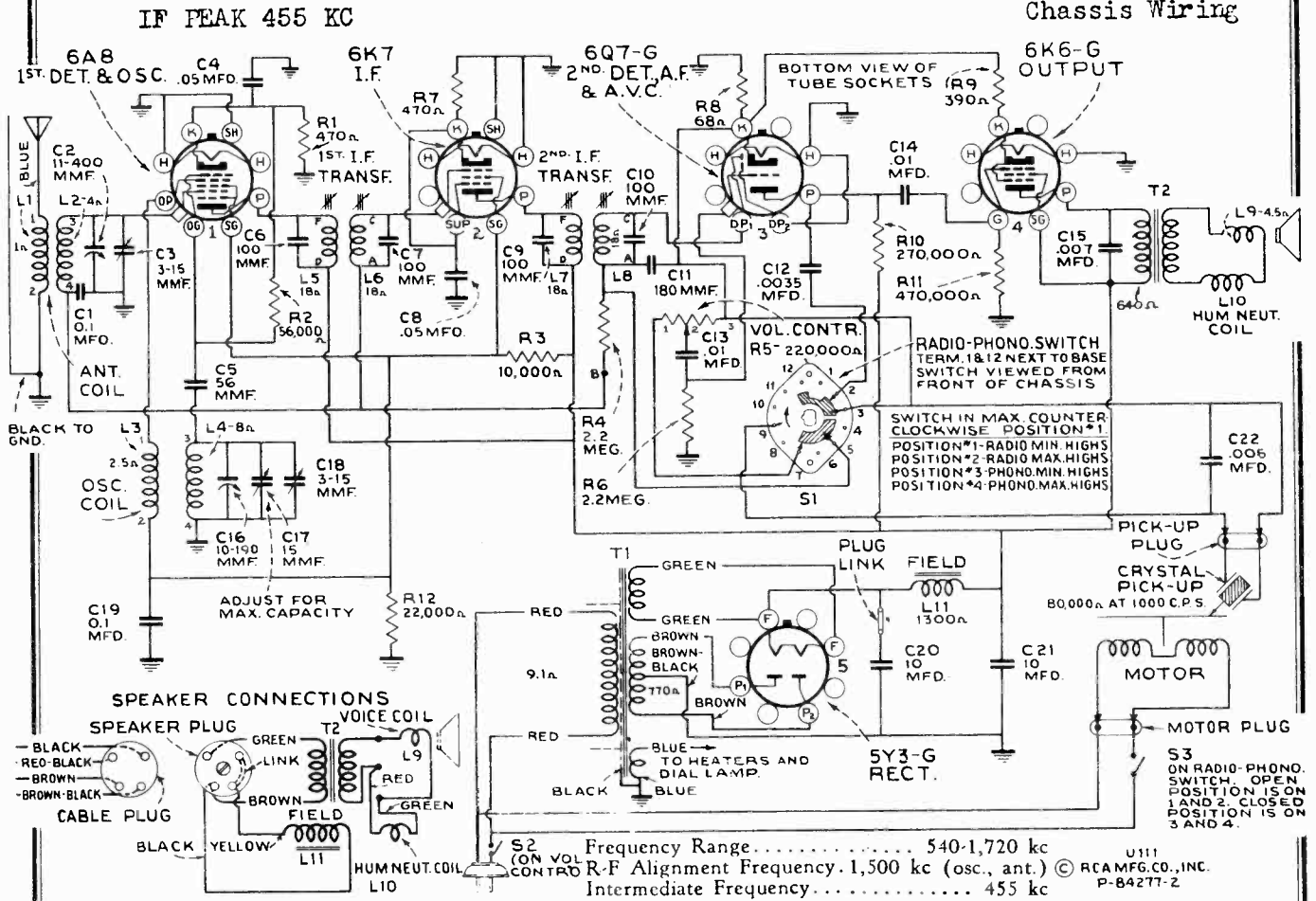
The Tuning Dial is of the airplane type, semi-circular, illuminated, and clearly marked. It incorporates a mechanical band-spread system with two vernier scales (outside and central), particularly suited to amateur or other work where precise adjustment and has a spread reduction ratio of 100:1. The combination of the high ratio tuning drive and the vernier scales makes it possible to make precise and easy tuning adjustments.

The range of frequencies which the receiver covers is indicated by the frequency limits (for example, 100 to 10,000) which are tabulated under "Elect



RCA MFG. CO., INC.

MODEL U 111  
Schematic, Voltage  
Chassis Wiring



Dial Lamp..... Mazda No. 46, 6.3 volts, 0.25-amps.  
Power Output (125-volt, a-c supply)..... 2.0 watts  
Undistorted.....  
Maximum..... 3.5 watts

\* Note: Values with star (\*) are operating voltages.  
Values not starred are actual measured voltages.  
Measurements made to chassis unless otherwise indicated.  
Measurements made with set tuned to quiet point, volume control at minimum, using 1,000-ohm-per-volt meter, having

ranges of 10, 50, 250, and 500 volts. (Use nearest range above the specified measured voltage.)  
Values should hold within approximately ± 20% for 117-volt 60-cycle supply.



MODEL U 111  
Socket, Trimmers

RCA MFG. CO., INC.

Phono, Alignment  
Parts, Lead Dress

**Service Data**

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be repeated until the speaker is centered. The dust cover may be acetone using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place with an arbrod upon completion of adjustment.

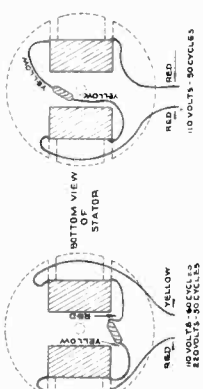


Figure 5—Motor Coil Assembly and Connections  
D-C resistance of each coil (for 110 volts, 50 and 60 cycles) is approximately 81 ohms.

**PHONOGRAPH MOTOR SERVICE DATA**

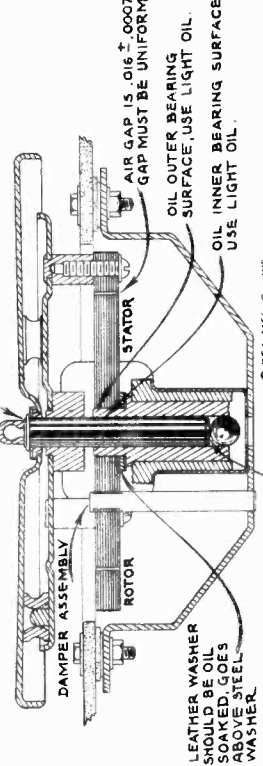
1. Motor not properly supported from motor board.  
2. Burrs on poles of rotor or stator. Remove with fine emery cloth.

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

**Rotor Adjustment.**—Loosen the three screws that hold the rotor to the motor housing. The rotor should be spaced evenly around the top 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.

**Lubrication.**—Oiling points are indicated in figure.

**TURNTABLE HELD ON SHAFT BY RETAINING RING & WASHER**



© RCA MFG. CO., INC.  
SN 756

**Alignment Procedure**

**Pre-setting dial.**—With gang condenser in full mesh, move dial pointer to coincide with horizontal lines. This is a friction adjustment.

**Re-wiring I.F. Adjustment Screws.**—After completion of alignment, seal the I.F. magnetron core adjustment screws with a few drops of household cement.

Step	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	6K7 I.F. grid with 01 mfd.	455 kc	Quiet point between 550-750 kc	L7 and L8 (2nd I.F. Transformer)
No. 2	6A8 1st-det. grid exp. in series with .01 mfd.	455 kc		L5 and L6 (1st I.F. Transformer)
No. 3	Antenna lead, in series with 200 mmfd.	1,500 kc	1,500 kc	C18* (use C3 antenna)

\* Trimmer C17 on gang condenser should be screwed clockwise for maximum capacity before adjusting C18.

**Loudspeaker**  
Type..... 5 inch electrodynamic  
V-C impedance..... 5 ohms at 400 cycles  
Power Supply Ratings  
Rating A-6..... 105-125 volts, 60 cycles, 80 watts  
Rating A-5..... 105-125 volts, 50 cycles, 80 watts

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 figure 1. The motor is started by turning on the power switch and giving the turntable a clockwise spin 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.)

**Phonograph Motor Service Data**

1. Motor not properly supported from motor board.  
2. Burrs on poles of rotor or stator. Remove with fine emery cloth.

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

**Rotor Adjustment.**—Loosen the three screws that hold the rotor to the motor housing. The rotor should be spaced evenly around the top 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.

**Lubrication.**—Oiling points are indicated in figure.

**TURNTABLE HELD ON SHAFT BY RETAINING RING & WASHER**

**Alignment Procedure**

**Pre-setting dial.**—With gang condenser in full mesh, move dial pointer to coincide with horizontal lines. This is a friction adjustment.

**Re-wiring I.F. Adjustment Screws.**—After completion of alignment, seal the I.F. magnetron core adjustment screws with a few drops of household cement.

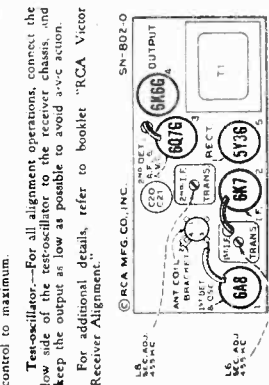


Figure 2—Radiotron and Trimmer Locations

**Precautory Lead Dress**

- Dress power leads to phono motor cable switch away from the audio wiring.
- Dress power cord and motor cable to end of chassis (free from volume control wiring).
- Dress pilot lamp lead away from 6Q7G grid.
- Capacitors C13 and C15 (located at volume control) must be dressed at right angles to each other and as far apart as possible.

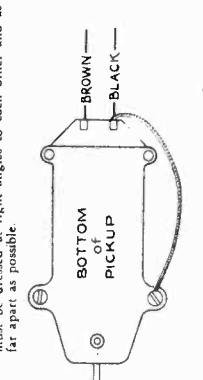


Figure 6—Pickup Connections

**REPLACEMENT PARTS**

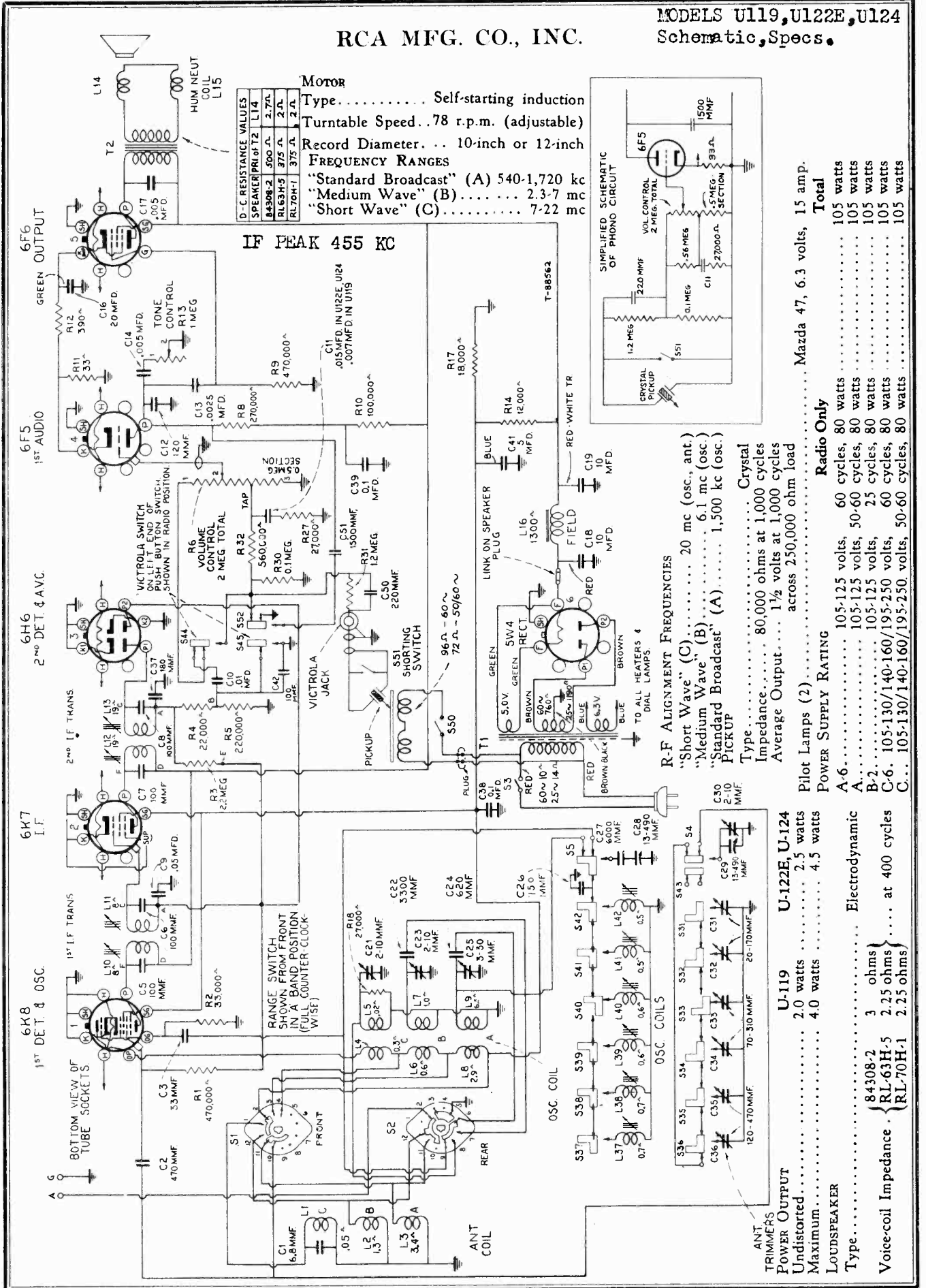
Insist on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	Unit Price	STOCK No.	DESCRIPTION	Unit Price
4387	Body—Dial cable, connector body	.02	31045	Base—Motor support, damper, and bearing cup	.60
31077	Bushing—Pickup cable connector, bushing and bearing assembly	1.00	31046	Bearing—Bearing assembly	.70
4288	Cap—Grid connector cap	.05	31047	Cap—Rubber spindle cap	.05
11360	Capacitor—.48 mmfd. (C5)	.35	31048	Motor—110 volt, 50 cycle—complete with mount	8.90
35224	Capacitor—.10 mmfd. (C1)	.25	9841	Motor—110 volt, 60 cycle—complete with mount	8.50
31003	Capacitor—.180 mmfd. (C1, C7, C9, C10)	.35	31049	Mounting—Turntable top, rubber mounting	.26
30303	Capacitor—.025 mmfd. (C12)	.40	31037	Adjustment for one turntable	4.65
30303	Capacitor—.007 mfd. (C22)	.55	31038	Complete for 90 cycle operation assembly	4.65
3148	Capacitor—.007 mfd. (C22)	.55	31043	Stator—Stator assembly complete with coils and complete for 60 cycle operation	4.56
14323	Capacitor—.05 mfd. (C4, C9)	.30	31042	Stator—Stator assembly complete with coils and complete for 90 cycle operation	2.50
30889	Capacitor—.05 mfd. (C4, C9)	.30	31042	Stator—Stator assembly complete with coils and complete for 90 cycle operation	2.50
31099	Capacitor—Compensating 2 sections each 10 mfd. (C20, C21)	1.75	31039	Washer—Metal spacing washer	.02
30894	Coil—Oscillator coil (L3, L4)	.85	4083	Washer—Leather washer	.02
31087	Coil—C6, C16, C17, C18	2.70	14521	Washer—Metal spacing washer	.02
30877	Coil—Oscillator coil (L3, L4)	.85			
30965	Condenser—.5 meg, variable tuning condenser (C6, C16, C17, C18)	2.70			
31075	Diodes—Diode selector dial cable and holder	.35	31049	Base—Motor support, damper, and bearing cup	.65
30886	Indicator—Station selector indicator pointer	.40	4288	Motor—110 volt, 50 cycle—complete with mount	.25
6226	Lamp—Dial lamp	.17	31080	Pickup—Pickup crystal and needle screw	3.75
15676	Reactor—300 ohms, 1 watt (R9)	.30	9842	Pickup—Pickup crystal and needle screw	3.75
30548	Reactor—300 ohms, 1 watt (R9)	.30	12539	Screw—Pickup needle screw	4.22
31108	Reactor—10,000 ohms, wire wound, 3 watt (R30)	.20			
30736	Reactor—32,000 ohms, 1 watt (R12)	.35			
12286	Reactor—50,000 ohms, 1 watt (R21)	.30	31110	Core—Reproducer core and voice coil (L9)	1.80
12285	Reactor—470,000 ohms, 1 watt (R11)	.20	31109	Reproducer—Complete plug for reproducer	4.35
12879	Reactor—2.2 meg, 1 watt (R4, R6)	.20	31111	Transformer—Output transformer (T2)	1.45
30826	Socket—2-contact female socket for motor power	.35			
15040	Socket—4-contact female socket for speaker cable	.30	30921	Crystal—Station selector dial crystal	.45
11186	Socket—Dial lamp socket assembly	.25	13045	Knob—Station selector, volume control or radio	.24
30821	Spring—Indicator drive cord tension spring	.04	30853	Knob—Station selector, volume control or radio	.24
3284	Spring—Pickup cable connector spring	.25	31053	Mounting—Motor mounting screw assembly complete	.15
30802	Transformer—First of transformer (L5, L6, C8, C7)	1.80	31064	Mounting—Pickup arm mounting nuts, washer and rubber spacer	.30
30903	Transformer—Second of transformer (L7, L8, C9, C10)	1.40	30976	Plug—Contact male plug for motor leads	.35
30607	Transformer—Power transformer, 105-125 volts, 80 watts	7.55	31079	Screw—Chassis mounting screw and washer	.20
30881	Volume Control and power switch (R5, S2)	1.50	30909	Spring—Retaining spring for knob Stock No. 30885	.25
4285	Washer—Pickup cable connector insulating washer	.25	31184	Support—Cabinet lid support	.45

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RCA MFG. CO., INC.

MODELS U119, U122E, U124  
Schematic, Specs.

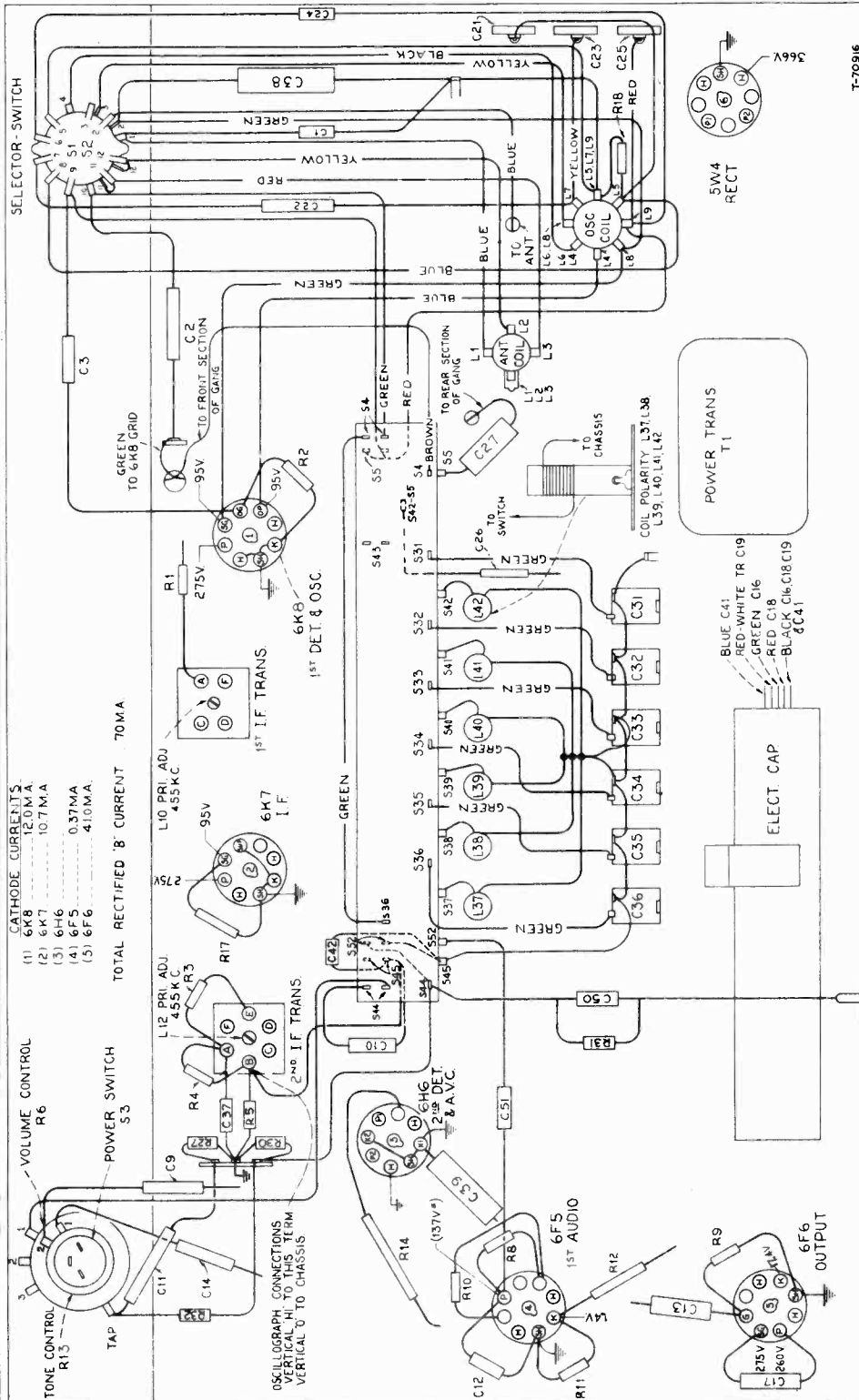


MODELS U119, U122E, U124  
Voltage, Chassis Wiring  
Transformers, Lead Dress

RCA MFG. CO., INC.

\* 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.

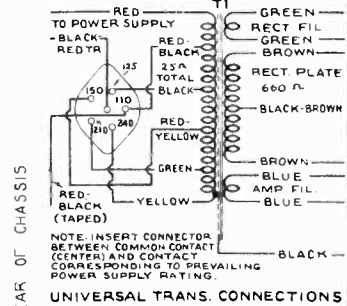
Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within  $\pm 20\%$  with 117-volt a-c supply.



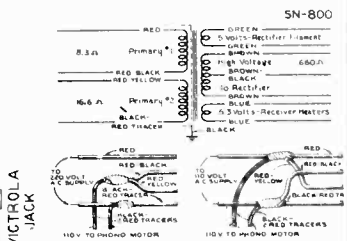
Six Electric Tuning Positions..... 550-1,500 kc  
2 stations between approximately 550- 950 kc (Buttons 1 and 2)  
2 stations between approximately 680-1,180 kc (Buttons 3 and 4)  
2 stations between approximately 890-1,500 kc (Buttons 5 and 6)

Precautionary Lead Dress—

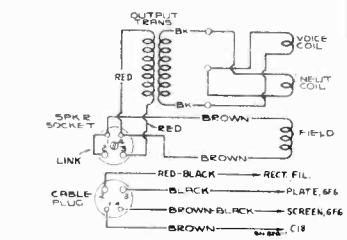
1. Dress power-switch leads against left apron to prevent hum pickup.
2. Dress R1 away from front of chassis.
3. Leads across back of chassis should be dressed under electrolytic to prevent approaching Victrola jack.
4. Dress lead from L5 to range switch away from other leads.
5. Dress leads away from antenna coil.
6. Dress other parts and leads away from R14, as it becomes heated.



Below — Universal Power Transformer Connections. (110-volt supply for the Victrola motor is obtained by connecting the motor to the red and the red-black leads.)



Above—Replacement Universal Power Transformer. (Stock No. 31446.)



Above — Connections and Colors of Loudspeaker and Cable.

## ADJUSTMENTS FOR ELECTRIC TUNING

These models have eight push buttons. The left-hand button is a Victrola switch. The right-hand button connects the gang condenser for manual tuning. The other six buttons are for electric tuning of six different stations in the standard-broadcast range. The station 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.

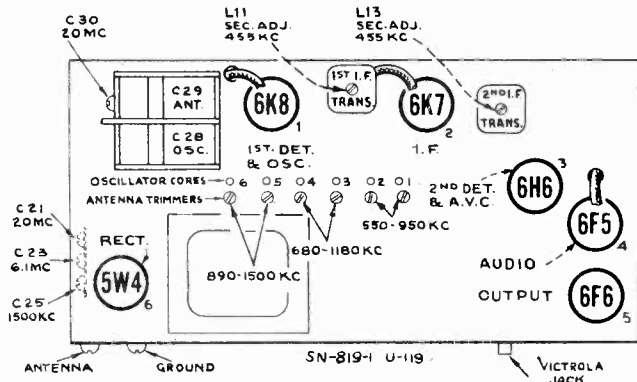
Use one or two feet of wire as an antenna to ensure sharp peaking.

The procedure is as follows:

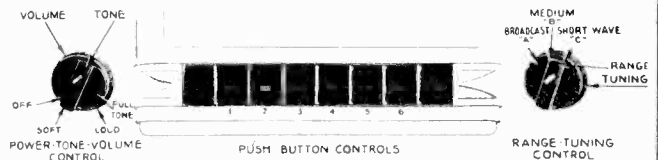
1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning button, and manually tune in the first station on the list.
3. Push in station button No. 1 (second from left) and adjust No. 1 oscillator core (L37) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer (C36) for maximum output on this station.

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

5. Adjust for each of the remaining five stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers.

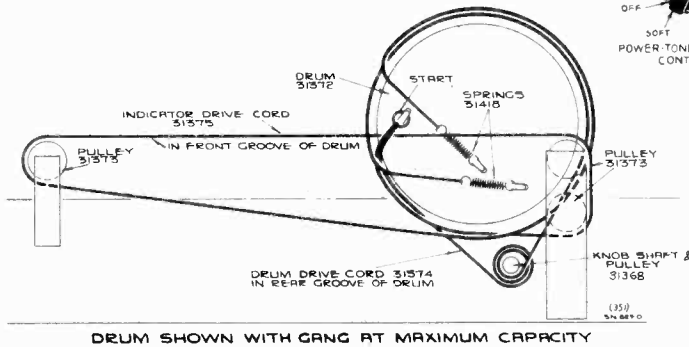


Tube and Trimmer Locations



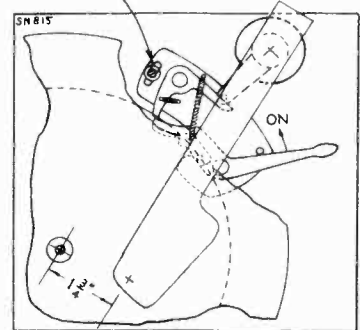
Location of Controls

The left-hand push-button is a Victrola switch.  
The right-hand push-button is for dial tuning.

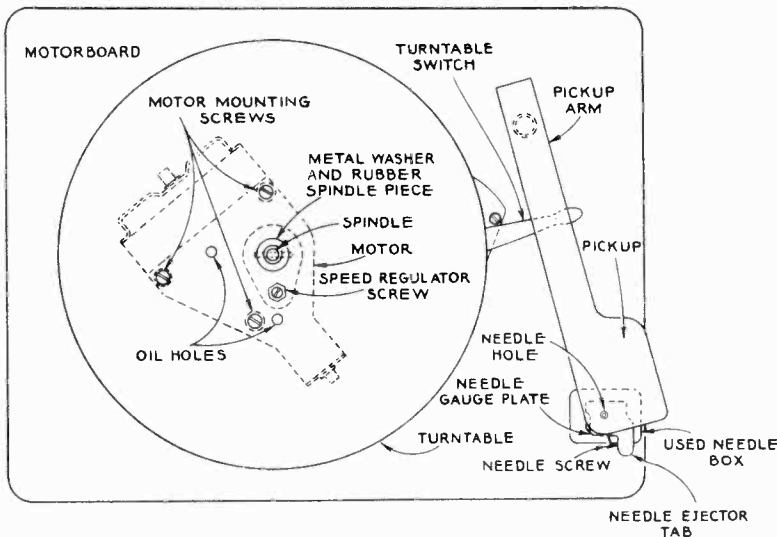


Arrangement of Drive Cords for Tuning Condenser and Dial Indicator

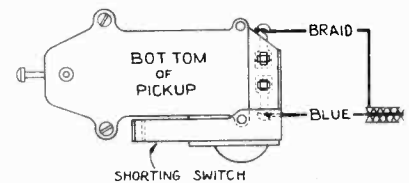
ADJUST SWITCH TO TRIP WHEN NEEDLE IS ON 1-3/4" RADIUS FROM C. OF MOTOR SPINDLE



Adjustment of Automatic Switch



Top View of Motor Board



Pickup Connections

MODELS U119, U122E, U124  
Alignment, Motor Data  
Parts

RCA MFG. CO., INC.

ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.

STOCK No.	DESCRIPTION	Unit Price	STOCK No.	DESCRIPTION	Unit Price
14974	Receiver Assemblies	.25	14974	Reactor—22,000 ohms, 1/10 watt (R4)	.15
14975	Reactor—27,000 ohms, 1/10 watt (R4)	.20	14975	Reactor—27,000 ohms, 1/10 watt (R4)	.20
14976	Reactor—100,000 ohms, 1/10 watt (R10, R30)	.20	14976	Reactor—100,000 ohms, 1/10 watt (R10, R30)	.20
14977	Reactor—200,000 ohms, 1/10 watt (R10, R30)	.20	14977	Reactor—200,000 ohms, 1/10 watt (R10, R30)	.20
14978	Reactor—400,000 ohms, 1/10 watt (R10, R30)	.20	14978	Reactor—400,000 ohms, 1/10 watt (R10, R30)	.20
14979	Reactor—800,000 ohms, 1/10 watt (R10, R30)	.20	14979	Reactor—800,000 ohms, 1/10 watt (R10, R30)	.20
14980	Reactor—1,600,000 ohms, 1/10 watt (R10, R30)	.20	14980	Reactor—1,600,000 ohms, 1/10 watt (R10, R30)	.20
14981	Reactor—3,200,000 ohms, 1/10 watt (R10, R30)	.20	14981	Reactor—3,200,000 ohms, 1/10 watt (R10, R30)	.20
14982	Reactor—6,400,000 ohms, 1/10 watt (R10, R30)	.20	14982	Reactor—6,400,000 ohms, 1/10 watt (R10, R30)	.20
14983	Reactor—12,800,000 ohms, 1/10 watt (R10, R30)	.20	14983	Reactor—12,800,000 ohms, 1/10 watt (R10, R30)	.20
14984	Reactor—25,600,000 ohms, 1/10 watt (R10, R30)	.20	14984	Reactor—25,600,000 ohms, 1/10 watt (R10, R30)	.20
14985	Reactor—51,200,000 ohms, 1/10 watt (R10, R30)	.20	14985	Reactor—51,200,000 ohms, 1/10 watt (R10, R30)	.20
14986	Reactor—102,400,000 ohms, 1/10 watt (R10, R30)	.20	14986	Reactor—102,400,000 ohms, 1/10 watt (R10, R30)	.20
14987	Reactor—204,800,000 ohms, 1/10 watt (R10, R30)	.20	14987	Reactor—204,800,000 ohms, 1/10 watt (R10, R30)	.20
14988	Reactor—409,600,000 ohms, 1/10 watt (R10, R30)	.20	14988	Reactor—409,600,000 ohms, 1/10 watt (R10, R30)	.20
14989	Reactor—819,200,000 ohms, 1/10 watt (R10, R30)	.20	14989	Reactor—819,200,000 ohms, 1/10 watt (R10, R30)	.20
14990	Reactor—1,638,400,000 ohms, 1/10 watt (R10, R30)	.20	14990	Reactor—1,638,400,000 ohms, 1/10 watt (R10, R30)	.20
14991	Reactor—3,276,800,000 ohms, 1/10 watt (R10, R30)	.20	14991	Reactor—3,276,800,000 ohms, 1/10 watt (R10, R30)	.20
14992	Reactor—6,553,600,000 ohms, 1/10 watt (R10, R30)	.20	14992	Reactor—6,553,600,000 ohms, 1/10 watt (R10, R30)	.20
14993	Reactor—13,107,200,000 ohms, 1/10 watt (R10, R30)	.20	14993	Reactor—13,107,200,000 ohms, 1/10 watt (R10, R30)	.20
14994	Reactor—26,214,400,000 ohms, 1/10 watt (R10, R30)	.20	14994	Reactor—26,214,400,000 ohms, 1/10 watt (R10, R30)	.20
14995	Reactor—52,428,800,000 ohms, 1/10 watt (R10, R30)	.20	14995	Reactor—52,428,800,000 ohms, 1/10 watt (R10, R30)	.20
14996	Reactor—104,857,600,000 ohms, 1/10 watt (R10, R30)	.20	14996	Reactor—104,857,600,000 ohms, 1/10 watt (R10, R30)	.20
14997	Reactor—209,715,200,000 ohms, 1/10 watt (R10, R30)	.20	14997	Reactor—209,715,200,000 ohms, 1/10 watt (R10, R30)	.20
14998	Reactor—419,430,400,000 ohms, 1/10 watt (R10, R30)	.20	14998	Reactor—419,430,400,000 ohms, 1/10 watt (R10, R30)	.20
14999	Reactor—838,860,800,000 ohms, 1/10 watt (R10, R30)	.20	14999	Reactor—838,860,800,000 ohms, 1/10 watt (R10, R30)	.20
15000	Reactor—1,677,721,600,000 ohms, 1/10 watt (R10, R30)	.20	15000	Reactor—1,677,721,600,000 ohms, 1/10 watt (R10, R30)	.20
15001	Reactor—3,355,443,200,000 ohms, 1/10 watt (R10, R30)	.20	15001	Reactor—3,355,443,200,000 ohms, 1/10 watt (R10, R30)	.20
15002	Reactor—6,710,886,400,000 ohms, 1/10 watt (R10, R30)	.20	15002	Reactor—6,710,886,400,000 ohms, 1/10 watt (R10, R30)	.20
15003	Reactor—13,421,772,800,000 ohms, 1/10 watt (R10, R30)	.20	15003	Reactor—13,421,772,800,000 ohms, 1/10 watt (R10, R30)	.20
15004	Reactor—26,843,545,600,000 ohms, 1/10 watt (R10, R30)	.20	15004	Reactor—26,843,545,600,000 ohms, 1/10 watt (R10, R30)	.20
15005	Reactor—53,687,091,200,000 ohms, 1/10 watt (R10, R30)	.20	15005	Reactor—53,687,091,200,000 ohms, 1/10 watt (R10, R30)	.20
15006	Reactor—107,374,182,400,000 ohms, 1/10 watt (R10, R30)	.20	15006	Reactor—107,374,182,400,000 ohms, 1/10 watt (R10, R30)	.20
15007	Reactor—214,748,364,800,000 ohms, 1/10 watt (R10, R30)	.20	15007	Reactor—214,748,364,800,000 ohms, 1/10 watt (R10, R30)	.20
15008	Reactor—429,496,729,600,000 ohms, 1/10 watt (R10, R30)	.20	15008	Reactor—429,496,729,600,000 ohms, 1/10 watt (R10, R30)	.20
15009	Reactor—858,993,459,200,000 ohms, 1/10 watt (R10, R30)	.20	15009	Reactor—858,993,459,200,000 ohms, 1/10 watt (R10, R30)	.20
15010	Reactor—1,717,986,918,400,000 ohms, 1/10 watt (R10, R30)	.20	15010	Reactor—1,717,986,918,400,000 ohms, 1/10 watt (R10, R30)	.20
15011	Reactor—3,435,973,836,800,000 ohms, 1/10 watt (R10, R30)	.20	15011	Reactor—3,435,973,836,800,000 ohms, 1/10 watt (R10, R30)	.20
15012	Reactor—6,871,947,673,600,000 ohms, 1/10 watt (R10, R30)	.20	15012	Reactor—6,871,947,673,600,000 ohms, 1/10 watt (R10, R30)	.20
15013	Reactor—13,743,895,347,200,000 ohms, 1/10 watt (R10, R30)	.20	15013	Reactor—13,743,895,347,200,000 ohms, 1/10 watt (R10, R30)	.20
15014	Reactor—27,487,788,694,400,000 ohms, 1/10 watt (R10, R30)	.20	15014	Reactor—27,487,788,694,400,000 ohms, 1/10 watt (R10, R30)	.20
15015	Reactor—54,975,577,388,800,000 ohms, 1/10 watt (R10, R30)	.20	15015	Reactor—54,975,577,388,800,000 ohms, 1/10 watt (R10, R30)	.20
15016	Reactor—109,951,154,777,600,000 ohms, 1/10 watt (R10, R30)	.20	15016	Reactor—109,951,154,777,600,000 ohms, 1/10 watt (R10, R30)	.20
15017	Reactor—219,902,309,555,200,000 ohms, 1/10 watt (R10, R30)	.20	15017	Reactor—219,902,309,555,200,000 ohms, 1/10 watt (R10, R30)	.20
15018	Reactor—439,804,619,110,400,000 ohms, 1/10 watt (R10, R30)	.20	15018	Reactor—439,804,619,110,400,000 ohms, 1/10 watt (R10, R30)	.20
15019	Reactor—879,609,238,220,800,000 ohms, 1/10 watt (R10, R30)	.20	15019	Reactor—879,609,238,220,800,000 ohms, 1/10 watt (R10, R30)	.20
15020	Reactor—1,759,218,476,441,600,000 ohms, 1/10 watt (R10, R30)	.20	15020	Reactor—1,759,218,476,441,600,000 ohms, 1/10 watt (R10, R30)	.20
15021	Reactor—3,518,436,952,883,200,000 ohms, 1/10 watt (R10, R30)	.20	15021	Reactor—3,518,436,952,883,200,000 ohms, 1/10 watt (R10, R30)	.20
15022	Reactor—7,036,873,905,766,400,000 ohms, 1/10 watt (R10, R30)	.20	15022	Reactor—7,036,873,905,766,400,000 ohms, 1/10 watt (R10, R30)	.20
15023	Reactor—14,073,747,811,532,800,000 ohms, 1/10 watt (R10, R30)	.20	15023	Reactor—14,073,747,811,532,800,000 ohms, 1/10 watt (R10, R30)	.20
15024	Reactor—28,147,495,623,065,600,000 ohms, 1/10 watt (R10, R30)	.20	15024	Reactor—28,147,495,623,065,600,000 ohms, 1/10 watt (R10, R30)	.20
15025	Reactor—56,294,991,246,131,200,000 ohms, 1/10 watt (R10, R30)	.20	15025	Reactor—56,294,991,246,131,200,000 ohms, 1/10 watt (R10, R30)	.20
15026	Reactor—112,589,982,492,262,400,000 ohms, 1/10 watt (R10, R30)	.20	15026	Reactor—112,589,982,492,262,400,000 ohms, 1/10 watt (R10, R30)	.20
15027	Reactor—225,179,964,984,524,800,000 ohms, 1/10 watt (R10, R30)	.20	15027	Reactor—225,179,964,984,524,800,000 ohms, 1/10 watt (R10, R30)	.20
15028	Reactor—450,359,929,969,049,600,000 ohms, 1/10 watt (R10, R30)	.20	15028	Reactor—450,359,929,969,049,600,000 ohms, 1/10 watt (R10, R30)	.20
15029	Reactor—900,719,859,938,099,200,000 ohms, 1/10 watt (R10, R30)	.20	15029	Reactor—900,719,859,938,099,200,000 ohms, 1/10 watt (R10, R30)	.20
15030	Reactor—1,801,439,719,876,198,400,000 ohms, 1/10 watt (R10, R30)	.20	15030	Reactor—1,801,439,719,876,198,400,000 ohms, 1/10 watt (R10, R30)	.20
15031	Reactor—3,602,879,439,752,396,800,000 ohms, 1/10 watt (R10, R30)	.20	15031	Reactor—3,602,879,439,752,396,800,000 ohms, 1/10 watt (R10, R30)	.20
15032	Reactor—7,205,758,879,504,793,600,000 ohms, 1/10 watt (R10, R30)	.20	15032	Reactor—7,205,758,879,504,793,600,000 ohms, 1/10 watt (R10, R30)	.20
15033	Reactor—14,411,517,759,009,587,200,000 ohms, 1/10 watt (R10, R30)	.20	15033	Reactor—14,411,517,759,009,587,200,000 ohms, 1/10 watt (R10, R30)	.20
15034	Reactor—28,823,035,518,019,174,400,000 ohms, 1/10 watt (R10, R30)	.20	15034	Reactor—28,823,035,518,019,174,400,000 ohms, 1/10 watt (R10, R30)	.20
15035	Reactor—57,646,071,036,038,348,800,000 ohms, 1/10 watt (R10, R30)	.20	15035	Reactor—57,646,071,036,038,348,800,000 ohms, 1/10 watt (R10, R30)	.20
15036	Reactor—115,292,142,072,076,697,600,000 ohms, 1/10 watt (R10, R30)	.20	15036	Reactor—115,292,142,072,076,697,600,000 ohms, 1/10 watt (R10, R30)	.20
15037	Reactor—230,584,284,144,153,395,200,000 ohms, 1/10 watt (R10, R30)	.20	15037	Reactor—230,584,284,144,153,395,200,000 ohms, 1/10 watt (R10, R30)	.20
15038	Reactor—461,168,568,288,306,790,400,000 ohms, 1/10 watt (R10, R30)	.20	15038	Reactor—461,168,568,288,306,790,400,000 ohms, 1/10 watt (R10, R30)	.20
15039	Reactor—922,337,136,576,613,581,600,000 ohms, 1/10 watt (R10, R30)	.20	15039	Reactor—922,337,136,576,613,581,600,000 ohms, 1/10 watt (R10, R30)	.20
15040	Reactor—1,844,674,273,153,227,163,200,000 ohms, 1/10 watt (R10, R30)	.20	15040	Reactor—1,844,674,273,153,227,163,200,000 ohms, 1/10 watt (R10, R30)	.20
15041	Reactor—3,689,348,546,306,454,326,400,000 ohms, 1/10 watt (R10, R30)	.20	15041	Reactor—3,689,348,546,306,454,326,400,000 ohms, 1/10 watt (R10, R30)	.20
15042	Reactor—7,378,697,092,612,908,652,800,000 ohms, 1/10 watt (R10, R30)	.20	15042	Reactor—7,378,697,092,612,908,652,800,000 ohms, 1/10 watt (R10, R30)	.20
15043	Reactor—14,757,394,185,225,817,315,600,000 ohms, 1/10 watt (R10, R30)	.20	15043	Reactor—14,757,394,185,225,817,315,600,000 ohms, 1/10 watt (R10, R30)	.20
15044	Reactor—29,514,788,370,451,634,631,200,000 ohms, 1/10 watt (R10, R30)	.20	15044	Reactor—29,514,788,370,451,634,631,200,000 ohms, 1/10 watt (R10, R30)	.20
15045	Reactor—59,029,576,740,903,269,262,400,000 ohms, 1/10 watt (R10, R30)	.20	15045	Reactor—59,029,576,740,903,269,262,400,000 ohms, 1/10 watt (R10, R30)	.20
15046	Reactor—118,059,153,481,806,538,524,800,000 ohms, 1/10 watt (R10, R30)	.20	15046	Reactor—118,059,153,481,806,538,524,800,000 ohms, 1/10 watt (R10, R30)	.20
15047	Reactor—236,118,306,963,613,077,049,600,000 ohms, 1/10 watt (R10, R30)	.20	15047	Reactor—236,118,306,963,613,077,049,600,000 ohms, 1/10 watt (R10, R30)	.20
15048	Reactor—472,236,613,927,226,154,098,200,000 ohms, 1/10 watt (R10, R30)	.20	15048	Reactor—472,236,613,927,226,154,098,200,000 ohms, 1/10 watt (R10, R30)	.20
15049	Reactor—944,473,227,854,452,308,196,400,000 ohms, 1/10 watt (R10, R30)	.20	15049	Reactor—944,473,227,854,452,308,196,400,000 ohms, 1/10 watt (R10, R30)	.20
15050	Reactor—1,888,946,455,708,904,616,392,800,000 ohms, 1/10 watt (R10, R30)	.20	15050	Reactor—1,888,946,455,708,904,616,392,800,000 ohms, 1/10 watt (R10, R30)	.20
15051	Reactor—3,777,892,911,417,809,232,785,600,000 ohms, 1/10 watt (R10, R30)	.20	15051	Reactor—3,777,892,911,417,809,232,785,600,000 ohms, 1/10 watt (R10, R30)	.20
15052	Reactor—7,555,785,822,835,618,465,571,200,000 ohms, 1/10 watt (R10, R30)	.20	15052	Reactor—7,555,785,822,835,618,465,571,200,000 ohms, 1/10 watt (R10, R30)	.20
15053	Reactor—15,111,571,645,671,236,930,942,400,000 ohms, 1/10 watt (R10, R30)	.20	15053	Reactor—15,111,571,645,671,236,930,942,400,000 ohms, 1/10 watt (R10, R30)	.20
15054	Reactor—30,223,143,291,342,473,863,884,800,000 ohms, 1/10 watt (R10, R30)	.20	15054	Reactor—30,223,143,291,342,473,863,884,800,000 ohms, 1/10 watt (R10, R30)	.20
15055	Reactor—60,446,286,582,684,947,727,769,600,000 ohms, 1/10 watt (R10, R30)	.20	15055	Reactor—60,446,286,582,684,947,727,769,600,000 ohms, 1/10 watt (R10, R30)	.20
15056	Reactor—120,892,573,165,369,895,455,539,200,000 ohms, 1/10 watt (R10, R30)	.20	15056	Reactor—120,892,573,165,369,895,455,539,200,000 ohms, 1/10 watt (R10, R30)	.20
15057	Reactor—241,785,146,330,739,790,911,078,400,000 ohms, 1/10 watt (R10, R30)	.20	15057	Reactor—241,785,146,330,739,790,911,078,400,000 ohms, 1/10 watt (R10, R30)	.20
15058	Reactor—483,570,292,661,479,581,822,156,800,000 ohms, 1/10 watt (R10, R30)	.20	15058	Reactor—483,570,292,661,479,581,822,156,800,000 ohms, 1/10 watt (R10, R30)	.20
15059	Reactor—				



RCA MFG. CO., INC.

