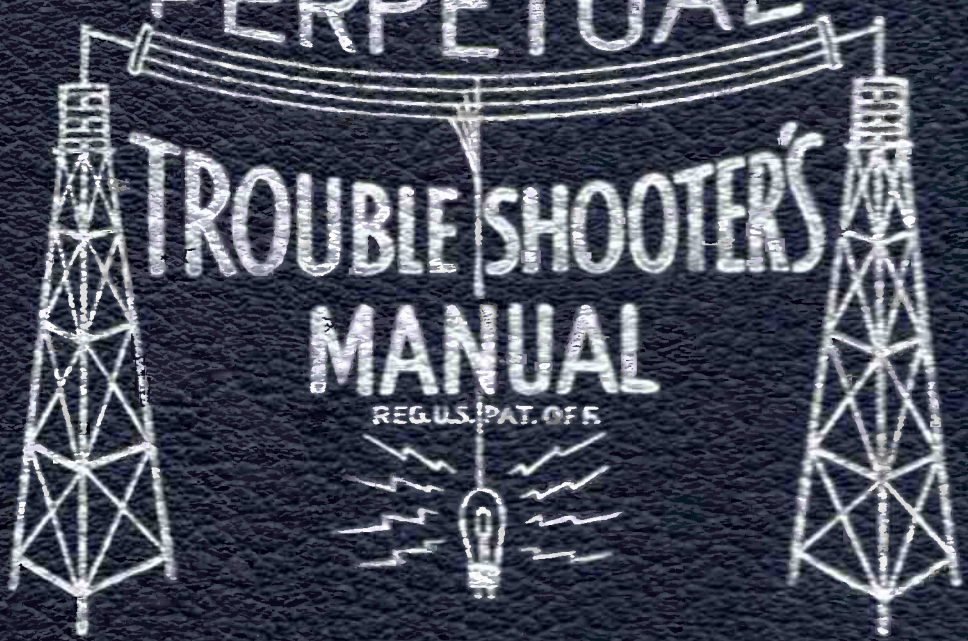
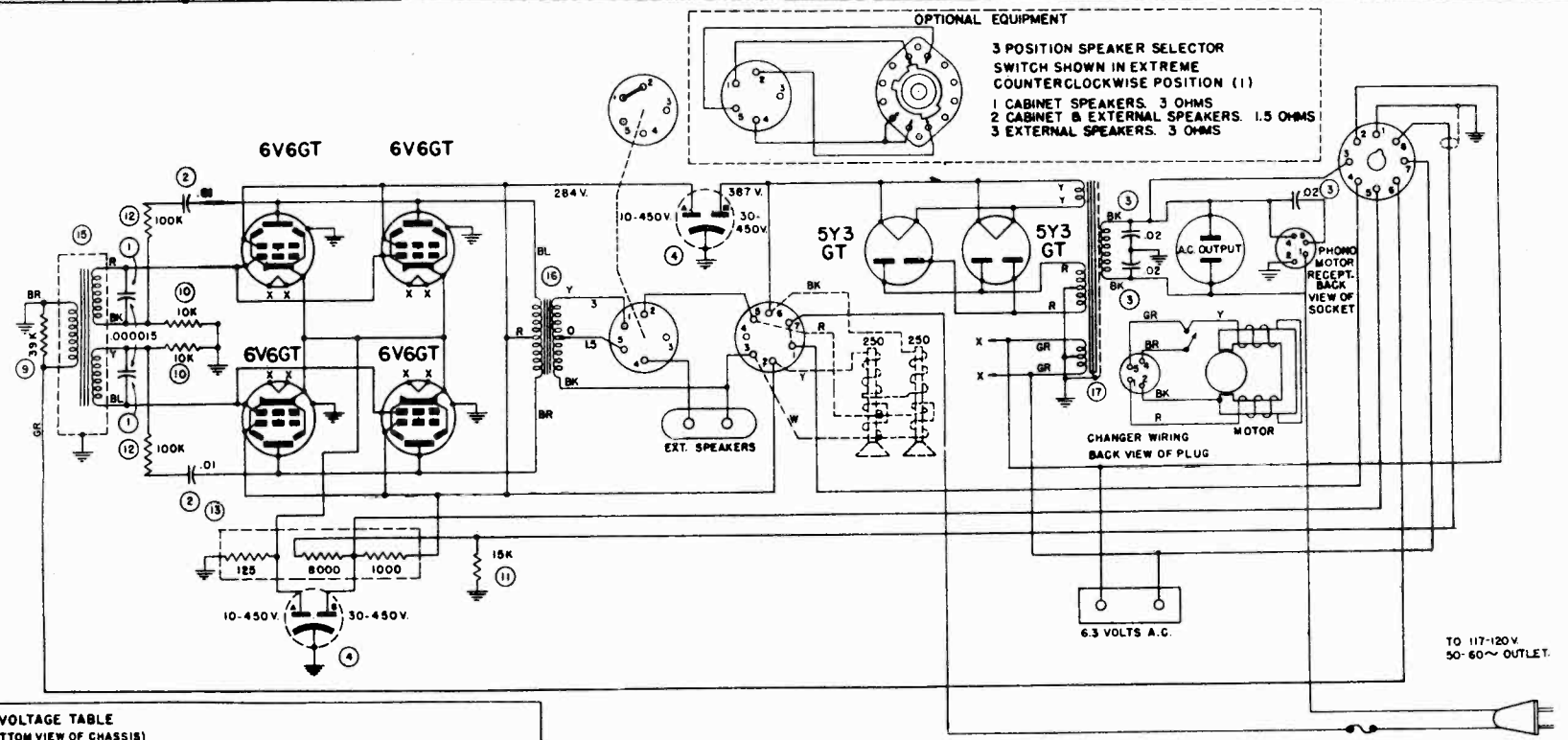
VOLUME XV

PERPETUAL TROUBLE SHOOTER'S MANUAL

REG. U.S. PAT. OFF.

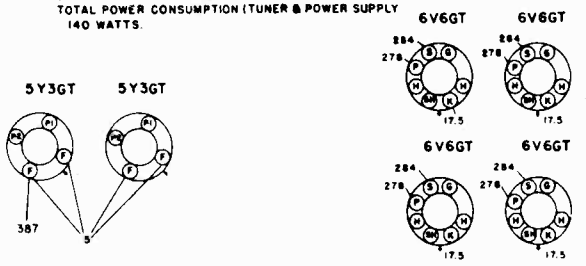


JOHN F. RIDER



VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTE: MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.
ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BANDSWITCH IN SHORT WAVE POSITION.
(H) HEATERS 6.3 VOLTS A.C.
MEASURE CATHODES ON 30 V. SCALE. ALL OTHERS ON 600 V. SCALE.
LINE VOLTAGE 117 V. A.C.
TOTAL POWER CONSUMPTION (TUNER & POWER SUPPLY 140 WATTS.



Power supply	117 volts 50/60 cycles AC
Power consumption	*140 watts
Power output	20 watts
Output impedance	2.5/1.7 ohms

Speakers:

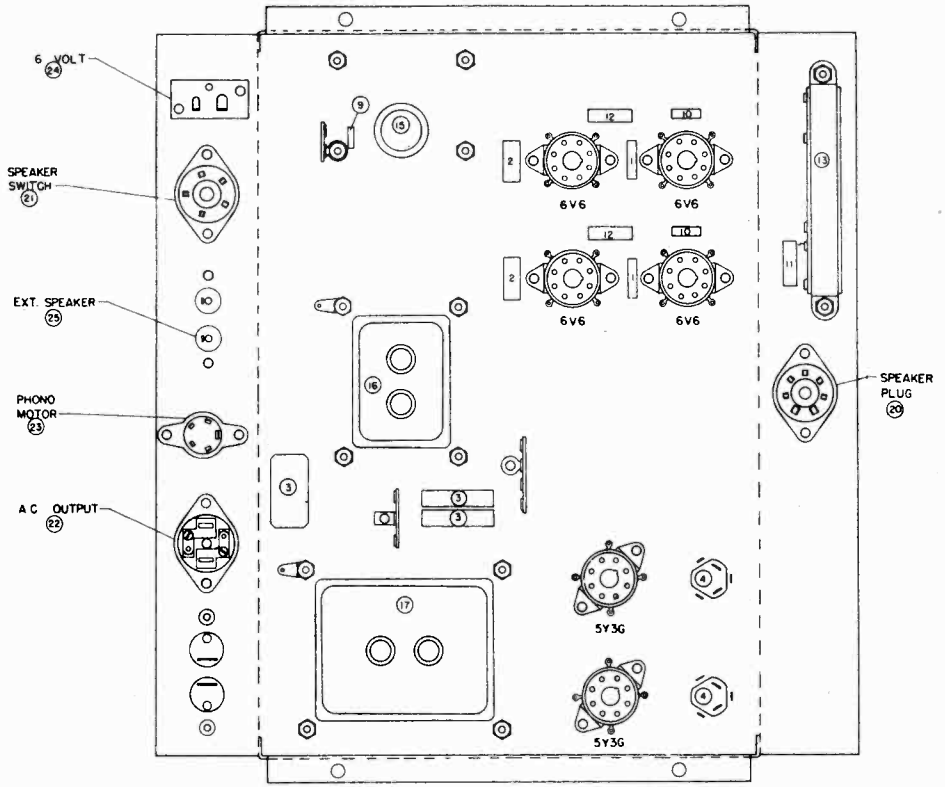
	No. 582815	No. 582869
Field coil resistance	250 ohms	250 ohms
Voice coil impedance (400 cycles)	5.0 ohms	5.0 ohms

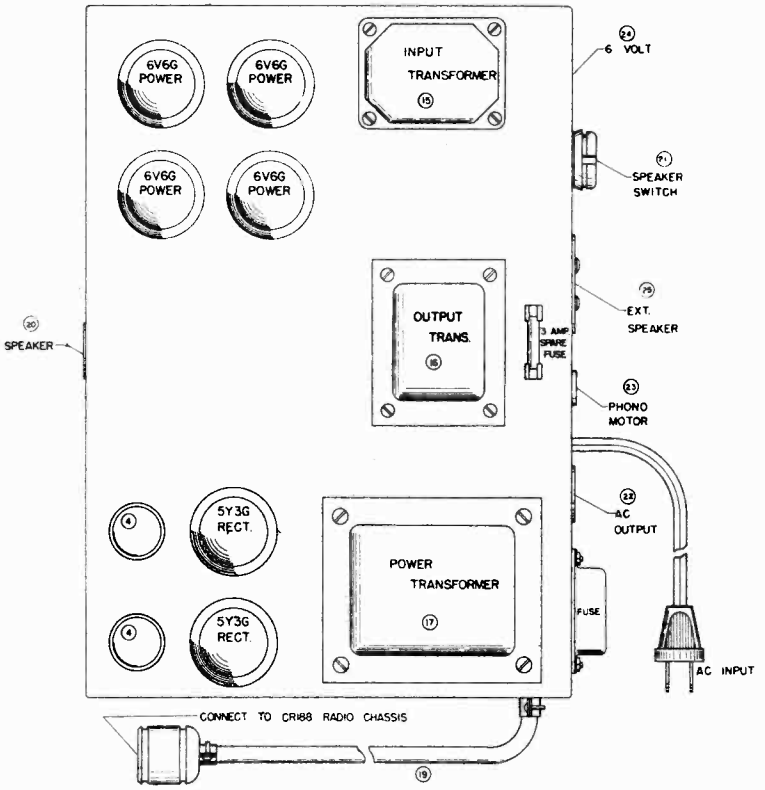
*Power consumption is for amplifier and CR-188 radio chassis.

METHOD FOR REMOVING CHASSIS FROM CABINET

JUNE, 1946

To remove the chassis, first remove all plugs and cables from the receptacles and the connector from the rear of the radio chassis. The amplifier chassis is mounted to the cabinet shelf with four screws and nuts; after they have been removed, the amplifier may be lifted from the cabinet.





ACCESSORIES

SPEAKER SELECTOR SWITCH—Provision is made in this amplifier for connecting extension speakers and a speaker selector switch. By means of this switch, the cabinet and extension speakers may be operated separately or together while maintaining the proper load on the amplifier. This is accomplished by means of a rotary switch with a connecting plug that may be purchased from any authorized Magnavox dealer. When shipped from the factory, a shorting plug is inserted in the amplifier receptacle stamped SPEAKER SWITCH. This plug must not be removed unless the speaker selector switch is added. Then the shorting plug is replaced with a plug that is supplied as a part of the selector switch assembly.

EXTENSION SPEAKER—Two screw terminals are provided on the rear of the amplifier chassis for the connection of an extension speaker line. High-fidelity permanent-magnet extension speakers are available through all authorized Magnavox dealers.

CR-189

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, antenna, two band	360265G1
2	Coil assembly, r-f, 42.9—48.7 mc. band	360262G1
3	Coil assembly, r-f, 87.2—108.7 mc. band	360261G2
4	Coil assembly, oscillator, two band	360263G1
5	Transformer, i-f	360258G1
6	Transformer, discriminator	360259G1
7	Transformer, power, 117 volt 50/60 cycle	300030G1
8	Choke, r-f, filament	360264G1
9	Choke, a-f, filter	350032G1
10	Capacitor, variable, three-gang tuning	260058G1
11	Capacitor, trimmer 1.5—7 mmf.	*260067G1
12	Capacitor, trimmer 4.5—25 mmf.	260042G3
13	Capacitor, two-gang trimmer, 4-70 mmf. each section	260066G1
14	Capacitor, two-gang trimmer, 4-70 mmf. each section	260065G1
15	Capacitor, ceramic, 4 mmf.	250088G28
16	Capacitor, ceramic, 35 mmf.	250088G26
17	Capacitor, molded mica, 47 mmf.	250159G96
18	Capacitor, molded mica, 100 mmf.	250159G98
19	Capacitor, molded mica, 470 mmf. +10%	250159G90
20	Capacitor, molded mica, 470 mmf. +20%	250159G102
21	Capacitor, ceramic, 500 mmf.	250088G31
22	Capacitor, paper, .01 mfd. 600V.	250129G2
23	Capacitor, paper, .05 mfd. 600V.	250129G5
24	Capacitor, electrolytic, 10 mfd. 450V.	270026G3
25	Capacitor, electrolytic, 30-10 mfd. 475V.	270023G2
30	Resistor, composition, 100 ohm ½ W.	230063G7
31	Resistor, composition, 220 ohm ½ W.	230084G9
32	Resistor, composition, 680 ohm ½ W.	230084G12
33	Resistor, composition, 1000 ohm ½ W.	230084G13
34	Resistor, composition, 3300 ohm ½ W.	230084G16
35	Resistor, composition, 4700 ohm ½ W.	230084G17
36	Resistor, composition, 4700 ohm 1 W.	230085G17
37	Resistor, composition, 6800 ohm 2 W.	230061G18
38	Resistor, composition, 22,000 ohm ½ W.	230084G21
39	Resistor, composition, 47,000 ohm ½ W.	230084G23
40	Resistor, composition, 100,000 ohm ½ W.	230084G25
41	Resistor, composition, 120,000 ohm ½ W. ±10%	230084G87
42	Resistor, composition, 100,000 ohm ½ W. ±10%	230084G86
43	Resistor, composition, 220,000 ohm ½ W.	230084G27
44	Resistor, composition, 470,000 ohm ½ W.	230084G29
45	Resistor, composition, 1 megohm ½ W.	230084G31
46	Resistor, composition, 1.5 megohm ½ W.	230084G32
47	Resistor, wire wound, 5000 ohm, 5 W.	240035G4
55	Switch, rotary, band selector and power	160163G1
56	Socket, output	180060G1
	Calibrated glass dial—CR-189A	150272G1
	Calibrated glass dial—CR-189B	150272G2

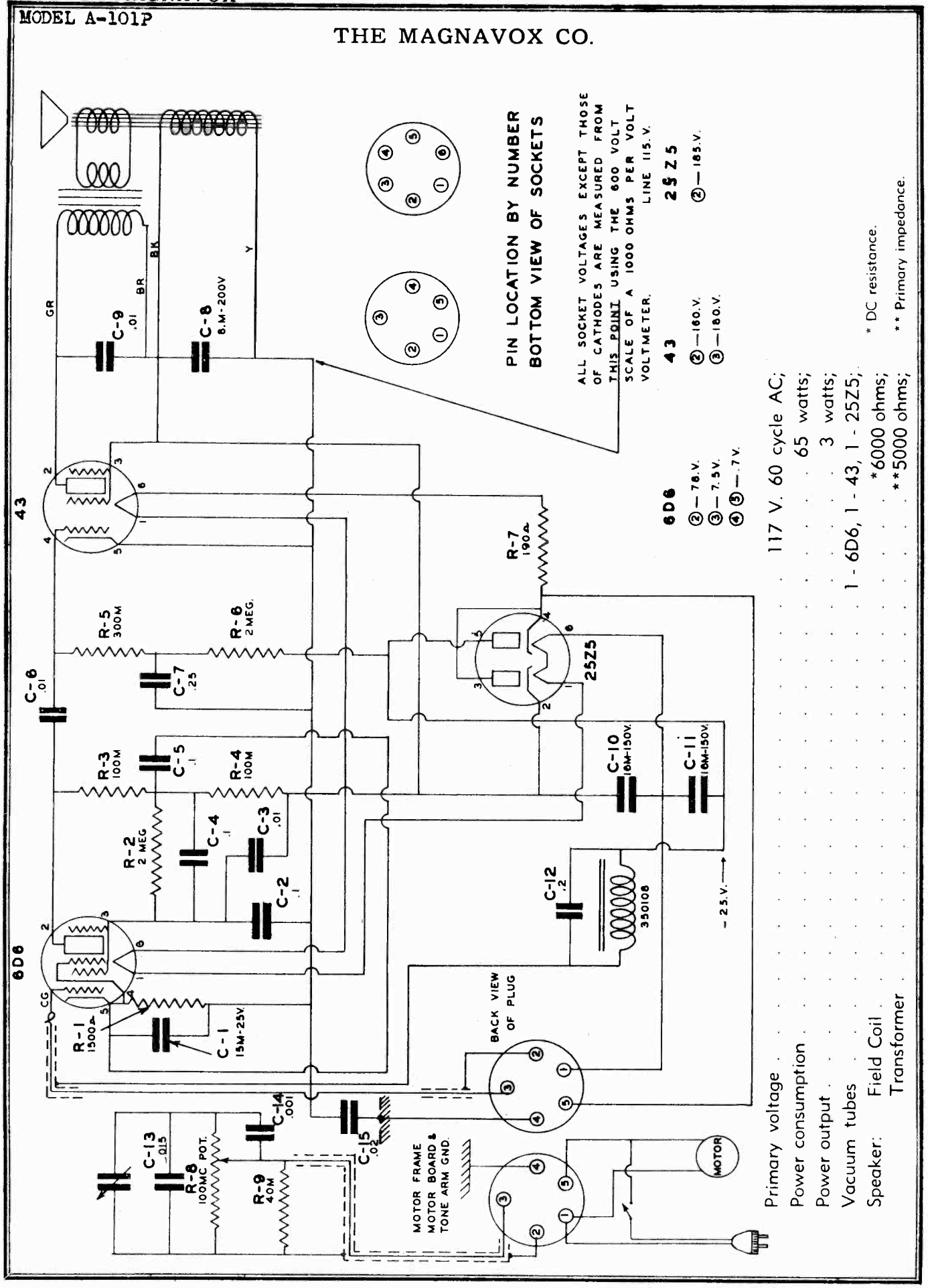
*Electrically replaces 260027G1 used in early production.

AMP-101A

REFERENCE NO.		MAGNAVOX PART NO.
1	Capacitor, molded mica, 15 mmf.	250107G93
2	Capacitor, paper, .01 mfd. 600 V.	250129G2
3	Capacitor, paper, .02 mfd. 600 V.	250129G3
4	Capacitor, electrolytic, 30-10 mfd. 450 V.	270023G2
9	Resistor, composition, 39,000 ohm ½ W.	230084G81
10	Resistor, composition, 10,000 ohm ½ W.	230084G19
11	Resistor, composition, 15,000 ohm 2 W.	230086G20
12	Resistor, composition, 100,000 ohm 1 W.	230085G25
13	Resistor, wire wound, 125-8000-1000 ohm	240037G1
15	Transformer, input	320017G1
16	Transformer, output	330024G1
17	Transformer, power, 117 V. 50-60 cycle	300026G1
19	Cable and plug assembly	460557G1
20	Socket, speaker connection	180393G3
21	Socket, speaker switch	180393G5
22	Socket, power connection	180422G1
23	Socket, phonograph motor connection	180501G5
24	Socket, 6-volt	189788G1
	Socket, octal	180194G4
	Terminal board—external speaker connection	209601G2
	Fuse mounting	182467G1
	Fuse cover	182467G2
	Fuse, 3 amp. 250 V., cartridge	180157G10
	Fuse clip for spare fuse (2 required)	180236G1

MODEL A-101P

THE MAGNAVOX CO.



A-101P

Ref. No.	Description	Magnavox Part No.
C1	Capacitor, electrolytic, 15 mfd. 25V., 8 mfd. 200V.	274201
C2	Capacitor, tubular, .1 mfd. 200 V.	254152
C3	Capacitor, tubular, .01 mfd. 600 V.	254153
C4	Capacitor, tubular, .1 mfd. 200 V.	254152
C5	Capacitor, tubular, .1 mfd. 200 V.	254152
C6	Capacitor, tubular, .01 mfd. 600 V.	254153
C7	Capacitor, tubular, .25 mfd. 120 V.	254149
C8	Capacitor, electrolytic, 15 mfd. 25V., 8 mfd. 200V.	274201
C9	Capacitor, tubular, .01 mfd. 600 V.	254153
C10	Capacitor, electrolytic, 16 mfd. 250 V.	274212
C11	Capacitor, electrolytic, 16 mfd. 250 V.	274212
C12	Capacitor, tubular, .2 mfd. 200 V.	254182
C13	Capacitor, tubular, .015 mfd. 600 V.	254131
C14	Capacitor, tubular, .001 mfd. 600 V.	254142
C15	Capacitor, tubular, .02 mfd. 600 V.	254127
R1	Resistor, carbon, 1500 ohm ½ W.	234425
R2	Resistor, carbon, 2 megohm ½ W.	234451
R3	Resistor, carbon, 100,000 ohm ½ W.	234445
R4	Resistor, carbon, 100,000 ohm ½ W.	234445
R5	Resistor, carbon, 300,000 ohm ½ W.	234448
R6	Resistor, carbon, 2 megohm ½ W.	234451
R7	Resistor, wire wound, 190 ohm	247808
R8	Control, volume, 100,000 ohm with switch	224354
R9	Resistor, carbon, 40,000 ohm ½ W	234438
L1	Choke, filter	350108
	Socket, 6 prong marked 6D6	187328
	Socket, 6 prong marked 43	187333
	Socket, 6 prong marked 25Z5	187330
	Knob, control	144101

A-106P

Ref. No.	Description	Magnavox Part No.
C1	Capacitor, tubular, .015 mfd. 600 V.	254131
C2	Capacitor, tubular, .001 mfd. 600 V.	254142
C3	Capacitor, electrolytic, 25 mfd. 25 V.	274236
C4	Capacitor, tubular, .1 mfd. 200 V.	254152
C5	Capacitor, tubular, .015 mfd. 600 V.	254131
C6	Capacitor, tubular, .25 mfd. 120 V.	254149
C7	Capacitor, tubular, .01 mfd. 600 V.	254153
C8	Capacitor, tubular, .01 mfd. 600 V.	254153
C9	Capacitor, tubular, .02 mfd. 600 V.	254127
C10	Capacitor, electrolytic, 16 mfd. 150 V.	274212
C11	Capacitor, electrolytic, 16 mfd. 150 V.	274212
C12	Capacitor, tubular, .05 mfd. 600 V.	254159
R1	Control, volume, 100,000 ohm	224354
R2	Resistor, carbon, 40,000 ohm ½ W.	234438
R3	Resistor, carbon, 5,000 ohm ½ W.	234430
R4	Resistor, carbon, 2 megohm ½ W.	234451
R5	Resistor, carbon, 150,000 ohm ½ W.	234446
R6	Resistor, carbon, 300,000 ohm ½ W.	234448
R7	Resistor, carbon, 2 megohm ½ W.	234451
R8	Resistor, wire wound, 190 ohm	247808
	Choke, filter	350102
	Socket, 6 prong marked 6D6	187328
	Socket, 6 prong marked 43	187333
	Socket, 6 prong marked 25Z5	187330
	Knob, control	144101

A-205C

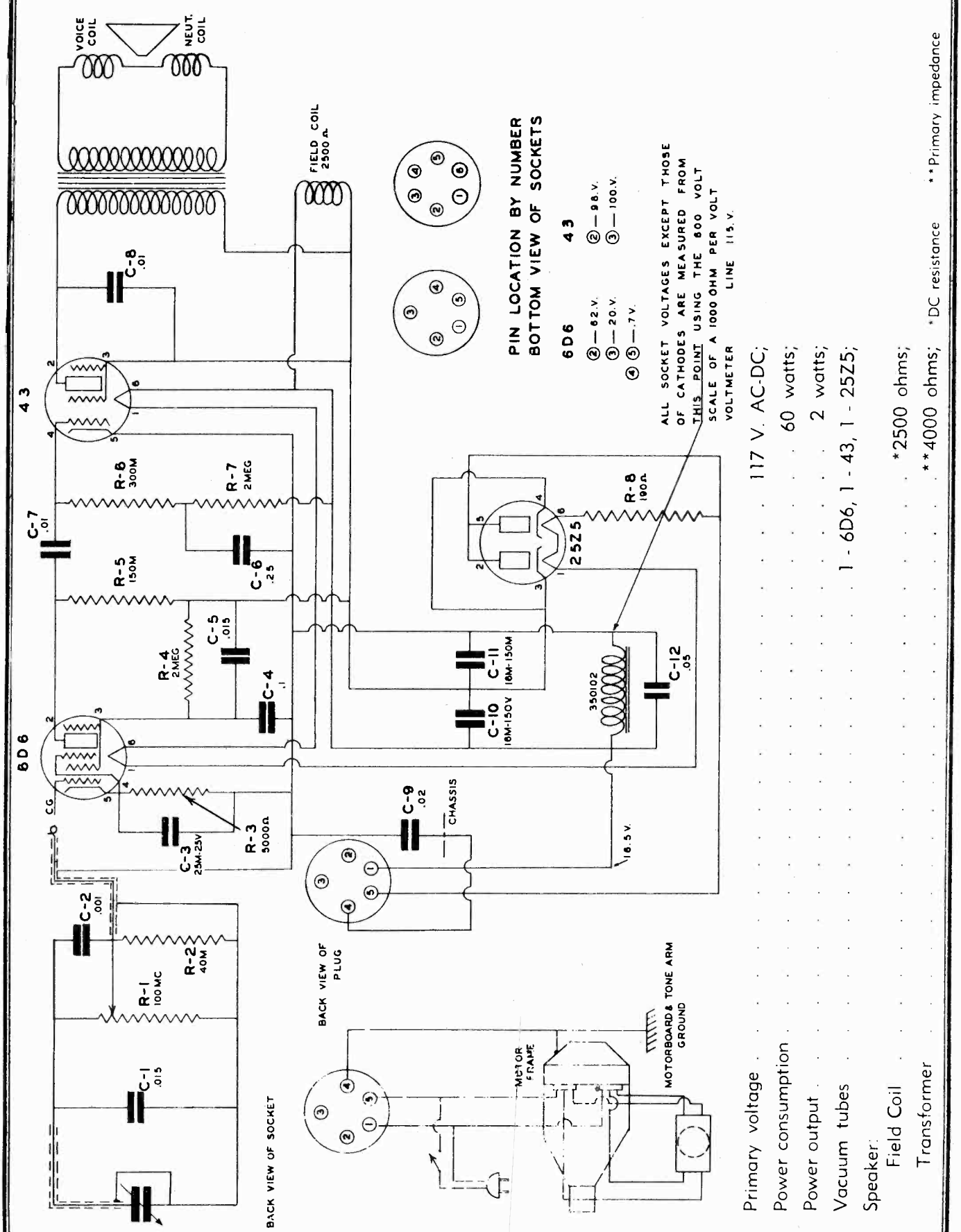
Ref. No.	Description	Magnavox Part No.
1	Capacitor, molded paper, .02 mfd. 600 V.	250056
2	Capacitor, molded paper, .01 mfd. 400 V.	250054
3	Capacitor, molded paper, .01 mfd. 400 V.	250054
4	Capacitor, electrolytic, 100-20 mfd. 150 V., 20 mfd. 25 V.	270008
5	Capacitor, electrolytic, 20 mfd. 150 V.	270005
6	Resistor, carbon, 250,000 ohm ⅓ W.	230010
7	Resistor, carbon, 3000 ohm ⅓ W.	230032
8	Resistor, carbon, 175 ohm ½ W.	230037
9	Resistor, carbon, 100 ohm ⅓ W.	239744
10	Resistor, carbon, 30 ohm ⅓ W.	230023
11	Control, volume with power switch, 2 megohm	220014
	Socket, octal marked 50L6GT	180130
	Socket, octal marked 35Z5GT	180131
	Knob, control	144100

A-206, A-206A

Ref. No.	Description	Magnavox Part No.
1	Capacitor, electrolytic, 40-40 mfd. 150 V.	270013
2	Capacitor, moulded paper, .02 mfd. 600 V.	250056
3	Capacitor, moulded paper, .02 mfd. 600 V.	250056
4	Resistor, carbon, 500,000 ohm ⅓ W.	239755
5	Resistor, carbon, 500,000 ohm ⅓ W.	239755
6	Resistor, carbon, 1000 ohm ⅓ W.	239745
7	Resistor, carbon, 88 ohm 1 W.	230047
8	Resistor, wire wound, 166 ohm	240013
9	Control, volume, 1 megohm	222518
10	Control, tone, 20,000 ohm, with power switch	220021
	Socket, octal marked 70L7GT	180050
	Switch, SPST toggle, (motor)	167402
	Escutcheon, OFF-ON	150074
	Knob, control marked VOLUME	140035
	Knob, control marked OFF-ON-TONE	140036

MODEL A-106P

THE MAGNAVOX CO.



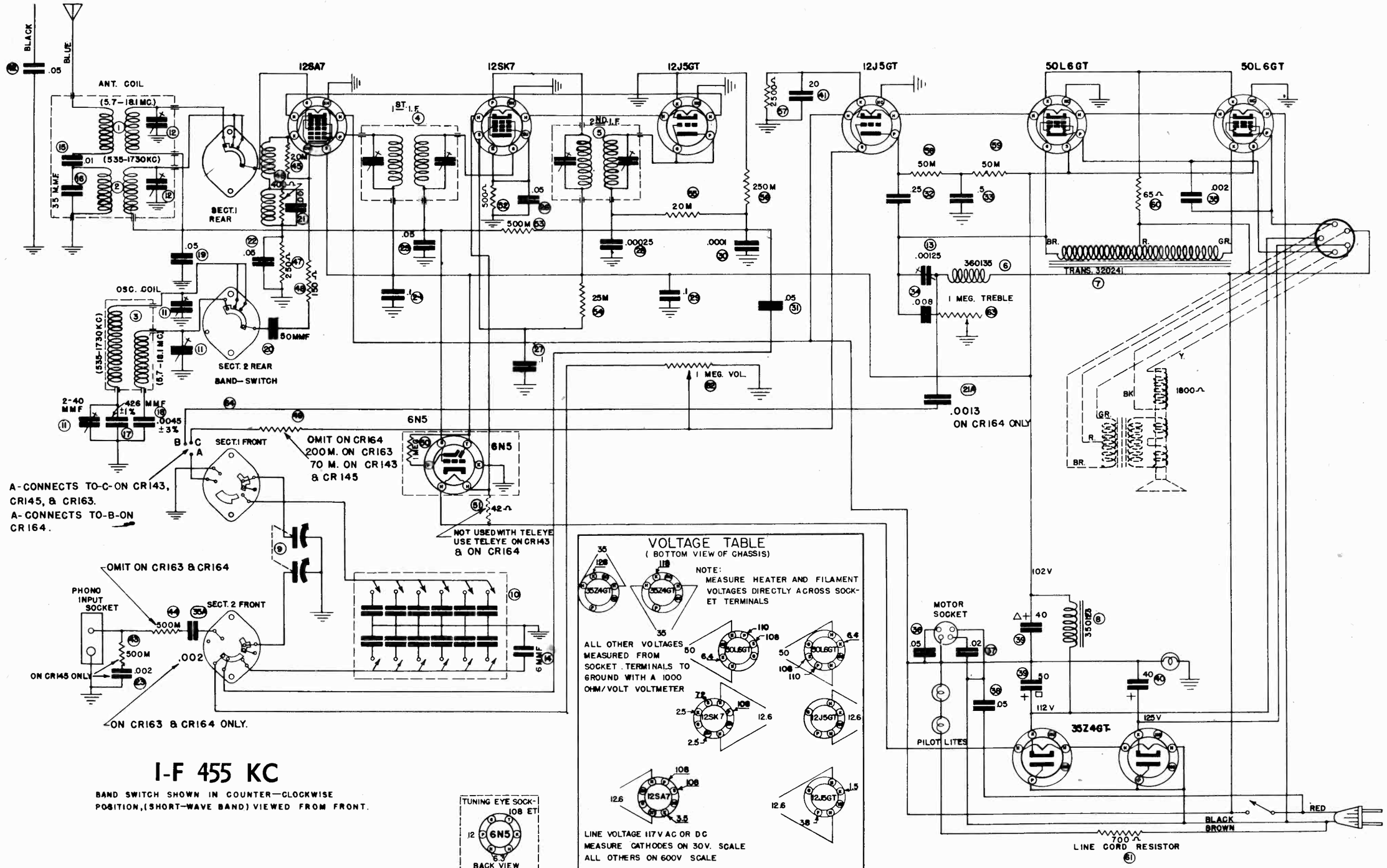
Primary voltage	117 V. AC-DC;
Power consumption	60 watts;
Power output	2 watts;
Vacuum tubes	1 - 6D6, 1 - 43, 1 - 25Z5;
Speaker:	
Field Coil	*2500 ohms;
Transformer	**4000 ohms;

*DC resistance **Primary impedance

For Parts list, see P.15-5

MODELS CR-143, CR-145 (Revised)
CR-163, CR-164

THE MAGNAVOX CO.



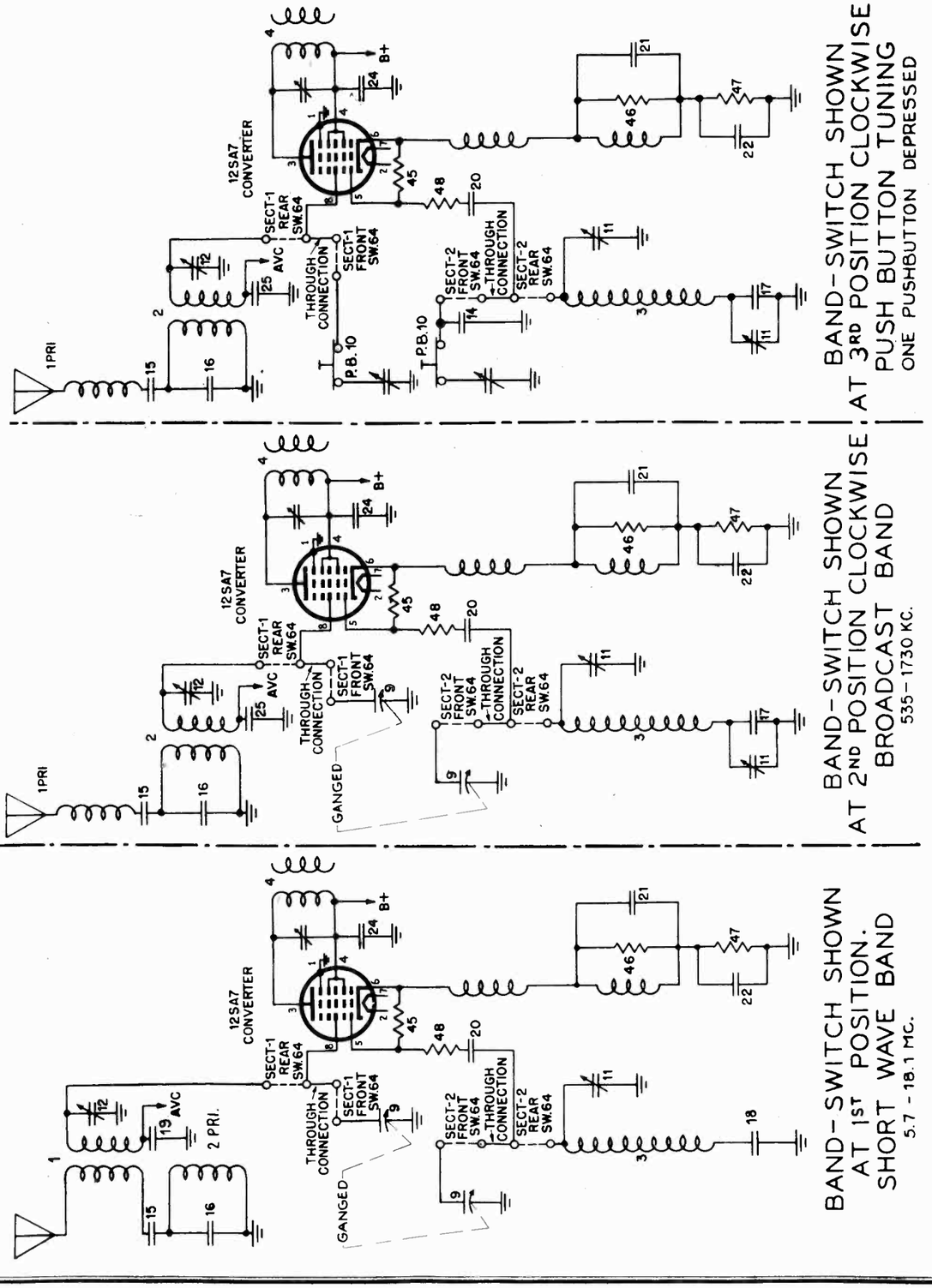
I-F 455 KC

BAND SWITCH SHOWN IN COUNTER—CLOCKWISE POSITION, (SHORT-WAVE BAND) VIEWED FROM FRONT.

Schematic Diagram, Models CR-143, CR-145, CR-163, CR-164

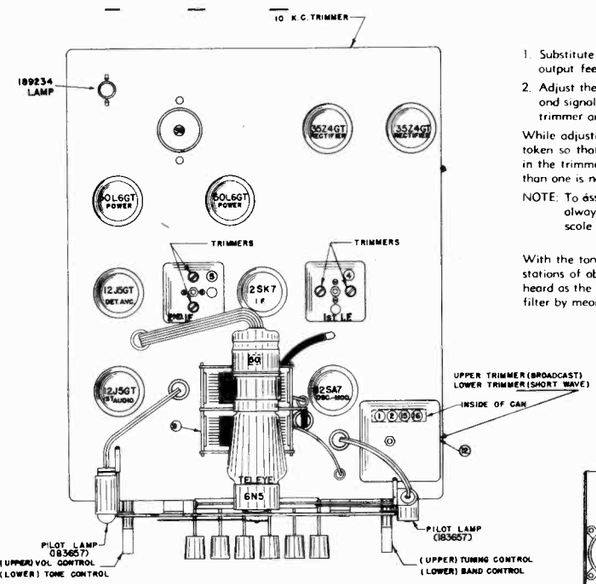
MODELS CR-143, CR-145, CR-163, CR-165

THE MAGNAVOX CO.



MODELS CR-143, CR-145, CR-163, CR-165

THE MAGNAVOX CO.



Instructions for removing the CR-143 or CR-163 chassis from the Sheraton Console, American Modern, Chippendale, Hepplewhite and Berkeley cabinets.

1. Remove the plugs from the bottom of the chassis.
2. Remove the antenna-ground terminal strip from the side of the cabinet.
3. Pull the control knobs and the push button knobs from their shafts.
4. Remove the four machine screws that secure the two chassis brackets to the cabinet, and lower the chassis from the cabinet.

ALIGNMENT PROCEDURE

ALIGNING THE I-F AT 455 KILOCYCLES

1. Connect the ground lead of the signal generator to the chassis or radio ground lead. Connect the other lead of the signal generator to the oscillator grid of the 12SA7 tube through a .00025 mfd. series condenser.
2. Set the signal generator to EXACTLY 455 kilocycles and turn the receiver volume to maximum setting.
3. Peak each of the second i-f transformer trimmer condensers.
4. Peak each of the first i-f transformer trimmer condensers.

To insure most accurate trimmer setting, repeat the above adjustment several times, always using the lowest possible signal generator output consistent with readable output meter scale deflection.

ALIGNING THE 535-1730 KILOCYCLE BAND

1. Remove the signal generator lead from the grid of the 12SA7 tube. Connect it to the receiver antenna lead (blue) through a .00025 mfd. series condenser.
2. Check the tuning dial adjustment by turning the gang condenser until the plates are completely meshed, at which point the dial pointer must be exactly even with the last line at the low frequency end of the dial calibration.
3. Adjust the band selector switch for operation on the 545-1730 kilocycle BROADCAST band.
4. Set the signal generator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the BROADCAST oscillator trimmer and the antenna trimmer to bring in the 1400 kilocycle signal generator signal to maximum output.
5. Set the signal generator and receiver frequency to 600 kilocycles. While rocking the gang condenser slightly to the right and to the left, adjust the 600 kilocycle oscillator padder to maximum output.

ALIGNING THE 5.7-18.1 MC BAND

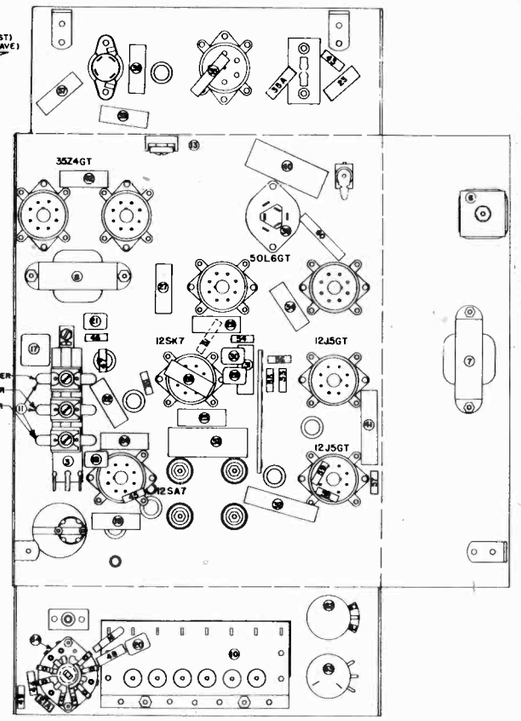
1. Substitute a 400 ohm resistor for the .00025 mfd. condenser in series with the signal generator output feeding the antenna lead.
2. Adjust the band selector switch to the 5.7-18.1 megacycle short wave band, tune the receiver and signal oscillator frequency to EXACTLY 15 megacycles and adjust the short wave oscillator trimmer and antenna trimmer for maximum output as indicated on the output meter.

While adjusting the oscillator trimmer, two peaks may be noticed, in which case, care must be taken so that the proper peak is used for aligning the receiver at 15 megacycles. Always screw in the trimmer to maximum capacity, then back off the trimmer until the second peak (if more than one is noticed), which is the correct one, is tuned in.

NOTE: To assure most accurate trimmer setting, repeat all of the above adjustments several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

10 KC FILTER ADJUSTMENT

With the tone control set for maximum treble response, tune the receiver to a point between two stations of about the same signal strength on adjacent channels. If a 10,000 cycle heterodyne is heard as the beat note between the two carriers, it may be eliminated by tuning the 10 kc output filter by means of the 10 kc trimmer condenser, located at the rear of the chassis.



Ref. No.	Description	Magnavox Part No.
1	Coil, antenna, short wave	360016
2	Coil, antenna, broadcast	360015
3	Coil, oscillator	360029
4	Coil, i-f transformer, first	363700
5	Coil, i-f transformer, second	363700
6	Coil, 10 kc filter choke	360135
7	Transformer, input	320241
8	Coil, filter choke	350123
9	Capacitor, two-gang tuning	260002
10	Capacitor, push button tuner assembly	160009
11	Capacitor, three-gang trimmer	260010
12	Capacitor, two-gang trimmer	260009
13	Capacitor, 10 kc filter, .00125 mfd.	259610
14	Capacitor, temperature compensator	290002
15	Capacitor, moulded paper, .01 mfd. 400 V.	250054
16	Capacitor, moulded mica, 35 mmf.	250050
17	Capacitor, silver mica, 426 mmf. ±1%	250038
18	Capacitor, moulded mica, .0045 mfd. ±3%	259779
19	Capacitor, tubular, .05 mfd. 200 V.	254123
20	Capacitor, silver mica, 50 mmf. ±10%	250037
21	Capacitor, moulded mica, .001 mfd. ±3%	259776
21A	Capacitor, moulded mica, .0013 mfd. ±3%, CR-164 only	259777
22	Capacitor, tubular, .05 mfd. 200 V.	254123
23	Capacitor, tubular, .002 mfd. 600 V., CR-145 only	254161
24	Capacitor, tubular, .1 mfd. 200 V.	254152
25	Capacitor, tubular, .05 mfd. 200 V.	254123
26	Capacitor, tubular, .05 mfd. 200 V.	254123
27	Capacitor, tubular, .1 mfd. 200 V.	254152
28	Capacitor, moulded mica, .00025 mfd.	259772
29	Capacitor, tubular, 1 mfd. 200 V.	254152
30	Capacitor, moulded mica, .0001 mfd.	259769
31	Capacitor, tubular, .05 mfd. 200 V.	254123
32	Capacitor, tubular, .25 mfd. 200 V.	254135
33	Capacitor, tubular, 5 mfd. 200 V.	254134
34	Capacitor, tubular, .008 mfd. 600 V.	250014
35	Capacitor, tubular, .002 mfd. 600 V.	254161
35A	Capacitor, tubular, .002 mfd. 600 V., CR-163, 164 only	254161
36	Capacitor, tubualr, .05 mfd. 400 V.	254146
37	Capacitor, tubulor, .02 mfd. 600 V.	254127
38	Capacitor, tubular, .05 mfd. 400 V.	254146
39	Capacitor, molanode, 50 - 40 mfd. 150 V.	270004
40	Capacitor, molanode, 40 mfd. 150 V.	270010
41	Capacitor, molanode, 20 mfd. 25 V.	273611
42	Capacitor, tubular, .05 mfd. 200 V.	254123
43	Resistor, carbon, 500,000 ohm 1/3 W., CR-145 only	239755
44	Resistor, carbon, 500,000 ohm 1/3 W.	239755
45	Resistor, carbon, 20,000 ohm 1/3 W	239750
46	Resistor, carbon, 400 ohm 1/3 W.	230005
47	Resistor, carbon, 250 ohm 1/3 W.	230001
48	Resistor, carbon, 150 ohm 1/3 W.	230033
49	Resistor, carbon, 70,000 ohm 1/3 W.	230042
50	Resistor, carbon, 1 megohm 1/3 W.	239756
51	Resistor, carbon, 42 ohm, 2 W., CR-145 only	230040
52	Resistor, carbon, 500 ohm 1/3 W.	230043
53	Resistor, carbon, 500,000 ohm 1/3 W.	239755
54	Resistor, carbon, 25,000 ohm 1/3 W.	230002
55	Resistor, carbon, 20,000 ohm 1/3 W.	239750
56	Resistor, carbon, 250,000 ohm 1/3 W.	230010
57	Resistor, carbon, 2500 ohm 1/3 W.	239746
58	Resistor, carbon, 50,000 ohm 1/3 W.	239751
59	Resistor, carbon, 50,000 ohm 1/3 W.	239751
60	Resistor, carbon, 65 ohm 1 W.	230020
61	Power cord, 700 ohm line cord resistance	460004
62	Control, volume, 1 megohm	220008
63	Control, treble, with switch — 1 megohm	220015
64	Switch, band selector	160010
	Socket, pilot lamp	180078
	Socket, motor	180018
	Socket, phonograph input	189741
	Dial, calibrated scale	150033
	Pointer, dial	101471
	Cable, dial drive (specify length)	449801
	Spring, dial cable tension	103321
	Knob, control	140012
	Knob, push button	149593
	Lamp, #51 Mazda 6-8 V. 0.2 amp. (pilot)	183657
	Lamp, #44 Mazda 68 V. 0.25 amp. (fuse)	189234
	Socket, speaker	180059
	Escutcheon, push button	150056
	Escutcheon, dial	150035
	Crystal, for dial escutcheon	153723
	Call letter sheet for push buttons	593681

SPECIFICATIONS

Primary voltage . 117 V. 50-60 cycle AC or DC;
Power consumption . . . . . 85 watts;
Power output . . . . . 6 watts;
Speaker: Field Coil . . . . . *1800 ohms;
Transformer . . . . . **3000 ohms;
Intermediate frequency . . . . . 455 kc;
Tuning frequency range . . . . . 535-1730 kc;
5.7-18.1 mc;

Circuit: Superheterodyne with two-gang tuning condenser, six-station condenser-type push button tuner, two tuning ranges, treble control, automatic volume control, bass compensation in volume control for phonograph pickup, teleye tuning indicator (CR-143 and CR-163 only).

* DC resistance. ** Primary impedance.

Models CR-143, CR-145, CR-163 and CR-164 are basically alike. Minor circuit differences are indicated on Figure 36.

The phonograph input circuit in CR-143 and CR-145 is designed for use with a 3 oz. pressure crystal pickup; CR-163 and CR-164 phonograph input circuit accommodates the 1 oz. pressure crystal pickup.

Instructions for removing the CR-145 or CR-164 chassis from the Concerto Combination, Sheraton Table and Modern Table cabinets.

1. Remove the back from the cabinet.
2. Pull the control knobs and push button knobs from their shafts.
3. Remove the plugs from the rear of the chassis and disconnect the antenna and ground connections.
4. Completely mesh the tuning condenser plates by turning the station selector knob until the dial pointer is in the lowest frequency setting on the dial.
5. Remove the four machine screws, located on the bottom of the cabinet, that secure the chassis.
6. Slide to the rear of the cabinet, lifting the rear of the chassis to permit the dial assembly to clear the rear opening.

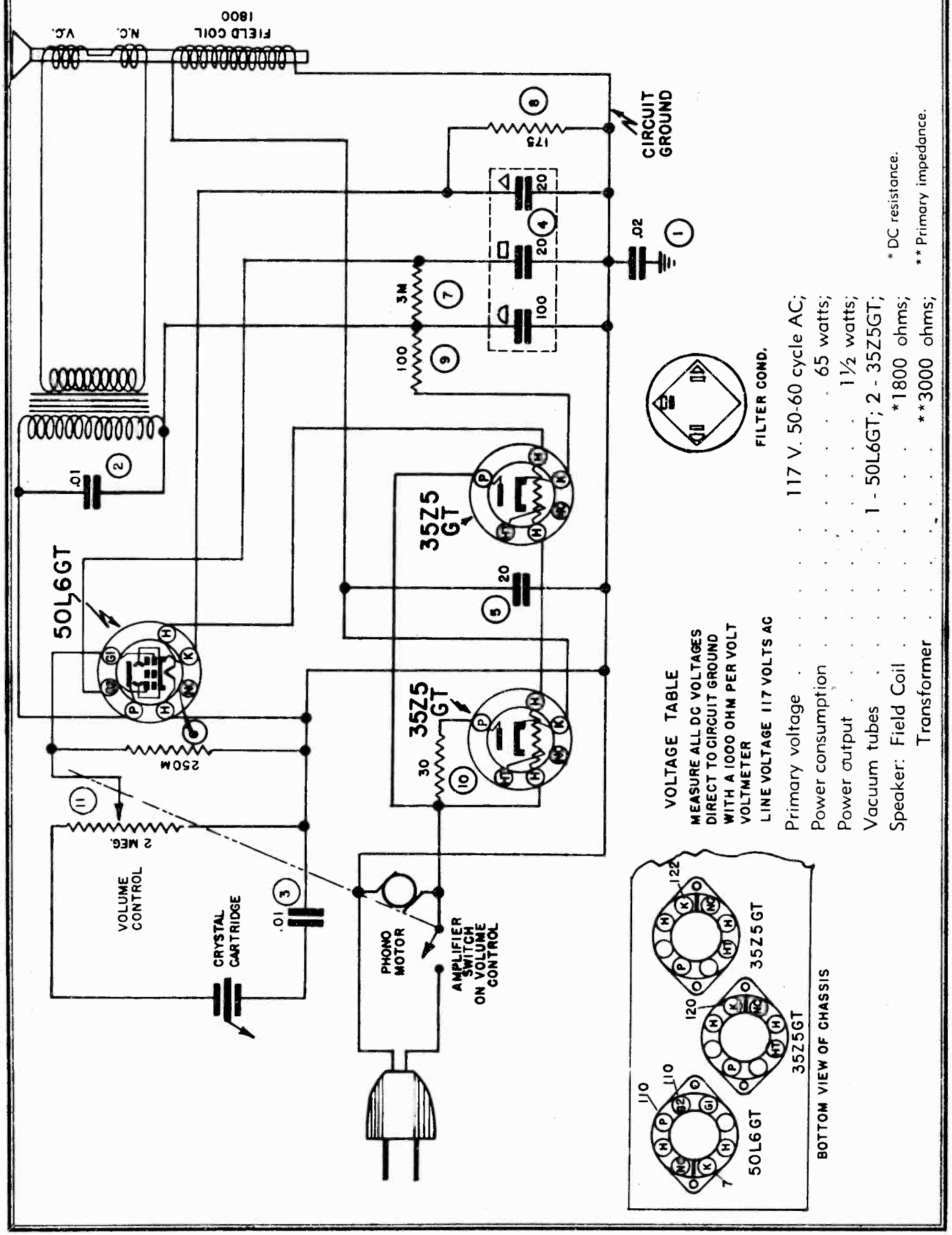
Instructions for removing the CR-143 or CR-163 chassis from the Chairside cabinet.

1. Set the cabinet on end so that the speaker is facing upward.
2. Remove the plugs from the rear of the chassis.
3. Remove the antenna-ground terminal strip from the side of the cabinet.
4. Pull the control knobs and the push button knobs from their shafts.
5. Remove the four Phillips-head wood screws securing the radio panel, and lift the panel from the cabinet.
6. Remove the four machine screws that secure the chassis to the cabinet. Two of these screws are accessible in the phonograph compartment and the other two are beneath the motorboard.
7. Slide the chassis out the top opening of the cabinet.

NOTE: If it is necessary to remove the speaker, the four mounting nuts on the speaker should be removed and the speaker taken through the bottom opening of the cabinet.

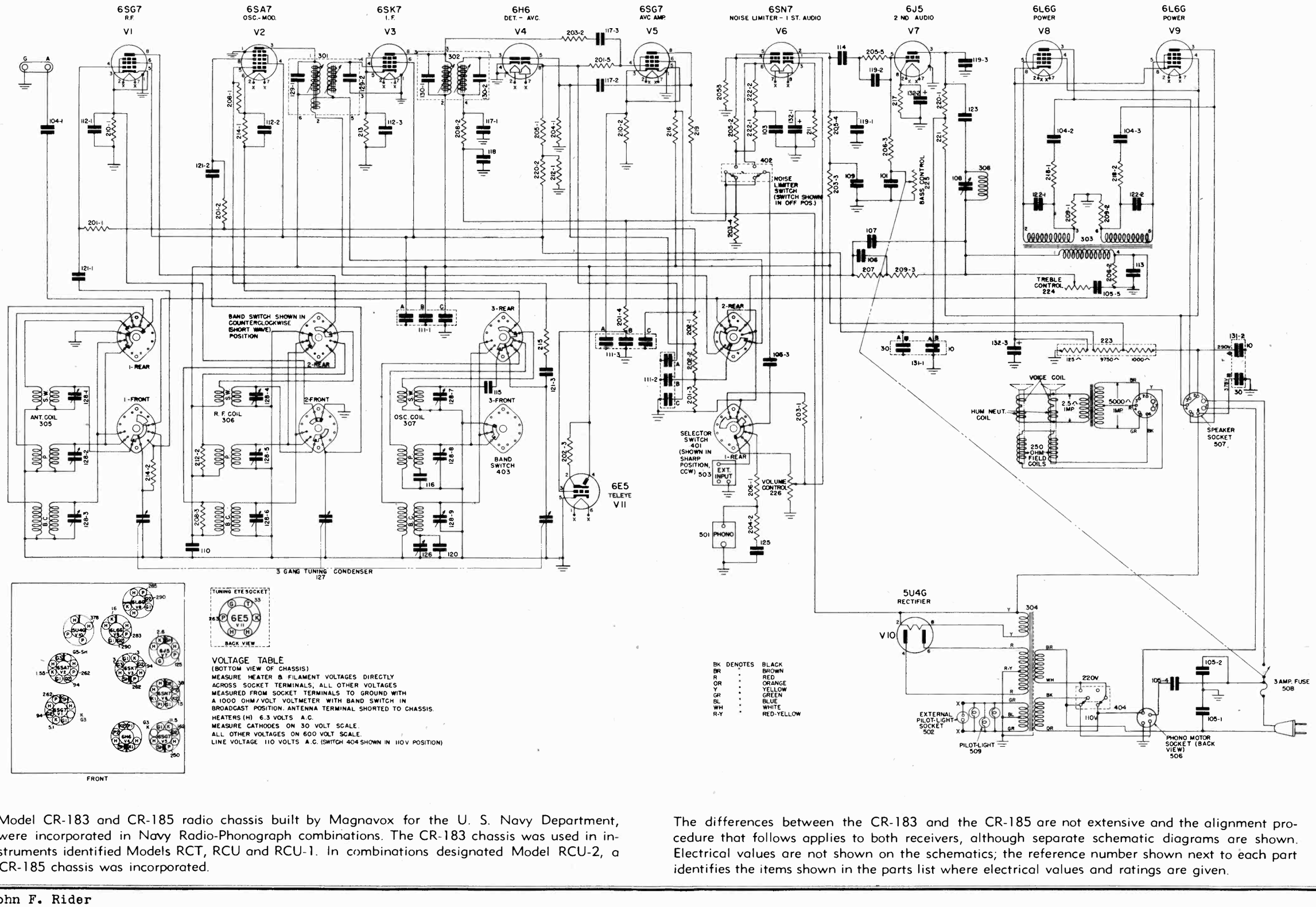
MODEL A-205C

THE MAGNAVOX CO.



For Parts list, see P.15-5

THE MAGNAVOX CO.

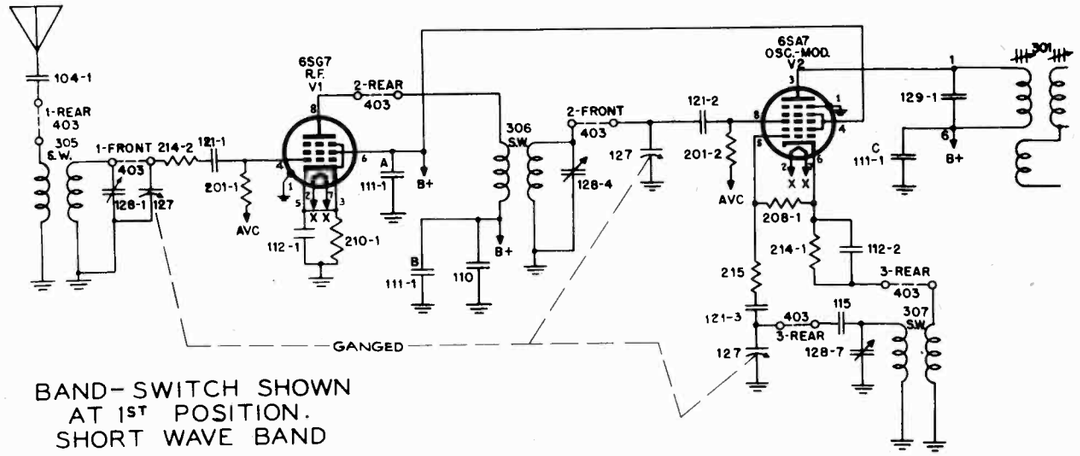


VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)
MEASURE HEATER & FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS, ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND SWITCH IN BROADCAST POSITION. ANTENNA TERMINAL SHORTED TO CHASSIS.
HEATERS (H) 6.3 VOLTS A.C.
MEASURE CATHODES ON 30 VOLT SCALE.
ALL OTHER VOLTAGES ON 600 VOLT SCALE.
LINE VOLTAGE 110 VOLTS A.C. (SWITCH 404 SHOWN IN 110V POSITION)

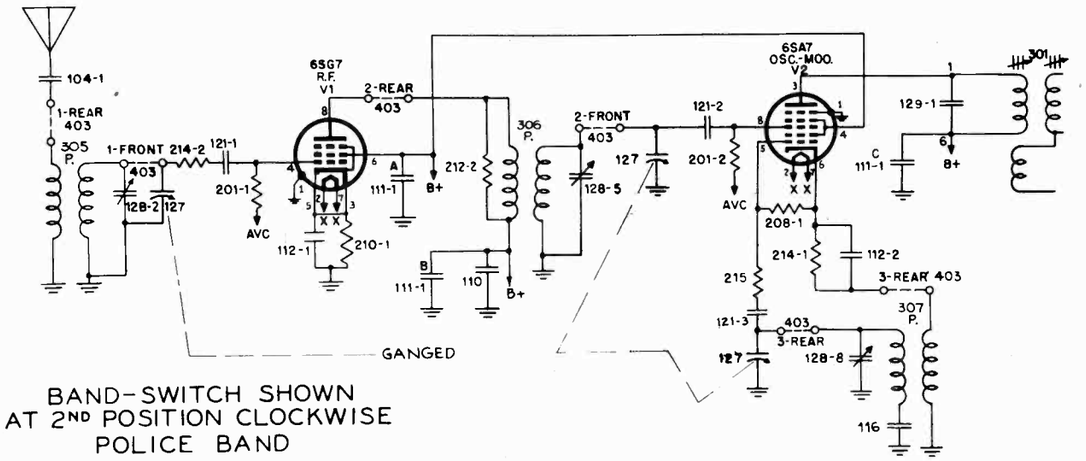
Model CR-183 and CR-185 radio chassis built by Magnavox for the U. S. Navy Department, were incorporated in Navy Radio-Phonograph combinations. The CR-183 chassis was used in instruments identified Models RCT, RCU and RCU-1. In combinations designated Model RCU-2, a CR-185 chassis was incorporated.

The differences between the CR-183 and the CR-185 are not extensive and the alignment procedure that follows applies to both receivers, although separate schematic diagrams are shown. Electrical values are not shown on the schematics; the reference number shown next to each part identifies the items shown in the parts list where electrical values and ratings are given.

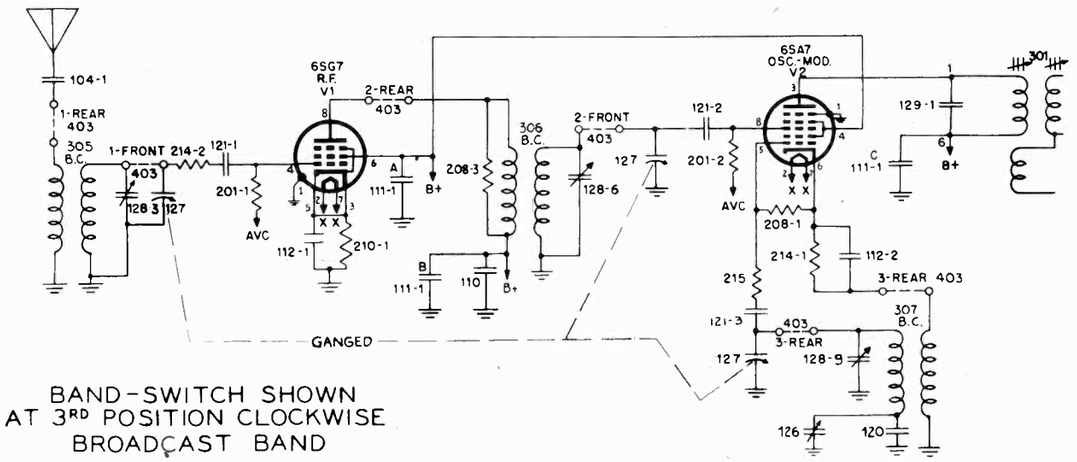
THE MAGNAVOX CO.



BAND-SWITCH SHOWN AT 1ST POSITION. SHORT WAVE BAND



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE POLICE BAND



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE BROADCAST BAND

THE MAGNAVOX CO.

CR-183, CR-185

SHORT WAVE BAND ALIGNMENT

1. With the 400 ohm resistor in series with the test oscillator lead to the antenna of the radio receiver, set the band selector switch to SHORT WAVE.
2. Set the test oscillator frequency and receiver dial to EXACTLY 15 megacycles. Adjust the short wave oscillator trimmer, r-f trimmer and antenna trimmer for maximum deflection on the output meter.

While adjusting the oscillator trimmer, two peaks may be noticed, in which case care must be taken so that the proper peak is used for aligning the receiver at 15 megacycles. Always turn the trimmer screw clockwise to maximum capacity; then back off the trimmer until the second peak (if more than one is noticed) is reached.

NOTE: To assure most accurate trimmer setting, repeat all of the above adjustments several times, always using the lowest possible test oscillator signal, consistent with readable output meter scale deflection.

10 KC FILTER ADJUSTMENT

1. Turn the tone control to the right as far as possible for maximum treble response and the selectivity switch to the BROAD position.
2. Tune the receiver to a point between two station of about the same signal strength, located on adjacent channels 10 kc apart.
3. If a 10,000 cycle heterodyne is heard as a beat note between the two carriers, adjust the 10 kc trimmer until this beat note can no longer be heard. The 10 kc trimmer is located on the top of the radio chassis between the two 6L6G output tubes.
4. The preferred method for making this adjustment is to connect the output of an audio oscillator set at EXACTLY 10,000 cycles, to the phonograph input socket and set the 10 kc trimmer for minimum signal.

ALIGNMENT PROCEDURE

An accurate calibrated r-f test oscillator, an output indicator and a screw driver are required to align the radio receiver. The output meter should be connected across the voice coil terminals, and the test oscillator output should be kept to such a value that the reading on the output meter does not exceed one volt. Be sure that the selectivity switch is set in the SHARP position when aligning the set. This is important!

INTERMEDIATE-FREQUENCY STAGE ALIGNMENT

1. Connect the ground lead of the test oscillator to the chassis or to the ground terminal on the rear of the chassis. Connect the "high" side of the oscillator to the control grid of the oscillator section of the 6SA7 tube (pin #5), through a .00025 mfd. series capacitor.
2. Set the test oscillator to EXACTLY 455 kc and turn the receiver volume control to its maximum setting.
3. Adjust both second i-f transformer trimmers for maximum deflection on the output meter. One trimmer is accessible from the top of the i-f transformer; the other from the bottom.
4. Adjust both first i-f transformer trimmers for maximum signal as indicated on the output meter.

To assure most accurate trimmer setting, repeat the above adjustment several times, always using the lowest possible test oscillator output consistent with readable output meter scale deflection.

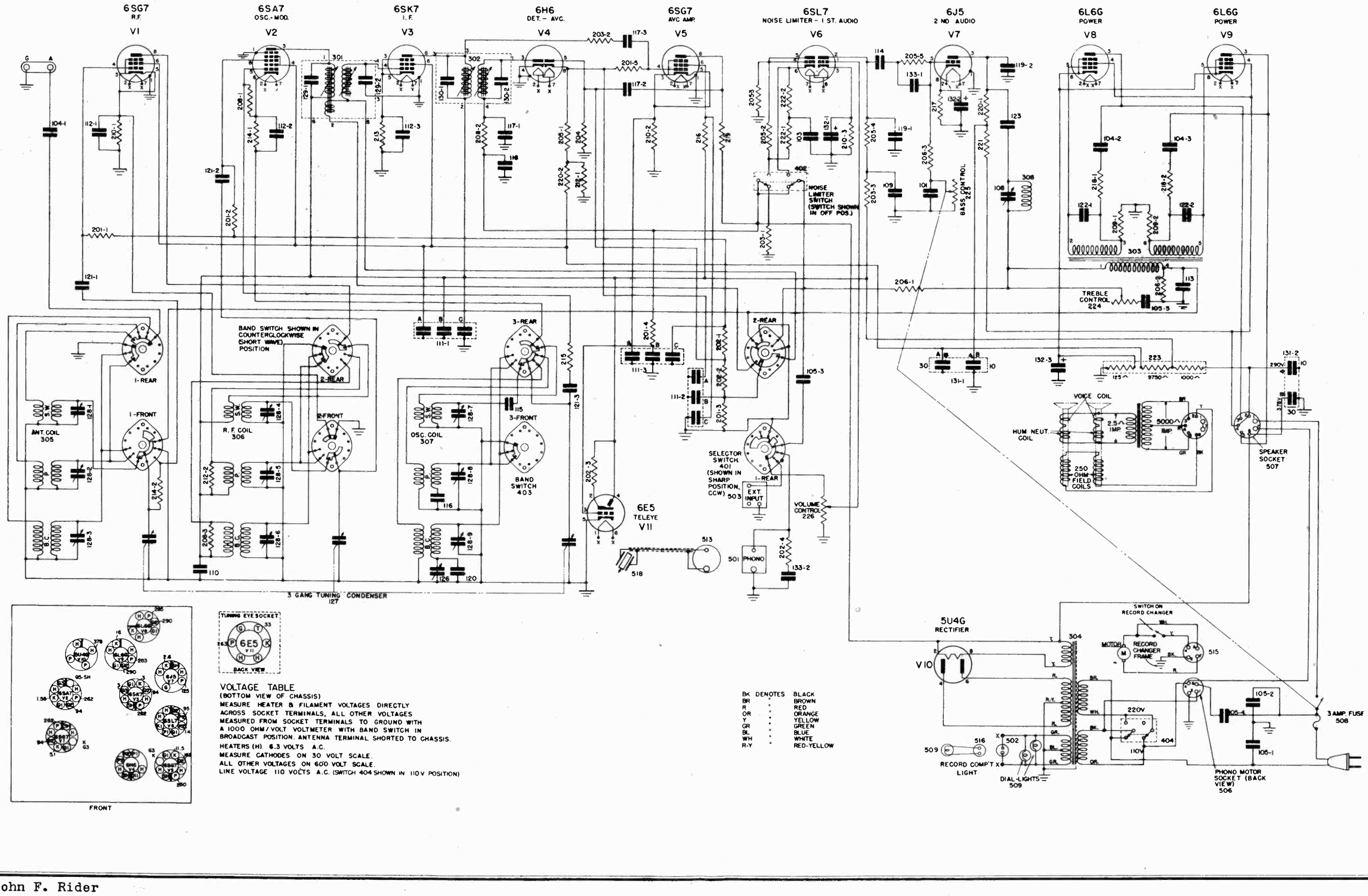
BROADCAST BAND ALIGNMENT

1. Check the tuning dial adjustment by turning the gang condenser until the condenser plates are completely meshed, at which point the dial pointer must coincide with the last line at the low frequency end of the dial scale. If the pointer is not in this position, remove the dial scale, loosen the screw that holds the pointer in place and set to the proper position.
2. Remove the test oscillator lead from the grid of the 6SA7 tube and connect it to the antenna terminal on the rear of the chassis through a .00025 mfd. series capacitor.
3. Set the band selector switch to BROADCAST
4. Set the test oscillator frequency and receiver dial to EXACTLY 1400 kilocycles. Adjust the broadcast oscillator trimmer, r-f trimmer and antenna trimmer for maximum deflection on the output meter.
5. Set the test oscillator and receiver frequency to 600 kilocycles. While rocking the condenser gang slightly to the right and to the left, adjust the 600 kilocycle oscillator padder for maximum output. The 600 kc padder is located on the side of the chassis below the three-band oscillator coil. If this padder requires considerable adjustment, repeat operation given in step 4.

POLICE BAND ALIGNMENT

1. Replace the .00025 mfd. test oscillator antenna series capacitor with a 400 ohm resistor.
2. Set the bond selector switch to POLICE.
3. Set the test oscillator frequency and receiver dial to EXACTLY 5000 kilocycles. Adjust the police oscillator trimmer, r-f trimmer and antenna trimmer for maximum deflection on the output meter.

THE MAGNAVOX CO.



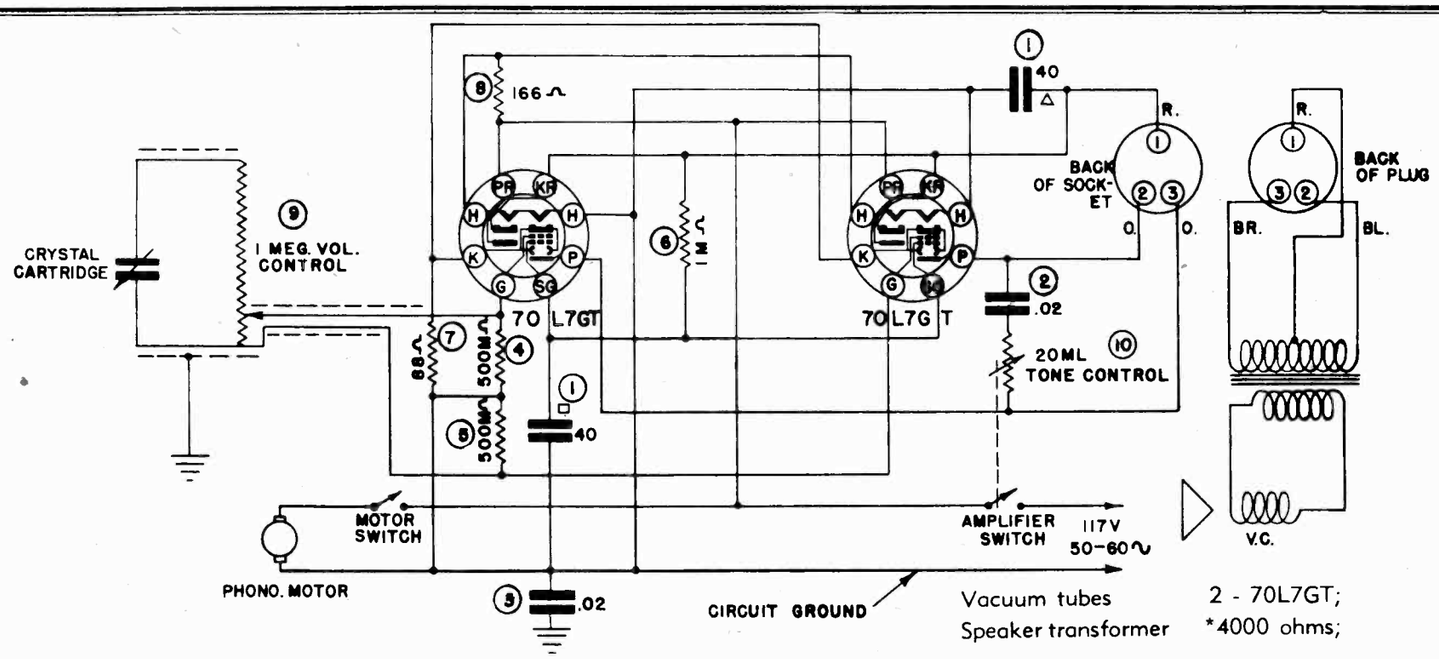
VOLTAGE TABLE

(BOTTOM VIEW OF CHASSIS)
MEASURE HEATER & FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS, ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND SWITCH IN BROADCAST POSITION. ANTENNA TERMINAL SHORTED TO CHASSIS.
HEATERS (H) 6.3 VOLTS A.C.
MEASURE CATHODES ON 30 VOLT SCALE.
ALL OTHER VOLTAGES ON 600 VOLT SCALE.
LINE VOLTAGE 110 VOLTS A.C. (SWITCH 404 SHOWN IN 110V POSITION)

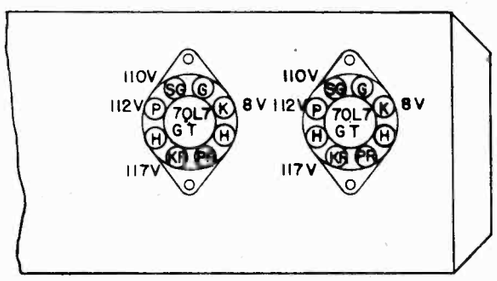
BK	DENOTES	BLACK
BR	:	BROWN
R	:	RED
OR	:	ORANGE
Y	:	YELLOW
GR	:	GREEN
BL	:	BLUE
WH	:	WHITE
R-Y	:	RED-YELLOW

CR-183, CR-185

Ref. No.	Description	Magnavox Part No.
101	Capacitor, molded paper, .0047 mfd. ±20%, 500 V. DC (working)	250110G51
103	Capacitor, paper, tubular, .05 mfd. ±20%, 600 V. DC (working)	250104G2
104	Capacitor, molded paper, .01 mfd. ±20%, 600 V. DC (working)	250129G2
105	Capacitor, molded paper, .02 mfd. ±20%, 600 V. DC (working)	250129G3
106	Capacitor, molded mica, .0022 mfd. ±20%, 500 V. DC (working)	250109G84
107	Capacitor, molded paper, .0039 mfd. ±10%, 500 V. DC (working)	250110G41
108	Capacitor, variable, mica, 700-2000 mmfd.	250071
109	Capacitor, paper, oil-filled, 0.5 mfd. ±5%, 600 V. DC (working)	250077G5
110	Capacitor, paper, oil-filled, 0.1 mfd. ±10%, 600 V. DC (working)	250126G4
111	Capacitor, paper, oil-filled, 0.1-0.1-0.1 mfd. ±20%, 600 V. DC (working)	250126G1
112	Capacitor, molded paper, .05 mfd. ±20%, 120 V. DC (working)	250129G5
113	Capacitor, molded paper, .03 mfd. ±20%, 400 V. DC (working)	250129G4
114	Capacitor, molded mica, .0018 mfd. ±3%, 500 V. DC (working)	250109G67
115	Capacitor, molded mica, .004 mfd. ±3%, 500 V. DC (working)	250131G2
116	Capacitor, molded mica, .0013 mfd.	250131G1
117	Capacitor, molded mica, 270 mmf. ±10%, 500 V. DC (working)	250107G87
118	Capacitor, molded mica, 100 mmf. ±20%, 500 V. DC (working)	250107G98
119	Capacitor, molded mica, 470 mmf. ±20%, 500 V. DC (working)	250107G102
120	Capacitor, silver mica, 404 mmf. ±1%, 500 V. DC	250085G25
121	Capacitor, molded mica, 50 mmf. ±5%, 500 V. DC (working)	250107G3040
122	Capacitor, molded mica, 15 mmf. ±20%, 500 V. DC (working)	250107G93
123	Capacitor, paper, tubular, 0.1 mfd. ±20%, 600 V. DC (working)	250104G1
125	Capacitor, molded mica, .0033 mfd. ±10%, 500 V. DC (working)	250109G85
126	Capacitor, variable, 5-50 mmf.	260042G2
127	Capacitor, 3 gang variable, 422.2 mmf.	260011
128	Capacitor, variable, 4.5-25 mmf.	260042G1
129	Capacitor, silver mica, 160 mmf. ±1%, 500 V. DC (working)	250085G28
130	Capacitor, silver mica, 170 mmf. ±1%, 500 V. DC (working)	250085G29
131	Capacitor, electrolytic, 30-10 mfd. 475 V. DC (working)	273610
132	Capacitor, electrolytic, 40 mfd. 40 V. DC (working)	270020G3
133	Capacitor, molded mica, .001 mfd. ±10%, 500 V. DC (working)	250109G64
201	Resistor, composition, pigtail, 2.2 megohms ±10%, 500 V. DC (working)	230069G33
202	Resistor, composition, pigtail, 1 megohm ±10%, ⅓ watt	230069G98
203	Resistor, composition, pigtail, 0.27 megohm ±10%, ⅓ watt	230069G91
204	Resistor, composition, pigtail, 0.22 megohm ±10%, ⅓ watt	230069G90
205	Resistor, composition, pigtail, 100,000 ohm ±10%, ⅓ watt	230069G86
206	Resistor, composition, pigtail, 47,000 ohm ±10%, ⅓ watt	230069G78
207	Resistor, composition, pigtail, 39,000 ohm ±10%, ⅓ watt	230069G91
208	Resistor, composition, pigtail, 22,000 ohm ±10%, ⅓ watt	230069G78
209	Resistor, composition, pigtail, 10,000 ohm ±10%, ⅓ watt	230069G74
210	Resistor, composition, pigtail, 4700 ohm ±10%, ⅓ watt	230069G70
211	Resistor, composition, pigtail, 2700 ohm ±10%, ⅓ watt	230069G67
212	Resistor, composition, pigtail, 1000 ohm, ±10%, ⅓ watt	230069G62
213	Resistor, composition, pigtail, 330 ohm ±10%, ⅓ watt	230069G56
214	Resistor, composition, pigtail, 150 ohm ±10%, ⅓ watt	230069G52
215	Resistor, composition, pigtail, 100 ohm ±10%, ⅓ watt	230069G50
216	Resistor, composition, pigtail, 0.15 megohm ±10%, ⅓ watt	230069G88
217	Resistor, composition, pigtail, 390 ohm ±10%, ⅓ watt	230069G57
218	Resistor, composition, pigtail, 100,000 ohm ±10%, 1 watt	230062G86
219	Resistor, composition, pigtail, 68,000 ohm ±10%, 1 watt	230062G84
220	Resistor, composition, pigtail, 15,000 ohm ±10%, 1 watt	230062G76
221	Resistor, composition, pigtail, 10,000 ohm ±10%, 1 watt	230062G74
222	Resistor, composition, pigtail, 300,000 ohm ±10%, ⅓ watt	230069G218
223	Resistor, 2-section, wire wound, lug terminals, 10,750 ohm ±10% tapped at 1000 ohms; 125 ohms ±10%	240023
224	Potentiometer, 1 megohm ±20%	220054
225	Potentiometer, 1 megohm ±20% with switch	220055
226	Potentiometer, 3 megohm ±20%	220056G2
301	Transformer, including two 160 mmf. capacitors 129-1 and 129-2	360178
302	Transformer, including two 170 mmf. capacitors 130-1 and 130-2	360179
303	Transformer, input	320013
304	Transformer, power 110-220 V. 50-60 cycle	300017
305	Transformer, antenna, 3-band	360186
306	Transformer, R.F., 3-band	360188
307	Transformer, oscillator, 3-band	360190
308	Coil, 10 kc filter	360193
401	Switch, rotary, 2-deck 4-position	160107
402	Switch, rotary, D.P.D.T.	160106
403	Switch, rotary, 3-deck, 3-position	160089
404	Switch, rotary, D.P.D.T., screwdriver slot adjustment	160091
501	Socket	189741
502	Socket	189788
503	Socket	180060
504	Socket, miniature bayonet	180078
505	Socket and cable assembly including 1 megohm resistor	180323
506	Socket, 4-prong	180018
507	Socket, 7-prong	180039
508	Fuse, cartridge, 3A. 250 V.	180157G10
509	Pilot lamp, 6-8 V. min. bayonet #51 Mazda	180161G7
510	Socket, 8-prong octal	180194G1
511	Line cord with plug	469056
512	Plug	180311G2
513	Plug, 2-prong	180311G1
514	Shell	180310G1
515	Plug, 4-prong	180053
516	Plug, 2-prong	180295G1
517	Shell	180286G1
518	Crystal cartridge	560041G1
519	Knob	140080G1
520	Knob	140078G1
521	Knob	140079G1
522	Knob	140079G2
523	Switch, rotary, S.P.S.T.	160108G1
524	Dial Assembly	631793G1



Vacuum tubes 2 - 70L7GT;
Speaker transformer *4000 ohms;

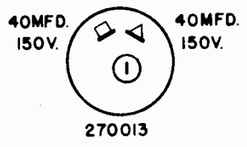


VOLTAGE TABLE

(BOTTOM VIEW OF CHASSIS)

MEASURE ALL D.C. VOLTAGES FROM SOCKET TERMINALS TO CIRCUIT GROUND (NOT CHASSIS) WITH 1000 OHM PER VOLT VOLTMETER.
LINE VOLTAGE 117 V. A.C.
MEASURE CATHODES ON 30 V. SCALE—ALL OTHERS ON 300V. SCALE.

