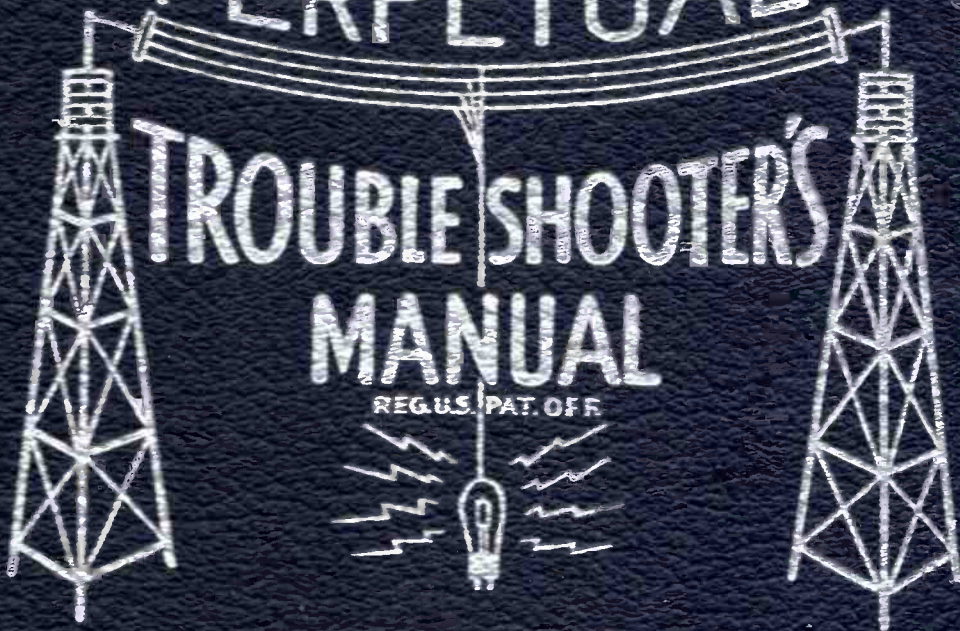


VOLUME XVI

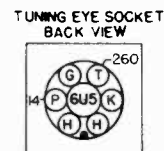
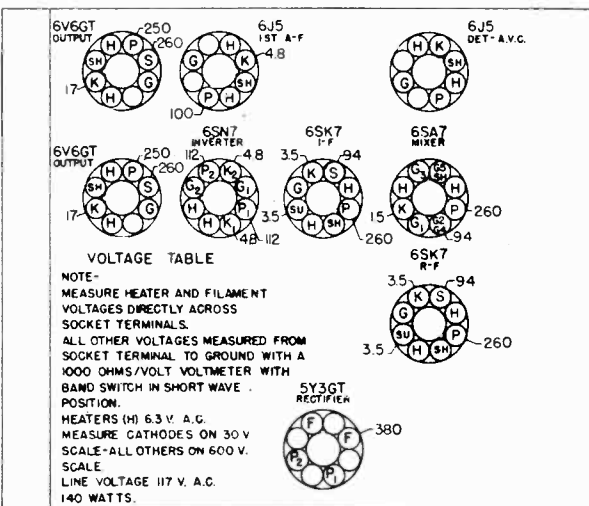
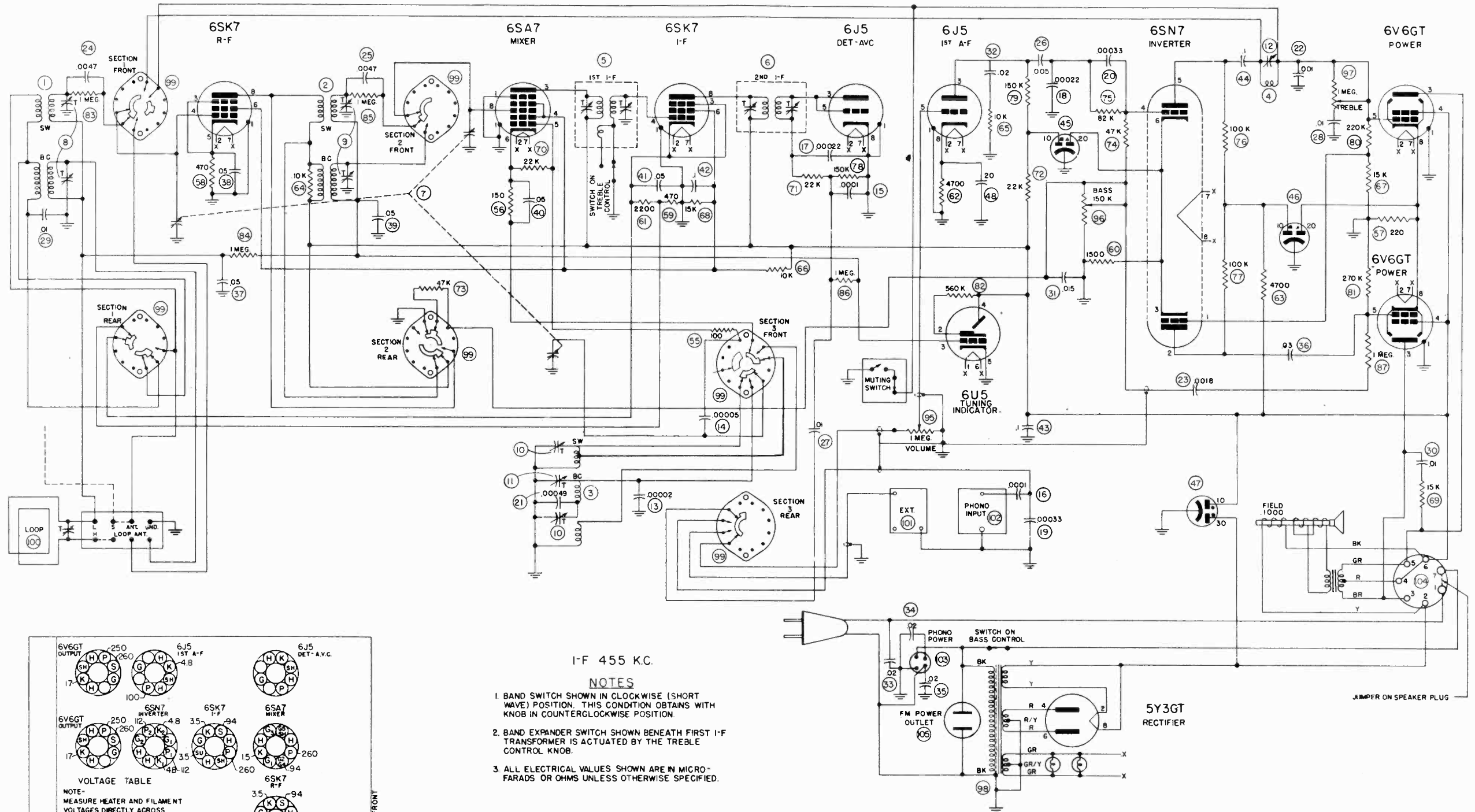
PERPETUAL



JOHN F. RIDER

THE MAGNAVOX CO.

FIRST ISSUE—MARCH, 1947



- I-F 455 K.C.
- NOTES**
1. BAND SWITCH SHOWN IN CLOCKWISE (SHORT WAVE) POSITION. THIS CONDITION OBTAINS WITH KNOB IN COUNTERCLOCKWISE POSITION.
  2. BAND EXPANDER SWITCH SHOWN BENEATH FIRST I-F TRANSFORMER IS ACTUATED BY THE TREBLE CONTROL KNOB.
  3. ALL ELECTRICAL VALUES SHOWN ARE IN MICRO-FARADS OR OHMS UNLESS OTHERWISE SPECIFIED.

**GENERAL**

Models CR-197A and CR-197B are alike electrically. However, a change is incorporated in the dial

drive mechanism. The differences are indicated on Figure 4.

FIGURE 6



THE MAGNAVOX CO. MODELS CR-197, CR-197A, CR-197B  
MODELS CR-198, CR-198A, CR-198B

**Method for Removing Chassis from Cabinet**  
THE DATA ON THIS ENTIRE PAGE ALSO APPLIES TO THE CR-198 SERIES Model CR-197 radio chassis is designed for easy removal from the cabinet in which it is installed. As the radio panel is permanently fastened to the chassis, the control knobs need not be removed when the chassis is taken out of the cabinet for service.

To remove the chassis, first remove the antenna leads from their terminals and all plugs from the receptacles on the rear of the chassis. Then remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis. Lift the rear of the chassis about one inch and pull it straight back. Never remove the chassis tray from the cabinet—it has been properly positioned to bring the radio panel in place when the chassis is replaced. In replacing the chassis, slide it so that the small

6. Set the receiver to 1400 kc. and adjust the trimmer on the receiver loop for maximum output.

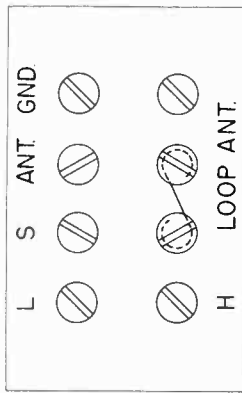


FIGURE 2

**SHORT WAVE BAND ALIGNMENT**

1. Set the band selector switch to SW as for short wave reception and substitute a 400 ohm resistor for the capacitor in series with the signal generator lead connected to the antenna terminal on the receiver.
2. Set the signal generator and the radio receiver to 15 mc.; then adjust the 15 mc. oscillator trimmer, the 15 mc. r-f trimmer and the 15 mc. antenna trimmer for maximum output. While adjusting the 15 mc. oscillator trimmer two peaks may be observed; only one is the correct peak for 15 mc. alignment. Screw in the trimmer to maximum capacity—then decrease the capacity until the first peak is observed. This is the correct one.

**10 KC FILTER ADJUSTMENT**

This chassis incorporates a 10 kc. filter circuit to eliminate the beat note heard as a whistle between stations on the broadcast band. If the trimmer is out of adjustment, the following procedure should be observed.

1. Set the Selectivity Switch to FULL RANGE by turning the Treble Control knob clockwise as far as possible.
2. Connect the output of an audio oscillator to the phonograph pickup socket on the radio chassis and adjust the oscillator to EXACTLY 10,000 cycles.
3. Set the band selector to PHONO and adjust the 10 kc. trimmer for minimum output.
4. If an audio oscillator is not available for making this adjustment, set the band selector to BDCST, connect an antenna to the receiver and set the gang condenser to a point between two stations on adjacent channels having approximately the same power. If the 10 kc. trimmer is out of adjustment, a whistle will be heard. Adjust the trimmer until the whistle is eliminated.

**SETTING THE PUSH BUTTONS**

1. Loosen each of the push button knobs several turns.
2. Select a station that is to be automatically tuned

by one of the push buttons, using the Dial Tuning knob. Be sure to set the Selectivity Switch to Sharp Tune and observe that the shaded portion of the green circle in the tuning indicator is as narrow as possible.

3. Press inward on the Dial Tuning knob (without turning it to the left or right) to hold the station in tune and press one of the push button knobs in as far as it will go—while holding it in this position, tighten the push button knob by turning it clockwise as far as possible.

4. Insert the correct tab with the call letters of the selected station in the space provided and proceed with setting up the remaining push buttons in the same manner. Stations should be set up on the push buttons in the order of their frequency so that the lowest frequency station is tuned by the button at the extreme left of the assembly; the highest frequency station should be selected by the button at the right end.

**SPECIAL SERVICE INFORMATION**

The following information is provided for the service man who has a vacuum tube voltmeter or a similar measuring instrument available.

**STAGE GAINS\***

Antenna Post to Converter Grid at:	600 kc.	4.1
	6 mc.	1.85
R-F to Converter Grid at:	600 kc.	14.3
	6 mc.	2.8
R-F on Converter to I-F Grid at:	600 kc.	46
	6 mc.	42
I-F on Converter Grid to I-F Grid at:	455 kc.	60
I-F Grid to Detector Plate at:	455 kc.	SW
	BDCST	30

**OSCILLATOR OUTPUT VOLTAGE**  
The DC voltage developed across Oscillator Grid Resistor (48) at:

600 kc.	6.6
6 mc.	5.3

**AUDIO GAIN**  
Voltage required across Volume Control to produce .05 watt speaker output\*\* at 400 cycles is .0075 volt with Band Selector Switch in BDCST setting.

\* Variations of ± 20% are acceptable. All readings made with sufficient input signal to provide .05 watt speaker output.  
\*\* Variations of ± 50% are acceptable to a reading of 0.4 volts as measured by a high resistance AC voltmeter across the voice coil of either speaker.

**ALIGNMENT PROCEDURE**

On some models of the CR-197 chassis, the two I-F trimmers are located in the top of the respective I-F transformers, while in others one trimmer is accessible from the top and the other from the bottom of each transformer as shown in the layout diagram, Figure 7.

**Broadcast Band Alignment**

1. Remove the signal generator lead from the 6S47 grid and connect it to the radio antenna terminal through the .00025 mfd. capacitor. The link on the antenna terminal board must be set in the ANT position as shown in Figure 1.
2. Check the tuning dial pointer adjustment. When the plates of the tuning condenser are completely meshed, the dial pointer must be in line with the last calibration mark at the low frequency end of the dial. If it is not, loosen the set screws in the hub of pulley "D" shown on Figure 3 and make the necessary adjustment.
3. With the band selector still set for broadcast band reception, adjust the signal generator and the radio receiver to 600 kc. While rocking the gang condenser a few degrees to the right and to the left, adjust the 600 kc. oscillator paddler for maximum indication on the output meter.
4. Set the signal generator and the radio receiver to 1400 kc., adjust the 1400 kc. oscillator trimmer, the 1400 kc. r-f trimmer and the 1400 kc. antenna trimmer for maximum output. If considerable adjustment was necessary, recheck the 600 kc. paddler setting.
5. If the loop antenna trimmer is out of adjustment it should be set after the radio chassis is in the cabinet. Set the link on the antenna terminal board to the LOOP position as shown in Figure 2. Adjust the signal generator to 1400 kilocycles and connect its output to a loop containing approximately five turns of wire eight inches in diameter placed eighteen inches from the receiver loop and in the same plane.

**I-F Alignment**

1. Connect the output of the signal generator to the oscillator grid (pin No. 5) of the 6S47 tube through a .00025 mfd. capacitor. The ground on the signal generator should be connected to the radio chassis ground.
2. Turn the condenser gang until it is completely meshed, (low-frequency end of dial calibration) and set the band selector switch to BDCST as for broadcast band reception.
3. Adjust the signal generator to EXACTLY 455 kc. and peak the second i-f transformer and the first i-f transformer trimmers in that order.

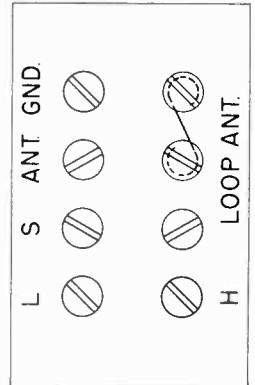


FIGURE 1



THE MAGNAVOX CO. MODELS CR-197, CR-197A, CR-197B  
MODELS CR-198, CR-198A, CR-198B

PARTS LIST

MODELS CR-197, CR-197A, CR-197B

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.	REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil Assembly, Antenna, two band	360273G1	48	Capacitor, electrolytic, 20 mfd, 25V	270027G2
2	Coil Assembly, r-f, two band	360274G1	55	Resistor, composition, 100 ohms, 1/2 W	230084G7
3	Coil Assembly, Oscillator, two band	360275G1	56	Resistor, composition, 150 ohms, 1/2 W	230084G8
4	Coil Assembly, 10KC filter	360278G1	57	Resistor, composition, 220 ohm, 2W ± 10%	230064G54
5	Transformer, First i-f	360024G1	58	Resistor, composition, 470 ohms, 1/2 W	230084G11
6	Transformer, Second i-f	360025G1	59	Resistor, composition, 470 ohms, 1/2 W	230084G14
7	Capacitor, Variable, three-gang, tuning Push button assembly for 260071G1 capacitor	260071G1 260063G1	60	Resistor, composition, 1500 ohms, 1/2 W	230084G15
8	Capacitor, Variable, two-gang trimmer	260021G1	61	Resistor, composition, 2200 ohms, 1/2 W	230084G17
9	Capacitor, Variable, two-gang trimmer	260021G1	62	Resistor, composition, 4700 ohms, 1/2 W	230084G19
10	Capacitor, Variable, two-gang trimmer	260021G1	63	Resistor, composition, 4700 ohms, 1/2 W	230084G17
11	Capacitor, Variable, Oscillator padder	260067G3	64	Resistor, composition, 10,000 ohms, 1/2 W	230084G21
12	Capacitor, Variable, 10 KC trimmer	250008G1	65	Resistor, composition, 10,000 ohms, 1/2 W	230084G31
13	Capacitor, Ceramic, 20 mmf	250088G32	66	Resistor, Wire wound, 10,000 ohms, 3 W ± 10%	240035G2
14	Capacitor, Ceramic, 50 mmf	250088G24	67	Resistor, composition, 15,000 ohms, ± 5%, 1/2 W	230084G187
15	Capacitor, molded mica, 100 mmf ± 20%	250159G98	68	Resistor, composition, 15,000 ohms, 2 W	230086G20
16	Capacitor, molded mica, 100 mmf ± 10%	250159G82	69	Resistor, composition, 15,000 ohms, 1 W	230085G20
17	Capacitor, molded mica, 220 mmf ± 20%	250159G100	70	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
18	Capacitor, molded mica, 220 mmf ± 20%	250159G100	71	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
19	Capacitor, molded mica, 330 mmf ± 10%	250159G88	72	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
20	Capacitor, molded mica, 330 mmf ± 10%	250159G88	73	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
21	Capacitor, silvered mica, 490 mmf ± 1%	250085G32	74	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
22	Capacitor, molded mica, 1000 mmf ± 20%	250160G82	75	Resistor, composition, 82,000 ohms, ± 10%, 1/2 W	230084G85
23	Capacitor, molded mica, 1800 mmf ± 10%	250160G67	76	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
24	Capacitor, molded mica, 4700 mmf ± 2%	250160G5	77	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
25	Capacitor, molded mica, 4700 mmf ± 2%	250160G5	78	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
26	Capacitor, paper, .005 mfd, 400V	250152G30	79	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
27	Capacitor, paper, .01 mfd, 200V	250152G18	80	Resistor, composition, 220,000 ohms ± 5%, 1/2 W	230084G215
28	Capacitor, paper, .01 mfd, 200V	250152G18	81	Resistor, composition, 270,000 ohms, ± 10%, 1/2 W	230084G91
29	Capacitor, paper, .01 mfd, 600V	250152G38	82	Resistor, composition, 560,000 ohms, ± 10%, 1/2 W	230084G95
30	Capacitor, paper, .01 mfd, 600V	250152G38	83	Resistor, composition, 1 megohm, 1/2 W	230084G31
31	Capacitor, paper, .015 mfd, 200V	250152G70	84	Resistor, composition, 1 megohm, 1/2 W	230084G31
32	Capacitor, paper, .02 mfd, 400V	250152G26	85	Resistor, composition, 1 megohm, 1/2 W	230084G31
33	Capacitor, molded paper, .02 mfd, 600V	250129G3	86	Resistor, composition, 1 megohm, 1/2 W	230084G31
34	Capacitor, molded paper, .02 mfd, 600V	250129G3	87	Resistor, composition, 1 megohm ± 10%, 1/2 W	230084G98
35	Capacitor, molded paper, .02 mfd, 600V	250129G3	95	Control, Volume, 1 megohm	220044G23
36	Capacitor, paper, .03 mfd, 400V	250152G25	96	Control, Bass, 150,000 ohm with Power Switch	220045G6
37	Capacitor, paper, .05 mfd, 200V	250152G15	97	Control, Treble, 1 megohm with Band Expander Switch	220071G2
38	Capacitor, paper, .05 mfd, 200V	250152G15	98	Transformer, Power, 117 V., 50/60 cycle	300034G1
39	Capacitor, paper, .05 mfd, 200V	250152G15	99	Switch, Rotary, Band Selector	16012G1
40	Capacitor, paper, .05 mfd, 200V	250152G15	100	Antenna Loop Assembly	*
41	Capacitor, paper, .05 mfd, 200V	250152G15	101	Socket, FM Input	180060G1
42	Capacitor, paper, .1 mfd, 200V	250152G13	102	Socket, Phonograph Input	189741G1
43	Capacitor, paper, .1 mfd, 400V	250152G22	103	Socket, Phonograph Motor	180501G5
44	Capacitor, paper, .1 mfd, 400V	250152G22	104	Socket, Speaker	180504G1F
45	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6	105	Socket, FM Power	180428G1
46	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6		Dial Glass Assembly	150291G1
47	Capacitor, electrolytic, 10-30 mfd, 450V	270023G2			

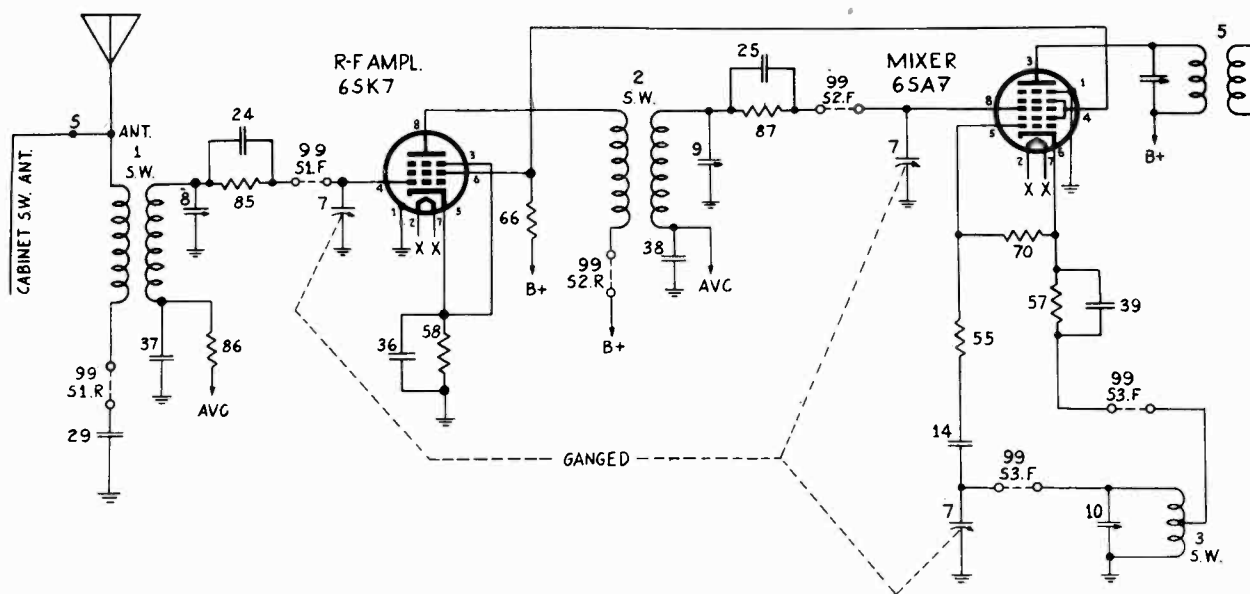
PARTS LIST

MODELS CR-198, CR-198A, CR-198B

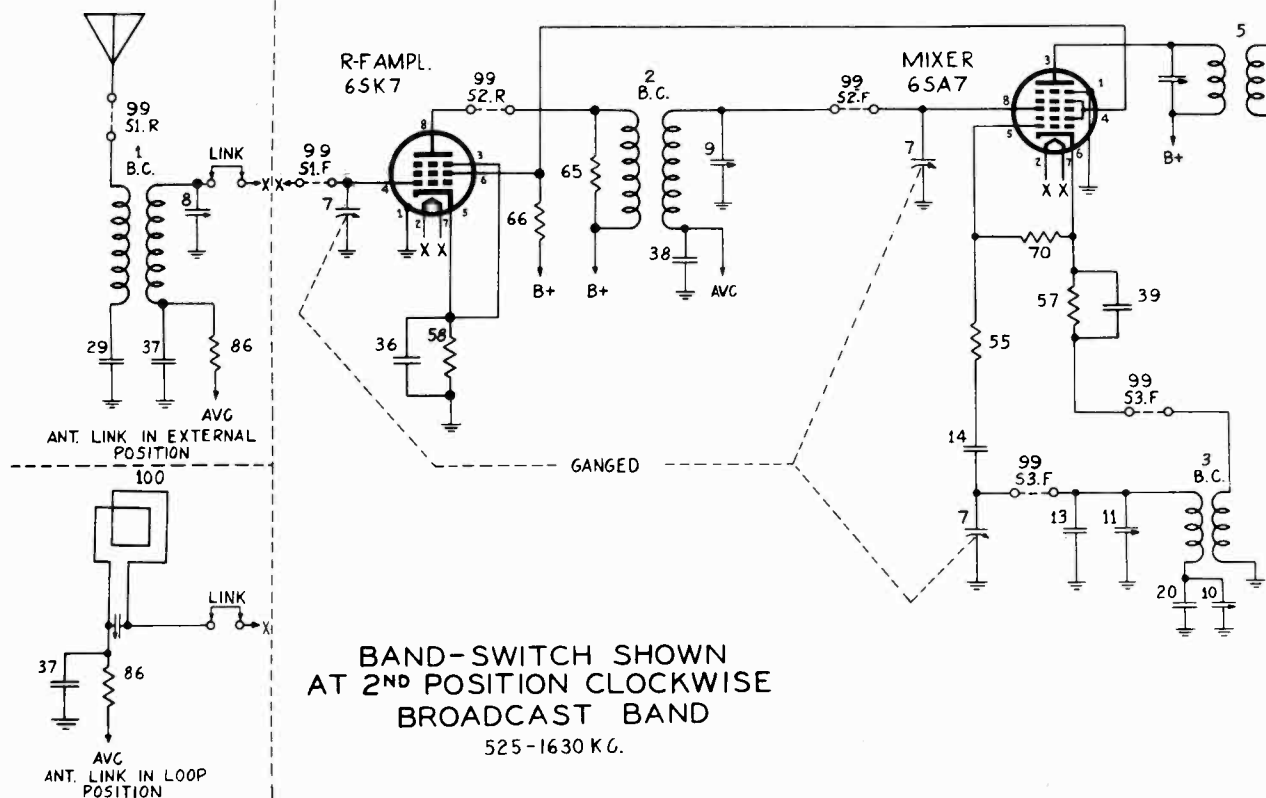
REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.	REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil Assembly, Antenna, two band	360273G1	55	Resistor, composition, 100 ohms, 1/2 W	230084G7
2	Coil Assembly, r-f, two band	360274G1	56	Resistor, Wire wound, 125 ohms, 5 W	240021G11
3	Coil Assembly, Oscillator, two band	360275G1	57	Resistor, composition, 150 ohms, 1/2 W	230084G8
4	Coil Assembly, 10KC filter	360278G1	58	Resistor, composition, 470 ohms, 1/2 W	230084G11
5	Transformer, First i-f	360024G1	59	Resistor, composition, 470 ohms, 1/2 W	230084G11
6	Transformer, Second i-f	360025G1	60	Resistor, composition, 1000 ohms; 2 W ± 10%	230064G62
7	Capacitor, Variable, three gang, tuning Push Button assembly for 260071G1	260071G1 260063G1	61	Resistor, composition, 1500 ohms, 1/2 W	230084G14
8	Capacitor, Variable, two gang trimmer	260021G1	62	Resistor, composition, 2200 ohms, 1/2 W	230084G15
9	Capacitor, Variable, two gang trimmer	260021G1	63	Resistor, composition, 4700 ohms, 1/2 W	230084G17
10	Capacitor, Variable, two gang trimmer	260021G1	64	Resistor, composition, 4700 ohms, 1/2 W	230084G17
11	Capacitor, Variable, Oscillator padder	260067G3	65	Resistor, composition, 10,000 ohms, 1/2 W	230084G19
12	Capacitor, Variable, 10KC trimmer	250008G1	66	Resistor, Wire wound, 10,000 ohms, ± 10%, 3 W	240035G2
13	Capacitor, Ceramic, 20 mmf	250088G32	67	Resistor, composition, 15,000 ohms, ± 5%, 1/2 W	230084G187
14	Capacitor, Ceramic, 50 mmf	250088G24	68	Resistor, composition, 15,000 ohms, 2 W	230086G20
15	Capacitor, molded mica, 100 mmf ± 20%	250159G98	69	Resistor, composition, 15,000 ohms, 1 W	230085G20
16	Capacitor, molded mica, 100 mmf ± 10%	250159G82	70	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
17	Capacitor, molded mica, 220 mmf ± 20%	250159G100	71	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
18	Capacitor, molded mica, 220 mmf ± 20%	250159G100	72	Resistor, composition, 22,000 ohms, 1/2 W	230084G21
19	Capacitor, molded mica, 330 mmf ± 10%	250159G88	73	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
20	Capacitor, silvered mica, 490 mmf ± 1%	250085G32	74	Resistor, composition, 47,000 ohms, 1/2 W	230084G23
21	Capacitor, molded mica, 1000 mmf ± 20%	250159G131	75	Resistor, composition, 82,000 ohms, ± 10%, 1/2 W	230084G85
22	Capacitor, molded mica, 1800 mmf ± 10%	250160G82	76	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
23	Capacitor, molded mica, 1800 mmf ± 10%	250160G67	77	Resistor, composition, 100,000 ohms, 1/2 W	230084G25
24	Capacitor, molded mica, 4700 mmf ± 2%	250161G5	78	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
25	Capacitor, molded mica, 4700 mmf ± 2%	250161G5	79	Resistor, composition, 150,000 ohms, 1/2 W	230084G26
26	Capacitor, paper, .005 mfd, 400V	250152G30	80	Resistor, composition, 220,000 ohms, ± 5%, 1/2 W	230084G215
27	Capacitor, paper, .01 mfd, 200V	250152G18	81	Resistor, composition, 270,000 ohms, ± 10%, 1/2 W	230084G91
28	Capacitor, paper, .01 mfd, 200V	250152G18	82	Resistor, composition, 560,000 ohms, ± 10%, 1/2 W	230084G95
29	Capacitor, paper, .01 mfd, 600V	250152G38	83	Resistor, composition, 680,000 ohms, 1/2 W	230084G30
30	Capacitor, paper, .01 mfd, 600V	250152G38	84	Resistor, composition, 1 megohm, ± 10%, 1/2 W	230084G98
31	Capacitor, paper, .015 mfd, 200V, ± 10%	250152G70	85	Resistor, composition, 1 megohm, 1/2 W	230084G31
32	Capacitor, molded paper, .02 mfd, 600V	250129G3	86	Resistor, composition, 1 megohm, 1/2 W	230084G31
33	Capacitor, molded paper, .02 mfd, 600V	250129G3	87	Resistor, composition, 1 megohm, 1/2 W	230084G31
34	Capacitor, molded paper, .02 mfd, 600V	250129G3	88	Resistor, composition, 1 megohm, 1/2 W	230084G31
35	Capacitor, paper, .03 mfd, 400V	250152G25	95	Control, Volume, 1 megohm	220044G23
36	Capacitor, paper, .05 mfd, 200V	250152G15	96	Control, Bass, 150,000 ohm with Power Switch	220045G6
37	Capacitor, paper, .05 mfd, 200V	250152G15	97	Control, Treble, 1 megohm with Band Expander Switch	220071G2
38	Capacitor, paper, .05 mfd, 200V	250152G15	98	Transformer, Power, 117 V., 50/60 cycle	300034G1
39	Capacitor, paper, .05 mfd, 200V	250152G15	99	Switch, Rotary, Band Selector	16012G1
40	Capacitor, paper, .05 mfd, 200V	250152G15	100	Antenna Loop Assembly	*
41	Capacitor, paper, .05 mfd, 200V	250152G15	101	Socket, FM Input	180060G1
42	Capacitor, paper, .1 mfd, 200V	250152G13	102	Socket, Phonograph Input	189741G1
43	Capacitor, paper, .1 mfd, 400V	250152G22	103	Socket, Phonograph Motor	180501G5
44	Capacitor, paper, .1 mfd, 400V	250152G22	104	Socket, Speaker	180504G16
45	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6	105	Socket, FM Power	180428G1
46	Capacitor, electrolytic, 10 mfd, 450V, 20 mfd, 25V	270023G6		Dial Glass Assembly	150291G1
47	Capacitor, electrolytic, 10-30 mfd, 450V	270023G2			

\*The part number of the loop antenna assembly changes with different cabinets. It is therefore important that you specify the Style Number of the instrument when ordering a replacement loop antenna assembly.

# "clarified schematics"



BAND-SWITCH SHOWN  
AT 1<sup>ST</sup> POSITION  
SHORT WAVE BAND  
4.95-18.4 MC.



BAND-SWITCH SHOWN  
AT 2<sup>ND</sup> POSITION CLOCKWISE  
BROADCAST BAND  
525-1630 K.C.





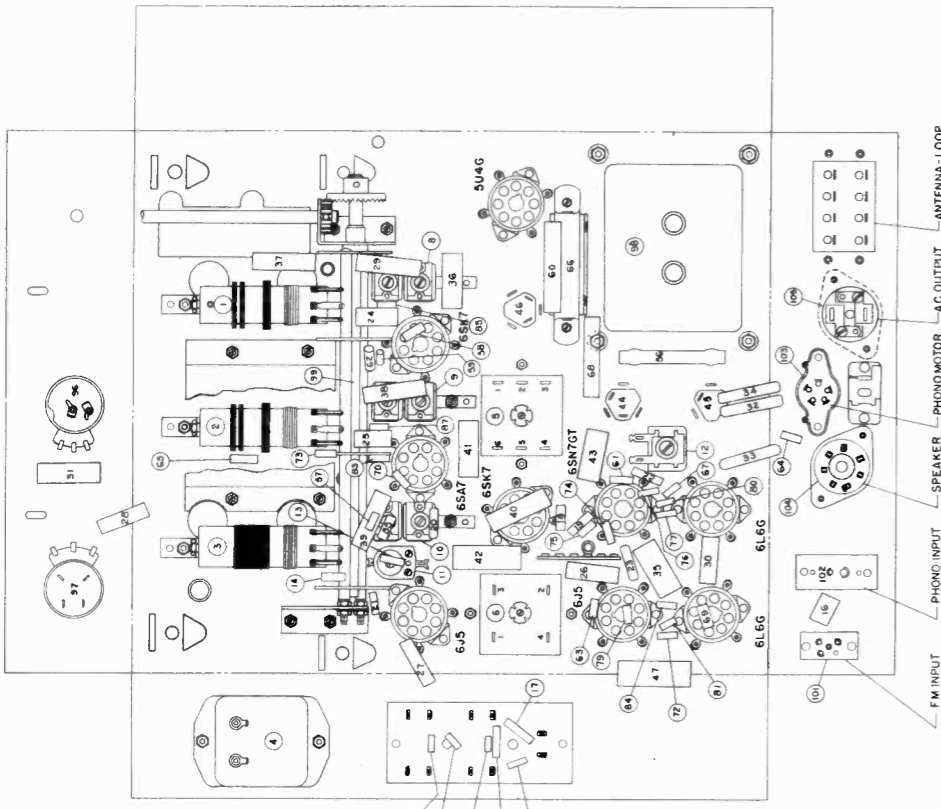


FIGURE 7

**SPECIFICATIONS**

Detector and AVC..... 6I5  
 First Audio..... 6I5  
 Inverter..... 6SN7GT  
 Power output (push-pull stage)..... (2) 6L6G  
 Rectifier..... 5U4G  
 Tuning Indicator..... 6U5  
 Dial lamps..... Mazda No. 44  
 Speakers: No. 582815 No. 582847  
 Field coil resistance 250 ohms 250 ohms  
 Voice coil impedance (400 cycles) 5.7 ohms 5.4 ohms  
 Output transformer..... None 5,000/3 ohms

Power supply..... 117 volts 50/60 cycles AC  
 Power consumption..... 140 watts  
 Power output..... 20 watts  
 Intermediate frequency..... 455 kc.  
 Tuning frequency range:  
 Broadcast band..... 525-1630 kc.  
 Short Wave band..... 4.95-18.4 mc.  
 Tubes:  
 R-F Amplifier..... 6SK7  
 Converter..... 6SA7  
 I-F Amplifier..... 6SK7

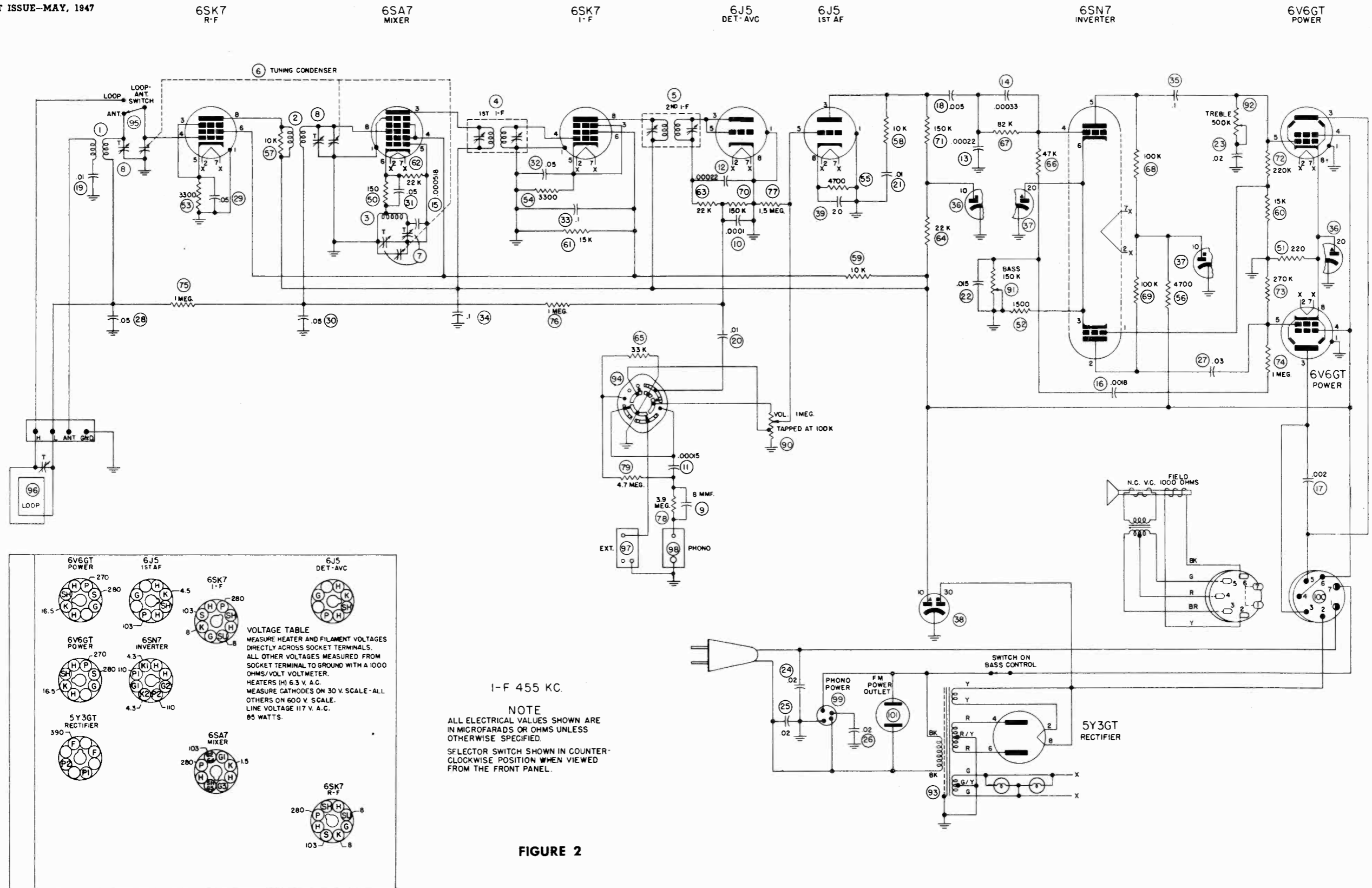
**PARTS LIST**  
 REFERENCE NO.

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, antenna.....	360279G1
2	Coil assembly, r-f.....	360280G1
3	Coil assembly, oscillator.....	360281G1
4	Transformer, first i-f.....	363700G1
5	Transformer, second i-f.....	363700G1
6	Capacitor, variable, three-gang tuning.....	260074G1
7	Capacitor, variable, two-gang trimmer.....	260021G1
8	Capacitor, variable, two-gang trimmer.....	260078G1
9	Capacitor, 8 mmf.....	250164G1
10	Capacitor, molded mica, 100 mmf. ± 20%.....	250159G98
11	Capacitor, molded mica, 150 mmf. ± 10%.....	250159G84
12	Capacitor, molded mica, 220 mmf. ± 20%.....	250159G100
13	Capacitor, molded mica, 220 mmf. ± 20%.....	250159G100
14	Capacitor, molded mica, 330 mmf. ± 10%.....	250159G88
15	Capacitor, silvered mica, 518 mmf. ± 1%.....	250085G35
16	Capacitor, molded mica, 1800 mmf. ± 10%.....	250160G67
17	Capacitor, paper, .002 mfd. 600 V.....	250152G44
18	Capacitor, paper, .005 mfd. 600 V.....	250152G41
19	Capacitor, paper, .01 mfd. 200 V.....	250152G18
20	Capacitor, paper, .01 mfd. 200 V.....	250152G18
21	Capacitor, paper, .01 mfd. 400 V.....	250152G27
22	Capacitor, paper, .015 mfd. ± 10%, 200 V.....	250152G70
23	Capacitor, paper, .02 mfd. 200 V.....	250152G17
24	Capacitor, molded paper, .02 mfd. 600 V.....	250129G3
25	Capacitor, molded paper, .02 mfd. 600 V.....	250129G3
26	Capacitor, molded paper, .02 mfd. 600 V.....	250129G3
27	Capacitor, paper, .03 mfd. 400 V.....	250125G25
28	Capacitor, paper, .05 mfd. 200 V.....	250152G15
29	Capacitor, paper, .05 mfd. 200 V.....	250152G15
30	Capacitor, paper, .05 mfd. 200 V.....	250152G15
31	Capacitor, paper, .05 mfd. 200 V.....	250152G15
32	Capacitor, paper, .05 mfd. 200 V.....	250152G15
33	Capacitor, paper, .1 mfd. 200 V.....	250152G13
34	Capacitor, paper, .1 mfd. 400 V.....	250152G22
35	Capacitor, paper, .1 mfd. 400 V.....	250152G22
36	Capacitor, electrolytic, 10 mfd. 450 V., 20 mfd. 25 V.....	270023G6
37	Capacitor, electrolytic, 10 mfd. 450 V., 20 mfd. 25 V.....	270023G6
38	Capacitor, electrolytic, 10-30 mfd. 475 V.....	270023G2
39	Capacitor, electrolytic, 20 mfd. 25 V.....	270027G2
50	Resistor, Composition, 150 ohm, ½ W.....	230084G8
51	Resistor, wire wound, 220 ohm, ± 10%, 2 W.....	230084G34
52	Resistor, composition, 1500 ohm, ½ W.....	230084G14
53	Resistor, composition, 3300 ohm, ½ W.....	230084G16
54	Resistor, composition, 3300 ohm, ½ W.....	230084G16
55	Resistor, composition, 4700 ohm, ½ W.....	230084G17
56	Resistor, composition, 4700 ohm, ½ W.....	230084G17
57	Resistor, composition, 10,000 ohm, ½ W.....	230084G19
58	Resistor, composition, 10,000 ohm, 1 W.....	230085G19
59	Resistor, wire wound, 10,000 ohm ± 10%, 3 W.....	240035G2
60	Resistor, composition, 15,000 ohm ± 5%, ½ W.....	230084G187
61	Resistor, composition, 15,000 ohm, 2 W.....	230088G20
62	Resistor, composition, 22,000 ohm, ½ W.....	230084G21
63	Resistor, composition, 22,000 ohm, ½ W.....	230084G21
64	Resistor, composition, 22,000 ohm, ½ W.....	230084G21
65	Resistor, composition, 33,000 ohm, ½ W.....	230084G22
66	Resistor, composition, 47,000 ohm, ½ W.....	230084G23
67	Resistor, composition, 82,000 ohm, ± ½ W.....	230084G85
68	Resistor, composition, 100,000 ohm, ½ W.....	230084G25
69	Resistor, composition, 100,000 ohm, ½ W.....	230084G25
70	Resistor, composition, 150,000 ohm, ½ W.....	230084G26
71	Resistor, composition, 150,000 ohm, ½ W.....	230084G26
72	Resistor, composition, 220,000 ohm, ± 5%, ½ W.....	230084G215
73	Resistor, composition, 270,000 ohm, ± 10%, ½ W.....	230084G91
74	Resistor, composition, 1 megohm, ± 10%, ½ W.....	230084G98
75	Resistor, composition, 1 megohm, ½ W.....	230084G31
76	Resistor, composition, 1 megohm, ½ W.....	230084G31
77	Resistor, composition, 1.5 megohm, ½ W.....	230084G32
78	Resistor, composition, 3.9 megohm, ± 10%, ½ W.....	230084G105
79	Resistor, composition, 4.7 megohm, ± 10%, ½ W.....	230084G106
90	Control, volume, 1 megohm with 100,000 ohm tap.....	220074G1
91	Control, bass, 150,000 ohm with power switch.....	220045G6
92	Control, treble, 500,000 ohm.....	220044G22
93	Transformer, power, 117 V. 50-60 cycle.....	300036G1
94	Switch, rotary, band selector.....	160175G1
95	Switch, slide, SPDT antenna loop.....	160176G1
96	Antenna loop assembly.....	*
97	Socket, fm input.....	180060G1
98	Socket, phonograph input.....	189741G1
99	Socket, phonograph motor.....	180501G5
100	Socket, speaker.....	180504G16
101	Socket, fm power.....	180428G1
97	Dial glass assembly.....	150293G1
101	Socket, FM input.....	180060G1
101	Socket, FM power.....	180428G1
	Dial Glass Assembly.....	150293G1

All resistor tolerances not given are ± 20%.

THE MAGNAVOX CO.

FIRST ISSUE-MAY, 1947



METHOD FOR REMOVING CHASSIS FROM CABINET

Model CR-199 radio chassis is designed for easy removal from the cabinet in which it is installed. As the radio panel is permanently fastened to the chassis the control knobs need not be removed when the chassis is taken out of the cabinet for service.

To remove the chassis, first remove the antenna leads from their terminals and all plugs from the receptacles on the rear of the chassis. Then remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis. Lift the rear of the chassis about one inch and pull it straight back. Never remove the chassis tray from the cabinet—it has been properly positioned to bring the

OSCILLATOR OUTPUT VOLTAGE

The DC voltage developed across the Oscillator Grid Resistor at: 600 kc. through 22,000 ohm Oscillator Grid Resistor (82).

AUDIO GAIN

Voltage required across the Volume Control to produce .05 watt speaker output\* at 400 cycles is .011 volt with Input Selector Switch in RAD setting.

DIAL CORD REPLACEMENT

Two separate drive cables are used in the CR-199 dial assembly. One cable is used to transmit the motion from the tuning knob to the large pulley that is coupled to the condenser gang; the other cable actuates the dial pointer whenever the large pulley on the condenser gang is rotated. Separate instructions for replacing either of these cables is given in the following paragraphs.

CONDENSER DRIVE CABLE REPLACEMENT

Remove dial assembly after taking out two screws on each side of chassis. Slip a one-half inch length of sleeving into a 42-inch length of dial cable. The two ends to the loop end of the cable spring, "E", securely so that the cable doubled measures 20 3/4 inches end to end including spring.

Place spring hook in bottom hole and draw cable through slot of pulley "C". Loop one end of cable around pulley "C" in a clockwise direction in front of condenser drive cable (viewing chassis from front) then loop the remaining end around pulley in a counterclockwise direction. Secure both ends of cable to chassis at edge of pulley slot with scotch tape, keeping piece of sleeving on remaining loop of cable.

DIAL POINTER DRIVE CABLE REPLACEMENT

Remove dial assembly and loop cable over pulley "A". While holding cable taut remove scotch tape and loop cable over pulley "B". Turn the tuning control shaft until the condenser gang is completely meshed and slide the dial pointer on its track until it is in line with the last calibration mark at the low frequency end of the dial. The short piece of sleeving installed prior to the stringing operation should be slid to the rear of the dial pointer and the crimping lug on the pointer pressed over the sleeving. After checking to make certain that the condenser gang is completely meshed and the dial pointer is in the position specified previously, apply a few drops of cement to each end of the sleeving to which the dial pointer is fastened. This completes the operation.

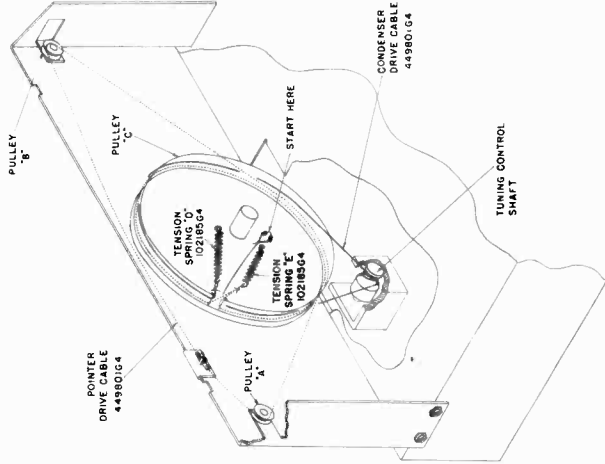


FIGURE 1

ALIGNMENT PROCEDURE

- 3. Adjust the signal generator and the radio receiver to 600 kc. While rocking the gang condenser a few degrees to the right and to the left, adjust the 600 kc. oscillator padder for maximum indication on the output meter.
4. Set the signal generator and the radio receiver to 1400 kc., adjust the 1400 kc. oscillator trimmer, the 1400 kc. r-f trimmer and the 1400 kc. antenna trimmer for maximum output. If considerable adjustment was necessary, recheck the 600 kc. padder setting.
5. If the loop antenna trimmer is out of adjustment it should be set after the radio chassis is in the cabinet. Set the ANT-LOOP switch on the top of the chassis to the LOOP setting. Adjust the signal generator to 1400 kilocycles and connect its output to a loop containing approximately five turns of wire eight inches in diameter placed eighteen inches from the receiver loop and in the same plane.
6. Set the receiver to 1400 kc. and adjust the trimmer on the receiver loop for maximum output.

SPECIAL SERVICE INFORMATION

The following information is provided for the service man who has a vacuum tube voltmeter or a similar measuring instrument available.

STAGE GAINS\*

- Antenna Post to R-F Grid at: 4.88
R-F Grid to Converter Grid at: 4.7
R-F on Converter to I-F Grid at: 42.6
I-F on Converter Grid to I-F Grid at: 50.7
I-F Grid to Detector Plate at: 72

BROADCAST BAND ALIGNMENT

- 1. Remove the signal generator lead from the 6SA7 grid and connect it to the radio antenna terminal through the .00025 mid. capacitor. The Anti-Loop switch on top of the chassis must be in the ANT setting.
2. Check the tuning dial pointer adjustment. When the plates of the tuning condenser are completely meshed, the dial pointer must be in line with the last calibration mark at the low frequency end of the dial. If it is not, slide the pointer on its string to the correct position. Be sure to crimp the lugs on the rear of the pointer) tightly around the string to hold the pointer in adjustment.

AUDIO GAIN

Voltage required across the Volume Control to produce .05 watt speaker output\* at 400 cycles is .011 volt with Input Selector Switch in RAD setting.

DIAL CORD REPLACEMENT

Two separate drive cables are used in the CR-199 dial assembly. One cable is used to transmit the motion from the tuning knob to the large pulley that is coupled to the condenser gang; the other cable actuates the dial pointer whenever the large pulley on the condenser gang is rotated. Separate instructions for replacing either of these cables is given in the following paragraphs.

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Place spring hook in bottom hole and draw cable through slot of pulley "C". Loop one end of cable around pulley "C" in a clockwise direction in front of condenser drive cable (viewing chassis from front) then loop the remaining end around pulley in a counterclockwise direction. Secure both ends of cable to chassis at edge of pulley slot with scotch tape, keeping piece of sleeving on remaining loop of cable.

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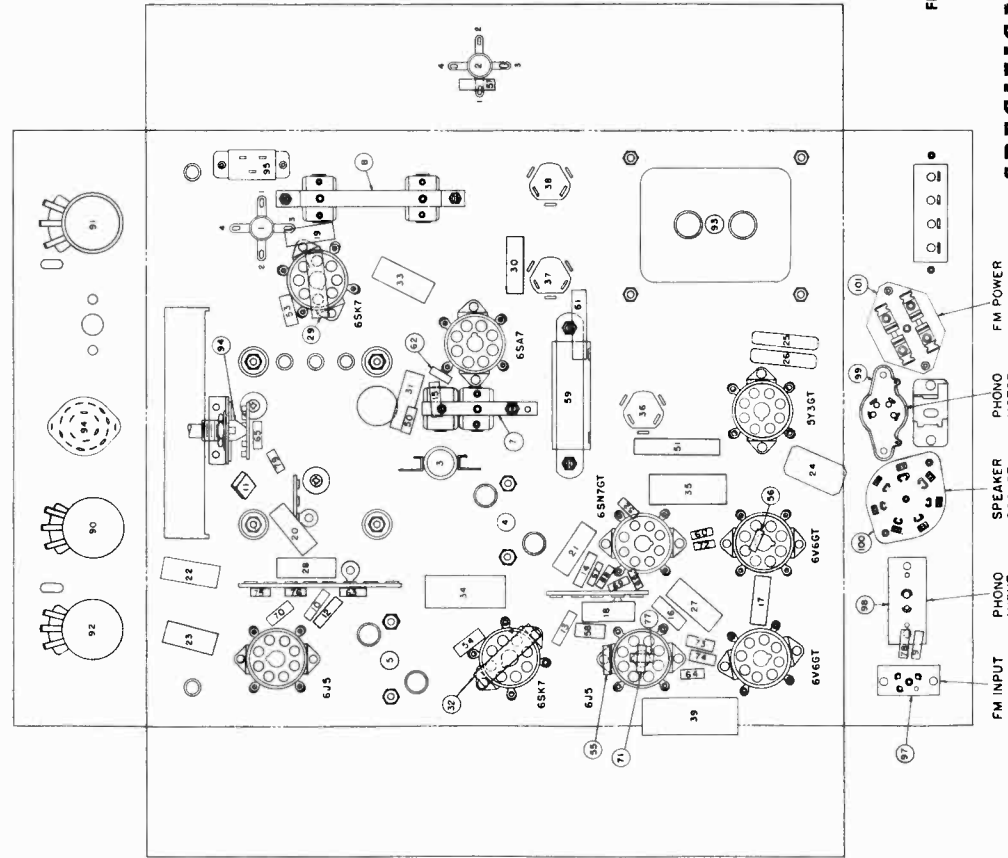
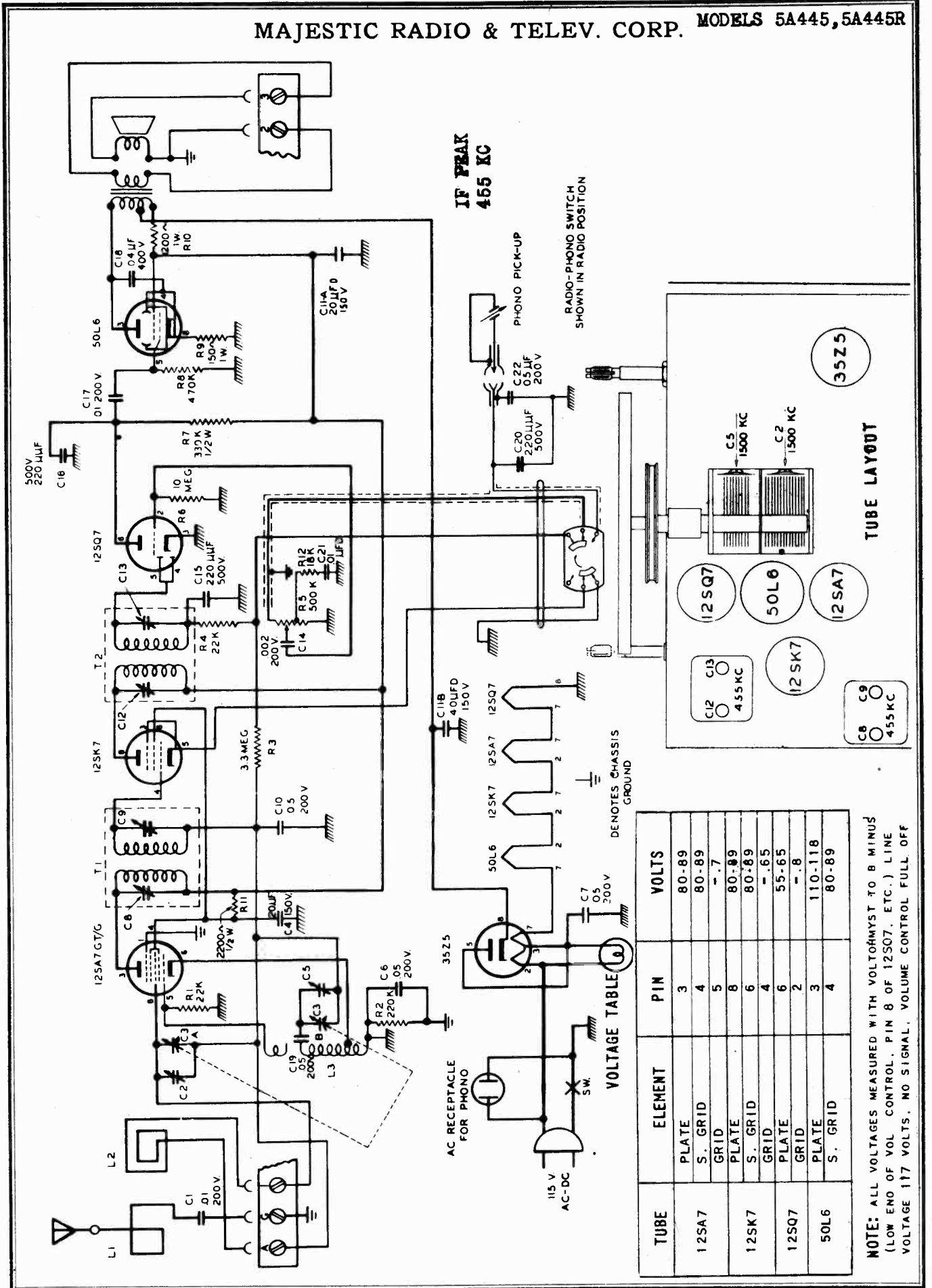


FIGURE 3

SPECIFICATIONS

Table with 2 columns: Specification and Value. Includes: Power supply (117 volts 50/60 cycles AC), Power consumption (85 watts), Power output (.10 watts), Intermediate frequency (455 kc.), Tuning frequency range (534-1620 kc.), Converter (6SA7), I-F Amplifier (6SA7), Detector and AVC (6I5), First Audio (6I5), Inverter (6SN7GT), Power output (push-pull stage) (2) 6V6GT, R-F Amplifier (6SK7), Phono Motor (6Y3GT), Phono Input, Speaker Socket, FM Power, and Mazda No. 44.

MAJESTIC RADIO & TELEV. CORP. MODELS 5A445, 5A445R



MODELS 5A445, 5A445R

MAJESTIC RADIO & TELEV. CORP.

**PARTS LIST**

ITEM	DESCRIPTION	PART NO.
R1	22,000 OHM, 20%, 1/4 WATT	9-184
R2	220,000 OHM, 20%, 1/4 WATT	9-182
R3	3.3 MEGOHM, 20%, 1/4 WATT	9-206
R5	VOLUME CONTROL WITH SWITCH, 1/2 MEGOHM	13-28
R6	10 MEGOHM, 20%, 1/4 WATT	9-160
R7	330,000 OHM 20%, 1/2 WATT	9-89
R8	470,000 OHM 20%, 1/4 WATT	9-207
R9	150 OHM, 20%, 1 WATT	9-251
R10	1200 OHM, 10%, 1 WATT	9-216
R11	2200 OHM, 10%, 1/2 WATT	02-100
R12	18,000 OHM, 20%, 1/4 WATT	9-269
C1, C17	.01 MFD. + 40%-10%, 200V.	5-57
C2, C3, C5	GANGED TUNING CONDENSER	7-24
C6, C7		
C10, C19	.05. MFD. + 40%-10%, 200V.	5-40
C8, C9	TRIMMER (PART OF GANG CONDENSER)	
C12, C13	20-40 MFD 150V ELECTROLYTIC	19-24
C11	20 MFD ELECTROLYTIC CONDENSER 150V.	19-32
C4	.002 MFD. + 40%-10%, 200V.	5-52
C14		
C15, C16		

C20	220 MMFD ± 20%, 500V	6-151
C18	.04 MFD + 20%-10%, 400V	5-58
T1	1ST I. F. TRANSFORMER	3-116
T2	2ND I. F. TRANSFORMER	3-117
L3	OSCILLATOR COIL ASSEMBLY	3-158
	OUTPUT TRANSFORMER	12-20
	SPEAKER	22-32
	DIAL SCALE	117-66
	DIAL CORD TENSION SPRING	129-29
	DIAL POINTER	135-14
	SWITCH, PHONO-RADIO	11-52
	LOOP ANTENNA AND BACK COVER	20-30
	KNOB-TUNING	128-54
	KNOB, RADIO-PHONO	128-55
	KNOB, VOLUME	128-56
	PILOT LIGHT JEWEL	127-205
	PILOT LIGHT SHIELD	23-45
	PILOT LIGHT, #47	26-2
	PHONO MOTOR RECEPTACLE	15-98
	CABINET, MODEL 5A445R	115-22
	ESCU TCHEON, MODEL 5A445R	122-38
	CABINET MODEL 5A445	115-18
	DIAL CRYSTAL AND ESCUTCHEON, MODEL 5A445	122-33

**A L I G N M E N T**

BEFORE ALIGNING, SET THE DIAL POINTER AS FOLLOWS: OPEN THE TUNING GANG CONDENSER (PLATES FULLY OPEN) SET DIAL POINTER SO THAT IT IS IN LINE WITH THE LAST MARK AT THE HIGH FREQUENCY END OF THE DIAL SCALE

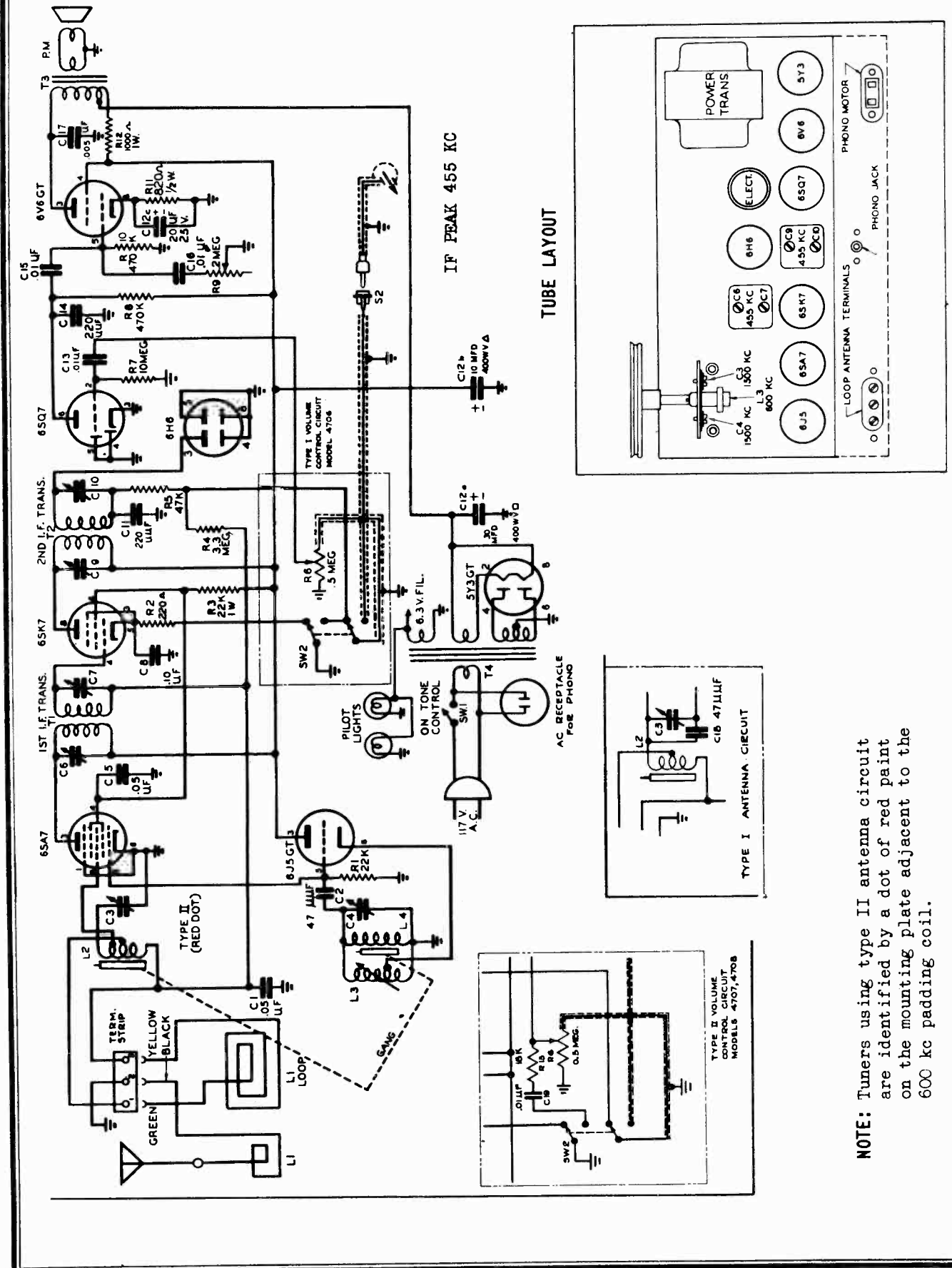
WHILE ALIGNING THIS RECEIVER, TURN THE VOLUME CONTROL FULL ON, AND KEEP THE SIGNAL GENERATOR OUTPUT AS LOW AS POSSIBLE TO PREVENT AVC ACTION AND FALSE READINGS

STEP	DUMMY ANT.	TEST OSC. CONNECTION	TEST OSC. FREQUENCY	RECEIVER DIAL	ADJUST	REMARKS
1	.01 MFD	12SA7 GRID (PIN NO 5)	455 KC. MODULATED	ANY QUIET SPOT	C13, C12, C9, C8 FOR MAX. OUTPUT	REPEAT IN REVERSE ORDER
2	.....	LOOP*	1500 KC MODULATED	150	C5 FOR MAXIMUM OUTPUT	
3	.....	LOOP*	1500 KC MODULATED	150	C2 FOR MAXIMUM OUTPUT	ROCK GANG WHILE ADJUSTING
4	REPEAT COMPLETE ALIGNMENT PROCEDURE CAREFULLY					

\* MAKE A TWO OR THREE TURN LOOP ABOUT 12 INCHES IN DIAMETER CONNECT TO OUTPUT TERMINALS OF THE SIGNAL GENERATOR PLACE THIS LOOP IN A PLANE PARALLEL TO THE RECEIVER LOOP ANTENNA AND ABOUT A FOOT AWAY FROM THE RECEIVER LOOP IMPORTANT: WHEN MAKING RF ADJUSTMENTS, THE RECEIVER LOOP ANTENNA SHOULD BE SPACED FROM THE CHASSIS EXACTLY AS WHEN THE RECEIVER IS IN THE CABINET

MAJESTIC RADIO & TELEV. CORP.

MODELS 7C432, 7C447  
Chassis 4706, 4707



**NOTE:** Tuners using type II antenna circuit are identified by a dot of red paint on the mounting plate adjacent to the 600 kc padding coil.

MODELS 7C432, 7C447  
Chassis 4706, 4707

MAJESTIC RADIO & TELEV. CORP.

VOLTAGE TABLE

TUBE	PLATE	SCREEN	CATHODE
6SA7 (CONV.)	244	74	..
6J5 (OSC.)	244	..	..
6SK7 (I.F.)	244	74	1.6
6SQ7 (A.F.)	75		
6V6 (OUT)	268	243	11

NOTE: All voltages measured to ground with 1,000 Ohm per volt meter; line 117 v.a.c. values may vary 10 per cent.

CRITICAL LEAD DRESS:

- Green lead from r.f. coil on tuner to pin 8 of the 6SA7 socket should be dressed well over toward the 6J5 socket, around the ceramic condenser C2.
- Plate leads (BLUE) of both I.F. transformers should be laid down against the chassis.
- Grid leads (GREEN) of both I.F. transformers should be dressed up away from the chassis as far as possible.
- The .01 mfd. 400 v. condenser (C13) from the volume control to the 6SQ7 grid should be dressed as far over as possible toward the electrolytic condenser.
- The .005 mfd. 600 v. condenser (C17) from the 6V6 C13 to ground should be dressed as far away from C13 as possible.

Before aligning, close the tuner (slugs fully into the coils). Set the pointer to extreme left-hand mark on the dial.  
When making r.f. adjustments, connect to the output of the signal generator a loop, about 12 inches in diameter, consisting of two or three turns of wire. Place this loop in a plane parallel to that of the receiver loop antenna and about a foot away from it. The receiver loop antenna should be in about the same position relative to the chassis as it is when installed in the cabinet.

While aligning, keep the volume control full on and the signal generator output no higher than is necessary to obtain an output indication.

USE ONLY ALL ELASTIC OR FIBRE SCREWDRIVER ON THE 600 KC PADDING COIL. INSERTION OF THE SLIGHTEST BIT OF METAL INTO THIS COIL WILL DETUNE THE CIRCUIT.

PART NO.

ITEM	DESCRIPTION	PART NO.
C1	.05 mfd., + 40% - 10%, 200 volt, paper	5-40
C2	47 mfd. 20% 500 volts, ceramic	6-159
C3, C4	Trimmers, part of tuning unit	
C5	.05 mfd., 30% 600 v. paper	5-77
C6, C7	Trimmers, part of T1	
C8	.1 mfd + 40% - 10% 200 volts, paper	5-39
C9, C10	Trimmers, part of T2	
C11, C14	220 mfd. 20% 500 volts, mica	6-151
C12a,b,c	30-10-20 mfd., 400-400-25 volts, electrolytic	19-26
C13	.01 mfd., + 20% - 10% 200 volts, paper	6-112
C15, C16	.01 mfd., + 30% - 10% 400 volts, paper	6-132
C17	.005 mfd 20% 600 volts, paper	5-61
C18	47 mfd 20% 500 volts ceramic	6-159
C19	.01 mfd., + 40% - 10% 200 v., paper	5-57
R1	22,000 ohms, 20%, 1/3 watt	9-184
R2	220 ohms, 20%, 1/3 watt	9-208
R3	22,000 ohms, 10%, 1 watt	9-280
R4	3.3 megohms, 20%, 1/3 watt	9-206
R5	47,000 ohms, 20%, 1/3 watt	9-201
R6	Volume control, .5 megohms	13-19
R7	10 megohms, 20%, 1/3 watt	9-160
R8	470,000 ohms, 20%, 1/2 watt	9-211
R9	Tone control, 2 megohm, (with switch)	14-6
R10	470,000 ohms, 20%, 1/3 watt	9-207
R11	820 ohms, 10%, 1/2 watt	9-283
R12	1,000 ohms, 20%, 1 watt	9-169
R13	18,000 ohms, 20%, 1/4 watt	9-269
T1	1st I.F. transformer, inc. C6 & C7	3-159
T2	2nd I.F. transformer, inc. C9 & C10	3-160
T3	Output transformer (chassis 4706)	12-27
T4	Output transformer (chassis 4707)	12-26
	Power transformer	2-16
	Tuner assembly	32-1
	Speaker, Model 7C432	22-20
	Speaker, Model 7C447	22-26
	Loop antenna assembly, Model 7C432	20-23
	Loop antenna assembly, Model 7C447	20-24
	Phono-radio switch	11-52
	Phono motor receptacle	15-98
	Pilot light, Mazda #47	26-2
	Knobs	128-50
	Escutcheon, Model 7C447	122-30
	Dial scale, Model 7C432	117-56
	Dial scale, Model 7C447	117-59
	Dial pointer	135-8
	Dial cord spring	129-29
	Dial cord assembly	S-1297
	Cabinet, Model 7C432	115-7
	Cabinet, Model 7C447	115-14

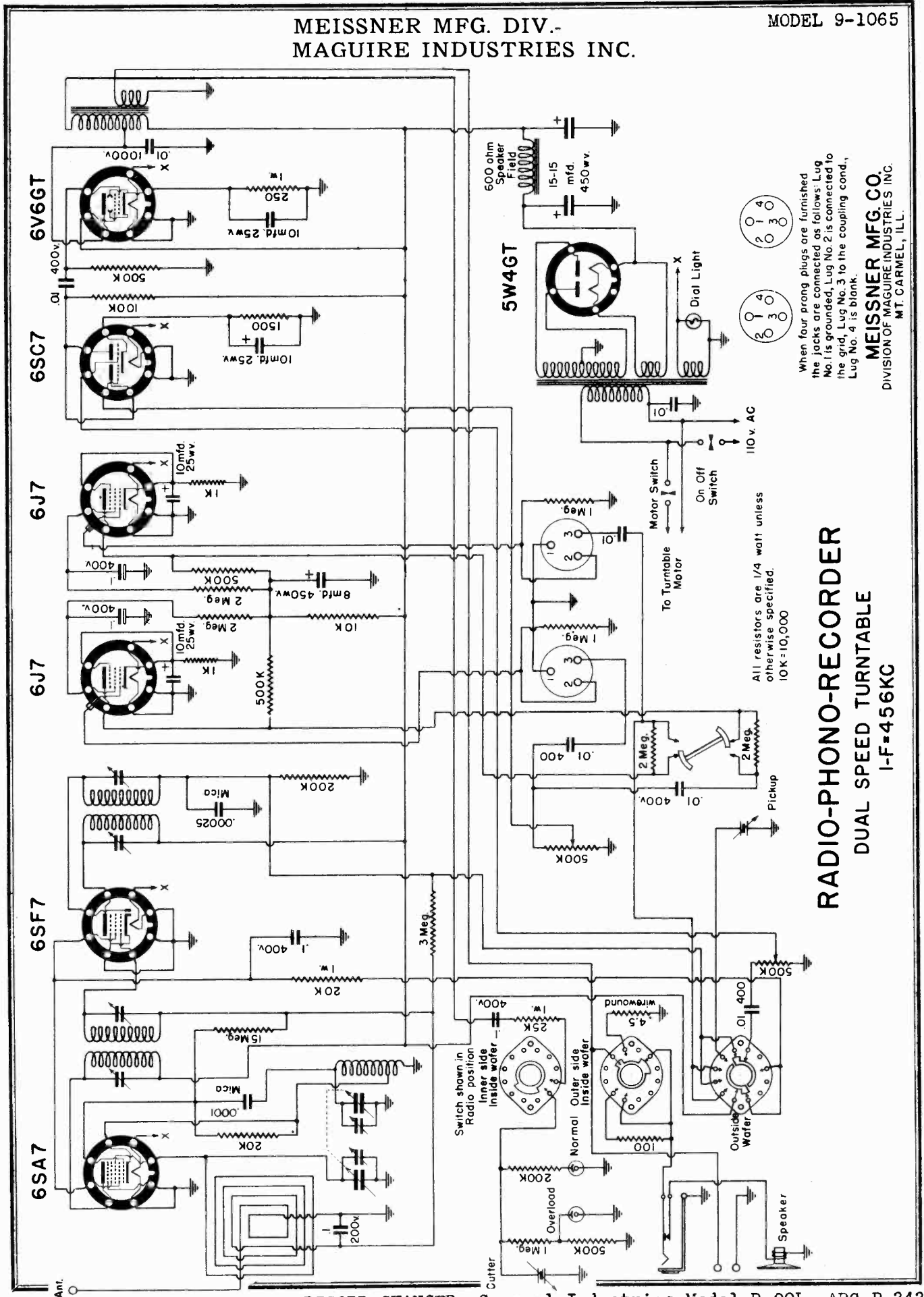
Model 7C447 - REMOVING CHASSIS FROM CABINET:

Always slide the chassis out through the BACK of the cabinet, NEVER through the bottom. On some cabinets there is a reinforcing block in the rear, lower left corner. Remove this block by removing the two wood screws before removing chassis.