MODELS 810K, 810K1, 810T  
Schematic, Notes

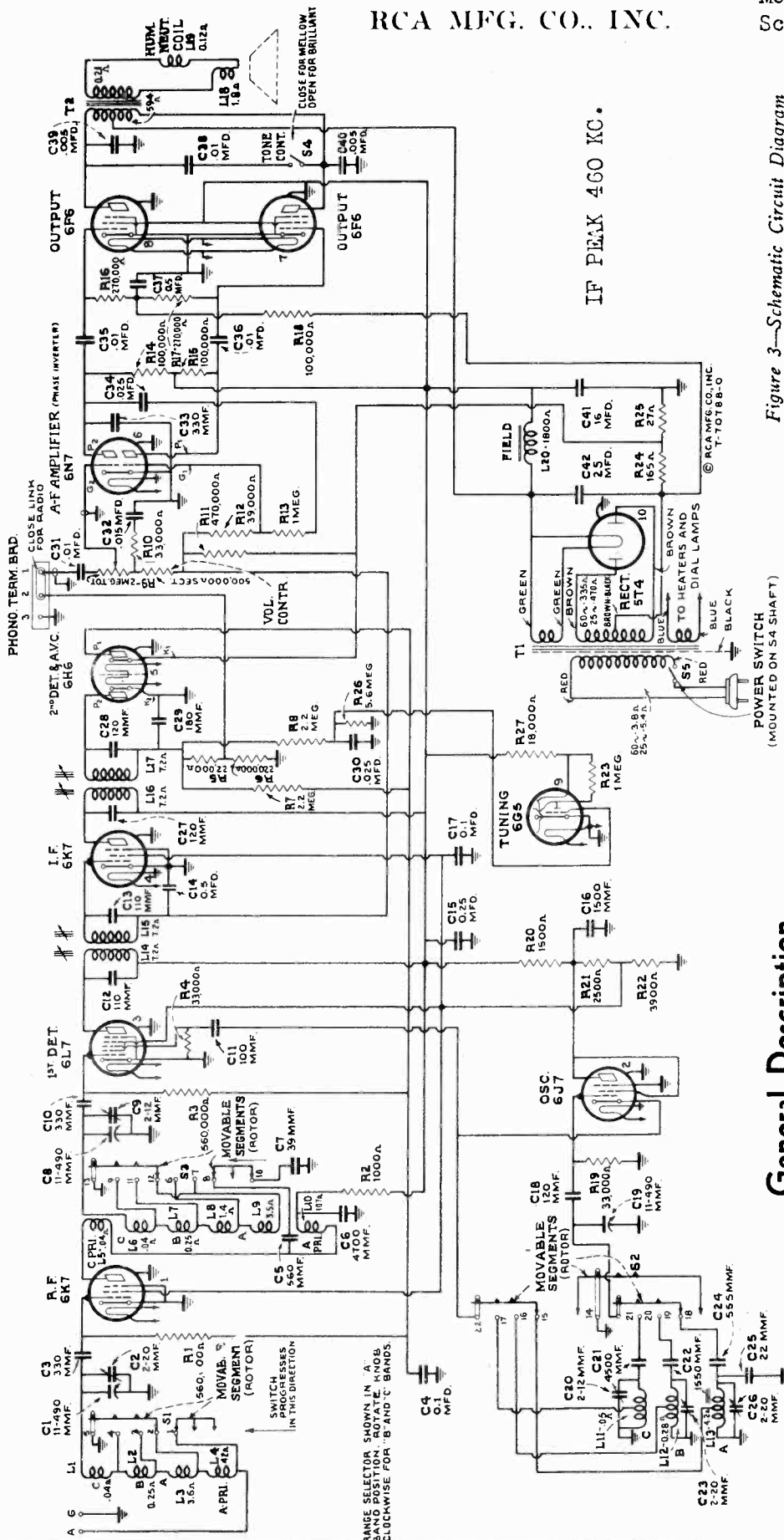


Figure 3—Schematic Circuit Diagram

General Description

These receivers employ a ten-tube, three-band, "Magic Brain," superheterodyne circuit, the arrangement of which is shown by the Schematic Circuit Diagram. Models 810K and 810K1 are console models, each employing a 12-inch electrodynamic loudspeaker. Model 810T is a table model employing an 8-inch electrodynamic loudspeaker. Features of design include an r-f amplifier stage, "cumulative-wound" antenna and r-f transformers for high signal-to-noise ratio; magnetite-core, i-f transformers and low-frequency oscillator tracking; automatic volume control; phonograph terminal board; "Magic Eye" tuning tube; plunger-type, air-dielectric trimming capacitors; aural-compensated, audio-volume control; "Mellow-Brilliant" tone control; audio phase-inverter voltage amplifier; push-pull, power-output stage; improved dust-proof electrodynamic loudspeaker; and a new sunburst dial with short-wave stations listed by name and illuminated band and tone indicators. In addition, Model 810K1 has a cabinet incorporating the "Sonic-Arc" Magic Voice.

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RCA MFG. CO., INC.

MODELS 81OK, 81OK1, 81CT  
Specifications, Voltage  
Trimmers

### Electrical Specifications

**FREQUENCY RANGES**

"Broadcast" (A)..... 530-1,720 kc  
"Medium Wave" (B)..... 2,100-6,800 kc  
"Short Wave" (C)..... 6,800-22,000 kc  
Intermediate Frequency..... 460 kc

**R-F ALIGNMENT FREQUENCIES**

"Short Wave" (C)..... 20,000 kc (osc., det., ant.)  
"Medium Wave" (B)..... 6,000 kc (osc.)  
"Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)  
..... 460 kc

**RADIOTRON COMPLEMENT**

- |   |   |
|---|---|
| (1) RCA-6K7..... R-F Amplifier              | (6) RCA-6N7..... Phase Inverter A-F Amplifier |
| (2) RCA-6J7..... Heterodyne Oscillator      | (7) RCA-6F6..... Power Output                 |
| (3) RCA-6L7..... First Detector             | (8) RCA-6F6..... Power Output                 |
| (4) RCA-6K7..... Intermediate Amplifier     | (9) RCA-6G5..... "Magic Eye" Tuning Tube      |
| (5) RCA-6H6..... Second Detector and A.V.C. | (10) RCA-5T4..... Full-Wave Rectifier         |
- Pilot Lamps (4)..... Mazda No. 46, 6.3 volts, 0.25 amp.

**POWER SUPPLY RATINGS**

Rating A..... 105-125 volts, 50-60 cycles, 135 watts  
Rating B..... 105-125 volts, 25-60 cycles, 135 watts  
Rating C..... 100-130/140-160/195-250 volts, 40-60 cycles, 135 watts

**POWER OUTPUT**

Undistorted..... 10 watts  
Maximum..... 12.5 watts

**LOUDSPEAKER**

Type..... Electrodynamic  
Impedance (v.c.)..... 2.2 ohms at 400 cycles

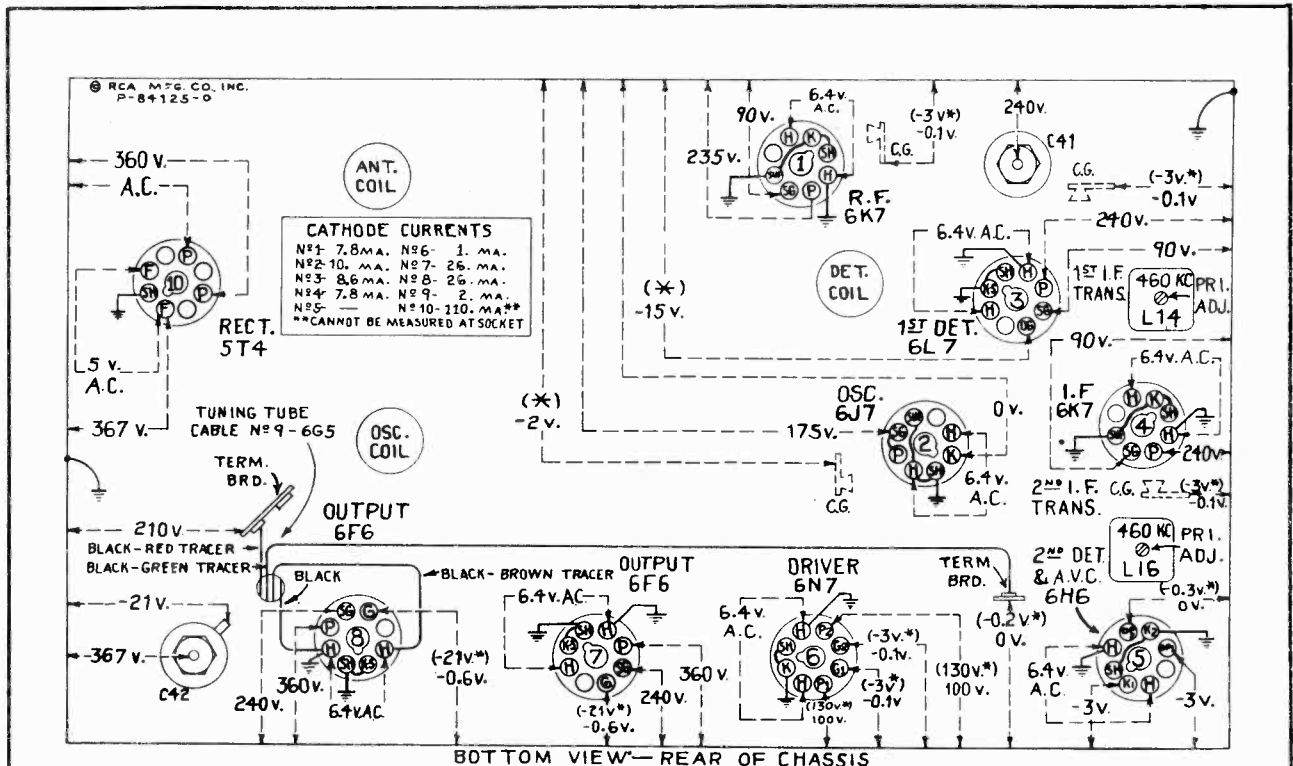


Figure 2—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—  
No signal being received—Volume control minimum

*Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.*

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODELS 810K, 810K1, 810T

Alignment, Socket

Phono. Notes

RCA MFG. CO., INC.

### Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch. If additional volume is desired, connect an RCA Stock No. 9632 transformer between the two conductor twisted cable and the screw-

terminals on Radio-Record switch as follows: yellow and brown transformer leads and one side of twisted cable to ground screw-terminal on switch; black transformer lead to other side of twisted cable; and blue transformer lead to other screw-terminal on switch.

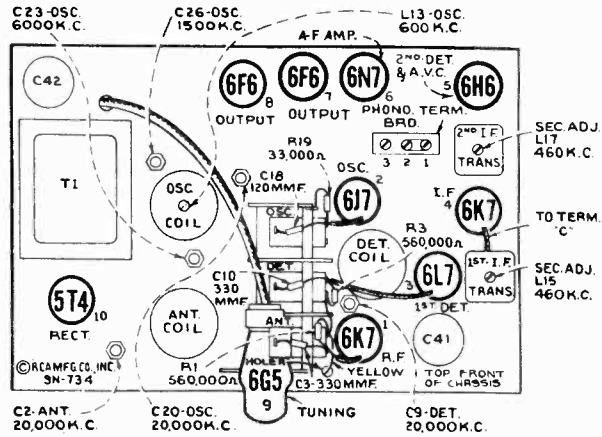


Figure 1—Radiotron, Coil, and Trimmer Locations

### Alignment Procedure

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2. Cathode-ray alignment is highly preferable: the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position. Connect the "low" output terminal of the test oscillator to

the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L16 and L17	Max. (peak)
2	6L7 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L14 and L15	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C20	Max. (peak) *
4	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Det.	C9	Max. (peak) †
5	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Ant.	C2	Max. (peak) ‡
6	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C23	Max. (peak) *
7	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L13	Max. (peak)
8	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)
9	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L13	Max. (peak)
10	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)

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

† Use maximum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.

RCA MFG. CO., INC.

MODELS 810K, 810K1, 810T  
Lead Dress, Parts

**Precautionary Lead Dress.**—(1) Keep leads to a-c switch dressed away from antenna coil and trimmer C2. (2) Keep all filament leads twisted. (3) Keep yellow lead from term. E of 2nd i-f trans. to phono. term. board as short as possible. (4) Keep leads of C21 as short as possible. (5) Dress shielded lead from volume control to phono. term. board against side of chassis and away from 6L7 socket. (6) Yellow lead from 6J7 oscillator cathode to dummy terminal on 6L7 socket must be dressed away from chassis base and from brown filament lead. (7) All molded capacitors should be dressed so that flat side is perpendicular to chassis base. (8) Yellow lead from cathode of 6J7 socket to term. 22 of S2 must be dressed under spaghetti on 6J7 socket jumper

and pulled tight away from chassis. The following bus leads should be kept as short as possible and, when necessary, replaced only with wire having same diameter as original: (9) Lead from L11-L12-L13 to ground lance; (10) Lead from term. 13 of S3 to ground lance; (11) Lead from term. 9 of S3 to L6-L7; (12) Lead from L6 to C8; (13) Lead from C9 to C8; (14) Lead from term. 5 of S1 to ground lance; (15) Lead from L1-L2 to term. 4 of S1; (16) Lead from L1 to C1; (17) Lead from term. 21 of S2 to C19. (18) Keep filament leads dressed away from grid prongs of 6N7. (19) Keep blue and green leads from plate prongs of output tubes twisted their entire length.

## REPLACEMENT PARTS

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

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
12038	Band—Rubber band for tuning tube	11172	Resistor—470,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R11)
14384	Belt—Variable condenser drive belt	11397	Resistor—560,000 Ohms, Carbon type, 1/10 watt (R1, R3)
14517	Board—Antenna and ground terminal board	12013	Resistor—1 Megohm, Carbon type, 1/10 watt (R23)
12717	Board—Phonograph terminal board	13730	Resistor—1 Megohm, Carbon type, $\frac{1}{2}$ watt (R13)
14338	Bushing—Variable condenser mounting bushing assembly	11626	Resistor—2.2 Megohm, Carbon type, $\frac{1}{2}$ watt (R7, R8)
14524	Cable—Band indicator cable approx. 6 $\frac{1}{2}$ in. long	11668	Resistor—5.6 Megohm, Carbon type, $\frac{1}{2}$ watt (R26)
14523	Cable—Tone control indicator cable approx. 3 in. long	14532	Resistor—Voltage divider comprising one 1500 Ohm, one 2500 Ohm, one 3900 Ohm, one 27 Ohm and one 165 Ohm sections (R20, R21, R22, R24, R25)
14394	Cable—Tuning tube cable and socket	14343	Retainer—Station selector knob shaft and pulley retainer
11350	Cap—Grid contact cap	14350	Screw—No. 8-32 x 3/16 square head set screw for drum Stock No. 14345 gear Stock No. 30085 and hub and arm on band indicator cable
12607	Cap—First I.F. transformer shield top	14374	Shield—Antenna or R.F. coil shield
12581	Cap—Second I.F. transformer shield top	12008	Shield—First or Second I.F. transformer shield
12884	Capacitor—Adjustable trimmer (long) (C2, C23, C26)	14375	Shield—Oscillator coil shield
12714	Capacitor—Adjustable trimmer (Medium) (C9, C20)	14114	Socket—Dial lamp socket
14021	Capacitor—22 Mmfd. (C25)	11195	Socket—5 contact 5T4 Radiotron socket
13545	Capacitor—39 Mmfd. (C7)	11196	Socket—8 contact 6F6, 6H6, 6K7, 6L7, 6N7, or 6J7 Radiotron socket
12720	Capacitor—100 Mmfd. (C11)	12907	Spring—Tension spring for indicator drum gear Stock No. 30085
14262	Capacitor—110 Mmfd. (C12, C13)	14342	Spring—Tension spring for idler Stock No. 14341
12404	Capacitor—120 Mmfd. (C27, C28)	12007	Spring—Retaining spring for core Stock No. 12006 and No. 12800
12724	Capacitor—120 Mmfd. (C18)	14371	Switch—Low frequency tone and power switch (S4, S5)
12406	Capacitor—180 Mmfd. (C29)	14535	Switch—Range switch (S1, S2, S3)
12952	Capacitor—330 Mmfd. (C3, C10, C33)	14376	Transformer—First I.F. transformer (L14, L15, C12, C13)
12727	Capacitor—555 Mmfd. (C24)	14283	Transformer—Second I.F. transformer (L16, L17, C27, C28, C29, R5, R6)
12537	Capacitor—560 Mmfd. (C5)	11211	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1)
13762	Capacitor—1500 Mmfd. (C16)	11212	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1)
12729	Capacitor—1550 Mmfd. (C22)	11213	Transformer—Power transformer 105-125/140-160/200-250 volts, 50-60 cycle (T1)
12728	Capacitor—4500 Mmfd. (C21)	14335	Volume Control—(R9)
12897	Capacitor—4700 Mmfd. (C8)	14379	Washer—Felt washer for indicator pointer
4838	Capacitor—.005 Mfd. (C39, C40)	<b>REPRODUCER ASSEMBLIES</b>	
13138	Capacitor—.01 Mfd. (C31, C35, C36)	14356	Board—3 contact reproducer terminal board
4937	Capacitor—.01 Mfd. (C38)	13866	Cap—Cone center dust cap
11315	Capacitor—.015 Mfd. (C32)	11234	Coil—Field coil (L20)
4870	Capacitor—.025 Mfd. (C30, C34)	11469	Coil—Hum neutralizing coil (L-19)
4839	Capacitor—.01 Mfd. (C4, C17)	12642	Cone—Reproducer cone and dust cap (L18)
12484	Capacitor—.025 Mfd. (C15)	5039	Plug—4 contact male plug for reproducer
12741	Capacitor—.05 Mfd. (C14, C37)	14533	Reproducer—Reproducer complete
5212	Capacitor—.16 Mfd. (C41)	14358	Screw—Screw, washer, and lockwasher to hold core in yoke
14531	Capacitor—.25 Mfd. (C42)	14534	Transformer—Output transformer (T2)
14372	Coil—Antenna coil and shield (L1, L2, L3, L4)	14357	Washer—Spring washer to hold field coil
14518	Coil—Oscillator coil and shield (L11, L12, L13)	<b>REPRODUCER ASSEMBLIES</b>	
14414	Coil—R.F. coil and shield (L5, L6, L7, L8, L9, L10)	<b>MODELS 810K and 810K1 (RL-70-E2)</b>	
14513	Condenser—3 gang variable tuning condenser (C1, C8, C19)	13866	Cap—Dust cap for cone center
5040	Connector—4 contact female connector for reproducer cable	11234	Coil—Field coil (L20)
12006	Core—Adjustable core and stud for transformer Stock No. 14376 and Stock No. 14283	11469	Coil—Hum neutralizing coil (L19)
12800	Core—Adjustable core and stud for coil Stock No. 14516	12867	Cone—Reproducer cone and dust cap (L18)
14518	Dial—Station selector dial scale complete with tuning tube escutcheon	5039	Plug—4 contact male plug for reproducer
14514	Drive—Variable condenser vernier drive pinion gear and shaft	14536	Reproducer—Reproducer complete
14345	Drum—Variable condenser drive belt drum complete with set screws	14358	Screw—Screw, washer and lockwasher to hold core in yoke
14387	Escutcheon—Tuning tube escutcheon	14534	Transformer—Output transformer (T2)
11982	Fastener—Dial scale fastener	14357	Washer—Spring washer to hold field coil
30085	Gear—Indicator drive gear and hub, and pointer stem and gear	<b>MISCELLANEOUS ASSEMBLIES</b>	
14341	Idler—Station selector drive belt idler	14527	Escutcheon—Station selector escutcheon and crystal complete with tone and band indicating strips
14519	Indicator—Station selector indicator pointer	14528	Index—Tone control indicating strip—mounts in station selector escutcheon
14520	Indicator—Vernier indicator pointer	14529	Index—Band indicating strip—mounts in station selector escutcheon
5228	Lamp—Dial lamp	14359	Knob—Station selector knob
14028	Nut—Jamb nut for adjustable trimmer capacitor Stock No. 12714 and No. 12884	14269	Knob—Volume control, tone control or range switch knob
12471	Plate—6J7 Radiotron socket mounting plate and rubber cushions—less socket	11210	Screw—Chassis mounting screw and washer assembly for console model
14340	Pulley—Station selector drive belt pulley and knob shaft	11377	Screw—Chassis mounting screw and washer assembly for the table model
14522	Reflector—Dial reflector and bracket complete with dial lamp bracket, tuning tube bracket and tone and band indicators	4982	Spring—Retaining spring for knob Stock No. 14359
14720	Resistor—1000 Ohms, Carbon type, $\frac{1}{2}$ watt (R2)	14270	Spring—Retaining spring for knob Stock No. 14269
14078	Resistor—18,000 Ohms, Carbon type, 1 watt (R27)		
14284	Resistor—22,000 Ohms, Carbon type, 1/10 watt (R5)		
11300	Resistor—33,000 Ohms, Carbon type, 1/10 watt (R19)		
13735	Resistor—33,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R4, R10)		
11322	Resistor—39,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R12)		
5145	Resistor—100,000 Ohms, Carbon type, $\frac{1}{2}$ watt (R14, R15, R18)		
11398	Resistor—220,000 Ohms, Carbon type, 1/10 watt (R6)		
11453	Resistor—270,000 Ohms, Carbon type, 1/10 watt (R16, R17)		



MODEL 810T4  
Parts List

RCA MFG. CO., INC.

RADIOTRON COMPLEMENT

- |                   |                            |                    |                              |
|-------------------|----------------------------|--------------------|------------------------------|
| (1) RCA-6K7 ..... | R-F Amplifier              | (6) RCA-6N7.....   | Phase Inverter A-F Amplifier |
| (2) RCA-6J7.....  | Heterodyne Oscillator      | (7) RCA-6F6.....   | Power Output                 |
| (3) RCA-6L7.....  | First Detector             | (8) RCA-6F6.....   | Power Output                 |
| (4) RCA-6K7.....  | Intermediate Amplifier     | (9) RCA-6G5.....   | "Magic Eye" Tuning Tube      |
| (5) RCA-6H6.....  | Second Detector and A.V.C. | (10) RCA-5U4G..... | Full-Wave Rectifier          |

REPLACEMENT PARTS

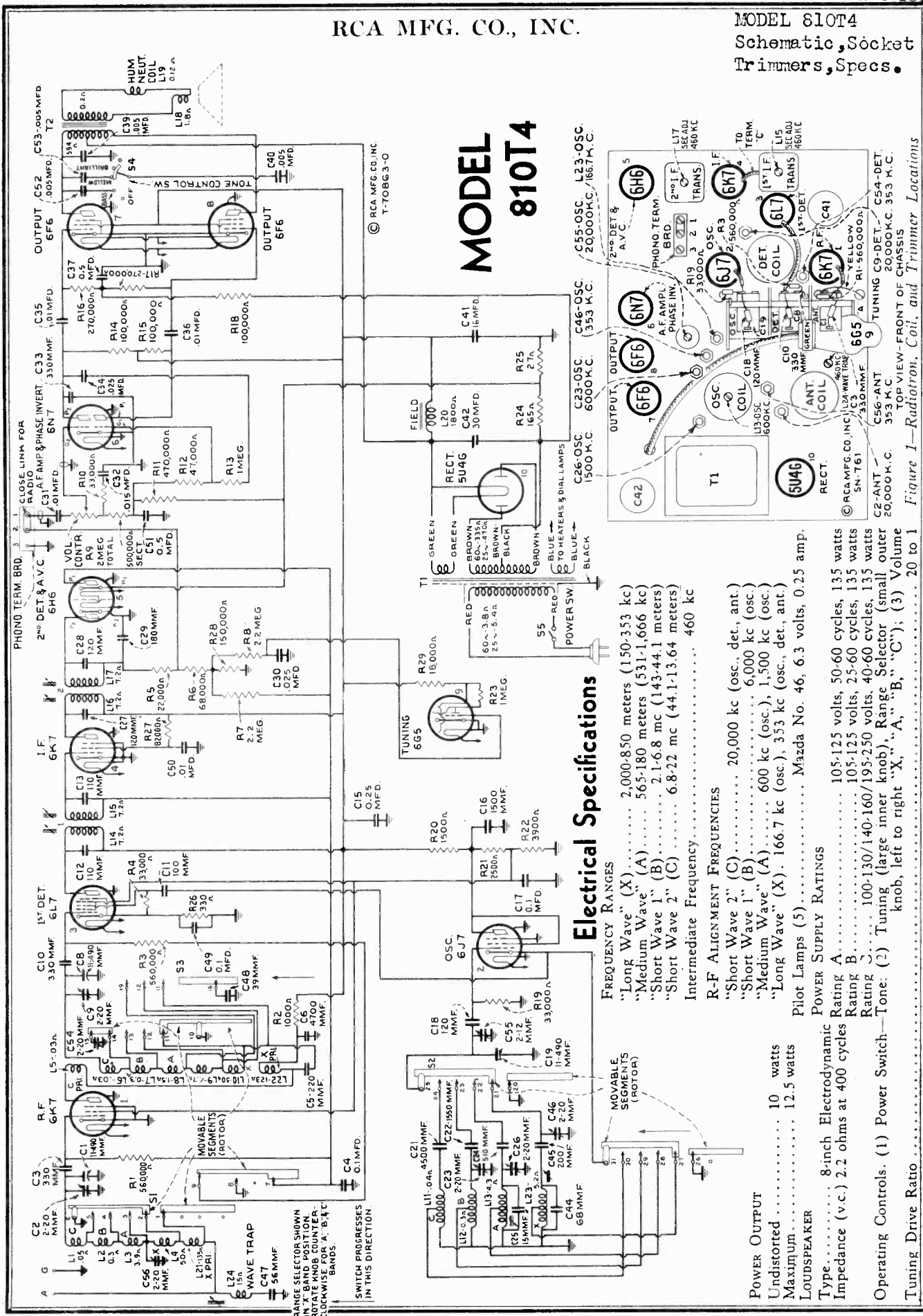
Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
12038	Band—Rubber band for tuning tube	14720	Resistor—1,000 ohms, carbon type, ½ watt (R2)
14384	Belt—Variable condenser drive belt	14078	Resistor—18,000 ohms, carbon type, 1 watt (R29)
14517	Board—Antenna and ground terminal board	14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R5)
12717	Board—Phonograph terminal board	11300	Resistor—33,000 ohms, carbon type, 1/10 watt (R19)
14338	Bushing—Variable condenser mounting bushing assembly	13735	Resistor—33,000 ohms, carbon type, ½ watt (R4, R10)
14524	Cable—Band indicator cable, approximately 6½ inches long	11646	Resistor—47,000 ohms, carbon type, ½ watt (R12)
14523	Cable—Tone control indicator cable, approximately 3 inches long	12333	Resistor—68,000 ohms, carbon type, ½ watt (R6)
14394	Cable—Tuning tube cable and socket	8064	Resistor—82,000 ohms, carbon type, ½ watt (R27)
11350	Cap—Grid contact cap	11281	Resistor—100,000 ohms, carbon type, 1/10 watt (R18)
12607	Cap—First I-F transformer shield top	5145	Resistor—100,000 ohms, carbon type, ½ watt (R14, R15)
12581	Cap—Second I-F transformer shield top	5027	Resistor—150,000 ohms, carbon type, ½ watt (R28)
12884	Capacitor—Adjustable trimmer (long) (C2, C9, C23, C26, C46, C54, C56)	11453	Resistor—270,000 ohms, carbon type, 1/10 watt (R16, R17)
12714	Capacitor—Adjustable trimmer (medium) (C55)	11172	Resistor—470,000 ohms, carbon type, ½ watt (R11)
12896	Capacitor—15 Mmfd. (C25)	11397	Resistor—560,000 ohms, carbon type, 1/10 watt (R1, R3)
13545	Capacitor—39 Mmfd. (C48)	12013	Resistor—1 megohm, carbon type, 1/10 watt (R23)
12723	Capacitor—56 Mmfd. (C47)	13730	Resistor—1 megohm, carbon type, ½ watt (R13)
30233	Capacitor—88 Mmfd. (C44)	11626	Resistor—2.2 megohms, carbon type, ½ watt (R7, R8)
12720	Capacitor—100 Mmfd. (C11)	14532	Resistor—Voltage divider—comprising one 1,500 ohm, one 2,500 ohm, one 3,900 ohm, one 27 ohm, and one 165 ohm sections (R20, R21, R22, R24, R25)
14262	Capacitor—110 Mmfd. (C12, C13)	14343	Retainer—Station selector knob shaft and pulley retainer
12404	Capacitor—120 Mmfd. (C27, C28)	14350	Screw—No. 8-32 x 3/16 square-head set-screw for drum, Stock No. 14345, gear, Stock No. 30085, and hub and arm on band indicator cable
12724	Capacitor—120 Mmfd. (C18)	12799	Shield—Antenna or R-F coil shield
12408	Capacitor—180 Mmfd. (C29)	12008	Shield—First or second I-F transformer shield
30232	Capacitor—200 Mmfd. (C45)	14375	Shield—Oscillator coil shield for Stock No. 14516
14546	Capacitor—220 Mmfd. (C5)	12883	Shield—Oscillator coil shield for Stock No. 12881
12952	Capacitor—330 Mmfd. (C3, C10, C33)	14114	Socket—Dial lamp socket
30231	Capacitor—510 Mmfd. (C24)	11195	Socket—5-contact 5U4G Radiotron socket
13762	Capacitor—1,500 Mmfd. (C16)	11196	Socket—8-contact 6F6, 6H6, 6K7, 6L7, 6J7, or 6N7 Radiotron socket
12729	Capacitor—1,550 Mmfd. (C22)	12907	Spring—Tension spring for indicator drum gear, Stock No. 30085
12728	Capacitor—4,500 Mmfd. (C21)	14342	Spring—Tension spring for idler, Stock No. 14341
12897	Capacitor—4,700 Mmfd. (C6)	12007	Spring—Retaining spring for core, Stock Nos. 12006 and 12800
4838	Capacitor—.005 Mfd. (C39, C40, C52, C53)	30084	Switch—High-frequency tone and power switch (S4, S5)
13138	Capacitor—.01 Mfd. (C31, C35, C36, C50)	30226	Switch—Range switch (S1, S2, S3)
11315	Capacitor—.015 Mfd. (C32)	12654	Trap—Wave trap (L24)
4870	Capacitor—.025 Mfd. (C30, C34)	14376	Transformer—First I-F transformer (L14, L15, C12, C13)
4839	Capacitor—.01 Mfd. (C4, C17, C49)	14308	Transformer—Second I-F transformer (L16, L17, C27, C28, C29, R5)
12484	Capacitor—.025 Mfd. (C15)	11212	Transformer—Power transformer, 105-125 volts, 25-60 cycles (T1)
12741	Capacitor—.05 Mfd. (C37, C51)	11213	Transformer—Power transformer, 105-250 volts, 50-60 cycles (T1)
5212	Capacitor—.16 Mfd. (C41)	14335	Volume Control (R9)
14531	Capacitor—.25 Mfd. (C42)	14379	Washer—Felt washer for indicator pointer
30228	Coil—Antenna coil and shield—A, B, C, and X bands (L1, L2, L3, L4, L21)	<b>REPRODUCER ASSEMBLIES (RL-63F-2)</b>	
14516	Coil—Oscillator coil and shield—A, B, and C bands (L11, L12, L13)	14356	Board—3-contact reproducer terminal board
12881	Coil—Oscillator coil and shield—X band only (L23)	13866	Cap—Cone center dust cap
30229	Coil—R-F coil and shield—A, B, C, and X bands (L5, L6, L7, L8, L9, L10, L22)	11234	Coil—Field coil (L20)
14513	Condenser—3-gang variable tuning condenser (C1, C8, C19)	11469	Coil—Hum neutralizing coil (L19)
5040	Connector—4-contact female connector for reproducer cable	12642	Cone—Reproducer cone and dust cap (L18)
30567	Connector—4-contact female connector with metal shell for reproducer cable in later production	5039	Plug—4-contact male plug for reproducer
12006	Core—Adjustable core and stud for transformer, Stock Nos. 14376 and 14308	14533	Reproducer, complete
12800	Core—Adjustable core and stud for coil, Stock No. 14516	14358	Screw—Screw, washer, and lockwasher to hold core in yoke
30230	Dial—Station selector dial scale, complete with tuning tube escutcheon	14534	Transformer—Output transformer (T2)
14514	Drive—Variable condenser vernier drive pinion gear and shaft	14357	Washer—Spring washer to hold field coil
14345	Drum—Variable condenser drive belt drum, complete with set screws	<b>MISCELLANEOUS ASSEMBLIES</b>	
14387	Escutcheon—Tuning tube escutcheon	5040	Connector—4-contact female connector for reproducer interconnecting cable in later production
11982	Fastener—Dial scale fastener	30568	Connector—4-contact male connector for reproducer interconnecting cable in later production
30085	Gear—Indicator drive gear and hub, and pointer stem and gear	30234	Escutcheon—Station selector escutcheon and crystal, complete with tone and band indicating strips
14341	Idler—Station selector drive belt idler	14611	Index—Tone control indicating strip—mounts in station selector escutcheon
14519	Indicator—Station selector indicator pointer	30235	Index—Band indicating strip—mounts in station selector escutcheon
14382	Indicator—Vernier indicator pointer	14359	Knob—Station selector knob
5226	Lamp—Dial lamp	14269	Knob—Volume control, tone control, or range switch knob
14028	Nut—Jamb nut for adjustable trimmer capacitor, Stock Nos. 12714 and 12884	11377	Screw—Chassis mounting screw and washer assembly
12471	Plate—6J7 Radiotron socket mounting plate and rubber cushions—less socket	4982	Spring—Retaining spring for knob, Stock No. 14359
14340	Pulley—Station selector drive belt pulley and knob shaft	14270	Spring—Retaining spring for knob, Stock No. 14269
30227	Reflector—Dial reflector and bracket, complete with dial lamp bracket, tuning tube bracket and tone and band indicators		
13250	Resistor—330 ohms, carbon type, ½ watt (R26)		

Height .....	20 1/4 inches	Weight (shipping) .....	43 pounds
Width .....	17 1/4 inches	Chassis Base Dimensions .....	14 7/8 inches x 9 3/4 inches x 3 1/4 inches
Depth .....	11 1/16 inches	Over-all Chassis Height .....	9 3/4 inches
Weight (net) .....	33 pounds		

RCA MFG. CO., INC.

MODEL 810T4  
Schematic, Socket  
Trimmers, Specs.



# MODEL 810T4

## Electrical Specifications

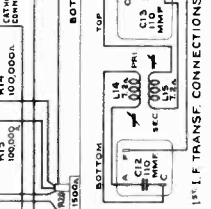
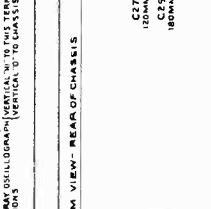
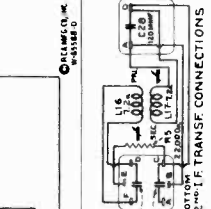
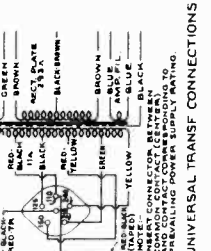
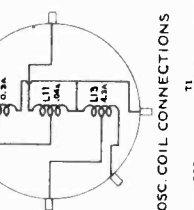
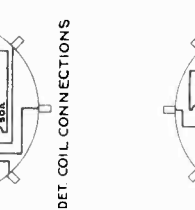
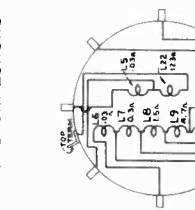
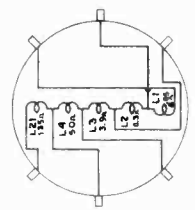
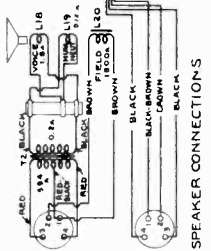
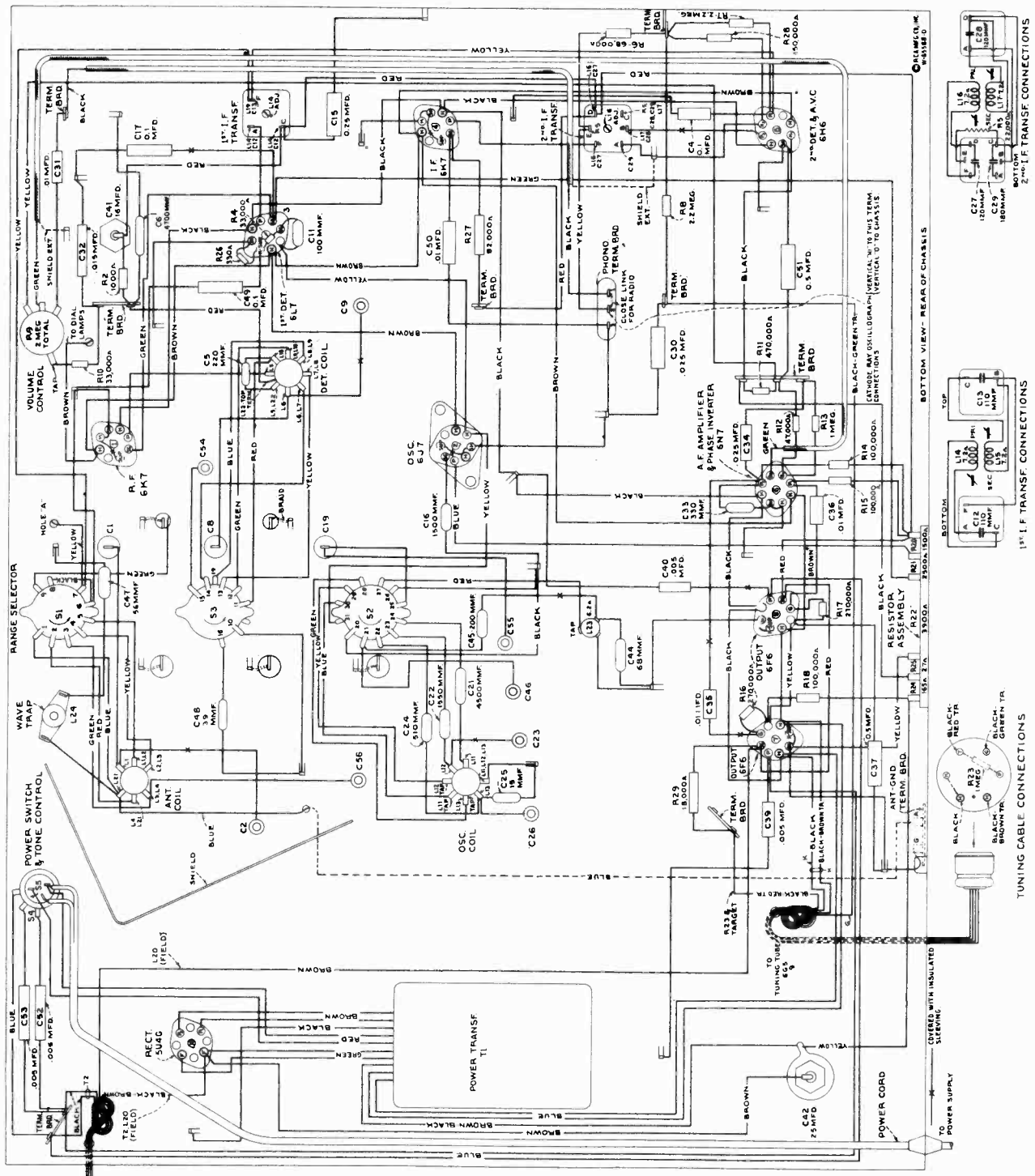
- FREQUENCY RANGES**
- "Long Wave" (X) ..... 2,000-850 meters (150-353 kc)
  - "Medium Wave" (A) ..... 565-180 meters (531-1,666 kc)
  - "Short Wave 1" (B) ..... 21-6.8 mc (143-44.1 meters)
  - "Short Wave 2" (C) ..... 6.8-2.2 mc (44.1-13.64 meters)
- Intermediate Frequency** ..... 460 kc
- R-F ALIGNMENT FREQUENCIES**
- "Short Wave 2" (C) ..... 20,000 kc (osc., det., ant.)
  - "Short Wave 1" (B) ..... 6,000 kc (osc.)
  - "Medium Wave" (A) ..... 600 kc (osc.), 1,500 kc (osc.)
  - "Long Wave" (X) ..... 166.7 kc (osc.), 353 kc (osc., det., ant.)
- Pilot Lamps (5)** ..... Mazda No. 46, 6.3 volts, 0.25 amp.
- POWER SUPPLY RATINGS**
- Rating A ..... 105-125 volts, 50-60 cycles, 135 watts
  - Rating B ..... 105-125 volts, 25-60 cycles, 135 watts
  - Rating C ..... 100-130/140-160/195-250 volts, 40-60 cycles, 135 watts
- Tone**—Tuning (large inner knob), Range Selector (small outer knob, left to right "X," "A," "B," "C"); (3) Volume knob, left to right ..... 20 to 1
- POWER OUTPUT**
- Undistorted ..... 10 watts
  - Maximum ..... 12.5 watts
- LOUDSPEAKER**
- Type ..... 8-inch Electrodynamic
  - Impedance (v.c.) ..... 2.2 ohms at 400 cycles
- Operating Controls**. (1) Power Switch—Tuning Drive Ratio ..... 20 to 1

Figure 1—Radiation, Coil, and Trimmer Locations

MODEL 810T4

Chassis Wiring  
Coils

RCA MFG. CO., INC.