*Primary impedance



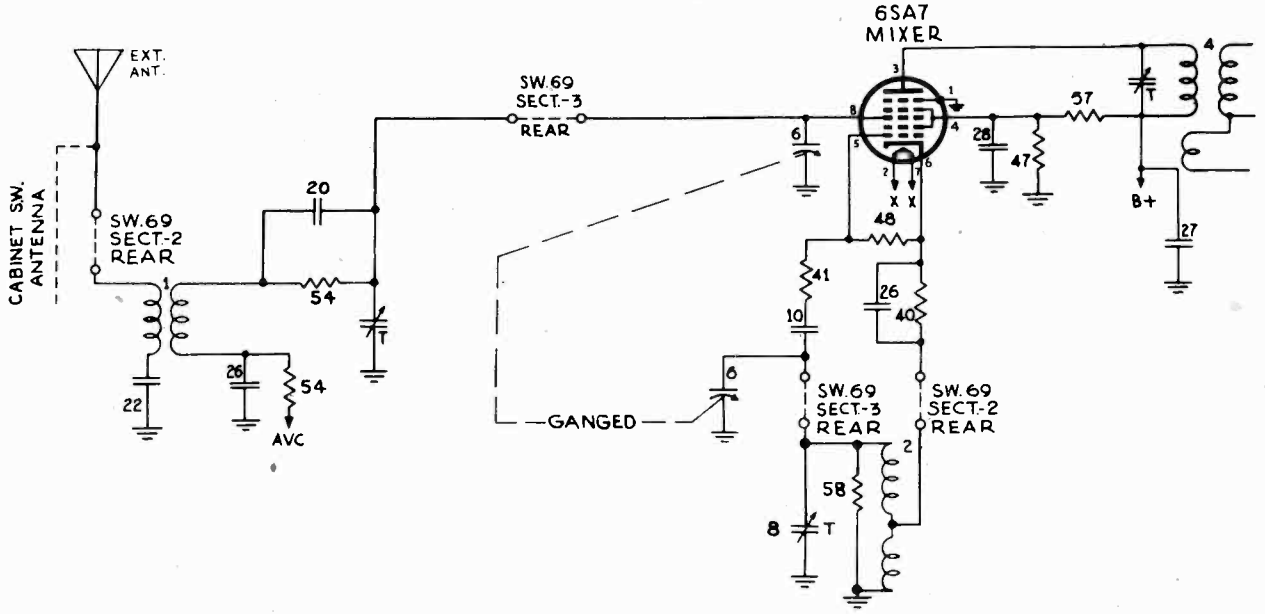
Primary voltage . . . 117 V. 60 cycle AC;
Power consumption . . . . . 60 watts;
Power output . . . . . 3 watts;

Models A-206 and A-206A amplifier chassis are alike electrically. They differ mechanically only to the extent that A-206A has its volume and tone controls mounted on the amplifier chassis; these controls are mounted on the case motorboard remote from the amplifier when A-206 is incorporated.

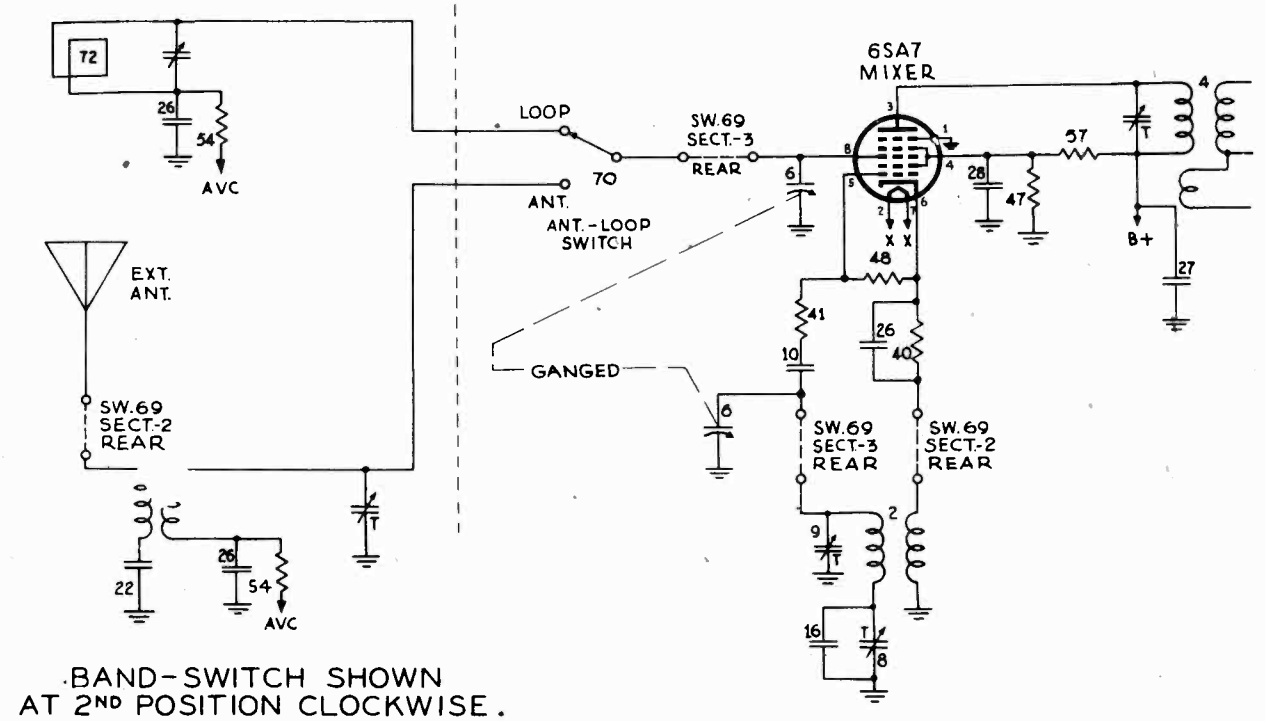
For Parts list, see P.15-5

MODEL CR-187
MODEL CR-193

THE MAGNAVOX CO.



BAND-SWITCH SHOWN
AT 1ST POSITION.
SHORT WAVE BAND
5.0 - 18.2 MC.



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
BROADCAST BAND
520 - 1620 KC.

MODEL CR-187

THE MAGNAVOX CO.

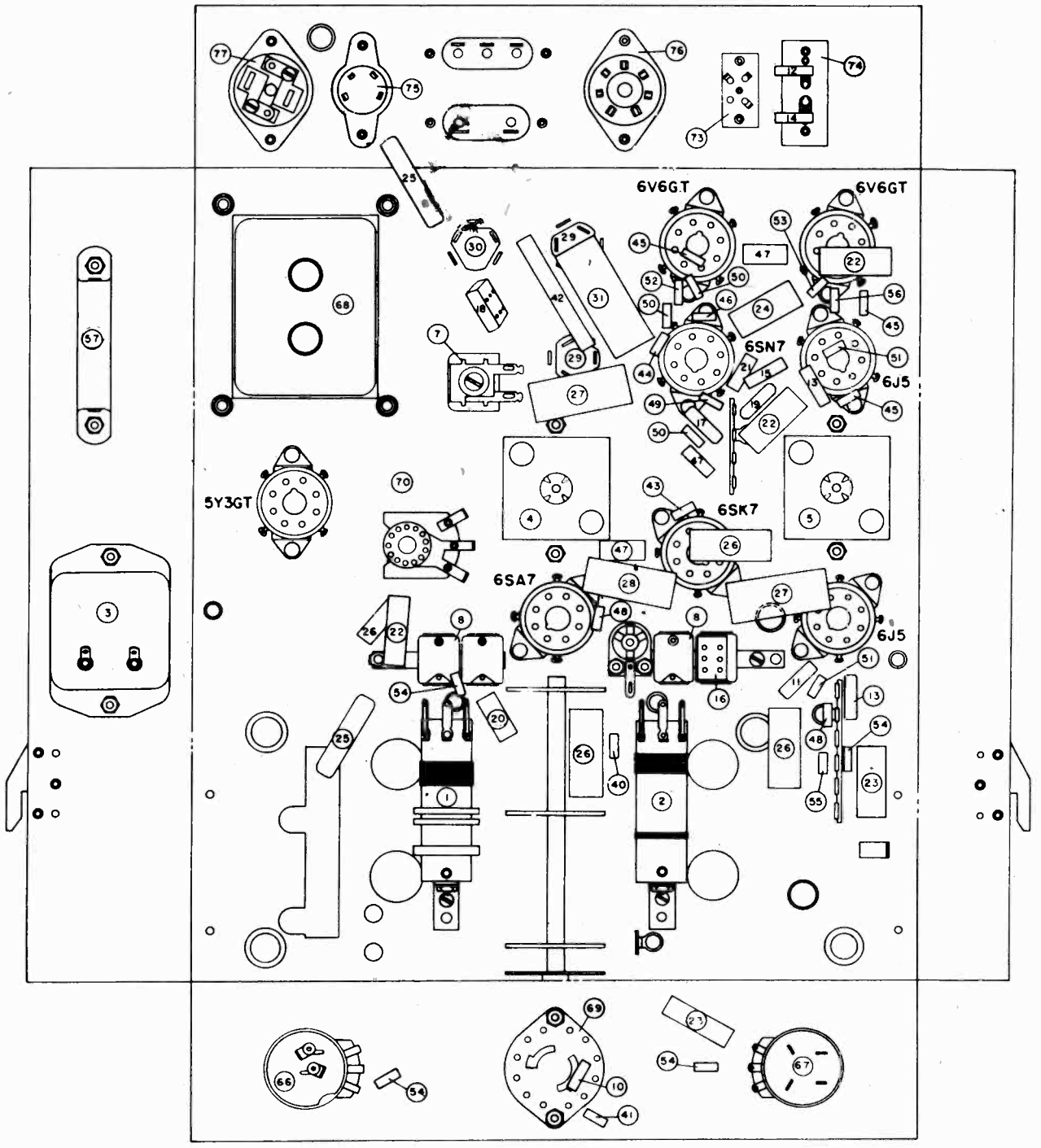


FIGURE 5

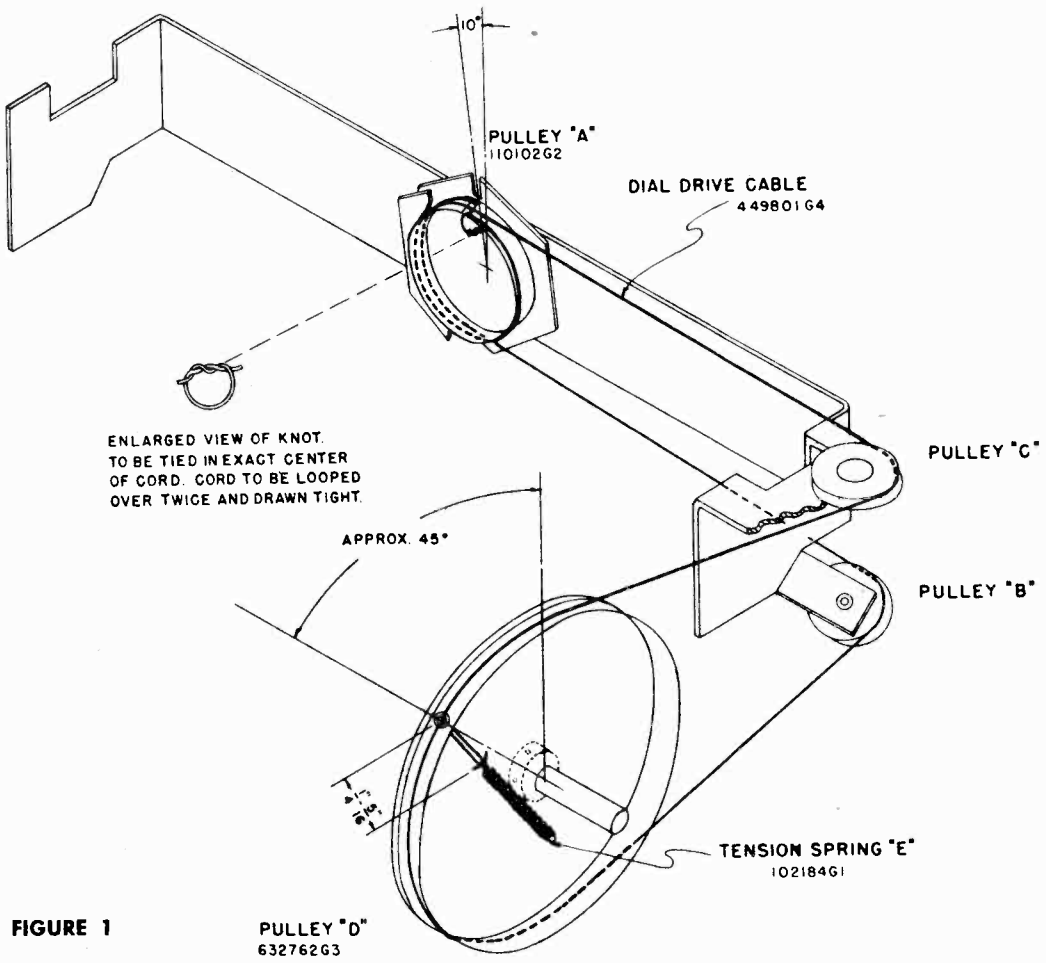


FIGURE 1

DIAL CORD REPLACEMENT

Rotate the brass pulley designated "A" in Figure 1 until the dial pointer strikes the stop at the high frequency end of the dial calibration. In this condition the slot in pulley "A" should be approximately ten degrees to the left of being vertical—see Figure 1. If the slot in the pulley is in some other position under the above mentioned conditions, the pointer set screw is probably loose and has allowed the pointer to slip. To correct this condition, first remove the glass dial and loosen the pointer screw. Then while holding pulley "A" so that its slot is approximately ten degrees to the left of vertical (when viewed from the rear) adjust the pointer until it is resting against the stop at the high frequency end of its travel. Then tighten the pointer set screw securely and replace the glass dial.

Completely unmesh the condenser gang and check the location of the hole or slot in pulley "D." If this hole is not approximately 45 degrees back from vertical as shown on Figure 1, loosen the two No. 6 Allen set screws in the hub of pulley "D" and slip the pulley on its shaft (while holding the condenser gang unmeshed) until the specified adjustment is obtained; then tighten one of the set screws securely. It will be shown later that this is a temporary setting. Next, tie a double knot in the exact center of a 25-inch length of dial cable and fold the cable back on itself so that the knot is at one end. The correct method for tying this knot is shown as an inset on Figure 1. Grasp the cable near the knotted end and slide it into the pulley slot so that the knot is against the inside rim of the pulley as shown in the sketch. The piece of cable nearest the dial frame should be wound in the direction shown for one-half turn; then over the lower pulley "B," around the bottom of the large pulley "D" and into the hole. Pull the cable taut and wrap the end around the small hook on pulley "D" temporarily.

The remaining piece of cable should be wound around pulley "A" in the direction shown, for one complete turn, over the upper pulley "C," and over the top of pulley "D." Thread the end through the small hole in pulley "D" and pull both ends of the cable taut. With one end of tension spring "E" fastened to the hook on pulley "D" lace the two free ends of the cable through the opposite end of the spring and tie a knot at a point that will allow ¼" to 5/16" of cable between the spring and the inside rim of pulley "D." Be sure to tie the knot around one coil of the spring in the manner shown.

Now with the condenser gang completely meshed, check the position of the dial pointer. If it is not in line with the last calibration mark at the low frequency end of the dial, loosen the set screw in pulley "D" and turn it until the pointer is in the specified position. Be sure that the condenser gang does not move during this adjustment. Then tighten the two screws in pulley "D" securely completing the operation.

MODEL CR-187
MODEL CR-188
MODEL CR-193

THE MAGNAVOX CO.

CONDENSER GANG DRIVE ADJUSTMENTS

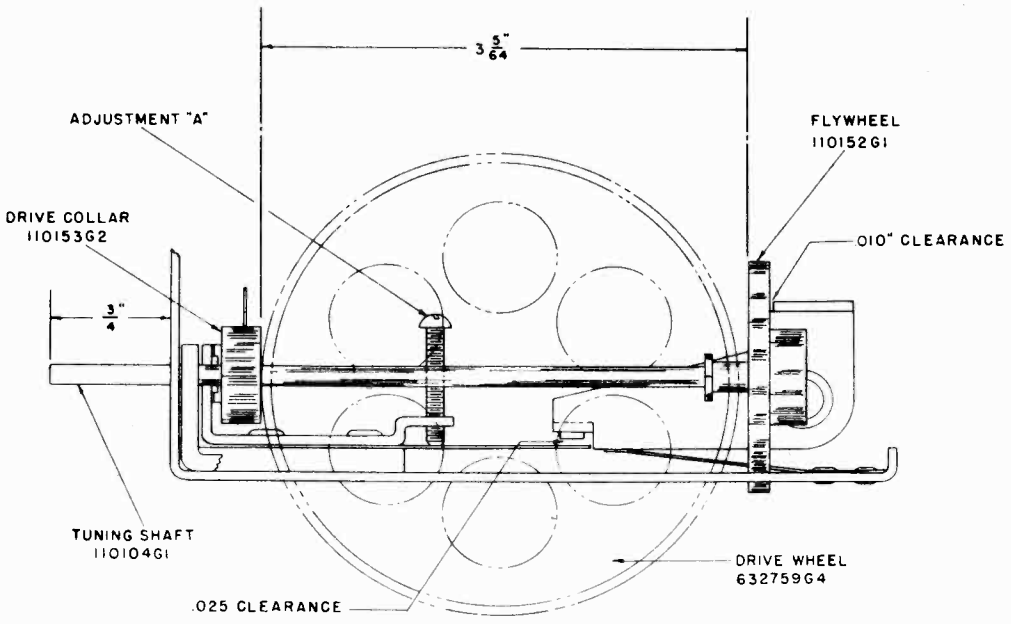


FIGURE 2

Whenever any of the mechanical parts in the condenser gang drive assembly require replacement due to rough handling or for any other reason, it is extremely important that clearances and adjustments shown on Figures 2 and 3 are affected; otherwise the tuning mechanism will be sluggish or it may slip during operation.

In reassembling the mechanism after any part was replaced, follow the procedure outlined below:

1. Assemble the Tuning Shaft, Drive Collar, Compression Spring, Spring Retainer and Flywheel in the manner shown on Figure 3. The Tuning Shaft must extend ¾" from the front of the assembly and that the spacing between the rear of the Drive Collar and the front of the Flywheel must be 3-5/64" as specified on Figure 2. Any excess length in the Tuning Shaft may extend beyond the rear of the Flywheel.

2. The distance between the rubber-tired Drive Wheel and the smaller diameter section of the Spring Retainer must be 1/32" to 1/16". This adjustment is effected by loosening the two No. 6 Allen set screws in the Drive Wheel hub and sliding the wheel on its shaft until the required clearance is obtained. When the adjustment is completed, tighten the two screws in the hub of the Drive Wheel. See Figure 3.

3. While pressing down on the Treadle Bar at the location shown on Figure 3, adjust the Thrust Bracket until the clearance between the rest of the Flywheel and the projection on the Thrust Bracket is .010" as shown on the diagram. To make this adjustment, loosen the two No. 6 Allen set screws (use No. 6 Allen Wrench—Magnavox Part No. 800044G2) in the hub of Thrust Bracket and rotate the bracket until the specified clearance is obtained when the push buttons are NOT actuated. Tighten the two screws securely when the adjustment is completed. Press each push button and check that the Drive Collar is pushed away from the rubber-tired Drive Wheel.

4. Next, adjust the clearance in the muting switch contacts by turning the Phillips-head screw designated Adjustment "A" on Figure 2, until the specified clearance of .025" is obtained (when the push buttons are NOT actuated.)

5. While pressing any one of the push buttons in as far as possible, turn the screw designated Adjustment "B" (Figure 3) until a minimum clearance of .015" is obtained between the front surface of the Drive Collar and the switch spring directly in front of it. This setting should also cause a minimum clearance of .010" between the switch contacts actuated

THE MAGNAVOX CO.

MODEL CR-187
MODEL CR-188
MODEL CR-193

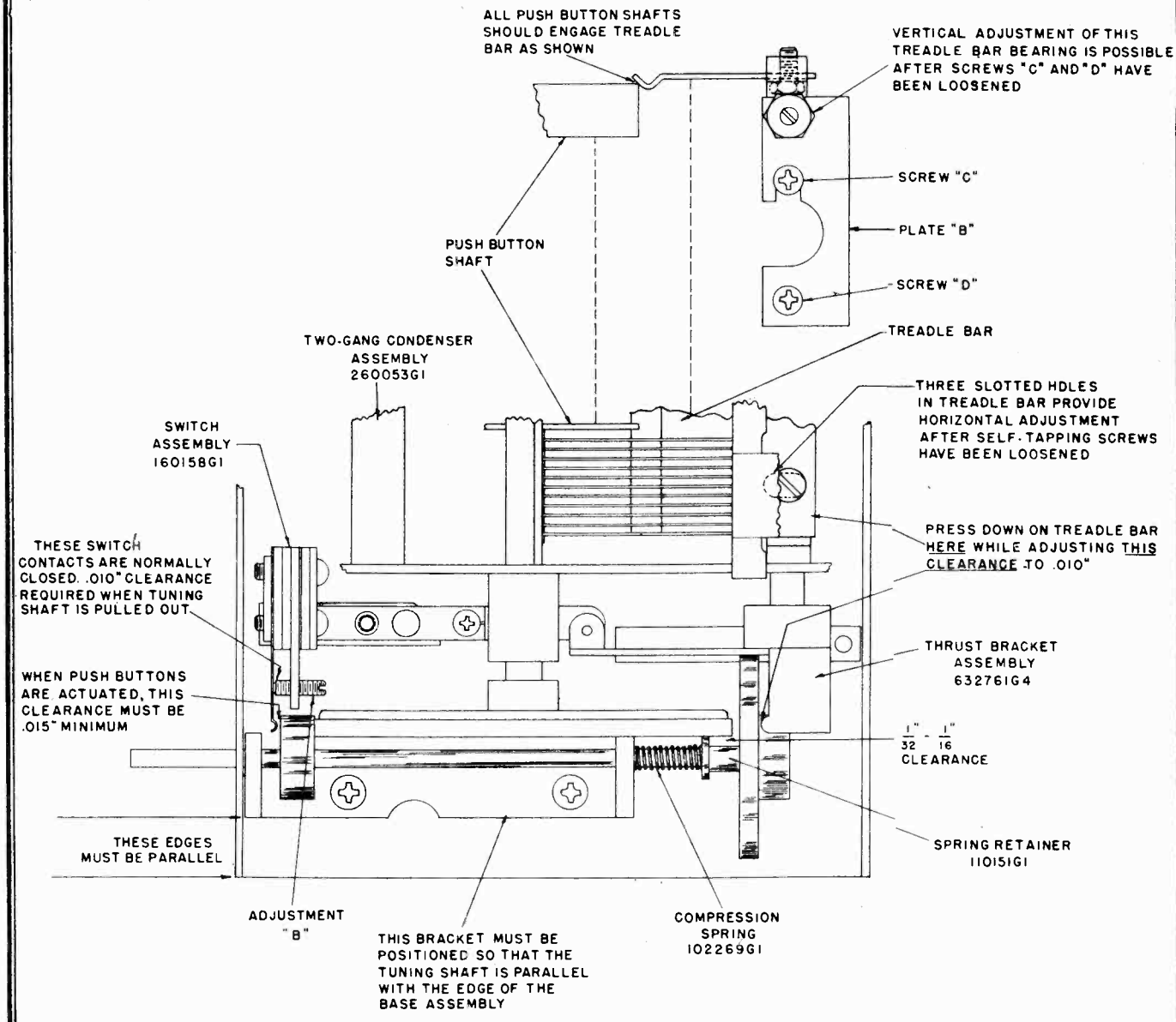


FIGURE 3

by pressure of the front surface of the Drive Collar, when the Tuning Shaft is pulled out. The function of this switch is to open the muting circuit when setting up the push buttons. As its contacts are wired in series with the large muting switch (contacts are shorted by pressing any push button), pulling out on the Tuning Shaft causes the small switch contacts to open the muting circuit so that a station can be heard while the push button is held in and tightened. On rare occasions it may be necessary to adjust the relation between the push button bars and the Treadle Bar. Such adjustment might be required if when pushing any of the push buttons, sufficient motion is not transmitted to the Treadle Bar to cause a disengagement between the Drive Collar and the Drive wheel.

This can usually be accomplished by loosening the two screws designated "C" and "D" on Figure 3, and moving plate "B" in the direction required to correct this condition.

MODEL CR-187
MODEL CR-193

THE MAGNAVOX CO.

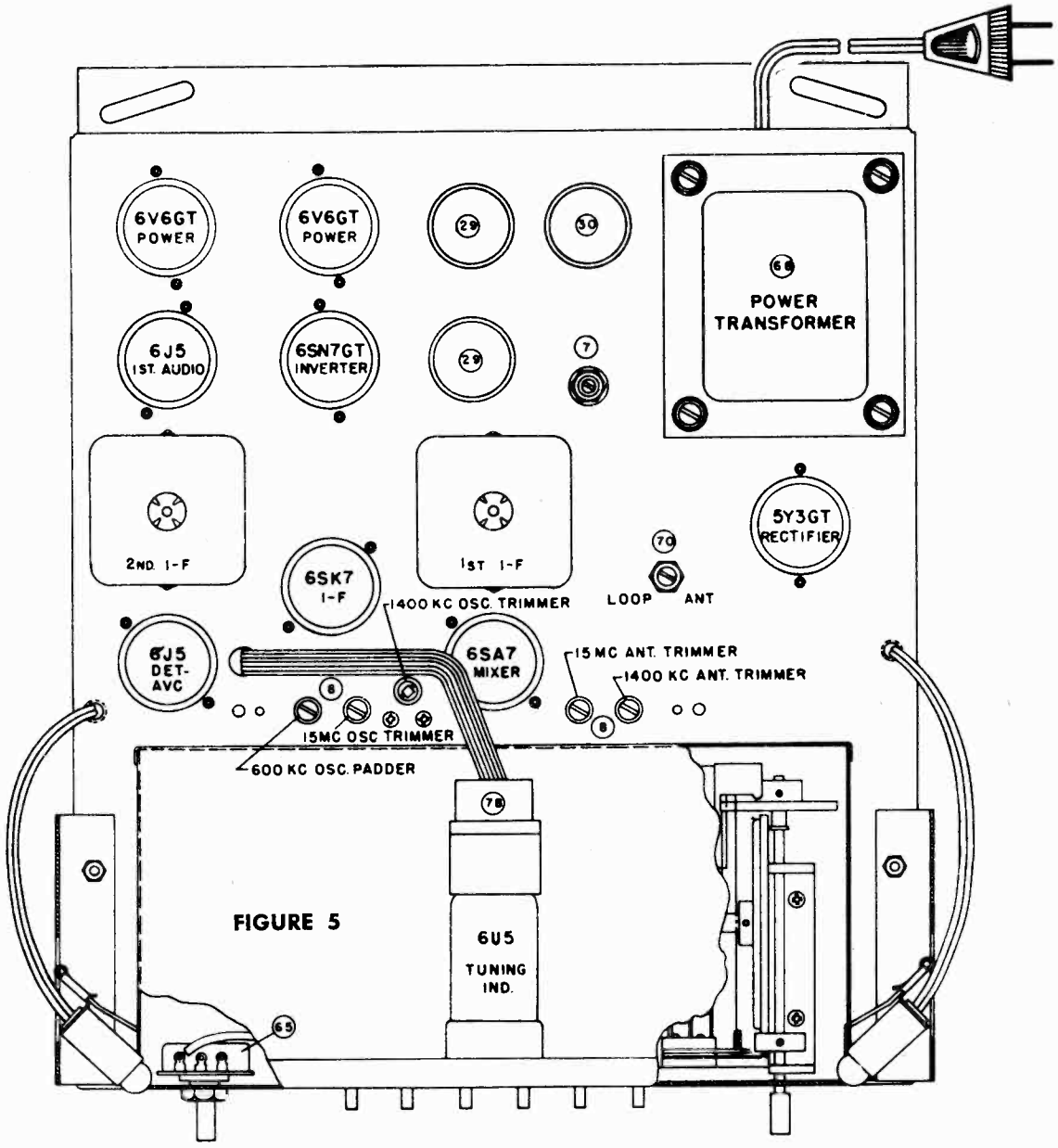


FIGURE 5

Method for Removing Chassis from Cabinet

Model CR-187 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 hooks near the front, ride inside the flanges on the sides of the chassis tray. Push the chassis forward as far as it will go and the hook should then engage the slots in the chassis tray. Replace the two Phillips-head screws and nuts and tighten securely. Replace all plugs in their receptacles and the antenna leads on their correct terminals. The antenna terminal board for the loop antenna connections is designated S-L-H. The end of the short wave antenna that is fastened to the inside of the cabinet connects to S. Always disconnect this antenna from terminal S when an outdoor antenna is used as it may pick up noise. The two terminals on the loop are designated L and H. The leads connected to these terminals should be wired to the corresponding terminals (L and H) on the chassis.

THE MAGNAVOX CO.

MODEL CR-137
MODEL CR-193

The alignment of this receiver requires the use of an accurately calibrated r-f signal generator and an output meter. All trimmer condenser locations are shown on the chassis layout diagram, Figure 5. The radio volume control should be turned to maximum and the signal generator output kept as low as possible during alignment to prevent the AVC from operating and giving false readings. *Always set the Selectivity Switch to SHARP TUNE before aligning the i-f stages.* This is done by turning the Treble Control counter-clockwise as far as possible.

I-F ALIGNMENT

1. Connect the output of the signal generator to the oscillator grid (pin No. 5) of the 6SA7 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.

On early models of the CR-187 chassis, the two i-f trimmers are located in the top of the respective i-f transformers. In later production, one trimmer is accessible from the top and the other from the bottom of each transformer as shown in the layout diagram, Figure 5.

BROADCAST BAND ALIGNMENT

1. Remove the signal generator lead from the 6SA7 grid and connect it to the radio antenna terminal through the .00025 mfd. capacitor. The ANT-LOOP switch (70) 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, loosen the set screws in the hub of pulley "D" shown on Figure 1 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 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 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 (70) to the LOOP position. 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.

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 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 (7) 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.

MODEL CR-187
MODEL CR-194

THE MAGNAVOX CO.

CR-187

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, r-f, two band	360238G1
2	Coil assembly, oscillator, two band	360239G1
3	Coil assembly, 10 kc filter	360240G1
4	Transformer, first i-f	360266G1
5	Transformer, second i-f	360267G1
6	Capacitor, variable, two-gang tuning	260053G1
7	Capacitor, variable, 10 kc trimmer	250008G1
8	Capacitor, variable, 2 gang trimmer	260021G1
9	Capacitor, variable, oscillator padder	260042G2
10	Capacitor, ceramic, 50 mmf.	250088G24
11	Capacitor, molded mica, 100 mmf. ±20%	250159G98
12	Capacitor, molded mica, 100 mmf. ±10%	250159G82
13	Capacitor, molded mica, 220 mmf.	250159G100
14	Capacitor, molded mica, 330 mmf.	250159G88
15	Capacitor, molded mica, 270 mmf.	250159G87
16	Capacitor, silvered mica, 583 mmf. ±1%	250085G33
17	Capacitor, molded mica, 470 mmf.	250159G102
18	Capacitor, molded mica, 1000 mmf.	250160G82
19	Capacitor, molded mica, 1800 mmf.	250160G67
20	Capacitor, molded mica, 5100 mmf. ±2%	250161G6
21	Capacitor, paper, .003 mfd. 400 V.	250152G43
22	Capacitor, paper, .01 mfd. 600 V.	250152G38
23	Capacitor, paper, .01 mfd. 200 V.	250152G18
24	Capacitor, paper, .02 mfd. 400 V.	250152G26
25	Capacitor, molded paper, .02 mfd. 600 V.	250129G3
26	Capacitor, paper, .05 mfd. 200 V.	250152G15
27	Capacitor, paper, .1 mfd. 400 V.	250152G22
28	Capacitor, paper, .1 mfd. 200 V.	250152G13
29	Capacitor, electrolytic, 10 mfd. 450 V., 20 mfd. 25V.	270023G6
30	Capacitor, electrolytic, 10-30 mfd. 450 V.	270023G2
31	Capacitor, electrolytic, 20 mfd. 25V.	270027G2
40	Resistor, composition, 150 ohm ½ W.	230084G8
41	Resistor, composition, 220 ohm ½ W.	230084G9
42	Resistor, composition, 220 ohm 3 W.	230064G54
43	Resistor, composition, 470 ohm ½ W.	230084G1
44	Resistor, composition, 1500 ohm ½ W.	230084G14
45	Resistor, composition, 4700 ohm ½ W.	230084G17
46	Resistor, composition, 15,000 ohm ±5% ½ W.	230084G187
47	Resistor, composition, 15,000 ohm 1 W.	230085G20
48	Resistor, composition, 22,000 ohm ½ W.	230084G21
49	Resistor, composition, 47,000 ohm ½ W.	230084G23
50	Resistor, composition, 100,000 ohm ½ W.	230084G25
51	Resistor, composition, 150,000 ohm ½ W.	230084G26
52	Resistor, composition, 220,000 ohm ±5% ½ W.	230084G215
53	Resistor, composition, 270,000 ohm ½ W.	230084G91
54	Resistor, composition, 470,000 ohm ½ W.	230084G29
55	Resistor, composition, 1 megohm ½ W.	230084G31
56	Resistor, composition, 4.7 megohm ½ W.	230084G35
57	Resistor, wire wound, 10,000 ohm	240035G2
58	Resistor, composition, 15,000 ohm ½ W.	230084G20
65	Control, volume, 1 megohm	220044G15
66	Control, bass, 1 megohm, with power switch	220045G2
67	Control, treble, 1 megohm, with band expander switch	220071G2
68	Transformer, power, 117 V. 50/60 cycle	300025G1
69	Switch, rotary, band selector	160156G1
70	Switch, rotary, loop to outdoor antenna	160157G1
71	Switch assembly, muting	160158G1
72	Antenna, loop assembly	*
73	Socket, external input	180060G1
74	Socket, phonograph input	189741G1
75	Socket, phonograph motor	180501G5
76	Socket, speaker	180393G3
77	Socket, FM power	180422G1
78	Socket & Cable assembly, tuning indicator	180423G1

CR-194

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, r-f, two band	360256G1
2	Coil assembly, oscillator, two band	360255G1
3	Coil assembly, 10 kc filter	360240G1
4	Transformer, first i-f	360266G1
5	Transformer, second i-f	360267G1
6	Capacitor, variable, two-gang tuning	260056G1
7	Capacitor, variable, 10 kc trimmer	250008G1
8	Capacitor, variable, 2 gang trimmer	260021G1
9	Capacitor, variable, oscillator trimmer	260042G2
10	Capacitor, ceramic, 50 mmf.	250088G24
11	Capacitor, molded mica, 100 mmf. ±20%	250159G98
12	Capacitor, molded mica, 100 mmf. ±10%	250159G82
13	Capacitor, molded mica, 220 mmf. ±20%	250159G100
14	Capacitor, molded mica, 330 mmf. ±10%	250159G88
15	Capacitor, molded mica, 270 mmf. ±10%	250159G87
16	Capacitor, silvered mica, 529 mmf. ±1%	250085G34
17	Capacitor, molded mica, 470 mmf. ±20%	260159G102
18	Capacitor, molded mica, 1000 mmf. ±20%	250160G82
19	Capacitor, molded mica, 1800 mmf. ±10%	250160G67
20	Capacitor, molded mica, 5600 mmf. ±2%	250161G7
21	Capacitor, paper, .003 mfd. 600 V.	250152G43
22	Capacitor, paper, .01 mfd. 600 V.	250152G38
23	Capacitor, paper, .01 mfd. 200 V.	250152G18
24	Capacitor, paper, .02 mfd. 400 V.	250152G26
25	Capacitor, molded paper, .02 mfd.	250129G3
26	Capacitor, paper, .05 mfd. 200 V.	250152G15
27	Capacitor, paper, .1 mfd. 400 V.	250152G22
28	Capacitor, paper, .1 mfd. 200 V.	250152G13
29	Capacitor, electrolytic, 10 mfd. 450 V.-20 mfd. 25 V.	270023G6
30	Capacitor, electrolytic, 10-30 mfd. 450 V.	270023G2
31	Capacitor, electrolytic, 20 mfd. 25 V.	270027G2
40	Resistor, composition, 150 ohm ½ W.	230084G8
41	Resistor, composition, 220 ohm ½ W.	230084G9
42	Resistor, wire wound, 125 ohm	240021G11
43	Resistor, composition, 470 ohm ½ W.	230084G11
44	Resistor, composition, 1500 ohm ½ W.	230084G14
45	Resistor, composition, 4700 ohm ½ W.	230084G17
46	Resistor, composition, 15,000 ohm ±5% ½ W.	230084G187
47	Resistor, composition, 15,000 ohm 1 W.	230085G20
48	Resistor, composition, 22,000 ohm ½ W.	230084G21
49	Resistor, composition, 47,000 ohm ½ W.	230084G23
50	Resistor, composition, 100,000 ohm ½ W.	230084G25
51	Resistor, composition, 150,000 ohm ½ W.	230084G26
52	Resistor, composition, 220,000 ohm ±5% ½ W.	230084G215
53	Resistor, composition, 270,000 ±10% ½ W.	230084G91
54	Resistor, composition, 470,000 ohm ½ W.	230084G29
55	Resistor, composition, 1 megohm ½ W.	230084G31
56	Resistor, composition, 4.7 megohm ½ W.	230084G35
57	Resistor, wire wound, 10,000 ohm	240035G2
58	Resistor, composition, 15,000 ohm ½ W.	230084G20
59	Resistor, composition, 1000 ohm 2W.	230064G62
65	Control, volume, 1 megohm	220044G15
66	Control, bass, 1 megohm, with power switch	220045G2
67	Control, treble, 1 megohm, with band expander sw.	220071G2
68	Transformer, power, 117 V. 50/60 cycle	300032G1
69	Switch, rotary, band selector	160156G1
70	Switch, rotary, loop to outdoor antenna	160157G1
72	Antenna, loop assembly	*
73	Socket, external input	180060G1
74	Socket, phonograph input	189741G1
75	Socket, phonograph motor	180501G5
76	Socket, speaker	180393G3
77	Socket, FM power	180422G1
78	Socket and cable assembly, tuning indicator	180423G1

Due to the fact that a change was made in the mechanical construction of the dial assembly after the first CR-187 radio chassis production run, it is important that you follow the procedure outlined below in ordering replacement glass dials.

If the glass dial for which a replacement is required is marked 150260, order a 150276 dial glass assembly. If the glass is marked 150281, order a 150283 dial glass assembly. These assemblies include the rubber strips cemented in their correct positions.

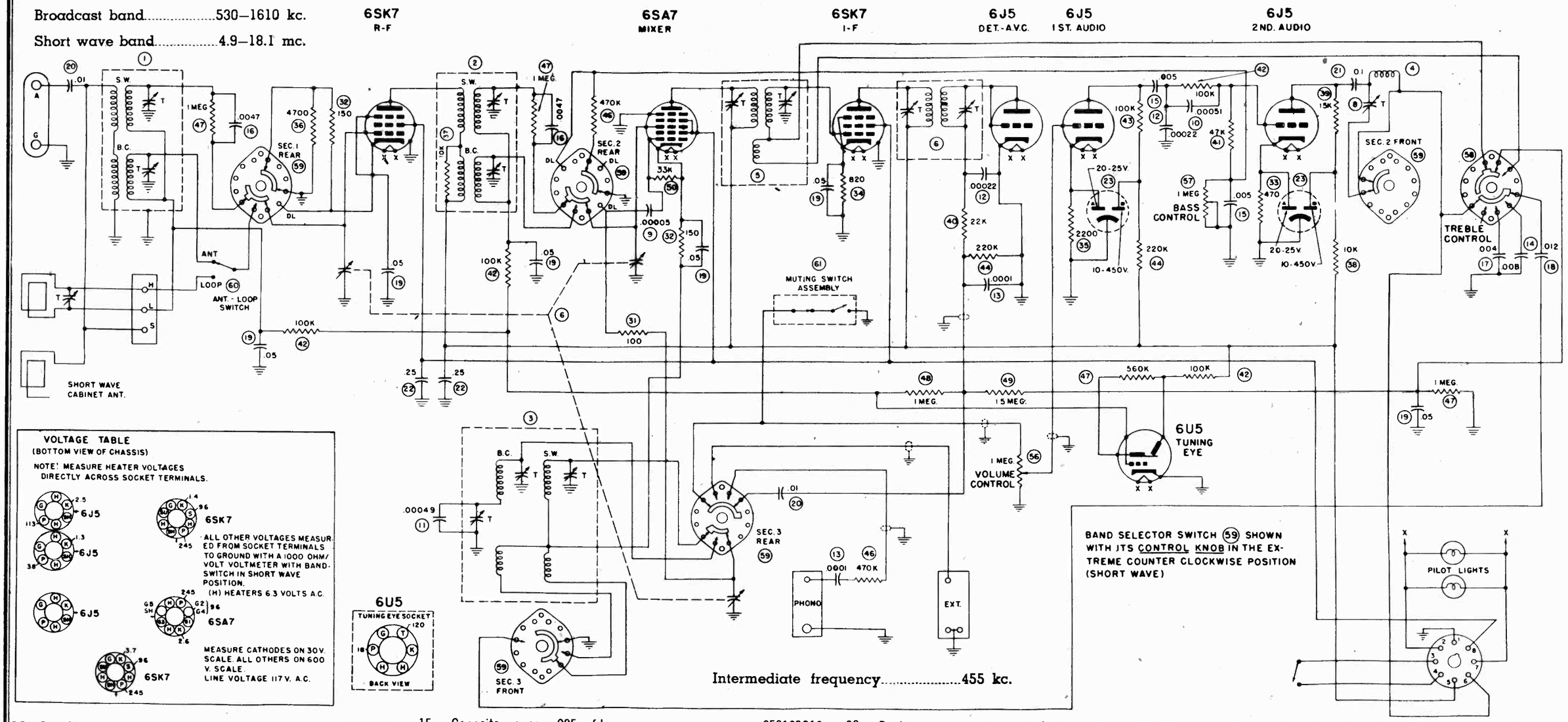
*The part number of the loop antenna assembly changes with different cabinets. It is therefore important that you specify the Style Number of the instrument when ordering a replacement loop antenna assembly.

THE MAGNAVOX CO.

Tuning frequency range:

Broadcast band.....530—1610 kc.

Short wave band.....4.9—18.1 mc.



VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)

NOTE: MEASURE HEATER VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.

ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINALS TO GROUND WITH A 1000 OHM/VOLT VOLTMETER WITH BAND-SWITCH IN SHORT WAVE POSITION.
(H) HEATERS 6.3 VOLTS A.C.

MEASURE CATHODES ON 30V. SCALE. ALL OTHERS ON 600 V. SCALE.
LINE VOLTAGE 117 V. A.C.

6U5
TUNING EYE SOCKET
BACK VIEW

Intermediate frequency.....455 kc.

BAND SELECTOR SWITCH (59) SHOWN WITH ITS CONTROL KNOB IN THE EXTREME COUNTER CLOCKWISE POSITION (SHORT WAVE)

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil Assembly, antenna, two band	360254G1
2	Coil Assembly, r-f, two band	360254G2
3	Coil Assembly, oscillator, two band	360253G1
4	Coil Assembly, 10 kc. filter	360244G1
5	Transformer, first i-f	360266G1
6	Transformer, second i-f	360267G1
7	Capacitor, variable, three-gang tuning	260054G1
8	Capacitor, variable, 10 kc. trimmer	259610G1
9	Capacitor, ceramic, 50 mmf.	250088G25
10	Capacitor, molded mica, 510 mmf.	250159G64
11	Capacitor, silvered mica, 490 mmf. ±1%	250085G32
12	Capacitor, molded mica, 220 mmf.	250159G100
13	Capacitor, molded mica, 100 mmf.	250159G98
14	Capacitor, paper, 008 mfd.	250129G11
15	Capacitor, paper, .005 mfd.	250129G10
16	Capacitor, molded mica, .0047 mfd.	250161G5
17	Capacitor, paper, .004 mfd.	250129G7
18	Capacitor, paper, .012 mfd.	250129G13
19	Capacitor, paper, .05 mfd.	250129G5
20	Capacitor, paper, .01 mfd.	250129G9
21	Capacitor, paper, 0.1 mfd.	250152G22
22	Capacitor, paper, 0.25 mfd.	250152G21
23	Capacitor, electrolytic, 20 mfd. 25V—10 mfd. 450V.	270023G6
31	Resistor, composition, 100 ohm ½ W.	230084G7
32	Resistor, composition, 150 ohm ½ W.	230084G8
33	Resistor, composition, 470 ohm ½ W.	230084G11
34	Resistor, composition, 820 ohm ½ W.	230084G61
35	Resistor, composition, 2200 ohm ½ W.	230084G15
36	Resistor, composition, 4700 ohm ½ W.	230084G17
37	Resistor, composition, 10,000 ohm ½ W.	230084G19
38	Resistor, composition, 10,000 ohm 1 W.	230085G19
39	Resistor, composition, 15,000 ohm 1 W.	230085G20
40	Resistor, composition, 22,000 ohm ½ W.	230084G21
41	Resistor, composition, 47,000 ohm ½ W.	230084G23
42	Resistor, composition, 100,000 ohm ½ W.	230084G25
43	Resistor, composition, 100,000 ohm 1 W.	230085G25
44	Resistor, composition, 220,000 ohm ½ W.	230084G27
46	Resistor, composition, 470,000 ohm ½ W.	230084G29
47	Resistor, composition, 560,000 ohm ½ W.	230084G95
48	Resistor, composition, 1 megohm ½ W.	230084G31
49	Resistor, composition, 1.5 megohm ½ W.	230084G32
50	Resistor, composition, 33,000 ohm ½ W.	230084G22
56	Control, volume, 1 megohm	220044G15
57	Control, bass, 1 megohm with switch	220045G2
58	Switch, rotary, treble control	160161G1
59	Switch, rotary, band selector	160160G1
60	Switch, rotary, loop to outdoor antenna	160157G1
61	Switch assembly, muting	160158G2
62	Socket, external input	180060G1
63	Socket, phonograph input	189741G1
64	Plug, octal, amplifier connection	180511G14
	Antenna, loop assembly	*
	Dial glass assembly	150285

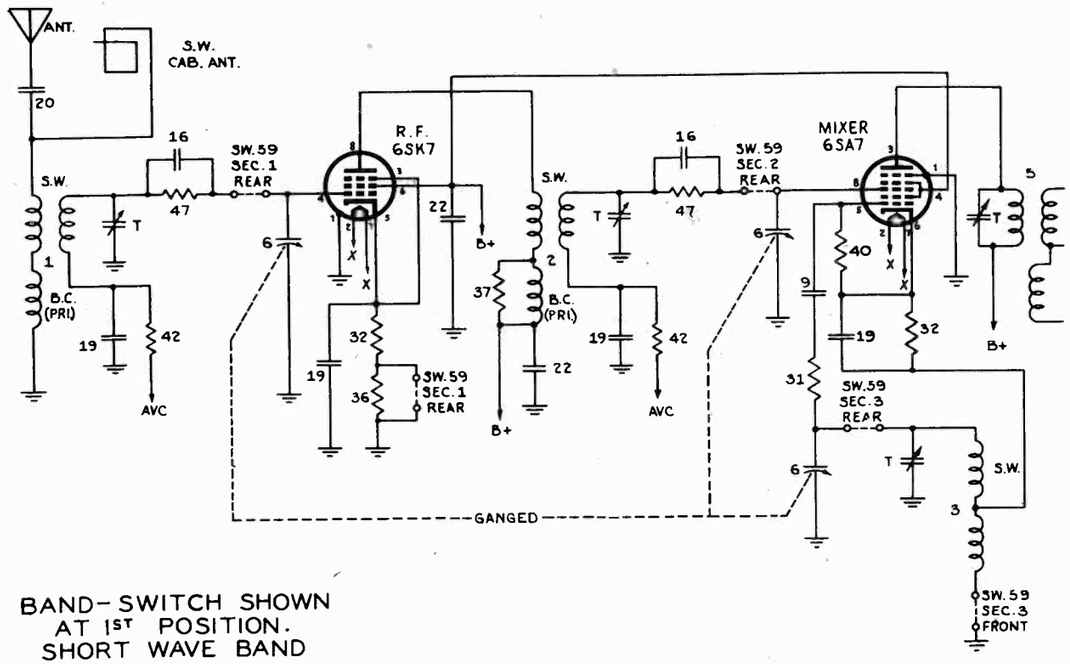
* The part number of the loop antenna changes with different cabinets. It is therefore important that you specify the Style Number of the instrument when ordering a replacement loop antenna assembly.

MAY 1946

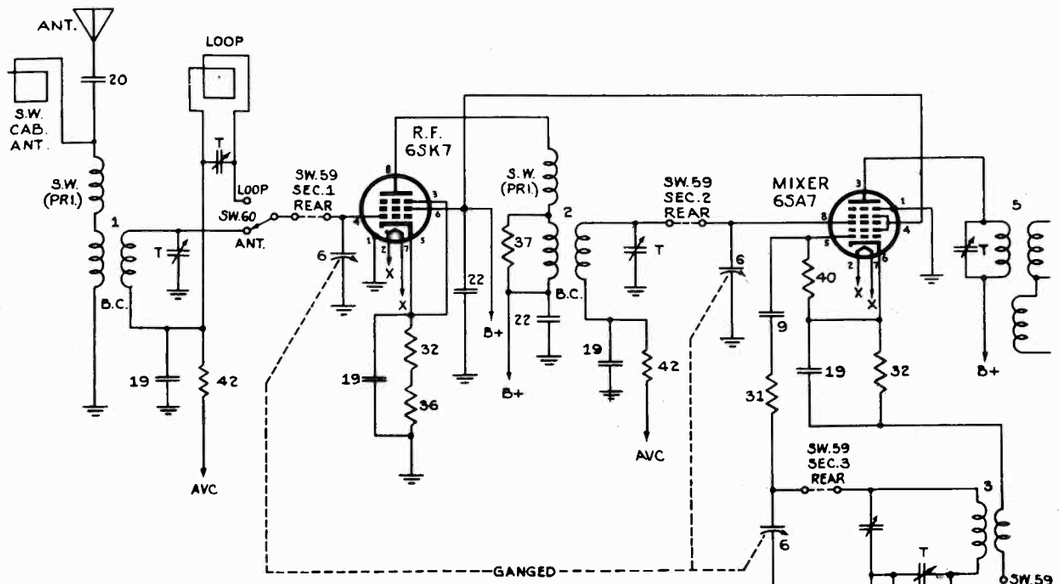
Record Changer: Webster Model 56; for dial data and gang condenser adjustment, see Pp.15-25 to 15-27

MODEL CR-188

THE MAGNAVOX CO.



BAND-SWITCH SHOWN AT 1ST POSITION. SHORT WAVE BAND



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE. BROADCAST BAND

MODEL CR-188

THE MAGNAVOX CO.

STAGE GAINS*

Antenna Post to R-F Grid at:
- 600 kc. 7.0
- 6 mc. 1.63

R-F to Converter Grid at:
- 600 kc. 3.4
- 6 mc. 3.4

R-F on Converter Grid to I-F Grid at:
- 600 kc. 40.0
- 6 mc. 35.5

I-F on Converter Grid to I-F Grid at:
- 455 kc. 59

I-F Grid to Detector Plate at:
- 455 kc. 68

AUDIO GAIN

Voltage required across Volume Control to produce .05 watt speaker output** at 400 cycles is .014 volt with Band Selector Switch in BDCST setting.

OSCILLATOR OUTPUT VOLTAGE

The DC voltage developed across Oscillator Grid Resistor (40) at:
- 600 kc. 5.8
- 6 mc. 6.6

* Variations of ±20% are permissible. All readings made with sufficient input signal to provide .05 watt speaker output.

** .05 watt speaker output at 400 cycles is equivalent to a reading of 0.35 volts as measured by a high resistance AC voltmeter across the voice coil of either speaker.

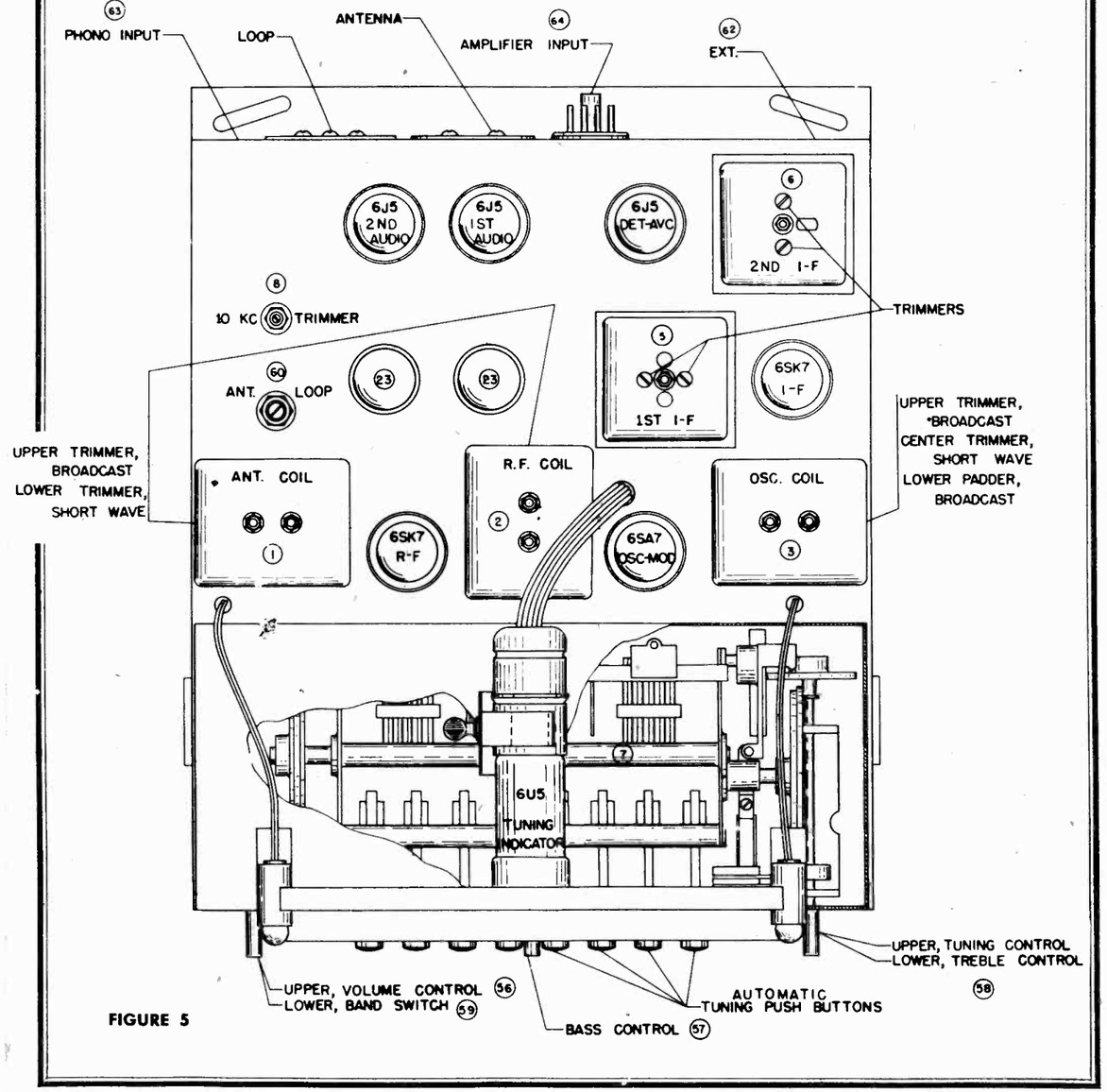


FIGURE 5

Model CR-188 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 hooks near the front, ride inside the flanges on the sides of the chassis tray. Push the chassis forward as far as it will go and the hooks should then engage the slots in the chassis tray. Replace the two Phillips-head screws and nuts and tighten securely. Replace all plugs in their receptacles and the antenna leads on their correct terminals. The antenna terminal board for the loop antenna connections is designated S-L-H. The end of the short wave antenna that is fastened to the inside of the cabinet connects to S. Always disconnect this antenna from terminal S when an outdoor antenna is used as it may pick up noise. The two terminals on the loop are designated L and H. The leads connected to these terminals should be wired to the corresponding terminals (L and H) on the chassis.

ALIGNMENT PROCEDURE

The alignment of this receiver requires the use of an accurately calibrated r-f signal generator and an output meter. All trimmer condenser locations are shown on the chassis layout diagram, Figure 5. The radio volume control should be turned to maximum and the signal generator output kept as low as possible during alignment to prevent the AVC from operating and giving false readings. *Always set the Treble Control to SHARP TUNE before aligning the i-f stages.* This is done by turning the Treble Control Knob to the No. 1 position.

I-F ALIGNMENT

1. Connect the output of the signal generator to the oscillator grid (pin No. 5) of the 6SA7 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.

On early models of the CR-188 chassis, the two i-f trimmers are located in the top of the respective i-f transformers as shown in the layout diagram Figure 5. In later production, one trimmer is accessible from the top and the other from the bottom of each transformer.

BROADCAST BAND ALIGNMENT

1. Remove the signal generator lead from the 6SA7 grid and connect it to the radio antenna terminal through the .00025 mfd. capacitor. The ANT-LOOP switch (60) 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, loosen the set screws in the hub of pulley "D" shown on Figure 1 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 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 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 (60) to the LOOP position. 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.

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 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. Turn the Treble Control to FULL RANGE (No. 4 position).
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 (8) 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.

MODEL CR-188

THE MAGNAVOX CO.

Model CR-188 radio chassis is a two-band tuner that must be used in conjunction with a power amplifier, such as the Model AMP-101 for speaker operation. Heater and plate voltages for the CR-188 radio chassis are supplied from the amplifier chassis; it is therefore essential that the radio and amplifier chassis be interconnected during alignment or for other electrical service operations.

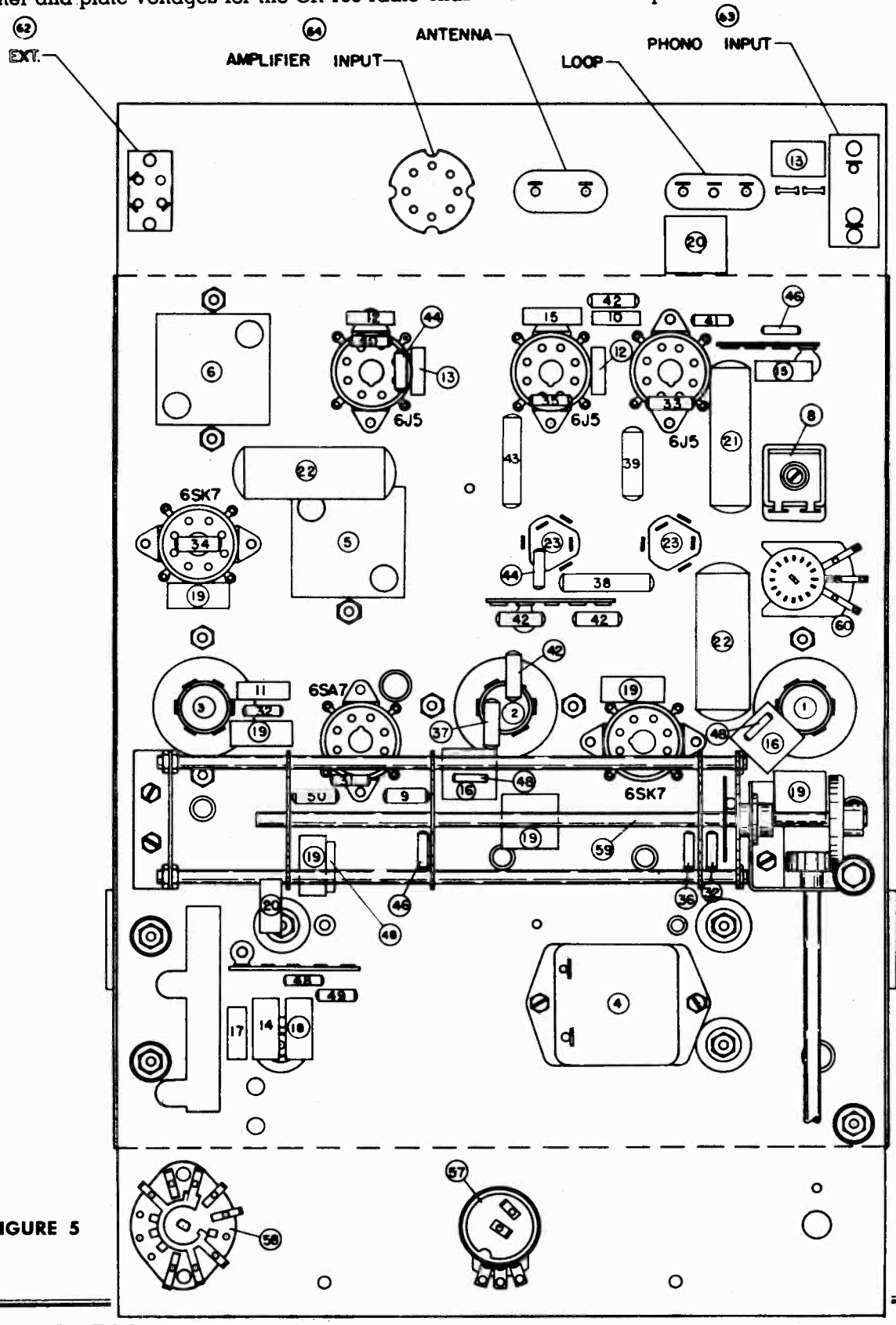
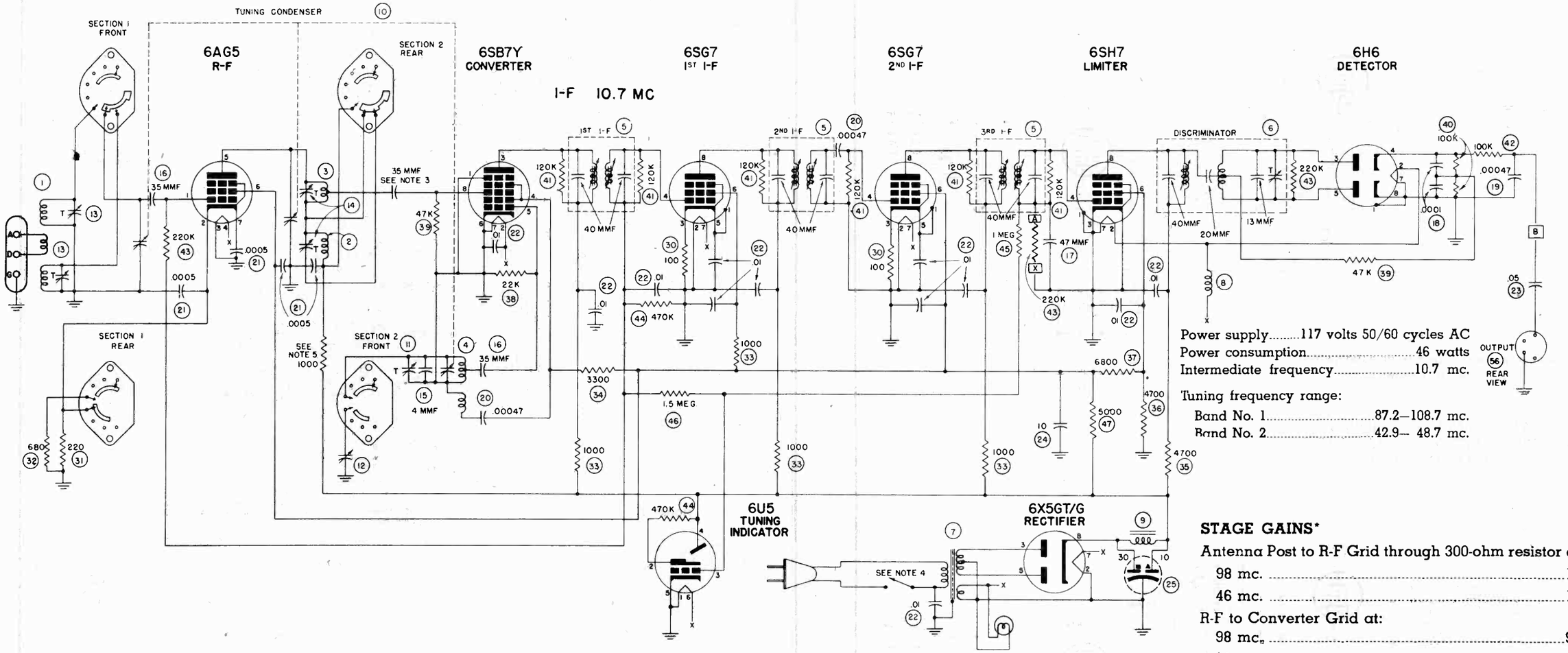


FIGURE 5

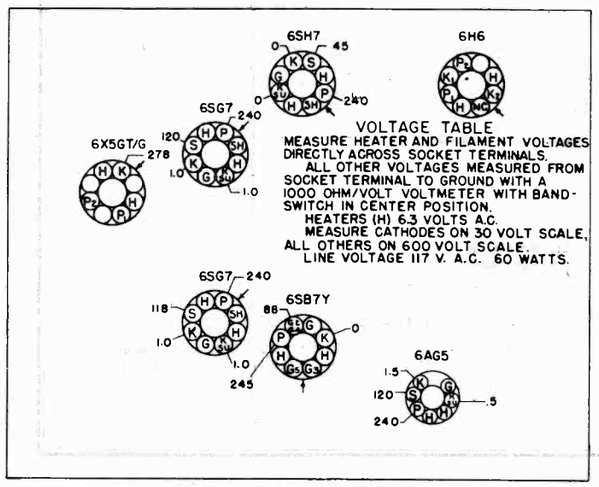
THE MAGNAVOX CO.

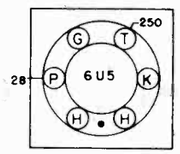


Power supply.....117 volts 50/60 cycles AC
Power consumption.....46 watts
Intermediate frequency.....10.7 mc.

Tuning frequency range:
Band No. 1.....87.2—108.7 mc.
Band No. 2.....42.9— 48.7 mc.

JUNE 1946





— NOTES —

1. BAND SWITCH 55 SHOWN IN COUNTERCLOCKWISE POSITION VIEWED FROM THE FRONT PANEL.
2. ALL ELECTRICAL VALUES SHOWN ARE IN MICROFARADS OR OHMS UNLESS OTHERWISE SPECIFIED.
3. SUPPLIED AS PART OF 360261G2 R-F COIL ASSEMBLY.
4. PART OF BAND SWITCH 55. POWER SWITCH IS IN OFF POSITION WHEN BAND SWITCH IS IN EXTREME COUNTERCLOCKWISE (NO. 1) POSITION. POWER IS ON IN NO. 2 AND NO. 3 POSITIONS OF BAND SWITCH.
5. SUPPLIED AS PART OF 360262G1 R-F COIL ASSEMBLY.
6. LETTERS SHOWN IN SQUARES DESIGNATE METER CONNECTION POINTS FOR ALIGNMENT AS DESCRIBED IN TEXT.

Model CR-189 series radio chassis are Frequency-Modulation tuners designed for connection to the F-M receptacle on any Magnavox A-M radio receiver. Two band operation provides complete coverage of the present 45 megacycle band as well as the new 100-megacycle band.

Because of the fact that in some cabinets the CR-189 F-M tuner must be mounted in an inverted position, the suffix letters A and B on the model number identify the change in dial mounting. The model number of this F-M tuner with an inverted dial assembly is CR-189B; when the upright dial assembly mounting is provided, the model number of the chassis is CR-189A.

STAGE GAINS*

Antenna Post to R-F Grid through 300-ohm resistor at:
98 mc. 1.2
46 mc. 1.7
R-F to Converter Grid at:
98 mc. 9.4
46 mc. 5.4
R-F on Converter Grid to 1st I-F Grid at:
98 mc. 8.7
46 mc. 8.7
I-F on Converter to 1st I-F Grid at:
10.7 mc. 10
I-F on 1st I-F Grid to 2nd I-F Grid at:
10.7 mc. 30
2nd I-F Grid to Limiter Grid at:
10.7 mc. 31

OSCILLATOR GRID VOLTAGE

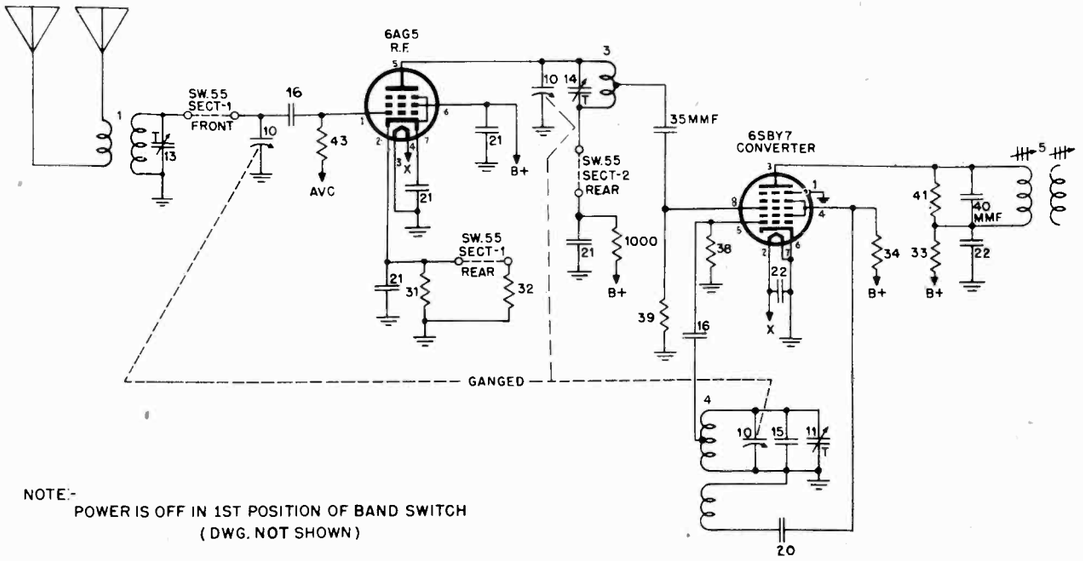
The DC voltage developed across Oscillator Grid Resistor (38) at:
98 mc. 7.0
46 mc. 4.6

*Variations of ±20% are permissible. All readings made with sufficient signal to provide 15 millivolts output at 400 cycles with 22.5 kc. modulation.

For Parts list, see P.15-3

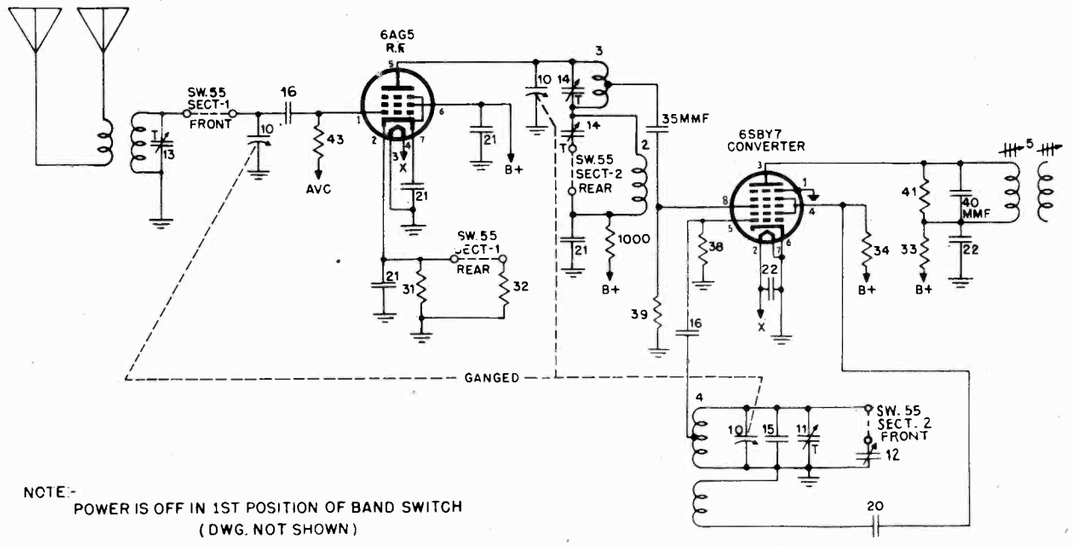
MODEL CR-189A,
CR-189B

THE MAGNAVOX CO.



NOTE:-
POWER IS OFF IN 1ST POSITION OF BAND SWITCH
(DWG. NOT SHOWN)

BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
F M BAND 1
87.2 — 108.7 MC.



NOTE:-
POWER IS OFF IN 1ST POSITION OF BAND SWITCH
(DWG. NOT SHOWN)

BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE.
F M BAND 2
42.9-48.7 MC.

MODEL CR-189A,
CR-189B

THE MAGNAVOX CO.

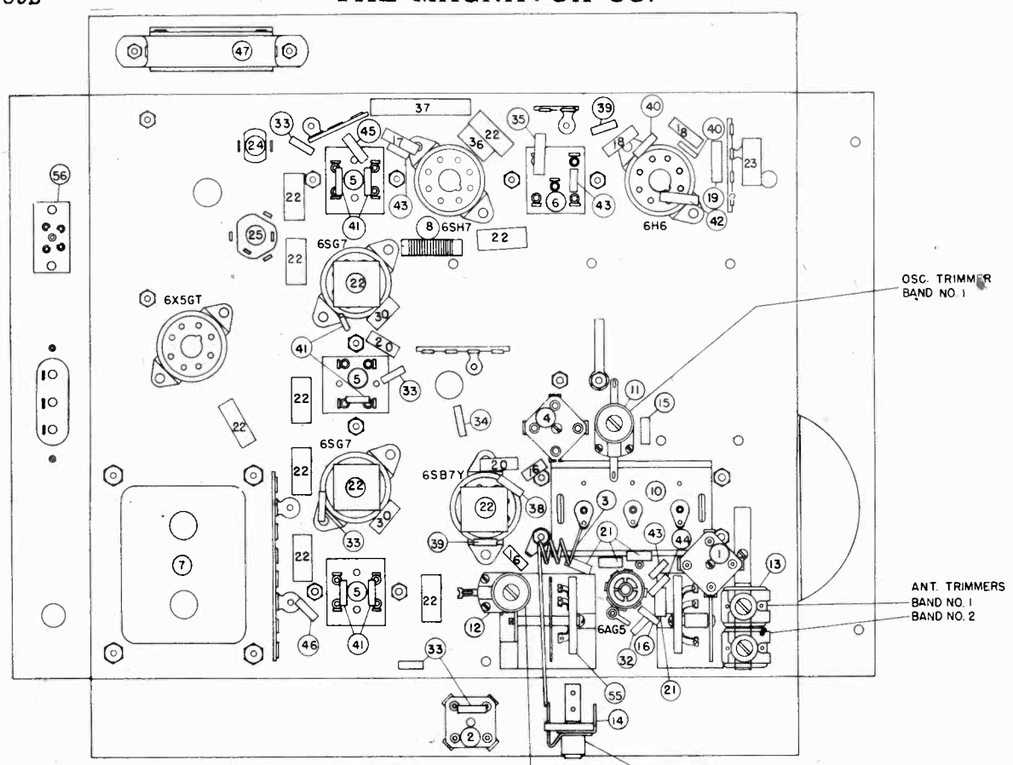
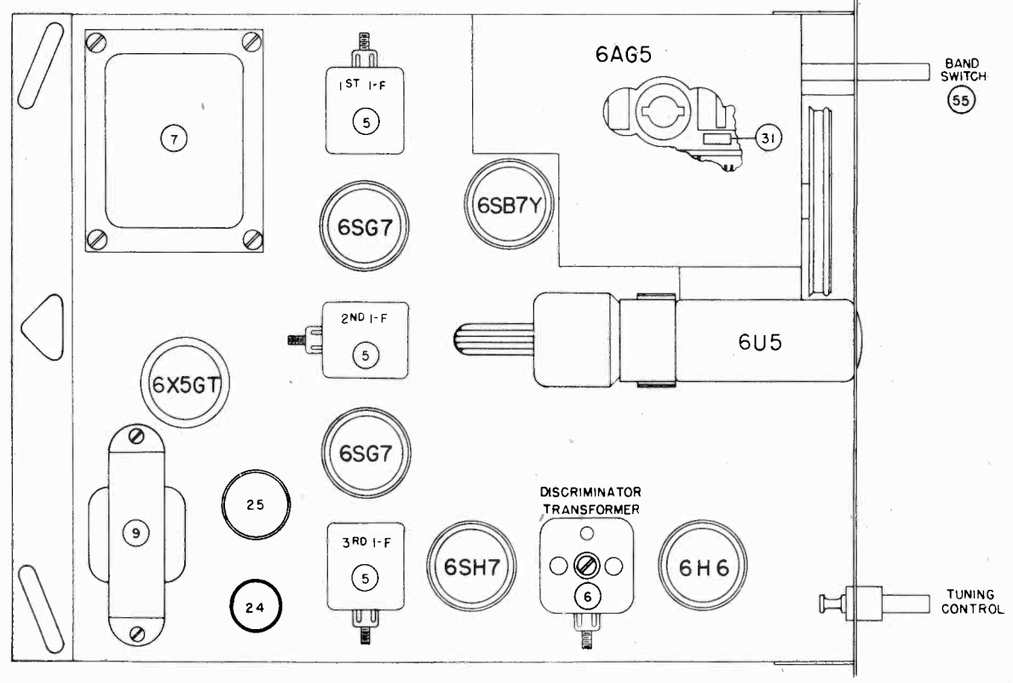


FIGURE 3



METHOD FOR REMOVING CHASSIS FROM CABINET

As the control panel is permanently fastened to the tuner in all models except those mounted in the Regency Symphony combination, it is not necessary to remove the control knobs from the cabinet. The instructions immediately following are for all combinations except the Regency Symphony. Separate instructions for removing the CR-189A chassis from that instrument are shown in this manual.