STEP	DUMMY ANTENNA	TEST OSCILLATOR CONNECTION	TEST OSCILLATOR FREQUENCY	RECEIVER DIAL	ADJUST FOR MAXIMUM	NOTES
1	.01 MFD.	6SA7 GRID	455 KC	ANY QUIET SPOT	C10. C9 REPEAT IN REVERSE ORDER	
2	LOOP	.....	1500 KC.	150	C3. C4	
3	LOOP	.....	600 KC	60	L3	ROCK TUNER WHILE ADJUSTING
4	LOOP	.....	1500 KC.	150	C4	DO NOT READJUST C3
5	REPEAT STEPS 3 & 4					

MEISSNER MFG. DIV.-  
MAGUIRE INDUSTRIES INC.

MODEL 9-1065



When four prong plugs are furnished the jacks are connected as follows: Lug No. 1 is grounded, Lug No. 2 is connected to the grid, Lug No. 3 to the coupling cond., Lug No. 4 is blank.

**MEISSNER MFG. CO.**  
DIVISION OF MAGUIRE INDUSTRIES INC.  
MT. CARMEL, ILL.

**RADIO-PHONO-RECORDER**  
**DUAL SPEED TURNTABLE**  
**I-F=456KC**

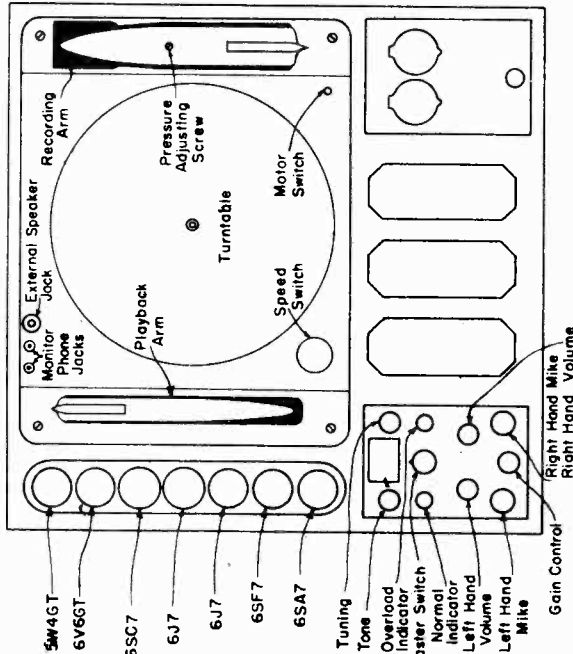
All resistors are 1/4 watt unless otherwise specified.  
10K=10,000



MODEL 9-1065

MEISSNER MFG. DIV.-  
MAGUIRE INDUSTRIES INC.

- 02076 .....Antenna coil (Loop)
- 01710 .....Oscillator coil
- 02072 .....Input I-F transformer
- 02074 .....Output I-F transformer
- 19851 .....Output transformer
- 19847 .....Power transformer
- 19843 .....D. P. S. T. wafer switch
- 19842 .....5 Position switch
- 19696 .....Motor switch
- 19828 .....Tone control with switch
- 19827 .....Volume control
- 18162 .....2-gang Variable cond.
- 16124 .....15-15 mfd. 450 wv. Electrolytic
- 24126 .....10-10 mfd. 25 wv. Electrolytic
- 16113 .....8 mfd. 450 wv. Electrolytic
- 15143 .....1 mfd. 400 v. paper condenser
- 15142 .....1 mfd. 200 v. paper condenser
- 14181 .....05 mfd. 400 v. paper condenser
- 16136 .....01 mfd. 1000 v. paper condenser
- 14110 .....01 mfd. 400 v. paper condenser
- 18107 .....01 mfd. line condenser
- 14102 .....00025 mfd. mica condenser
- 16198 .....4.5 ohm candohm resistor
- 15152 .....100 ohm 1/4 w. resistor
- 14191 .....1,000 ohm 1/4 w. resistor
- 14194 .....1,500 ohm 1/4 w. resistor
- 14143 .....10,000 ohm 1/4 w. resistor
- 14169 .....20,000 ohm 1/4 w. resistor
- 14190 .....20,000 ohm 1 w. resistor
- 14144 .....100,000 ohm 1/4 w. resistor
- 14155 .....200,000 ohm 1/2 w. resistor
- 18152 .....500,000 ohm 1/4 w. resistor
- 24127 .....1 megohm 1/4 w. resistor
- 17146 .....2 megohm 1/4 w. resistor
- 18166 .....3 megohm 1/4 w. resistor
- 19846 .....15 megohm 1/4 w. resistor
- 19628 .....Neon Indicators
- 19695 .....Speaker
- 19821 .....Motor turntable
- 19470 .....Jack
- 19468 .....Pin Jack
- 19855 .....Microphone
- 19856 .....Microphone Plug



POWER SUPPLY .....110-125 volts 50-60 cycles A.C.

**OPERATING VOLTAGES**

Below is given the voltage measured from the tube pins shown—to chassis, using a 1000 ohm per volt meter, line volts 117. It should be remembered that variations of as much as several percent from the voltages shown in the chart, do not necessarily indicate trouble, since variation in line voltage, variation of resistors within the allowable tolerance, etc. all effect the operating voltages.

POWER CONSUMPTION .....110 Watts including motor

INTERMEDIATE FREQUENCY .....456 KC

ALIGN .....1400 KC

PAD .....No adjustment necessary

NEON VOLUME INDICATORS .....GE T-2

DIAL LIGHT .....Any 6-8 Volt type—Bayonet Base

**VOLTAGE CHART**

Tubes	# 1 Pin	# 2 Pin	# 3 Pin	# 4 Pin	# 5 Pin	# 6 Pin	# 7 Pin	# 8 Pin
6SA7	—	—	260	80	—	—	6.3 AC	—
6SF7	—	—	—	80	—	260	6.3 AC	—
6J7	—	—	60 *	— †	.4	250	6.3 AC	.4
6J7	—	—	—	— †	.4	250	6.3 AC	.4
6SC7	—	125	—	—	125	1.7	6.3 AC	—
6V6 GT	—	—	230	260	—	—	6.3 AC	12.5
5W4GT	—	310	—	320AC	—	320AC	—	310

Note: Line voltage = 117 volts \* Measured on 1000 volt range. † Very low reading on 1000 volt range. Switch to be in RADIO position for all readings

MEISSNER MFG. DIV.-  
MAGUIRE INDUSTRIES INC.

**OPERATION**

The following chart is designed to give the user of the Meissner Radio-Recorder a quick insight of the functions of the various controls. For best results the notes and instructions following the chart should be read and followed, since the chart alone cannot contain all the information essential to the proper use of the equipment.

In the top row of the chart are listed the five functions of the unit, corresponding to the five positions of the selector switch in the center of the control panel. In the left hand column are listed the different controls and other devices on the control panel. By glancing down any vertical column it can be immediately determined what con-

trols and indicators are in use for that position of the selector switch.

In operating the Meissner Radio-Recorder as a radio receiver, a record player, a recorder, or a public address system, there are certain precautions that must be observed and also several special hook-ups that may be used to get the best results and to take advantage of the full flexibility of which the unit is capable. These are listed under sub-headings following, and should be studied carefully before attempting to operate the equipment, and should also be referred to often until the user is fully acquainted with his equipment and all functions it will perform.

Position of Selector Switch	Radio Only	Phono Playback	Record Mike	Record Radio	Public Address
Tuning	Radio Tuning	_____	_____	Radio Tuning	_____
Tone	_____ Tone Control & Line Switch _____				
Normal and Overload	_____	_____	Volume Level Indicators	Volume Level Indicators	_____
Volume (Left Hand)	_____ Volume Control for Left Hand Mike _____				
Volume (Right Hand)	Radio Volume Control	Phono Volume Control	Volume Control for Right Hand Mike	Radio Volume Control	Volume Control for Right Hand Mike
Mike (Left Hand)	Input for Mike, External Radio, or External Phono				
Mike (Right Hand)	_____	_____	Input for Mike Ext. Phono Ext. Radio	_____	Input for Mike Ext. Phono Ext. Radio
Gain	- Gain Control for using different types of Microphones				

**POWER SUPPLY**

This Radio-Recorder is designed to operate from a 110-125 volt 50-60 cycle alternating current supply. Never attempt to operate it from other source of supply—serious damage to the equipment is almost sure to occur.

**LINE SWITCH**

The line switch for the unit is located on the tone control. The switch for the turntable is located in the front, right hand corner of the turntable base. The turntable will not operate unless both the master switch on the tone control and the motor switch are turned on.

**ADJUSTMENT**

**CUTTER ARM HEIGHT**

The cutter arm height is adjusted at the factory for a standard 5/8" stylus. If recoring blanks of the usual home recording type are used, the cutter arm height should not have to be changed. If recording blanks of unusual thickness are used, it will be necessary to re-adjust the cutter arm height. For instructions for performing this adjustment, refer to the section of this instruction sheet entitled SERVICE NOTES.

**CUTTER ARM PRESSURE**

Variation in the hardness of different record coatings may require different cutting pressures for different makes of records.

The normal depth of cut produces a width of groove approximately equal to the width of the uncut portion left between grooves. When changing kinds or make of records examine a portion of the new record after having made a trial cutting to see if it approaches this condition. If not, refer to the SERVICE NOTES of this sheet and make the proper adjustment according to the instructions given there.

**REPRODUCING NEEDLES**

In choosing the correct reproducing needles to use, it should be kept in mind that while most any good make of reproducing needle is satisfactory for reproducing commercial records, the same is not true with home recordings. The material used to make instantaneous recording blanks is necessarily softer than the material used in commercial records and is more easily damaged by a reproducing needle which is not properly made to fit the groove in the record. There are a number of good needles on the market made especially for reproducing instantaneous recordings and one of these should be chosen.

**RECORDING SPEED**

Two recording speeds are provided on the Meissner Radio-Recorder, 78 RPM and 33 1/2 RPM. In general it may be said that the 78 RPM speed is for quality, the 33 1/2 RPM speed for economy.

The 33 1/2 RPM speed is not recommended where the best fidelity is desired. It will be found that at the center of the record, made at this speed, music loses its brilliance and does not have the high frequency notes recorded faithfully. The same is true of speech recordings but to a much lesser degree, since the high frequencies contained in voice are negligible. Thus when recording long speeches the 33 1/2 RPM speed offers the advantage of being able to record for longer time intervals without interruptions to change records, as well as the advantage of record economy. For instance, a 10 inch record when operated at 78 RPM will record 4 1/2 minutes of program material, while at 33 1/2 RPM it will record 10 minutes of program material.

In other cases where the best fidelity is not essential, it may be found that the economy of the lower recording speed is more desirable than the better quality of the higher speed.

The switch that controls the turntable speed is located on the front left-hand corner of the turntable base.

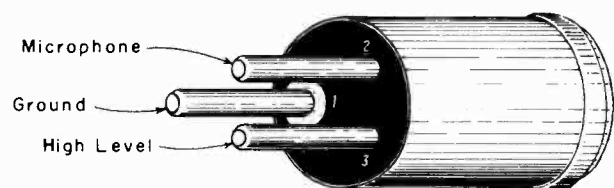
MODEL 9-1065

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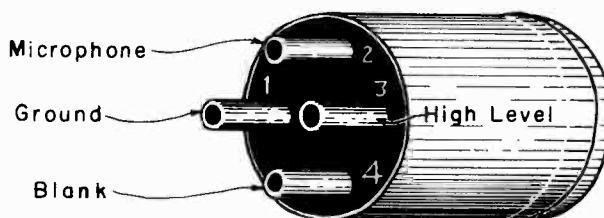
## INPUT OTHER THAN MICROPHONES

In many cases it may be desirable to introduce external input to the amplifier other than that from the microphone. For either recording or Public Address work it may be desirable to feed in the output of (a) an external radio (b) FM Tuner (c) external phono pickup or other electronic devices. Such sources are considered high level inputs and the gain switch should be set accordingly.

Any high level input may be introduced into either of the mike jacks through a plug like the extra plug supplied with the unit and should be connected as shown below.



Some trouble may be experienced in the making of instrumental recordings. There may be heard what appears to be distortion but due to the fact that the ordinary room does not have the acoustical properties of a recording studio there will be room reverberation. The ear does not notice this at the time but the microphone will. Frequently this trouble is corrected by the use of contact microphones. Placed directly on the sounding boards of the instrument, (Piano, Violin etc.), it gives a true reproduction of the tones and overtones produced by the instrument.



## CUTTING ARM ADJUSTMENTS

### CUTTING ARM HEIGHT

1. Place on the turntable an uncut record of the type that is to be used for recording.

2. Place stylus in the cutting head. Insert it as far as it will go, rotate it until the long flat on the shank of the stylus faces the stylus screw, then firmly tighten the screw.

3. Raise the cutter arm well up from its rest, swing it over the record and carefully lower it so that the stylus rests on the record near the center (which should not be revolving). Observe the position of the stylus screw in the slot in the cutter arm. If the screw is approximately in the middle of the slot no adjustment of the cutter arm height is required, but if the stylus screw is close to either the top or the bottom of the slot the arm should be adjusted in the following manner:

(a) Lift the cutter arm into a vertical position. Underneath the arm will be found a machine screw on which the arm rests. The adjustment of this screw is preserved by a lock nut. Loosen the lock nut and rotate this screw until the stylus screw occupies the center position in the slot when the cutter arm is in the recording position, then tighten the lock nut and again check the position of the stylus screw to see that the adjustment has not been disturbed by tightening the lock nut.

(b) Cut a few blank grooves (volume control at zero) while watching the stylus screw to see that as the record revolves, the stylus screw does not approach either end of the slot. If this condition holds true, the height of the cutter arm is properly adjusted until a new stylus is used having a length a great deal different than the stylus used in the original adjustment, or unless records of a new thickness are used that are sufficiently different from the original rec-

ords to require readjustment of cutter arm height. NEVER ATTEMPT TO MAKE A RECORDING WITH MORE THAN ONE DISC ON THE TURNTABLE.

If the normal position of the screw is too high, the entire weight of the cutting arm is placed on the stylus when the stylus screw hits the top of the slot. This heavy weight will cause the stylus to dig into the record base and ruin at least the record and in all probability the stylus as well.

### CUTTING PRESSURE

Variation in the hardness of different record coatings may require different cutting pressures for different makes of records.

The normal depth of cut produces a width of groove approximately equal to the width of the uncut portion left standing between grooves. Examine the blank grooves cut during the preliminary adjustment to see whether they approach this condition. If not, the adjusting screw exposed through the top of the cutting arm can be changed quite easily to accomplish the desired result. If the cut is too light, the playback needle may not "track" and may jump out of the groove and scratch across the record. If the cut is too heavy the stylus may cut over into the adjacent groove on loud notes, or in cutting one groove, the stylus may push some of the wall material into the previously cut groove producing what is called an "echo", although when played back the "echo" precedes rather than follows the normally recorded sound.

The most common error in adjusting cutting pressure is making the cutting pressure greater than necessary, which increases the wear on the stylus, increases echo, and increases the difference in speed between recording and playback.

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## MAKING A RECORD

The first attempt at cutting a record may best be done by recording from the microphone. After having plugged the microphone into the left-hand mike jack, turn on the line switch and set the selector switch to "Record Mike", speak into the microphone in a normal tone of voice about four to six inches away from it and adjust the left hand volume control until the "normal" neon indicator is flashing most of the time but the "overload" neon indicator flashes only occasionally. Touch a finger lightly to the needle in the cutting head and you will feel the needle vibrate in accordance with the sound impressed on the microphone.

In placing the recording disc on the turntable make certain that the drive pin enters the hole provided for it in all recording discs. NEVER PUT ON OR REMOVE A DISC WHILE TURNTABLE IS ROTATING. To do otherwise will injure the drive mechanism. ALWAYS HAVE TURNTABLE IN MOTION BEFORE LOWERING CUTTING STYLUS DOWN ON DISC as the stylus may easily be damaged if this care is not taken.

Pick up the cutting head, swing it over the record and lower it gently onto the record at the desired starting point. Permit two or three grooves to be cut before beginning the recording so that when the record is played back it will not be essential that the pickup start at the beginning of the first groove in order to reproduce the beginning of the recording. During the entire recording very careful attention should be paid to the volume indicators as explained in the section "Volume Indicators." Note: The mechanism which traverses the cutting head is engaged when the cutting head is lowered onto the record. Never attempt to force the cutting head sideways. Lift it first, which will disengage the cross-feed mechanism and allow the arm to be swung freely into any desired position. Lowering the arm onto its rest does not engage the cross-feed because the mechanism does not operate at such a great radius. For the same reason, the recorder will not cut 12 inch discs.

When the recording is finished, the "thread" that the stylus has cut out of the disc must be removed before the record is played. The best device for this purpose is a camel's hair brush with which the thread is "picked up" rather than merely brushed to the center for manual removal, but if no brush is available, a wad of cotton, a piece of soft cloth or even a finger drawn lightly over the disc may be used to gather the thread around the spindle where it can be easily removed. The "thread" should be deposited in some fireproof container since many of the "Instantaneous Recording" discs are coated with highly inflammable cellulose nitrate (celluloid) although there are others coated with cellulose acetate (safety film) which do not require such precautions. It is very wise operating procedure to assume that all "threads" are inflammable and to dispose of them accordingly.

## EXTERNAL ANTENNA

A built in loop antenna is supplied with the unit. This antenna should give excellent results in localities reasonably near the stations to be received. However, in some localities the performance of loop antennas is not entirely satisfactory and for this reason provision has been made for connecting an external antenna.

A lead will be found in the microphone compartment to which an external antenna may be connected. No ground connection is necessary.

## PUBLIC ADDRESS SYSTEM

The amplifier in the unit has ample power for many applications as a public address amplifier. When coverage of an area greater than that of a medium sized room in a home is desired, it is best to use an external speaker connected as explained under EXTERNAL SPEAKERS. Such a speaker should be mounted in a baffle or carrying case and a little experiment in its placement will soon show how best results may be obtained.

When using the unit as a public address system, it will be found that if the speaker is operated near the microphone the sound from the speaker will feed back into the microphone causing a "howl". This is true in any PA system and may be remedied by (a) removing the loud speaker farther from the microphone (b) reducing the volume (c) using a directional microphone turned so that its direction of greatest pickup is away from the loud speaker.

## EXTERNAL SPEAKER

If it is desired to use an external speaker instead of the one in the unit, provision is made for doing so. The voice coil of an external speaker may be plugged into the phone plug jack located on the back side of the turntable base. The voice coil impedance of the external speaker should be 6 to 8 ohms. This cuts out the internal speaker voice coil and substitutes the voice coil of the external speaker. An external speaker so used must either be of the permanent magnet type or of the electrodynamic type with self-contained field supply.

The advantages of such an arrangement are that for use as a public address system, the speaker may be placed in a remote position away from the amplifier to get better sound coverage in a room or building, at the same time, reducing the tendency for microphonic feed back from the speaker to the microphone when high output is desired.

## MIXING

The input from the left hand mike jack may be superimposed on any other input to the system at any time by merely turning up the left hand volume control. The input from this jack may be fed in any time regardless of the setting of the selector switch. Before attempting to make a recording by mixing in the input from this channel, it will be well to do a little experimenting with the setting of the two volume controls to assure that the signals from the two input channels have the correct relative levels when they reach the cutting head. This may be done by adjusting each volume control while the other is turned to zero, adjusting to the correct level by observing the neon indicators and noting the setting of the volume control knob. After the correct setting for each has been determined in this way, set each volume control knob to its correct position and make the recording.

## MICROPHONES

Microphones in general, as far as sensitivity is concerned, may be divided into two classes: (a) High level and (b) Low level. Ordinarily quality microphones will be found to fall in the low level classification. The crystal microphone supplied with this unit is this high quality low level type. The single button carbon type with transformer and battery and the contact microphones are high level microphones. Other high level sources will be discussed under the head, input other than microphone.

A gain switch has been provided to allow the use of high or normal input to the amplifier. When recording with a low level input the gain switch should be set on the High Gain position and when using a high level input, it should be set on the normal gain position.

## RE-RECORDING

Many novel effects may be obtained by Re-Recording, that is after a record is cut it may be placed on an external record player, the output of whose pickup head is fed into the right hand mike jack of the recorder. This should be fed in by a specially wired plug as shown above. As the record is being played on the record player and re-recorded on

the Recorder, input from the Recorder microphone may be superimposed on it by turning up the left hand volume control. As an example of the novel effects obtainable, a person might record a song, re-record it, mixing in his own voice while re-recording, thus sing a duet with himself.

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## RECORDING STYLI

Recording styli are made of three general types of material, ordinary hard steel, special tool steel and alloy such as Stellite or equivalent, or they may be made of the still harder material, sapphire. When samples of all three types of styli are in good condition, it can usually be demonstrated that the steel styli, either regular steel or tool steel, produce about equal surface noise, while the sapphire stylus will usually produce less.

The advantage of the special alloy steel stylus over the regular steel stylus is longer playing life, but this is accomplished at a sacrifice in ability to withstand abuse. The same thing applies to sapphire styli only to a much greater extent because the sapphire is quite brittle and can easily be chipped.

The two accidents most likely to damage a stylus are:

(1) Dropping the cutting arm so that the stylus strikes some surface thereby chipping or breaking the stylus.

(2) Cutting through the record coating into the base material.

The latter may be caused by poor quality or damaged records, either by cutting through thin spots that may exist, or by digging in after the stylus has been thrown off of the record surface by bumps or hard spots.

From the foregoing, it seems that in general home recording service, especially if the equipment may be handled by many people, as at parties, amateur dramatics, amateur concerts etc., it is more economical to use good quality regular steel styli that can be discarded without regret if accidentally damaged, rather than to invest in a supposedly long-lived high priced stylus, whose life may be greatly shortened by the careless act of some well meaning but un-informed person.

## RECORD BLANKS

The Meissner Radio-Recorder is designed to cut records up to 10 inches in diameter and to play records up to 12 inches in diameter.

"Instantaneous Recording" phonograph discs are comparatively new and consequently their manufacturer is far from being standardized. The only rule for selection is that of experience, either personal or that of your dealer. The record that performs best for you on your recorder is the best for you to use. Concentrate on that particular brand if you wish to produce consistently good recordings.

The most important characteristics of a record are listed below to be used as a guide in comparing and selecting records:

1. The blank should cut a clean shiny groove and produce a continuous thread. Records which produce a rough and dull looking groove, or which powder the material cut out of the groove, or which break the thread up into many pieces, or that produce a "sticky" thread, are not good records.

2. The "needle scratch" should be low. Generally the record producing the smoothest looking grooves will give the lowest needle scratch, but a more reliable method of testing is to cut a few blank grooves at the same radius with the same stylus on each of the records to be compared, and then to play them successively with the same setting of the volume control for all records, selecting the one producing the least volume of scratch, provided that its other characteristics are acceptable.

3. "Rumbel" is produced on some records having very flexible base materials. This is especially true of paper records. It is almost axiomatic that if a high quality recording is desired a paper (or other very flexible) base record should not be used, however, because of the economy that such discs offer they probably will enjoy the maximum volume of sale.

4. The "ageing" characteristics of records is a factor influencing the production of consistently good recordings but is somewhat difficult for the home recordist to check unless he is on the lookout for such differences and is a keen observer. Some records cut beautifully at a certain age and less well both before and after that time. Others cut well only when relatively fresh, while still others will not cut well until they have aged some time. This ageing characteristic may explain why a certain make of record may give excellent results at one time and not at another.

5. High Frequency Response is a characteristic in which wide variation can be expected. The variation between some makes of records is so great that only the most casual listening test is required to distinguish the record with good high-frequency response from that with poor high-frequency response. Such a test should, of course, be made with the same stylus, the same type of program, and the same type of play-back needle. Preferably the test should be made with live program material having a reasonable percentage of high-frequency notes. If the program is obtained from

the radio, the tuning should be adjusted to produce a reasonable percentage of high notes and should not be changed between the several test runs because the tuning of most sets has a considerable influence on the high-frequency response.

6. Groove depth should be uniform. If there is any great difference in cutting depth a definite "pattern" will be evident on the record and the variable load on the motor will tend to produce a "wow" or unsteadiness in tone.

## VOLUME INDICATORS

ONE OF THE MOST IMPORTANT PHASES OF RECORDING IS CLOSE ATTENTION TO THE PROPER RECORDING VOLUME. THE BEST OPERATION IS OBTAINED WHEN THE "NORMAL" NEON INDICATOR IS LIT AS MUCH OF THE TIME AS POSSIBLE WHILE THE "OVERLOAD" NEON INDICATOR FLASHES ONLY AT RARE INTERVALS. A close control of program level is required to achieve such results but every bit of effort expended in the attempt will be well worth while.

If the volume is too high, it will cause distortion to be recorded on the disc. Once this distortion is recorded, no playback amplifier, however perfect it may be, can reproduce the program without distortion. Too much volume while recording will also cause overcutting, that is cutting into an adjoining groove, and may damage the cutting stylus itself.

If the recording level is too low, the surface noise is exaggerated and the playback has to be made with a high setting of the volume control. In the extreme case of very low recording volume, the volume control on playback may have to be set so high that a low frequency "microphonic howl" may be set up that can be eliminated only by turning down the volume control or by playing the record on an electric phonograph that has the speaker well isolated from the turntable and pickup.

When a musical program of a limited range of volume levels is being recorded, the volume control should be set so that the maximum volume operates the "overload" indicator only at very rare intervals. If the program has a very wide range of level, the volume will have to be turned up somewhat in the softest passages and reduced in the loudest passages. Such a practice is standard in professional recording and is the only way in which, for example, the tremendous volume range of a symphony orchestra from a single instrumental solo to full orchestra can be recorded without having the loud passages "cut over" into adjacent grooves, or having the softest passages covered up by needle scratch.

It will be helpful when recording to keep in mind that the volume indicators are giving a direct indication of the volume level being applied to the cutting head.

## TONE CONTROL WHEN RECORDING

The setting of the tone control when recording is partly a matter of choice and preference of the operator but it might well be pointed out here that usually the most satisfactory recordings are made with the tone control turned to the counter-clockwise position. There are exceptions to this and the operator, after a little experience in handling the equipment will learn what setting of the tone control is required for any particular set of conditions.

## MONITORING

There are several conditions under which it is desirable to be able to listen to the output of the amplifier when the speaker must of necessity be in-operative. The one such condition most commonly encountered is when recording from the self contained radio receiver, and is automatically taken care of in the switching. When the selector switch is turned to the "Record Radio" position, the speaker is put into the circuit but is operated at reduced volume. Thus the operator may hear the program material at the same time it is being recorded and can determine when the recordings should be stopped etc.

Other conditions under which it may be desirable to monitor the amplifier output are:

1. When recording from an external radio.

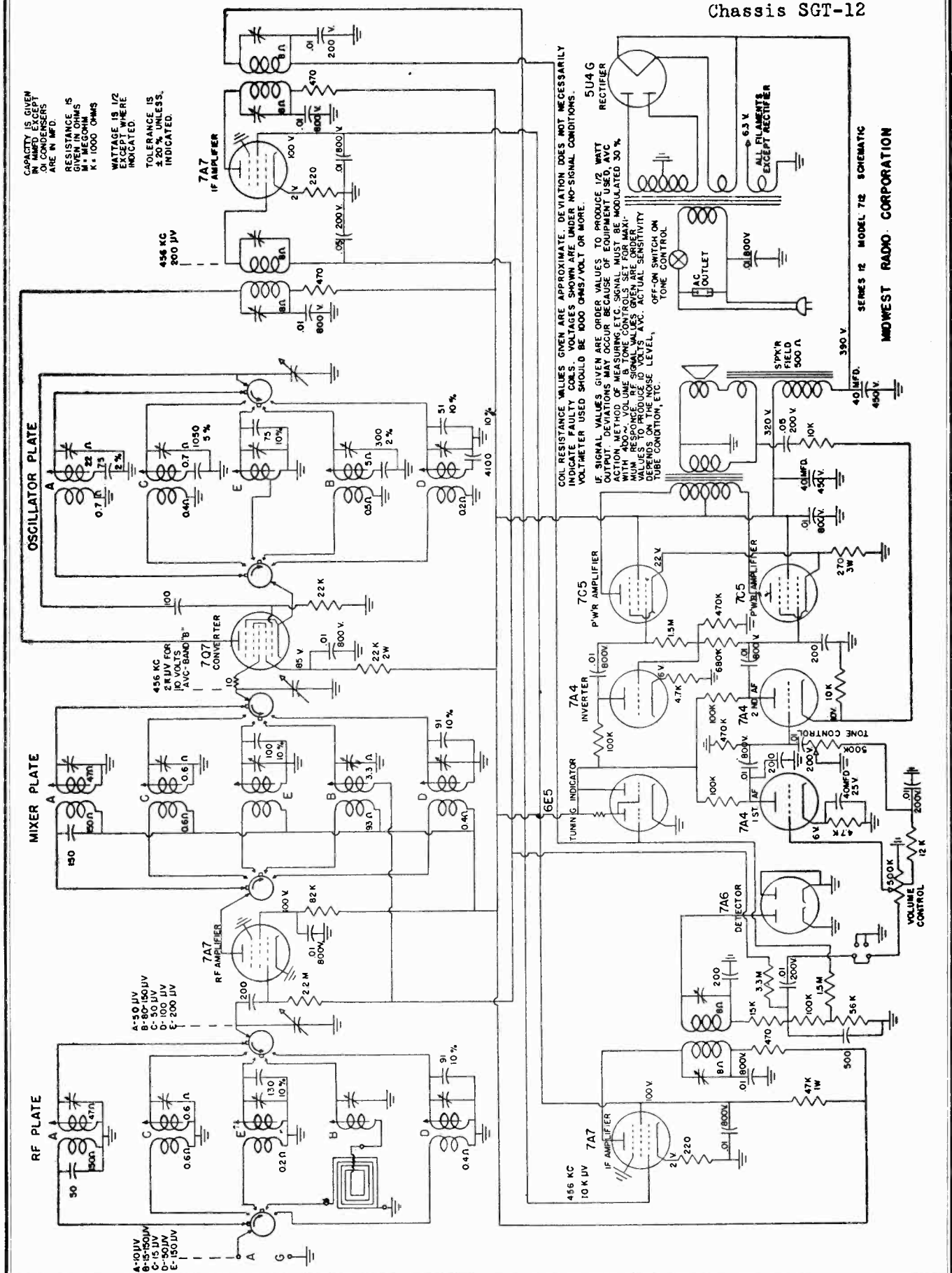
2. When recording from two mikes. The operator may desire to listen to the actual signal that is being applied to the cutting head to keep the levels from the two mikes equal.

3. When operating as a PA system using a remote speaker. If the remote speaker is located some distance away or in another room, the operator can use monitoring phones to adjust volume level etc.

Provision is made for plugging in high-impedance headphones for monitoring. They should plug into the Phone tip jacks located on the left hand rear side of the turntable base. Only high impedance phones should be used.

MIDWEST RADIO CORP.

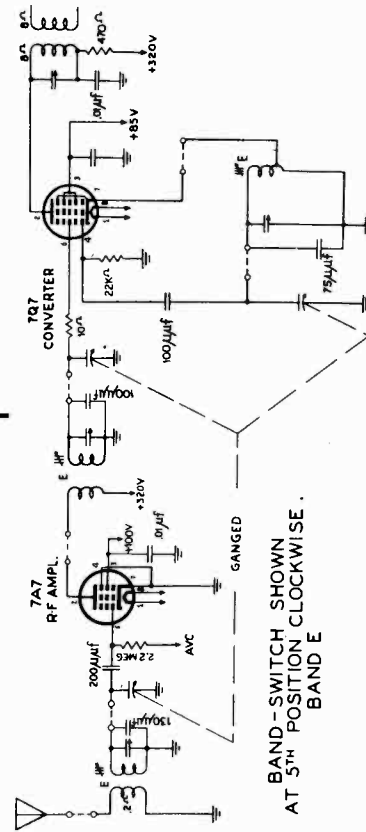
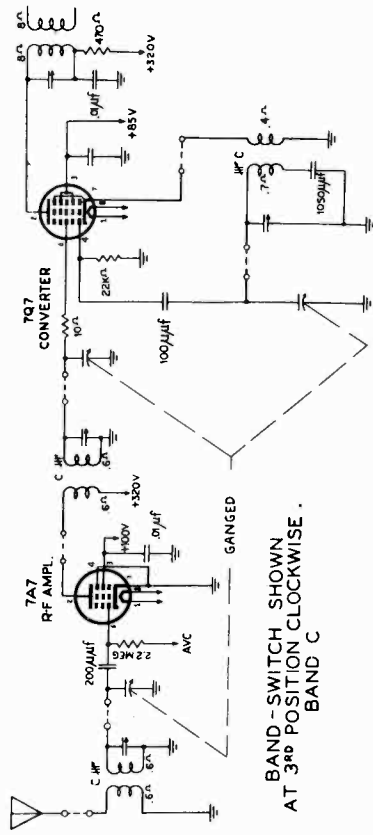
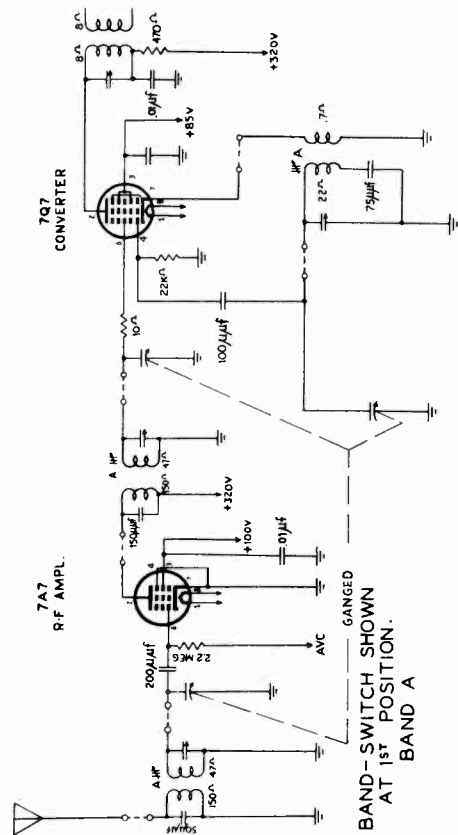
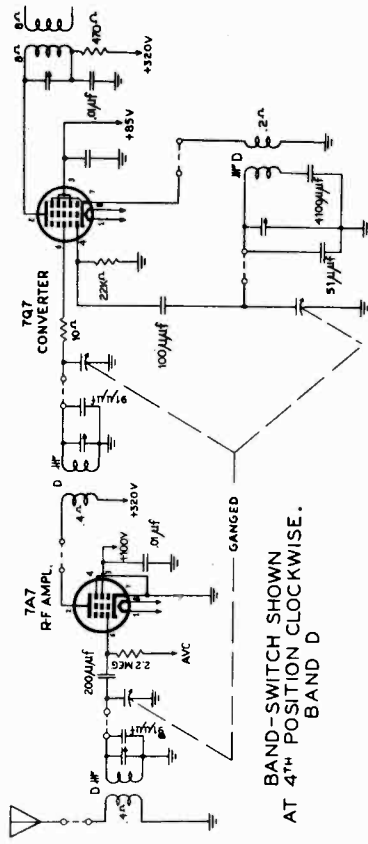
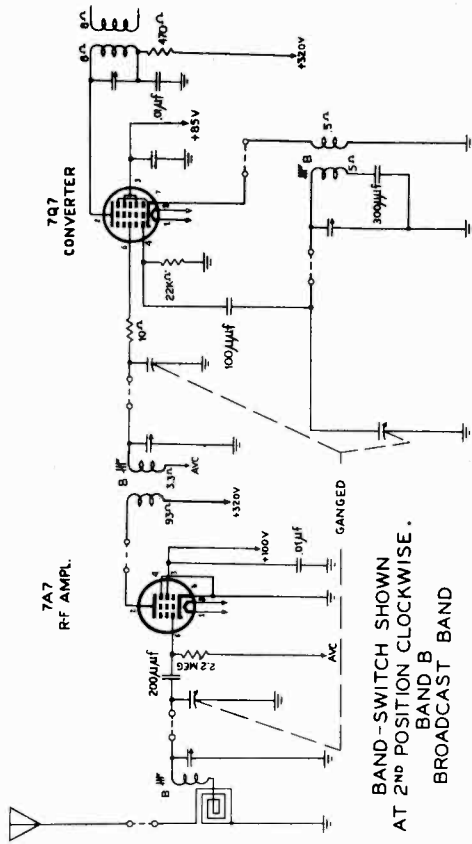
MODEL 712; Series 12:  
S-12, ST-12, SG-12;  
Chassis SGT-12

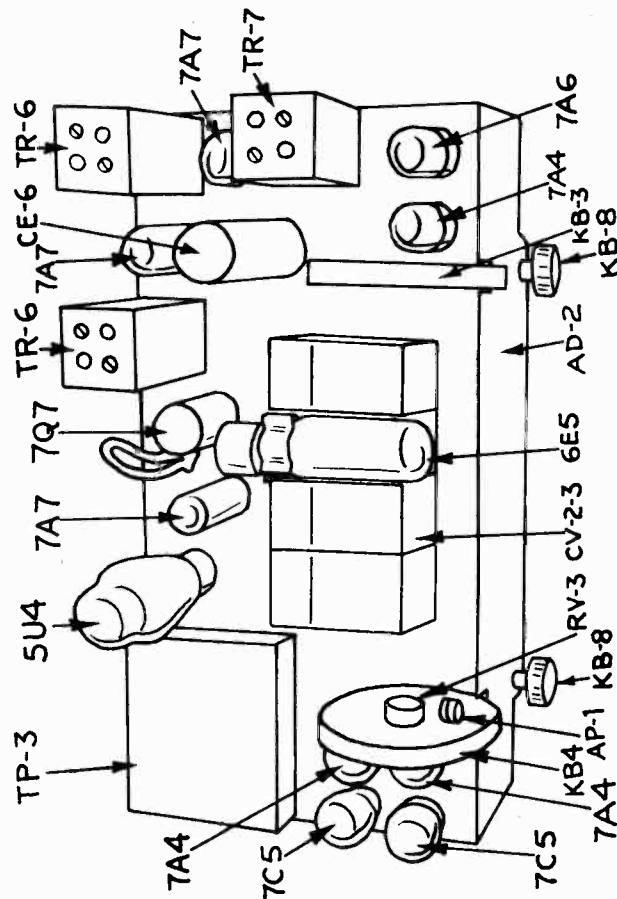


CAPACITY IS GIVEN IN MMFD EXCEPT WHERE INDICATED OTHERWISE ARE IN MF. RESISTANCE IS GIVEN IN OHMS, K = 1000 OHMS, M = 1000000 OHMS. WATTAGE IS 1/2 EXCEPT WHERE INDICATED. TOLERANCE IS ± 20% UNLESS INDICATED.

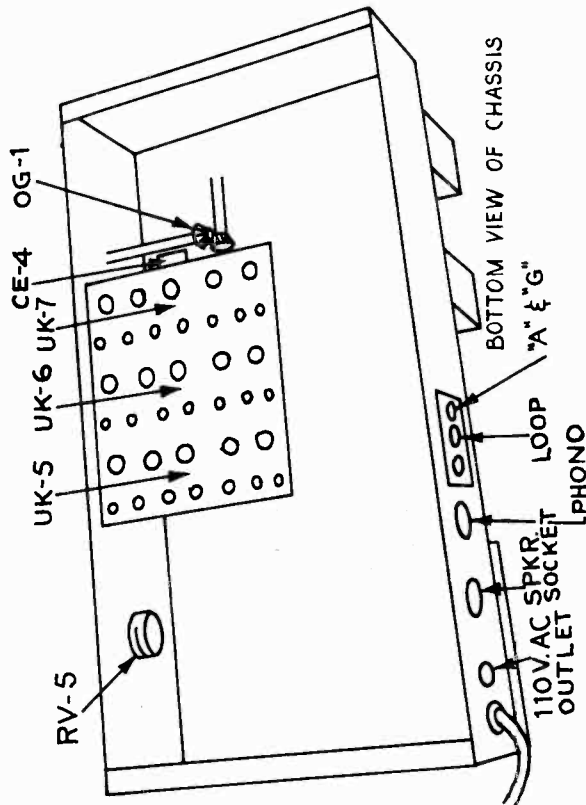
COIL RESISTANCE VALUES GIVEN ARE APPROXIMATE. DEVIATION DOES NOT NECESSARILY INDICATE FAULTY COILS. VOLTAGES SHOWN ARE UNDER NO-SIGNAL CONDITIONS. VOLTMETER USED SHOULD BE 1000 OHMS/VOLT OR MORE. IF SIGNAL VALUES GIVEN ARE ORDER VALUES TO PRODUCE 1/2 WATT OUTPUT DEVIATIONS MAY OCCUR BECAUSE OF EQUIPMENT USED. A VC ACTION METHOD OF MEASURING ETC. SIGNAL MUST BE MODULATED 30% WITH 400~ VOL. VOLUME & TONE CONTROLS SET FOR MAXIMUM RESPONSE. SIGNAL VALUES GIVEN ARE UNDER NO-SIGNAL CONDITIONS. ACTUAL SENSITIVITY DEPENDS ON THE NOISE LEVEL, TUBE CONDITION, ETC.

SERIES 12 MODEL 712 SCHEMATIC  
MIDWEST RADIO CORPORATION





TOP VIEW OF CHASSIS



BOTTOM VIEW OF CHASSIS

ALIGNMENT CHART

Coupling	Signal	Band Switch	Dial	Adjustment
To converter grid thru .05 mfd capacitor	456 KC	B	1000 KC	Peak 1st, 2nd & 3rd IF trimmers.
To "A" on antenna-ground terminal strip through 200 mmfd. and 400 ohms in series.	400 KC	A	400 KC	Peak RF, converter and oscillator trimmers marked "A".
	150 KC	A	150 KC	Peak RF, converter and oscillator cores marked "A".
	1600 KC	B	1600 KC	Peak "B" trimmers. Loop must be plugged in.
	550 KC	B	550 KC	Peak "B" cores except RF. Loop must be plugged in.
	4.7 MC	C	4.7 MC	Peak "C" trimmers.
	1.6 MC	C	1.6 MC	Peak "C" cores.
	10 MC	D	10 MC	Peak "D" trimmers.
	5 MC	D	5 MC	Peak "D" cores.
	22 MC	E	22 MC	Peak "E" trimmers.
	11.5 MC	E	11.5 MC	Peak "E" cores.

**ALIGNMENT** — The schematic includes the various signal strengths necessary for standard output of 0.5 watt for I. F. measurement, except at the converter grid. The output indicator may be an audio frequency meter across the voice coil, or a vacuum tube voltmeter at the avc. For 0.5 watt the voltage at the voice coil is 1.5 volts or 2.5 to 3.5 volts avc. if a 30% modulated signal is used.

I. F. alignment should be made with the band switch on B, pointer turned to 1000KC and signal coupled to the mixer grid through a .05 mfd. condenser. Trim the three I. F. transformers for maximum reading at avc.

R. F. alignment should be made with meter across avc. There is no inter-action between bands. The only precaution is that a dummy antenna be used between the generator and the antenna post on the receiver. This may be simply a 200 micro micro farad condenser in series with a 400 ohm resistor. The B band RF padder, 550 KC. is very broad and should not be adjusted. The loop must be plugged in when adjusting the B band RF trimmer, 1600 kc.

R. F. signal values given on the schematic will produce 10 volts of avc. This rather high level of signal is given to assure that the noise level will be overcome.



MODEL 712  
MODELS 716, 716A

**SERVICE** — Series 12, Model 712, is a straight forward design, containing no trick circuits. Servicing of the coil plates or IF transformers should be avoided, except under special conditions, and rather than attempt to repair these assemblies a replacement should be ordered.  
The Midwest Radio Corporation is anxious to help the service technician in every way; inquiries for special data will be promptly answered and your comments will be most welcome.

**PARTS LIST**

Part	Description
AD-2	Dial
AE-1	Escutcheon
AK-2	Coil plate cover
AP-1	Wood pulley
AP-6	Pointer
AS-1	Wood pulley mtg. stud
CE-6	Filter condenser 40-40
CE-4	Cathode by pass 40 mfd. 25v.
*CV-2-3	Tuning gang
EG-2	Speaker grommet
ES-12	Tube shield
HE-1	Speaker mtg. eyelet
IL-1	Panel lamp 6-8 volts
KB-3	Tuning knob
KB-4	Volume control knob
KB-8	Tone or Band knob
KB-6	Push buttons, set of 7
OG-1	Miter gear, pair
OS-3	Dial string spring
PC-3	Loop plug
PC-4	Phonograph plug
RV-3	Volume control
RV-5	Tone control
*SP-2	Speaker, 14 inch
TP-3	Power transformer
TP-4	Universal power transformer
*TR-6	1st IF and 2nd IF Transformer
*TR-7	3rd IF Transformer
*TR-6	1st IF and 2nd IF transformer
*TR-7	3rd IF transformer
*UK-5	R.F. Coil plate
*UK-6	Mixer coil plate
*UK-7	Oscillator coil plate

Note: Order resistors and condensers by value, tolerance and wattage or voltage.  
Note: When ordering include serial number of chassis, since Midwest records of changes in parts specifications are kept by that number.

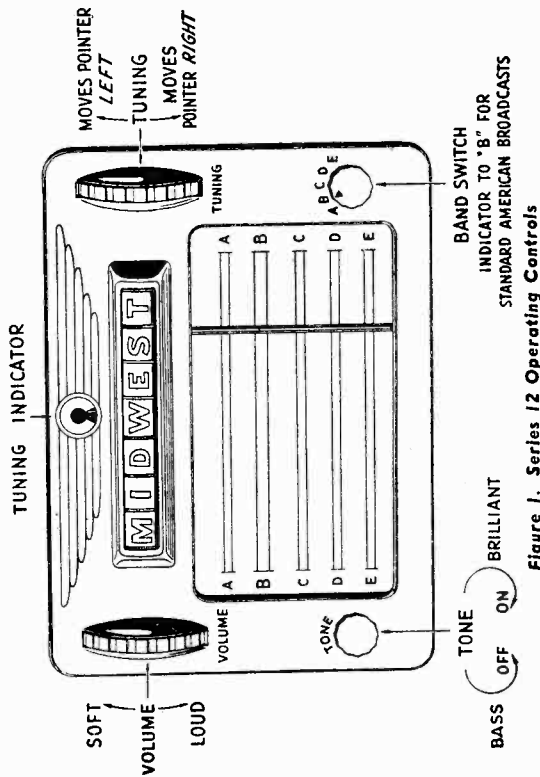


Figure 1. Series 12 Operating Controls

Note: Modulate the signal with 400 cycles 30%. The output indicator must be a VTUM on the avc. The IF sensitivity figures shown on the schematic are for 1/2 watt output except at converter grid; the voltage of the voice coil is 1.5 and the avc. voltage is between 2.5 and 3.5 for 1/2 watt output. The RF and IF alignment should be done with an avc. indicator only. The schematic shows RF signal values to produce 10 volts avc.

MODELS 712, 716, 716A

**DIAL STRINGING** — Use a light weight flexible dial cord when replacing worn or broken cord such as Beven-Wilcox FSN-25-12.

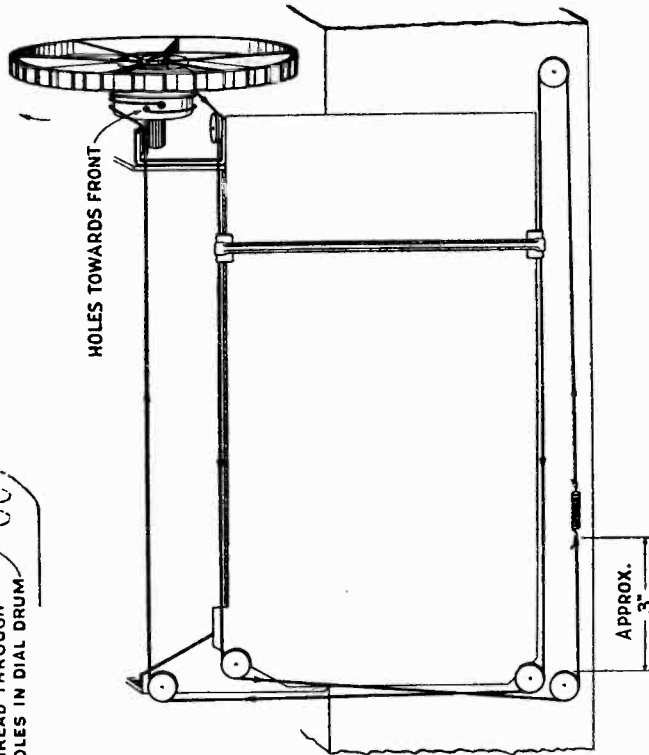
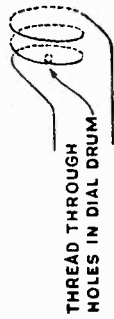


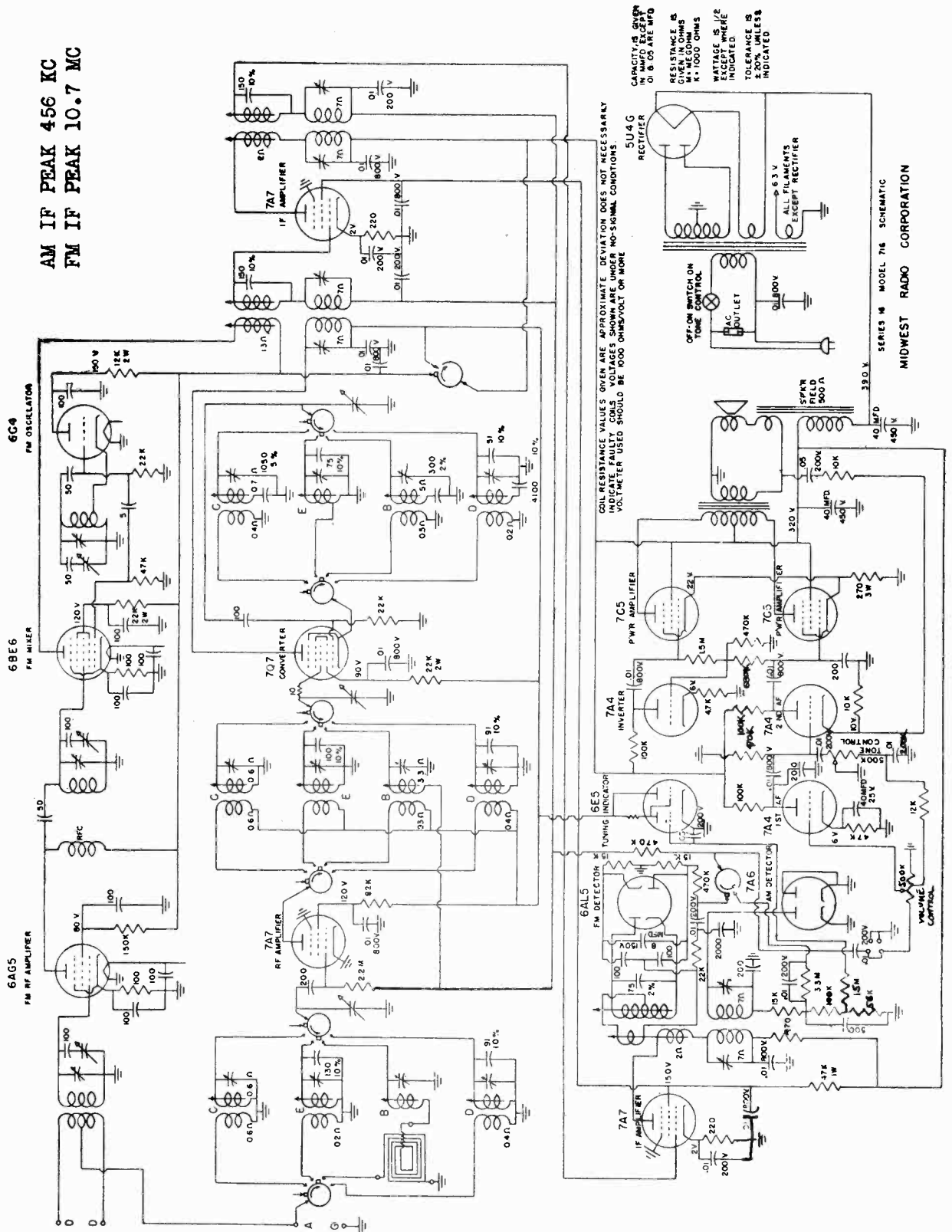
Figure 4. Series 12 Dial Stringing

Care must be taken to assure travel room for the SPRING. If the dial is strung with parts approximately as shown in Figure 4, there will not be too much adjustment necessary. The final step should be to set the pointer after replacing the dial at the low frequency end of the dial in line with the end of the calibration base line. Use a small piece of gummed tape on the string so that clamping the pointer does not cut the dial cord.

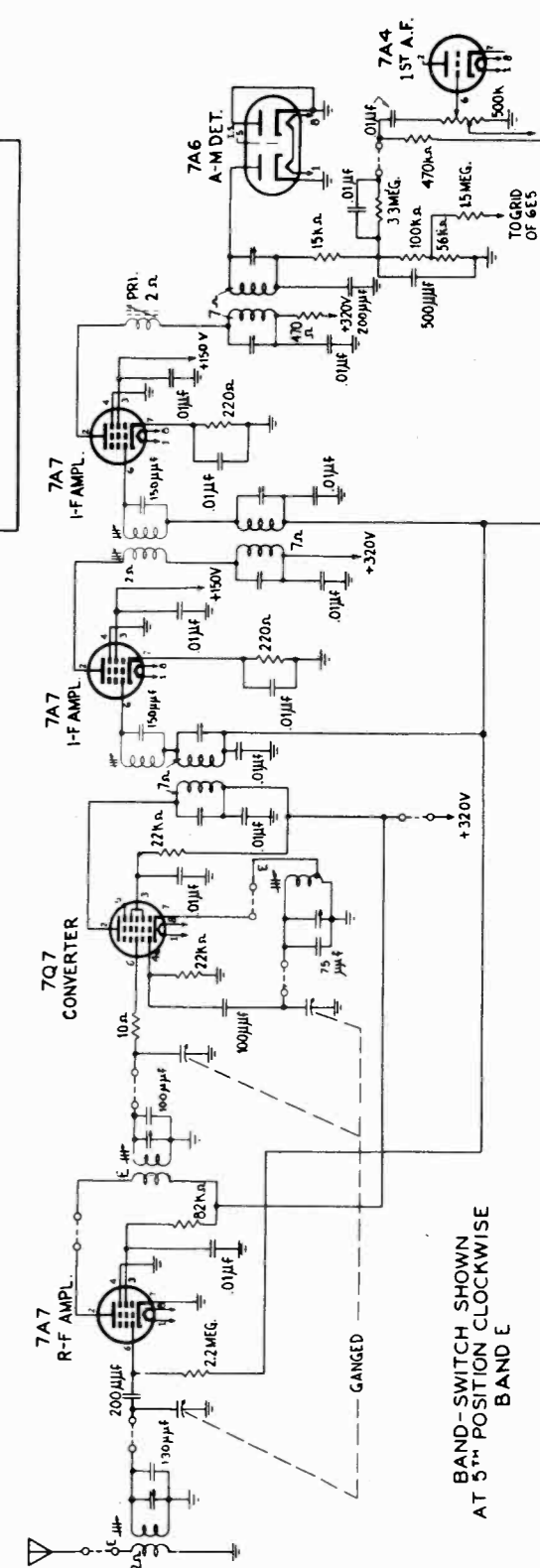
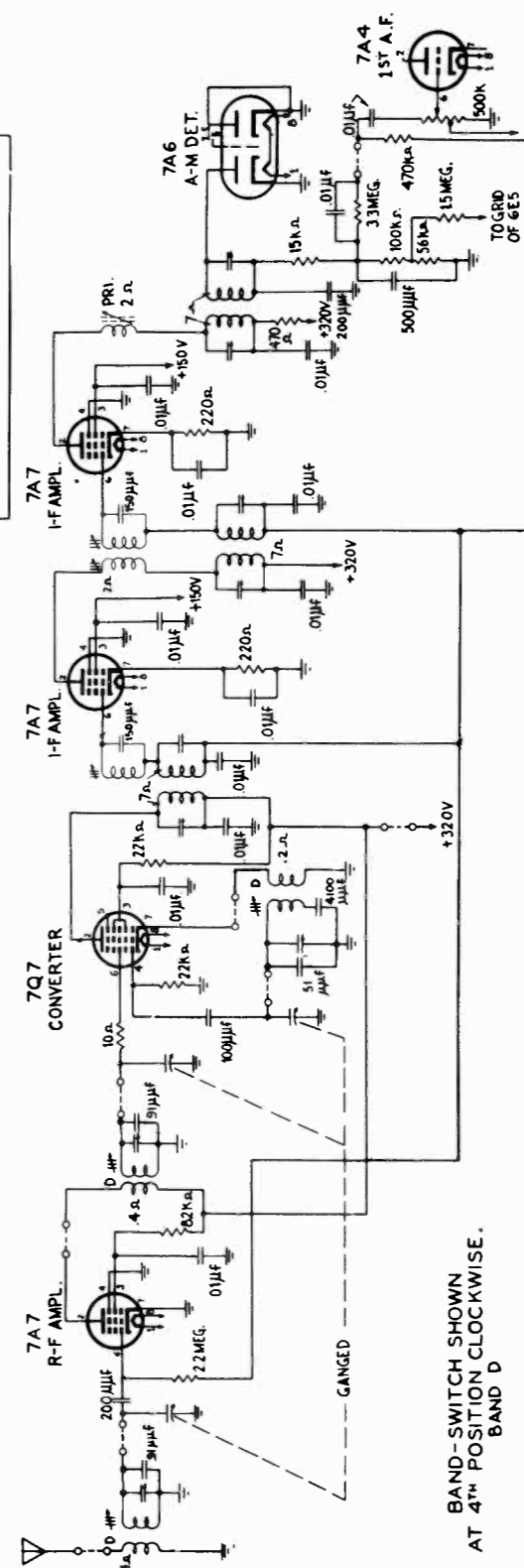
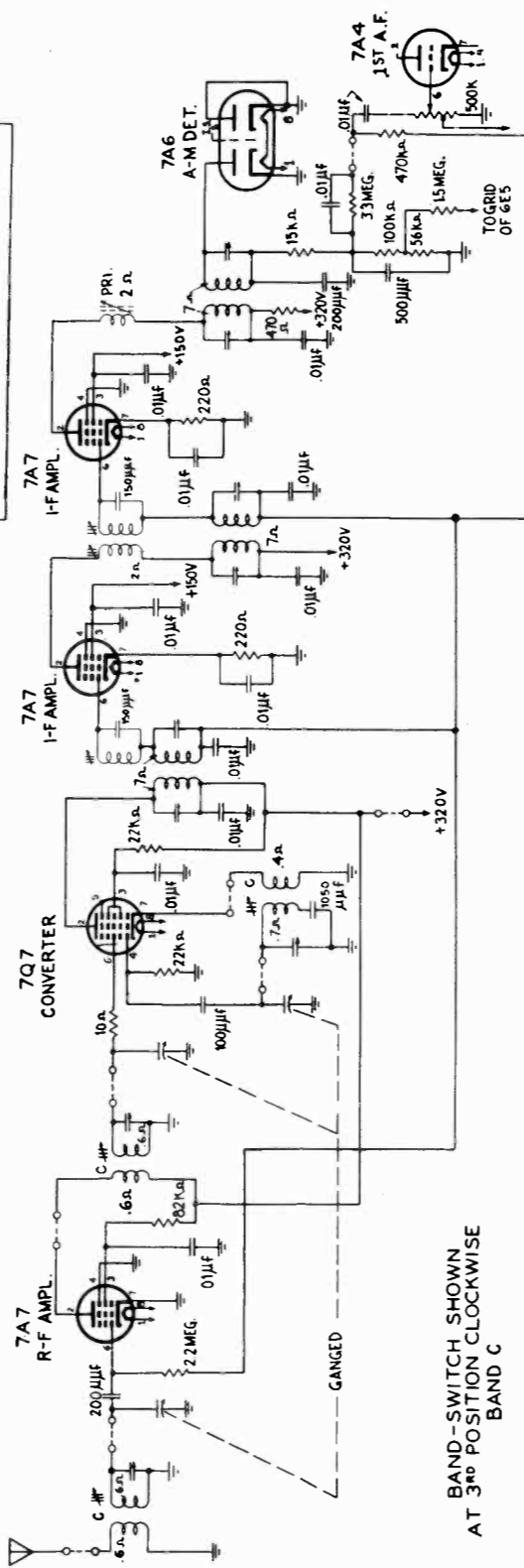
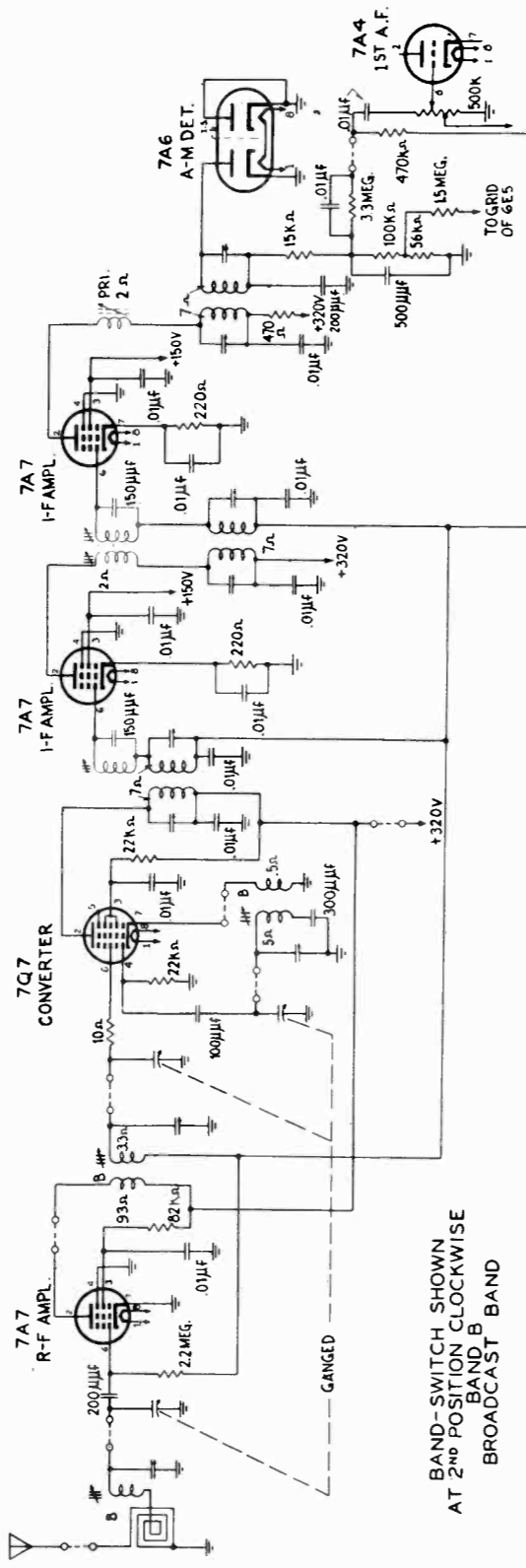
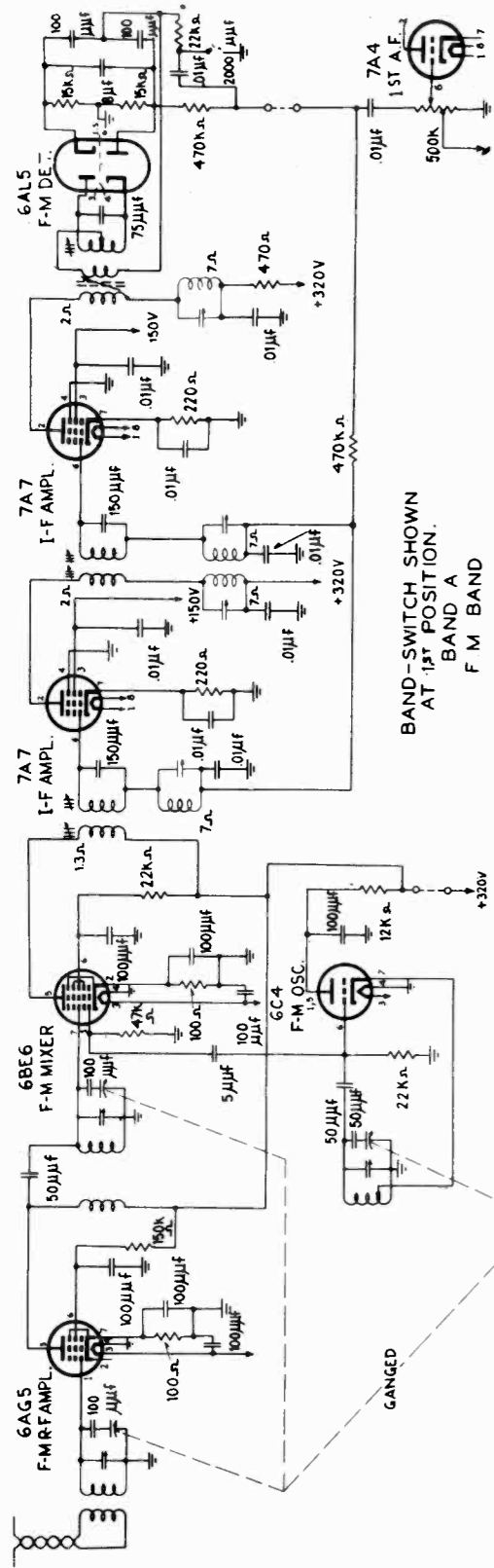
MIDWEST RADIO CORP.

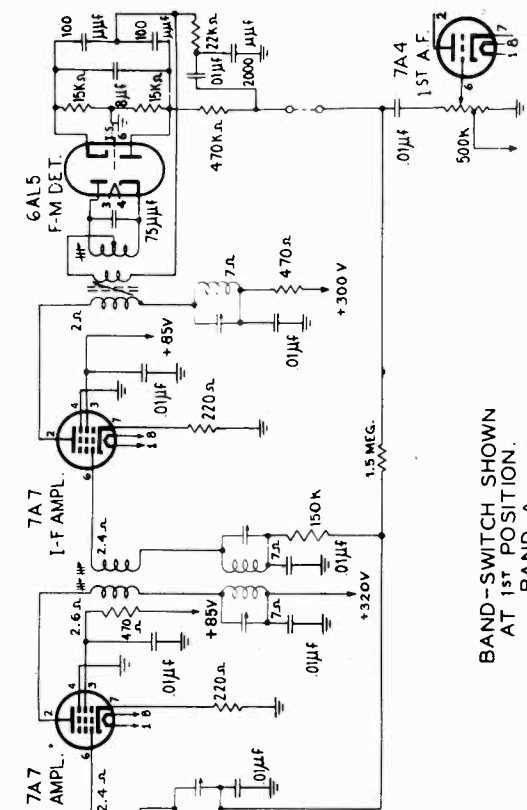
MODEL 716; Series 16:  
S-16, ST-16, SG-16;  
Chassis SGT-16

AM IF PEAK 456 KC  
FM IF PEAK 10.7 MC

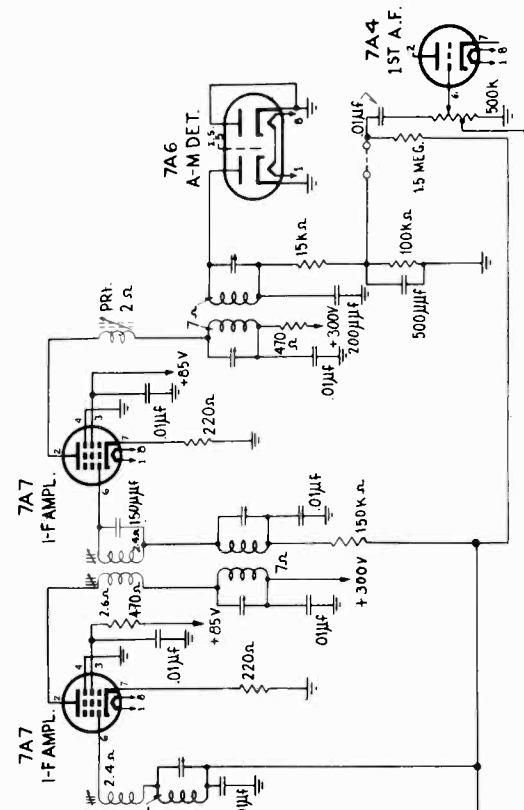




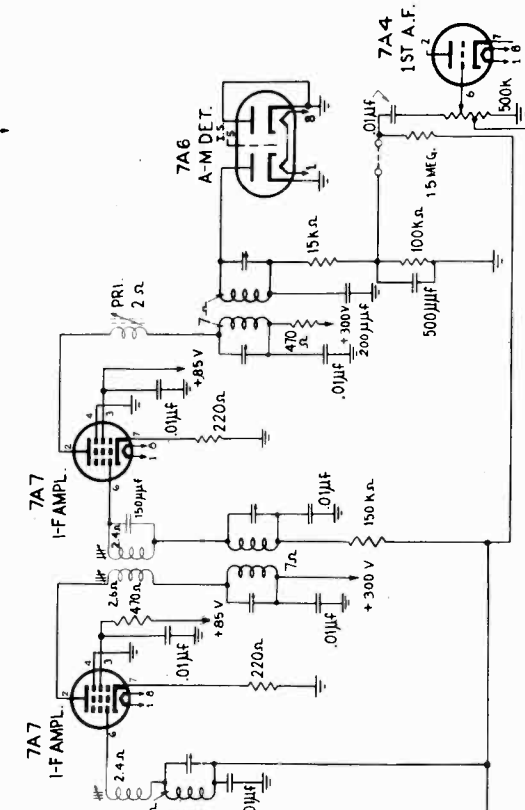




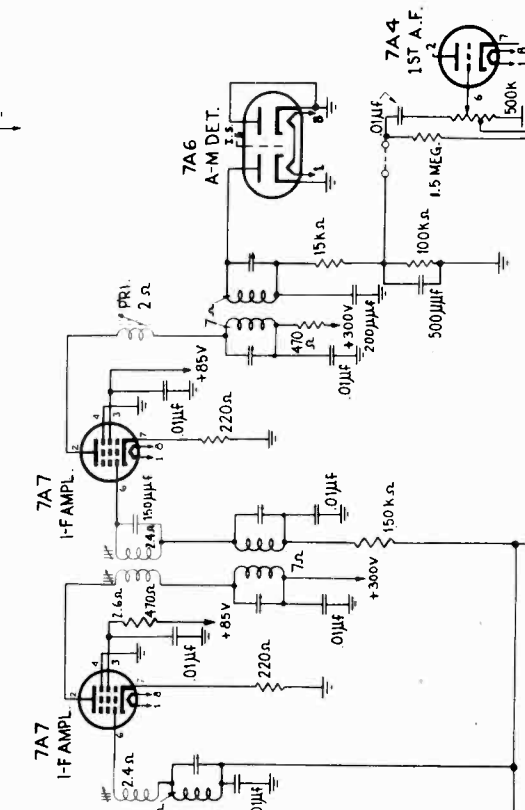
BAND-SWITCH SHOWN AT 1ST POSITION. BAND A F-M BAND



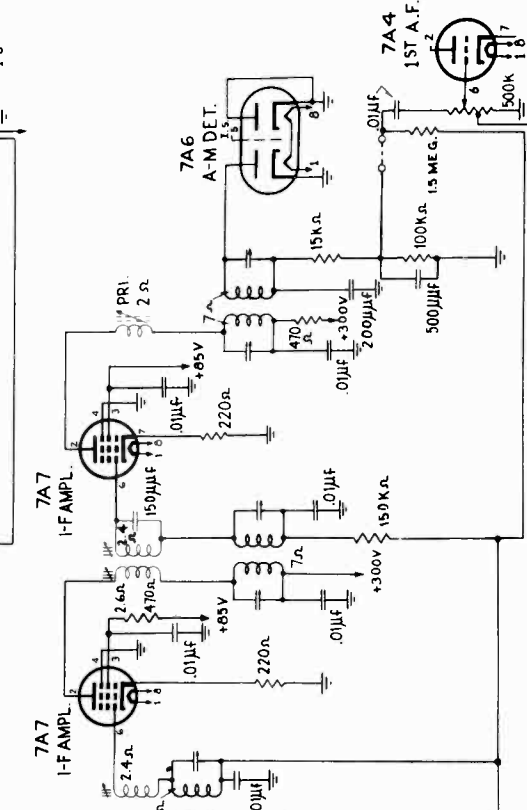
BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE BROADCAST BAND



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE BROADCAST BAND



BAND-SWITCH SHOWN AT 4TH POSITION CLOCKWISE BROADCAST BAND



BAND-SWITCH SHOWN AT 5TH POSITION CLOCKWISE BROADCAST BAND

**PUSH BUTTONS** — The push buttons are for your convenience in selecting stations without the bother of making the exact tuning adjustments necessary for best reception. There are seven buttons and each button may be set for a station. The station may be at any point on the dial.

It is not recommended that the buttons be used for short wave stations. To set the push buttons this exact procedure should be followed. A small screw driver will be needed.

1. Turn on the receiver and allow at least three minutes to warm up.
2. Remove the push button by pulling straight out. A hooked instrument will assist in removing the end buttons.
3. Loosen the LOCK SCREW at least one half turn.
4. Using the screw driver with the blade in the screw slot, push the mechanism in firmly. Hold in during step 5. The mechanism may bind at first. Use sufficient force to break loose so that the push button and tuning control are independent.
5. Tune the pointer past the desired station then back to the desired station and make the tuning adjustment as carefully as you know how.
6. Tighten the LOCK SCREW.
7. Check the setting of this push button by tuning away from the station manually, then pushing in firmly. Pushing the button must return the pointer to the position it had when the LOCK SCREW was tightened. If the station is not now tuned in perfectly repeat the steps 2 to 6 carefully.
8. Adjust each of the seven buttons, or as many as you wish to set, exactly as outlined above.

Any button can be set for any pointer position, however, you may find it more desirable to select the button nearest the pointer position so that each successive adjustment moves the pointer in the same direction. That is, the "M" button will be set for a station at the left of the dial, the "W" button will set for a station near the center, etc.