RCA MFG. CO., INC.

MODEL 810T4  
Lead Dress, Voltage  
Notes, Trimmers

## General Description

This receiver employs a ten-tube, four-band, "Magic Brain," superheterodyne circuit, the arrangement of which is shown by the Schematic Circuit Diagram. Features of design include an r-f amplifier stage; "cumulative-wound" "A" antenna and r-f transformers for high signal-to-noise ratio; magnetite-core, i-f transformers and low-frequency "X" and "A" oscillator tracking; automatic volume control; phonograph terminal board; "Magic Eye" tuning tube; plunger-

type, air-dielectric trimming capacitors; aural-compensated, audio-volume control; "Bass-Mellow-Brilliant" tone control; audio phase-inverter voltage amplifier; push-pull, power-output stage; improved dust-proof electrodynamic loud-speaker; a new sunburst dial with short-wave stations listed by name and illuminated band and tone indicators; and the improved "Magic Voice."

## Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

**Precautionary Lead Dress.**—(1) Twist yellow, blue, and green leads from oscillator coil to S2. (2) Dress C45 and C21 away from C55. (3) Dress black lead from S2 to ground lance away from C55. (4) Dress yellow lead from 6J7 socket to S2 under bus on 6J7 socket. (5) Make lead from S3 to ground 2½ inches long and dress away from chassis. (6) Twist filament leads. (7) Dress shielded lead from C31 to phono. term. board away from 6L7 socket. (8) Dress yellow lead from term. "K" of 6J7 to C11 away from chassis and from brown filament lead. (9) Dress all molded capacitors perpendicular to chassis. (10) Dress fila-

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch. If additional volume is desired, connect an RCA Stock No. 9632 transformer between the two-conductor twisted cable and the screw-terminals on Radio-Record switch as follows: yellow and brown transformer leads and one side of twisted cable to ground screw-terminal on switch; black transformer lead to other side of twisted cable; and blue transformer lead to other screw-terminal on switch.

ment leads away from terms. "G1" and "G2" of 6N7. (11) Twist blue leads from terms. "P" of 6F6's. Make the following as short as possible: (12) Lead from oscillator coils to ground. (13) Lead from S2 to C19. (14) Lead from detector coil to S3. (15) Lead from detector coil to C8. (16) Lead from S1 to chassis ground lance. (17) Lead from antenna coil, to S1. (18) Lead from antenna coil to C1. (19) Yellow lead from 2nd i-f transformer to phono. term. board. When necessary to replace bus leads, use only wire having same diameter as original.

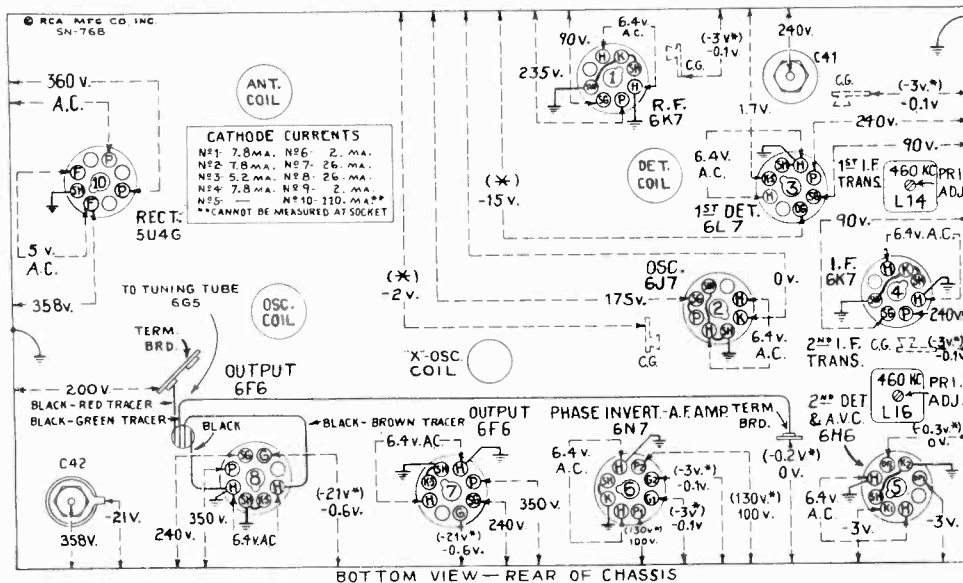


Figure 2—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc or 300 meters, "A" band ("Medium Wave")—No signal being received—Volume control minimum

**Note:** Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODEL 81CT4

Alignment

RCA MFG. CO., INC.

## Alignment Procedure

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "0." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid A-V-C action.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 545-400 meters" means that the receiver should be tuned to a point between 545 and 400 meters where no signal or interference is received from a station or local (heterodyne) oscillator. In extreme noisy locations, one end of C10 (top of gang) should be unsoldered during i-f alignment.

Conversion of kilocycles (kc) to meters for alignment frequencies is as follows: 20,000 kc (20 mc) = 15 meters; 6,000 kc (6 mc) = 50 meters; 1,500 kc = 200 meters; 600 kc = 500 meters; 460 kc = 652 meters; 353 kc = 850 meters; and 166.7 kc = 1,800 meters.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"Medium Wave"	No Signal 545-400 meters	2nd I-F Trans.	L16 and L17	Max. (peak)
2	6L7 Det. Grid Cap	.001 Mfd.	460 kc	"Medium Wave"	No Signal 545-400 meters	1st I-F Trans.	L14 and L15	Max. (peak)
3	Ant. Term.	200 Mmfd.	460 kc	"Medium Wave"	No signal 545-400 meters	Wave Trap	L24	Minimum Output
4	Ant. Term.	300 Ohms	20,000 kc	"Short Wave 2"	20 mc	"C" Osc.	C55	Max. (peak)*
5	Ant. Term.	300 Ohms	20,000 kc	"Short Wave 2"	20 mc	"C" Det.	C9	Max. (peak)†
6	Ant. Term.	300 Ohms	20,000 kc	"Short Wave 2"	20 mc	"C" Ant.	C2	Max. (peak)‡
7	Ant. Term.	300 Ohms	6,000 kc	"Short Wave 1"	6 mc	"B" Osc.	C23	Max. (peak)*
8	Ant. Term.	200 Mmfd.	600 kc	"Medium Wave"	500 meters	"A" L-F Osc.	L13	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	"Medium Wave"	200 meters	"A" H-F Osc.	C26	Max. (peak)
10	Ant. Term.	200 Mmfd.	600 kc	"Medium Wave"	500 meters	"A" L-F Osc.	L13	Max. (peak)
11	Ant. Term.	200 Mmfd.	1,500 kc	"Medium Wave"	200 meters	"A" H-F Osc.	C26	Max. (peak)
12	Ant. Term.	200 Mmfd.	166.7 kc	"Long Wave"	1,800 meters	"X" L-F Osc.	L23	Max. (peak)
13	Ant. Term.	200 Mmfd.	353 kc	"Long Wave"	850 meters	"X" H-F Osc.	C46	Max. (peak)
14	Ant. Term.	200 Mmfd.	353 kc	"Long Wave"	850 meters	"X" Det.	C54	Max. (peak)
15	Ant. Term.	200 Mmfd.	353 kc	"Long Wave"	850 meters	"X" Ant.	C56	Max. (peak)
16	Ant. Term.	200 Mmfd.	166.7 kc	"Long Wave"	1,800 meters	"X" L-F Osc.	L23	Max. (peak)
17	Ant. Term.	200 Mmfd.	353 kc	"Long Wave"	850 meters	"X" H-F Osc.	C46	Max. (peak)

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

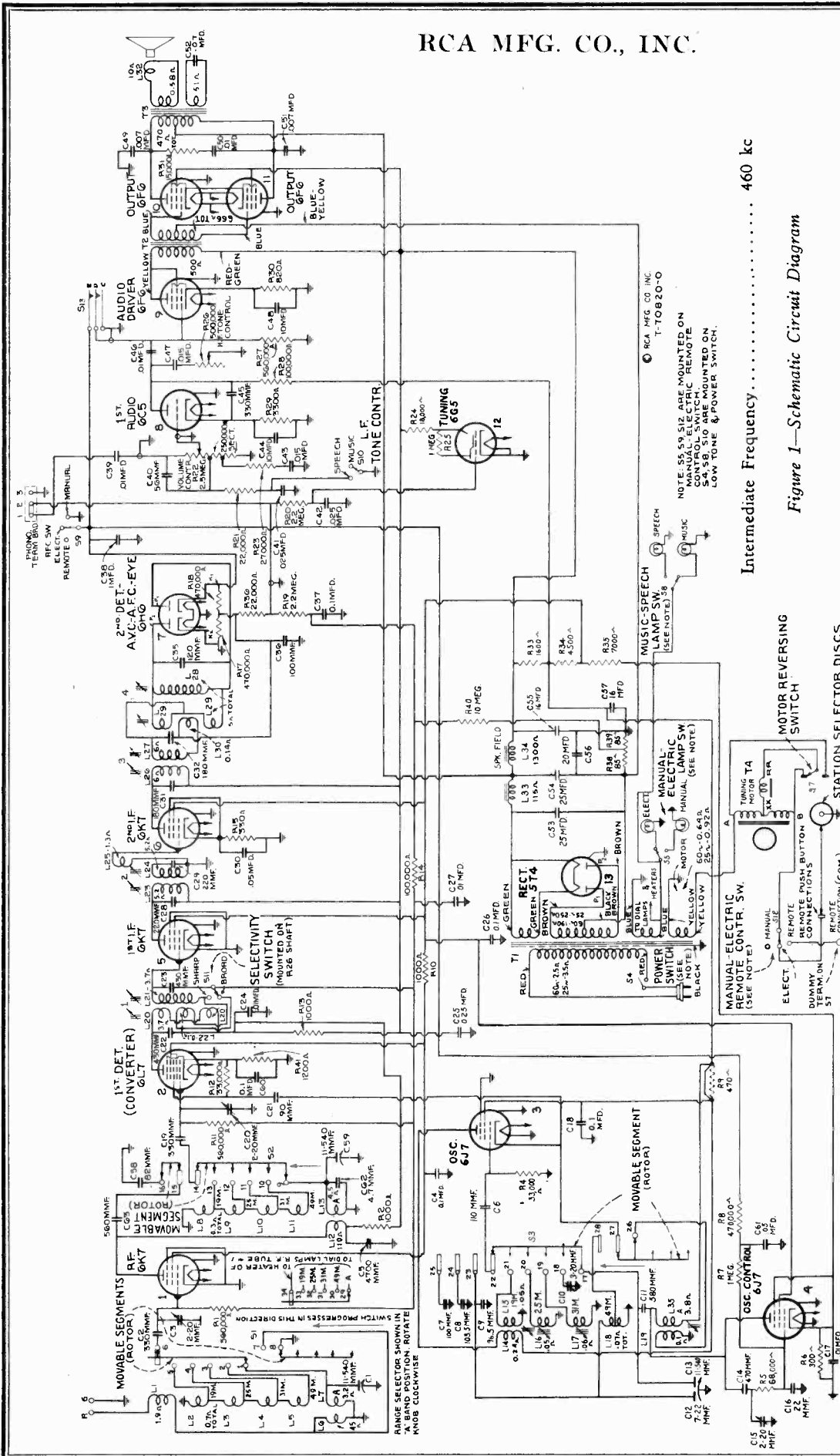
† Use maximum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 mc.



RCA MFG. CO., INC.

MODEL 813K  
Schematic



Intermediate Frequency..... 460 kc

Figure 1—Schematic Circuit Diagram

NOTE: On later production, a 1.8-ohm resistor (R42) is connected in series with the indicator lamps. (See figure 2, between term. 34 of range selector and center term. of S5.) When servicing, this resistor (Stock No. 30647) should be installed.

FREQUENCY RANGES

- "Standard Broadcast" (A)..... 530-1,720 kc
- "49M." (49 Meters)..... 5,970-6,240 kc
- "31M." (31 Meters)..... 9,410-9,690 kc
- "2.5M." (2.5 Meters)..... 11,680-11,920 kc
- "19M." (19 Meters)..... 15,090-15,380 kc

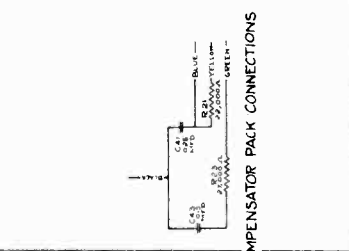
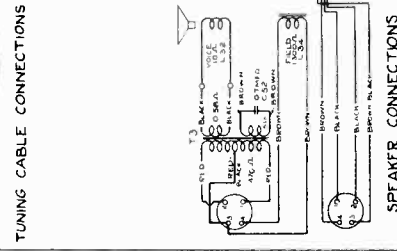
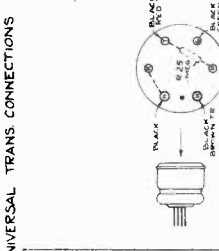
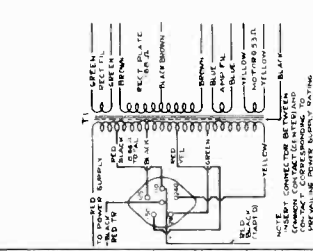
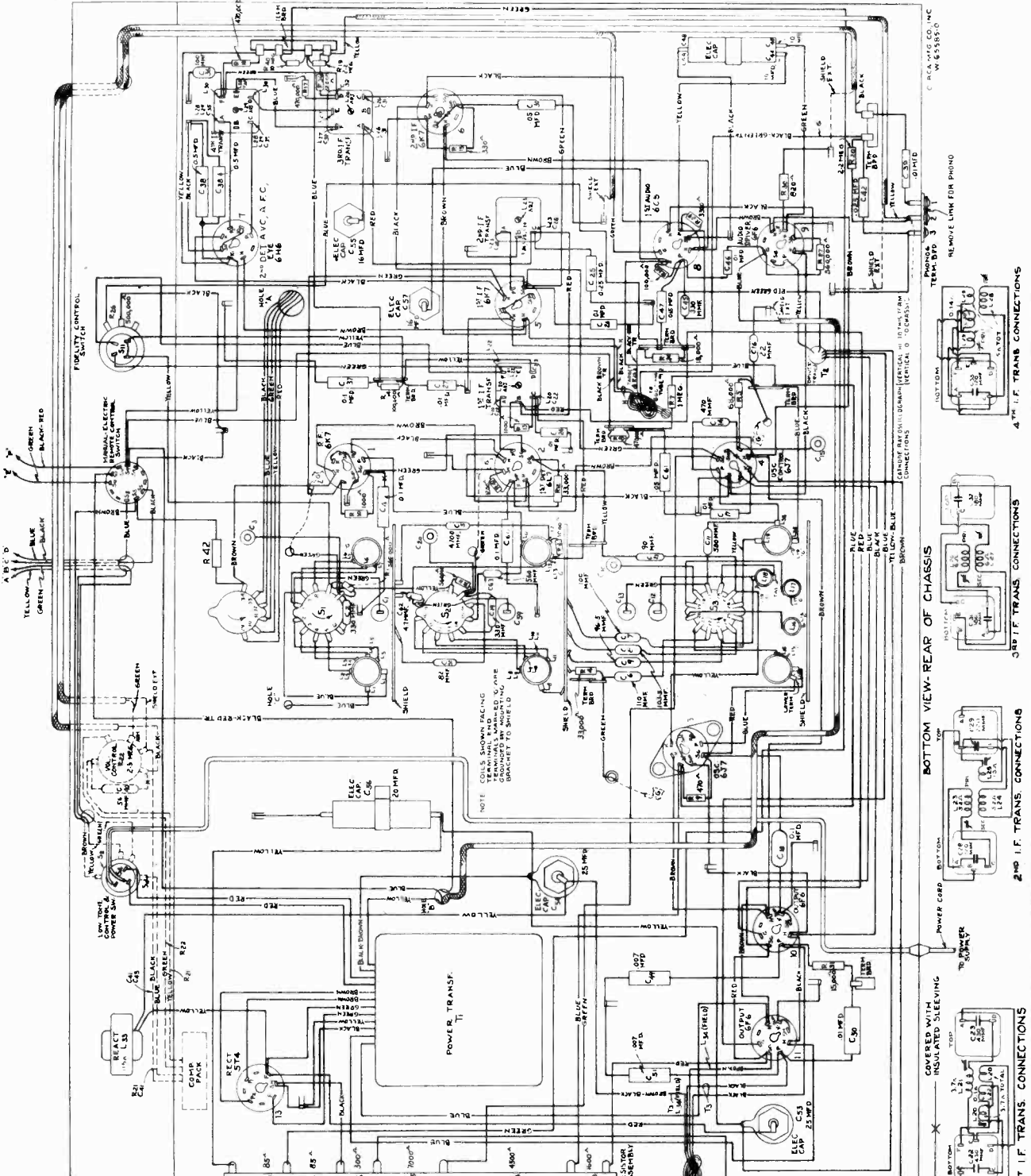
R-F ALIGNMENT FREQUENCIES

- "31M." (31 Meters)..... 9,600 kc (osc., det., ant.)
- "2.5M." (2.5 Meters)..... 11,700 kc (osc.)
- "19M." (19 Meters)..... 15,300 kc (osc.)
- "49M." (49 Meters)..... 6,100 kc (osc.)
- "Standard Broadcast" (A)..... 600 kc (osc.), 1,500 kc (osc.)

MODEL 813K  
Chassis Wiring

Transformer Connections

RCA MFG. CO., INC.



# Thirteen-Tube, Five-Band, A-C, Superheterodyne Receiver

## General Description

This receiver employs a thirteen-tube, five-band, "Magic Brain" superheterodyne circuit. Features of design include "Electric Tuning" with push-button operation; automatic frequency control; spread-band, "Overseas" dial; "cumulative-wound" antenna and detector "A" band coils; tuned r-f amplifier; magnetite-core adjusted i-f transformers and low-frequency "A" oscillator tracking; two-stage i-f amplifier; phonograph terminal board; "Magic Eye" tuning tube; twelve-inch electrodynamic loudspeaker; plunger-type, air-dielectric trimming capacitors; temperature-stabilized capacitors; two-point aural-compensated volume control; "Fidelity" control; "Music-Speech" control; and a driven push-pull power-output stage. In addition, this model has a cabinet incorporating the "Sonic Arc" Magic Voice.

### Radiotron Cathode Current Readings

Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

( 1 ) RCA-6K7—R-F Amp.....	9.0 ma.
( 2 ) RCA-6L7—1st Det.....	3.5 ma.
( 3 ) RCA-6J7—Osc.....	8.5 ma.
( 4 ) RCA-6J7—Osc. Control.....	1.8 ma.
( 5 ) RCA-6K7—1st I-F Amp.....	9.0 ma.
( 6 ) RCA-6K7—2nd I-F Amp.....	8.0 ma.
( 7 ) RCA-6H6—2nd Det.....	.....
( 8 ) RCA-6C5—A-F Amp.....	0.9 ma.
( 9 ) RCA-6F6—Driver.....	22 ma.
(10) RCA-6F6—Output.....	25 ma.
(11) RCA-6F6—Output.....	25 ma.
(12) RCA-6G5—Tuning Tube.....	3.0 ma.
(13) RCA-5T4—Rectifier.....	128 ma.**

(\*\*Cannot be measured at socket)

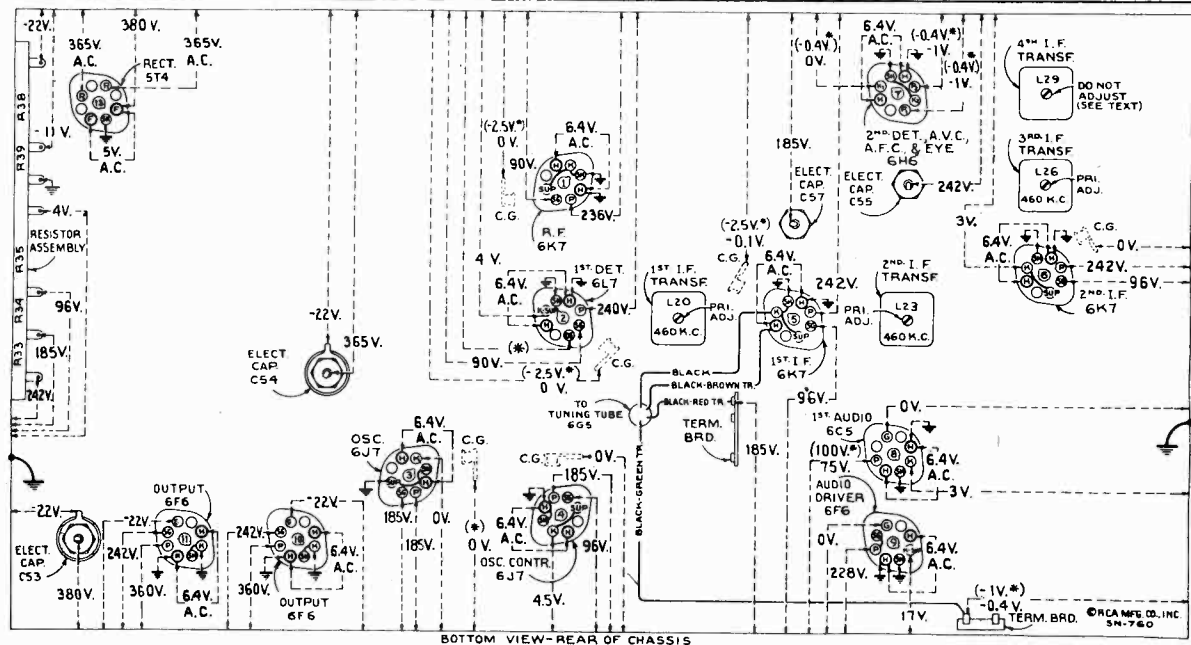


Figure 6—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—"Manual" control—No signal being received—Volume control minimum—Fidelity control optional

**Note:** Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODEL 813K  
Socket, Trimmers  
Tuner Wiring

RCA MFG. CO., INC.

Figure 3—Radiotron, Coil, and Trimmer Locations

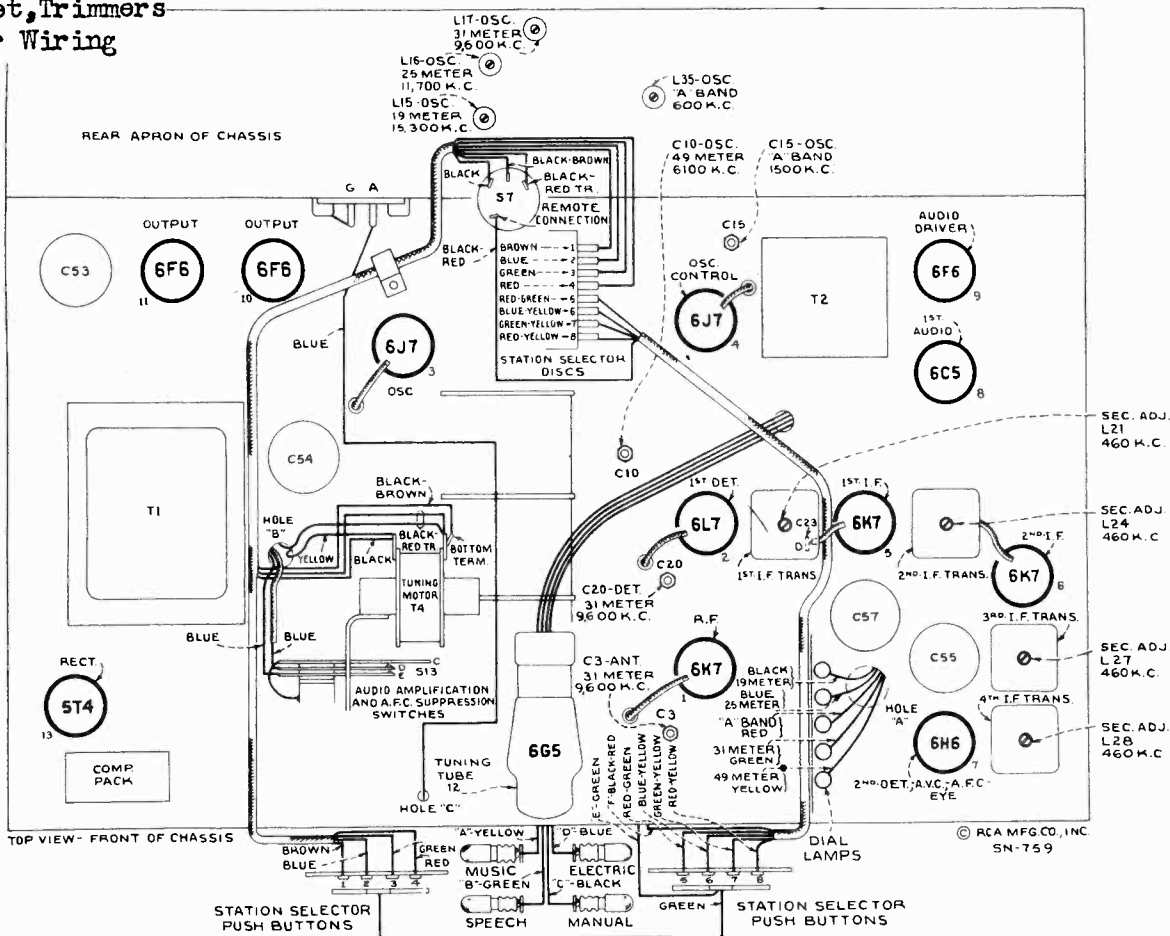
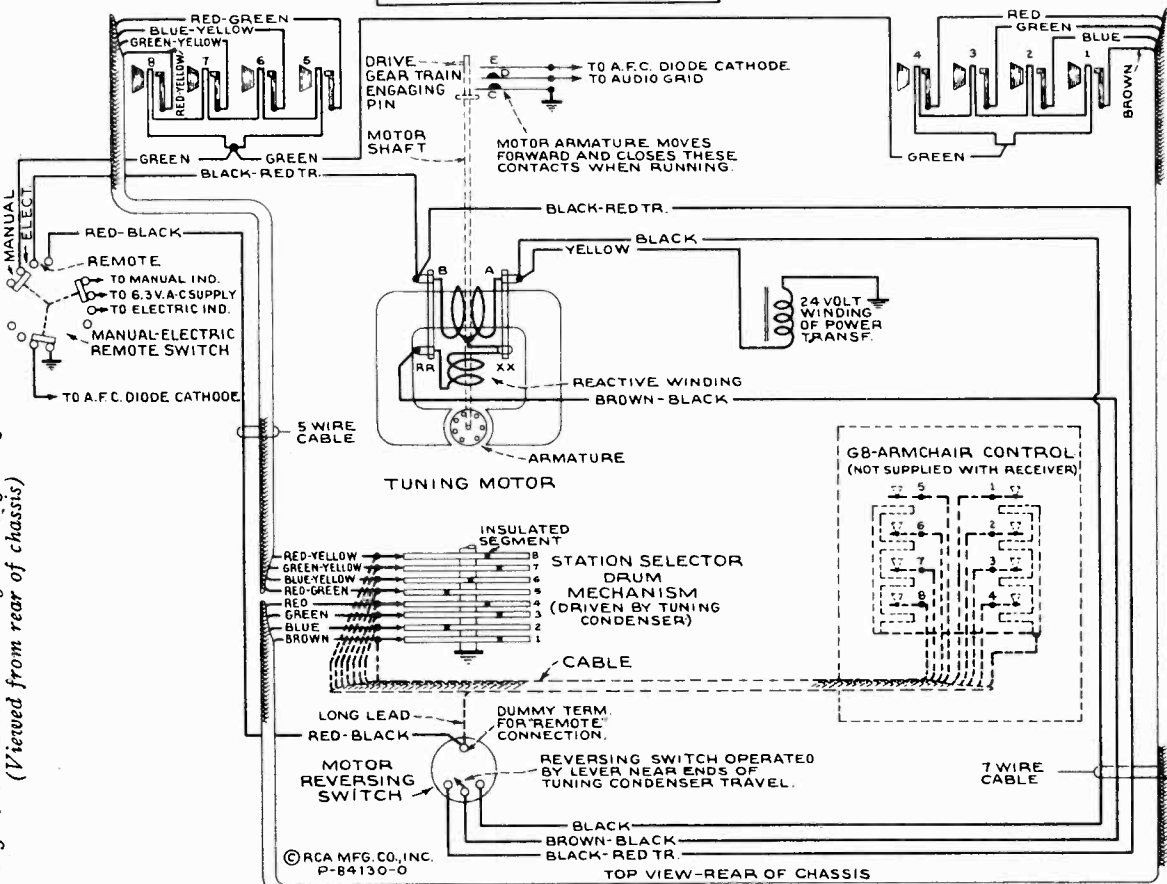


Figure 5—"Electric Tuning" Wiring Diagram  
(Viewed from rear of chassis)



RCA MFG. CO., INC.

MODEL 813K  
Alignment

Calibrate the tuning dial by adjusting dial pointer to the left ends of horizontal calibration lines with the gang tuning-condenser plates in full-mesh position. This is a screw-driver adjustment.

The "Fidelity" control should be turned counter-clockwise during all alignment operations. The "Manual-Electric-Remote" switch should be turned to "Manual" (clockwise) during alignment unless otherwise specified. The bottom shield-pan must be in place during spread-band alignment. Permit the set to operate at least five minutes before attempting alignment.

**CAUTION.**—The magnetite core screw L29 on the bottom of the 4th i-f transformer has been accurately adjusted, for an exact electrical balance of coil L29 to center tap, during manufacture and should not be disturbed. However, if for any reason the adjustment has been moved from its original position, it will be necessary to mechanically adjust this screw until the end of the stud protrudes exactly 1/8 of an inch (four threads exposed) above the brass bushing prior to any alignment operations.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. A-f-c discriminator adjustments should follow r-f and i-f adjustments tabulated below. Adjustment locations

are shown on figures 3 and 6.

Cathode-ray alignment is preferable for adjustments 2, 3, and 4 due to the flat-top i-f characteristics; the connections to the chassis are shown on figure 2. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position. The Magic Eye may be used as an output indicator for all other adjustments. It is preferable to replace the 6G5 tuning tube with a 6E5 during alignment.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action and reduce possibility of error in spread-band adjustments.

The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator. "Min. Eye" means minimum width of dark sector of Magic Eye.

For further details on alignment, refer to booklet "RCA Victor Receiver Alignment."

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	—	—	—	—	—	4th I-F Trans.	L28	Turn Extreme Counter-clockwise
2	No. 6, 6K7 2nd I-F Grid Cap	.001 Mfd.	460 kc	"Standard Broadcast"	No Signal 550-750 kc	3rd I-F Trans.	L26 and L27	Max. (peak)
3	No. 5, 6K7 1st I-F Grid Cap	.001 Mfd.	460 kc	"Standard Broadcast"	No Signal 550-750 kc	2nd I-F Trans.	L23 and L24	Max. (peak)
4	No. 2, 6L7 Det. Grid Cap	.001 Mfd.	460 kc	"Standard Broadcast"	No Signal 550-750 kc	1st I-F Trans.	L20 and L21	Max. (peak)
5	Ant. Term.	300 Ohms	1,300 kc <sub>a</sub>	"31M."	9.6 mc	"31M." Osc.	L17	Min. Eye <sub>b</sub>
6	Ant. Term.	300 Ohms	1,600 kc <sub>a</sub>	"31M."	9.6 mc	"31M." Det.	C20	Min. Eye
7	Ant. Term.	300 Ohms	1,600 kc <sub>a</sub>	"31M."	9.6 mc	"31M." Ant.	C3	Min. Eye
8	Ant. Term.	300 Ohms	1,300 kc <sub>a</sub>	"25M."	11.7 mc	"25M." Osc.	L16	Min. Eye <sub>c</sub>
9	Ant. Term.	300 Ohms	1,700 kc <sub>a</sub>	"19M."	15.3 mc	"19M." Osc.	L15	Min. Eye <sub>d</sub>
10	Ant. Term.	300 Ohms	6,000 kc <sub>e</sub>	"49M."	6.0 mc	"49M." Osc.	C10	Min. Eye <sub>f</sub>
11	Ant. Term.	300 Ohms	6,100 kc <sub>e</sub>	"49M."	6.1 mc	"49M." Osc.	C10	Min. Eye
12	Ant. Term.	200 Mmfd.	600 kc	"Standard Broadcast"	600 kc	"A" L-F Osc.	L35	Min. Eye
13	Ant. Term.	200 Mmfd.	1,500 kc	"Standard Broadcast"	1,500 kc	"A" H-F Osc.	C15	Min. Eye
14	Ant. Term.	200 Mmfd.	600 kc	"Standard Broadcast"	600 kc	"A" L-F Osc.	L35	Min. Eye
15	Ant. Term.	200 Mmfd.	1,500 kc	"Standard Broadcast"	1,500 kc	"A" H-F Osc.	C15	Min. Eye

16 Proceed to A-F-C Discriminator Adjustments Outlined Below

- a—Refer to "Spread-band Adjustments" below for Test Oscillator setting for adjustments 5, 6, 7, 8, and 9.
- b—Use minimum inductance peak (plunger out) if two peaks can be obtained. To check for correct harmonic, carefully set Test Oscillator to 1,200 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "31M." band near 9.6 mc.
- c—Use minimum inductance peak (plunger out) if two peaks can be obtained. To check for correct harmonic, carefully set Test Oscillator to 900 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "25M." band near 11.7 mc.
- d—Use minimum inductance peak (plunger out) if two peaks can be obtained. To check for correct harmonic, carefully set Test Oscillator to 900 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "19M." band near 15.3 mc.

e—Refer to "Spread-band Adjustments" below for method of using the RCA Stock No. 9572 Crystal Calibrator for adjustments 10 and 11.  
f—Use minimum capacity peak if two peaks can be obtained from 1,000 kc harmonics.



## MODEL 813K

## Circuit Data

## Adjustments, Lead Dress

RCA MFG. CO., INC.

**Spread-band Adjustments.**—Bottom shield-pan must be in place before attempting spread-band alignment. Alignment of the spread ("Overseas") bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Using the crystal calibrator to obtain the necessary accuracy, follow the tabulated alignment procedure for the "31M.", "25M.", and "19M." bands.

The "31M." band alignment, for example, is done as follows: Tune the receiver ("Standard Broadcast" band) to the 1,000 kc crystal calibrator output with the crystal calibrator "Hi-Lo" switch in "Hi" position. Snap "Hi-Lo" switch to "Lo" and carefully tune receiver to 1,600 kc (the sixth 100 kc harmonic above 1,000 kc) for minimum "Magic Eye" opening (Min. Eye). Move crystal calibrator away from antenna wire, connect test oscillator, and carefully adjust test oscillator for minimum "Magic Eye" opening at a setting of approximately 1,600 kc. (If Stock No. 150 Test Oscillator is used, refer to second paragraph below.) Raise test-oscillator output to give sufficient harmonic output and use 6th harmonic (9,600 kc) for aligning in "31M." band at 9.6 mc. Align in the "25M." band at 11.7 mc (11,700 kc), the 9th harmonic of the test-oscillator 1,300 kc output. Align in the "19M." band at 15.3 mc (15,300 kc), the 9th harmonic of the test-oscillator 1,700 kc output. In each case select the peak giving minimum "Magic Eye" opening.

For the "49M." band, snap crystal calibrator "Hi-Lo" switch to "Hi", turn the range selector to "49M." band, and set receiver dial pointer to 6.0 mc. Adjust oscillator trimming capacitor C10 for minimum "Magic Eye" opening. Use the peak indicated by the alignment table. Snap "Hi-Lo" switch to "Lo" and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting C10 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal-calibrator harmonic.

When aligning with the RCA Stock No. 150 Test Oscillator use the variable (unmodulated) oscillator and "Magic Eye" indication of receiver output. Set test-oscillator dial 800 kc lower than the desired signal for the four lower frequency ranges and 800 kc higher than the desired signal for the two high ranges and use in same manner as TMV-97-C. Insert an open-circuit telephone plug in the "Ext Mod." jack, so the modulated fixed-frequency oscillator will be cut off, and align on the unmodulated variable oscillator signal, which will close the "Magic Eye" and evidence itself by a rushing noise in the speaker.

If the crystal calibrator signals are weak, disconnect test oscillator while using the crystal calibrator.

More accurate alignment in the spread-bands can be accomplished by making final slight adjustments using American, English, or German short-wave broadcasting stations of known frequency for frequency standards.

**A-F-C Discriminator Adjustments.**—These adjustments are rather critical and should be performed with extreme care. Improper adjustment may result in complete failure of the oscillator control tube to function or else may cause it to detune the oscillator instead of tuning it to the signal. It is assumed that the magnetic core adjusting screw L28 (top of 4th i-f transformer) has been turned all the way out (extreme counter-clockwise) during the preceding tabulated adjustments. Adjustments are as follows: Remove spring "N" on link and arm assembly which connects the "Manual-Electric-Remote" switch shaft to the throw-out gear bracket. Turn "Fidelity" control counter-clockwise. Connect antenna to receiver antenna terminal. With the "Manual-Electric-Remote" switch in "Manual" (right) position, tune in a strong local station near 600 kc or the low-frequency end of the "A" band as accurately as possible by means of the tuning tube "Magic Eye." The most accurate adjustment will be obtained by adjusting the "vernier" tuning knob midway between the two points where the eye just appears to start to open. This will place the generated i-f carrier signal frequency exactly in the center of the i-f amplifier response curve (should be 460 kc if i-f amplifier was properly aligned) and is the frequency to which the a-f-c discriminator (4th i-f transformer) should be tuned to resonance. Without disturbing any of the receiver adjustments, place the "high" test-oscillator lead about 3/4 of an inch from the grid cap lead of the RCA-6K7, 1st i-f amplifier tube, adjust the test-oscillator output to maximum, turn test-oscillator "Modulation" off, and carefully zero-beat the test-oscillator frequency (approximately 460 kc) with the i-f carrier signal. Avoid placing the test-oscillator lead nearer to the grid-cap lead than specified above, as doing so will tend to detune the i-f amplifier. It may be necessary to reduce the local station signal, during this operation, by shortening antenna lead or grounding antenna "A" terminal to chassis in order to increase the loudness of the beat note sufficiently for accurate zero-beat adjustment.

Throw "Manual-Electric-Remote" switch to "Electric" (center) position. A high whistle or beat note will now be heard. Turn the magnetic core screw L28 (top of 4th i-f transformer) slowly clockwise. As this screw is turned, the beat note will first increase to a high audio frequency and will then decrease to a zero-beat and then increase in frequency again. The point of exact zero-beat is the position

for correct adjustment of the discriminator. Zero-beat should also still exist when the "Manual-Electric-Remote" switch is thrown back to "Manual" position. The adjustment is now complete and may be checked by slightly detuning the re-

ceiver above and below the local station frequency with the "Manual-Electric-Remote" in "Manual" position, switching to "Electric" position, and noting the oscillator pull-in. Release spring "N."

## Circuit Arrangement

The circuit consists of an r-f amplifier stage; first-detector (converter) stage; separate heterodyne-oscillator stage; oscillator-control stage; two i-f amplifier stages; diode detector; automatic-frequency and volume-control stage; audio voltage-amplifier stage; audio-driver stage; push-pull power-amplifier stage; tuning indicator "Magic Eye"; and a full-wave rectifier.