Before removing the chassis, disconnect the antenna and ground leads from their terminals, and the output and the power cables from their receptacles. While holding the rear of the chassis in place with one hand, remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis. Then while lowering the chassis, pull back on it to disengage the hooks from the slots in the tray to which the chassis is mounted, and withdraw the chassis from the cabinet.

In replacing the chassis, slide it in so that the small hooks near the front ride inside the flanges on the sides of the chassis tray. Push the chassis forward as far as it will go so that the hooks engage the slots in the chassis tray; then lift up the rear of the chassis until the guide pin in the chassis tray projects through the triangular opening the flange on the rear of the F-M chassis. Now pull back on the chassis. A ledge on the guide pin referred to above, will hold the chassis in place while the mounting screws are started into the captivated nuts on the top of the chassis tray. These nuts are accessible through the angular slots in the chassis flange and the Phillips-head screws should be turned in to within a few turns of being tight. Now slide the chassis forward until its panel is flush with the panel of the A-M radio chassis and tighten the two Phillips-head screws securely, completing the replacement operation.

REGENCY SYMPHONY. To remove the CR-189A chassis from the Regency Symphony first remove the antenna and ground leads from their terminals and the output and power cables from their receptacles. Then pull the control knobs from their shafts and remove the two fancy-head screws from the front panel. Next, remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis and pull the chassis out of the rear of the cabinet.

In replacing the chassis, the reverse order of the above instructions should be followed.

ALIGNMENT PROCEDURE

The alignment of this F-M tuner is made in three major steps namely, I-F alignment, Discriminator alignment and R-F alignment. An F-M generator is not required in aligning this F-M tuner. Any *accurately calibrated* signal generator covering a range in the vicinity of 10.7 megacycles may be used in aligning the I-F and the Discriminator stages. For R-F alignment, the generator must cover the tuning range of the tuner or approximately 42 to 110 megacycles. If such a signal generator is not available, this alignment may be made by using an F-M radio station as a frequency standard.

I-F ALIGNMENT

1. Connect the "high" side of the signal generator to Grid 3 (pin #8) of the 6SB7Y converter tube and the "low" side of the generator to the radio chassis.
2. If a vacuum tube voltmeter is available, connect it across the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube at points designated "A" and "X" on the schematic diagram (Figure 2) to measure the limiter grid bias voltage. Set the signal generator to exactly 10.7 megacycles and adjust the third, the second and the first i-f transformer trimmers in that order for maximum reading on the meter. A reading of 2 to 8 volts should be considered normal.

3. If a vacuum tube voltmeter is not available, connect a 0-50 or 0-200 microammeter in series with the "ground" end of the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube at point "X" on the schematic diagram. Set the signal generator to exactly 10.7 megacycles and adjust the third, the second and the first i-f transformer trimmers in that order for maximum meter readings. A normal reading will be in the range of 10 to 35 microamperes. At the completion of these adjustments, remove the microammeter and ground the 220,000 ohm resistor to the point where it was originally connected.

DISCRIMINATOR ALIGNMENT

The accurate alignment of the discriminator transformer cannot be overemphasized. Incorrect alignment will result in badly distorted reception. The following steps should be followed in the order given:

1. A DC vacuum tube voltmeter is connected to the output circuit by connecting it from ground to point "B" on the schematic diagram. This measures the detector output voltage. Adjust the signal generator frequency to exactly 10.775 megacycles and adjust both trimmers on the discriminator transformer for maximum reading. If the indicated voltage is less than 3 volts readjust the output of the generator until the meter indicates 3 volts or more. Now adjust the signal generator frequency to 10.7 megacycles and turn the trimmer screw on the top of the discriminator until the voltage is zero. *This is an extremely important adjustment.* Reset the generator frequency to 10.775 and record the meter reading.
2. Reverse the meter connections and set the signal generator frequency to 10.625 megacycles. The meter reading now obtained must be within 10% of the reading recorded in the previous operation—if it is not, the discriminator alignment was not done accurately and must be repeated.
3. The discriminator may also be aligned using a 0-50 or 0-200 microammeter if a vacuum tube voltmeter is not available. In this case, the detector output current is measured. Connect the microammeter to the same points specified in paragraph 1 and proceed in the manner outlined in paragraphs 1 and 2 of this section. In the operation described in paragraph 1, the meter reading should be at least 20 microamperes when the trimmers are peaked at 10.775 megacycles; if not, the generator should be adjusted until that value is obtained.

BAND NO. 1 R-F ALIGNMENT

It is essential that Band No. 1—the high frequency band, is aligned prior to the alignment of Band No. 2. If this is not done, Band No. 1 alignment will be incorrect.

1. Set the Band Selector switch to Band No. 1 and check that the dial pointer is in line with the last mark at the low frequency end of the dial calibration when the condenser gang is fully meshed. If it is not, slide the pointer on its string to the correct position, and crimp the lugs (on the rear of the pointer) tightly around the string and apply a drop of cement to hold the pointer in adjustment.
2. Connect the vacuum tube voltmeter to points "A" and "X" on the schematic diagram or connect a 0-50 or 0-200 microammeter in series with the "ground" end of the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube at point "X" on the schematic diagram.
3. An extremely accurate signal generator is a necessity in making the following adjustments and it should be connected to the antenna post through a 300 ohm resistor. If such a generator is not available, connect an F-M antenna to the antenna terminal (A) and use an F-M transmitter for a frequency standard. It is preferable that this station he located in the high frequency end of the band—102 to 108 megacycles.
4. Set the signal generator (if one is used) and the F-M tuner to exactly 108 megacycles—if an F-M station is used as a frequency standard accurately set the tuner to the frequency of the F-M station and adjust the Band No. 1 oscillator trimmer for a maximum reading on the meter. Then adjust the Band No. 1 antenna trimmer and the r-f trimmer for a maximum meter indication. If too much signal is fed to the tuner, it might appear at several settings of the tuning dial and confuse the adjustment. When the adjustments are completed, the second harmonic of the oscillator frequency will be 10.7 megacycles lower than the signal frequency.

BAND NO. 2 R-F ALIGNMENT

1. With the meter still connected to the tuner, set the Band Selector switch to Band No. 2. Set the signal generator and the F-M tuner to exactly 48 megacycles. If an F-M station is used as a frequency standard (this station should be in the high frequency end of the band) accurately set the tuner to the frequency of the F-M station. Adjust the Band No. 2 oscillator trimmer for a maximum reading on the meter. Then adjust the Band No. 2 antenna trimmer and the r-f trimmer for the highest meter reading. On Band No. 2, the oscillator frequency will be 10.7 megacycles lower than the signal frequency. This completes the alignment—remove the meter from the circuit and if the ground circuit of the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube was opened for the connection of a microammeter, ground the resistor to restore the circuit to normal.

MODEL CR-189A,
CR-189B
MODEL CR-192A,
CR-192B

THE MAGNAVOX CO.

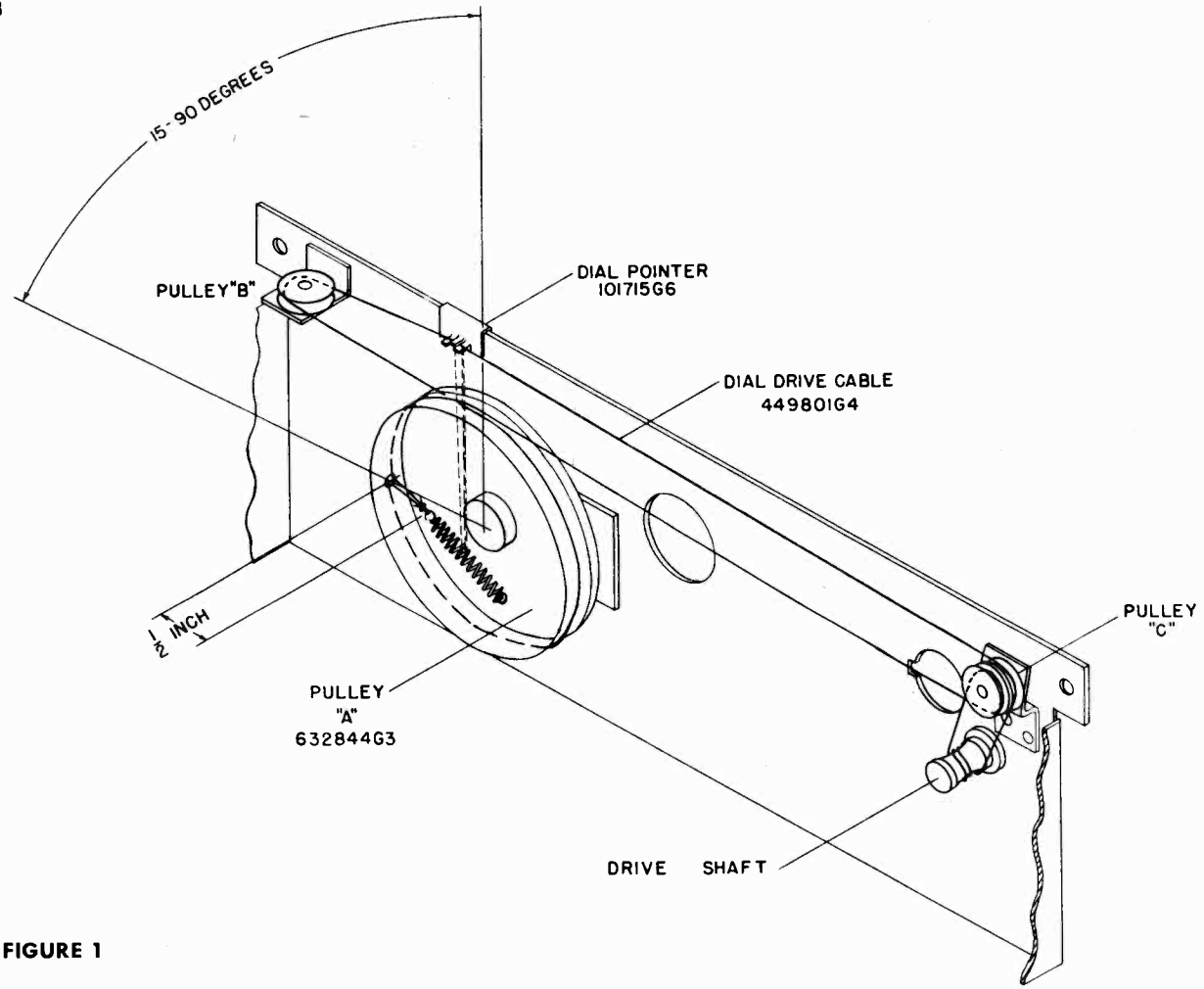


FIGURE 1

DIAL CORD REPLACEMENT

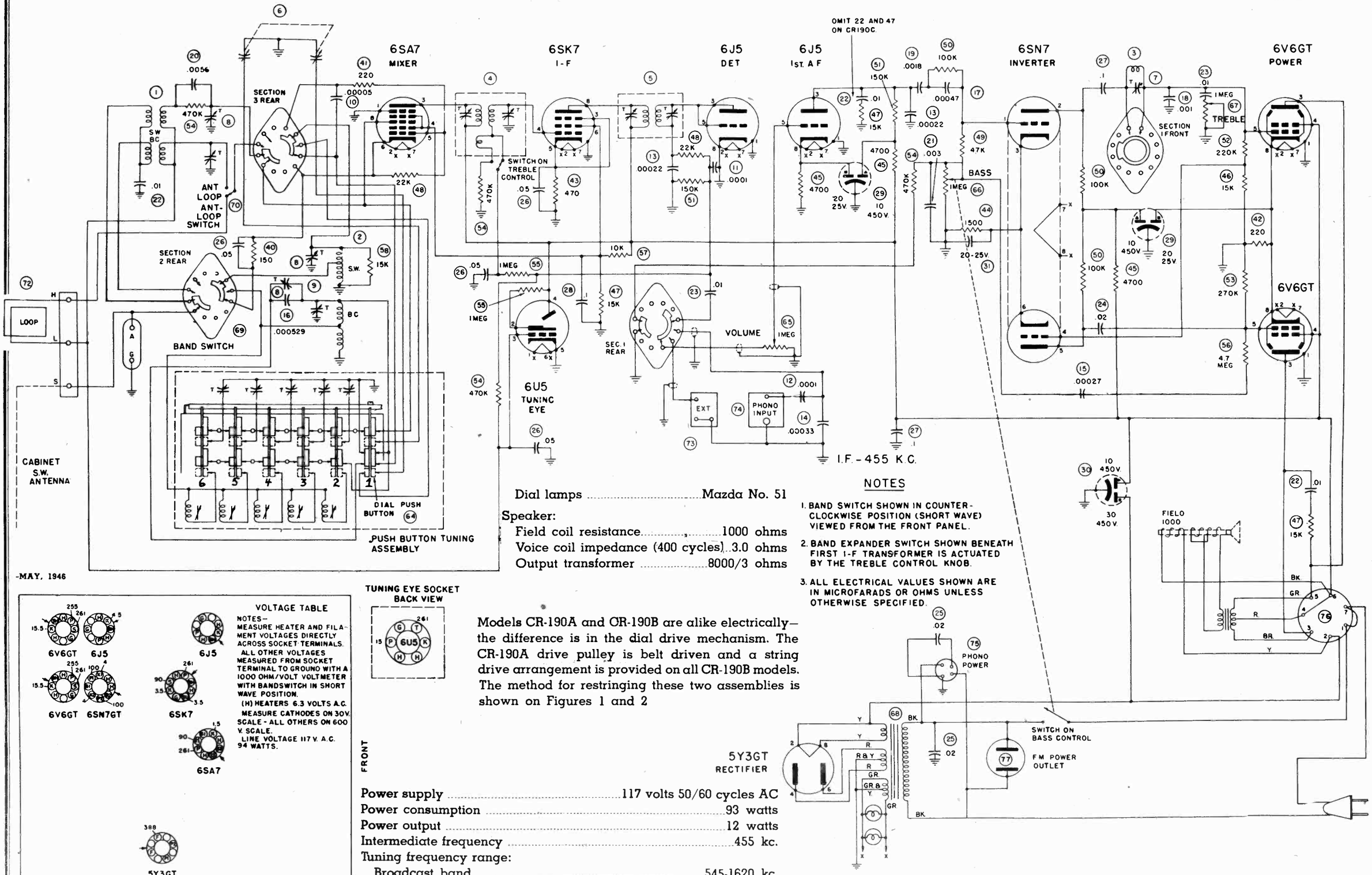
A single cable transmits motion from the dial tuning knob to rotate the condenser gang and to move the dial pointer. A 30-inch length of string is required to restring this assembly. After the broken cable is removed, turn pulley "A" (see Figure 1) until the condenser gang plates are completely meshed. In this condition, the small hole in the rim of pulley "A" should be within the limits of 15 to 90 degrees to the left of being vertical as shown in Figure 1. If this hole is at a different position from the condition specified, loosen the two screws in the coupling to the condenser gang and turn pulley "A" while holding the condenser plates meshed. Tighten the two set screws after the adjustment has been made.

Lace one end of the new length of cable through the hole in pulley "A" and temporarily fasten it to the hook to which the spring is normally fastened. Make a complete turn around pulley "A" in a counter-clockwise direction, lace it around pulley "B," then across the rear of the dial scale and over the top of the front groove in pulley "C." Proceed down around the tuning shaft for 2½ turns in a clockwise direction and wrapping the cable over pulley "D" from front to back. Continue up over the rear groove of pulley "C" in a clockwise direction for one turn and extend the cable to the left so that the loose end is to the rear of the section of cable that it crosses. The loose end of the cable should now be wound over the top of pulley "A" so that it is nearest the dial frame and into the hole in the pulley groove. Remove the other end of the cable from the hook and while holding both ends taut, insert one end of the spring on the hook in pulley "A." Lace the two free ends of the cable through the opposite end of the spring and pull the cable until the spring is stretched to within ½-inch of the rim on the pulley. Tie a double knot so that the knot is around one coil of the spring, while maintaining tension on the cable.

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. Press the crimping lugs on the dial pointer together over the cable. After checking to see that the condenser gang is still completely meshed and the dial pointer is in the position specified previously, apply a few drops of cement to the cable where it is crimped by the pointer. This completes the operation.

THE MAGNAVOX CO.

MODEL CR-190A, 190B



-MAY, 1946

Dial lamps ..... Mazda No. 51

Speaker:

Field coil resistance	1000 ohms
Voice coil impedance (400 cycles)	3.0 ohms
Output transformer	8000/3 ohms

NOTES

1. BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (SHORT WAVE) VIEWED FROM THE FRONT PANEL.
2. BAND EXPANDER SWITCH SHOWN BENEATH FIRST I-F TRANSFORMER IS ACTUATED BY THE TREBLE CONTROL KNOB.
3. ALL ELECTRICAL VALUES SHOWN ARE IN MICROFARADS OR OHMS UNLESS OTHERWISE SPECIFIED.

TUNING EYE SOCKET BACK VIEW

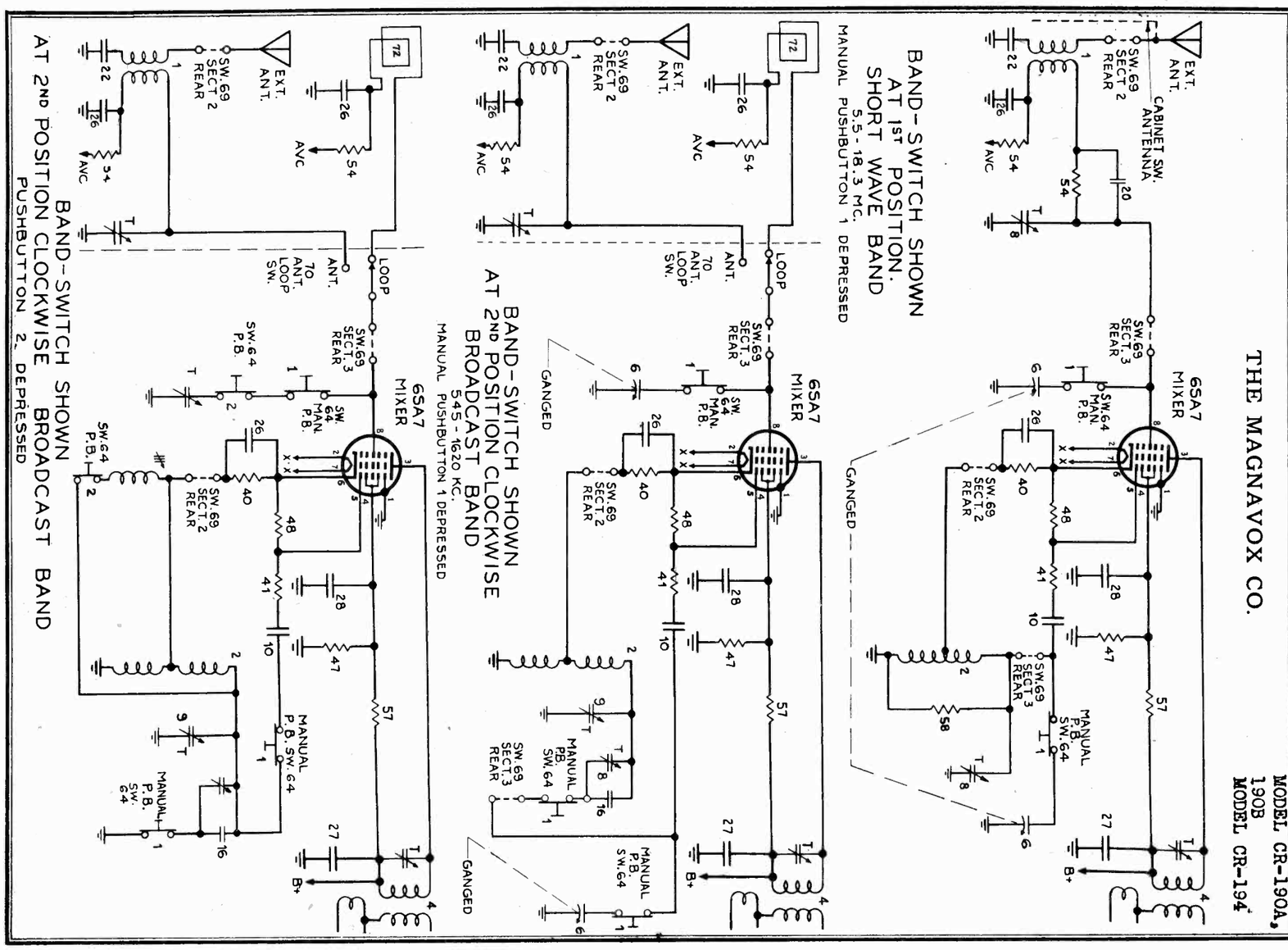
Models CR-190A and CR-190B are alike electrically—the difference is in the dial drive mechanism. The CR-190A drive pulley is belt driven and a string drive arrangement is provided on all CR-190B models. The method for restringing these two assemblies is shown on Figures 1 and 2

FRONT

5Y3GT RECTIFIER

Power supply	117 volts 50/60 cycles AC
Power consumption	93 watts
Power output	12 watts
Intermediate frequency	455 kc.
Tuning frequency range:	
Broadcast band	545-1620 kc.
Short wave band	5.5-18.3 mc.

Record Changer: Webster Model 56



DIAL CORD REPLACEMENT

As mentioned previously in this Service Bulletin, two types of drive mechanisms are used to transmit the motion from the dial tuning knob to the large pulley that is coupled to the condenser gang. These two arrangements are shown on Figures 1 and 2. The cable used to drive the dial pointer is strung the same on all CR-190A and CR-190B receivers. Separate instructions for installing a replacement belt or string on the CR-190A or CR-190B chassis are given below.

CR-190A Condenser Drive Belt Replacement—Hook one end of the belt on the right-hand edge of the slot in pulley "C" so that the smooth side contacts the pulley surface. Keeping the belt near the back of the groove in pulley "C" wrap it in a clockwise direction around that pulley (as indicated by the arrows on Figure 1) over the idler pulley and under the tuning control shaft; then around the opposite side of pulley "C." One end of the belt tension spring is hooked on the free end of the belt and the other end on the left-hand edge of the slot in pulley "C," completing the operation.

CR-190B Condenser Drive Cable Replacement—Slide a short length (approximately ½-inch) of sleeving over one end of a 19-inch length of dial cable, form a small loop and tie a knot in the manner shown on Figure 2. Hook this loop over the metal hook in pulley "C" and lace the cable through the pulley slot and around the pulley in a counter-clockwise direction when viewed from the rear of the panel, keeping the cable to the rear of the pulley groove. Lace the cable in the direction indicated by the arrow on Figure 2 wrapping 2½ turns around the smaller diameter portion of the tuning control shaft *from front to back;* then around the opposite side of pulley "C." Loop one end of tension spring "D" on the right-hand edge of the slot in pulley "C"; thread the free end of the drive cable through the opposite end of spring "D" and pull back on the cable until the spring coils are stretched to approximately one inch. Tie a double knot in the cable while maintaining tension on the spring, completing the operation.

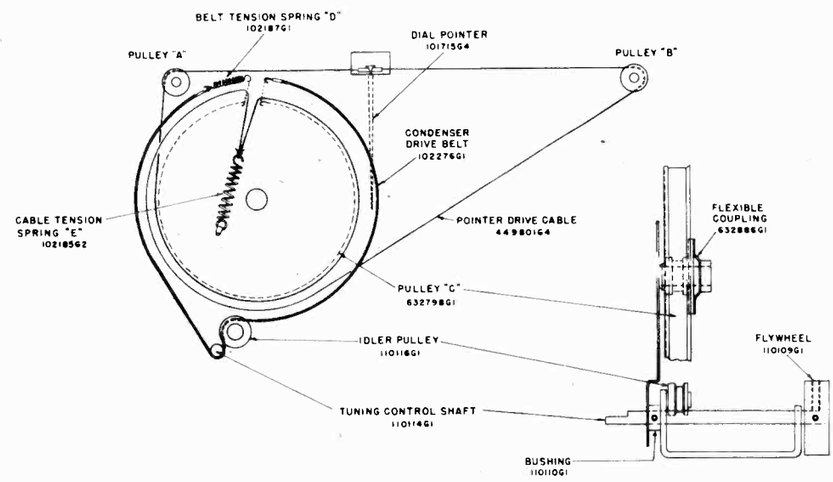


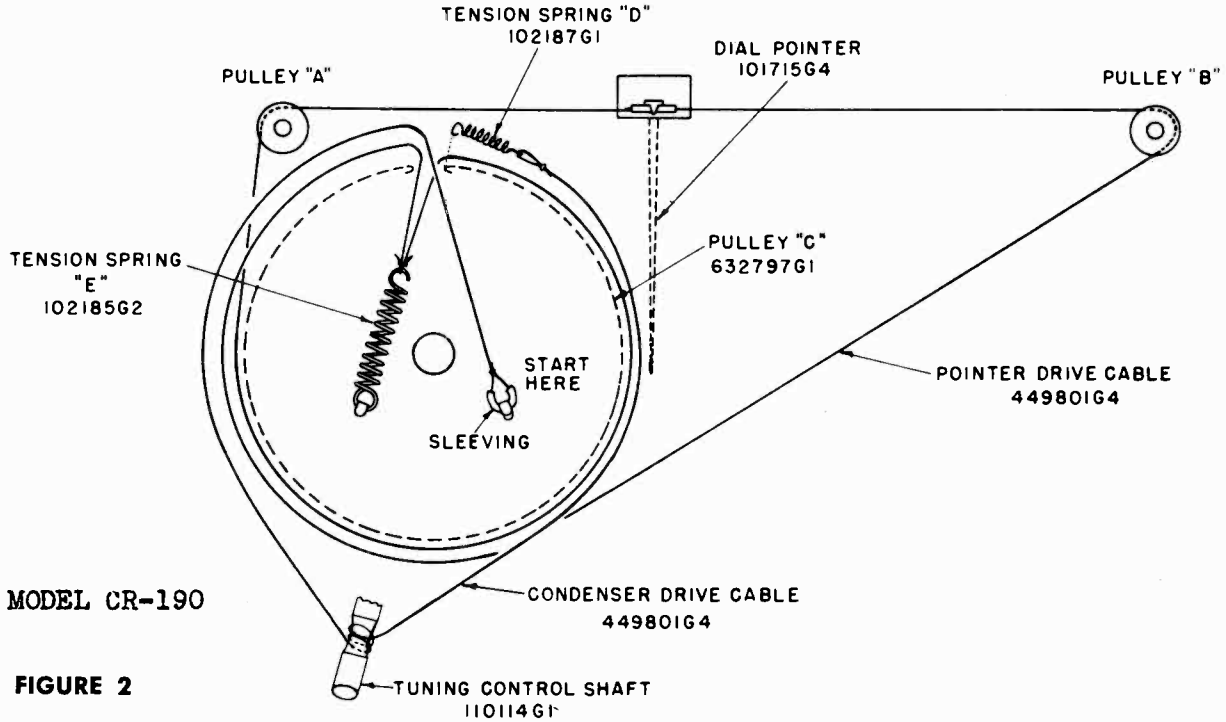
FIGURE 1

CR-190A and CR-190B Dial Pointer Drive Cable Replacement—Rotate the tuning control shaft until the slot in the groove of pulley "C" is up. Cut a piece of dial cable approximately 40 inches long and slide a short piece of sleeving over the cable. Tie a small loop in one end of the cable and temporarily hook it over the metal hook in pulley "C." Lace the other end through the slot in the pulley groove and in a counter-clockwise direction around the large pulley, then around pulley "B" and straight across the back of the dial frame; over pulley "A" and in a counter-clockwise direction around pulley "C." This last wrap around pulley "C" must be at the front of the pulley groove or nearest the panel. *This is important!* Lace the free end of the cable through the slot in pulley "C" and remove the other end of the cable from the hook. Fasten one end of tension spring "E" over the pulley hook and lace the two free ends of the drive cable through the other end of the spring. Now pull back on the cable until the tension spring coils are stretched to approximately 1⅜ inches. Tie a double knot in the cable while maintaining tension on the spring.

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 lugs on the dial pointer pressed together over the sleeving. After checking to see that the condenser gang is still 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.

THE MAGNAVOX CO.

MODEL CR-190A,
CR-190B
MODEL CR-194



MODEL CR-190

FIGURE 2

MODEL CR-190 PUSH BUTTON ADJUSTMENTS MODEL CR-194

There are six push buttons on the panel of the receiver, five of which may be pre-set to any station whose frequency is within the range covered by the respective buttons. See Figure 3. The right-hand button must be pressed for dial tuning.

Set-up Procedure—Turn on the receiver and allow it to operate for at least five minutes to permit tubes to reach normal operating conditions. Remove the push button escutcheon plate and proceed in the following manner.

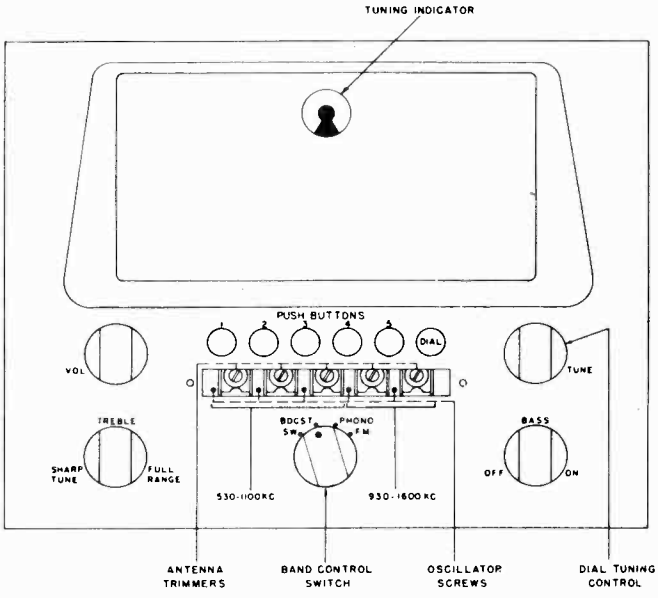


FIGURE 3

1. Turn the Band Control Switch knob to BDCST and press the push button at the right end of the assembly to permit dial tuning.

2. Using the Dial Tuning Control, carefully tune in the station to which the No. 1 push button is to be set and note the program. Be sure that the frequency of the station selected is within the frequency range covered by the No. 1 button.

3. Press the No. 1 button and carefully turn the oscillator screw for that button until the station that was tuned manually is heard. Carefully adjust the screw until the tuning indicator tube shows maximum deflection.

4. Adjust the No. 1 antenna trimmer for maximum speaker volume (tuning indicator tube shows maximum deflection).

5. Press the DIAL button to verify that the same station that was tuned manually was set up on the No. 1 button.

6. This completes the set-up of the No. 1 button. Follow the same procedure in setting up the remaining four buttons always adjusting the oscillator screw first, then the antenna trimmer screw.

7. After all five buttons have been set up, replace the escutcheon plate and insert the correct call letter tab in the space provided under each push button.

MODEL CR-190A,
CR-190B

THE MAGNAVOX CO.

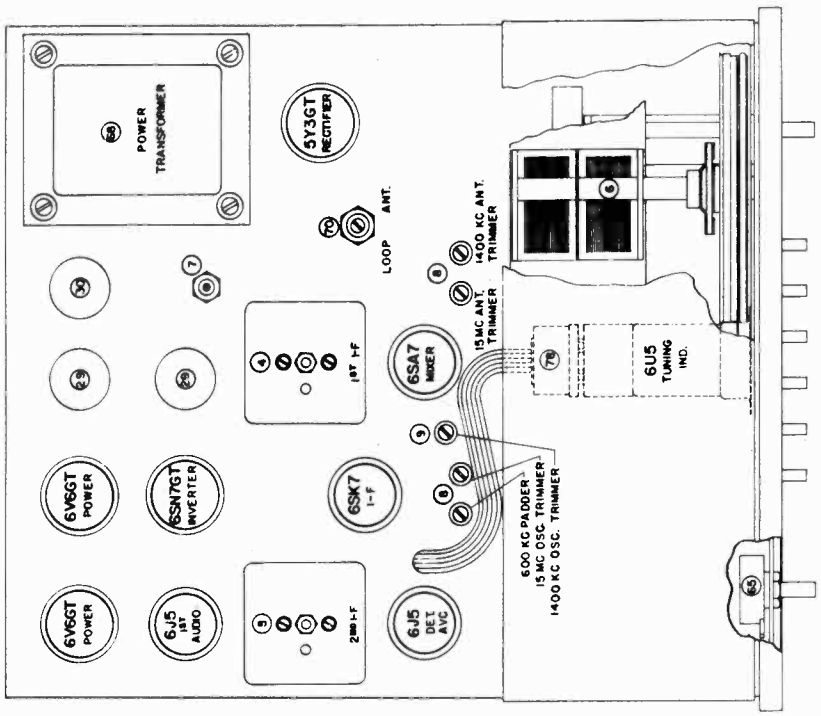
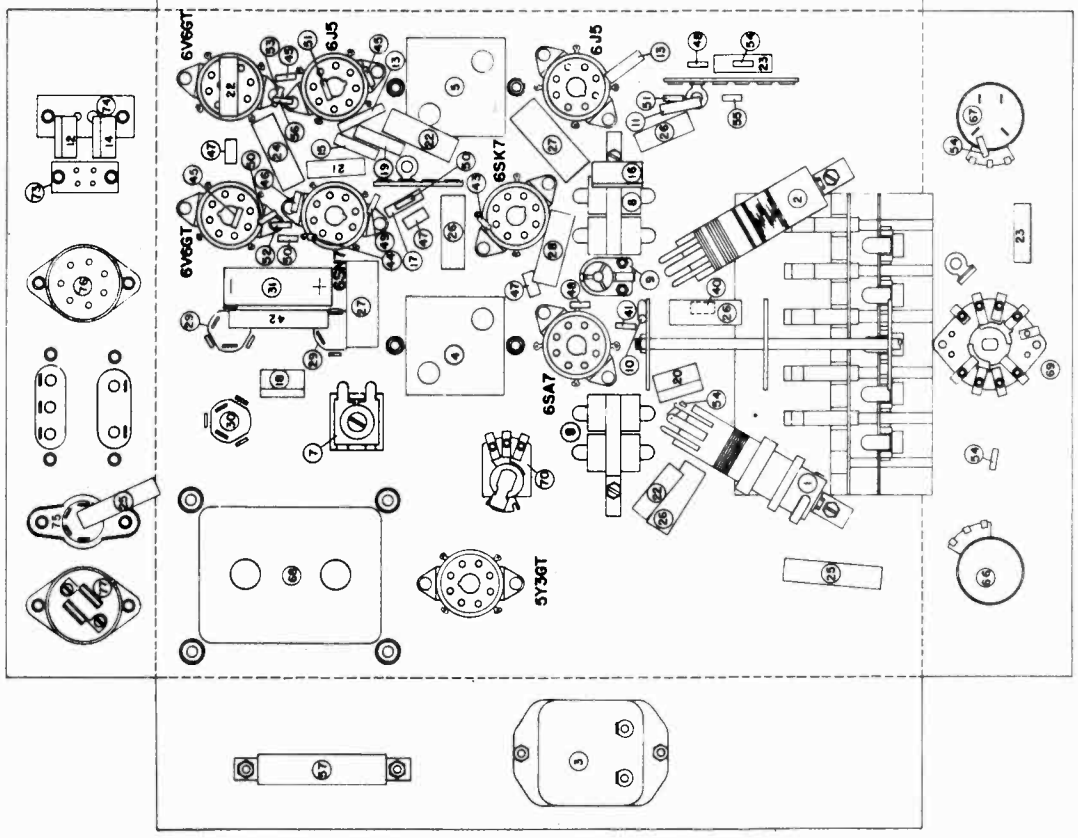


FIGURE 5



METHOD FOR REMOVING CHASSIS FROM CABINET

Model CR-190 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 hooks near the front ride inside the flanges on the sides of the chassis tray. Push the chassis forward as far as it will go and the hooks should then engage the slots in the chassis tray. Replace the two Phillips-head screws and nuts and tighten securely. Replace all plugs in their receptacles and the antenna leads on their correct terminals. The antenna terminal board for the loop antenna connections is designated S-L-H. The end of the short wave antenna that is fastened to the inside of the cabinet connects to S. Always disconnect this antenna from terminal S when an outdoor antenna is used as it may pick up noise. The two terminals on the loop are designated L and H. The leads connected to these terminals should be wired to the corresponding terminals (L and H) on the chassis.

The alignment of this receiver requires the use of an accurately calibrated r-f signal generator and an output meter. All trimmer condenser locations are shown on the chassis layout diagram, Figure 5. The radio volume control should be turned to maximum and the signal generator output kept as low as possible during alignment to prevent the AVC from operating and giving false readings. *Always set the Selectivity Switch to SHARP TUNE before aligning the i-f stages.* This is done by turning the Treble Control counter-clockwise as far as possible.

I-F Alignment

1. Connect the output of the signal generator to the oscillator grid (pin No. 5) of the 6SA7 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.

On early models of CR-190 chassis, the two i-f trimmers are located in the top of the respective i-f transformers as shown in the layout diagram, Figure 5. In later production, one trimmer is accessible from the top and the other from the bottom of each transformer.

Broadcast Band Alignment

1. Remove the signal generator lead from the 6SA7 grid and connect it to the radio antenna terminal through the .00025 mfd. capacitor. The ANT-LOOP switch (70) 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.

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 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 and the 1400 kc. antenna trimmer for maximum output. If considerable adjustment was necessary, recheck the 600 kc. padder setting.

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 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 (7) 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.

Special Service Information

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

STAGE GAINS*

Antenna Post to Converter Grid at:

600 kc.	5.5
6 mc.	2.0

R-F on Converter Grid to I-F Grid at:

600 kc.	28
6 mc.	22

I-F on Converter Grid to I-F Grid at:

455 kc.	34

I-F Grid to Detector Plate at:

455 kc.	67

AUDIO GAIN

Voltage required across Volume Control to produce .05 watt speaker output** at 400 cycles is .010 volt with Band Selector Switch in BDCST setting.

OSCILLATOR OUTPUT VOLTAGE

The DC voltage developed across Oscillator Grid Resistor (48) at:

600 kc.	9.7
6 mc.	5.3

* Variations of ±20% are permissible. All readings made with sufficient input signal to provide .05 watt speaker output.

** .05 watt speaker output at 400 cycles is equivalent to a reading of 0.4 volts as measured by a high resistance AC voltmeter across the speaker voice coil.

MODEL CR-190A,
CR-190B
MODEL CR-193

THE MAGNAVOX CO.

CR-190

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, r-f, two band	360256G1
2	Coil assembly, oscillator, two band	360255G1
3	Coil assembly, 10 kc filter	360240G1
4	Transformer, first i-f	360266G1
5	Transformer, second i-f	360267G1
6	Capacitor, variable, two-gang tuning	260056G1
7	Capacitor, variable, 10 kc trimmer	250008G1
8	Capacitor, variable, 2 gang trimmer	260021G1
9	Capacitor, variable, oscillator trimmer	260042G2
10	Capacitor, ceramic, 50 mmf.	250088G24
11	Capacitor, molded mica, 100 mmf. ±20%	250159G98
12	Capacitor, molded mica, 100 mmf. ±10%	250159G82
13	Capacitor, molded mica, 220 mmf. ±20%	250159G100
14	Capacitor, molded mica, 330 mmf. ±10%	250159G88
15	Capacitor, molded mica, 270 mmf. ±10%	250159G87
16	Capacitor, silvered mica, 529 mmf. ±1%	250085G34
17	Capacitor, molded mica, 470 mmf. ±10%	260159G102
18	Capacitor, molded mica, 1000 mmf. ±20%	250160G82
19	Capacitor, molded mica, 1800 mmf. ±10%	250160G67
20	Capacitor, molded mica, 5600 mmf. ±2%	250161G7
21	Capacitor, paper, .003 mfd. 600 V.	250152G43
22	Capacitor, paper, .01 mfd. 600 V.	250152G38
23	Capacitor, paper, .01 mfd. 200 V.	250152G18
24	Capacitor, paper, .02 mfd. 400 V.	250152G26
25	Capacitor, molded paper, .02 mfd.	250129G3
26	Capacitor, paper, .05 mfd. 200 V.	250152G15
27	Capacitor, paper, .1 mfd. 400 V.	250152G22
28	Capacitor, paper, .1 mfd. 200 V.	250152G13
29	Capacitor, electrolytic, 10 mfd. 450 V.-20 mfd. 25 V.	270023G6
30	Capacitor, electrolytic, 10-30 mfd. 450 V.	270023G2
31	Capacitor, electrolytic, 20 mfd. 25 V.	270027G2
40	Resistor, composition, 150 ohm ½ W.	230084G8
41	Resistor, composition, 220 ohm ½ W.	230084G9
42	Resistor, composition, 220 ohm 2 W.	230064G54
43	Resistor, composition, 470 ohm ½ W.	230084G11
44	Resistor, composition, 1500 ohm ½ W.	230084G14
45	Resistor, composition, 4700 ohm ½ W.	230084G17
46	Resistor, composition, 15,000 ohm ±5%, ½ W.	230084G187
47	Resistor, composition, 15,000 ohm 1 W.	230085G20
48	Resistor, composition, 22,000 ohm ½ W.	230084G21
49	Resistor, composition, 47,000 ohm ½ W.	230084G23
50	Resistor, composition, 100,000 ohm ½ W.	230084G25
51	Resistor, composition, 150,000 ohm ½ W.	230084G26
52	Resistor, composition, 220,000 ohm ±5%, ½ W.	230084G215
53	Resistor, composition, 270,000 ±10%, ½ W.	230084G91
54	Resistor, composition, 470,000 ohm ½ W.	230084G29
55	Resistor, composition, 1 megohm ½ W.	230084G31
56	Resistor, composition, 4.7 megohm ½ W.	230084G35
57	Resistor, wire wound, 10,000 ohm	240035G2
58	Resistor, composition, 15,000 ohm ½ W.	230084G20
65	Control, volume, 1 megohm	220044G15
66	Control, bass, 1 megohm, with power switch	220045G2
67	Control, treble, 1 megohm, with band expander sw.	220071G2
68	Transformer, power, 117 V. 50/60 cycle	300025G1
69	Switch, rotary, band selector	160156G1
70	Switch, rotary, loop to outdoor antenna	160157G1
71	Switch assembly, muting	160158G1
72	Antenna, loop assembly	*
73	Socket, external input	180060G1
74	Socket, phonograph input	189741G1
75	Socket, phonograph motor	180501G5
76	Socket, speaker	180393G3
77	Socket, FM power	180422G1
78	Socket and cable assembly, tuning indicator	180423G1

CR-193

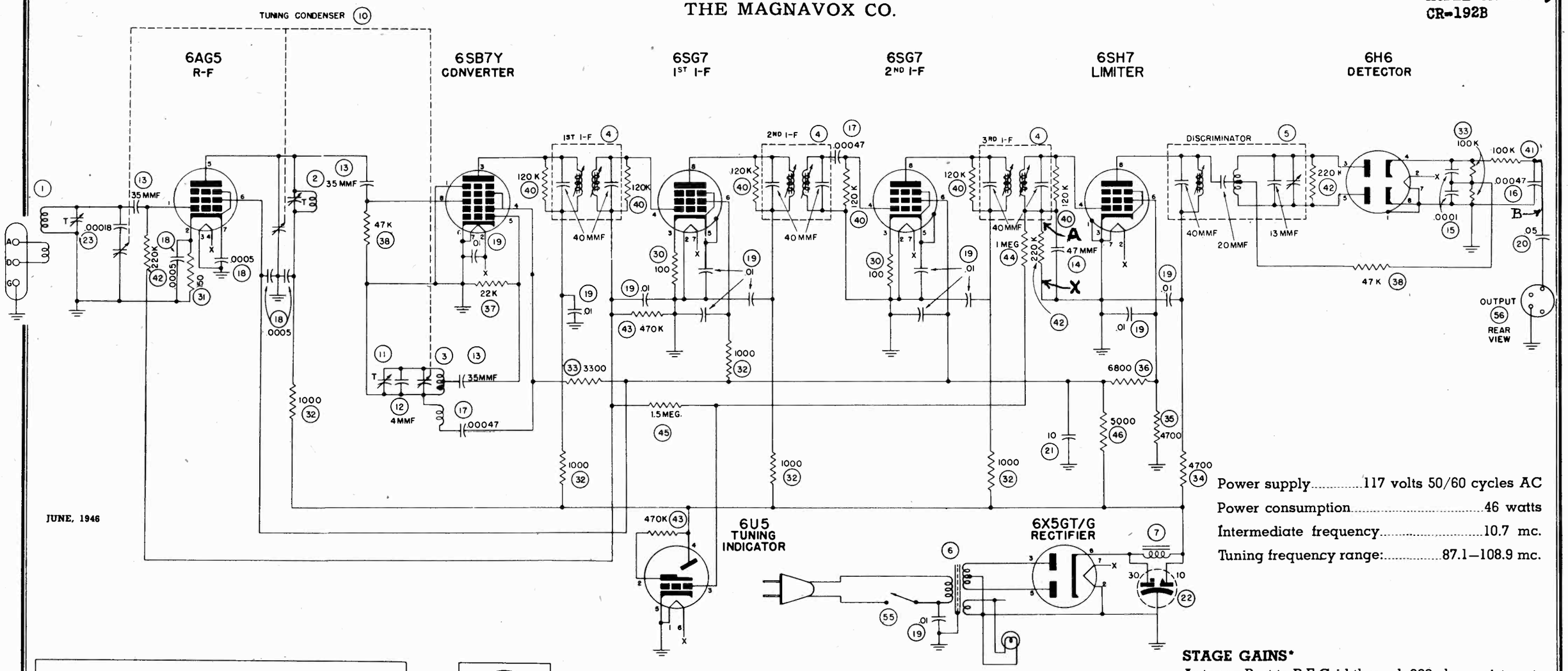
REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, r-f, two band	360238G1
2	Coil assembly, oscillator, two band	360239G1
3	Coil assembly, 10 kc filter	360240G1
4	Transformer, first i-f	360266G1
5	Transformer, second i-f	360267G1
6	Capacitor, variable, two-gang tuning	260053G1
7	Capacitor, variable, 10 kc trimmer	250008G1
8	Capacitor, variable, 2 gang trimmer	260021G1
9	Capacitor, variable, oscillator padder	260042G2
10	Capacitor, ceramic, 50 mmf.	250088G24
11	Capacitor, molded mica, 100 mmf. ±20%	250159G98
12	Capacitor, molded mica, 100 mmf. ±10%	250159G82
13	Capacitor, molded mica, 220 mmf.	250159G100
14	Capacitor, molded mica, 330 mmf.	250159G88
15	Capacitor, molded mica, 270 mmf.	250159G87
16	Capacitor, silvered mica, 583 mmf. ±1%	250085G33
17	Capacitor, molded mica, 470 mmf.	250159G102
18	Capacitor, molded mica, 1000 mmf.	250160G82
19	Capacitor, molded mica, 1800 mmf.	250160G67
20	Capacitor, molded mica, 5100 mmf. ±2%	250161G6
21	Capacitor, paper, .003 mfd. 400 V.	250152G43
22	Capacitor, paper, .01 mfd. 600 V.	250152G38
23	Capacitor, paper, .01 mfd. 200 V.	250152G18
24	Capacitor, paper, .02 mfd. 400 V.	250152G26
25	Capacitor, molded paper, .02 mfd. 600 V.	250129G3
26	Capacitor, paper, .05 mfd. 200 V.	250152G15
27	Capacitor, paper, .1 mfd. 400 V.	250152G22
28	Capacitor, paper, .1 mfd. 200 V.	250152G13
29	Capacitor, electrolytic, 10 mfd. 450 V., 20 mfd. 25V.	270023G6
30	Capacitor, electrolytic, 10-30 mfd. 450 V.	270023G2
31	Capacitor, electrolytic, 20 mfd. 25V.	270027G2
40	Resistor, composition, 150 ohm ½ W.	230084G8
41	Resistor, composition, 220 ohm ½ W.	230084G9
42	Resistor, wire wound 125 ohm 10 W.	240021G11
43	Resistor, composition, 470 ohm ½ W.	230084G1
44	Resistor, composition, 1500 ohm ½ W.	230084G14
45	Resistor, composition, 4700 ohm ½ W.	230084G17
46	Resistor, composition, 15,000 ohm ±5%, ½ W.	230084G187
47	Resistor, composition, 15,000 ohm 1 W.	230085G20
48	Resistor, composition, 22,000 ohm ½ W.	230084G21
49	Resistor, composition, 47,000 ohm ½ W.	230084G23
50	Resistor, composition, 100,000 ohm ½ W.	230084G25
51	Resistor, composition, 150,000 ohm ½ W.	230084G26
52	Resistor, composition, 220,000 ohm ±5%, ½ W.	230084G215
53	Resistor, composition, 270,000 ohm ½ W.	230084G91
54	Resistor, composition, 470,000 ohm ½ W.	230084G29
55	Resistor, composition, 1 megohm ½ W.	230084G31
56	Resistor, composition, 4.7 megohm ½ W.	230084G35
57	Resistor, wire wound, 10,000 ohm	240035G2
58	Resistor, composition, 15,000 ohm ½ W.	230084G20
59	Resistor, composition, 1000 ohm 2 W.	230064G62
65	Control, volume, 1 megohm	220044G15
66	Control, bass, 1 megohm, with power switch	220045G2
67	Control, treble, 1 megohm, with band expander switch	220071G2
68	Transformer, power, 117 V. 50/60 cycle	300032G1
69	Switch, rotary, band selector	160156G1
70	Switch, rotary, loop to outdoor antenna	160157G1
71	Switch assembly, muting	160158G1
72	Antenna, loop assembly	*
73	Socket, external input	180060G1
74	Socket, phonograph input	189741G1
75	Socket, phonograph motor	180501G5
76	Socket, speaker	180393G3
77	Socket, FM power	180422G1
78	Socket & Cable assembly, tuning indicator	180423G1
	Dial glass assembly	150283G1

Due to the fact that a change was made in the mechanical construction of the dial assembly after the first CR-190 radio chassis production run, it is important that you follow the procedure outlined below in ordering replacement glass dials.
If the glass dial for which a replacement is required is marked 150269, order a 150278 dial glass assembly. If the glass is marked 150282, order a 150280 dial glass assembly. These assemblies include the rubber strips cemented in their correct positions.

*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.

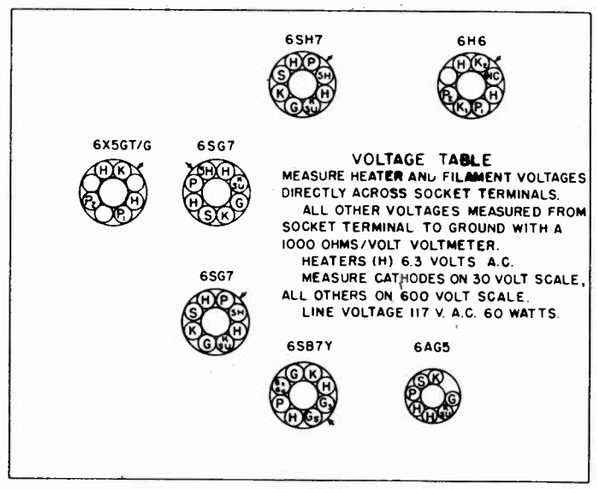
THE MAGNAVOX CO.

MODEL CR-192A, CR-192B



JUNE, 1946

Power supply.....117 volts 50/60 cycles AC
Power consumption.....46 watts
Intermediate frequency.....10.7 mc.
Tuning frequency range:.....87.1—108.9 mc.



VOLTAGE TABLE

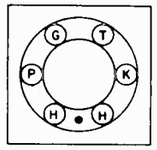
MEASURE HEATER AND FILAMENT VOLTAGES DIRECTLY ACROSS SOCKET TERMINALS.

ALL OTHER VOLTAGES MEASURED FROM SOCKET TERMINAL TO GROUND WITH A 1000 OHMS/VOLT VOLTMETER.

HEATERS (H) 6.3 VOLTS A.C.

MEASURE CATHODES ON 30 VOLT SCALE, ALL OTHERS ON 600 VOLT SCALE.

LINE VOLTAGE 117 V. A.C. 60 WATTS.



TUNING INDICATOR SOCKET
BACK VIEW

ALL ELECTRICAL VALUES SHOWN ARE IN MICROFARADS OR OHMS UNLESS OTHERWISE SPECIFIED.

I-F 10.7 MC

Dial Lamp.....Mazda No. 51

Model CR-192 series radio chassis are Frequency-Modulation tuners designed for connection to the F-M receptacle on any Magnavox A-M radio receiver.

Because of the fact that in some cabinets the CR-192 F-M tuner must be mounted in an inverted position, the suffix letters A and B on the model number identify the change in dial mounting. The model number of this F-M tuner with an inverted dial assembly is CR-192B; when the upright dial assembly mounting is provided, the model number of the chassis is CR-192A.

STAGE GAINS*

Antenna Post to R-F Grid through 300-ohm resistor at:
98 mc.....1.0

R-F to Converter Grid at:
98 mc.....17.5

R-F on Converter Grid to 1st I-F Grid at:
98 mc.....8.3

I-F on Converter Grid to 1st I-F Grid at:
10.7 mc.....9.2

I-F on 1st I-F Grid to 2nd I-F Grid at:
10.7 mc.....34

2nd I-F Grid to Limiter Grid at:
10.7 mc.....33

OSCILLATOR GRID VOLTAGE

The DC voltage developed across Oscillator Grid resistor (37) at:
98 mc.....7.0

*Variations of ± 20% are permissible. All readings made with sufficient signal to provide 15 millivolts output at 400 cycles with 22.5 kc. modulation.

For Dial Data, see P.15-42

THE MAGNAVOX CO.

MODEL CR-192A,
CR-192B

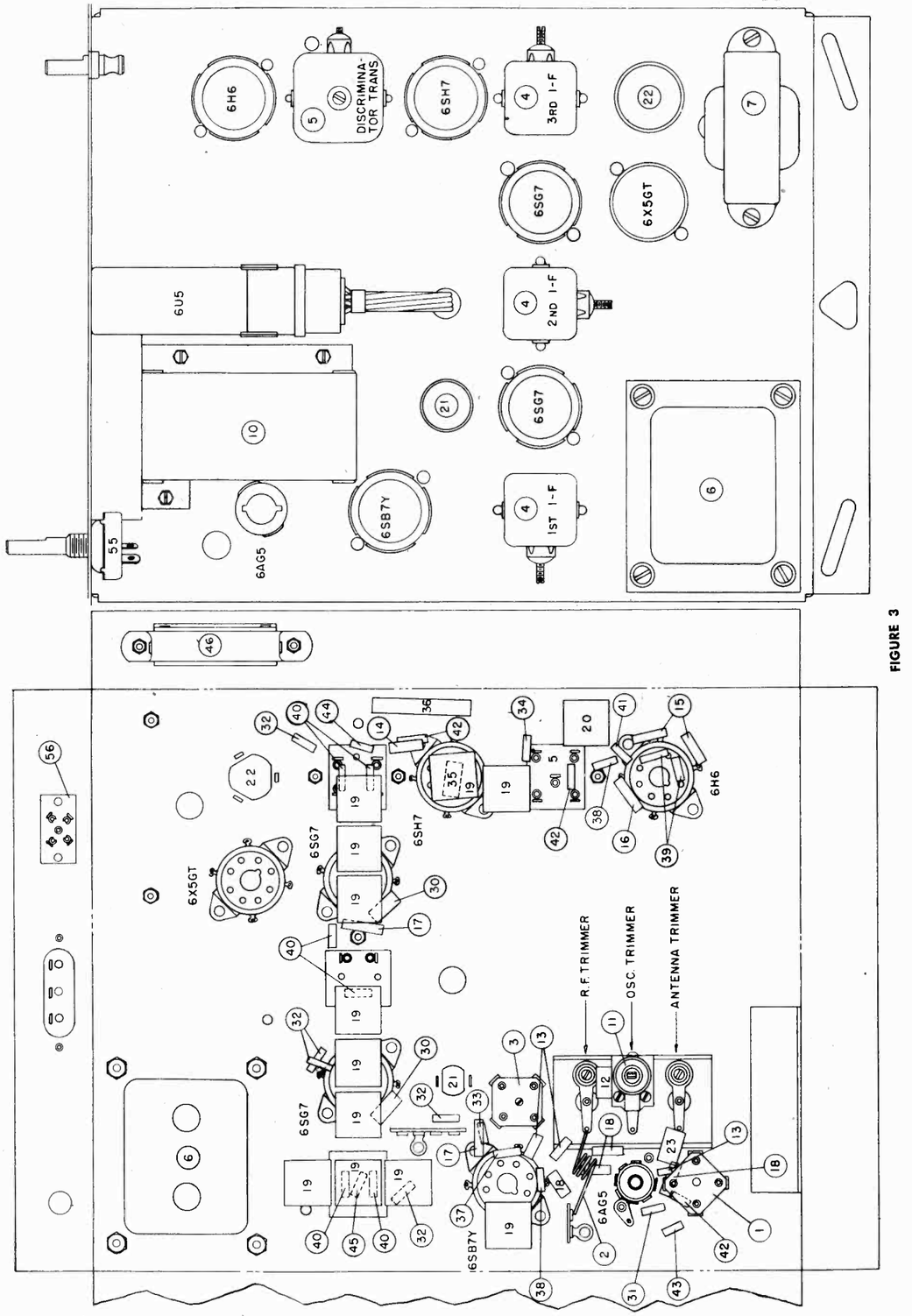


FIGURE 3

MODEL CR-192A,
CR-192B

THE MAGNAVOX CO.

ALIGNMENT PROCEDURE

The alignment of this F-M tuner is made in three major steps namely, I-F alignment, Discriminator alignment and R-F alignment. An F-M generator is not required in aligning this F-M tuner. Any *accurately calibrated* signal generator covering a range in the vicinity of 10.7 megacycles may be used in aligning the I-F and the Discriminator stages. For R-F alignment, the generator must cover the tuning range of the tuner or approximately 87 to 110 megacycles. If such a signal generator is not available, this alignment may be made by using an F-M radio station as a frequency standard.

I-F ALIGNMENT

1. Connect the "high" side of the signal generator to Grid 3 (pin #8) of the 6SB7Y converter tube and the "low" side of the generator to the radio chassis.

2. If a vacuum tube voltmeter is available, connect it across the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube at points designated "A" and "X" on the schematic diagram (Figure 2) to measure the limiter grid bias voltage. Set the signal generator to exactly 10.7 megacycles and adjust the third, the second and the first i-f transformer trimmers in that order for maximum reading on the meter. A reading of 2 to 8 volts should be considered normal.

3. If a vacuum tube voltmeter is not available, connect a 0-50 or 0-200 microammeter in series with the "ground" end of the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube at point "X" on the schematic diagram. Set the signal generator to exactly 10.7 megacycles and adjust the third, the second and the first i-f transformer trimmers in that order for maximum meter readings. A normal reading will be in the range of 10 to 35 microamperes. At the completion of these adjustments, remove the microammeter and ground the 220,000 ohm resistor to the point where it was originally connected.

DISCRIMINATOR ALIGNMENT

The accurate alignment of the discriminator transformer cannot be overemphasized. Incorrect alignment will result in badly distorted reception. The following steps should be followed in the order given:

1. A DC vacuum tube voltmeter is connected to the output circuit by connecting it from ground to point "B" on the schematic diagram. This measures the detector output voltage. Adjust the signal generator frequency to exactly 10.775 megacycles and adjust both trimmers on the discriminator transformer for maximum reading. If the indicated voltage is less than 3 volts readjust the output of the generator until the meter indicates 3 volts or more. Now adjust the signal generator frequency to 10.7 megacycles and turn the trimmer screw on the top of the discriminator until the voltage is zero. *This is an extremely important adjustment.* Reset the generator frequency to 10.775 and record the meter reading.

2. Reverse the meter connections and set the signal generator frequency to 10.625 megacycles. The meter reading now obtained must be within 10% of the reading recorded in the previous operation—if it is not, the discriminator alignment was not done accurately and must be repeated.

3. The discriminator may also be aligned using a 0-50 or 0-200 microammeter if a vacuum tube voltmeter is not available. In this case, the detector output current is measured. Connect the microammeter to the same points specified in paragraph 1 and proceed in the manner outlined in paragraphs 1 and 2 of this section. In the operation described in paragraph 1, the meter reading should be at least 20 microamperes when the trimmers are peaked at 10.775 megacycles; if not, the generator should be adjusted until that value is obtained.

R-F ALIGNMENT

1. Check that the dial pointer is in line with the last mark at the low frequency end of the dial calibration when the condenser gang is fully meshed. If it is not, slide the pointer on its string to the correct position, and crimp the lugs (on the rear of the pointer) tightly around the string and apply a drop of cement to hold the pointer in adjustment.

2. Connect the vacuum tube voltmeter to points "A" and "X" on the schematic diagram or connect a 0-50 or 0-200 microammeter in series with the "ground" end of the 220,000 ohm resistor in the grid circuit of the 6SH7 limiter tube at point "X" on the schematic diagram.

3. An extremely accurate signal generator is a necessity in making the following adjustments and it should be connected to the antenna post through a 300 ohm resistor. If such a generator is not available, connect an F-M antenna to the antenna terminal (A) and use an F-M transmitter for a frequency standard. It is preferable that this station be located in the high frequency end of the band—102 to 108 megacycles.

4. Set the signal generator (if one is used) and the F-M tuner to exactly 108 megacycles—if an F-M station is used as a frequency standard accurately set the tuner to the frequency of the F-M station and adjust the oscillator trimmer for a maximum reading on the meter. Then adjust the antenna trimmer and the r-f trimmer for a maximum meter indication. If too much signal is fed to the tuner, it might appear at several settings of the tuning dial and confuse the adjustment. When the adjustments are completed, the second harmonic of the oscillator frequency will be 10.7 megacycles lower than the signal frequency.

METHOD FOR REMOVING CHASSIS FROM CABINET

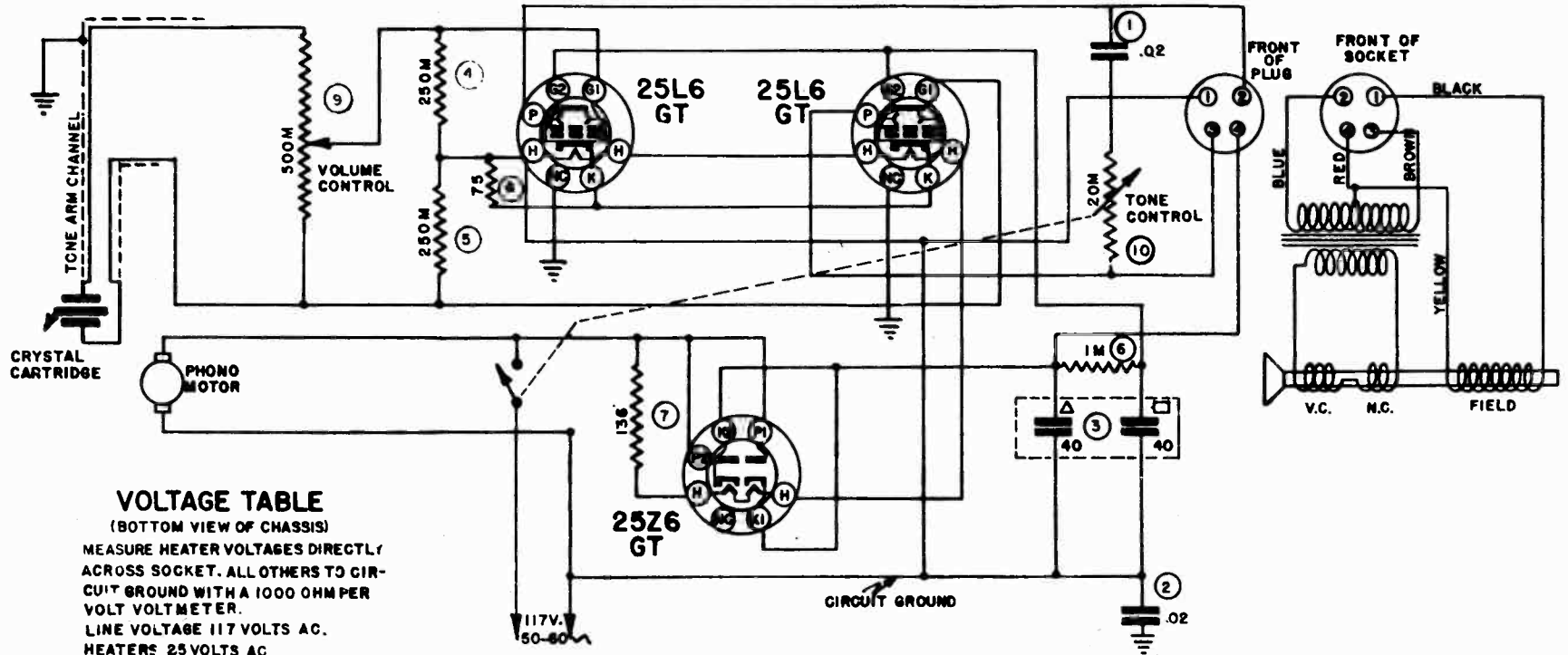
As the control panel is permanently fastened to the tuner in all models except those mounted in the Regency Symphony combination, it is not necessary to remove the control knobs from the cabinet. The instructions immediately following are for all combinations except the Regency Symphony. Separate instructions for removing the CR-192A chassis from that instrument are shown in this section.

Before removing the chassis, disconnect the antenna and ground leads from their terminals, and the output and the power cables from their receptacles. While holding the rear of the chassis in place with one hand, remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis. Then while lowering the chassis, pull back on it to disengage the hooks from the slots in the tray to which the chassis is mounted, and withdraw the chassis from the cabinet.

In replacing the chassis, slide it in so that the small hooks near the front ride inside the flanges on the sides of the chassis tray. Push the chassis forward as far as it will go so that the hooks engage the slots in the chassis tray; then lift up the rear of the chassis until the guide pin in the chassis tray projects through the triangular opening the flange on the rear of the F-M chassis. Now pull back on the chassis. A ledge on the guide pin referred to above, will hold the chassis in place while the mounting screws are started into the captivated nuts on the top of the chassis tray. These nuts are accessible through the angular slots in the chassis flange and the Phillips-head screws should be turned in to within a few turns of being tight. Now slide the chassis forward until its panel is flush with the panel of the A-M radio chassis and tighten the two Phillips-head screws securely, completing the replacement operation.

REGENCY SYMPHONY. To remove the CR-192A chassis from the Regency Symphony first remove the antenna and ground leads from their terminals and the output and power cables from their receptacles. Then pull the control knobs from their shafts and remove the two fancy-head screws from the front panel. Next, remove the two Phillips-head screws from the angular slots in the flange at the rear of the chassis and pull the chassis out of the rear of the cabinet.

REFERENCE NO.	DESCRIPTION	MAGNAVOX PART NO.
1	Coil assembly, antenna	360270G1
2	Coil assembly, r-f	360271G1
3	Coil assembly, oscillator	360263G1
4	Transformer, i-f	360258G1
5	Transformer, discriminator	360259G1
6	Transformer, power, 117 volt 50/60 cycle	300030G1
7	Choke, filter	350032G1
10	Capacitor, variable, three-gang tuning	260059G1
11	Capacitor, trimmer 1.5–7 mmf.	260067G1
12	Capacitor, ceramic, 4 mmf.	250088G28
13	Capacitor, ceramic, 35 mmf.	250088G26
14	Capacitor, molded mica, 47 mmf.	250159G96
15	Capacitor, molded mica, 100 mmf.	250159G98
16	Capacitor, molded mica, 470 mmf. +10%	250159G90
17	Capacitor, molded mica, 470 mmf. +20%	250159G102
18	Capacitor, ceramic, 500 mmf	250088G31
19	Capacitor, paper, .01 mfd. 600V.	250129G2
20	Capacitor, paper, .05 mfd. 600V.	250129G5
21	Capacitor, electrolytic, 10 mfd. 450V.	270026G3
22	Capacitor, electrolytic, 30-10 mfd. 475V.	270023G2
23	Capacitor, molded mica, 180 mmf.	250159G53
30	Resistor, composition, 100 ohm ½ W.	230084G7
31	Resistor, composition, 220 ohm ½ W.	230084G9
32	Resistor, composition, 1000 ohm ½ W.	230084G13
33	Resistor, composition, 3300 ohm ½ W.	230084G16
34	Resistor, composition, 4700 ohm ½ W.	230084G17
35	Resistor, composition, 4700 ohm 1 W.	230085G17
36	Resistor, composition, 6800 ohm 2 W.	230061G18
37	Resistor, composition, 22,000 ohm ½ W.	230084G21
38	Resistor, composition, 47,000 ohm ½ W.	230084G23
39	Resistor, composition, 100,000 ohm ½ W. ±20%	230084G25
40	Resistor, composition, 120,000 ohm ½ W. ±10%	230084G87
41	Resistor, composition, 100,000 ohm ½ W. ±10%	230084G86
42	Resistor, composition, 220,000 ohm ½ W.	230084G27
43	Resistor, composition, 470,000 ohm ½ W.	230084G29
44	Resistor, composition, 1 megohm ½ W.	230084G31
45	Resistor, composition, 1.5 megohm ½ W.	230084G32
46	Resistor, wire wound, 5000 ohm, 5 W	240035G4
55	Switch, rotary, power	160163G1
56	Socket, output	180060G1
	Calibrated glass dial—CR-192A	150287G1
	Calibrated glass dial—CR-192B	150287G2



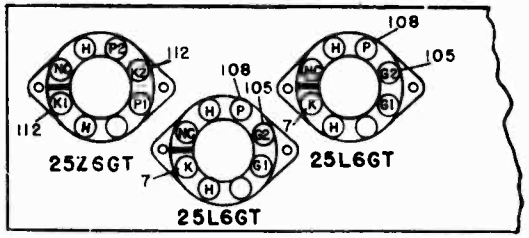
VOLTAGE TABLE

(BOTTOM VIEW OF CHASSIS)

MEASURE HEATER VOLTAGES DIRECTLY ACROSS SOCKET. ALL OTHERS TO CIRCUIT GROUND WITH A 1000 OHM PER VOLT VOLTMETER.

LINE VOLTAGE 117 VOLTS AC.

HEATERS 25 VOLTS AC



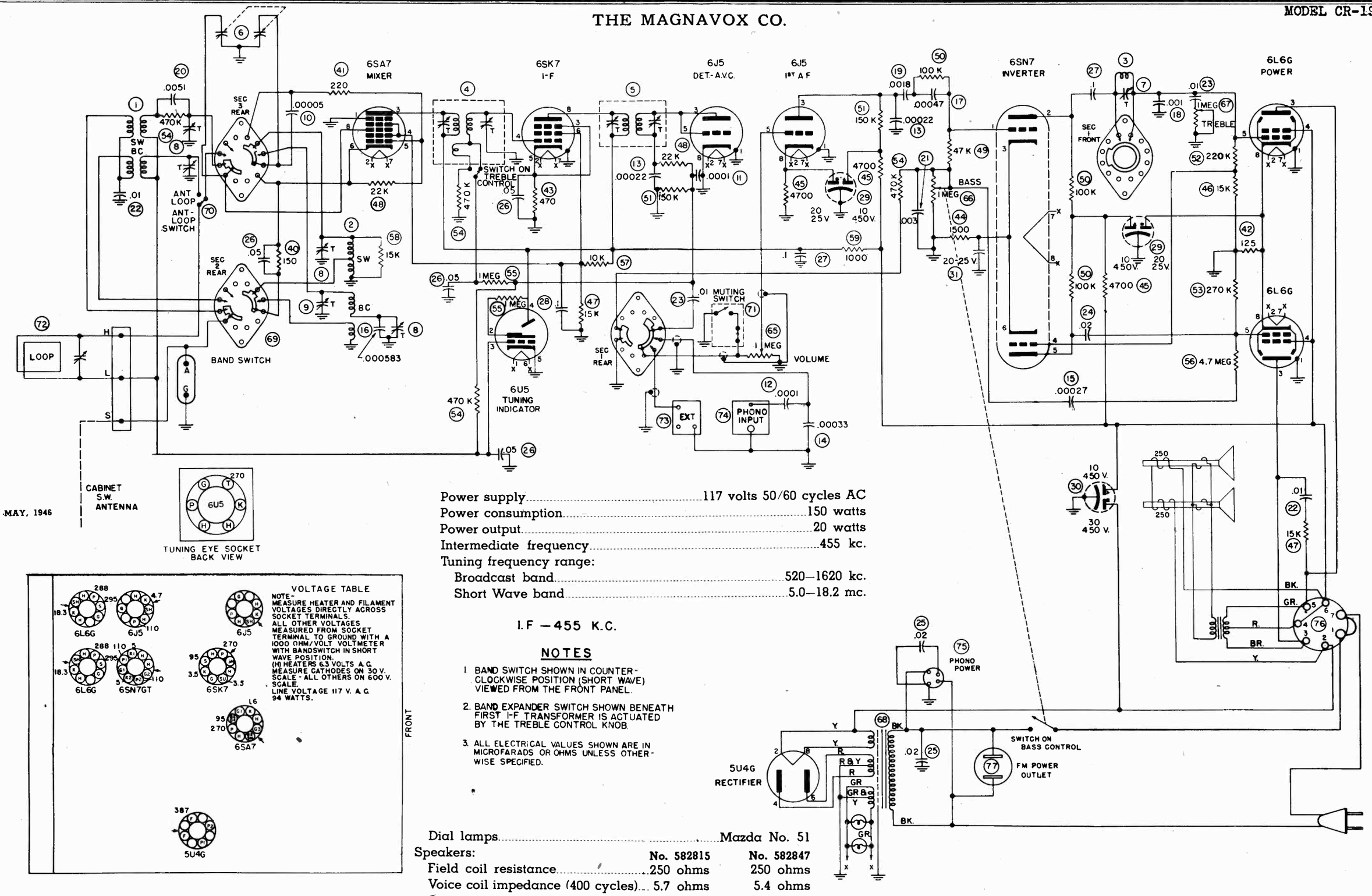
Primary voltage	117 V. AC-DC;
Power consumption	65 watts;
Power output	3 watts;
Vacuum Tubes	2 - 25L6GT; 1 - 25Z6GT;
Speaker: Field Coil	*1800 ohms;
Transformer	**3000 ohms;

* DC resistance. ** Primary impedance.

Ref. No.	Description	Magnavox Part No.
1	Capacitor, molded paper, .02 mfd. 600 V.	250056
2	Capacitor, molded paper, .02 mfd. 600 V.	250056
3	Capacitor, electrolytic, 40-40 mfd. 150 V.	270013
4	Resistor, carbon, 250,000 ohm ⅓ W.	230010
5	Resistor, carbon, 250,000 ohm ⅓ W.	230010
6	Resistor, carbon, 1000 ohm	239745
7	Resistor, wire wound, 136 ohm 15 W.	240014
8	Resistor, wire wound, 75 ohm 5 W.	230056
9	Control, volume, 500,000 ohm	220032
10	Control, tone with power switch, 20,000 ohm	220021
	Socket, octal marked 25L6GT	180128
	Socket, octal marked 25Z6GT	180129
	Knob, control stamped VOLUME	140035
	Knob, control stamped OFF-ON-TONE	140036

MODEL CR-193

THE MAGNAVOX CO.



MAY, 1946

Power supply	117 volts 50/60 cycles AC
Power consumption	150 watts
Power output	20 watts
Intermediate frequency	455 kc.
Tuning frequency range:	
Broadcast band	520—1620 kc.
Short Wave band	5.0—18.2 mc.

I.F —455 K.C.

NOTES

1. BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (SHORT WAVE) VIEWED FROM THE FRONT PANEL.
2. BAND EXPANDER SWITCH SHOWN BENEATH FIRST I-F TRANSFORMER IS ACTUATED BY THE TREBLE CONTROL KNOB.
3. ALL ELECTRICAL VALUES SHOWN ARE IN MICROFARADS OR OHMS UNLESS OTHERWISE SPECIFIED.