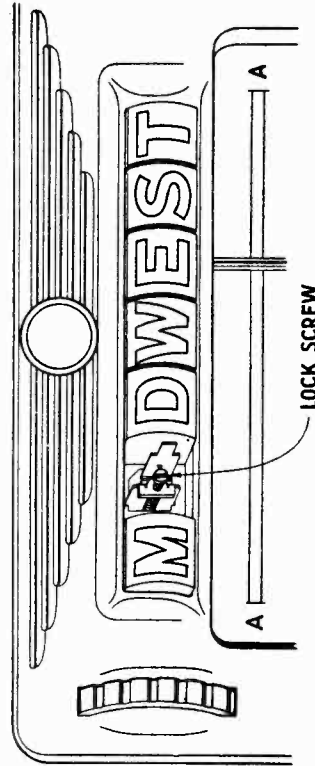


Figure 4. Push Button Mechanism

**ALIGNMENT** — Refer to the alignment chart for step by step procedure. It is preferable to align the FM IF stages with an AM or CW Signal. It should be noted that all adjustments are made for peak avc reading except the secondary of the third transformer. At this point, if you use an AM signal, it may be tuned for minimum audio signal; or the discriminator voltage may be used, reading it with a VTVM, and the secondary may be adjusted to the zero voltage. There may be some discrepancy between these methods, and if it is not excessive, is of no importance; it is simply an indication of the exactness of equivalent capacitive and inductive coupling balance in the transformer.

The FM RF alignment should be made using an FM signal and either avc or audio for peaking. In doing this alignment, or when feeding the IF signal into the FM mixer grid, care must be taken not to move the wiring. If the wiring is displaced so as to affect the inductance of the RF circuits it is difficult to re-establish the RF-Oscillator tracking.

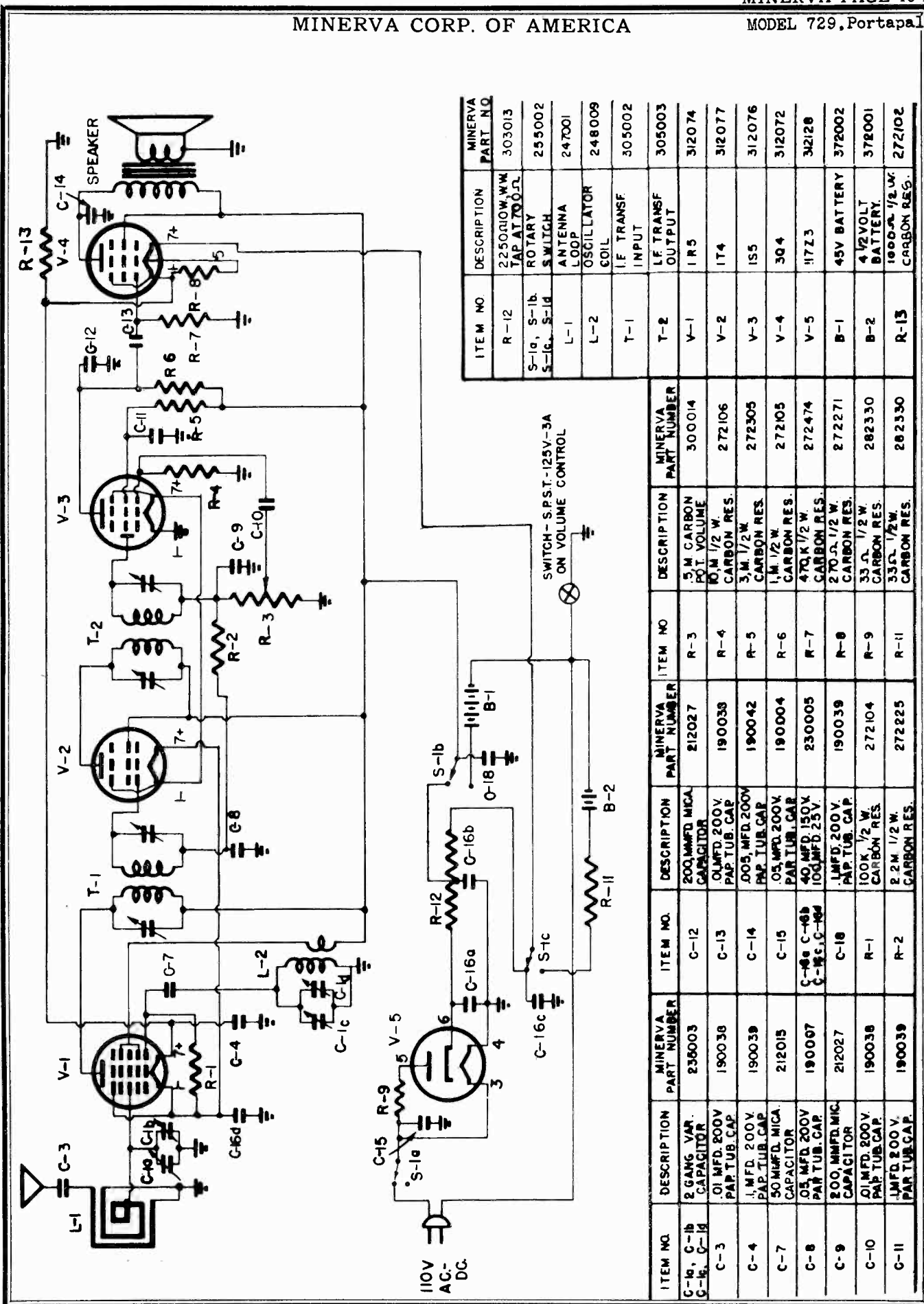
The AM, RF and IF alignment should be done with a VTVM across the avc. The recommended signal value is one which will generate 10 volts of avc. When aligning the "B" band the loop must be plugged in and you need not adjust the RF padder core. The RF padder is very broad and can be aligned only if the converter grid lead is connected to an RF type VTVM as indicator; this will usually involve a signal level greater than is normally available.

Coupling	Signal	Band Switch	Dial	Adjustment
To 7Q7 converter grid through .05 mfd. capacitor.	456 KC AM	B	1000 KC	Peak 1st, 2nd and 3rd IF trimmers on top of IF cans.
To "A" on antenna ground terminal strip through 200 mfd. and 400 ohms in service.	1600 KC AM	B	1600 KC	Peak RF, converter and oscillator trimmers marked "B".
	550 KC AM	B	550 KC	Peak converter and oscillator padder cores marked "B". Loop must be plugged in. Do not adjust RF.
	4.7 MC AM	C	4.7 MC	Peak "C" trimmers.
	1.6 MC AM	C	1.6 MC	Peak "C" cores.
	10 MC AM	D	10 MC	Peak "D" trimmer
	5 MC AM	D	5 MC	Peak "D" cores.
	22 MC AM	E	22 MC	Peak "E" trimmer.
	11.5 MC AM	E	11.5 MC	Peak "E" cores.
To 6BE6 mixer grid direct.	10.7 MC AM or CW	A	100 MC	Peak core adjustments for avc (around 3 volts) at 1st, 2nd and primary of 3rd IF. Adjust secondary of 3rd IF for audio null from 30% amplitude modulated 10.7 MC IF signal.
To "D" and "D" on doublet terminal strip above "A-C" strip through a pair 150 ohm resistors.	105 MC FM	A	105 MC	Peak RF mixer and oscillator trimmers for avc or audio.

Read text for use of CW for FM-IF alignment.

**SERVICE** — Series 16, Model 716, is a straight forward design, containing no trick circuits. Servicing of the coil plates or IF transformers should be avoided, except under special conditions, and rather than attempt to repair these assemblies a replacement should be ordered.





ITEM NO	DESCRIPTION	MINERVA PART NO.
R-12	2250OHM, WM TAP AT 70.0% L	303013
S-1a, S-1b	ROTARY SWITCH	255002
S-1c, S-1d	ANTENNA LOOP	247001
L-1	OSCILLATOR COIL	248009
L-2	IF TRANSF. COIL	305002
T-1	IF TRANSF. INPUT	305003
T-2	IF TRANSF. OUTPUT	305003
V-1	5M CARBON POT. VOLUME	300014
V-2	10M 1/2 W. CARBON RES.	272106
V-3	3M 1/2 W. CARBON RES.	272305
V-4	1M 1/2 W. CARBON RES.	272105
V-5	470K 1/2 W. CARBON RES.	272474
B-1	270.5 1/2 W. CARBON RES.	272271
B-2	33.5 1/2 W. CARBON RES.	282330
R-13	1000.5 1/2 W. CARBON RES.	282530

ITEM NO	DESCRIPTION	MINERVA PART NUMBER	ITEM NO	DESCRIPTION	MINERVA PART NUMBER
C-12	200MFD MICA CAPACITOR	212027	R-3	5M CARBON POT. VOLUME	300014
C-13	.01MFD. 200V PAP. TUB. CAP.	190038	R-4	10M 1/2 W. CARBON RES.	272106
C-14	.1MFD. 200V PAP. TUB. CAP.	190039	R-5	3M 1/2 W. CARBON RES.	272305
C-15	.05MFD. 200V PAP. TUB. CAP.	190004	R-6	1M 1/2 W. CARBON RES.	272105
C-16a	.01MFD. 200V CAPACITOR	230005	R-7	470K 1/2 W. CARBON RES.	272474
C-16b	.01MFD. 200V CAPACITOR	190039	R-8	270.5 1/2 W. CARBON RES.	272271
C-16c	.01MFD. 200V CAPACITOR	212027	R-9	33.5 1/2 W. CARBON RES.	282330
C-17	.01MFD. 200V CAPACITOR	190038	R-10	100K 1/2 W. CARBON RES.	272104
C-18	.01MFD. 200V CAPACITOR	190039	R-11	2.2M 1/2 W. CARBON RES.	272525
C-19	.01MFD. 200V CAPACITOR	190038			
C-20	.01MFD. 200V CAPACITOR	190039			



**VOLTAGE MEASUREMENT**

All reading in AC-DC position of power selector switch with 20,000 ohms per meter. Readings taken are referred to ground.

11723			RESISTANCE IN OHMS		
PIN	AC	DC			
1	117V	—	540		
2	—	120V	2000		
3	117V	—	500		
4	—	—	—		
5	117V	—	500		
6	120V	—	2000		
7	—	—	—		

3Q4			RESISTANCE IN OHMS		
PIN	DC	PIN	DC		
1	4.8V	50	—		
2	86V	2000	—		
3	—	500,000	3		
4	88V	1500	4	19V	400,000
5	6V	50	5	7.8V	3,000,000
6	86V	2000	6	—	1,500,000
7	7.6V	70	7	1.5V	10,000,000

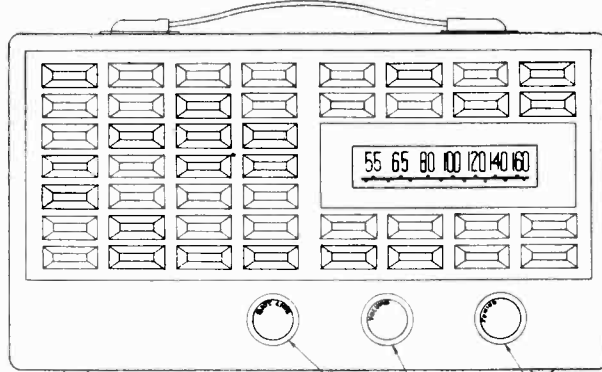
1T4			RESISTANCE IN OHMS		
PIN	DC	PIN	DC		
1	1.5V	260	1	3.3V	45
2	88V	1500	2	88V	1500
3	88V	1500	3	88V	1500
4	—	2,000,000	4	—	85
5	1.6V	—	5	1.6V	45
6	—	2,200,000	6	—	—
7	3.3V	45	7	2.3V	50

**SPECIFICATIONS**

**ELECTRICAL CHARACTERISTICS**

Tuning Range: Standard Broadcast 540-1640 KCS  
 Power Supply: Direct Current 105-125 volts or alternating current 105-125 volts, 50-60 Cycle or Batteries.  
 Power Consumption: AC or DC—12 watts  
 Battery Complement: 2—4½ Volt "A" Batteries  
 Eveready No. 746 or equivalent.  
 2—45 Volt "B" Batteries  
 Eveready No. 482 or equivalent.  
 Tube Complement: 1R5—Converter  
 1T4—1. F. Amplifier  
 1S5—2nd Det.—AVC—1st Audio  
 3Q4—Power Amplifier  
 117Z3—Rectifier

**Mechanical Characteristics: Dimensions** — Height: (including feet) 7 1/8 inches  
 Width: 13 inches  
 Depth: (including knobs) 6 3/4 inches



FRONT VIEW

**SERVICING NOTES**

All specifications and measurements based on 117 Volts, 60 Cycles, and all readings based on a 20,000 ohms per volt meter. All readings are taken with volume control (switch No. 2) in maximum clockwise position. Apply the lowest signal level from the signal generator.

Output: 50 mw into a 3.2 ohm voice coil impedance.

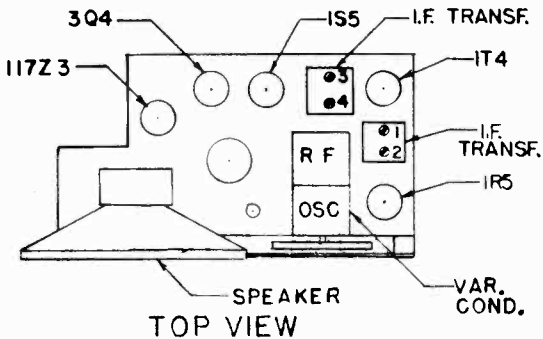
Approximate reading 0.4 Volt.

**I. F. ALIGNMENT:** With signal generator, set a 455 KC. apply signal through a .1 MFD condenser dummy to R.F. grid of converter (1R5) or the stator of RF section of the variable condenser (condenser must be fully meshed). Peak I.F. trimmers 1, 2, 3, 4 (top view diagram) to give maximum reading on output meter connected across voice coil. (Note: If for any possible reason the signal does not come through indicating the receiver is way out of alignment, apply the signal to the grid of the I.F. Amplifier (1T4) and tune signal in by trimmers 3, 4 of second I.F. Transformer. Peak for maximum and once this stage is tuned, repeat above procedure.)

**R.F. Alignment:** With signal generator, set at 1400 KC, apply signal through a dummy antenna (200 nmf condenser) to the antenna loop wire. Set dial of receiver to 1400 KC and peak trimmers 5 & 6 to give maximum reading of output meter. Then set signal generator at 600 KC and tune receiver to 600 KC mark on dial. This setting should fall on calibrated point.

**CORRECTIONS**

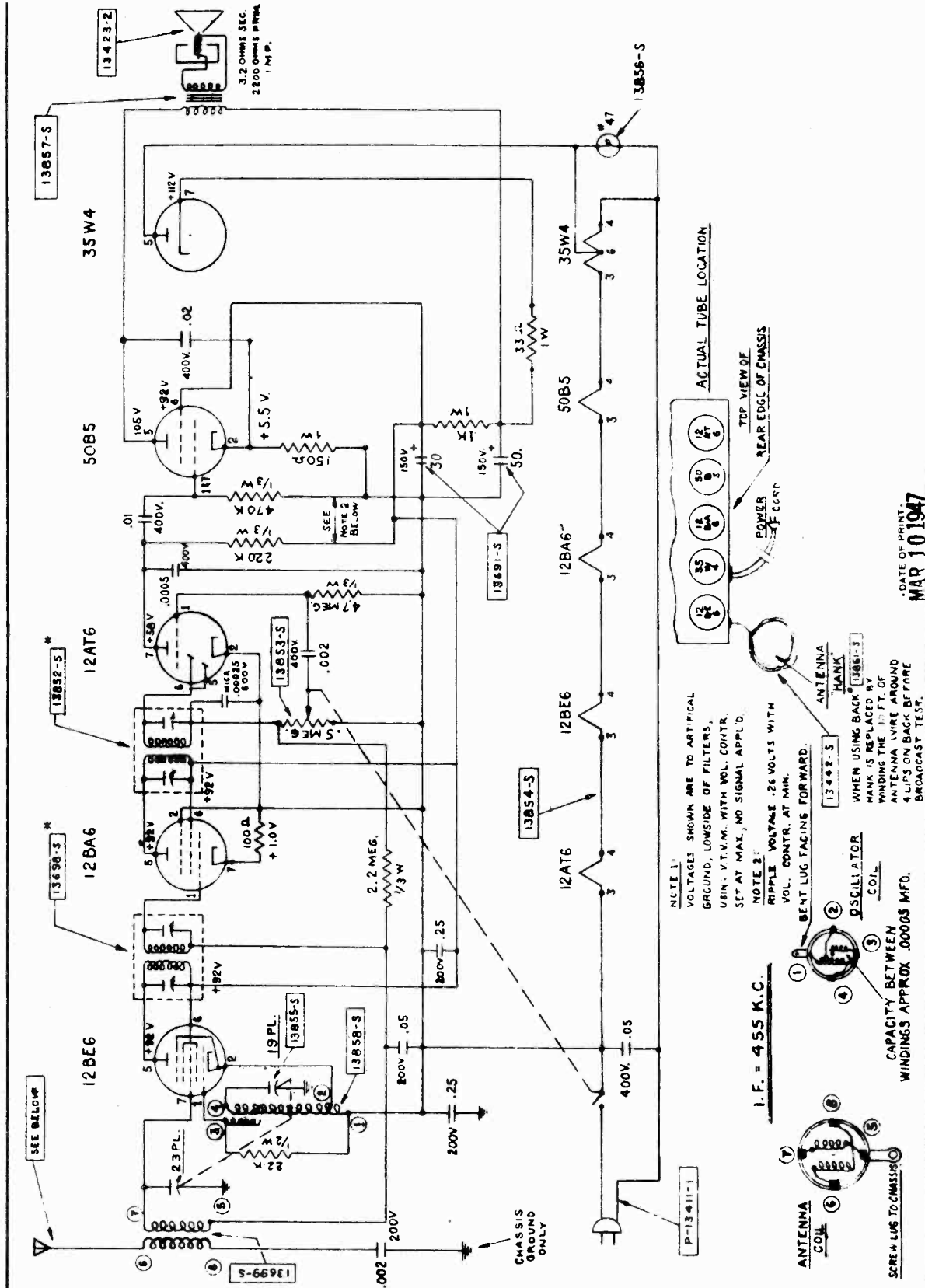
1. Servicing Notes Section: Stator large section gang open to read: Stator large section gang closed.
2. Voltage Measurements Section: 20,000 ohms per meter to read: 20,000 ohms per volt D. C. 1,000 ohms per volt A. C. meter 11723 to read: 117Z3
3. Schematic Diagram Section: No S-Id C 18: .1 mfd, 200 volts to read: .1 mfd, 400 volts 1000 mfd - 6v D.C. Pin # 1 of V2 to ground.



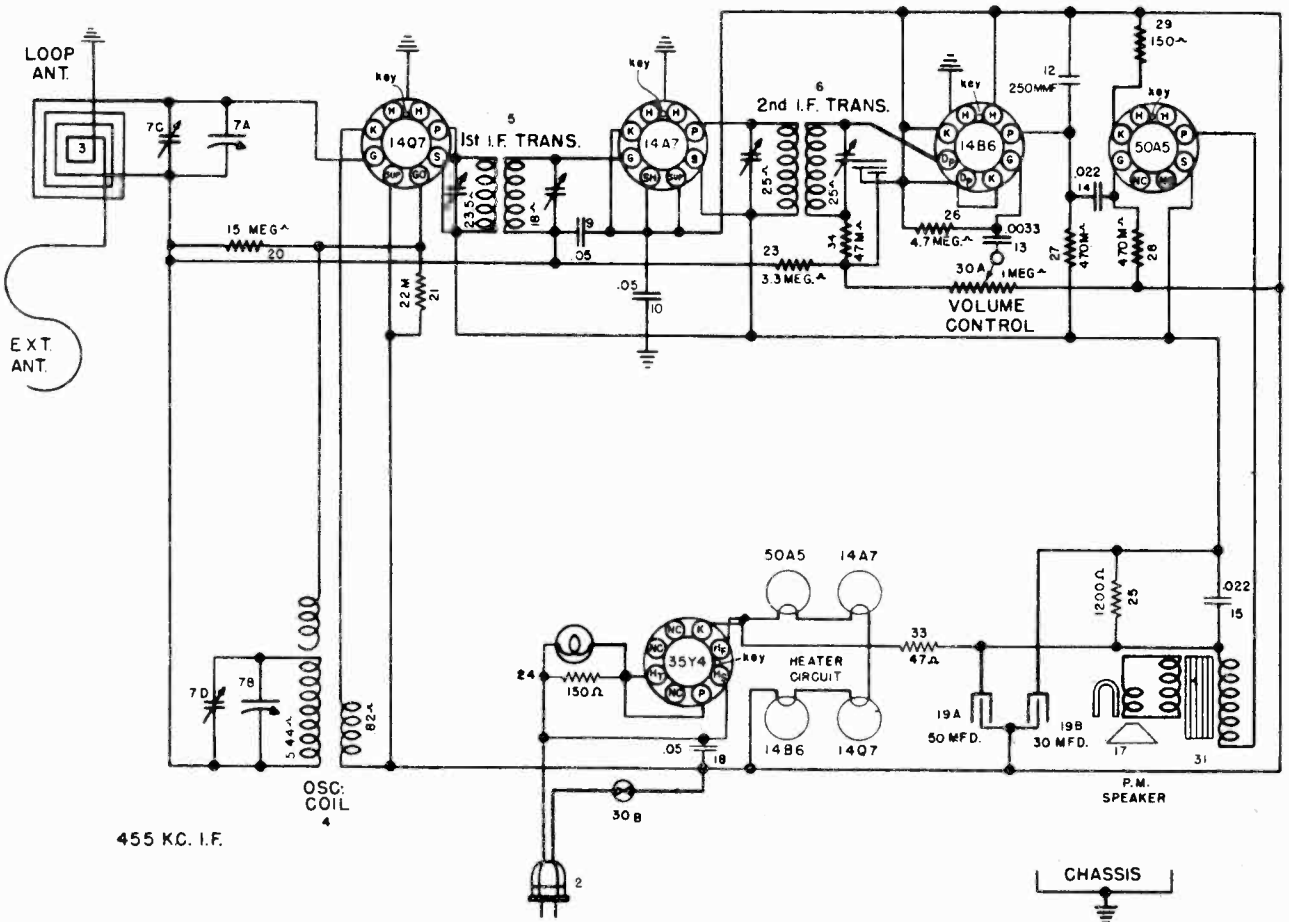
TOP VIEW

Generator Connection	Dummy Ant.	Freq.	Adj. Trimmers	Output	Sensitivity (uv.)
Stator large section gang open	.1 MFD cond.	455 KC	1, 2, 3, 4	Max.	120
Antenna loop wire	200 nmf cond.	1400 KC	5 & 6	Max.	50
Antenna loop wire	200 nmf	600 KC	Variable Plates	Max.	150





August, 1946



SCHMATIC DIAGRAM

When using direct current it may be necessary to reverse the position of the power plug in the electric outlet for correct polarity. Reversing the position of the power plug when alternating current is used may reduce power hum. UNDER NO CIRCUMSTANCES SHOULD A GROUND BE CONNECTED TO THIS RECEIVER.

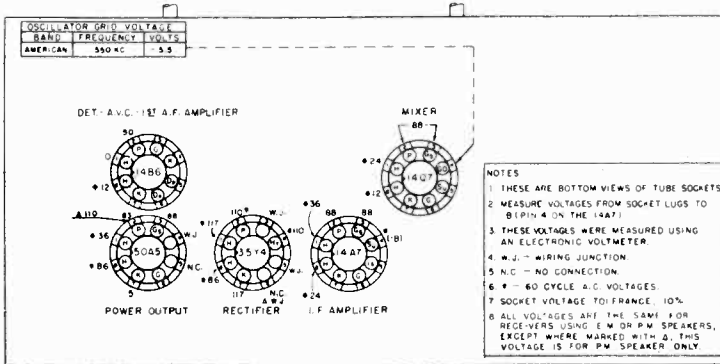
PARTS LIST

Figures in first column correspond to figures in Schematic Diagram

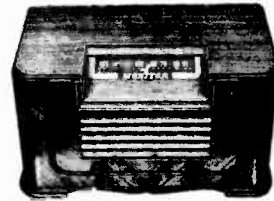
ITEM No.	PART No.	DESCRIPTION	ITEM No.	PART No.	DESCRIPTION
1	W-48858	Bulb (dial), Type 47, 6.3 v., .15 amp.	28	39294-29	Resistor, 470,000 ohm, 1/2 w.
2	C-132300-1	Cable and Plug (power)	29	39294-8	Resistor, 150 ohm, 1/2 w.
3	AC-135209	Ant. Loop and Back Assy. (TA56M, TW56M)	30A	C-135127	Control, Volume (1 megohm) } Assy.
	AC-135253	Ant. Loop and Back Assy. (TC56M)	30B		Switch (power)
4	AW-135195	Oscillator Coil Assembly	31	B-135077	Transformer (output)
5	AW-137665	Transformer (1st I.F.)	33	W-137367	Resistor, 47 ohm, 1 w.
6	AW-137667	Transformer (2nd I.F.)	34	Part of Item #6	Resistor, 47,000 ohm, 1/2 w.
7A	B-135202	Condenser (variable) } Two		W-135371	Socket (tube)
7B	Part of Item #7A	Condenser (variable) } Section		39017-5	Socket (dial light)
7C	Part of Item #7B	Condenser (trimmer)		AB-135135	Plate Assembly (dial)
7D		Condenser (trimmer)		W-135074	Pulley (idler)
9	39001-65	Condenser, .05 mfd., 200 v., paper		B-135094	Pointer (dial)
10	39001-65	Condenser, .05 mfd., 200 v., paper		B-135075	Pulley (idler)
12	39001-73	Condenser, 250 mmf., 600 v., paper		W-134916	Washer (spring)
13	39001-10	Condenser, 3300 mmf., 600 v., paper		W-31071	Ring (retaining)
14	39001-63	Condenser, .022 mfd., 200 v., paper		W-131154-1	Cotter (external)
15	39001-63	Condenser, .022 mfd., 200 v., paper		W-51752	Spring (drive cord)
17	B-136768	Speaker		W-134055	Grommet
18	39001-65	Condenser, .05 mfd., 200 v., paper		W-135164	Bumper
19A	B-136770	Condenser, 50 mfd., 150 v. } Two Section		W-136630	Trimount Stud
19B		Condenser, 30 mfd., 150 v. } Elect. Filter		R-135163	Cabinet (TA56M)
20	39294-38	Resistor, 15 megohm, 1/2 w.		AW-135245	Cabinet (TW56M)
21	39294-21	Resistor, 22,000 ohm, 1/2 w.		D-135235	Cabinet (TC56M)
23	39294-34	Resistor, 3.8 megohm, 1/2 w.		B-135461	Dial Glass
24	39294-8	Resistor, 150 ohm, 1/2 w.		W-135391	Knob (TA56M, TC56M)
25	39015-26	Resistor, 1200 ohm, 1 w.		W-135390	Knob (TW56M)
26	39294-35	Resistor, 4.7 megohm, 1/2 w.		W-132124	Trimount Stud (TA56M, TW56M)
27	39294-29	Resistor, 470,000 ohm, 1/2 w.			

MODELS TA56M, TC56M, MONITOR EQUIPMENT CORPORATION  
TW56M

SOCKET VOLTAGE CHART



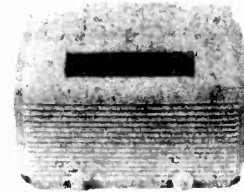
TC56M



TA56M



TW56M



DESCRIPTION

TYPE: Five-tube, single-band, superheterodyne.

FREQUENCY RANGE: 540 to 1600 kc.

INTERMEDIATE FREQUENCY: 455 kc.

POWER SUPPLY: a.c.—d.c.

VOLTAGE RATING: 105-125 volts.

POWER CONSUMPTION: 35 watts nominal.

POWER OUTPUT: 1 watt minimum.

TUBE COMPLEMENT:

Type	Function
14Q7	Mixer
14A7	I.F. Amplifier
14B6	Detector, AVC, 1st A.F. Amplifier
50A5	A.F. Power Output
35Y4	Rectifier

DIAL BULB: Type 47, 6.3 volts, .15 amp.

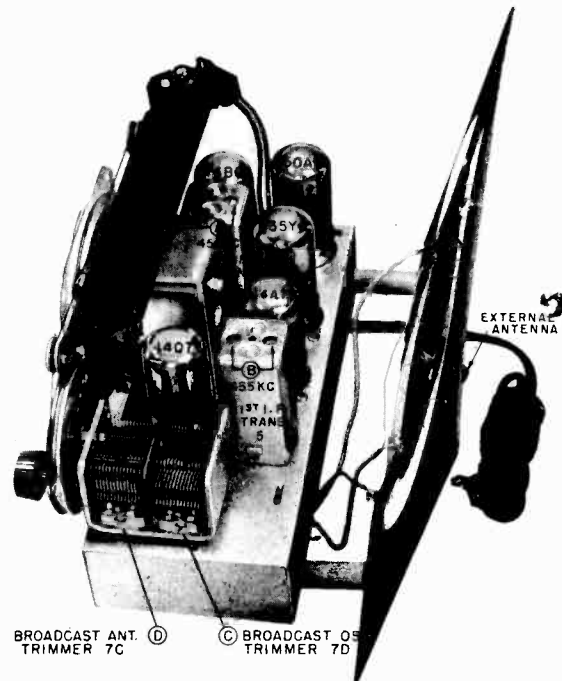
ALIGNMENT PROCEDURE

1. Turn the tuning condenser to the completely closed position against the stop and set the dial pointer to the reference line at the end of the dial scale.
2. Connect the output meter across the speaker voice coil,
3. The r.f. signal input from the signal generator should be connected to the external antenna lead. Connect the signal generator ground through a 0.1 mfd. condenser to —B (pin 4 on 14A7 tube socket).
4. Turn the volume control on full and adjust the signal generator output to produce approximately mid-scale deflection of the output meter, but maintain signal generator output as low as possible to prevent AVC action in the receiver.

ALIGNMENT CHART

Alignment adjustment locations are shown in Chassis, Side View at the right.

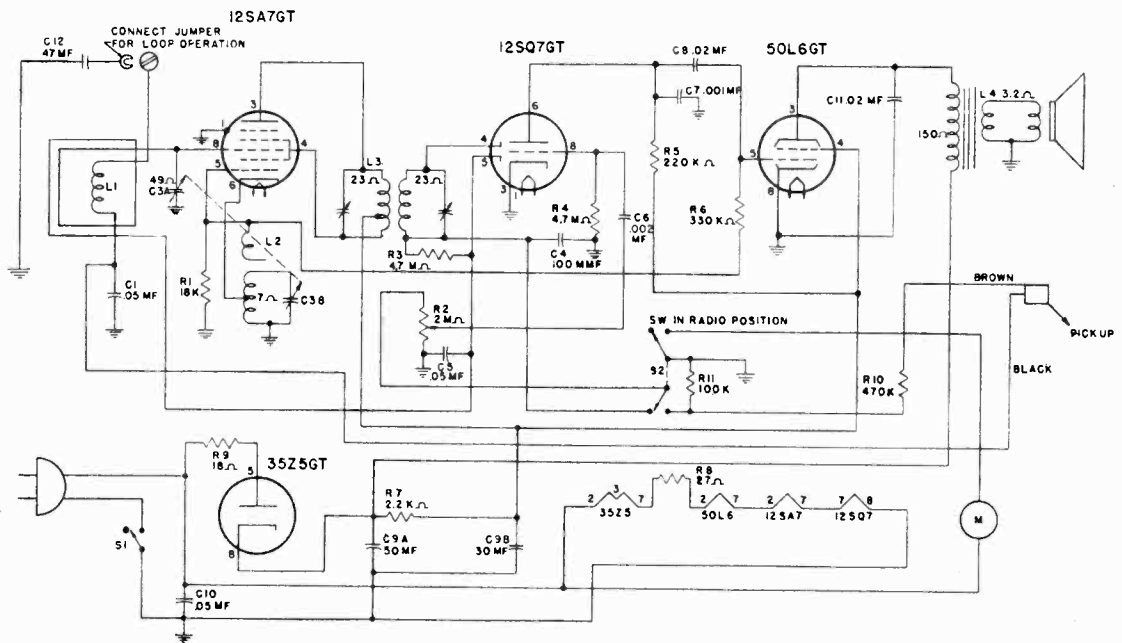
Alignment sequence	Signal Gen. Output			Position of Tuning Dial	Adjust for max. output
	Frequency in KC	In Series with	To		
1	455	200 mmf.	Ant.	1620	A & B
2	1620	200 mmf.	Ant.	1620	C
3	1400	200 mmf.	Ant.	1400	D



CHASSIS, SIDE VIEW

MONITOR EQUIPMENT CORPORATION

MODEL M-403



Tuning range ..... 530 to 1600 kc      Sensitivity (for 0.5 watt output):  
 Loop ..... 8000 microvolts per meter average  
 Intermediate frequency ..... 455 kc      Antenna ..... 800 microvolts average  
 Power consumption ..... 30 watts      Power output (in voice coil):  
 Undistorted ..... 0.8 watts  
 Selectivity ..... 1. A.C.A.—3 to 1.      2. A.C.A.—12.5 to 1      Maximum ..... 2.5 watts

Ref. No.      Part No.      Description

**Capacitors**

C1-C10		Paper, .05 mfd 400 volts
C6		Paper, .002 mfd 400 volts
C8-C11		Paper, .02 mfd 400 volts
C5		Paper, .05 mfd 200 volts
C7		Paper, .001 mfd 500 volts
C4		Ceramic 100 mmfd 500 volts
C12		Ceramic 47 mmfd 500 volts
C3	1675	Variable Air—2 gang
C9	2073	Electrolytic, 50-30 mfd 150 volts

**Resistors**

R2	2480	Control, volume with switch, 2 meg-ohms
R1		18000 ohms, 1/4 watt
R3, R4		4.7 meg ohms, 1/4 watt
R5, R10		220,000 ohms, 1/4 watt
R6		330,000 ohms, 1/4 watt
R7		2200 ohms, 2 watts
R8		27 ohms, 1/2 watt
R9		18 ohms, 1/2 watt
R11		100,000 ohms, 1/4 watt

Ref. No.      Part No.      Description

**Coils and Transformers**

L1	28186	Back cover with loop
L2	28184	Oscillator coil
L3	3376	I.F. transformer
L4	1300	Output transformer

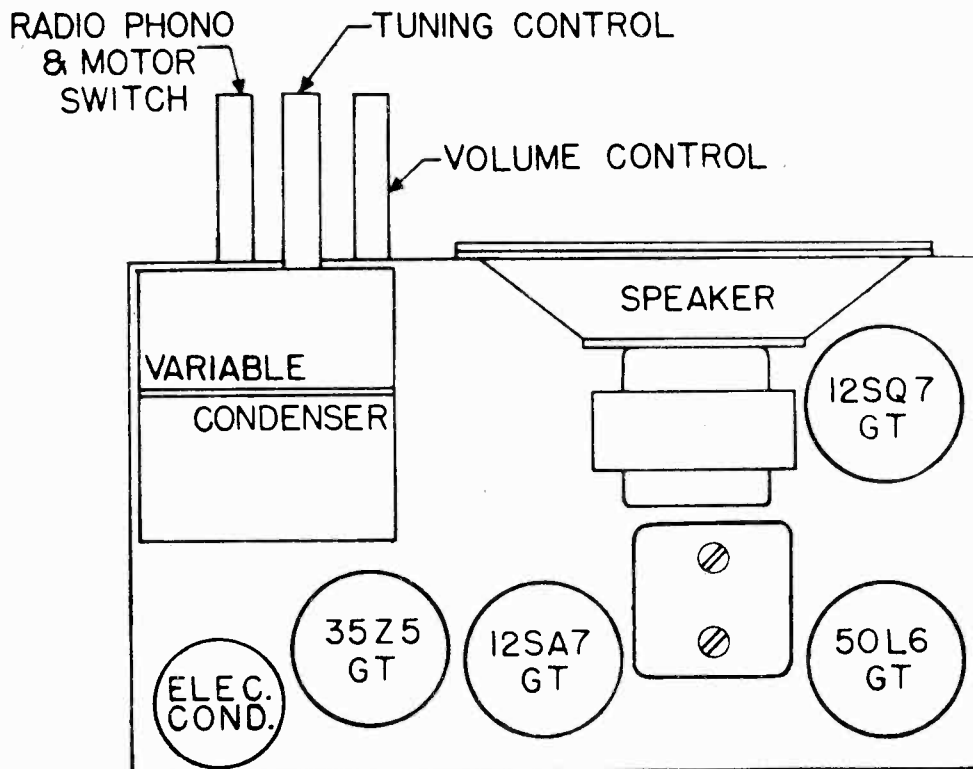
**Miscellaneous**

		Cord, line 6 ft.
	39160	Knob, tuning
	39161	Knob, volume
	5877	Speaker
	T470	Cabinet, wood
	54314	Tuning knob washer
		Phono-needle
	346-5	Walsco back clips
	18110	Sockets, wafer octal
	3828	Switch, phono-radio
		Phono motor and 8-inch turntable
		Phono crystal, L-26

\* The values of the resistors and mica capacitors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with components of pre-standardized values. This receiver will operate equally well with components of either group. An illustration of the differences in both resistors and capacitors follows:

Pre-standardized value—50,000 ohms, 1/3 watt, 10%  
 RMA value—47,000 ohms, 1/2 watt, 10%  
 Pre-standardized value—200 mmf, 500 volts, 20%  
 RMA value—220 mmf, 500 volts, 20%

## TUBE LOCATION



### ALIGNMENT PROCEDURE

(Refer to Chassis View)

- Output meter across 3.2-ohm output load.
- Volume control at maximum.
- Connect ground post of signal generator to chassis.
- Align for maximum output. Reduce input as needed to keep output near 0.4 volts.

Frequency	SIGNAL GENERATOR		TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT (in order shown)
	Dummy Antenna	Connection to Radio		
455 kc	0.1 mf	Stator of antenna section of gang	Any	Trimmers on I.F. can
1590 kc	* *	* *	Rotor full open (plates out of mesh)	Oscillator trimmer
1590 kc	* *	* *	Rotor full open (plates out of mesh)	Antenna trimmer

\* \* Run a wire from output terminal of the generator near the receiver. However, no connection is made between the signal generator and the receiver.

To remove the chassis from the cabinet, proceed as follows: Make sure the line cord is disconnected from the power receptacle. Remove the phonograph turntable and motor by unscrewing the three mounting screws on the phono motor. If the back has not been removed, pull out the four fasteners with which the back is mounted. Pull the volume and tuning knobs off their shafts. Remove the three mounting screws from the bottom of the cabinet. The chassis can then be slipped out of the cabinet.

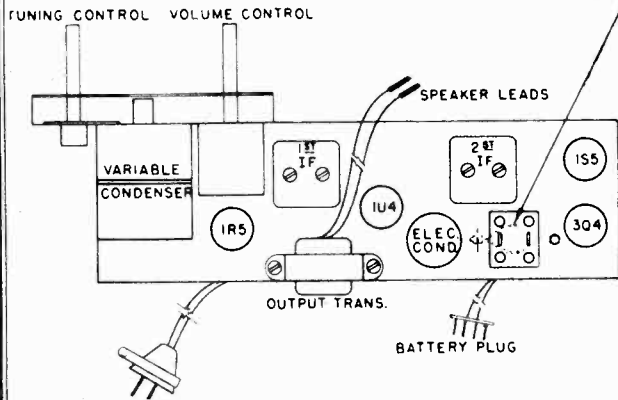
This receiver is designed to operate without a ground. NO ATTEMPT SHOULD BE MADE TO USE ONE.



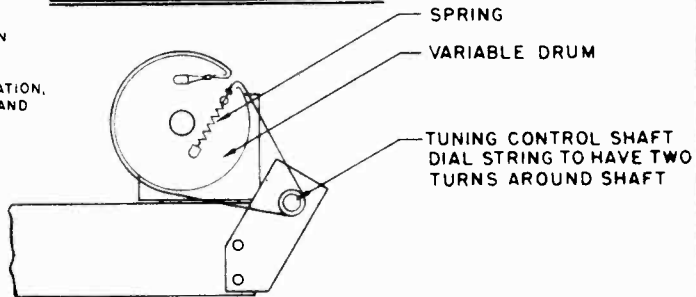


**TUBE LOCATION**

FOR BATTERY OPERATION PLUG LINE CORD IN THIS RECEPTACLE AS SHOWN BY DOTTED OUTLINE OF PLUG.  
 FOR 105-125 VOLT A.C. OR D.C. OPERATION, REMOVE THIS PLUG FROM SOCKET AND PLUG INTO ELECTRIC OUTLET.



**DIAL STRINGING DIAGRAM**



**ALIGNMENT PROCEDURE**

- Output Meter across 3.2 ohm output load
- Volume control at maximum
- Connect ground post of signal generator to chassis
- Align for maximum output. Reduce input as needed to keep output near 0.05 watts

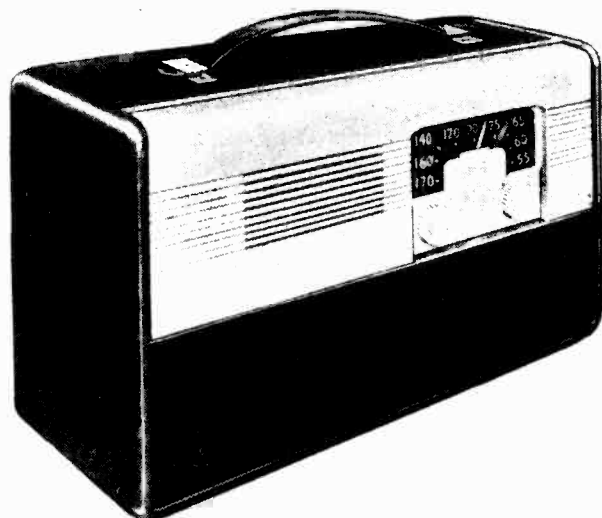
Frequency	SIGNAL GENERATOR		Tuner Setting	Adjust for Maximum Output (in order shown)
	Connection to Radio	Dummy Antenna		
455 KC	Center of antenna section of Gang	0.2 mf	Any	Trimmers on I.F. Can
•1500 KC	**	**	Set pointer at second dot from end. On dial pan	Oscillator Trimmer on Gang.
1500 KC	**	**	Set pointer at second dot from end. On dial pan	R.F. Trimmer on Gang

\*\* Run a wire from Output Terminal of the Generator near the Receiver. However, no connection is made between the signal generator and the Receiver.

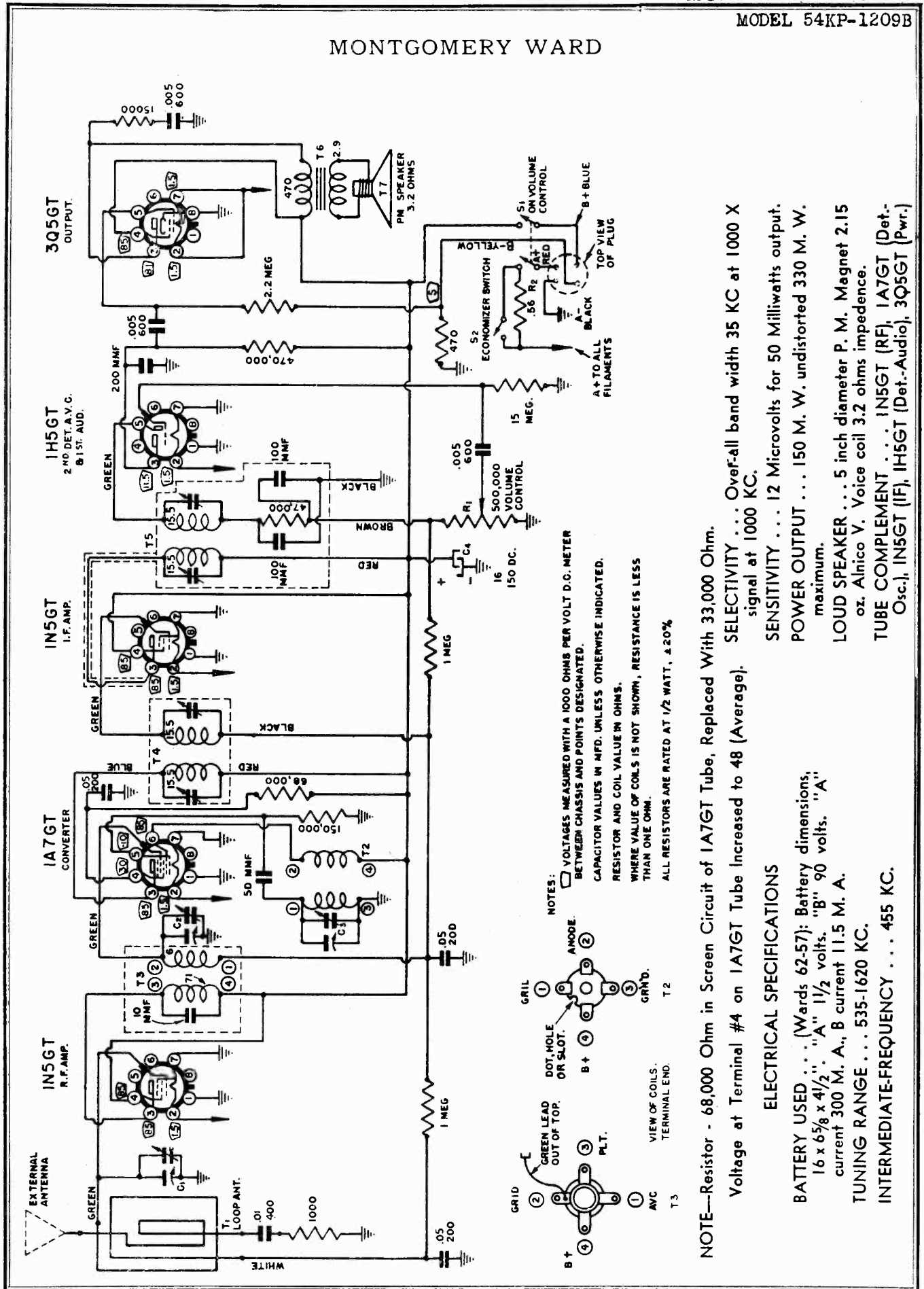
Tuning Range	540-1600	Sensitivity (For 0.05 Watt Output)	300 Microvolts per Meter Average
Intermediate Frequency	455 KC	Power Output (in voice coil):	
Power Consumption	15 Watts	Undistorted	.130 Watts
Selectivity	A.C.A. 12-1	Maximum	300 Watts

This receiver is designed to operate without a ground.  
**NO ATTEMPT SHOULD BE MADE TO USE ONE.**

To remove the chassis from the cabinet, proceed as follows:— Make sure the line cord is disconnected from the power receptacle. Remove the back and disconnect the wires to the loop antenna. Pull the volume and tuning knobs off their shafts. Remove the two mounting screws which hold the chassis mounting shelf in place. The chassis with the mounting shelf can now be slipped out of the cabinet. To remove the chassis from the chassis mounting shelf, it is only necessary to remove the three mounting screws on the bottom of the shelf.



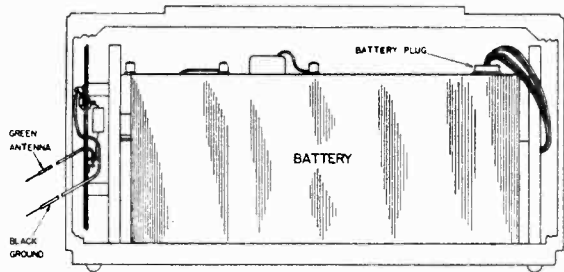
MONTGOMERY WARD



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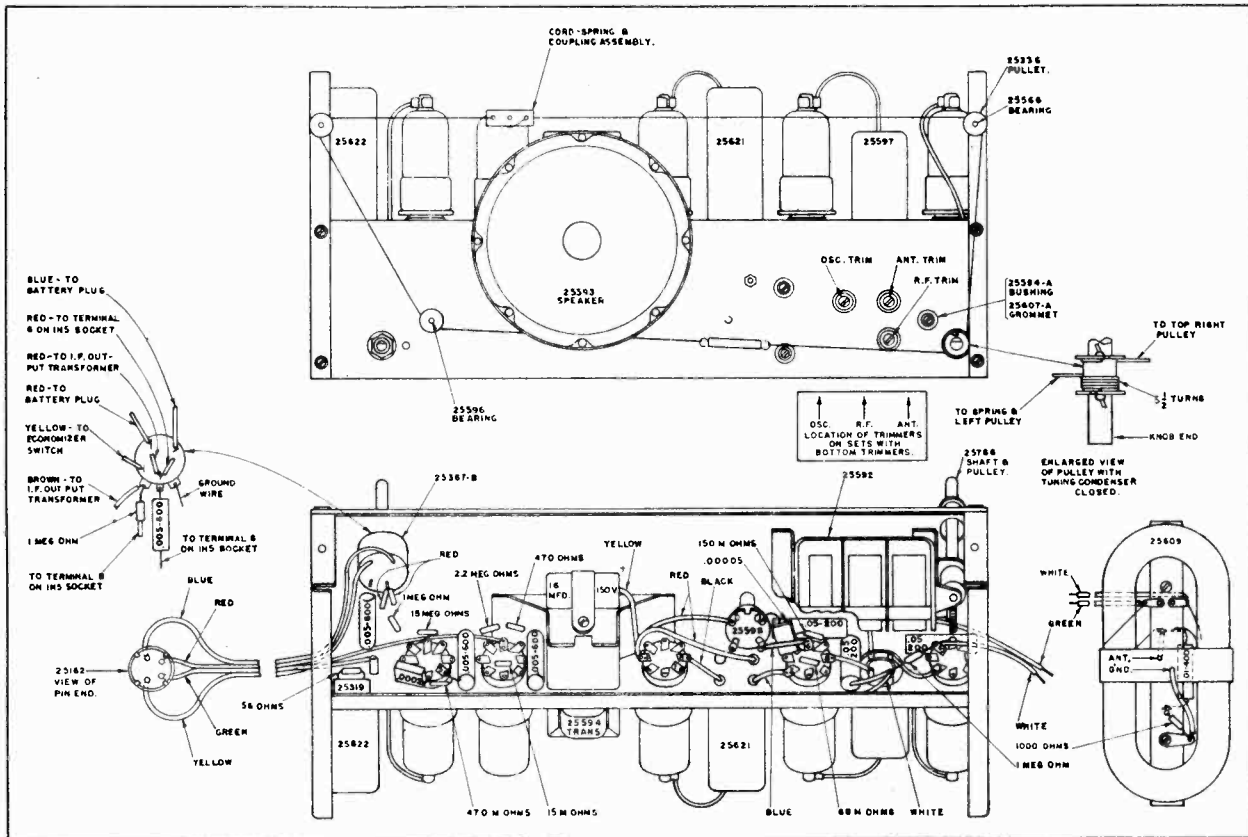
**NOTE**—Resistor - 68,000 Ohm in Screen Circuit of IA7GT Tube, Replaced With 33,000 Ohm.  
 Voltage at Terminal #4 on IA7GT Tube increased to 48 (Average).  
**ELECTRICAL SPECIFICATIONS**  
**SELECTIVITY** ... Over-all band width 35 KC at 1000 X signal at 1000 KC.  
**SENSITIVITY** ... 12 Microvolts for 50 Milliwatts output.  
**POWER OUTPUT** ... 150 M. W. undistorted 330 M. W. maximum.  
**LOUD SPEAKER** ... 5 inch diameter P. M. Magnet 2.15 oz. Alnico V. Voice coil 3.2 ohms impedance.  
**TUBES COMPLEMENT** ... IN5GT (RF), IA7GT (Det.-Osc.), IN5GT (IF), IH5GT (Det.-Audio), 3Q5GT (Pwr.)

MONTGOMERY WARD



BATTERY INSTALLATION

**REMOVAL OF CHASSIS**—If it is found necessary for any reason to remove the radio chassis from the cabinet, proceed as follows: Remove knobs by pulling straight off, disconnect battery by removing plug, and remove two screws inserted through bottom of cabinet. Chassis can be removed now. (Note—After installing chassis in cabinet see that the bakelite strip attached to dial cord is engaged with the pin on the dial pointer.)



**ALIGNMENT PROCEDURE**  
(Position of trimmers shown above)

- Output meter across 3.2-ohm output load. to keep output near 0.4 volts.
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed
- Loop antenna should be connected to receiver and in its proper position when making adjustments.

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT IN ORDER SHOWN
FREQUENCY	COUPLING CAPACITOR	CONNECTION TO RADIO	GROUND CONNECTION		
455 KC	.1	Grid Cap of 1N5GT (I.F.)	To Chassis	Capacitor full open (plates out of mesh)	2 trimmers on output IF can T5 (25622)
455 KC	.1	Grid Cap of 1A7GT	To Chassis	Capacitor full open (plates out of mesh)	2 trimmers on input IF can T4 (25621)
1620 KC	200 Mmf	Antenna Lead	To Chassis	Capacitor full open (plates out of mesh)	Oscillator trimmer C3 on gang
1400 KC	200 Mmf	Antenna Lead	To Chassis	Set dial pointer at 1400 KC	Antenna and R. F. trimmers C1, C2 on gang

MODEL 54KP-1209B  
 MODEL 64WG-1207A  
 MODEL 64WG-1804C

## MONTGOMERY WARD RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 kc for all readings. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm, 5-watt resistor across the secondary winding of the output transformer. A reading of 0.4 volts AC across this resistor will be equivalent to a 50-milliwatt output with the MODEL 54 KP-1209B

speaker connected.

The signal source must be an accurately calibrated signal generator capable of supplying both 1000 kc and 455 kc signals modulated 30% with a 400-cycle audio signal. Variations of plus or minus 25% are usually permissible.

The volume control must be set to maximum.

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
FREQUENCY	COUPLING CAPACITOR	CONNECTION TO RADIO	GROUND CONNECTION	
1000 KC	200 Mmf or RMA Dummy Antenna	External Antenna Clip	To Ground Lead	12 uv
1000 KC	.1 Mfd.	Grid (Top Connection) of R. F. Amp. (1N5)	To Chassis	20 uv
1000 KC	.1 Mfd.	Grid (Top Connection) of Converter (1A7)	To Chassis	220 uv
455 KC	.1 Mfd.	Grid (Top Connection) of Converter (1A7)	To Chassis	125 uv
455 KC	.1 Mfd.	Grid (Top Connection) I. F. Amp. (1N5)	To Chassis	6000 uv
400 Cycles	.1 Mfd.	Grid (Top Connection) Audio Amp. (1H5)	To Chassis	.1 v.
400 Cycles	.1 Mfd.	Grid (Pin) of Output Amp. (3Q5)	To Chassis	1.5 v.

MODEL 74WG-1207B 64WG-1207A & B

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Antenna Lead	Chassis	10 microvolts
1000 kc	.05 mf	1R5 Mixer, Pin 6	Chassis	30 microvolts
455 kc	.05 mf	1R5 Mixer, Pin 6	Chassis	25 microvolts
455 kc	.05 mf	1U4 1st I-F, Pin 6	Chassis	400 microvolts
455 kc	.05 mf	1U4 2nd I-F, Pin 6	Chassis	3500 microvolts
400 cycles	.05 mf	1S5 1st A-F, Pin 6	Chassis	.031 volt
400 cycles	.05 mf	3Q4 Output, Pin 3	Chassis	2.7 volts

MODEL 64 WG-1804C

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Loop Antenna— External antenna clip	Chassis	19.5 microvolts
1000 kc	.05 mf.	12SA7 Mixer—Pin 8	Point "X" (12SK7 Pin 3)	150 microvolts
455 kc	.05 mf	12SA7 Mixer—Pin 8	Same as above	100 microvolts
455 kc	.05 mf	12SF7 I-F—Pin 2	Same as above	3500 microvolts
400 cycles	.05 mf	12SJ7 1st A-F—Pin 4	Same as above	.042 volt
400 cycles	.05 mf	35L6GT Output—Pin 5	Same as above	1 volt

## MONTGOMERY WARD REPLACEMENT PARTS INFORMATION

HOW TO ORDER PARTS — When ordering, specify applicable, and CHASSIS MODEL number. The model PART number, schematic diagram reference number when number appears on a label on the chassis.

### REPLACEMENT PARTS LIST

Use Only Genuine Factory Replacement Parts

Ref. No.	Part No.	Description	Qty. Used In Set
<b>CAPACITORS</b>			
C1, C2, C3	25592	3 Gang Tuning Capacitor Including Trimmers	1
C4	25600	Electrolytic 16 Mfd. 150 V.	1
	8661	.05 Mfd. 200 V. Tubular	3
	8583	.01 Mfd. 400 V. Tubular	1
	14061	.005 Mfd. 600 V. Tubular	3
	14370	200 Mmf. Mica	1
	17091	50 Mmf. Mica	1
<b>RESISTORS</b>			
R1	25367	Control-Volume Including On-Off Switch	1
	14365	15 Megohm 1/2 Watt 20%	1
	25134	2.2 Megohm 1/2 Watt 20%	1
	8766	1 Megohm 1/2 Watt 20%	2
	25042	470,000 Ohm 1/2 Watt 20%	1
	14616	150,000 Ohm 1/2 Watt 20%	1
NOTE—	25040	68,000 Ohm 1/2 Watt 20%	1
	17164	15,000 Ohm 1/2 Watt 20%	1
	25414	1,000 Ohm 1/2 Watt 20%	1
	25085	470 Ohm 1/2 Watt 20%	1
	25613	.56 Ohm 1/2 Watt 10% (Wire Wound)	1
<b>TRANSFORMERS AND COILS</b>			
T1	25609	Loop Antenna (Includes Mounting Strips and Terminals)	1
T2	25598	Coil - Oscillator	1
T3	25597	Coil - RF (Includes Shield Can and 10 Mmf Condenser)	1
T4	25621	Transformer - IF Input (Complete in Can)	1
T5	25622	Transformer - IF Output (Complete in Can - Includes 2 100 Mmf Capacitors Built-In With Trimmers)	1
T6	25594	Transformer - Speaker (Includes Mounting Clamp)	1

Ref. No.	Part No.	Description	Qty. Used In Set
<b>SPEAKER</b>			
T7	25593	5" P. M. Speaker	1
<b>SWITCHES</b>			
S1		Part of Volume Control	
S2	25319	S. P. S. T. Slide Switch	1
<b>DIAL AND TUNING PARTS</b>			
	25566	Bearing - Short (For Upper Wood Pulleys)	2
	25596	Bearing - Long (For Lower Wood Pulley)	1
	25767	Cord - Dial (Includes Spring and Pointer Coupling)	1
	25336	Pulley - Wood	3
	25809	Plate - Assembly (Includes Dial Backing Plate with Brackets, Track, and Pointer)	1
	25586	Pointer	1
	25581	Track (For Pointer)	1
	25590	Scale - Dial	1
	25766	Shaft - Tuning (Includes "Spool" Pulley)	1
	25774	Screw - Set 8-32 x 1/8 (Used in Worm Gear of Tuning Condenser)	1
	25654	Screw - Wood #4 x 1/4 (Mounting Dial Back Plate)	4
<b>MISCELLANEOUS</b>			
	25553	Back - Chassis (Removable Back Plate)	1
	25591	Cabinet - Wood	1
	25603	Cap - Grid	4
	25605	End - Chassis	2
	25696	Knob - Bakelite	2
	25612	Plug - 4 Prong (For Battery Cable)	1
	25620	Socket - Octal, For Tubes	5
	25618	Screw - 10-32 x 7/8 (For Mounting Chassis)	2

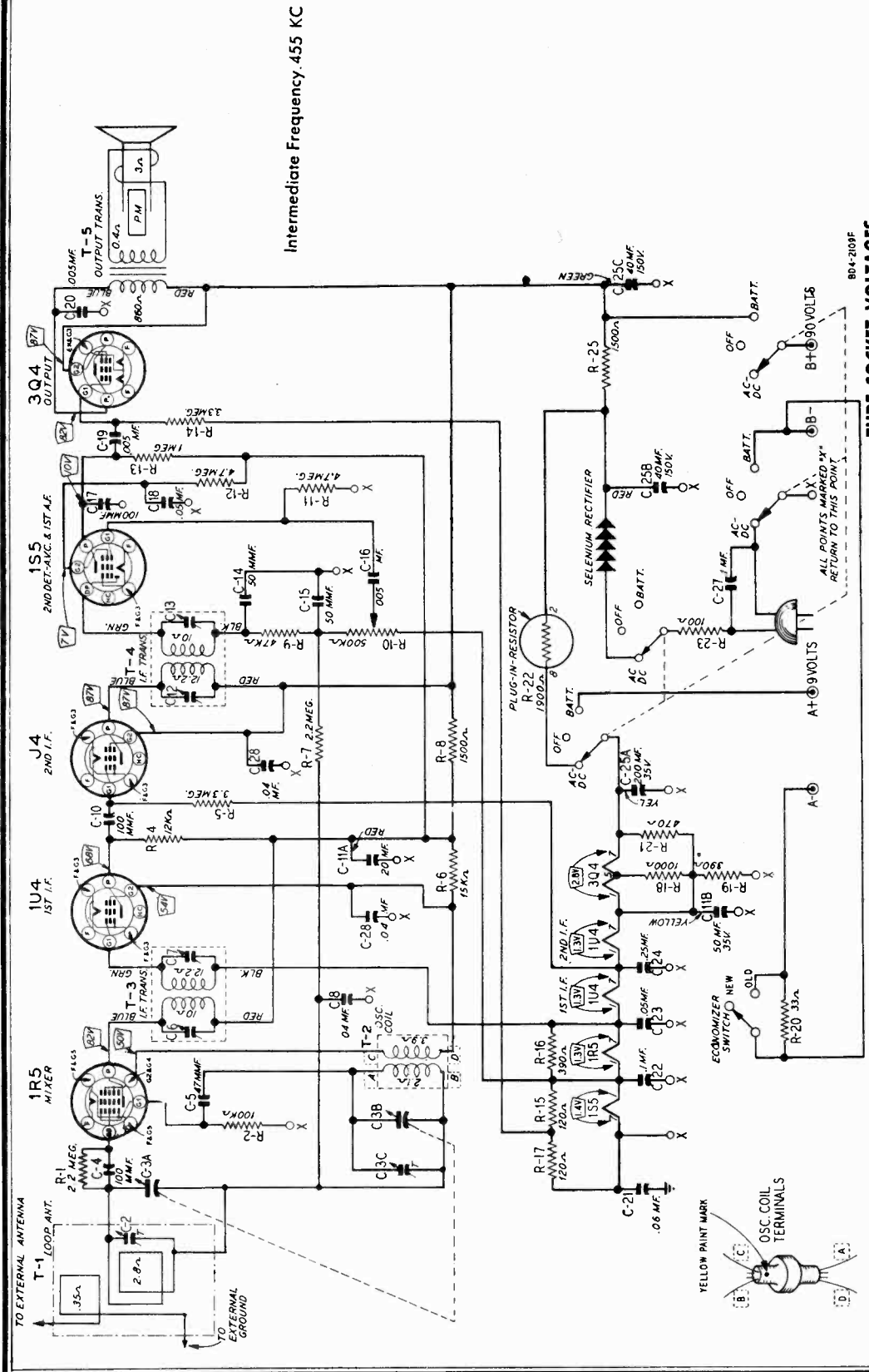
\*The values of the resistors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with resistors of pre-standardized values. This receiver will operate equally

well with resistors of either group. An illustration of the difference follows:

Pre-standardized value - 50,000 ohms,

RMA value - 47,000 ohms,

NOTE—#25040 resistor replaced with #25144 resistor  
33,000 ohm. 1/2 watt 20%.



Intermediate Frequency 455 KC

**TUBE SOCKET VOLTAGES**

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the filaments are between the socket terminal and "X" point.

The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

- Line voltage.....117 volts AC
- Volume control.....maximum
- Signal input.....none

A variation of ±10% is usually permissible.

**STANDARD TUBE SOCKET SYMBOLS**

- DP - DIODE PLATE
- G - GRID
- H - HEATER
- HT - HEATER TAP
- K - CATHODE
- NC - NO CONNECTION
- P - PLATE
- SH - METAL SHELL
- F - FILAMENT

**PLUG-IN RESISTOR SYMBOLS**

- 1R5 MIXER
- 1U4 1ST I.F.
- 1U4 2ND I.F.
- 1S5 2ND DET.-A.V.C. & 1ST A.F.
- 3Q4 OUTPUT

MODELS 64WG-1052B,  
74WG-1052B

MONTGOMERY WARD

**RECEIVER STAGE SENSITIVITIES**

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm 5 watt resistor across the secondary winding of the output transformer. A reading of .4 volt AC

across this resistor will be equivalent to a 50 milliwatt output with the speaker connected. The volume control must be set to maximum. The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Output variations of Plus or Minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Loop Antenna— External antenna clip	Chassis	20 microvolts
1000 kc	.05 mf.	1R5 Mixer—Pin 6	Point "X" (1S5 Pin 1)	30 microvolts
*455 kc	.05 mf.	1R5 Mixer—Pin 6	Same as above	15 microvolts
455 kc	.05 mf.	1U4 1st I-F—Pin 6	Same as above	440 microvolts
455 kc	.05 mf.	1U4 2nd I-F—Pin 6	Same as above	2200 microvolts
400 cycles	.05 mf.	1S5 1st A-F—Pin 6	Same as above	.022 volt
400 cycles	.05 mf.	3Q4 Output—Pin 3	Same as above	1.8 volts

\*Short out the oscillator section of the gang condenser while making this measurement.

**ALIGNMENT PROCEDURE**

Volume Control—Maximum All Adjustments.

Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antenna—.1 mf., 50 mmf.

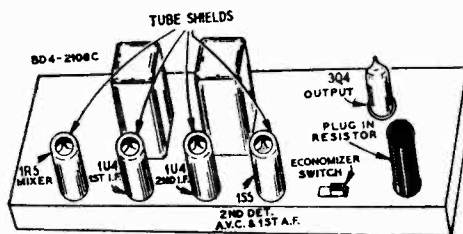
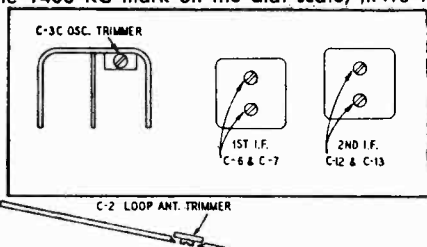
SIGNAL GENERATOR				CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM See Trimmer Illustration
Frequency Setting	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	.1 mf	Control Grid 1U4—1st I-F Pin 6	Point "X" At Electrolytic Capacitor Black Lead	Turn Rotor to full open	2nd I-F (C13) & (C12)
455 kc	.1 mf	Control Grid 1R5—Mixer Pin 6 See Note C	Same as above	Turn Rotor to full open	1st I-F (C7) & (C6)
1620 kc	.1 mf	Control Grid 1R5—Mixer Pin 6	Same as above	Turn Rotor to full open	Oscillator (C3C)
1400 kc	50 mmf	External Antenna Clip on Loop See Note A	External Ground connection on loop	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note B	Antenna (C2)

NOTE A—Re-assemble chassis in cabinet and close the cabinet back before making adjustment.

NOTE B—Tune in a 1400 KC signal. If pointer is not at the 1400 KC mark on the dial scale, move the pointer on

the string to the 1400 KC mark.

NOTE C—Short out the oscillator section of the gang condenser for this adjustment only.



MONTGOMERY WARD

MODELS 64WG-1052B,  
74WG-1C52B

MODEL 64WG-1052B, 74WG-1052B

**OPERATING VOLTAGES**—Chassis for Models 64WG-1052B and 74WG-1052B are available for operation on the following power supplies:  
105-125 Volts AC 50-60 Cycles or  
105-125 Volts DC  
Wards Battery (A Section 9 Volts  
Pack No. 62-35 (B Section 90 Volts  
Pack No. 62-35))

REPLACEMENT PARTS LIST

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

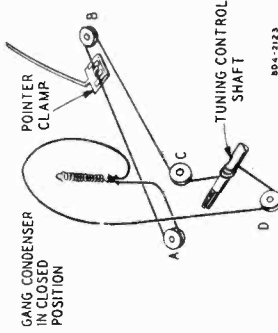
**HOW TO ORDER PARTS** — Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Parts should be ordered from the nearest Wards Retail Store, Catalog Order office or Mail Order House.

Ref. No.	Part No.	Description	Qty. Used in Set
<b>CAPACITORS</b>			
C-2	17A123	1.5 mmf/12 mmf Trimmer	1
C-3	14A186	Gang Capacitor with Drive Pulley	1
C-4	47X476	100 mmf Moulded	3
C-7	47X463	47 mmf Moulded	1
C-6		Part of T-3 (1st I.F. Transformer)	
C-8	B66403	.04 mf 200 V Tubular	3
C-9	45X348	120 mf 150 V / Dry	1
C-11		150 mf 55 V / electrolytic	1
C-12		Part of T-4 (2nd I.F. Transformer)	
C-13	47X112	50 mmf Dual Mica	1
C-14	B66502	.003 mf 200 V Tubular	2
C-15	B66503	.05 mf 200 V Tubular	2
C-16	D66502	.005 mf 400 V Tubular	1
C-17	D66603	.06 mf 400 V Tubular	1
C-18	B66104	.1 mf 200 V Tubular	1
C-19	B66254	.25 mf 200 V Tubular	1
C-20	C25A	200 mf 35 V Dry	1
C-21	C25B	40 mf 150 V electrolytic	1
C-22	C25C	40 mf 150 V electrolytic	1
C-23	D67104	1 mf 400 V Tubular	1
<b>RESISTORS</b>			
R-1	B85225	2.2 meg. 0.5	2
R-2	B85104	100 K 0.5	1
R-3	B84123	12 K 0.5	1
R-4	B85335	3.3 meg. 0.5	2
R-5	B84153	15 K 0.5	1
R-6	B84152	1500 0.5	2
R-7	B85473	47 K 0.5	1
R-8	B84307	500 K 0.5	1
R-9	B85475	47 K 0.5	1
R-10	B85473	47 K 0.5	1
R-11	B85475	47 meg. 0.5	2
R-12	B85105	1.0 meg. 0.5	1
R-13	B84121	120 0.5	2
R-14	B84391	350 0.5	2
R-15	B84102	1000 0.5	1
R-16	B85330	30 0.5	1
R-17	B85330	470 0.5	1
R-18	B85330	1900 0.5	1
R-19	B85330	1900 0.5	1
R-20	B85330	1900 0.5	1
R-21	B85330	1900 0.5	1
R-22	B85330	1900 0.5	1
R-23	D68101	100 2.0	1

Ref. No.	Part No.	Description	Qty. Used in Set
<b>TRANSFORMERS AND COILS</b>			
T-1	9A1843	B Range Loop Antenna	1
T-2	9A1876	Oscillator Coil-Assembly	1
T-3	9A1840	1st I.F. Transformer and Con. Assem.	1
T-4	9A1841	2nd I.F. Transformer and Con. Assem.	1
T-5		Output Transformer (Specify part number and letters stamped on speaker)	1
		Output Transformer (Specify part number and letters stamped on speaker)	1
		Selenium Rectifier and Housing	1
		Socket (B prong) Moulded	1
		Tube Shield (Miniature)	5
		Tube Shield (Econizer)	4
		Choke Coil Switch (ACDC, Battery Switch)	1
		Battery Cable and Plug Assembly	1
		Grille Cloth 4 1/2" x 6 1/2" (426W)	1
		Knob, Switch	1
		Knob, Tuning	1
		Knob, Volume	1
		Line Cord and Plug Assembly	1
		Shield, Volume Control and Switch	1
		Shield, Volume Control and Switch (Metal)	1
		Washer for Drive Shaft	2
<b>MISCELLANEOUS</b>			
		5 1/2" P.M. Speaker complete with Output Transformer	1
		Cone and Voice Coil Assembly (Specify part number and letters stamped on speaker)	1
		Output Transformer (Specify part number and letters stamped on speaker)	1
		Selenium Rectifier and Housing	1
		Socket (B prong) Moulded	1
		Tube Shield (Miniature)	5
		Tube Shield (Econizer)	4
		Choke Coil Switch (ACDC, Battery Switch)	1
		Battery Cable and Plug Assembly	1
		Grille Cloth 4 1/2" x 6 1/2" (426W)	1
		Knob, Switch	1
		Knob, Tuning	1
		Knob, Volume	1
		Line Cord and Plug Assembly	1
		Shield, Volume Control and Switch	1
		Shield, Volume Control and Switch (Metal)	1

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully closed position. Use a new cord 30" long and tie one end to the tension spring. Fasten the other end of the tension spring to the hook on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue around pulley rim 1/4 turn clockwise. Pass cord around pulleys A, B, and C as shown in the illustration. Wind three turns clockwise (viewed from rear of chassis) around tuning control shaft. The turns must progress toward rear of chassis. Pass cord around pulley D and continue 3/4 turn clockwise around large drive pulley. Pass cord through the slot in the pulley rim then stretch the tension spring and tie free end of cord to H. Cut off any excess string.

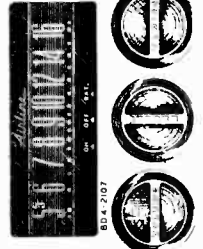


ELECTRICAL SPECIFICATIONS

Power Supply: "A" Battery Supply—9 Volts, 50 Ma.  
"B" Battery Supply—90 Volts, 11 Ma. or 105-125 volts AC, 50-60 cycles, 10 watts or 105-125 volts DC  
Ward's Battery Pack No. 62-35  
At 1000 KC, 53 KC wide at 1000 times signal  
(for .05 watt output with external antenna) 20 microvolts average  
0.3 watt maximum  
0.125 watt 10% distortion  
Loud Speaker: 5 1/2" PM dynamic  
Voice Coil Impedance: 3.2 ohms at 400 cycles

REMOVAL OF CHASSIS FROM CABINET

Pull off the three control knobs and disconnect the battery plug. Unwrap the power cord from the radio at the top of the cabinet if necessary. Remove the four screws that fasten the chassis to the cabinet (2 on the outside at each end of the cabinet). Tip the chassis slightly forward and at the same time withdraw it from the cabinet.