The antenna and first-detector coils are constructed with a special type of winding ("cumulative") to provide increased sensitivity and selectivity on the "Standard Broadcast" band. Special capacitors shunting the spread-band oscillator coils change in capacity with temperature variations to reduce oscillator frequency drift.

Spread-band tuning is accomplished electrically by shunting the low-capacity section of the oscillator variable capacitor with relatively large temperature-stabilized fixed capacitors for tuning the oscillator coil on the "19M.", "25M.", "31M.", and "49M." bands. Antenna and first-detector coils are designed to be sufficiently broad-tuned to require no variable tuning over the narrow frequency range of the spread-bands.

The spread-band oscillator coils and the "Standard Broadcast" band oscillator, first-detector, and antenna coils are all wound on separate forms. The antenna and first-detector spread-band coils are tapped. Undesirable interaction between coils is avoided by shorting proper unused sections by means of the range selector.

The intermediate-frequency amplifier consists of two RCA-6K7 tubes in a two-stage transformer-coupled circuit. The windings of all i-f transformers are resonated by fixed capacitors and are adjusted by molded magnetic cores to tune to 460 kc. A third winding, L22, in the first i-f transformer, closely coupled to the primary, L20, is placed in series with the main secondary, L21, when the fidelity control switch S11 is thrown to "broad" position (see figure 1), thereby increasing the coupling between the primary and secondary circuits with a consequent broadening of the band width of the i-f amplifier, permitting higher fidelity reception.

The function of the automatic-frequency-control circuit is to automatically change the frequency of the heterodyne oscillator so that the correct i-f frequency is formed for the i-f amplifier. The circuit consists essentially of an i-f discriminator which, as the name implies, discriminates or furnishes control voltage of the correct polarity to an oscillator frequency-control tube (or generated i-f carrier frequencies slightly above and below 460 kc, or the frequency to which the i-f amplifier is tuned).

The plate circuit of the RCA-6J7 oscillator-control tube is caused to act as an apparent variable inductance in parallel with the "A" band oscillator tuned circuit of which coil L35 is a part. The series combination of resistor R5 and the capacitor C16 is also in parallel with the oscillator tuned circuit. Since the reactance of R5 is many times greater than the reactance of C16, at the oscillator frequency, the r-f current through the combination will be practically in phase with the r-f voltage across the oscillator tuned circuit. However, the r-f voltage impressed across the C16 capacitance section of the combination, or from grid to cathode, will lag the r-f voltage across the combination, or the tuned circuit, approximately 90 degrees. The grid-cathode r-f voltage will be amplified by the control tube but will be shifted an additional 180 degrees (grid and plate voltages of all tubes are always opposite in phase) so that the amplified r-f voltage appearing across the plate circuit will now lead the voltage across the combination of the tuned circuit by 90 degrees, or, in other words, the control tube is acting as an equivalent shunt inductance. The amount of this action is determined by the amplification of the tube which, in turn, is governed by the grid-cathode bias voltage. In operation, a residual bias is developed across the cathode resistor R6. The d-c control-grid voltage is fed to the control grid from the discriminator circuit through resistor R7. If this voltage is negative with respect to ground, the amplification of the control tube will be decreased, the apparent plate-circuit inductance of the tube increased, which will lower the frequency of the oscillator tube. The converse will occur when the grid voltage is positive with respect to ground.

The action of the discriminator circuit depends upon the fact that a 90-degree phase difference exists between the primary and secondary potentials of a double-tuned loosely-coupled transformer when the resonant frequency is applied, and that this phase difference varies as the applied frequency varies, i.e., the maximum resultant response voltage across the primary and secondary windings connected in series will occur at a frequency either lower or higher in frequency than the frequency to which the individual windings are resonated, respectively, depending on whether the windings are connected series aiding or opposing.

The discriminator, or fourth i-f transformer, consists of the primary winding, L30, which is a part of the third i-f transformer secondary tuned circuit (tuned to 460 kc) and the center-tapped secondary, L29. The upper and lower halves of L29 may be considered as two secondary coils, the upper series aiding and the lower series opposing the primary, L30. The magnetic core in L29 is inserted to inductively balance the two halves. The function of coil L28 (magnetic core adjusted), in parallel with L29, is to tune the secondary to

460 kc. Therefore, the maximum voltage will be applied to diode circuit P<sub>1</sub>K<sub>3</sub> and R18 when the i-f signal frequency is below 460 kc and to the diode 460 kc. Resistors R17 and R18 are connected in series between ground and a point leading to the oscillator control-tube grid.

D-c voltages, resulting from diode rectification, across R17 and R18 are always in opposition, consequently the oscillator control-tube grid-bias voltage is a differential amount, depending upon the i-f signal strength and its frequency deviation from the nominal value of 460 kc. The polarity of this differential oscillator control-tube grid-bias, with respect to ground, depends on whether the i-f signal frequency is above or below 460 kc, but is always in the direction which will bring the generated i-f frequency nearer to 460 kc. A-f-c action is a stationary condition which is eliminated for "manual" tuning by grounding diode cathode K<sub>3</sub> through switch S9.

## Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

**Precautionary Lead Dress.**—(1) Green bus leads from C1 to S1 and from C59 to S2 should be dressed away from nearby parts. (2) Green bus lead from C13 to S3 should be 3/4-inch long and dressed away from nearby parts. (3) Bus leads from C12 to L18 and from L18 to S3 should be as short as possible. (4) Red and blue leads from tube No. 3 should be dressed away from C13. (5) Tube No. 3 grid lead should be 6-inches long and dressed away from grounded metal parts. (6) All leads behind oscillator coils should be dressed close to chassis. (7) "Magic Eye" cable should be clamped to dial bracket. (8) Filament leads should all be twisted. (9) Leads from C44 and C48 should be dressed close to chassis. (10) A-c leads near R22 should be dressed away from R22. (11) Leads from S11 to the first i-f transformer should be twisted and dressed away from chassis. (12) Capacitors C7, C8, and C9 should be dressed perpendicular to chassis and away from each other and grounded metal parts. (13) Motor-cable leads should be dressed away from pinion gear. (14) Blue bus lead from "A" detector coil to "P" of tube No. 1 should be dressed centrally between band-switch shield and air trimmer C20. The following should be dressed away from the chassis: (15) Yellow bus lead from "K" of tube No. 3 to S3. (16) Yellow bus lead from "OG" of tube No. 2. (17) Blue bus lead from C47 to R26.

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove the link from the phonograph terminal board. Connect green wire in Radio-Record switch cable to terminal 1; yellow to terminal 2; shield to terminal 3; and tape up the red and blue. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw-terminals on Radio-Record switch. If additional volume is desired, connect an RCA Stock No. 9632 transformer between the 2-conductor twisted cable and the screw-terminals on Radio-Record switch as follows: Yellow and brown transformer leads and one side of twisted cable to ground screw-terminal on switch; black transformer lead to other side of twisted cable; and blue transformer lead to other screw-terminal on switch.

**Loudspeaker.**—Two types of loudspeakers are used which will be referred to as types 1 and 2. In type 1 the cone centering diaphragm is cemented to a fixed ring, while in type 2 the centering diaphragm is cemented to an adjustable ring. Replacement of cone for either type is identical. Centering of cone for type 1 loudspeaker is made with three narrow rings of celluloid or paper feelers after first removing the front dust cover and cutting free the cone centering diaphragm. The dust cover may be removed by a light application of acetone, using care not to allow the acetone to flow into the air gap. The centering diaphragm should be cemented in place after placement of feelers. Sufficient time should be allowed for the ambroid to set before removing feelers. Use ambroid to replace dust cover. Centering of cone for type 2 loudspeaker differs only in that it is not necessary to cut free the centering-diaphragm, adjustment being made in the usual manner by means of screws on the adjustable cone centering ring.

† The No. 160 Test Oscillator employs a fixed-frequency (800 kc) modulated oscillator and a variable, unmodulated oscillator. The scale is calibrated to the sum frequency for the two higher frequency ranges and to the difference frequency for the four lower frequency ranges.

RCA MFG. CO., INC.

MODEL 813K  
Tuner Data  
Specifications

Principle of Operation

The electric tuning mechanism consists essentially of a quick engaging and disengaging reversible electric motor, tuning condenser driving gear train, and eight mechanically interlocked (pushing one button releases all others) station selector push buttons respectively wired to eight adjustable station selector contactor discs (each with a motor stopping insulated segment) mounted on a drum shaft. The arrangement coupled to the gang tuning condenser shaft is direct-coupled to any one of eight predetermined stations to be electrically tuned in by merely touching the correct push button. If all eight buttons are inadvertently locked in, firmly pushing the right-hand button will release them.

The operation may be more readily understood by reference to figures 1, 4, and 5. When the motor is not energized, the armature is pushed to the rear or slightly out of the magnetic center by tension of contact spring "C" and the motor shaft is disengaged from the driving gear train. Pressing in any one of the eight push buttons will complete the motor circuit through a station selector contactor disc, assuming that the "Manual-Electric-Remote" switch is in "Electric" position and that the insulated segment in the contactor disc is not opposite its contactor. As the motor starts, the armature will be drawn forward, due to solenoid action, and the pin "F" on the end of its shaft will engage the arm "G" on the small main pinion gear, thereby driving the tuning mechanism. At the same time contact springs "E" and "D" will be grounded, causing suppression of audio amplification and automatic frequency control during the tuning cycle. The motor will continue to operate until the insulated segment in the selector disc breaks the motor circuit, whereupon spring "C" will instantly disengage the motor pin "F" from the small pinion driving gear and will open contacts "E" and "D." Pushing another button will cause the above mentioned cycle to be repeated except that the motor will be interrupted by the insulated segment on a corresponding disc. The discs are individually adjustable on a drum mechanism, providing a choice of eight "Electric Tuned" "Broadcast" stations. The arrangement of the motor is such that its rotation will continue in the same direction regardless of the number of "Electric" tuning cycles until the tuning condenser approaches either full-out or full-in of mesh, whereupon lever "H" trips switch S7 which reverses the direction of rotation. A throw-out idler gear is linked-coupled to the "Manual-Electric-Remote" control to disconnect the motor drive gear train when the control is thrown to "Manual" position.

Mechanism Adjustments

The electric tuning mechanism is designed to be as simple in construction and as fool proof in operation as is possible. In order to maintain the accurate results possible with this device care must be taken in effecting any repairs or adjustments. Reference should be made to figure 4 and the following:

**A-F-C and A-F Amplification Suppression Switches.**—This switch assembly is located on the motor bracket and closes due to solenoid action of motor armature. The tension of the long contact spring "C" is important in bringing about quick disengagement of the motor and in permitting the motor to pull into mesh with the drive mechanism. Normal adjustment is attained when the short springs "D" and "E" are aligned exactly straight with contact points separated approximately 1/32 of an inch and with the spring "C" spaced approximately 7/32 of an inch from spring "D" at the point of contact. If necessary, in order to obtain positive pull-in and quick disengagement of the motor, the tension of spring "C" should be increased or decreased by bending. This action should be checked with the front apron of the chassis raised two inches higher than the rear. Contacts of the switch must be kept clean. Grouse cloth or a relay burnisher may be used for this purpose.

**Motor Reversing Switch.**—It is necessary to automatically stop and reverse the drive motor before the tuning condenser reaches the ends of its travel. Approximately 175 degrees of sweep is required, and the reversal must take place above 1,700 kc and below 540 kc but not too near the limits of the scale. The coupling between the station selector drum and the tuning condenser shaft should be attached so that the reversing switch trip lever "H" is exactly vertical when the condenser is full-out of mesh. There should be 1/32 of an inch clearance between the end of the condenser shaft and the selector drum shaft. While the trip lever is in this position the reversing switch bracket should be adjusted by means of its elongated mounting holes until the switch pin "I" just lightly touches trip lever "H."

**Main Pinion Gear.**—Clearance between the small high-speed pinion gear "E" and the intermediate gear "K" determines the amount of mechanical noise produced. Correct adjustment will give approximately 1/32 of an inch movement of back lash at the end of pinion arm "G" when gear "K" is held stationary. Arm "G" must also be adjusted for correct mesh with motor shaft drive pin "F." With the motor shaft completely forward and pinion "E" tight against its front bearing, the pinion mounting stud "J" should be adjusted so that pin "F" meshes full thickness with the rotating arm "G." An increase of this mesh will increase over travel on tuning while a decrease of mesh will decrease the over travel. The elongated hole in the front bracket allows sufficient movement of the mounting stud "J" to permit above mentioned gear mesh adjustment.

**"Manual-Electric-Remote" Changeover.**—(1) Link and arm adjustment—To properly line up the mechanical link between the switch shaft and throw-out gear bracket "MM," the set screws holding the link arm on the switch shaft must be loosened, the switch turned to the "Manual" position (extreme right) and the link lever revolved until the distance between the link-connecting pin (extends through chassis apron) and the right-hand (viewed from front) side of the slot, in front apron of chassis, is exactly 5/16 of an inch. If this adjustment is not properly made, correct operation of

ELECTRIC TUNING

"Electric" or "Remote" tuning will not result. (2) Throw-out Gear Adjustment—To obtain smooth operation on "Electric" or "Remote" positions it is important that the proper clearance is maintained between the throw-out gear "M" and the intermediate gear "L." With the "Manual-Electric-Remote" control thrown to "Remote" position (extreme left) adjust the mesh between these gears by means of the eccentric screw "O" and lock nut "P," contacting the throw-out gear bracket "MM," until there is approximately 1/64 of an inch backlash of gear "L" when gear "M" is held stationary.

**Vernier Tuning.**—In case it becomes necessary to remove tuning condenser drive shaft "T," it should be replaced by sliding anti-backlash gear "R" on condenser shaft, apart so that compression amounting to one tooth on the gear is obtained in the springs. Adjust mesh of gear "R" with pinion gear "U" on vernier shaft before tightening screws "S" so that smooth tuning is obtained throughout the range.

**Motor Alignment.**—The motor shaft must be exactly aligned with the axis of the pinion gear with which it engages. This may be adjusted by loosening the mounting screws "V" of the motor and aligning shaft by sight. Correct alignment may be tested by slowly rotating motor and observing the relation between the pin "F" of the motor shaft and the arm "G" on the pinion. The relation of the two should remain the same throughout the revolution. Additional movement for adjustment may be obtained by the motor bracket screws "W" if necessary.

**Station Selector Drum.**—(1) Bearing Adjustment—The selector drum may be removed by unscrewing the two bearing adjusting screws "X" on the front and rear bearings and sliding shaft out of slots on frame. To replace drum, the reverse procedure should be followed holding bearing adjusting plates "Y" firmly against the shaft and tightening adjusting screws. (2) Contact adjustment—Two types of contact strips are used. They are designated on figure 4, as types 1 and 2, on which the individual contacts are respectively adjustable and fixed. On type 1, the individual contacts should be adjusted by setting the end contact springs near the mid-position of their travel and aligning the remaining springs to them by means of a straight edge. Either type of contact strip should be adjusted to the selector drum by firmly placing two selector adjusting keys in the station adjustment strip, positions 1 and 8 (locking respective discs), loosening contact strip adjusting nuts "Z" and shifting the contact strip until the end contacts are exactly centered on the respective disc insulating segments. More accurate adjustment may be made by substituting the point of contact with a piece of white paper held behind the contact. Adjustment will be facilitated by removing complete assembly from rear of tuning condenser by unscrewing the three mounting screws. Contacts and discs must be kept free of dirt, filings, and other extraneous matter.

**Lubrication.**—The dial pointer slide should be greased with petrolatum. This same lubrication should be applied lightly to all gear faces of the drive mechanism and sparingly with a cloth to the station selector discs. Any good household oil, such as "3-IN-ONE," is suitable for the motor shaft bearings. A light grade of engine oil should be used for all gear bearings. Medium viscosity engine oil, similar to "PYROIL" (B), should be applied between the thrust washers on the motor shaft. "CASTORDAG," a mixture of graphite and castor oil, is recommended for use at the selector drum end-bearing slots and at the bearings of cable pulleys.

Station Adjustment

Any eight stations may be chosen for "Electric" tuning. Remove the two escutcheon plates from the side of the dial, place proper call letter labels in the celluloid windows, and replace escutcheons. Turn the power on and proceed to set up the "Electric" tuning as follows:

1. Set Range Selector to "Standard Broadcast."
2. Turn "Manual-Electric-Remote" control to "Electric."
3. Turn Fidelity control counter-clockwise.
4. Press push button No. 1 (left) and wait until station pointer comes to rest.
5. Turn the "Manual-Electric-Remote" control to "Manual."
6. Remove adjusting key from receptacle on top of station selector drum mechanism.
7. Insert key in position marked "1" in station adjustment strip and push the key all the way down to properly fit in slot in disc.
8. Tune the receiver very carefully by means of the manual tuning knob and the "Magic Eye," to station chosen for No. 1.
9. Remove key.
10. Turn the "Manual-Electric-Remote" control to "Electric."

Button No. 1 is now properly set for "Electric" tuning. Proceed similarly for the other seven push buttons, matching each station on the dial with the same number on the station adjustment strip. Repeat the above steps but place the key respectively in positions 2, 3, 4, etc., and in each case tune to the proper station. Pressing the proper button will now cause the desired station to be tuned in electrically.

Armchair Control

When a Model G-8 armchair control is attached to the receiver as shown in figure 5 it duplicates the action of the push buttons on the front panel when the "Manual-Electric-Remote" control is turned to "Remote" position.

Service Hints

- a. Capacitor C18 should be carefully checked for leakage or short circuit in cases of intermittent operation or no operation. R9 should be shorted out and C18 replaced by Stock No. 4839, as shown by the Schematic Circuit Diagram figure 1, in the event of trouble in this circuit.
- b. Capacitor C5 should be checked for leakage or short circuit.

- c. Resistor R5 was 33,000 ohms in some instruments. Replace with Stock No. 12333.
- d. Capacitor C16 was 82 mmfd. in some instruments. Replace with Stock No. 14021.
- e. Capacitor C38 was two 0.5 mfd. in parallel on some instruments. Replace with Stock No. 30623.

Mechanical Specifications

Height	43 inches
Depth	18 3/4 inches
Weight (shipping)	16 1/2 pounds
Weight (net)	13 1/2 pounds
Overall Dimensions	22 1/2 inches x 12 1/2 inches x 4 1/2 inches
Chassis Height	18 1/2 inches
Operating Controls	127 1/2 inches

Volume, (3) Tuning, (4) Range Selector, (5) Manual-Electric-Remote, (6) Fidelity Control, (7) Power Switch—Low Tone, (2)

Tuning Drive Ratios (manual)..... 10 to 1 and 50 to 1

Trademarks: "Magic Eye," "Magic Volume," "Magic Dial" Reg. U. S. Pat. Off. by RCA Mfg. Co., Inc.

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(7) RCA-6H6.....	Second Detector, A.V.C. and A.F.C.
(8) RCA-6C5.....	First Audio Amplifier
(9) RCA-6F6.....	Audio Driver
(10) RCA-6F6.....	Power Output
(11) RCA-6F6.....	Power Output
(12) RCA-6G5.....	"Magic Eye" Tuning Tube
(13) RCA-5T4.....	Full-Wave Rectifier

(1) RCA-6K7.....	R.F. Amplifier
(2) RCA-6L7.....	First Detector
(3) RCA-6I7.....	Oscillator
(4) RCA-6I7.....	Oscillator Control
(5) RCA-6K7.....	First I.F. Amplifier
(6) RCA-6K7.....	Second I.F. Amplifier

Mazda No. 46, 63 volts, 0.25 amp.	
105-125 volts, 50-60 cycles, 150 watts	
115-125 volts, 25 cycles, 150 watts	
100-130/140-160/195-250 volts, 50-60 cycles, 150 watts	

LOUDSPEAKER

Type.....	12-inch Electrodynamic
Impedance (v.c.).....	11.5 ohms at 400 cycles

POWER OUTPUT

Undistorted.....	15 watts
Maximum.....	20 watts

POWER SUPPLY RATINGS

Rating A.....	150 watts
Rating B.....	150 watts
Rating C.....	150 watts

Pilot Lamps (9)

Rating A.....	150 watts
Rating B.....	150 watts
Rating C.....	150 watts

MODEL 813K  
MODEL 816K  
Tuner Mechanism  
Adjustments

RCA MFG. CO., INC.

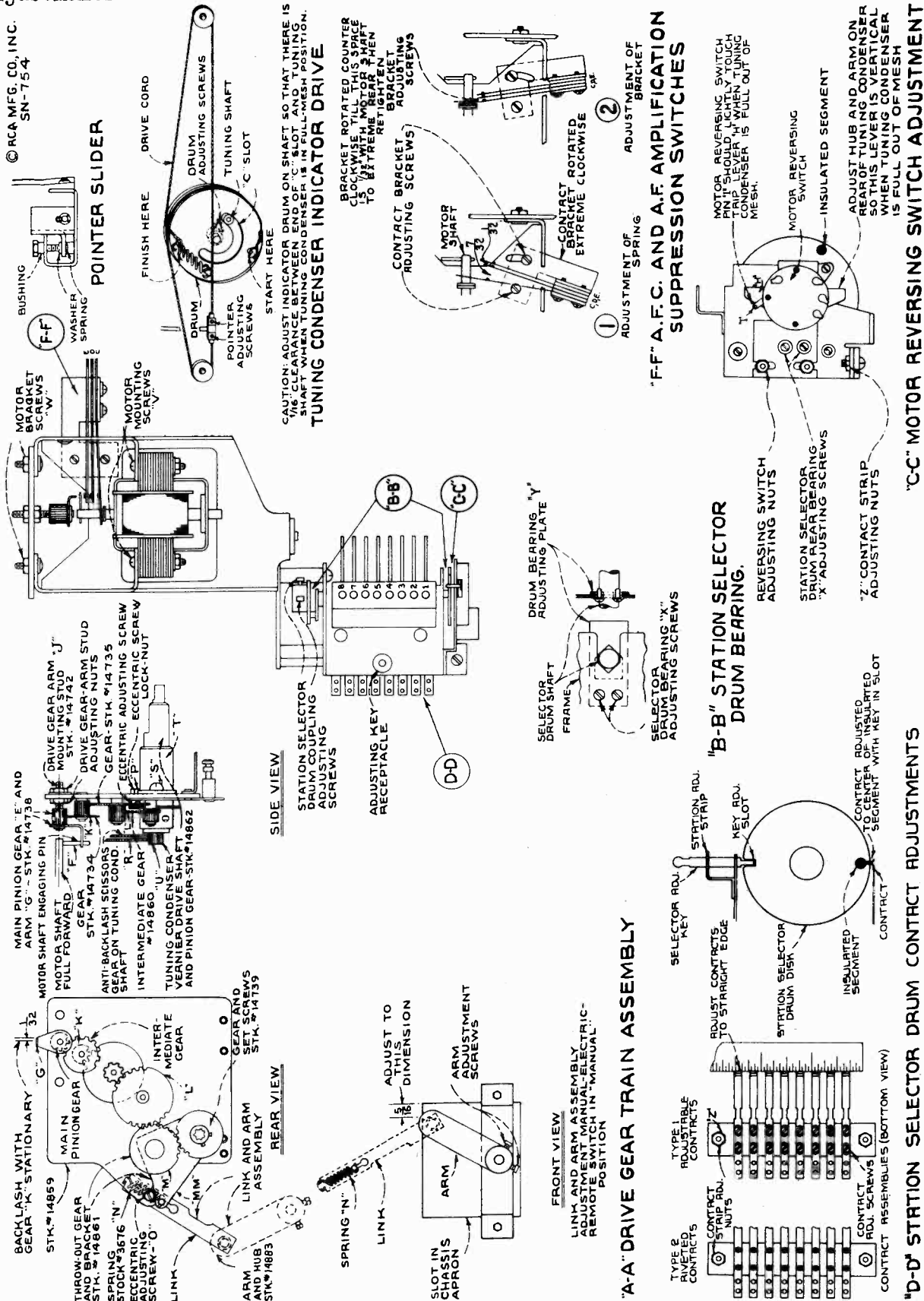


Figure 4—"Electric Tuning" Mechanism Adjustments

RCA MFG. CO., INC.

MODEL 813K  
Parts List

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
14911	Capacitor—580 Mmfid. (C11)	5112	Resistor—1000 ohms, carbon type, 1/2 watt (R10)	14855	Transformer—Driver transformer (T2)
12897	Capacitor—4700 Mmfid. (C5)	13030	Resistor—1000 ohms, carbon type, 1/10 watt (R2, R13)	14879	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1)
13033	Capacitor—007 Mfd. (C49, C51)	11583	Resistor—1200 ohms, carbon type, 1/2 watt (R41)	14880	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1)
4937	Capacitor—01 Mfd. (C50)	13031	Resistor—3300 ohms, carbon type, 1/10 watt (R29)	14881	Transformer—Power transformer 100-130/140-160/195-250 volts, 50-60 cycle (T1)
13138	Capacitor—01 Mfd. (C17, C24, C27, C39, C46)	5114	Resistor—15,000 ohms, carbon type, 1 watt (R31)	12861	Volume Control (R22)
11315	Capacitor—01 Mfd. (C47)	14078	Resistor—18,000 ohms, carbon type, 1 watt (R24)		REPRODUCER ASSEMBLIES (RL76-2)
4870	Capacitor—025 Mfd. (C42)	14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R36)	14806	Cap—Dust cap for cone center
4886	Capacitor—05 Mfd. (C30, C61)	12454	Resistor—33,000 ohms, carbon type, 1/10 watt (R4)	14522	Coil—Reproducer field coil (L34)
4839	Capacitor—01 Mfd. (C4, C18, C26, C37, C60)	12454	Resistor—68,000 ohms, carbon type, 1/2 watt (R5)	14602	Cone—Reproducer cone, voice coil, center suspension and dust cap (L32)
5170	Capacitor—025 Mfd. (C25)	12333	Resistor—100,000 ohms, carbon type, 1/10 watt (R14, R28)	5039	Plug—1 contact male plug for reproducer
30623	Capacitor—1 Mfd. (C38)	11452	Resistor—470,000 ohms, carbon type, 1/10 watt (R17, R18)	14820	Reproducer—Complete
5212	Capacitor—16 Mfd. (C55)	11172	Resistor—470,000 ohms, carbon type, 1/2 watt (R8)	14821	Transformer—Output transformer (T3, C52)
14377	Capacitor—16 Mfd. (C57)	11397	Resistor—560,000 ohms, carbon type, 1/10 watt (R1, R11, R27)	14821	Transformer—Spring washer to hold field coil securely
14377	Capacitor—20 Mfd. (C56)	12013	Resistor—1 Megohm, carbon type, 1/10 watt (R25)	14857	Washer—Spring washer to hold field coil securely
14381	Capacitor—20 Mfd. (C53, C54)	3033	Resistor—1 Megohm, carbon type, 1/2 watt (R7)		MISCELLANEOUS ASSEMBLIES
30017	Capacitor Pack—Compensating capacitor pack comprising one .025 Mfd. and one .019 Mfd. capacitor, 22,000 ohm resistor (C41, C43, R21, R23) and one 27,000 ohm resistor (C41, C43, R21, R23)	11531	Resistor—2.2 Megohm, carbon type, 1/2 watt (R20)	14745	Button—Station selector switch button
14902	Capacitor Pack—Comprising two sections 10 mfd. each (C44, C48)	13673	Resistor—10 Megohm, carbon type, 1/2 watt (R40)	30361	Card—Call letter cards for station selector
14865	Coil—"A" band antenna coil (L6, L7)	14875	Resistor—Voltage divider comprising one 1600 ohm, one 4500 ohm, one 7,000 ohm, one 300 ohm and two 85 ohm sections (R6, R33, R34, R35, R38, R39)	5040	Connect—1 contact female connector for reproducer inter-connecting cable in later production
14866	Coil—Special band spread antenna coil (L1, L2, L3, L4, L5)		Retainer—Indicator drive cord pulley retainer	30368	Connector—1 contact male connector for reproducer inter-connecting cable in later production
14867	Coil—"A" band detector coil (L12, L13)	14887	Scale—19 meter glass dial strip	14925	Crystal—Dial escutcheon crystal only
14868	Coil—Special band spread detector coil (L8, L9, L10, L11)	14897	Scale—25 meter glass dial strip	14823	Escutcheon—Dial and tuning tube escutcheon only—less crystal and buttons
14869	Coil—"A" band oscillator coil (L19, L35)	14896	Scale—31 meter glass dial strip	14924	Escutcheon—Dial and tuning tube escutcheon only—less crystal and buttons
14873	Coil—19 meter band oscillator coil (L14, L15)	14894	Scale—49 meter glass dial strip	14926	Indicator—"Electric Manual" indicating screen
14872	Coil—25 meter band oscillator coil (L16)	14893	Scale—49 meter glass dial strip	14927	Indicator—"Music Speech" indicating screen
14871	Coil—31 meter band oscillator coil (L17)	30012	Scale—"A" band glass dial strip	14751	Key—Key for use in adjusting "Electric Tuning"
14870	Coil—49 meter band oscillator coil (L18)	14899	Screw—No. 8-32x5/32 square head set screw for drum No. 14883, 14896, arm Stock No. 14726 and Stock No. 14739	14359	Knob—"Tuning" (large) control knob
14858	Condenser—3 gang variable tuning condenser complete with gear train (C1, C12, C13, C59)	12418	Screw—No. 8-32x3/16 milled head screw for gear Stock No. 14739	14688	Knob—"Range Selector" control knob
5040	Connector—4 contact female connector for reproducer cable	14848	Selector—Station selector drum mechanism—comprising selector contact discs, spring contacts, and motor reversing switch assembled in metal frame	14269	Knob—"Power-Tone" (Music-Speech), "Volume", "Tuning" (small), "Manual-Electric-Remote", and "Fidelity" control knobs
30367	Connector—4 contact female connector with metal shell for reproducer cable in later production	14882	Shield—Chassis bottom shield	5210	Screw—Chassis mounting screw and washer assembly
14733	Contact—Spring contact for engaging discs in station selector	12735	Shield—Dial lamp shield	4746	Shield—Cellulose D shield for station markers
30365	Contact—Comprising 6 spring contacts assembled on insulating strip for engaging discs in station selector drum (type 2 contact assembly)	14901	Shield—Rubber shield for tuning tube	4982	Spring—Retaining spring for knob Stock No. 14359
14857	Core—Indicator drive cord	14892	Slide—Indicator pointer slider and spring assembly	14270	Spring—Retaining spring for knob Stock Nos. 14269 and 14688
12006	Core—Adjustable core and stud for I-F transformers	11195	Socket—5 contact 5T4 Radiotron socket		RECEIVER ASSEMBLIES
14890	Cushion—Black rubber dial cushion	11196	Socket—8 contact 6K7, 6J7, 6F6, 6H6, or 6C5, Radiotron socket	14726	Arm—Hub and arm complete with set screws—Connects station selector drum with tuning condenser shaft
14888	Dial—Dial assembly, ready to mount on support brackets. Includes 7 glass dial strips and indicator slider assembled on metal frame	14877	Socket—8 contact 6J7 Radiotron impregnated socket for 6L7 Radiotron	14883	Arm—Arm and hub assembly located on "Manual-Electric-Remote" switch shaft
14862	Drive—Tuning condenser vernier drive shaft and pinion gear	14114	Socket—Dial lamp socket	14517	Board—Antenna and ground terminal board
14856	Drum—Drive cord drum complete with set screws	13638	Spring—Drive cord tension spring	12717	Board—Phonograph terminal board
14731	Drum—Station selector drum rotor—comprising 8 station selector contact discs assembled on shaft	12007	Spring—Retaining spring for core Stock No. 12006	14885	Bracket—Left hand dial bracket and pulley assembly
14738	Gear—Drive pinion gear and arm	3676	Spring—Tension spring for link and arm Stock No. 14863	14884	Bracket—Right hand dial bracket and pulley assembly
14739	Gear—Drive gear and set screws—located on tuning condenser knob shaft	14694	Strip—Strap and bolt assembly used to hold glass dial strips in position	14878	Bracket—Tuning tube mounting bracket and clamp assembly
14734	Gear—Intermediate gear assembly—comprising one .749 in. O.D., 34 tooth gear and one .291-in. O.D., 12 tooth pinion assembly	14899	Strip—Bottom glass dial strip	5237	Bushing—Variable condenser rubber mounting bushing assembly
14735	Gear—Intermediate gear assembly—comprising one .541-in. O.D., 72 tooth gear and one .291-in. O.D., 12 tooth pinion assembly	14891	Strip—Finish strip used between glass dial strips	14919	Cable—5 conductor push-button selector cable
14860	Gear—Intermediate gear assembly—comprising one 1.541-in. O.D., 72 tooth gear and hub assembled	14898	Stud—Mounting stud for gear and arm Stock No. 14738	14918	Cable—7 conductor tuning drive motor and push-button selector cable
14861	Gear—Throwout gear and bracket	14874	Switch—"Manual-Electric-Remote" switch (S5, S9, S12)	12607	Cap—First or second I-F transformer shield cap
14800	Indicator—Station selector indicator pointer	14863	Switch—"Power-Tone" (Music-Speech) switch (S4, S8, S10)	14958	Cap—Third or fourth I-F transformer shield cap
5226	Lamp—Dial Lamp	14752	Switch—Motor reversing switch and mounting plate for station selector (S7)	14850	Cap—Grid contact cap
14729	Motor—Tuning drive motor for 60 cycle models only (M-1)	14904	Switch—A-F-C and A-F amplification suppression switch (S13)	12884	Capacitor—Adjustable trimmer (long) (C3, C10, C15, C20)
14730	Motor—Tuning drive motor for 25 cycle models only (M-1)	14703	Station selector switch parts comprising one 4 point contact board, one 4 point conductor plate, insulator and lock	14392	Capacitor—4.7 Mmfid. (C62)
14859	Plate—Tuning condenser front plate and studs assembled for mounting drive gears	14706	Tone control—"Fidelity" control (R26, S11)	14021	Capacitor—22 Mmfid. (C16)
12471	Plate—6J7 socket mounting plate assembly for cushion socket—less socket	14707	Transformer—First I-F transformer (L20, L21, L22, C22, C23)	12723	Capacitor—36 Mmfid. (C40)
14886	Pulley—Indicator drive cord pulley—located on right or left hand dial bracket	14708	Transformer—Second I-F transformer (L23, L24, L25, C28, C29)	12813	Capacitor—87 Mmfid. (C66)
14854	Reactor—18 ohms, Resistor-tube, 1 amp. (R49)	14709	Transformer—Third I-F transformer (L26, L27, C31, C32)	14908	Capacitor—94.5 Mmfid. (C5)
30847	Resistor—330 ohms, carbon type, 1/2 watt (R15)		Transformer—Fourth I-F transformer (L28, L29, L30, C33)	14906	Capacitor—100 Mmfid. (C8)
30158	Resistor—823 ohms, carbon type, 1/2 watt (R30)			12720	Capacitor—103.5 Mmfid. (C36)

MODEL 816K  
Parts List

RCA MFG. CO., INC.

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
<b>RECEIVER ASSEMBLIES</b>			
14726	Arm—Hub and arm complete with set screws—Connects station selector drum to rear of tuning condenser shaft	14888	Pulley—Indicator drive cord pulley—located on right or left hand dial bracket
14883	Arm—Arm and hub assembly located on "Manual-Electric-Remote" switch shaft	14946	Reactor—Filter reactor (L37)
14517	Board—Antenna and ground terminal board	13250	Resistor—330 ohms, carbon type, 1/2 watt (R15)
12717	Board—Phonograph terminal board	11355	Resistor—390 ohms, carbon type, 1/2 watt (R6)
14885	Bracket—Left hand dial bracket and pulley assembly	30158	Resistor—820 ohms, carbon type, 1/2 watt (R30)
14884	Bracket—Right hand dial bracket and pulley assembly	11935	Resistor—1000 ohms, carbon type, 1/10 watt (R2, R13)
14878	Bracket—Tuning tube mounting bracket and clamp assembly	14720	Resistor—1000 ohms, carbon type, 1/10 watt (R10, R36)
5237	Bushing—Variable condenser rubber mounting bushing assembly	14993	Resistor—1000 ohms, carbon type, 1/10 watt (R41)
14919	Cable—5 conductor push-button selector cable	13031	Resistor—3300 ohms, carbon type, 1/10 watt (R29)
14918	Cable—7 conductor tuning drive motor and push-button selector cable	5114	Resistor—15,000 ohms, carbon type, 1 watt (R31)
12607	Cap—First or second I-F transformer shield cap	14078	Resistor—18,000 ohms, carbon type, 1 watt (R37)
12581	Cap—Third, fourth or fifth I-F transformer shield cap	14284	Resistor—22,000 ohms, carbon type, 1/10 watt (R4, R12)
11350	Cap—Grid contact cap	12333	Resistor—68,000 ohms, carbon type, 1/2 watt (R5)
12884	Capacitor—Adjustable trimmer (long) (C3, C10, C15, C20, C65, C68)	11365	Resistor—82,000 ohms, carbon type, 1/2 watt (R32)
14392	Capacitor—4.7 Mmfd. (C82)	5145	Resistor—100,000 ohms, carbon type, 1/2 watt (R14, R28)
13002	Capacitor—12 Mmfd. (C67)	11398	Resistor—220,000 ohms, carbon type, 1/10 watt (R40)
30016	Capacitor—12 Mmfd. (C34)	11452	Resistor—470,000 ohms, carbon type, 1/2 watt (R8)
12896	Capacitor—15 Mmfd. (C64)	11397	Resistor—560,000 ohms, carbon type, 1/10 watt (R1, R27)
30015	Capacitor—15 Mmfd. (C33)	5035	Resistor—560,000 ohms, carbon type, 1/2 watt (R11)
14021	Capacitor—22 Mmfd. (C16)	12013	Resistor—1 Megohm, carbon type, 1/10 watt (R25)
12948	Capacitor—33 Mmfd. (C40)	3033	Resistor—1 Megohm, carbon type, 1/2 watt (R7)
14910	Capacitor—90 Mmfd. (C21)	12200	Resistor—1 Megohm, insulated, 1/2 watt (R16)
14908	Capacitor—98.5 Mmfd. (C9)	12679	Resistor—2.2 Megohm, insulated, 1/2 watt (R19, R20)
14906	Capacitor—100 Mmfd. (C7)	14878	Resistor—Voltage divider comprising one 1450 ohm, one 5200 ohm, one 7700 ohm, one 18 ohm and one 82 ohm sections (R33, R34, R35, R38, R39)
12720	Capacitor—100 Mmfd. (C38, C58)	14887	Retainer—Indicator drive cord pulley retainer
14960	Capacitor—100 Mmfd. (C73)	30014	Scale—19 meter glass dial strip
14907	Capacitor—103.5 Mmfd. (C8)	30013	Scale—25 meter glass dial strip
14909	Capacitor—110 Mmfd. (C6)	30011	Scale—31 meter glass dial strip
12404	Capacitor—120 Mmfd. (C35, C71, C72, C75)	30010	Scale—49 meter glass dial strip
14712	Capacitor—180 Mmfd. (C31, C32)	14962	Scale—"C" band glass dial strip
14711	Capacitor—220 Mmfd. (C28, C29)	14961	Scale—"B" band glass dial strip
12952	Capacitor—330 Mmfd. (C2, C19, C45)	30285	Scale—"A" band glass dial strip
14710	Capacitor—330 Mmfd. (C2, C23)	4669	Screw—No. 8-32x5/32 square head set screw for drum
13052	Capacitor—470 Mmfd. (C14)	12418	Screw—No. 8-32x3/16 milled head screw for gear Stock No. 14739
14911	Capacitor—580 Mmfd. (C11)	14848	Selector—Station selector drum mechanism—comprising selector contactor disc's, spring contacts, and motor reversing switch assembled in metal frame
13140	Capacitor—1500 Mmfd. (C83)	14882	Shield—Chassis bottom shield
30160	Capacitor—2700 Mmfd. (C86)	12735	Shield—Dial lamp shield
12897	Capacitor—4700 Mmfd. (C5)	12008	Shield—I-F transformer shield can
4838	Capacitor—.005 Mfd. (C49, C51)	14901	Shield—Rubber shield for tuning tube
4937	Capacitor—.01 Mfd. (C50)	14892	Slide—Indicator pointer slider and spring assembly
13138	Capacitor—.01 Mfd. (C17, C24, C27, C30, C39, C46, C69, C70)	11195	Socket—5 contact 5T4 Radiotron socket
11315	Capacitor—.015 Mfd. (C47)	11196	Socket—8 contact 6K7, 6L6, 6J7, 6F6, 6H6, or 6C5 Radiotron socket
4870	Capacitor—.025 Mfd. (C42)	14877	Socket—8 contact 6J7 Radiotron impregnated socket for socket mounting plate Stock No. 12471 and 6K7 or 6L7 Radiotron
4886	Capacitor—.05 Mfd. (C61)	14114	Socket—Dial lamp socket
4839	Capacitor—.05 Mfd. (C4, C18, C25, C26, C37, C60)	13838	Spring—Drive cord tension spring
12741	Capacitor—.05 Mfd. (2 in parallel) (C38)	12007	Spring—Retaining spring for core Stock No. 12006
5212	Capacitor—.16 Mfd. (C55)	3678	Spring—Tension spring for link and arm Stock No. 14883
14377	Capacitor—.16 Mfd. (C57)	14694	Spring—Tension spring for station selector push-button switch latch bar
13611	Capacitor—.20 Mfd. (C56)	14889	Strap—Strap and bolt assembly used to hold glass dial strips in position
14531	Capacitor—.25 Mfd. (C53, C54)	14891	Strip—Finish strip used between glass dial strips
30053	Capacitor Pack—Compensating capacitor pack comprising two .015 mfd. capacitors, one 27,000 ohm and one 33,000 ohm resistors (C41, C43, R21, R23)	14742	Stud—Mounting stud for gear and arm Stock No. 14738
14902	Capacitor Pack—Comprising two sections 10 mfd. each (C44, C48)	14874	Switch—"Manual-Electric-Remote" switch (S6, S10, S13)
14948	Coil—"A" band antenna coil (L7, L8)	14883	Switch—L-F tone and power switch (S7, S9, S11)
14949	Coil—"B" band antenna coil (L5, L6)	14732	Switch—Motor reversing switch and mounting plate for station selector (S12)
14950	Coil—"C" band antenna coil (L3, L4)	14947	Switch—Range switch (S2, S3, S4)
14951	Coil—Special band spread antenna coil (L1, L2)	14728	Switch—A-F-C and A-F amplification suppression switch (S5)
14867	Coil—"A" band detector coil (L21, L22)	14904	Switch—Station selector switch parts comprising one 4 point contact board, one 4 point conductor plate, insulator and lockplate
14952	Coil—"B" band detector coil (L20)	14703	Tone control—H-F tone control (R28, S5)
14953	Coil—"C" band detector coil (L19)	14706	Transformer—First I-F transformer (L23, L24, L25, C22, C23)
14954	Coil—Special band spread detector coil (L18)	14958	Transformer—Second I-F transformer (L26, L27, L28, C28, C29, C75, R16)
14869	Coil—"A" band oscillator coil (L16, L17)	14708	Transformer—Third I-F transformer (L29, L30, C31, C32)
14956	Coil—"B" band oscillator coil (L15)	14709	Transformer—Fourth I-F transformer (L31, L32, L33, C35)
14956	Coil—"C" band oscillator coil (L14)	14959	Transformer—Fifth I-F transformer (L35, L36, C71, C72, C73, R37, R40)
14873	Coil—19 meter band oscillator coil (L9, L10)	14855	Transformer—Driver transformer (T2)
14872	Coil—25 meter band oscillator coil (L11)	14944	Transformer—Power transformer 105-125 volts, 50-60 cycle (T1)
14871	Coil—1 meter band oscillator coil (L12)	14945	Transformer—Power transformer 105-125 volts, 25-60 cycle (T1)
14957	Coil—49 meter band oscillator coil (L13)	30156	Transformer—Power transformer 100-130/140-160/195-250 volts, 50-60 cycle (T1)
14858	Condenser—3 gang variable tuning condenser complete with gear train (C1, C12, C13, C59)	12861	Volume Control (R22)
5040	Connector—4 contact female connector for reproducer cable	<b>REPRODUCER ASSEMBLIES (RL76-3)</b>	
14733	Contact—Spring contact for engaging discs in station selector drum for type 1 contact assembly	14606	Cap—Dust cap for cone center
30365	Contact—Comprising 8 spring contacts assembled on insulating strip for engaging discs in station selector drum (type 2 contact assembly)	14922	Coil—Reproducer field coil (L38)
14857	Cord—Indicator drive cord	14602	Cone—Reproducer cone, voice coil, center suspension and dust cap (L34)
12006	Core—Adjustable core and stud for I-F transformers	5039	Plug—Contact male plug for reproducer
14890	Cushion—Black rubber dial cushion	30131	Reproducer—Complete
14862	Drive—Tuning condenser vernier drive shaft and pinion gear	14992	Transformer—Output transformer (T3, C52)
14856	Drum—Drive cord drum complete with set screws	14357	Washer—Spring washer to hold field coil securely
14731	Drum—Station selector drum rotor—comprising 8 station selector contactor discs assembled on shaft	<b>MISCELLANEOUS ASSEMBLIES</b>	
10907	Fuse—3 Amp. (F1)	14745	Button—Station selector switch button
14738	Gear—Drive pinion gear and arm	30381	Card—Call letter cards for station selector
14739	Gear—Drive gear and set screws—located on tuning condenser knob shaft	14925	Crystal—Dial escutcheon crystal only
14734	Gear—Intermediate gear assembly—comprising one .749-in. O.D., 34 tooth gear and one .291-in. O.D., 12 tooth pinion assembled	14923	Escutcheon—Dial and tuning tube escutcheon only—less crystal and buttons
14735	Gear—Intermediate gear assembly—comprising one 1.541-in. O.D., 72 tooth gear and one .291-in. O.D., 12 tooth pinion assembled		
14860	Gear—Intermediate gear assembly—comprising one 1.541-in. O.D., 72 tooth gear and hub assembled		
14861	Gear—Throwout gear and bracket		
14900	Indicator—Station selector indicator pointer		
5226	Lamp—Dial lamp		
14729	Motor—Tuning drive motor for 60 cycle models only (M-1)		
14730	Motor—Tuning drive motor for 25 cycle models only (M-1)		
14859	Plate—Tuning condenser front plate and studs assembled for mounting drive gears		
12471	Plate—6J7 socket mounting plate assembly for cushion socket—less socket		
30557	Plug—Power cord plug less fuses Stock No. 10907		

14924 Escutcheon—Dial and tuning tube escutcheon and crystal complete  
 14928 Indicator—"Electric-Manual" indicating screen  
 14927 Indicator—"Music-Speech" indicating screen  
 14751 Key—Key for use in adjusting "Electric Tuning"  
 14359 Knob—Large station selector knob  
 14688 Knob—Range switch knob  
 14669 Knob—Volume control, "Manual-Electric-Remote" switch  
 H-F tone control, L-F tone control or small station selector knob  
 5210 Screw—Chassis mounting screw and washer  
 14746 Shield—Celluloid shield for station markers  
 4982 Spring—Retaining spring for knob Stock No. 14359  
 14270 Spring—Retaining spring for knob Stock Nos. 14269 and 14688







RCA MFG. CO., INC.