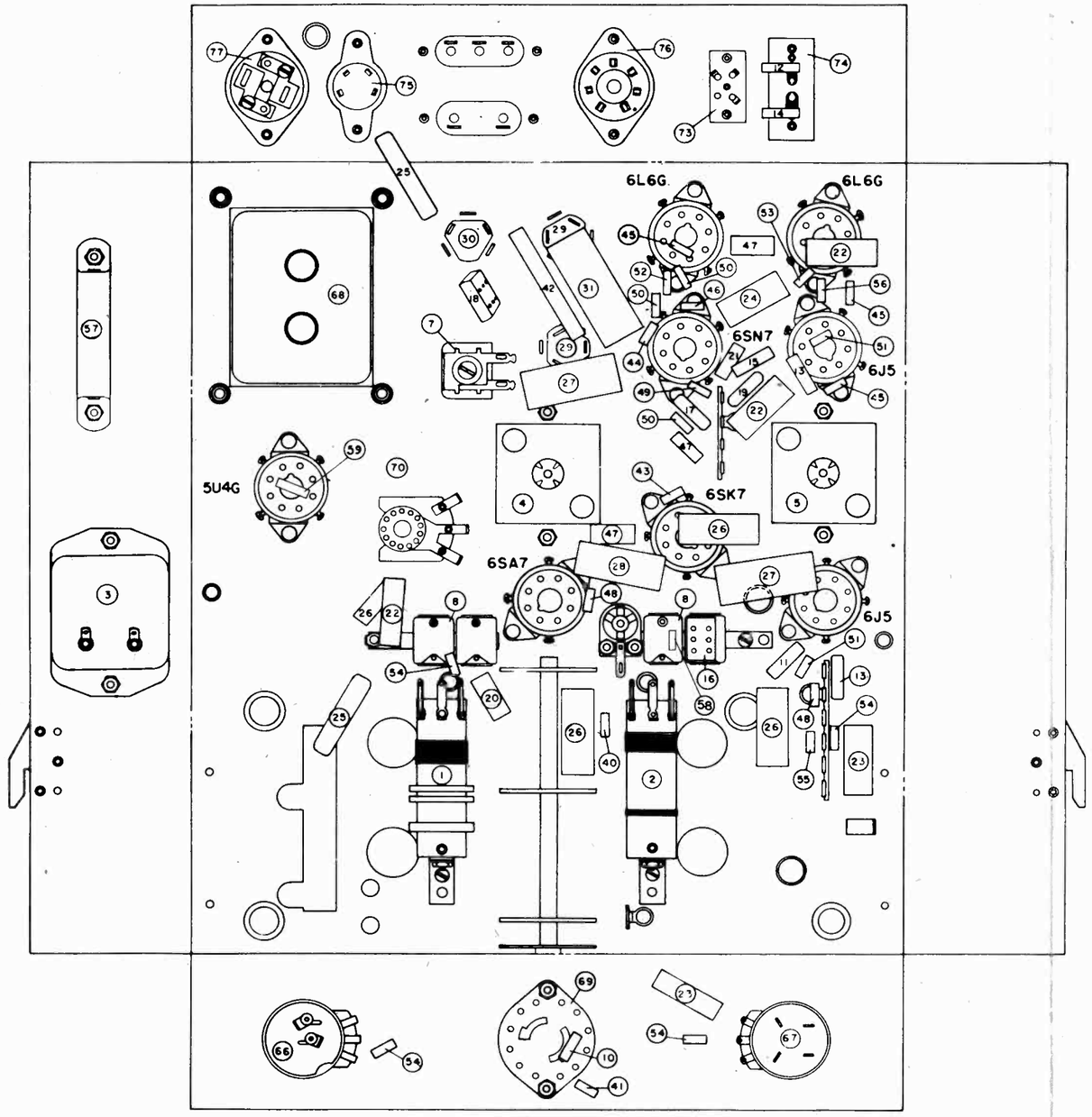
Dial lamps	Mazda No. 51

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

Record Changer: Seeburg Model K

For Clarified schematics, see P.15-23; for alignment and other data, see Pp.15-25 to 15-29

THE MAGNAVOX CO.



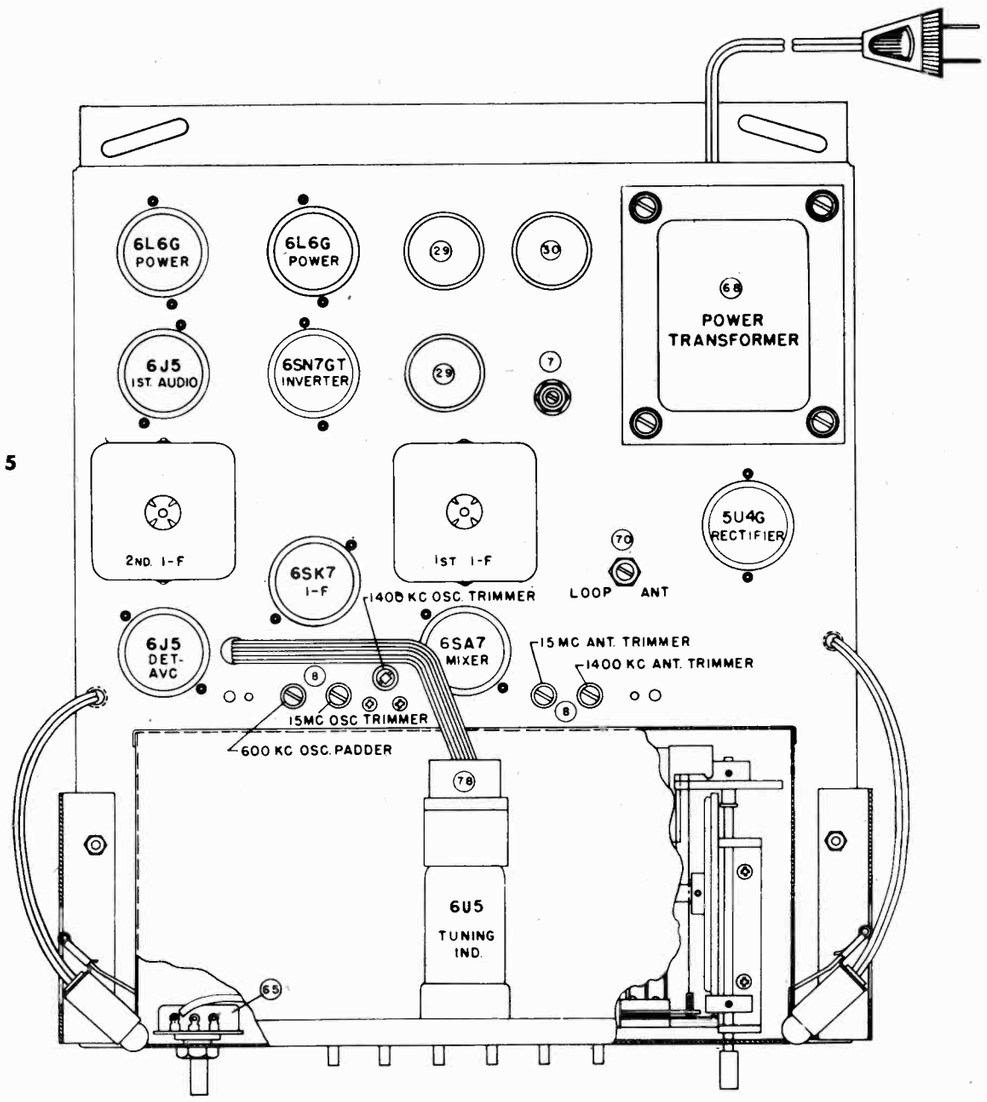


FIGURE 5

SPECIAL SERVICE INFORMATION

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

STAGE GAINS*

Antenna Post to Converter Grid at:

600 kc.	5.5
6 mc.	2.0

R-F on Converter to I-F Grid at:

600 kc.	28
6 mc.	22

I-F on Converter Grid to I-F Grid at:

455 kc.	34

I-F Grid to Detector Plate at:

455 kc.	67

OSCILLATOR OUTPUT VOLTAGE

The DC voltage developed across Oscillator Grid Resistor (48) at:

600 kc.	5.6
6 mc.	6.0

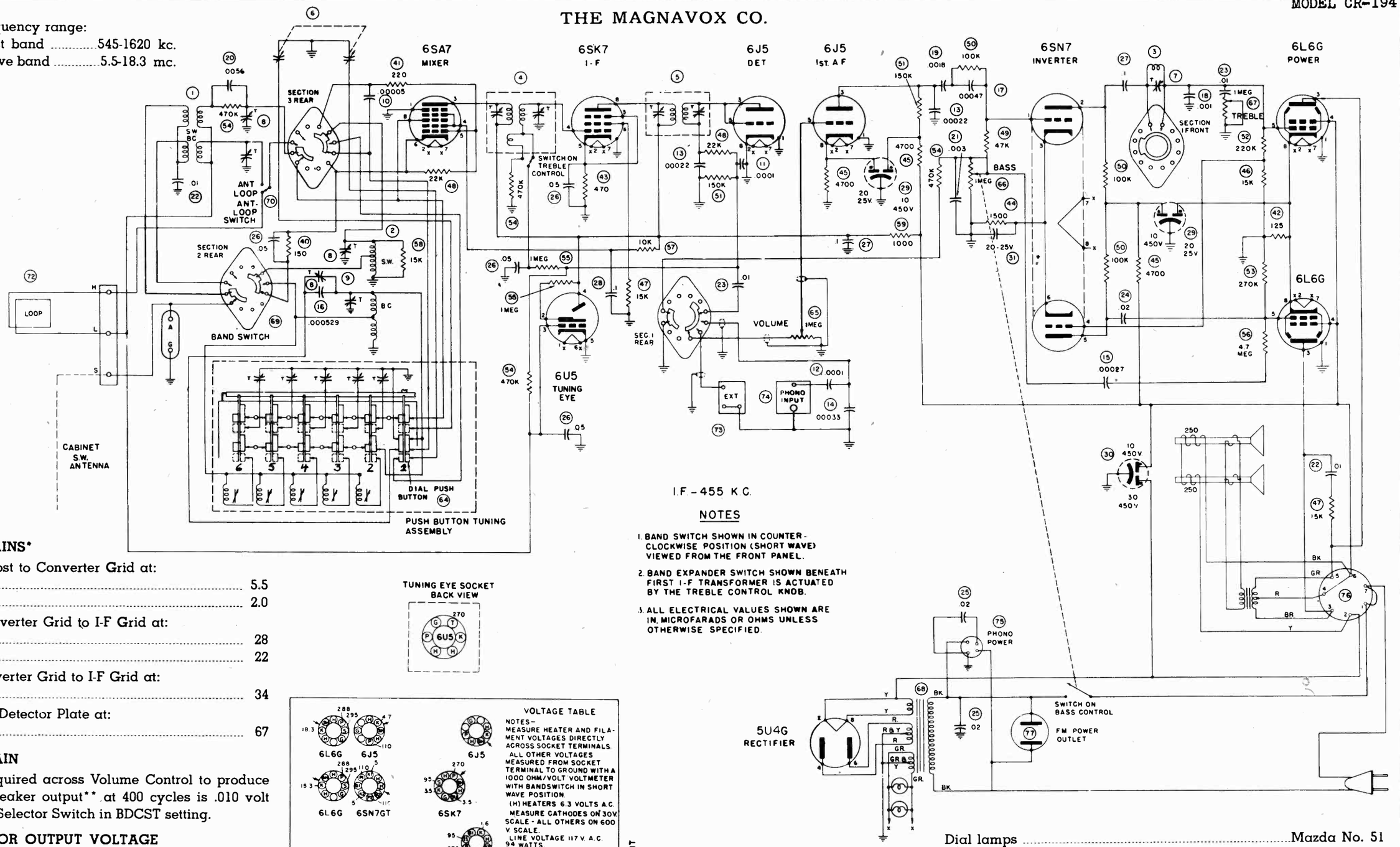
AUDIO GAIN

Voltage required across Volume Control to produce .05 watt speaker output** at 400 cycles is .010 volt with Band Selector Switch in BDCST setting.

* Variations of ±20% are permissible. All readings made with sufficient input signal to provide .05 watt speaker output.
** .05 watt speaker output at 400 cycles is equivalent to a reading of 0.4 volts as measured by a high resistance AC voltmeter across the voice coil of either speaker.

THE MAGNAVOX CO.

Tuning frequency range:
Broadcast band .....545-1620 kc.
Short wave band .....5.5-18.3 mc.



STAGE GAINS*

Antenna Post to Converter Grid at:

600 kc.	5.5
6 mc.	2.0

R-F on Converter Grid to I-F Grid at:

600 kc.	28
6 mc.	22

I-F on Converter Grid to I-F Grid at:

455 kc.	34

I-F Grid to Detector Plate at:

455 kc.	67

AUDIO GAIN

Voltage required across Volume Control to produce .05 watt speaker output** at 400 cycles is .010 volt with Band Selector Switch in BDCST setting.

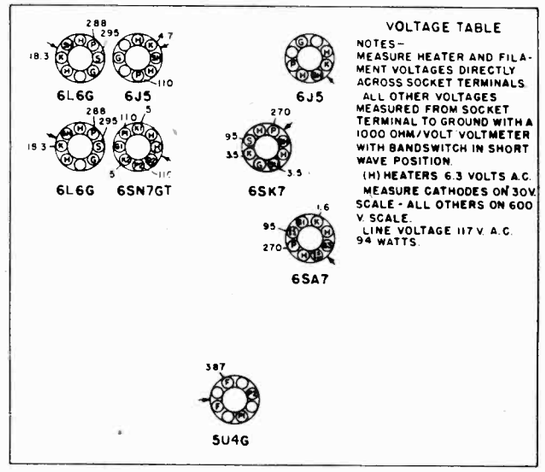
OSCILLATOR OUTPUT VOLTAGE

The DC voltage developed across Oscillator Grid Resistor (48) at:

600 kc.	9.7
6 mc.	5.3

* Variations of 20%; are permissible. All readings made with sufficient input signal to provide .05 watt speaker output.
** .05 watt speaker output at 400 cycles is equivalent to a reading of 0.4 volts as measured by a high resistance AC voltmeter across the voice coil of either speaker

TUNING EYE SOCKET BACK VIEW



NOTES

1. BAND SWITCH SHOWN IN COUNTER-CLOCKWISE POSITION (SHORT WAVE) VIEWED FROM THE FRONT PANEL.
2. BAND EXPANDER SWITCH SHOWN BENEATH FIRST I-F TRANSFORMER IS ACTUATED BY THE TREBLE CONTROL KNOB.
3. ALL ELECTRICAL VALUES SHOWN ARE IN MICROFARADS OR OHMS UNLESS OTHERWISE SPECIFIED.

Dial lamps	Mazda No. 51	
Speaker:	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	150 watts	
Power output	20 watts	
Intermediate frequency	455 kc.	

For Clarified schematics, see P.15-45; for push button data, see P.15-47; for Parts list, see P.15-30

THE MAGNAVOX CO.

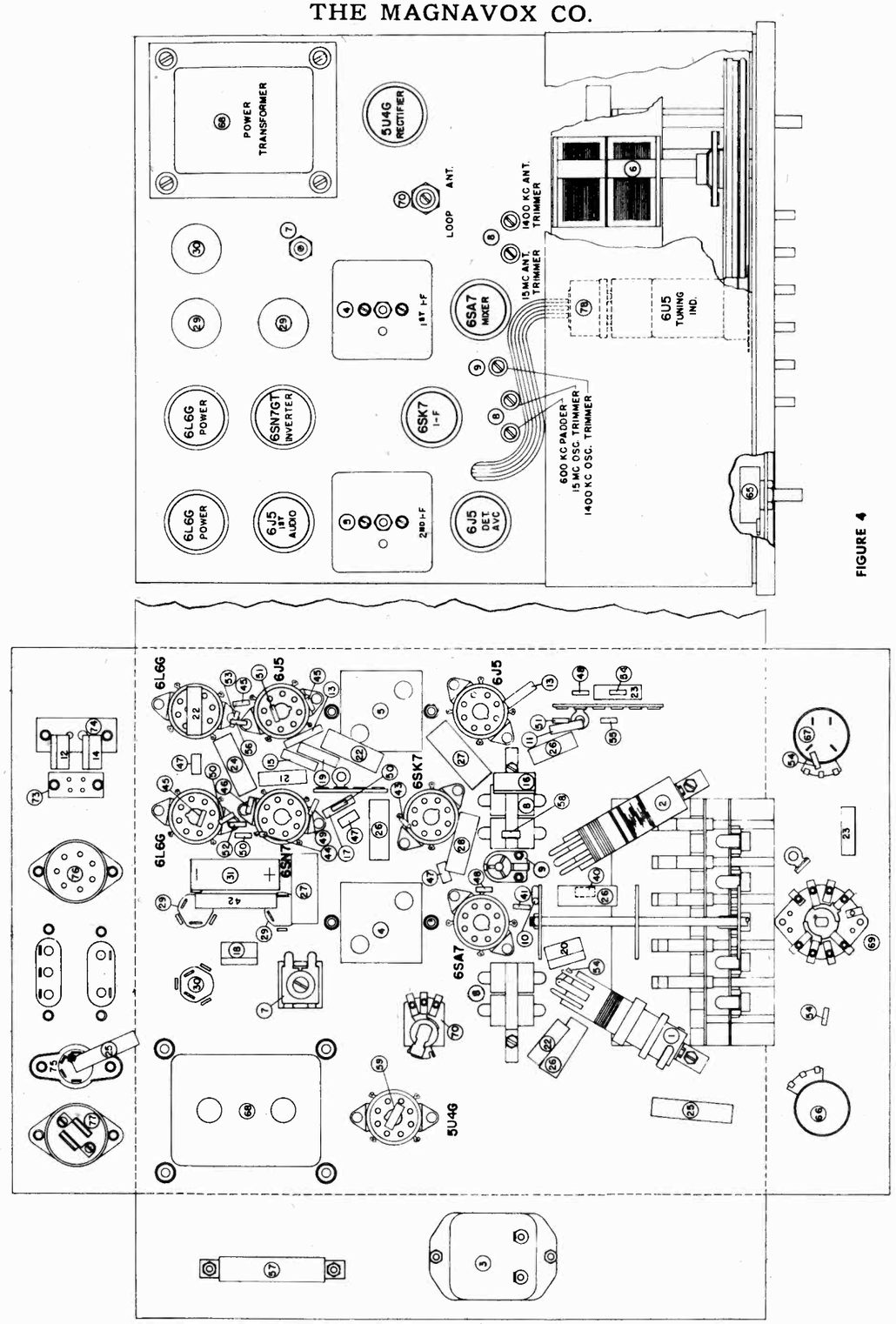


FIGURE 4

THE MAGNAVOX CO

METHOD FOR REMOVING CHASSIS FROM CABINET

Model CR-194 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 hooks near the front, ride inside the flanges on the sides of the chassis tray. Push the chassis forward as far as it will go and the hooks should then engage the slots in the chassis tray. Replace the two Phillips-head screws and nuts and tighten securely. Replace all plugs in their receptacles and the antenna leads on their correct terminals. The antenna terminal board for the loop antenna connections is designated S-L-H. The end of the short wave antenna that is fastened to the inside of the cabinet connects to S. Always disconnect this antenna from terminal S when an outdoor antenna is used as it may pick up noise. The two terminals on the loop are designated L and H. The leads connected to these terminals should be wired to the corresponding terminals (L and H) on the chassis.

ALIGNMENT PROCEDURE

The alignment of this receiver requires the use of an accurately calibrated r-f signal generator and an output meter. All trimmer condenser locations are shown on the chassis layout diagram, Figure 4. The radio volume control should be turned to maximum and the signal generator output kept as low as possible during alignment to prevent the AVC from operating and giving false readings. *Always set the Selectivity Switch to SHARP TUNE before aligning the i-f stages.* This is done by turning the Treble Control counter-clockwise as far as possible.

I-F Alignment

1. Connect the output of the signal generator to the oscillator grid (pin No. 5) of the 6SA7 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.

Broadcast Band Alignment

1. Remove the signal generator lead from the 6SA7 grid and connect it to the radio antenna terminal through the .00025 mfd. capacitor. The ANT-LOOP switch (70) 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.

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 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 and the 1400 kc. antenna trimmer for maximum output. If considerable adjustment was necessary, recheck the 600 kc. padder setting.

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 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 (7) 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.

THE MAGNAVOX CO.

DIAL CORD REPLACEMENT

Two separate drive cables are used in the CR-194 dial assembly. One cable is used to transmit the motion from the dial 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 moved. Separate instructions for replacing either of these cables is given in the following paragraphs.

CONDENSER DRIVE CABLE REPLACEMENT

Slide a short length (approximately ½-inch) of sleeving over one end of a 19-inch length of dial cable, form a small loop and tie a knot in the manner shown on Figure 1. Hook this loop over the metal hook in pulley "C" and lace the cable through the pulley slot and around the pulley in a counter-clockwise direction when viewed from the rear of the panel, keeping the cable to the rear of the pulley groove. Lace the cable in the direction indicated by the arrow on the drawing wrapping 2½ turns around the smaller diameter portion of the tuning control shaft *from front to back;* then around the opposite side of pulley "C." Loop one end of tension spring "D" on the right-hand edge of the slot in pulley "C"; thread the free end of the drive cable through the opposite end of spring "D" and pull back on the cable until the spring coils are stretched to approximately one inch. Tie a double knot in the cable while maintaining tension on the spring, completing the operation.

DIAL POINTER DRIVE CABLE REPLACEMENT

Rotate the tuning control shaft until the slot in the groove of pulley "C" is up. Cut a piece of dial cable approximately 40 inches long and slide a short piece of sleeving over the cable. Tie a small loop in one end of the cable and temporarily hook it over the metal hook in pulley "C." Lace the other end through the slot in the pulley groove and in a counter-clockwise direction around the large pulley, then around pulley "B" and straight across the back of the dial frame; over pulley "A" and in a counter-clockwise direction around pulley "C." This last wrap around pulley "C" must be at the front of the pulley groove or nearest the panel. *This is important!* Lace the free end of the cable through the slot in pulley "C" and remove the other end of the cable from the hook.

Fasten one end of tension spring "E" over the pulley hook and lace the two free ends of the drive cable through the other end of the spring. Now pull back on the cable until the tension spring coils are stretched to approximately 1⅝ inches. Tie a double knot in the cable while maintaining tension on the spring.

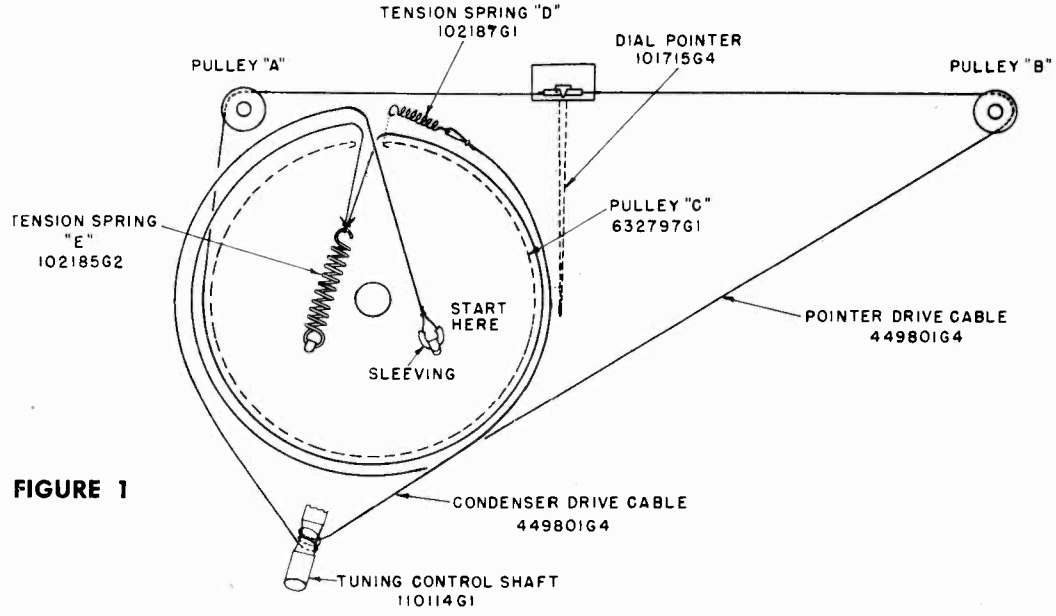
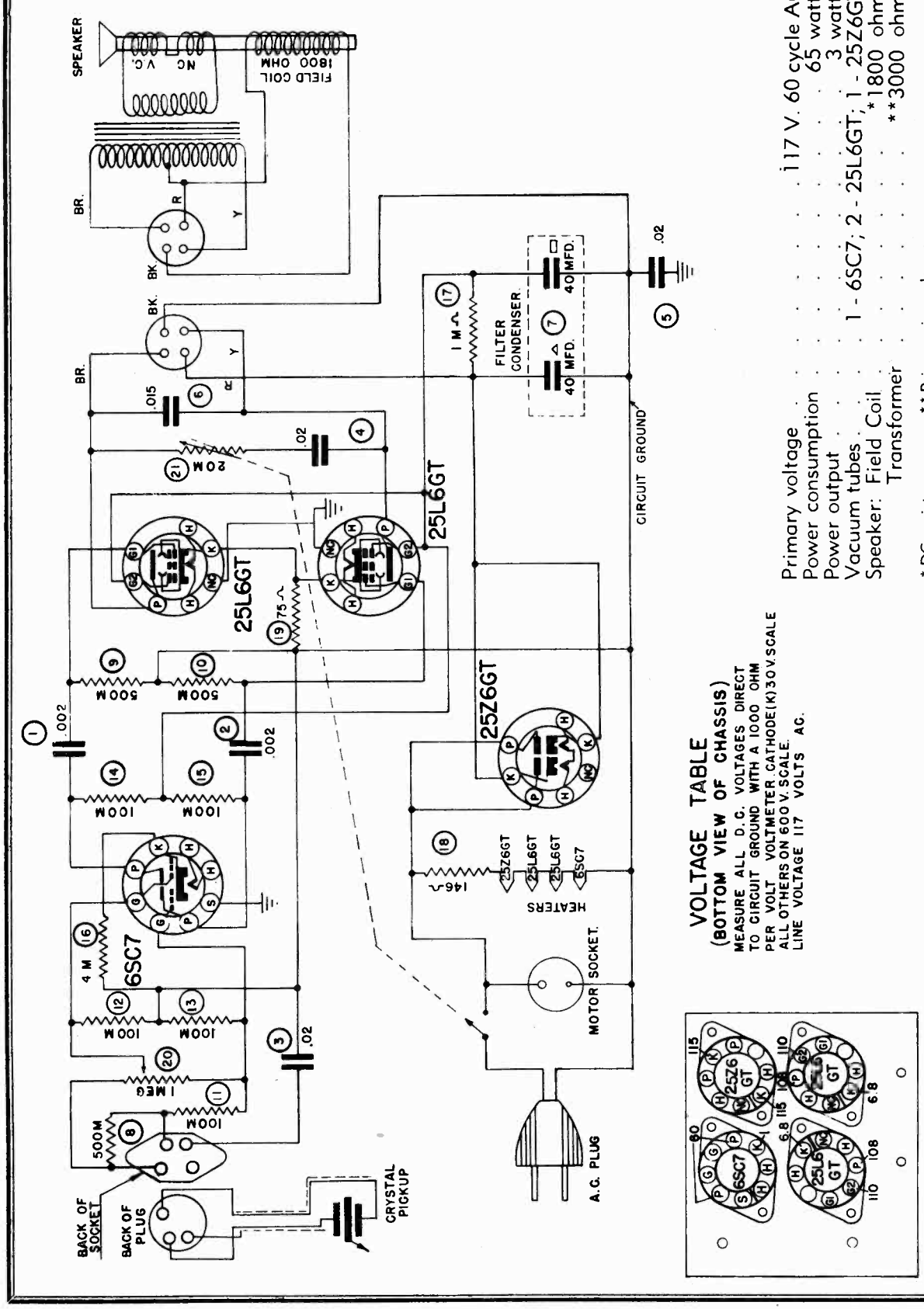


FIGURE 1

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 lugs on the dial pointer pressed together over the sleeving. After checking to see that the condenser gang is still 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.

MODELS A-206F,
A-206G

THE MAGNAVOX CO.



Primary voltage	117 V. 60 cycle AC;
Power consumption	65 watts;
Power output	3 watts;
Vacuum tubes	1 - 6SC7; 2 - 25L6GT; 1 - 25Z6GT;
Speaker: Field Coil	*1800 ohms;
Transformer	**3000 ohms;

* DC resistance. ** Primary impedance.

VOLTAGE TABLE

(BOTTOM VIEW OF CHASSIS)

MEASURE ALL D.C. VOLTAGES DIRECT TO CIRCUIT GROUND WITH A 1000 OHM PER VOLT VOLTMETER. CATHODE (K) 30 V. SCALE. ALL OTHERS ON 600 V. SCALE. LINE VOLTAGE 117 VOLTS A.C.

Models A-206F and A-206G are alike electrically. They differ slightly only in their mechanical layout.

A-206F. A-206G

Ref. No.	Description	Magnavox Part No.
1	Capacitor, tubular, .002 mfd. 600 V.	254161
2	Capacitor, tubular, .002 mfd. 600 V.	254161
3	Capacitor, tubular, .02 mfd. 600 V.	250056
4	Capacitor, tubular, .02 mfd. 600 V.	250056
5	Capacitor, molded paper, .02 mfd. 600 V.	250056
6	Capacitor, molded paper, .015 mfd. 600 V.	250069
7	Capacitor, electrolytic, 40-40 mfd. 150 V.	270013
8	Resistor, carbon, 500,000 ohm ⅓ W.	239755
9	Resistor, carbon, 500,000 ohm ⅓ W.	239755
10	Resistor, carbon, 500,000 ohm ⅓ W.	239755
11	Resistor, carbon, 100,000 ohm ⅓ W.	239753
12	Resistor, carbon, 100,000 ohm ⅓ W.	239753
13	Resistor, carbon, 100,000 ohm ⅓ W.	239753
14	Resistor, carbon, 100,000 ohm ⅓ W.	239753
15	Resistor, carbon, 100,000 ohm ⅓ W.	239753
16	Resistor, carbon, 4,000 ohm ⅓ W.	230024
17	Resistor, carbon, 1,000 ohm ⅓ W.	239745
18	Resistor, wire wound, 146 ohm 15 W.	240015
19	Resistor, wire wound, 75 ohm 5 W.	230056
20	Control, volume, 1 megohm	222518
21	Control, tone with power switch, 20,000 ohm	220021
	Socket, octal marked 6SC7	180126
	Socket, octal marked 25L6GT	180128
	Socket, octal marked 25Z6GT	180129
	Socket, crystal pickup	180081
	Socket and cable assembly, motor	460052
	Socket and cable assembly, speaker	460076
	Knob, control, stamped VOLUME	140035
	Knob, control, stamped OFF-ON-TONE	140036

A-307P2

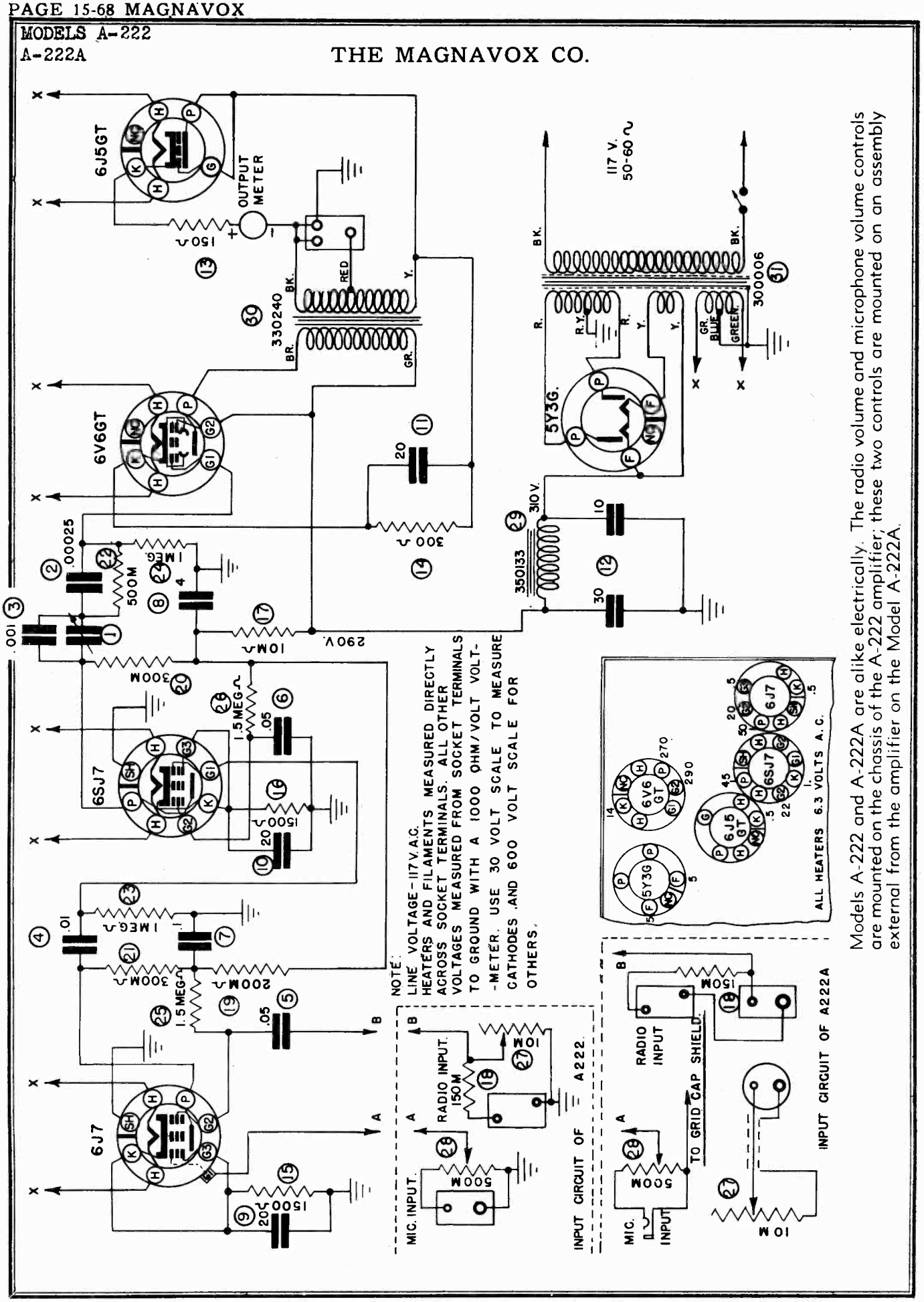
Ref. No.	Description	Magnavox Part No.
C1	Capacitor, tubular, .005 mfd. 600 V.	254180
C2	Capacitor, tubular, .00025 mfd. 600 V.	254133
C3	Capacitor, tubular, .003 mfd. 600 V.	254163
C4	Capacitor, electrolytic, 25 mfd. 25 V.	274165
C5	Capacitor, electrolytic, 10 mfd. 150 V.	270001
C6	Capacitor, tubular, .2 mfd. 200 V.	254182
C7	Capacitor, tubular, .2 mfd. 200 V.	254182
C8	Capacitor, electrolytic, 16 mfd. 150 V.	274212
C9	Capacitor, electrolytic, 16 mfd. 150 V.	274212
C10	Capacitor, electrolytic, 16 mfd. 150 V.	274212
C11	Capacitor, tubular, .2 mfd. 200 V.	254182
C12	Capacitor, tubular, .02 mfd. 600 V.	254127
R1	Control, volume 100,000—500,000 ohm	222383
R2	Resistor, carbon, 100,000 ohm ½ W.	234445
R4	Resistor, carbon, 60,000 ohm ½ W.	234440
R5	Resistor, carbon, 20,000 ohm ½ W.	234435
R6	Control, treble, 20,000 ohm, with switch	222556
R7	Resistor, carbon, 1 megohm ½ W.	234450
R8	Resistor, carbon, 5,000 ohm ½ W.	234430
R9	Resistor, carbon, 50,000 ohm ½ W.	234439
R10	Resistor, carbon, 40,000 ohm ½ W.	234438
R11	Resistor, carbon, 10,000 ohm ½ W.	234433
R12	Resistor, carbon, 10,000 ohm ½ W.	234433
R13	Resistor, carbon, 100,000 ohm ½ W.	234445
R14	Resistor, carbon, 100,000 ohm ½ W.	234445
R15	Resistor, wire wound, 60 ohm	247852
R16	Resistor, carbon, 3 megohm ½ W.	234452
R17	Resistor, carbon, 3 megohm ½ W.	234452
T1	Transformer, input	320189
	Choke, filter	350107
	Knob, control marked VOLUME	149570
	Knob, control marked TONE	149571
	Lamp, 120 V. pilot	182593
	Socket, octal marked 6C5	182658
	Socket, octal marked 25L6	182657
	Socket, octal marked 25Z5	182656
	Socket, 5 prong marked SPK	182525
	Socket, pilot lamp	182769
	Fuse, cartridge, 2 amp.	182606

A-307P6

Ref. No.	Description	Magnavox Part No.
1	Capacitor, tubular, .005 mfd. 600 V.	254180
2	Capacitor, tubular, .02 mfd. 400 V.	250015
3	Capacitor, tubular, .01 mfd. 400 V.	254158
4	Capacitor, tubular, .01 mfd. 400 V.	254158
5	Capacitor, tubular, .5 mfd. 200 V.	254134
6	Capacitor, electrolytic, 20 mfd. 15 V.	270018
7	Capacitor, electrolytic 40-40 mfd. 150 V.	270013
8	Resistor, carbon, 500,000 ohm ⅓ W.	239755
9	Resistor, carbon, 500,000 ohm ⅓ W.	239755
10	Resistor, carbon, 500,000 ohm ⅓ W.	239755
11	Resistor, carbon, 250,000 ohm ⅓ W.	230010
12	Resistor, carbon, 250,000 ohm ⅓ W.	230010
13	Resistor, carbon, 50,000 ohm ⅓ W.	239751
14	Resistor, carbon, 20,000 ohm ⅓ W.	239750
15	Resistor, carbon 4,000 ohm ⅓ W.	230024
16	Resistor, carbon, 1,000 ohm ⅓ W.	239745
17	Resistor, wire wound, 146 ohm	240015
18	Resistor, carbon, 75 ohm	230056
	Socket, octal marked 6SC7	180126
	Socket, octal marked 25L6GT	180137
	Socket, octal marked 25Z6GT	180129
	Socket, 5-prong marked SPK	180012
	Socket, 4-prong marked IN	180024
	Socket, pilot lamp	182769
	Socket, crystal pickup	180081
	Lamp, 120 V. pilot	182593

MODELS A-222
A-222A

THE MAGNAVOX CO.



Models A-222 and A-222A are alike electrically. The radio volume and microphone volume controls are mounted on the chassis of the A-222 amplifier; these two controls are mounted on an assembly external from the amplifier on the Model A-222A.

A-222, A-222A

Primary voltage	117 V. 60 cycle AC;
Power consumption	46 watts;
Input impedance: Radio Input	10,000 ohms;
Microphone Input	500,000 ohms;
Output impedance:	15 ohms;
Power output	3 watts;
Vacuum tubes	1-6J7; 1-6SJ7; 1-6V6GT; 1-6J5GT; 1-5Y3G;

Ref. No.	Description	Magnavox Part No.
1	Capacitor, trimmer, 250-525 mmf.	250066
2	Capacitor, molded mica, .00025 mfd.	259772
3	Capacitor, molded mica, .001 mfd.	259604
4	Capacitor, paper, .01 mfd. 400 V.	254158
5	Capacitor, paper, .05 mfd. 400 V.	254146
6	Capacitor, paper, .05 mfd. 400 V.	254146
7	Capacitor, paper, 0.1 mfd. 400 V.	254166
8	Capacitor, electrolytic, 4 mfd. 450 V.	270015
9	Capacitor, electrolytic, 20 mfd. 25 V.	273611
10	Capacitor, electrolytic, 20 mfd. 25 V.	273611
11	Capacitor, electrolytic, 20 mfd. 25 V.	273611
12	Capacitor, electrolytic, 30-10 mfd. 450 V.	273610
13	Resistor, carbon, 150 ohm ⅓ W.	230033
14	Resistor, carbon, 300 ohm 2 W.	234508
15	Resistor, carbon, 1500 ohm ⅓ W.	230041
16	Resistor, carbon, 1500 ohm ⅓ W.	230041
17	Resistor, carbon, 10,000 ohm ⅓ W.	239749
18	Resistor, carbon, 150,000 ohm ⅓ W.	239785
19	Resistor, carbon, 200,000 ohm ⅓ W.	239754
20	Resistor, carbon, 300,000 ohm ⅓ W.	230017
21	Resistor, carbon, 300,000 ohm 1 W.	234488
22	Resistor, carbon, 500,000 ohm ⅓ W.	239755
23	Resistor, carbon, 1 megohm ⅓ W.	239756
24	Resistor, carbon, 1 megohm ⅓ W.	239756
25	Resistor, carbon, 1.5 megohm ⅓ W.	230012
26	Resistor, carbon, 1.5 megohm ⅓ W.	230012
27	Control, 10,000 ohm with power switch	220023
28	Control, 500,000 ohm	220026
29	Choke, filter	350133
30	Transformer, output	330240
31	Transformer, power, 117 V. 50-60 cycle	300006
	Lamp, 6-8 V. pilot	183657
	Socket, pilot lamp	180078
	Socket, octal marked 6J7	180100
	Socket, octal marked 6SJ7	180064
	Socket, octal marked 6V6GT	180099
	Socket, octol marked 6J5GT	180085
	Socket, octal marked 5Y3G	180094
	Socket, output	180097
	Socket, radio input	180098
	Socket, microphone input	189741
	Socket, output meter	182776

A-3001

Primary voltage	117 V. 60 cycle AC;	
Power consumption	134 watts;	
Power output	25 watts;	
Vacuum tubes	1-6C5; 1-6L6G; 1-5Z3;	
Speaker:	Model 132	Model 302;
Field coil	*2600 ohms	*3500 ohms;
Transformer	None	**5000 ohms;

* DC resistance. ** Primary impedance.

AMPLIFIER

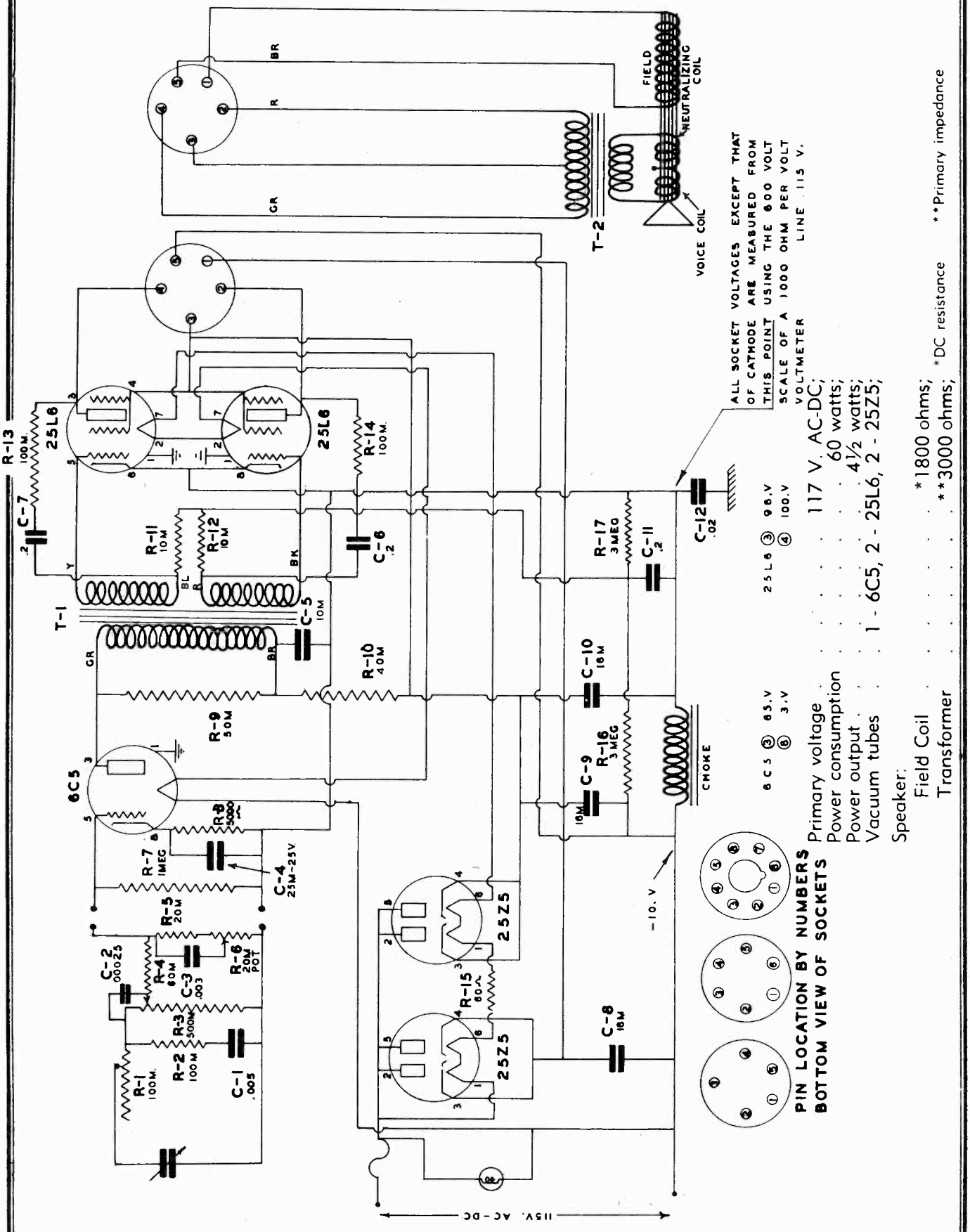
Ref. No.	Description	Magnavox Part No.
C1, C6	Capacitor, electrolytic, 25 mfd. 25 V., 25 mfd. 50 V.	274224
C2	Capacitor, tubular, .5 mfd. 400 V.	254147
C3	Capacitor, tubular, .5 mfd. 400 V.	254147
C4	Capacitor, tubular, .5 mfd. 400 V.	254147
C5	Capacitor, tubular, .002 mfd. 600 V.	254161
C7	Capacitor, tubular, .01 mfd. 600 V.	254153
C8	Capacitor, tubular, .01 mfd. 600 V.	254153
C9	Capacitor, tubular, .5 mfd. 400 V.	254147
C10	Capacitor, electrolytic, 10 mfd. 500 V.	274194
C11	Capacitor, tubular, .2 mfd. 200 V.	254182
C12	Capacitor, electrolytic, 10 mfd. 500 V.	274194
C13	Capacitor, tubular, .1 mfd. 200 V.	254152
R1	Resistor, carbon, 200,000 ohm ½ W.	234447
R2	Resistor, carbon, 2000 ohm ½ W.	234426
R3	Resistor, carbon, 15,000 ohm ½ W.	234434
R4	Resistor, carbon, 15,000 ohm ½ W.	234434
R5	Resistor, carbon, 15,000 ohm ½ W.	234434
R6	Resistor, wire wound, 200 ohm	242607
R7	Resistor, carbon, 7500 ohm 2 W.	234518
R8	Resistor, carbon, 7500 ohm 2 W.	234518
T1	Transformer, input	320187
T2	Transformer, output	330188
T3	Transformer, power, 117 V. 50-60 cycle	300106
1	Choke, tone filter	350122
	Choke, filter	350113

CONTROL PANEL

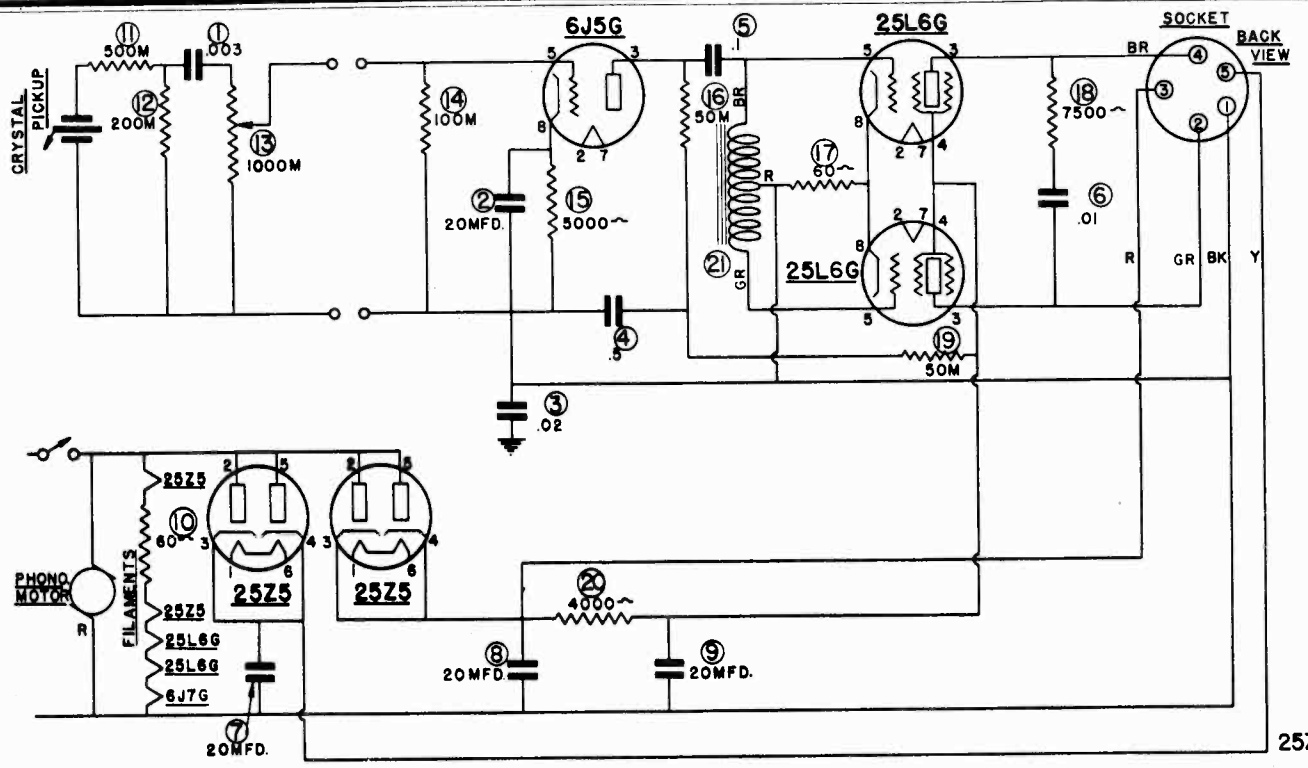
C1	Capacitor, molded mica, .002 mfd.	259603
C2	Capacitor, molded mica, .001 mfd.	259604
C3	Capacitor, molded mica, .002 mfd.	259603
R1	Control, bass, 1 megohm	222444
R2	Resistor, carbon, 150,000 ohm ½ W.	234446
R3	Control, volume, 1 megohm	222444
R4	Resistor, carbon, 50,000 ohm ½ W.	234439
R5	Control, treble, 200,000 ohm	222445
1	Choke, tone filter	362463
2	Switch, "radio-phono" changeover	169602
	Socket, Phonograph pickup cable	182465
	Socket, pilot lamp	182803

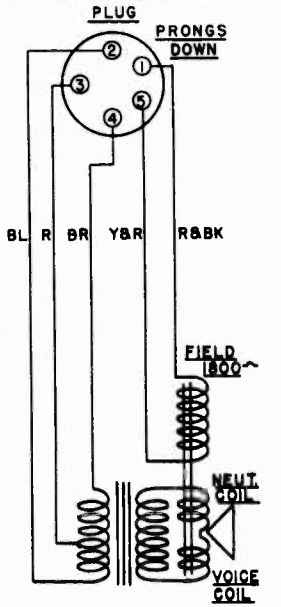
MODEL A-307P2

THE MAGNAVOX CO.

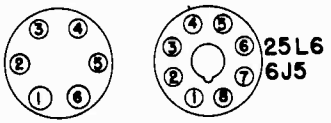


For Parts list, see P.15-67





PIN LOCATION OF SOCKETS
BOTTOM VIEW



NUMBERS IN CIRCUIT ARE NUMBERS SHOWN WHEN VIEWING CHASSIS FROM BOTTOM SIDE

SOCKET VOLTAGES

LINE VOLTAGE 117 V. A.C.
ALL VOLTAGES MEASURED TO CONDENSER (FILTER) GROUND WITH A 1000 OHM/VOLT VOLTMETER ON 600 V. SCALE.
MEASURE CATHODES ON 30 V. SCALE

25L6G		6J5G	
③	110 V.	③	48 V.
④	96 V.	⑧	1.2 V.
⑧	5.3 V.		

Primary voltage	117 V. AC-DC;
Power consumption	60 watts;
Power output	6 watts;
Vacuum tubes	1 - 6J5, 2 - 25L6G, 2 - 25Z5
Speaker:	
Field Coil	*1800 ohms;
Transformer	**3500 ohms;

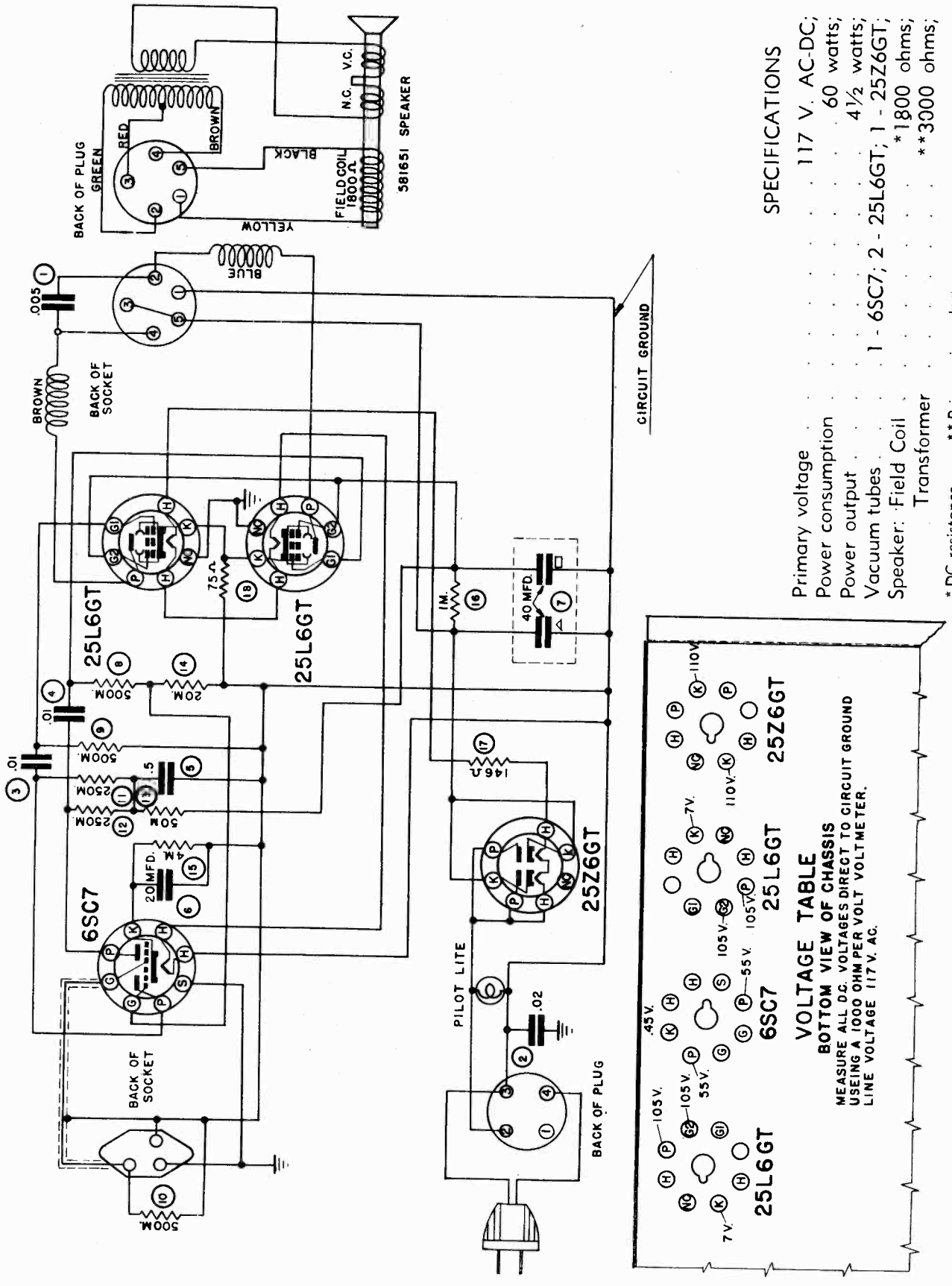
*DC resistance

**Primary impedance

Ref. No.	Description	Magnavox Part No.
1	Capacitor, moulded mica, .003 mfd.	259778
2	Capacitor, electrolytic, 20 mfd. 25 V.	279993
3	Capacitor, tubular, .02 mfd. 600 V.	254127
4	Capacitor, tubular, .5 mfd. 200 V.	254134
5	Capacitor, tubular, .1 mfd. 400 V.	254166
6	Capacitor, tubular, .01 mfd. 400 V.	254158
7	Capacitor, electrolytic, 20 mfd. 150 V.	279992
8	Capacitor, electrolytic, 20 mfd. 150 V.	279992
9	Capacitor, electrolytic, 20 mfd. 150 V.	279992
10	Resistor, wire wound, 60 ohm 10 W.	247852
11	Resistor, carbon, 500,000 ohm ⅓ W.	239755
12	Resistor, carbon, 200,000 ohm ⅓ W.	239754
13	Control, volume, 1 megohm, with switch	223555
14	Resistor, carbon, 100,000 ohm ⅓ W.	239753
15	Resistor, carbon, 5,000 ohm ½ W.	234430
16	Resistor, carbon, 50,000 ohm ½ W.	234439
17	Resistor, carbon, 60 ohm 2 W.	234502
18	Resistor, carbon, 7,500 ohm ½ W.	239991
19	Resistor, carbon, 50,000 ohm ½ W.	234439
20	Resistor, carbon, 4,000 ohm ½ W	234429
21	Transformer, input	320233
	Socket, octal marked 6J5	189914
	Socket, octal marked 25L6	189995
	Socket, octal marked 25Z5	189996
	Knob, control	144100

MODEL A-307P6

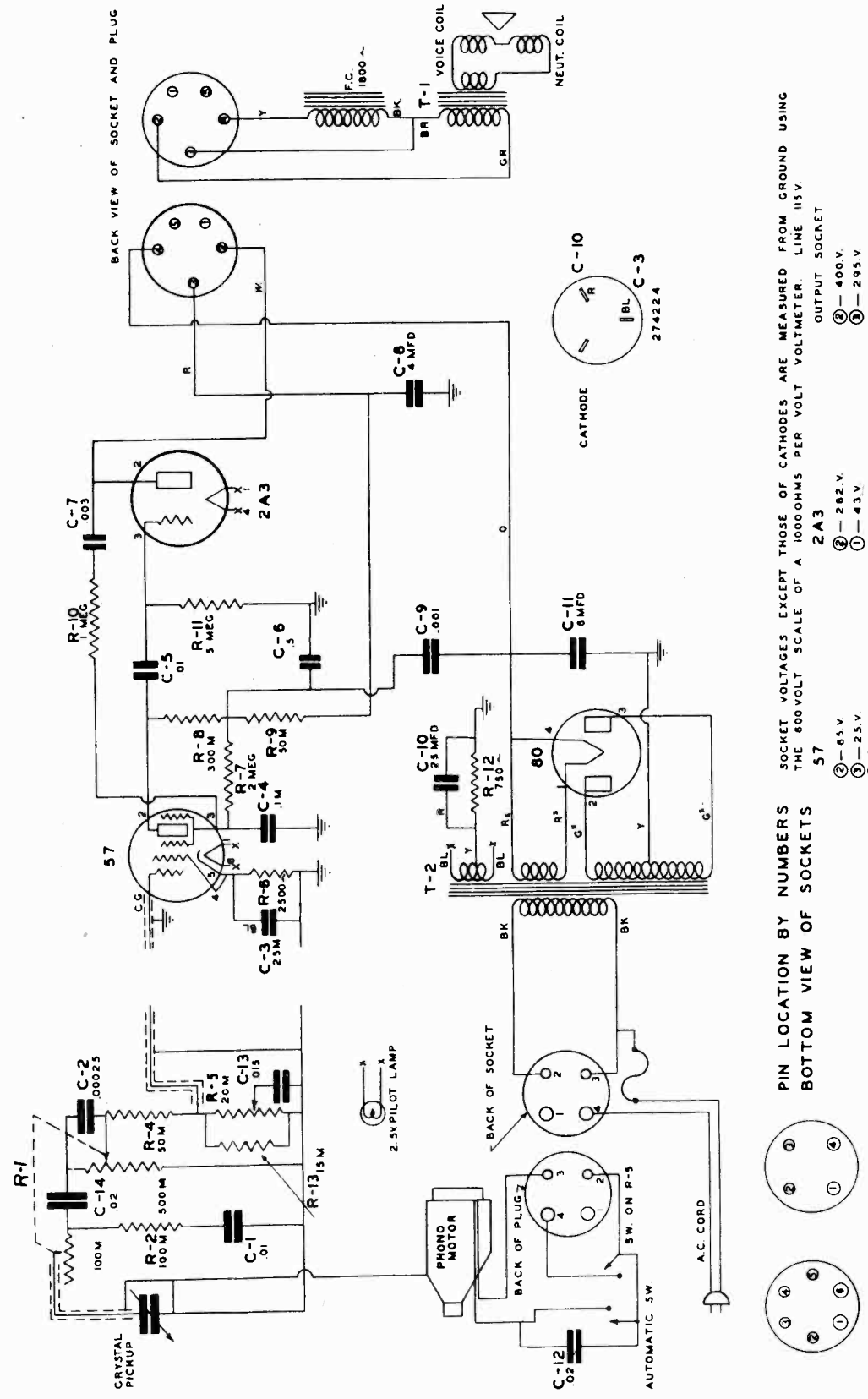
THE MAGNAVOX CO.



For Parts list, see P.15-67

MODEL A-501

THE MAGNAVOX CO.



PIN LOCATION BY NUMBERS
BOTTOM VIEW OF SOCKETS

SOCKET VOLTAGES EXCEPT THOSE OF CATHODES ARE MEASURED FROM GROUND USING THE 600 VOLT SCALE OF A 1000 OHMS PER VOLT VOLTMETER. LINE 115 V.

57	2A3	OUTPUT SOCKET
② — 65. V	② — 282. V	② — 400 V.
③ — 25. V.	① — 43. V.	⑤ — 295. V.
④ ⑤ — 1.3 V.		

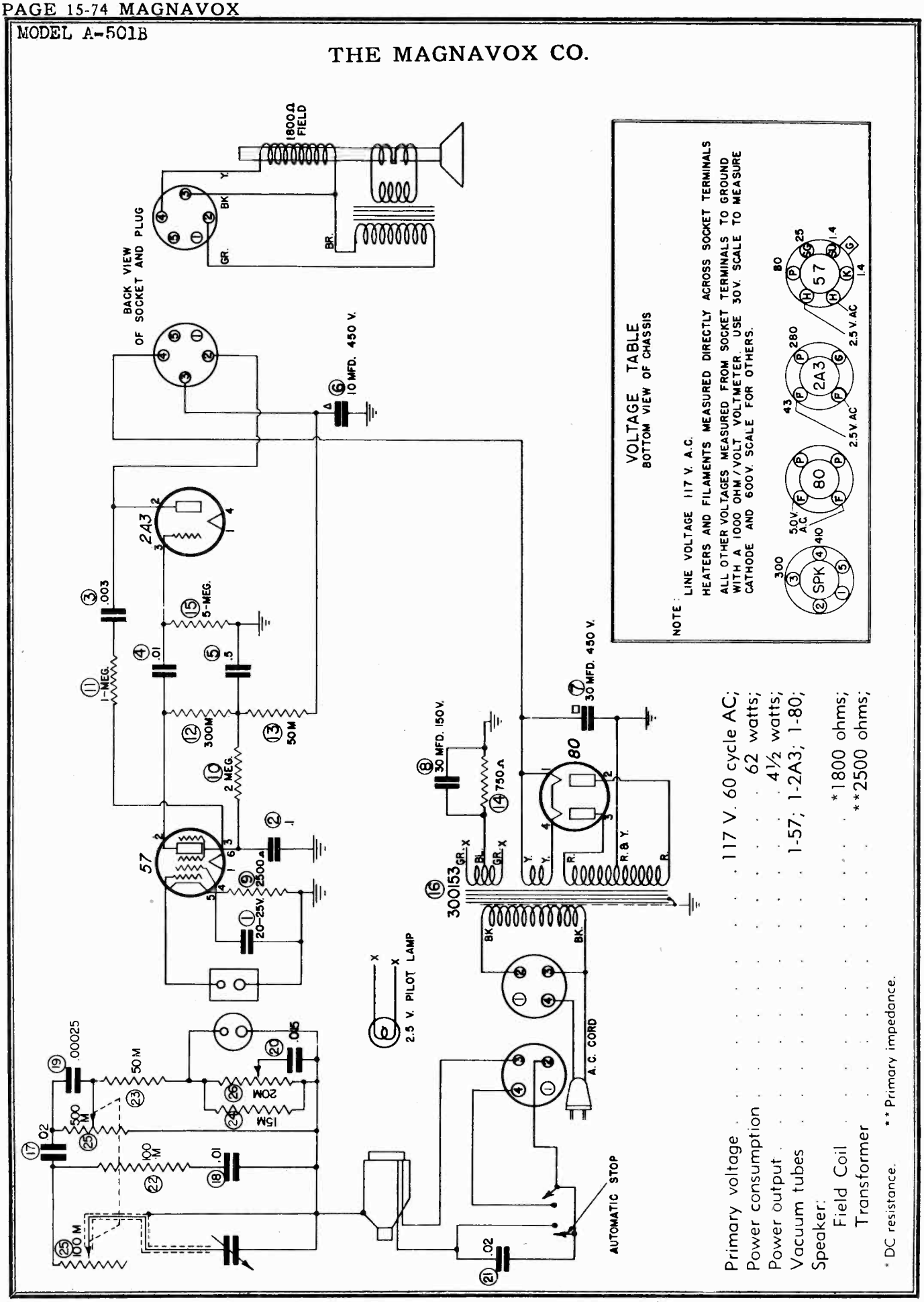
Primary voltage	117 V. 60 cycle AC;
Power consumption	62 watts;
Power output	4½ watts;
Vacuum tubes	1 57, 1 2A3, 1 80;
Speaker:	
Field Coil	*1800 ohms;
Transformer	**2500 ohms;

* DC resistance. ** Primary impedance.

For Parts list, see P.15-75

MODEL A-501B

THE MAGNAVOX CO.



Primary voltage	117 V. 60 cycle AC;
Power consumption	62 watts;
Power output	4½ watts;
Vacuum tubes	1-57; 1-2A3; 1-80;
Speaker:	
Field Coil	*1800 ohms;
Transformer	**2500 ohms;

* DC resistance. ** Primary impedance.

A-501

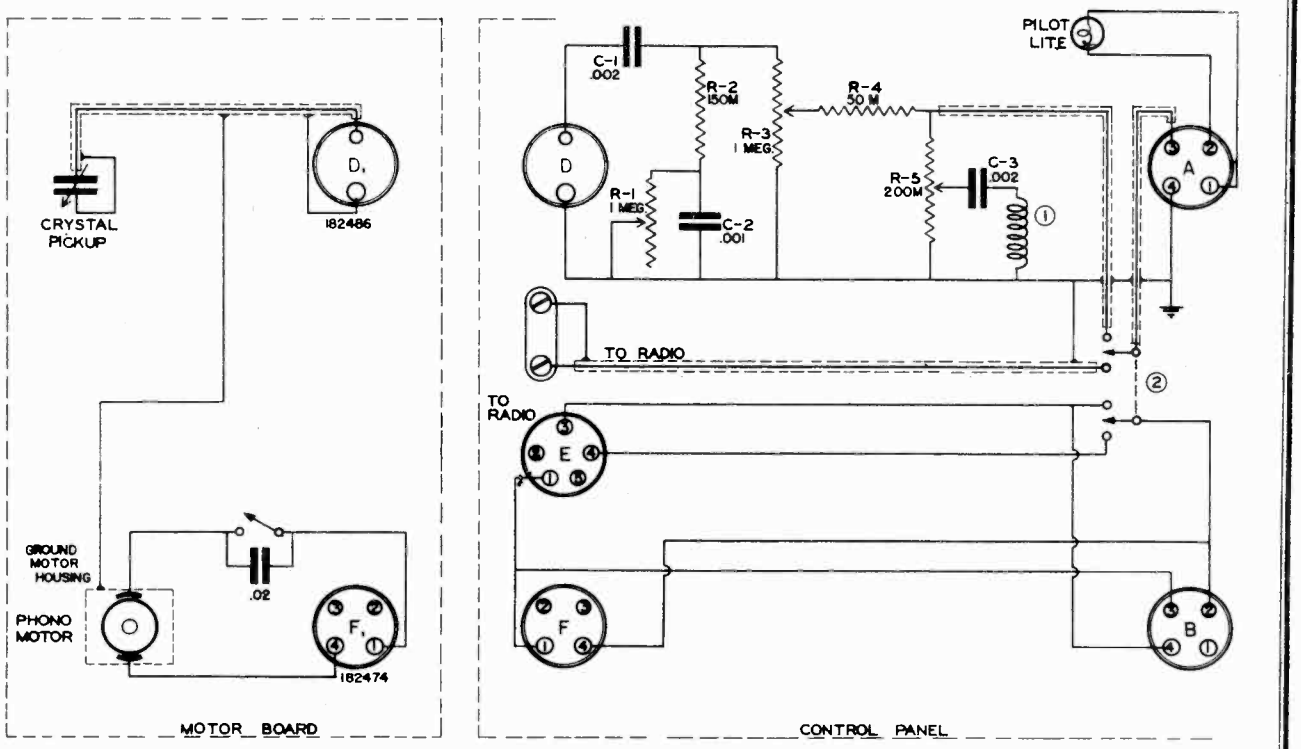
Ref. No.	Description	Magnavox Part No.
C1	Capacitor, tubular, .01 mfd. 600 V.	254153
C2	Capacitor, tubular, .00025 mfd. 600 V.	254133
C3, C10	Capacitor, electrolytic, 25 mfd. 25 V., 25 mfd. 50 V.	274224
C4	Capacitor, tubular, .1 mfd. 600 V.	254181
C5	Capacitor, tubular, .01 mfd. 600 V.	254153
C6	Capacitor, tubular, .5 mfd. 400 V.	254147
C7	Capacitor, tubular, .003 mfd. 600 V. +10%	254163
C8	Capacitor, electrolytic, 4 mfd. 500 V.	274238
C9	Capacitor, tubular, .001 mfd. 600 V.	254142
C11	Capacitor, electrolytic, 6 mfd. 500 V.	274250
C12	Capacitor, tubular, .02 mfd. 110 V. AC	259228
C13	Capacitor, tubular, .015 mfd. 600 V.	254131
C14	Capacitor, tubular, .02 mfd. 600 V.	254127
R1	Control, volume, 110,000-500,000 ohm	222383
R2	Resistor, carbon, 100,000 ohm ½ W.	234445
R4	Resistor, carbon, 50,000 ohm ½ W.	234439
R5	Control, treble, 20,000 ohm	222556
R6	Resistor, carbon, 2,500 ohm ½ W.	234427
R7	Resistor, carbon, 2 megohm ½ W.	234451
R8	Resistor, carbon, 300,000 ohm ½ W.	234448
R9	Resistor, carbon, 50,000 ohm ½ W.	234439
R10	Resistor, carbon, 1 megohm ½ W.	234450
R11	Resistor, carbon, 5 megohm 1 W.	234498
R12	Resistor, wire wound, 750 ohm	247816
T1	Transformer, power, 117 V. 60 cycle	300100
	Knob, "volume"	149570
	Knob, "tone"	149571
	Socket, pilot lamp	182458
	Socket, 6 prong marked 57	187334
	Socket, 4 prong marked 2A3	187332
	Socket, 4 prong marked 80	187326
	Socket, 5 prong (for speaker plug)	187331
	Socket, 4 prong (for motor plug)	182668
	Lamp, 2.5 V. pilot	187152
	Fuse, 2 amp. cartridge	182606

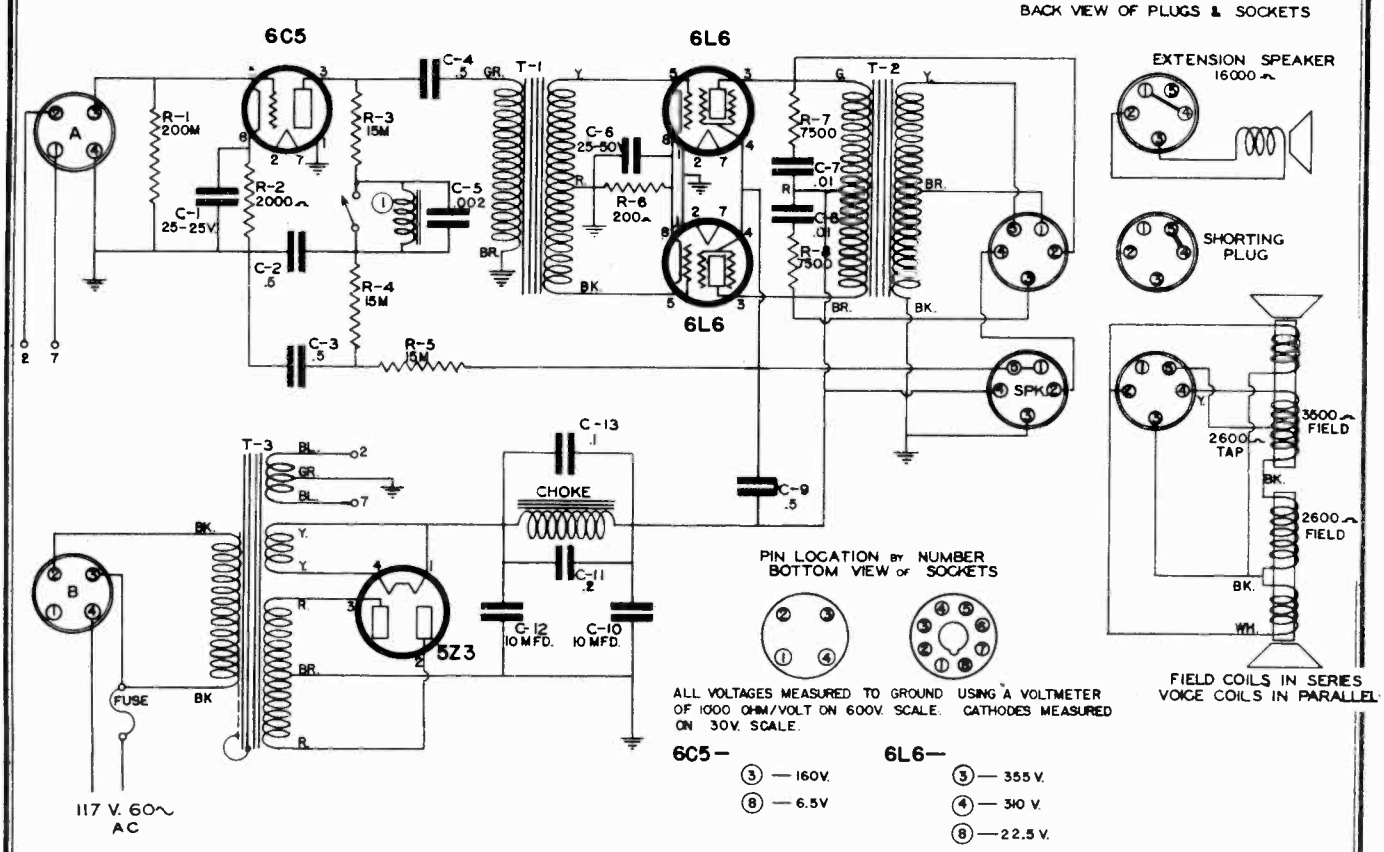
A-501B

Ref. No.	Description	Magnavox Part No.
1	Capacitor, electrolytic, 20 mfd. 25 V.	273611
2	Capacitor, tubular, .1 mfd. 600 V.	254181
3	Capacitor, tubular, .003 mfd. 600 V.	254163
4	Capacitor, tubular, .01 mfd. 600 V.	254153
5	Capacitor, tubular, .5 mfd. 400 V.	254147
6, 7	Capacitor, electrolytic, 30-10 mfd. 450 V.	273610
8	Capacitor, electrolytic, 30 mfd. 50 V.	270003
9	Resistor, carbon, 2500 ohms ½ W.	234427
10	Resistor, carbon, 2 megohm ½ W.	234451
11	Resistor, carbon, 1 megohm ½ W.	234450
12	Resistor, carbon, 300,000 ohm ½ W.	234448
13	Resistor, carbon, 50,000 ohm ½ W.	234439
14	Resistor, wire wound, 750 ohm 5 W.	240005
15	Resistor, carbon, 5 megohm ½ W.	234454
16	Transformer, power, 117 V. 60 cycle	300153
17	Capacitor, tubular, .02 mfd. 600 V.	254127
18	Capacitor, tubular, .01 mfd. 600 V.	254153
19	Capacitor, tubular, .00025 mfd. 600 V.	254133
20	Capacitor, tubular, .015 mfd. 600 V.	254131
21	Capacitor, tubular, .02 mfd. 110 V. AC	259935
22	Resistor, carbon, 100,000 ohm ½ W.	234445
23	Resistor, carbon, 50,000 ohm ½ W.	234439
24	Resistor, carbon, 15,000 ohm ½ W.	234434
25	Control, volume, 500,000—100,000 ohm	222383
26	Control, treble, 20,000 ohm	222556
	Socket, 2 prong, phonograph input	189741
	Socket, 6 prong marked 57	180011
	Socket, 5 prong marked SPK	180012
	Socket, 4 prong marked IN	180014
	Socket, 4 prong marked 2A3	180013
	Socket, 4 prong marked 80	180010
	Socket, pilot lamp	180017
	Knob, marked VOLUME	149570
	Knob, marked TONE	149571

MODEL A-3001

THE MAGNAVOX CO.

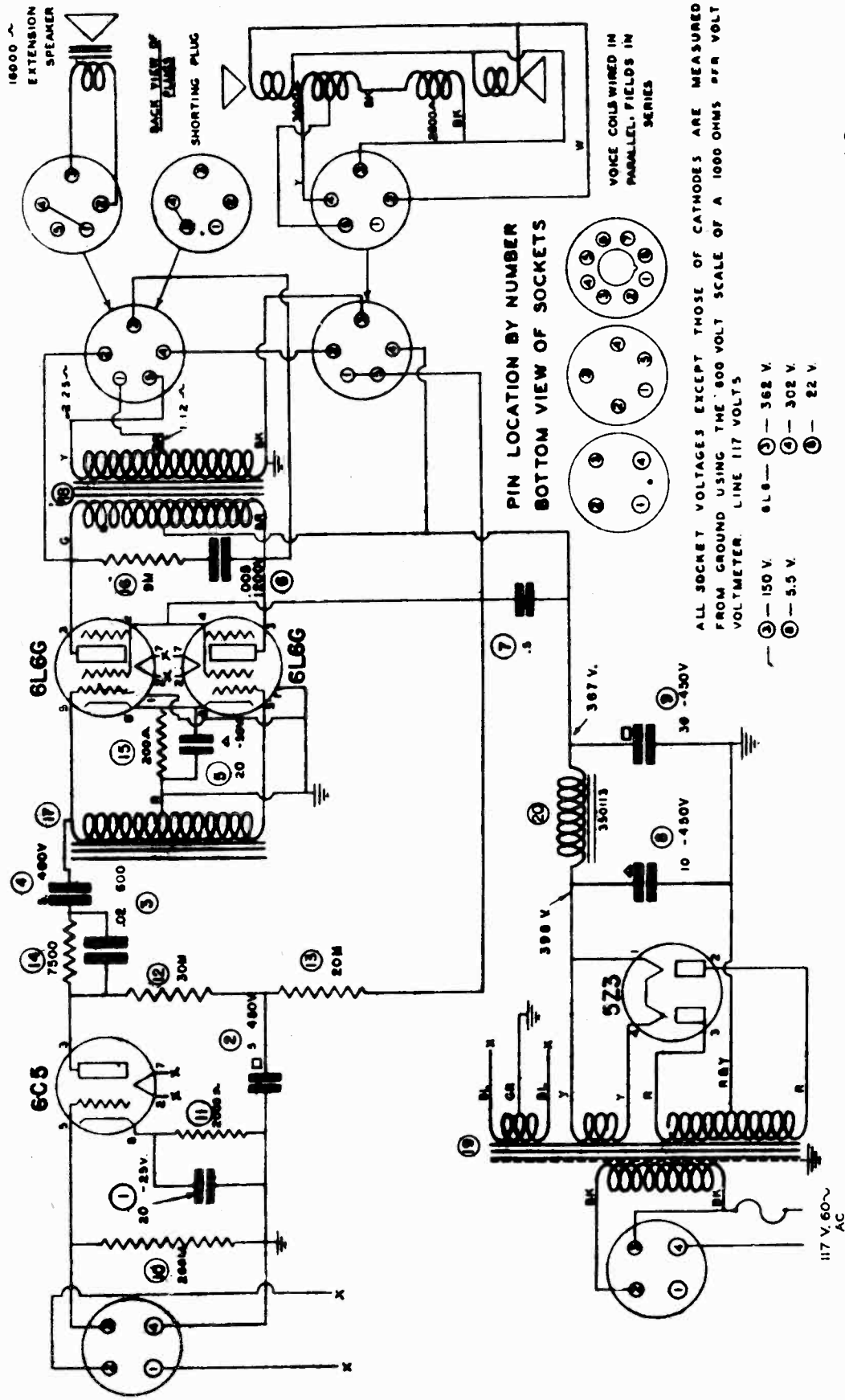




For Parts list, see P.15-69

MODEL A-3001B

THE MAGNAVOX CO.