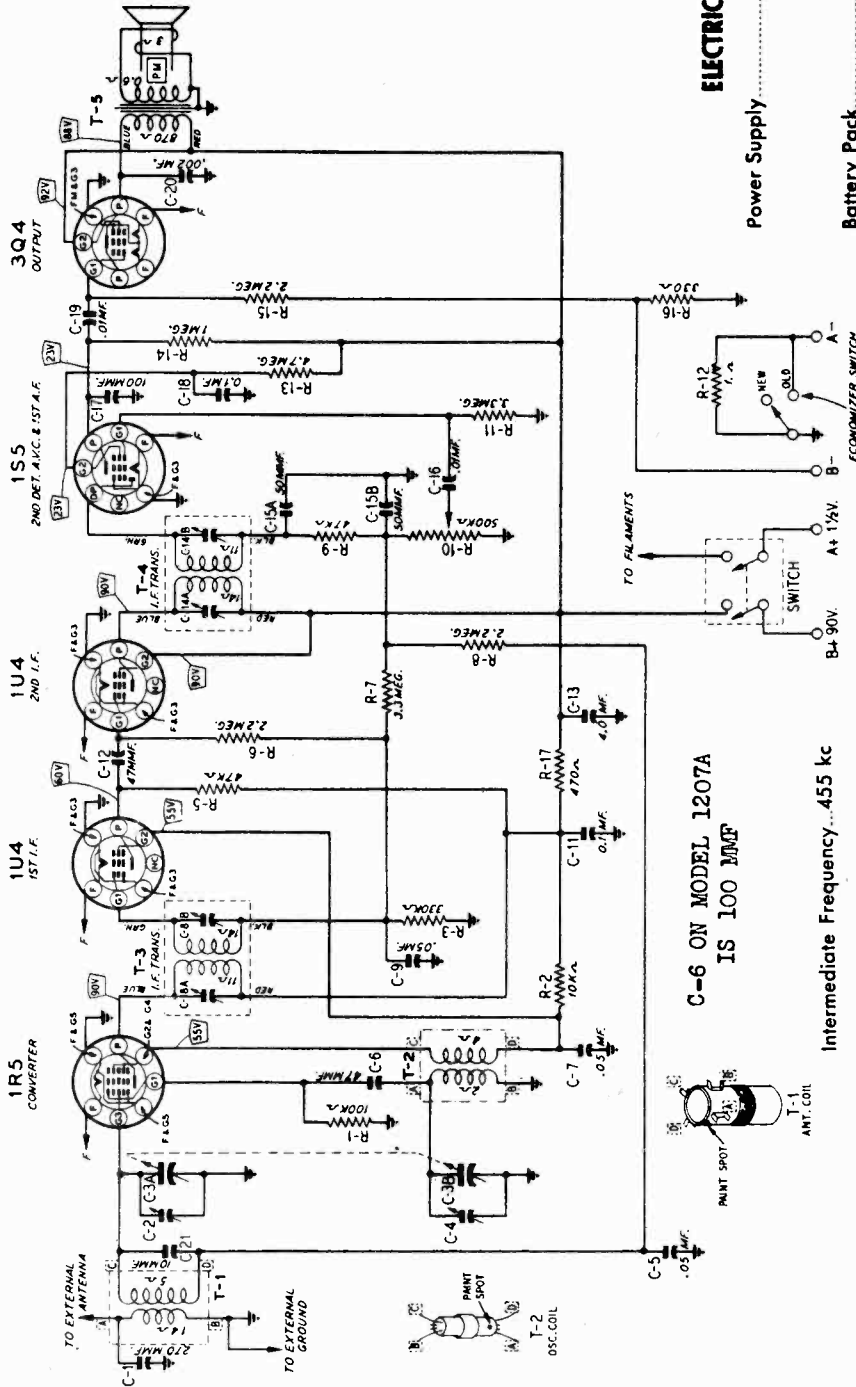


MODELS 64WG-1207A,  
64WG-1207B,  
74WG-1207B

**ELECTRICAL SPECIFICATIONS**

Power Supply....."A" Battery Supply 1½ volts, 220 Ma.  
"B" Battery Supply 90 volts, 12 Ma.  
Battery Pack.....Wards Battery Pack 62-51 or 62-57

Frequency Range.....540-1600 kc  
Selectivity.....At 1,000 kc, 40 kc broad at 1,000 times signal  
(For .05 watt output and with external antenna) 10 microvolts average  
Sensitivity......23 watts maximum  
Power Output......1 watt 10% distortion  
Loud Speaker.....5" PM dynamic  
Voice Coil Impedance.....3.2 ohms at 400 cycles



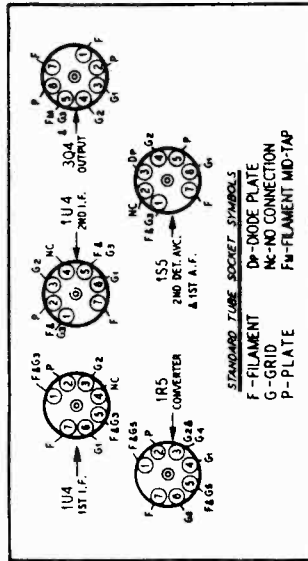
C-6 ON MODEL 1207A  
IS 100 MMF

Intermediate Frequency...455 kc

**TUBE SOCKET VOLTAGES**

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and the chassis. All readings, except those for the 1S5 tube, were taken with a 1000 ohm-per-volt meter and read on a 500 volt scale. The plate and screen voltages for the 1S5 tube were read with a vacuum tube voltmeter. Conditions of measurement are:

- Battery voltages under load.....B, 90 volts
- Volume control.....A, 1½ Volts
- Signal input.....maximum
- .....none
- A variation of ±10% is usually permissible.



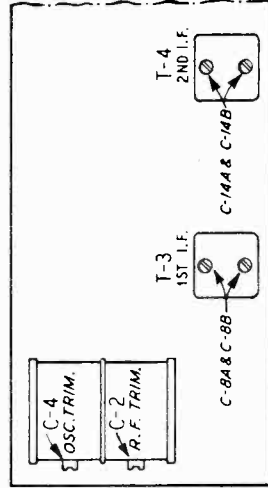
MODELS 64WG-1207A,  
64WG-1207B,  
74WG-1207B

MONTGOMERY WARD

**ALIGNMENT PROCEDURE**

Volume Control—Maximum All Adjustments. Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.  
Allow Chassis and Signal Generator to "Heat Up" for several minutes. Output Indicating Meter; Non-Metallic Screwdriver.  
The equipment in column at right is required for aligning: Dummy Antenna—.1 mf., 50 mmf.

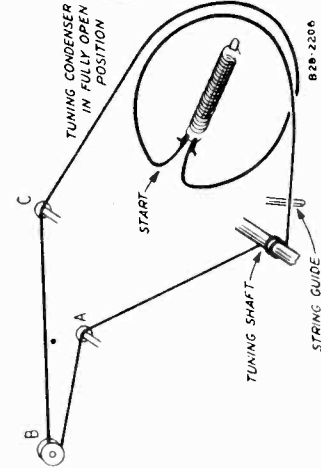
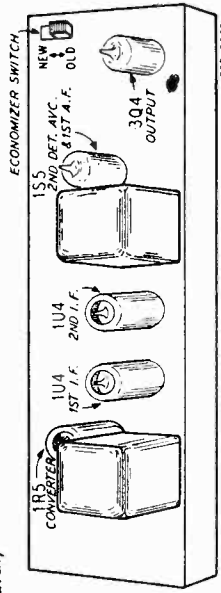
SIGNAL GENERATOR			RECEIVER		
Frequency Setting	Coupling Capacitor	Connection to Radio	Ground Connection	Condenser Setting	Adjust Trimmers for Maximum Output (See Trimmer Illustration)
455 kc	.1 mf	Control Grid 1R5 Mixer Pin 6	Chassis	Turn Rotor to full open	2nd I-F C-14A and C-14B 1st I-F C-8A and C-8B
1620 kc	.1 mf	Control Grid 1R5 Mixer Pin 6	Chassis	Turn Rotor to full open	Oscillator C-4
1400 kc	50 mmf	External Antenna lead	Chassis	Turn Rotor to Max. Output Set pointer to 1400 kc See note A	Antenna C-2



NOTE A—Tune in a 1400 kc signal. If the pointer is not at the 1400 kc mark on the dial, move it along the string to 1400 kc.

**DRIVE CORD REPLACEMENT**

Turn the gang condenser to the fully open position and use a new drive cord 35" long. Tie one end of the new cord to the tension spring and hook the other end of the tension spring over the tab on the large drive pulley. Pass the cord through the opening in the drive pulley rim and continue 3/4 turn clockwise around the pulley rim. Pass the cord in front of the string guide, under the tuning shaft and wind 2 3/4 turns around the shaft with the turns progressing toward the chassis. Run the cord up and over the idler stud A, around pulley B, over idler stud C and then wind 1/2 turn clockwise around the large drive pulley. Pass the cord through the opening in the pulley rim, stretch the tension spring and tie the free end of the cord to it. Rotate the tuning shaft several times in order to take up any slack in the drive cord. If the installation is satisfactory cut off any excess string and attach the dial pointer.



MODELS 64WG-1207A,  
64WG-1207B,  
74WG-1207B  
MODEL 64WG-1804C

MONTGOMERY WARD

Ref. No.	Part No.	Description	Qty. Used in Set
<b>TRANSFORMERS AND COILS</b>			
T-1	26A445	8" Range loop antenna assembly...	1
T-2	9A1805	Oscillator coil assembly...	1
T-3	9A1775	1st I-F Transformer and can assembly	1
T-4	9A1776	2nd I-F Transformer and can assembly	1
T-5	51X116	Output transformer...	1
<b>RESISTORS</b>			
R-1	884332	3300 Ohms	1
R-2	885104	100,000 0.5 Carbon	1
R-3	884393	39,000 0.5 Carbon	1
R-4	885225	2.2 meg 0.5 Carbon	1
R-5	885473	47,000 0.5 Carbon	1
R-6	36X347	500,000 Volume control and switch	1
R-7	884153	15,000 0.5 Carbon	1
R-8	885475	4.7 meg. 0.5 Carbon	1
R-9	884474	470,000 0.5 Carbon	1
R-10	884333	33,000 0.5 Carbon	1
R-11	884823	82,000 0.5 Carbon	1
R-12	885474	470,000 0.5 Carbon	1
R-13	883181	180 0.5 Carbon	1
R-14	884274	270,000 0.5 Carbon	1
R-15	884390	39 2.0 Carbon	1
R-16	884770	27 0.5 Carbon	1
R-17	884152	1500 1.0 Carbon	1
R-20	885471	470 0.5 Carbon	1
<b>DIAL AND DRIVE ASSEMBLY</b>			
6X21		Rubber grommet	3
20X329		Cond. cushion stud	3
58X667		Dial	1
25X1461		Dial bracket	1
26A446		Pointer bracket assembly	1
15X217		Pointer	1
25X1398		Pilot light bracket	1
7A192		Pilot light socket assembly	1
		Pilot light No. 47	1
		42" drive card	1
28X95		Drive cord tension spring	1
26X464		Drive shaft	1
19X192		"C" washer for drive shaft	2
41X81		Dial light diffuser	1
25X1385		Holder, light diffuser	1
4X884		Eucutcheon	1
25X1460		Eucutcheon mounting bracket	2
<b>MISCELLANEOUS</b>			
12A431		4" x 6" speaker with mounting bracket	1
		Cond. and voice coil assembly (specify part number and letters stamped on speaker)	1
3A303		Tube socket—octal (8 prong) malded	5
3A421		Tube socket with shield	1
10A297		Knob (walnut) on-off switch, volume control and tuning	2

Ref. No.	Part No.	Description	Qty. Used in Set
<b>MISCELLANEOUS</b>			
12A443		5" P.M. Speaker with Mtg. Bracket	1
		Cond. and Voice Coil Assembly (Specify part no. and letters stamped on speaker)	1
26A432		Dial Bracket Assembly Complete with Dial, Bracket, Clamps, Pulleys and Crystal	1
20X95		Drive Card Tension Spring	1
15X224		35" Drive Card	1
26X483		Painter	1
6X19		Rubber Grommet	3
20X329		Cond. Cushion Stud (Mtg. Gang Cond.)	3
2A175		On-Off Switch (Economizer)	1
3A312		Miniature Tube Socket	5
32X221		Tube Shield	3
13X555		Battery Cable Assembly	1
10A530		Knob (Volume)	1
10A531		Knob (Tuning)	1

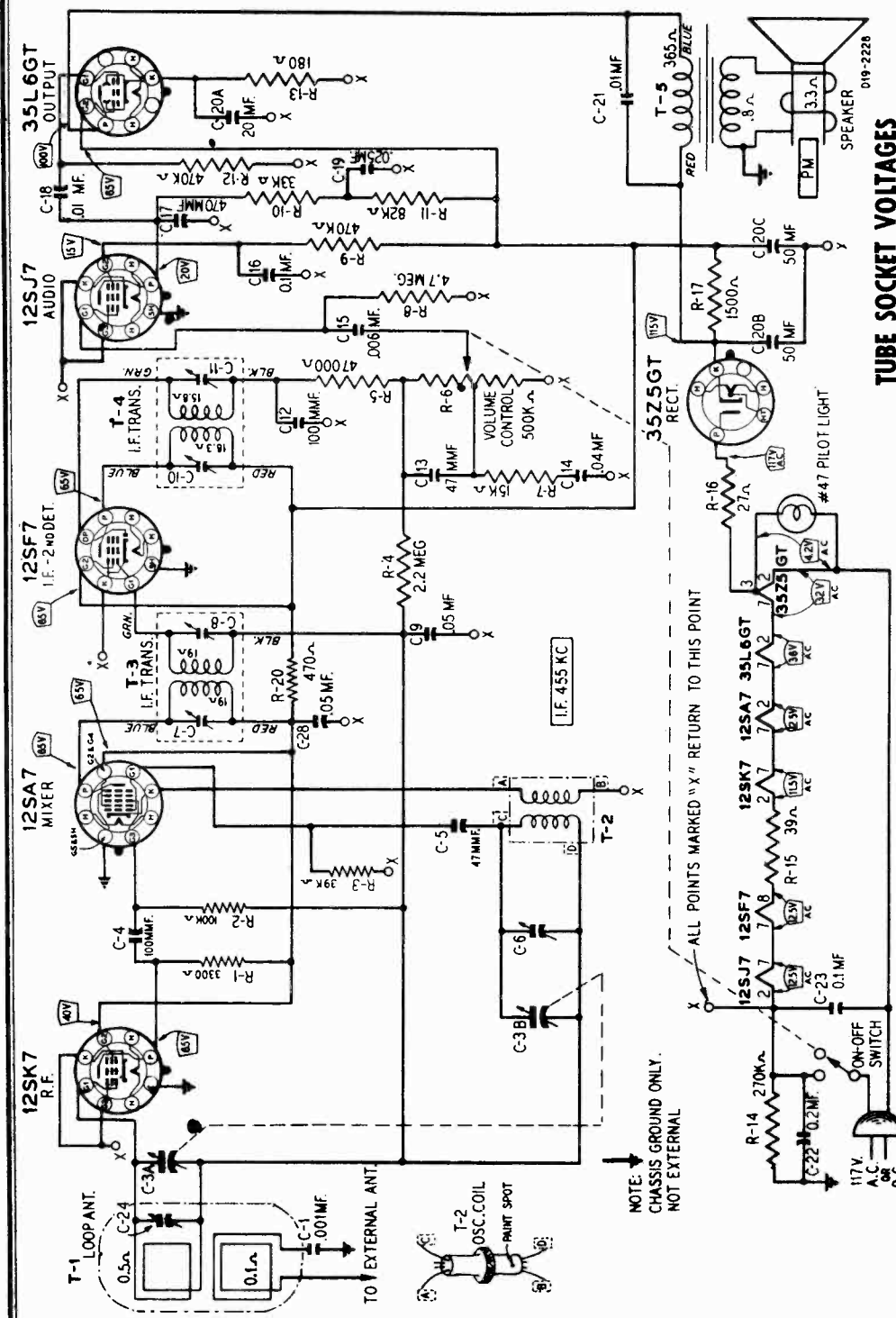
**OPERATING VOLTAGES**—Chassis for Model 64WG-1804C are available for operation on the following power supplies: 105-125 volts AC, 50-60 cycles or 105-125 volts DC.

Ref. No.	Part No.	Description	Qty. Used in Set
<b>CAPACITORS</b>			
C-1	D67102	.001 mf 400 V Tubular	1
C-3A	26A402	Gang condenser and pulley assembly	1
C-3B			1
C-4	47X476	100 mfd Molded	2
C-5	47X446	47 mfd Molded	1
C-6		Part of C-3	1
C-7		Part of T-3, 1st I-F Transformer	1
C-8	866503	.05 mf 200 V Tubular	1
C-9		Part of T-4, 2nd I-F Transformer	1
C-10		Molded	1
C-11	47X463	47 mfd Molded	1
C-12	867103	100 mfd Molded	1
C-13	867102	.006 mf 200 V Tubular	1
C-14	866104	.1 mf 200 V Tubular	1
C-15	47X467	470 mfd Molded	1
C-16	866103	.01 mf 200 V Tubular	1
C-17	867253	.025 mf 200 V Tubular	2
C-18	45X344	50 mf 150 V condenser	1
C-19	867204	0.2 mf 200 V Tubular	1
C-20A		20 mf 25 V Dry electrolytic	1
C-20B		50 mf 150 V condenser	1
C-20C		50 mf 150 V condenser	1
C-21	867204	0.2 mf 200 V Tubular	1
C-22	D67104	1 mf 400 V Tubular	1
C-23	17A123	1.5-1.2 mfd Trimmer	1
C-24		0.5 mf 200 V Tubular	1
C-28	867503	0.5 mf 200 V Tubular	1

**OPERATING VOLTAGES**—Chassis for Model 64WG-1207A are available for operation on the following power supply: Battery Wards Battery Pack (A Section 1½ Volts No. 62-51 or 62-57 (B Section 90 Volts

Ref. No.	Part No.	Description	Qty. Used in Set
<b>CAPACITORS</b>			
C-1	47X445	270 mfd Molded	1
C-2		Part of C-3 (Gang Capacitor)	1
C-3	26A431	Gang Capacitor and Pulley Assembly	1
C-4			3
C-5	866500	.05 mf 200 V Tubular	1
C-6	47X476	100 mfd Molded	2
C-7		Part of T-3, 1st I-F Transformer	1
C-8A			2
C-8B			1
C-11	866104	0.1 mf 200 V Tubular	1
C-12	47X463	47 mfd Molded	1
C-13	45X350	4.0 mf 100 V Dry Electrolytic	1
C-14A		Part of T-4, 2nd I-F Transformer	1
C-14B			1
C-15A	47X112	50 mfd Dual Mica	1
C-15B			2
C-16	866103	.01 mf 200 V Tubular	1
C-19	866202	.002 mf 200 V Tubular	1
C-20	47X111	10 mfd Molded	1
C-21			1
<b>TRANSFORMERS AND COILS</b>			
T-1	9A1800	Antenna Coil Assembly	1
T-2	9A1853	Oscillator Coil Assembly	1
T-3	9A1801	1st I-F Transformer and Can Assembly	1
T-4	9A1802	2nd I-F Transformer and Can Assembly	1
T-5	51X128	Output Transformer	1
<b>RESISTORS</b>			
R-1	885104	100k Ohms	1
R-2	884103	10k 0.5 Carbon	1
R-3	885334	330k 0.5 Carbon	1
R-5	884473	47k 0.5 Carbon	1
R-6	884225	2.2 meg. 0.5 Carbon	2
R-7	884335	3.3 meg. 0.5 Carbon	1
R-8	885473	47k 0.5 Carbon	1
R-9	885475	4.7 meg. 0.5 Carbon	1
R-10	36X355	500k Volume Control & Switch	1
R-11	885335	3.3 meg. 0.5 Carbon	1
R-12	43X95	1.0 (5% Resist. Wire)	1
R-13	885475	4.7 meg. 0.5 Carbon	1
R-14	885105	1.0 meg. 0.5 Carbon	1
R-15	885225	2.2 meg. 0.5 Carbon	1
R-16	884331	330 0.5 Carbon	1
R-17	885471	470 0.5 Carbon	1

MONTGOMERY WARD



TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the heater and dial lamp are between the socket terminal and "X" point.

The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

- Line voltage ..... 117 volts AC
  - Volume control ..... maximum
  - Signal input ..... none
- A variation of ±10% is usually permissible.

NOTE: CHASSIS GROUND ONLY. NOT EXTERNAL

ALL POINTS MARKED "X" RETURN TO THIS POINT

		STANDARD TUBE SOCKET SYMBOLS	
O--MODE PLATE G--CONTROL GRID C--ANODE GRID G <sub>2</sub> --OSCILLATOR GRID S--SCREEN GRID H--HEATER K--CATHODE M--NO CONNECTION P--PLATE S--METAL SHELL S <sub>1</sub> --SUPPRESSOR GRID			

MODEL 64WG-1804C

## MONTGOMERY WARD ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.

Volume Control—Maximum All Adjustments.

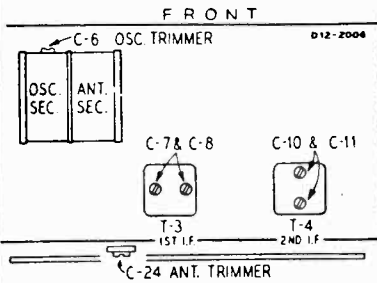
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

The equipment in column at right is required for aligning:

Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter; Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 50 mmf.

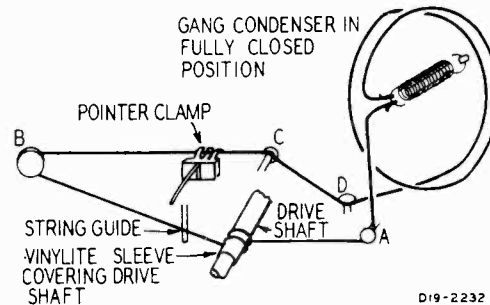


SIGNAL GENERATOR			Coupling Capacitor	DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT IN ORDER SHOWN (See Trimmer Illustration)
Frequency Setting	Connection to Receiver	Ground Connection			
455 kc	Control Grid 12SF7—I-F (Prong No. 2)	Point "X" 12SK7—R-F (Prong No. 3)	.1 mf	Turn Rotor to full open	2nd I-F (C10) & (C11)
455 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	Turn Rotor to full open	1st I-F (C7) & (C8)
1620 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	Turn Rotor to fully open position	Oscillator (C6)
1400 kc	External Antenna Clip on Loop	Chassis	50 mmf	Turn Rotor to 1400 kc Index Line. See Note A	Antenna (C24)

NOTE A:—Index line is on dial light diffuser strip. See DIAL CALIBRATION paragraph.

### DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully closed position. Use a new drive cord 42" long and tie one end to the tension spring. Hook the other end of the tension spring over the tab on the drive pulley. Pass the cord through the slot on the drive pulley rim, around stud A and wind two turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Pass cord around pulley B and studs C and D. Pass cord under drive pulley and wind 1 3/4 turns counterclockwise around drive pulley. Stretch tension spring and tie free end of cord to spring. Cut off any excess cord.



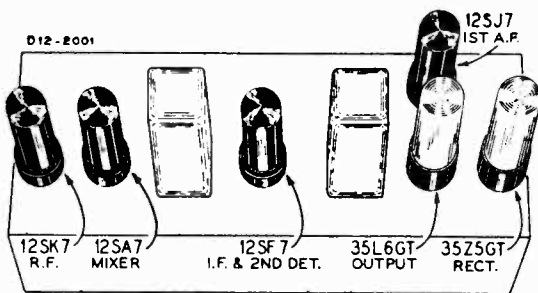
D19-2232

Attach the dial pointer to the cord and position as instructed in paragraph DIAL CALIBRATION.

### DIAL CALIBRATION

In order to align the receiver, the dial pointer must be positioned on the dial string correctly with reference to the dial. Index lines are provided on the dial light diffuser for this purpose.

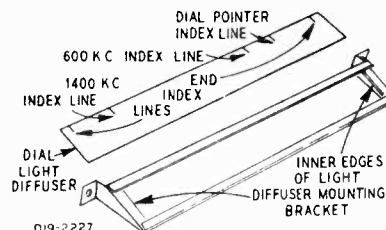
Before aligning the receiver (or when replacing the dial light diffuser) check the position of the diffuser strip, making certain that the two end index lines are aligned with the inner edges of the diffuser mounting bracket opening. The bracket should be crimped at one point to prevent movement of the diffuser strip. To position the dial pointer, turn the gang condenser to the fully closed position. The dial pointer should be directly over the dial pointer index line. (See illustration)



### ELECTRICAL SPECIFICATIONS

- Power Supply.....105-125 volts AC, 50-60 cycles, 35 watts or 105-125 volts DC
- Selectivity.....At 1000 KC, 50 KC wide at 1000 times signal
- Sensitivity.....(for .05 watt output with external antenna) 15 microvolts average
- Power Output.....1.3 watts maximum  
.75 watt 10% distortion
- Loud Speaker.....4" x 6" PM dynamic
- Voice Coil Impedance...3.2 ohms at 400 cycles

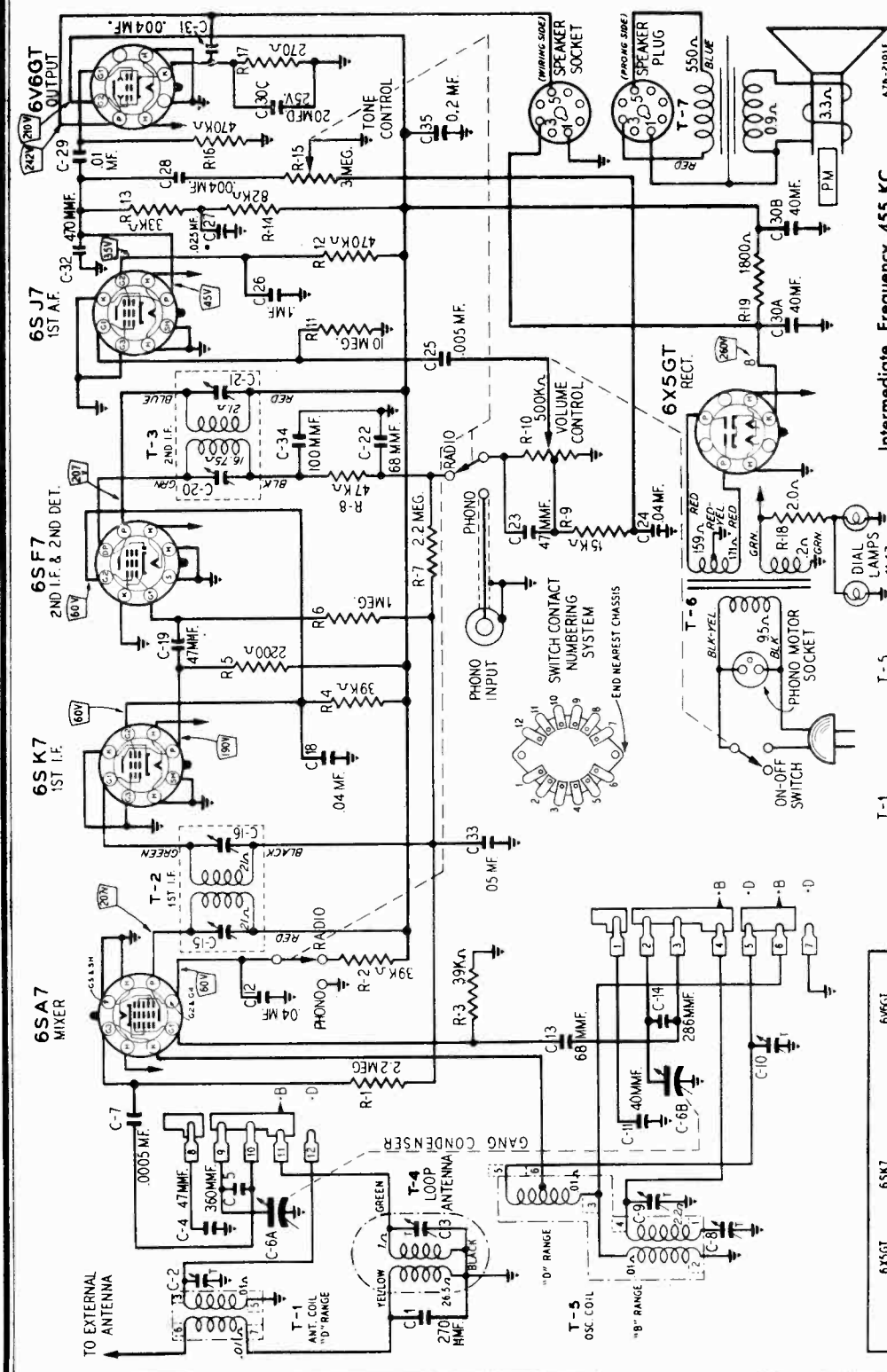
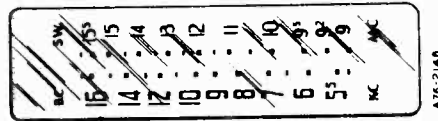
The 1400 KC index line is for use when aligning the receiver.



D19-2227

MONTGOMERY WARD

MODELS 64WG-2010A,  
64WG-2010B,  
74WG-2010B



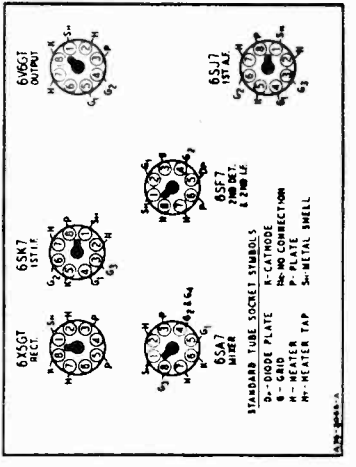
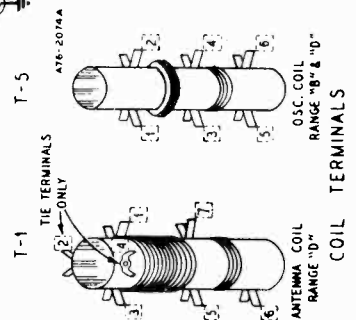
Intermediate Frequency...455 KC

TUBE SOCKET VOLTAGES

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

The readings were taken with a 1000 ohm per volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

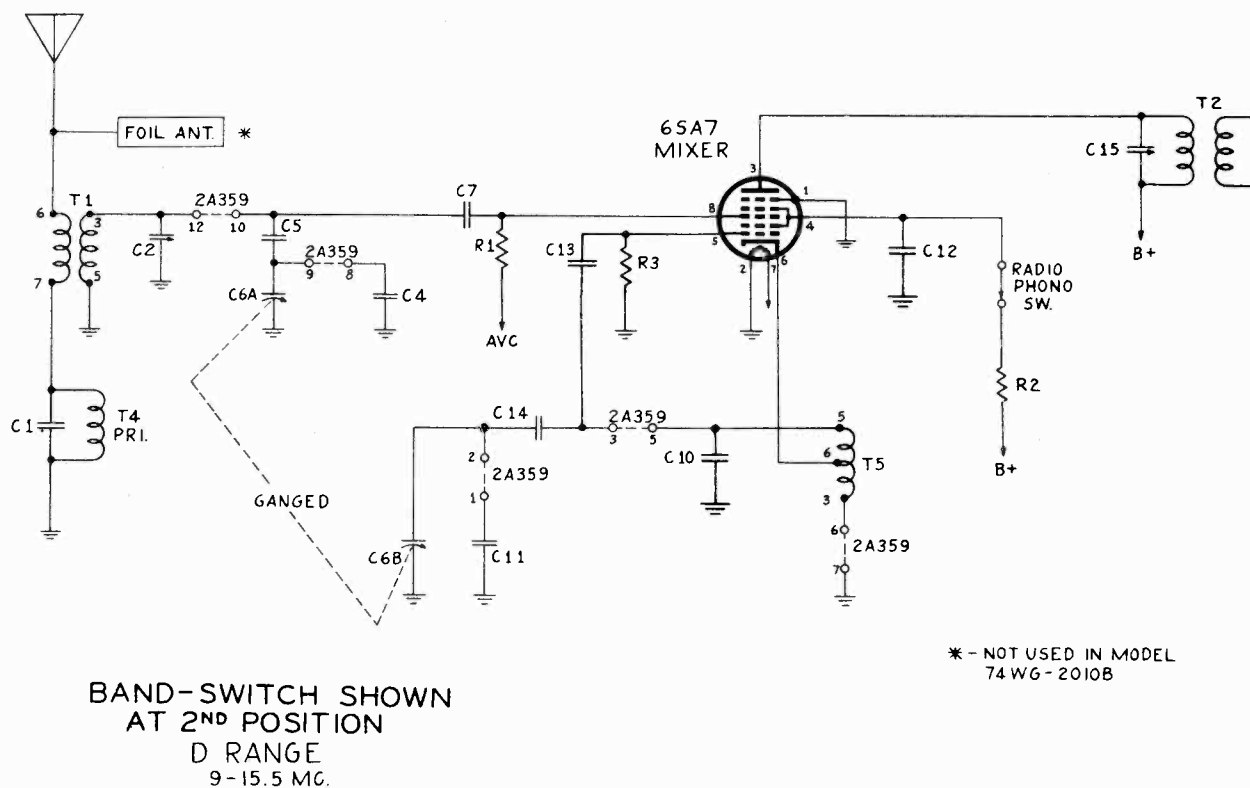
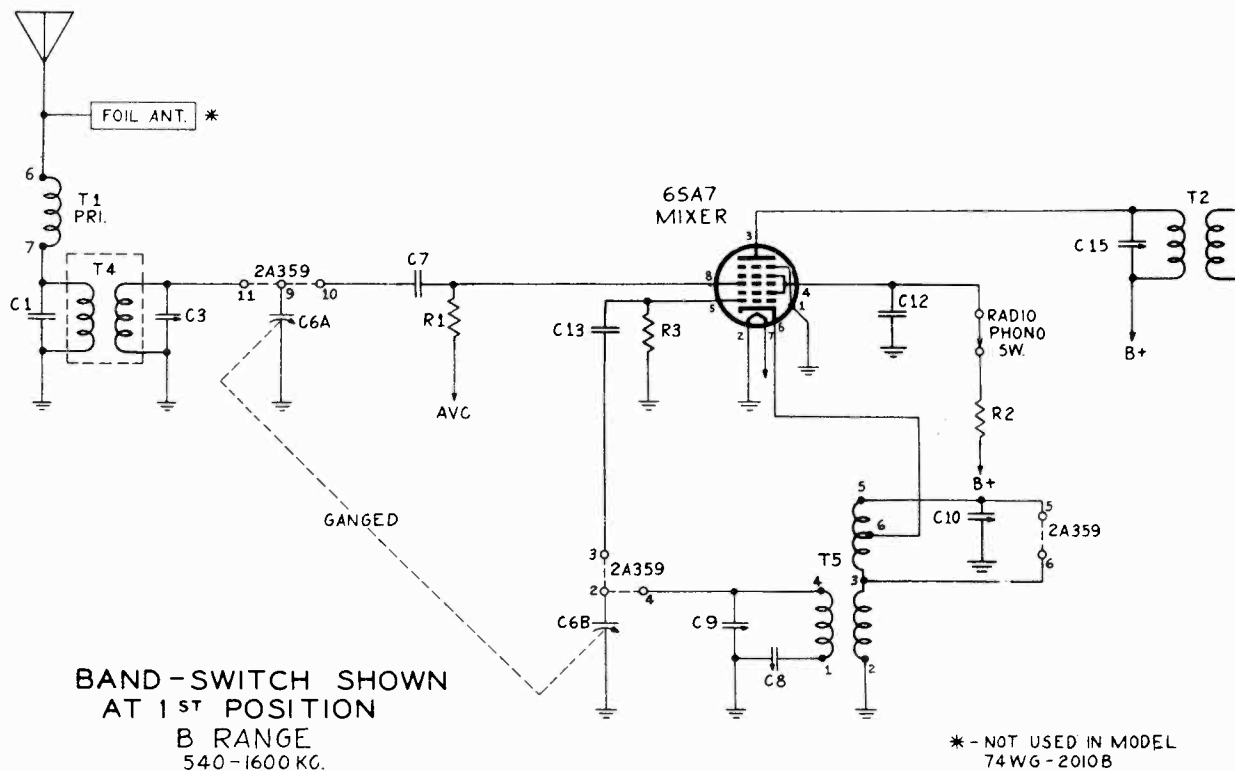
Line voltage..... 117 volts AC  
Volume control..... maximum  
Signal input..... none  
A variation of ± 10% is usually permissible.



# "clarified schematics"

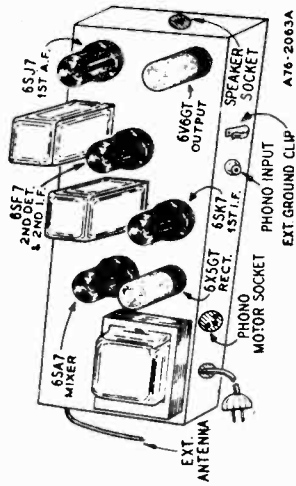
## MONTGOMERY WARD

MODELS 64WG-2010A,  
64WG-2010B,  
74WG-2010B



MONTGOMERY WARD

MCDELS 64WG-201CA,  
64WG-2010B,  
74WG-2010B

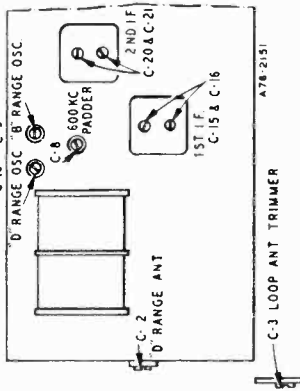
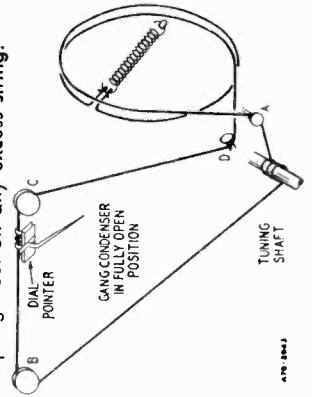


50 CYCLE OPERATION

Should it be desired to use the radio and record player on a 50 cycle power supply, it will be necessary to slip a 50 cycle conversion spring over the motor drive shaft on the record player. This conversion spring is listed in the parts list; however, alternate motor sources have been used for the changer and it will be necessary to check the motor assembly number stamped on the motor mounting plate and then order the conversion spring listed in the parts list under that motor.

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new drive cord 46" long and tie one end to the tension spring. Hook the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue one and one-half turns counterclockwise around the drive pulley. Then pass the cord around idler stud A and wind three and one-half turns clockwise around the tuning shaft (turns must progress away from chassis). Pass cord around pulleys B and C and around idler stud D. Wrap cord counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring. Cut off any excess string.



ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.  
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.  
Allow Chassis and Signal Generator to "Heat Up" for several minutes.  
The following equipment is required for aligning:  
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.  
Output Indicating Meter; Non-Metallic Screwdriver.  
Dummy Antennas—1 mf., 100 mmf., and 400 ohms.

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

NOTE A—If the pointer is not at 1400 KC on the dial, re-set pointer at the 1400 KC mark on the dial scale.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

SIGNAL GENERATOR	Frequency Setting	Band Switch Setting	Condenser Setting	Adjust Trimmers to Maximum
I-F	455 kc	B Range	Turn Rotor to Full Open	2nd I-F (C-20) & (C-21) 1st I-F (C-15) & (C-16)
RANGE B	1620 kc	B Range	Turn Rotor to Full Open	Oscillator Range B (C-9)
	1400 kc	B Range	Tune Rotor to Max. Output. Set Indicator to 1400 KC. See Note A	Antenna Range B (C-3)
	600 kc	B Range	Tune Rotor to Max. Output	600 kc (C-8) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C-9) causes no further improvement in output.				
RANGE D	15.6 mc	D Range	Turn Rotor to Full Open	Oscillator Range D (C-10)
	14 mc	D Range	Tune Rotor to Max. Output	Antenna Range D (C-2) Rock Rotor—See Note B
LOOP RANGE B	1400 kc	B Range	Tune Rotor to Max. Output	Antenna Range B (C-3)

- Selectivity.....40 KC broad at 1000 times signal, 1000 KC
- Sensitivity.....(for .5 watt output) with external antenna  
B range—9 microvolts average  
D range—20 microvolts average
- Power Output.....4 watts maximum  
Loud Speaker.....2.3 watts, 10% distortion  
Voice Coil Impedance.....3.2 ohms at 400 cycles

ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts AC, 60 cycles, 40 watts. (60 watts phono operating)  
Frequency Range.....B range—540-1600 KC  
D range—9 to 15.5 MC



MONTGOMERY WARD

MODELS 64WG-2010A,  
64WG-2010B, 74WG-2010B  
MODELS 74WG-2505A,  
74WG-2705A

RECEIVER STAGE SENSITIVITIES MODEL 74WG-2010B 64WG-2010A & B

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of .5 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of

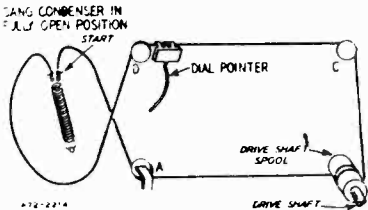
1.26 volts across this resistor will be equivalent to a .5 watt output with the speaker connected. The volume control must be set to maximum. The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Variations of Plus or Minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR .5 WATT OUTPUT
Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	External antenna lead	Chassis	9 microvolts
1000 kc	.05 mf	6SA7 Mixer, Pin 8	Same as above	42 microvolts
455 kc	.05 mf	6SA7 Mixer, Pin 8	Same as above	40 microvolts
455 kc	.05 mf	6SK7 1st I-F, Pin 4	Same as above	1075 microvolts
455 kc	.05 mf	6SF7 2nd I-F, Pin 2	Same as above	3900 microvolts
400 cycles	.05 mf	6SJ7 1st A-F, Pin 4	Same as above	.08 volt
400 cycles	.05 mf	6V6GT Output, Pin 5	Same as above	3.75 volts

DRIVE CORD REPLACEMENT

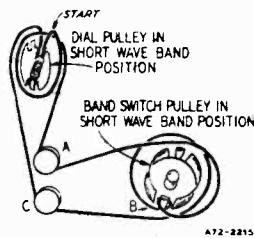
DIAL POINTER CORD

Use a new 10X60 drive cord assembly or a new length of cord 50 inches long for the installation. Install the cord as shown in the illustration winding two turns counterclockwise around the drive shaft spool with the turns progressing towards the front end of the drive shaft. After completing the installation rotate the drive shaft a few turns to take up the slack in the cord.

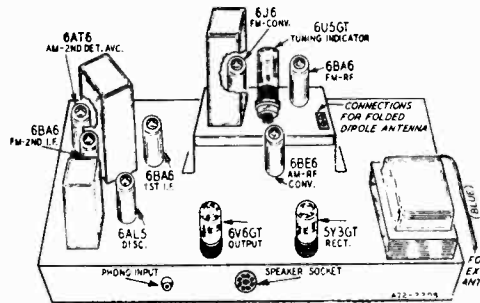
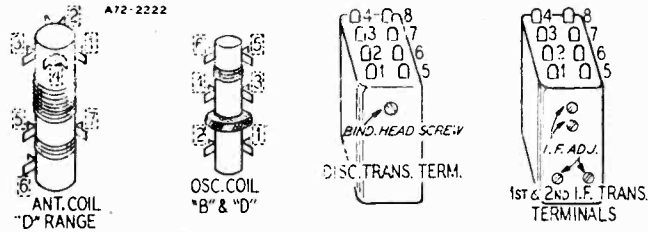


DIAL ROTATION CORD

Use a new 10X61 drive cord assembly or a new length of cord 21 inches long for the installation. Both the dial pulley and the band switch pulley must be turned to the short wave band positions as shown in the illustration. Install the new cord exactly as shown then change the position of the band switch several times and note the movement of the dial.



MODEL 74WG-2505A, 2705A



ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts AC 50-60 cycles, 80 watts  
 Frequency Ranges.....Broadcast 540-1600 KC  
 Frequency Modulation 88-108 MC  
 Short Wave 9-15.5 MC  
 Selectivity.....AM-40 KC broad at 1000 times signal, measured at 1000 KC  
 I.F. FM-225 KC broad at 2 times down  
 I.F. FM-700 KC broad at 200 times down

AM Sensitivity.....(For .5 watt output with external antenna)  
 Broadcast, 12 microvolts average  
 Short Wave, 20 microvolts average  
 FM Sensitivity.....(For .5 watt output)  
 25 microvolts average  
 Power Output.....5.2 watts maximum  
 3.5 watts 10% distortion  
 Loud Speaker.....10" Electro Dynamic  
 Voice Coil Impedance.....3.2 ohms 400 cycles

MONTGOMERY WARD

MODELS 64WG-2010A, 64WG-2010B, 74WG-2010B, MODEL 74BR-1812A

MODEL 74BR-1812A

HOW TO ORDER PARTS—When ordering, specify PART applicable, and CHASSIS MODEL number. The model number appears on a label on the chassis.

REPLACEMENT PARTS INFORMATION

OPERATING VOLTAGES—Chassis for Model 74WG-2010B are available for operation on the following power supply: 105-125 volts AC, 60 cycles

HOW TO ORDER PARTS—Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Repair parts should be ordered from your nearest Wards Retail Store, Catalog Order office or Mail Order House.

REPLACEMENT PARTS LIST

Use Only Genuine Factory Replacement Parts

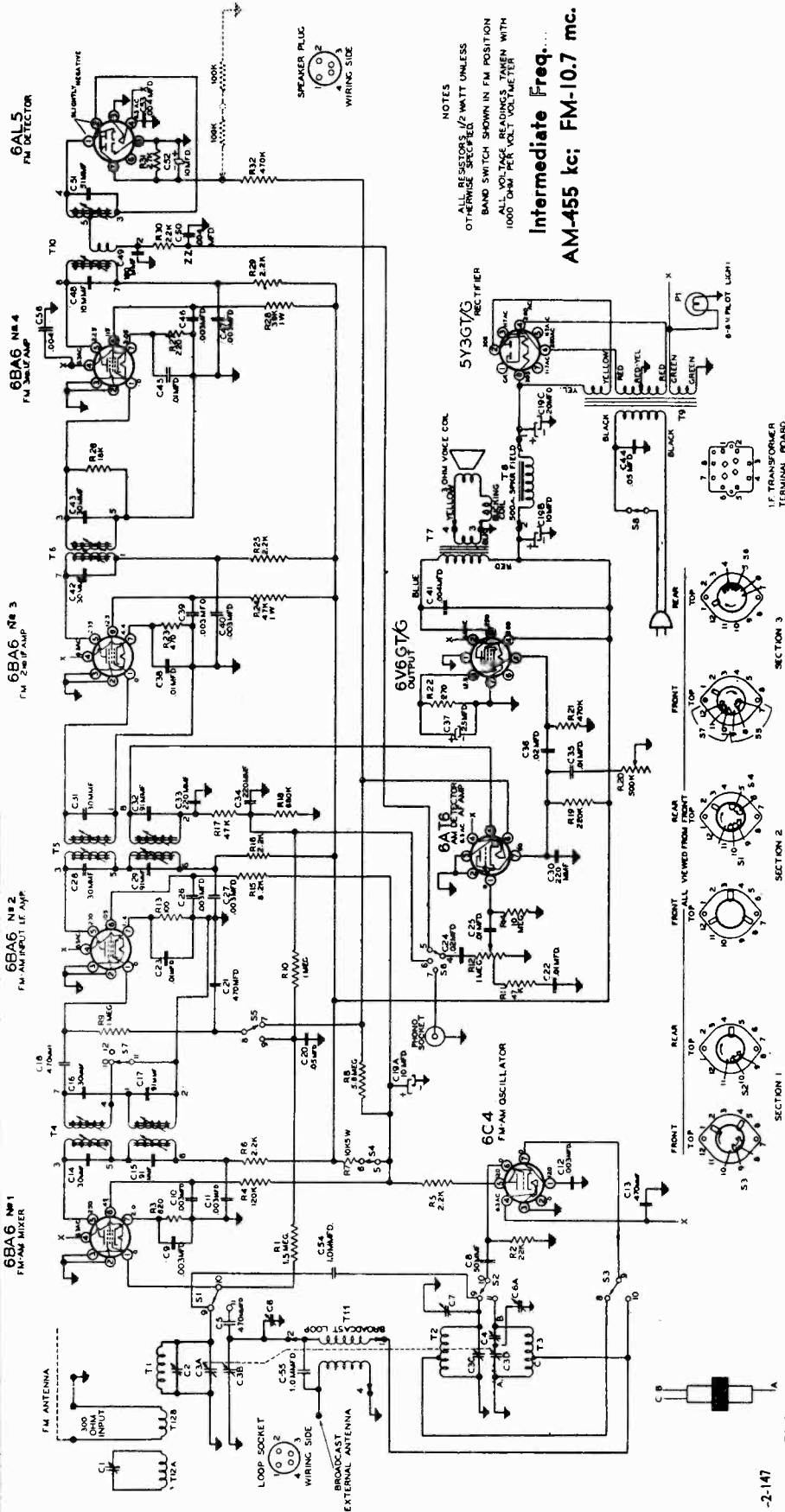
Table with columns: Ref. No., Part No., Description, Qty. Used in Set. Includes sections for R. F. TUNER PARTS, CONDENSERS, RESISTORS, TRANSFORMERS AND COILS, MISCELLANEOUS, and MAIN CHASSIS PARTS.

REPLACEMENT PARTS LIST

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Table with columns: Ref. No., Part No., Description, Qty. Used in Set. Includes sections for CAPACITORS, TRANSFORMERS AND COILS, DIAL AND DRIVE ASSEMBLY, MISCELLANEOUS, TYPE S-28A119 RECORD CHANGER PARTS, SUBSTITUTE PARTS, and RESISTORS.

USES SEEBURG MODEL "X" RECORD CHANGER



NOTES  
 ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED  
 BAND SWITCH SHOWN IN FM POSITION  
 ALL VOLTAGE READINGS TAKEN WITH 1000 OHM PER VOLT VOLTMETER

Intermediate Freq. . . . .  
 AM-455 kc; FM-10.7 mc.

IF TRANSFORMER TERMINAL BOARD

SECTION 1

SECTION 2

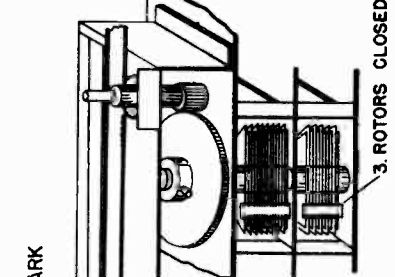
SECTION 3

SECTION 4

SECTION 5

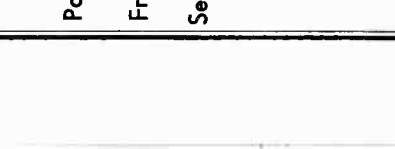
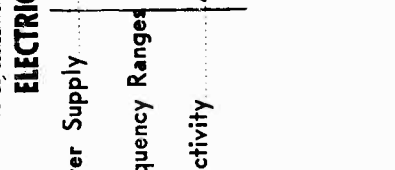
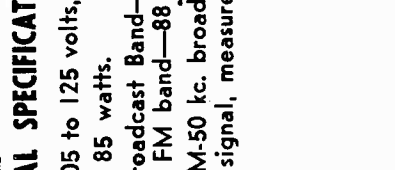
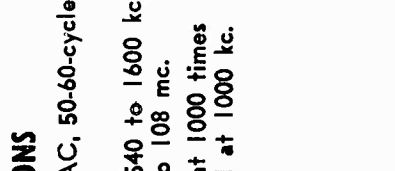
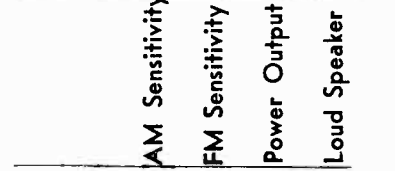
SECTION 6

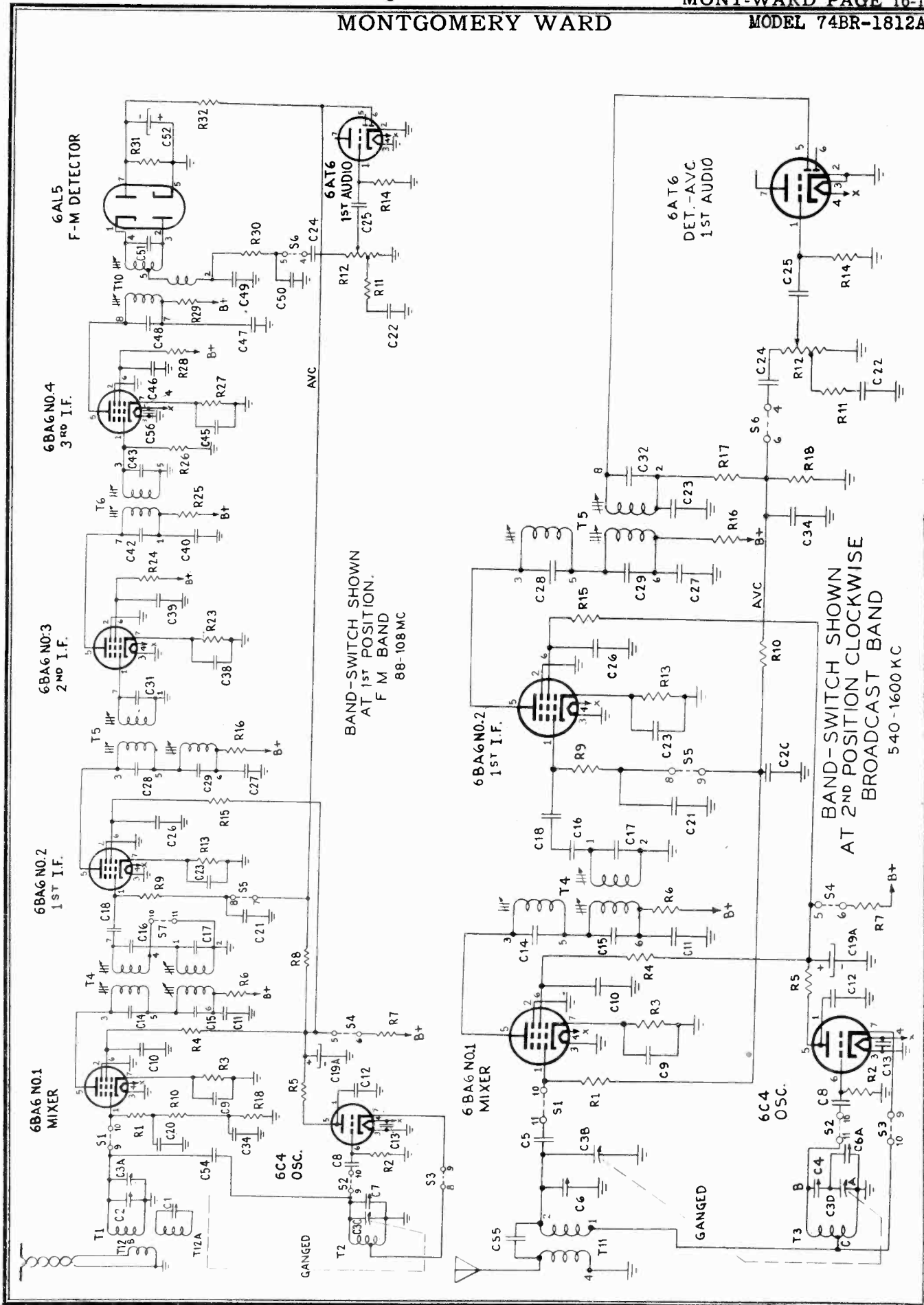
SECTION 7



- CALIBRATION SCALE**
1. LOOSEN SET SCREW
  2. PULL SLIDE OUT UNTIL SET SCREW IS APPROXIMATELY IN POSITION SHOWN.
  3. ROTORS CLOSED & WITH POINTERS CLOSED LINE UP ON CALIBRATION SCALE.
  4. TIGHTEN SCREW.

- ELECTRICAL SPECIFICATIONS**
- Power Supply . . . . . 105 to 125 volts, AC, 50-60-cycles; 85 watts.
  - Frequency Ranges Broadcast Band—540 to 1600 kc. FM band—88 to 108 mc.
  - Selectivity . . . . . AM-50 kc. broad at 1000 times signal, measured at 1000 kc.
  - I.F. FM-180 kc. broad at 2 times down.
  - I.F. FM-290 kc. broad at 10 times down.
  - AM Sensitivity (For .5 watt output with external antenna)—20 microvolts average
  - FM Sensitivity (For .5 watt output)—15 microvolts average.
  - Power Output 3.5 watts 10% distortion. 7 watts maximum.
  - Loud Speaker 6" x 9" oval electrodynamic. Voice coil impedance 3.2 ohms, 400 cycles.





**ALIGNMENT PROCEDURE**

*Broadcast Band Section I.F. and R. F.*

The alignment procedure below includes the sensitivities at the inputs of various stages. All signal input values are based on an output of 1/2 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2-ohm resistor across the secondary winding of the output transformer. A reading of 1.3 volts AC across this resistor will be approximately equivalent to a 1/2-watt output with the speaker connected. The volume control

must be set at maximum. The tone control must be set for maximum treble.

The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycles audio signal. A 400 cycle audio signal is required for the audio measurement. Variations in sensitivities of plus or minus 25% are usually permissible.

**AM - I. F. ALIGNMENT**

*Band Switch in AM Position. Tune Set to 1400 Kc. Dummy Antenna .1 Mfd.*

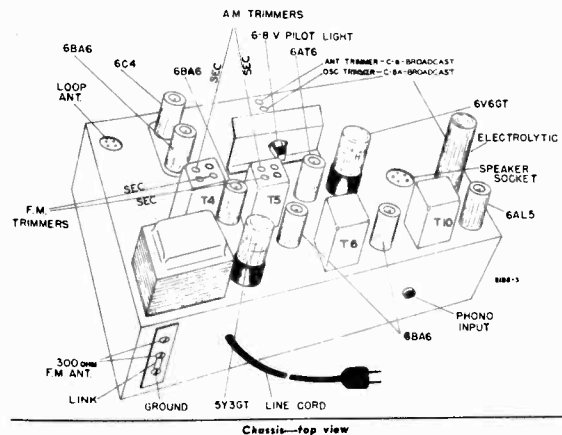
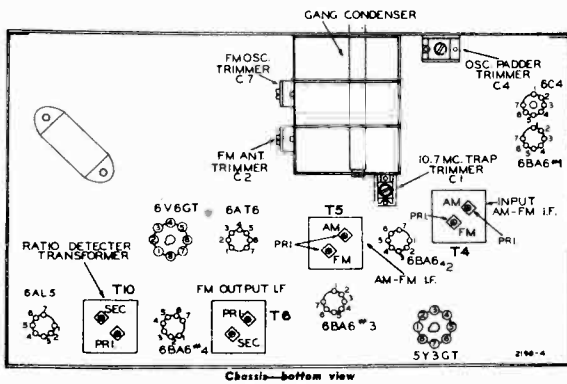
SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	ADJUSTMENT TO BE MADE	ADJUST FOR
455 Kc. Use 2100 microvolts	Pin No. 1 of 6BA6 No. 2 and ground	Primary and Secondary of T5 AM windings. See top and bottom views	Maximum output Should be 1/2 watt
455 Kc. Use 64 microvolts	Pin No. 1 of 6BA6 No. 1 and ground	Primary and Secondary of T4 AM windings. See top and bottom views	Maximum output Should be 1/2 watt
400 cycles. Use 63 millivolts	Pin No. 1 of 6AT6 and ground	None	Maximum output Should be 1/2 watt

**BROADCAST BAND - R. F. ALIGNMENT**

*Check Pointer so that it is Exactly Over Calibration Marker to the Extreme Left When Gang is Fully Closed. For Adjustment Loosen Set Screw on Large Gear. (see dial mechanism illustration.)*

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	DUMMY ANTENNA	ADJUST
1400 Kc. Use 15 microvolts	Antenna and Ground	200 mmf.	C6A for maximum 1/2 watt
600 Kc. Use 25 microvolts	Antenna and Ground	200 mmf.	C4 for maximum 1/2 watt
1400 Kc.	Antenna and Ground	200 mmf	C6 See Note

NOTE: Recheck first two adjustments after this adjustment because of inter-locking effects.



MONTGOMERY WARD

**ALIGNMENT PROCEDURE**

*FM Band Section. I.F. and R.F.*

**IMPORTANT**

No alignment of the FM section of this radio should be attempted unless you are positive that the circuits are in need of adjustment and you have the necessary equipment.

All components used in this radio are extremely stable and the tuned circuits should require no adjustment over long periods of time.

**NOTE**

The following alignment is based on the use of the new Simpson vacuum tube voltmeter which has a "floating ground". In other words, the meter, when used as a vacuum tube voltmeter, can have both the positive and negative sides connected to points above ground and still give true readings.

A standard AM signal generator is required.

**FM - I. F. ALIGNMENT**

*Band Switch in FM Position. Dummy Antenna .1 Mfd.*

SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	VACUUM TUBE VOLT METER CONNECTION TO RADIO	ADJUSTMENT TO BE MADE	ADJUST FOR
10.7 Mc. Use about .1 volt	Pin No.1 of 6BA6 no. 4 and ground	Pin no. 7 of 6AL5 and ground	Primary of T10	Resonance should be about 3 volts
10.7 Mc. Use about .1 volt	Pin No.1 of 6BA6 no. 4 and ground	See note "A"	Secondary of T10	Zero. Use zero center scale. See note "B"
10.7 Mc. Use about 4000 microvolts	Pin No.1 of 6BA6 no. 3 and ground	Pin no. 7 of 6AL5 and ground	Primary and Secondary of T6	Resonance should be about 3 volts
10.7 Mc. Use about 150 microvolts	Pin No.1 of 6BA6 no. 2 and ground	Pin no. 7 of 6AL5 and ground	Primary and Secondary of 10.7 mc. windings of T5. See top and bottom views	Resonance should be about 3 volts
10.7 Mc. Use 3000 microvolts	FM Antenna input and ground	Pin no. 7 of 6AL5 and ground	Primary and Secondary of 10.7 mc. windings of T4. See top and bottom views	Resonance should be about 3 volts See Note "C"
10.7 Mc.	FM Antenna input and ground	Pin no. 7 of 6AL5 and ground	C1	Minimum reponse. This is a trap circuit

**NOTES ON FM—I.F. ALIGNMENT:**

NOTE "A" Connect two resistors, 100K OHMS each, from Pin No. 7 of 6AL5 to ground. These resistors must be matched within 5%. Connect as shown in dotted lines on schematic diagram. Connect vacuum tube voltmeter between the mid point of the resistors and point zz.

NOTE "B" If T10 has been tampered with, it is possible that no

crossover point will be found at first. Careful adjustment of both primary and secondary is necessary.

GENERAL: Input signals should be adjusted to give approximately 3 volts. The ratio detector is operating at a reasonable level at this point and will give the truest indication of correct alignment with the procedure specified.

NOTE "C" The input microvolts specified is based on the trap circuits being adjusted.

**FM - R. F. ALIGNMENT**

*Check Pointer so that it is Exactly Over Calibration Marker to the Extreme Left When Gang is Fully Closed. For Adjustment Loosen Set Screw on Large Gear. (see dial mechanism illustration.)*

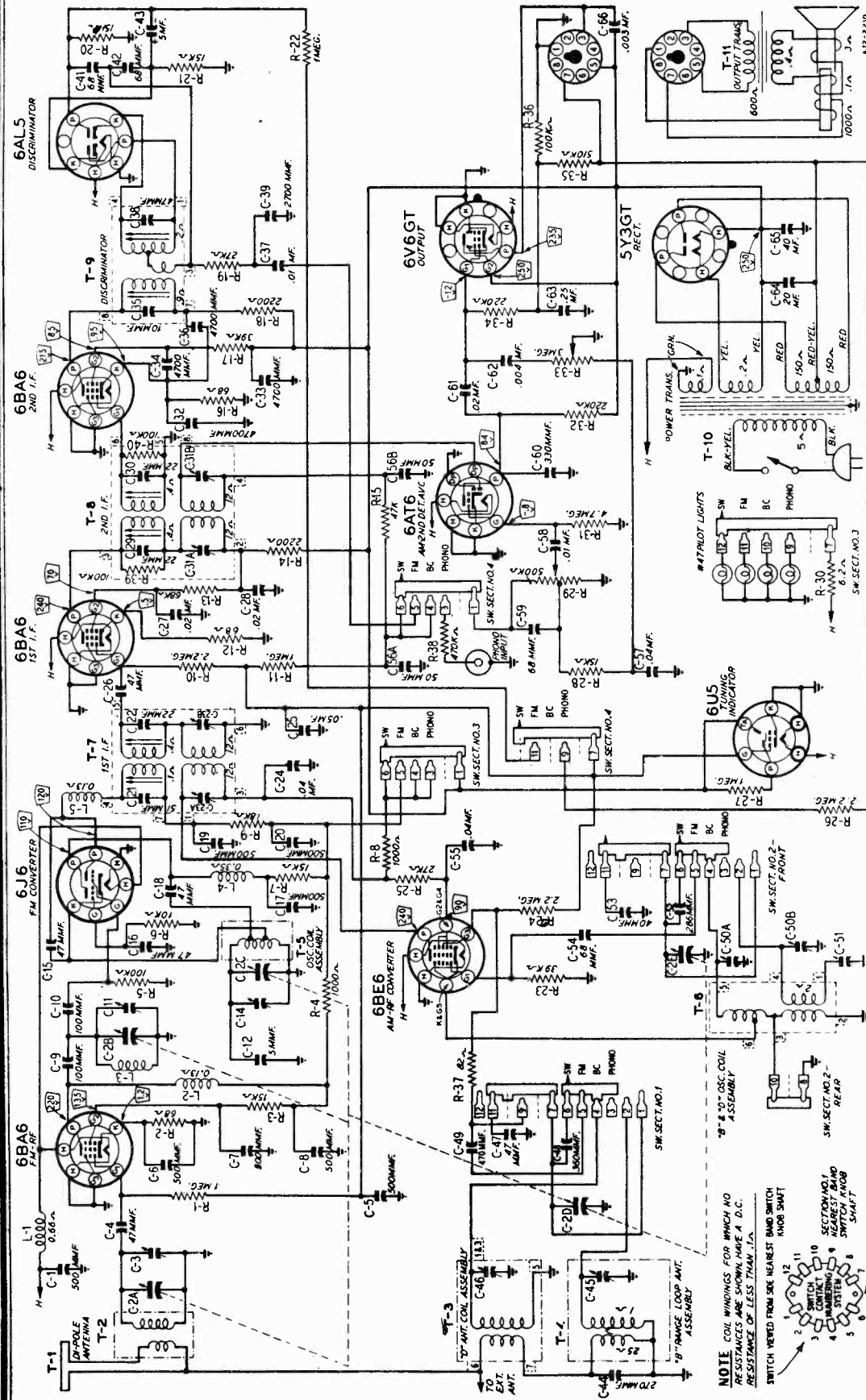
SIGNAL GENERATOR FREQUENCY	CONNECTION TO RADIO	DUMMY ANTENNA	ADJUST	VACUUM TUBE VOLT METER CONNECTION TO RADIO	ADJUST TO
100 Mc. Use about 15 microvolts	FM Antenna lead	300 ohms	C7 Osc. C2 Ant.	Pin No. 7 of 6AL5 and Ground	Resonance about 3 volts

NOTE: If a signal generator with the above fundamental frequency is not available, it is sometimes possible to use harmonics. Use extreme care in picking harmonics. An alternate procedure is

to use a local station carrier of known frequency to align the FM Band and to use the vacuum tube volt meter as above for resonance indication. A weak carrier, however will not produce 3 volts.

MODELS 74WG-2505A,  
74WG-2705A

MONTGOMERY WARD



Intermediate Frequency, AM-455 KC  
FM-10.7 MC



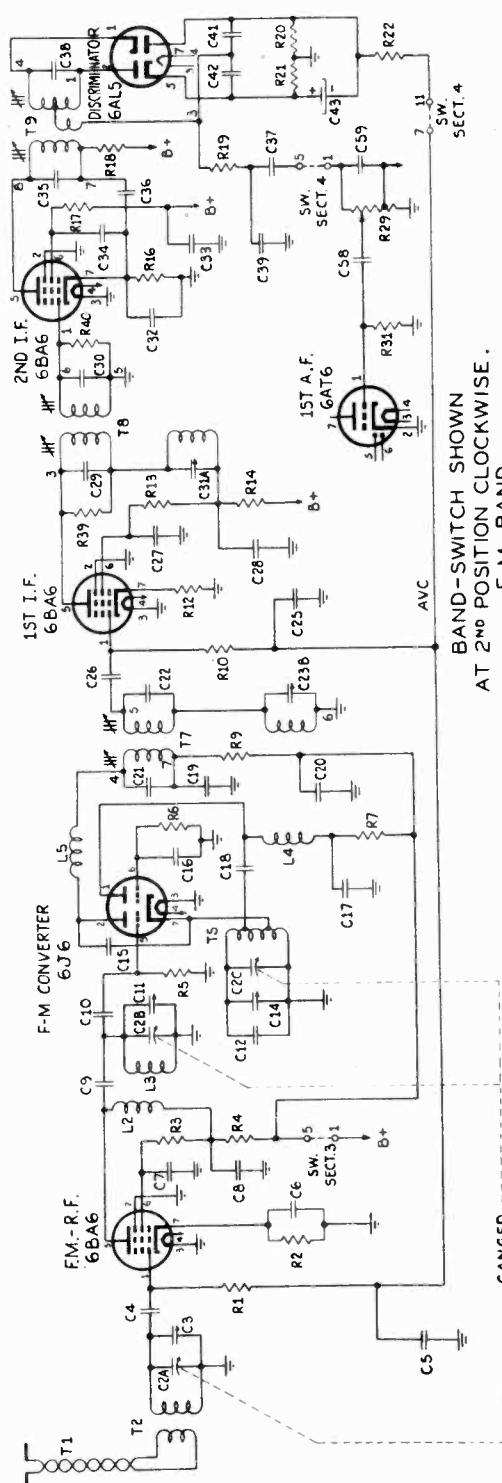
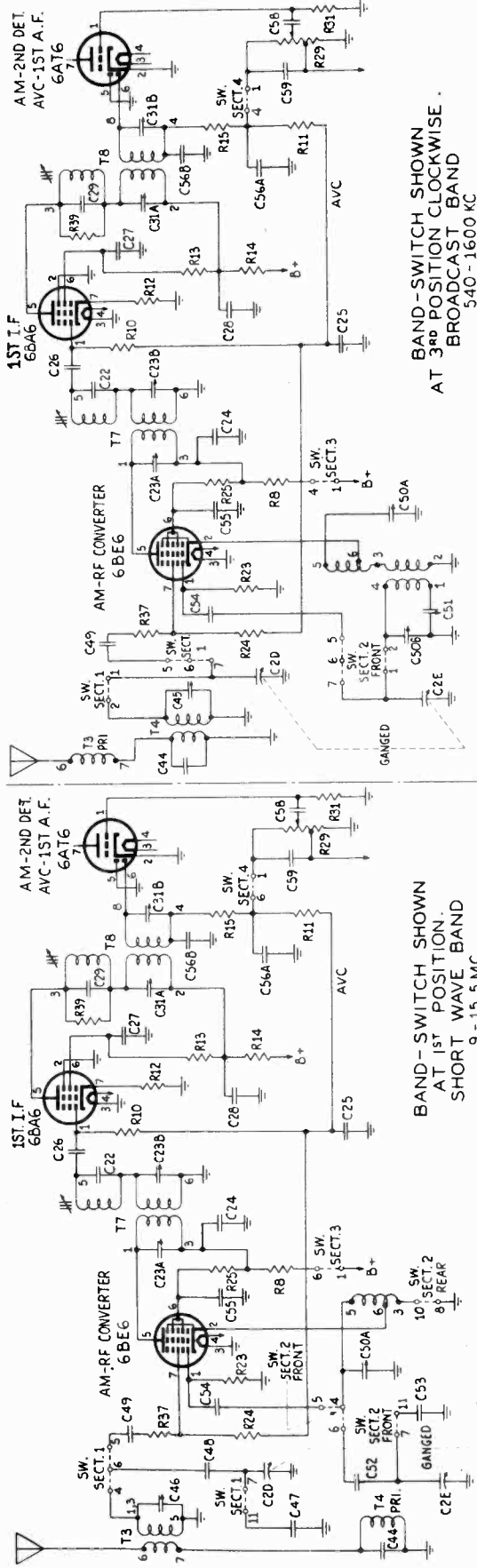
NOTE: COIL WINDINGS FOR WHICH NO RESISTANCES ARE SHOWN HAVE A D.C. RESISTANCE OF LESS THAN 1 Ω.

SWITCH VIEWED FROM SIDE NEAREST BAND SWITCH IN/OUT SWITCH

SECTION NO. 1  
NEAREST BAND SWITCH KNOB  
SECTION NO. 2  
REAR  
SECTION NO. 3  
FRONT

11  
10  
9  
8  
7  
6  
5  
4  
3  
2  
1  
END NEAREST CHASSIS

RECORD CHANGER for MODEL 74WG-2705A: Seeburg Model L. P.15-18





**ALIGNMENT PROCEDURE**

**FM STAGES**

Allow chassis and signal generator to warm up for several minutes. The following equipment is required for aligning:

An accurately calibrated signal generator providing unmodulated signals at the test frequencies listed below.

Non-metallic screwdriver.

Dummy Antennas and I-F Loading Resistor—.01 mf, 300 ohms and 5000 ohms.

Zero center scale DC vacuum tube voltmeter having a range of approximately 3 volts.

(If a zero center scale meter is not available, a standard scale vacuum tube voltmeter may be used by reversing the meter connections for negative readings.)

SIGNAL GENERATOR		DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUSTMENT FOR MAX. METER DEFLECTION
FREQUENCY SETTING	CONNECTION AT RADIO				
Discriminator	10.7 MC Note B	6BA6 2nd I-F Pin 1 and Chassis	.01 mf	FM	Rotor to Full Open Disc. Pri. ① Note A
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above Disc. Sec. Note C ②
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above Disc. Pri. ① Note A
	10.7 MC Note B	Same as above	.01 mf	FM	Same as above Disc. Sec. Note C ②
I-F	10.7 MC	6BA6 1st I-F, Pin 1 and Chassis	.01 mf	FM	Same as above 2nd I-F Pri. Note A and D ③ 2nd I-F Sec. Note A and E ④
	10.7 MC	Connect to the FM-RF Gang Condenser terminal on underside of chassis	.01 mf	FM	Same as above 1st I-F Pri. ⑤ 1st I-F Sec. ⑥ Note A
Recheck I-F Adjustments in order given					
R-F & Osc.	108.4	Disconnect dipole and connect generator to dipole terminals with resistor in series	300 ohms	FM	Rotor to full open Oscillator C-14
	104.5	Same as above	300 ohms	FM	Tune Rotor for Max. AVC voltage R.F. C-11
	104.5	Same as above	300 ohms	FM	Same as above .Ant. C-3
Recheck R-F and Osc. Adjustments in order given					

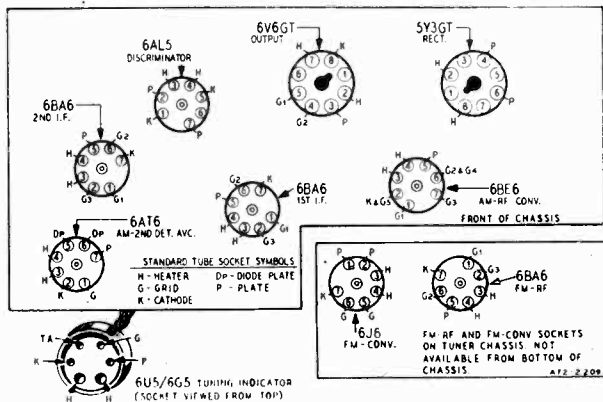
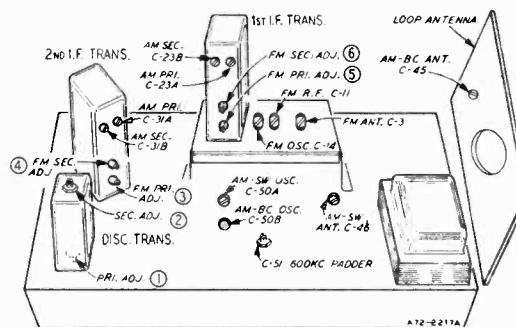
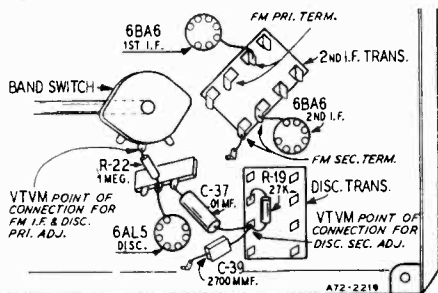
Note A—Test Equipment connections are as given in the table. The zero center scale DC vacuum tube voltmeter is to be connected between chassis ground and the AVC line at the 1 megohm resistor R-22 and the band switch terminal (as shown in the illustration) for all adjustments except the discriminator secondary adjustment, for which see Note C.