MODEL 816K  
Socket, Trimmers  
Voltage

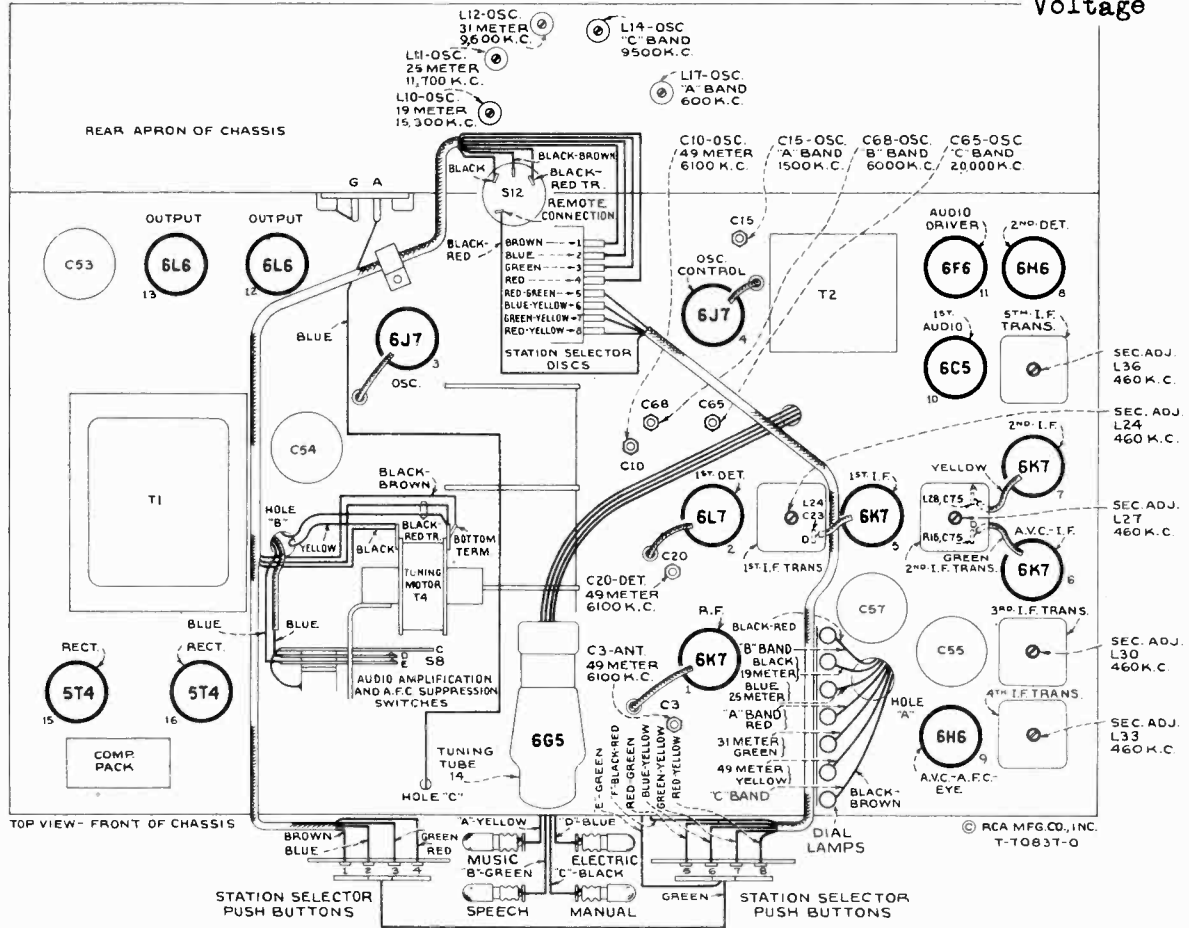


Figure 3—Radiotron, Coil, and Trimmer Locations

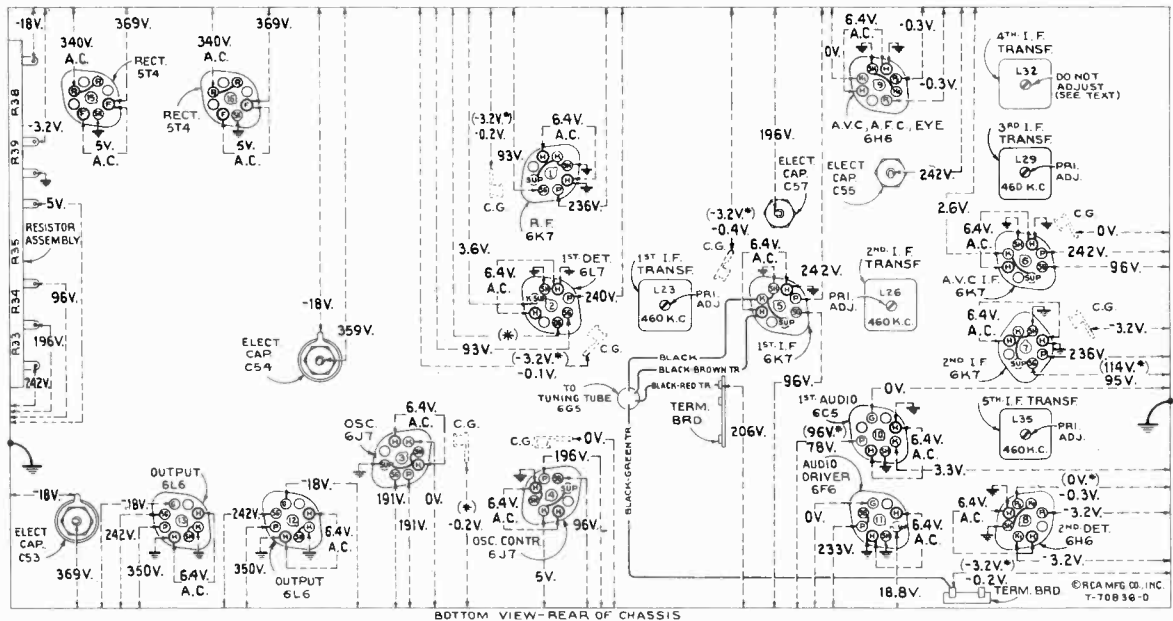


Figure 6—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply.—Tuned to approximately 1,000 kc ("Standard Broadcast")—"Manual" control—No signal being received—Volume control minimum—Fidelity control optional

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (\*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter.

Voltage values as specified should hold within  $\pm 20\%$  when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250 and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

MODEL 816K

"Electric Tuning" Wiring Specifications

RCA MFG. CO., INC.  
Electrical Specifications

FREQUENCY RANGES

"Standard Broadcast" (A)	530-1,720 kc
"M.W." Medium Wave (B)	2,400-7,100 kc
"S.W." Short Wave (C)	7,100-21,750 kc
"49M." (49 Meters)	5,970-6,240 kc
"31M." (31 Meters)	9,410-9,690 kc
"25M." (25 Meters)	11,680-11,920 kc
"19M." (19 Meters)	15,090-15,380 kc

R-F ALIGNMENT FREQUENCIES

"49M." (49 Meters)	6,100 kc (osc., det., ant.)
"31M." (31 Meters)	9,600 kc (osc.)
"25M." (25 Meters)	11,700 kc (osc.)
"19M." (19 Meters)	15,300 kc (osc.)
"S.W." Short Wave (C)	9,500 kc (osc.), 20,000 kc (osc.)
"M.W." Medium Wave (B)	6,000 kc (osc.)
"Standard Broadcast" (A)	600 kc (osc.), 1,500 kc (osc.)

Intermediate Frequency ..... 460 kc

RADIOTRON COMPLEMENT

(1) RCA-6K7	R-F Amplifier
(2) RCA-6L7	First Detector
(3) RCA-6J7	Heterodyne Oscillator
(4) RCA-6J7	Oscillator Control
(5) RCA-6K7	First I-F Amplifier
(6) RCA-6K7	A-V-C, A-F-C, and Eye I-F Amplifier
(7) RCA-6K7	Second I-F Amplifier
(8) RCA-6H6	Second Detector

(9) RCA-6H6	A.V.C., A.F.C., and Eye
(10) RCA-6C5	First Audio Amplifier
(11) RCA-6F6	Audio Driver
(12) RCA-6L6	Power Output
(13) RCA-6L6	Power Output
(14) RCA-6G5	"Magic Eye" Tuning Tube
(15) RCA-5T4	Half-wave Rectifier
(16) RCA-5T4	Half-wave Rectifier

Pilot Lamps (11) ..... Mazda No. 46, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

Rating A	105-125 volts, 50-60 cycles, 200 watts
Rating B	105-125 volts, 25 cycles, 200 watts
Rating C	100-130/140-160/195-250 volts, 50-60 cycles, 200 watts

POWER OUTPUT

Undistorted	25 watts
Maximum	30 watts

LOUDSPEAKER

Type	12-inch Electrodynamic
Impedance (v.c.)	11.5 ohms at 400 cycles

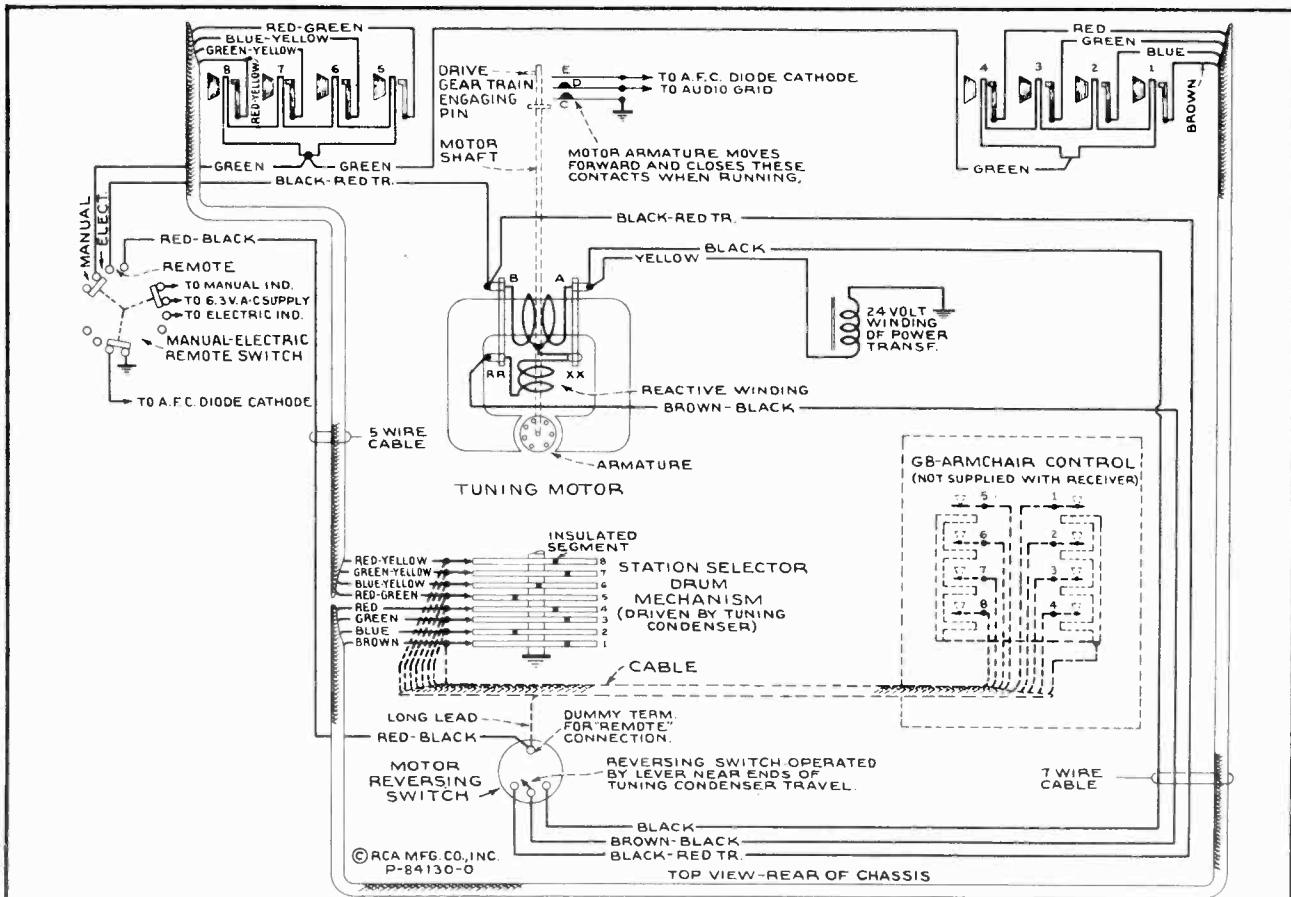


Figure 5—"Electric Tuning" Wiring Diagram (Viewed from rear of chassis)

RCA MFG. CO., INC.

MODEL 816K  
Alignment

Alignment Procedure

Calibrate the tuning dial by adjusting dial pointer to the left ends of horizontal calibration lines with the gang tuning condensers plates in full-mesh position. This is a screw-driver adjustment.

The "Fidelity" control should be turned counter-clockwise during all alignment operations. The "Manual-Electric-Remote" switch should be turned to "Manual" (clockwise) during alignment unless otherwise specified. The bottom shield pan must be in place during spread-band alignment. Permit the set to operate at least five minutes before attempting alignment.

**CAUTION**—The magnetite core screw L32 on the bottom of the 4th i-f transformer has been accurately adjusted, for an exact electrical balance of coil L32 to center tap, during factory calibration. Do not adjust this screw. If the set is for any reason the adjustment has been moved from its original position, it will be necessary to mechanically adjust this screw until the end of the stud protrudes exactly 3/8 of an inch (four threads exposed) above the brass bushing prior to any alignment operations.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. A-f-c discriminator adjustments should follow i-f and i-f adjustments tabulated below. Adjustment locations are shown on figures 3 and 6.

Cathode-ray alignment is preferable; the connections to the chassis are shown on figure 2. Cathode-ray connection "A" is used for adjustment of i-f transformers Nos. 1, 2, and 3 and connection "B" for adjustment of i-f transformer No. 5. If an output indicator is used, connect it across the loud-speaker voice-coil and advance the receiver volume control to full-volume position. The "Magic Eye" may be used as an output indicator for all adjustments except L36 and L37. It is preferable to replace the 6G5 tuning tube with a 6E5 during alignment.

Connect the "low" output terminal of the test oscillator to the receiver chassis for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action and reduce possibility of error in spread-band adjustments.

The "high" output terminal means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc." means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (theorodine) oscillator. "Min. Eye" means minimum width of dark sector of "Magic Eye." "Max. Eye" means maximum width of dark sector on alignment, refer to booklet "RCA Victor Receiver Alignment."

**Spread-band Adjustments**—Alignment of the spread ("Overcast") bands requires special procedure since test oscillators used alone are not ordinarily sufficiently accurate for this purpose. The RCA Stock No. 9572 Crystal Calibrator affords a convenient and accurate alignment standard. Wrap a few turns of wire around the crystal calibrator and connect one free end to the antenna terminal of the receiver. Snap the crystal calibrator "Hi-Lo" band, and (see figure 2) turn dial pointer to 6.0 mc. Adjust oscillator trimming capacitor C10 for minimum "Magic Eye" opening (Min. Eye). Use the peak indicated by the alignment table Snap "Hi-Lo" switch to "Lo" (100 kc) and locate 6,100 kc (the first 100 kc harmonic above 6,000 kc) by slightly readjusting C10 with the dial pointer set at 6.1 mc. This method insures selection of correct crystal calibrator harmonic. Adjust 1st detector and antenna trimming capacitors, C20 and C31, for maximum 90° phase shift.

Follow the tabulated alignment procedure for the "31M," "25M," and "19M," bands. Use the crystal calibrator to obtain the necessary accuracy. For example, tune the receiver to the 1,000 kc crystal calibrator output with the crystal calibrator "Hi-Lo" switch in "Hi" position. Snap

switch to "Lo," and carefully tune receiver to 1,200 kc (the second 100 kc harmonic above 1,000 kc) for minimum "Magic Eye" opening. Move crystal calibrator away from antenna wire, connect test oscillator, and carefully adjust test oscillator for minimum "Magic Eye" opening at a setting of approximately 1,200 kc. Raise test-oscillator output to give sufficient harmonic output and use 8th harmonic (9,600 kc) for aligning in "31M" band at 9.6 mc. Align in the "25M" band at 1,300 kc (11,700 kc); the 9th harmonic of the test oscillator (10,530 kc) is the 9th harmonic of the test-oscillator output. In each case select the peak giving minimum "Magic Eye" opening.

When aligning with the RCA Stock No. 150 Test Oscillator, use the variable (unmodulated) oscillator and "Magic Eye" indication of receiver output. Set test-oscillator dial 800 kc lower than the desired signal for the four lower frequency bands and 800 kc higher than the desired signal for the two higher frequency bands. Turn the "Ext. Mod." switch to the modulated fixed-frequency oscillator.

The No. 150 Test Oscillator employs a fixed-frequency oscillator. The scale is calibrated to the sum frequency for the two higher frequency ranges and to the difference frequency for the four lower frequency ranges.

will be cut off and align on the unmodulated variable oscillator signal which will close the "Magic Eye" and evidence itself by a rushing noise in the speaker.

If the crystal calibrator signals are weak, disconnect test oscillator while using the crystal calibrator.

More accurate alignment in the spread-bands can be accomplished by making final slight adjustments using American, English, or German short-wave broadcasting stations of known frequency for frequency standards.

Proper alignment of the spread-bands requires care rather critical and should be performed with extreme care. Improper adjustment may result in complete failure of the oscillator control tube to function or else may cause it to detune the oscillator instead of tuning it to the signal. It is assumed that the magnetite core adjusting screw L33 (top of 4th i-f transformer) has been turned all the way out (extreme counter-clockwise) during the preceding tabulated adjustments. Adjustments are as follows: Rewinding on "Fidelity" control counter-clockwise. Connect antenna to receiver antenna terminal. With the "Manual-Electric-Remote" switch shaft to the throw-out gear bracket. Turn "Fidelity" control counter-clockwise. Connect antenna to receiver antenna terminal. With the "Manual-Electric-Remote" switch in "Manual" (right) position, tune in a strong local station near 600 kc or the low-frequency end of the "A" band as accurately as possible by means of the tuning tube "Magic Eye." The most accurate adjustment will be obtained by tuning to the minimum "Magic Eye" opening between the two points where the eye begins to open. This will place the generated i-f carrier signal frequency exactly in the center of the i-f amplifier response curve (should be 460 kc if i-f amplifier was properly aligned) and is the frequency to which the a-f-c discriminator (4th i-f transformer) should be tuned to resonance. Without disturbing any of the receiver adjustments, place the "high" test-oscillator output about 3/8 of an inch from the grid cap of the 4th i-f transformer. Turn test-oscillator "Modulation" control off, and carefully zero-beat the test-oscillator frequency (approximately 460 kc) with the i-f carrier signal. Avoid placing the test-oscillator lead nearer to the grid cap lead than specified above, as doing so will tend to detune the i-f amplifier. It may be necessary to reduce the local station amplifier, during this operation, by shortening antenna lead or by increasing the antenna trimmer capacitor in order to increase the loudness of the best note adequately for accurate zero-beat adjustment.

Throw "Manual-Electric-Remote" switch to "Electric" (center) position. A high whistle or beat note will now be heard. Turn the magnetite core screw L33 (top of 4th i-f

transformer) slowly clockwise. As this screw is turned, the beat note will first increase to a high audio frequency and will then decrease to a zero-beat and then increase in frequency again. The point of exact zero-beat is the position of exact harmonic resonance. Turn the "Manual-Electric-Remote" switch to "Manual" position, and noting the oscillator dial, place spring "N" in position.

Order of Alignment	Test Oscillator		Range-Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna					
1	—	—	—	—	4th I-F Trana.	L33	Turn Extreme Counter-clockwise
2	No. 6 6K7 Eye I-F Grid Cap	.001 Mfd.	"Standard Broadcast"	No Signal 650-750 kc	3rd I-F Trana.	L28 and L30	Min. Eye
3	No. 5 6K7 1st I-F Grid Cap	.001 Mfd.	"Standard Broadcast"	No Signal 550-750 kc	2nd I-F Trana.	L26 and L27	Min. Eye
4	No. 3 6L7 Det. Grid Cap	.001 Mfd.	"Standard Broadcast"	No Signal 500-750 kc	1st I-F Trana.	L23 and L24	Min. Eye
5	No. 2 6L7 Det. Grid Cap	.001 Mfd.	"Standard Broadcast"	No Signal 500-750 kc	6th I-F Trana.	L35 and L36	Max. (peak)
6	Ant. Term.	300 Ohms	"49M."	6.0 mc	"49M." Osc.	C10	Min. Eye b
7	Ant. Term.	300 Ohms	"49M."	6.1 mc	"49M." Osc.	C10	Min. Eye
8	Ant. Term.	300 Ohms	"49M."	6.1 mc	"49M." Det.	C20	Min. Eye
9	Ant. Term.	300 Ohms	"49M."	6.1 mc	"49M." Ant.	C3	Min. Eye
10	Ant. Term.	300 Ohms	"31M."	9.6 mc	"31M." Osc.	L12	Min. Eye d
11	Ant. Term.	300 Ohms	"25M."	11.7 mc	"25M." Osc.	L11	Min. Eye e
12	Ant. Term.	300 Ohms	"19M."	16.9 mc	"19M." Osc.	L10	Min. Eye f
13	Ant. Term.	300 Ohms	"S.W."	20 mc	"S.W." H-F Osc. ("C")	C85	Min. Eye g
14	Ant. Term.	300 Ohms	"S.W."	9.6 mc	"S.W." L-F Osc. ("B")	L14	Min. Eye h
15	Ant. Term.	300 Ohms	"S.W."	20 mc	"S.W." H-F Osc. ("C")	C85	Min. Eye
16	Ant. Term.	300 Ohms	"M.W."	6.0 mc	"M.W." Osc. ("B")	C86	Min. Eye
17	Ant. Term.	200 Mmid.	"Standard Broadcast"	1,500 kc	"A" H-F Osc.	C15	Min. Eye
18	Ant. Term.	200 Mmid.	"Standard Broadcast"	800 kc	"A" L-F Osc.	L17	Min. Eye
19	Ant. Term.	200 Mmid.	"Standard Broadcast"	1,500 kc	"A" H-F Osc.	C15	Min. Eye

**Proceed to A-F-C Discriminator Adjustments Outlined Below**

a—Refer to "Spread-band Adjustments" below for method of using the RCA Stock No. 9572 Crystal Calibrator for adjustments 6, 7, 8, and 9.

b—45-minute interval between adjustments can be obtained from 1,000 kc harmonics.

c—Refer to "Spread-band Adjustments" below for Test Oscillator setting for adjustments 10, 11 and 12.

d—To check for correct harmonic carefully set Test Oscillator to 1,600 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "31M." band near 9.6 mc.

e—To check for correct harmonic carefully set Test Oscillator to 900 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "25M." band near 11.7 mc.

f—To check for correct harmonic carefully set Test Oscillator to 900 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "19M." band near 13.3 mc.

g—To check for correct harmonic carefully set Test Oscillator to 900 kc using Crystal Calibrator. Signal should be indicated by "Magic Eye" in "19M." band near 13.3 mc.

h—Check for image at 8.58 mc. (8,580 kc).



MODEL 816K  
Tuner Notes  
Lead Dress, Phono.

RCA MFG. CO., INC.

ELECTRIC TUNING

Principle of Operation

The electric tuning mechanism consists essentially of a tuning coil and disengaging reversible electric motor, tuning condenser driving gear train, and eight mechanically interlocked (pushing one button releases all others) selector push buttons respectively wired to eight tuning stations selector contactor connected to a drum which is directly coupled to the gang tuning condenser shaft. The arrangement permits any one of eight predetermined stations to be electrically tuned in by merely touching the correct push button. If all eight buttons are inadvertently locked in, firmly pushing the right-hand button will release them.

The operation may be more readily understood by reference to figures 1, 2, and 3. When the motor is not energized, the tuning coil is pushed to the rear or slightly out of the magnetic center by tension of contact spring "C" and the motor shaft is disengaged from the driving gear train. Pressing in any one of the eight push buttons will complete the motor circuit through a station selector contactor disc, assuming that the "Manual-Electric-Remote" switch is in the "Electric" position and that the motor is in the "On" position. The contactor disc will be drawn forward, due to solenoid action, and the pin "F" on the end of its shaft will engage the arm "G" on the small main pinion gear, thereby driving the tuning mechanism. At the same time contact springs "E" and "D" will be grounded, causing suppression of audio amplification and automatic frequency control during the tuning cycle. The motor will continue to operate until the in-

**Radioelectron Cathode Current Readings**  
Measured with Milliammeter Connected at Tube Socket Cathode Terminals Under Conditions Similar to Those of Voltage Measurements

(1) RCA-6K7—RF Amp.....	6.2 ma.
(2) RCA-6L7—1st Det.....	10.0 ma.
(3) RCA-6V7—Osc. Control.....	10.0 ma.
(4) RCA-6K7—1st IF Amp.....	6.2 ma.
(5) RCA-6K7—A.V.C. A-F.C. Eye I-F Amp.....	8.0 ma.
(6) RCA-6K7—2nd IF Amp.....	6.9 ma.
(7) RCA-6H6—2nd Det.....	10.0 ma.
(8) RCA-6H6—A.P. C., A-F.C., and Eye.....	10.0 ma.
(9) RCA-6F6—Driver Amp.....	23.0 ma.
(10) RCA-6F6—Output.....	23.0 ma.
(11) RCA-6L6—Output.....	51.5 ma.
(12) RCA-6G5—Tuning Tube.....	51.5 ma.
(13) RCA-5Y4—Rectifier.....	2.2 ma.
(14) RCA-5Y4—Rectifier.....	90 ma.
(15) RCA-5Y4—Rectifier.....	90 ma.
(16) RCA-5Y4—Rectifier.....	90 ma.

(\*\*Cannot be measured at socket)

ulated segment in the selector disc breaks the motor circuit, whereupon spring "C" will instantly disengage the motor pin "F" from the arm "G" on the small pinion driving gear and open contacts "E" and "D". Pushing another button will cause the above mentioned cycle to be repeated except that the motor will not be drawn forward. The discs are individually adjustable on a drum mechanism, providing a choice of eight "Electric Tuned" "Broadcast" stations. The arrangement of the motor is such that its rotation will continue in the same direction regardless of the number of "Electric" tuning cycles until the tuning condenser approaches either full-out or full-in mesh, whereupon lever "H" trips switch "JL" which reverses the rotation of the motor. The "Manual-Electric-Remote" control is connected to the motor drive gear train when the control is thrown to "Manual" position. FOR FIG. 4, SEE FIG. 4.

Mechanism Adjustments 4 OF MODEL 816K

The electric tuning mechanism is designed to be as simple in construction and as fool proof in operation as is possible. In order to maintain the accurate results possible with this device care must be taken in effecting any repairs and adjustments. Reference should be made to figure 4 and the following:

A-F.C. and A-F. Amplification Suppression Switches.—This switch assembly is located on the motor bracket and closes due to solenoid action of motor armature. The tension of the long contact spring "C" is important in bringing about quick disengagement of the motor and in permitting the adjustment to be made when the contact springs "D" and "E" are aligned exactly straight with contact points separated approximately 1/32 of an inch and with the spring "C" spaced approximately 7/32 of an inch from spring "D" at the point of contact. If necessary, in order to obtain positive pull-in and quick disengagement of the motor, the tension of spring "C" should be increased or decreased by bending. This is done by sliding the contact spring "C" up or down the raised portion which is higher than the rest. Contacts of the switch must be kept clean. Crocus cloth or a relay burnisher may be used for this purpose.

Motor Reversing Switch.—It is necessary to automatically stop and reverse the drive motor before the tuning condenser reaches the ends of its travel. Approximately 175 degrees of sweep is required, and the reversal must take place above 1,700 kc and below 540 kc but not near the limits of the scale. The coupling between the station selector drum and the tuning condenser shaft should be attached so that the reversing switch trip lever "H" is exactly vertical when the shaft clearance between the end of the condenser shaft and the selector drum shaft. While the trip lever is in this position the reversing switch bracket should be adjusted by means of its elongated mounting holes until the switch pin "I" just lightly touches trip lever "H".

Main Pinion Gear.—Clearance between the small high-speed pinion gear "F" and the intermediate gear "K" determines the amount of mechanical noise produced. Correct meshing of the gears is important in order to prevent slipping of back lash at the end of pinion gear "F" when gear "K" is held stationary. Arm "G" must also be adjusted to correct mesh with motor shaft drive pin "F". With the motor shaft completely forward and pinion "F" tight against its front bearing, the pinion mounting stud "J" should be adjusted so that pin "I" meshes full thickness with the rotating arm "G". An increase of this mesh will increase the over travel. The elongated hole in the front bearing allows sufficient movement of the mounting stud "J" to permit above mentioned gear mesh adjustment.

"Manual-Electric-Remote" Changeover.—(1) Link and arm adjustment.—To properly line up the mechanical link between the switch shaft and throw-out gear bracket "MM" the set screws holding the link arm on the switch shaft must be loosened, and the link moved to the desired position. Care between the link connecting pin (viewed through chassis apron) and the right-hand (viewed from front) side of the slot, in front apron of chassis, is exactly 5/16 of an inch. If this adjustment is not properly made, correct operation of "Electric" or "Remote" tuning will not result. (2) Throw-out gear adjustment.—To obtain smooth operation on "Electric" or "Remote" positions it is important that the proper clearance exist between the intermediate gear "L" and the intermediate gear "N". With the "Manual-Electric-Remote" control thrown to "Remote" position (extreme left) adjust the mesh between these gears by means of the eccentric screw "O" and lock nut "P", contacting the throw-out gear bracket "MM" until there is approximately 1/64 of an inch backlash of gear "L" when gear "M" is held stationary.

Verrier Tuning.—In case it becomes necessary to remove tuning condenser drive shaft "I", it should be replaced by sliding anti-backlash gearing to on condenser shaft as shown in figure 5. The spring adjust mesh of gear "R" with pinion gear "U" on verrier before tightening screws "V", so that smooth tuning is obtained throughout the range.

Motor Alignment.—The motor shaft with which it is aligned with the axis of the motor gear with which it engages. This may be adjusted by loosening the mounting screws "V" of the motor and aligning shaft by sight. Correct alignment of the motor shaft with the axis of the motor gear is the relation between the pin "F" of the motor shaft and the arm "G" on the pinion. The relation of the two should remain the same throughout the revolution. Additional motor gear mesh adjustment may be required. Motor bracket screws "W" if necessary.

Station Selector Drum.—(1) Bearing Adjustment.—The selector drum may be removed by unscrewing the two bearing adjusting screws "X" on the front and rear bearings and sliding them out but not more than 1/16 of an inch. The adjusting plates "Y" should be followed holding bearings adjusting screws. (2) Contact adjustment.—Two types of contact strips are used. They are designated on figure 4, as types 1 and 2, on which the individual contacts are respectively adjustable and fixed. On type 1, the individual contacts should be adjusted by setting the end contact springs near the spring to shaft by means of a straight edge. Either type of contact strip should be adjusted to the selector drum by firmly placing two selector adjusting keys in the station adjustment strip, positions 1 and 8 (locking respective adjustment strip, positions 1 and 8) and shifting the contact strip until the end contacts are exactly centered on the respective disc insulating segments. More contact adjustment will be facilitated by removing the complete contact with a piece of white paper held behind the contact assembly from rear of tuning condenser by unscrewing the three mounting screws. Contacts and discs must be kept free of dirt, filings, and other extraneous matter.

Lubrication.—The dial pointer slide should be greased with petroleum. This same lubrication should be applied lightly to the friction surfaces of the selector drum and to the hold oil, such as "3-IN-ONE", is suitable for the motor shaft bearings. A light grade of engine oil should be used for all gear bearings. Medium viscosity engine oil, similar to "PYROL" (B), should be applied between the thrust washers on the motor shaft. "CASTOR-DAG", a mixture of graphite and castor oil, is recommended for use at the selector drum end-bearing slot and at the bearings of cable pulleys.

Station Adjustment

Any eight stations may be chosen for "Electric" tuning. Remove the two excitation plates from the side of the dial, and place proper call letter labels in the celluloid windows, and replace excitation tubes. Turn the power on and proceed to set up the "Electric" tuning as follows:

1. Set Range Selector to "Standard Broadcast."
2. Turn "Manual-Electric-Remote" control to "Electric."
3. Turn Fidelity control counter-clockwise.
4. Power comes on test. 1 (left) and wait until station pointer comes to rest.
5. Turn the "Manual-Electric-Remote" control to "Manual."
6. Remove adjusting key from receptacle on top of station selector drum mechanism.
7. Insert key in position marked "1" in station adjustment strip and push the key all the way down to proper position.
8. Turn the receiver very carefully by means of the manual tuning knob and the "Magic Eye" to station chosen for No. 1.
9. Remove key.
10. Turn the "Manual-Electric-Remote" control to "Electric."

Button No. 1 is now properly set for "Electric" tuning. Proceed with the dial with the same number on the station adjustment strip. Repeat the above steps but place the key respectively in positions 2, 3, 4, etc., and in each case tune to the proper station. Pressing the proper button will now cause the desired station to be tuned in electrically.

Armchair Control

When a Model G-8 armchair control is attached to the receiver as shown in figure 5 it duplicates the action of the push buttons on the front panel when the "Manual-Electric-Remote" control is turned to "Remote" position.

Service Hints

1. Capacitors C18 and C14 should be carefully checked for leakage or short circuit in cases of intermittent operation or no operation. C14 should be eliminated from the circuit, and R9 should be shorted out, and C18 replaced by Stock No. 4839, as shown by the Schematic Circuit Diagram figure 1, in the event of trouble in this circuit.

b. Capacitor C5 should be checked for leakage or short circuit.  
Resistor R5 was 33,000 ohms in some instruments. Replace with Stock No. 12333.  
Capacitor C16 was 82 mmfd. in some instruments. Replace with Stock No. 14021.

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the illustrations. The various parts on the diagrams are identified by the following Replacement Parts List. The coils, transformer windings, and resistors are rated in terms of d-c resistance to permit continuity checks.

**Pre-wiring Lead Dress.**—(1) Green bus lead from C1 to S7 should be 2 3/4 inches long. (2) Green bus lead from C2 to S4 should be 2 3/4 inches long. (3) Green bus lead from C13 to S3 should be 2 3/4 inches long. (4) Bare bus lead from C12 to S3 should be 1 1/2 inches long. (5) Blue lead and red leads from tube No. 3 to L9 should be dressed away from the coil. (6) Tube No. 3 grid lead should be 6 inches long. (7) All leads to rear of oscillator coil should be dressed close to the chassis. (8) Clamp "Magic Eye" cable to the dial bracket. (9) Antenna lead should also be dressed to the leads from tube No. 11. (10) Leads from antenna lead should be dressed away from the coil. (11) Wires to leads near R22 should be dressed away from R22. (12) Leads from S5 to the first i-f transformer should be twisted. (13) Temperature stabilizing capacitors marked 1A, 2A, and 3A should be dressed perpendicular to chassis. (14) Blue bus lead from L21 to tube No. 1 plate should be dressed away from shield plate on range selector assembly. (15) C36, C38, and R2 of tube No. 9 should be grounded to the ground lances near corner of chassis. The following should be dressed away from chassis: (16) Yellow bus lead to OG of tube No. 2. (17) Yellow bus lead to OG of tube No. 1. (18) Yellow bus lead to R19. (19) Blue bus lead from C47 to R76. When necessary to replace bus leads, use only wire having same diameter as original.

**Phonograph Attachment.**—A terminal board is provided for connecting a phonograph into the audio-amplifying circuit. RCA Victor Models R-93, R-93-A, R-93-2, or R-94 Record Players should be connected as follows: Remove the wire in Radio-Record switch cable to terminal 1; yellow to terminal 2; shield terminal 3; and tap up the rest of the blue connect phonograph and the screw-terminals on the Phonograph binding posts and the screw-terminals on Radio-Record switch. If additional volume is desired, connect an RCA Stock No. 9632 transformer between the 2-conductor twisted cable and the screw-terminals on Radio-Record switch as follows: Yellow and brown transformer leads and one side of twisted cable to ground screw-terminal on switch; black transformer lead to other screw-terminal on switch.

**Loudspeaker.**—Two types of loudspeakers are used which will be referred to as "Type 1" and "Type 2". The centering diaphragm is cemented to a fixed ring, while in type 2 the centering diaphragm is cemented to an adjustable ring. Replacement of cone for either type is identical. Centering of cone for type 1 loudspeaker is made with three narrow celluloid or paper feelers after first removing the front dust cover and cutting free the cone centering diaphragm. The dust cover may be removed by a light application of acetone, using care not to allow the acetone to flow into the air gap. The centering diaphragm should be held in place by the centering adjusting screws. The centering diaphragm should be allowed for the amount to set before removing feelers. Use ambrond to replace dust cover. Centering of cone for type 2 loudspeaker differs only in that it is not necessary to cut free the centering diaphragm, adjustment being made in the usual manner by means of adjustments on the adjustable cone centering ring.





RCA MFG. CO., INC.