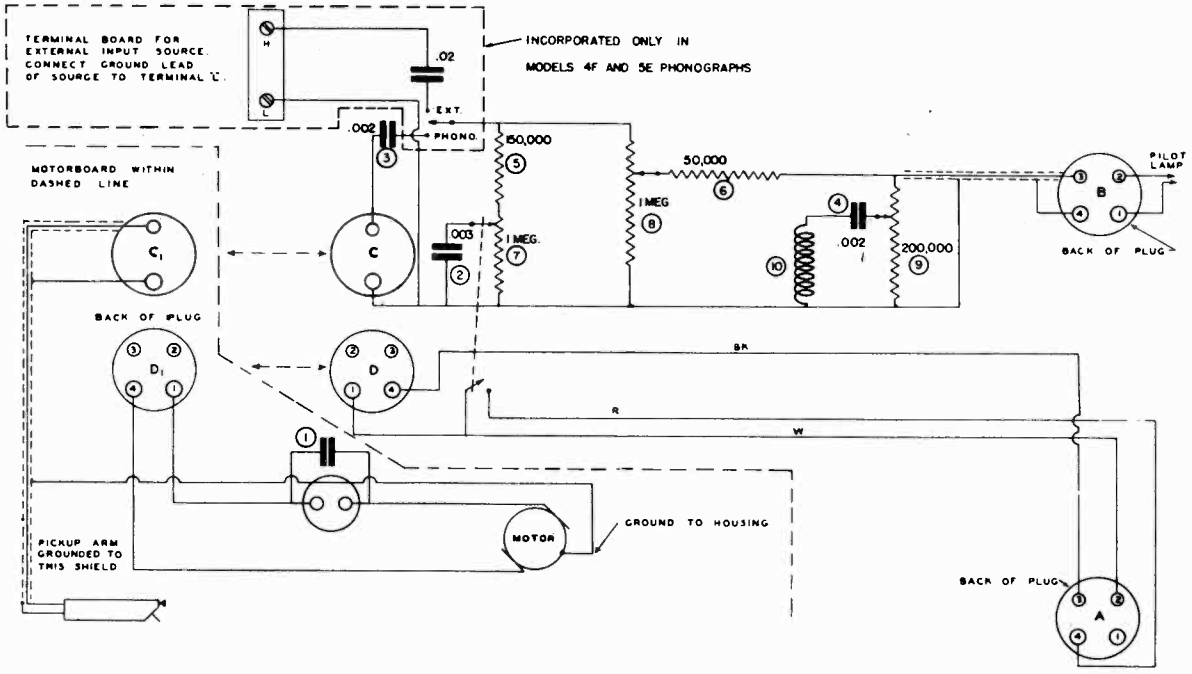


Primary voltage	117 V. 60 cycle AC
Power consumption	134 watts;
Power output	25 watts;
Vacuum tubes	1-6C5; 2-6L6G; 1-5Z3;
Speaker:	Model 302
Field Coil	*3500 ohms;
Transformer	**5000 ohms;
	None

* DC resistance. ** Primary impedance.

MODEL A-3001B

THE MAGNAVOX CO.



Ref. No.	Description	Magnavox Part No.
	AMPLIFIER CHASSIS	
1, 2, 5	Capacitor, electrolytic 20-20 mfd. 25 V., 5 mfd. 450 V.	270007
3	Capacitor, tubular, .02 mfd. 600 V.	254127
4	Capacitor, tubular, .5 mfd. 400 V.	254147
6	Capacitor, tubular, .005 mfd. 1200 V.	250042
7	Capacitor, tubular, .5 mfd. 400 V.	254147
8, 9	Capacitor, electrolytic 30-10 mfd. 450 V.	273610
10	Resistor, carbon, 200,000 ohm ½ W.	234447
11	Resistor, carbon, 2000 ohm ½ W.	234426
12	Resistor, carbon, 30,000 ohm 1 W.	234477
13	Resistor, carbon, 20,000 ohm 1 W.	234475
14	Resistor, carbon, 7500 ohm ½ W.	239991
15	Resistor, wire wound, 200 ohm 5 W.	240009
16	Resistor, carbon, 9000 ohm 3 W.	230039
17	Transformer, input	320240
18	Transformer, output	330188
19	Transformer, power, 117 V. 50-60 cycle	300106
20	Choke, filter	350113
	Socket, octal marked 6L6	182532
	Socket, octal marked 6C5	180051
	Socket, 5 prong marked SPK	182525
	Socket, 4 prong marked 5Z3	182530
	Socket, 4 prong—no marking	182668
	Fuse, 3 amp. 250 V. cartridge	189887
	CONTROL PANEL	
1	Capacitor, tubular, .02 mfd. 110 V.	259935
2	Capacitor, tubular, .003 mfd. 600 V.	254163
3	Capacitor, tubular, .002 mfd. 600 V.	254161
4	Capacitor, tubular, .002 mfd. 600 V.	254161
5	Resistor, carbon, 150,000 ohm ½ W.	234446
6	Resistor, carbon, 50,000 ohm ½ W.	234439
7	Control, bass, 1 megohm—with power switch	222446
8	Control, volume, 1 megohm	222444
9	Control, treble, 200,000 ohm	222445
10	Choke, filter	362463
	Knob, control	140019
	Lamp, pilot 6.3 V.	182592

THE MAGNAVOX CO.

IDENTIFICATION OF MAGNAVOX MODELS FROM 1937 TO 1946

The list of Magnavox models in the following pages has been arranged in such a way that the identifying number for servicing these receivers is in all cases the style number (such as C101G11). This style number is on a serial plate which is attached to all phonograph and radio-phonographs. It should not be confused with the model number (such as 155B) which can not be used in locating the necessary information since instruments having as many as ten different style numbers may all have the same model number.

The model number indicates a series of instruments while the style number indicates any changes made during the production of a series. These changes might be a different phonograph pick-up, a different radio chassis, a different speaker, etc. As an example, instrument style number 101G11 is instrument model number 155B and instrument style numbers C101G13, C101G21, C101G23, C101G41, C101G43, are also model 155B. Each of the style numbers has some change.

In previous indexes of Rider's Manuals we have listed radio chassis numbers of Magnavox receivers first, giving model numbers and style numbers. To use this new listing successfully you would look up the instrument style number, which is tabulated in numerical order, and following through to the chassis number, would refer to this chassis number in past indexes. In case of record changer troubles, you would follow the same procedure and would find the details of the record changer in Rider's "Automatic Record Changers and Recorders" or in this Manual.

STYLE NOS. C101G11 TO C103G15

THE MAGNAVOX CO.

MAGNAVOX MODEL IDENTIFICATION FROM 1937 TO 1946

The Style Number and Model Number are shown on the serial plate attached to each cabinet.

*THIS PICK-UP ARM INCLUDES ONE 563584 CRYSTAL PICK-UP.
**THIS PICK-UP ARM INCLUDES ONE 560006 CRYSTAL PICK-UP.
†THIS PICK-UP ARM INCLUDES ONE 560015 CRYSTAL PICK-UP.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
C101G11	155B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G12	155BF	CR-188A	CR-189A	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G13	155B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G14	155BF	CR-188A	CR-189A	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G21	155B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G22	155BF	CR-188A	CR-189A	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G23	155B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G24	155BF	CR-188A	CR-189A	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G41	155B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G42	155BF	CR-188A	CR-189A	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G43	155B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C101G44	155BF	CR-188A	CR-189A	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G11	142B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G12	142BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G13	142B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G14	142BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G15	*242B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G16	242BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G21	142B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G22	142BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G23	142B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G24	142BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G25	242B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G26	242BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G31	142B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G32	142BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G33	142B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G34	142BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G35	242B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G36	242BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G45	242B	CR-188A		520508	AMP-101A		560049G2		582815 582869	60 cyc.
C102G46	242BF	CR-188A	CR-189B	520508	AMP-101A		560049G2		582815 582869	60 cyc.
C103G11	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G12	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G13	151B	CR-190B		520508			560049G3		582806	60 cyc.
C103G14	151BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C103G15	151B	CR-187A		520508			560049G3		582806	60 cyc.

*Model 242 Series has drawer-type record changer.

STYLE NOS. C103G16 TO C105G15

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
C103G16	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G21	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G22	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G23	151B	CR-190B		520508			560049G3		582806	60 cyc.
C103G24	151BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C103G25	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G26	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G41	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G42	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G43	151B	CR-190B		520508			560049G3		582806	60 cyc.
C103G44	151BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C103G113	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G114	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G127	151B	CR-190D		520508			560049G3		582806	60 cyc.
C103G128	151BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C103G213	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G214	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G227	151B	CR-190D		520508			560049G3		582806	60 cyc.
C103G228	151BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C103G413	151B	CR-187A		520508			560049G3		582806	60 cyc.
C103G414	151BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C103G427	151B	CR-190D		520508			560049G3		582806	60 cyc.
C103G428	151BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C104G11	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G12	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G13	148B	CR-190B		520508			560049G3		582806	60 cyc.
C104G14	148BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C104G21	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G22	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G23	148B	CR-190B		520508			560049G3		582806	60 cyc.
C104G24	148BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C104G31	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G32	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G33	148B	CR-190B		520508			560049G3		582806	60 cyc.
C104G34	148BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C104G41	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G42	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G43	148B	CR-190A		520508			560049G3		582806	60 cyc.
C104G44	148BF	CR-190A	CR-189B	520508			560049G3		582806	60 cyc.
C104G115	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G116	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G127	148B	CR-190D		520508			560049G3		582806	60 cyc.
C104G128	148BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C104G215	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G216	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G227	148B	CR-190D		520508			560049G3		582806	60 cyc.
C104G228	148BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C104G315	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G316	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G327	148B	CR-190D		520508			560049G3		582806	60 cyc.
C104G328	148BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C104G413	148B	CR-190B		520508			560049G3		582806	60 cyc.
C104G414	148BF	CR-190B	CR-189B	520508			560049G3		582806	60 cyc.
C104G415	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G416	148BF	CR-187A	CR-189B	520508			560049G3		582806	60 cyc.
C104G419	148B	CR-187A		520508			560049G3		582806	60 cyc.
C104G427	148B	CR-190D		520508			560049G3		582806	60 cyc.
C104G428	148BF	CR-190D	CR-189B	520508			560049G3		582806	60 cyc.
C105G11	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G12	132B	CR-190C		520508			560049G3		582840	60 cyc.
C105G13	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G15	132B	CR-190E		520508			560049G3		582840	60 cyc.

STYLE NOS. C105G16
TO EA-307P10

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
C105G16	132B	CR-190E		520508			560049G3		582840	60 cyc.
C105G21	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G22	132B	CR-190C		520508			560049G3		582840	60 cyc.
C105G23	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G25	132B	CR-190E		520508			560049G3		582840	60 cyc.
C105G26	132B	CR-190E		520508			560049G3		582840	60 cyc.
C105G31	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G32	132B	CR-190C		520508			560049G3		582840	60 cyc.
C105G33	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G34	132B	CR-190C		520508			560049G3		582840	60 cyc.
C105G35	132B	CR-190E		520508			560049G3		582840	60 cyc.
C105G36	132B	CR-190E		520508			560049G3		582840	60 cyc.
C105G41	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G42	132B	CR-190C		520508			560049G3		582840	60 cyc.
C105G43	132B	CR-187B		520508			560049G3		582840	60 cyc.
C105G44	132B	CR-190C		520508			560049G3		582840	60 cyc.
C105G45	132B	CR-190E		520508			560049G3		582840	60 cyc.
C105G46	132B	CR-190E		520508			560049G3		582840	60 cyc.
C106G13	154B	CR-193B		520516			560049G3		582815 582847	60 cyc.
C106G14	154BF	CR-193B	CR-189B	520516			560049G3		582815 582847	60 cyc.
C106G15	154B	CR-194B		520508			560049G3		582815 582847	60 cyc.
C106G16	154BF	CR-194B	CR-189B	520508			560049G3		582815 582847	60 cyc.
C106G23	154B	CR-193B		520516			560049G3		582815 582847	60 cyc.
C106G24	154BF	CR-193B	CR-189B	520516			560049G3		582815 582847	60 cyc.
C106G33	154B	CR-193B		520516			560049G3		582815 582847	60 cyc.
C106G34	154BF	CR-193B	CR-189B	520516			560049G3		582815 582847	60 cyc.
C106G43	154B	CR-193B		520516			560049G3		582815 582847	60 cyc.
C106G44	154BF	CR-193B	CR-189B	520516			560049G3		582815 582847	60 cyc.
RT-5	6					631600	562729	507601		60 cyc.
RT-5A	6A					631600	562729	507601		60 cyc.
RTU-5	U6					631600	562729	507602		AC-DC
RTU-5A	U6A					631600	562729	507602		AC-DC
RT-8	6					*569889	563584	500029		60 cyc.
RT-8A	6A					*569889	563584	500029		60 cyc.
RTU-8	U6					*569889	563584	507602		AC-DC
RTU-8A	U6A					*569889	563584	507576		AC-DC
RT-9	6B					*569889	563584	507576		50-60 cyc.
RT-9A	6C					*569889	563584	507602		50-60 cyc.
EA-101P	½				A-101P	631595	562729	507601	58415	60 cyc.
EA-106P	U2				A-106P	631595	562729		58416	AC-DC
EA-201	10				A-201	**560005	560006	500015	581533	Battery
EA-201B	10A				A-201	**560005	560006	500015	581533	Battery
EA-205	2C				A-205	**560007	560006	500026	581543	60 cyc.
EA-205B	2C				A-205	**560007	560006	500026	581723	60 cyc.
EA-205E	2C				A-205	‡560017	560015	500026	581723	60 cyc.
EA-205H	2C-1				A-205	‡560017	560015	500026	581723	50-60 cyc.
EA-205L	2D				A-205C	‡560017	560015	500026	582298	60 cyc.
EA-205N	2D-1				A-205C	‡560017	560015	500026	582298	50-60 cyc.
EA-307P2	U3				A-307P2	631595	562729	507602	58946	AC-DC
EA-307P4	U2A				A-307P4	*569934	563584	507602	581389	AC-DC
EA-307P5	U3				A-307P2	633541	562729	507602	58946	AC-DC
EA-307P6	U2A				A-307P4	630209	563584	507602	581389	AC-DC
EA-307P7	U3B				A-307P2	633541	562729	507602	581651	AC-DC
EA-307P8	U3B				A-307P2	630238	562729	507602	581651	AC-DC
EA-307P9	U3D				A-307P5	630341	560022	507602	581651	AC-DC
EA-307P10	U3D				A-307P6	630341	560022	507602	581651	AC-DC

STYLE NOS. EA-401 TO TPR-337

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
EA-401	2A				A-401	°569889	563584	509888	581358	60 cyc.
EA-401A	2B				A-401	°569889	563584	507601	581358	50-60 cyc.
EA-401B	2A				A-401	630209	560006	500043	581358	60 cyc.
EA-401C	2A				A-206	630209	560015	500043	581779	60 cyc.
EA-401D	2F				A-206A	†560017	560015	500026	581834	60 cyc.
EA-401E	2F-1				A-206A	†560017	560015	500026	581834	50-60 cyc.
EAA-401	A2H			520173	A-206F		560031		582398	60 cyc.
EAU-401D	U2F				A-206A	†560017	563584	507602	581834	AC-DC
EAU-401F	2G				A-206E	†560017	560015	500026	582318	60 cyc.
EA-401F-1	2G-1				A-206E	†560017	560015	500026	582318	50-60 cyc.
EAU-401G	U2G				A-206E	†560017	560015	507602	582318	AC-DC
EA-501	3				A-501	631595	562729	507601	58622	60 cyc.
EA-501E	3				A-501	633541	562729	509888	58622	60 cyc.
EA-501F	3A				A-501	633541	562729	507576	58622	50-60 cyc.
EA-501G	3				A-501B	633541	562729	500029	58622	60 cyc.
EA-501H	3A				A-501B	633541	562729	507576	58622	50-60 cyc.
EA-501I	3C				A-501B	633541	562729	507576	581615	50-60 cyc.
EA-501J	3B				A-501B	633541	562729	500029	581651	60 cyc.
EA-501K	3B				A-501B	630238	562729	500029	581651	60 cyc.
EA-501L	3C				A-501B	630238	562729	507576	581615	50-60 cyc.
EA-501M	3D				A-501B	630341	560022	500029	581615	60 cyc.
EA-501N	3D-1				A-501B	630341	560022	507576	581615	50-60 cyc.
EAA-501	A3M			520173	A-206G				582318	60 cyc.
CPAR-301	35	CR-101M		529562	A-3001		562729		58869 582140	60 cyc.
CPAR-302	36	CR-101M		529650	A-3001		560008		58869 582140	50-60 cyc.
CPR-305	33	CR-109				631595	562729	507601	582125	60 cyc.
EPR-306	32	CR-103				631600	562729	507601	582125	60 cyc.
TPR-307	31	CR-102				631595	562729	507601	582124	60 cyc.
RTR-308	37	CR-101								50-60 cyc.
TPR-309	31	CR-104				631595	562729	507601	582124	60 cyc.
EPR-310	32	CR-105				631600	562729	507601	582125	60 cyc.
TPUR-311	U31	CR-107				631595	562729	507602	58946	AC-DC
CPAR-312	35A	CR-101M		529650	A-3001		560008		58869 582148	50-60 cyc.
EPR-313	32	CR-109				631600	562729	507601	582125	60 cyc.
EPUR-314	U32	CR-110				631600	562729	507602	581313	AC-DC
CPAR-315	34	CR-111		529562			562729		581314	60 cyc.
TPR-316	31	CR-106				631595	562729	507601	582124	60 cyc.
CPUR-317	U33	CR-110				631595	562729	507602	581313	AC-DC
CPAUR-318	U34	CR-112		529797			562729		581315	AC-DC
CPAR-319	35	CR-108		529562	A-3001		562729		58869 582140	60 cyc.
CPAR-320	36	CR-108		529650	A-3001		560008		58869 582140	50-60 cyc.
CPAR-321	34A	CR-111		529650			560008		581314	60 cyc.
PR-322	30	CR-117				°569889	563584	509888	581349	60 cyc.
TPR-323	31	CR-113				631595	562729	507601	581342	60 cyc.
EPR-324	32	CR-114				631600	562729	507601	581343	60 cyc.
CPR-325	33	CR-115				631595	562729	507601	581343	60 cyc.
CPAR-326	34	CR-118		529562			562729		581341	60 cyc.
CPAR-327	34A	CR-118		529650			560008		581341	60 cyc.
CPAUR-328	U34A	CR-119		529894			560008		581315	AC-DC
CPAR-329	35A	CR-108		529650	A-3001		560008		58869 582140	50-60 cyc.
CPR-330	34B	CR-118				631595	562729	507601	581341	60 cyc.
PRU-331	U30	CR-107				°569889	563584	507602	581357	AC-DC
CPUR-332	U34B	CR-119				631595	562729	507602	581315	AC-DC
PAR-333	36A	CR-108		529650	A-3001		560008		58869 582140	50-60 cyc.
EPR-334	32A	CR-114				631600	562729	507576	581343	50-60 cyc.
TPR-335	31	CR-107				631595	562729	507601	58946	60 cyc.
EPR-336	32	CR-110				631600	562729	507601	581313	60 cyc.
TPR-337	31	CR-113				633541	562729	509888	581342	60 cyc.

STYLE NOS. TPR-338
TO CPR-401

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
TPR-338	31B	CR-141				630213	563584	500037	581630	60 cyc.
TPUR-339	U31B	CR-107				630213	562729	507602	58946	AC-DC
TPR-340	31C	CR-141				630213	563584	507576	581430	50-60 cyc.
CPR-341	33A	CR-118				631595	562729	507576	581343	50-60 cyc.
CPR-342	34C	CR-115				631595	562729	507576	581341	50-60 cyc.
CPR-343	38	CR-121				633541	562729	509888	581420	AC-DC
CPUR-344	U38	CR-127				633541	562729	507602	581315	60 cyc.
CPR-345	38A	CR-121				633541	562729	507576	581420	50-60 cyc.
CPAR-346	38B	CR-123		529650			560008		581419	60 cyc.
CPAUR-347	U38B	CR-127		529894			560008		581315	AC-DC
PR-348	30A	CR-117				569889	563584	507576	581349	50-60 cyc.
TPR-349	31A	CR-113				633541	562729	507576	581342	50-60 cyc.
EPR-350	32B	CR-123				633781	562729	509888	581419	60 cyc.
CPAR-351	34A	CR-125		529650			560008		581341	60 cyc.
CPAR-352	36	CR-122		529650	A-3001		560008		58869 582140	50-60 cyc.
CPAR-353	34D	CR-121		529650			560008		581420	60 cyc.
CPAR-354	34E	CR-124		529650			560008		581421 581422	60 cyc.
EPUR-355	U32	CR-110				633781	562729	507602	581313	AC-DC
CPAR-356	35A	CR-122		529650	A-3001		560008		58869 582140	50-60 cyc.
EPR-358	32	CR-114				631600	562729	509888	581343	60 cyc.
CPAUR-359	U34A	CR-126		529894			560008		581315	AC-DC
TPR-360	31D	CR-123				633541	562729	509888	581430	60 cyc.
TPUR-361	U31	CR-107				633541	562729	507602	58946	AC-DC
EPR-362	32C	CR-123				633781	562729	507576	581419	50-60 cyc.
TPR-363	31E	CR-123				633541	562729	507576	581430	50-60 cyc.
CPAR-364	34D	CR-121		529650			560008		581420	60 cyc.
CPAR-365	34E	CR-124		529650			560008		581421 581422	60 cyc.
CPR-366	40	CR-128				633781	562729	509888	581419	60 cyc.
CPAR-370	38B	CR-128		529650			560008		581419	60 cyc.
CPR-371	38	CR-121				633541	562729	509888	581420	60 cyc.
CPR-372	38A	CR-121				633541	562729	507576	581420	50-60 cyc.
CPAR-373	38B	CR-128		529650			560008		581419	60 cyc.
CPAUR-374	U38B	CR-127		529894			560008		581315	AC-DC
CPUR-375	U38	CR-127				633541	562729	507602	581315	AC-DC
PBR-378	41	CR-133				569889	563584	500015	581515	Battery
EPR-379	32B	CR-144				633781	562729	500029	581419	60 cyc.
CPR-380	40B	CR-134				633781	562729	500029	581520	60 cyc.
CPAR-381	38C	CR-121		520005			560008		581420	50-60 cyc.
EPR-382	32C	CR-144				633781	562729	507576	581419	50-60 cyc.
TPR-383	31D	CR-134				633541	562729	500029	581430	60 cyc.
CPAR-384	42	CR-136		520001			560008		581421 581422	50-60 cyc.
CPAR-385	35B	CR-122		520001	A-3001B		560008		58869 582140	50-60 cyc.
CPAR-386	36B	CR-122		520001	A-3001		560008		58869 582140	50-60 cyc.
CPR-387	40A	CR-134				633781	562729	507576	581520	50-60 cyc.
CPAR-388	34F	CR-121		529650			560008		581420	60 cyc.
CPAR-389	43	CR-151		520007			560012		581420	60 cyc.
EPR-391	44	CR-141				630213	563584	500037	581630	60 cyc.
EPR-392	45	CR-141				630213	563584	500037	581630	60 cyc.
CPAR-393	42	CR-147		520001			560008		581421 581422	50-60 cyc.
CPAR-394	34F	CR-146		520001			560008		581420	60 cyc.
CPAR-395	38C	CR-146		520005			560008		581420	50-60 cyc.
CPR-396	38	CR-146				633541	562729	500029	581420	60 cyc.
CPR-397	38A	CR-146				633541	562729	507576	581420	50-60 cyc.
EPR-398	32B	CR-140				633781	562729	500029	581420	60 cyc.
CPR-399	40B	CR-140				633781	562729	500029	581625	60 cyc.
CPAR-400	43A	CR-140		520005			560008		581420	50-60 cyc.
CPR-401	40A	CR-140				633781	562729	500029	581625	50-60 cyc.

STYLE NOS. CPAR-402 TO CPAR-457

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
CPAR-402	42	CR-148		520001			560008		581421 581422	50-60 cyc.
EPR-403	32C	CR-140				633781	562729	507576	581420	50-60 cyc.
CPAR-404	61	CR-150		520007			560012		581420	60 cyc.
CPAR-405	42	CR-149		520001			560008		581421 581422	50-60 cyc.
CPAR-406	38C	CR-146		520005			560008		581420	50-60 cyc.
CPR-407	38	CR-146				630238	562729	500029	581420	60 cyc.
CPR-408	38A	CR-146				630238	562729	507576	581420	50-60 cyc.
CPAR-409	46	CR-140				630238	562729	500029	581420	60 cyc.
CPAUR-410	U43A	CR-143		520021		630238	560008		581652	AC-DC
EPUR-411	U44	CR-145					562729	507602	581651	AC-DC
EPUR-412	U45	CR-145				630238	562729	507602	581651	AC-DC
TPUR-413	U31B	CR-145				630238	562729	507602	581651	AC-DC
CPAUR-414	U38C	CR-143		529894			560008		581652	AC-DC
CPUR-415	U38	CR-143				630238	562729	507602	581652	AC-DC
EPUR-416	U32B	CR-143				633781	562729	507602	581652	AC-DC
CPUR-417	U40B	CR-143				633781	562729	507602	581652	AC-DC
CPAUR-418	U38C	CR-143		520021			560008		581652	AC-DC
CPAUR-419	U34F	CR-143		520022			560008		581652	AC-DC
CPR-420	46A	CR-140				630238	562729	507607	581420	50-60 cyc.
CPAR-421	43A	CR-140		520005			560008		581420	50-60 cyc.
CPUR-422	U46	CR-143				630238	562729	507602	581652	AC-DC
CPAR-423	34E	CR-147		529650			560008		581421 581422	60 cyc.
CPAR-424	34E	CR-147		520001			560008		581421 581422	60 cyc.
CPAUR-425	U34F	CR-143		529894			560008		581652	AC-DC
EPR-426	32B	CR-141				633541	562729	500029	581420	60 cyc.
CPR-427	42	CR-149				633541	562729	500029	581421 581422	50-60 cyc.
CPAR-428	38E	CR-156		520076			560022		581917	60 cyc.
CPAR-429	51C	CR-156	CR-158 (FM)	520090	A-222A		560023		581917	60 cyc.
CPAR-430	51C-1	CR-156	CR-158 (FM)	520091	A-222A		560023		581917	50 cyc.
CPAR-431	42	CR-152		520001			560008		581421 581422	50-60 cyc.
EPAR-432	32D	CR-140		520005			560008		581420	50-60 cyc.
EPAUR-433	U32D	CR-145		520021			560008		581652	AC-DC
CPAR-434	35C	CR-152		520001			560008		581421 581422	50-60 cyc.
CPAR-436	61A	CR-140		520005			560008		581420	50-60 cyc.
EPAR-437	32E	CR-156		520076			560022		581917	60 cyc.
EPAR-438	32E-1	CR-156		520078			560022		581917	50 cyc.
CPAR-439	61B	CR-140		520077			560008		581420	60 cyc.
CPAR-440	62	CR-154C		520080			560023		581915 581916	60 cyc.
CPAR-441	72	CR-154C		520080			560023		581913 581914	60 cyc.
CPAR-442	38E-1	CR-156		520078			560022		581917	50 cyc.
CPAR-443	72-1	CR-154C		520081			560023		581913 581914	50 cyc.
CPAR-444	62-1	CR-154C		520081			560023		581915 581916	50 cyc.
CPAR-445	49	CR-156		520080			560023		581917	60 cyc.
CPAR-446	49-1	CR-156		520081			560023		581917	50 cyc.
CPAR-447	48	CR-156		520080			560023		581917	60 cyc.
CPAR-448	48-1	CR-156		520081			560023		581917	50 cyc.
CPAR-449	42A	CR-154		520085			560022		581915 581916	50-60 cyc.
CPAR-450	38D	CR-156		520094			560022		581917	50-60 cyc.
CPAR-451	47	CR-157		520082			560025		581420	60 cyc.
TPR-452	31F	CR-159				630341	560022	500037	581630	50-60 cyc.
EPR-453	44A	CR-159				630341	560022	500037	581630	60 cyc.
CPAR-454	34G	CR-155		520080			560023		581917	60 cyc.
CPAR-455	34G-1	CR-155		520081			560023		581917	50 cyc.
CPAR-456	34G	CR-155		520080			560023		581917	60 cyc.
CPAR-457	34G-1	CR-155		520081			560023		581917	50 cyc.

STYLE NOS. CPAR-458
TO CPAR-506

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
CPAR-458	38G	CR-160		520093			560022		581420	60 cyc.
CPAR-459	38G-1	CR-160		520005			560022		581420	50-60 cyc.
CPAR-460	42A	CR-161		520085			560022		581915 581916	50-60 cyc.
CPAR-461	72A	CR-154C	CR-158(FM)	520080			560023		581913 581914	60 cyc.
CPAR-462	72A-1	CR-154C	CR-158(FM)	520081			560023		581913 581914	50 cyc.
CPAR-463	50	CR-155		520080			560023		581917	60 cyc.
CPAR-464	50-1	CR-155		520081			560023		581917	50 cyc.
CPAR-465	50A	CR-155	CR-158(FM)	520080			560023		581917	60 cyc.
CPAR-466	50A-1	CR-155	CR-158(FM)	520081			560023		581917	50 cyc.
CPAR-467	51	CR-156		520080			560023		581917	60 cyc.
CPAR-468	51-1	CR-156		520081			560023		581917	50 cyc.
CPAR-469	51A	CR-156	CR-158(FM)	520080			560023		581917	60 cyc.
CPAR-470	51A-1	CR-156	CR-158(FM)	520081			560023		581917	50 cyc.
CPAR-471	51B	CR-156	CR-158(FM)	520090	A-222A		560023		581917	60 cyc.
CPAR-472	62A	CR-154C	CR-158(FM)	520080			560023		581915 581916	60 cyc.
CPAR-473	62A-1	CR-154C	CR-158(FM)	520081			560023		581915 581916	50 cyc.
CPAR-474	62B	CR-154C		520090	A-222		560023		581915 581916	60 cyc.
CPAR-475	62B-1	CR-154C		520091	A-222		560023		581915 581916	50 cyc.
CPAR-476	62C	CR-154C		520090	A-222		560023		581915 581916	60 cyc.
CPAR-477	62C-1	CR-154C	CR-158(FM)	520091	A-222		560023		581915 581916	50 cyc.
CPAR-480	72D	CR-154C		520085			560022		581913 581914	50-60 cyc.
CPAR-481	62D	CR-154C		520085			560022		581913 581914	50-60 cyc.
CPAR-482	50B	CR-155		520090	A-222		560023		581917	60 cyc.
CPAR-483	50B-1	CR-155		520091	A-222		560023		581917	50 cyc.
CPAR-484	62E	CR-154C	CR-158(FM)	520085			560022		581913 581914	50-60 cyc.
CPAR-485	72E	CR-154C	CR-158(FM)	520085			560022		581913 581914	50-60 cyc.
CPAR-489	55	CR-154C		520080			560023		581915 581916	60 cyc.
CPAR-490	55-1	CR-154C		520081			560023		581915 581916	50 cyc.
CPAR-491	55A	CR-154C		520080			560023		581915 581916	60 cyc.
CPAR-492	55A-1	CR-154C	CR-158(FM)	520081			560023		581915 581916	50 cyc.
CPAR-493	55B	CR-154C		520090	A-222		560023		581915 581916	60 cyc.
CPAR-494	55B-1	CR-154C		520091	A-222		560023		581915 581916	50 cyc.
CPAR-495	38G	CR-156		520093			560022		581917	60 cyc.
CPAR-496	38G-1	CR-156		520092			560022		581917	50-60 cyc.
CPAR-497	42A	CR-162		520085			560022		581915 581916	50 cyc.
CPAR-498	51B-1	CR-156	CR-158(FM)	520091			560023		581917	50-60 cyc.
CPAR-499	42A	CR-154		520072			560022		581915 581916	50-60 cyc.
CPAR-500	55D	CR-154C		520094			560022		581915 581916	50-60 cyc.
CPAR-501	55E	CR-154C	CR-158(FM)	520094			560022		581915 581916	50-60 cyc.
CPAR-502	72H	CR-154C		520090	A-222		560023		581913 581914	60 cyc.
CPAR-503	72H-1	CR-154C		520091	A-222		560023		581913 581914	50 cyc.
CPAR-504	72J	CR-154C	CR-158(FM)	520090	A-222		560023		581913 581914	60 cyc.
CPAR-505	72J-1	CR-154C	CR-158(FM)	520091	A-222		560023		581913 581914	50 cyc.
CPAR-506	72E	CR-154C		520072			560022		581913 581914	50-60 cyc.

STYLE NOS. CPAR-507 TO CPAR-557

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
CPAR-507	72D	CR-154C	CR-158(FM)	520072			560022		581913 581914	50-60 cyc.
CPAR-508	62D	CR-154C		520072			560022		581913 581914	50-60 cyc.
CPAR-509	62E	CR-154C	CR-158(FM)	520072			560022		581913 581914	50-60 cyc.
CPAUR-510	U34F	CR-163		520022			560022		581652	AC-DC
CPAUR-511	U38C	CR-163		520021			560022		581652	AC-DC
EPUR-512	U44A	CR-164				507602	560022	630341	581630	AC-DC
TPUR-513	U31F	CR-164				507602	560022	630341	581630	AC-DC
EPAUR-514	U32D	CR-163		520021			560022		581652	AC-DC
CPAR-515	42B	CR-154		520094			560022		581915 581916	50-60 cyc.
CPAUR-516	U38E	CR-165		520151			560022		581987	AC-DC
EPAUR-517	U32E	CR-165		520151			560022		581652	AC-DC
EPR-518	45A	CR-159				500037	560022	630341	581630	60 cyc.
CPAUR-519	U38D	CR-165		520098			560022		581987	AC-DC
CPAUR-520	U49	CR-165		520151			560022		581987	AC-DC
CPAUR-521	U48	CR-165		520151			560022		581987	AC-DC
CPAR-522	49D	CR-156		520094			560022		581917	50-60 cyc.
CPAR-523	50D	CR-155		520094			560022		581917	50-60 cyc.
CPAR-524	50E	CR-155	CR-158(FM)	520094			560022		581917	50-60 cyc.
CPAR-525	51D	CR-156		520094			560022		581917	50-60 cyc.
CPAR-526	51E	CR-156	CR-158(FM)	520094			560022		581917	60 cyc.
CPAR-527	42A	CR-154		520094			560022		581915 581916	50-60 cyc.
CPAR-530	42B	CR-154		520099			560022		581915 581916	50-60 cyc.
CPAR-531	42A	CR-154		520099			560022		581915 581916	50-60 cyc.
CPAR-532	42A	CR-154		520099			560022		581915 581916	50-60 cyc.
CPAR-533	55D	CR-154C		520099			560022		581915 581916	50-60 cyc.
CPAR-534	55E	CR-154C	CR-158(FM)	520099			560022		581915 581916	50-60 cyc.
CPAR-535	50	CR-155		520080			560023		581917	60 cyc.
CPAR-536	50-1	CR-155		520081			560023		581917	50 cyc.
CPAR-537	50A	CR-155	CR-158(FM)	520080			560023		581917	60 cyc.
CPAR-538	50A-1	CR-155	CR-158(FM)	520081			560023		581917	50 cyc.
CPAR-539	50B	CR-155		520090	A-222		560023		581917	60 cyc.
CPAR-540	50B-1	CR-155		520091	A-222		560023		581917	50 cyc.
CPAR-541	42E	CR-154	CR-167(FM)	520099			560022		581915 581916	50-60 cyc.
CPAR-542	55	CR-154C		520080			560023		581915 581916	60 cyc.
CPAR-543	55-1	CR-154C		520081			560023		581915 581916	50 cyc.
CPAR-544	55A	CR-154C	CR-158(FM)	520080			560023		581915 581916	60 cyc.
CPAR-545	55A-1	CR-154C	CR-158(FM)	520081			560023		581915 581916	50 cyc.
CPAR-546	55B	CR-154C		520090	A-222		560023		581915 581916	60 cyc.
CPAR-547	55B-1	CR-154C		520091	A-222		560023		581915 581916	50 cyc.
CPAR-548	62D	CR-154C		520099			560022		581913 581914	50-60 cyc.
CPAR-549	62E	CR-154C	CR-158(FM)	520099			560022		581913 581914	50-60 cyc.
CPAR-550	42E	CR-154	CR-167(FM)	520094			560022		581915 581916	50-60 cyc.
CPAR-551	48	CR-156		520080			560023		581917	60 cyc.
CPAR-552	48-1	CR-156		520081			560023		581917	50 cyc.
CPAR-553	51	CR-156		520080			560023		581917	60 cyc.
CPAR-554	51-1	CR-156		520081			560023		581917	50 cyc.
CPAR-555	51K	CR-156	CR-169(FM)	520080			560023		581917	60 cyc.
CPAR-556	51K-1	CR-156	CR-169(FM)	520081			560023		581917	50 cyc.
CPAR-557	51B	CR-156	CR-169(FM)	520090	A-222A		560023		581917	60 cyc.

STYLE NOS. CPAR-558
TO CPAR-613

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
CPAR-558	51B-1	CR-156	CR-169 (FM)	520091			560023		581917	50 cyc.
CPAR-559	50D	CR-155		520094			560022		581917	50-60 cyc.
CPAR-560	50E	CR-155	CR-158 (FM)	520094			560022		581917	50-60 cyc.
CPAR-561	48K	CR-156	CR-170 (FM)	520080			560023		581917	60 cyc.
CPAR-562	48K-1	CR-156	CR-170 (FM)	520081			560023		581917	50 cyc.
CPAR-563	49F	CR-156		520170			560023		581917	60 cyc.
CPAR-564	49F	CR-156		520172			560023		581917	60 cyc.
EPAR-566	32F	CR-156		520170			560023		581917	60 cyc.
CPAR-567	50D	CR-155		520099			560022		581917	50-60 cyc.
CPAR-568	50E	CR-155	CR-158 (FM)	520094			560022		581917	50-60 cyc.
CPAUR-569	U48D	CR-165		520098			560022		581987	AC-DC
EPAUR-570	U32D	CR-165		520098			560022		581652	AC-DC
CPAR-571	48D	CR-156		520094			560022		581917	50-60 cyc.
CPAR-572	48DK	CR-156	CR-170 (FM)	520094			560022		581917	50-60 cyc.
CPAR-573	48FK	CR-156		520170			560023		581917	60 cyc.
CPAR-574	48F	CR-156	CR-170 (FM)	520170			560023		581917	60 cyc.
CPAR-575	51F	CR-156		520170			560023		581917	60 cyc.
CPAR-576	51FK	CR-156	CR-169 (FM)	520170			560023		581917	60 cyc.
CPAR-577	48G	CR-156		520301			560023		581917	60 cyc.
CPAR-578	48GK	CR-156		520301			560023		581917	60 cyc.
CPAR-579	49G	CR-156		520301			560023		581917	60 cyc.
CPAR-580	51G	CR-156		520301			560023		581917	60 cyc.
CPAR-581	51GA	CR-156		520301			560023		581917	60 cyc.
CPAR-582	51GK	CR-156	CR-169 (FM)	520301			560023		581917	60 cyc.
CPAR-583	51D	CR-156		520099			560022		581917	50-60 cyc.
CPAR-584	51DK	CR-156	CR-158 (FM)	520099			560022		581917	50-60 cyc.
CPAR-585	51DA	CR-156	CR-169 (FM)	520099			560022		581917	50-60 cyc.
CPAR-586	51FA	CR-156	CR-158 (FM)	520170			560023		581917	60 cyc.
CPAR-587	50L	CR-155		520302			560023		581917	60 cyc.
CPAR-588	48D	CR-156		520099			560022		581917	50-60 cyc.
CPAR-589	48DK	CR-156	CR-170 (FM)	520099			560022		581917	50-60 cyc.
CPAR-590	50G	CR-155		520301			560023		581917	60 cyc.
CPAR-591	50GA	CR-155	CR-158 (FM)	520301			560023		581917	60 cyc.
CPAR-592	50GK	CR-155	CR-169 (FM)	520301			560023		581917	60 cyc.
CPAR-593	50F	CR-155		520170			560023		581917	60 cyc.
CPAR-594	50FA	CR-155	CR-158 (FM)	520170			560023		581917	60 cyc.
CPAR-595	50FK	CR-155	CR-169 (FM)	520170			560023		581917	60 cyc.
CPAR-596	50DK	CR-155	CR-169 (FM)	520099			560022		581917	50-60 cyc.
CPAR-597	42AK	CR-154	CR-170 (FM)	520099			560022		581915 581916	50-60 cyc.
CPAR-598	55DK	CR-154C	CR-169 (FM)	520099			560022		581915 581916	50-60 cyc.
CPAR-599	55G	CR-154C		520301			560023		581915 581916	60 cyc.
CPAR-600	55GA	CR-154C		520301			560023		581915 581916	60 cyc.
CPAR-601	55GK	CR-154C	CR-169 (FM)	520301			560023		581915 581916	60 cyc.
CPAR-602	55L	CR-154C		520302	A-222		560023		581915 581916	60 cyc.
CPAR-603	51F	CR-156		520170			560023		581917	60 cyc.
CPAR-604	51L	CR-156		520302	A-222		560023		581917	60 cyc.
CPAR-605	51LA	CR-156	CR-158 (FM)	520302	A-222		560023		581917	60 cyc.
CPAR-606	51LK	CR-156	CR-169 (FM)	520302	A-222		560023		581917	60 cyc.
CPAR-607	51A	CR-156	CR-158 (FM)	520080			581917		560023	60 cyc.
CPAR-608	51A-1	CR-156	CR-158 (FM)	520081			581917		560023	50 cyc.
CPAR-609	62G	CR-154C	CR-158 (FM)	520301			581913 581914		560023	60 cyc.
CPAR-610	62GA	CR-154C		520301			581913 581914		560023	60 cyc.
CPAR-611	62GK	CR-154C	CR-169 (FM)	520301			581913 581914		560023	60 cyc.
CPAR-612	72G	CR-154C		520301			581913 581914		560023	60 cyc.
CPAR-613	72GA	CR-154C	CR-158 (FM)	520301			581913 581914		560023	60 cyc.

STYLE NOS. CPAR-614 TO CPAR-661

THE MAGNAVOX CO.

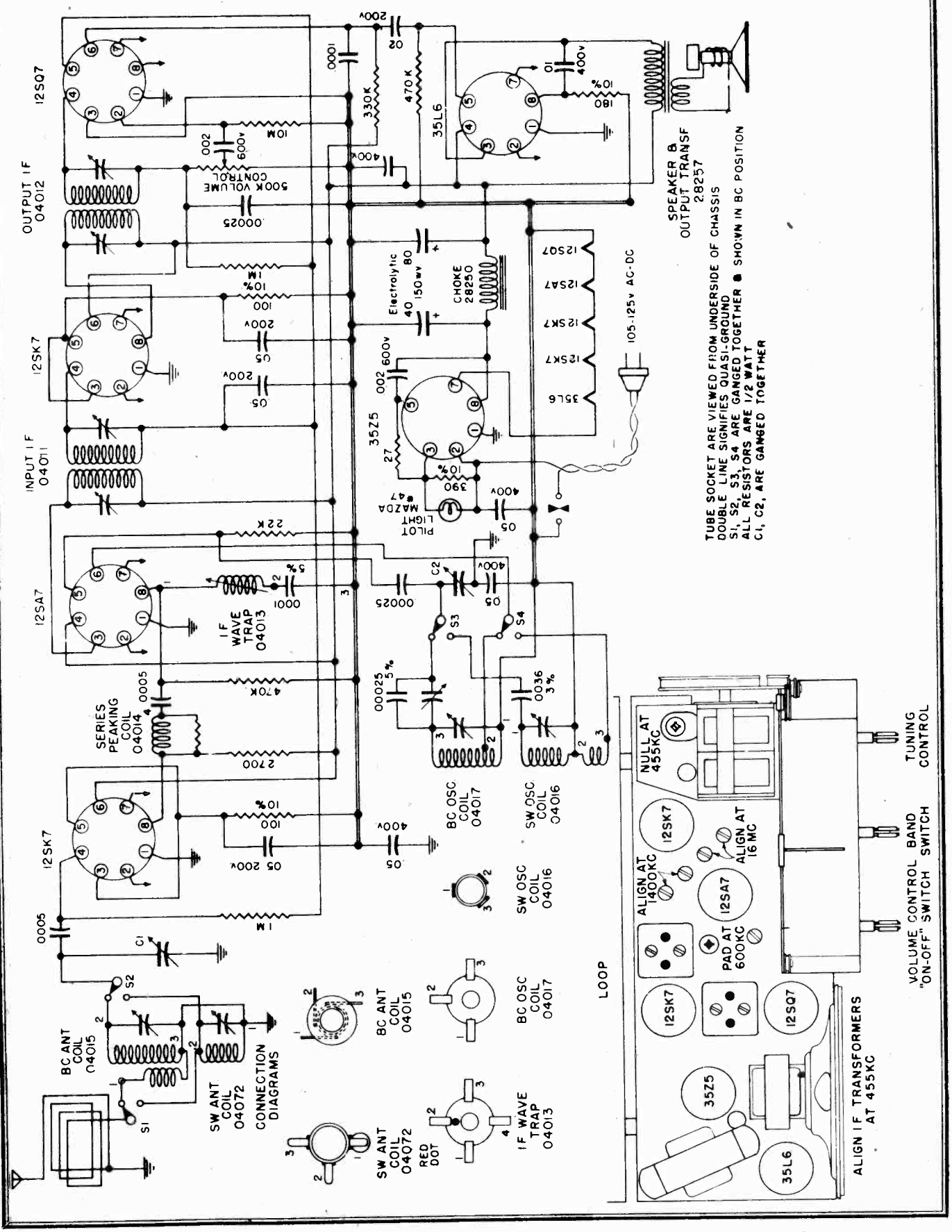
INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
CPAR-614	62DK	CR-154C	CR-169(FM)	520072			581913 581914		560022	50-60 cyc.
CPAR-615	72GK	CR-154C	CR-169(FM)	520301			581913 581914		560023	60 cyc.
CPAR-616	72L	CR-154C		520302	A-222		581913 581914		560023	60 cyc.
CPAR-617	62DK	CR-154C	CR-169(FM)	520099			581913 581914		560022	50-60 cyc.
CPAR-618	47F	CR-171		520170			581917		560022	60 cyc.
CPAR-619	47F	CR-171		520170			581917		560022	60 cyc.
CPAR-620	62L	CR-154C		520302	A-222		581913 581914		560023	60 cyc.
CPAR-621	62LA	CR-154C	CR-158(FM)	520302	A-222		581913 581914		560023	60 cyc.
CPAR-622	62LK	CR-154C	CR-169(FM)	520302	A-222		581913 581914		560023	60 cyc.
CPAR-623	38F	CR-156		520170			560023		581917	60 cyc.
CPAR-624	72LA	CR-154C	CR-158(FM)	520302	A-222		560023		581913 581914	60 cyc.
CPAR-625	72LK	CR-154C	CR-169(FM)	520302	A-222		560023		581913 581914	60 cyc.
CPAR-626	42G	CR-154		520301			560023		581915 581916	60 cyc.
CPAR-627	42GA	CR-154	CR-167(FM)	520301			560023		581915 581916	60 cyc.
CPAR-628	42GK	CR-154	CR-170(FM)	520301			560023		581915 581916	60 cyc.
CPAR-629	32F	CR-171		520170			560023		581917	60 cyc.
CPAR-630	38F	CR-171		520170			560023		581917	60 cyc.
CPAR-631	28M	CR-178		520173			560031		581917	60 cyc.
CPAR-632	52F	CR-156		520170			560023		581917	60 cyc.
CPAR-633	52FK	CR-156	CR-170(FM)	520170			560023		581917	60 cyc.
CPAR-634	52G	CR-156		520301			560023		581917	60 cyc.
CPAR-635	52GK	CR-156	CR-170(FM)	520301			560023		581917	60 cyc.
TPAR-636	26M	CR-168		520173			560031		582402	60 cyc.
TPR-637	20	CR-168				†560033	560031	500026	282402	60 cyc.
TPR-639	20-1	CR-168				†560033	560031	500026	582402	50 cyc.
CPAR-640	43F	CR-140		520170			560023		581917	60 cyc.
CPAR-641	35D	CR-154		520099			560022		581915 581916	50-60 cyc.
CPAR-642	72D	CR-154C		520099			560022		581913 581914	50-60 cyc.
CPAR-643	72E	CR-154C	CR-158(FM)	520099			560022		581913 581914	50-60 cyc.
CPAR-644	72DK	CR-154C	CR-169(FM)	520099			560022		581913 581914	50-60 cyc.
CPAR-645	47HF	CR-178		520170			560023		581917	60 cyc.
CPAR-646	47HFK	CR-178	CR-169(FM)	520170			560023		581917	60 cyc.
CPAR-647	54F	CR-177		520170			560023		581915 581916	60 cyc.
CPAR-648	54FA	CR-177	CR-167(FM)	520170			560023		581915 581916	60 cyc.
CPAR-649	54FK	CR-177	CR-170(FM)	520170			560023		581915 581916	60 cyc.
CPAUR-650	U52D	CR-165		520098			560022		581987	AC-DC
EPAR-651	32NF	CR-176		520170			560023		581917	60 cyc.
EPAR-652	32HF	CR-178		520170			560023		581917	60 cyc.
CPAR-653	38HF	CR-178		520170			560023		581917	60 cyc.
CPAR-654	38HFK	CR-178	CR-169(FM)	520170			560023		581917	60 cyc.
CPAR-655	50K	CR-155	CR-169(FM)	520080			560023		581917	60 cyc.
CPAR-656	55G	CR-174C		520301			560023		581915 581916	60 cyc.
CPAR-657	55GA	CR-174C	CR-158(FM)	520301			560023		581915 581916	60 cyc.
CPAR-658	55GK	CR-174C	CR-169(FM)	520301			560023		581915 581916	60 cyc.
CPAR-659	55L	CR-174C		530302	A-222		560023		581915 581916	60 cyc.
CPAR-660	55D	CR-174C		520099			560022		581915 581916	50-60 cyc.
CPAR-661	55E	CR-174C	CR-158(FM)	520099			560022		581915 581916	50-60 cyc.

STYLE NOS. CPAR-662
TO CPA-3001L

THE MAGNAVOX CO.

INSTRUMENT STYLE No.	INSTRUMENT MODEL No.	A.M. RADIO CHASSIS MODEL No.	F.M. RADIO CHASSIS MODEL No.	RECORD CHANGER PART No.	AMPLIFIER CHASSIS MODEL No.	PHONOGRAPH PICK-UP ARM PART No.	CRYSTAL PICK-UP PART No.	TURNTABLE MOTOR PART No.	PART No. SPEAKER	CURRENT
CPAR-662	55DK	CR-174C	CR-169(FM)	520099			560022		581915 581916	50-60 cyc.
CAPR-663	52F	CR-176		520170			560023		581917	60 cyc.
CPAR-664	52FK	CR-176	CR-170(FM)	520170			560023		581917	60 cyc.
CPAR-665	52G	CR-176		520301			560023		581917	60 cyc.
CPAR-666	52GK	CR-176	CR-170(FM)	520301			560023		581917	60 cyc.
CPAR-667	48G	CR-176		520301			560023		581917	60 cyc.
CPAR-668	48GK	CR-176	CR-170(FM)	520301			560023		581917	60 cyc.
CPAR-669	48F	CR-176		520170			560023		581917	60 cyc.
CPAR-670	48FK	CR-176	CR-170(FM)	520170			560023		581917	60 cyc.
CPAR-671	48D	CR-176		520099			560022		581917	50-60 cyc.
CPAR-672	48DK	CR-176	CR-170(FM)	520099			560022		581917	50-60 cyc.
CPAR-673	48G	CR-176		520301			560023		581917	60 cyc.
CPAR-677	42G	CR-174		520301			560023		581915 581916	60 cyc.
CPAR-678	42GA	CR-174	CR-167(FM)	520301			560023		581915 581916	60 cyc.
CPAR-679	42GK	CR-174	CR-170(FM)	520301			560023		581915 581916	60 cyc.
CPAR-681	72D	CR-174C		520099			560022		581913 581914	50-60 cyc.
CPAR-682	72E	CR-174C	CR-158(FM)	520099			560022		581913 581914	50-60 cyc.
CPAR-683	72DK	CR-174C	CR-169(FM)	520099			560022		581913 581914	50-60 cyc.
CPAR-685	38NF	CR-176		520170			560023		581917	60 cyc.
CPAR-686	38NFK	CR-176	CR-169(FM)	520170			560023		581917	60 cyc.
CPAR-687	54F	CR-181		520170			560023		581915 581916	60 cyc.
CPAR-688	54FA	CR-181	CR-167(FM)	520170			560023		581915 581916	60 cyc.
CPAR-689	54FK	CR-181	CR-170(FM)	520170			560023		581915 581916	60 cyc.
CPAR-692	49	CR-176		520080			560023		581917	60 cyc.
CPAR-693	43M	CR-159		520173			560023		581917	60 cyc.
EPAUR-694	U32E	CR-164		520151			560022		581652	AC-DC
CPAUR-695	U48E	CR-165		520151			560022		581987	AC-DC
CPAUR-696	U52E	CR-165		520151			560022		581987	AC-DC
EPAR-697	32NF	CR-176		520170			560023		581917	60 cyc.
CPAR-698	72L	CR-174C		520302	A-222		560023		581913 581914	60 cyc.
CP-1101	4K				A-1101	630341	560023	500029	582331	60 cyc.
CP-3001A	4				A-3001A	631595	562729	507605	58869 58968	60 cyc.
CP-3001B	4A				A-3001A	631595	562729	507605	58869 58968	60 cyc.
CP-3001C	4B				A-3001A	631595	562729	507607	58869 58968	50-60 cyc.
CP-3001D	4C				A-3001A	631595	562729	507607	58869 58968	50-60 cyc.
CP-3001E	4D				A-3001A	633541	562729	509888	58869 58968	60 cyc.
CP-3001F	4E				A-3001A	633541	562729	509888	58869 58968	60 cyc.
CP-3001G	4F				A-3001B	633541	562729	507576	58869 58968	50-60 cyc.
CP-3001H	4G				A-3001B	633541	562729	509888	58869 58968	60 cyc.
CP-3001K	4H				A-3001C	630341	560022	509888	58869 58968	60 cyc.
CP-3001L	4J				A-3001C	630341	560022	509888	58869 58968	60 cyc.
CPA-3001A	5			529562	A-3001A		562729		58869 58968	60 cyc.
CPA-3001B	5A			529562	A-3001A		562729		58869 58968	60 cyc.
CPA-3001C	5B			529650	A-3001A		560008		58869 58968	60 cyc.
CPA-3001D	5C			529650	A-3001A		560008		58869 58968	60 cyc.
CPA-3001E	5D			529650	A-3001A		560008		58869 58968	60 cyc.
CPA-3001F	5E			529650	A-3001A		560008		58869 58968	60 cyc.
CPA-3001G	5D			529650	A-3001A		560008		58869 58968	60 cyc.
CPA-3001H	5E			529650	A-3001B		560008		58869 58968	60 cyc.
CPA-3001I	5G			520001	A-3001B		560008		58869 58968	60 cyc.
CPA-3001J	5F			520001	A-3001B		560008		58869 58968	60 cyc.
CPA-3001K	5H			520072	A-3001C		560022		58869 58968	50-60 cyc.
CPA-3001L	5J			520072	A-3001C		560022		58869 58968	50-60 cyc.

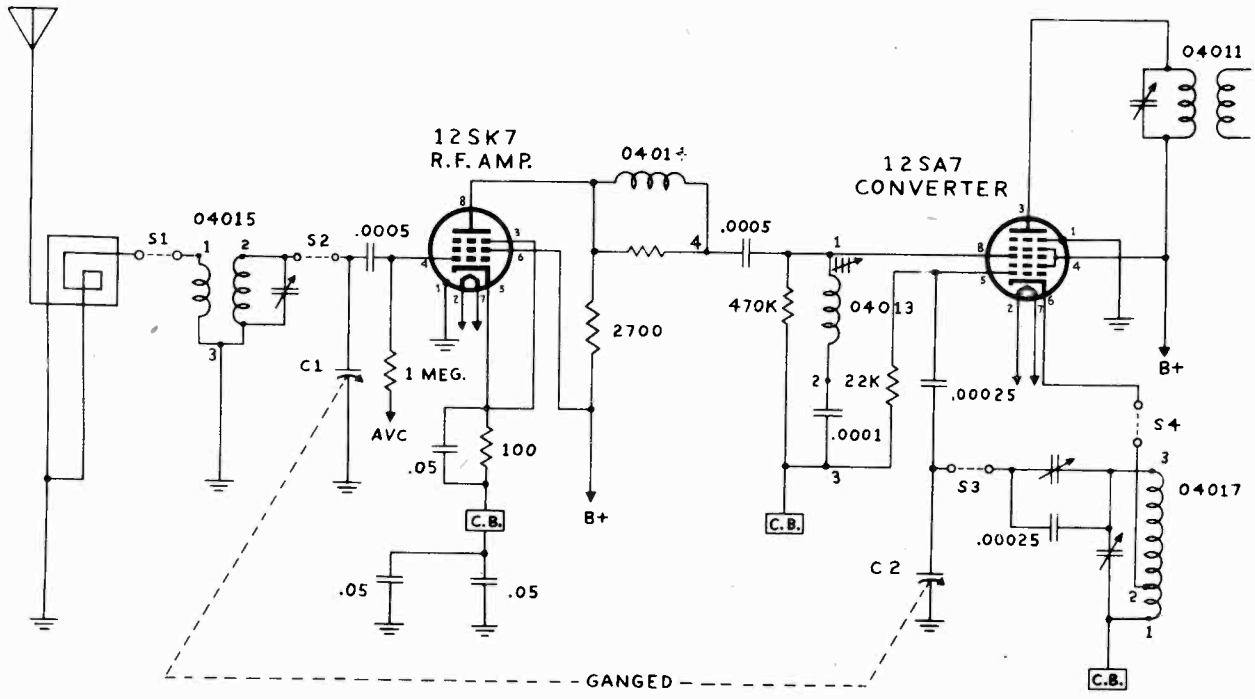
MEISSNER MFG. DIV.-
MAGUIRE INDUSTRIES INC.



"clarified schematics"

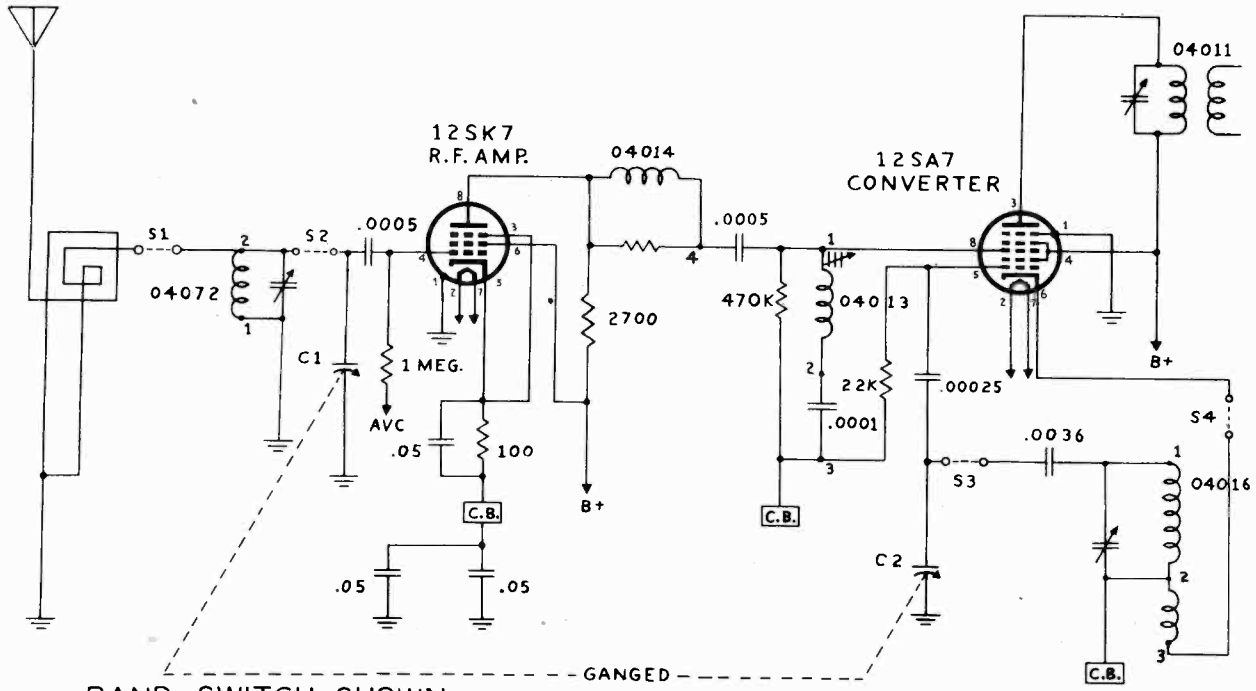
MODELS 9-1084, 9-1086

MEISSNER MFG. DIV.- MAGUIRE INDUSTRIES INC.



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND 530-1600 KC.

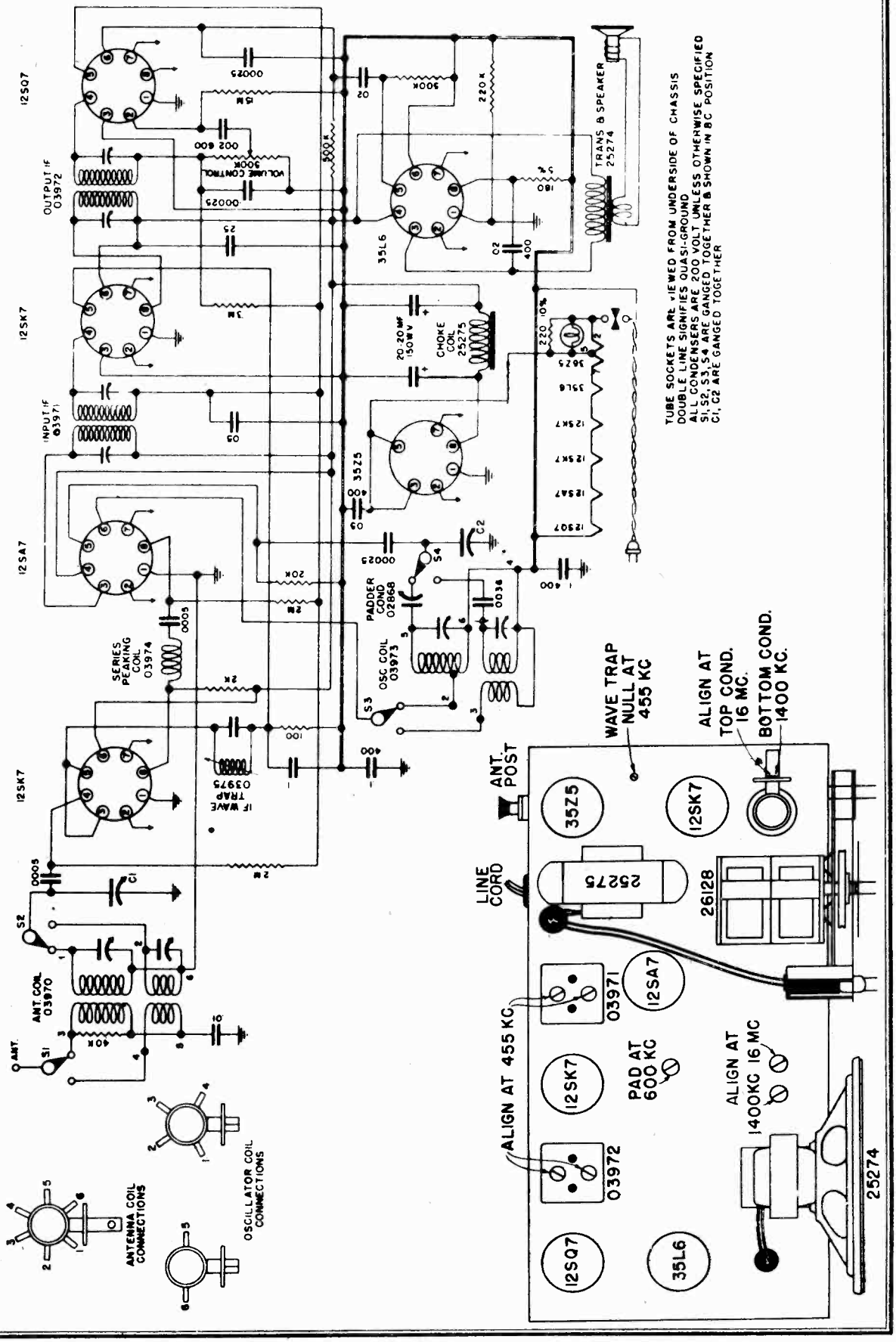
C.B. - DENOTES COMMON BUS



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE SHORT WAVE BAND 6-18 MC.

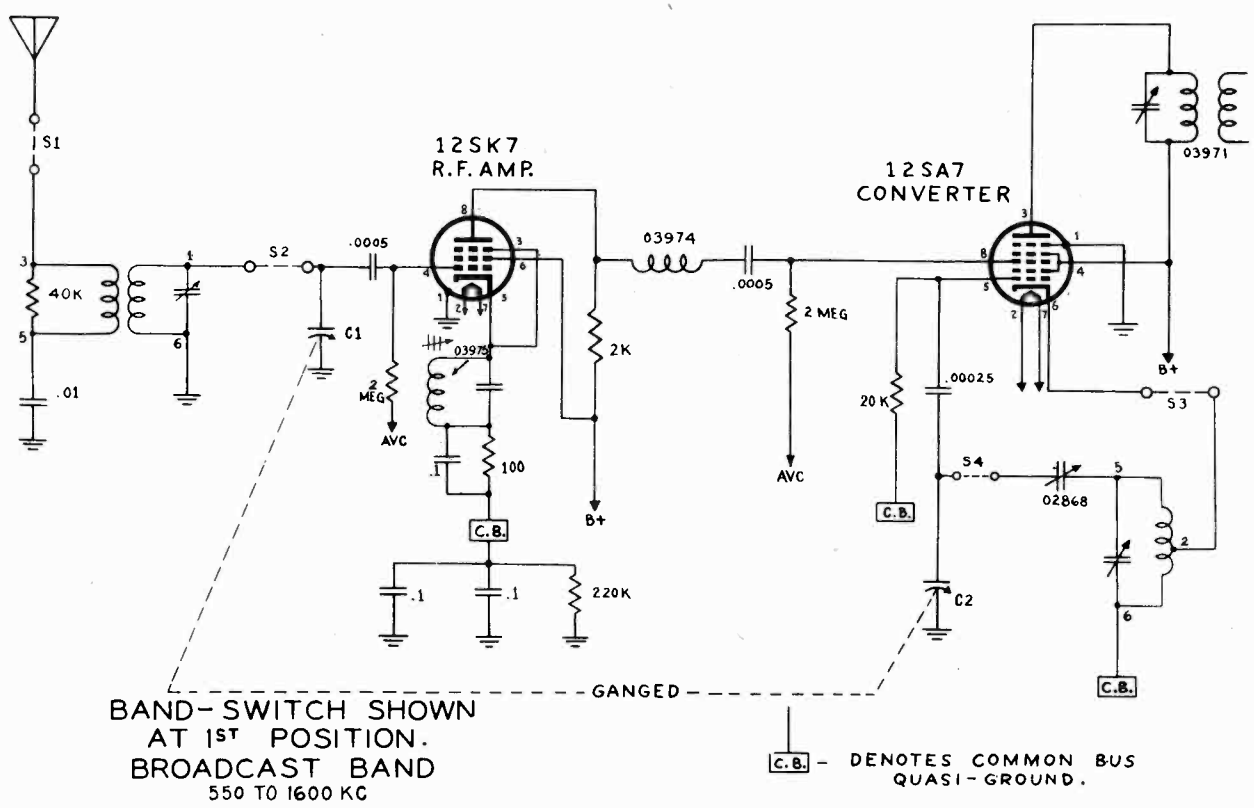
C.B. - DENOTES COMMON BUS

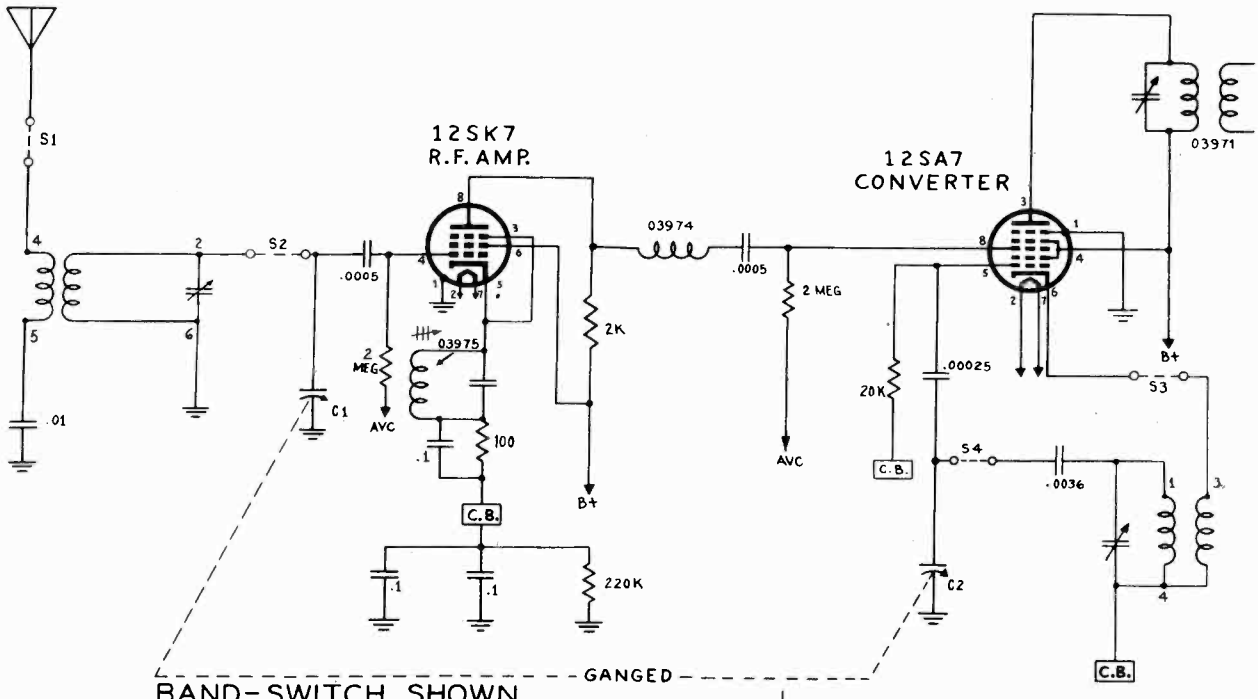
MEISSNER MFG. DIV.-
MAGUIRE INDUSTRIES INC.

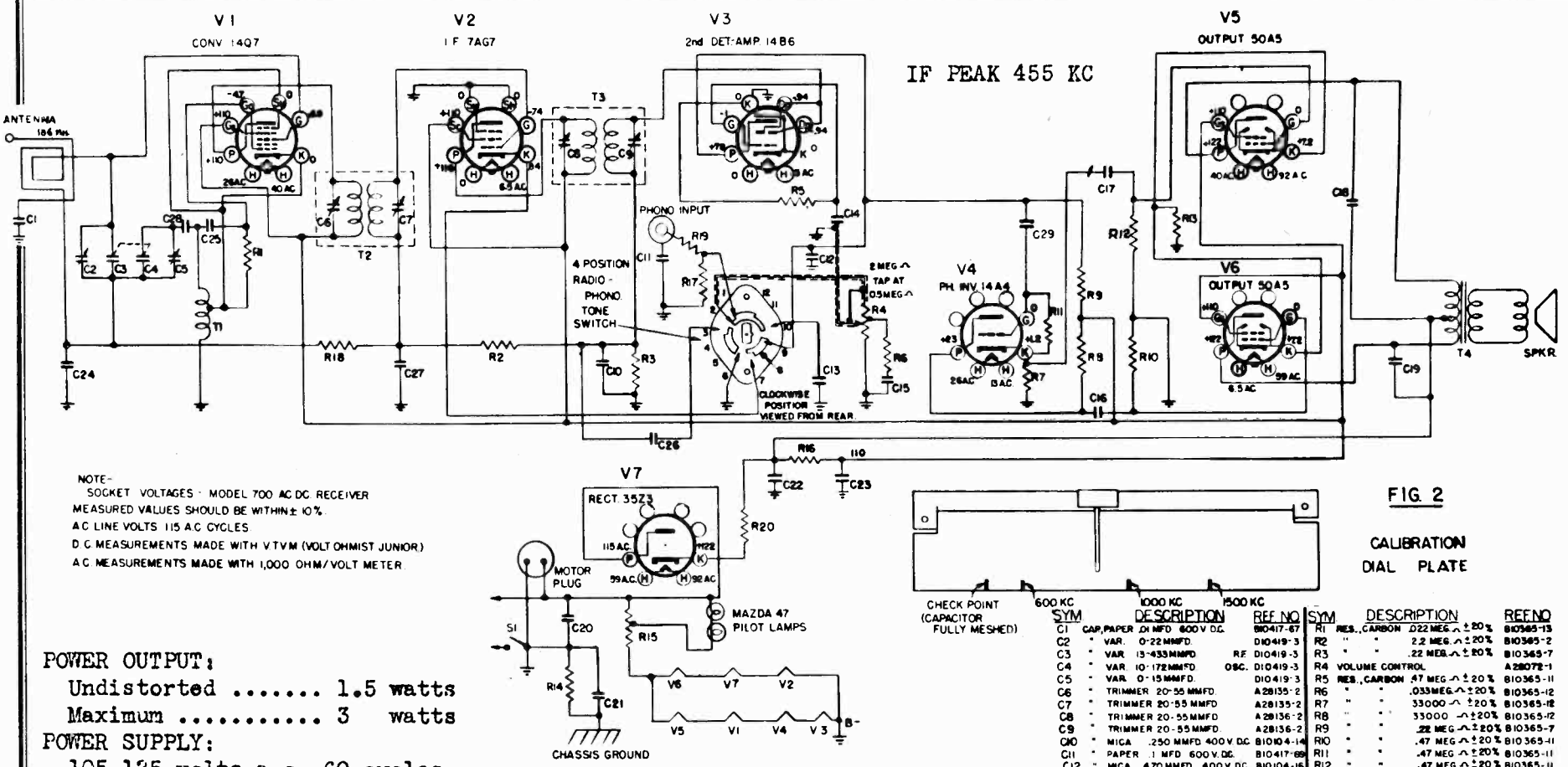


MODEL 9-1085

MEISSNER MFG. DIV.- MAGUIRE INDUSTRIES INC.







NOTE-
SOCKET VOLTAGES - MODEL 700 AC DC RECEIVER
MEASURED VALUES SHOULD BE WITHIN ± 10%
A.C. LINE VOLTS 115 A.C. CYCLES
D.C. MEASUREMENTS MADE WITH V.T.V.M. (VOLT OHMIST JUNIOR)
A.C. MEASUREMENTS MADE WITH 1,000 OHM/VOLT METER

FIG. 2

CALIBRATION
DIAL PLATE

SYM	DESCRIPTION	REF. NO.
C1	CAP., PAPER .01 MFD. 600 V. D.C.	B10417-67
C2	" VAR. 0-22 MMFD.	D10419-3
C3	" VAR. 13-433 MMFD. R.F.	D10419-3
C4	" VAR. 10-172 MMFD. OSC.	D10419-3
C5	" VAR. 0-15 MMFD.	D10419-3
C6	" TRIMMER 20-55 MMFD.	A28135-2
C7	" TRIMMER 20-55 MMFD.	A28135-2
C8	" TRIMMER 20-55 MMFD.	A28136-2
C9	" TRIMMER 20-55 MMFD.	A28136-2
C10	" MICA .250 MMFD. 400 V. D.C.	B10104-14
C11	" PAPER .1 MFD. 600 V. D.C.	B10417-69
C12	" MICA 470 MMFD. 400 V. D.C.	B10104-16
C13	" PAPER .005 MFD. 600 V. D.C.	B10417-47
C14	" " .01 MFD. 400 V. D.C.	B10417-17
C15	" " .01 MFD. 400 V. D.C.	B10417-17
C16	" " .001 MFD. 600 V. D.C.	B10417-43
C17	" " .001 MFD. 600 V. D.C.	B10417-43
C18	" " .01 MFD. 400 V. D.C.	B10417-17
C19	" " .01 MFD. 400 V. D.C.	B10417-17
C20	" " .05 MFD. 600 V. D.C.	B10417-68
C21	" " 1 MFD. 600 V. D.C.	B10417-69
C22	" ELECTROLYTIC 40 MFD. 150 V. D.C.	A10427
C23	" " 80 MFD. 150 V. D.C.	A10427
C24	" PAPER .05 MFD. 600 V. D.C.	B10417-68
C25	" MICA .56 MMFD. 400 V. D.C.	B10104-9
C26	" PAPER .01 MFD. 400 V. D.C.	B10417-17
C27	" PAPER .01 MFD. 400 V. D.C.	B10417-17
C28	CAP., PAPER .05 MFD. 400 V. D.C.	B10417-20
C29	CAP., PAPER .01 MFD. 400 V. D.C.	B10417-17

SYM	DESCRIPTION	REF. NO.
R1	RES., CARBON .022 MEG. ± 20%	B10365-13
R2	" " 2.2 MEG. ± 20%	B10365-2
R3	" " .22 MEG. ± 20%	B10365-7
R4	VOLUME CONTROL	A28072-1
R5	RES., CARBON .47 MEG. ± 20%	B10365-11
R6	" " .033 MEG. ± 20%	B10365-12
R7	" " 33000 Ω ± 20%	B10365-12
R8	" " 33000 Ω ± 20%	B10365-12
R9	" " .22 MEG. ± 20%	B10365-7
R10	" " .47 MEG. ± 20%	B10365-11
R11	" " .47 MEG. ± 20%	B10365-11
R12	" " .47 MEG. ± 20%	B10365-11
R13	" " 100 Ω ± 20%	A10366-2
R14	" " .22 MEG. ± 20%	B10365-7
R15	" BLEEDER 90 Ω, TAP AT 50 Ω	A10368-2
R16	" CARBON 560 Ω ± 10%	C10351-72
R17	" " .22 MEG. ± 20%	B10365-7
R18	" " .47 MEG. ± 20%	B10365-11
R19	" " .47 MEG. ± 20%	B10365-11
R20	RES., CARBON 10 Ω 1/2 W ± 20%	C10351-1
T1	OSC. COIL	A28145
T2	I.F. COIL 455 KC	A28135-2
T3	I.F. COIL 455 KC	A28136-2
T4	AUDIO OUTPUT TRANSFORMER	A28068-2
SPKR	SPEAKER 5" X 7" P.M.	C20485-2

POWER OUTPUT:
  Undistorted ..... 1.5 watts
  Maximum ..... 3 watts
POWER SUPPLY:
  105-125 volts, a.c. 60 cycles
POWER CONSUMPTION: 45 watts
LOUDSPEAKER:
  5×7 inch oval (or 5-inch round);
  permanent magnet.
Voice Coil Impedance: 3.2 ohms at
400 cycles.

NOTES:
R19, R20 and C28, shown in the above schematic, were not included in earlier models.
The following changes were effected in later models: R2 changed from 10 to 2.2 megohms;
R16 changed from 1800 to 560 ohms; R17 changed from 0.47 megohm to 0.22 megohm.
The rectifier output voltage of +110 volts, as shown above, may be 10 to 15 volts
lower in earlier models due to the higher resistance of R16 in the filter section.