Note B—A signal of .1 volt must be fed into the receiver for this adjustment.

Note C—Disconnect zero center DC vacuum tube voltmeter from AVC and reconnect to junction of R-19, C-37 and C-39 (See illustration). Adjust for zero voltage indication.

Note D—Before adjusting Pri. core connect 5000 ohm load resistor across the 2nd I.F. secondary terminals, (See illustration).

Note E—Disconnect 5000 ohm load resistor from secondary terminals and reconnect across the 2nd I.F. primary terminals, (See illustration).



**TUBE SOCKET VOLTAGES**

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground. Plate, screen and cathode voltages were taken with a 1000 ohm-per-volt meter with a 300 volt scale used for plate and screen voltages. Audio grid voltages were read with a vacuum tube voltmeter. Conditions of measurement are:

Line voltage.....117 Volts AC  
Signal Input.....None

A variation of ±10% is usually permissible.

**RECEIVER STAGE SENSITIVITIES  
AM AND AUDIO STAGES**

The table below lists the sensitivity of the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of .5 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of 1.26 volts across this resistor will be equivalent to a .5 watt output.

The volume control must be set to maximum.

The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Variations in sensitivity of Plus or Minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR .5 WATT OUTPUT
FREQUENCY	COUPLING CAPACITOR	CONNECTION TO RECEIVER	GROUND CONNECTION	
1000 KC	200 mmf or RMA Dummy Antenna	External Antenna Lead	Chassis	25 Microvolts
1000 KC	.05 mf	6BE6 Converter Pin 7	Chassis	60 Microvolts
455 KC	.05 mf	6BE6 Converter Pin 7	Chassis	58 Microvolts
455 KC	.05 mf	6BA6 1st I-F Pin 1	Chassis	2400 Microvolts
400 cycles	.05 mf	6AT6 1st A-F Pin 1	Chassis	.05 Volt
400 cycles	.05 mf	6V6GT Output Pin 5	Chassis	2.8 Volts

**FM STAGES**

The table below lists the sensitivity for the FM stages of the receiver. The receiver must be tuned to 98 MC for all readings. Measurements are based on a .5 watt output the same as for the AM and Audio stage measurements.

The signal source must be an accurately calibrated signal generator capable of supplying a 98 MC signal modulated by a 400 cycle audio signal. For these measurements the generator must be adjusted for a 22.5 KC deviation. This will correspond to 30% AM modulation.

SIGNAL GENERATOR				INPUT FOR .5 WATT OUTPUT
FREQUENCY	COUPLING TO RECEIVER	CONNECTION TO RECEIVER	GROUND CONNECTION	
98 MC	300 ohms	External Antenna Terminal	External Ant. Terminal	30 microvolts
10.7 MC	.01 mf	6BA6 1st I-F Pin 1	Chassis	1200 microvolts
10.7 MC	.01 mf	6BA6 2nd I-F Pin 1	Chassis	37,000 microvolts

**ALIGNMENT PROCEDURE  
AM BROADCAST AND SHORT WAVE BAND**

Volume Control—Maximum all Adjustments. Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead. Allow Chassis and Signal Generator to "Heat Up" for several minutes. The following equipment is required for aligning: An All Wave Signal

Generator which will provide an accurately calibrated signal at the test frequencies as listed.  
Output Indicating Meter; Non-Metallic Screwdriver.  
Dummy Antennas—.1 mf, 200 mmf, and 400 ohms.

	SIGNAL GENERATOR			BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA			
I-F	455 kc	6BE6 Pin 7	.1 mf	Broadcast	Rotor Fully Open	2nd I-F C-31B & C-31A 1st I-F C-23B & C-23A
Broadcast	1620 kc	External ant. lead	200 mmf	Broadcast	Rotor Fully Open	Oscillator C-50B
	1400 kc	External antenna lead	200 mmf	Broadcast	Turn Rotor to Max. Output Set pointer to 1400 kc See Note A	Antenna C-45
	600 kc	External antenna lead	200 mmf	Broadcast	Turn Rotor to Max. Output and Rock See Note B	600 Kc padder C-51
Repeat above oscillator adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer C-50B causes no further improvement in output.						
Short Wave	15.5 MC	External antenna lead	400 ohm	Short Wave	Rotor Fully Open	Oscillator C-50A
	15 MC	External antenna lead	400 ohm	Short Wave	Turn Rotor to Max. Output	Antenna C-46
Reassemble chassis in cabinet						
Broadcast	1400 kc	External antenna lead	200 mmf	Broadcast	Turn Rotor to Max. Output	Antenna C-45

After each range is completed, repeat the procedure as a final check. Note A—If the pointer is not at 1400 KC on the dial, reset pointer at the 1400 KC mark on the dial scale.

Note B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

MODELS 74WG-2505A,  
74WG-2705A

MONTGOMERY WARD

**OPERATING VOLTAGES**—Chassis for Models 74WG-2505A are available for operation on the following power supply:

105-125 volts AC, 50-60 cycles

**HOW TO ORDER PARTS**—Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Repair parts should be ordered from your nearest Words Retail Store, Catalog Order office or Mail Order House.

**REPLACEMENT PARTS LIST**

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Ref. No.	Part No.	Description	Qty. Used in Set
<b>CAPACITORS</b>			
C1	47X492	2700 mmf	1
C2	47X501	68 mmf	4
C3	43X352	5 mf	1
C4	47X445	270 mmf	1
C5	17A123	1.5-12 mmf	1
C6	17A244	5.30 mmf	1
C7	47X500	47 mmf	1
C8	47X474	360 mmf	1
C9	47X467	470 mmf	1
C10	17A246	3.2-35 mmf	1
C11	17A241	300-475 mmf	1
C12	47X500	5 mmf	1
C13	17A247	3.12 mmf	1
C14	47X459	47 mmf	1
C15	47X498	47 mmf	1
C16	47X450	51 mmf	1
C17	47X467	22 mmf	1
C18	17A248	70-150 mmf	2
C19	D66403	04 mf	2
C20	865503	05 mf	1
C21	D66203	02 mf	3
C22	47X491	4700 mmf	4
C23	47X489	10 mmf	1
C24	E66103	01 mf	2

Part No.	Description	Qty. Used in Set
C-39	47X492	2700 mmf
C-41	47X501	68 mmf
C-42	43X352	5 mf
C-43	47X445	270 mmf
C-44	17A123	1.5-12 mmf
C-45	17A244	5.30 mmf
C-46	47X500	47 mmf
C-47	47X474	360 mmf
C-48	47X467	470 mmf
C-49	17A246	3.2-35 mmf
C-50A	17A241	300-475 mmf
C-51	47X459	47 mmf
C-52	47X498	47 mmf
C-53	47X500	5 mmf
C-54	17A247	3.12 mmf
C-55	47X467	22 mmf
C-56	17A248	70-150 mmf
C-57	865503	05 mf
C-58	D66203	02 mf
C-59	47X491	4700 mmf
C-60	47X489	10 mmf
C-61	E66103	01 mf
C-62	D66403	04 mf
C-63	865503	05 mf
C-64	D66203	02 mf
C-65	47X491	4700 mmf
C-66	47X489	10 mmf
C-67	E66103	01 mf
C-68	D66403	04 mf

Part No.	Description	Qty. Used in Set
R-1	885105	1 meg
R-2	885105	1 meg
R-3	885105	1 meg
R-4	885105	1 meg
R-5	885105	1 meg
R-6	885105	1 meg
R-7	885105	1 meg

Part No.	Description	Qty. Used in Set
R-1	885105	1 meg
R-2	885105	1 meg
R-3	885105	1 meg
R-4	885105	1 meg
R-5	885105	1 meg
R-6	885105	1 meg
R-7	885105	1 meg

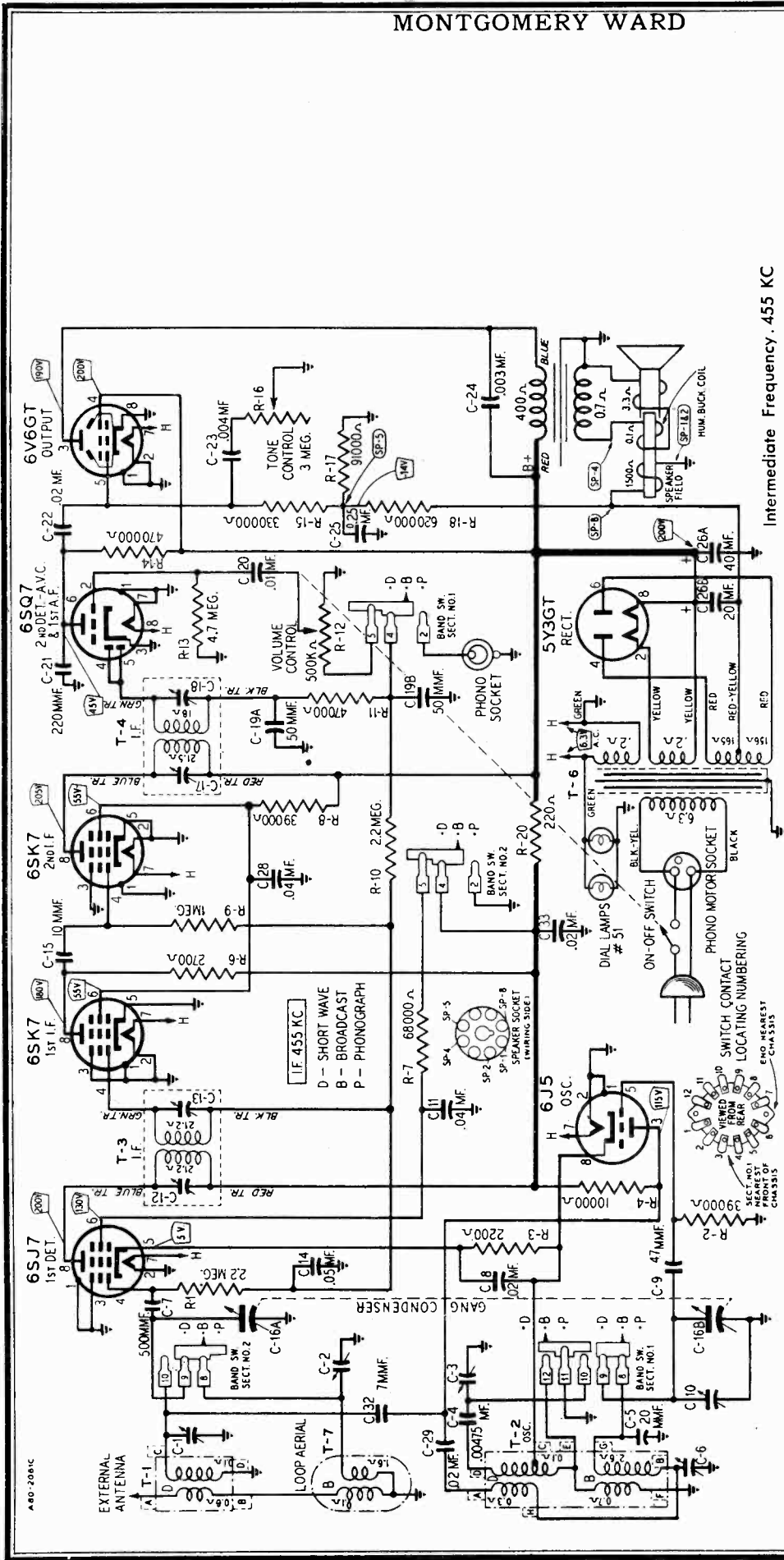
Part No.	Description	Qty. Used in Set
R-9	Ohms	1
R-10	18K	1
R-11	2.2 meg	3
R-12	68K	1
R-13	2200	2
R-14	47K	1
R-15	39K	1
R-16	27K	1
R-17	15K	2
R-18	39K	1
R-19	27K	1
R-20	15K	1
R-21	39K	1
R-22	27K	1
R-23	15K	1
R-24	39K	1
R-25	27K	1
R-26	15K	1
R-27	39K	1
R-28	27K	1
R-29	15K	1
R-30	39K	1
R-31	27K	1
R-32	15K	1
R-33	39K	1
R-34	27K	1
R-35	15K	1
R-36	39K	1
R-37	27K	1
R-38	15K	1
R-39	39K	1
R-40	27K	2

Part No.	Description	Qty. Used in Set
<b>MISCELLANEOUS</b>		
12A470	10" E.D. Speaker complete with output transformer	1
3A303	Cone and voice coil assembly type 471 par: number and letters stamped on speaker	3
3A425	Output transformer (specify part type and letters stamped on speaker)	5
3Z386	Tube socket—miniature	7
3A427	Tube shield—miniature (for FM R.F. and Converter Tubes)	2
13X549	Cable and socket assembly—tuning indicator	1
3A305	Phone socket—single pin	1
3A304	Phone motor socket	1
2A367	Band switch	1
13X328	Line cord and plug assembly	1
10A510	Knob—tuning-band-tone	3
10A513	Knob—volume control and switch	6
10A509	Push Button	6
2EX320	Push Button Spring	6
26A439	Escutcheon Assembly	1
4X870	Escutcheon Eye	1
<b>DIAL AND DRIVE ASSEMBLY</b>		
26A435	Dial Bracket Assembly	1
58X590	Dial	1
58X591	Dial Background	1
15X221	Printer	1
26A438	Dial Drum Assembly	2
26X500	Dial Drum Shaft	1
26A440	Pulley and Collar Assembly (For Dial Drum Shaft)	1
26A437	Pulley Assembly (For Band Switch)	1
26X469	Band Switch Shaft	1
24X553	Pinion Gear (For Band Switch Shaft)	1
26A441	Crown Gear Assembly (For Wgt. to Band Switch)	1
26A434	Idler Bracket Assembly	1
29X1389	Drive Shaft Bracket	1
26X467	Drive Shaft	1
24X551	Drive Shaft Spool	1
10X60	Drive Cord and Clip Assembly (Band Change)	1
28X524	Tension Spring (Band Change)	1
10X61	Drive Cord and Clip Assembly (Dial Drive)	1
28X530	Tension Spring (Dial Drive)	1
7A209	Indicator Light Socket Assembly	4
41X72	Light Shield	4
7A187	Pilot Light Socket Assembly (Dual)	2
41X35	Light Shield	2
25X498	No. 47 Pilot Light	6
25X1396	Tuning Eye Clamp	1
	Tuning Eye Bracket	1

Part No.	Description	Qty. Used in Set
<b>RESISTORS (cont.)</b>		
R-9	Ohms	1
R-10	18K	1
R-11	2.2 meg	3
R-12	68K	1
R-13	2200	2
R-14	47K	1
R-15	39K	1
R-16	27K	1
R-17	15K	2
R-18	39K	1
R-19	27K	1
R-20	15K	1
R-21	39K	1
R-22	27K	1
R-23	15K	1
R-24	39K	1
R-25	27K	1
R-26	15K	1
R-27	39K	1
R-28	27K	1
R-29	15K	1
R-30	39K	1
R-31	27K	1
R-32	15K	1
R-33	39K	1
R-34	27K	1
R-35	15K	1
R-36	39K	1
R-37	27K	1
R-38	15K	1
R-39	39K	1
R-40	27K	2

Part No.	Description	Qty. Used in Set
<b>TRANSFORMERS AND COILS</b>		
L-1	Filament Choke Assembly	1
L-2	FM Mixer Plate Choke	2
L-3	R.F. Coil	1
L-4	FM Oscillator Plate Choke	1
T-1	Di-Pole Antenna	1
T-2	Antenna Coil Assembly	1
T-3	"D" Antenna Coil Assembly	1
T-4	"B" Range Loop Antenna Assembly	1
T-5	Oscillator Coil Assembly	1
T-6	"B" and "D" Oscillator Coil Assembly	1
T-7	1st I.F. Coil Assembly	1
T-8	2nd I.F. Coil Assembly	1
T-9	Discriminator Coil Assembly	1
T-10	Power Transformer (60 cycle)	1
T-10	33X287	1
T-10	Power Transformer (25 cycle)	1
T-10	33X288	1
T-11	Power Transformer (40 cycle)	1
T-11	Output Transformer (see misc list/areas)	1

Part No.	Description	Qty. Used in Set
R-1	885105	1 meg
R-2	885105	1 meg
R-3	885105	1 meg
R-4	885105	1 meg
R-5	885105	1 meg
R-6	885105	1 meg
R-7	885105	1 meg



Intermediate Frequency .455 KC

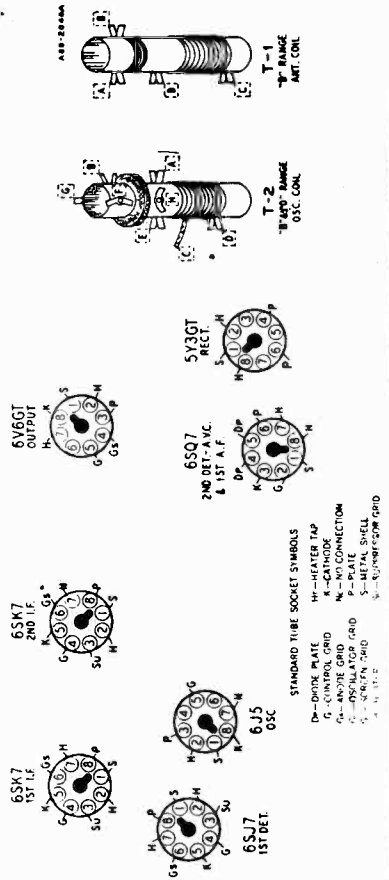
**TUBE SOCKET VOLTAGES**

Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

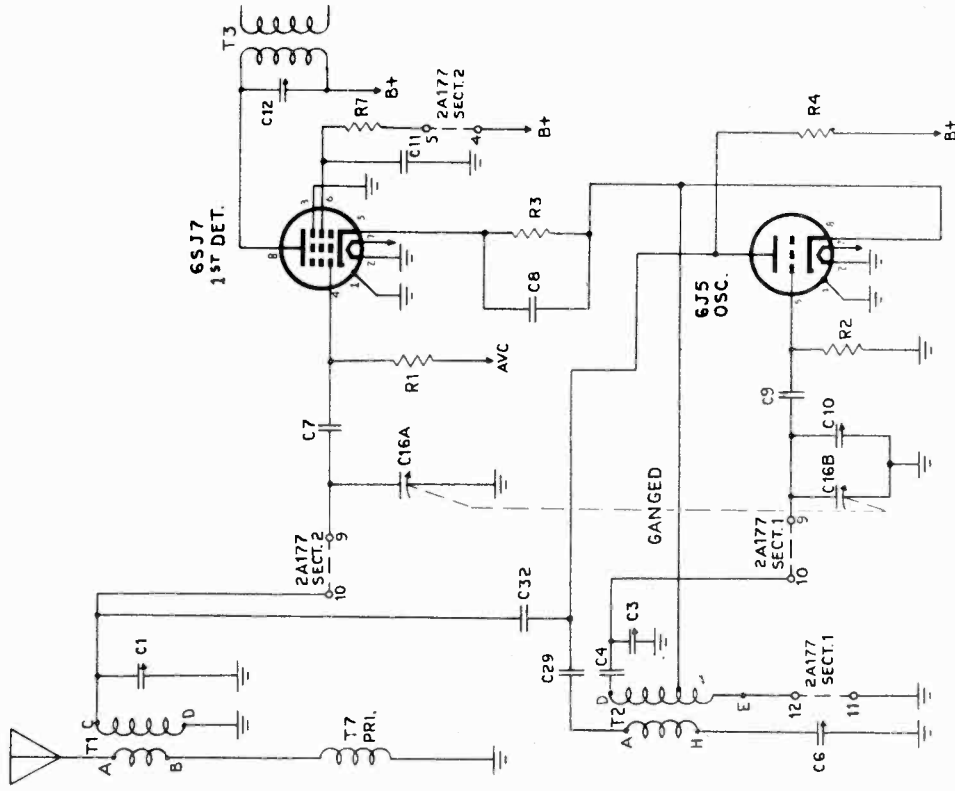
The readings were taken with a 1000 ohm per volt meter and all plate and screen voltages read on a 500 volt scale.

Conditions of measurement are:

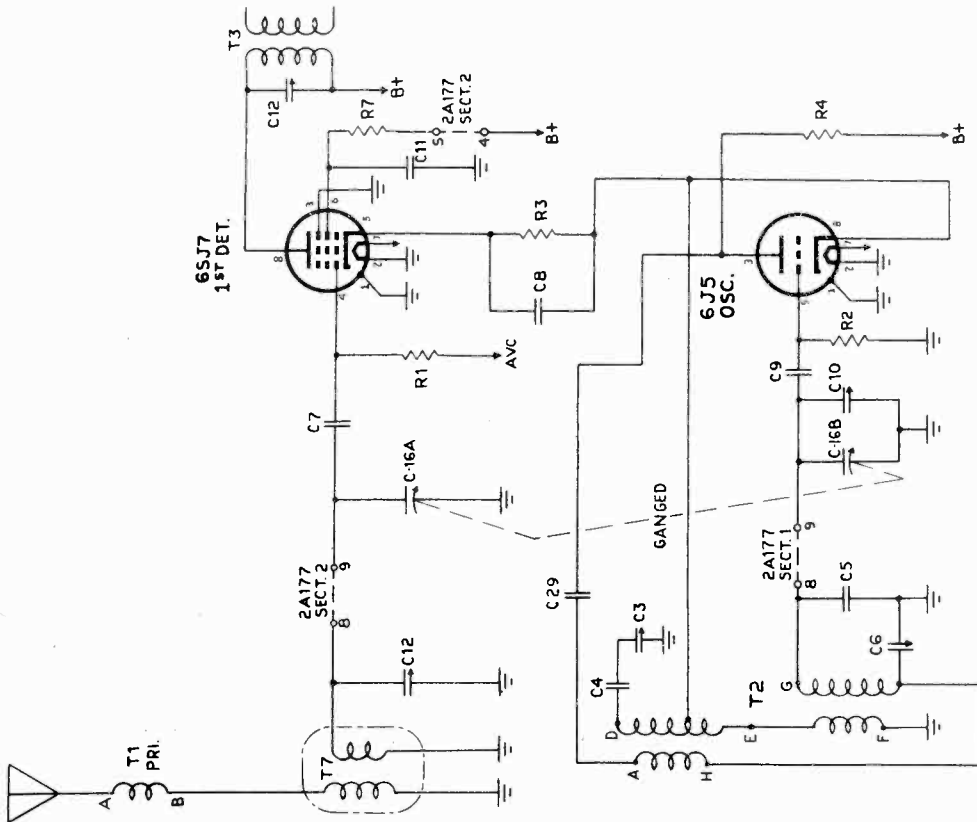
- Line voltage.....117 volts AC
- Volume control.....maximum
- Signal input.....none
- A variation of ± 10% is usually permissible.



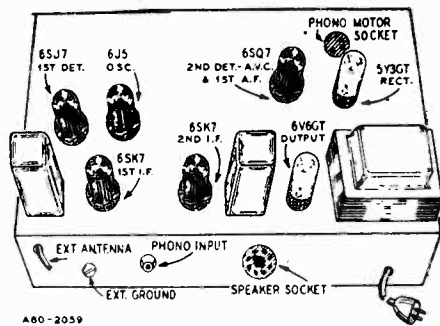
*"clarified schematics"*



BAND-SWITCH SHOWN  
AT 2<sup>ND</sup> POSITION.  
D RANGE  
5.71 - 18.3 MC



BAND-SWITCH SHOWN  
AT 1<sup>ST</sup> POSITION.  
B RANGE  
540 - 1600 KC

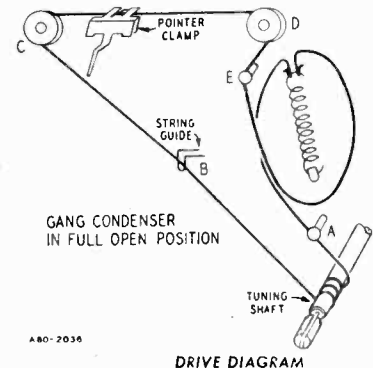
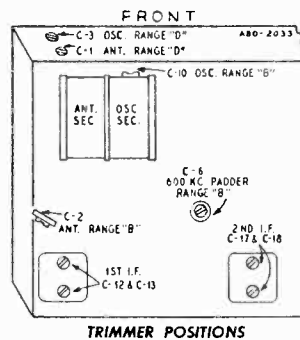


**50 CYCLE OPERATION**

If it is desired to use the radio and record player on a 50 cycle power supply, it will be necessary to replace the metal drive pulley on the record player motor shaft with a 50 cycle pulley. This pulley is listed in the parts list. To change the pulley, turn the record selector post to the 12" position and lift the turntable off the record changer. Loosen the set screw holding the drive pulley on the motor shaft and remove the old pulley. Install the new 50 cycle pulley and replace the turntable.

**DRIVE CORD REPLACEMENT**

Turn the gang condenser to the fully open position. Use a new 10X59 drive cord or a piece of cord 46" long and tie one end to the tension spring. Hook the other end of the tension spring to the tab on the drive pulley. Pass the cord through the slot in the drive pulley rim and continue one half turn counterclockwise around the drive pulley. Then pass the cord around idler stud A and wind three turns clockwise around the tuning shaft (turns must progress away from chassis). Pass cord through string guide B, over pulleys C and D and around idler stud E. Wrap 3/4 turn counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring. Cut off any excess cord.



**ALIGNMENT PROCEDURE**

Volume Control—Maximum All Adjustments.  
Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.  
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning:  
An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.  
Output Indicating Meter; Non-Metallic Screwdriver.  
Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR		Dummy Antenna	Band Switch Setting	Condenser Setting	ADJUST TRIMMERS TO MAXIMUM
	Frequency Setting	Connection at Radio				
I-F	455 kc	6SJ7, Pin 4	.1 mf	B Range	Turn Rotor to Full Open	2nd I-F (C17) & (C18) 1st I-F (C12) & (C13)
RANGE B	1600 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Full Open	Oscillator Range B (C10)
	1400 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC See Note A	Antenna Range B (C2)
	600 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output	600 kc (C6) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1600 and 600 kc until readjusting the oscillator Range B Trimmer (C10) causes no further improvement in output.						
RANGE D	18,300 kc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C3)
	17,000 kc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Max. Output	Antenna Range D (C1) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Max. Output	Antenna Range B (C2)

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

NOTE A—If the pointer is not at 1400 KC on the dial, re-set

pointer at the 1400 KC mark on the dial scale.

NOTE B—Turn the rotor back and forth and adjust the trimmer until the peak of greatest intensity is obtained.

**REPLACEMENT PARTS INFORMATION**

**OPERATING VOLTAGES** Chassis for Model 74WG-2703A, are available for operation on the following power supply  
105-125 volts AC, 60 cycles

**HOW TO ORDER PARTS** Should it be necessary to write us or to order any repair parts, it is important that the complete model number which appears on the label attached to the rear of the chassis be specified. Repair parts should be ordered from your nearest Wards Retail Store, Catalog Order office or mail Order House.

**REPLACEMENT PARTS LIST**

Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Ref. No.	Part No.	Description	Qty. Used in Set
C-1	17A163	2.25 mfd Ant. "D" Range Trimmer	1
C-3	17A149	2.25 mfd Osc. "D" Range Trimmer	1
C-2	46X289	1.812 mfd Loop aerial trimmer	1
C-4	46X289	.00475 180 V Tubular	1
C-5	47X482	20 mfd Molded	1
C-6	17A234	300-450 mfd 600 kc Padder	1
C-7	D67501	.0005 mfd 400 V Tubular	1
C-8	865203	.02 200 V Tubular	2
C-9	47X463	Molded	1
C-10	1066403	Part of gang condenser C-16	1
C-11	1066403	.04 mfd 400 V Tubular	2
C-12	1066403	Part of 1st I.F. Assembly	1
C-13	865503	.05 mfd 200 V Tubular	1
C-14	47X477	10 mfd Molded	1
C-15	14A150	Gang condenser assembly	1
C-16	14A150	Part of 2nd I.F. Assembly	1
C-17	14A150	Part of 2nd I.F. Assembly	1
C-18	14A150	Part of 2nd I.F. Assembly	1
C-19A	47X112	30 mfd Dual Mold	1
C-19B	866103	.01 mfd Tubular	1
C-20	47X468	220 mfd Molded	1
C-21	1066403	Part of 1st I.F. Assembly	1
C-22	866402	.004 mfd 200 V Tubular	2
C-23	D66302	.003mfd 400 V Tubular	1
C-24	D66302	.003mfd 400 V Tubular	1
C-25	866254	.25 mfd 200 V Tubular	1
C-26A	45X277	40 mfd 400 V Dry electrolytic	1
C-26B	45X277	20 mfd 400 V Dry electrolytic	1
C-32	47X182	7 mfd Ceramic	1
R-1	885225	2.2 meg. 0.5	2
R-2	884393	39,000 0.5	1
R-3	884222	2200 0.5	1
R-4	C84103	10,000 1.0	1
R-5	884272	2700 0.5	1
R-6	884683	98,000 0.5	1
R-7	884593	39,000 1.0	1
R-8	885105	1.0 meg. 0.5	1
R-9	885473	47,000 0.5	1
R-10	36X311	500,000 Yellowine control, ON-OFF switch	1
R-11	885475	4.7 meg. 0.5	1
R-12	885474	470,000 0.5	1
R-13	885334	330,000 0.5	1
R-14	40X259	3 meg. Tone control	1
R-15	885913	91,000 0.5	1
R-16	885924	620,000 0.5	1
R-17	885221	220 0.5	1
R-18	885221	220 0.5	1
R-19	885221	220 0.5	1
R-20	885221	220 0.5	1

Ref. No.	Part No.	Description	Qty. Used in Set
T-1	9A1451	Antenna transformer assembly "D" range	1
T-2	9A1452	Oscillator coil assembly	1
T-3	9A1810	1st I.F. Transformer and fan assembly	1
T-4	9A1811	2nd I.F. Transformer and fan assembly	1
T-5	51X197	Output transformer	1
T-6	53X235	117 volt, 60 cycle standard power transformer	1
T-7	9A1395	10" Band loop antenna	1
MISCELLANEOUS			
12A455	10" Electro dynamic speaker	1	
3A300	Cone and voice coil assembly (specify part number and letter stamped on speaker)	1	
3A293	Tube Socket—octal (8 prong) molded	7	
3A304	Speaker socket—octal (8 prong)	1	
3A305	Phono input socket	1	
10A579	Single pin-top socket (phono)	1	
10A578	Knob (Volume control)	1	
10A618	Knob (Tuning)	1	
10A619	Knob (Tone control)	1	
13X328	Knob (Band change)	1	
2A177	Line cord and plug assembly	1	
8X99	Band and phono switch	1	
	Rubber chassis cushions (chassis to cabinet)	4	
DIAL AND DRIVE ASSEMBLY			
25X839	Gang mounting bracket	1	
6A26	Rubber grommets	4	
20X347	Can. cushion studs	4	
17X445	Pin-washer	4	
20X459	Plate washer	4	
	Plate washers for chassis with roller pulleys, idler, stud, brace bracket, string guide and dial back ground	1	
58X681	Dial scale glass	1	
30X184	Glass clamp	2	
4X962	Dial escutcheon	1	
	No. 2 x 1/4 Phillips Fr. oval hd. Flat. screws (screws for escutcheon painter)	5	
15X190	Drive cord	1	
10X59	Drive cord tension spring	1	
28X113	Drive shaft	1	
26X336	Drive shaft bracket	1	
25X580	"C" washers for drive shaft	2	
19X192	Pilot light socket assembly	2	
7A142	Dial lamp (No. 51)	2	
41X75	Light shield	2	
TYPE W-28A111 RECORD CHANGER PARTS			
W15X084.6	Motor assembly, 40 cycle, 115 volt	1	
Arcotic L275	Crystal cartridge	1	
W41P544.4	50 cycle drive pulley	1	

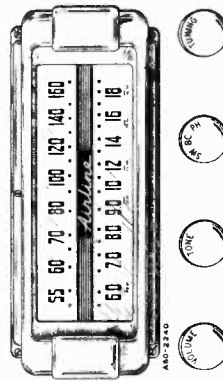
**RECEIVER STAGE SENSITIVITIES**

The table below lists the sensitivity at the input of each stage. The receiver should be tuned to 1000 KC for all readings. All measurements are based on an output of .5 watt. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm, 5 watt resistor across the secondary winding of the output transformer. A reading of 1.26 volts usually permissible.

Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	INPUT FOR .5 WATT OUTPUT
1000 kc	200 mmf or RMA Dummy Antenna	External antenna lead	Chassis	2.3 microvolts
1000 kc	.05 mf	6S17 1st Detector, Pin 4	Same as above	17 microvolts
455 kc	.05 mf	6S17 1st Detector, Pin 4	Same as above	13.0 microvolts
455 kc	.05 mf	6SK7 1st I.F., Pin 4	Same as above	1300 microvolts
455 kc	.05 mf	6SK7 2nd I.F., Pin 4	Same as above	3400 microvolts
400 cycles	.05 mf	6SQ7 1st A-F, Pin 2	Same as above	.07 volt
400 cycles	.05 mf	6V6GT Output, Pin 5	Same as above	3.8 volts

**ELECTRICAL SPECIFICATIONS**

Power Supply ..... 105-125 volts AC, 60 cycles, operating 55 watts normal, 72 watts phone  
 Frequency Range ..... B range—540-1600 KC  
 D range—5.71 to 18.3 MC  
 Selectivity ..... 43 KC broad at 1000 times signal, 1000 KC (for .5 watt output) with external antenna  
 Sensitivity ..... B range—2.5 microvolts average  
 D range—12 microvolts average  
 Power Output ..... 3.5 watts maximum  
 Loud Speaker ..... 2 watts, 10% distortion  
 Voice Coil Impedance ..... Electro dynamic  
 ..... 3.2 ohms at 400 cycles



MOTOROLA, INC.

MODEL CR6

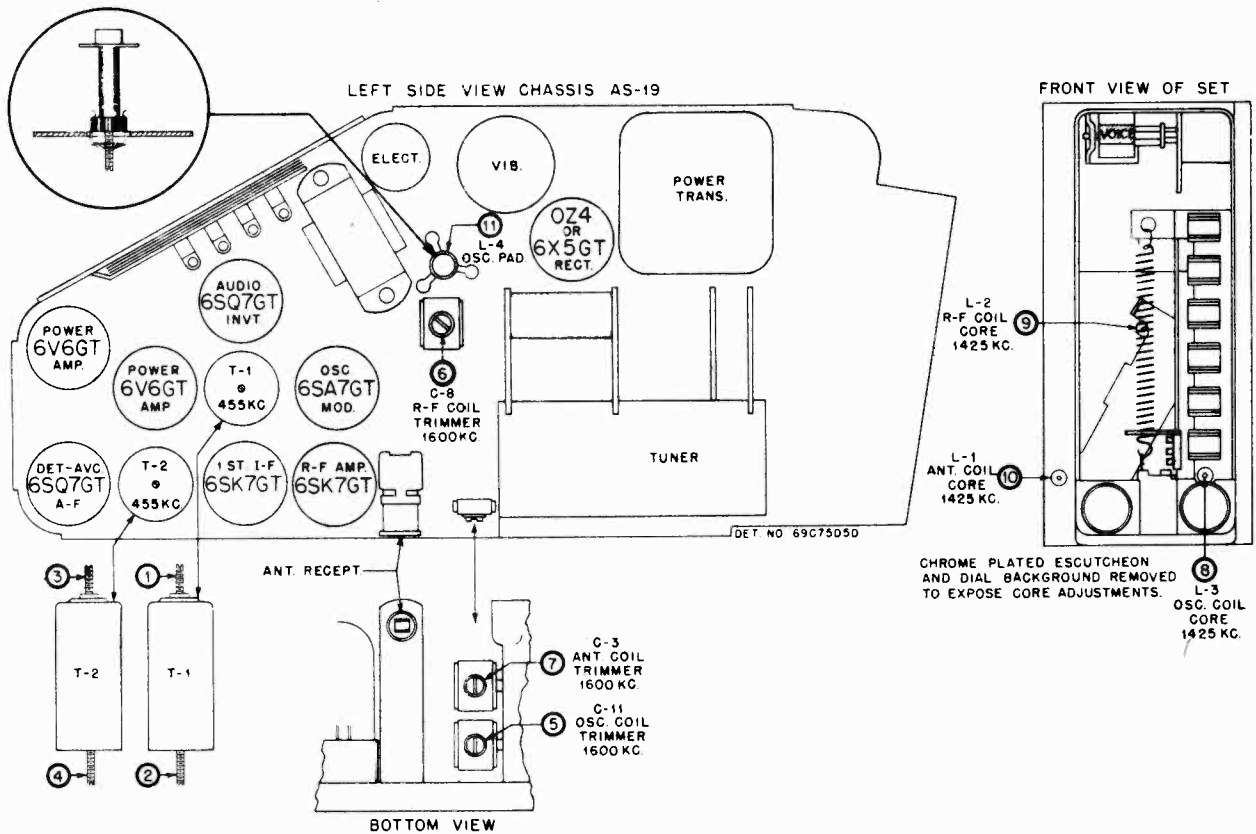


FIGURE 5. TUBE AND TRIMMER LOCATION DETAIL.

ALIGNMENT TABLE

Refer to Figure 5 for location of trimmers and adjustable iron cores.

STEP	TUNER POSITION SET TO	DUMMY ANTENNA	SIGNAL GENERATOR LEAD CONNECTED TO	SIG. GEN. SET AT	ADJUST FOR PEAK ON OUTPUT METER
1.	High frequency end (cores out)	.1 mfd. at Sig. Gen.	Osc.-Mod. grid (#5 pin)	455 Kc	#1 and 2 P & S in T-1 #3 and 4 P & S in T-2
2.	High frequency end, tuning shaft against stop. Cores should be set to project 1-1/8" from cans.	60 mmf. at Sig. Gen. in series in 21" long coax lead.	Antenna Receptacle	1600 Kc	#5 Osc. trimmer C-11 #6 R.F. trimmer C-8 #7 Ant. trimmer C-3
3.	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start measuring turn the moment tuner carriage starts moving inward.	"	"	1425 Kc	#8 Osc. Core of L-3 #9 R.F. Core of L-2 #10 Ant. Core of L-1
4.	EXACTLY four more full turns in (as indicated by knob setscrew)	"	"	Power turned OFF	#11 Osc. Pad core of L-4 for maximum noise.
5.	Assemble and install receiver in car and connect car antenna. Turn the dial to approximately 1400 Kc (not to a local station) and adjust antenna trimmer for maximum noise. This adjustment is referred to as Antenna Padder in Figure 7.				

NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3, and 4. It may be necessary to repeat alignment more than once if padder adjustment has been indiscriminately tampered with.

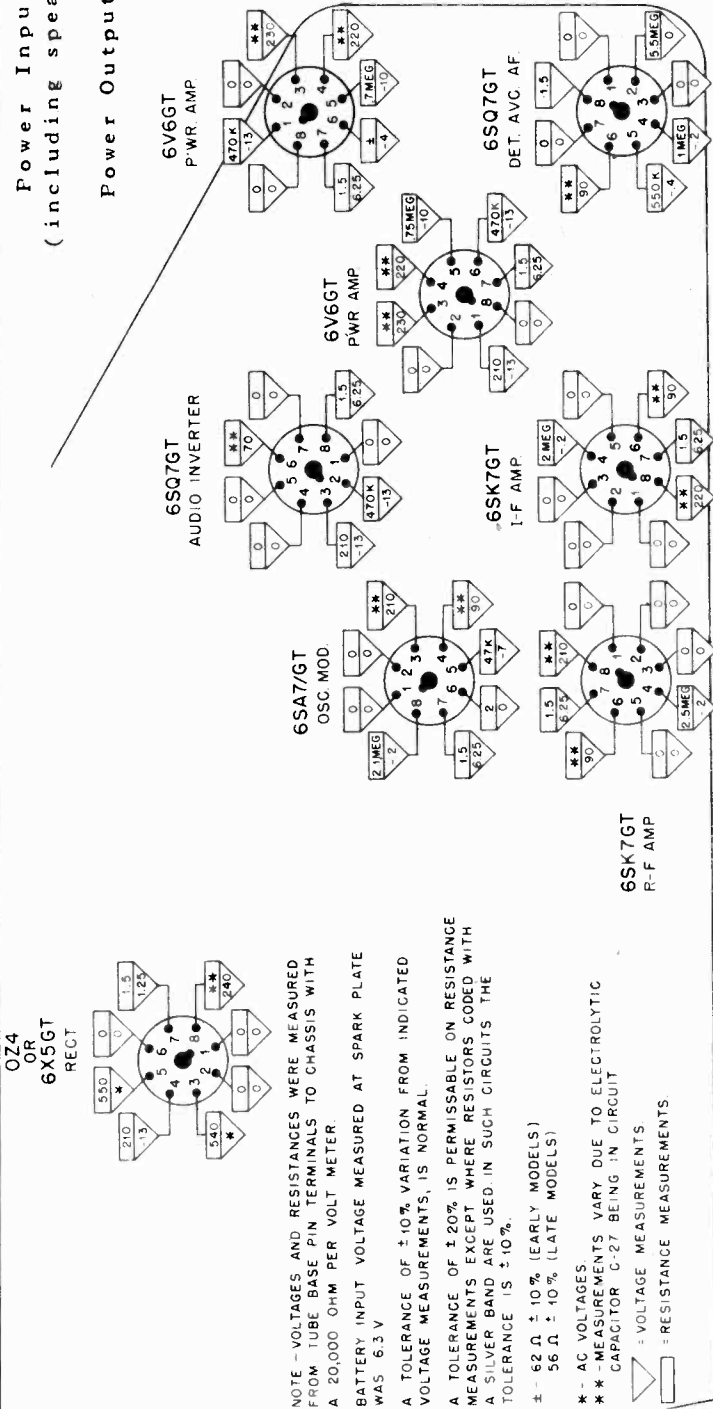


MODEL CR6

MOTOROLA, INC.

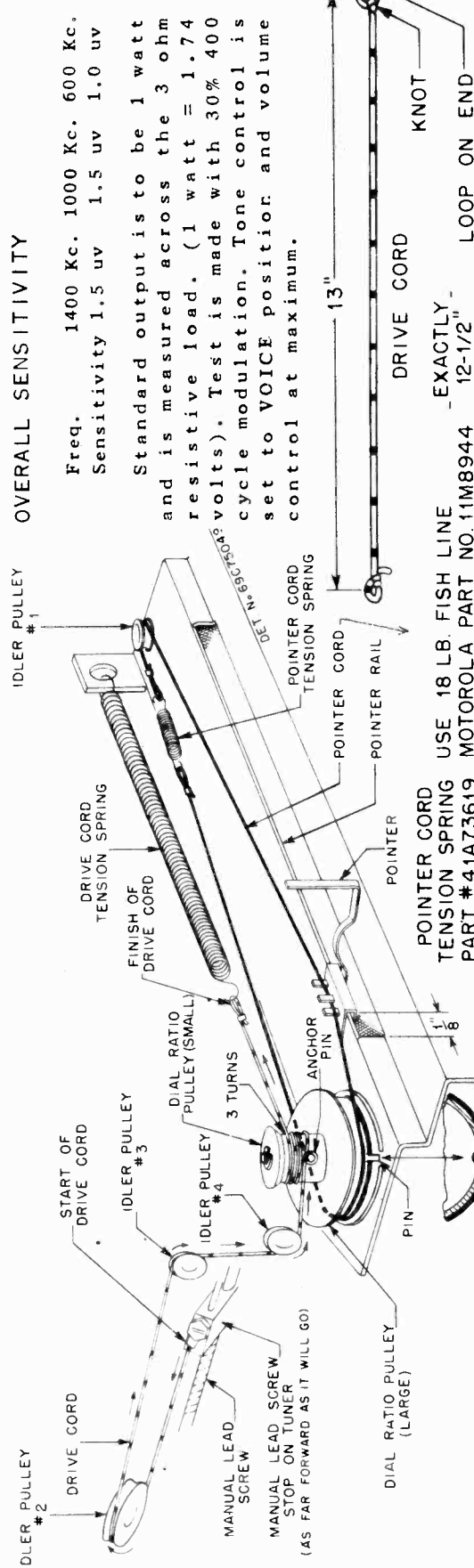
Power Input: 10 A. at 6.3V  
(including speaker field)

Power Output: 9 watts



VOLTAGE AND RESISTANCE DIAGRAM

RIGHT SIDE VIEW OF CHASSIS



OVERALL SENSITIVITY

Freq. 1400 Kc. 1000 Kc. 600 Kc.  
Sensitivity 1.5 uv 1.5 uv 1.0 uv

Standard output is to be 1 watt and is measured across the 3 ohm resistive load. (1 watt = 1.74 volts). Test is made with 30% 400 cycle modulation. Tone control is set to VOICE position and volume control at maximum.

DRIVE CORD - EXACTLY -  
12-1/2" LOOP ON END

USE 18 LB. FISH LINE MOTOROLA PART NO. 11M8944

NOTE - VOLTAGES AND RESISTANCES WERE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER.  
BATTERY INPUT VOLTAGE MEASURED AT SPARK PLATE WAS 6.3 V

A TOLERANCE OF ± 10% VARIATION FROM INDICATED VOLTAGE MEASUREMENTS, IS NORMAL.  
A TOLERANCE OF ± 20% IS PERMISSIBLE ON RESISTANCE MEASUREMENTS EXCEPT WHERE RESISTORS CODED WITH A SILVER BAND ARE USED IN SUCH CIRCUITS THE TOLERANCE IS ± 10%.

± - 62 Ω ± 10% (EARLY MODELS)  
56 Ω ± 10% (LATE MODELS)

\* - AC VOLTAGES  
\*\* - MEASUREMENTS VARY DUE TO ELECTROLYTIC CAPACITOR C-27 BEING IN CIRCUIT

△ = VOLTAGE MEASUREMENTS  
□ = RESISTANCE MEASUREMENTS

## MOTOROLA, INC.

ELIMINATION OF  
IGNITION INTERFERENCE

- a. Install distributor suppressor.
- b. Install generator condenser.

Mount the generator condenser on the generator frame, under the ground lead screw. Connect the space tip end of the condenser wire under the battery terminal of the generator. **WARNING: Do not connect the condenser wire to the field terminal.**

- c. Install hood bonds.

Remove one of drive screws that holds the cloth tape along the rear edge of the hood. Insert Hood Bond under tape so hole lines up with hole drive screw was in, put in self-tapping screw and fold hood bond are against under side of hood when hood is closed.

## ADDITIONAL MOTOR NOISE HINTS

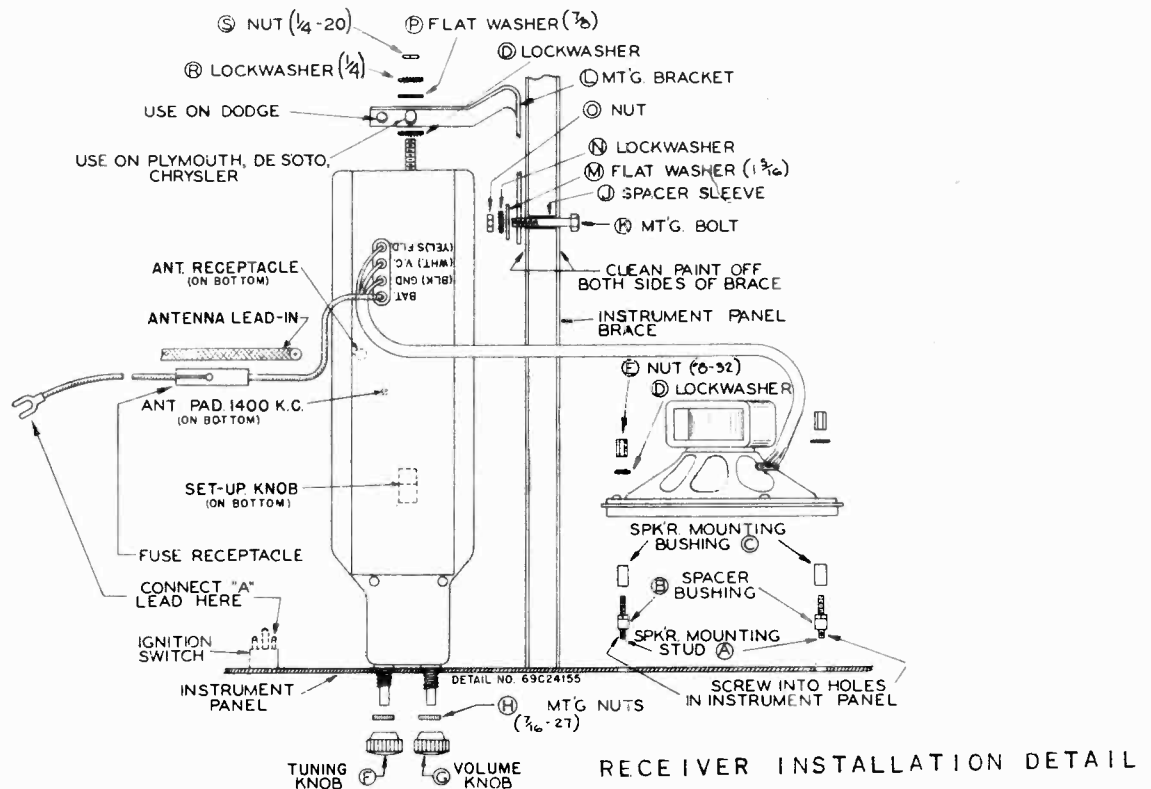
In most cars, the steps outlined above will completely take care of ignition interference. However, there are occasions when additional corrections are needed. Below are listed some suggestions which may be helpful in curing these unusual cases.

a. When checking the car for motor noise, clamp the hood down tight.

b. Motorola Hood Bonds (Part No. 39A4205) should be installed at the shoulders so that the hood makes a good-ground to the cowl of the car on the side the antenna is mounted.

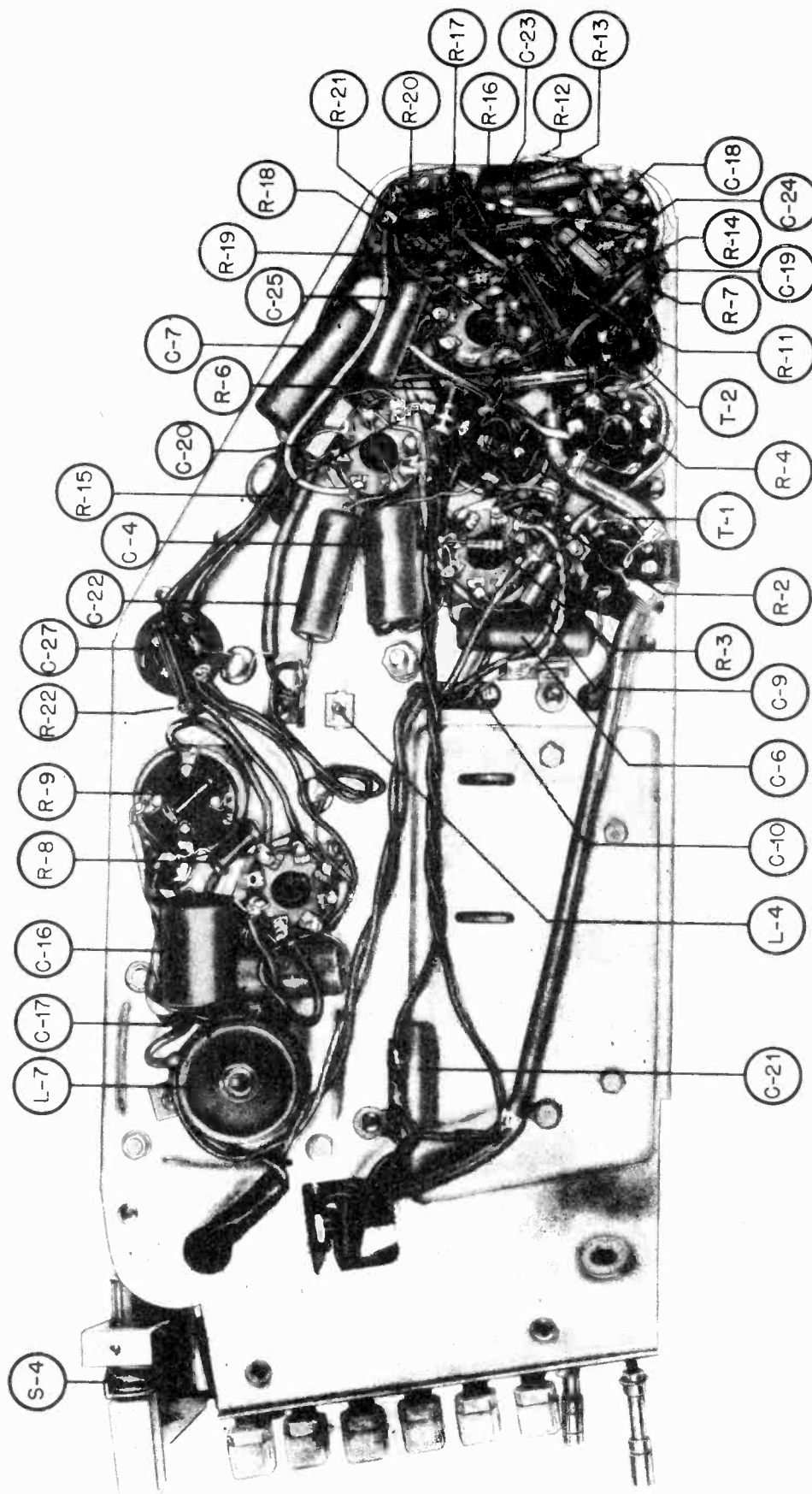
c. Wheel static can be cured by installing static collectors in the front hub caps. (Part No. 39A20513).

d. If required, install an ammeter condenser, (Part No. 8K4661).



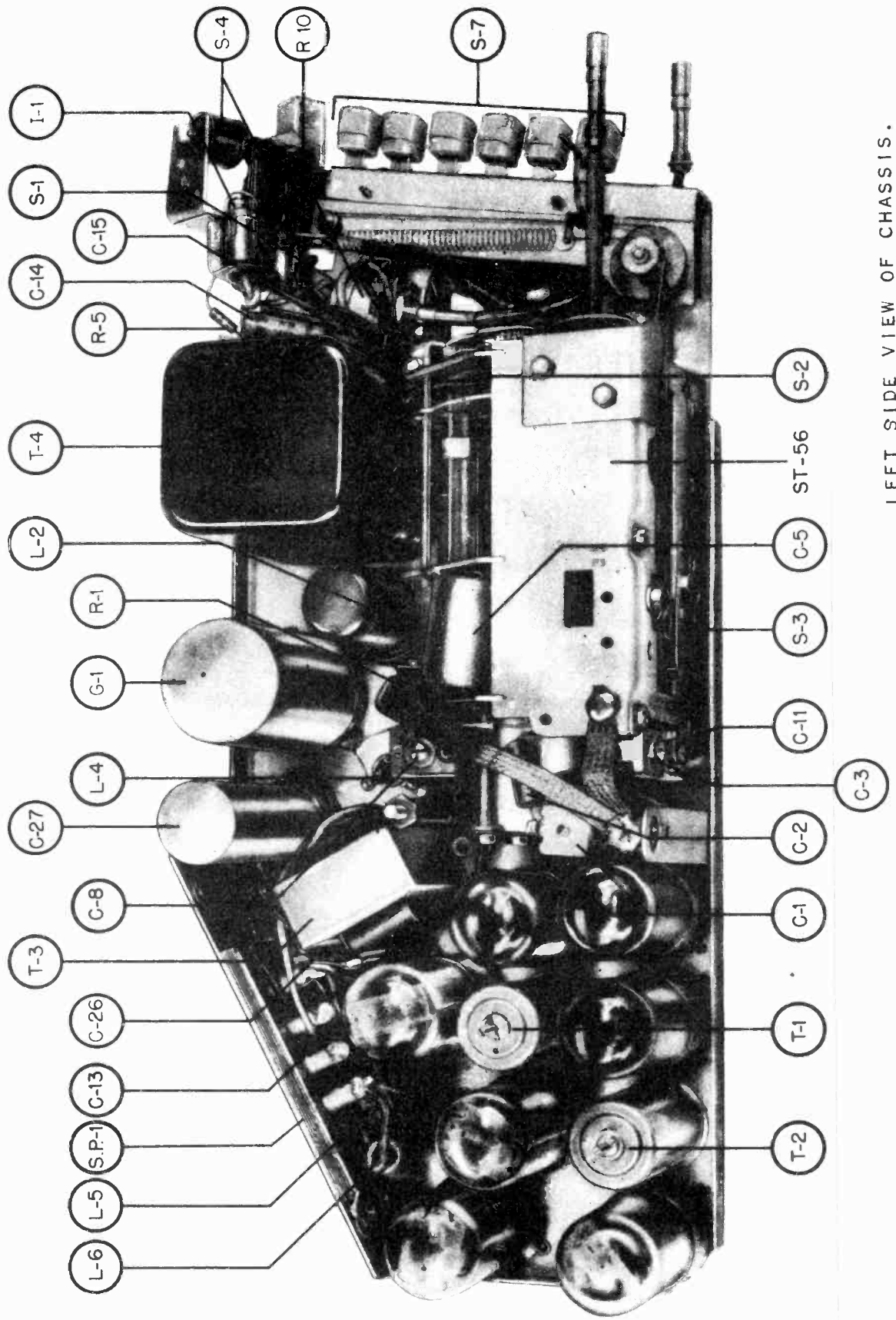
MODEL CR6

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RIGHT SIDE VIEW OF CHASSIS

MOTOROLA, INC.



LEFT SIDE VIEW OF CHASSIS.

MODEL CR6  
 MODEL FD6  
 MODELS FD6, NH6

MOTOROLA, INC.

SETTING THE PUSH BUTTONS

PROCEDURE

- a. Turn ON the receiver
- b. Press the manual button marked "M"
- c. Turn the tuning knob until the desired station is tuned in.
- d. Press the number one button.
- e. Turn the set-up lever CLOCK-WISE (right) as far as it will go and release allowing it to return.
- f. Turn the tuning knob until the previously noted program is heard. (The dial will not indicate the station to which the button is set.)

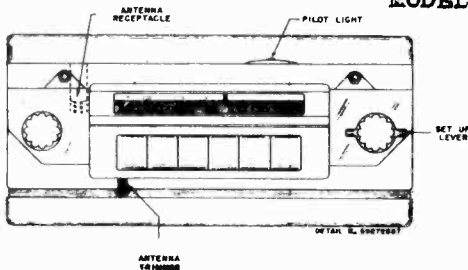
NOTE: The dial pointer may reach the end of the dial scale before the desired station is received. However, continue turning the tuning knob until the station is received. The dial pointer mechanism will not be affected.

- g. Press the "M" button and the "1" button is set.

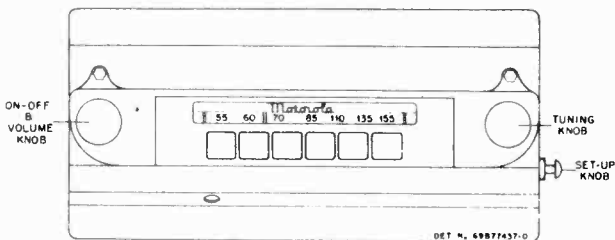
NOTE: Check the setting of the automatic button by tuning in the desired station, having the "M" button pushed in and then push the automatic button, either button should give the same volume and clarity.

- h. Repeat the above procedure, steps b and through g for each of the push buttons.

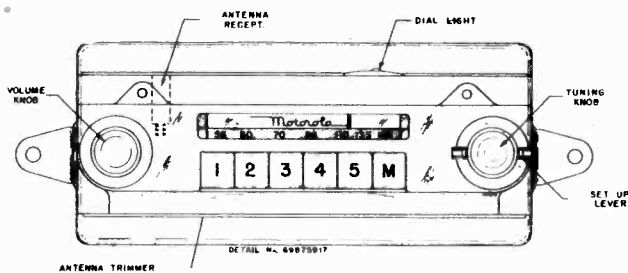
MODEL NH6



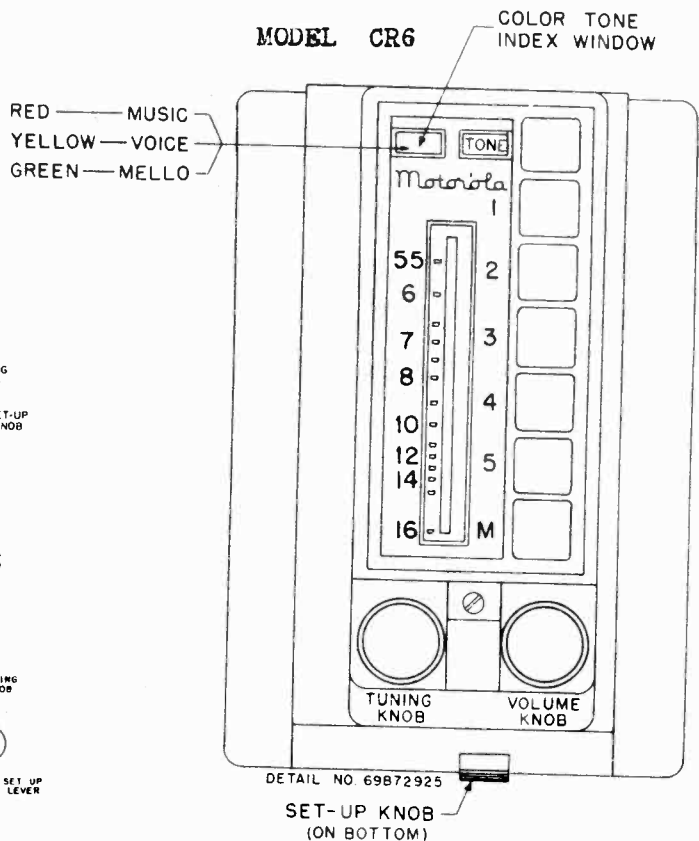
MODEL FD6



MODEL FD6



MODEL CR6



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MODEL CR6	MODEL 405
MODELS CT6,OE6,PC6	MODEL 505
MODELS FD6,NH6	MODEL 605
MODEL PD6	MODEL 705

Two types of I.F.-Diode transformers have been used. The early I.F.-Diode transformers, if necessary, with same transformer shields for the late type as in the receiver. units have a powdered iron sleeve whereas none was used with the early I.F.-Diode transformers. See Figure 5.

Replace transformer coil as-semblies, if necessary, with same transformer shields for the late type as in the receiver. The capacitor across each winding of both types of I.F.-Diode transformers is a dual 100 mmf. wafer type silver mica.

The late transformer or shield assemblies are not interchangeable with the early ones. EARLY SETS  
Although a late transformer and shield can be used to replace an early transformer and shield combination, it is not recommended because of difficulty in replacing shields which are staked to the chassis. Do not attempt to intermix the transformers and shields. If the wrong combination of transformer and shield is used, the transformer will not peak at the I.F. frequency of 455 Kc.

LATE SETS:  
Transformer, I.F. or diode: Part No. 24B70827  
Shield: Part No. 26B70107  
Transformer, I.F. or diode: Part No. 24B76553.  
Shield & Iron Core Sleeve Assembly: Part No. 1A71049.

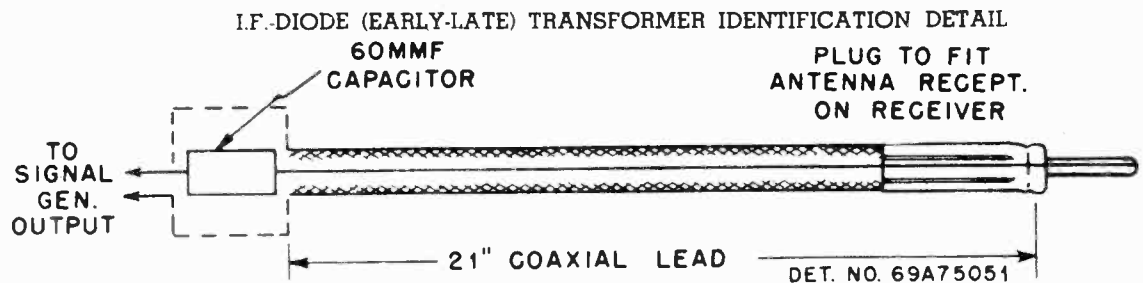
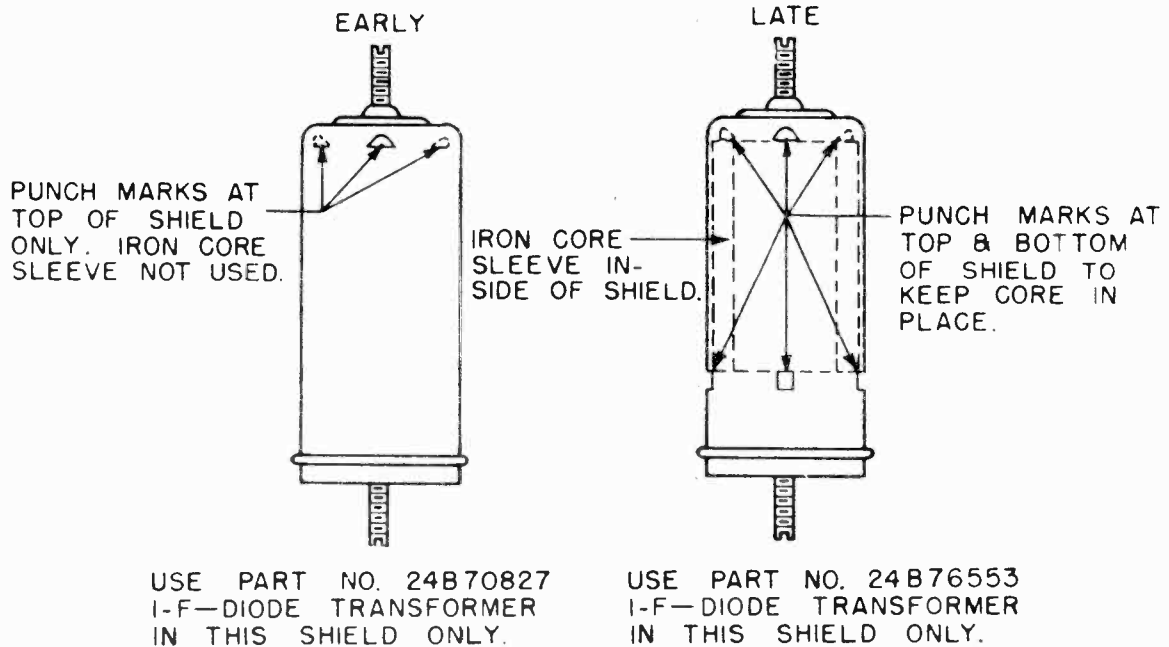


FIGURE 2. DUMMY ANTENNA CONSTRUCTION DETAIL

MODEL CR6

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REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C-1	21A20877	Capacitor, fixed: metal mica; 80 muf	C-20	8R13186	Capacitor, fixed: carbon; 1000 V	F-1	65K657	Fuse: 20 amp; type 3AG	1X71047	Core & Palnut Assembly (I.F. & diode coil top tuning iron core with nut)
C-2	8A4520	Capacitor, fixed: paper; .008 mf 100 V	C-27	23A75429	Capacitor, electrolytic: 20-201-1 mf 400 V, 20 mf 25V	0-1	49B3333	Vibrator, non-sync.	1X71048	Core & Clip Assembly (I.F. & diode bottom tuning iron core & clip)
C-3	20A70601	Capacitor, variable: mica; 50-180 muf	NOTE: Unless otherwise specified, all Resistors are 20%.			L-1	1A71861	Coll, antenna or R.F. (See manual before replacing).	1X4895	Lead, battery: 10" long; insulated bushing and contact eyelet on one end, red insulated pin on other end.
C-4	8A14791	Capacitor, fixed: paper; .05 mf 400 V	R-1	6R6032	Resistor, fixed: carbon; 470,000 1/2W Ins.	L-2	1A71881	Coll, antenna or R.F. (See manual before replacing).	1X4894	Lead, fuse: 20" long; fuse receptacle on one end, spade lug on other end
C-5	8A19133	Capacitor, fixed: paper; .5 mf 100 V	R-2	6R6075	Resistor, fixed: carbon; 100,000 1/2W Ins.	L-3	1A71879	Coll, oscillator. (See manual before replacing).	1X72125	Lead, speaker: 3 conductor rubber covered lead with insulated pin terminals on one end
C-6	8A14791	Capacitor, fixed: paper; .05 mf 400 V	R-3	6R6056	Resistor, fixed: carbon; 47,000 1/2W Ins.	L-4	24A70227	Coll, oscillator padder: includes mounting clip and adjustable iron core.	1X74106	Pointer & Slider Assembly Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together
C-7	8R13186	Capacitor, fixed: paper; .1 mf 400 V	R-4	6R6106	Resistor, fixed: carbon; 10,000 1W N.I.	L-5	24K70840	Coll, "A" choke	1X70646	Receptacle, antenna: metal ferrule with ins. contact
C-8	20A70601	Capacitor, variable: mica; 50-180 muf	R-5	6R6028	Resistor, fixed: carbon; 22,000 1/2W Ins.	L-6	24K70840	Coll, "A" choke	9A70208	Socket, tube: 4 prong (vibrator socket)
C-9	21K70720	Capacitor, fixed: mica; 5 muf	R-6	6R6147	Resistor, fixed: carbon; 330 1W Ins.	L-6	24K70840	Coll, dial light & speaker field choke: 9 turns #16 yellow wire	9A70165	Socket, tube: octal; plain type (for R.F. & I.F. amp)
C-10	21R6513	Capacitor, fixed: mica; 50 muf 300 V	R-7	6R6004	Resistor, fixed: carbon; 1 meg. 1/2W Ins.	L-7	24A70199	Coll, "A" choke: with mounting bracket	1X74142	Speaker Assembly: includes mounting plate and connecting cable
C-11	20A70214	Capacitor, variable: mica; 30-60 muf	R-8	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	L-7	24A70199	Coll, "A" choke: with mounting bracket	50B71900	Speaker: 8" electro; 3 ohm V.C. less mtg. plate and lead
C-12	21A71872	Capacitor, fixed: ceramic; 400 muf	R-9	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	S-1	Part of R-10 Switch; SPST (part of volume control R-10)	Ing bracket	50B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-13	8A17028	Capacitor, fixed: paper; .5 mf 100 V	R-10	18A71925 or 18A70172	Resistor, fixed: carbon; 50 1/2W N.I.	S-2	40B70952	Switch, selector	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-14	8R23690	Capacitor, fixed: paper; .01 mf 400 V	R-11	6R6068	Resistor, variable: carbon; .5 meg; with SPST switch	S-3	1B70944	Switch Assembly, solenoid	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-15	8R23690	Capacitor, fixed: paper; .01 mf 400 V	R-12	6R6027	Resistor, fixed: carbon; 47,000 1/2W Ins.	S-4	1X74087	Switch, tone control: with bracket; complete	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-16	8A17028	Capacitor, fixed: paper; .5 mf 100 V	R-13	6R6118	Resistor, fixed: carbon; 47,000 1/2W Ins.	S-5	40A70831	Switch, mute	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-17	8A12840	Capacitor, fixed: paper; .006 mf 1800 V	R-14	6R6015	Resistor, fixed: carbon; 220,000 1/2W Ins.	S-7	1K73625	Switch, push button assembly	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-18	21A70176	Capacitor, fixed: mica; dual 120 muf	R-15	6R6015	Resistor, fixed: carbon; 220,000 1/2W Ins.	S.P.1	1X76194	Spark plate assembly	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-19	21R6513	Capacitor, fixed: mica; 50 muf 300 V	R-16	6R6004	Resistor, fixed: carbon; 1 meg. 1/2W Ins.	T-1	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-20	21R6538	Capacitor, fixed: mica; 1000 muf 500 V	R-17	6R6263	Resistor, fixed: carbon; 1 meg. 1/2W Ins.	T-2	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-21	8A4738	Capacitor, fixed: paper; .002 mf 400 V	R-18	6R6514	Resistor, fixed: carbon; 150 10K 1W N.I.	T-3	25K72044	Transformer, output	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-22	8R13186	Capacitor, fixed: paper; .1 mf 400 V	R-19	6R6032	Resistor, fixed: carbon; 56 10K 1/2W Ins.	T-4	25B70860	Transformer, power	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-23	8R23690	Capacitor, fixed: paper; .01 mf 400 V	R-20	6R6407	Resistor, fixed: carbon; 470,000 1/2W Ins.	T-4	1X74121	Accessories, group CR6: includes all parts necessary to install receiver in car, except speaker assembly and receiver mounting bracket.	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-24	21R6648	Capacitor, fixed: mica; 250 muf 500 V	R-21	6R6414	Resistor, fixed: carbon; 220,000 10K 1/2W Ins.	T-4	8A4491	Capacitor, generator	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
C-25	8R23690	Capacitor, fixed: paper; .01 mf 400 V	R-22	6R6184	Resistor, fixed: carbon; 270,000 10K 1/2W Ins.	T-4	1X74111	CORD. Assembly: dial pointer cord	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)
							1X74293	CORD. Assembly: drive cord; with lug on one end	60B74041	Transformer, I.F. or diode: 455 kc; iron core tuned; less shield can. (Used in early sets only)

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MODELS CT6, OE6, PC6

SETTING THE PUSH BUTTONS

1. Turn ON the receiver.
2. Press the push button marked "M"
3. Turn the tuning knob until the desired station is tuned in. (Make mental note of the program)
4. Press the number one button.
5. Turn the set-up lever CLOCKWISE (right) as far as it will go and release, allowing it to return.
6. Turn the tuning knob until the previously heard program is heard. (The dial will not indicate the station to which the button is set).