MODELS 910KG, U126, U128  
Circuit Data, Antenna  
Lead Dress, Tuning Dial

## General Description

The RCA Victor Model 910KG Receiver employs a ten-tube, three-band, "Magic Brain" superheterodyne circuit, the arrangement of which is shown in the schematic circuit diagram. Features of design include: "Electric Tuning" for eight broadcast stations; a link-coupled antenna circuit; magnetite-core i-f transformers and "A" band oscillator coil; full automatic volume control; Victrola jack and switch; "Magic Eye" tuning tube; improved 12-inch dust-proof electrodynamic loudspeaker; aurally compensated audio volume control; continuously variable high-frequency tone control; provision for armchair control attachment; illuminated band indicator; noise-reducing antenna adjustment on "A" band; temperature-stabilized capacitors; phase inverter audio amplifier; and push-pull power output stage.

The Model U-126 combination instrument consists of a

radio receiver similar to the Model 910KG, and in addition, a phonograph turntable with a self-starting electric motor, and crystal pickup. The phonograph will play ten- or twelve-inch records; and automatically shuts "off" at the end of record play. The output of the pickup is "shorted" out when the pickup is on the pickup rest.

The Model U-128 combination instrument consists of a radio receiver similar to the Model 910KG, with an automatic phonograph mechanism. The phonograph has a self-starting motor, crystal pickup, and may be set to play ten-inch and twelve-inch records singly, or automatically. In the automatic position, seven twelve-inch; eight ten-inch; or a mixed group of seven, ten- and twelve-inch records, may be played in succession. The output of the pickup is "shorted" out when the pickup is on the pickup rest.

## Service Data

**Victrola Attachment.**—A jack located near the "Magic Eye" tube is provided for connecting a Victrola Attachment into the audio-amplifying circuit on Model 910KG. The cable running from the Victrola attachment should be terminated in a Stock No. 31048 plug to fit the jack.

**Loudspeaker.**—Centering of the loudspeaker is made in the usual manner with three narrow celluloid or paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. A dust cover should be cemented in place upon completion of adjustment.

**Precautionary Lead Dress.**—(1) The lead from the left pilot light should be kept behind the bulb and toward the "Magic Eye," to keep it away from the 6F5 grid cap, (2) leads from mica trimmers to coil should be kept away from the coil and other parts, (3) leads on oscillator coil which are an extended part of the coil winding should be as short as possible, (4) "C" band series capacitor C31 must have leads as short as possible, (5) all leads from antenna board to antenna coils should be dressed toward back apron, (6) the one lead of the line cord and the primary lead of the power transformer which run to the power switch should be twisted together, (7) shielding on leads to Victrola switch should be kept away from the switch terminals and jack.

## Antenna Connections

**RCA Victor Master Antenna Kit.**—Connect the twisted-pair transmission line to terminals A1 and A2 on the terminal board at rear of chassis. Connect the counter-poise to A3. Terminal G may be connected to ground, but this connection is not necessary for correct operation.

**Noise-Reducing Adjustment.**—After the RCA Victor Master Antenna Kit is connected to the receiver, tune the receiver to a point near 900 kc where no station is heard. Turn volume control clockwise until noise is heard. If no noise of a regular character is audible, start any brush-type motor-driven appliance, such as a vacuum cleaner, electric razor, refrigerator, etc., but do not bring it too near the receiver. This will generate noise as a continuous "crackling, or buzz. Adjust C5, which is mounted behind the antenna terminal board, to a point where this noise is reduced to a minimum.

Adjustment of the noise reducing trimmer C5 should be made in the customer's home, with the RCA Victor Master Antenna connected to the receiver.

This adjustment is effective only when the RCA Victor Master Antenna is used. For all other types of antenna, the noise-adjustment trimmer C5 should be screwed all the way down.

**Other Antennas.**—Use terminals A1 and A3 on the receiver terminal board as antenna and ground connecting points respectively. Terminal A3 may be connected to terminal G, unless this causes interference, in which case this connection should be omitted.

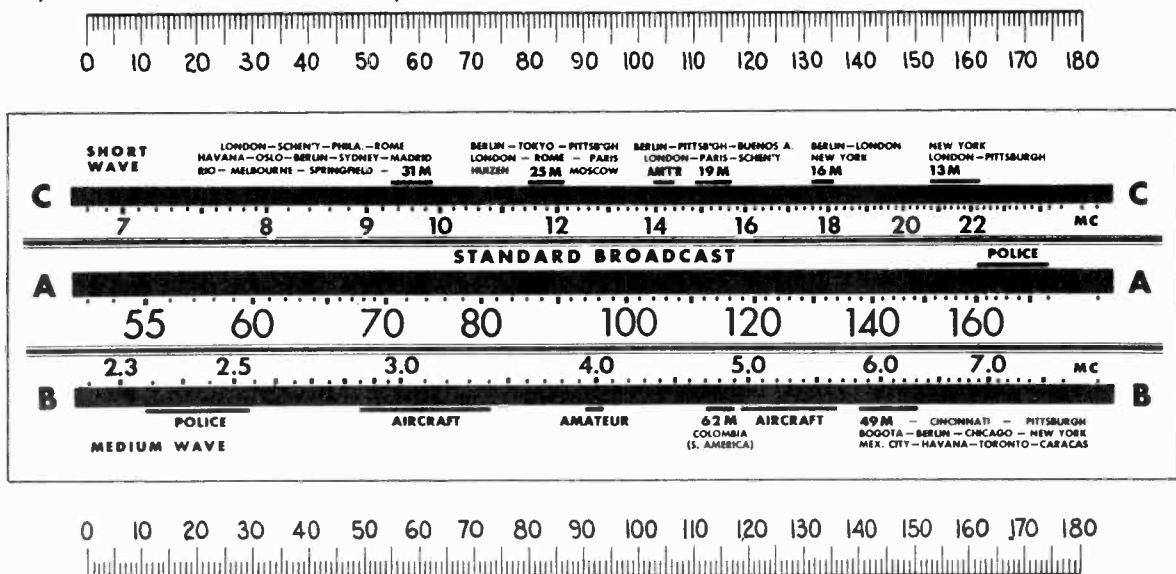


Figure 1—Tuning Dial, and Corresponding 0-180° Calibration Scale

The corresponding dial setting for any reading of the calibration scale can be determined by drawing a line straight up from this point; for example, 151.5° on the calibration scale corresponds to a dial reading of 1,500 kc on "A" band. Read instructions under "Alignment Procedure."

MODELS 910KG, U126, U128  
Alignment, Turntable Data

RCA MFG. CO., INC.

Steps	Connect the high side of test-oscillator to —	Tune test-oscillator to —	Range Selector	Set tuning gang to—	Adjust the following for max. peak output
No. 1	6K7 I-F grid cap in series with .01 mfd.	455 kc	"A"	Quiet point between 550-750 kc	L10, L11 (2nd I-F Transformer)
No. 2	6A8 Det. grid cap in series with .01 mfd.	455 kc	"A"		L8, L9 (1st I-F Transformer)
No. 3	A2. Connect A1 to chassis.	20 mc	"C"	20 mc (147.5°)	C24 (osc.)* C8 (det.)†
No. 4	A2, in series with 100 mmfd. Connect A3 to chassis.	6,100 kc	"B"	6,100 kc (145.5°)	C25 (osc.)**
No. 5	A2, in series with 100 mmfd. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (151.5°)	C29 (osc.) C3 (ant.)
No. 6	A2, in series with 100 mmfd. Connect A3 to chassis.	600 kc	"A"	600 kc (29.5°)	L17 (osc.)
No. 7	A2, in series with 100 mmfd. Connect A3 to chassis.	1,500 kc	"A"	1,500 kc (151.5°)	C29 (osc.)

\* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 141.5° (19,090 kc), at which point a weaker signal should be received.

\*\* Use minimum capacity peak if two peaks can be obtained. Check to determine that the correct peak has been used by turning to 124° (5,190 kc), at which point a weaker signal should be received.

† Rock gagg condenser and use maximum capacity peak if two peaks can be obtained with C8.

**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 indicator-drive-cord drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

**Turntable Mechanism Model U-126**

The crystal unit of the pickup is sealed in a metal case against extremes of climate. The offset mounting of the crystal unit in the pickup arm insures ideal tracking between needle and record grooves. If failure should occur due to a defective crystal, no attempt should be made to repair the crystal, but a new replacement crystal unit should be installed.

The turntable drive is a self-starting, variable-speed, governor-type, induction motor. The motor speed adjusting screw is located under the turntable, and may be adjusted by inserting a screwdriver thru one of the holes in the turntable, after the hole has been lined up with the screw. The flexible motor drive arrangement is similar to the U-128. The motor speed should be 78 r.p.m., and may be checked by placing a piece of paper between a record and the turntable, and then counting the number of revolutions of the turntable per minute. The motor is designed to be simple and fool-proof in operation. Occasionally, however, certain adjustments and lubrication may be required. These are illustrated and explained in figure 12. In addition, an application of oil to the felt pad, which rubs against the governor disc, will insure smooth operation.

The turntable is started by pushing to the rear the motor starting lever, which appears to the right of the turntable. The adjustment on the automatic motor stopping switch should be made so that the switch will snap to the "off" position when the needle in the pickup head is 13/4 inches away from the center of the turntable. The locking screw and details of the switch mechanism are shown in figure 14. The locking screw and nut may be reached, from underneath the motor board, or, by an open end wrench, under the turntable.

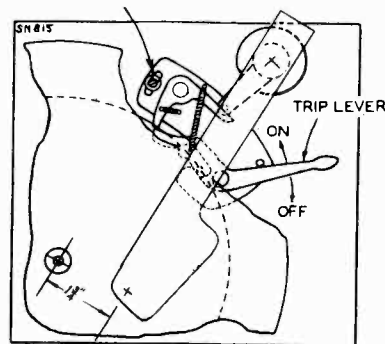
FOR AUTOMATIC RECORD  
CHANGER DATA, SEE INDEXADJUST SWITCH TO TRIP WHEN NEEDLE  
IS ON 1-3/4" RADIUS FROM C OF MOTOR SPINDLE

Figure 14—Adjustment of Automatic Stop Switch

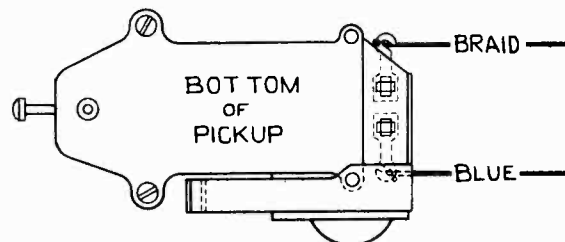
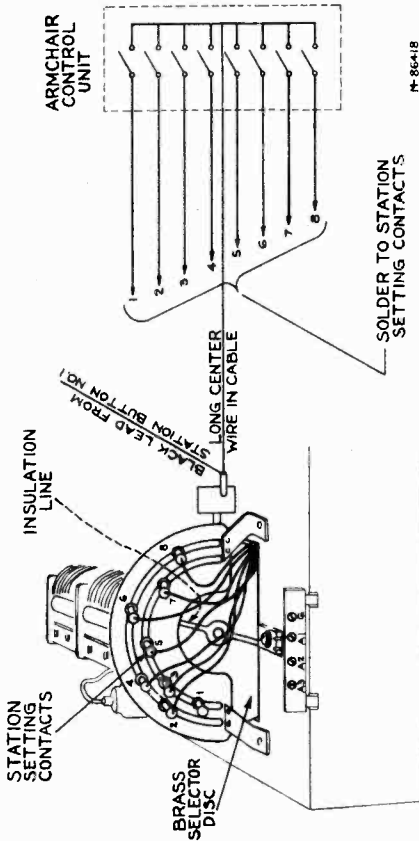


Figure 15—Pickup Connections





14-86418

Figure 7—Station-Setting Contacts and Selector Disc

This illustration shows connections for a GBA Armchair-Control Unit. This unit is not supplied with the receiver but may be added as an accessory.

Colors of Leads from Push Buttons to Station-Setting Contacts

Station Button No.	Color of Lead To Station-Setting Contact	Station Button No.	Color of Lead To Station-Setting Contact
No. 1	Black	No. 5	Brown
No. 2	Brown	No. 6	Green
No. 3	Green	No. 7	Red
No. 4	Red	No. 8	Red-yellow

Electric Tuning Mechanism

The circuit of the electric tuning mechanism is shown in the schematic diagram, and the mechanical details are illustrated below.

The action can be understood by following a cycle of operation.

When a station button is pushed in, it completes the 24-volt circuit through the corresponding station-setting contact and one-half of the brass selector disc, which is connected to one side of the motor field coil. This energizes the motor, and the rotor is pulled forward, engaging with the gear train that drives the tuning condenser and selector disc. The condenser and disc rotate until the insulation line comes under the particular station-setting contact, and the tuning circuit is broken.

At the same time, the rotor has rotated one-half of the disc, which then makes contact to the other half of the disc. This completes the circuit to the other side of the motor field coil, causing the motor to reverse. The floating flywheel is still turning in the original direction and therefore slows down the reversal movement of the motor; as a result the selector disc is moved slowly back until the insulation line is under the station-setting contact, when the circuit is broken and the mechanism stops.

Adjustment of Flywheel Friction

In normal operation, the motor drives the tuning condenser and selector disc until the insulation line just passes the particular station-setting contact. The motor then reverses and moves the disc slowly in the opposite direction until the insulation line is under the contact, and the mechanism stops.

In some cases, particularly with high line-voltages, the disc may make two or three reversals before stopping.

The flywheel friction adjustment screw should be set to give the least number of reversals with the chases in normal horizontal position.

Adjustment of Selector Disc

The brass selector disc is fastened to the rear shaft of the tuning condenser by means of two set-screws. When the condenser is at maximum (plates fully meshed) the insulation line should be horizontal, with the operating end at the left (viewed from the front of the receiver). The dark insulation line on the selector disc should be aligned with this end.

The selector disc should be set so that the contact-plungers in the station-setting contacts project not more than 1/16-in. from the body of the contacts.

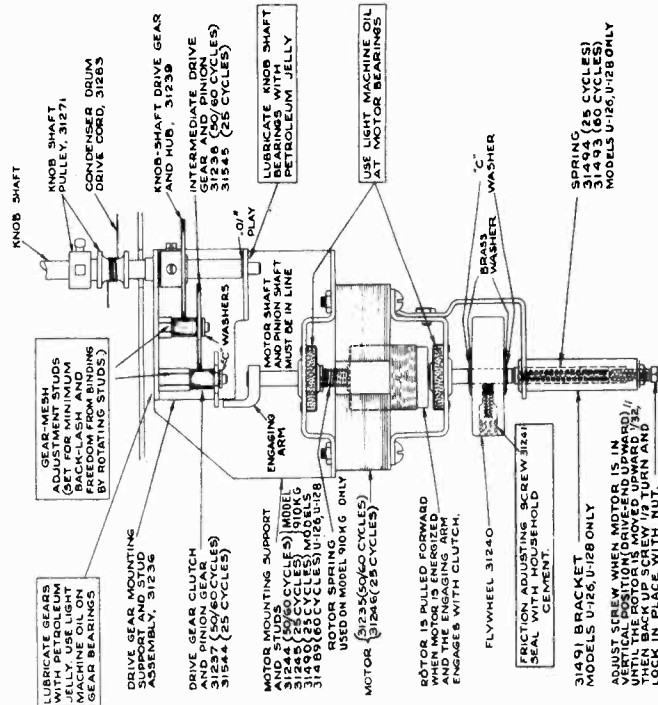


Figure 6—Motor and Gear Mechanism

There must be 1/32-inch clearance between the end of the engaging arm and the face of the intermediate gear when the motor is in its full forward position.

Muting Circuit

When the electric tuning mechanism is in action, the motor-supply voltage is fed into a diode rectifier circuit which applies a high bias to the tri-audio amplifier. This prevents any amplification and makes the set quiet or "mute" while the mechanism is operating.

Lubrication

Motor bearings and gear bearings use light machine oil. Gear faces use "Pure Oil No. 611" or petroleum jelly. Dial-indicator pulleys and rails use "Castoroid" or petroleum jelly.

Selector disc: apply thin film of petroleum jelly. Friction leather on flywheel: apply "neat-foot" oil. When replacing motor: use "neat-foot" oil for at least 24 hours in neat-foot oil, and insert in flywheel while dipping.

ADJUSTMENTS FOR ELECTRIC TUNING

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



Figure 3—Location of Controls  
The left-hand push-button is a Vetro-A-Attachment switch. The right-hand push-button is for dial tuning.

Armchair Control Unit

When a Model GBA Armchair Control is connected to the receiver as shown in figure 7 it duplicates the action of the push-button on the station-setting contacts. The black lead from push-button No. 1 is unsoldered from No. 1 station-setting contact and soldered to a terminal board which is to be mounted on the frame of selector mechanism. In some cases one of the other seven station buttons on the set may be used in place of No. 1 button for the operation of the Armchair Control. The other seven buttons when tuning in stations at the set, but allows the use of the entire eight buttons on the Model GBA Armchair Control. In operating the GBA Armchair Control the push-button must be held down until the station has tuned in. Care must be taken not to hold two of the station buttons down at the same time. The station-setting contacts may be engaged instantaneously causing the motor to be inoperative and overheated.

2. Turn range selector to "A" band, turn power on, and allow a few minutes for warming up.

3. Press down the "dial-tuning" (right-hand) button.

4. Manually tune in the first station on the list, using the "Magic Eye" for accurate tuning.

5. Hold down the "dial-tuning" button, and push station button No. 1 (second from left). Both buttons will stay down. Move adjusting pin No. 1 to the insulating line on the dial at rear of gang. When the pin is moved on the insulating line, the central dial lamp will go out.

6. Press down any other button in order to release the dial-tuning button and station button No. 1. When the tuning mechanism will function to tune in the station, and the central dial lamp will stay on.

7. Repeat this process for the remaining stations.

MODELS 910KG, U126, U128  
Parts List

RCA MFG. CO., INC.

REPLACEMENT PARTS

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	STOCK No.	DESCRIPTION	Unit List Price
<b>RECEIVER ASSEMBLIES</b>			14531	Capacitor—25 mfd. (C34) (Model 910KG)	1.55	<b>MOTOR ASSEMBLIES</b>		
31492	Bearing—Variable condenser motor rotor adjustment bearing—less bracket and cup assembly (Models U-126 and U-128)	.10	31237	Clutch—Variable condenser drive gear clutch and pinion gear—engages pin on motor shaft—30-80 cycle models only	.35	11703	Governor—Motor speed governor	3.05
31253	Board—Antenna and ground terminal board (Model 910KG)	.25	31544	Clutch—Variable condenser drive gear clutch and pinion gear—engages pin on motor shaft—25 cycle models only	.45	31448	Motor—105-125 volts, 25 cycle (M2)	23.70
31531	Board—Antenna and ground terminal board (Models U-126 and U-128)	.25	31293	Coil—"A" band antenna coil (L1, L6, L7)	1.30	31163	Motor—105-125 volts, 50-60 cycle (M2)	20.50
31229	Body—Station-setting contact body, less contact tip and tip spring	.18	31296	Coil—"A" band oscillator coil (L17)	1.05	31557	Motor—105-125 volts, 60 cycle (M2)	17.75
31276	Bracket—Band indicator mounting bracket complete—less indicator strip, cord, and tension spring	.40	31294	Coil—"B" band antenna coil (L15, L14)	.80	30888	Plug—2-contact female plug for motor leads (Model U-128 only)	.35
31491	Bracket—Bracket and bearing cup for variable condenser motor rotor adjustment (Models U-126 and U-128)	.45	31295	Coil—"C" band antenna coil (L11, L3)	.85	30870	Plug—2-contact male plug for motor power cable (Model U-128 only)	.35
31282	Bracket—Magic Eye mounting bracket and holder	.22	31297	Condenser—3-gang variable condenser (C3, C4, C7, C8, C32)	6.50	31447	Screw—Complete set of motor mounting screws, washers, and spacers—for 25 cycle models only	.40
12714	Capacitor—Adjustable trimmer 2-12 mmfd. (C2)	1.50	31231	Contact—Contact tip for station-setting contact	.12	31158	Screw—Complete set of motor mounting screws, washers, and spacers—for 50-60 cycle models only	.25
31202	Capacitor—Dual adjustable trimmer 3-30 mmfd. each section (C24, C25)	.40	31345	Contact—Push button switch contacts—comprising 10 contacts riveted on insulating strip	1.20	14206	Switch—Motor toggle switch (S7) (Model U-128 only)	.90
31252	Capacitor—Adjustable trimmer 5-80 mmfd. (C5)	.25	31276	Contact—Push button switch contacts—comprising 13 contacts riveted on insulating strip	1.20	<b>PICKUP AND ARM ASSEMBLIES</b>		
12548	Capacitor—20 mmfd. (C2, C64)	.35	31281	Cord—Indicator pointer drive cord	.50	Model U-128		
18948	Capacitor—33 mmfd. (C1)	.35	31283	Cord—Variable condenser drum drive cord	.20	31469	Base—Pickup arm base and pivot shaft	.95
31432	Capacitor—20 mmfd. (C27)	.40	31285	Cord—Adjustable core and stud for "A" band oscillator coil	.15	31158	Crysal—Pickup crystal cartridge and needle	4.25
31287	Capacitor—68 mmfd. (C31) (Models U-126 and U-128)	.35	31260	Crim—Adjustable core and stud for "A" band oscillator coil	.35	31180	Pickup and arm complete	7.50
12726	Capacitor—100 mmfd. (C20)	.35	31273	Drum—Indicator drive drum	.80	31161	Shaft—Pickup pivot arm and shaft assembly	.15
31270	Capacitor—100 mmfd. (C11, C12, C13, C14)	.35	31248	Flywheel—Variable condenser drive motor flywheel	.25	<b>PICKUP AND ARM ASSEMBLIES</b>		
12724	Capacitor—120 mmfd. (C37, C38)	.35	31259	Gear—Variable condenser knob shaft drive gear and hub	.85	Model U-128		
12725	Capacitor—120 mmfd. (C21)	.35	31545	Gear—Variable condenser intermediate drive gear and pinion gear—25 cycle models only	.40	31182	Cable—Pickup arm lift cable and clips	.15
31433	Capacitor—560 mmfd. (C28)	.35	31238	Gear—Variable condenser intermediate drive gear and pinion gear—50-80 cycle models only	.40	31159	Crysal—Pickup crystal cartridge and needle	4.25
31033	Capacitor—1,000 mmfd. (C26)	.35	31304	Gear—Variable condenser intermediate drive gear and pinion gear—50-80 cycle models only	.40	31159	Pickup and arm complete	7.45
31405	Capacitor—2,000 mmfd. (C31) (Models U-126 and U-128)	.75	31532	Indicator—Band indicator strip (Models U-126 and U-128)	.15	31160	Screw—Pickup needle screw	.12
5107	Capacitor—.0025 mfd. (C53) (Models U-126, U-128)	.20	11891	Lamp—Dial pilot, or compartment lamp, 6.3 V, 0.25 amp	.17	31181	Shaft—Pickup pivot arm and shaft assembly	.45
30363	Capacitor—.0035 mfd. (C46)	.20	31480	Lamp—Electric tuning adjustment indicator lamp, 6.3 V, 0.15 amp	.17	<b>SPEAKER ASSEMBLIES</b>		
4938	Capacitor—.005 mfd. (C17, C22, C49, C50)	.45	31243	Leather—Friction leather for flywheel	.04	13866	Cap—Dust cap for cone center	.03
4838	Capacitor—.01 mfd. (C21, C45) (Models U-126 and U-128)	.25	31245	Lock—Push button switch lock plate—comprising 10 contact locks in one strip	.80	12134	Coil—Field coil (L12)	3.85
14593	Capacitor—.01 mfd. (C6, C18, C21, C39, C49, C52, C55) (C1, C48, C52) (Models U-126 and U-128 only) (C55 in Models U-126 and U-128 only)	.30	31246	Motor—Variable condenser drive motor (M1)—25 cycle models only	6.50	14489	Coil—Neutralizing coil (L14)	1.75
11315	Capacitor—.015 mfd. (C36)	.20	31235	Motor—Variable condenser drive motor (M1)—50 cycle models only	6.50	5039	Plug—4-contact male plug for speaker (Model 910KG only)	.30
30882	Capacitor—.05 mfd. (C9)	.30	31227	Plate—Selector contact plate—less contacts	4.85	31539	Plug—6-contact male plug for speaker (Models U-126 and U-128 only)	.25
4938	Capacitor—.1 mfd. (C10, C16)	.30	30868	Plate—Selector mounting plate—mounts on rear of variable condenser	.50	31530	Speaker complete (R1701-2) (Model 910KG only)	12.35
12484	Capacitor—.25 mfd. (C33)	.30	31247	Plug—2-contact female plug for phono. motor cable (Models U-126 and U-128)	.35	31538	Speaker complete (R170H-4) (Models U-126 and U-128 only)	10.45
30865	Capacitor—.25 mfd. (C40)	.30	<b>MOTORBOARD ASSEMBLIES</b>			14534	Transformer—Output transformer (T2)	3.85
30387	Capacitor—.5 mfd. (C19)	.35	31338	Coupling—Flexible motor coupling complete	2.10	14507	Washer—Spring washer to hold field coil securely	.08
5212	Capacitor—16 mfd. (C35) (Model 910KG)	1.35	9848	Cup—Used needle cup and lid complete	.75	<b>MISCELLANEOUS ASSEMBLIES</b>		
31496	Capacitor—16 mfd. (C35) (Models U-126 and U-128)	1.25	31465	Mounting—Pickup arm base rubber mounting	.10	31508	Button—Station selector push buttons	.15
31495	Capacitor—20 mfd. (C34) (Models U-126 and U-128)	1.75	31535	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31303	Cap—Pilot lamp cap (Bulla Eye) (Models U-126 and U-128 only)	.15
5040	Plug—4-contact female plug for speaker cable (Model 910KG)	.30	30870	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31456	Cover—8-protective covers for push button markers	.08
12493	Plug—5-contact female plug for speaker cable (Models U-126 and U-128)	.30	14195	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31540	Cushion—Chassis mounting cushion and screw assemblies—sufficient for one chassis (Models U-126 and U-128 only)	.50
31280	Pulley—Motor pointer drive cord pulley	.10	30100	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31541	Cushion—Motor plate mounting cushion and screw assemblies—sufficient for one instrument (Models U-126 and U-128 only)	.50
31271	Pulley—Motor pulley	.10	31105	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31151	Dial—Station selector dial scale and crystal	.95
31272	Pulley—50 cycle pulley	.20	31147	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31361	Dial—Station selector dial scale and crystal	.95
31250	Resistor—Voltage divider comprising one 1,800 ohm, one 2,950 ohm, one 3,400 ohm, one 18 ohm, and one 180 ohm sections (R19, R28, R41, R32, R33)	.90	31534	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	30608	Dial—Station selector dial scale and crystal	2.65
12484	Resistor—100 ohms, 1/10 watt (R24)	.15	31537	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31305	Indicator—Station selector indicator pointer (Model 910KG only)	.35
13988	Resistor—22,000 ohms, 1/10 watt (R4)	.15	31149	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31542	Indicator—Station selector indicator pointer (Models U-126 and U-128 only)	.40
11300	Resistor—33,000 ohms, 1/10 watt (R27, R30)	.15	31534	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31355	Knob—Station selector, volume control, tone control, or range switch knob	.12
12474	Resistor—47,000 ohms, 1/10 watt (R5, R26, R42)	.20	31537	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31467	Marker—Dial Tuning push button marker	.01
14560	Resistor—100,000 ohms, 1/10 watt (R15)	.20	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31589	Marker—Record Player push button marker	.20
12464	Resistor—150,000 ohms, 1/10 watt (R16, R42)	.20	31151	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31760	Marker—Station call letter push button markers	.36
11398	Resistor—220,000 ohms, 1/10 watt (R14)	.15	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31396	Screen—Compartment lamp screen (Models U-126 and U-128 only)	.20
11453	Resistor—270,000 ohms, 1/10 watt (R16, R29)	.15	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31396	Screen—Chassis mounting screws and washers (4 required) (Model 910KG only)	.45
11452	Resistor—470,000 ohms, 1/10 watt (R1)	.15	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	14270	Spring—Retaining spring for knob Stock No. 31355	.05
12588	Resistor—470,000 ohms, 1/10 watt (R8)	.20	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31470	Suspension—Motor board suspension springs, screw, and lockwasher (4 required) (Models U-126 and U-128 only)	1.80
12013	Resistor—1 meg., 1/10 watt (R7, R25)	.15	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	11831	Support—Cabinet lid support (Models U-126 and U-128 only)	.15
30208	Resistor—1.2 meg., 1/10 watt (R22, R41) (R41 Models U-126 and U-128 only)	.20	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	<b>ANTENNA ASSEMBLIES</b>		
11991	Resistor—1.5 meg., 1/10 watt (R40) (Models U-126 and U-128 only)	.15	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	31126	Counterpoise Line—Additional length 60 ft. long	1.35
5131	Resistor—2 meg., 1/10 watt (R3)	.15	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	12428	Insulator—Strain and counterpoise insulator	.05
14887	Retainer—Indicator pointer drive cord pulley retainer	.01	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	9816	Transmission Line—Additional length 60 ft. long	1.50
31233	Rotor—Selector rotor disc—mounts on rear of variable condenser shaft	1.18	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03	<b>ALL PRICES ARE SUBJECT TO CHANGE OR WITHDRAWAL WITHOUT NOTICE.</b>		
31241	Screw—#10 headless, cone point set screw for flywheel	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
4119	Screw—No. 8-32 headless set screw for gear	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
14350	Screw—No. 8-32 square head set screw for selector	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
4669	Screw—No. 8-32 square head set screw for pulley Stock Nos. 31271 and 31272, and drum Stock No. 31273	.03	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31384	Socket—Dial lamp socket	.45	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
13874	Socket—Magic Eye socket	.25	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31417	Socket—Push button switch and bracket	.30	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31251	Socket—Tube socket	.25	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31365	Spring—Tuning indicator lamp insulated socket	.03	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31278	Spring—Indicator mounting spring for station-setting contact	.03	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31232	Spring—Contact tip spring for station-setting contact	.03	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
13638	Spring—Indicator pointer drive cord tension spring	.08	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31418	Spring—Variable condenser drive cord tension spring	.05	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
12007	Spring—Retaining spring for core Stock No. 31269	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31230	Spring—Station-setting contact body spring	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31262	Spring—Tension spring for core Stock No. 31260	.01	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31242	Spring—Tension spring for flywheel	.01	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31313	Spring—Tension spring for push button switch latch bar	.06	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31494	Spring—Variable condenser motor rotor adjustment bearing spring for 25 cycle models only (Models U-126 and U-128 only)	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31493	Spring—Variable condenser motor rotor adjustment bearing spring for 50-60 cycle models only (Models U-126 and U-128 only)	.02	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31236	Support—Variable condenser drive gear mounting support and studs assembly	.62	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31245	Support—Variable condenser motor mounting support and studs for 25 cycle models only (Model 910KG only)	.70	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31490	Support—Variable condenser motor mounting support and studs for 25 cycle models only (Models U-126 and U-128 only)	.60	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31244	Support—Variable condenser motor mounting support and studs for 50-60 cycle models only (Model 910KG only)	.45	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31489	Support—Variable condenser motor mounting support and studs for 50-60 cycle models only (Models U-126 and U-128 only)	.35	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31360	Switch—Pickup switch for mounting on push button switch assembly (S3)	2.70	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31291	Switch—Range switch (S1, S2)	.95	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31312	Switch—Station selector push button switch and bracket complete	4.25	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31248	Tone Control—H-I tone control and power switch (R12, S4)	2.50	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31267	Transformer—First I-f transformer (L4, L9, C13, C14)	1.20	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31268	Transformer—Second I-f transformer (L10, L11, C13, C14)	2.05	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31308	Transformer—Power transformer 105/100/140/160-200 250 volts, 50-60 cycle (T1)	13.85	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31228	Transformer—Power transformer 110 volts, 25-60 cycle (T3)	13.00	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31225	Transformer—Power transformer 110 volts, 50-60 cycle (T1)	8.50	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31450	Volume Control (R9) (Model 910KG only)	1.50	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			
31249	Volume Control (R9) (Models U-126 and U-128 only)	1.50	31150	Pin—Drive pin to fasten flexible coupling to turntable shaft	.03			

RCA MFG. CO., INC.

MODEL 911K  
Schematic  
Lead Dress

**RCA Victor Master Antenna Kit.**—Connect the twisted-pair transmission line to terminals A1 and A2 on the terminal board at rear of chassis. Connect the counter-poise to A3. Terminal G may be connected to ground, but this connection is not necessary for correct operation.

**Noise-Reducing Adjustment.**—After the RCA Victor Master driven appliance, such as a vacuum cleaner, electric razor, refrigerator, etc., but do not bring it too near the receiver. This will generate noise as a continuous crackling, or buzz. Adjust C1 to a point where this noise is reduced to a minimum.

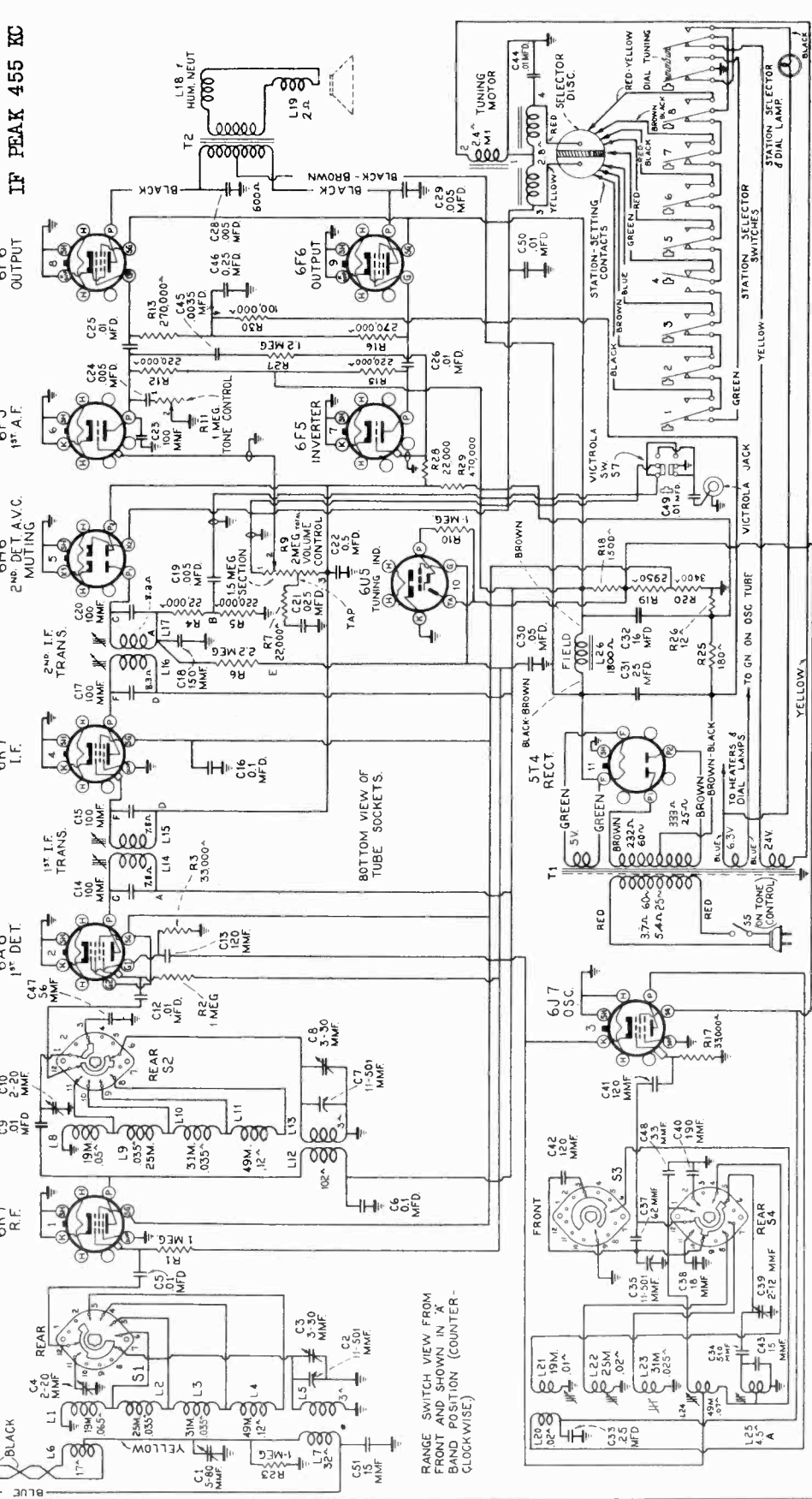


Figure 4—Schematic Circuit Diagram

- Precautionary Lead Dress.**—
- (1) Keep tuning tube cable and the lead from the left pilot light away from the 6F5 grid cap.
  - (2) Leads on spread-band antenna and r-f coils should be kept short as possible.
  - (3) Keep black lead from L25 away from C38 and L24.
  - (4) Keep black lead from L25 to cathode lug on 6J7 away from R17.
  - (5) The power cord lead and the primary lead of the power transformer which connect to the power switch should be twisted together.
  - (6) Keep C13 away from the 6A8 control grid lead and from the chassis.
  - (7) Shielded leads to Victrola jack must be dressed away from switch terminals and jack.
  - (8) Blue and black leads from antenna board to coils must be twisted.
  - (9) Black lead and condenser which connect to 6F6 plate should be kept away from inverter grid lead and resistors which connect to it.

MODEL 911K

Chassis Wiring, Transformer Voltage, Specs.

RCA MFG. CO., INC.

This receiver employs an eleven-tube, three-band "Magic Brain" superheterodyne circuit, the arrangement of which is shown in the Schematic Circuit Diagram. Features of design include electric tuning for eight broadcast stations; push-pull power output stage; magnetite-core i-f transformers; magnetite-core "A" band oscillator tracking adjustment; temperature-stabilized capacitors; four spread-bands; automatic volume control; jack and switch for Victrola attachment;

"Magic Eye" tuning tube; 12-inch, dust-proof electrodynamic loudspeaker; aural-compensated audio volume control; continuously variable high-frequency tone control; provision for armchair control attachment; new straight-line dial; illuminated band indicator; noise-reducing adjustment on "A" band and noise reduction on "C" band with RCA Victor Master Antenna; air-core trimmer condensers.

Pilot Lamps..... One Mazda 47, 6-8 volts, .15 amp; Two Mazda 44, 6.3 volts, .25 amp.

POWER SUPPLY RATINGS

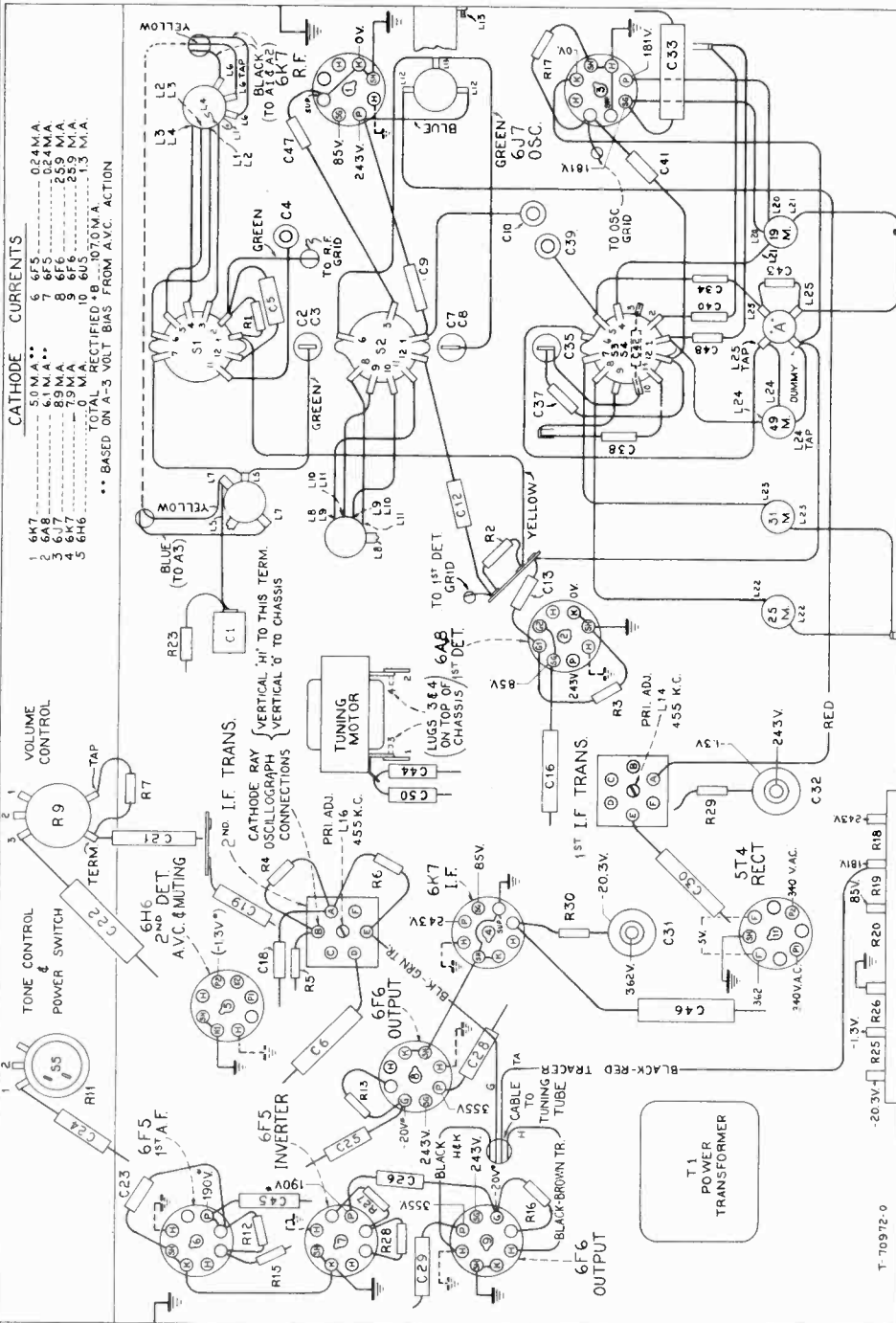
Rating A..... 105-125 volts, 50-60 cycles, 120 watts  
 Rating B..... 105-125 volts, 25-30 cycles, 120 watts  
 Rating C..... 105-125/140-160/195-250 volts, 50-60 cycles, 120 watts

POWER OUTPUT

Undistorted..... 10 watts  
 Maximum..... 12 watts

LOUDSPEAKER

Type..... 12-inch Electrodynamic  
 Voice Coil Impedance..... 2.2 ohms at 400 cycles



**CATHODE CURRENTS**

1 6K7	50 MA	0.24 MA
2 6F5	7.6 FS	0.24 MA
3 6F6	6.0 MA	0.24 MA
4 6F7	9.0 MA	0.24 MA
5 6F8	9.0 MA	0.24 MA
6 6F9	9.0 MA	0.24 MA
7 6F5	7.6 FS	0.24 MA
8 6F6	6.0 MA	0.24 MA
9 6F7	9.0 MA	0.24 MA
10 6F8	9.0 MA	0.24 MA
11 6F9	9.0 MA	0.24 MA
TOTAL	0 MA	0.00 MA
TOTAL RECTIFIED	0 MA	0.00 MA
TOTAL	0 MA	0.00 MA

.. BASED ON A-3 VOLT BIAS FROM A.V.C. ACTION

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

BOTTOM VIEW REAR OF CHASSIS (110-volt supply for a Victrola Attachment may be obtained by connecting the motor to the red and the red-black leads.)