MAGUIRE INDUSTRIES INC.

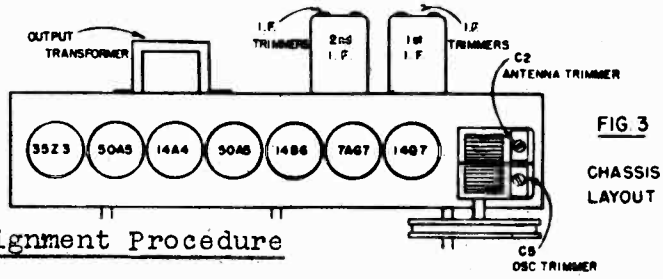


FIG 3
CHASSIS LAYOUT

Alignment Procedure

A signal generator capable of producing a modulated radio-frequency signal, and a suitable output meter are required for proper alignment of the receiver.

Adjust the signal generator for 30%, 400 cycle modulation. At all times, use only the minimum signal intensity which will produce a readable indication on the output meter, in order to minimize alignment error due to a.v.c. action in the receiver.

Set the receiver controls for "Radio", maximum volume, and treble tone.

Make all adjustments with the signal generator connected directly to the external antenna lead of the receiver, and with the output meter across the speaker voice coil.

Use a non-metallic screwdriver in making all receiver alignment adjustments.

NOTE: The calibrated tuning dial of the receiver is fastened in the cabinet and cannot be used for reference during alignment. Therefore, calibration marks have been stamped on the plate on the front of the chassis, as shown in Figure 2. These are the reference marks referred to in the following procedure:

Step 1. Set signal generator to 455 kc. and the receiver dial to a "quiet spot" between stations. Peak the I.F trimmer condensers (Figure 3) for maximum signal indication on the output meter, beginning with the 2nd I.F. transformer.

Step 2. Turn ganged tuning condenser to maximum capacity (fully meshed) and adjust dial pointer on cord so that it coincides with the extreme left hand white mark on the metal dial plate.

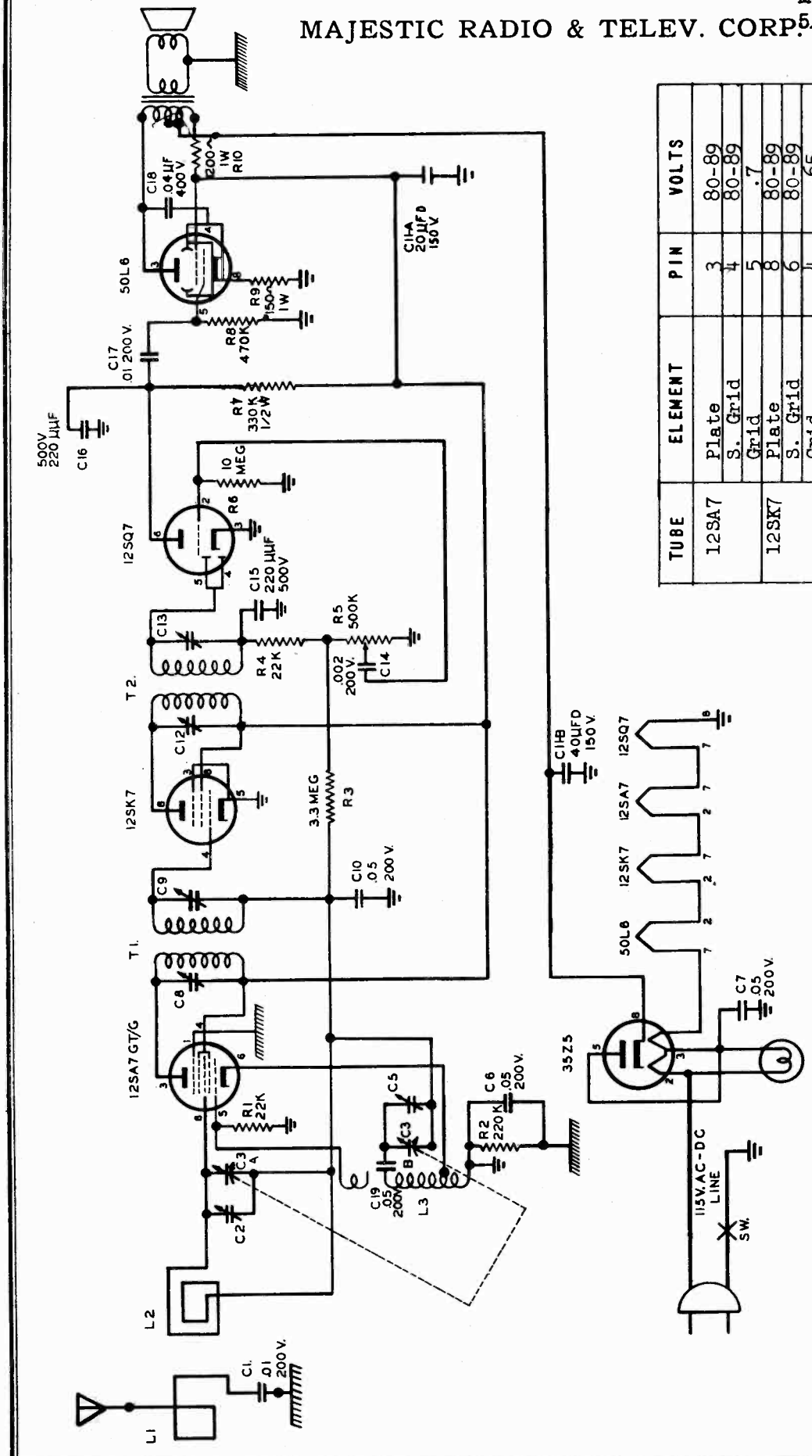
Step 3. Set signal generator to 1500 kc. Turn ganged tuning condenser until pointer coincides with extreme right hand (1500 kc.) calibration mark. Adjust oscillator trimmer condenser C5 (Figure 3) for maximum indication on the output meter.

Step 4. With the signal generator and receiver dial set as in step 3, adjust the antenna trimmer condenser C2 for maximum indication on the output meter.

When chassis has been returned to cabinet after alignment, the receiver calibration should be checked against the tuning dial. It may be found necessary to slide the dial pointer slightly in either direction on the cord to correct for small deviations in calibration.

MODELS 5A410,Ch.4501;
5A430,Ch.4504

MAJESTIC RADIO & TELEV. CORP.



TUBE	ELEMENT	PIN	VOLTS
12SA7	Plate	3	80-89
	S. Grid	4	80-89
	Grid	5	.7
12SK7	Plate	8	80-89
	S. Grid	6	80-89
	Grid	4	.65
12SQ7	Plate	6	55-65
	Grid	2	.8
50L6	Plate	3	110-118
	S. Grid	4	80-89

NOTE: ALL VOLTAGES MEASURED WITH VOLT-OHMYST TO B MINUS (LOW END OF VOL. CONTROL, PIN 8 OF 12SQ7, etc.) LINE VOLTAGE 117 VOLTS, NO SIGNAL, VOLUME CONTROL FULL OFF.

MODELS 5A410,Ch.4501;
5A430,Ch.4504

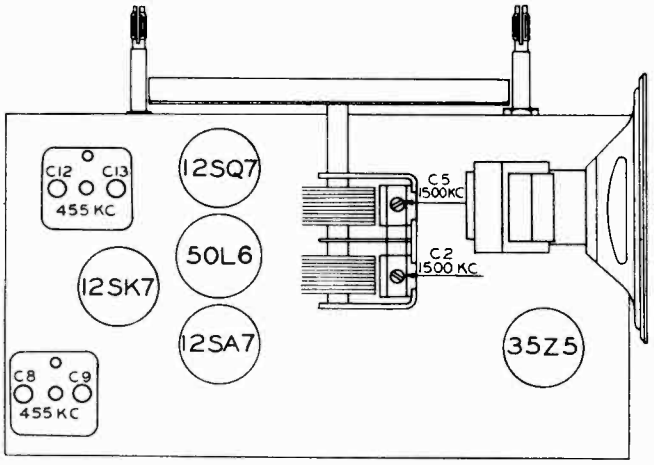
MAJESTIC RADIO & TELEV. CORP.

Before aligning, set the dial pointer as follows: Close the tuning gang condenser (plates fully meshed). Set dial pointer so that its left hand edge is in line with the right hand edge of the last mark at the low 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 MUST BE MOUNTED ON THE CHASSIS EXACTLY AS WHEN THE RECEIVER IS IN THE CABINET.

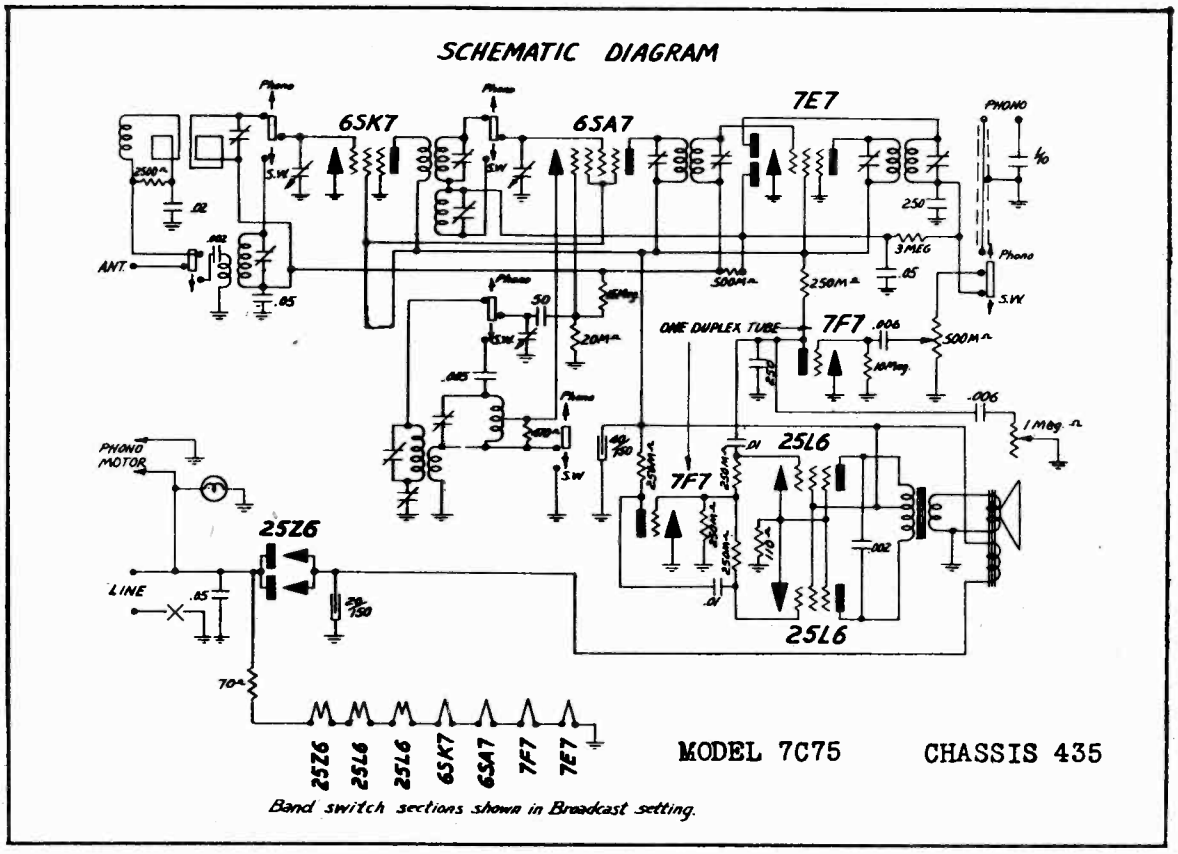


TUBE LAYOUT

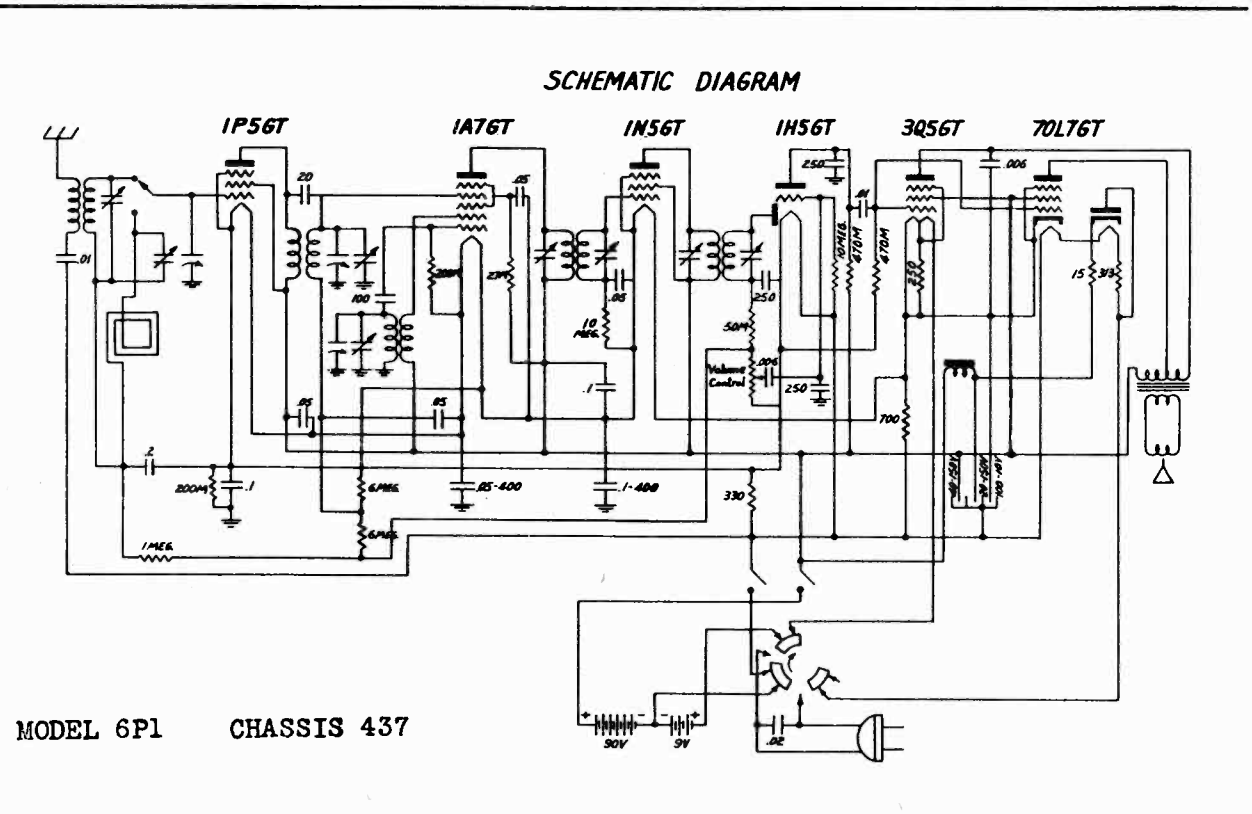
ITEM	DESCRIPTION	PART NO.
R1,R4	22,000 ohm 20% 1/3 watt	9-184
R2	220,000 ohm 20% 1/3 watt	9-182
R3	3.3 megohm 20% 1/3 watt	9-206
R5	Volume Control with switch	13-14
R6	10 megohm 20% 1/3 watt	9-160
R7	330,000 ohm 20% 1/2 watt	9-89
R8	470,000 ohm 20% 1/3 watt	9-207
R9	150 ohm 20% 1 watt	9-251
R10	1,200 ohm 10% 1 watt	9-216
C1,C17	.01 mfd +20% -10% 200 v	6-112
C2,C3,C5	Ganged Tuning Condenser	7-16
C6	.05mfd +40% -10% 200 v	5-40
C7,C10	.05 mfd +40% -10% 200 v	5-40
C8,C9, C12,C13	Trimmer, 135 mmfd, mica	8-46
C11	20-40 mfd 150 v electrolytic	19-24
C14	.002 mfd +40% -10% 200 v	5-52
C15,C16	220 mmfd 20% 500 v mica	6-151
C18	.04 mfd +20% -10% 400 v	5-58
C19	.05 mfd + 40% - 10% 200 v	5-40
T1	1st IF Transformer	3-116
T2	2nd IF Transformer	3-117
L3	Oscillator Coil Assembly	3-158
	Speaker	22-12
	Dial Glass	117-30
	Dial Cord Tension Spring	129-29
	Dial Pointer	135-5
	MODEL 5A410	
	Cabinet, walnut	116-1
	Cabinet, white	116-2
	Loop antenna & back cover	20-7
	Knobs, walnut	128-23
	Knobs, black	128-25
	MODEL 5A430	
	Cabinet	115-6
	Loop antenna & back cover	20-17
	Knobs	128-32

MODEL 6P1,Ch.437
MODEL 7C75,Ch.435

MAJESTIC RADIO & TELEV. CORP.



Chassis 435



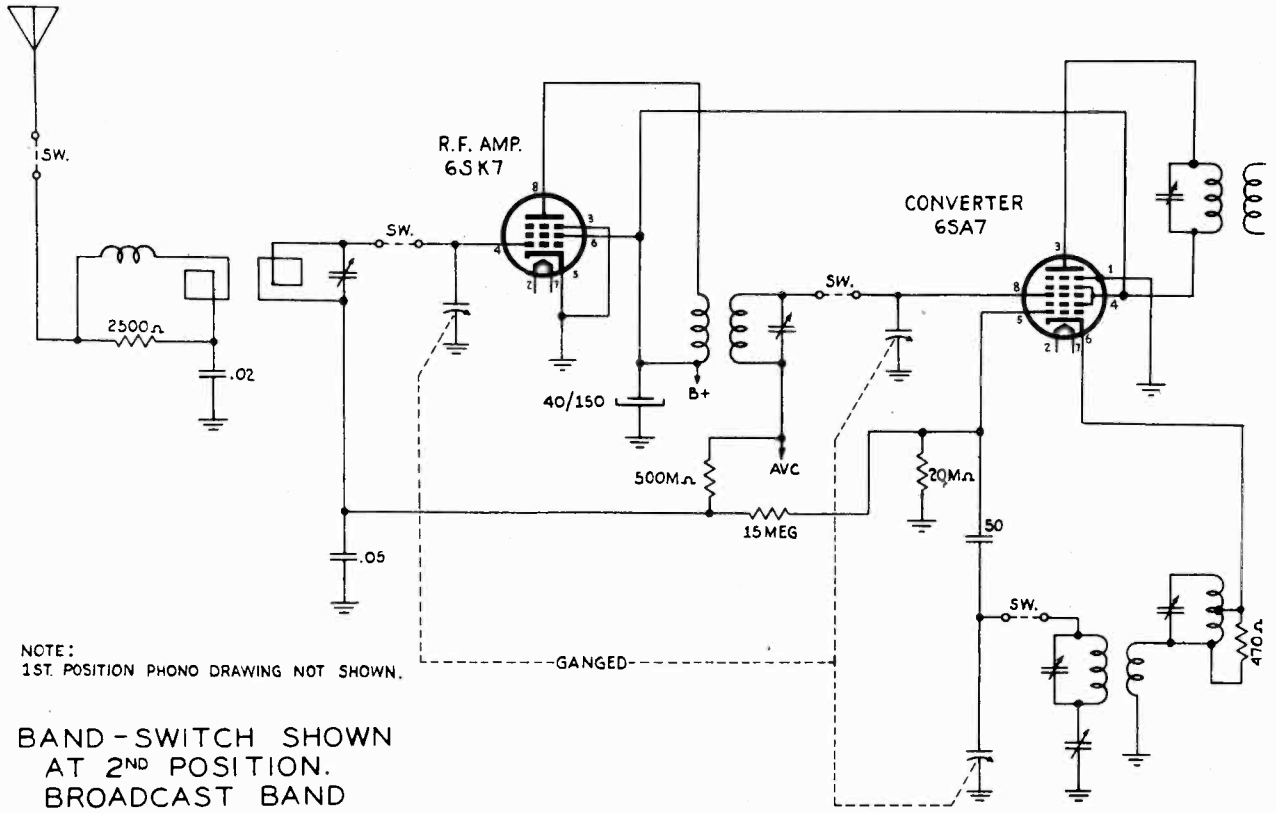
Chassis 437

For Socket and Trimmers, see P.15-5

"clarified schematics"

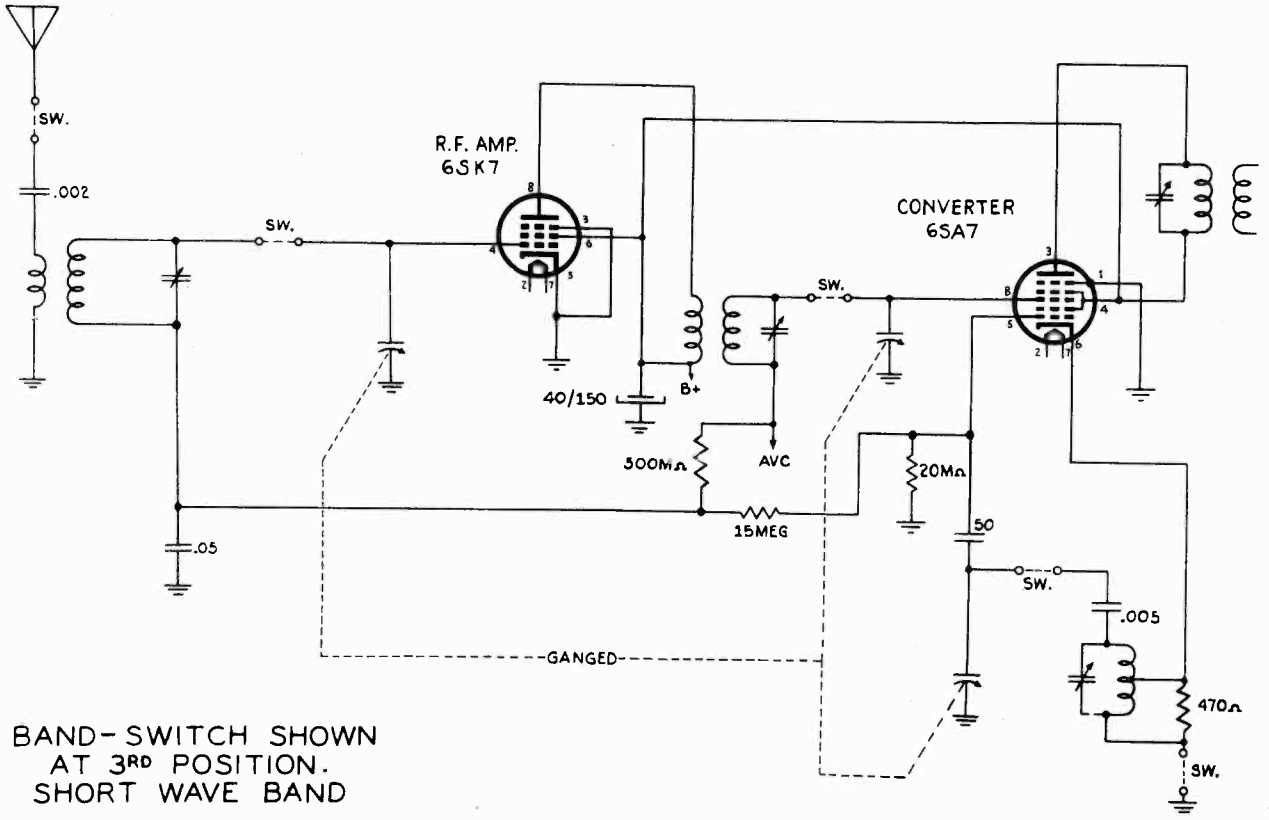
MODEL 7C75, Ch. 435

MAJESTIC RADIO & TELEV. CORP.



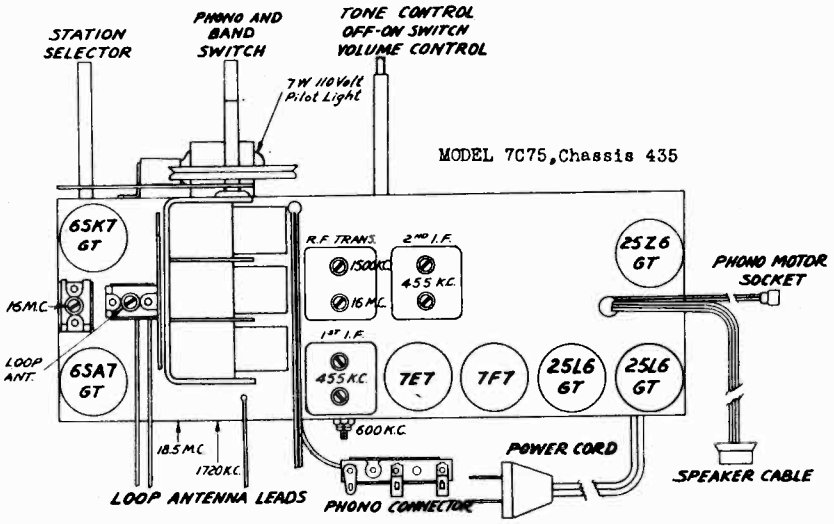
NOTE:
1ST. POSITION PHONO DRAWING NOT SHOWN.

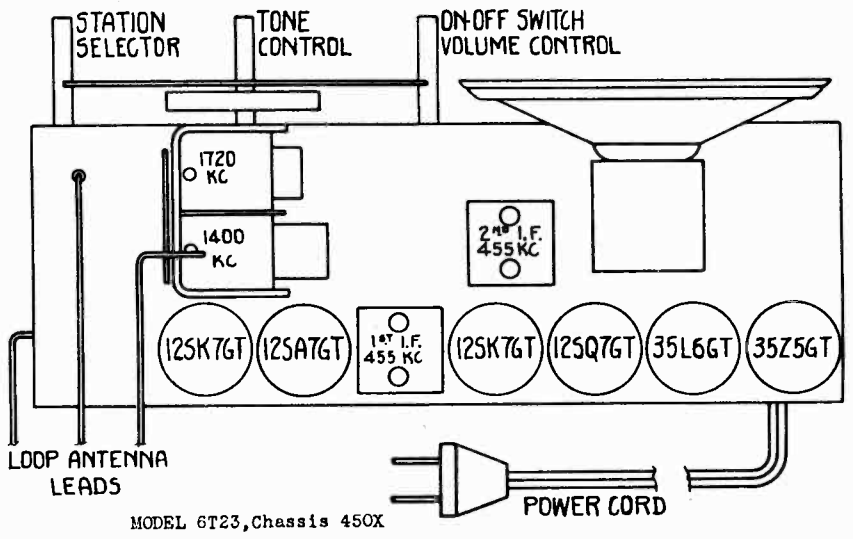
BAND-SWITCH SHOWN
AT 2ND POSITION.
BROADCAST BAND

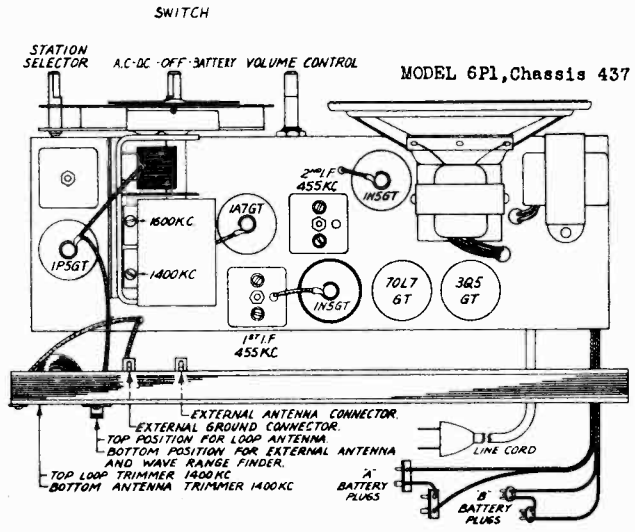


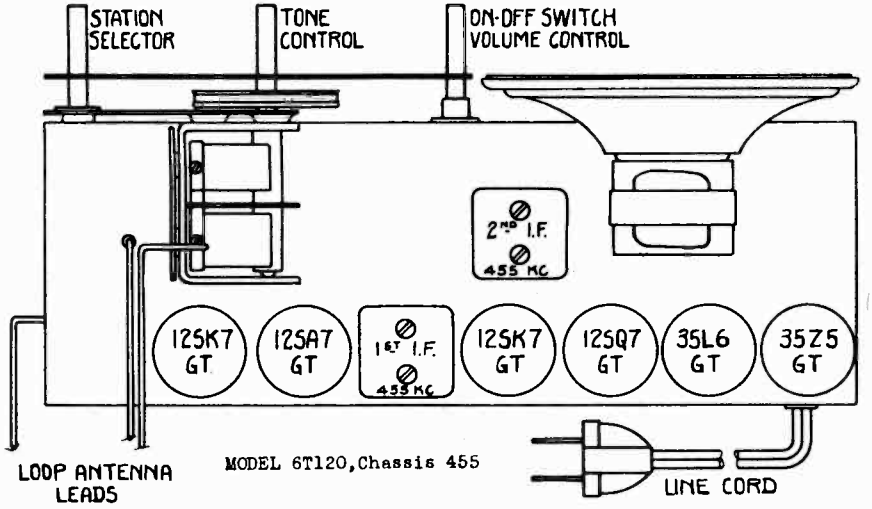
BAND-SWITCH SHOWN
AT 3RD POSITION.
SHORT WAVE BAND

MODEL 6P1,Ch.437
MODEL 6T23,Ch.450X
MODEL 6T120,Ch.455
MODEL 7C75,Ch.435



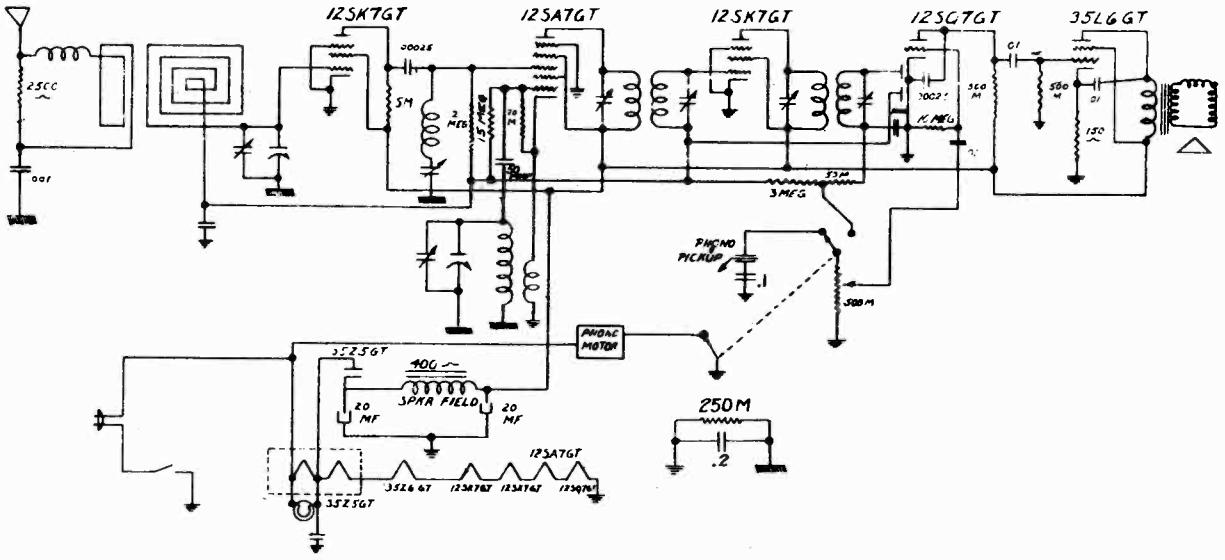






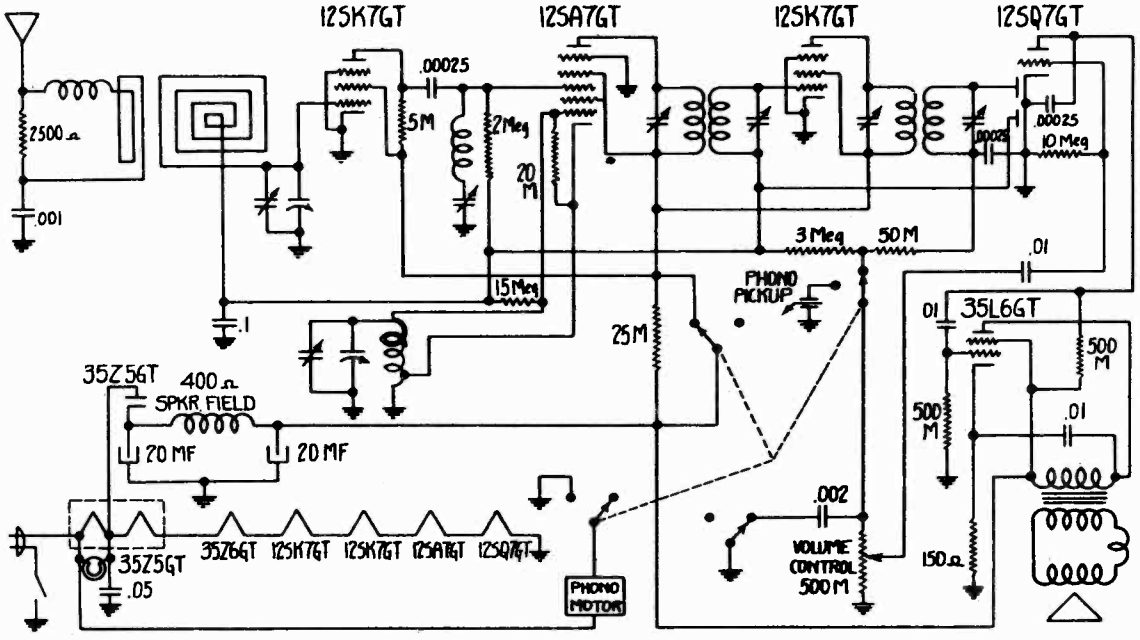
MODEL 6C137,Ch.456
MODEL 6CU35,Ch.440

MAJESTIC RADIO & TELEV. CORP.



MODEL 6CU35 CHASSIS 440

Chassis 440



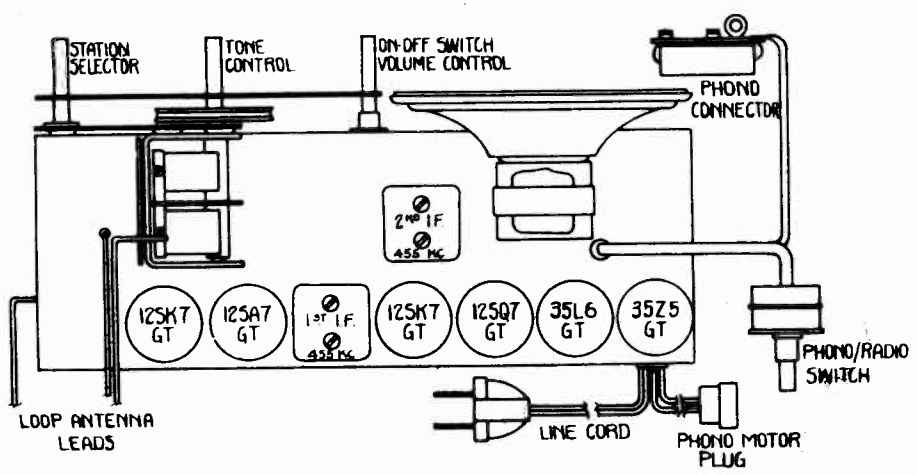
MODEL 6C137
CHASSIS 456

Chassis 456

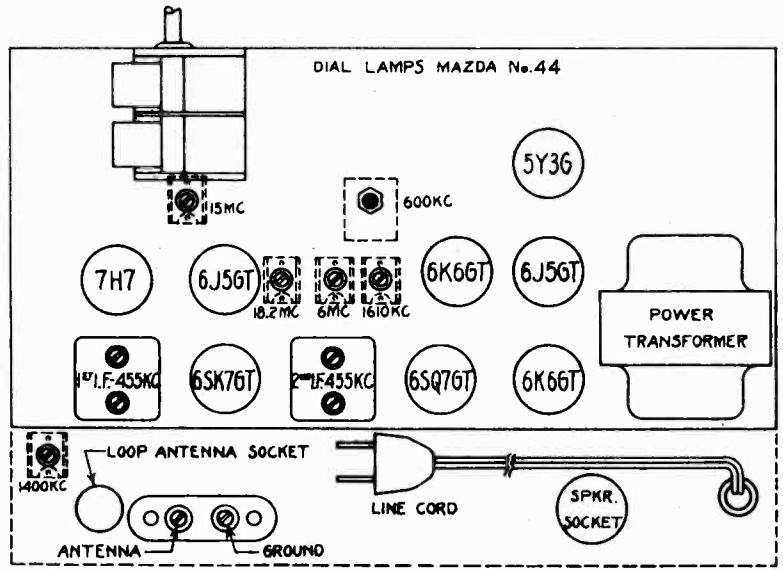
 Model 6C137:Socket,trimmers,P.15-7;Record Changer:Seeburg Model K

MAJESTIC RADIO & TELEV. CORP.

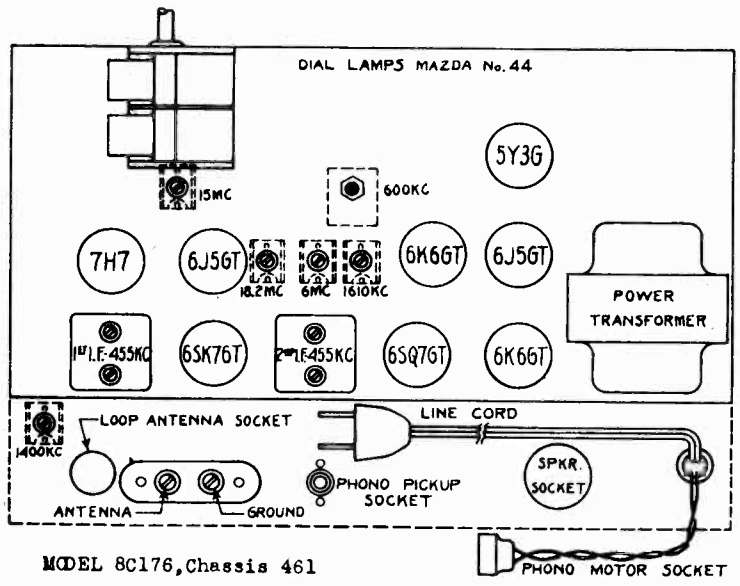
MODEL 6C137,Ch.456
MODEL 8C176,Ch.461
MODEL 8T129,Ch.459;
8K161,Ch.460



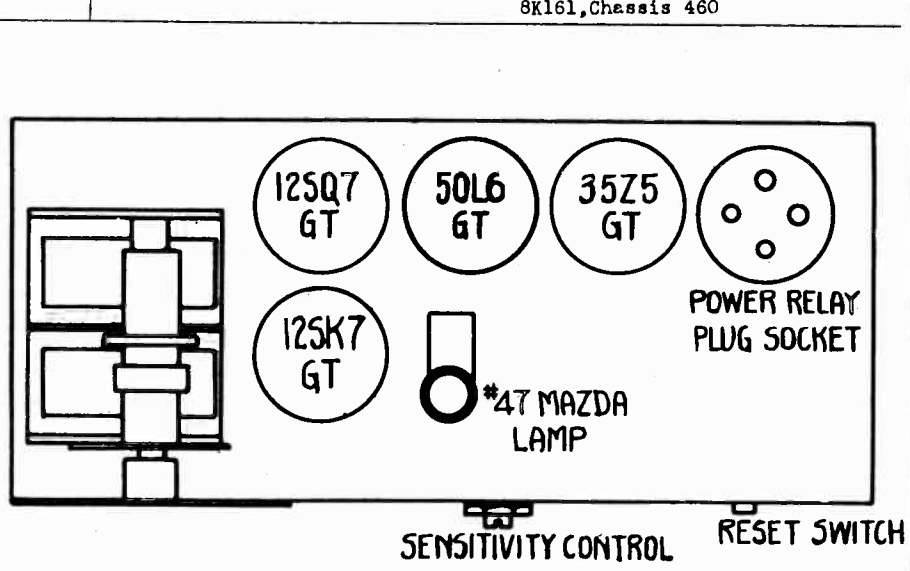
MODEL 6C137,Chassis 456



MODEL 8T129,Chassis 459
8K161,Chassis 460

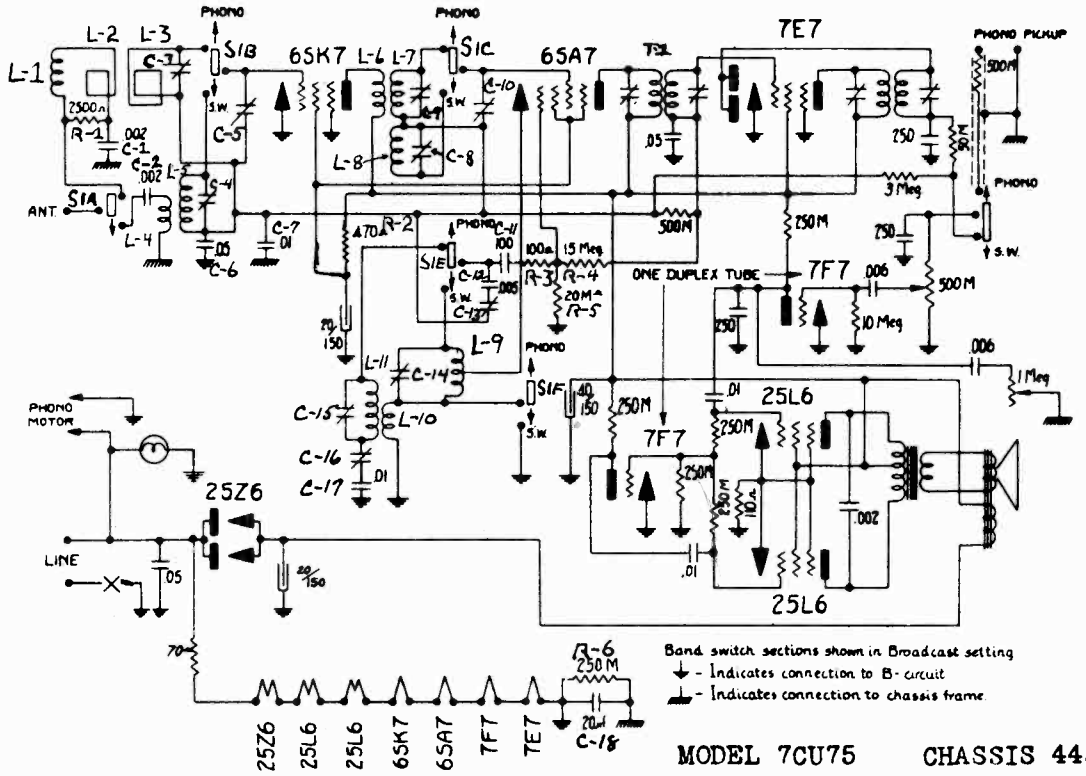


MODEL 8C176,Chassis 461



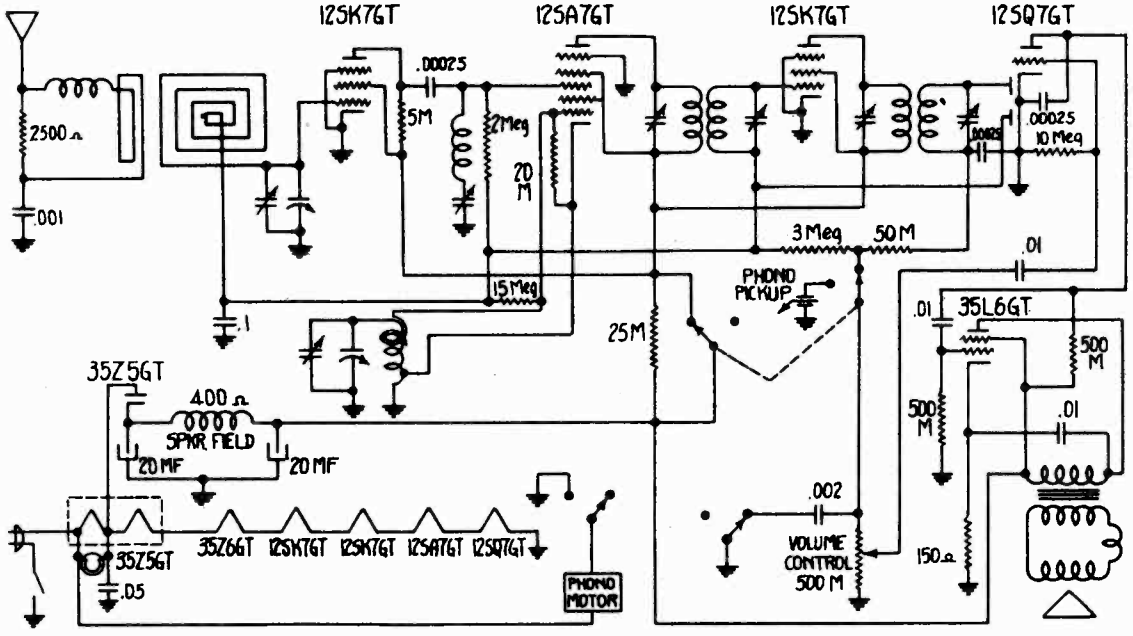
MODEL 6C141,Ch.457
MODEL 7CU75,Ch.445

MAJESTIC RADIO & TELEV. CORP.



MODEL 7CU75 CHASSIS 445

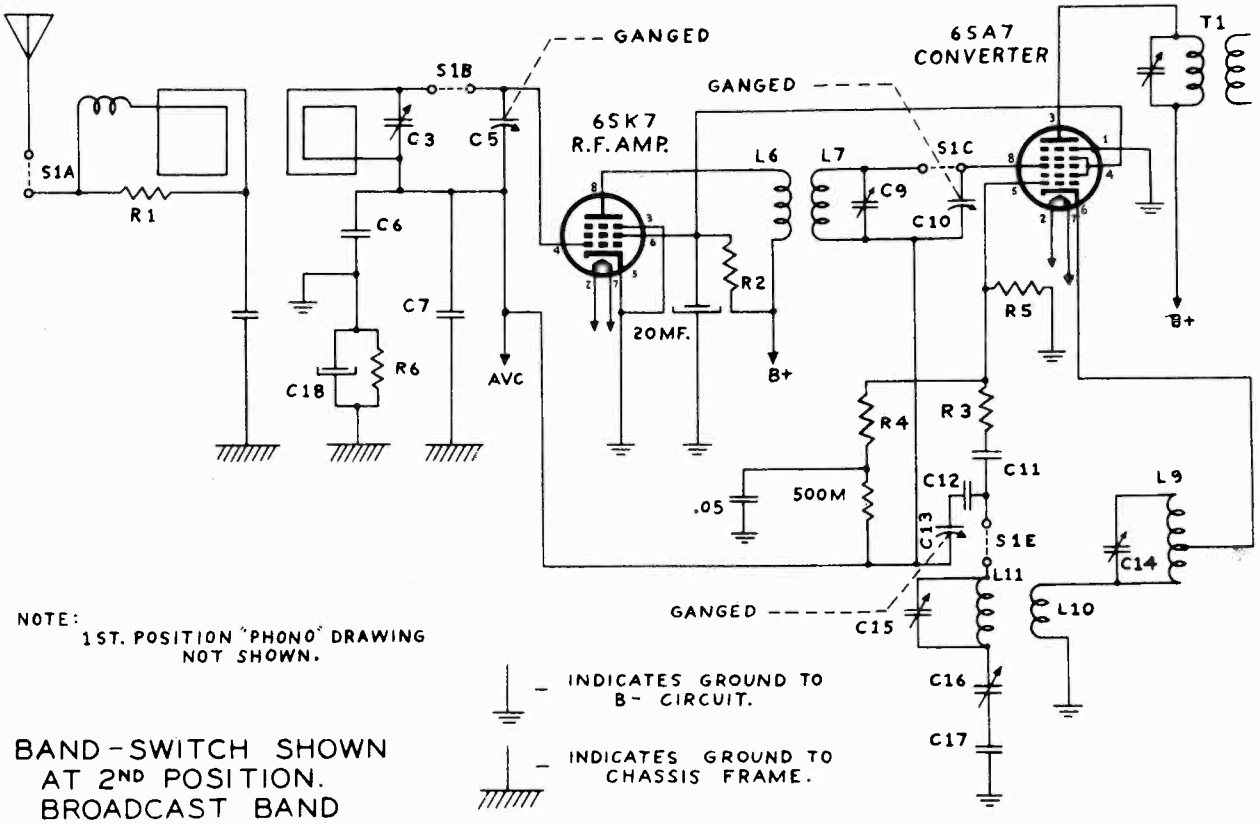
Chassis 445



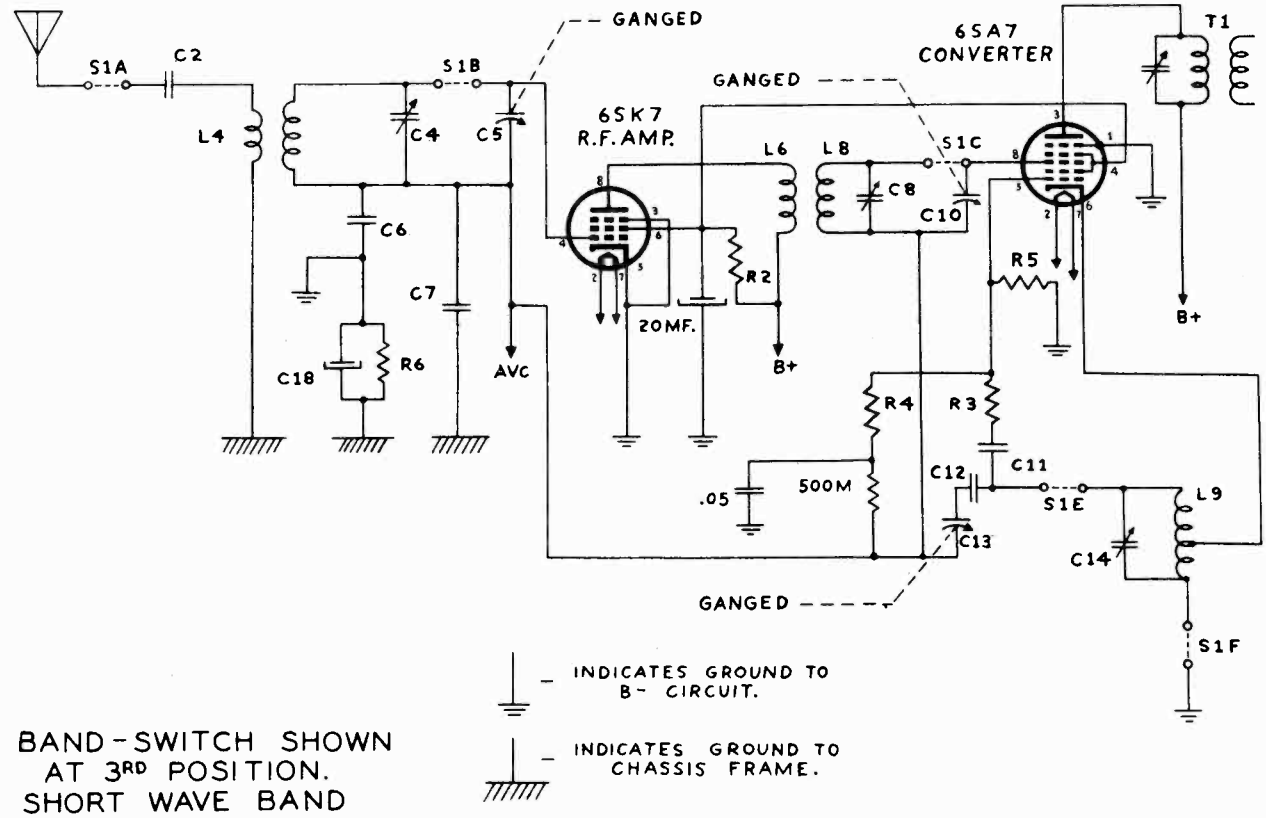
MODEL 6C141 CHASSIS 457

Chassis 457

MAJESTIC RADIO & TELEV. CORP.



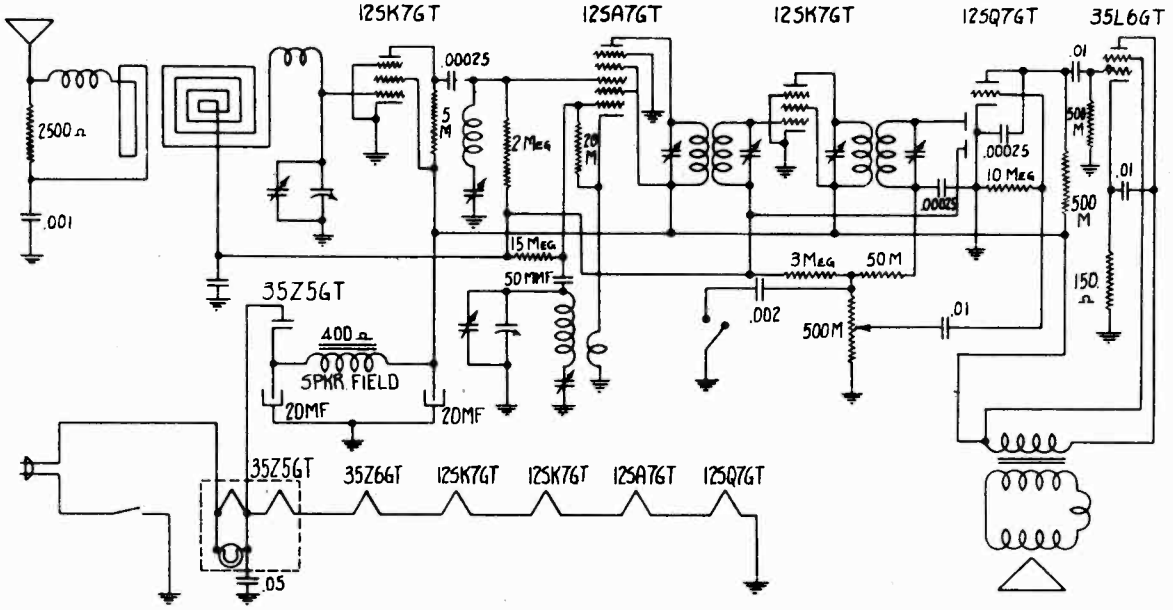
BAND-SWITCH SHOWN
AT 2ND POSITION.
BROADCAST BAND



BAND-SWITCH SHOWN
AT 3RD POSITION.
SHORT WAVE BAND

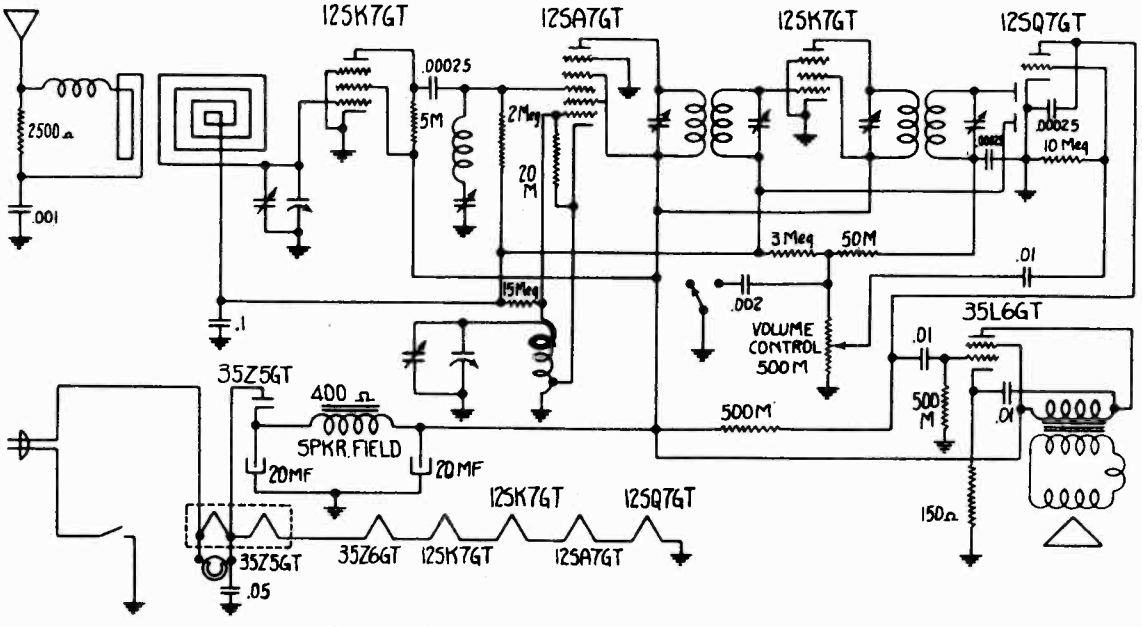
MODEL 6T23,Ch.450X
MODEL 6T120,Ch.455

MAJESTIC RADIO & TELEV. CORP.



MODEL 6T23 CHASSIS 450X

Chassis 450X



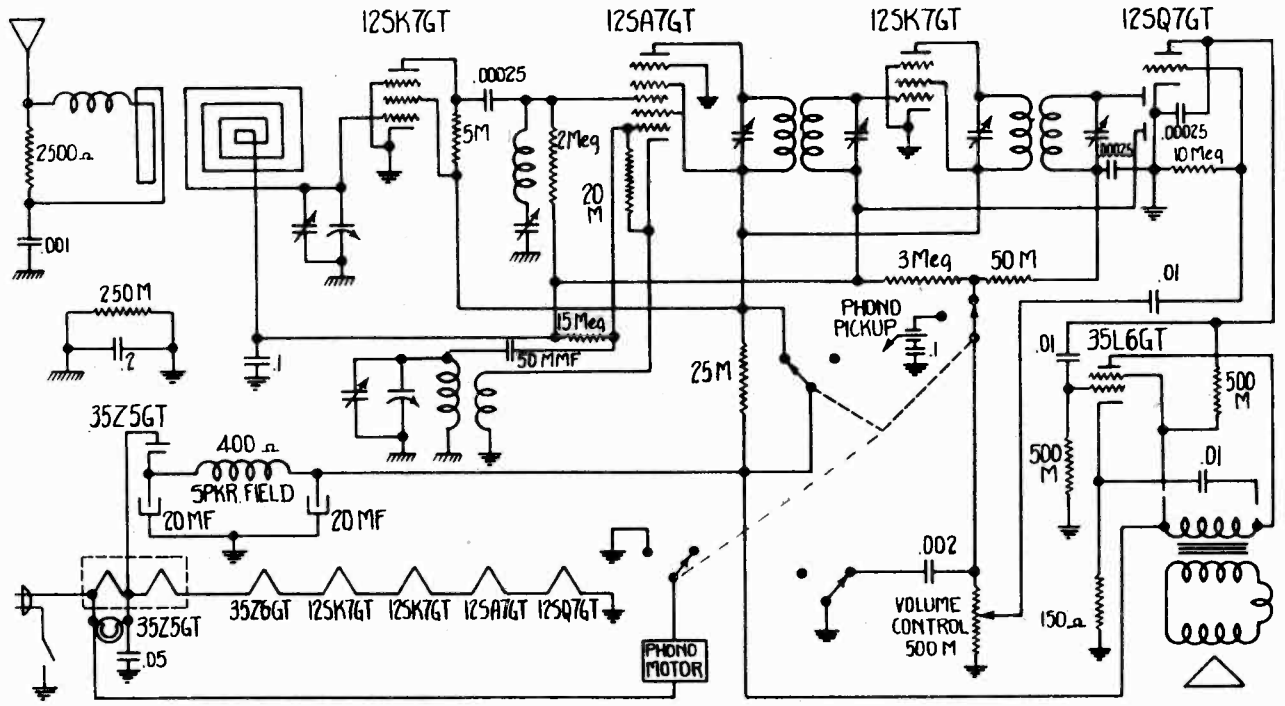
MODEL 6T120 CHASSIS 455

Chassis 455

For Socket,trimmers, see P.15-5

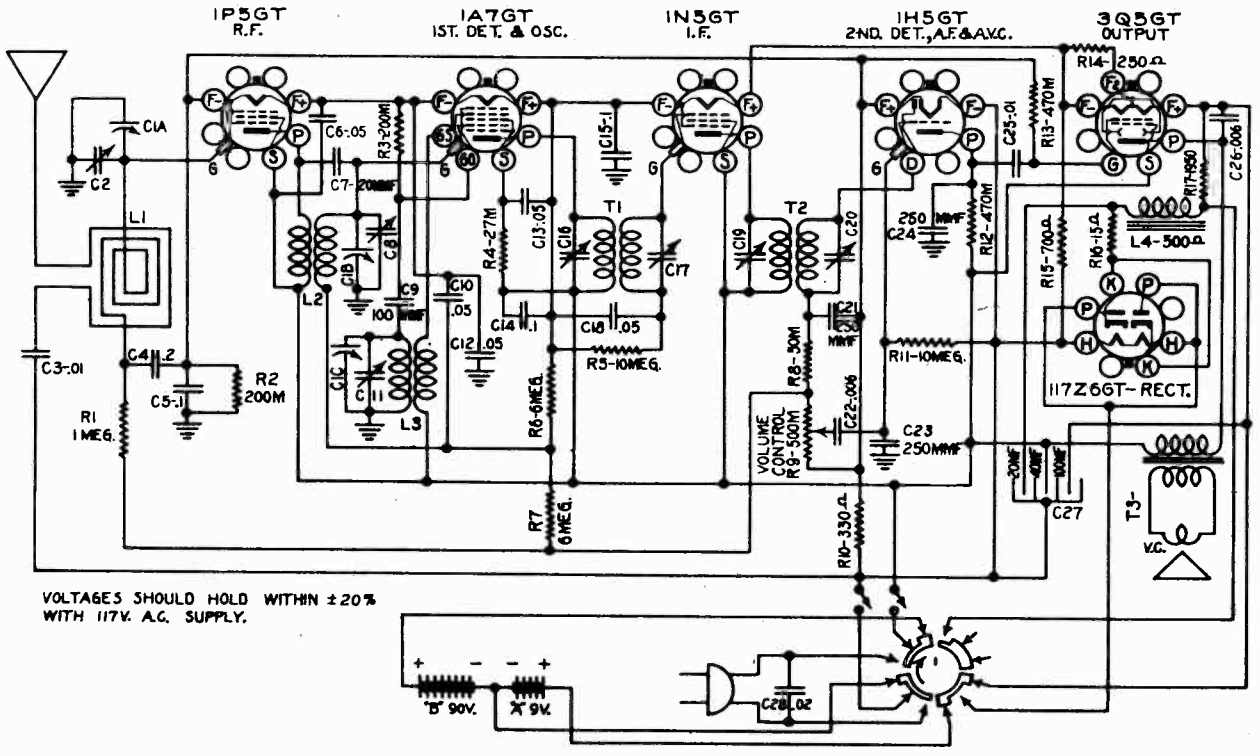
MODEL 6CU137,Ch.464
MODEL 6CU141,Ch.466

MAJESTIC RADIO & TELEV. CORP.



MODEL 6CU137 CHASSIS 464

Chassis 464

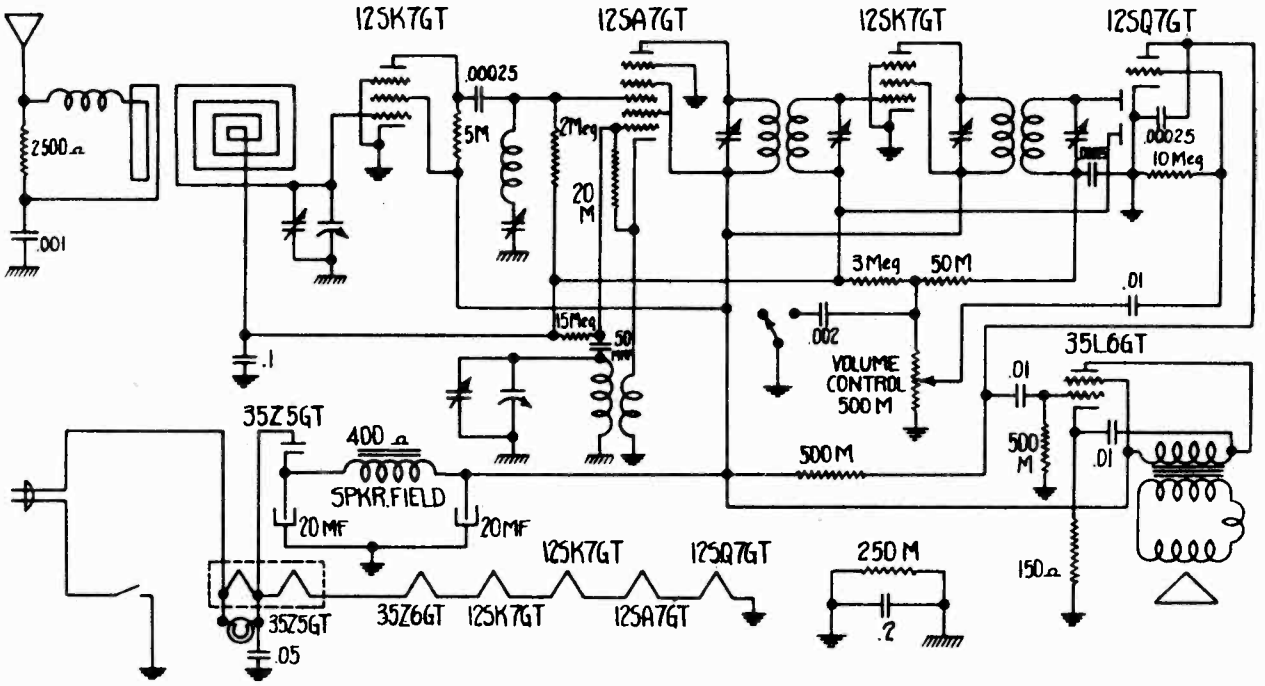


MODEL 6CU141 CHASSIS 466

Chassis 466

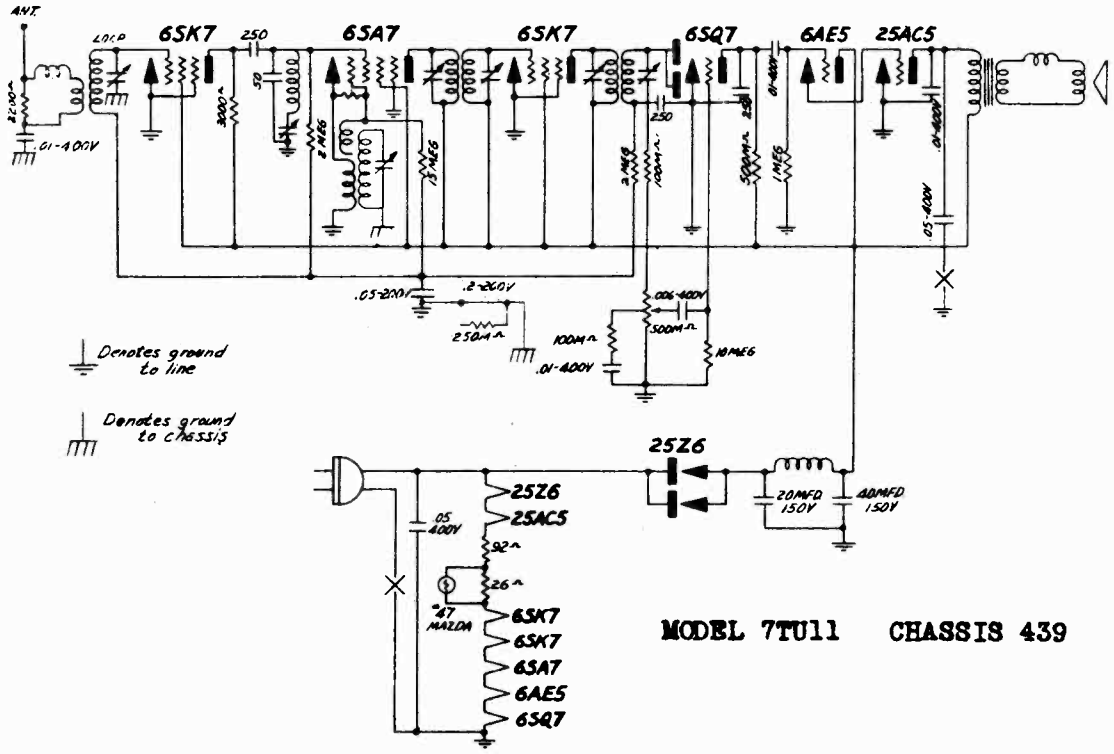
MODEL 6TU120,Ch.462
MODEL 7TU11,Ch.439

MAJESTIC RADIO & TELEV. CORP.



MODEL 6TU120 CHASSIS 462

Chassis 462

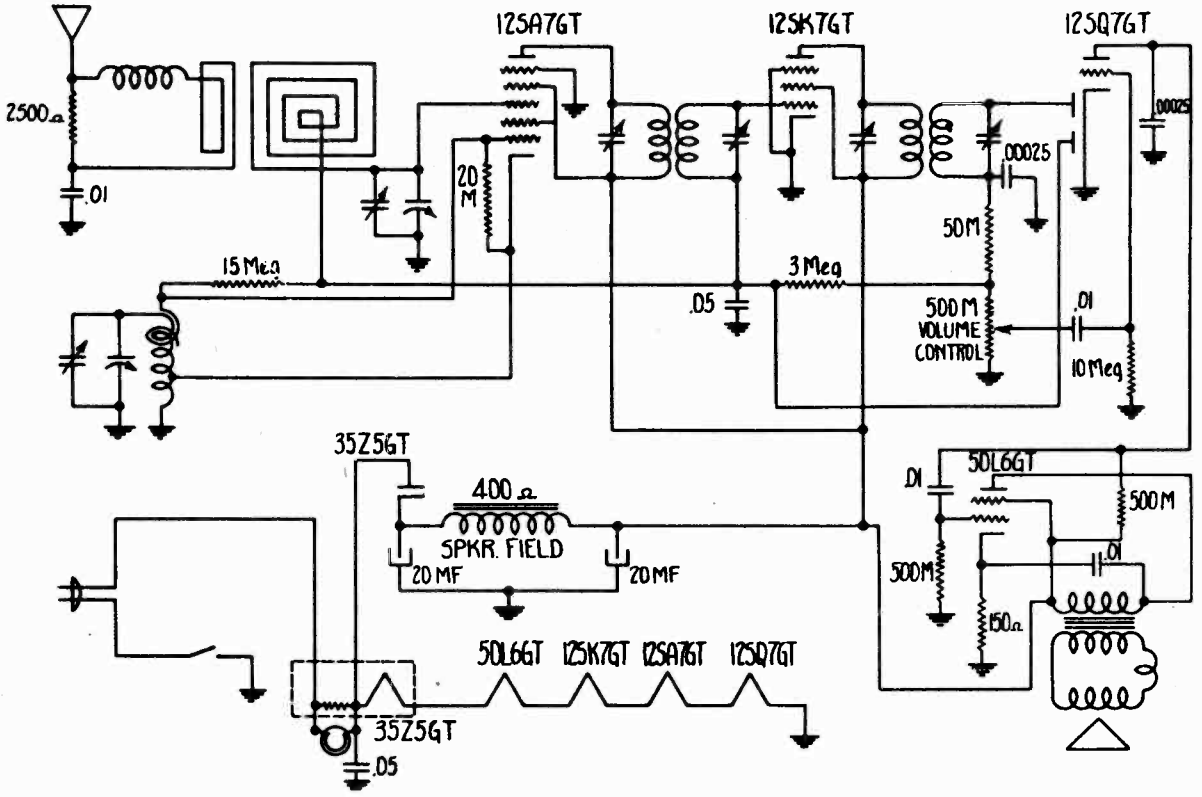


MODEL 7TU11 CHASSIS 439

Chassis 439

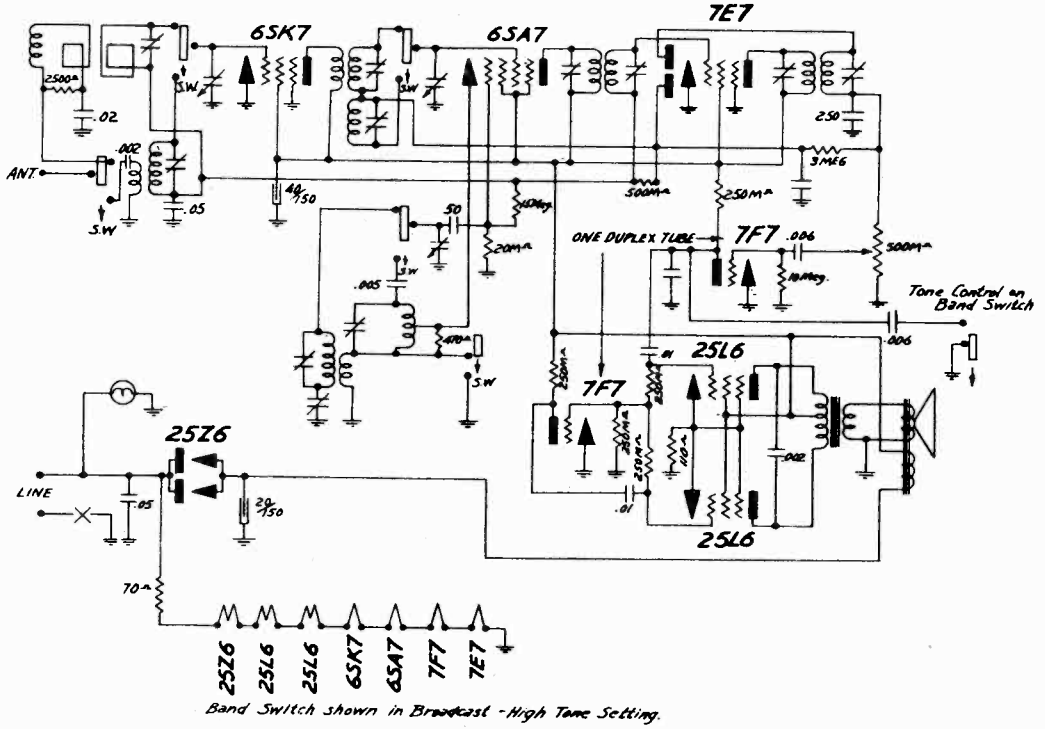
MODEL 7K60, Ch. 434
MODEL 410, Ch. 410

MAJESTIC RADIO & TELEV. CORP.



MODEL 410 CHASSIS 410

SCHEMATIC DIAGRAM



Band Switch shown in Broadcast - High Tone Setting.

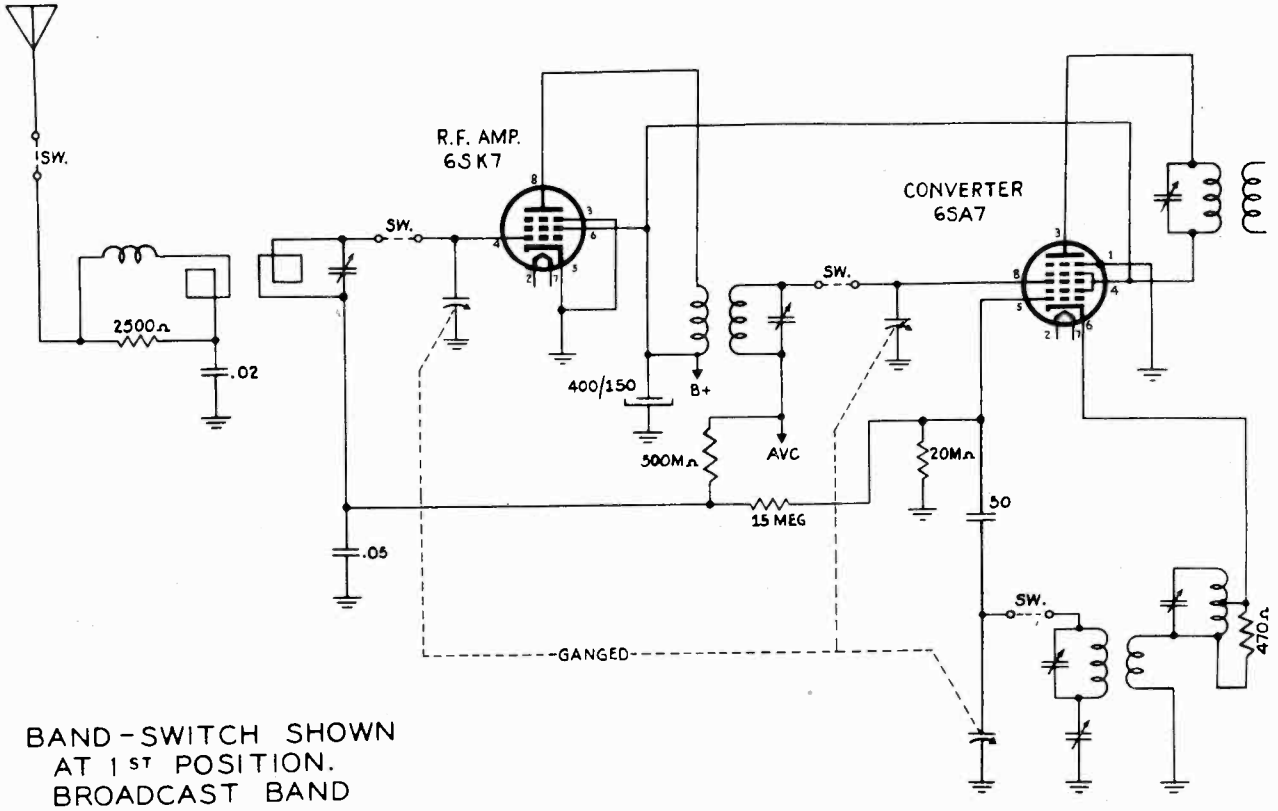
MODEL 7K60 CHASSIS 434

For Socket, trimmers, see P. 15-33

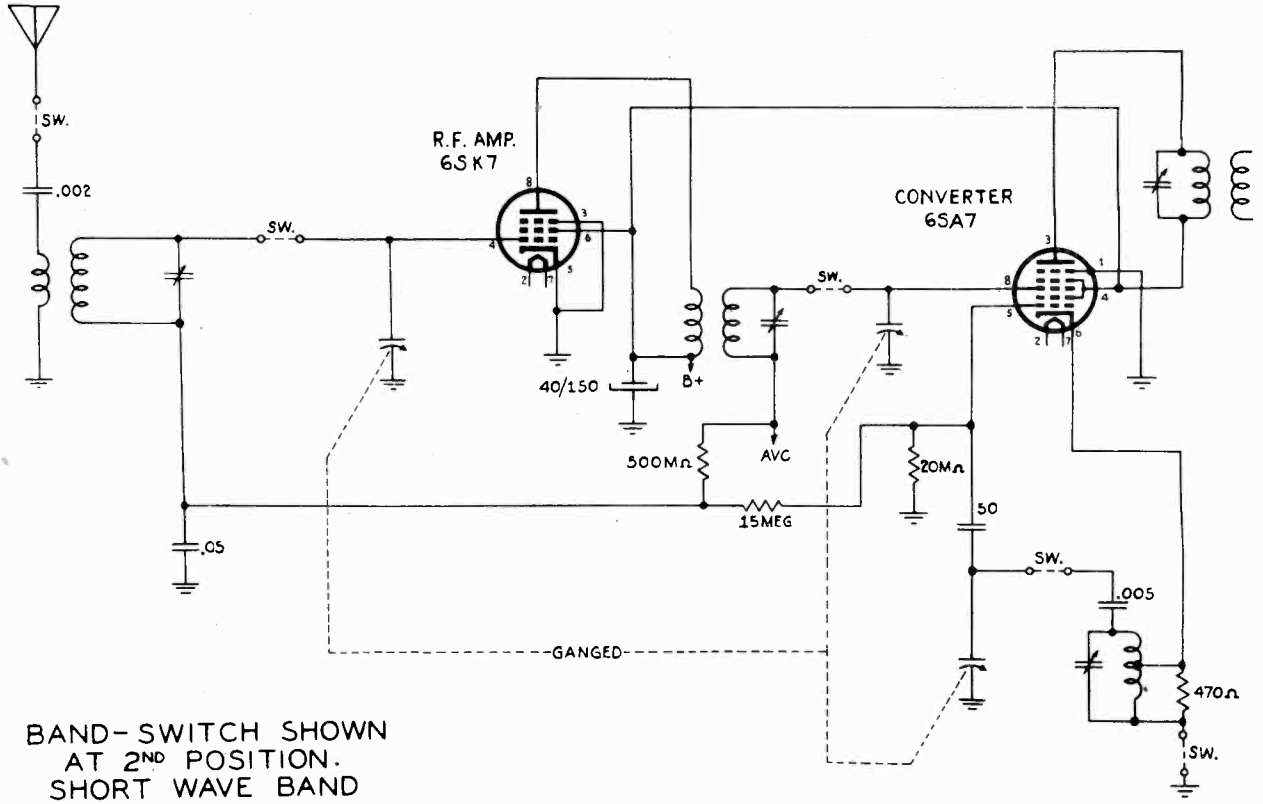
"clarified schematics"

MODEL 7K60, Ch. 434

MAJESTIC RADIO & TELEV. CORP.