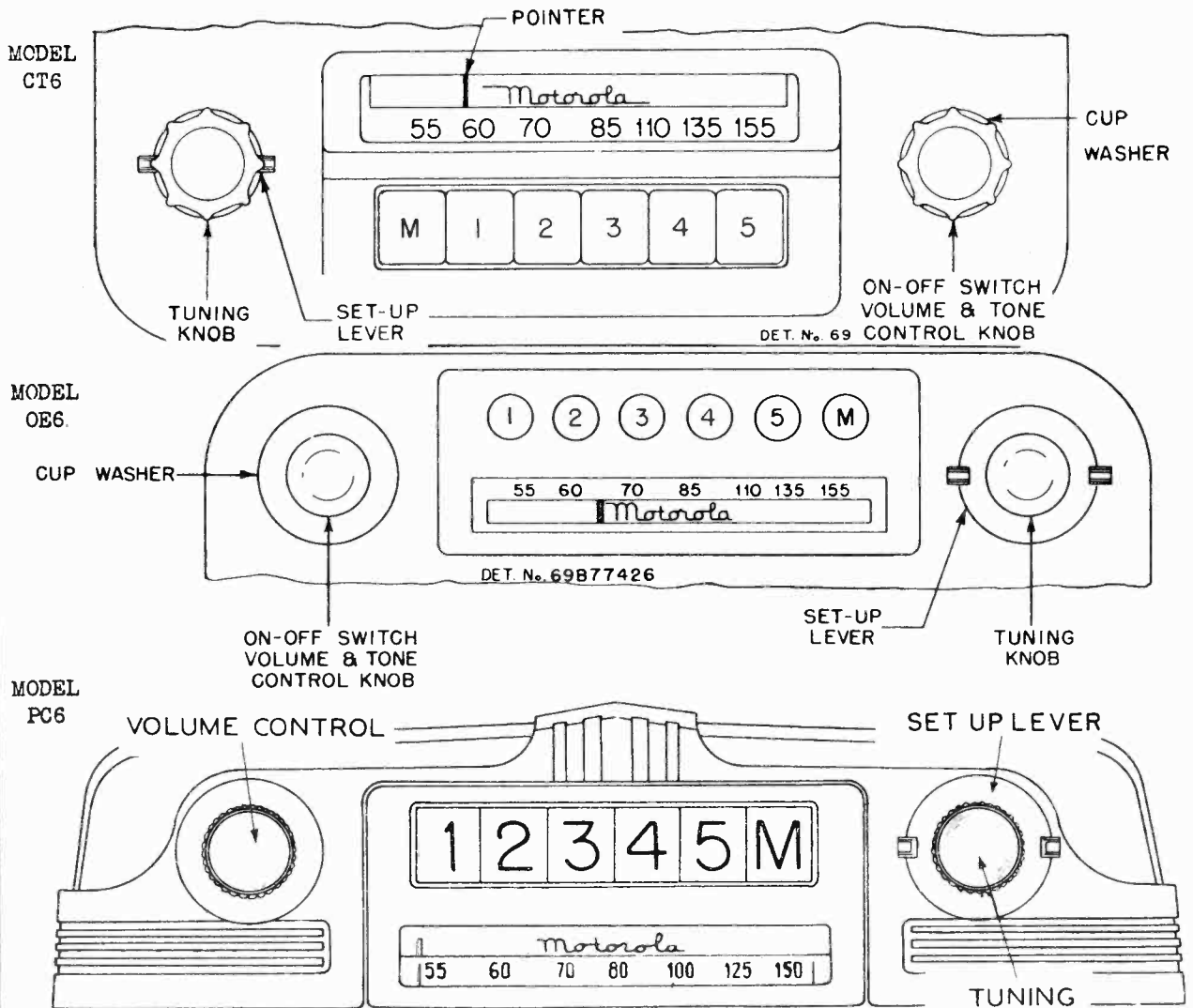
the desired station is received. However, continue turning the tuning knob until the station is received. The dial pointer mechanism will not be affected.

7. Press the "M" button and the number one push button is set.

NOTE: Check the setting of the automatic button by tuning in the desired station having the "M" button pushed in, and then push the automatic button that is set to the same station that was tuned in manually, either button should give the same volume and clarity. Any difference indicates that the push button was not set correctly.

NOTE: The dial pointer may reach the end of the dial scale before

8. Repeat the above procedure, steps 2 through 7 for each of the push buttons.





MODELS CT6,OE6,PC6

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**WARNING: CHECK VOLTAGE REGULATOR**

Many late cars develop exceedingly high voltage due to improper adjustment of voltage regulator, which shortens the life of radio tubes, vibrator, electrical accessories and headlights. When

voltage exceeds 7.3 volts with motor running at about 35 miles per hour and no load on battery, have the voltage regulator adjusted for maximum voltage of 7.3 volts under a no load condition.

**TO REPLACE DIAL LIGHT**

It will be necessary to remove set from car when replacing dial light. Pry out large snap

button directly under push-button "M" and replace with a #44 bayonet base pilot lamp.

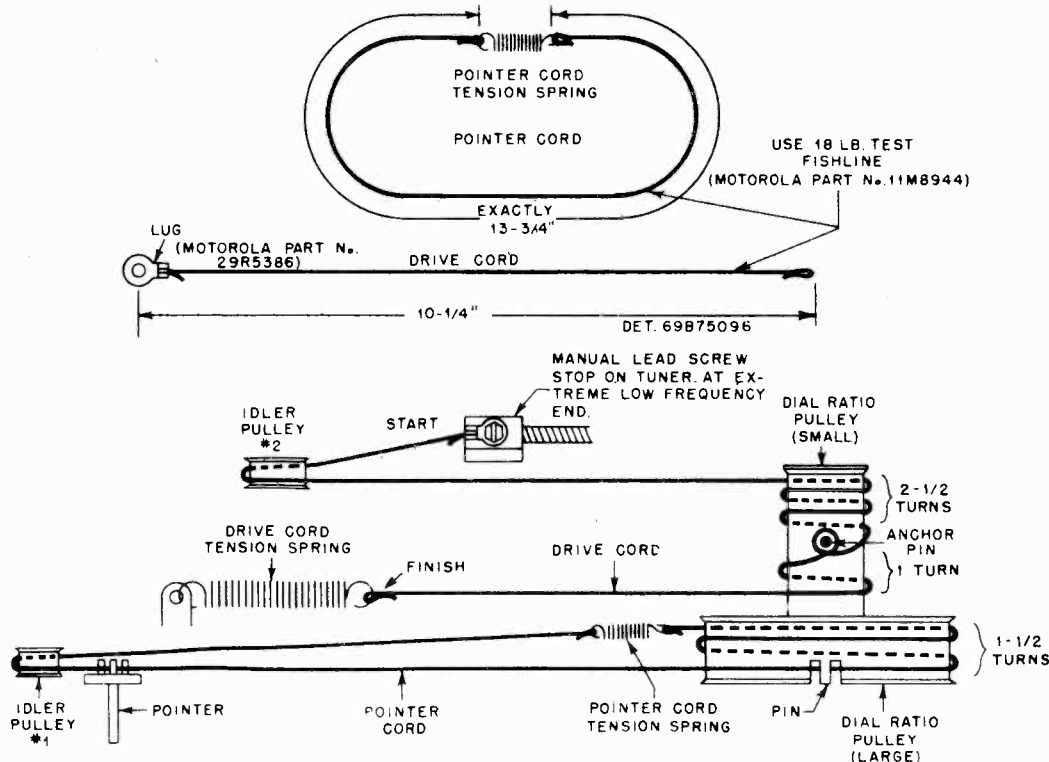
**POINTER AND DRIVE CORD REPLACEMENT**

PREPARE RECEIVER AS FOLLOWS

1. Remove the front cover.
2. Remove the dial background. Two snap-in eyelets hold it in position.
3. Remove the push button assembly. Four screws hold it in position. Do not unsolder any

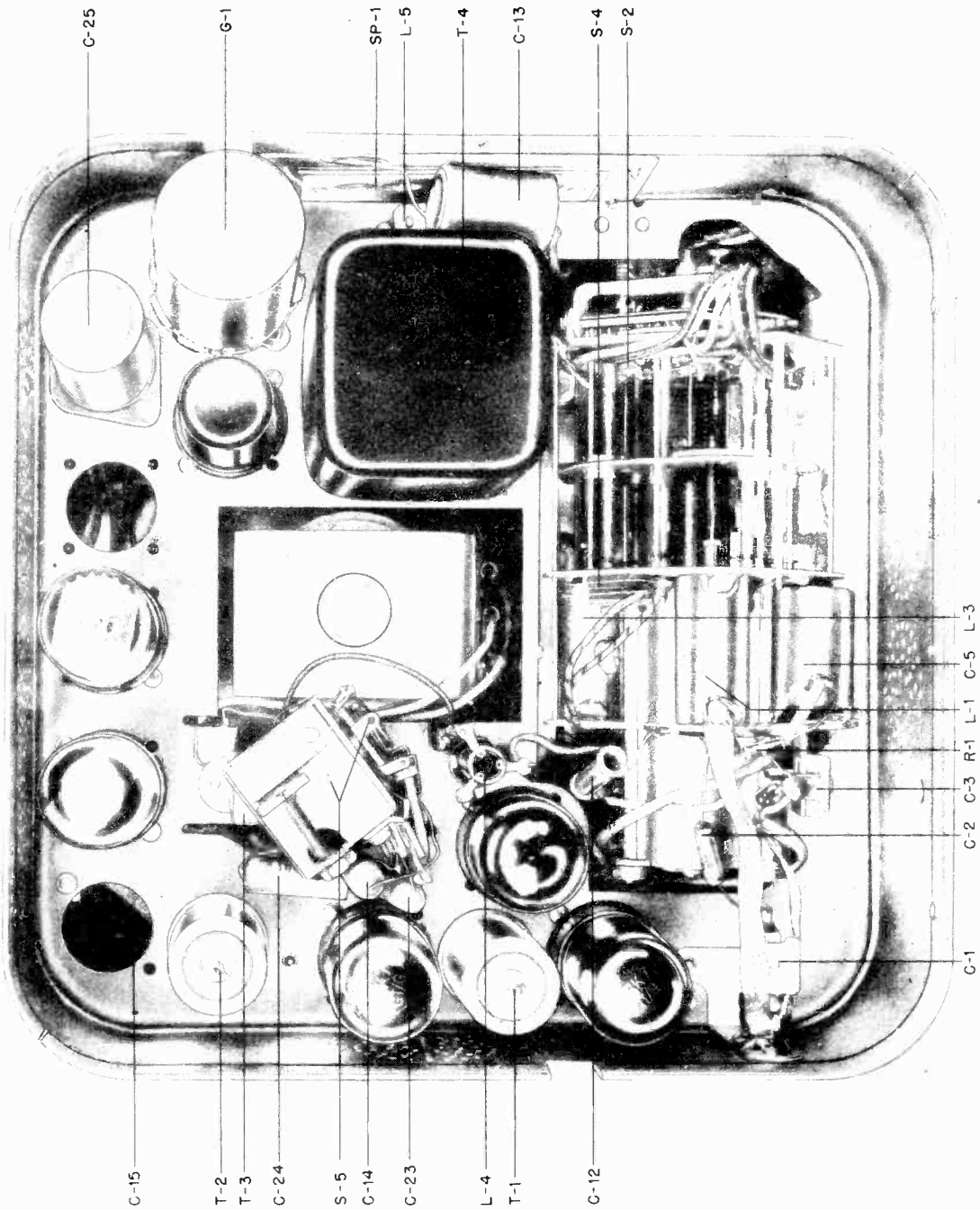
wire leads; just lay the push button assembly on top of the set.

4. The pointer & drive cords are now fully exposed. If only the pointer cord is to be replaced, temporarily remove the drive cord from dial ratio pulley to make the pointer cord more readily accessible.



POINTER AND DRIVE CORD RESTRINGING DETAIL

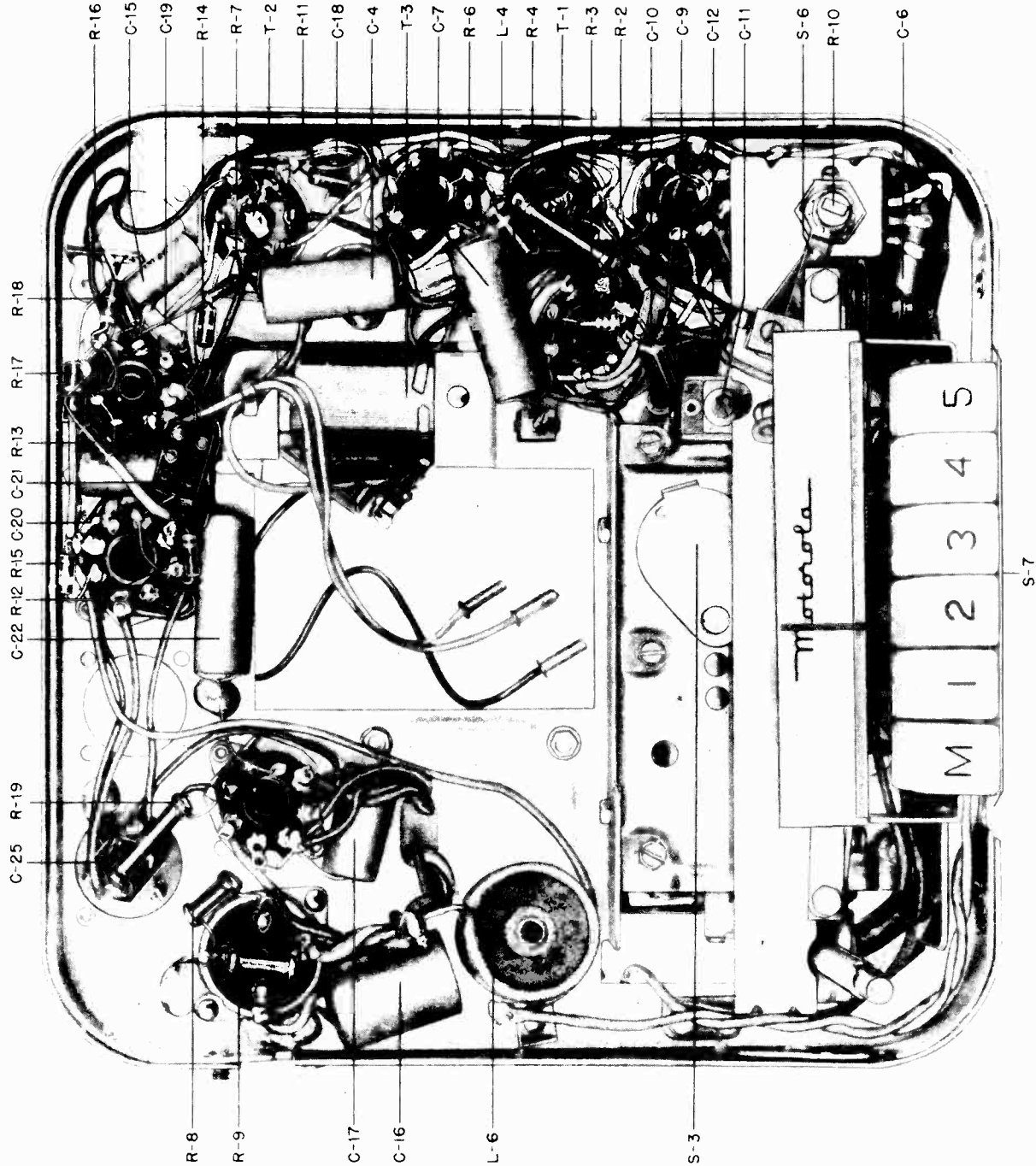
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CHASSIS TOP VIEW

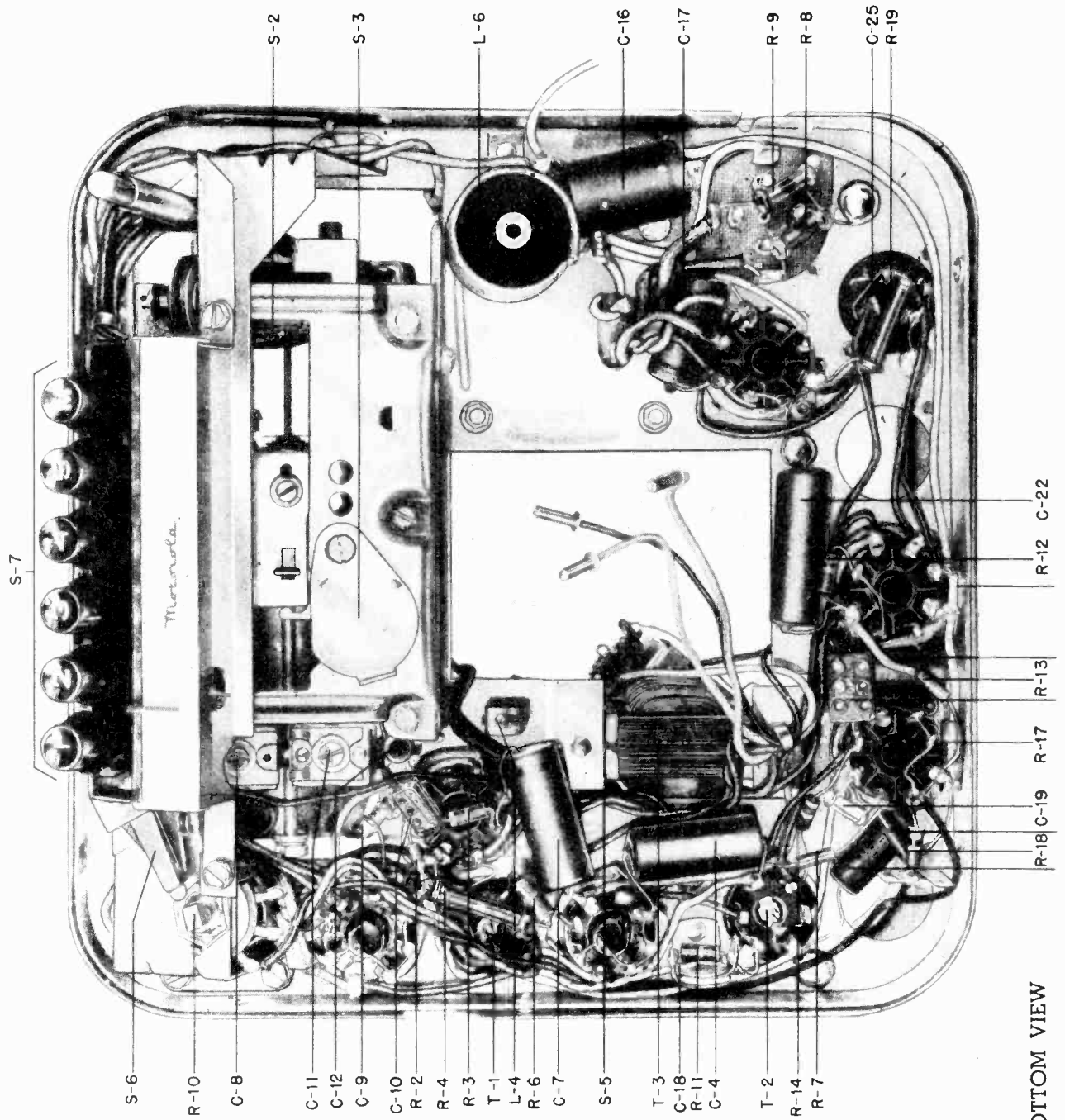
MODEL CT6

MOTOROLA, INC.



CHASSIS BOTTOM VIEW

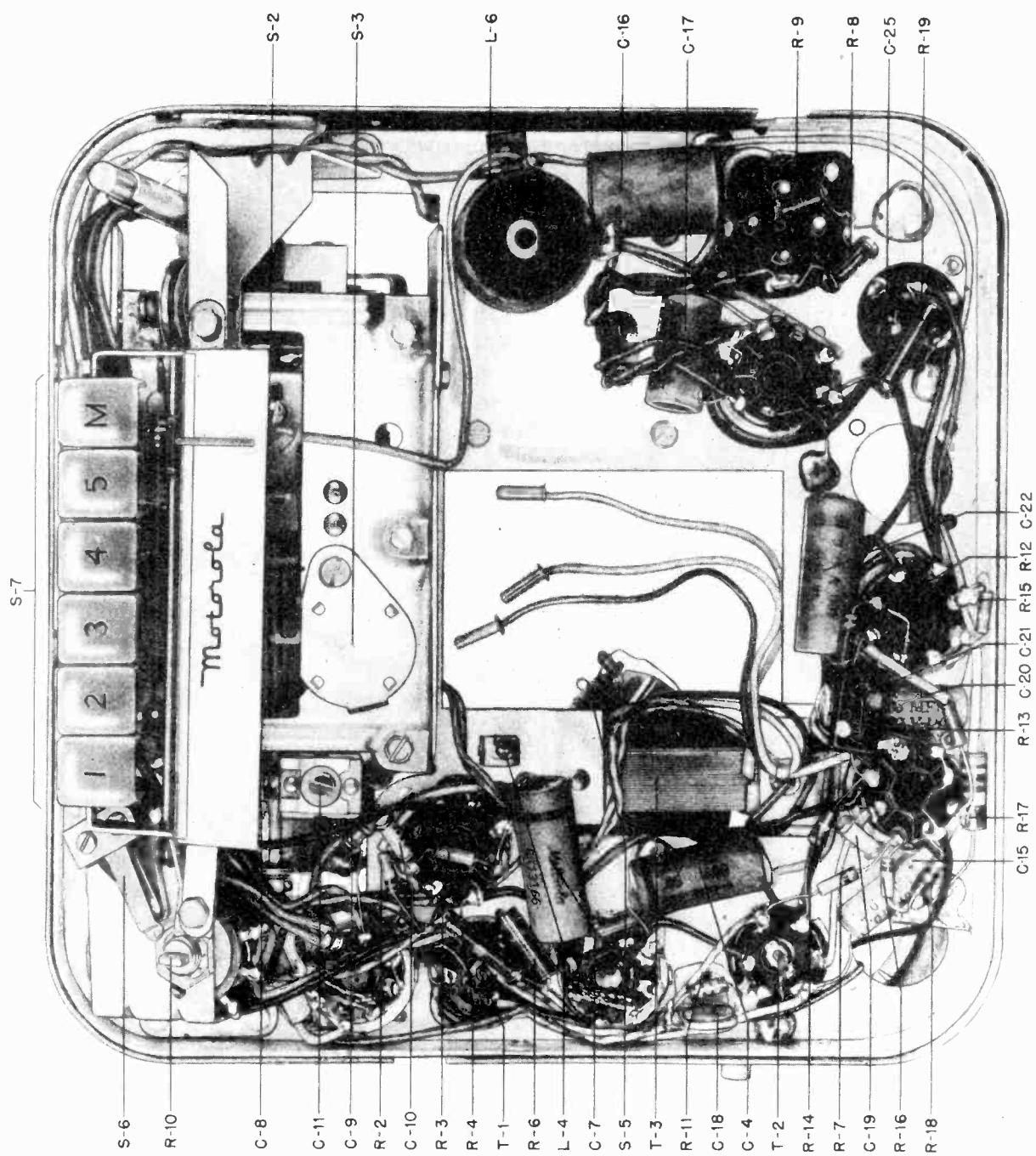
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CHASSIS BOTTOM VIEW

MODEL PC6

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CHASSIS BOTTOM VIEW

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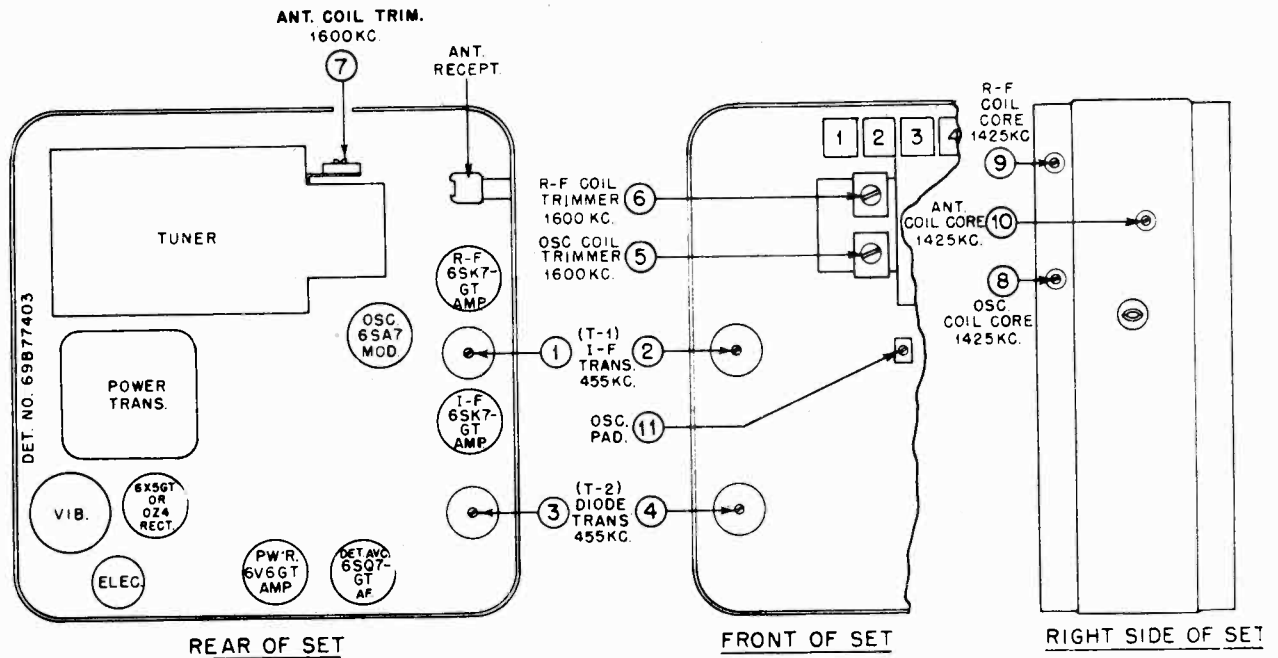
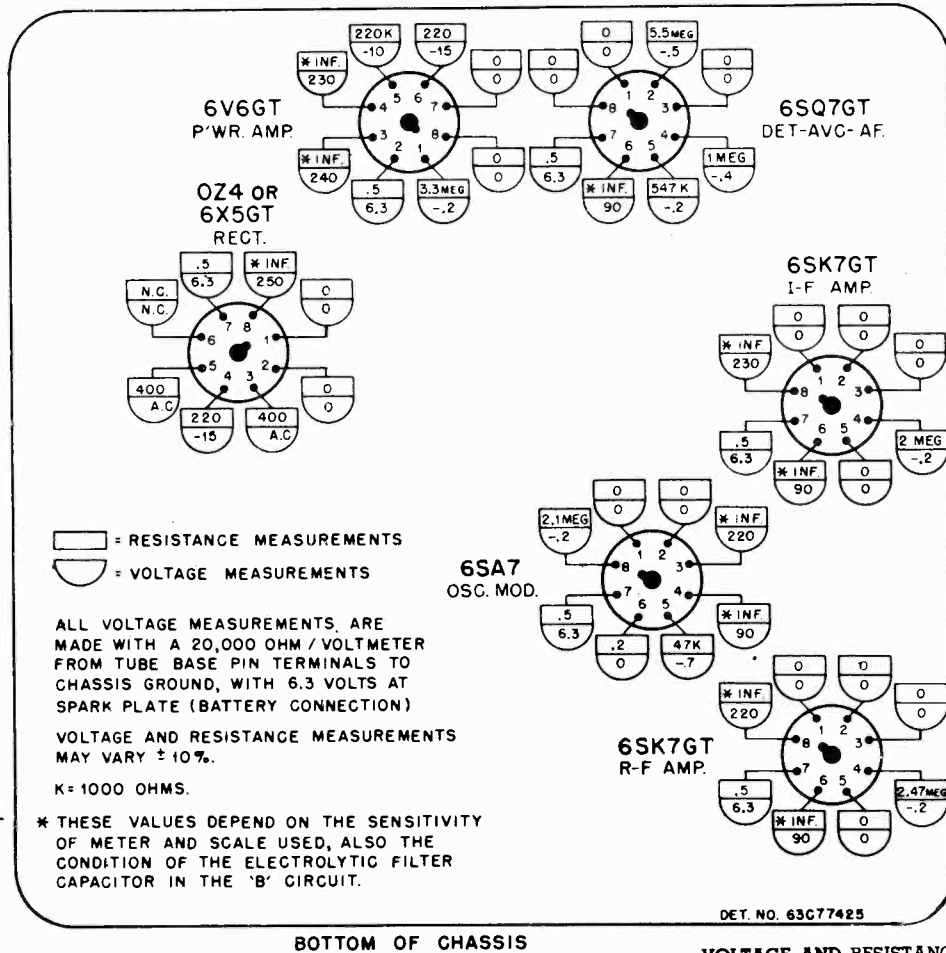


FIGURE 3. TUBE AND TRIMMER LOCATION DETAIL



BOTTOM OF CHASSIS

VOLTAGE AND RESISTANCE DIAGRAM

MODELS CT6, OE6, PC6  
 MODELS FD6, NH6  
 MODEL 405, MODEL 505  
 MODEL 605, MODEL 705

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STEP	TUNER POSITION SET TO	DUMMY ANTENNA	SIGNAL GENERATOR LEAD CONNECTED TO	SIG. GEN. SET AT	ADJUST FOR PEAK ON OUTPUT METER
1.	High frequency end (cores out)	.1 mfd. at. Sig. Gen.	Osc Mod grid (#5 pin)	455 Kc	#1 and 2 P & S in T-1 #3 and 4 P & S in T-2
2.	High frequency end, tuning shaft against stop. Cores should be set to project 1-1/8" from cans. *	60 mfd. at. Sig. Gen. in series with 21" long coax lead.	Antenna receptacle	1600 Kc	#5 Osc. coil trimmer #6 R.F. coil trimmer #7 Ant. coil trimmer
3.	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start securing turn the moment tuner carriage starts moving inward *	"	"	1425 Kc	#8 Osc. coil core #9 R.F. coil core #10 Ant. coil core
4.	EXACTLY four more full turns in (as indicated by knob set screw)	"	"	Power turned Off.	#11 Osc. Pad. core for maximum noise

NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3, and 4. It may be necessary to repeat alignment more than once if padder adjustment has been indistinctly tampered with.

Assemble receiver and peak antenna trimmer (#7) to car antenna. The antenna trimmer is located at the top of the receiver and is inaccessible when the receiver is installed behind instrument panel, therefore, it is necessary to adjust antenna trimmer before final installation. Proceed by laying set on floor of car, connect antenna and "A" leads, tune set to a spot around 1400 kc that is free of stations and adjust antenna trimmer for maximum noise. The antenna should be fully extended.

**IMPORTANT:** Do not push in on the alignment tool when adjusting the tuner cores. The slightest inward pressure on the alignment tool may move the tuner carriage and result in inaccurate alignment.

**TUNING RANGE**

535 to 1600 K.C.  
 I. F. Frequency - 455 kc.

**ELECTRICAL CHARACTERISTICS**

Power Input: 6 Amp. at 6.3V (with P.M. dynamic type speaker)  
 7.5 Amp. at 6.3V (with electrodynamic type speaker)  
 Power Output: 5.6 watts (max.)

**OVERALL SENSITIVITY**

Frequency	1400 Kc	1000 Kc	600 Kc
Sensitivity	1.4uv	1.6uv	1.4 uv

Standard output is to be 1 watt and is measured across the 3 ohm resistive load. (1 watt = 1.74 volts). Test is made with 30% 400 cycle modulation. Tone control is set to voice position (high) and volume control at maximum. Signal is fed through 60 mfd. dummy to antenna connector of set through 21" coaxial lead. See Figure 2 for dummy antenna detail.

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**ALIGNMENT**

**EQUIPMENT REQUIRED**

- A special tool for adjusting the tuner cores. Use alignment tool, Motorola Part No. 66A76278.
- A small screwdriver for I.F. and R.F. Alignment.
- A modulated signal generator that can be accurately tuned to the frequencies indicated in the alignment chart.
- A special dummy antenna for R.F. alignment. Construct dummy antenna per instructions given in Figure 2. The 21" coaxial lead needed in its construction is the same type as used for lead-in on Motorola car antenna.
- A low range output meter.
- A special tuner gauge, Motorola Part No. 66X76825, for accurately setting tuner to exact alignment frequencies is available. Instructions on its use come with the gauge. Receiver can be aligned without using gauge, but use of gauge will help you to do a speedier and more accurate job.

**PROCEDURE**

- Remove the front and rear covers. All adjustments are now exposed. Refer to Figure 3 for their location.
- Turn the receiver on and allow it to warm up for a few minutes. Press the "M" button to place automatic tuner in manual tuning position.
- Connect the output meter across the speaker voice coil.
- Set receiver volume control at maximum and tone control to voice position (high position).
- Refer to the following alignment chart for procedure.

MOTOROLA, INC.

MODELS CT6, PC6, OE6

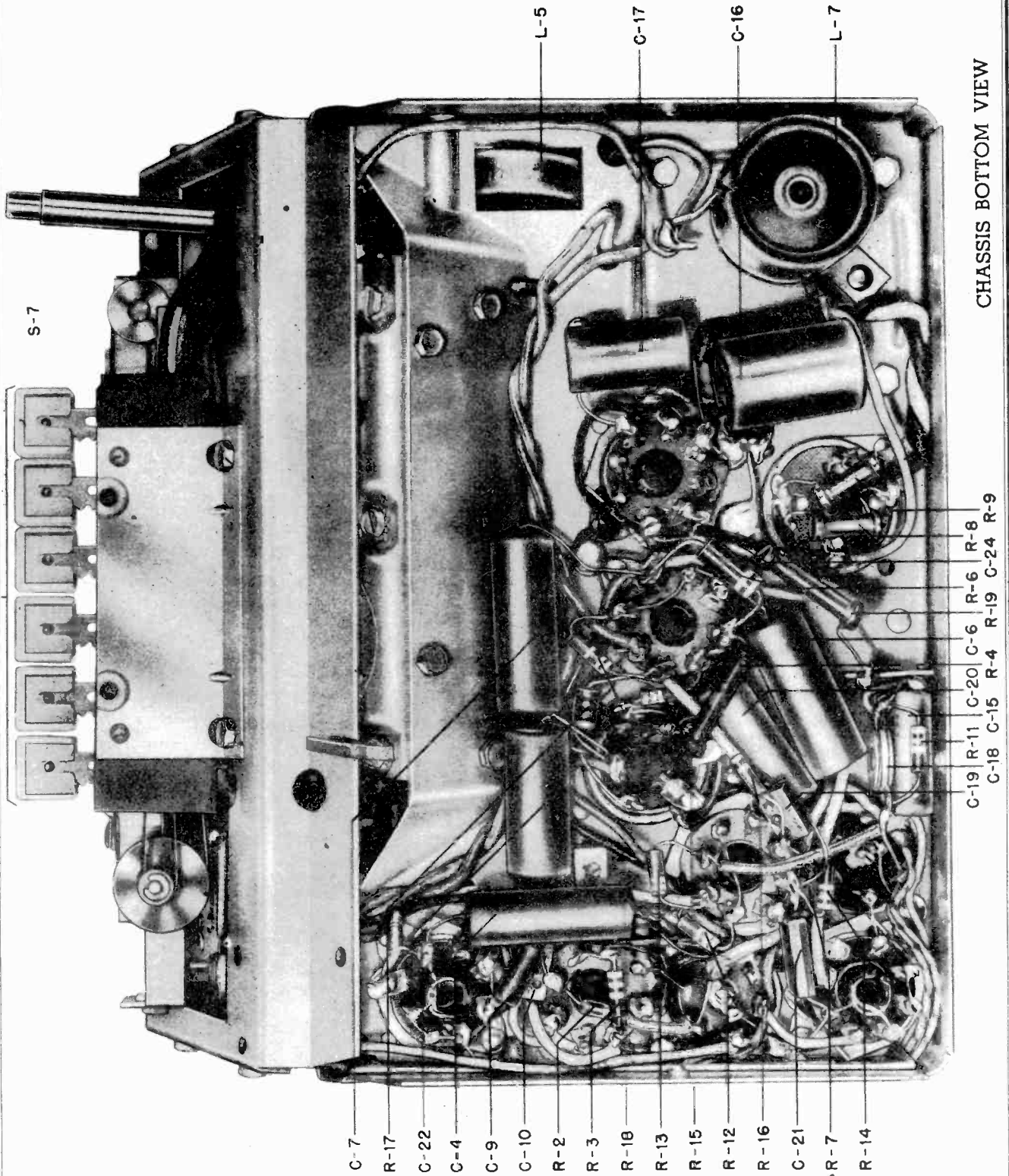
PARTS LIST - MODELS CT6, PC6, OE6

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	
			R-4	6R6106	Resistor, fixed: carbon; 10,000 1W N.I.	9A12705	Plate, electrolytic capacitor mtg.; bakelite wafer	
C-1	21A20877	Capacitor, fixed: metal mica; 90 mmf	R-5	6R6028	Resistor, fixed: carbon; 22,000 1/2W Ins.	1X74288	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
C-2	8A4529	Capacitor, fixed: paper; .006 mf. 100V	R-6	6R6147	Resistor, fixed: carbon; 330 1W Ins.	1X74338	Shaft Assembly, tuning control: consists of manual tuning shaft with gear, cam and shaft, cam spring, manual tuning shaft bearing block, miter gear bracket and large "C" washer	
C-5	20A70601	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	R-7	6R6004	Resistor, fixed: carbon; 1 meg 1/2W Ins.	9A70208	Socket, tube: 4 prong (vibrator socket)	
C-4	8A14791	Capacitor, fixed: paper; .06 mf. 400V	R-8	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	9A6788	Socket, tube: octal; plain	
C-5	8A19133	Capacitor, fixed: paper; .5 mf. 100V	R-9	6R6005	Resistor, fixed: carbon; 50 1/2W N.I.	9A70165	Socket, tube: octal; shielded type	
C-6	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-10	18A71925 or 18A70172	Resistor, variable: carbon; 500,000 with S.P.S.T. switch; tapped at 50,000 ohms; less shaft	50B73808	Speaker, dynamic: 6"; 3 ohm V.C.	
C-7	8E13166	Capacitor, fixed: paper; .1 mf. 400V	R-11	6R6056	Resistor, fixed: carbon; 47,000 1/2W Ins.	8X4141	Suppressor distributor	
C-8	20A70601	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	R-12	6R2118	Resistor, fixed: carbon; 5.3 meg 1/2W Ins.	1X74336	Tuner, Model ST-56-CT6 (complete)	
C-9	21K70720	Capacitor, fixed: mica; 5 mmf. 500V	R-15	6R5927	Resistor, fixed: carbon; 2.2 meg 1/2W Ins.	ADDITIONAL PARTS LIST - MODEL PC6		
C-10	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	R-14	6R6052	Resistor, fixed: carbon; 470,000 1/2W Ins.	8E4661	Capacitor, ammeter	
C-11	20A70214	Capacitor, variable: mica; 30-60 mmf.; with mounting bracket	R-16	6R6016	Resistor, fixed: carbon; 220,000 1/2W Ins.	8A4491	Capacitor, generator	
C-12	21A71872	Capacitor, fixed: ceramic; 400 mmf. 5X 500V	R-16	6R6004	Resistor, fixed: carbon; 1 meg 1/2W Ins.	11M8944	Cord, dial: 18 lb; black	
C-13	8A17028	Capacitor, fixed: paper; .5 mf. 100V	R-17	6R6390	Resistor, fixed: carbon; 180 10% 1W Ins.	1X74306	Dial Background & Strip Assembly; plastic; with reinforcing strip	
C-14	8E23690	Capacitor, fixed: paper; .01 mf. 400V	R-18	6R5550	Resistor, fixed: carbon; 47 10% 1/2W Ins.	1X74304	Dial Light & Bracket Assembly; with 5-1/2" lead	
C-15	8E23690	Capacitor, fixed: paper; .01 mf. 400V	R-19	6R6184	Resistor, fixed: carbon; 1000 1W N.I.	1X4895	Lead Assembly, battery: 10" long; insulated bushing and contact eyelet on one end, red insulated pin on the other	
C-16	8A19133	Capacitor, fixed: paper; .5 mf. 100V	S-1		ON-OFF switch (part of volume control R-10)	1X74932	Lead Assembly, fuse: 20" long; fuse retainer on one end, ammeter clip on other end	
C-17	8A12840	Capacitor, fixed: paper; .006 mf. 1600V	S-2	1870944	Switch, solenoid; with mounting plate	1K73886	Pointer & Slider Assembly	
C-18	21A70176	Capacitor, fixed: mica; dual 120 mmf. 300V	S-3	40B70952	Switch, selector	1X74268	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
C-19	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	S-4	40A70931	Switch, mute	1X74296	Shaft Assembly, tuning: consists of manual tuning shaft with gear, cam and shaft, cam spring, manual tuning shaft bearing block, miter gear bracket and large "C" washer	
C-20	8A71911	Capacitor, fixed: paper; .03 mf. 400V	S-5	1X71470	Relay, MR-5 tone control; complete	9A70208	Socket, 4 prong	
C-21	21R6648	Capacitor, fixed: mica; 250 mmf. 500V	S-6	40B71365	Switch, tone control actuating	9A6788	Socket, tube: octal; plain	
C-22	8A13166	Capacitor, fixed: paper; .1 mf. 400V	S-7	1K75625	Switch Assembly, push button	9A70165	Socket, tube: octal; shielded type	
C-23	8A71909	Capacitor, fixed: paper; .004 mf. 400V	SP-1	1X74252	Spark Plate Assembly	50B73808	Speaker, dynamic: 8" 3 ohm v.c.	
C-24	8A71910	Capacitor, fixed: paper; .006 mf. 400V	T2	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in early sets only)	1X74336	Tuner, Model ST-56-PC6 (complete)	
C-25	23A75429	Capacitor, electrolytic: 20-20 mf. 400V, 20 mf. 25V				ADDITIONAL PARTS LIST - MODEL OE6		
F-1	65E4637	Fuse: 20 Amp.; type 3A0				8A4491	Capacitor, generator	
G-1	48B3333	Vibrator: full wave; non-sync.				1X74273	Dial Background and Strip Assembly; translucent white plastic; with metal reinforcing strip	
I-1	65X10867	Bulb: 6-8V, .25 Amp., tubular bayonet; type #44				1X4895	Lead Assembly, battery: 10" long; insulated bushing and contact eyelet on one end, red insulated pin on other end.	
L-1	1A71881	Coil, antenna or R.F. (specify color of paint dots on old coil when ordering)		24B76553	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in late sets only)	1X4894	Lead Assembly, fuse: 20" long; fuse receptacle on one end, spade lug on other end	
L-2	1A71881	Coil, antenna or R.F. (specify color of paint dots on old coil when ordering)	T-3	26A72258	Transformer, output: with bracket	1K73732	Pointer and Slider Assembly	
L-3	1A71879	Coil, oscillator (specify color of paint dots on old coil when ordering)	T-4	25B70950	Transformer, power	1X74268	Pulley Assembly, dial ratio: consists of one large and one small pulley assembled together	
L-4	24A70227	Coil, oscillator padder: includes mounting clip and adjustable iron core	ADDITIONAL PARTS LIST - MODEL CT6				49A73806	Pulley, cord: brass, 5/16 diameter (pointer cord idler pulley)
L-5	24A74254	Coil, "A" choke		8X4661	Capacitor, ammeter	9A70208	Socket, 4 prong	
L-6	24A70199	Coil, "A" choke: with mounting bracket		8A4491	Capacitor, generator	9A6788	Socket, tube: octal, plain	
R-1	6R6032	Resistor, fixed: carbon; 470,000 1/2W Ins.		11M8944	Cord, dial: 18 lb; black	1X74263	Shaft Assembly, tuning: includes manual tuning shaft with gear, cam & shaft, cam spring, manual tuning shaft bearing block, miter gear bracket and large "C" washer	
R-2	6R6075	Resistor, fixed: carbon; 100,000 1/2W Ins.		1X74729	Dial Background & Strip Assembly; plastic; with re-inforcing strip			
R-3	6R6056	Resistor, fixed: carbon; 47,000 1/2W Ins.		1X74352	Dial Light & Bracket Assembly			
				1X74932	Lead Assembly, fuse: 20" long; fuse retainer on one end, ammeter clip on other end			
				1X4895	Lead Assembly, battery: 10" long; male ferrule on one end			
				1X78898	Lead-in, antenna extension: 20" long	1X74336	Tuner, Model ST-56-OE6 (complete)	



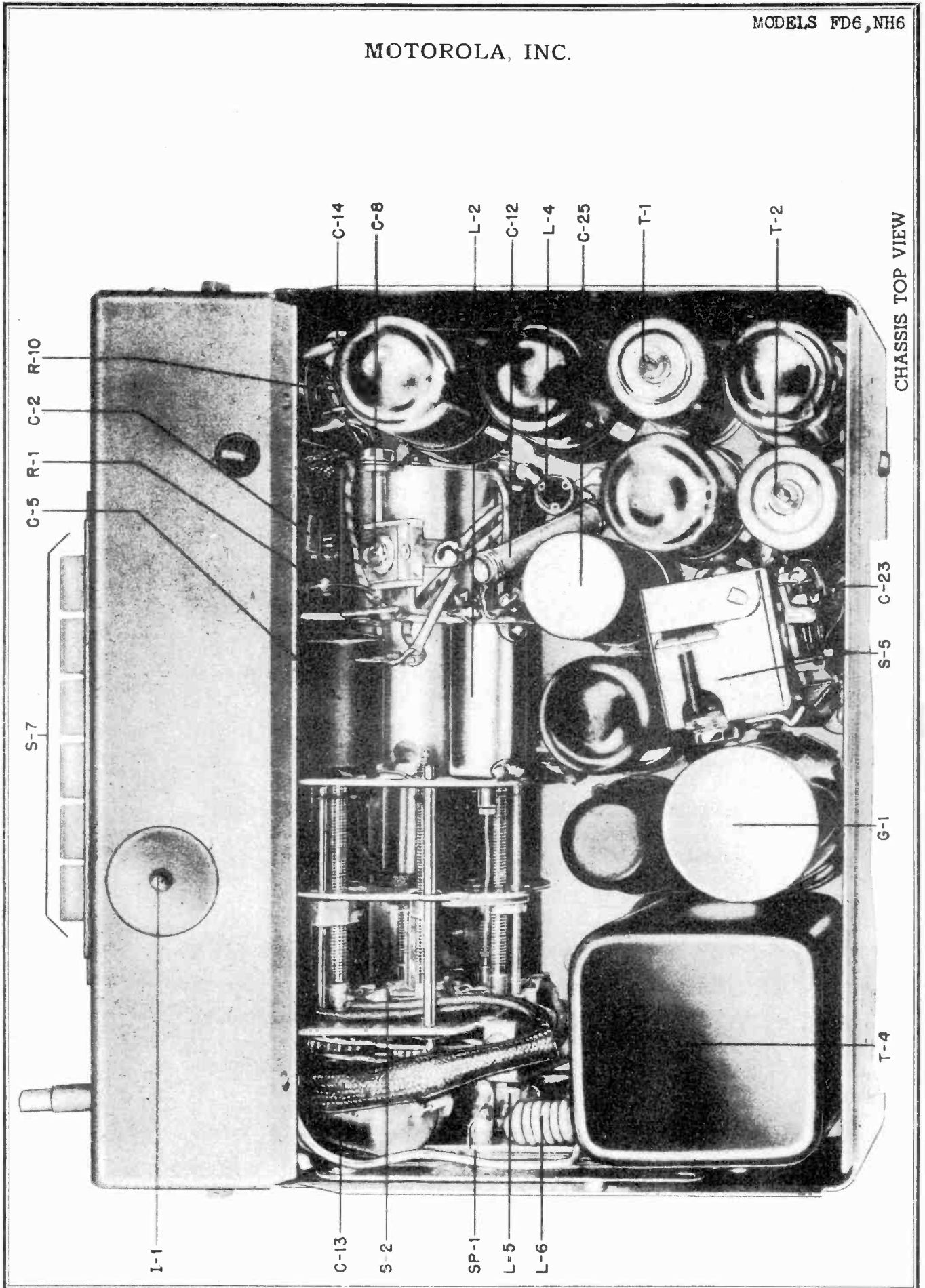
MODELS FD6, NH6

MOTOROLA, INC.



CHASSIS BOTTOM VIEW

MOTOROLA, INC.



CHASSIS TOP VIEW

MODELS FD6,NH6

MOTOROLA, INC.

**WARNING: CHECK VOLTAGE REGULATOR**

Many late cars develop exceedingly high voltage due to improper adjustment of voltage regulator, which shortens the life of radio tubes, vibrator, electrical accessories and headlights. When voltage exceeds 7.3

volts with motor running at about 35 miles per hour and no load or battery, have the voltage regulator adjusted for maximum voltage of 7.3 volts under a no load condition.

**TO REPLACE DIAL LIGHT**

It will be necessary to remove set from car when replacing dial light. Pry off the large plug button directly over the "M" push

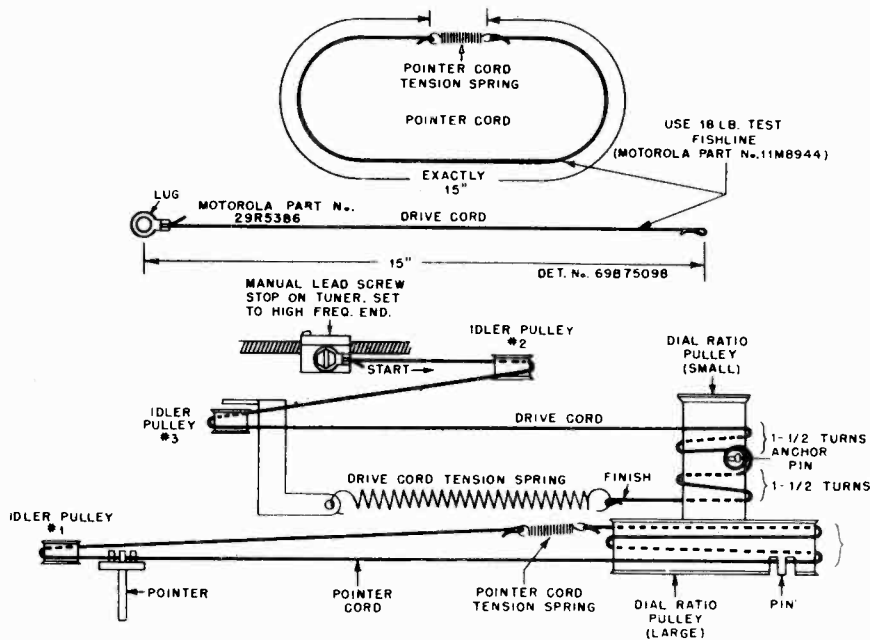
button and replace with a #44 miniature bayonet base pilot lamp.

**POINTER AND DRIVE CORD REPLACEMENT****PREPARE RECEIVER AS FOLLOWS**

1. Remove the escutcheon.

2. Remove the push button assembly. Two screws hold it in position. Do not unsolder any wire leads; just lay the push button assembly on top of the set.

3. The pointer & drive cords are now fully exposed. If only the pointer cord is to be replaced, temporarily remove the drive cord to make the pointer cord more readily accessible.

**POINTER AND DRIVE CORD RESTRINGING DETAIL.**

MOTOROLA, INC.

MODEL FD6

Hash, Ripple and Mechanical Vibration in Model FD-6.

Some Model FD-6's have been troubled by hash, ripple and mechanical vibration. These conditions can be remedied by dressing leads, changing the position of the screen by-pass capacitor (C06) and adding a copper washer to the hash choke.

**Hash:** Remove Capacitor C-6 from its present location and mount it between electrolytic capacitor and the 6SA7 tube along side of the oscillator padder ad-

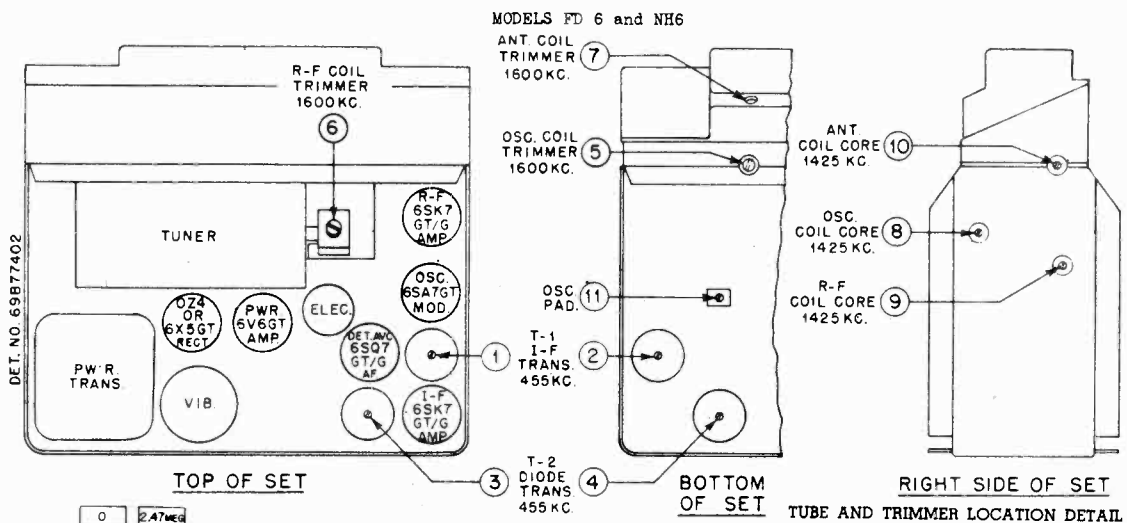
justment screw. It is a tight fit but there is room for it.

Dress the vibrator leads (black and green) into the opening in the chassis base. Next, dress the hot "A" (yellow) lead away from the black and green vibrator leads.

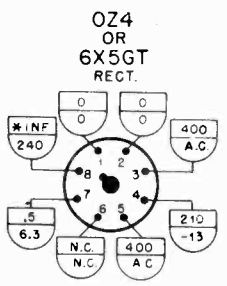
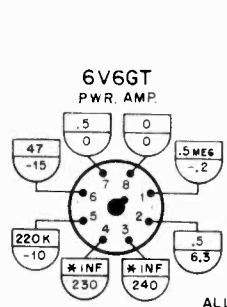
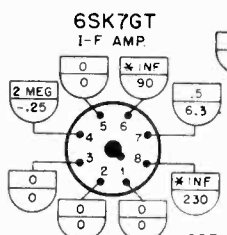
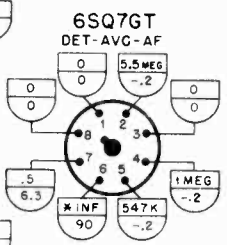
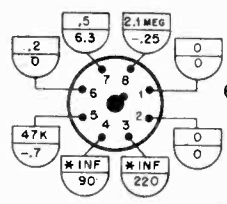
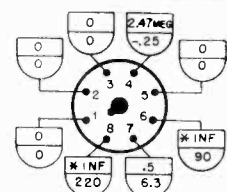
**Ripple:** Ripple may be reduced by removing the chassis from the housing and removing the nose of the set exposing the volume control. Unsolder the grounded lug of the volume control from the bracket. Attach a lead to this lug and run it back

to the cathode terminal of the 6SQ7 tube socket.

**Mechanical Vibration:** A magnetic field is set up by the hash choke which in some instances causes a mechanical vibration (buzz). This condition can be eliminated by soldering a copper washer, Motorola Part Number 4S8203, (15/16 - 7/32 x .025) on top (end) of the hash choke. Solder the washer to the hash choke eyelet.



◻ = RESISTANCE MEASUREMENTS.  
◐ = VOLTAGE MEASUREMENTS.



ALL VOLTAGE MEASUREMENTS ARE MADE WITH A 20,000 OHM / VOLT METER FROM TUBE BASE PIN TERMINALS TO CHASSIS GROUND, WITH 6.3 VOLTS AT SPARK PLATE (BATTERY CONNECTION)

VOLTAGE AND RESISTANCE MEASUREMENTS MAY VARY ± 10%.

K = 1000 OHMS.

\* THESE VALUES DEPEND ON THE SENSITIVITY OF METER AND SCALE USED, ALSO THE CONDITION OF THE ELECTROLYTIC FILTER CAPACITOR IN THE 'B' CIRCUIT.

DET. NO. 63C75992-0

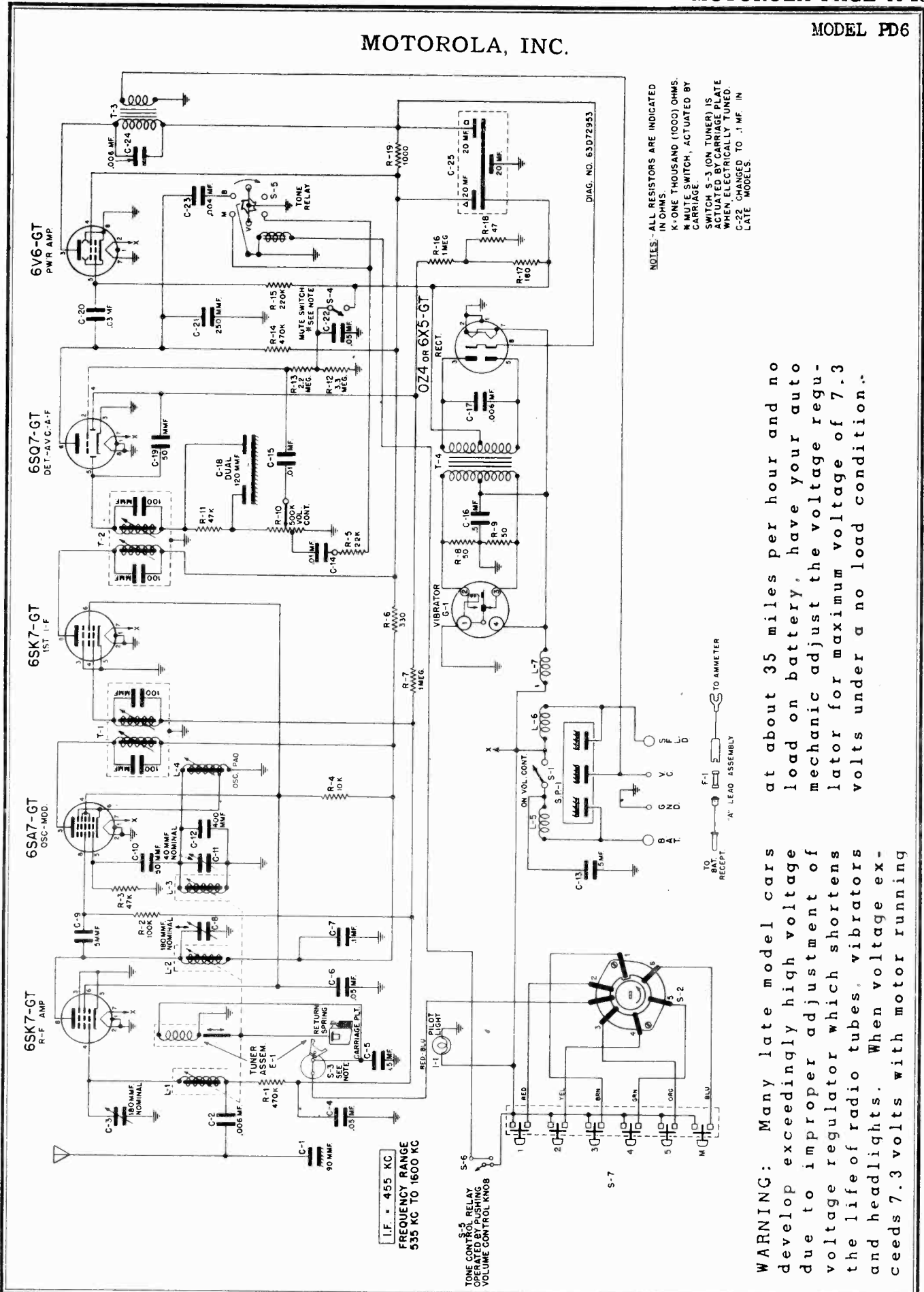
VOLTAGE AND RESISTANCE DIAGRAM

MODELS FD6, NH6

MOTOROLA, INC.

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION	
C-1	21A20877	Capacitor, fixed: metal mica; 90 mmf	R-7	6R6004	Resistor, fixed: carbon; 1 meg-1/2W; Ins.	46A72155	Stud, dial ratio pulley: brass; 1/8" diameter x 51/64" long	
C-2	8A4529	Capacitor, fixed: paper; .006 mf. 100V	R-8	6R6005	Resistor, fixed: carbon; 50-1/2W; N. I.	6A76813	Suppressor, distributor	
C-3	20A70801	Capacitor, variable: mica; 50-180 mmf.; with mounting bracket	R-9	6R6005	Resistor, fixed: carbon; 50-1/2W; N. I.	29K5405	Terminal, insulated pin: black; (speaker ground terminal)	
C-4	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-10	18A71925 or 18A70172	Resistor, variable: carbon; .5 meg; with S.P.S.T. switch; tapped at 50,000 ohms; less shaft	14A74226	Insulator, switch: aramite; 4" x 2-7/16"	
C-5	8A19133	Capacitor, fixed: paper; .5 mf. 100V	R-11	6R6056	Resistor, fixed: carbon; 47,000-1/2W; Ins.	36B72165	Knob, station set-up: die cast; polished chrome finish	
C-6	8A14791	Capacitor, fixed: paper; .05 mf. 400V	R-12	6R2118	Resistor, fixed: carbon; 3.3 meg 1/2W; Ins.	36K73406	Knob, control: with setscrew; (volume & tuning)	
C-7	8K13166	Capacitor, fixed: paper; .1 mf. 400V	R-13	6R3927	Resistor, fixed: carbon; 2.2 meg 1/2W Ins.	29R5366	Lug, soldering: #4 hot-tin dipped (used on one end of drive cord)	
C-8	20A70801	Capacitor, variable; mica; 50-180 mmf.; with mounting bracket	R-14	6R6032	Resistor, fixed: carbon; 470,000-1/2W; Ins.	1X4894	Lead Assembly, fuse: 20" long; fuse retainer on one end, spade lug on other end	
C-9	21K70720	Capacitor, fixed: mica; 5 mmf. 500V	R-15	6R6016	Resistor, fixed: carbon; 220,000-1/2W; Ins.	1X4895	Lead Assembly, battery: 10" long, male connector on one end, insulated pin terminal on other end.	
C-10	21R6513	Capacitor, fixed: mica; 60 mmf. 300V	R-16	6R6004	Resistor, fixed: carbon; 1 meg 1/2W; Ins.	1X76859	Lead Assembly, speaker: 2 conductor with black & white insulated pin terminals	
C-11	20A70214	Capacitor, variable; mica; 30-80 mmf.; with mounting bracket	R-17	6R6390	Resistor, fixed: carbon; 180 10% 1W Ins.	1X27619	Lead Assembly, speaker: 3 conductor, with black, white & yellow insulated pin terminals	
C-12	21A71872	Capacitor, fixed: ceramic; 400 mmf. 6% 500V	R-18	6R5550	Resistor, fixed: carbon; 47 10% 1/2W Ins.	1X72203	Plate, speaker mounting: Includes speaker gasket	
C-13	8A17028	Capacitor, fixed: paper; .5 mf. 100V	R-19	6R6184	Resistor, fixed: carbon; 1000 1W N. I.	1X72248	Pointer & Slider Assembly	
C-14	8K23690	Capacitor, fixed: paper; .01 mf. 400V	S-1		ON-OFF switch (part of volume control R-10)	1X74268	Pulley Assembly, dial ratio: one large and one small pulley assembled together	
C-15	8K23690	Capacitor, fixed: paper; .01 mf. 400V	S-2	1B70944	Switch, solenoid: with mounting plate	49A73807	Pulley, cord: 1/2" groove	
C-16	8A19133	Capacitor, fixed: paper; .5 mf. 100V	S-3	40B70952	Switch, selector	1X70646	Receptacle Assembly, antenna: metal ferrule with insulated contact	
C-17	8A12840	Capacitor, fixed: paper; .006 mf. 1600V	S-4	40A70931	Switch, mute	34B72259	Scale, dial; plastic	
C-18	21A70176	Capacitor, fixed: mica; dual 120 mmf.	S-5	1X71470	Relay, MR-5 Tone Control: complete	8K19266	Capacitor, distributor	
C-19	21R6513	Capacitor, fixed: mica; 50 mmf. 300V	S-6	40B71383	Switch, tone control	8A4491	Capacitor, generator	
C-20	8A71911	Capacitor, fixed: paper; .03 mf. 400V	S-7	1X73625	Switch Assembly, push button	42A51461	Clamp, electrolytic capacitor mounting	
C-21	21R6648	Capacitor, fixed: mica; 250 mmf. 500V	SP-1	1X75194	Spark Plate Assembly	42A4215	Clip, vibrator grounding	
C-22	8A13166	Capacitor, fixed: paper; .1 mf. 400V	T-1 & T-2	24B70827	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in early sets only)	11M8944	Cord, dial: 18 lb; black	
C-23	8A71909	Capacitor, fixed: paper; .004 mf. 400V		or		1X75221	Dial Background & Strip Assembly: plastic with reinforcing strip	
C-24	8A71810	Capacitor, fixed: paper; .006 mf. 400V		24B76553	Transformer, I.F. or diode: 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in late sets only)	1X75319	Dial Light Assembly: miniature bayonet base socket riveted to large plug button; with 12" lead	
C-25	23A75429	Capacitor, electrolytic: 20-20 mf. 400V, 20 mf. 25V	T-3	25A72256	Transformer, output: with bracket	13C72265	Escutcheon, front plate: polished chrome finish (less dial scale and retaining frame)	
E-1	1X75200	Tuner, Model ST-56 - FD6 - NH6 PD6: complete	T-4	25B70950	Transformer, power	587805	Eyelet, snap-in: steel (dial background strip mounting)	
F-1	65K4637	Fuse: 20 Amp.; type 3AG	MODEL FD6 - ADDITIONAL PARTS				7C74211	Frame, dial scale retaining
G-1	48B3333	Vibrator: full wave; non-async.	1X75223		Shaft Assembly, volume control: brass shaft with bakelite washer at one end	14K74155	Insulator, electrolytic: fishpaper; 3-7/8 x 2-5/8"	
I-1	65X10867	Bulb: 6-8V, .25 Amp., tubular bayonet; type #44	47A73635		Shaft, volume control: hairpin shaped; 29/32" long (fits into volume control)	14X51112	Insulator, fuse: fibre tube	
L-1	1A71881	Coil, antenna or R. F. (specify color of paint dots on old coil when ordering)	26B70107		Shield, coil (for T-1 & T-2; use with 24B70827 I.F.-diode)	MODEL NH6 - ADDITIONAL PARTS		
L-2	1A71881	Coil, antenna or R. F. (specify color of paint dots on old coil when ordering)	1A71049		Shield and Iron Core Sleeve Assembly (for T-1 & T-2; use with 24B76553 I.F.-diode transformers only)	11M8944	Cord, dial: 18 lb. black	
L-3	1A71879	Coil, oscillator (specify color of paint dots on old coil when ordering)	9A70208		Socket, tube: 4 Pin	49A73807	Pulley, cord: 1/2" groove	
L-4	24A70227	Coil, oscillator padder: includes mounting clip and adjustable iron core	9A6788		Socket, tube: octal; plain	1X74268	Pulley Assembly, dial ratio: one large & one small pulley assembled together	
L-5	24K70840	Coil, *A* choke	9A70165		Socket, tube: octal, shielded type	1X70646	Receptacle Assembly, antenna: metal	
L-6	24K73535	Coil, choke: dial light and speaker field; 9 turns #18 yellow wire	50B71900 or 50B76589		Speaker: dynamic 6"; 3 ohm v.c.	26B70107	Shield, coil: (for T-1 & T-2; use with 24B70827 I.F.-Diode transformers only)	
L-7	24A70199	Coil, *A* choke: with mounting bracket	31K72404		Strip, terminal: 1 insulated lug, #1 mounting.	1A71049	Shield and Iron Core Sleeve Assembly (for T-1 & T-2; use with 24B76553 I.F.-Diode transformers only)	
R-1	6R6032	Resistor, fixed: carbon; 470,000-1/2W Ins.	31K74292		Strip, terminal: 1 insulated lug, #2 mounting	9A70208	Socket, tube: 4 pin	
R-2	6R6075	Resistor, fixed: carbon; 100,000-1/2W Ins.	31K74291		Strip, terminal: 2 insulated lugs, #2 mounting	9A6788	Socket, tube: octal; plain	
R-3	6R6056	Resistor, fixed: carbon; 47,000-1/2W; Ins.	41A51096		Spring, coil (used under volume knob for tone control operation)	9A70165	Socket, tube: octal; shielded type	
R-4	6R6106	Resistor, fixed: carbon; 10,000-1W; N. I.	41A73996		Spring, drive cord tension (large)	50B71900 or 50B76589	Speaker, dynamic: 6"; 3 ohm v.c.	
R-5	6R6068	Resistor, fixed: carbon; 22,000-1/2W; Ins.	41A73619		Spring, string tension (small)	6X4141	Suppressor, distributor	
R-6	6R6147	Resistor, fixed: carbon; 350-1W; Ins.						

MOTOROLA, INC.



NOTES: ALL RESISTORS ARE INDICATED IN OHMS.  
 K=ONE THOUSAND (1000) OHMS.  
 M=MUTE SWITCH, ACTUATED BY CARRIAGE.  
 S=3 (ON TUNER) IS SWITCHED BY CARRIAGE PLATE WHEN ELECTRICALLY TUNED.  
 C-22 CHANGED TO .1 MF IN LATE MODELS.

at about 35 miles per hour and no load on battery, have your auto mechanic adjust the voltage regulator for maximum voltage of 7.3 volts under a no load condition.

WARNING: Many late model cars develop exceedingly high voltage due to improper adjustment of voltage regulator which shortens the life of radio tubes, vibrators and headlights. When voltage exceeds 7.3 volts with motor running

MODEL PD6

MOTOROLA, INC.

ALIGNMENT

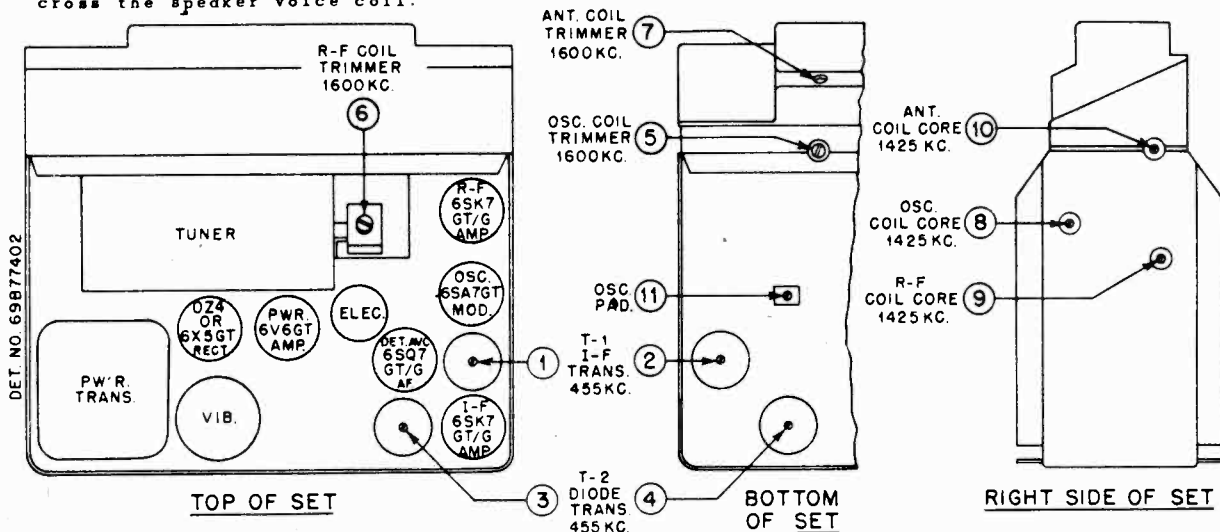
PROCEDURE

1. Remove the top and bottom covers. All adjustments are now exposed. Refer to Figure 3 for their location.
2. Turn the receiver on and allow it to warm up for a few minutes. Press the "M" button to place automatic tuner in manual tuning position.
3. Connect the output meter across the speaker voice coil.

4. Set receiver volume control at maximum and tone control to voice position (high position).

5. Refer to the following alignment chart for procedure.

**IMPORTANT:** Do not push in on the alignment tool when adjusting the tuner cores. The slightest inward pressure on the alignment tool may move the tuner carriage and result in inaccurate alignment.



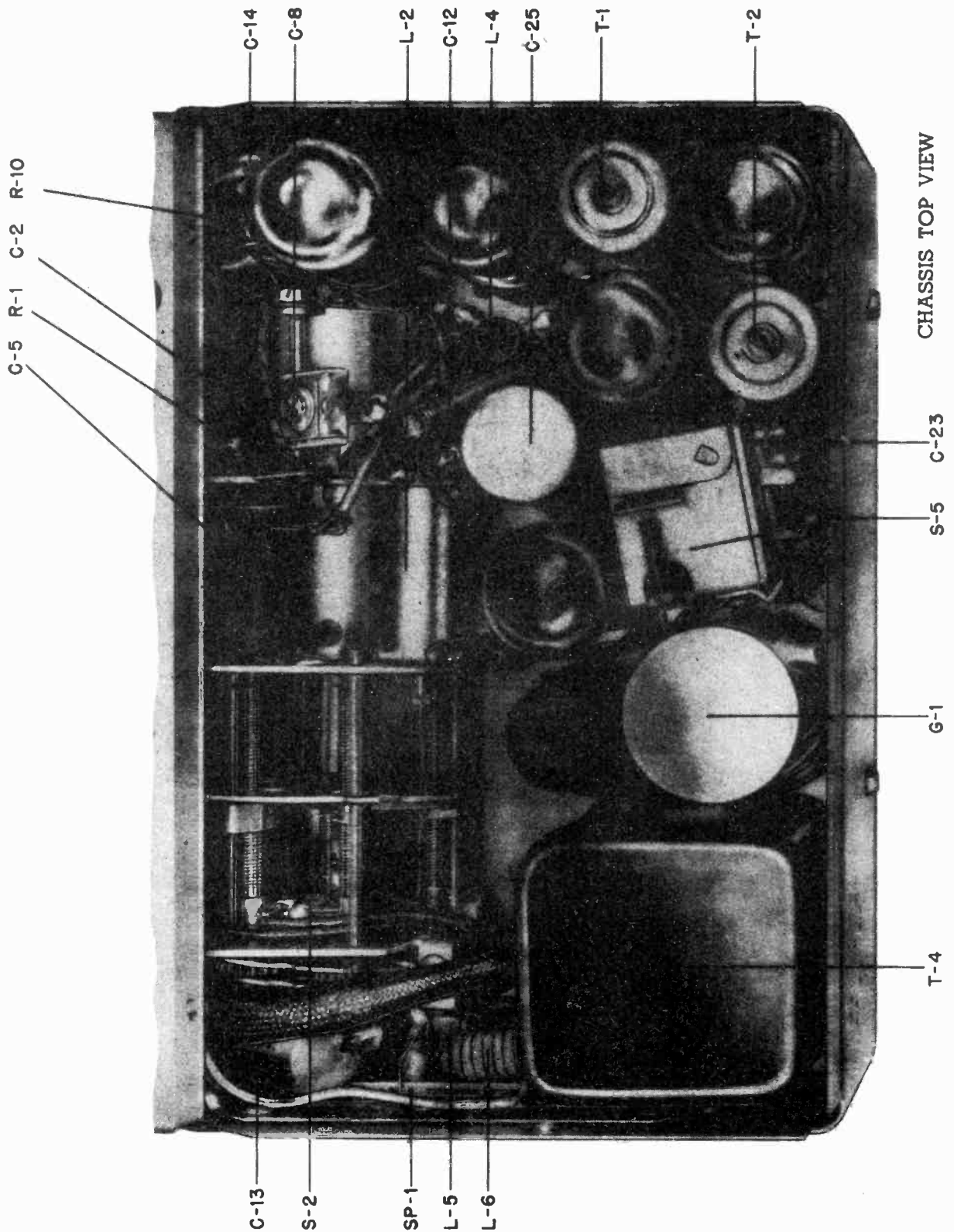
TUBE AND TRIMMER LOCATION DETAIL

Step	Tuner Position Set to	Dummy Antenna	Signal Generator Lead Connected to	Sig. Gen. Set at	Adjust for Peak on Output Meter
1.	High frequency end	.1 mfd. at Sig. Gen.	Osc. Mod grid (#5 pin)	455 Kc	#1 and 2, P & S in T-1 #3 and 4, P & S in T-2
2. *	High frequency end, tuning shaft against stop. Cores should be set to project 1-1/8" from cans.	60 mmf. at Sig. Gen. in series with 21" long coax lead.	Antenna Receptacle	1600 Kc	#5 Osc. coil trimmer #6 R.F. coil trimmer #7 Ant. Coil trimmer
3. *	EXACTLY one full turn in from high frequency end. Use knob set screw as an indicator. Start measuring turn the moment tuner carriage starts moving inward.	"	"	1425 Kc	#8 Osc. coil core #9 R.F. coil core #10 Ant. coil core
4.	EXACTLY four more full turns in (as indicated by knob setscrew)	"	"	Power turned Off	#11 Osc. Pad. core for maximum noise

NOTE: If oscillator padder core adjustment is too far off, repeat alignment procedure, steps 2, 3 and 4. It may be necessary to repeat alignment more than once if padder adjustment has been indiscriminately tampered with.