**FREQUENCY RANGES**

"Standard Broadcast" (A)	540-1,720 kc
"49 Meter Band"	5,920-6,230 kc
"31 Meter Band"	9,480-9,690 kc
"25 Meter Band"	11,680-11,940 kc
"19 Meter Band"	15,089-15,390 kc
Intermediate Frequency	455 kc

**R-F ALIGNMENT FREQUENCIES**

"Standard Broadcast" (A)	1,500 kc (osc., det., ant.), 600 kc (osc.)
"49 Meter Band"	6,100 kc (osc.)
"31 Meter Band"	9,600 kc (osc., det., ant.)
"25 Meter Band"	11,800 kc (osc.)
"19 Meter Band"	15,200 kc (osc.)

**UNIVERSAL TRANS. CONNECTIONS**

Above — Universal Power Transformer Connections



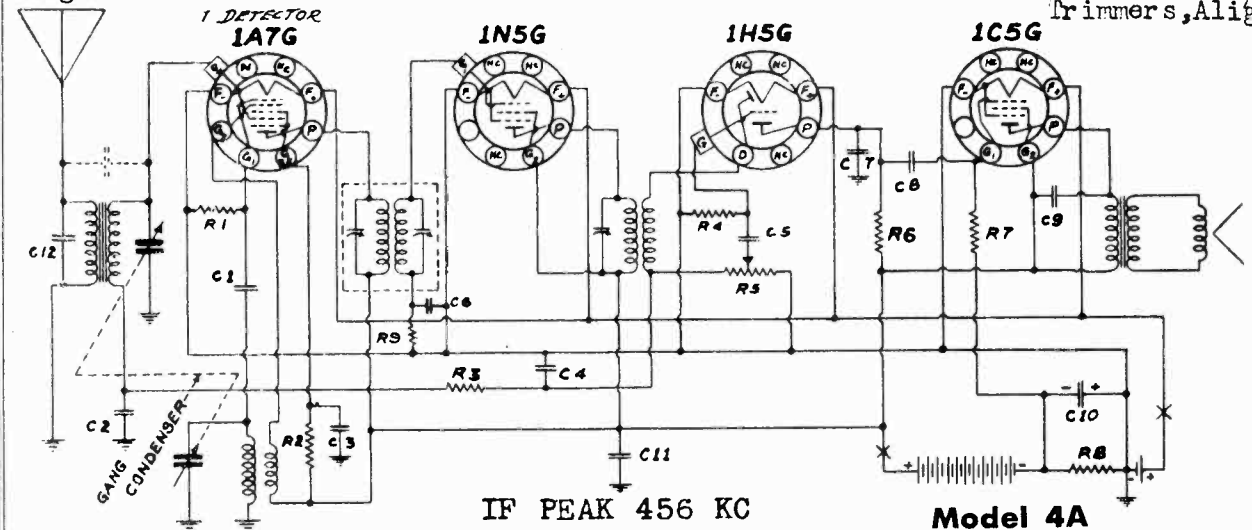




MODELS 5E,55  
Alignment

RADIO PRODUCTS CORP.

MODEL 4A  
Schematic, Socket  
Trimmers, Alignment



**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 alignment should be the next procedure.

**I.F. ALIGNMENT**

Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

**BROADCAST BAND ALIGNMENT**

Adjust the oscillator to 1730 KC and connect the output to the antenna lead (Blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. This is all that is necessary for the alignment unless the plates of the gang condenser have been bent out of shape. In case of bent plates, set the test oscillator and the receiver to 600 KC and bend the plates into the position for maximum sensitivity over the tuning range. **\*50 MMF. (MODEL 55)**

**Model 4A**

**RESISTORS**

NO	OHMS	WATTS
R1	200,000	1/4
R2	70,000	1/4
R3	1 MEG.	1/4
R4	2 MEG.	1/4
R5	500,000	1/4 VOL.
R6	250,000	1/4
R7	500,000	1/4
R8	600	1/4
R9	2 MEG.	1/4
CONTROL		

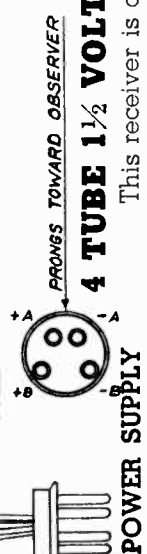
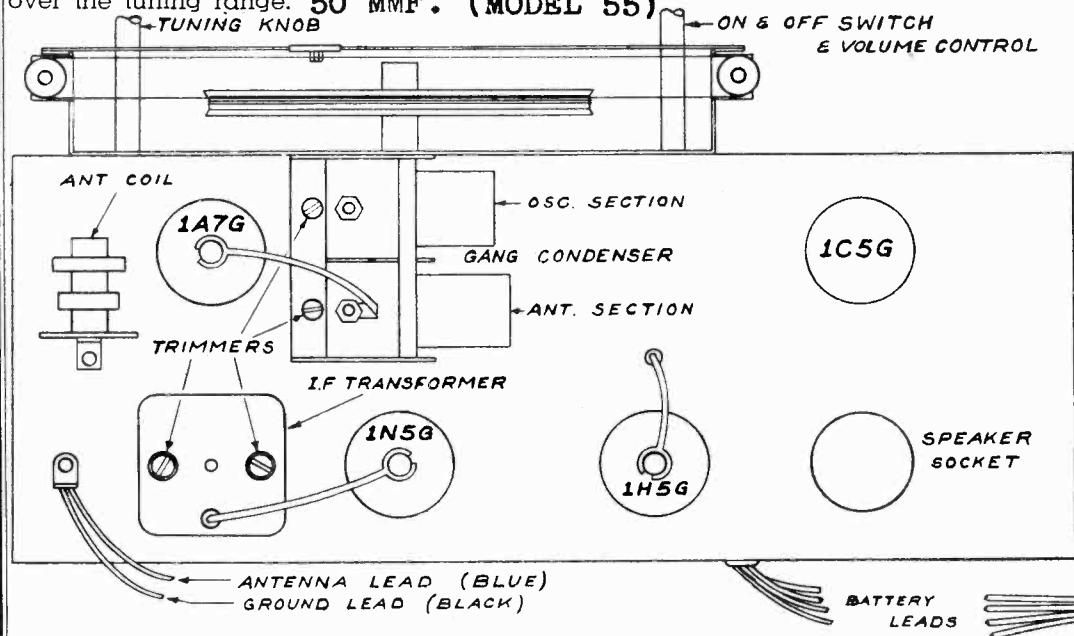
**CAPACITORS**

NO	CAP. MFDS	TYPE
C1	.00025	MICA
C2	.05	200V.
C3	.1	200V.
C4	.00025	MICA
C5	.01	400V.
C6	.05	400V.
C7	.00025	MICA
C8	.01	400V.
C9	.005	400V.
C10	20. (ELECT)	25V.
C11	.1	200V.
C12	.00005	MICA

**4 TUBE 1 1/2 VOLT "AB" BATTERY SUPERHETERODYNE RANGE 535 - 1730 KILOCYCLES**

This receiver is designed to operate on a single unit "Ray-o-vac" No. AB82 Dry

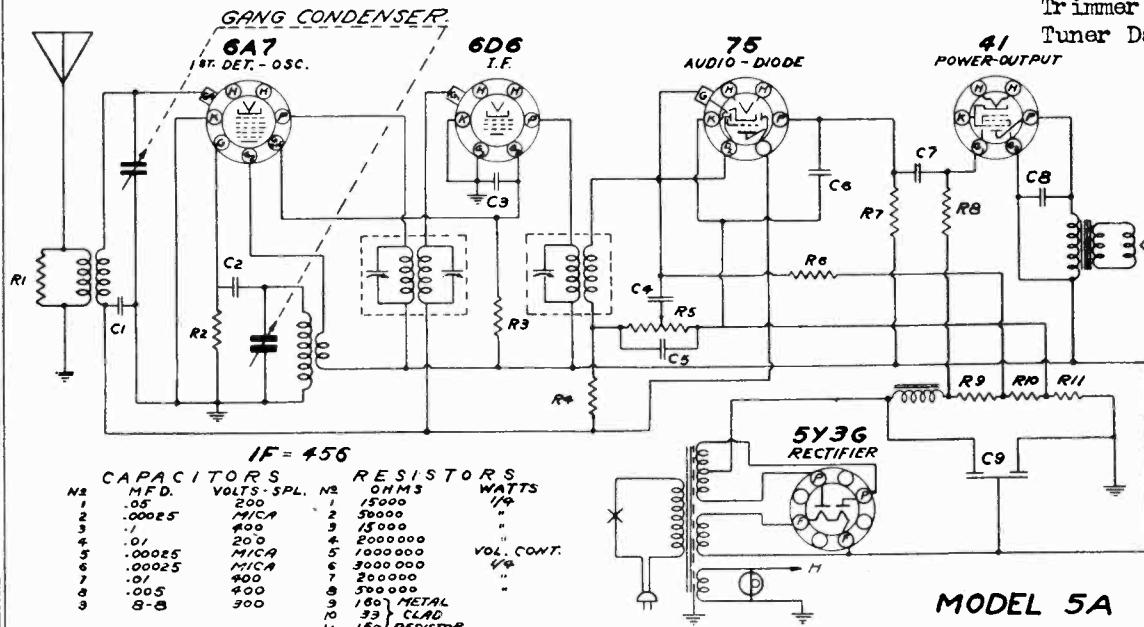
IT IS ABSOLUTELY NECESSARY THAT A GOOD GROUND BE EMPLOYED WITH THIS TYPE OF RECEIVER.





RADIO PRODUCTS CORP.

MODEL 5A  
Schematic, Socket  
Trimmers, Alignment  
Tuner Data



IF = 456

CAPACITORS			RESISTORS		
N <sub>2</sub>	MFD.	VOLTS-SPL.	N <sub>2</sub>	OHMS	WATTS
1	.05	200	1	15000	1/4
2	.00025	MICA	2	15000	"
3	.1	200	3	15000	"
4	.01	200	4	2000000	"
5	.00025	MICA	5	10000000	"
6	.00025	MICA	7	3000000	1/4
7	.01	400	8	200000	"
8	.005	400	9	500000	"
9	B-B	300	10	150	METAL
			11	33	CLAD
				150	RESISTOR

Wherever possible, a good ground should be employed. Water pipes and steam or hot water radiators make a very desirable ground connection. The ground wire should be connected to the "Black" lead.

**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 alignment should be the next procedure.

**I.F. ALIGNMENT**

Adjust the test oscillator to 456 KC and connect the output to the grid of the first detector tube (6A7) through a .05 or .1 mfd. condenser. The ground on the test oscillator can be connected to the chassis ground. Align all three I.F. trimmers to peak or maximum reading on the output meter.

**BROADCAST BAND ALIGNMENT**

Adjust the oscillator to 1730 KC and connect the output to the antenna lead (Blue) through a .0002 mfd. mica condenser. Set the gang condenser to minimum capacity and adjust the gang condenser trimmer (oscillator) to receive this signal. After this has been carefully done, the next step is to set the generator to 1400 KC and after tuning in the signal adjust the antenna trimmer to peak. This is all that is necessary for the alignment unless the plates of the gang condenser have been bent out of shape. In case of bent plates, set the test oscillator and the receiver to 600 KC and bend the plates into the position for maximum output.

**PROCEDURE FOR SETTING UP AND OPERATING AUTOMATIC PUSH BUTTONS**

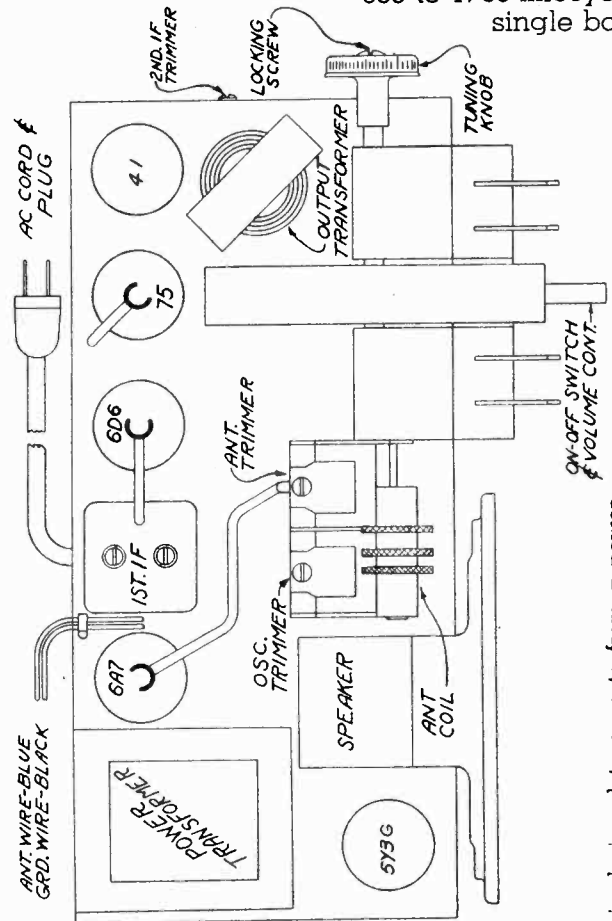
Select four strong local stations tuned in regularly. Now loosen **Locking Screw** (see chassis layout) several turns with a coin or a screw driver and press in any one of the four push buttons. Holding the button down, tune in any one of four selected stations by rotating the tuning knob (side knob) slowly back and forth until the signal is cleared.

Release the push button and press in another button and hold down, tuning in another favorite station with tuning knob. Follow the same procedure for the remaining stations. Now hold tuning knob (side knob) securely and with coin or screw driver, tighten locking screw. This screw holds all stations in adjustment.

In order to change any station already set up, to another, hold tuning knob securely, loosen locking

**Five Tube A.C. Superheterodyne**

535 to 1735 kilocycles single band.



**5A Chassis**

screw and select the new station as explained above. Tear the correct station call letter tabs from the set of sheets supplied and push them into rectangular windows above each push button.

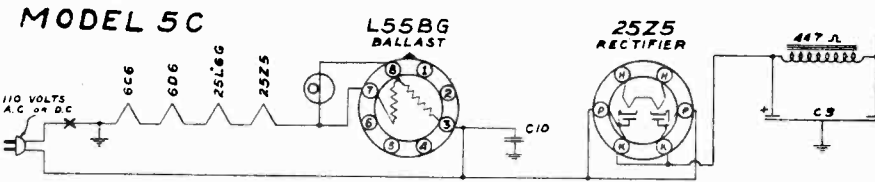
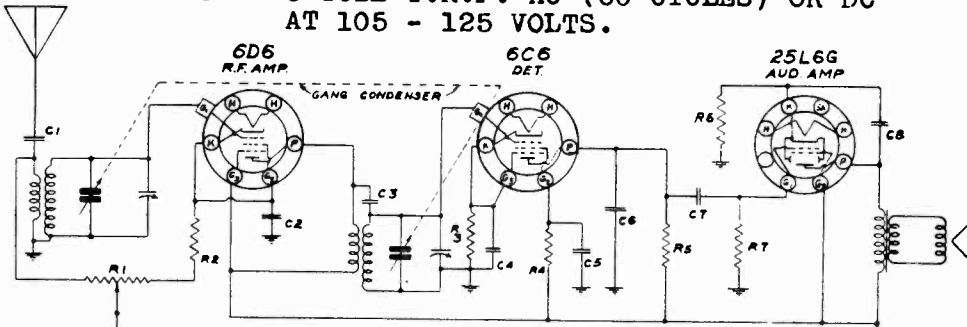
The automatic push button dial is now set up for quick tuning.

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

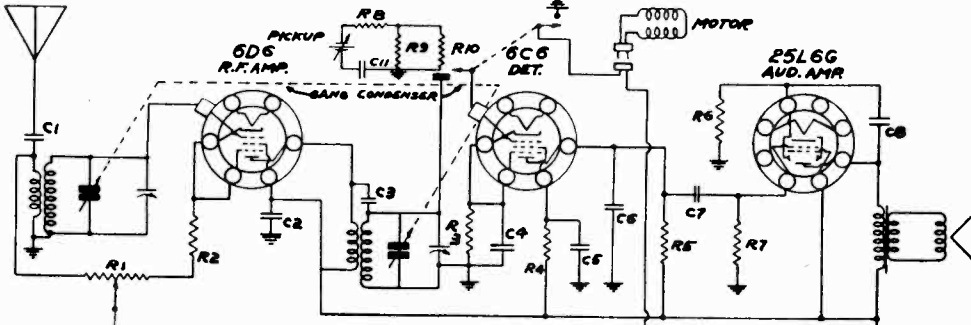
MODEL 5C  
 MODEL 5CPH  
 Schematics, Socket  
 Trimmers, Alignment

RADIO PRODUCTS CORP.

MODEL 5C - 5 TUBE T.R.F. AC (60 CYCLES) OR DC  
 AT 105 - 125 VOLTS.

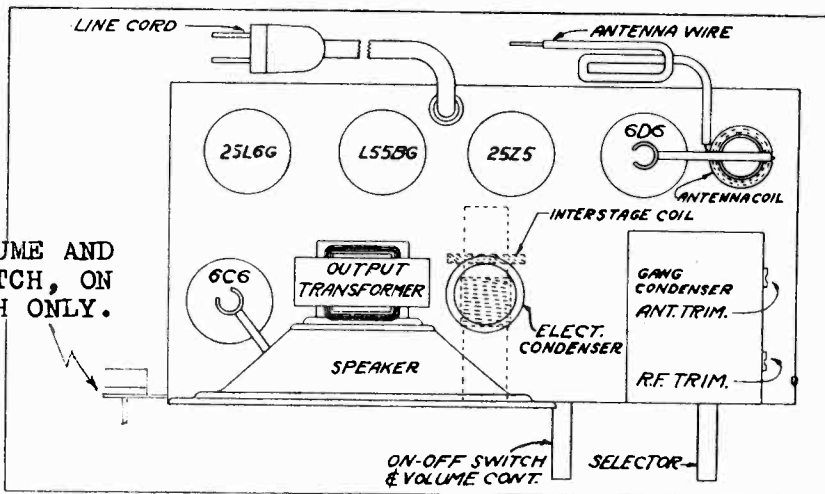


MODEL 5CPH - 5 TUBE T.R.F. AC ONLY 60 CYCLES  
 AT 105 - 125 VOLTS.



MODEL 5C  
 PHONO COMBINATION

PHONO VOLUME AND  
 MOTOR SWITCH, ON  
 MODEL 5CPH ONLY.



THESE VALUES REFER TO BOTH SCHEMATICS.

RESISTORS	WATTS	VOL. CONT.	WIRE WOUND	PHONO VOL. CONT.
R1	15,000	1/4		
R2	250	1/4		
R3	25,000	1/4		
R4	2,500,000	1/4		
R5	500,000	1/4		
R6	110	1/4		
R7	500,000	1/4		
R8	1,000,000	1/4		
R9	250,000	1/4		
R10	500,000	1/4		

CONDENSERS	CAPACITY	TYP. VOLT.
C1	.002 MFD.	400V.
C2	.1	200V.
C3	1.5 MFD.	50V.
C4	.25 MFD.	200V.
C5	.1	200V.
C6	.0002	200V.
C7	.01	400V.
C8	.02	400V.
C9	100 MFD.	25V.
C10	.005	200V.

NOTES ON BOTH MODELS (5C AND 5CPH).  
 CAUTION: NEVER USE A GROUND ON THESE RECEIVERS.  
 RANGE: 535 - 1750 KILOCYCLES.

**ALIGNMENT DATA AND SERVICING**

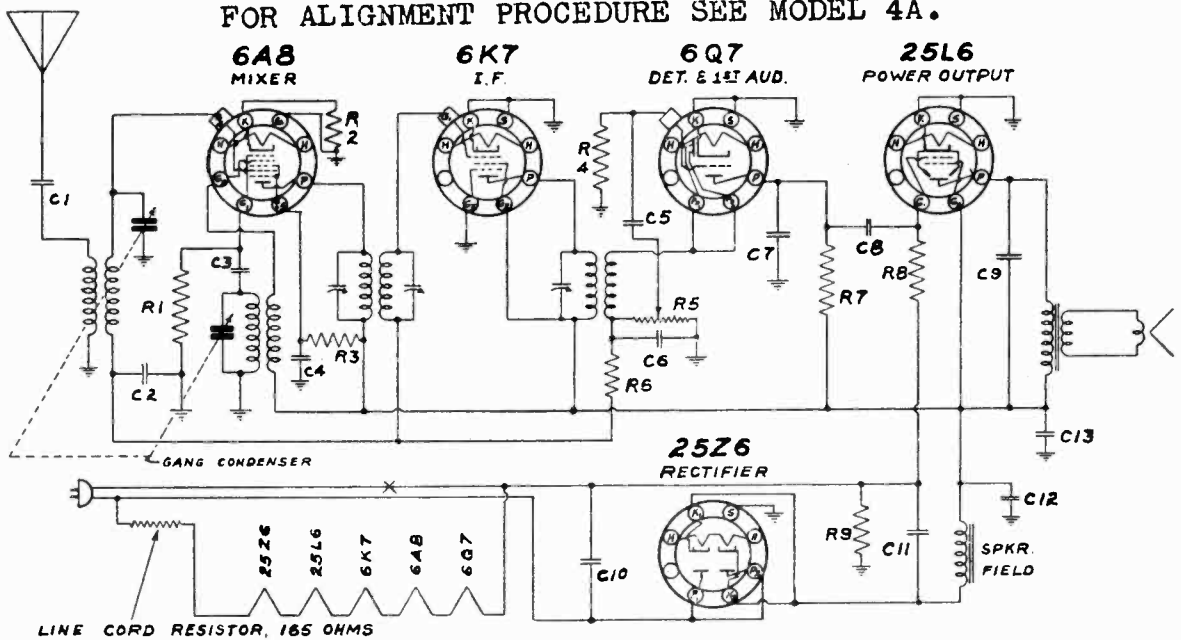
Connect a signal generator to the antenna lead of the receiver through a 100 Mmf. condenser. Set the dial pointer at 1400 KC. Set the generator at 1400 KC. Now adjust the antenna and RF trimmers of the gang condenser to maximum output.



RADIO PRODUCTS CORP.

MODEL 5E  
Schematic, Socket  
Trimmers, Alignment

FOR ALIGNMENT PROCEDURE SEE MODEL 4A.



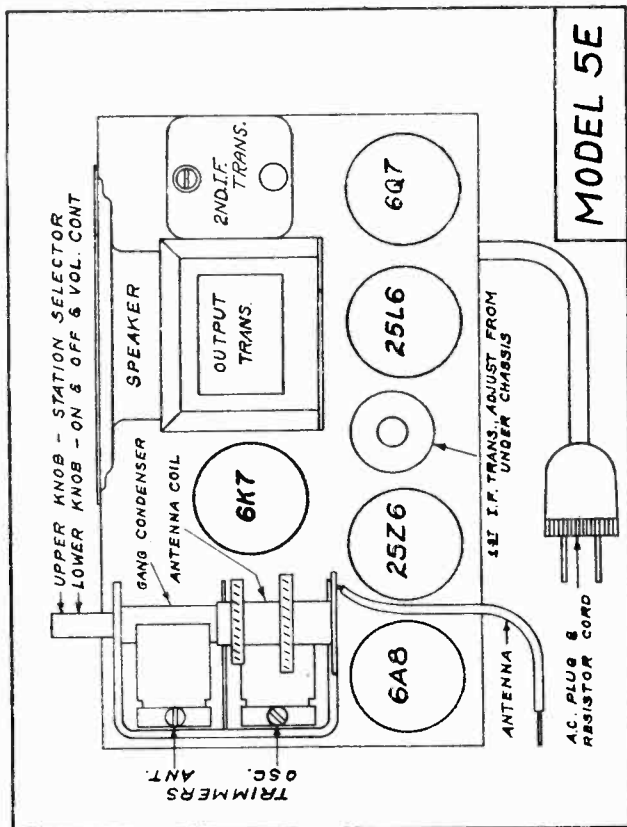
LINE CORD RESISTOR, 165 OHMS

RESISTORS			
NR	OHMS	WATTS	SPL.
R1	50,000	1/4	
R2	110	1/4	
R3	40,000	1/4	
R4	15 Meg.	1/4	
R5	500,000		VOL. CONT.
R6	2 Meg.	1/4	
R7	250,000	1/4	
R8	500,000	1/4	
R9	150	1/4	± 10%

CONDENSERS			
NR	M.F.D.	TYPE	VOL.
C1	.00250	MICA	400V.
C2	.02	MICA	400V.
C3	.000050	MICA	400V.
C4	.01	MICA	400V.
C5	.01	MICA	300V.
C6	.00025	MICA	400V.
C7	.0005	MICA	400V.
C8	.01	MICA	400V.
C9	.005	MICA	600V.
C10			400V.
C11	30.		150V.
C12	10.		150V.
C13	05		200V.

I.F. - 456 KC

SCHEMATIC DIAGRAM  
MODEL 5E



5 TUBE

BROADCAST BAND A.C.-D.C. SUPERHETERODYNE  
RANGE 535 - 1730 KILOCYCLES

POWER SUPPLY

This receiver is designed to operate from any AC (Alternating Current) or DC (Direct Current) power supply main of 105-125 volts, 60 cycle. If the receiver fails to operate on DC (direct current), reverse the power line plug.

Note: Do not attempt to ground this receiver as one side of the power line acts as the ground. Any external ground connection to the chassis will cause a short and consequent damage.



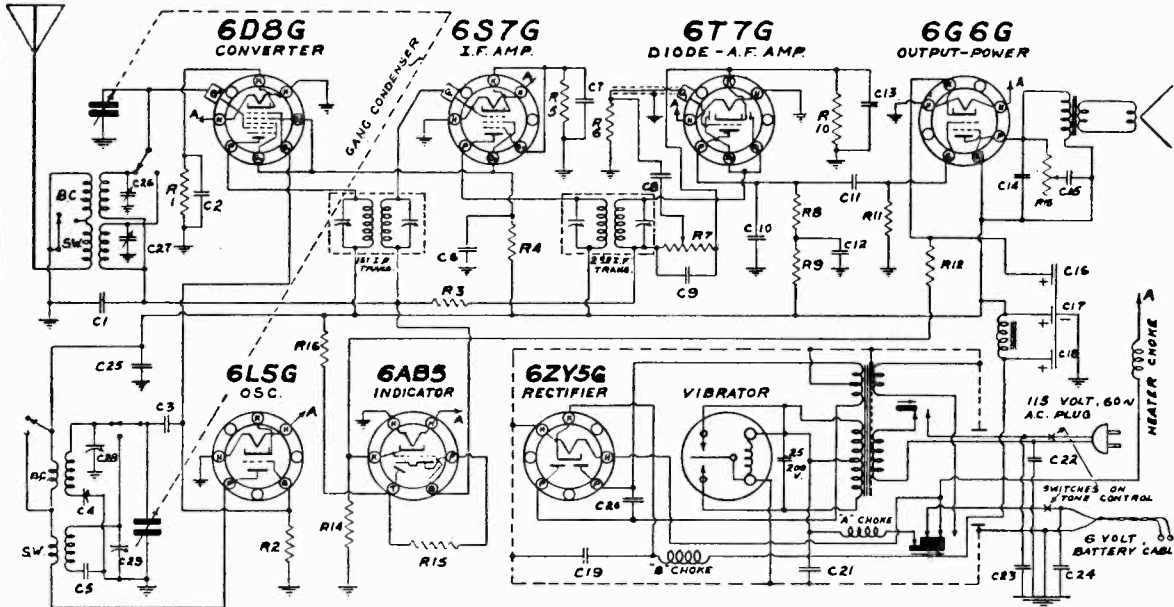


MODEL 7A  
Schematic, Socket  
Trimmer

RADIO PRODUCTS CORP.

# Seven Tube Combination 6 Volt Battery and 110-120 Volt AC 60 Cycle Dual Wave Superheterodyne

ALIGNMENT:  
FOLLOW PROCEDURE OF MODEL 6D, BUT USE 18.100 AND 6000 KC FOR S.W.



**CONDENSERS**

No.	CAPACITY	TYPE	No.	CAPACITY	TYPE
1	.05 Mfd.	200 V.	14	.005 Mfd.	600 V.
2	.05 Mfd.	200 V.	15	.05	400 V.
3	50 muf.	MICA	16	.5	25 V.
4	300-600 muf.	MICA	17	B.	200 V.
5	4000 muf.	M. ± 5%	18	B.	200 V.
6	.1 Mfd.	200 V.	19	.01	600 V.
7	.05	200 V.	20	.015	1000 V.
8	.01	400 V.	21	.5	10 V.
9	250 muf.	MICA	22	.05	400 V.
10	250		23	.01	600 V.
11	.01 Mfd.	400 V.	24	.5	10 V.
12	.1	200 V.	25	.1	200 V.
13	.5	200 V.			

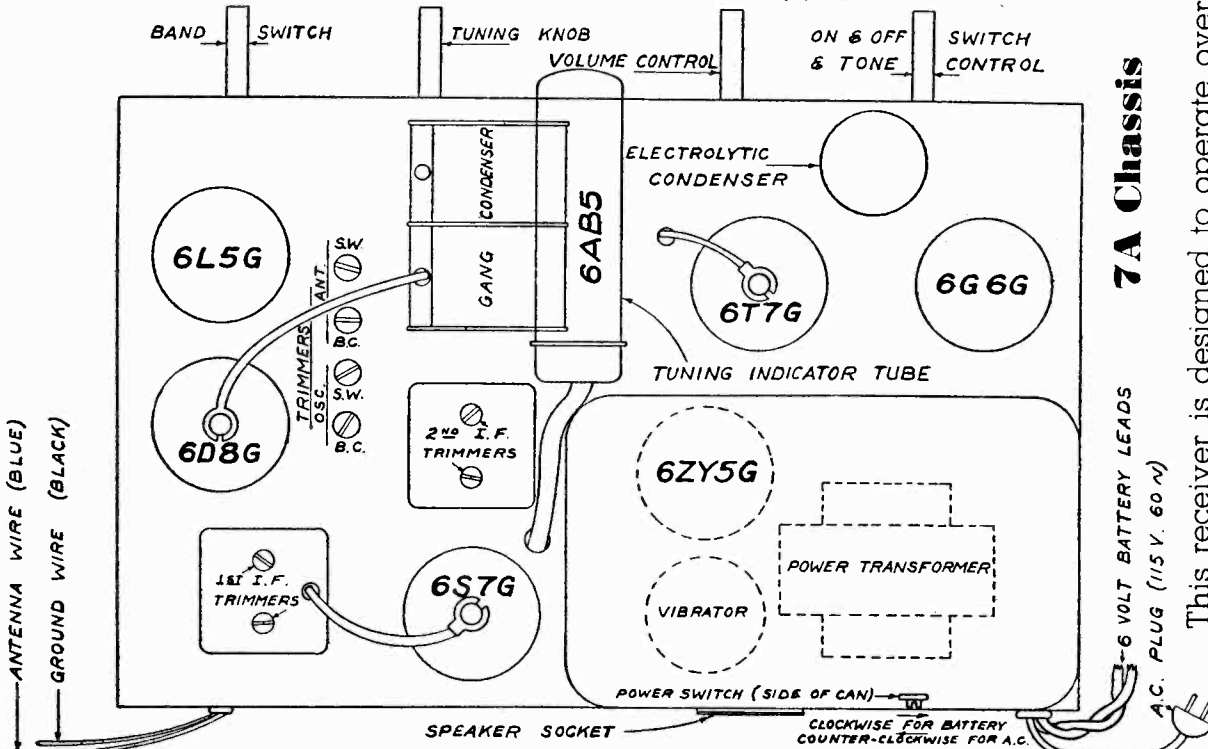
\* OIL TYPE

**RESISTORS**

No.	OHMS	WATTS	SPL. TOL.	14	110	1/4	± 10%
1	1500	1/2	± 10%	15	250,000	1/4	
2	40,000	1/2	± 10%	16	15,000	1/4	
3	1,000,000	1/2					
4	30,000	1/2					
5	1,500	1/2	± 10%				
6	1,000,000	1/2					
7	500,000	1/2					
8	200,000	1/2					
9	10,000	1/2	± 10%				
10	500,000	1/2					
11	325	1/2	± 10%				
12	100,000	1/2					

BAND SWITCH IN BROADCAST POSITION  
POWER SWITCH IN BATTERY POSITION.  
I.F. - 456 K.C.  
C26 TO C29, 2-20 muf TRIMMERS.

**SCHEMATIC DIAGRAM  
MODEL 7A**

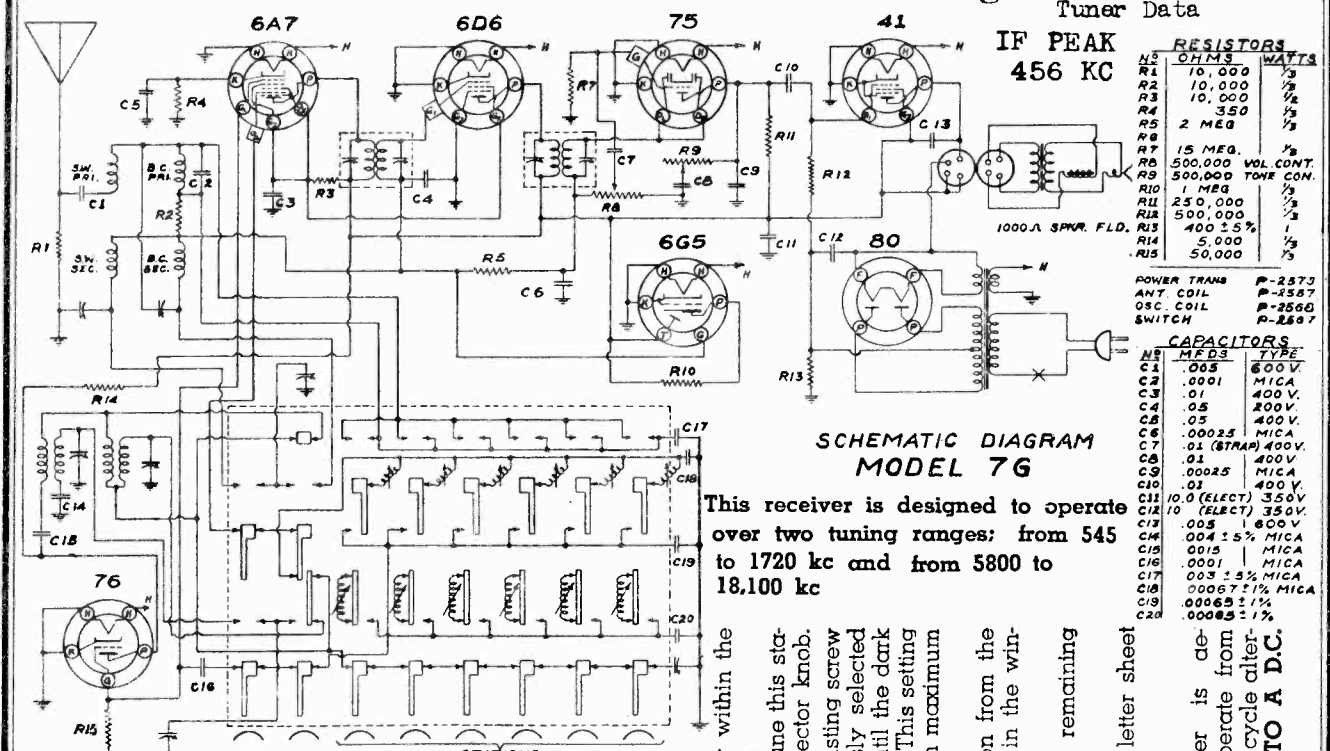


This receiver requires a good ground.

This receiver is designed to operate over two tuning ranges; from 535 to 1730 Kilocycles (KC) (173.4 to 561 meters), and from 5650 to 18,100 Kilocycles (KC) (16.5 to 53 Meters).

# RADIO PRODUCTS CORP. Seven Tube AC Automatic Tuning

MODEL 7G  
Schematic, Socket  
Trimmers, Alignment  
Tuner Data



**IF PEAK 456 KC**

RESISTORS	OHMS	WATTS
R1	10,000	1/2
R2	10,000	1/2
R3	10,000	1/2
R4	350	1/2
R5	2 MEG	1/2
R6		
R7	15 MEG.	1/2
R8	500,000	VOL. CONT.
R9	500,000	TONE CON.
R10	1 MEG	
R11	250,000	
R12	500,000	
R13	400 Ω 5%	1
R14	5,000	1/2
R15	50,000	1/2

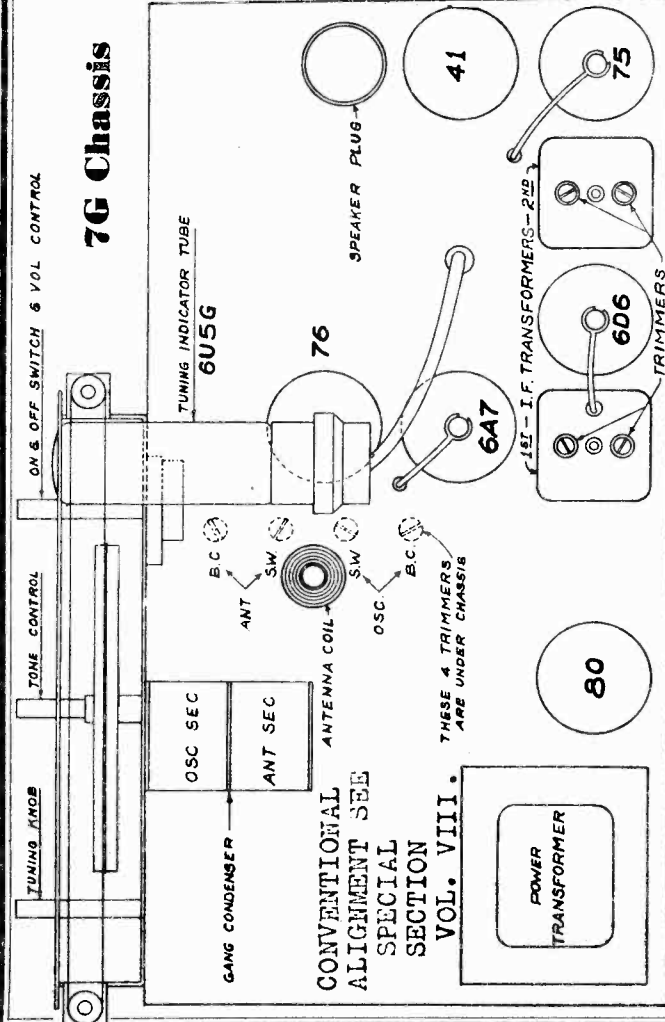
**POWER TRANS P-2573**

ANT. COIL	P-1587
OSC. COIL	P-2590
SWITCH	P-2597

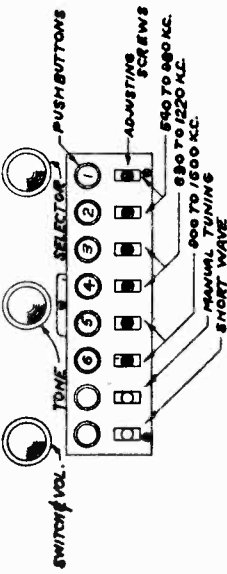
**CAPACITORS**

TYPE	VALUE	VOL.
C1	.005	500V
C2	.0001	MICA
C3	.01	400V
C4	.05	400V
C5	.05	400V
C6	.00025	MICA
C7	.01 (STRAP)	400V
C8	.01	400V
C9	.00025	MICA
C10	.01	400V
C11	.01	400V
C12	.01 (SELECT)	350V
C13	.01 (SELECT)	350V
C14	.005	100V
C15	.004 ± 5%	MICA
C16	.0015	MICA
C17	.001	MICA
C18	.004 ± 5%	MICA
C19	.00067 ± 1%	MICA
C20	.00065 ± 1%	MICA
C21	.00065 ± 1%	MICA

This receiver is designed to operate over two tuning ranges; from 545 to 1720 kc and from 5800 to 18,100 kc



## PROCEDURE FOR SETTING UP AUTOMATIC PUSH BUTTONS



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 dark area of the "electric eye" is smallest. This setting will give the best tonal response with maximum sensitivity.
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.

## POWER SUPPLY

This receiver is designed to operate from a power supply main of 110-120 volts, 60 cycle alternating current (A.C.). **NEVER PLUG INTO A D.C. OUTLET.**

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.