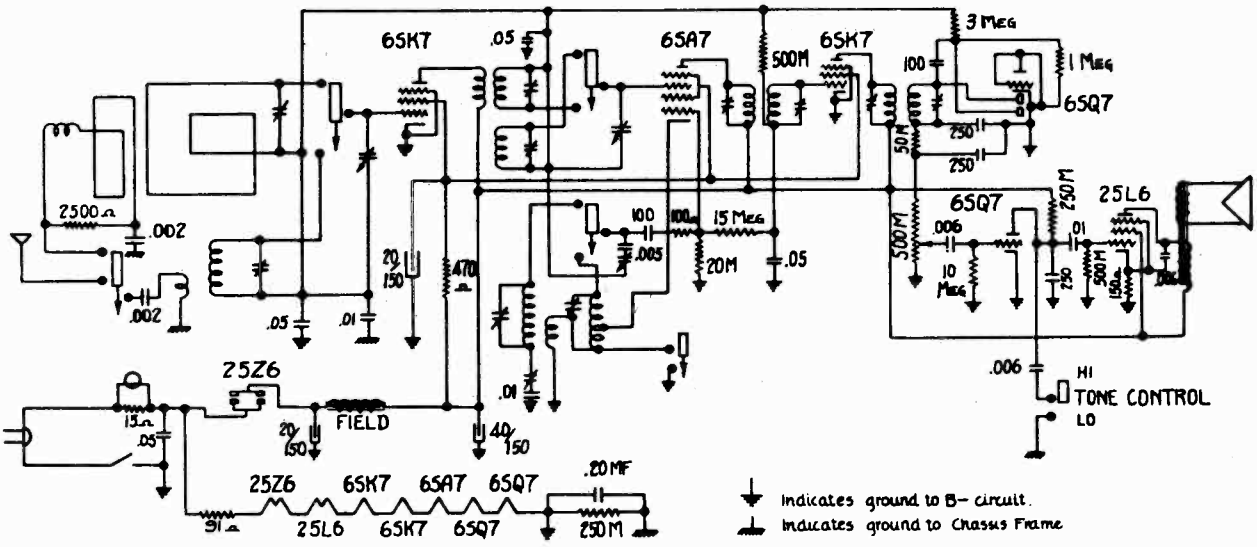
BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND



BAND-SWITCH SHOWN
AT 2ND POSITION.
SHORT WAVE BAND

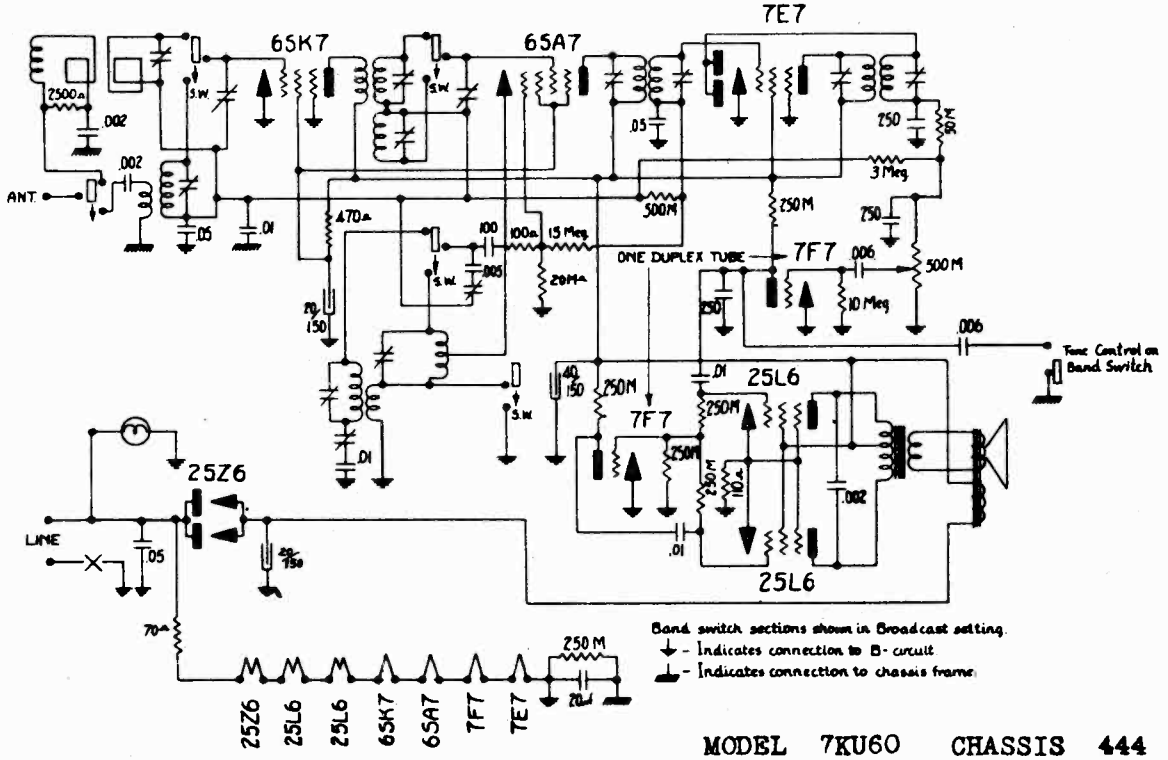
MODEL 7KU60,Ch.444
MODEL 7TU20,Ch.442

MAJESTIC RADIO & TELEV. CORP.



MODEL 7TU20 CHASSIS 442

Chassis 442



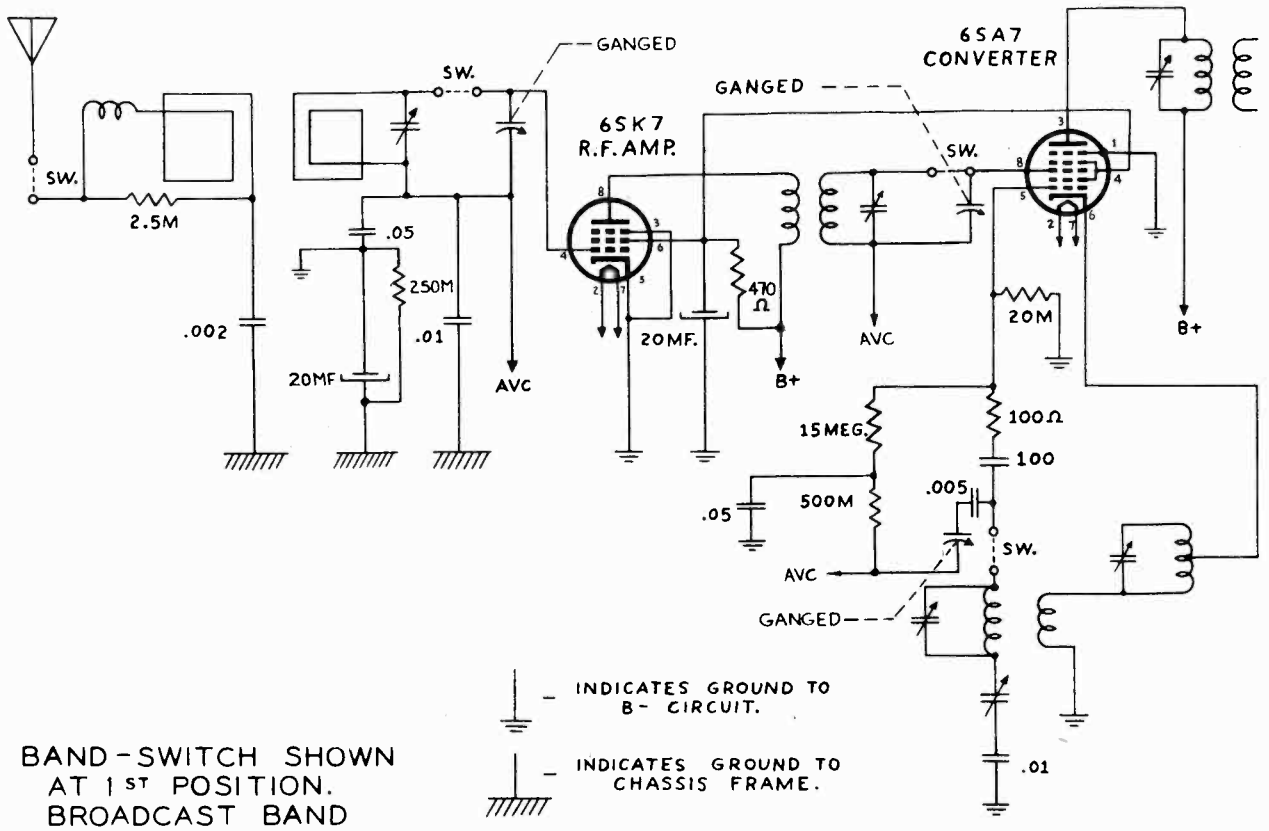
MODEL 7KU60 CHASSIS 444

Chassis 444

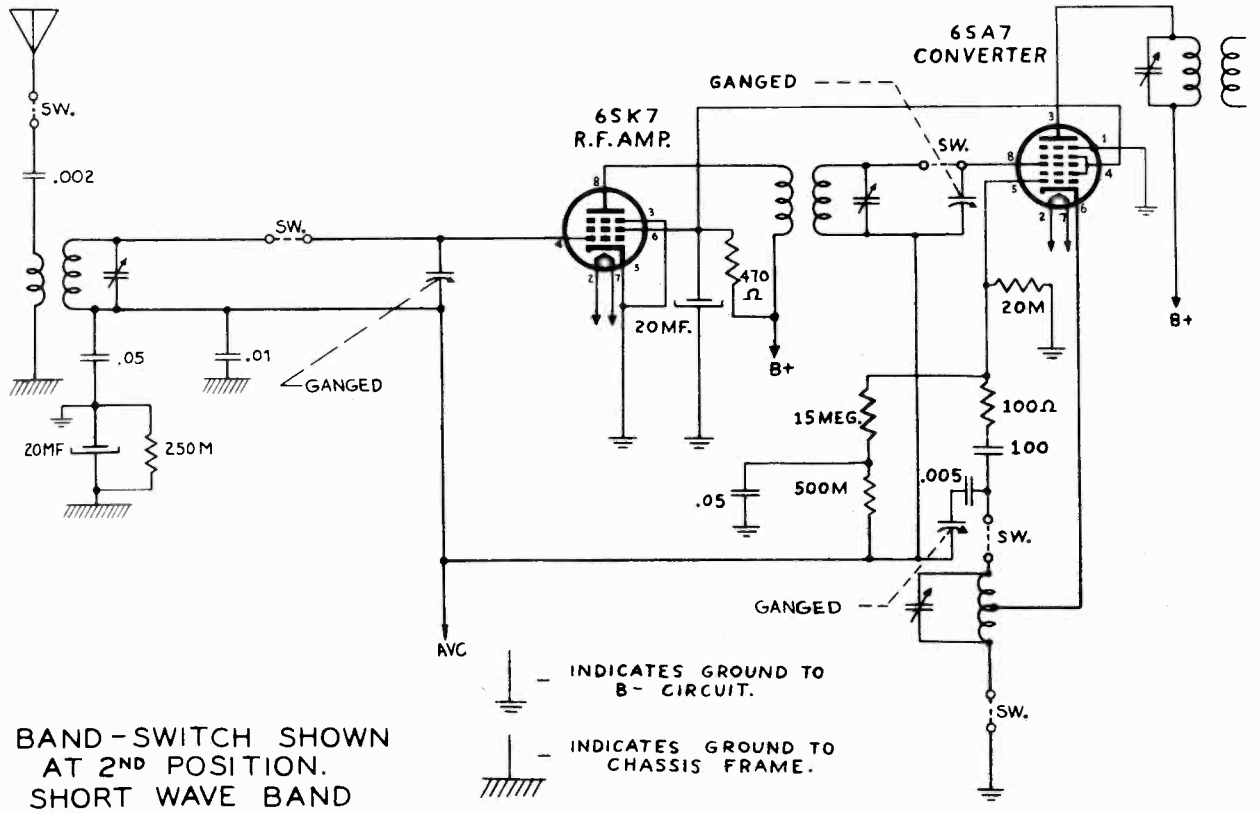
"clarified schematics"

MODEL 7KU60,Ch.444

MAJESTIC RADIO & TELEV. CORP.



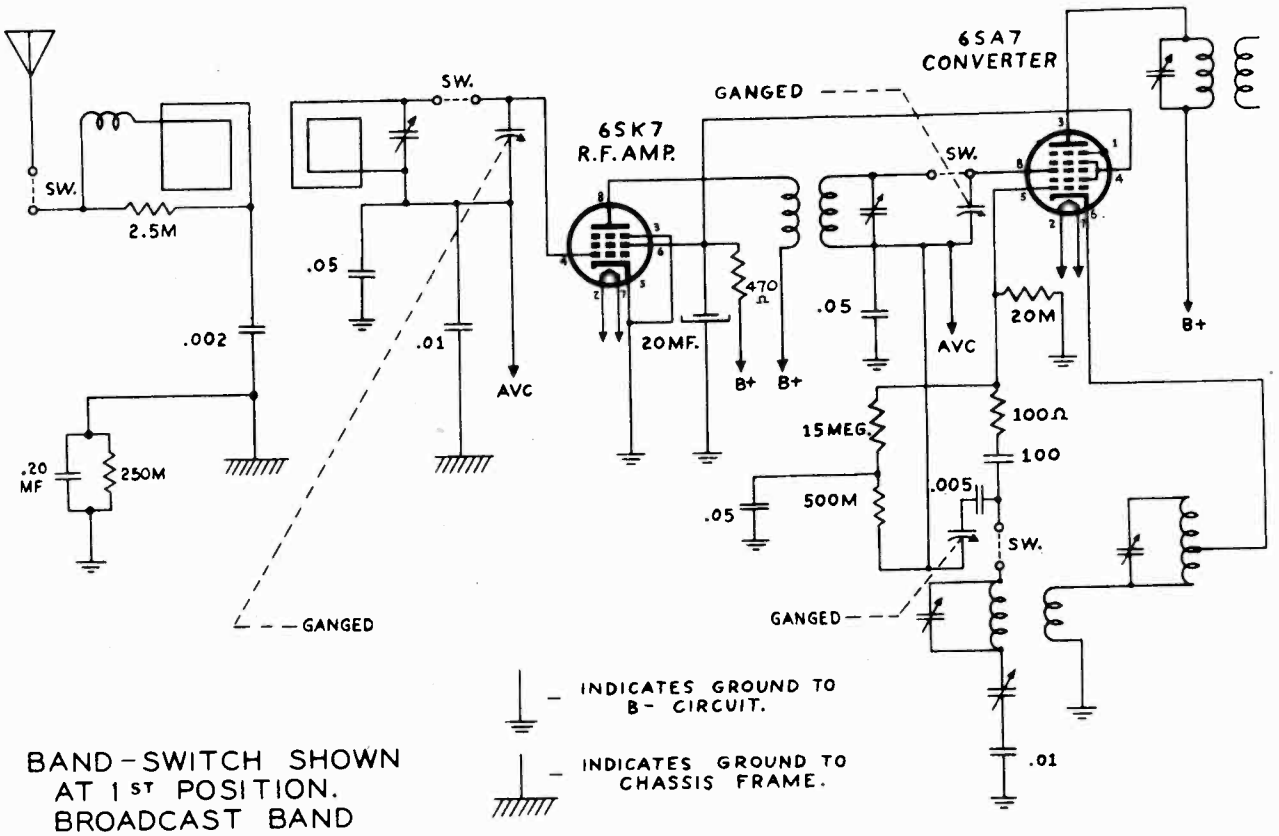
BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND



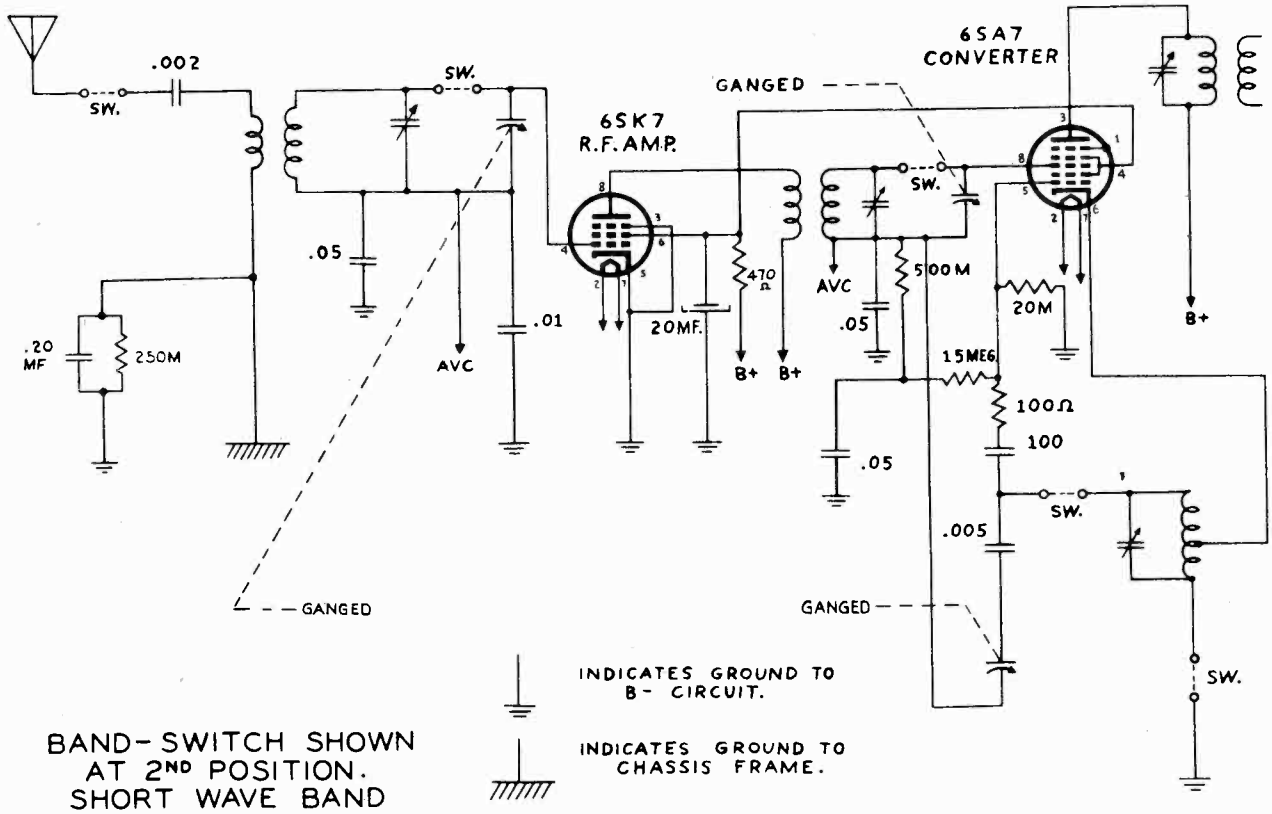
BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND

MODEL 7TU20, Ch. 442

MAJESTIC RADIO & TELEV. CORP.

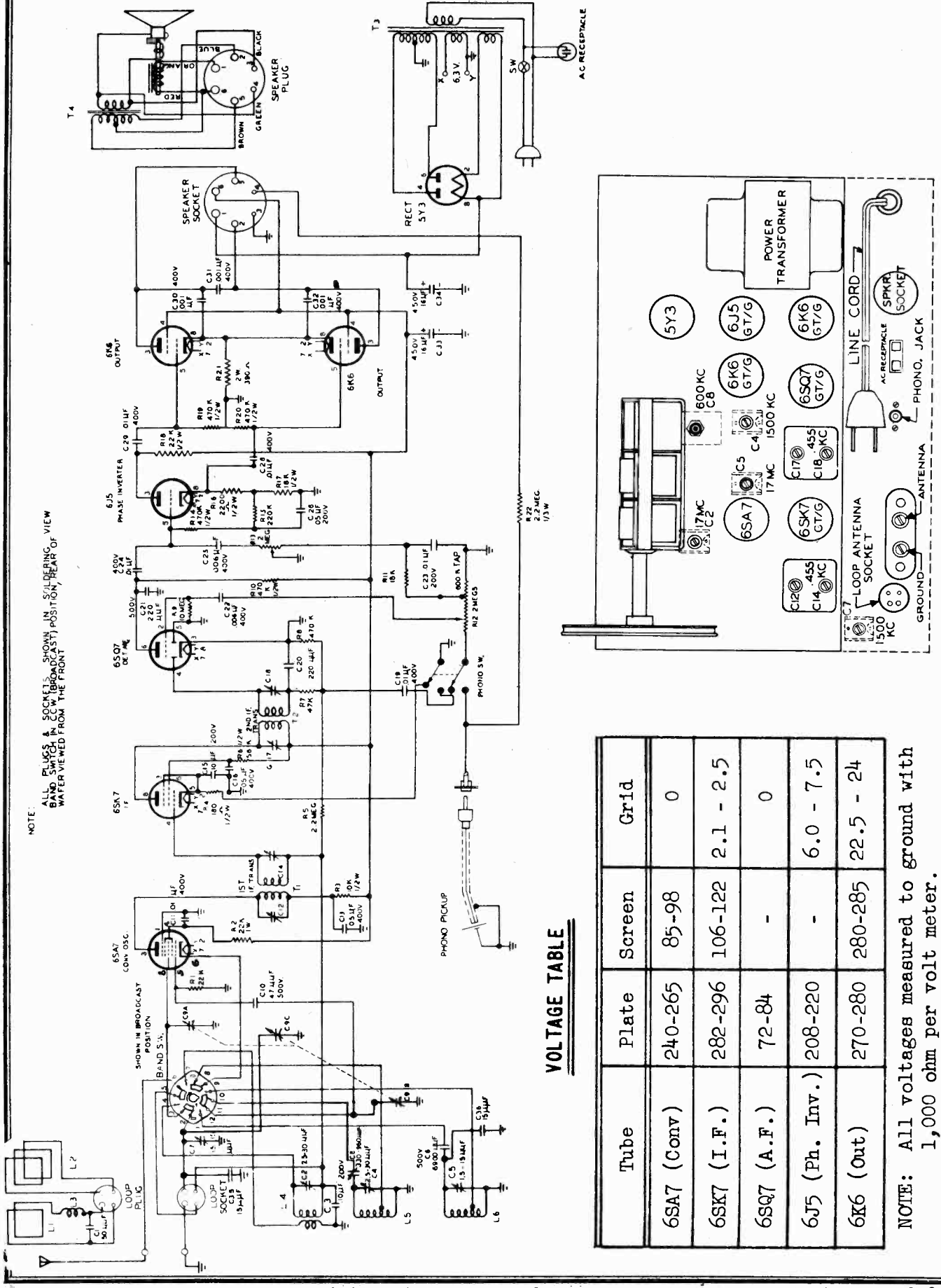


BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND



BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND

MODELS 7S433, 7S450, Ch.4702; 7S470, Ch.4703 MAJESTIC RADIO & TELEV. CORP.



VOLTAGE TABLE

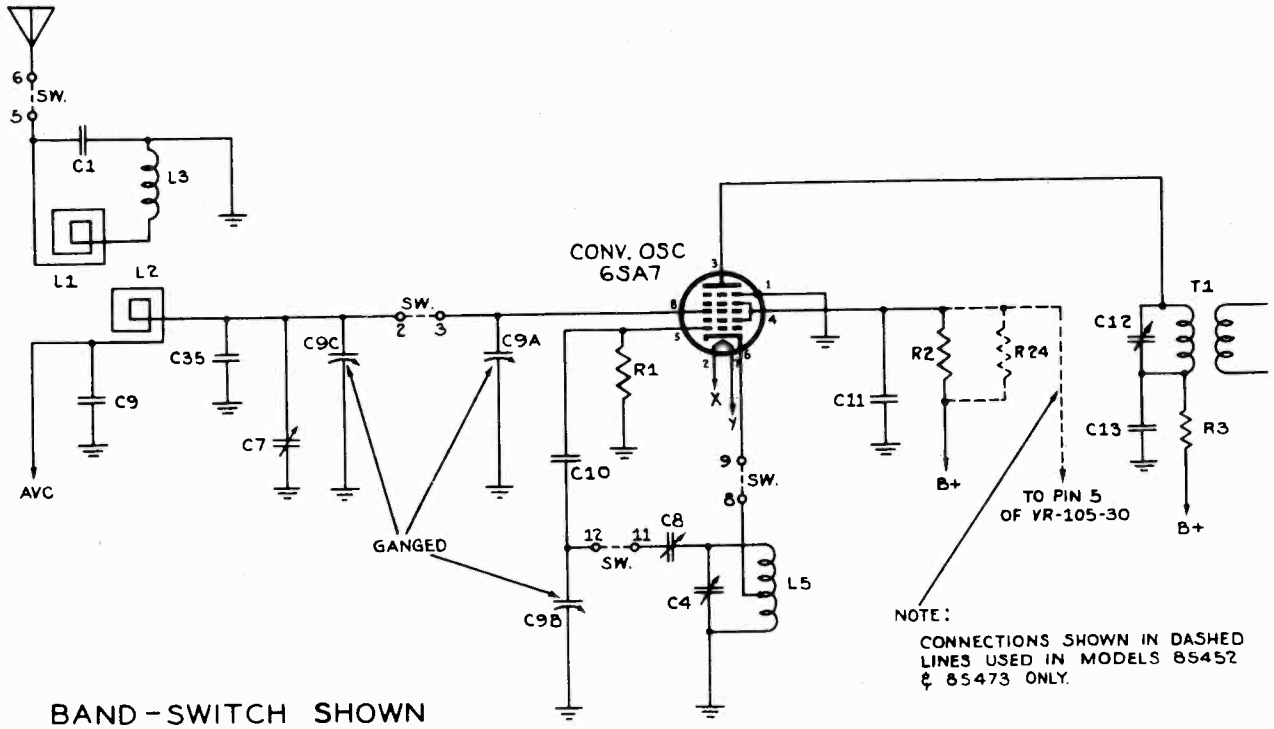
Tube	Plate	Screen	Grid
6SA7 (Conv)	240-265	85-98	0
6SK7 (I.F.)	282-296	106-122	2.1 - 2.5
6SQ7 (A.F.)	72-84	-	0
6J5 (Ph. Inv.)	208-220	-	6.0 - 7.5
6K6 (Out)	270-280	280-285	22.5 - 24

NOTE: All voltages measured to ground with 1,000 ohm per volt meter.

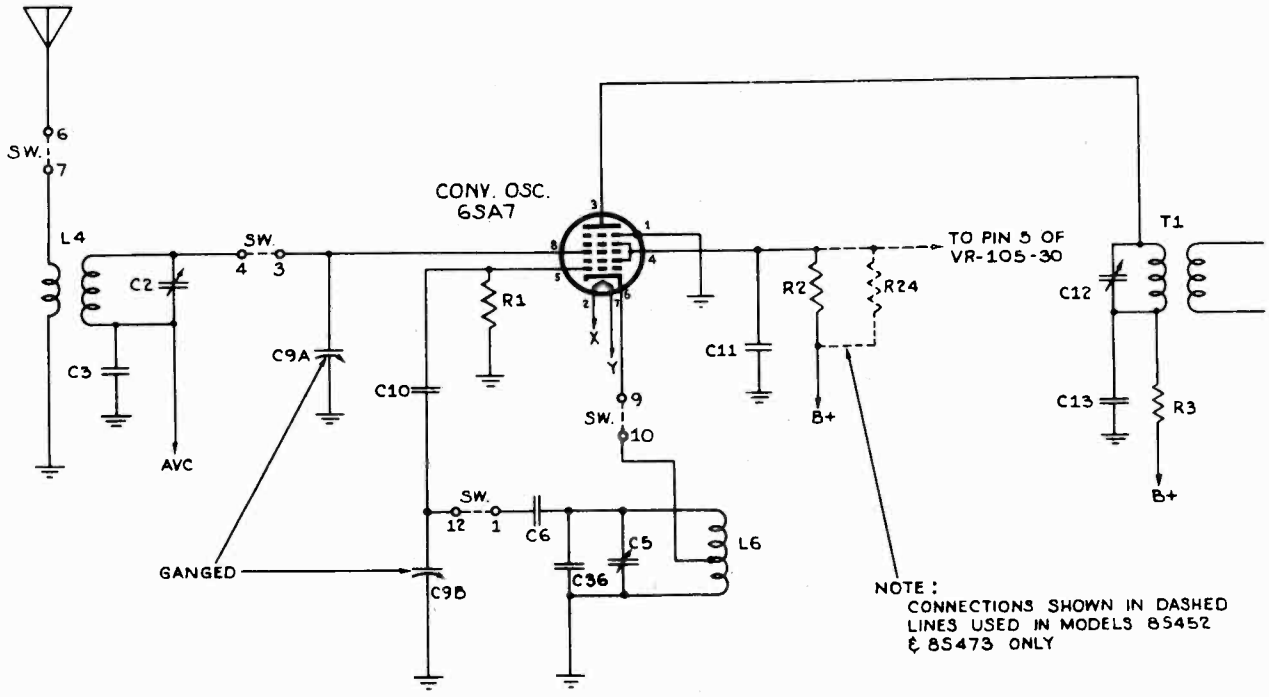
For filter box see p. 15-28. Record Changer; Seeburg Model K

MODELS 7S433, 7S450, 7S470

MAJESTIC RADIO & TELEV. CORP.



BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
SHORT WAVE BAND

MODELS 7S433, 7S450, 7S470
MODELS 8S452, 8S473

MAJESTIC RADIO & TELEV. CORP.

ALIGNMENT

Before aligning, close tuning condenser (plates fully meshed). Set pointer to center of extreme left hand mark on the dial.

When aligning broadcast band, connect to 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, turn the volume control full on and keep the signal generator output as low as possible.

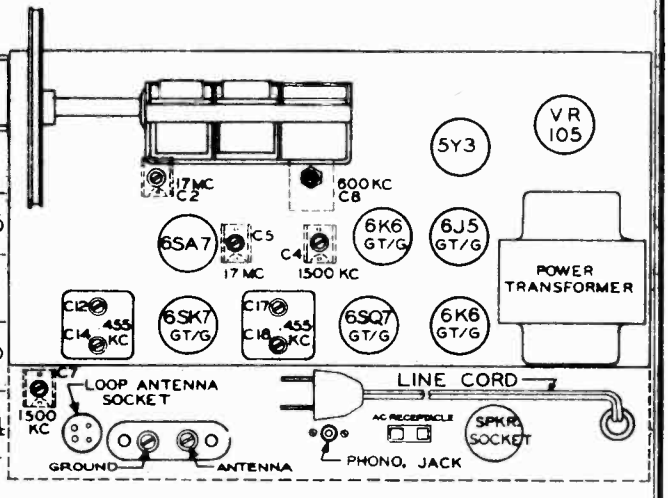
Step	Dummy Antenna	Test Oscillator Connection	Test Oscillator Frequency	Receiver Bandswitch	Receiver Dial	Adjust for Maximum	Notes
1	.01 mfd	6SA7 grid	455 kc	B.C.	Any quiet spot	C18, C17 C14, C12	
2	Loop	-	1500 kc	B.C.	150	C4, C7	
3	Loop	-	600 kc	B.C.	60	C8	Note #1
4	400 ohms	Receiver antenna post	17 mc	S.W.	17	C2, C5	

Note #1 - Rock gang while making this adjustment. Then recheck step 2.

VOLTAGE TABLE

Tube	Plate	Screen	Grid
6SA7 (Conv)	240-265	105	0
6SK7 (I.F.)	282-296	106-122	2.1 - 2.5
6SQ7 (A.F.)	72-84	-	0
6J5 (Ph.Inv.)	208-220	-	6.0 - 7.5
6K6 (Out)	270-280	280-285	22.5 - 24
VR-105	105	-	-

NOTE: All voltages measured to ground with 1,000 ohm per volt meter.

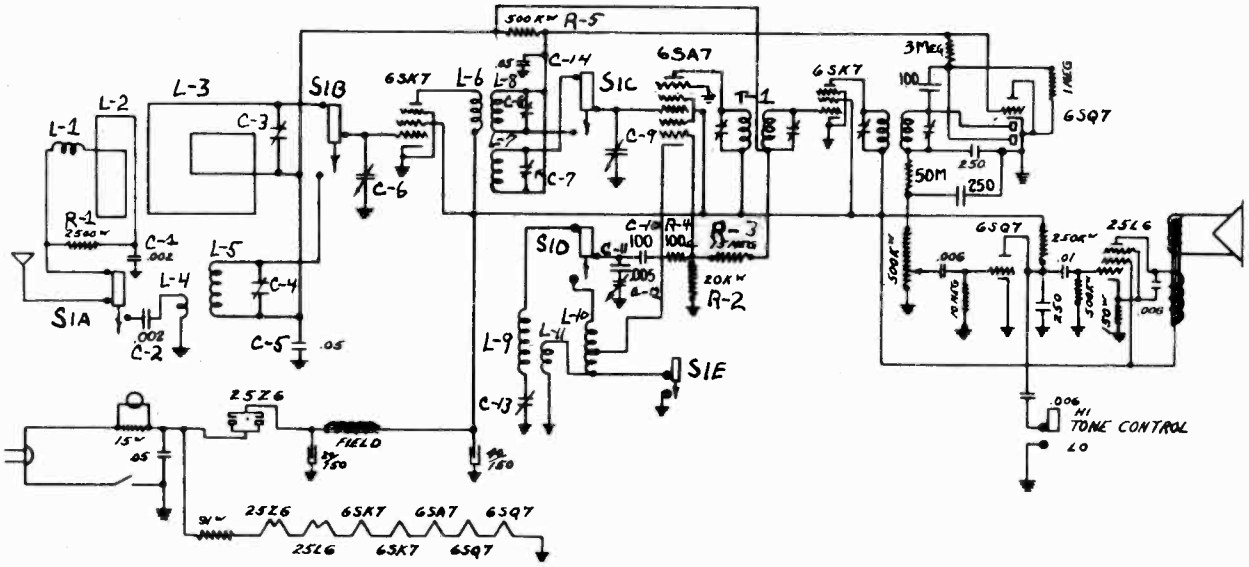


TUBE LAYOUT

Item	Description	Part #
C1	50 mmfd ± 20% 500 v mica	6-125
C2,C4	Trimmer, 2.5 - 30 mmfd	8-35
C3,C15	.1 mfd ± 40% - 10% 200 v paper	5-39
C5	Trimmer, 1.5 - 15 mmfd	8-36
C6	6900 mmfd ± 10% 500 v mica	6-177
C7	Trimmer, 1.5 - 15 mmfd	8-36
C8	Padder, 330 - 960 mmfd	8-33
C9a,C9b,C9c	Tuning Condenser	7-18
C10	47 mmfd ± 20% 500 v ceramic	6-159
C11,C19,C24,C28 C29	.01 mfd ± 20% - 10% 400 v paper	6-132
C12,C14,C17,C18	Dual trimmer	8-41
C13,C16	.05 mfd ± 40% - 10% 400 v paper	6-130
C20,C21	220 mmfd ± 20% mica	6-151
C22,C25	.006 mfd ± 20% 400 v paper	6-133
C23	.01 mfd ± 40% - 10% 200 v paper	5-57
C26	.05 mfd ± 40% - 10% 200 v paper	5-40
C30,C31,C32	.001 mfd ± 50% - 25% 400 v paper	6-129
C33,C34	16-16 mfd 450 v electrolytic	19-16
R1	22,000 ohms 20% 1/3 watt	9-184
R2	22,000 ohms 10% 1 watt	9-186
R3	10,000 ohms 10% ½ watt	9-17
R4	180 ohms 10% ½ watt	9-173
R5,R22	2.2 megohms 20% 1/3 watt	9-183
R6	56,000 ohms 10% ½ watt	9-177
R7	47,000 ohms 10% ¼ watt	9-226
R8	470,000 ohms 10% ¼ watt	9-227
R9	10 megohms 20% 1/3 watt	9-160
R10,R14,R19,R20	470,000 ohms 10% ½ watt	9-4
R11	18,000 ohms 10% ¼ watt	9-225
R12	Volume control, 2 megohm with SPST switch	13-15
R13	Tone control, 2 megohms	14-4
R15	220,000 ohms 20% 1/3 watt	9-182
R16	2200 ohms 10% ½ watt	9-7
R17	18,000 ohms 10% ½ watt	9-95
R18	22,000 ohms 10% ½ watt	9-180
R21	390 ohms 10% 2 watt	9-185
L4	S.W. antenna coil	3-120
L5,L6	Oscillator coil	3-118
T1	1st I-F transformer	3-165
T2	2nd I-F transformer	3-166
T3	Power transformer	2-12
T4	Output transformer	22-8-2
	Bandswitch	11-46
	Phono-radio switch	11-45
	Phono-motor receptacle	15-98
	Pilot light, Mazda #44	26-7
	Dial pointer	135-6
	Dial cord spring	129-32
	Dial cord	S-1152
	Knob, phono-radio	128-45
	Knob, off-volume	128-46
	Knob, B.C. - S.W.	128-47
	Knob, bass-treble	128-48
	Knob, tuning	128-49
	Knob, plain	128-32
	Cabinets:	
	7S433	115-8
	7S450	115-12
	7S470	115-15
	Speaker, 8" electrodynamic	22-8-1
	Escutcheon, 7S433	112-23
	Glass escutcheon, 7S450, 7S470	122-18
	Metal escutcheon, 7S470	122-29
	Dial scale, 7S433	117-60
	Dial scale, 7S450, 7S470	117-51
	Escutcheon clamp, 7S450, 7S470	112-283
	Loop antenna assembly, 7S433	S-1192
	Loop antenna assembly, 7S450, 7S470	20-20
	Pilot light socket	15-84
	Speaker plug	22-8-3

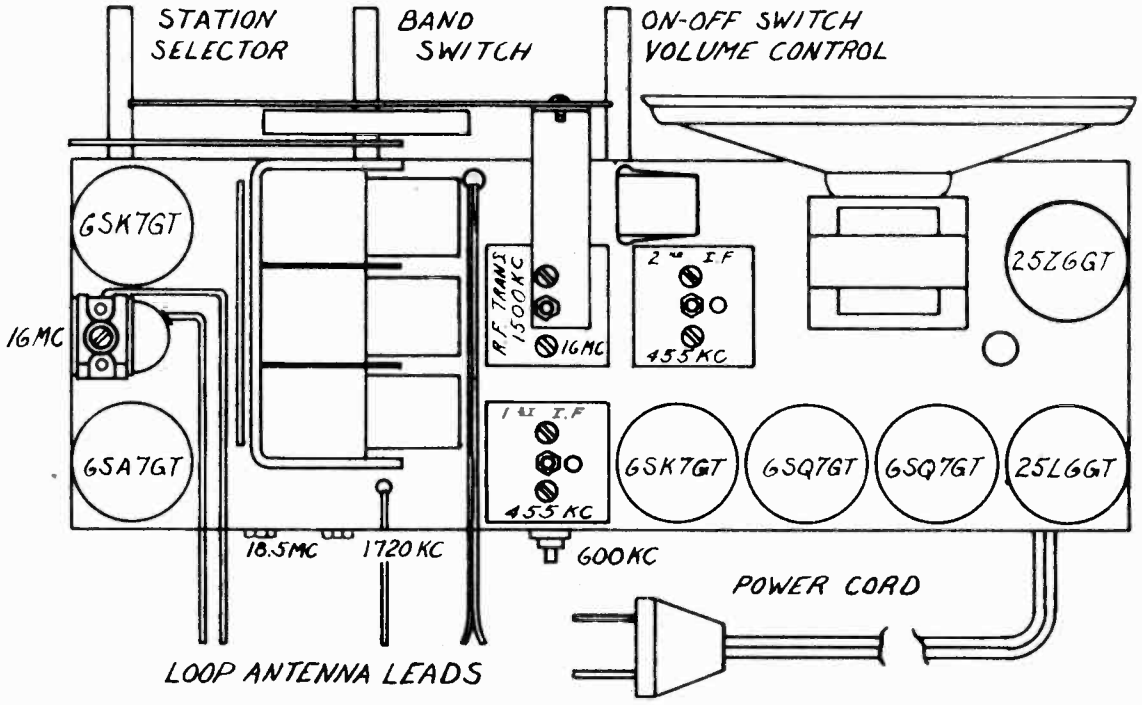
MODEL 7T20,Ch.432

MAJESTIC RADIO & TELEV. CORP.



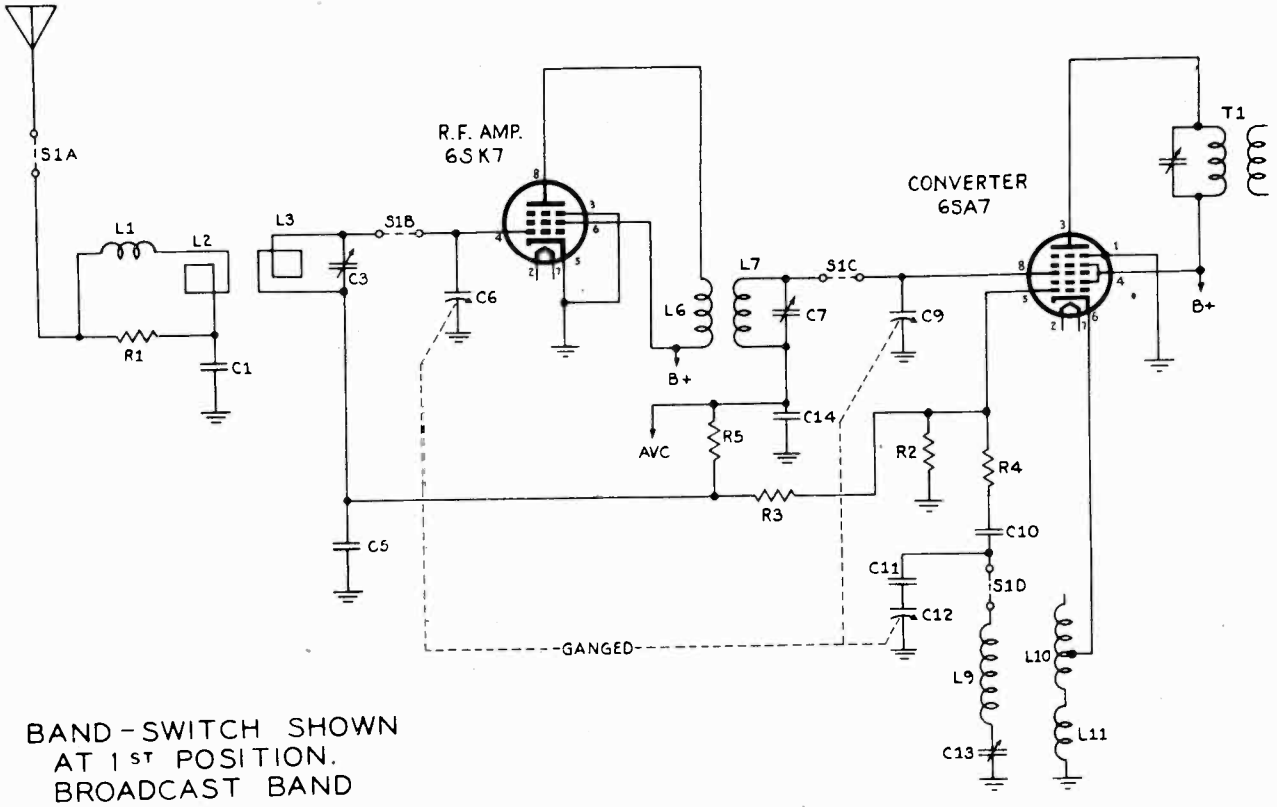
MODEL 7T20 CHASSIS 432

Chassis 432

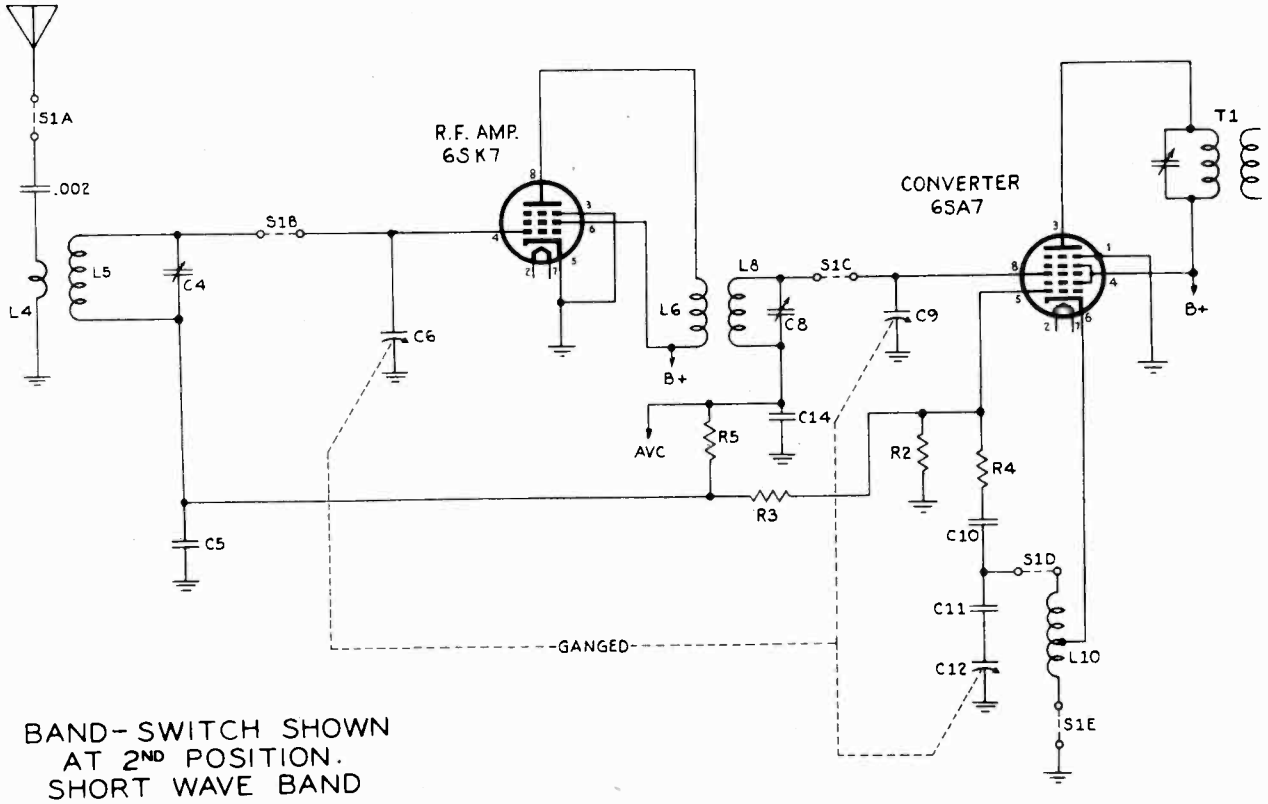


Tube Layout

MAJESTIC RADIO & TELEV. CORP.



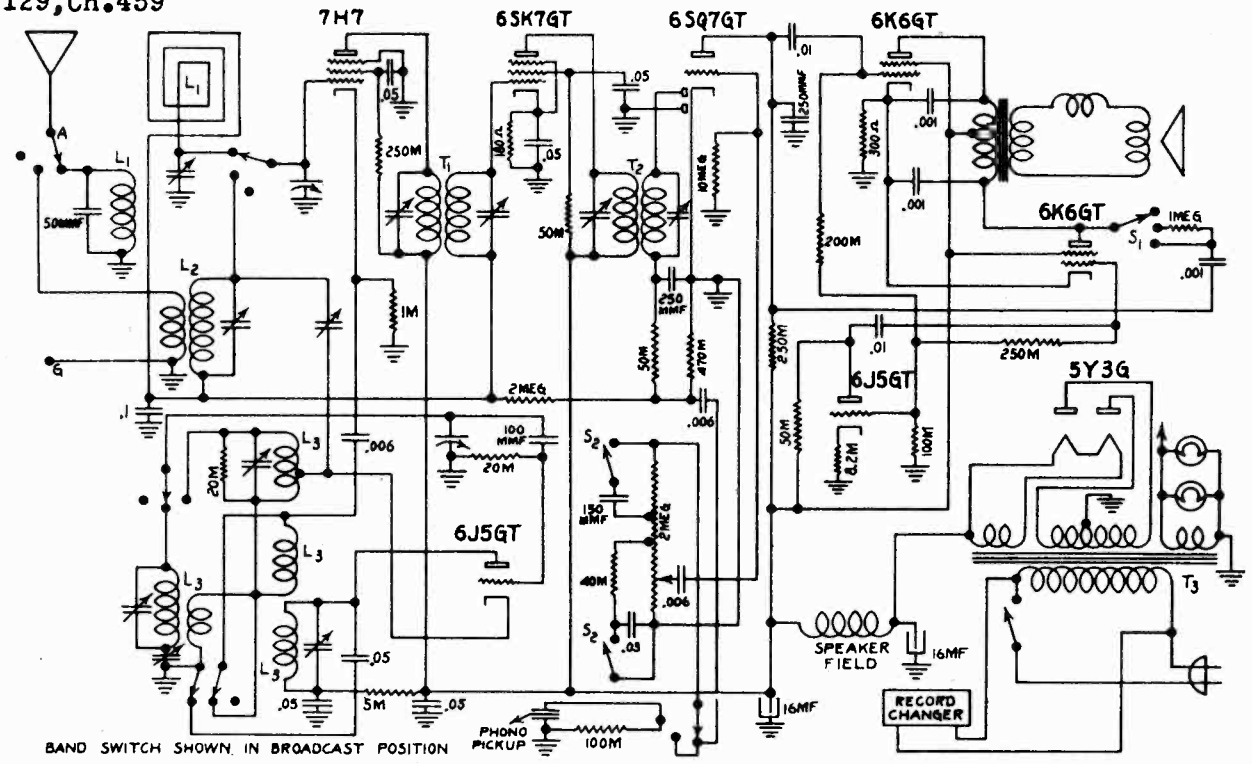
BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND



BAND-SWITCH SHOWN
AT 2ND POSITION.
SHORT WAVE BAND

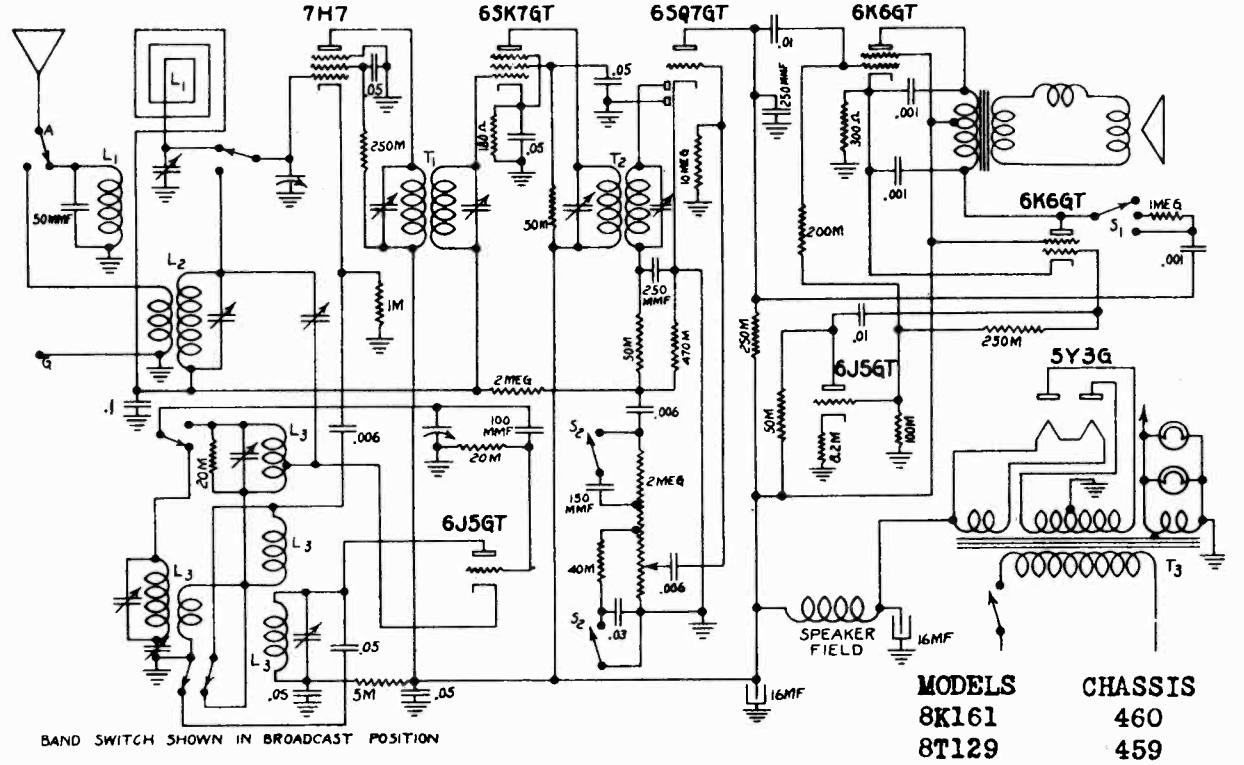
MODEL 8C176,Ch.461
MODELS 8K161,Ch.460; 8T129,Ch.459

MAJESTIC RADIO & TELEV. CORP.



MODEL 8C176 CHASSIS 461

Chassis 461



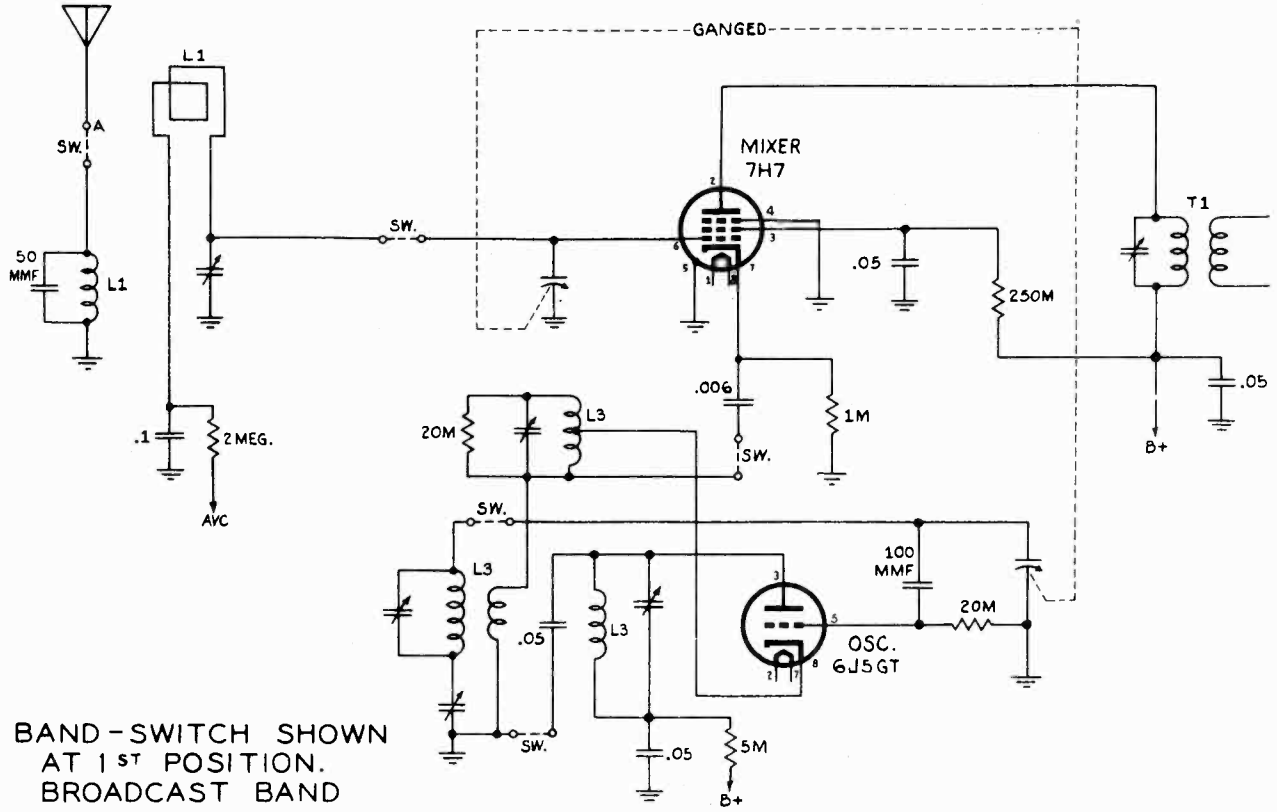
MODELS	CHASSIS
8K161	460
8T129	459

Chassis 459 - 460

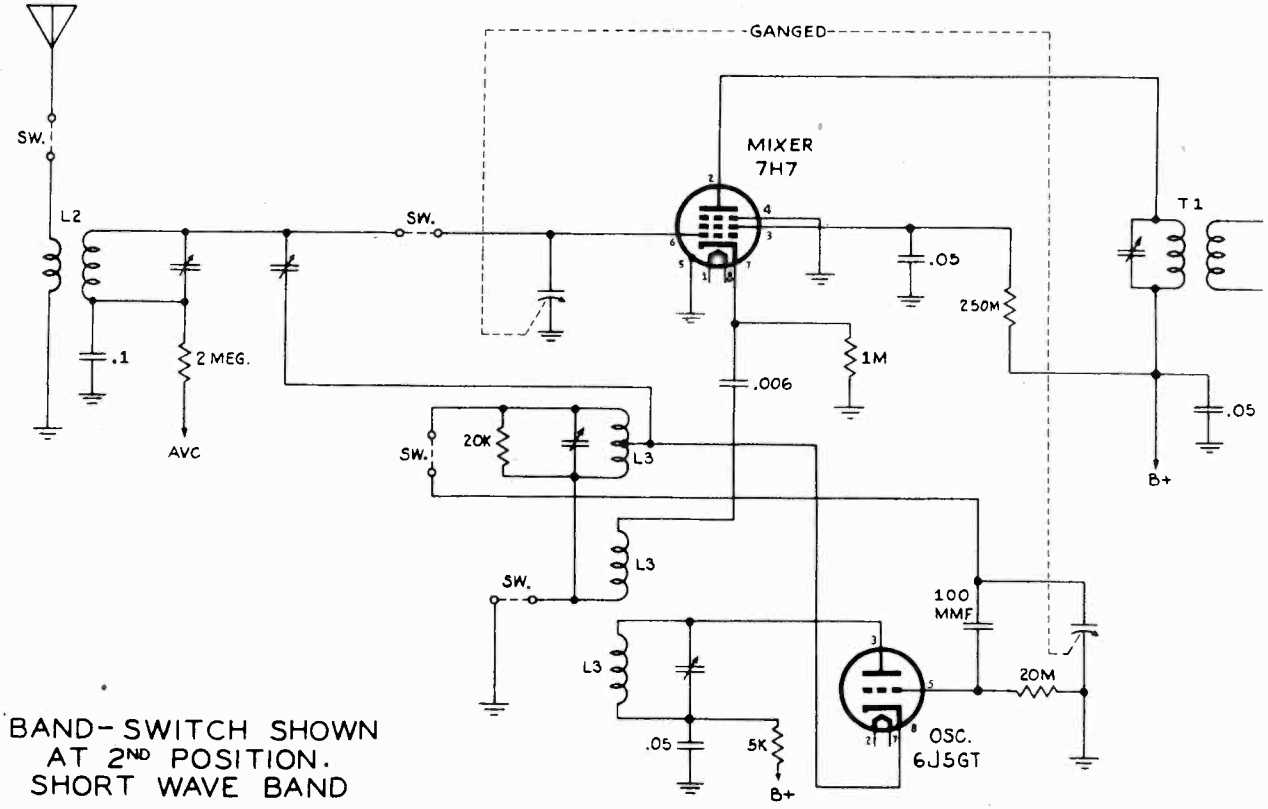
For Socket and trimmers, see P.15-7

MODEL 8C176
MODELS 8K161, 8T129

MAJESTIC RADIO & TELEV. CORP.



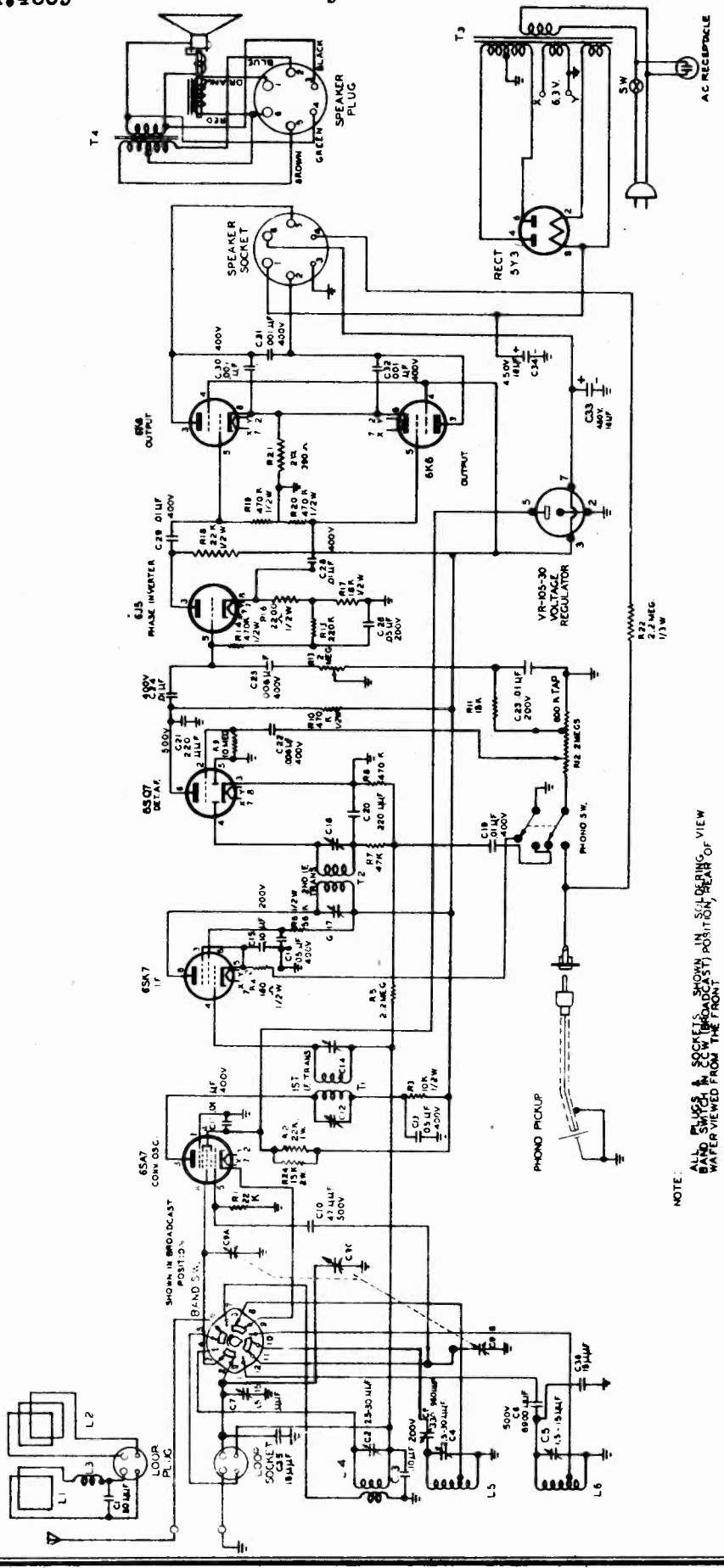
BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND



BAND-SWITCH SHOWN AT 2ND POSITION. SHORT WAVE BAND

MODELS 8S452, 8S473, Ch.4809

MAJESTIC RADIO & TELEV. CORP.



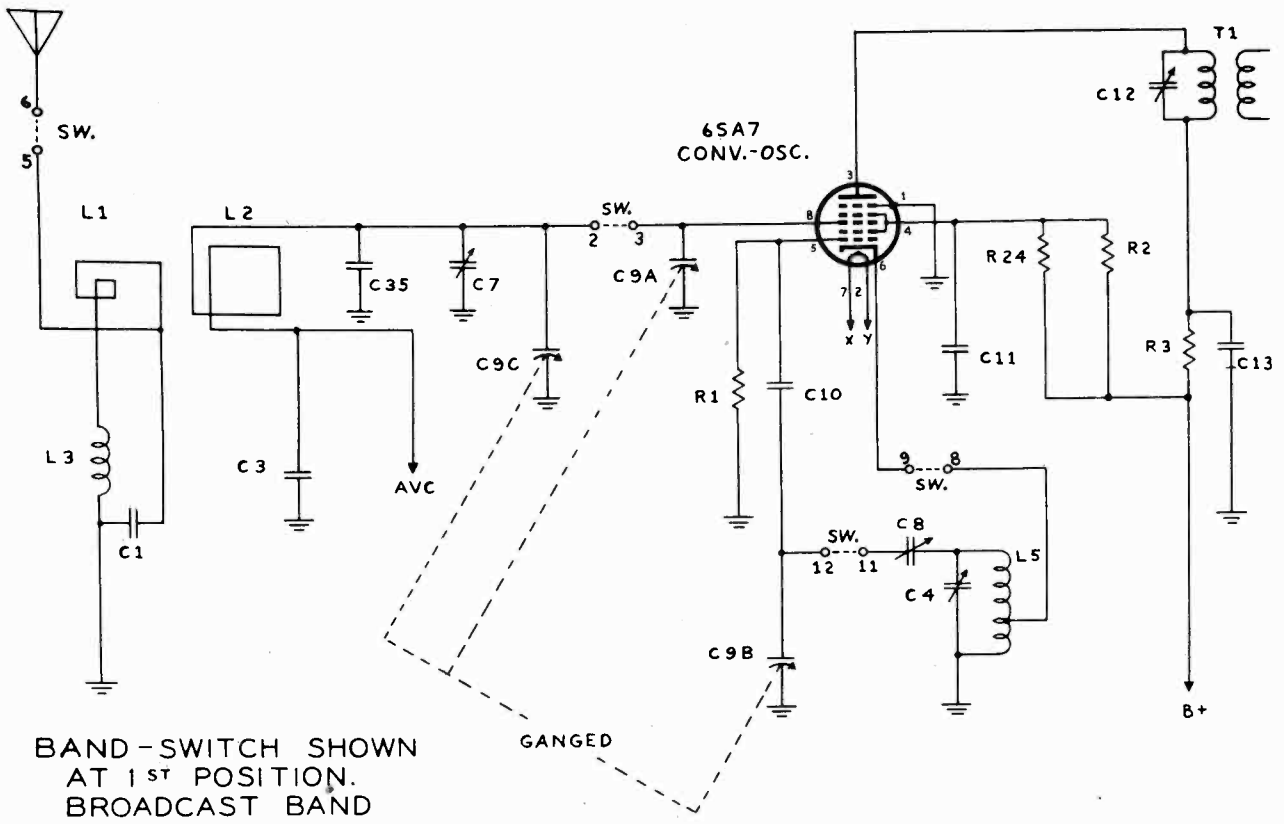
SCHEMATIC DIAGRAM - CHASSIS 4809

Parts for Model 8S452 correspond to Model 7S450 and Model 8S473 to Model 7S470. R24, 15,000 ohms, 2 watts (Part number 9-299) has been added in addition to the VR-105 tube.

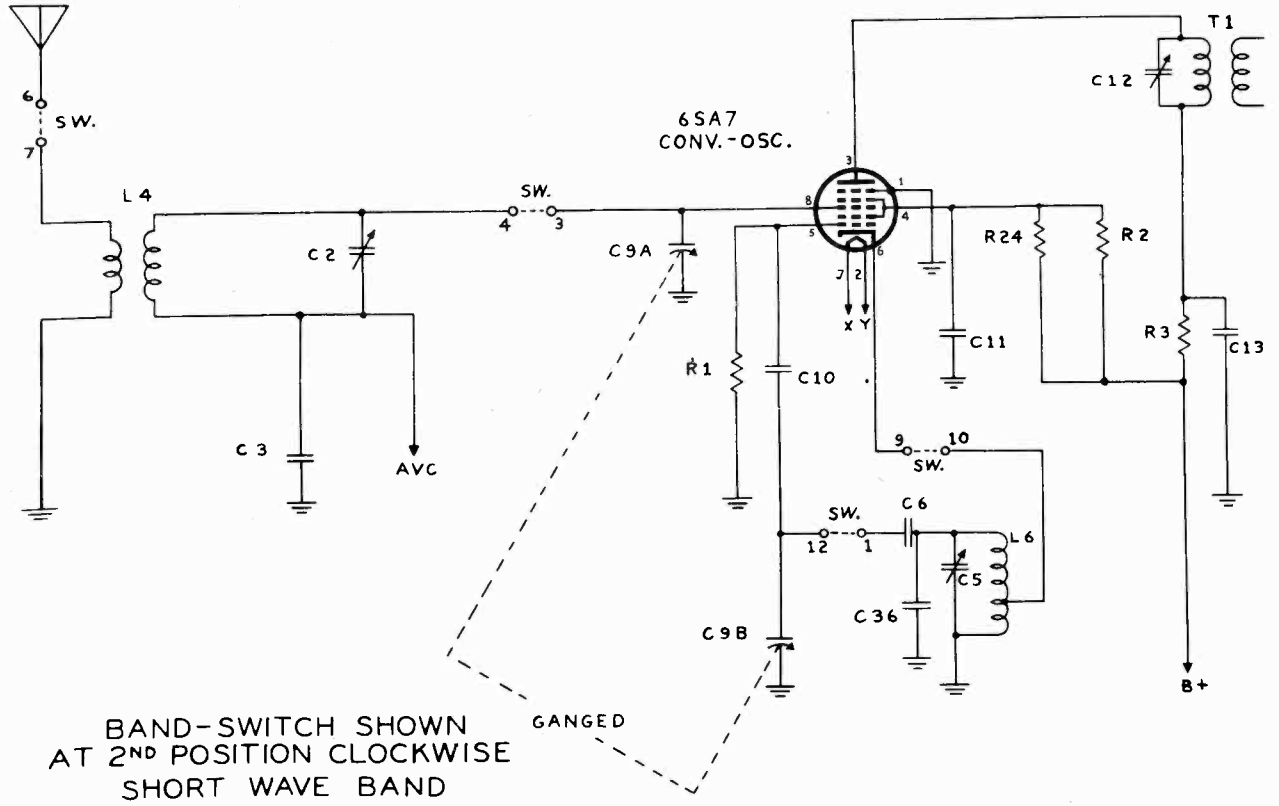
Record Changer: Milwaukee Erwood Model 10700
For other data, see Pp.15-20,15-21

MODELS 8S452, 8S473, Ch.4809

MAJESTIC RADIO & TELEV. CORP.



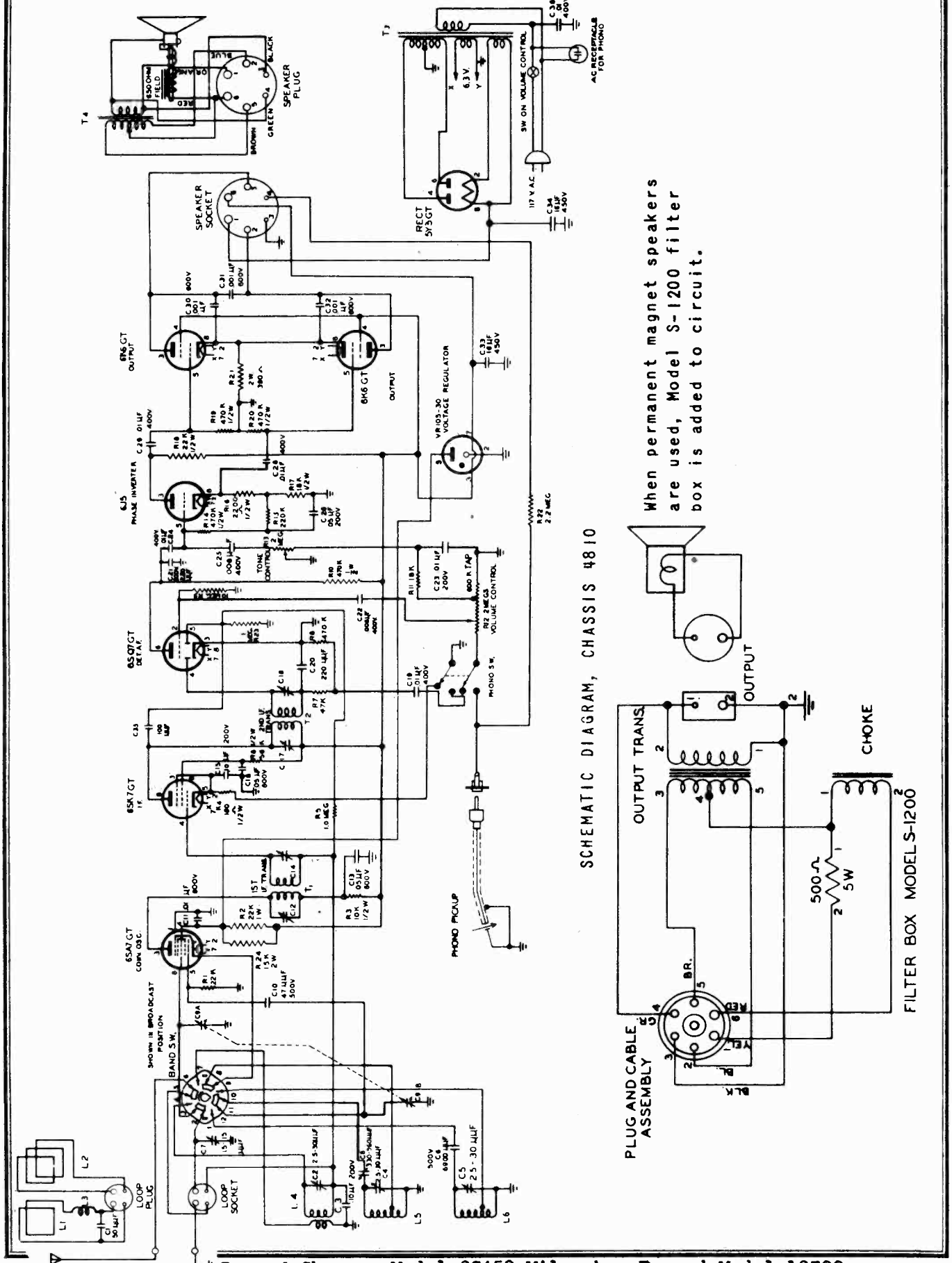
BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND



BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE SHORT WAVE BAND

MODELS 8S452,8S473,
Ch.4810

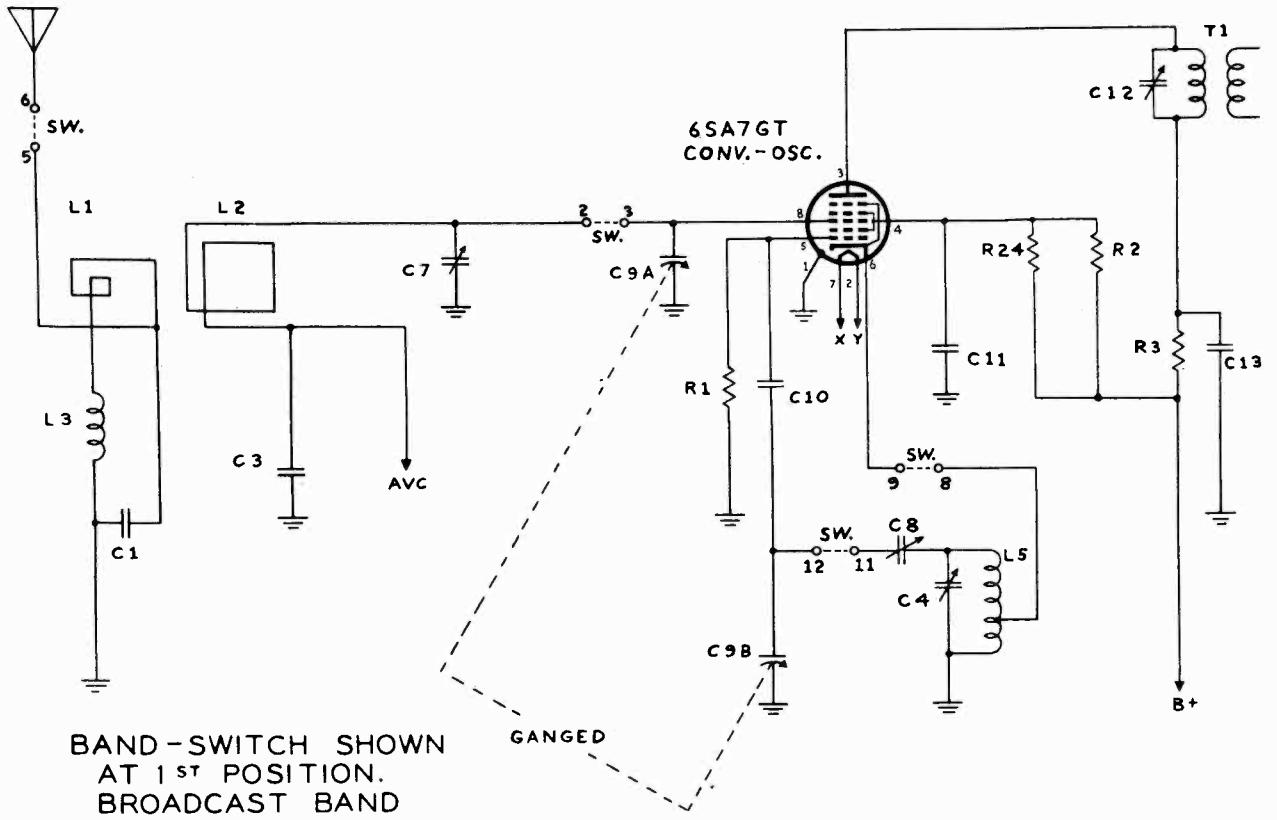
MAJESTIC RADIO & TELEV. CORP.