5. Assemble receiver and peak antenna trimmer (#7) to car antenna. The antenna trimmer is inaccessible when the receiver is installed behind instrument panel, therefore, it is necessary to adjust antenna trimmer before final installation. Proceed by laying set on floor of car, connect antenna and "A" leads, tune set to a spot around 1400 kc that is free of stations and adjust antenna trimmer for maximum noise. The antenna should be fully extended.

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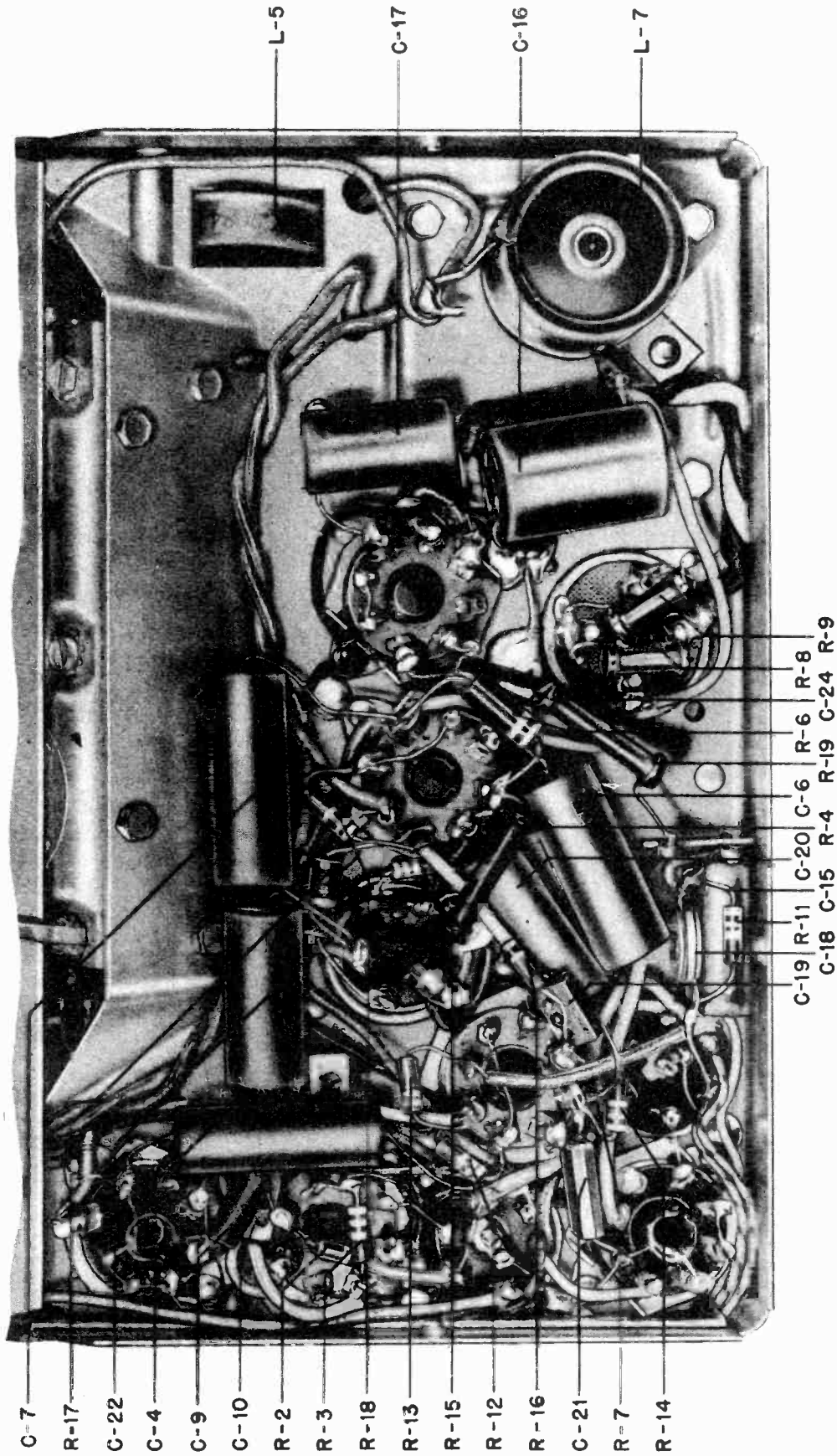


CHASSIS TOP VIEW

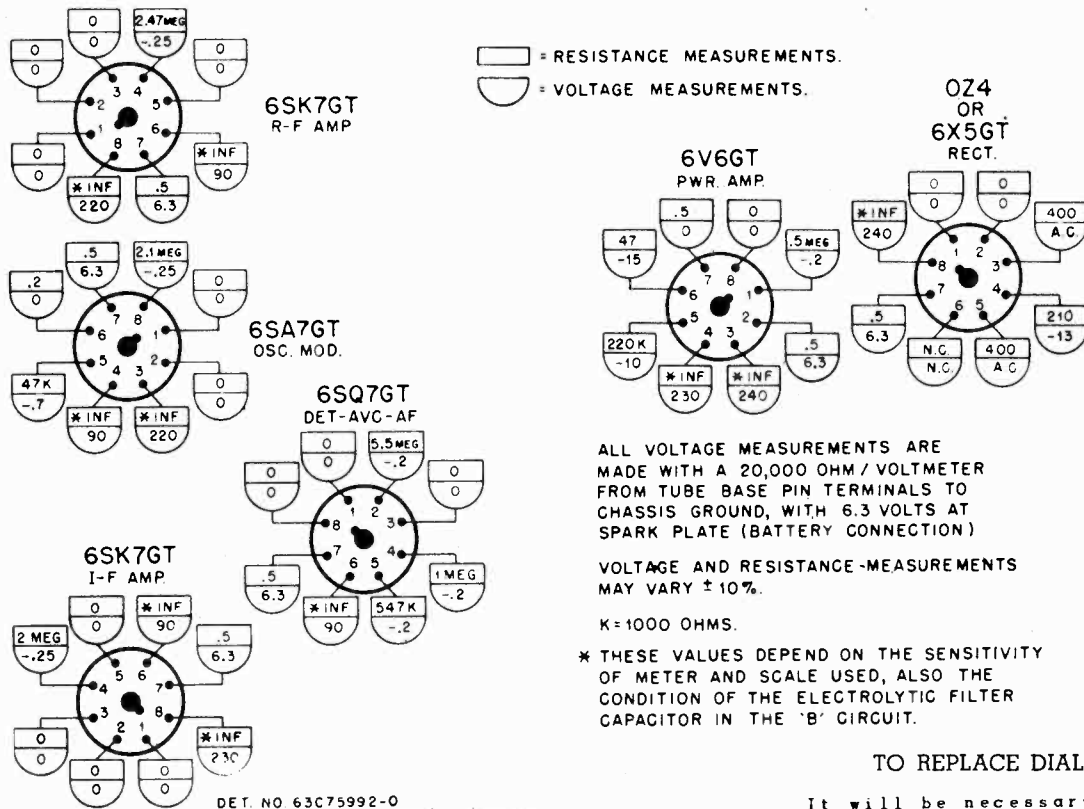


MODEL PD6

MOTOROLA, INC.



CHASSIS BOTTOM VIEW



TO REPLACE DIAL LIGHT

It will be necessary to remove set from car when replacing dial light. Pry out the large plug button directly over the "M" push button and replace bulb with a #44 miniature bayonet base pilot lamp.

POINTER CORD REPLACEMENT

1. Make up the pointer cord as shown in Figure 1. The ends are tied to the pointer cord spring. IT MUST MEASURE 17-3/4" FROM ONE END OF THE SPRING TO THE OTHER AFTER BEING TIED. Secure the knots with a drop of shellac or household cement.

2. Restring as shown in Figure 1.

DIAL DRIVE CORD REPLACEMENT

1. Make up the drive cord as shown in Figure 1. Secure the knots with a drop of shellac or household cement.

3. Restring as shown in Figure 1.

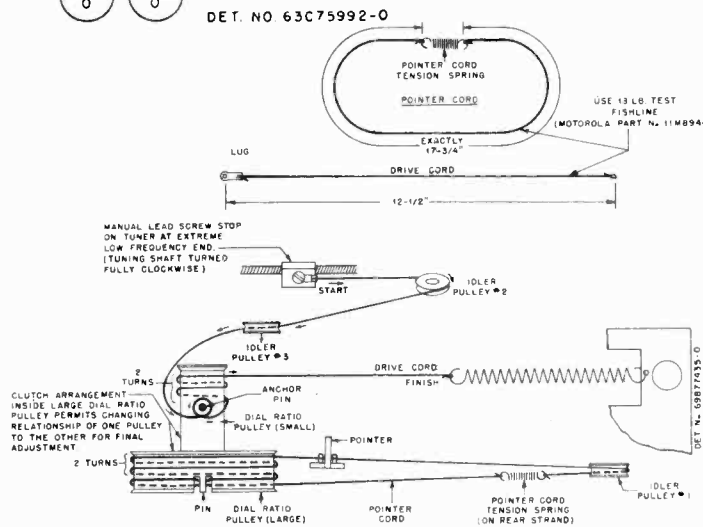


FIGURE 1. POINTER AND DRIVE CORD RESTRINGING DETAIL

POINTER AND DRIVE CORD REPLACEMENT

PREPARE RECEIVER AS FOLLOWS

1. Remove the escutcheon and push button assembly. Four screws hold it in position. Do not unsolder any wire leads; just lay the escutcheon and push button assembly to one side.

2. The pointer cord is now fully exposed. If only the pointer

cord is to be replaced, temporarily remove the drive cord to make the pointer cord more readily accessible.

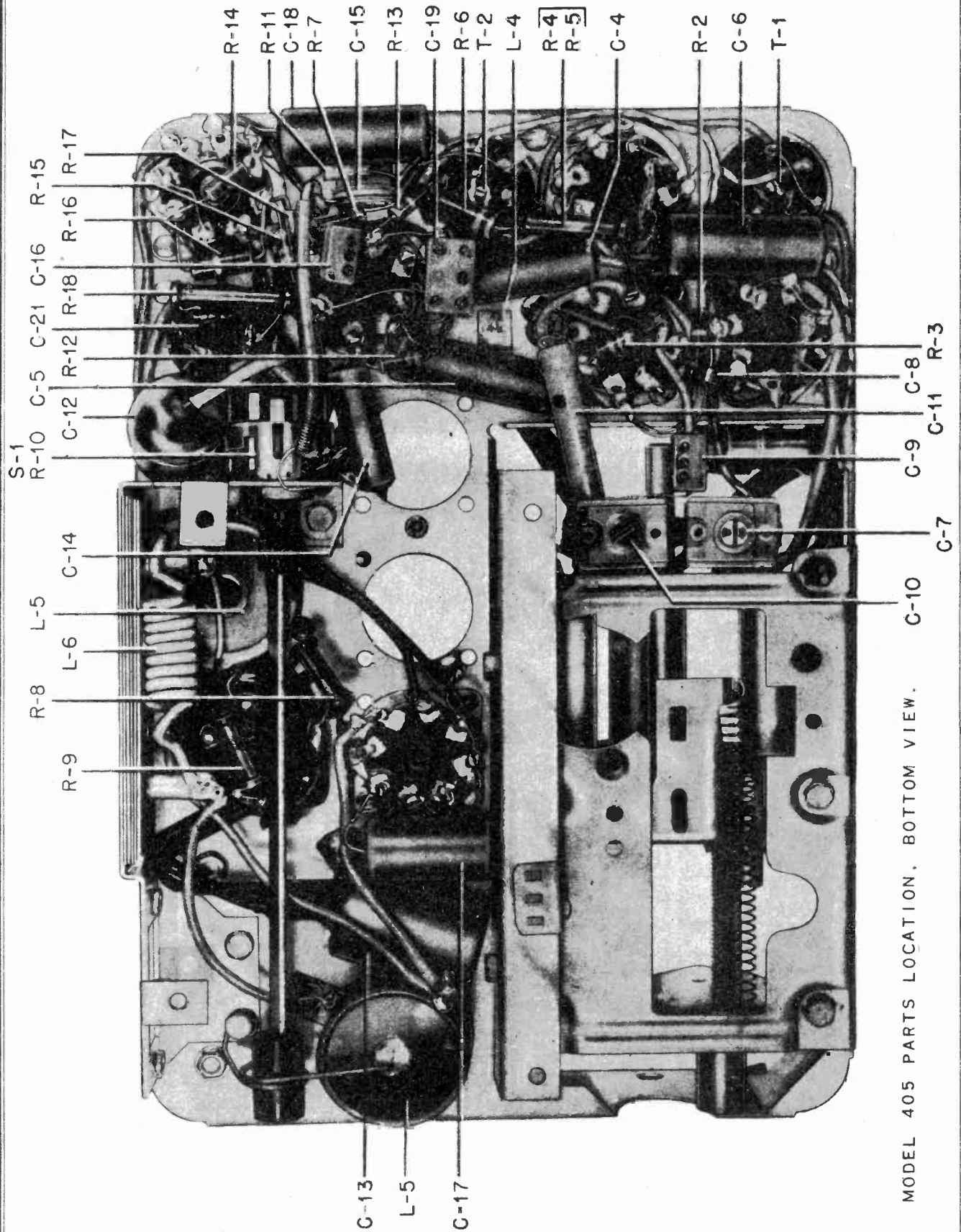
3. To reach drive cord, it will be necessary to remove stamped front of receiver in addition to escutcheon.

MODEL PD6

MOTOROLA, INC.

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
C-1	21A20877	Capacitor, fixed; metal mica; 90 mmf	L-2	1A71881	Coil, antenna or R. F. (specify color of paint dots on old coil when ordering)	S-1	ON-OFF switch (part of volume control R-10)
C-2	8A4529	Capacitor, fixed; paper; .006 mf. 100V	L-3	1A71879	Coil, oscillator (specify color of paint dots on old coil when ordering)	S-2	1570944 Switch, solenoid; with mounting plate
C-3	20A70401	Capacitor, variable; mica; 50-180 mmf.; with mounting bracket	L-4	24A70227	Coil, oscillator padder; includes mounting clip and adjustable iron core	S-3	40B70962 Switch, selector
C-4	8A14791	Capacitor, fixed; paper; .05 mf. 400V	L-6	24K70840	Coil, "A" choke	S-4	40A70931 Switch, mute
C-5	8A19133	Capacitor, fixed; paper; .5 mf. 100V	L-6	24K73535	Coil, choke; dial light and speaker field; 9 turns #16 yellow wire	S-5	1X71470 Relay, MR-6 Tone Control; complete
C-6	8A14791	Capacitor, fixed; paper; .05 mf. 400V	L-7	24A70199	Coil, "A" choke; with mounting bracket	S-6	40B71363 Switch, tone control
C-7	8K13166	Capacitor, fixed; paper; .1 mf. 400V	R-1	6R6032	Resistor, fixed; carbon; 470,000-1/2W Ins.	S-7	1K73625 Switch Assembly, push button
C-8	20A70801	Capacitor, variable; mica; 50-180 mmf.; with mounting bracket	R-2	6R6075	Resistor, fixed; carbon; 100,000-1/2W Ins.	SP-1	1X75194 Spark Plate Assembly
C-9	21K70720	Capacitor, fixed; mica; 5 mmf. 500V	R-3	6R6056	Resistor, fixed; carbon; 47,000-1/2W; Ins.	T-1 &	24B70827 Transformer, I.F. or diode; 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in early sets only)
C-10	21R6513	Capacitor, fixed; mica; 50 mmf. 300V	R-4	6R6106	Resistor, fixed; carbon; 10,000-1W; N. I.	T-2	25A72258 Transformer, I.F. or diode; 455 kc; iron core tuned; includes 100 mmf padder across each winding; less shield can (used in late sets only)
C-11	20A70214	Capacitor, variable; mica; 30-60 mmf.; with mounting bracket	R-5	6R6028	Resistor, fixed; carbon; 22,000-1/2W; Ins.	T-3	25A72258 Transformer, output; with bracket
C-12	21A71872	Capacitor, fixed; ceramic; 400 mmf. 5% 500V	R-6	6R6147	Resistor, fixed; carbon; 350-1W; Ins.	T-4	25B70950 Transformer, power 64A4491 Capacitor, generator 1X4895 Lead Assembly, battery 10" long; insulated bushing and contact eyelet on one end, insulated pin on the other end
C-13	8A17028	Capacitor, fixed; paper; .5 mf. 100V	R-7	6R6004	Resistor, fixed; carbon; 1 meg-1/2W; Ins.	1X74932	Lead Assembly; 20" long; fuse retainer on one end, ammeter clip on other end
C-14	8K23690	Capacitor, fixed; paper; .01 mf. 400V	R-8	6R6005	Resistor, fixed; carbon; 50-1/2W; N. I.	1X78859	Lead Assembly, speaker; 2 conductor; with black and white insulated pin terminals
C-15	8K23690	Capacitor, fixed; paper; .01 mf. 400V	R-9	6R6005	Resistor, fixed; carbon; 50-1/2W; N. I.	1X27619	Lead Assembly, speaker; 3 conductor; with black, white and yellow insulated pin terminals
C-16	8A19133	Capacitor, fixed; paper; .5 mf. 100V	R-10	18A71925 or 18A70172	Resistor, variable; carbon; .5 meg; with S.P.S.T. switch; tapped at 50,000 ohms; less shaft	64A24794	Plate, dial scale retainer
C-17	8A12840	Capacitor, fixed; paper; .006 mf. 1600V	R-11	6R6056	Resistor, fixed; carbon; 47,000-1/2W; Ins.	1X72011	Plate, speaker mounting; includes speaker gasket
C-18	21A70176	Capacitor, fixed; mica; dual 120 mmf.	R-12	6R2118	Resistor, fixed; carbon; 3.3 meg 1/2W; Ins.	1K75353	Pointer & Slider Assembly
C-19	21R6513	Capacitor, fixed; mica; 50 mmf. 300V	R-13	6R3927	Resistor, fixed; carbon; 2.2 meg 1/2W Ins.	1X74266	Pulley Assembly, dial ratio; consists of one large and one small pulley assembled together
C-20	8A71911	Capacitor, fixed; paper; .03 mf. 400V	R-14	6R6032	Resistor, fixed; carbon; 470,000-1/2W; Ins.	49A73807	Pulley, cord; 1/2" groove
C-21	21R6646	Capacitor, fixed; mica; 250 mmf. 500V	R-15	6R6015	Resistor, fixed; carbon; 220,000-1/2W; Ins.	1X75405	Shaft Assembly, tuning; consists of tuning shaft with gear, "C" washer, miter gear bracket and manual drive bearing
C-22	8A13166	Capacitor, fixed; paper; .1 mf. 400V	R-16	6R6004	Resistor, fixed; carbon; 1 meg 1/2W; Ins.	1X75328	Shaft Assembly, volume control; brass; with bakelite washer at one end.
C-23	8A71909	Capacitor, fixed; paper; .004 mf. 400V	R-17	6R6390	Resistor, fixed; carbon; 180 10% 1W Ins.	47A73635	Shaft, volume control; hairpin shaped; 29/32" long (fits into volume control)
C-24	8A71910	Capacitor, fixed; paper; .006 mf. 400V	R-18	6R6550	Resistor, fixed; carbon; 47 10% 1/2W Ins.	9A786	Socket, tube; octal; plain
C-25	25A75429	Capacitor, electrolytic; 20-20 mf. 400V, 20 mf. 25V	R-19	6R6184	Resistor, fixed; carbon; 1000 1W N. I.	9A70185	Socket, tube; octal; shielded type
E-1	1I75200	Tuner, Model St-56 - FD6 - NH6 PD6: complete				9A70208	Socket, tube; 4 prong
F-1	65K4637	Fuse; 20 Amp.; type 3AG				80B71900 or 50B76589	Speaker, dynamic; 6"; 3 ohm v.c.
G-1	48B3333	Vibrator; full wave; non-sync.					
I-1	65A10867	Bulb; 6-8V, .25 amp., tubular bayonet; type #44					
L-1	1A71861	Coil, antenna or R.F. (specify color of paint dots on old coil when ordering)					

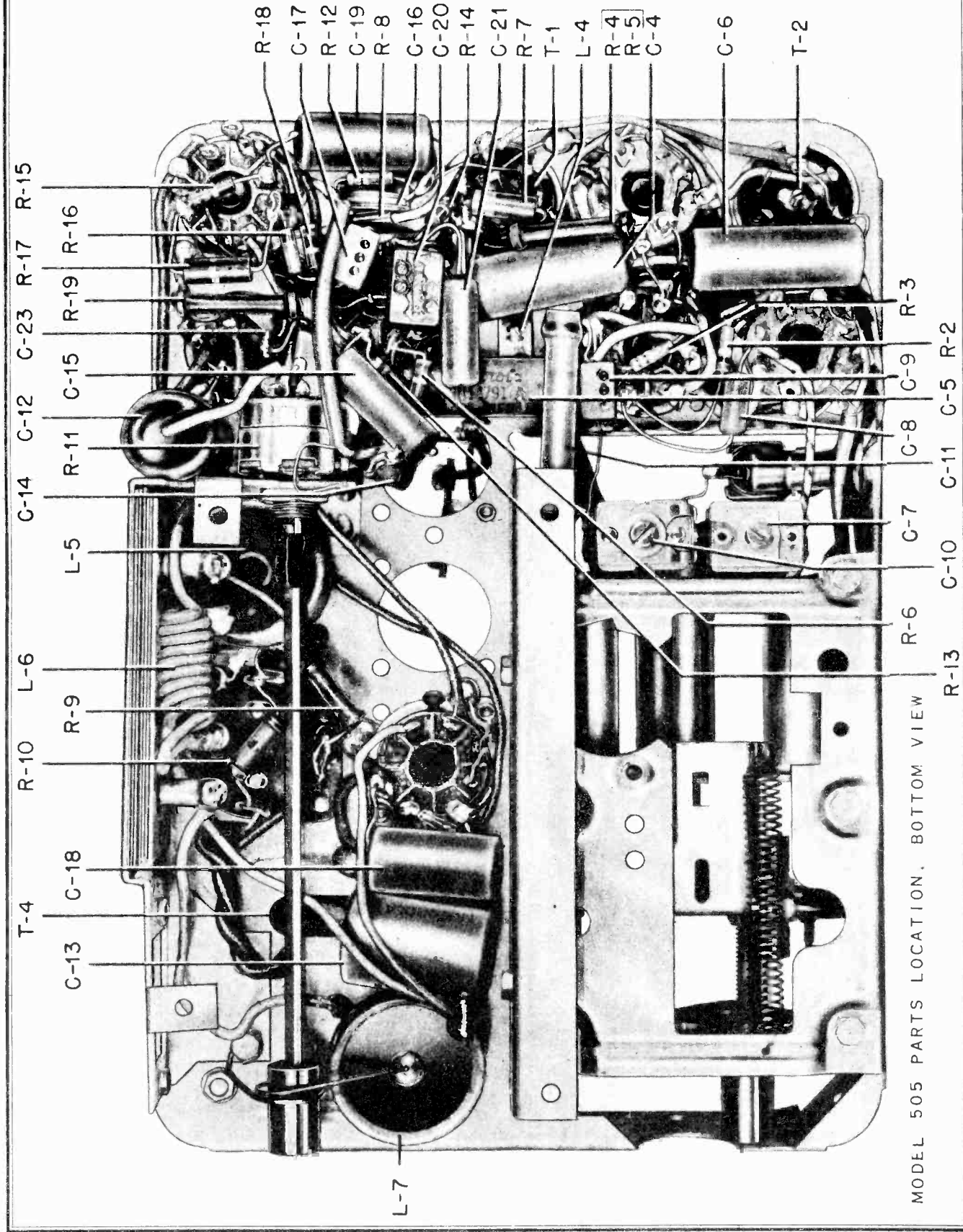
MOTOROLA, INC.



MODEL 405 PARTS LOCATION, BOTTOM VIEW.

MODEL 505

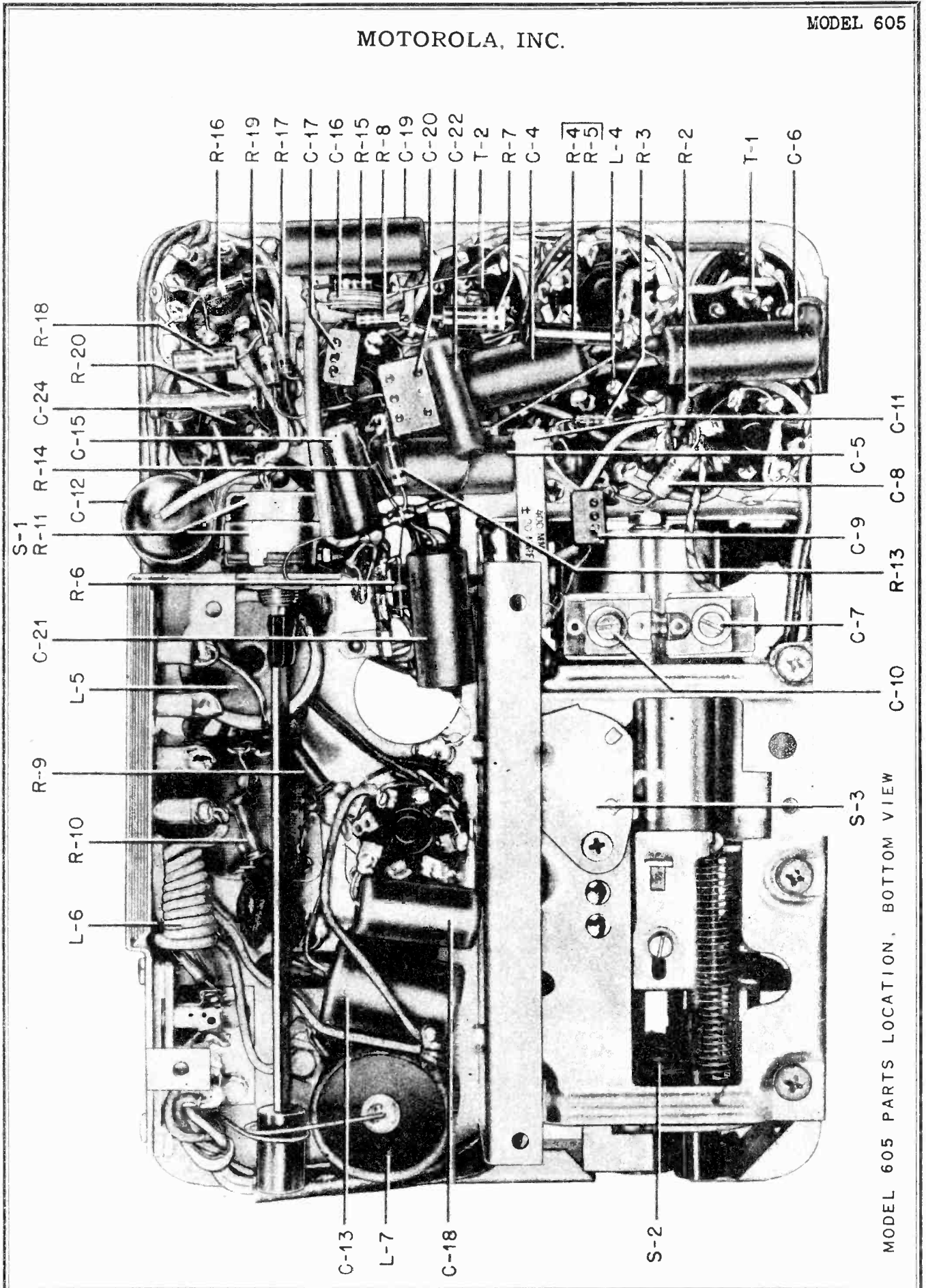
MOTOROLA, INC.



MODEL 505 PARTS LOCATION, BOTTOM VIEW

MOTOROLA, INC.

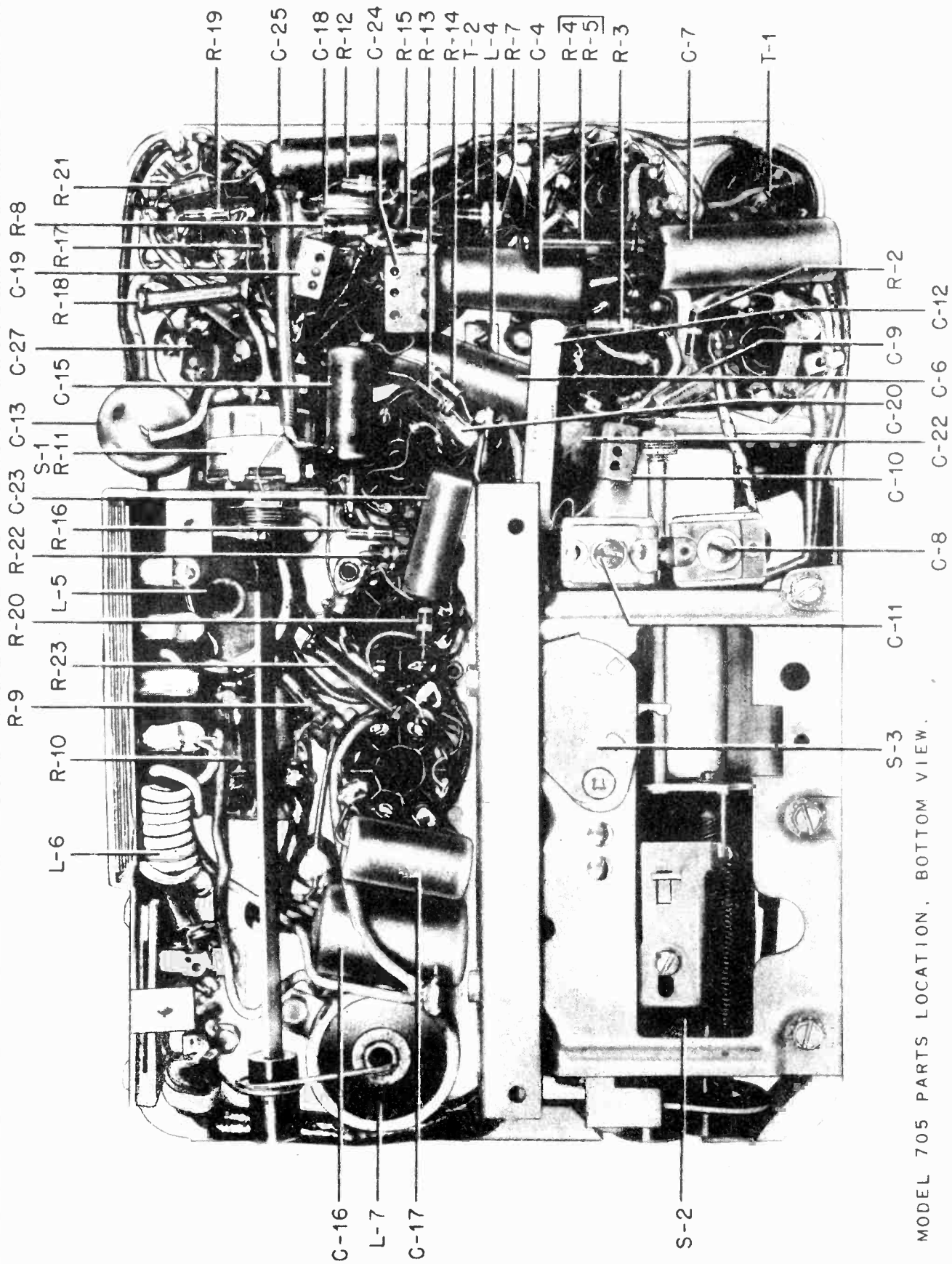
MODEL 605



MODEL 605 PARTS LOCATION, BOTTOM VIEW

MODEL 705

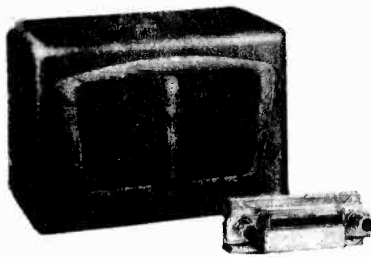
MOTOROLA, INC.



MODEL 705 PARTS LOCATION, BOTTOM VIEW.

MOTOROLA, INC.

MODEL 405, MODEL 505  
MODEL 605, MODEL 705



**MODEL 405**

MODEL 405

Current drain - 7.5 amps at 6.3 volts

Power output - 5.6 watts

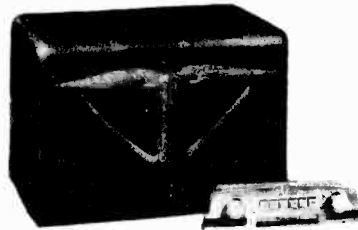
Frequency	1400 kc	1020 kc	600 kc
Max. Sensitivity	1.4 uv	1.3 uv	1.1 uv

MODEL 605

Current drain - 7.5 amps at 6.3 volts

Power output - 5.6 watts

Frequency	1400 kc	1020 kc	600 kc
Max. Sensitivity	1.4 uv	1.6 uv	1.45 uv



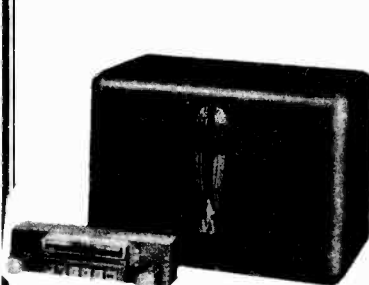
**MODEL 605**

MODEL 705

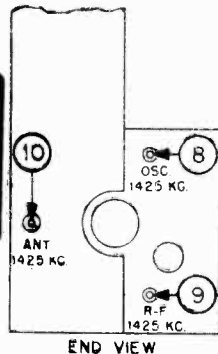
Current drain - 10 amps at 6.3 volts

Power output - 9 watts

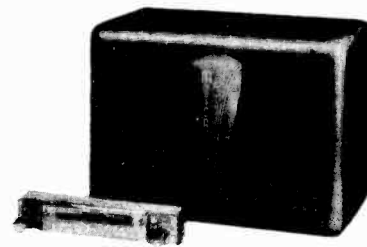
Frequency	1400 kc	1000 kc	600 kc
Max. Sensitivity	1.5 uv	1.6 uv	.9 uv



**MODEL 705**



END VIEW



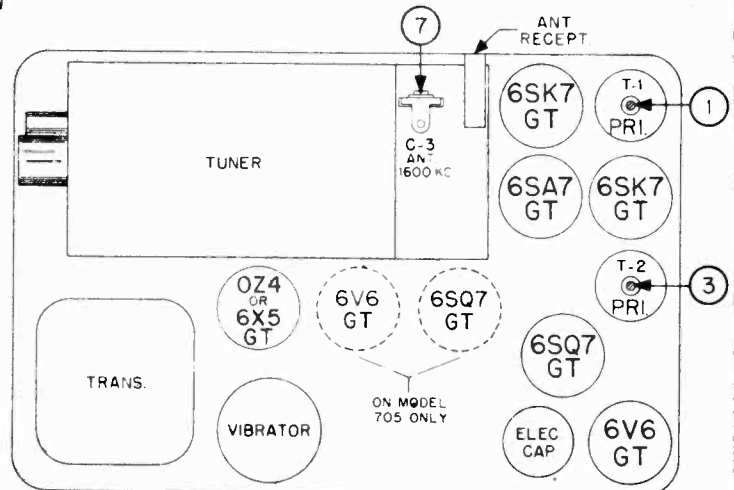
**MODEL 505**

MODEL 505

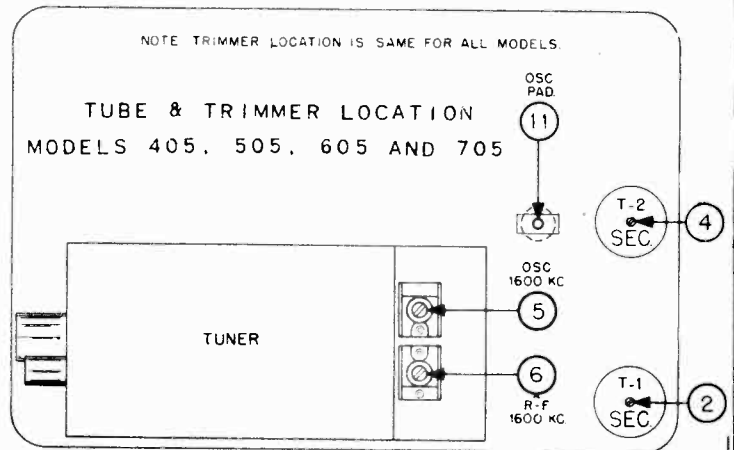
Current drain - 7.5 amps at 6.3 volts

Power output - 5.6 watts

Frequency	1400 kc	1000 kc	600 kc
Max. Sensitivity	1.5 uv	1.4 uv	1.5 uv



TOP VIEW



DET. NO. 69C75046

BOTTOM VIEW

NOTE TRIMMER LOCATION IS SAME FOR ALL MODELS.

TUBE & TRIMMER LOCATION  
MODELS 405, 505, 605 AND 705



MODEL 605  
MODEL 705

MOTOROLA, INC.

PROCEDURE FOR SETTING UP PUSHBUTTONS (MODELS 605 & 705)

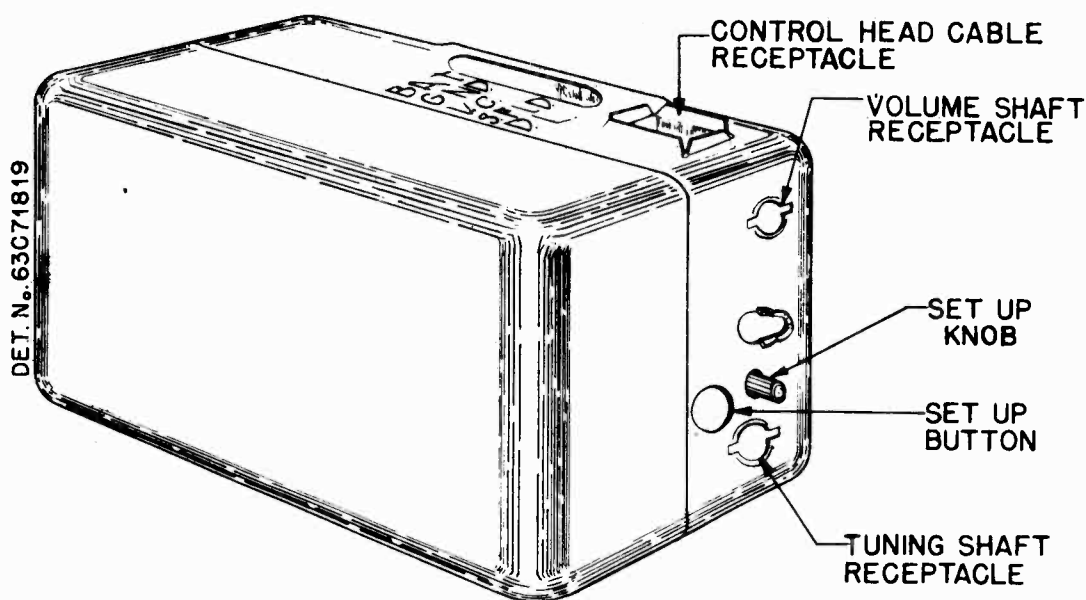
1. Receiver must be turned on for heads, the push-buttons latch a few minutes before setting when pressed in. up push-buttons.
2. Extend antenna fully.
3. Press manual button "M" on the control head till tuner in the receiver stops cycling.
4. Turn tuning knob on the control head till the desired station is heard. (Make mental note of the program).
5. Keep volume low, so that you can tell when a station is tuned in correctly.
6. Press desired button in and hold till tuning mechanism completes its operation.
7. Press "set-up button" in till click is heard (see Figure 4 )
8. Turn "set-up knob" till previously noted program is heard. See Figure 4
9. Press the "M" button and that station is set.
10. Repeat the above procedure for each additional station desired.

**IMPORTANT:**

To check whether push-buttons were set accurately, press the "M" button in, tune in a station manually that is set to a push-button, then press the push-button in that was set to that station. There should be no difference in quality or volume when a push-button is set correctly. Make this check for each push-button.

**NOTE:**

It will be necessary to hold the push-button in only when an early type of control head is used. On later model control



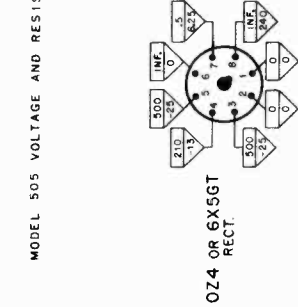
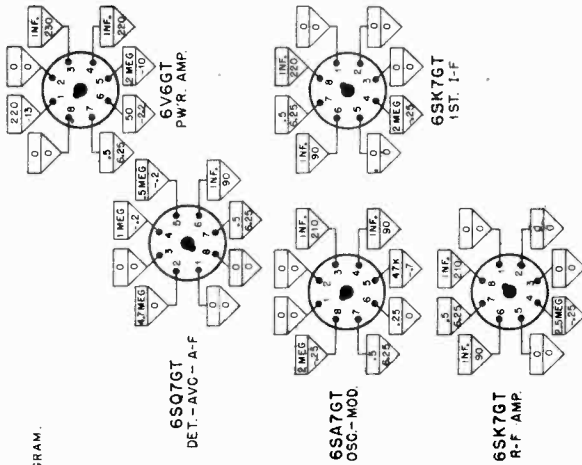
LOCATION OF "SET-UP BUTTON" AND "SET-UP KNOB:"

FIGURE 4 PUSH-BUTTON MODELS 605. AND 705.

MOTOROLA, INC.

MODEL 405, MODEL 505  
MODEL 605, MODEL 705

MODEL 505 VOLTAGE AND RESISTANCE DIAGRAM.



NOTE - VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER.

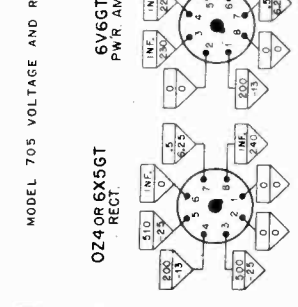
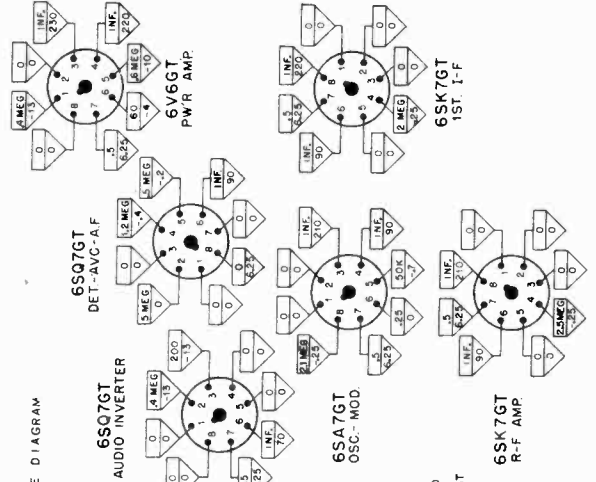
METER POINTER WILL KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING INF. VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER.

TRUE READINGS ARE OBTAINED BY KEEPING TEST PROD ON TERMINAL FOR A FEW SECONDS. (REVERSE TEST PRODS IF METER POINTER BACKS UP.)

ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS  
△ = VOLTAGE MEASUREMENTS  
ALL READINGS MAY VARY ±10%.

MODEL 705 VOLTAGE AND RESISTANCE DIAGRAM



NOTE - VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER.

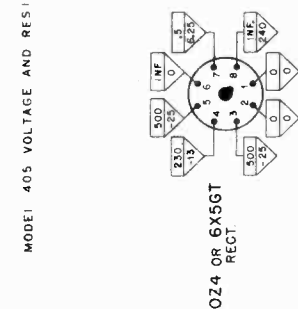
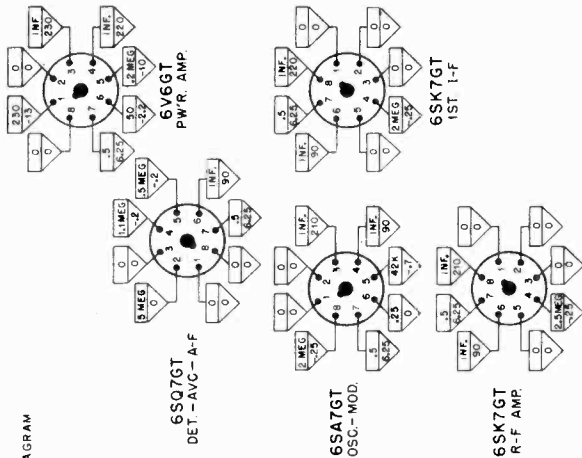
METER POINTER WILL KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING INF. VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER.

TRUE READINGS ARE OBTAINED BY KEEPING TEST PROD ON TERMINAL FOR A FEW SECONDS. (REVERSE TEST PRODS IF METER POINTER BACKS UP.)

ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS  
△ = VOLTAGE MEASUREMENTS  
ALL READINGS MAY VARY ±10%.

MODEL 405 VOLTAGE AND RESISTANCE DIAGRAM



NOTE - VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER.

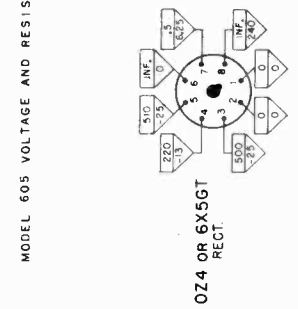
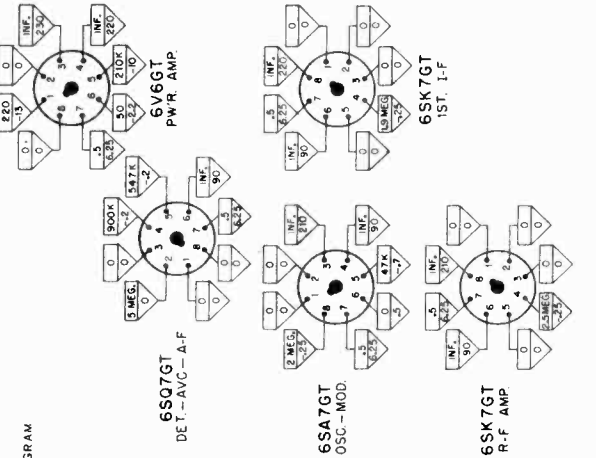
METER POINTER WILL KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING INF. VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER.

TRUE READINGS ARE OBTAINED BY KEEPING TEST PROD ON TERMINAL FOR A FEW SECONDS. (REVERSE TEST PRODS IF METER POINTER BACKS UP.)

ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS  
△ = VOLTAGE MEASUREMENTS  
ALL READINGS MAY VARY ±10%.

MODEL 605 VOLTAGE AND RESISTANCE DIAGRAM



NOTE - VOLTAGES AND RESISTANCES ARE MEASURED FROM TUBE BASE PIN TERMINALS TO CHASSIS WITH A 20,000 OHM PER VOLT METER.

METER POINTER WILL KICK SLIGHTLY WHEN TAKING RESISTANCE READINGS AT TERMINALS SHOWING INF. VALUES DUE TO FILTER CAPACITOR BEING CHARGED BY BATTERY OF TESTER.

TRUE READINGS ARE OBTAINED BY KEEPING TEST PROD ON TERMINAL FOR A FEW SECONDS. (REVERSE TEST PRODS IF METER POINTER BACKS UP.)

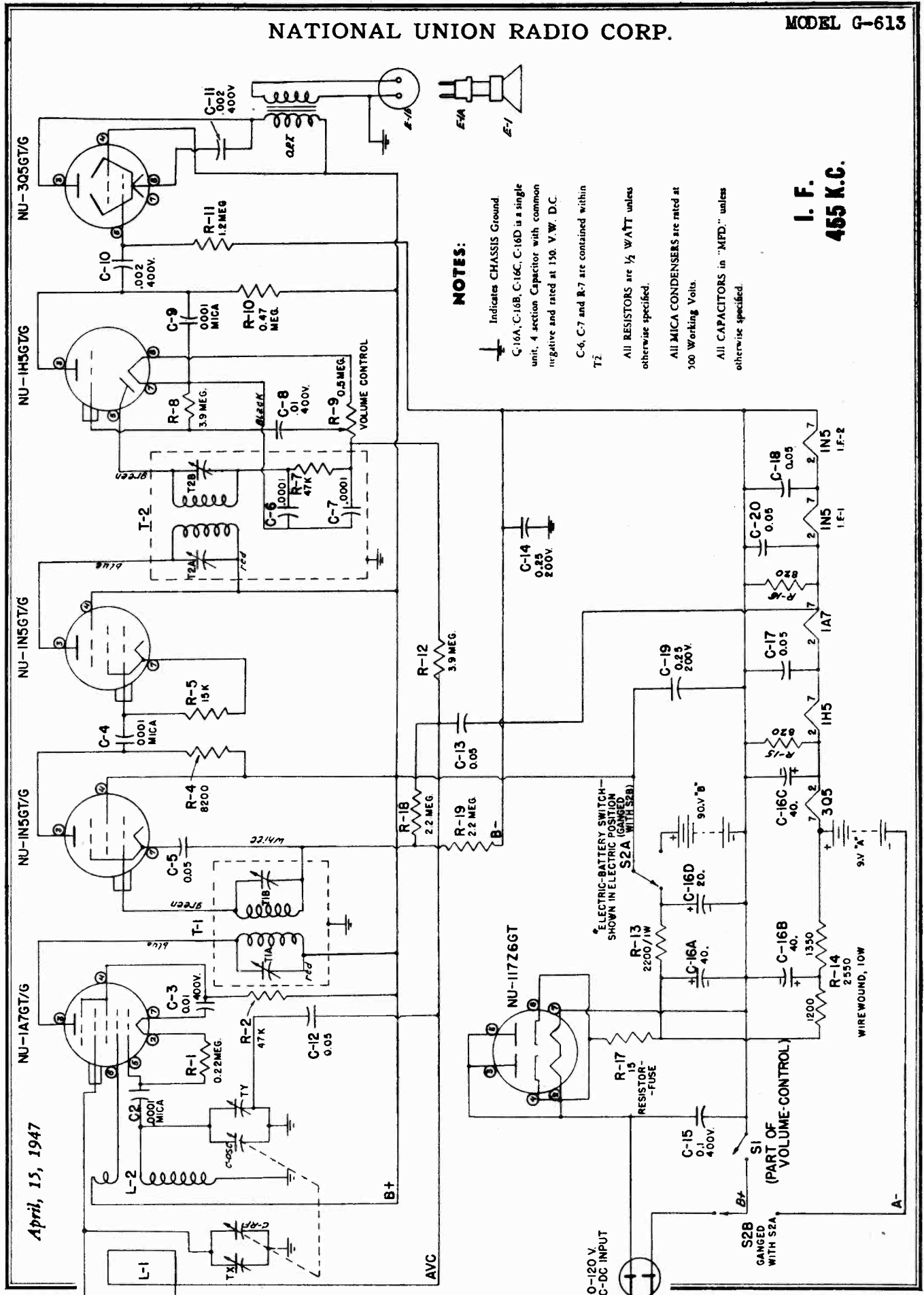
ALL LEADS AND CONTROL HEAD CABLE ARE DISCONNECTED.

□ = RESISTANCE MEASUREMENTS  
△ = VOLTAGE MEASUREMENTS  
ALL READINGS MAY VARY ±10%.



NATIONAL UNION RADIO CORP.

MODEL G-615



NOTES:

- Indicates CHASSIS Ground.
- C-16A, C-16B, C-16C, C-16D is a single unit, 4 section Capacitor with common negative and rated at 150. V.W. D.C.
- C-6, C-7 and R-7 are contained within T2
- All RESISTORS are 1/2 WATT unless otherwise specified.
- All MICA CONDENSERS are rated at 100 Working Volts.
- All CAPACITORS in "MFD." unless otherwise specified.

I. F. 455 K.C.

April, 15, 1947

©John F. Rider

MODEL G-613

NATIONAL UNION RADIO CORP.

**SPECIFICATIONS:**

**CIRCUIT**—Superheterodyne—A.C.-D.C.—Battery Automatic Volume Control

**ANTENNA**—Self-Contained plug-in Loop

**TUNING**—Broadcast Band 540-1650 K.C.

**POWER SUPPLY**—105-120 Volts A.C. or D.C. or Batteries Consumption approx. 25 Watts (Electric operation)

**BATTERY COMPLEMENT**—2 NU-A835 "A" Batteries—2 NU-B862 "B" Batteries

**TUBE COMPLEMENT**—1 NU-1A7GT Converter  
2 NU-1N5GT I.F.  
1 NU-1H5GT Detector  
1 NU-3Q5GT Power Amplifier  
1 NU-117Z6GT Rectifier

**CABINET**—(Approx.) 13" Wide, 6" Deep, 10 $\frac{5}{8}$ " High (Not incl. Carrying Handle)

**PARTS LIST**

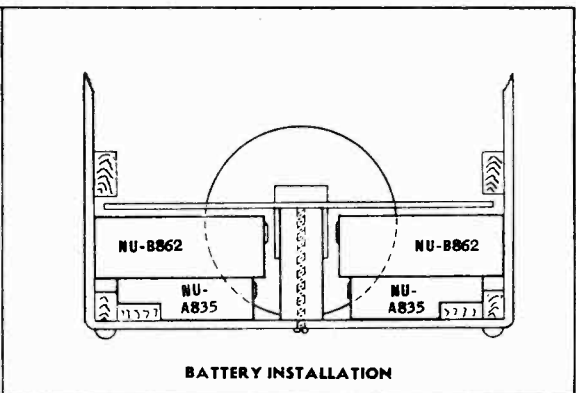
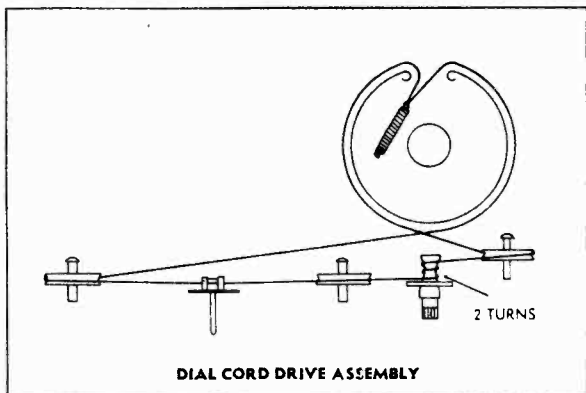
SYMBOL	DESCRIPTION	FACTORY PART NO.	NOTES
E-1	Speaker	EH-6-3	Less Ouput Transf.
L-1	Loop Antenna	LL-3	
T-1	1st I.F. Transf.	TM2-12	
T-2	2nd I.F. Transf.	TM2-13	
O.P.T.	Output Transf.	TA7-1	For 3Q5GT
C-RF C-OSC	2 gang Variable Capacitor	CV-6	
C1&A, B, C, D	Quadruple—Single Unit Electrolytic Capacitor	CEI-4A81	
R-9	Volume Control	RPS-2	
R-17	Resistor Fuse		
S2A, B	Switch	SS-1	
	Dial Pointer	NP-3	
	Dial Scale	ND-12	
	"A" Battery Plug	PM2-1	
	"B" Battery Plug	PM2-2	
E-1a	Speaker Plug	PM1-2	Male Section
E-1b	Speaker Plug	PM1-1	Female Section
	Cabinet	CCCD-613	
	Back Panel	AP-8	
	Window	NW-1	
	Handle	HK-27	

**ALIGNMENT PROCEDURE**

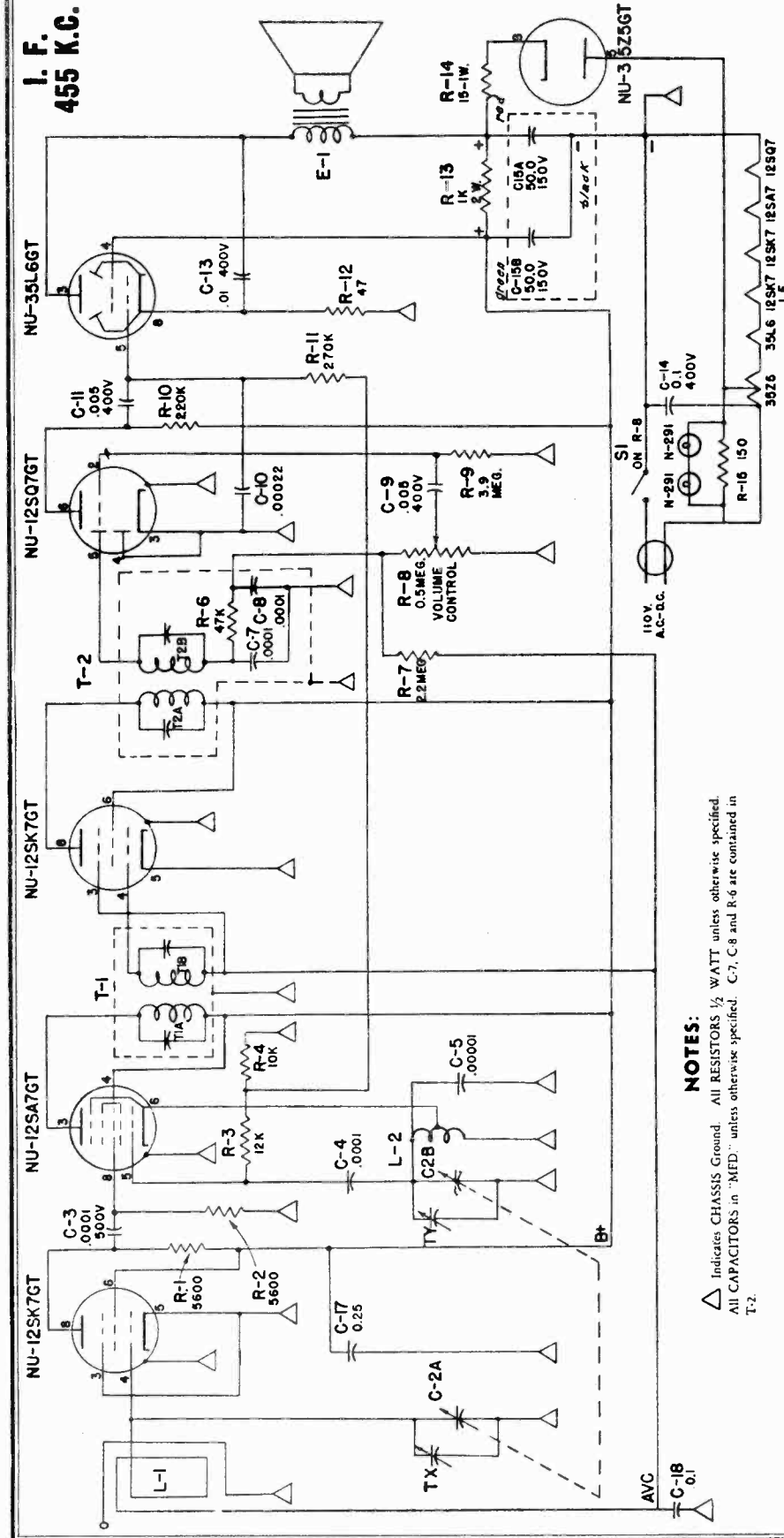
**PRELIMINARY.**

(a) Set VOLUME CONTROL to the FULL ON position; (b) OUTPUT METER across voice coil; (c) Maintain SIGNAL GENERATOR output at MINIMUM consistent with a readable Output meter indication; (d) Follow sequence indicated below.

SEQUENCE	DUMMY ANTENNA	DIAL SETTING	SIGNAL GENERATOR CONNECTIONS	SIGNAL GENERATOR SETTING	ADJUST TRIMMERS	NOTES
1 I.F.	.01 mfd.	At HIGH frequency end of scale. (Min. Capacity)	High side to stator lug of C-RF. Low side to B—	455 K.C.	T2a T2b T1a T1b	Adjust Trimmers for MAX. output reading
2 OSC.	3 turn coil of #18 or #20 Insulated wire on 7" or 8" diameter LOOSELY Coupled to loop Antenna in Receiver.	Pointer at extreme RIGHT HAND END of dial scale (Min. Capacity)	Across Dummy Antenna	1700 K.C.	TY	Adjust Trimmer for MAX. output reading
3 R.F.	Same as in 2 above	1550 K.C.	Across Dummy Antenna	1550 K.C.	TX	Adjust Trimmer for MAX. output reading



NATIONAL UNION RADIO CORP.



I. F.  
455 K.C.

NOTES:

△ Indicates CHASSIS Ground. All RESISTORS 1/2 WATT unless otherwise specified. All CAPACITORS in "MFD." unless otherwise specified. C-7, C-8 and R-6 are contained in T-2.

SPECIFICATIONS:

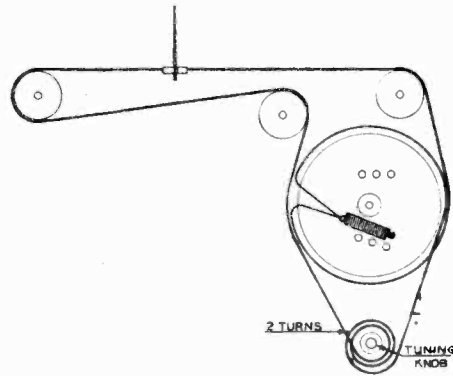
- CIRCUIT**—A.C.-D.C. Superheterodyne—Tuned R.F. Stage—Auto-Tube Complement—1 NU-12SK7GT R.F. Amp. 1 NU-12SA7GT Converter 1 NU-12SK7GT I.F. Amp. 1 NU-12SQ7GT Det-AVC-AF 1 NU-35L6GT Power Output 1 NU-35Z5GT Rectifier
- ANTENNA**—Self-contained Loop—Coupling for External Antenna
- TUNING**—Broadcast Band—535 K.C. to 1620 K.C.—2 Gang Variable Capacitor
- POWER SUPPLY**—105-125 Volts, 60 cycles A.C.—105-125 Volts, Direct Current—Approx. 30 Watts Consumption
- PANEL LAMP**—2 N-291 (2.9V/.17A) Bayonet
- CABINET**—Approximate Dimensions 13 3/4" Wide, 8 5/8" High, 6 1/2" Deep

MODEL G-615

NATIONAL UNION RADIO CORP.

**PARTS LIST**

SYMBOL	DESCRIPTION	FACTORY PART NO.	NOTES
E-1	Complete Assembly (O.P. Transf. and P.M. Speaker)	EH-2	Replacement of complete assembly is advisable if either part fails
Loop	Loop Antenna	LL-15	
L-2	Oscillator Coil	LO-2	
T-1	1st I.F. Trans.	TM2-1	
T-2	2nd I.F. Trans.	TM2-3	
R-8	Vol. Control With Switch (S-1)	RP5-2	NU-500M-C8 may be used as a replacement
C2-A C2-B	2 Gang Variable Capacitor	CV-16	
C15A C15B	Electrolytic Capacitor 50-50/150	CE-85	
	Dial Lamps 2.5 Volt .170 Amp.		N 291
	Dial Scale (Glass)	ND-17-2	
	Dial Pointer	ND-1-2	
	Dial Lamp Socket	JS13-163	



**DIAL DRIVE ASSEMBLY**

**ALIGNMENT PROCEDURE**

**PRELIMINARY.**

- (a) Adjust the DIAL POINTER along the dial cord to the position opposite the first right-hand punch mark on the dial backing-plate, with the tuning condenser gang completely out of mesh (Minimum Capacity); (b) Set VOLUME CONTROL to the FULL ON position; (c) Maintain SIGNAL GENERATOR output at MINIMUM consistent with a readable Output Meter indication; (d) OUTPUT METER across voice coil; (e) Follow sequence indicated below.

SEQUENCE	DUMMY ANTENNA	DIAL SETTING	SIGNAL GENERATOR CONNECTIONS	SIGNAL GENERATOR SETTING	ADJUST TRIMMERS	NOTES
1 I.F.	.01 mfd.	At HIGH frequency end of scale. (Min. Capacity)	High side to stator lug of C2-A Low side to B-	455 K.C.	T2a T2b T1a T1b	Adjust Trimmers for MAX. output reading
2 OSC.	3 turn coil of #18 or #20 insulated wire on 7" or 8" diameter LOOSELY Coupled to loop Antenna in Receiver	Pointer at extreme RIGHT HAND END of dial scale (Min. Capacity) Pointer will be in line with FIRST punch mark at right	Across Dummy Antenna	1700 K.C.	TY	Adjust Trimmer for MAX. output reading
3 R.F.	Same as in 2 above	Pointer in line with punch mark SECOND from right	Same as in 2 above	1520 K.C.	TX	Adjust Trimmer for MAX. output reading
4	Same as in 2 above	At LOW frequency end of scale (Max. Capacity)	Same as in 2 above	530 K.C.	None	530 K.C. signal should be picked up at or near this dial setting. Check operation in Seq. 2 if signal is not picked up

**REINSTALLING CHASSIS (AFTER ALIGNMENT):—**

- 5
  - (a) With chassis still on the bench, set dial pointer at the minimum capacity end of travel.
  - (b) Slide chassis into cabinet and adjust its position so that the dial pointer is opposite and in line with the FIRST calibration mark at the right-hand end of the GLASS DIAL SCALE.
  - (c) Tighten the chassis hold down screws.
  - (d) Tuning should now track so that peak signal is attained at the proper frequency calibration on the glass dial scale.

MODELS 552N, 552AN  
555, 555A

NOBLITT-SPARKS INDUSTRIES INC.

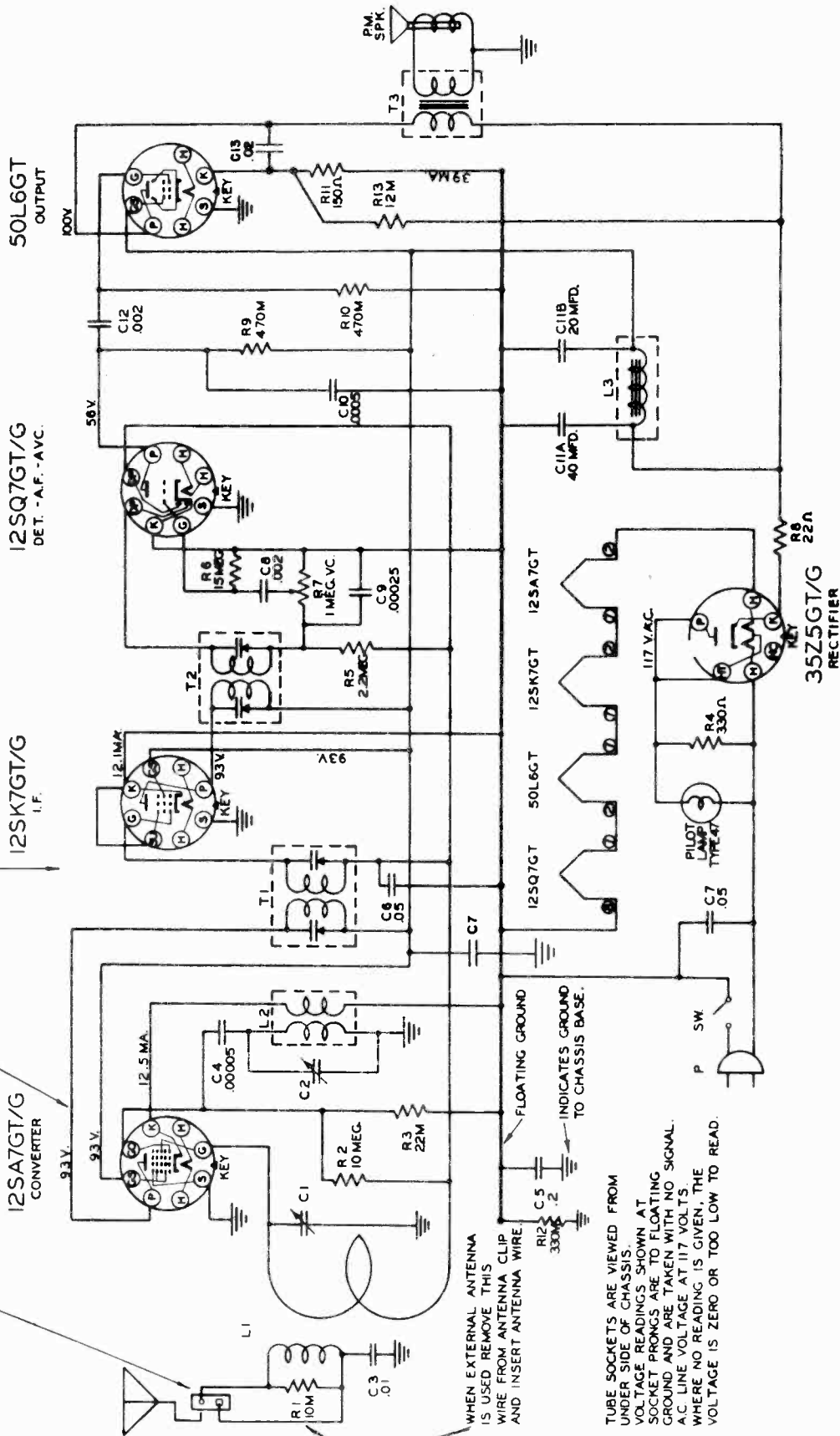
IF PEAK 455 KC

APPROX INPUT REQUIRED FOR 50 MILLIWATTS STANDARD OUTPUT:

500V/10-1400 KC  
150V-1400 KC  
100V-1400 KC  
400V/10-800 KC  
WITH STANDING LOOP

75V/10-4000 KC  
400V/10-4000 KC  
AT MIXER GRID

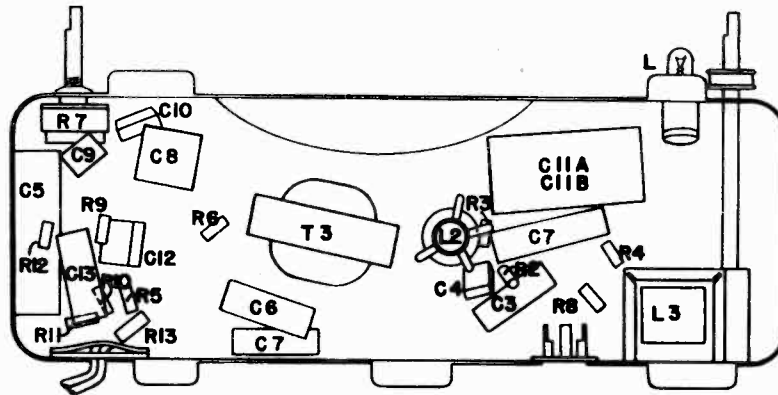
93V.  
12.5 MA.



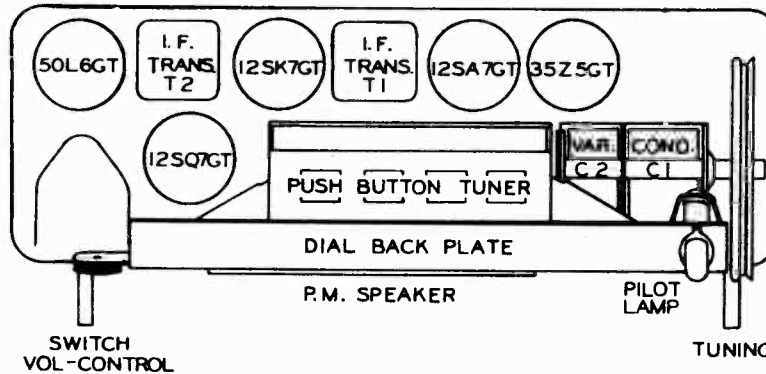


MODELS 552N, 552AN,  
555, 555A

NOBLITT-SPARKS INDUSTRIES INC.



LOCATION OF PARTS UNDER CHASSIS



TUBE LAYOUT OUTLINE

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection ..... Across Speaker Voice Coil  
 Output meter reading to indicate 200 milliwatts (Standard output) ..... .8 Volt  
 Generator Modulation ..... 30% 400 cycles  
 Position of Volume Control ..... Fully clockwise  
 Position of dial pointer with variable condenser fully closed ..... See Note below

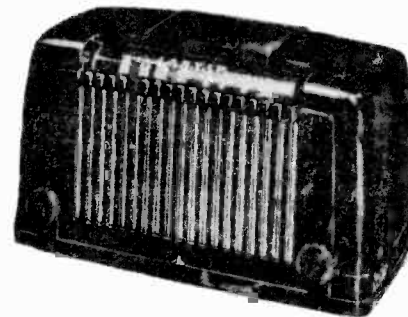
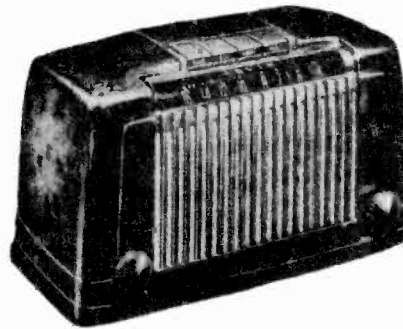
POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION HIGH SIDE	GENERATOR CONNECTION GROUND LEAD	ADJUST TRIMMERS IN ORDER SHOWN	TRIMMER FUNCTION
Open	455 KC	.05 mfd.	Mixer grid	Floating Ground	T2-T1	IF
1400 KC	1400 KC	50 mmf.	Ant. Clip	Floating Ground	C2	Oscillator
1400 KC	1400 KC	50 mmf.	Ant. Clip	Floating Ground	C1	Ant.

NOTES:

- To Set Pointer: There are 4 notches cut in the dial scale backing plate for calibration marks at 540; 600; 1400 & 1620 KC. Set the dial pointer at the 540 KC mark at the right-hand end of the dial plate with the variable completely closed.
- Place set loop in the same position and at the same distance with respect to the back of the chassis as it would be when the set is mounted in the cabinet, during alignment of the RF stage. (1 7/16" from back of chassis to front of long loop strip).
- If a standard test loop is used with the Signal Generator for alignment of the receiver the black wire will be left in the antenna clip. When the generator lead is connected to ant. clip the black wire is removed from the clip.
- The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the A.V.C. action of the receiver ineffective.