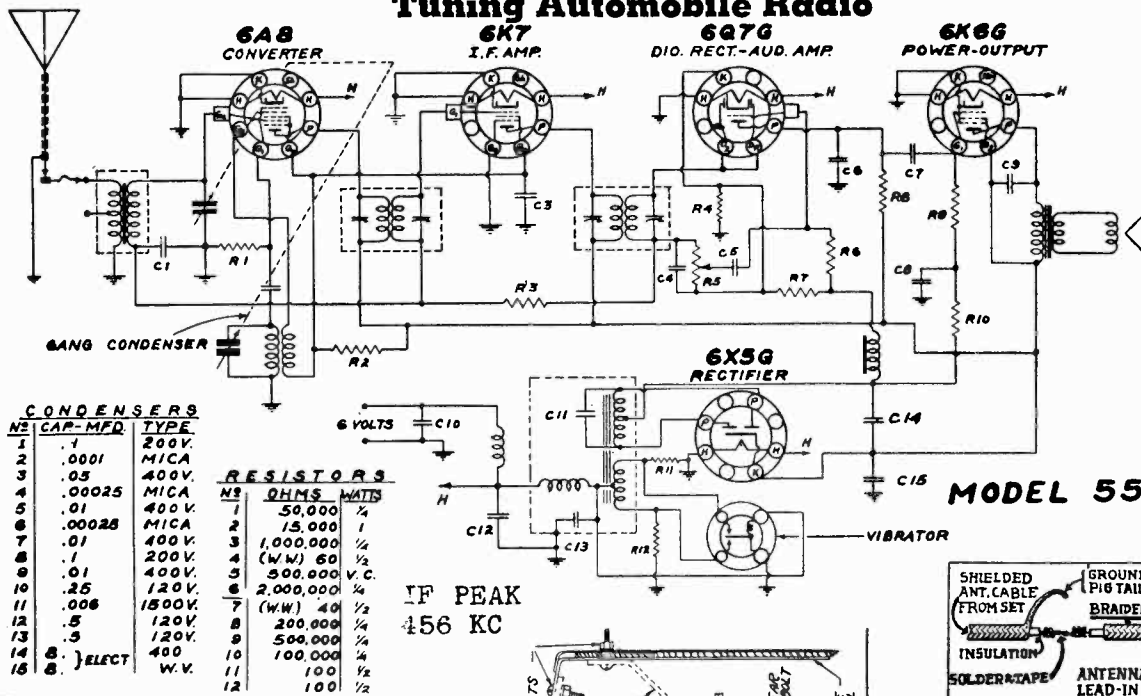
The remaining two (2) push buttons, located at the extreme left hand end of the push button plate are for short wave and manual tuning. Short wave tuning is accomplished by pressing "short wave" button and tuning with the selector knob. By pressing "manual tuning" button, the automatic disconnects and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



MODEL 55 Auto  
Schematic, Socket  
Trimmers, Tuner

RADIO PRODUCTS CORP.

## For 5 Tube Under Dash Automatic Push Button Tuning Automobile Radio



NO.	CAP. MFD.	TYPE
1	.1	200V. MICA
2	.0001	400V. MICA
3	.05	400V. MICA
4	.00025	400V. MICA
5	.01	400V. MICA
6	.00025	400V. MICA
7	.01	400V. MICA
8	.1	200V. MICA
9	.01	400V. MICA
10	.25	120V. MICA
11	.006	1500V. MICA
12	.5	120V. MICA
13	.5	120V. MICA
14	.5	120V. MICA
15	.5	120V. MICA
16	.5	120V. MICA
17	.5	120V. MICA
18	.5	120V. MICA

NO.	OHMS	WATTS
1	50,000	1/4
2	15,000	1
3	1,000,000	1/2
4	(W/W) 60	1/2
5	500,000	V.C.
6	2,000,000	1/4
7	(W/W) 40	1/2
8	200,000	1/4
9	500,000	1/4
10	100,000	1/4
11	100	1/2
12	100	1/2

IF PEAK  
456 KC

MODEL 55

ALIGNMENT: (SEE MODEL 4A)  
IF AT 456 KC.  
BROADCAST: AT 1550 KC & 1400 KC.



### 3. SETTING UP STATIONS ON PUSH BUTTONS.

Select five (5) favorite powerful local stations. With the dial pointer at the extreme left hand end, loosen knurled locking screw, (see Figures 5 and 6) two (2) full turns. Now carefully tune in any one of five chosen stations using station selector knob; press in the first button all the way then release. (There is no sequence of buttons—that is, any station may be set up on any particular button desired.)

Note: Should there be any noticeable pointer movement while pressing any push button, it is an indication that the knurled locking screw has not been loosened quite sufficiently. Now tune in the second station and press in the second button all the way then release. Repeat the same procedure for the remaining three buttons. After the stations have been set up, tighten the knurled locking screw securely. This screw will lock in place all the stations that have been set up. If you desire to change any station already set up, loosen knurled locking screw two (2) full turns and set up as explained above. Be sure to tighten knurled nut securely when resetting has been completed. Tear the correct station call letter tabs from the set of sheets supplied and insert them into the rectangular openings provided on the front of the push button knob.

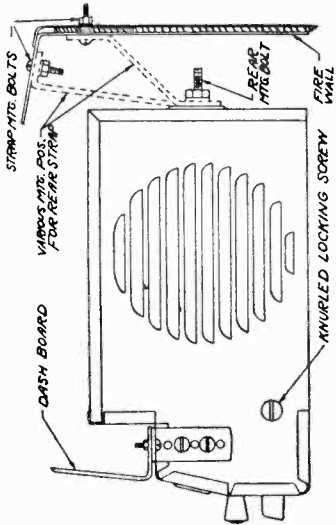


FIGURE 6

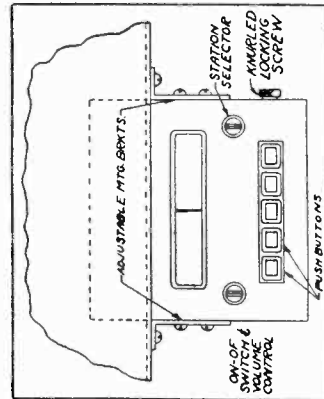
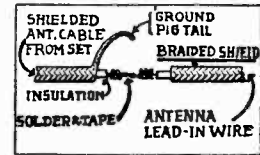
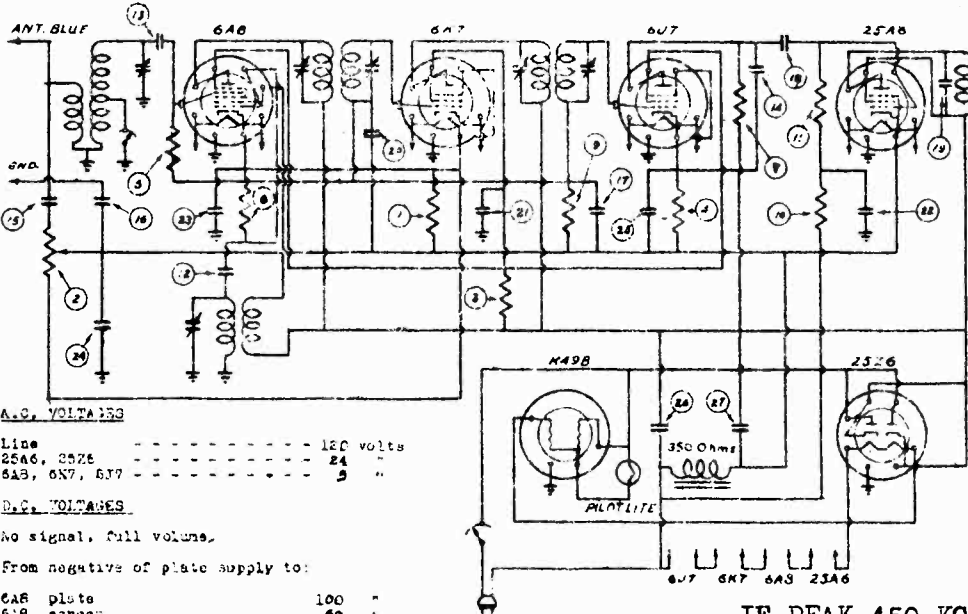


FIGURE 5

Schematics, Voltage Alignment

REMLER COMPANY, LTD.

MODEL 28 "Scottie"  
Above Ser. 77039  
MODEL 46 "Scottie"  
Ser. 98515 to 107767



A.C. VOLTAGES

Line	25Z6	120 volts
6A8, 6X7, 6U7	24	"
6A8, 6X7, 6U7	3	"

D.C. VOLTAGES

No signal, full volume.

From negative of plate supply to:

6A8 plate	100
6A8 screen	60
6A8 osc. plate	100
6A8 cathode	3
6X7 plate	100
6X7 screen	100
6X7 cathode	3
6U7 plate	40
6U7 screen	60
6U7 cathode	3
25A6 plate	95
25A6 screen	100
25A6 grid bias supply	15

Voltages read with 1000 ohm per volt meter

RESISTORS	
1	500 Ohms
2	1000
3	25000
4	45000
5	100,000
6	100,000
7	250,000
8	500,000
9	500,000
10	500,000
11	1 Meg.

CONDENSERS	
12	.0005
13	.0005
14	.001
15	.001
16	.01
17	.01
18	.01
19	.01
20	.05
21	.05
22	.1
23	.25
24	.25
25	.25
26	.10
27	.10

IF PEAK 450 KC.

MODEL 28

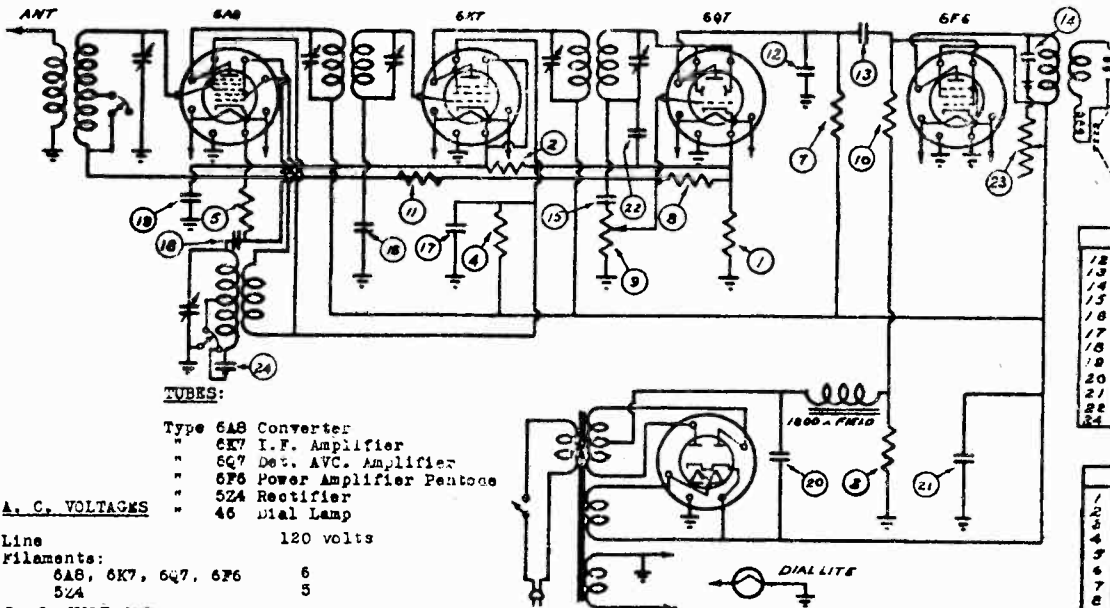
Beginning Serial # 77039

TUBES

- Type 6A8 - Converter
- " 6X7 - I.F. Amplifier
- " 6U7 - Detector
- " 25A6 - Power amplifier pentode
- " 25Z6 - Rectifier
- " 449B - Ballast
- " 46 - Dial lamp.

110-125 VOLTS AC-DC  
SEE SERVICE DATA BELOW.

Whenever the power source is 220 volts, a resistor voltage reducer may be secured and inserted in the line cord.



A. C. VOLTAGES

Line	120 volts
Filaments:	
6A8, 6X7, 6Q7, 6F6	6
524	5

D. C. VOLTAGES

No signal,

from ground to:

6A8 Plate	240 volts
6A8 Screen	125
6A8 Osc. Plate	125
6A8 Cathode	4.2
6X7 Plate	240
6X7 Screen	125
6X7 Cathode	4.2
6Q7 Plate	100
6Q7 Cathode	1.8
6F6 Plate	230
6F6 Screen	240
6F6 Grid Bias	18

Voltages read with 1000-ohm per volt meter.

CONDENSERS	
12	.001 MFD.
13	.01
14	.05
15	.01
16	.05
17	.05
18	.00007
19	.1
20	4
21	4
22	.0005
23	.0004

RESISTORS	
1	100 Ohms
2	150
3	400
4	15000
5	100,000
6	250,000
7	250,000
8	500,000
9	500,000
10	500,000
11	1 Meg.
12	25,000

IF PEAK 450 KC.

MODEL 46

BEGINNING SERIAL No. 98515

The receiver is designed for operation from an alternating current (A.C.) power supply of 110-125 volts, 50 or 60 cycles.

SERVICE DATA MODELS 28 & 46

The antenna R.F. coil is located over the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The oscillator coil is mounted under the chassis and is trimmed by the front trimmer section. The I.F. transformers and trimmers are mounted under the chassis. The I.F. frequency is 450 K.C.

MODEL 46 "Scottie"

Above Ser. 107767

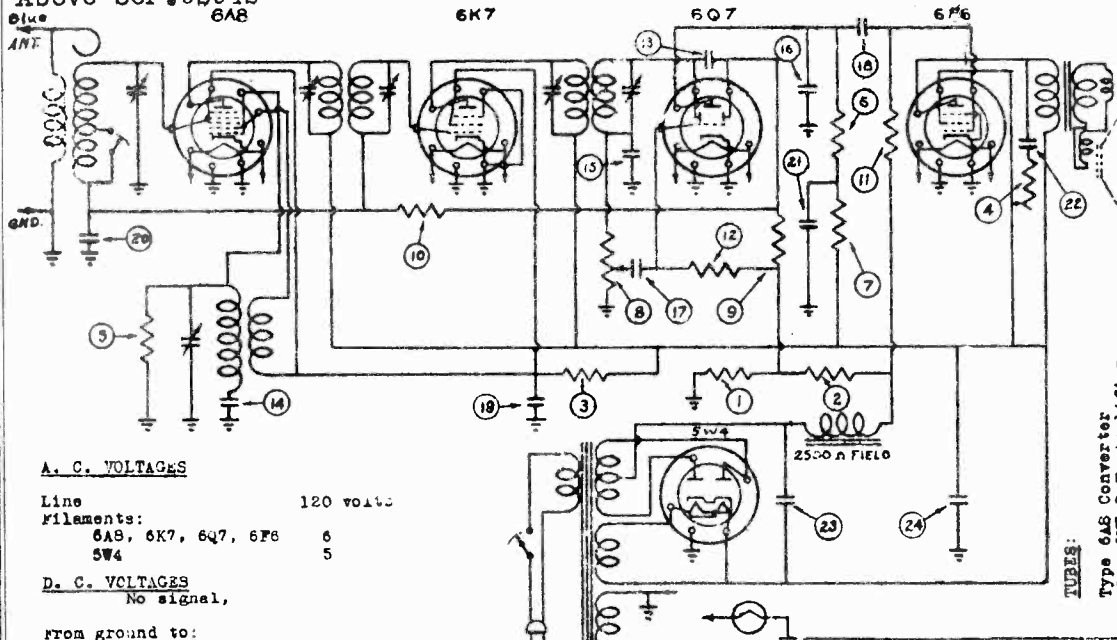
MODEL 47 "Worldwide Scottie"

Above Ser. 92942

REMLER COMPANY, LTD.

Schematics, Voltage,

Alignment



A. C. VOLTAGES

Line	120 volts
Filaments:	
6A8, 6K7, 6Q7, 6F6	6
5W4	5

D. C. VOLTAGES

No signal,  
From ground to:

6A8 Plate	240 volts	110-125 volts, 50 or 60 cycles.
6A8 Screen	125 "	
6A8 Osc. Plate	125 "	
6A8 Bias supply	2	
6K7 Plate	240	
6K7 Screen	125	
6K7 Bias supply	2	
6Q7 Plate	70	
6Q7 Bias Supply	2	
6F6 Plate	250	
6F6 Screen	240	
6F6 Grid Bias	18	

IF PEAK 450 KC.

MODEL 46  
Beginning Serial No. 107767

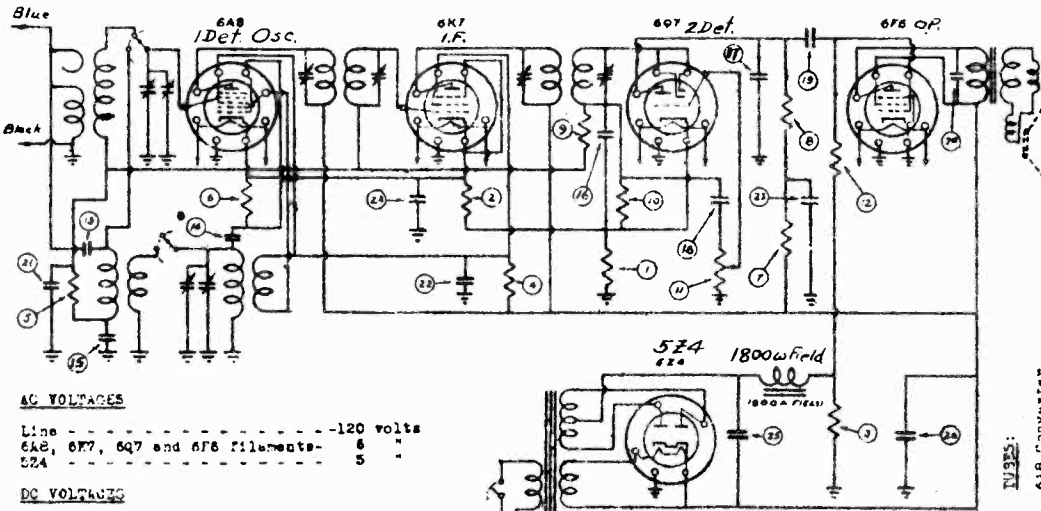
Voltages read with 1000-ohm per volt meter.

TUBES:

- Type 6A8 Converter
- " 6K7 I. F. Amplifier
- " 6Q7 Det. AVC. Amplifier
- " 6F6 Power Amplifier Pentode
- " 5W4 Rectifier
- " 46 Dial Lamp

SERVICE DATA:  
The antenna k.f. coil is located over the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The oscillator coil is mounted under the chassis and is trimmed by the front trimmer section. The I. F. transformers and trimmers are mounted under the chassis. The I. F. frequency is 450 K.C.

RESISTORS		CONDENSERS	
1	25 Ohms	13	.00007 Mfd
2	400	14	.0004
3	15000	15	.0005
4	25000	16	.001
5	100000	17	.01
6	250000	18	.01
7	250000	19	.05
8	500000	20	.05
9	3 Meg.	21	.05
10	1 Meg.	22	.05
11	1 Meg.	23	4
12	2 Meg.	24	4



AC VOLTAGES

Line	-120 volts
6A8, 6Q7, 6Q7 and 6F6 Filaments-	6
5Z4	5

DC VOLTAGES

From chassis to:

6A8 plate	240 volts	110-125 volts, 50 or 60 cycles.
6A8 Screen	110	
6A8 Oscillator plate	110	
6A8 Cathode	4.5	
6Q7 Plate	240	
6K7 Screen	110	
6Q7 Cathode	4.5	
6Q7 Plate	75	
6Q7 Cathode	1.5	
6F6 Plate	255	
6F6 Screen	240	
6F6 Grid bias	18.5	

IF PEAK 450 KC.

MODEL 47  
Beginning Serial No. 92942

Voltage across field - 120 volts

Voltages read with 1000 ohm per volt meter.

TUBES:

- 6A8 Converter
- 6K7 I. F. Amplifier
- 6Q7 Diode detector-audio amplifier
- 6F6 Power amplifier pentode
- 5Z4 Rectifier
- 746 Dial lamp.

SERVICE DATA:  
The antenna-mixer coil is located adjacent to the variable condenser and is trimmed by the trimmer on the rear section of the variable condenser. The oscillator coil is mounted under the chassis and is trimmed by the front trimmer section. The I. F. transformers and trimmers are mounted under the chassis and are adjusted to 450 KC. The antenna filter is located adjacent to the antenna-mixer coil and is tuned to 450 KC to minimize interference from code stations.

RESISTORS		CONDENSERS	
1	100 Ohms	13	.000025 Mfd.
2	110	14	.00007
3	400	15	.0005
4	15,000	16	.0005
5	100,000	17	.001
6	100,000	18	.01
7	250,000	19	.01
8	250,000	20	.01
9	500,000	21	.05
10	500,000	22	.05
11	500,000	23	.05
12	1 Meg.	24	4
		25	4
		26	4



MODEL 61

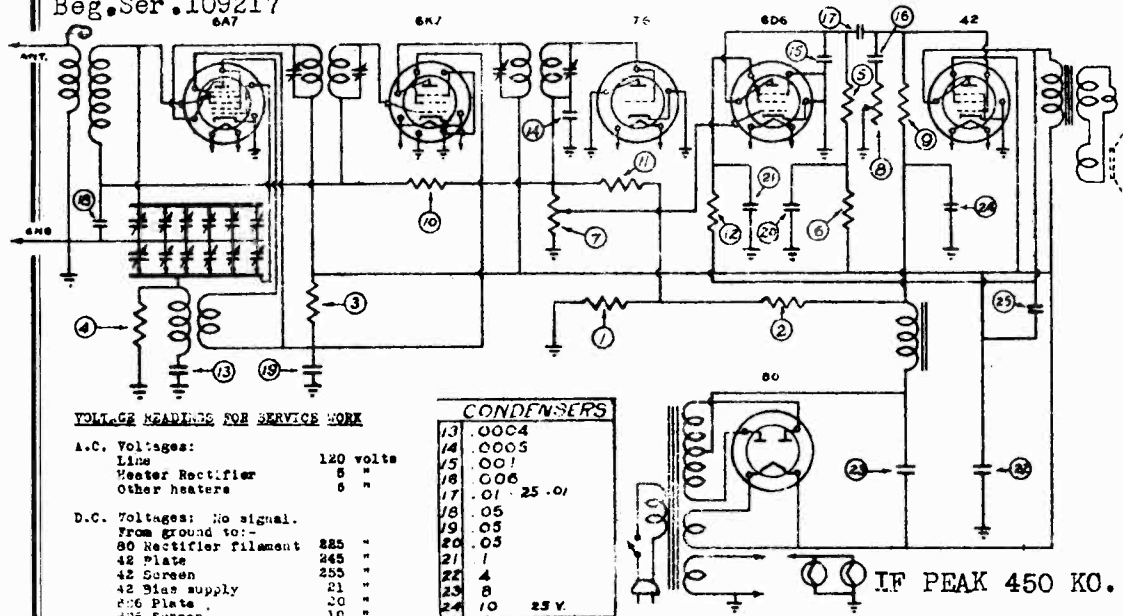
Beg. Ser. 113701

MODEL 65

Beg. Ser. 109217

REMLER COMPANY, LTD.

Schematics, Voltage Alignment, Tuner



RESISTORS	
1	50
2	400
3	15000
4	100000
5	2500000
6	25000000
7	50000000
8	50000000
9	50000000
10	1 Meg
11	1 Meg
12	2 Meg

VOLTAGE READINGS FOR SERVICE WORK

A.C. Voltages:	
Line	120 volts
Heater Rectifier	0 "
Other heaters	0 "
D.C. Voltages: No signal.	
From ground to:-	
80 Rectifier filament	285 "
42 Plate	245 "
42 Screen	255 "
42 Bias supply	21 "
6D6 Plate	20 "
6D6 Screen	20 "
6D6 Bias supply	2.5 "
6K7 Plate	255 "
6K7 Screen	120 "
6K7 Bias supply	2.5 "
6A7 Pentode Plate	255 "
6A7 Oscillator Plate	120 "
6A7 Screen	120 "
6A7 Bias supply	2.5 "

CONDENSERS	
13	.0004
14	.0005
15	.001
18	.006
17	.01 - 25 .01
18	.05
19	.05
20	.05
21	1
22	4
23	8
24	10

- 6A7 - Pentagrid Converter
- 6K7 - I.F. Amplifier
- 76 - Diode detector
- 6D6 - Audio amplifier
- 42 - Power amplifier
- 80 - Rectifier
- Type 46 dial lamps.

AUTOMATIC PUSH-BUTTON TUNING

The receiver is adjusted for selecting five stations by means of the push-buttons. Call letters of these stations are indicated on the buttons. To receive these stations, turn on the set as described in the above paragraph and depress the button corresponding to the desired station. Adjust volume and intensity required.

The knob on the right is the tone control. When turned to the left, the higher audio frequencies are suppressed.

Directions for changing the push-button station set-up are attached to the bottom of the cabinet. A sheet of push-button call letters is furnished with the set. The call letter discs may be removed from the buttons with a pen knife, and other discs pressed in.

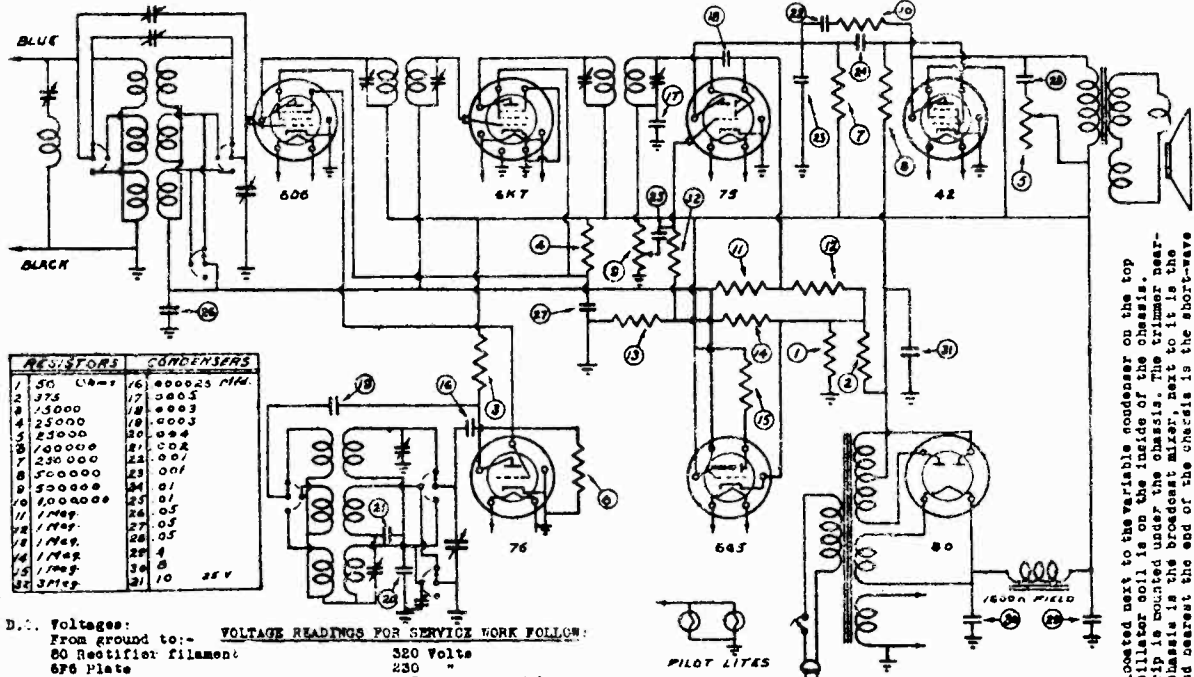
MODEL 61  
Beginning S. No. 113701

**SERVICE DATA**  
The mixer coil is located next to the variable condenser on the top of the chassis. The oscillator coil is on the chassis. Parallel trimmer condensers are mounted on the variable condenser. The oscillator trimmer is nearest the front of the set.

Trimmers for the I.F. circuit are adjustable through holes in the I.F. shield. The I.F. frequency is 450 KC.

Trimmers for the push-button circuits are accessible through a slot in the bottom of the cabinet. These trimmers have the following approximate tuning ranges:

#4 group	650-1075 KC
#1 group	520-850 KC
#2	520-850 KC
#3	650-1075 KC



RESISTORS		CONDENSERS	
1	50 Ohms	16	.000025 MIN.
2	375	17	.0005
3	15000	18	.0003
4	25000	19	.0003
5	250000	20	.001
6	1000000	21	.002
7	2500000	22	.007
8	5000000	23	.007
9	5000000	24	.01
10	10000000	25	.01
11	1Meg	26	.05
12	1Meg	27	.05
13	1Meg	28	.05
14	1Meg	29	4
15	1Meg	30	8
16	2Meg	31	10

D.C. Voltages: From ground to:-

80 Rectifier filament	320 Volts
6D6 Plate	280 "
6D6 Screen	285 "
6D6 Bias supply	19 "
76 Plate	115 "
6K7 Plate	245 "
6K7 Screen	95 "
6K7 Bias	2.5 "
6D6 Plate	245 "
6D6 Screen	95 "
6D6 Bias	2.5 "
76 Plate	150 "
6A5 Plate	245 "
6A5 Bias	2.5 "

A.C. Voltages:	
Line	120 Volts
Heater 80 Rectifier	4.8 "
Other heaters	5.8 "

IF PEAK 450 KC.

MODEL 65  
Beginning Serial No. 109217

**SERVICE DATA**  
The mixer coil is located next to the variable condenser on the top of the chassis. The oscillator coil is on the inside of the chassis. A trimmer condenser strip is mounted under the chassis. The trimmer nearest the center of the chassis is the broadcast mixer, next to it is the broadcast oscillator and nearest the end of the chassis is the short-wave oscillator trimmer. A trimmer for the short-wave mixer coil is mounted on the short-wave switch.

An antenna filter is mounted on the top of the chassis. The trimmer should be adjusted for minimum signal for 450 K.C. input to the antenna.

Trimmers for the I.F. transformers are adjustable thru holes in the I.F. transformer shield cans. The I.F. frequency is 450 K.C.

Readings taken with 1000 ohm per volt meter.



REMLER COMPANY, LTD.

MODEL 72  
 Beg. Ser. 104459  
 Schematic, Voltage  
 Alignment, Data

SERVICE DATA

The following tubes are used in this receiver:

- 1 6K7 R.F. Amplifier
- 1 6L7 Mixer
- 1 6Z5 Oscillator
- 1 6K7 I.F. Amplifier
- 1 6H6 Diode Detector
- 1 6N7 A.V. Amplifier
- 2 6F6 Power Amplifiers
- 1 6G5 Tuning Indicator
- 1 5Z4 Full-wave Rectifier

The R.F. Mixer and Oscillator coils are located in the square shields on the right end of the chassis. Trimmers for these circuits are mounted along the end of the chassis in the following order from front to rear:—R.F. short-wave, Mixer short-wave, Oscillator broadcast, Oscillator medium wave, Oscillator short-wave. The R.F. broadcast and the Mixer broadcast trimmers are mounted on the band switch assembly.

Oscillator pads are located at the rear of the chassis. The broadcast pad is nearest the end of the chassis and the medium wave next.

Trimmers for the I.F. transformers are adjustable thru holes in the I.F. transformer shield cans. The I.F. frequency is 450 K.C.

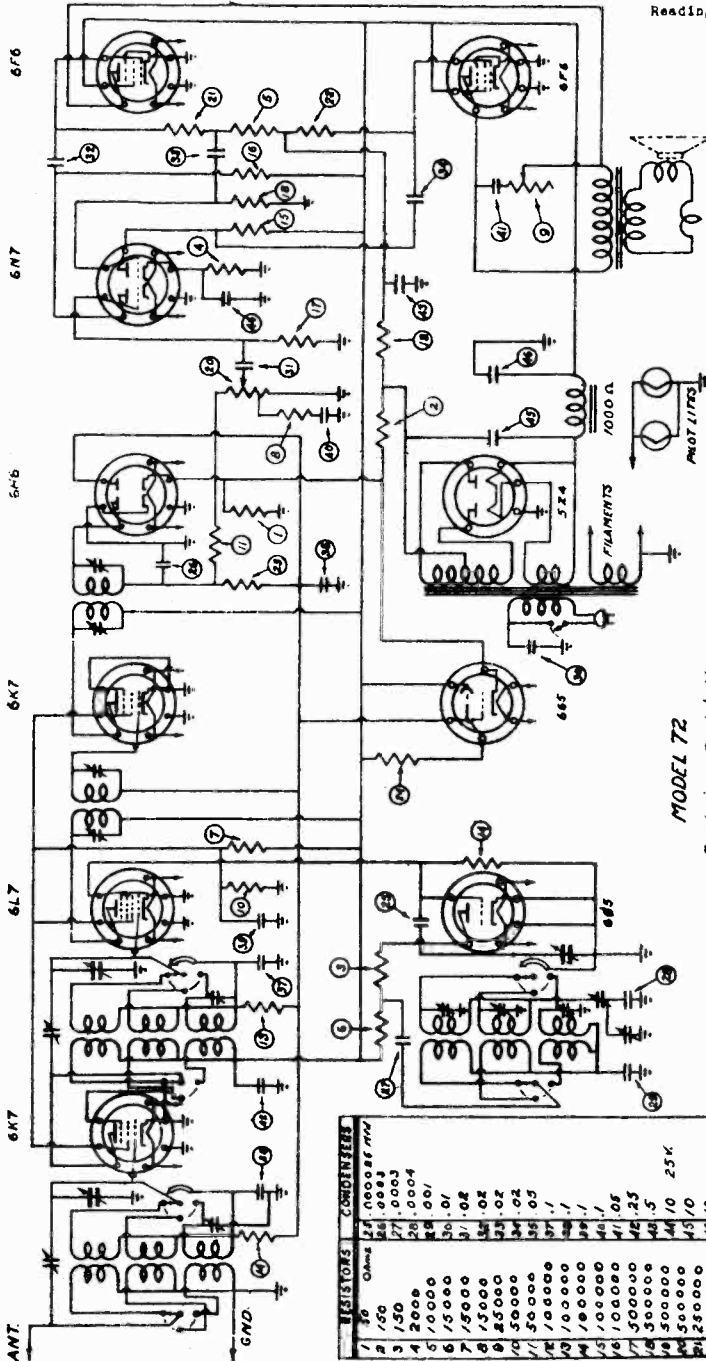
A.C. Voltages

Line	120	Volts
Heater 5Z4 Rectifier	5.00	"
Other Heaters	6.00	"

D.C. Voltages

From ground to:—		
5Z4 Rectifier	540	Volts
6F6 Plate	225	"
6F6 Screen	240	"
6F6 Bias supply	17.5	"
6N7 audio plate	130	"
6N7 Bias	-5	"
6K7 I.F. plate	240	"
6K7 I.F. screen	160	"
6K7 I.F. grid bias	-1.5	"
6L7 Mixer plate	240	"
6L7 Mixer screen	160	"
6L7 Mixer grid bias	-1.5	"
6K7 R.F. plate	240	"
6K7 R.F. screen	160	"
6K7 R.F. grid bias	-4.5	"
6J5 Oscillator plate	150	"
6G5 Tuning indicator plate	240	"

Readings taken with 1000 ohm per volt meter.



IF PEAK 450 KC.

TUNING RANGES

The lower scale of figures on the dial is the calibration for the broadcast range which extends from 340 to 1715 kilocycles. The medium wave range is indicated by the middle scale of figures which are colored green. This range covers from 1.7 megacycles to 5.7 megacycles and includes the amateur, police and aircraft bands. The upper red scale is the short-wave range and extends from 5.7 to 18 megacycles. The various foreign and broadcast short-wave broadcast bands are included on this range and are denoted by the inscriptions on the scale.

OPERATION

With the line cord connected, turn the volume control to the right. The dial should light up brightly. Allow about half a minute for the tubes to warm up and turn the selector knob until the desired program is heard. If too loud reduce the volume by turning the volume control to the left. For best quality, the selector should be adjusted for minimum shadow in the tuning indicator which is located in the center of the dial.

MODEL 72

MODEL 72  
 Beginning Serial No. 104459

This is a ten tube all-wave receiver with metal tubes. It is designed to operate from a 110 to 125 volt, 50 or 60 cycle power supply.

INSTALLATION

When a standard antenna is used, the length should be from 25 to 100 feet. Connect to the blue wire extending from the back of the receiver. The antenna lead-in should be kept clear of all metal objects, such as pipes and wires, and should be run in as straight a line as possible. An indoor antenna may be used for local reception or when the receiver is used in an isolated wooden building. Superior performance on short wave will result from the use of a well constructed doublet antenna, or short wave antenna system. Such antennas are available on the market in kit form with complete instructions for their installation.

A good ground is essential for clearest reception. Connect the black wire to a water or water pipe. The pipe should be scraped clean before attaching the wire.

MODELS 89, 89C

Beg. Ser. 92582

Schematic, Voltage

Alignment, Phono.

REMLER COMPANY, LTD.

The following tubes are used in this receiver:

- 6K7-R.F. Amplifier
- 6L7-Mixer
- 6CS-Oscillator
- 6K7-I.F. Amplifier
- 6H6-Diode Detector
- 6FB-A.P. Amplifier
- 6FB-A.P. Amplifier
- 5V6-Beam Power Amplifier
- 5V6-Beam Power Amplifier
- 6BE-Tuning Indicator
- 5X4-Rectifier

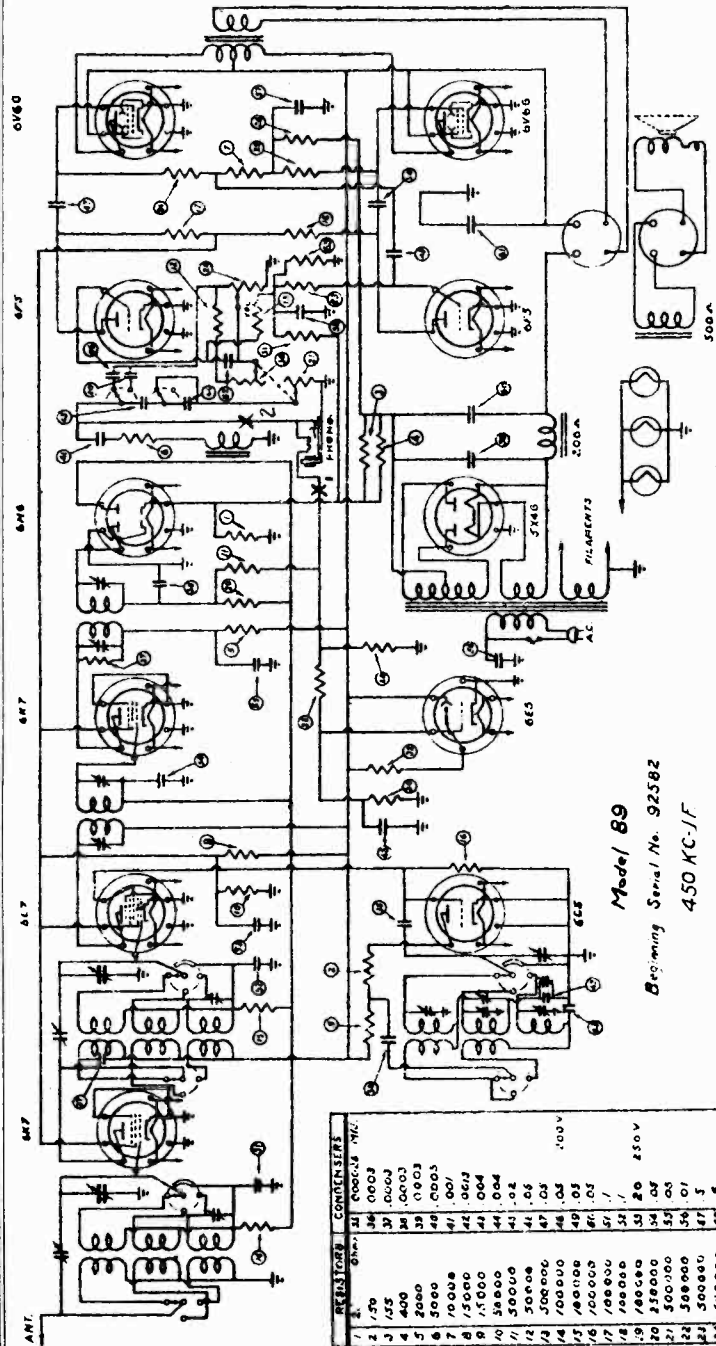
The R.F. Mixer and oscillator coils are located in the large square shields on the right end of the chassis. Trimmers for these circuits are mounted along the end of the chassis, beneath the coils in the following order: R.F. short wave, Mixer short wave, Oscillator broadcast, Oscillator medium wave, Oscillator short wave. From front to rear. The R.F. broadcast and Mixer broadcast trimmers are mounted on the range switch assembly. Oscillator pads are located at the back of the variable condenser. The pad nearest the end of the chassis is for the broadcast band and the medium wave is next. Trimmers for the I.F. transformers are adjustable thru holes in the I.F. transformer shield cans. The I.F. frequency is 450 K.C.

Voltage readings for service work:

A.C. Voltages:	
Line	120 Volts
Heater 5X4	4.8 "
Heaters other tubes	6 "

D.C. Voltages: (no signal) From ground to:	
5X4 Rectifier Filament	240 Volts
5V6 Plate	240
5V6 Screen	240
5V6 Bias	16.5
6F6 Plate	80
6F6 Bias	21.5
6K7 I.F. Plate	100
6K7 I.F. Screen	100
6K7 I.F. Bias	3
6L7 Plate	260
6L7 Screen	100
6L7 Bias	100
602 Plate	100
5B7 R.F. Plate	240
5B7 I.F. Screen	100
6A7 R.F. Bias	3
6BE Target Voltage	260
Voltage across speaker field	75



Model 89  
Beginning Serial No. 92582  
450 KC./F

OPERATION - PHONOGRAPH

Switch the receiver to the PHONO position on the change-over switch. Turn the volume control to the right and allow about one half minute for the tubes to warm up.

Grasp Seven 12-inch or Eight 10-inch Records, line them up with center holes and slip them onto center pin of the turntable.

See that needle is securely fastened by means of the small thumb screw on the front of the pickup. We recommend standard length needles. On an automatic you should use a needle which will play many records without re-placing. Your dealer can give you detailed information on this.

All that is necessary to start the phonograph after placing the records on the turn-table and securing the needle in pick-up, is to turn the motor switch, at the right of the turntable, to the ON position.

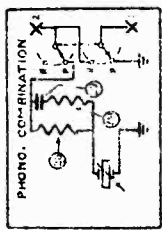
To play 10-inch records push the thumb stop on right of tone arm, to the back as far as it will go, and place the lever on the left of the turntable, in the 10-inch position. Place needle in starting position on top record.

To play 12-inch records pull the thumb stop, on the right of tone arm, as far as it will go, and place the lever, on the left of turntable in the 12-inch position. Place needle in starting position on top record.

The last record on the turntable automatically repeats.

To reject a record, pull the lever at the base of the tone arm.

Adjust volume and tone by means of the controls on the front of the cabinet.



Model 89C  
Beginning Serial No. 92582  
450 KC./F