MODELS 552N, 552AN  
555, 555A

## NOBLITT-SPARKS INDUSTRIES INC.



## FREQUENCY RANGE

Broadcast ..... 540-1800 kc  
IF ..... 455 kc

## TUBES &amp; FUNCTIONS

12SA7 ..... Mixer-oscillator  
12SK7 ..... IF Amp.  
12SQ7GT ..... DET-AVC-AP  
50L6GT ..... Output  
35Z5GT ..... Rectifier

## POWER SUPPLY

105-125 Volts AC-DC, 35 Watts

## POWER OUTPUT

Undistorted ..... 1.1 Watts  
Maximum ..... 2.4 Watts  
Plate load ..... 2000 ohms

## LOUD SPEAKER

Type: Permanent magnet  
Size: 4 inch  
Voice coil impedance ..... 3.2 ohms

## CHASSIS FEATURES

Automatic Volume Control  
Built-in Loop  
Underwriters' Listed

## OPERATING CONTROLS

1. Left knob ..... ON-OFF Sw. & Volume
2. Right knob ..... Tuning

## PHYSICAL DIMENSIONS

Length ..... 11 $\frac{1}{2}$  inches  
Height ..... 6 $\frac{1}{2}$  inches  
Depth ..... 6 $\frac{1}{2}$  inches

Models 552N and 555 are in walnut cabinets. Models 552AN and 555A are in ivory cabinets.  
Models 555 and 555A have push buttons. Models 552N and 552AN do not have push buttons.

## THE HEATER CIRCUIT.

The heaters of all of the tubes are connected in series, accordingly if one tube burns out the others will not light. It is necessary to replace only the burned out tube, the others will then light. The burned out tube can be located through the fact that the full line voltage will appear across its heater prongs.

To obtain best results always rebalance receiver after replacing tubes.

## POSITION OF POWER CORD PLUG.

On AC, the power cord plug should be tried in both its possible positions in the receptacle, and left in the position that gives least hum. On DC, the receiver will work in only one position of the plug in its receptacle.

## THE ANTENNA.

This receiver has a built-in loop which gives satisfactory reception in most locations. If the receiver is located some distance from a broadcasting station, or where the electrical interference is high, an outside antenna will improve reception. The Black wire should be removed from the antenna clip before the antenna is connected.

This receiver is designed to operate without a ground connection and no attempt should be made to use one.

## CIRCUIT CHANGES.

On some sets C4 condenser is connected from Plate to Screen Grid instead of from Plate to Cathode of the output tube.

C-10, .05 uf condenser from screen grid of 12SA7 tube to chassis was added after the start of production to prevent oscillation.

MODELS 552N, 552AN  
555, 555A

## NOBLITT-SPARKS INDUSTRIES INC.

Replacement parts should be ordered by Arvin part number, description and model number of receiver from your Arvin Distributor. The Distributor will order direct from the factory, except in the case of tubes, which should be obtained through regular tube distribution channels.

Parts shipments are F.O.B. Columbus, Indiana. Terms of sale are the same as those applying to finished Arvin products.

REF. NO.	PART NO.	DESCRIPTION	LIST PRICE	REF. NO.	PART NO.	DESCRIPTION	LIST PRICE
R1	C20060-103	Resistor, 10,000 ohm, $\frac{1}{2}$ watt	.10	Spk.	C19393	4" P. W. Speaker	4.25
R2	C20060-106	Resistor, 10 megohm, $\frac{1}{2}$ watt	.10	P	B20064-3	Line Cord & Plug Assy	1.00
R3	C20060-223	Resistor, 22,000 ohm, $\frac{1}{2}$ watt	.10		E19301	Cabinet, Walnut (Model 555)	5.00
R4	C20060-331	Resistor, 330 ohm, $\frac{1}{2}$ watt	.10		E19302	Cabinet, Ivory (Model 555A)	5.50
R5	C20060-225	Resistor, 2.2 megohm, $\frac{1}{2}$ watt	.10		E19303	Cabinet, Walnut (Model 552N)	5.00
R6	C20060-156	Resistor, 15 megohm, $\frac{1}{2}$ watt	.10		E19304	Cabinet, Ivory (Model 552AN)	5.50
R7	C19369	Volume Control & Switch	1.00		A19401	Dial Crystal Mtg. Clip	.05
R8	C20060-220	Resistor, 22 ohm, $\frac{1}{2}$ watt	.10		A19410	Ant. Loop Retainer Brkt.	.05
R9, R10	C20060-474	Resistor, .47 megohm, $\frac{1}{2}$ watt	.10		C19408	Dial	1.00
R11	C20060-151	Resistor, 150 ohm, $\frac{1}{2}$ watt	.10		A19391-1	Knob, Walnut	.20
R12	C20060-334	Resistor, 330,000 ohm, $\frac{1}{2}$ watt	.10		C19422	Speaker Baffle	.15
R13	C20070-123	Resistor, 12,000 ohm, 1 watt	.15		*C19348-1	Call Letter Sheets (3)	.50
C1, C2	*E19359	Var. Condenser, 2 gang	8.00		A19414	Carton	.80
	**C19840	Var. Condenser, 2 gang	3.85		A19391-2	Knob, Ivory	.20
C3	C20068-103	Condenser, .01 uf, 400 V.	.25		*A19276	P. B. Knobs, Walnut	.25
C4	C20065-500	Condenser, .00005 uf, 500 V.	.25		*A19275	P. B. Knobs, Ivory	.30
C5	A19765	Condenser, .2 uf, 400 V.	.35		*A19346	P. B. Knob Shaft	.05
C6	C20067-503	Condenser, .06 uf, 200 V.	.25		A19344-3	Idler Pulley	.05
C7	C20068-503	Condenser, .06 uf, 400 V.	.25		A19344-2	Idler Pulley	.05
C8, C12	C20068-202	Condenser, .002 uf, 400 V.	.20		A19364	Dial Pointer	.15
C9	C20065-251	Condenser, .00025 uf, 500 V.	.25		A19205	Capacitor Mtg. Clip	.10
C10	C20065-501	Condenser, .0005 uf, 500 V.	.40		A20149-2	Dial Cord Spring	.10
C11A, C11B	A19360	Elect. Cond., 40-20 uf, 150 V.	1.25		A19361	Hair Pin Clip	.05
C13	C20068-203	Condenser, .02 uf, 400 V.	.25		A19132	Dial Drive Cord	.10
L1	AC19207-1	Ant. Loop Assy.	1.50		A19351	Dial Light Bulb	.20
L2	AC19354-1	Sec. Coil	.60		A18254-1	Tube Sockets	.15
L3	AC19357-1	Iron Core "B" Choke	1.00		A19233-1	Tube Sockets	.15
T1	AC19355-1	1st I. F. Coil	1.95		A19234	Ant. Loop Socket	.10
T2	AC19356-1	2nd I. F. Coil	1.95		A19396	Dial Light Socket Assy.	.35
T3	AC19358-1	Output Transformer	1.25		AA19423-1	Tuning Shaft Assy.	.25
					A19252	Ant. Conn. Plug	.10

\* used only on 555 and 555A.

\*\* used only on 552N and 552AN.

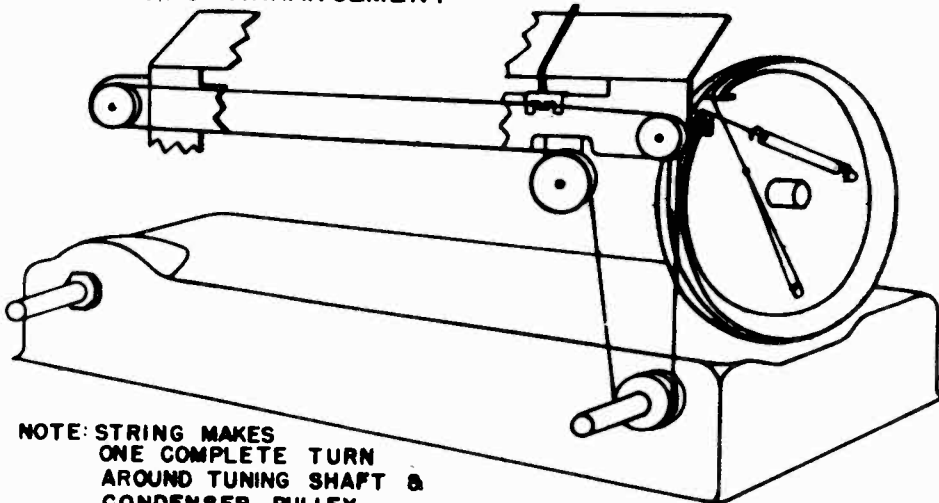
## INSTRUCTIONS FOR SETTING UP PUSH BUTTONS:

Allow the receiver to remain on for ten to fifteen minutes before making the push button adjustments.

Each of the push buttons should be set to a desired station in the following manner:

1. Make a list of the four local stations for which push button tuning is desired and punch out the corresponding call letters from the call letter sheets.
2. Lift each button and insert a call letter tab into the slot at the side of the button, centering it in the front opening.
3. Lift a push button and insert a screw driver in the slotted screw head just below the button. Press down and loosen the locking screw by turning it to the left about two turns.
4. While holding the screw all the way down with the screw driver, tune in the desired station by hand with the tuning knob. Turning the tuning knob back and forth slightly either side of the station while holding the screw down will help to obtain a precise setting.
5. Tighten the screw, keeping it pushed all the way down while tightening it.
6. Check for accuracy by moving the pointer off the station about an inch and retuning it by depressing the push button set up for that station. If the setting is not accurate, repeat the foregoing procedure.
7. Follow the same procedure for each of the remaining buttons.
8. Should you desire to change your selection of stations, the old call letters can be removed from the buttons by pushing them out with a penknife, nail file or eraser on a pencil and repeating steps 3 to 8.

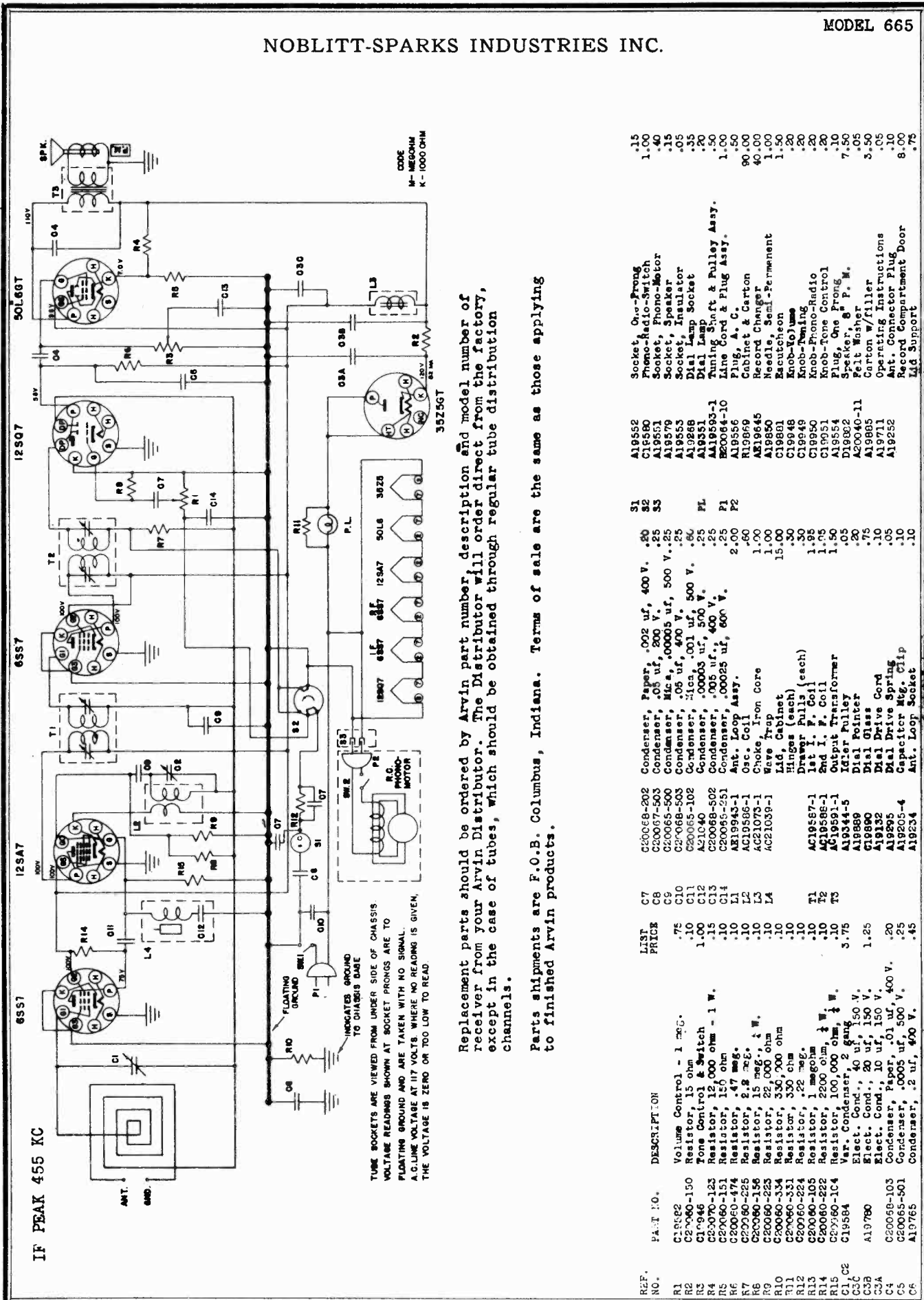
## DIAL CORD STRINGING ARRANGEMENT



NOTE: STRING MAKES  
ONE COMPLETE TURN  
AROUND TUNING SHAFT &  
CONDENSER PULLEY

NOBLITT-SPARKS INDUSTRIES INC.

MODEL 665



©John F. Rider

RECORD CHANGER; General Instrument Model 205, RCD. CH. P.15-5

Replacement parts should be ordered by Arvin part number, description and model number of receiver from your Arvin Distributor. The Distributor will order direct from the factory, except in the case of tubes, which should be obtained through regular tube distribution channels.

Parts shipments are F.O.B. Columbus, Indiana. Terms of sale are the same as those applying to finished Arvin products.

REF. NO.	PART NO.	DESCRIPTION	LIST PRICE	C7	C8	C9	C10	C11	C12	C13	C14	L1	L2	L3	L4	T1	T2	T3	AL9780	C20056-103	C20065-501	AL9765
R1	C19522	Volume Control - 1 meg.	.75																			
R2	C20060-150	Resistor, 15 ohm	1.00																			
R3	C19746	Tone Control & Switch	1.00																			
R4	C20070-123	Resistor, 12,000 ohm - 1 W.	.15																			
R5	C20060-151	Resistor, 150 ohm	.15																			
R6	C20060-474	Resistor, 47 meg.	.10																			
R7	C20060-225	Resistor, 22,000 ohm	.10																			
R8	C20060-334	Resistor, 330 ohm	.10																			
R9	C20060-224	Resistor, 22 meg.	.10																			
R10	C20060-331	Resistor, 330 ohm	.10																			
R11	C20060-224	Resistor, 22 meg.	.10																			
R12	C20060-105	Resistor, 100,000 ohm, 1/2 W.	3.75																			
R13	C20060-222	Resistor, 22,000 ohm, 1/2 W.	1.25																			
R14	C20060-104	Resistor, 100,000 ohm, 1/2 W.	.25																			
R15	C20060-104	Resistor, 100,000 ohm, 1/2 W.	.25																			
C1	C19584	Var. Condenser, 2 gang, 150 V.	.45																			
C2	AL9780	Elect. Cond., 40 uf, 150 V.	1.25																			
C3	C20056-103	Elect. Cond., 20 uf, 150 V.	.25																			
C4	C20065-501	Condenser, Paper, .01 uf, 400 V.	.10																			
C5	C20065-501	Condenser, Paper, .01 uf, 400 V.	.10																			
C6	AL9765	Condenser, .2 uf, 400 V.	.45																			
S1	C20068-202	Condenser, Paper, .002 uf, 400 V.	.20																			
S2	C20067-503	Condenser, .05 uf, 200 V.	.25																			
S3	C20065-500	Condenser, Mic, .00005 uf, 500 V.	.25																			
FL	C20068-102	Condenser, .05 uf, 400 V.	.80																			
P1	A21040	Condenser, .00003 uf, 500 V.	.25																			
P2	C20068-251	Condenser, .00025 uf, 600 V.	2.00																			
P3	A219945-1	Ant. Loop Assy.	.60																			
P4	AC19586-1	Osc. Coil	1.00																			
P5	AC21075-1	Wave Trap	15.00																			
P6	AC21039-1	Lid, Cabinet	.30																			
P7	AC19587-1	Hinges (each)	.95																			
P8	AC19586-1	Drawer Pulls (each)	1.95																			
P9	AC19591-1	Std. I. F. Coil	1.50																			
P10	AL9344-5	Output Transformer	.05																			
P11	AL9889	IC'er Pulley	.20																			
P12	AL9885	Dial Pointer	.75																			
P13	AL9882	Dial Glass	.10																			
P14	AL9880	Dial Drive Cord	.05																			
P15	AL9825-4	Dial Drive Spring	.10																			
P16	AL9205-4	Capacitor Mfg. Clip	.10																			
P17	AL9234	Ant. Loop Socket	.10																			
P18	AL9552	Socket, On-Front	1.00																			
P19	C19580	Phono-Radio-Switch	.40																			
P20	AL9551	Socket, Phono-Motor	.15																			
P21	AL9579	Socket, Speaker	.05																			
P22	AL9553	Socket, Insulator	.35																			
P23	AL9268	Dial Lamp Socket	.20																			
P24	AL9351	Lamp	1.00																			
P25	AA19593-1	Tuning Shaft & Pulley Assy.	.50																			
P26	E20064-10	Plug, A. C.	90.00																			
P27	AL9556	Cabinet & Carton	40.00																			
P28	R19969	Record Changer	1.00																			
P29	AL9645	Needle, Semi-Permanent	1.50																			
P30	C19881	Eacutheon	.20																			
P31	C19948	Knob-Volume	.20																			
P32	C19949	Knob-Tuning	.20																			
P33	C19950	Knob-Phono-Radio	.20																			
P34	C19951	Knob-Tone Control	.20																			
P35	AL9554	Plug, On Front	.10																			
P36	D19882	Speaker, 8" P. M.	7.50																			
P37	A20040-11	Pelt Washer	.05																			
P38	AL9885	Carton w/ Miller	3.50																			
P39	AL9711	Operating Instructions	.05																			
P40	AL9252	Ant. Connector Plug	.10																			
P41	AL9252	Record Compartment Door	8.00																			
P42	AL9252	Lid Support	.75																			

MODEL 665

NOBLITT-SPARKS INDUSTRIES INC.



FREQUENCY RANGE

Broadcast ..... 540-1600 kc  
 IF ..... 455 kc

TUBES & FUNCTIONS

6SS7 ..... RF Amp.  
 12SA7 ..... Mixer-oscillator  
 6SS7 ..... IF Amp.  
 12SQ7GT ..... DET-AVC-AF  
 50L6GT ..... Output  
 35Z5GT ..... Rectifier

POWER SUPPLY

105-125 Volts AC , 55 Watts

POWER OUTPUT

Undistorted ..... 1 Watt  
 Maximum ..... 2.2 Watts  
 Plate load ..... 2000 ohms

SERVICE HINTS AND CIRCUIT CHANGES

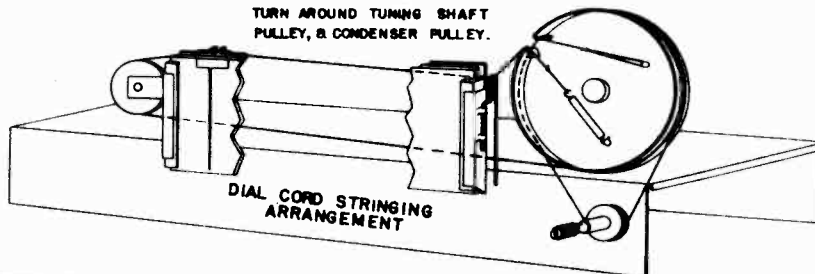
On AC, the power cord plug should be tried in both its possible positions in the receptacle, and left in the position that gives least hum. Do not attempt to operate on DC.

For service information on the record changer see "Automatic Record Changer Service Instructions, Model 205", which should be filed with this bulletin.

CIRCUIT CHANGES MADE SINCE THE START OF PRODUCTION.

1. C3B and C3C have been interchanged, and Filter Choke L3 changed from Part No. AC19589-1 to AC21073-1 to reduce hum.
2. The filament string arrangement has been changed. The original order was 35Z5; 6SS7 IF; 12SA7; 6SS7 RF; 50L6; and 12SQ7. If frequent burnout of the 6SS7 IF tube is encountered on these sets, the filaments should be rewired to correspond with the present Schematic Diagram.
3. 1 Megohm Resistor, R13 in grid circuit of converter tube replaced by 100M Resistor, R15 to eliminate hum modulation. R15 is connected from grid to floating ground, R13 was connected from grid to AVC.
4. Condensers C5, .0005 mfd., 500 V., across Volume Control, and C7, .002 mfd., 400 V., on Tone Control, replaced by C14, .00025 mfd., 600 V., and C13, .005 mfd., 400 V. respectively, to improve tone quality.

NOTE: STRING MAKES ONE COMPLETE TURN AROUND TUNING SHAFT PULLEY, & CONDENSER PULLEY.



LOUD SPEAKER

Type: Permanent magnet  
 Size: 8 inch  
 Voice coil impedance ..... 3.2 ohms

CHASSIS FEATURES

Automatic Record Changer  
 Automatic Volume Control  
 Built-in Loop  
 Underwriters Listed

OPERATING CONTROLS, LEFT TO RIGHT

1. Volume
2. Radio-Phono Sw.
3. ON-OFF - TONE
4. Tuning

PHYSICAL DIMENSIONS

Length ..... 30 1/2 inches  
 Height ..... 33 1/4 inches  
 Depth ..... 16 1/2 inches

NOBLITT-SPARKS INDUSTRIES INC.

ALIGNMENT PROCEDURE

PRELIMINARY.

Output meter connection ..... Across leudspeaker voice coil  
 Output meter reading to indicate 200 milliwatts (standard output) ..... .8 volts  
 Dummy antenna value to be used in series with generator output ..... See chart below  
 Connection of generator output lead ..... See chart below  
 Connection of generator ground lead ..... Floating ground  
 Generator modulation ..... 30% 400 cycles  
 Position of Volume Control ..... Fully clockwise  
 Position of dial pointer with variable fully closed ... Last rectangular mark at left edge  
 of dial

Place the set loop in the same position with respect to the chassis, and the same distance from the chassis, as it would be with the set mounted in the cabinet.

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers adjusted in Order Shown for *Max. Output	Function of Trimmer
Open	455	.05 mfd.	12SA7 Grid (Stator of rear section of variable condenser)	Top of 2nd & 1st IF Trans.	IF
Open	455	.05 mfd.	RF Grid	*Adj. L4 for min. output	Wave Trap
1400	1400	.00005 mfd.	Antenna connection on back of loop	C2; C1, trimmers on Front & Rear sections of Variable Condenser	Osc. Ant.
600	600	.00005 mfd.	Antenna connection on back of loop	*Adj. antenna section plates of variable cond. for Max. output	Antenna

If a standard test loop is used with the signal generator for alignment of the receiver, the approximate sensitivities should be 350 uv/m and 250 uv/m or less at 600 Kc and 1400 Kc respectively.

Approximate stage by stage sensitivities for 200 Milliwatt output.

IF - 455 Kc. -----	2600 uv	Mixer 1000 Kc. -----	75 uv
Mixer 455 Kc. -----	60 uv	Antenna 1400 Kc. -----	70 uv

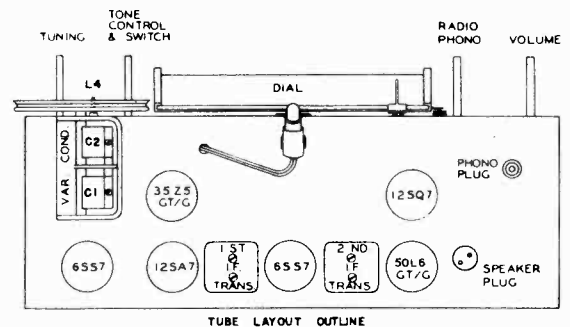
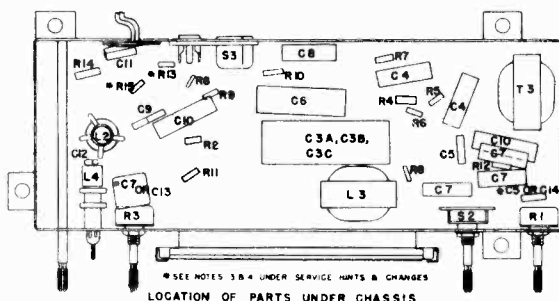
The alignment procedure should be repeated in the original order for greatest accuracy. Always keep the output from the signal generator at its lowest possible value to make the AVC action of the receiver ineffective.

\*\*AS THE CONDENSERS ARE ALL TRACKED BEFORE LEAVING THE FACTORY IT IS NOT PROBABLE THAT THE PLATES WILL NEED TO BE ADJUSTED UNLESS WIDE VARIATIONS IN TUBES ARE ENCOUNTERED.

The outside plates on the antenna section of the variable condenser are cut, so they can be bent in or out to give more or less capacity at any given position of the rotor, after the trimmers on the variable have been adjusted at 1400 Kc. A disc type tuning wand affords a quick method of determining whether more or less capacity is needed in the antenna circuit. If the output increases when the Iron end of the wand is placed near the loop, the plates should be bent in to give more capacity. If the output increases when the brass or aluminum end of the wand is placed near the loop the plates should be spread out. If the wand indicates that the plates should go closer, but cannot go closer without shorting, the oscillator section plates can be spread, but the calibration should be checked after adjusting the oscillator section. Also the band coverage should be checked to see that 540 Kc can be received.

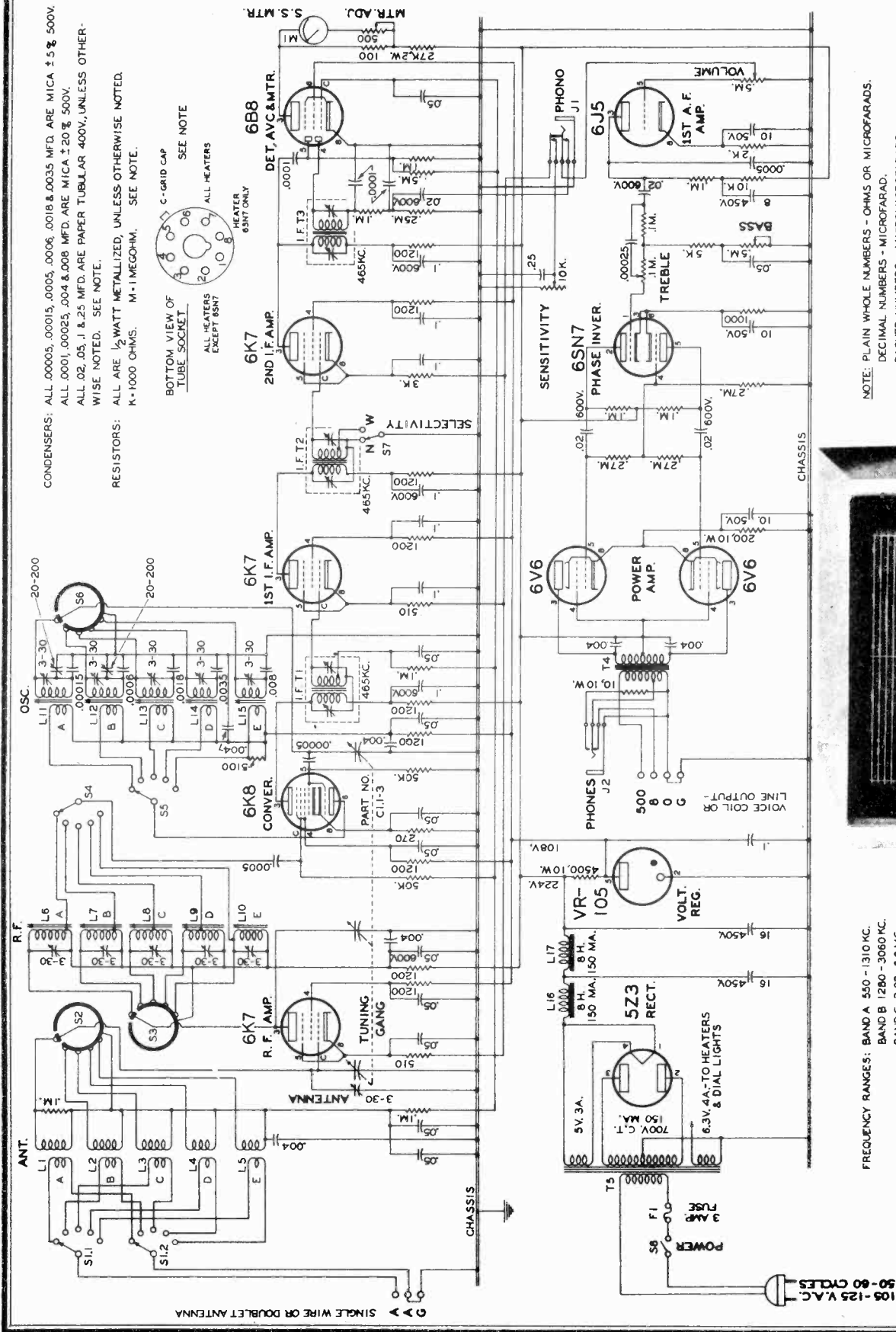
If the receiver is weak at 1000 Kc the same procedure can be followed at 1000 Kc as outlined above for 600 Kc but this will change the tracking at 800 Kc and may affect 1400 Kc so that all points should be rechecked in the original order.

The condenser should be checked for any possible shorting of the plates after the alignment is completed.

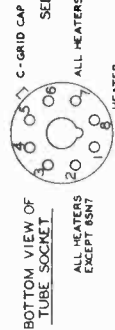




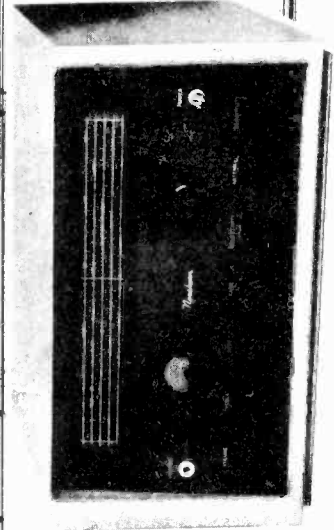
NORTHERN RADIO COMPANY



CONDENSERS: ALL .00005, .00015, .0005, .0018 & .0035 MFD. ARE MICA ± 5% 500V.  
 ALL .001, .00225, .004 & .008 MFD. ARE MICA ± 20% 500V.  
 ALL .02, .05, .1 & .25 MFD. ARE PAPER TUBULAR 400V, UNLESS OTHERWISE NOTED. SEE NOTE.  
 RESISTORS: ALL ARE 1/2 WATT METALLIZED, UNLESS OTHERWISE NOTED.  
 K-1000 OHMS. M-1 MEGOHM. SEE NOTE.



NOTE: PLAIN WHOLE NUMBERS - OHMS OR MICROFARADS.  
 DECIMAL NUMBERS - MICROFARAD.  
 DASHED NUMBERS - MICROMICROFARADS.  
 NUMBERS AROUND TUBES INDICATE BASING DESIGNATION.

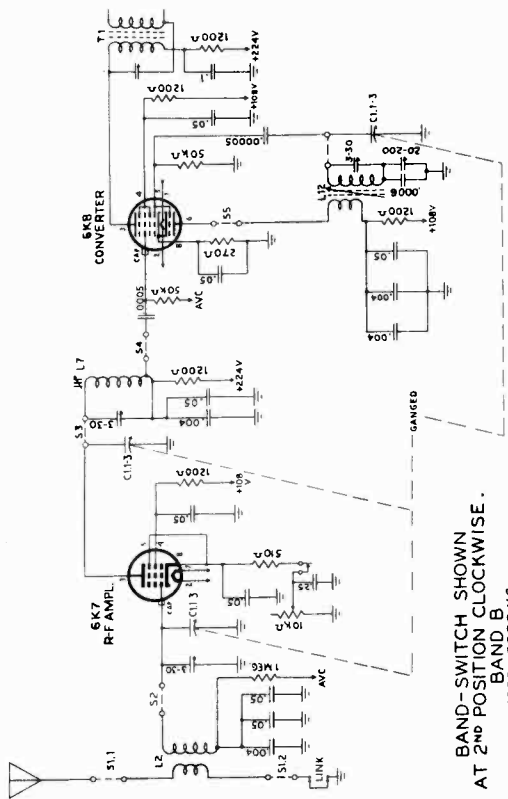


FREQUENCY RANGES: BAND A 550 - 1310 KC.  
 BAND B 1280 - 3060 KC.  
 BAND C 2.92 - 6.6 MC.  
 BAND D 6.43 - 15.1 MC.  
 BAND E 14.7 - 33.5 MC.

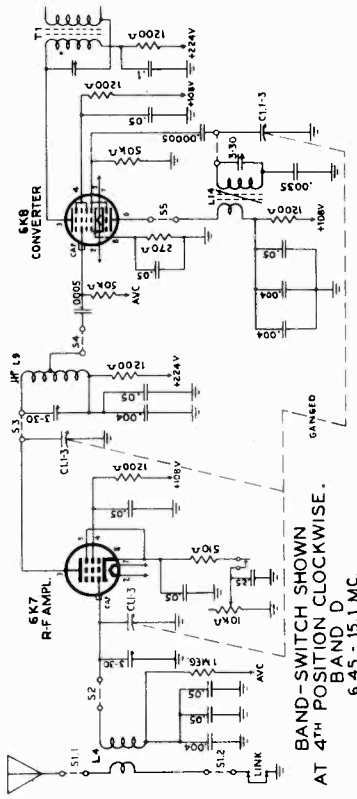


MODEL N605-E

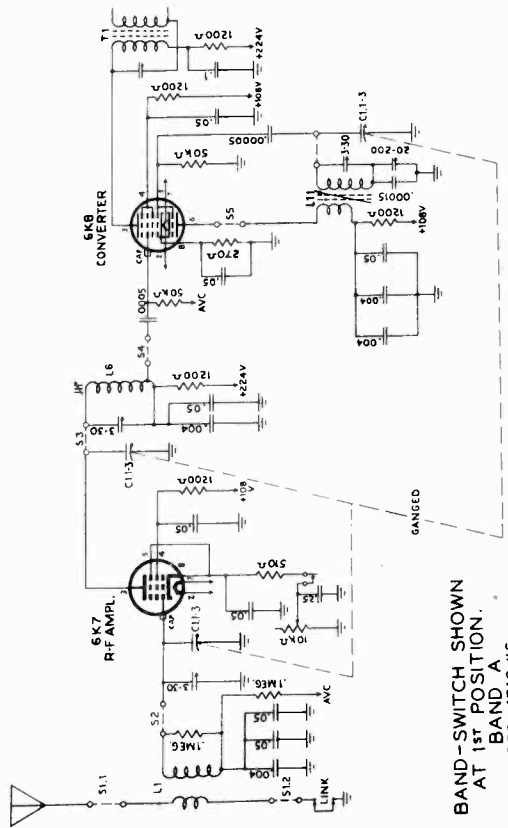
NORTHERN RADIO COMPANY



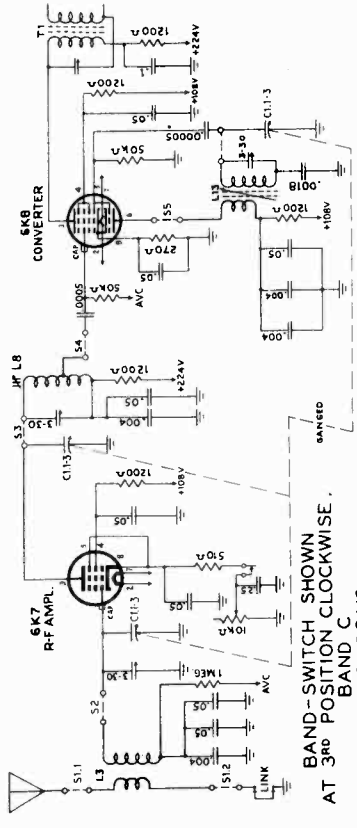
BAND-SWITCH SHOWN AT 2nd POSITION CLOCKWISE. BAND B 1280 - 3060 KC



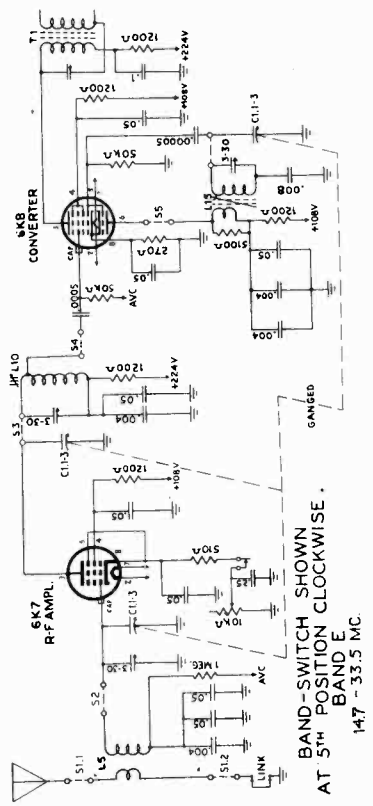
BAND-SWITCH SHOWN AT 4th POSITION CLOCKWISE. BAND D 6.45 - 15.1 MC



BAND-SWITCH SHOWN AT 1st POSITION. BAND A 550 - 1310 KC.



BAND-SWITCH SHOWN AT 3rd POSITION CLOCKWISE. BAND C 2.92 - 6.8 MC.



BAND-SWITCH SHOWN AT 5th POSITION CLOCKWISE. BAND E 14.7 - 33.5 MC.

# NORTHERN RADIO COMPANY

**ALIGNMENT:** Alignment of this receiver will not be necessary unless a component part of the tuned circuits is replaced or the adjustments have been tampered with. When alignment is necessary, the following conditions must be observed before proceeding:

- A. SENSITIVITY control full on—clockwise.
- B. SELECTIVITY control in W (wide) position.
- C. BASS and TREBLE controls off—counterclockwise.
- D. Receiver chassis effectively grounded.
- E. Antenna terminals strapped for single-wire antenna.
- F. Dial pointer must center on vertical line at low frequency end of scale when tuning condenser is at maximum capacity.
- G. A dummy antenna consisting of a 400 ohm non-inductive resistor and .01 uf. mica condenser should be connected in series with the "hot" lead from the signal generator.

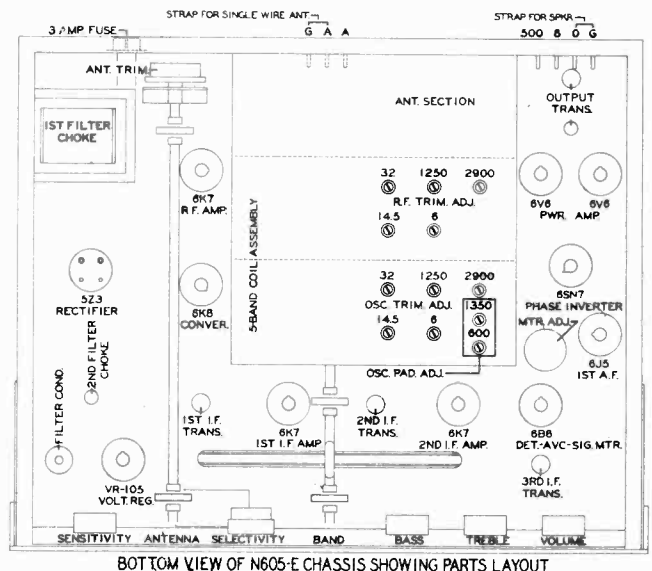
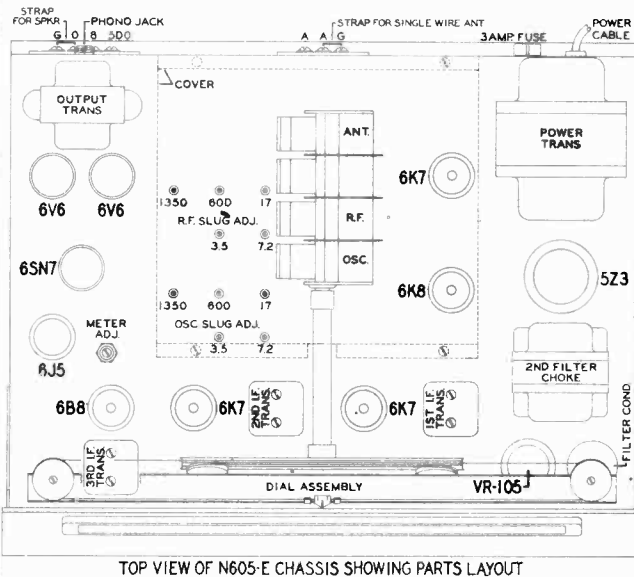
FILE NO 605E-12-1		ALIGNMENT CHART					12-46
STEP	CONNECT DUMMY ANT. TO-	SET SIG. GEN. TO-	SET BAND SW. TO-	SET DIAL TO-	ADJUST FOR MAXIMUM S.S. METER READING	SEE NOTE	
1	CONV. 6K8 GRID CAP	465 KC	A	QUIET POINT	ALL I. F. TRIMMERS	1,2 & 6	
2	"A" TERM.	600 KC	A	600 KC	OSC. 600 PAD, ANT. TRIM & RF 600 SLUG	1 & 3	
3	"A" TERM.	1250 KC	A	1250 KC	OSC. 1250 TRIM, ANT. TRIM & RF 1250 TRIM		
4	"A" TERM.	1350 KC	B	1350 KC	OSC. 1350 PAD, ANT. TRIM & RF 1350 SLUG	1 & 3	
5	"A" TERM.	2900 KC	B	2900 KC	OSC. 2900 TRIM, ANT. TRIM & RF 2900 TRIM		
6	"A" TERM.	3.5 MC	C	3.5 MC	OSC. 3.5 SLUG, ANT. TRIM & RF 3.5 SLUG	1 & 4	
7	"A" TERM.	6.0 MC	C	6.0 MC	OSC. 6.0 TRIM, ANT. TRIM & RF 6.0 TRIM	1 & 4	
8	"A" TERM.	7.2 MC	D	7.2 MC	OSC. 7.2 SLUG, ANT. TRIM & RF 7.2 SLUG	1 & 4	
9	"A" TERM.	14.5 MC	D	14.5 MC	OSC. 14.5 TRIM, ANT. TRIM & RF 14.5 TRIM	1 & 4	
10	"A" TERM.	17 MC	E	17 MC	OSC. 17 SLUG, ANT. TRIM & RF 17 SLUG	1 & 4	
11	"A" TERM.	32 MC	E	32 MC	OSC. 32 TRIM, ANT. TRIM & RF 32 TRIM	1,4 & 5	

**Notes:**

1. Trimming and padding steps for each band should be repeated several times as each adjustment affects the other a small percentage. The SIGNAL STRENGTH (S.S.) meter is used as a tuning indicator, with a signal input sufficient to give one-half scale deflection.
2. A very large input, 100,000 microvolts or more, may be required to force a signal through the I.F. stages if seriously detuned. The dummy antenna can be connected to the I.F. grids as an alternative if sufficient signal is not available.
3. Do not adjust A and B band oscillator coil slugs. Use padding condensers only for dial calibration.
4. Above 3.5 mc. care must be taken to avoid image frequencies.

When two signals are heard in the range of an oscillator trimming or padding adjustment the one tuned with minimum C or L is correct.

5. A small amount of interlock between Osc. and RF stages is present above 30 mc. Use a strong signal for aligning, rock the tuning condenser slightly while making the "RF-32 trim" adjustment and set this adjustment approx. 1/4 turn towards maximum C past the apparent optimum setting.
6. One trimmer of the 3rd I.F. transformer will be found to give maximum output at minimum meter reading and should be adjusted correspondingly.



MODEL N605-E

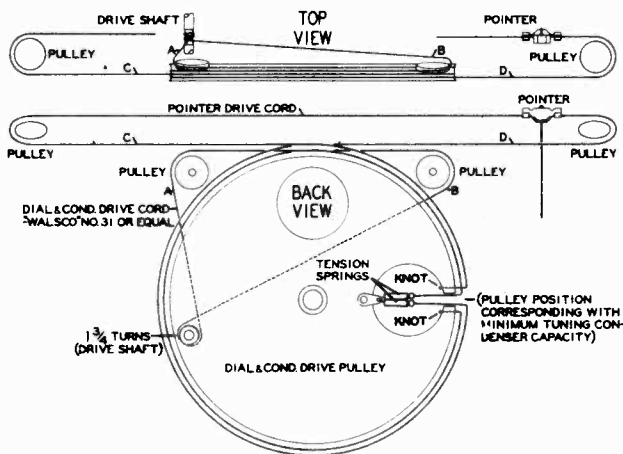
NORTHERN RADIO COMPANY

Before attempting any maintenance disconnect the power cable (cord), remove the four screws holding the back plate, remove three screws in the back lip of the chassis and slide the chassis out of the cabinet.

All tubes should be checked in a mutual-conductance type tester and replacements made accordingly. Regardless of test results, tubes having been in service more than two years should be replaced to avoid unnecessary maintenance expense. Tube sockets are stamped for quick identification. Dial lights are Mazda type 47 and should be replaced whenever other maintenance work is done. Ready access to the center pilot light may be had by rotating the dial until the hole in the pulley is behind the light. Whenever the type 6B8 is replaced it will be necessary to reset the tuning meter as follows: set BAND switch on "C", SENSITIVITY control at minimum, disconnect antenna, set mechanical zero on meter, turn on POWER switch and after warm-up set METER ADJ. control for zero.

TEST READINGS: Test readings are taken under the following conditions:

- A. SENSITIVITY (R.F. Gain) control full on—clockwise.
- B. SELECTIVITY switch in W (Wide) position.
- C. BASS and TREBLE controls off—counterclockwise.
- D. Antenna disconnected—no signal tuned in.
- E. Band switch in Band B position for voltage readings.
- F. A.C. line voltage—117 volts.



DIAL AND TUNING CONDENSER DRIVE MECHANISM

# SPECIFICATIONS

FREQUENCY RANGES:

- Overall..... 550 Kc to 33.5 Mc (546 to 8.96M)
- Band A..... 550 Kc to 1310 Kc (546 to 228.8M)
- Band B..... 1280 Kc to 3060 Kc (234 to 98.1M)
- Band C..... 2.92 Mc to 6.8 Mc (102.7 to 44.1M)
- Band D..... 6.45 Mc to 15.1 Mc (46.5 to 19.8M)
- Band E..... 14.7 Mc to 33.5 Mc (20.4 to 8.96M)

INTERMEDIATE FREQUENCY.....465 Kc.

POWER OUTPUT.....7 Watts, undistorted

OUTPUT IMPEDANCE.....8 and 500 ohms

TUBE COMPLEMENT:

- (1) 6K7..... R.F. Amplifier
- (2) 6K8..... Converter (1st Detector-Oscillator)
- (3) 6K7..... 1st I.F. Amplifier
- (4) 6K7..... 2nd I.F. Amplifier
- (5) 6B8..... 2nd Detector, A.V.C. & Signal Meter
- (6) 6J5..... 1st A.F. Amplifier
- (7) 6SN7..... Phase Inverter
- (8-9) 6V6G..... Push-Pull Power Amplifier
- (10) VR105..... Voltage Regulator
- (11) 5Z3..... Plate Power Rectifier

FILE NO. 605E-13-1		TEST READINGS				12-46
TUBE	STAGE	PLATE VOLTAGE	SCREEN VOLTAGE	CATHODE VOLTAGE	GRID VOLTAGE	SEE NOTE
6K7	R.F. AMP.	216	106	3.5	.6	1,2 & 3
6K8	CONVERTER, OSC. SECTION	220 104	100 --	2.8 --	.6 1.8-8.0	1,2 & 3 1,2,3 & 4
6K7	1ST I.F. AMP.	220	106	7	.6	1,2 & 3
6K7	2ND I.F. AMP.	215	106	3.7	0	1 & 2
6B8	2ND DET. & AVC SECTION, SIG. STRENGTH METER SECTION	-- 43	-- 108	-- 0	0 6	 1,2,3 & 5
6J5	1ST A.F. AMP.	75	--	2.9	0	1 & 2
6SN7	PHASE INVERTER	82	--	3.1	0	1 & 2
6V6	POWER OUTPUT	219	224	12.5	0	1,2 & 6
VR-105	VOLTAGE REG.	108	--	0	--	1 & 2
5Z3	RECTIFIER	350	--	--	--	1,2 & 7

Notes:

1. All voltages shown are in respect to chassis.
2. Plate, screen and cathode voltages read with 20,000 ohm/volt meter.
3. Control grid voltage read with VTVM having a d.c. input resistance of 11 megohms.
4. Oscillator grid voltage varies between limits over various bands.
5. Grid of 6B8 (AVC bus) varies from .5 to .9 V. over all bands.
6. Readings shown are applicable to either tube or section of dual tube.
7. Reading taken with .05—600 V. cond. in series with "hot" meter lead.

AUDIO RESPONSE..... Normal response (bass and treble controls off) within plus or minus 2.5 db. from 100 to 10,000 cycles.

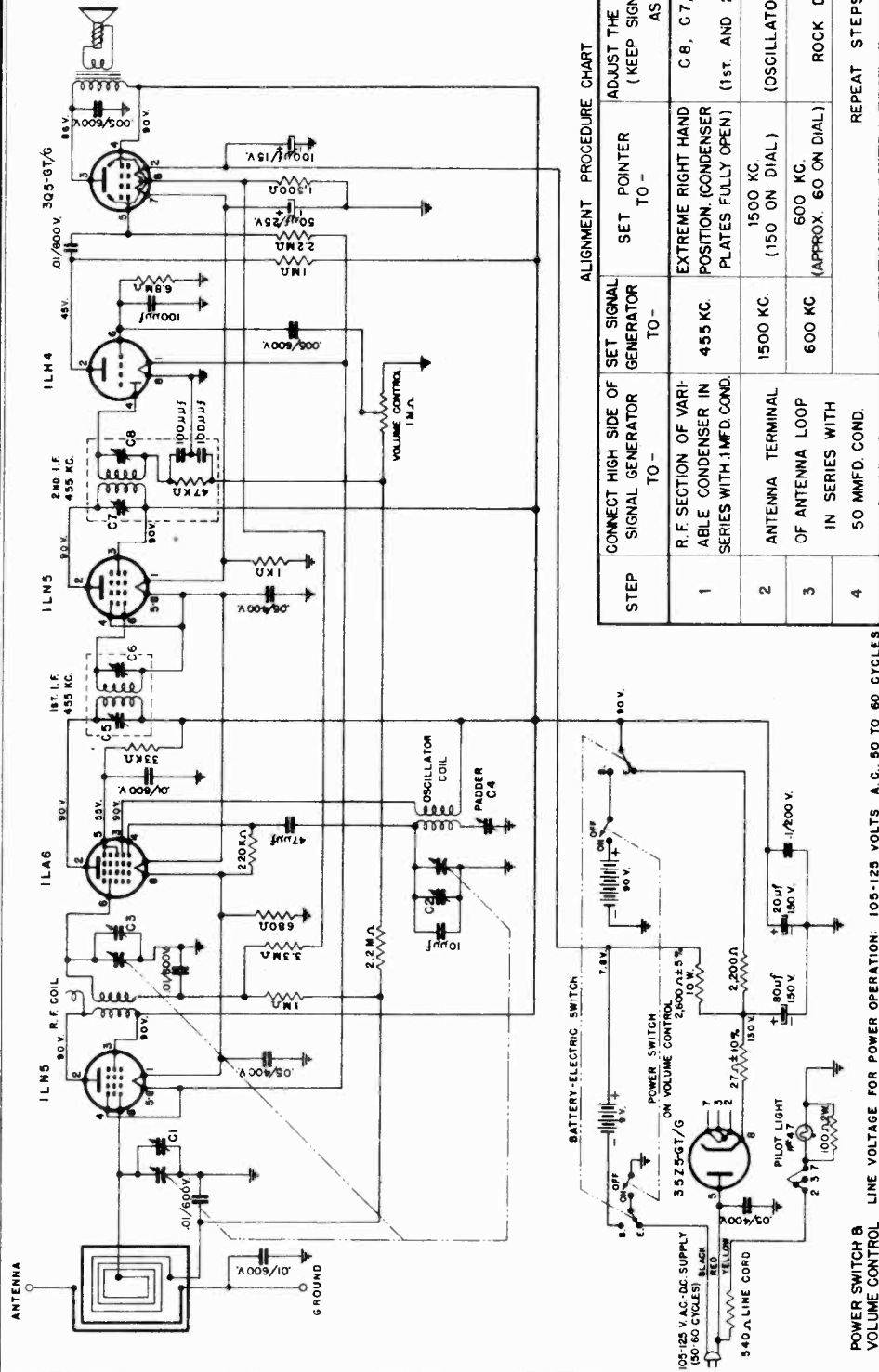
BASS & TREBLE BOOST.....10 db. above normal

POWER SUPPLY RATING: \*  
105-125 Volts, A.C., 50-60 cycles.....85 Watts

CABINET DIMENSIONS.....17-3/4" Wide; 9-1/2" High;  
14-7/8" Deep

NET WEIGHT.....45 lbs.

\*On special order, the N605-E Receiver can be supplied for 115-230 volt, A.C. operation.



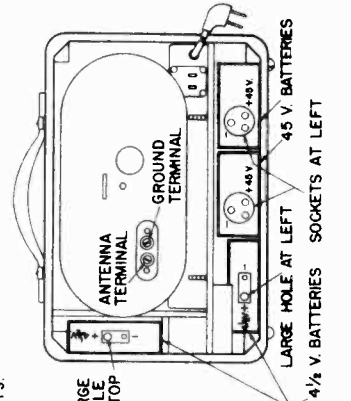
ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1 MF. COND.	455 KC.	EXTREME RIGHT HAND POSITION (CONDENSER PLATES FULLY OPEN)	C 8, C 7, C 6, C 5 AND REPEAT IN SAME ORDER (1st. AND 2nd. I.F. TRANSFORMERS)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1500 KC.	1500 KC. (150 ON DIAL)	C 2, C 3, C 1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3		600 KC.	600 KC. (APPROX. 60 ON DIAL)	C 4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL

REPEAT STEPS 2 AND 3

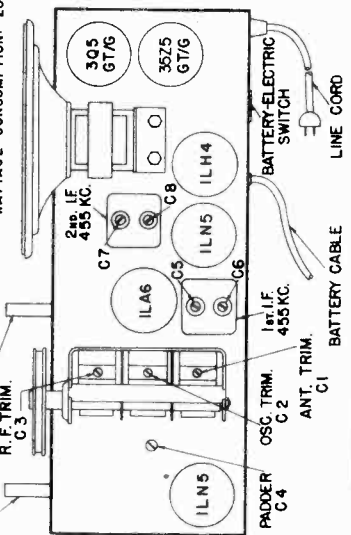
NOTES:

1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL MICA CONDENSERS ± 20% TOLERANCE.
3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.



POWER SWITCH B  
VOLUME CONTROL  
TUNING  
R.F. TRIM.  
C 3

LINE VOLTAGE FOR POWER OPERATION: 105-125 VOLTS A.C., 50 TO 60 CYCLES  
OR 105-125 VOLTS D.C.  
WATTAGE CONSUMPTION: 20 WATTS.



Frequency Range 530 - 1700 kc.

MODEL 6A-606

## OLYMPIC RADIO &amp; TELEV. INC.

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

**ALIGNMENT**

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

**BATTERIES**

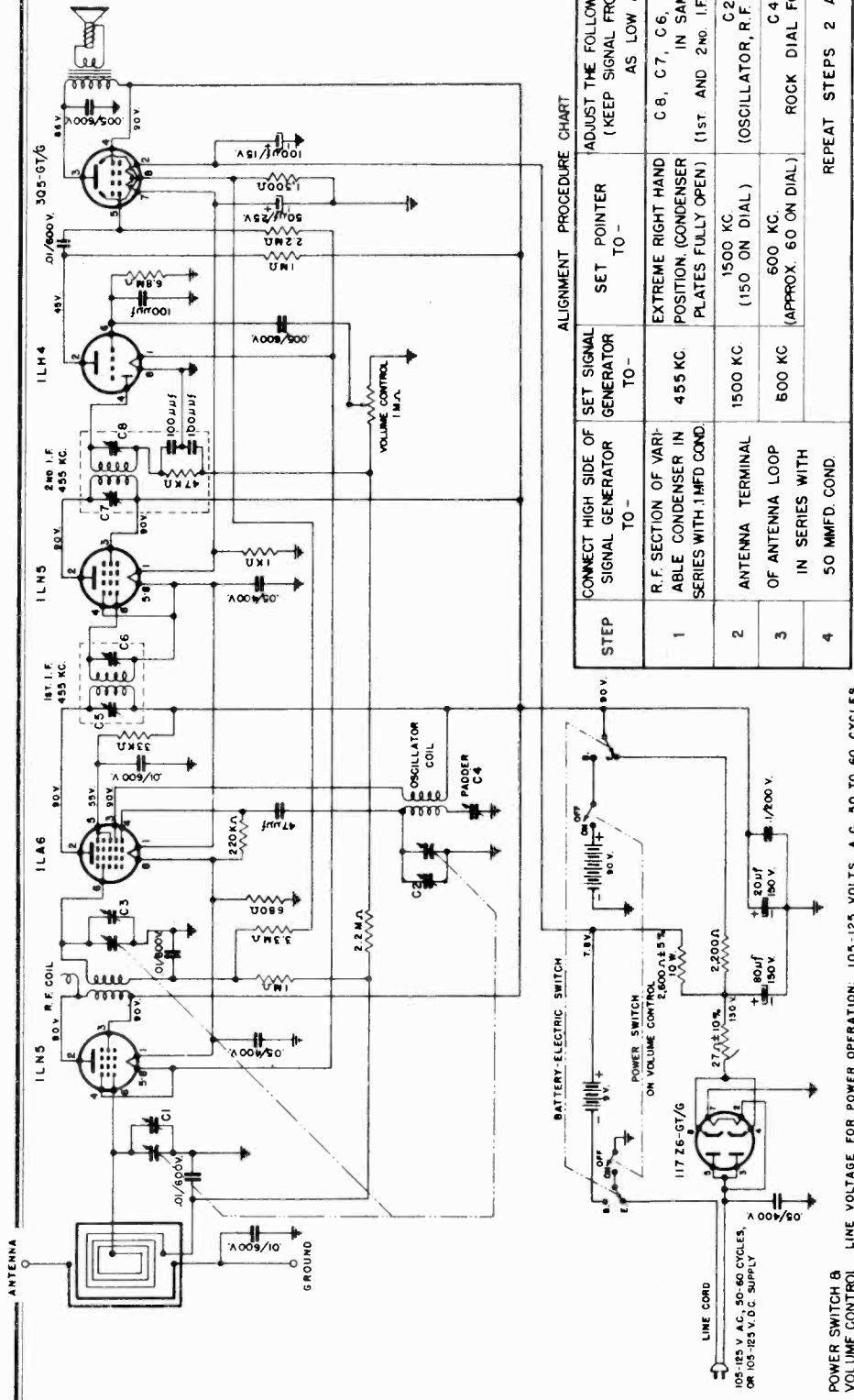
The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

**REPLACEMENT PARTS**

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCP10W6502A	Condenser-.005/600WV paper tubular condenser
BU-187	Bulb-pilot light bulb 6.3v (#47 Mazda)	RE-407	Resistor-2600 ohms ±5% 10 watt resistor
CA-229	Cabinet-portable cabinet	REB102M	Resistor-1000 ohms ±20% ½ watt resistor
CB-335	Cable-battery cable	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-177	Coil-oscillator coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CL-630	Coil-R.F. coil	REB222M	Resistor-2200 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CO 808	Condenser-50 mfd /25 W.V. electrolytic condenser	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CR-299	Crystal-dial crystal	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB333M	Resistor-33,000 ohms ±20% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REB581M	Resistor-680 Ohms ±20% ½ watt resistor
ES-274-1	Escutcheon-moulded escutcheon	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
KN-260	Knob-walnut knob	RED101M	Resistor-100 ohms ±20% 2 watt resistor
KN-261	Knob-walnut knob with dot	SK-476	Speaker-5" P.M. Speaker with output transformer
LC-315	Line Cord-540 ohms resistance line cord	SO-572	Socket-pilot light socket assembly
LP-178	Loop-Antenna	SP-191	Spring-Drive shaft retaining spring
PO-395	Pointer-dial pointer	SW-185	Switch-battery-electric D.P.D.T. slide switch
PT-576	Control-volume control 1 megohm with D.P.S.T. switch	TR-707	Transformer-I.F. 455 K.C. input-Transformer
RCM20A100M	Condenser-10 mmfd ±20% mica condenser	TR-708	Transformer-Output I.F. 455 K.C. Transformer with built-in I.F. filter
RCM20A101M	Condenser-100 mmf ±20% mica condenser		
RCM20A470M	Condenser-47 mmfd ±20% mica condenser		
RCP10W2104A	Condenser-.1/200WV paper tubular condenser		
RCP10W4503A	Condenser-.05/400WV paper tubular condenser		
RCP10W6103A	Condenser-.01/600WV paper tubular condenser		

OLYMPIC RADIO & TELEV. INC.

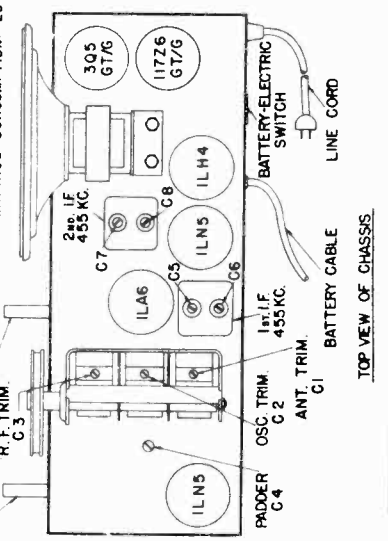
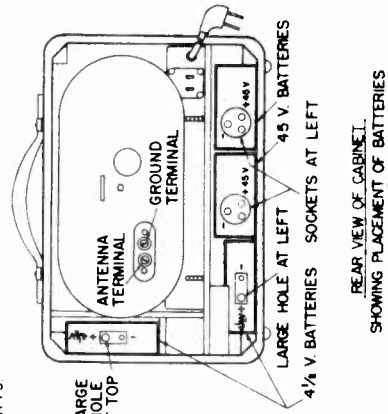
MODEL 6B-606



**ALIGNMENT PROCEDURE CHART**

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	SET POINTER TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF VARIABLE CONDENSER IN SERIES WITH 1 MFD COND.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN)	C 8, C 7, C 6, C 5 AND REPEAT IN SAME ORDER (1st AND 2nd I.F. TRANSFORMERS)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1500 KC.	(150 ON DIAL)	C 2, C 3, C 1 (OSCILLATOR, R.F. AND ANTENNA TRIMMERS)
3		600 KC.	(APPROX. 60 ON DIAL)	C 4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL
REPEAT STEPS 2 AND 3				

- NOTES:**
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
  2. ALL MICA CONDENSERS ± 20% TOLERANCE.
  3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 V., 60 CYCLES, A.C.



**Frequency Range** 530 - 1700 kc.

REAR VIEW OF CABINET.  
SHOWING PLACEMENT OF BATTERIES

TOP VIEW OF CHASSIS

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

### ALIGNMENT

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

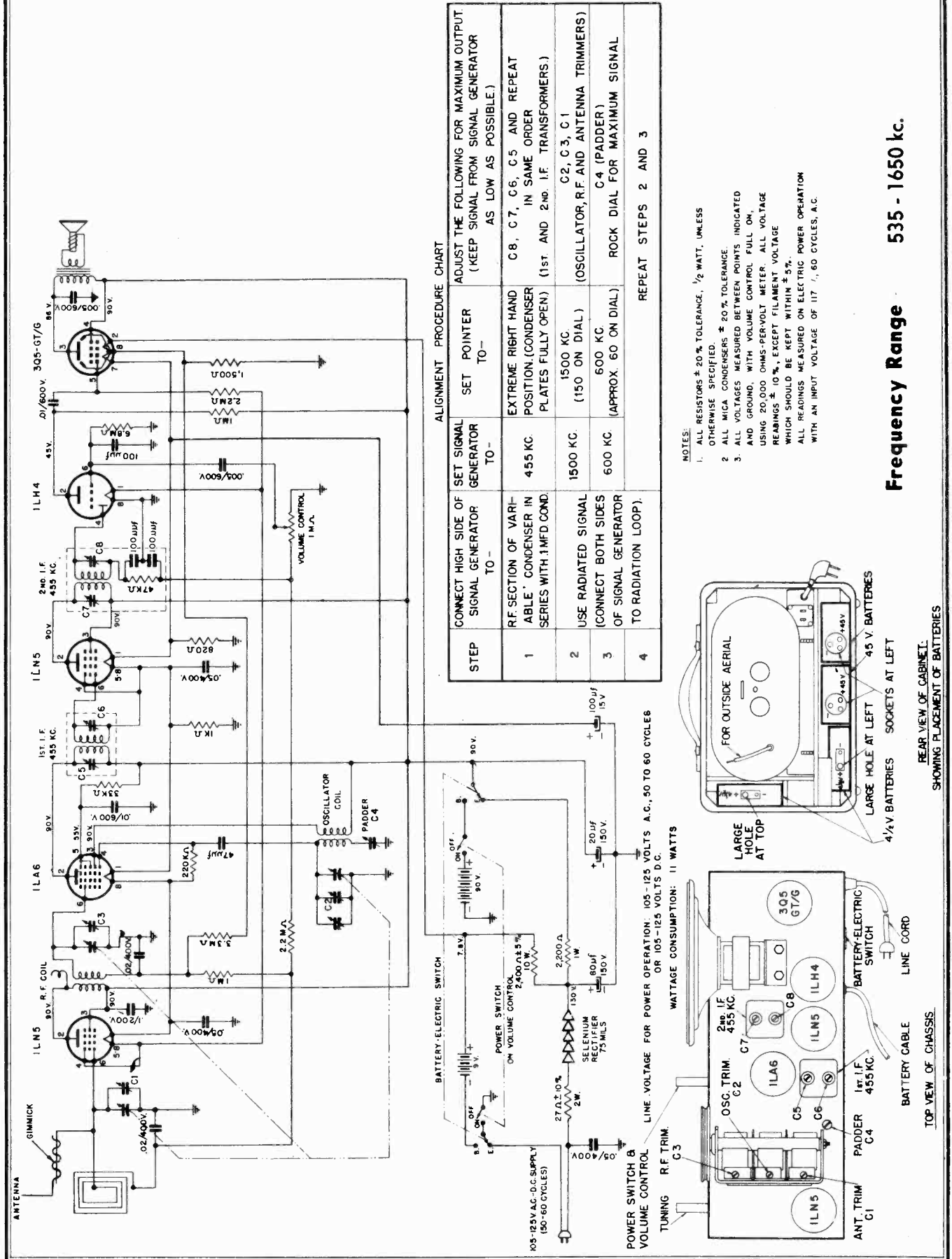
Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

### BATTERIES

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

### REPLACEMENT PARTS

Part No.	Description	Part No.	Description
BK-405	Bracket-Resistor mounting bracket	RCPI0W6502A	Condenser-.005/600WV paper tubular condenser
CA-229	Cabinet-portable cabinet	RE-407	Resistor-2600 ohms ±5% 10 watt resistor
CB-335	Cable-battery cable	REB102M	Resistor-1000 ohms ±20% ½ watt resistor
CL-177	Coil-oscillator coil	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-630	Coil-R.F. coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser	REB222M	Resistor-2200 ohms ±20% ½ watt resistor
CO 808	Condenser-50 mfd /25 W.V. electrolytic condenser	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CR-299	Crystal-dial crystal	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CT-388	Condenser-220-680 mmfd padder condenser	REB270K	Resistor-27 ohms ±10% ½ watt resistor
CV-146	Condenser-3 gang variable condenser (with pulley)	REB333M	Resistor-33,000 ohms ±20% ½ watt resistor
DL-391	Dial-metal dial scale	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
ES-274-1	Escutcheon-moulded escutcheon	REB681M	Resistor-680 Ohms ±20% ½ watt resistor
KN-260	Knob-walnut knob	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
KN-261	Knob-walnut knob with dot	RED101M	Resistor-100 ohms ±20% 2 watt resistor
LP-178	Loop-Antenna	SK-476	Speaker-5" P.M. Speaker with output transformer
PO-395	Pointer-dial pointer	SP-191	Spring-Drive shaft retaining spring
PT-576	Control-volume control 1 megohm with D.P.S.T. switch	SW-185	Switch-battery-electric D.P.D.T. slide switch
RCM20A101M	Condenser-100 mmf ±20% mica condenser	TR-707	Transformer-I.F. 455 K.C. input-Transformer
RCM20A470M	Condenser-47 mmfd ±20% mica condenser	TR-708	Transformer-Output I.F. 455 K.C. Transformer with built-in I.F. filter
RCPI0W2104A	Condenser-.1/200WV paper tubular condenser		
RCPI0W4503A	Condenser-.05/400WV paper tubular condenser		
RCPI0W6103A	Condenser-.01/600WV paper tubular condenser		

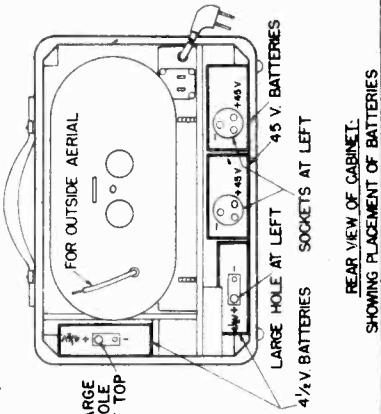


ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	SET POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	RF SECTION OF VARIABLE CONDENSER IN SERIES WITH 1MFD COND.	455 KC.	EXTREME RIGHT HAND POSITION (CONDENSER PLATES FULLY OPEN)	C 8, C 7, C 6, C 5 AND REPEAT IN SAME ORDER (1ST AND 2ND I.F. TRANSFORMERS)
2	USE RADIATED SIGNAL (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP).	1500 KC.	1500 KC (150 ON DIAL)	C 2, C 3, C 1 (OSCILLATOR, RF AND ANTENNA TRIMMERS)
3		600 KC.	600 KC (APPROX. 60 ON DIAL)	C 4 (PADDER)
4				ROCK DIAL FOR MAXIMUM SIGNAL

REPEAT STEPS 2 AND 3

- NOTES:
1. ALL RESISTORS ± 20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
  2. ALL MICA CONDENSERS ± 20% TOLERANCE.
  3. ALL VOLTAGES MEASURED BETWEEN POINTS INDICATED AND GROUND, WITH VOLUME CONTROL FULL ON, USING 20,000 OHMS-PER-VOLT METER. ALL VOLTAGE READINGS ± 10%, EXCEPT FILAMENT VOLTAGE WHICH SHOULD BE KEPT WITHIN ± 5%. ALL READINGS MEASURED ON ELECTRIC POWER OPERATION WITH AN INPUT VOLTAGE OF 117 ± 60 CYCLES, A.C.



Frequency Range 535 - 1650 kc.



MODEL 7-526

## OLYMPIC RADIO &amp; TELEV. INC.

WHEN SERVICING THIS RECEIVER DO NOT PLACE CHASSIS ON A GROUNDED METALLIC BENCH.

For tube replacement it is not necessary to remove the chassis from the cabinet. Access to the tubes may be made by removing the center screw on the loop holding same to the bracket, and then lifting loop carefully off the bracket so as to avoid breaking of wires connecting same.

For ALIGNMENT the chassis must be removed from case. Remove first batteries and then the three screws holding chassis to the bottom of the shelf.

To insure proper alignment, it is suggested to use a radiated signal. To radiate a signal connect a loop of about 6" to 8" diameter 1 turn of #14 or #12 wire across the output of the signal generator and place this loop parallel to the loop of the receiver to be aligned at a distance of about 8" or 10".

**ALIGNMENT**

Equipment Required: Modulated r-f signal generator; output meter; insulated screw driver; two .1 mfd 400 volt condensers.

Turn variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the first thin calibration mark on the dial. Connect the output meter and signal generator as follows:

Output meter: Connect across voice coil and turn volume control to maximum.

Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

**BATTERIES**

The batteries recommended for this receiver are two #746 "Eveready" 4½ volt batteries (National Carbon Co.) and two #482 "Eveready" 45 volt batteries (National Carbon Co.) or replacement types of equal size and voltage. To replace batteries, remove back of cabinet by pulling at top of back. Batteries are accessible without removing chassis or loop. Consult layout drawing for correct placement and connections of batteries.

**REPLACEMENT PARTS**

Part No.	Description	Part No.	Description
BK-405	Bracket-resistor mounting bracket	RE-879	Resistor-2400 ohms ±5% 10 watt resistor
CA-229	Cabinet-portable cabinet	REB102M	Resistor-1000 ohms ±20% ½ watt resistor
CB-335	Cable-battery cable	REB105M	Resistor-1 megohm ±20% ½ watt resistor
CL-954	Coil-r-f coil	REB152M	Resistor-1500 ohms ±20% ½ watt resistor
CL-957	Coil-oscillator coil	REB224M	Resistor-220,000 ohms ±20% ½ watt resistor
CO-182	Condenser-80/20/150 W.V. & 100/15 W.V. elect. condenser	REB225M	Resistor-2.2 megohms ±20% ½ watt resistor
CT-388	Condenser-220/680 mmfd. padder condenser	REB333M	Resistor-33,000 ohms ±20% ½ watt resistor
CV-816	Condenser-3 gang variable condenser	REB335M	Resistor-3.3 megohms ±20% ½ watt resistor
DL-872	Dial-metal dial scale	REB685M	Resistor-6.8 megohms ±20% ½ watt resistor
ES-274-1	Escutcheon-molded escutcheon	REB821M	Resistor-820 ohms ±20% ½ watt resistor
KN-352	Knob-walnut knob	REC222M	Resistor-2200 ohms ±20% 1 watt resistor
KN-947	Knob-walnut knob with dot	RED270K	Resistor-27 ohms ±10% 2 watt resistor
LP-993	Loop-antenna	RF-770	Rectifier-75 mils selenium rectifier
PO-395	Pointer-dial pointer	SK-476	Speaker-5" P.M. speaker
PT-576	Control-volume control	SP-191	Spring-drive shaft retaining spring
RCM20A101M	Condenser-100 mmfd. ±20% mica condenser	SP-295	Spring-pointer drive spring
RCM20A470M	Condenser-47 mmfd. ±20% mica condenser	SW-185	Switch-battery electric slide switch
RCP10W2104A	Condenser-.1/200 W.V. tubular paper condenser	TR-707	Transformer-455 kc first I.F. transformer
RCP10W4203A	Condenser-.02/400 W.V. tubular paper condenser	TR-708	Transformer-455 kc second I.F. transformer with diode filter
RCP10W4503A	Condenser-.05/400 W.V. tubular paper condenser		
RCP10W6103A	Condenser-.01/600 W.V. tubular paper condenser		
RCP10W6502A	Condenser-.005/600 W.V. tubular paper condenser		