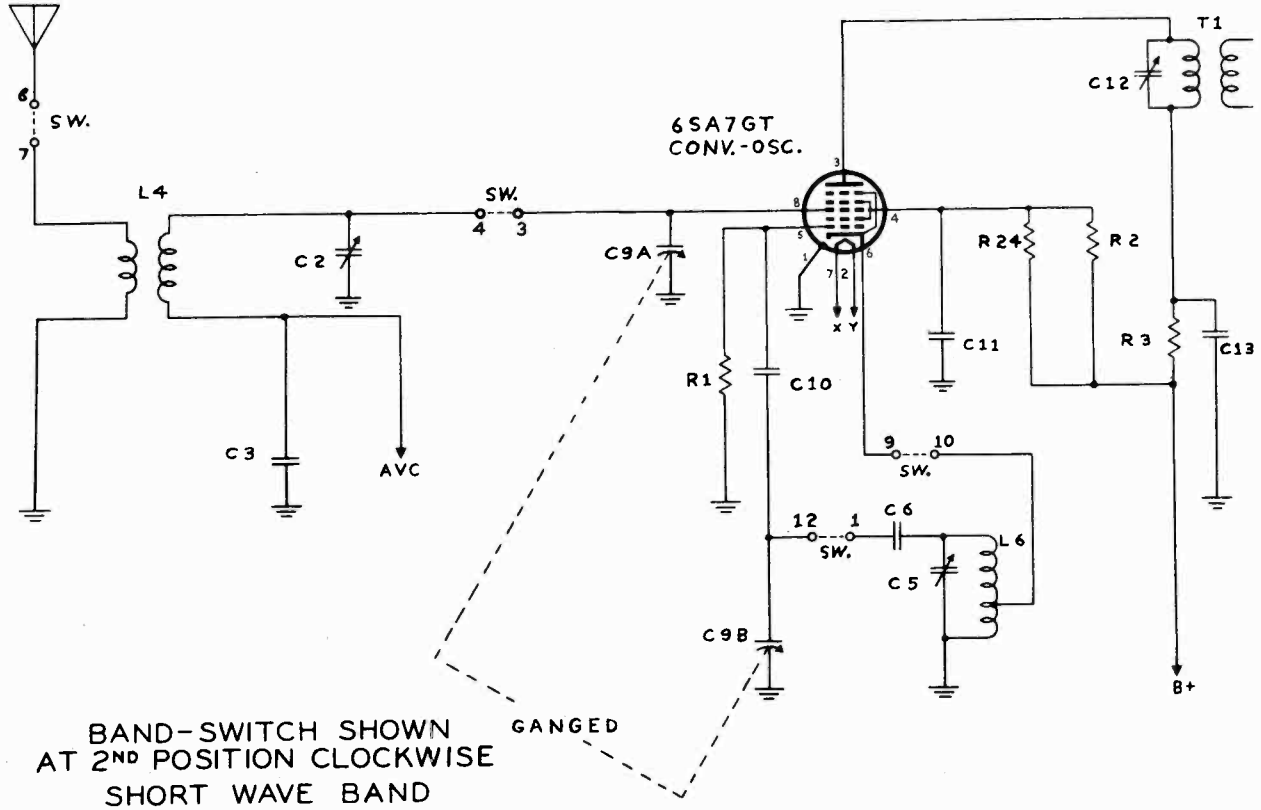
Record Changer:Model 8S452,Milwaukee Erwood Model 10700
Model 8S473,Milwaukee Erwood Model 10700,Oak Model 6666,Seeburg K

MODELS 8S452, 8S473
Ch. 4810

MAJESTIC RADIO & TELEV. CORP.



BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND



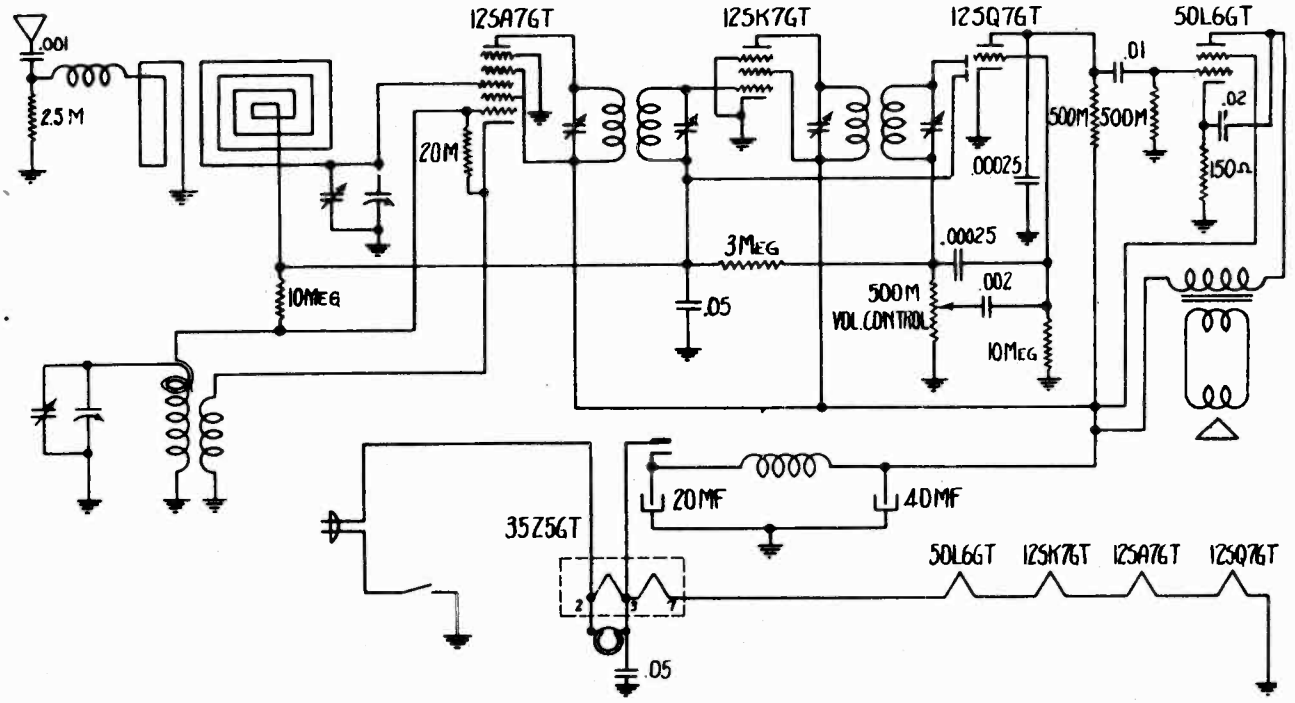
BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE
SHORT WAVE BAND

ITEM	DESCRIPTION	PART NO.
C2, C4, C5	Trimmer, 2.5 - 30 mmfd	8-35
C3, C15	.1 mfd + 40% - 10% 200 v paper	5-39
C6	6900 mmfd ± 10% 500 v mica	6-177
C7	Trimmer, 1.5 - 15 mmfd	8-36
C8	Padder, 330 - 960 mmfd	8-33
C9a, C9b, C9c	Tuning Condenser	7-22 or
		7-23
C10	47 mmfd ± 20% 500 v ceramic	6-159
C11	.01 mfd 20% 600 v paper	5-74
C19, C24, C28		
C29, C36	.01 mfd + 30% - 10% 400 v paper	6-132
C12, C14, C17, C18	Dual trimmer	8-41
C13, C16	.05 mfd 20% 600 v paper	5-77
C20, C21	220 mmfd ± 20% mica	6-151
C22, C25	.006 mfd ± 20% 400 v paper	6-133
C23	.01 mfd + 40% - 10% 200 v paper	5-57
C26	.05 mfd + 40% - 10% 200 v paper	5-40
C30, C31, C32	.001 mfd + 50% - 25% 600 v paper	5-79
C33, C34	16-16 mfd 450 v electrolytic	19-16
C35	100 mmfd ± 20% 500 v mica	6-232
R1	22,000 ohms 20% 1/4 watt	9-222
R2	22,000 ohms 10% 1 watt	9-186
R3	10,000 ohms 10% ½ watt	9-17
R4	180 ohms 10% ½ watt	9-272
R5, R23	1 megohm 20% 1/4 watt	9-255
R6	56,000 ohms 10% ½ watt	9-177
R7	47,000 ohms 10% 1/4 watt	9-226
R8	470,000 ohms 10% 1/4 watt	9-227
R9	10 megohms 20% 1/4 watt	9-213
R10, R14, R19, R20	470,000 ohms 10% ½ watt	9-234
R11	18,000 ohms 10% 1/4 watt	9-225
R12	Volume control, 2 megohm with SPST switch	13-15
R13	Tone control, 2 megohms	14-4
R15	220,000 ohms 20% 1/4 watt	9-220
R16	2200 ohms 10% ½ watt	9-107
R17	18,000 ohms 10% ½ watt	9-95
R18	22,000 ohms 10% ½ watt	9-180
R21	390 ohms 10% 2 watt	9-185
R22	2.2 megohms 20% 1/4 watt	9-296
R24	15,000 ohms 20% 2 watt	9-299
L4	S.W. antenna coil	3-120
L5, L6	Oscillator coil	3-118
T1	1st I-F transformer	3-165
T2	2nd I-F transformer	3-166
T3	Power transformer	2-12
T4	Output transformer	22-8-2

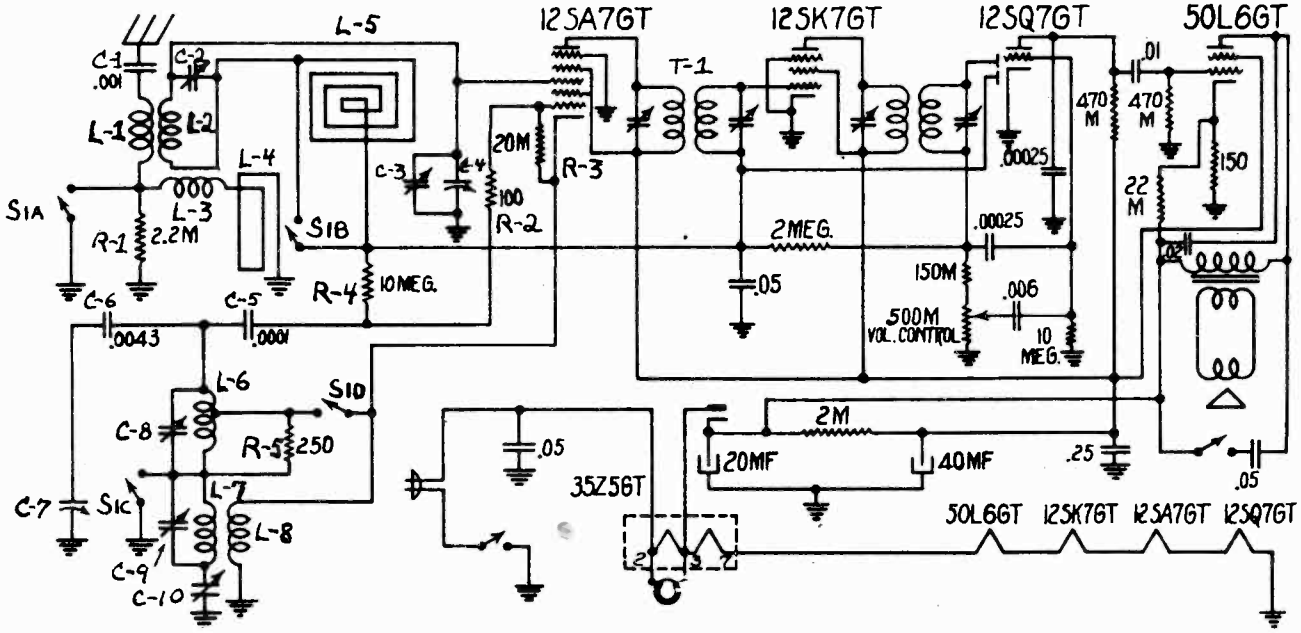
DESCRIPTION	PART NO.
Phono-motor receptacle	15-98
Pilot light, Mazda #44	26-7
Dial pointer	135-6
Dial cord spring	129-29
Dial cord	S-1263
Knob, phono-radio	128-45
Knob, off-volume	128-46
Knob, B.C. - S.W.	128-47
Knob, bass-treble	128-48
Knob, tuning	128-49
Knob, plain	128-32
Cabinets:	
8S452	115-12
8S473	115-15
Speaker, 8" electrodynamic	22-8-1
Speaker, 10" electrodynamic	22-14-1
Glass escutcheon	122-18
Metal escutcheon	122-29
Dial scale,	117-69
Escutcheon clamp	112-355
Loop antenna assembly	20-8
Pilot light socket	15-84
Speaker plug	22-8-3
S-1200 Filter Box	
Resistor, 500 ohms, 5 watt, wire wound	9-287
Transformer	12-23
Choke	12-29
Speakers: 8" P.M.	22-21
10" P.M.	22-22
12" P.M.	22-23

MODEL 400,Ch.400
MODEL 401,Ch.401

MAJESTIC RADIO & TELEV. CORP.



MODEL 400,Chassis 400



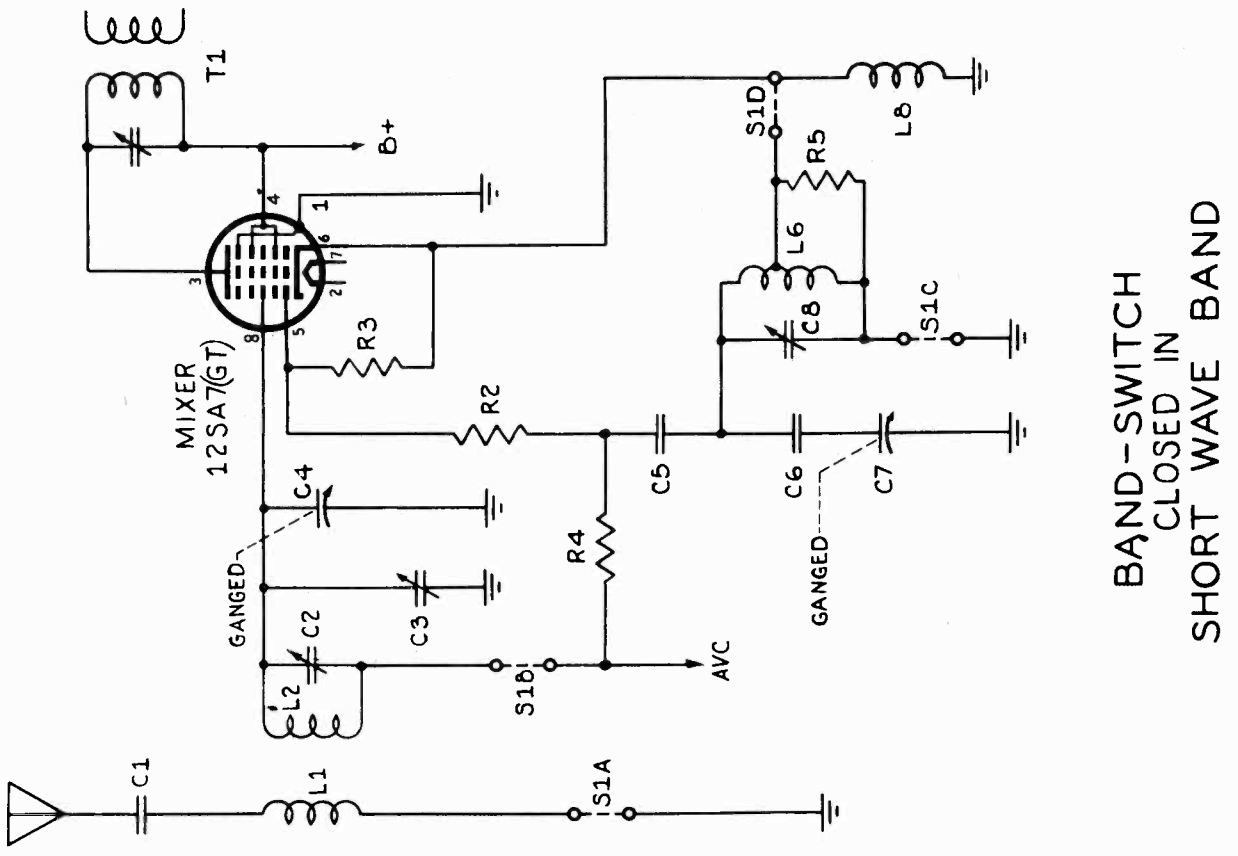
MODEL 401,Chassis 401

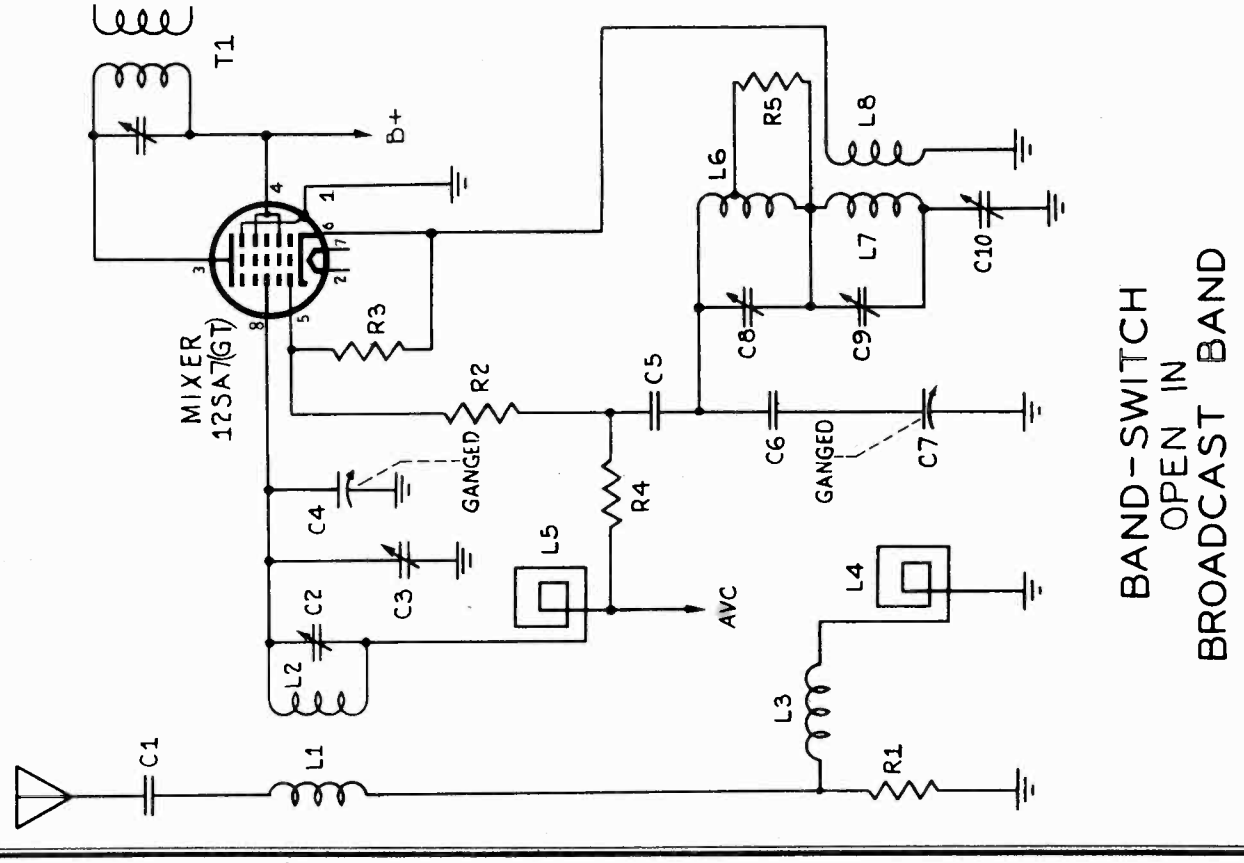
For Socket and trimmers, see P.15-33

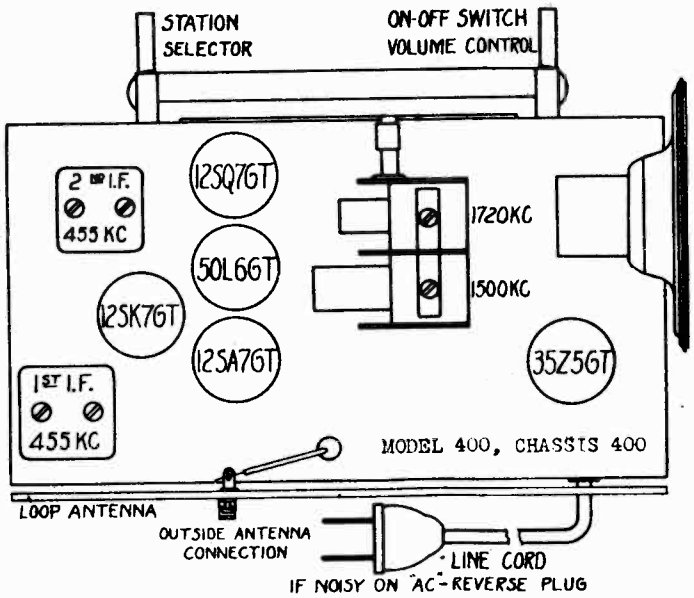
"clarified schematics"

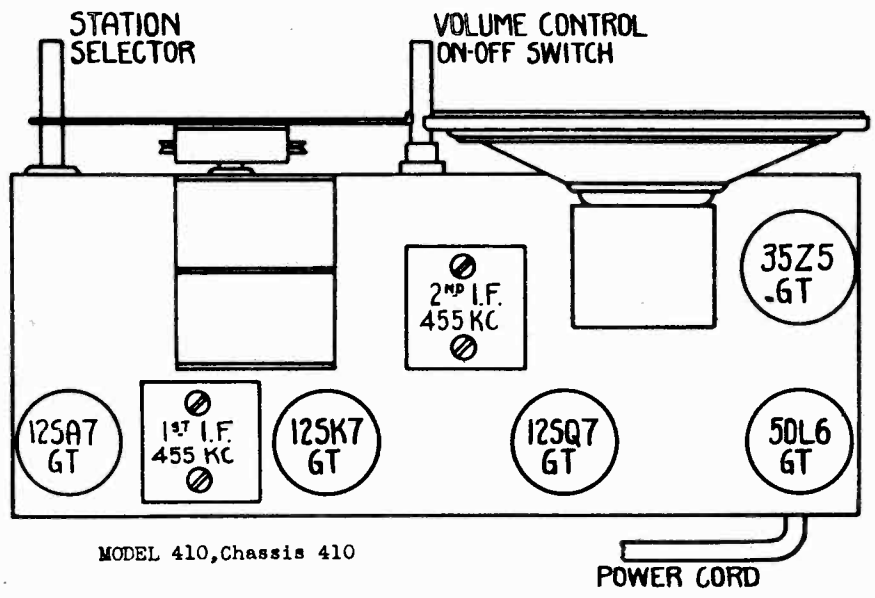
MODEL 401,Ch.401

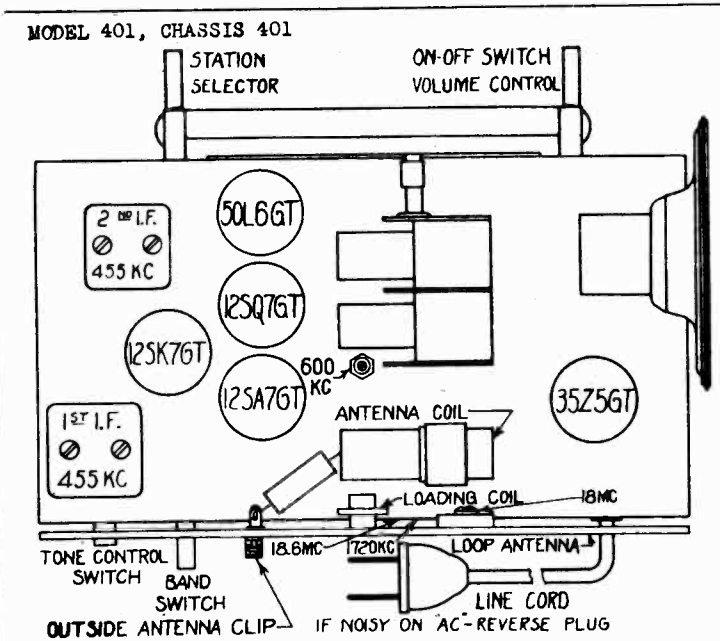
MAJESTIC RADIO & TELEV. CORP.

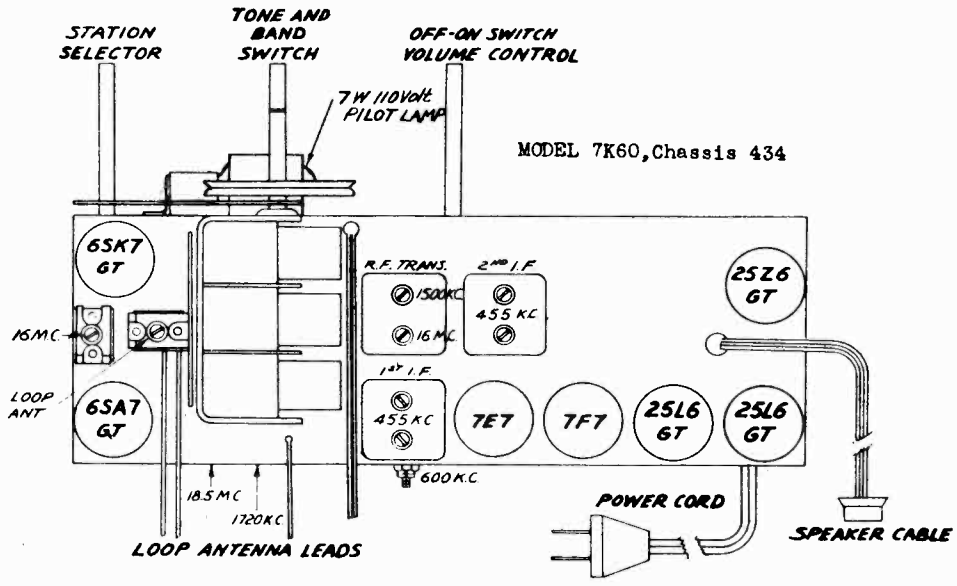






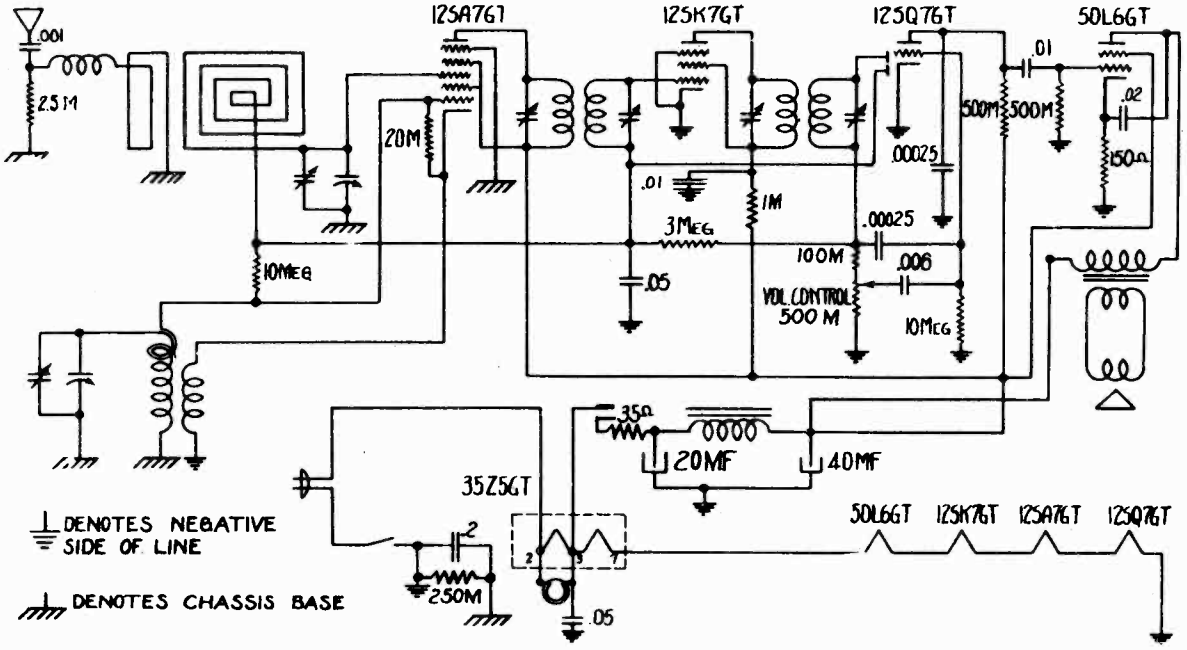






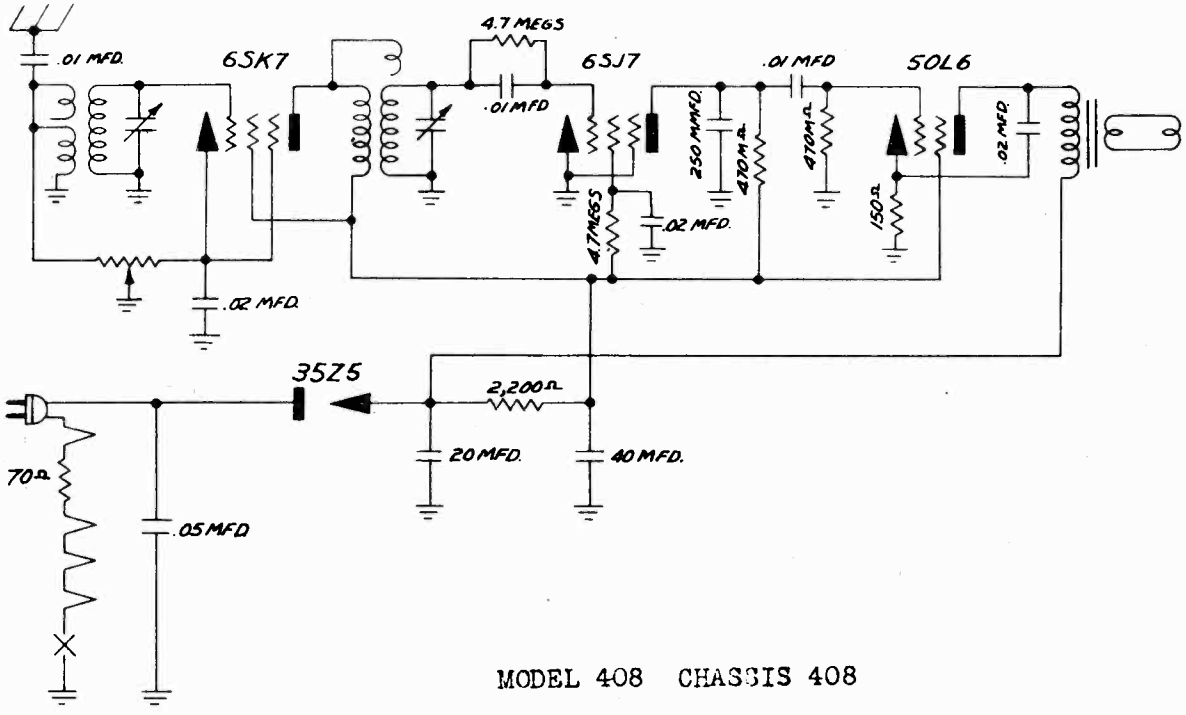
MODEL 407,Ch.407
MODEL 408,Ch.408
Camera Port.

MAJESTIC RADIO & TELEV. CORP.



MODEL 407 CHASSIS 407

Chassis 407

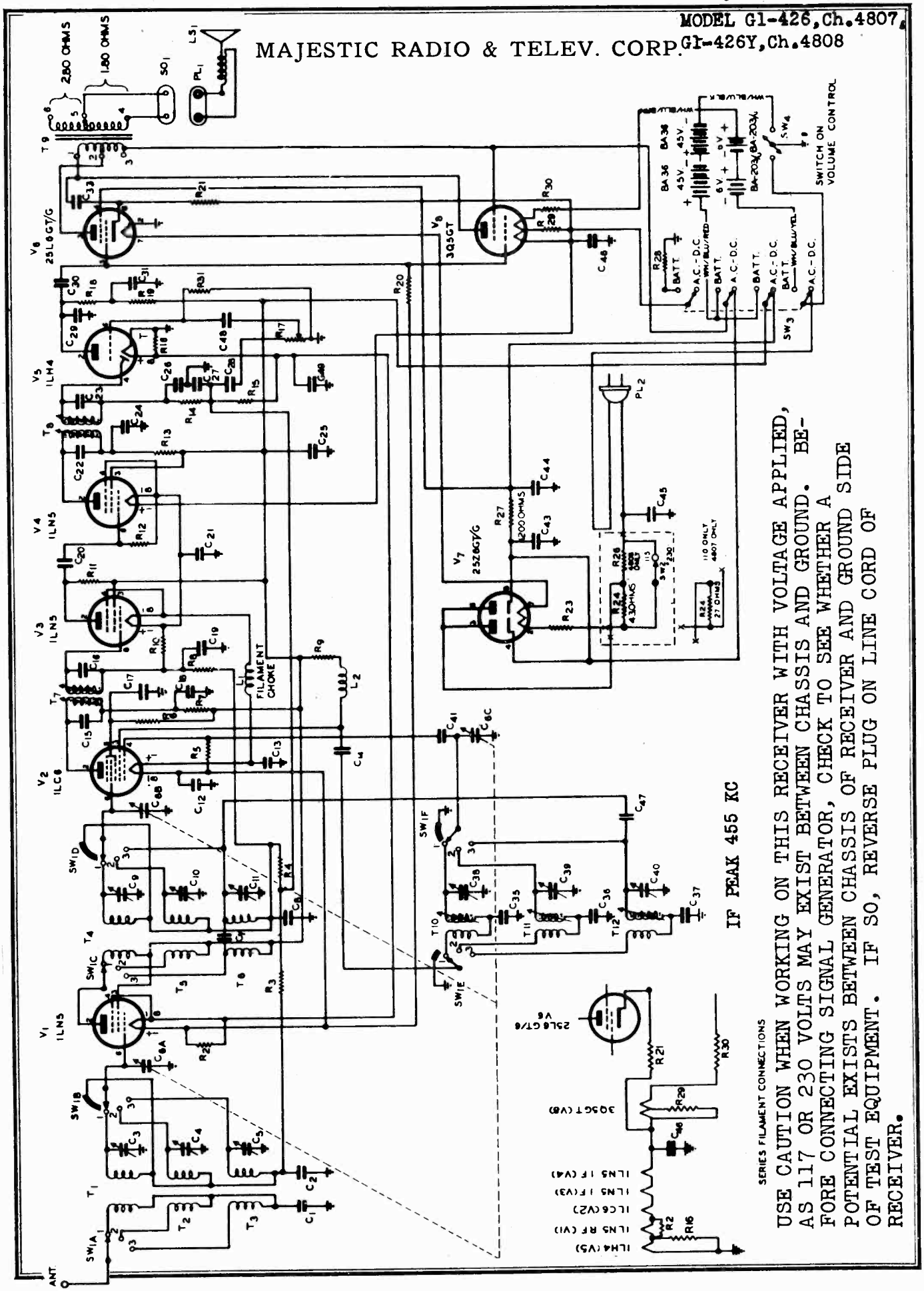


MODEL 408 CHASSIS 408

Chassis 408
Model Camera Port.

MODEL G1-426,Ch.4807,
G1-426Y,Ch.4808

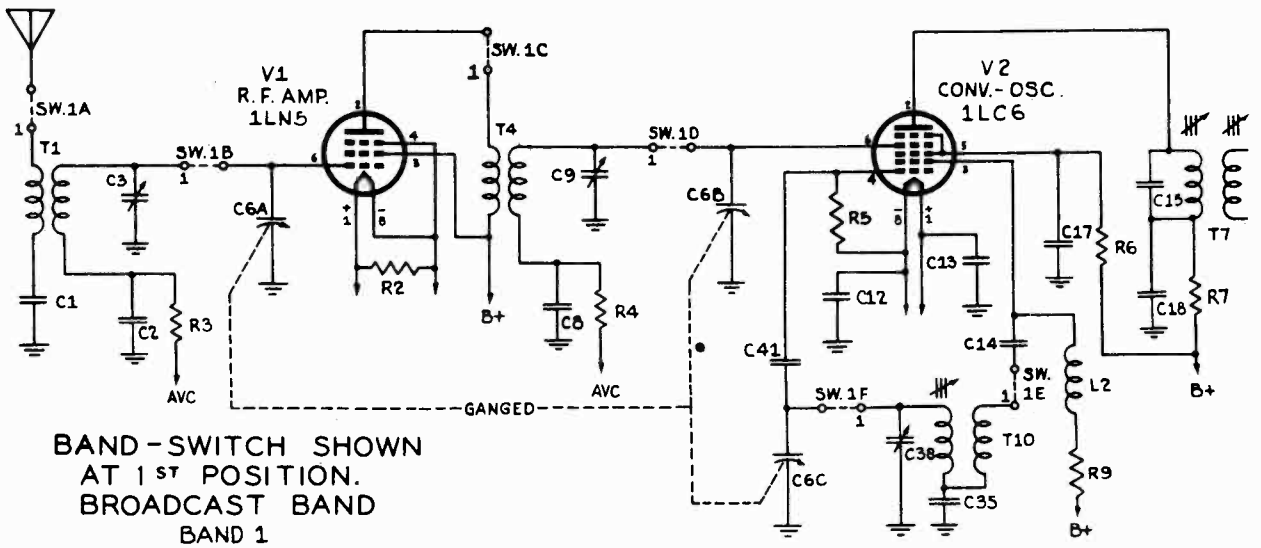
MAJESTIC RADIO & TELEV. CORP.



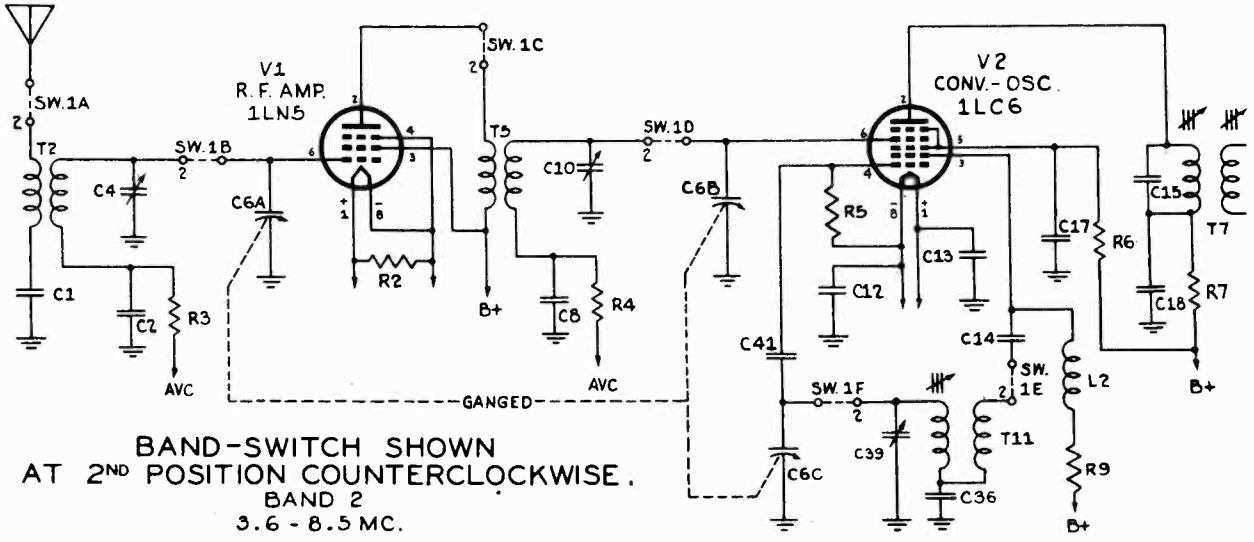
USE CAUTION WHEN WORKING ON THIS RECEIVER WITH VOLTAGE APPLIED, AS 117 OR 230 VOLTS MAY EXIST BETWEEN CHASSIS AND GROUND. BEFORE CONNECTING SIGNAL GENERATOR, CHECK TO SEE WHETHER A POTENTIAL EXISTS BETWEEN CHASSIS OF RECEIVER AND GROUND SIDE OF TEST EQUIPMENT. IF SO, REVERSE PLUG ON LINE CORD OF RECEIVER.

MODELS G1-426,
G1-426Y

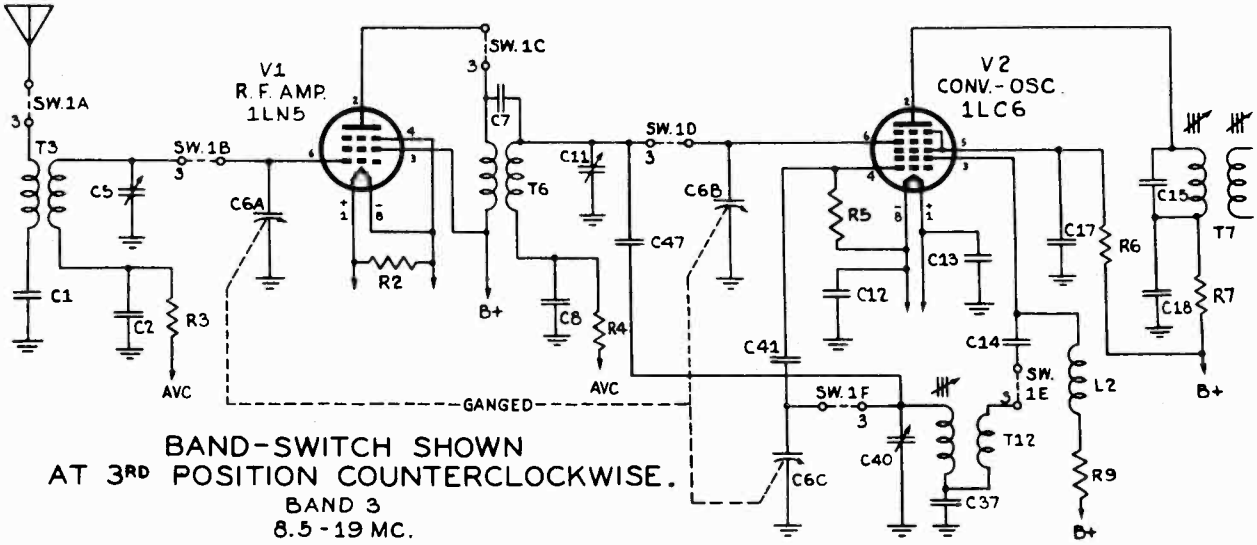
MAJESTIC RADIO & TELEV. CORP.



BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
BAND 1



BAND-SWITCH SHOWN
AT 2ND POSITION COUNTERCLOCKWISE.
BAND 2
3.6 - 8.5 MC.



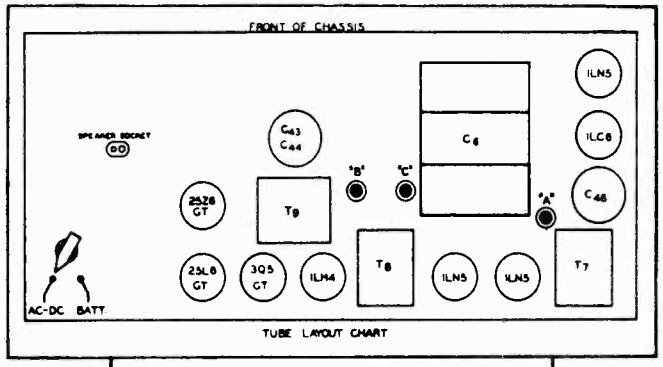
BAND-SWITCH SHOWN
AT 3RD POSITION COUNTERCLOCKWISE.
BAND 3
8.5 - 19 MC.

ALIGNMENT

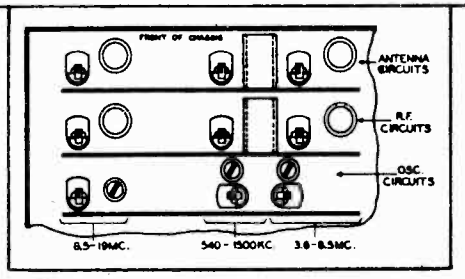
Before aligning, make sure that the dial pointer is exactly horizontal when the tuning condenser is closed (plates fully meshed). While aligning the receiver, turn the volume control full on and keep the signal generator output as low as possible, to prevent AVC action and false readings.

Band-switch positions are extreme right for Broadcast, center for 3.6 to 8.5 mc., extreme left for 8.5 to 19 mc.

STEP	DUMMY ANT.	TEST. OSC. CONNECTION	TEST. OSC. FREQUENCY	RECEIVER BANDSWITCH	RECEIVER DIAL	ADJUST IN ORDER SHOWN	NOTES
1	.01 mfd	1LC6 grid (pin 6)	455 KC.	Right	Any Quiet Spot	T8, T7	#1
2	200 mmfd	ANT. post	600 KC.	Right	.6	"C"	#2
3	200 mmfd	ANT. post	1400 KC.	Right	1.4	Osc.Trimmer	
4	200 mmfd	ANT. post	1400 KC.	Right	1.4	R.F.Trimmer Ant.Trimmer	#3
5	400 ohms	ANT. post	4 MC.	Center	4	"B"	#2
6	400 ohms	ANT. post	8 MC.	Center	8	Osc.Trimmer	#4
7	400 ohms	ANT. post	8 MC.	Center	8	R.F.Trimmer Ant.Trimmer	
8	400 ohms	ANT. post	9 MC.	Left	9	"A"	#2
9	400 ohms	ANT. post	18 MC.	Left	18	Osc.Trimmer	#4
10	400 ohms	ANT. post	18 MC.	Left	18	R.F.Trimmer Ant.Trimmer	



TUBE LAYOUT CHART



TRIMMER LOCATION

VOLTAGE TABLE

TUBE	PLATE	SCREEN	PLUS FIL.	MINUS FIL.	CATHODE
1LN5 (V1)	100	100	2.5	1.4	
1LC6 (V2)	100	50 (pin 3)	4	2.5	
		40 (pin 5)			
1LN5 (V3)	55	100	5.1	4	
1LN5 (V4)	100	100	6.2	5.1	
1LH4 (V5)	60		1.4	0	
25L6 (V6)	110	115	25 A.C.	0	9
25Z6 (V7)	110AC		50 A.C.	25 A.C.	140

NOTE: All voltages measured with respect to chassis with 1,000 ohm per volt meter, line voltage 117 volts A.C.

NOTES

NOTE #1 - Ground oscillator grid (1LC6 pin 4) while adjusting I.F. transformers.

NOTE #2 - "Rock" tuning gang while making this adjustment.

NOTE #3 - Carefully repeat steps 1 through 4.

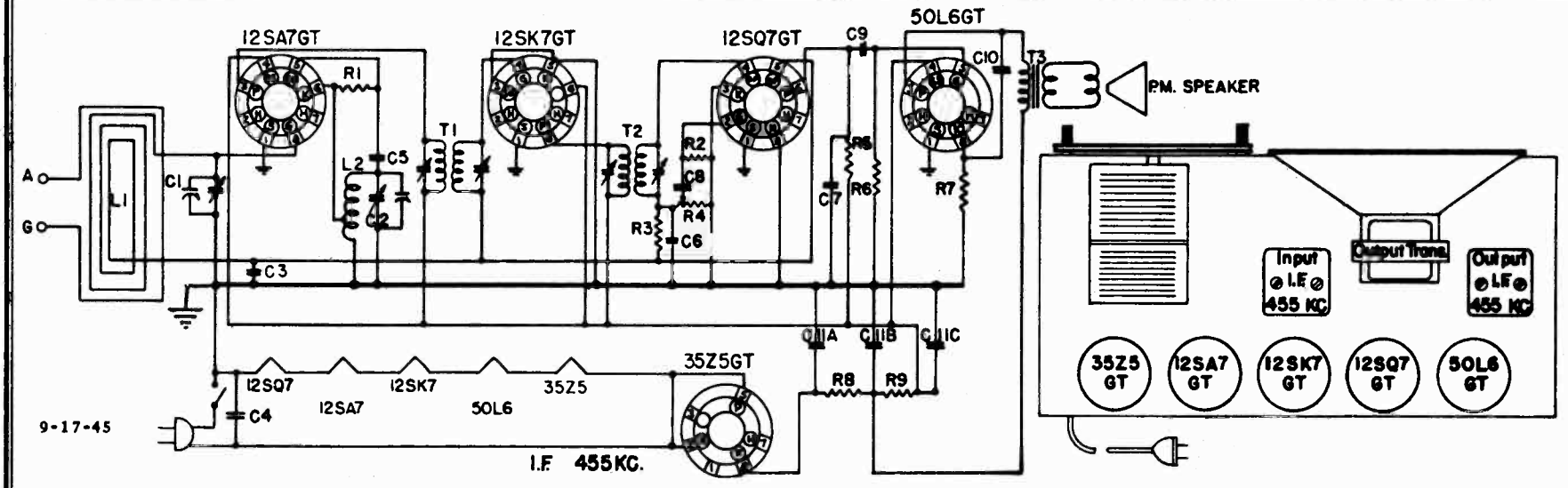
NOTE #4 - When making short wave oscillator adjustments, take great care to see that alignment is not made on the image. When the trimmer is correctly adjusted, a weaker peak will be noticed at a receiver dial adjustment which is 910 KC lower than the aligning frequency. It may be necessary to greatly increase the output of the signal generator in order to find this weaker peak.

MODELS G1-426, G1-426Y

MAJESTIC RADIO & TELEV. CORP.

ITEM	DESCRIPTION	PART NUMBER
C1,C28,C30,C48	.006 mfd +20% 600 v molded paper	6-96
C2,C8	.05 mfd +20% -10% 200 v molded paper	6-135
C3,C9,C10,C38,C39,C40	Ceramic Trimmer 7-35 mmfd	8-26
C4,C5,C11	Ceramic Trimmer 34-72 mmfd	8-49
C6A,C6B,C6C	Variable, 3 gang	7-9
C7	15 mmfd +20% 500 v fixed ceramic	6-88
C12,C13,C21,C25,C31,C49	.1 mfd +40% -10% 400 v molded paper	6-91
C14	.0022 mfd 10% 500 v mica	6-109
C15	150 mmfd 5% 500 v mica	6-106
C16,C23	82 mmfd 5% 500 v mica	6-108
C17,C19	.02 mfd +40% -10% 200 v molded paper	6-93
C18	.01 mfd +20% -10% 400 v molded paper	6-97
C20	220 mmfd 20% 400 v fixed ceramic	6-86
C22	51 mmfd 5% 500 v mica	6-107
C24	.05 mfd +40% - 10% 600 v molded paper	6-99
C26,C27,C41	100 mmfd 20% 500 v molded mica	6-82
C29	470 mmfd 20% 500 v molded paper	6-102
C33,C45	.01 mfd +40% -10% 600 v molded paper	6-98
C34,C43,C42,C44	40-40 mfd 250 v dual electrolytic	19-2
C35	430 mmfd 2% 500 v molded mica	6-101
C36	2200 mmfd 5% 500 v molded mica	6-84
C37	.003 mfd 5% 500 v molded mica	6-149
C46	1000 mfd 15 v electrolytic	19-6
J1	Phone jack	18-27
L1	Line filter choke coil	3-102
L2	R.F. choke	3-104
LS1	Speaker, P.M. 6"	22-5
SO1	Speaker receptacle	15-66
PL1	Speaker plug	18-28
R2	270 ohm 10% ¼ watt carbon	9-122
R3,R8,R10	3.3 megohms 10% ½ watt carbon	9-135
R4	3.9 megohms 10% ½ watt carbon	9-136
R5	220,000 ohm 20% ¼ watt carbon	9-115
R6	68,000 ohm 10% ¼ watt carbon	9-116
R7,R13	1,000 ohm 20% ¼ watt carbon	9-131
R9,R11	22,000 ohm 10% ¼ watt carbon	9-140
R12,R15,R18	470,000 ohm 20% ½ watt carbon	9-120
R14	47,000 ohm 20% ¼ watt carbon	9-121
R16,R29	330 ohm 10% ½ watt carbon	9-126
R17	1 megohm 20% variable with switch	13-12
R19	100,000 ohm 20% ½ watt carbon	9-123
R20	470,000 ohm 10% ¼ watt carbon	9-118
R21	62 ohm 5% ½ watt carbon	9-137
R22	10 ohm 20% 1 watt carbon	9-128
R23	220 ohms 5% 30 watt wirewound	9-134
R24	43 ohm 5% 8 watt wirewound	9-132
R25	2200 ohm 10% ½ watt carbon	9-7
R26	260 ohm 5% 60 watt wirewound	9-133
R27	4700 ohm 10% 1 watt carbon	9-139
R28	820 ohm 10% ¼ watt carbon	9-127
R30	27 ohm 10% ¼ watt carbon	9-125
R31	12 megohms 10% ¼ watt carbon	9-138
SW1A,B,C,D	Switch wafer	11-40
SW1E,F	Switch wafer	11-41
SW3	4P 2-position switch	11-39
T1	Band 1 antenna	3-99
T2	Band 2 antenna	3-91
T3	Band 3 antenna	3-96
T4	Band 1 R.F.	3-100
T5	Band 2 R.F.	3-94
T6	Band 3 R.F.	3-95
T7	1st I.F.	3-93
T8	2nd I.F.	3-101
T9	Output transformer	12-16
T10	Band 1 oscillator	3-92
T11	Band 2 oscillator	3-97
T12	Band 3 oscillator	3-98

Chassis mounting stud assembly	111-149	Dial cord	134-5
Knobs, band switch and volume control	128-17	Dial pointer, black	135-1
Cabinet back assembly	112-190	Dial pointer, white	135-11
Tuning knob	128-18	Dial, white	112-179
AC-DC - BATT knob	128-19	Dial, black	112-336
		Dial window	117-28



Circuit Symbol	Part Number	Description	Model
C1, C2	CV-10002	Condenser-Variable, with pulley	RC-5C5
C1, C2	CV-10002-A	Condenser-Variable, with pulley	RC-5C5-A
C1, C2	CV-10002-B	Condenser-Variable, with pulley	RC-5C5-B
C1, C2	CV-10002-C	Condenser-Variable, with pulley	RC-5C5-C
C3, C4, C10	CP-14503	Condenser-Paper, 0.05mfd. 400V	All
C5	CM-15500	Condenser-Mica, 0.00005mfd.	All
C6, C7	CM-15251	Condenser-Mica, 0.00025mfd.	All
C8, C9	CP-14103	Condenser-Paper, 0.01mfd. 400V	All
C11A, C11B, C11C	CL-10001	Condenser-Electrolytic 20/20/20 mfd 150V	All
R1	RC-32002	Resistor-Carbon, 20,000 ohms ½watt	All
R2	RC-31005	Resistor-Carbon, 10 megohms ½watt	All
R3	RC-32004	Resistor-Carbon, 2 megohms ½watt	All
R4	VC-10103	Control-Volume, with switch, 1 megohm	All
R5	RC-32503	Resistor-Carbon, 250,000 ohms ½watt	All

Symbol	Part Number	Description	Model
R6	RC-35003	Resistor-Carbon, 500,000 ohms ½watt	All
R7	RC-31500	Resistor-Carbon, 150 ohms ½watt	All
R8	RC-32000	Resistor-Carbon, 200 ohms ½watt	All
R9	RC-31001	Resistor-Carbon, 1000 ohms ½watt.	All
L1	AL-10000	Antenna-Loop,	RC-5C5, A, B,
L1	AL-10001-C	Antenna-Loop	RC-5C5-C
L2	TRC-10000	Coil-Oscillator	RC-5C5, A, B,
L2	TRC-10000-C	Coil-Oscillator	RC-5C5-C
T1	TS-10000	Transformer-1st I.F.	All
T2	TS-10001	Transformer-2nd I.F.	All
T3	TO-10000	Transformer-Output	All
SPKR	SR-10000	Speaker-P.M. 4" round, less T3	All
SPKR	SR-10001	Speaker-P.M. 4" round, with T3	All

VOLTAGE TABLE - Use high resistance voltmeter of 1000 ohms per volt

Type tube	1	2	3	4	5	6	7	8
12SA7	0	24AC	78	78	-7 to-12	0	12AC	-.65 to-1.2
12SK7	0	36AC	0	-.8 to-1.2	0	78	24AC	78
12SQ7	0	-.9 to-1.2	0	0	-.8 to-1.2	55	12AC	0
50L6	0	--	95	78	0	--	36AC	4 to 5
35Z5	-	82	--	78	115 AC	100	115 AC	110

JOHN MECK INDUSTRIES

MODELS 5C5, 5C5-A, 5C5-B, 5C5-C
Trail Blazer

MODELS 5C5,5C5-A,
5C5-B,5C5-C
Trail Blazer

JOHN MECK INDUSTRIES

The Meck Trail Blazer Models 5C5; 5C5-A; 5C5-B; 5C5-C are five tube superhetrodyne receivers covering the broadcast band from 535 to 1720 kilocycles. A loop antenna is incorporated in the top of the cabinet. When an external antenna and ground are used, connect the antenna to the red wire and the ground wire to the black wire extending from the back of the cabinet.

The circuit employs automatic volume control (A.V.C.) through the action of the type 12SQ7GT tube. These models are designed to operate on 110 to 120 volts AC-DC In operation; the incoming signal is first passed to the tuned first detector circuit and then beats with the oscillator output to produce a 455 kilocycle intermediate frequency signal.

The intermediate frequency signal is amplified in an exceptionally high gain stage, and is then rectified by the diodes of the type 12SQ7GT tube. Detection is accomplished by the diode directly connected to the output intermediate frequency transformer. A modulated direct current voltage drop is produced across the one megohm potentiometer by the rectified current. The volume is controlled by selecting any desired portion of the audio frequency voltage with the moving arm of the potentiometer which is connected to the grid of the type 12SQ7GT tube. The triode section of this tube acts as an audio amplifier and is resistance coupled to the 50L6GT output tube.

PRELIMINARY: Before attempting to align a radio set, the service man should become familiar with the general layout of the chassis and with the function and location of the various trimmer condensers. The following discussion briefly explains the action of each alignment step.

R.F. alignment and calibration are accomplished by the two trimmer condensers located on the side of the variable condenser gang. The oscillator is kept in exact step with the R.F. circuit by the special shape of the stator plates in the oscillator tuning section.

Both windings of the I.F. transformers are tuned. The I.F. trimmers are mounted in their respective I.F. coil cans, and are reached through holes in the top of each I.F. coil can.

EQUIPMENT and PRELIMINARY STEPS: A good modulated oscillator, an output meter, an isolation or a coupling transformer and a loop antenna are essential for the proper alignment. The attenuator on the oscillator must be capable of reducing the signal to a low value because the A.V.C. will function if the signal is too strong and thus make correct alignment impossible. The output meter must be sensitive enough to give a satisfactory reading with a small signal. An isolation or a coupling transformer must be used when an AC-DC radio is to be aligned. The loop antenna can be made by winding five to ten turns of insulated wire on a three or four inch form and closely coupled to the loop antenna of the receiver.

The output meter should be connected across the speaker voice coil or connected from the plate of the 50L6GT to ground or chassis through a 0.25 mfd. condenser, depending upon the type of output meter used.

All alignment adjustments must be made with the volume control full on, but with no broadcast signal being received.

I.F. ALIGNMENT: The step-by-step routine given below should be carefully followed after reading the preceding instructions:

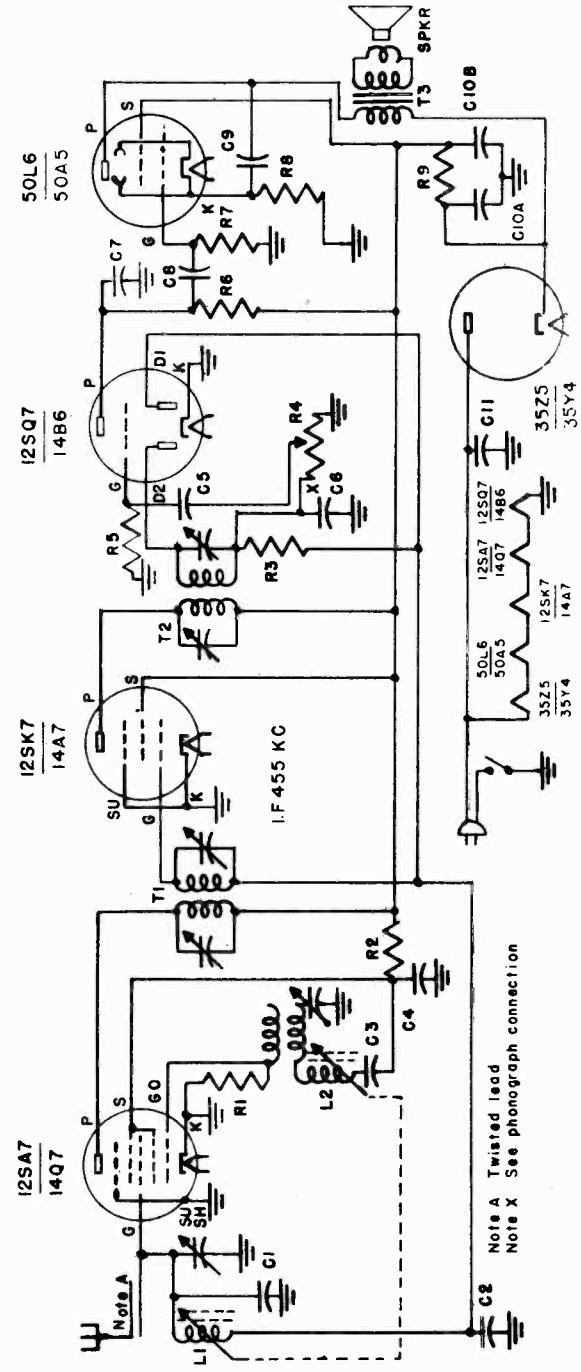
1. The modulated oscillator must be tuned to 455 K.C.
2. Connect the high side of the oscillator output to the lug on the R.F. section of the gang condenser. The low side of the oscillator is connected to the chassis through a .01 condenser.
3. Set the gang condenser of the radio to 1720 on the dial and turn the volume control on full.
4. Adjust the four I.F. trimmers tuning each carefully to get the maximum deflection of the output meter. Reduce the oscillator output if the output meter goes off scale.
5. Repeat all four adjustments since the adjustment of each I.F. trimmer may effect the others to a certain extent.

R.F. AND OSCILLATOR ALIGNMENT:

1. Connect the oscillator output to the external loop antenna and closely couple to the loop antenna of the receiver.
2. Set the generator at 1720 KC and turn the gang condenser to 1720 on the dial. Adjust the oscillator trimmer for maximum output.
3. Set the generator at 1400 KC and turn the gang condenser to 1400 on the dial. Adjust the R.F. trimmer for maximum output while rocking the gang.
4. Set the generator at 600 KC and turn the gang to 600 KC on the dial and check for tracking.

MODELS PM-5C5-P, RC-5C5-P

JOHN MECK INDUSTRIES



IF PEAK 455 KC

VOLTAGE TABLE - Use high resistance voltmeter of 1000 ohms per volt

Type tube	1	2	3	4	5	6	7	8
12SA7	0	24AC	78	78	-7 to-12	0	12AC	-.65 to-1.2
12SK7	0	36AC	0	-.8 to-1.2	0	78	24AC	78
12SQ7	0	-.9 to-1.2	0	0	-.8 to-1.2	55	12AC	0
50L6	0	- -	95	78	0	--	36AC	4 to 5
35Z5	-	82	--	78	115 AC	100	115 AC	110
1Q7	24AC	78	78	-7 to-12	0	-.65 to-1.2	0	12AC
1A7	36AC	78	78	0	0	-.8 to-1.2	0	24AC
1B6	0	55	-.9 to-1.2	0	-.8 to-1.2	0	0	12AC
50A5	82AC	95	78	--	---	0	4 to 5	36AC
35Y4	115AC	115AC	78	--	100	--	110	82AC

Circuit Symbol	Part Number	Description
C1	CM-15250	Condenser-Mica, 25 mmf., 500 volt
C2,C9,C11	CP-145031	Condenser-Paper, 0.05 mfd., 400 volt
C3,C5,C8	CP-14103	Condenser-Paper, 0.01 mfd., 400 volt
C4	CM-15301	Condenser-Mica, 300 mmf., 500 volt
C6,C7	CM-15251	Condenser-Mica, 250 mmf., 500 volt
C10A,C10B	CL-10001	Condenser-Elect., 20/20 mfd., 150 volt
L1,L2	VP-10000	Tuner-Permeability, assembly
R1	RC-32002	Resistor-Carbon, 20,000 ohms, ½ watt
R2	RC-34001	Resistor-Carbon, 4000 ohms, ½ watt
R3	RC-32004	Resistor-Carbon, 2 megohms, ½ watt
R4	VC-10105	Control-Volume, 1 megohm with switch
R5	RC-31005	Resistor-Carbon, 10 megohms, ½ watt
R6	RC-32502	Resistor-Carbon, 250,000 ohms, ½ watt
R7	RC-35003	Resistor-Carbon, 500,000 ohms, ½ watt
R8	RC-31500	Resistor-Carbon, 150 ohms, ½ watt
R9	RC-31001	Resistor-Carbon, 1000 ohms, ½ watt
SPKR	SR-10000	Speaker-P.M. 4" round less T3
T1	TS-10000	Transformer-1st. I.F.
T2	TS-10001	Transformer-2nd. I.F.
T3	TO-10000	Transformer-Output
PHONOGRAPH MODEL		
M1	PRS-10000	Motor-Phono, with turntable
P1	PA-10000	Pickup-Crystal
R10	RC-31004	Resistor-Carbon, 1 megohm, ½ watt
R11	RC-37503	Resistor-Carbon, 750,000 ohms, ½ watt
S1	VS-10000	Switch-Radio,phono

JOHN MECK INDUSTRIES

ALIGNMENT

PRELIMINARY: Before attempting to align the RC-5C5-P chassis, the service man should become familiar with the general layout of the chassis, with the function and location of the various trimmers. The following discussion briefly explains the action of each alignment step.

R.F. alignment and calibration are accomplished by the two trimmers mounted on top of the permeability tuner assembly. Facing the dial of the chassis, the r.f. trimmer is to the left and the oscillator trimmer to the right.

I.F. The i.f. trimmers are mounted in their respective i.f. coil cans and are reached through holes in the top of each i.f. coil can.

EQUIPMENT and PRELIMINARY STEPS: A good modulated oscillator, an output meter and an isolation transformer are essential for the proper alignment. The attenuator on the oscillator must be capable of reducing the signal to a low value because the a.v.c. will function if the signal is too strong and thus make correct alignment impossible. The output meter must be sensitive enough to give a satisfactory reading with a small signal. An isolation transformer must be used when aligning an AC-DC radio chassis.

The output meter may be connected across the voice coil of the speaker or one lead of the output meter may be connected to the plate of the output tube and the other lead of the meter to one side of a 0.25 mfd. condenser which is then connected to the chassis, depending upon the type of output meter used.

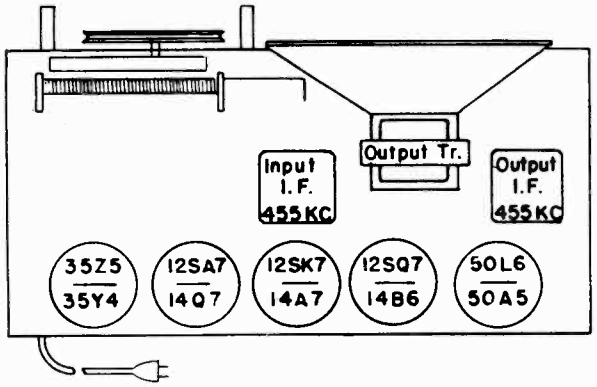
All alignment adjustments must be made with the volume control full on, but with no broadcast signal being received.

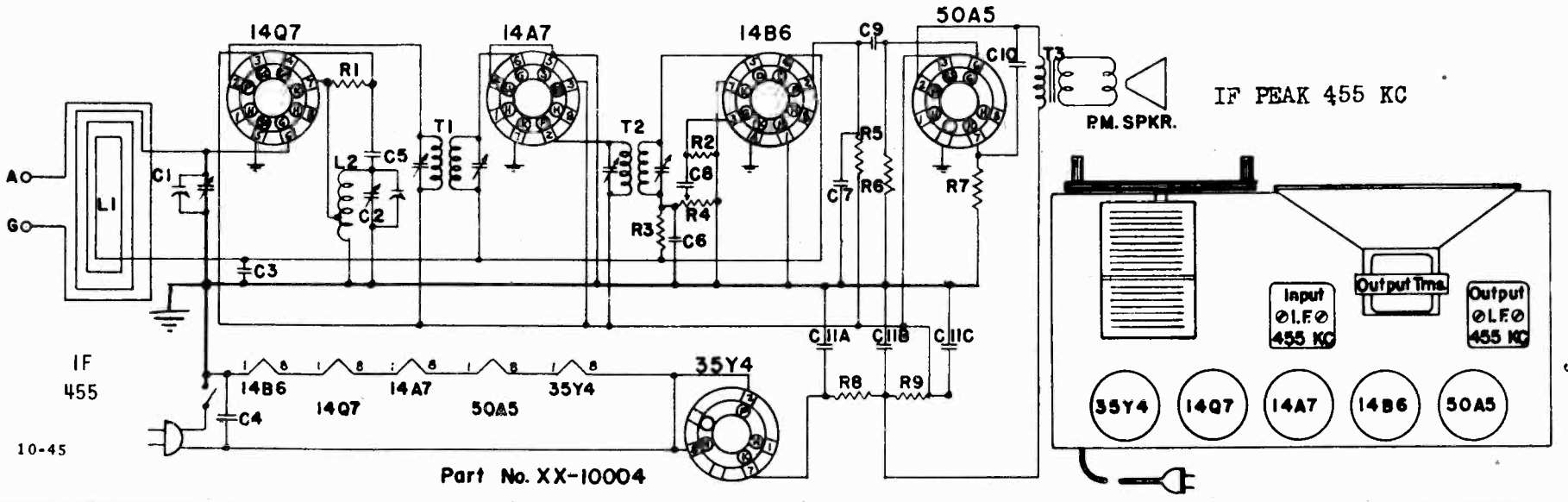
I.F. ALIGNMENT: The step-by-step routine given below should be carefully followed after reading the preceding instructions.

1. The signal generator must be set at 455 kilocycles.
2. Connect the output meter so that the output can be determined.
3. Connect the high side of the signal generator output to the antenna lead of the tuner, the white wire. The low side of the signal generator output lead is connected to the chassis through a 0.01 mfd. condenser.
4. Turn the volume control on full and turn the dial drive shaft so that the slugs of the tuner unit are all the way out against the stop.
5. Adjust the four I.F. trimmers, tuning each carefully to get the maximum deflection of the output meter. Reduce the signal generator output if the output meter goes off scale.
6. Repeat all four adjustments since the adjustment of each I.F. trimmer may effect the others to a certain extent.

OSCILLATOR and R.F. ALIGNMENT:

1. Connect the high side of the signal generator output to the insulation covering of the antenna wire and not the wire itself.
2. Set the signal generator to 1680 kilocycles with the slugs of the tuner all the way out against the stop. Adjust the oscillator trimmer, right hand trimmer screw, for maximum reading on the output meter.
3. Set the signal generator at 1120 kilocycles and turn the dial drive shaft until the 1120 kilocycle note is heard. Adjust the R.F. trimmer, left hand trimmer, for maximum reading on the output meter. Set the dial pointer on 1120 kilocycles on the dial scale. By aligning the R.F. section at 1120 kilocycles the overall alignment will be very good.





Circuit Symbol	Part Number	Description	Model
C1,C2	CV-10002-C	Condenser-Variable, with pulley	RC-5C5-CL
C1,C2	CV-10002-D	Condenser-Variable, with pulley	RC-5C5-DL
C3,C4,C10	CP-14503	Condenser-Paper, 0.05mfd. 400V	All
C5	CM-15500	Condenser-Mica, 0.00005mfd.	All
C6,C7	CM-15251	Condenser-Mica, 0.00025mfd.	All
C8,C9	CP-14103	Condenser-Paper, 0.01mfd. 400V	All
C11A,C11B,C11C	CL-10001	Condenser-Electrolytic 20/20/20 mfd 150V	All
R1	RC-32002	Resistor-Carbon, 20,000 ohms ½watt	All
R2	RC-31005	Resistor-Carbon, 10 megohms ½watt	All
R3	RC-32004	Resistor-Carbon, 2 megohms ½watt	All
R4	VC-10105	Control-Volume, with switch, 1 megohm	All
R5	RC-32503	Resistor-Carbon, 250,000 ohms ½watt	All

Circuit Symbol	Part Number	Description	Model
R6	RC-35003	Resistor-Carbon, 500,000 ohms ½watt	All
R7	RC-31500	Resistor-Carbon, 150 ohms ½watt	All
R8	RC-32000	Resistor-Carbon, 200 ohms ½watt	All
R9	RC-31001	Resistor-Carbon, 1000 ohms ½watt	All
L1	AL-10000-D	Antenna-Loop,	RC-5C5-DL
L1	AL-10001-C	Antenna-Loop	RC-5C5-CL
L2	TRC-10000	Coil-Oscillator	RC-5C5-DL
L2	TRC-10000-C	Coil-Oscillator	RC-5C5-CL
T1	TS-10000	Transformer-1st I.F.	All
T2	TS-10001	Transformer-2nd I.F.	All
T3	TO-10000	Transformer-Output	All
SPKR	SR-10001	Speaker-P.M. 4" round, with T3	All

VOLTAGE TABLE - Use high resistance voltmeter of 1000 ohms per volt

Type tube	1	2	3	4	5	6	7	8
14Q7	24AC	78	78	-7 to-12	0	-.65 to-1.2	0	82AC
14A7	36AC	78	78	0	0	-.8 to-1.2	0	24AC
14B6	0	55	-.9 to-1.2	0	-.8 to-1.2	0	0	12AC
50A5	82AC	95	78	--	---	0	4 to 5	36AC
35Y4	115AC	115AC	78	--	100	--	110	82AC

MODELS RC-5C5-CL,
RC-5C5-DL

JOHN MECK INDUSTRIES

The Meck Trail Blazer Chassis RC-5C5-CL and RC-5C5-DL are five tube superheterodyne receivers. The RC-5C5-CL covers the broadcast band from 545 to 1520 kilocycles and the RC-5C5-DL covers the broadcast band from 535 to 1720 kilocycles. A loop antenna is incorporated in the top of the cabinet. The red and black wires extending from the back of the cabinet are used when an external antenna and ground are used. The external antenna is connected to the red wire and the ground to the black wire. DO NOT CONNECT A GROUND WIRE TO THE METAL CHASSIS.

The circuit employs automatic volume control (A.V.C.) through the action of the type 1486 tube. These models are designed to operate on 110 to 120 volts AC-DC. In operation; the incoming signal is first passed to the tuned first detector circuit and then beats with the oscillator output to produce a 455 kilocycle intermediate frequency signal.

The intermediate frequency signal is amplified in an exceptionally high gain stage, and is then rectified by the diodes of the type 1486 tube. Detection is accomplished by the diode directly connected to the output intermediate frequency transformer. A modulated direct current voltage drop is produced across the one megohm potentiometer by the rectified current. The volume is controlled by selecting any desired portion of the audio frequency voltage with the moving arm of the potentiometer which is connected to the grid of the type 1486 tube. The triode section of this tube acts as an audio amplifier and is resistance coupled to the 50A5 output tube.

PRELIMINARY: Before attempting to align a radio set, the service man should become familiar with the general layout of the chassis and with the function and location of the various trimmer condensers. The following discussion briefly explains the action of each alignment step.

R.F. alignment and calibration are accomplished by the two trimmer condensers located on the side of the variable condenser gang. The oscillator is kept in exact step with the R.F. circuit by the special shape of the stator plates in the oscillator tuning section.

Both windings of the I.F. transformers are tuned. The I.F. trimmers are mounted in their respective I.F. coil cans, and are reached through holes in the top of each I.F. coil can.

EQUIPMENT and PRELIMINARY STEPS: A good modulated oscillator, an output meter, an isolation or a coupling transformer and a loop antenna are essential for the proper alignment. The attenuator on the oscillator must be capable of reducing the signal to a low value because the A.V.C. will function if the signal is too strong and thus make correct alignment impossible. The output meter must be sensitive enough to give a satisfactory reading with a small signal. An isolation or a coupling transformer must be used when an AC-DC radio is to be aligned. The loop antenna can be made by winding five to ten turns of insulated wire on a three or four inch form and closely coupled to the loop antenna of the receiver.

The output meter should be connected across the speaker voice coil or connected from the plate of the 50A5 to ground or chassis through a 0.25 mfd. condenser, depending upon the type of output meter used.

All alignment adjustments must be made with the volume control full on, but with no broadcast signal being received.

I.F. ALIGNMENT: The step-by-step routine given below should be carefully followed after reading the preceding instructions:

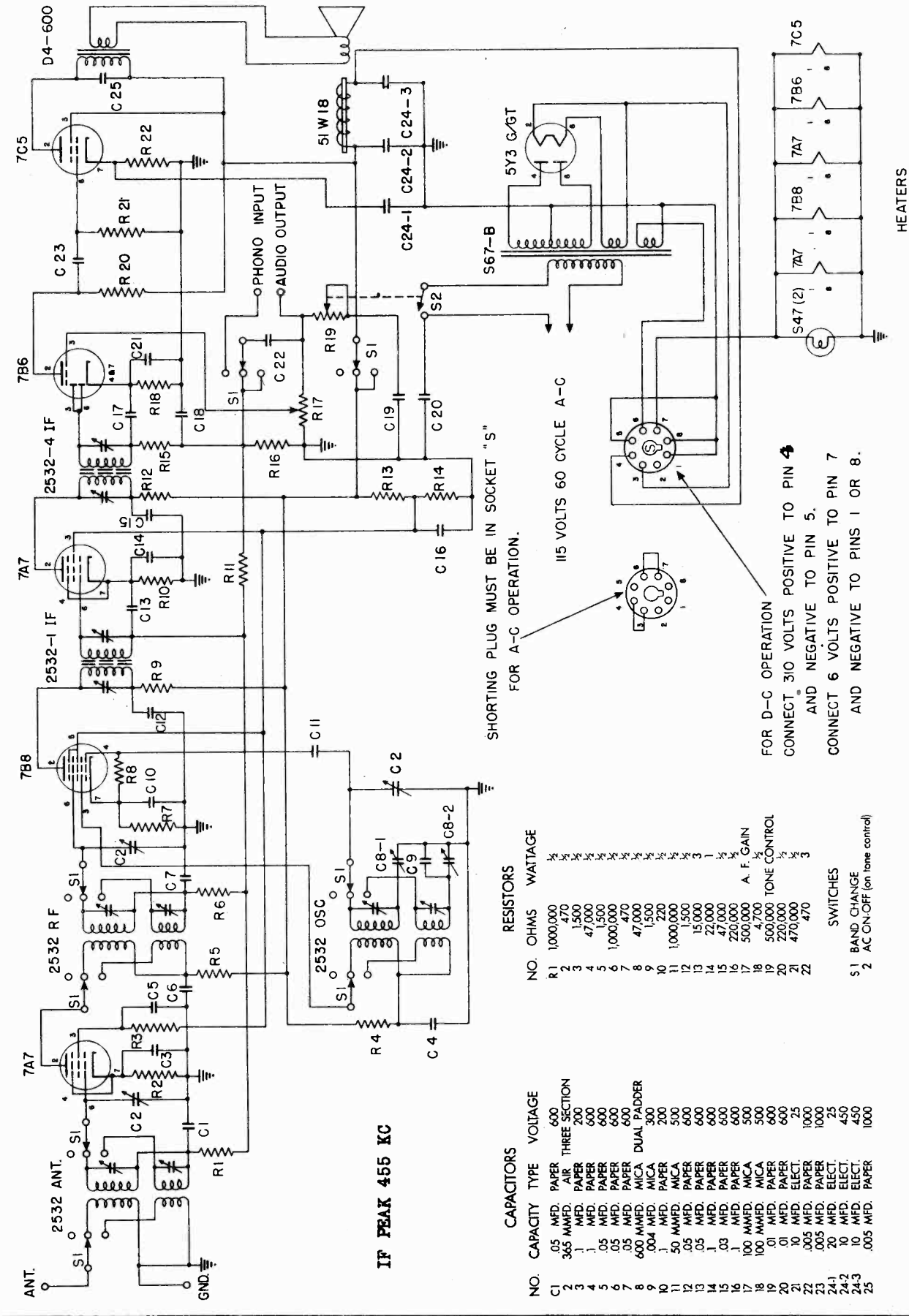
1. The modulated oscillator must be tuned to 455 K.C.
2. Connect the high side of the oscillator output to the lug on the R.F. section of the gang condenser. The low side of the oscillator is connected to the chassis through a .01 condenser.
3. Set the gang condenser of the radio to the low end of the dial and turn the volume control on full.
4. Adjust the four I.F. trimmers tuning each carefully to get the maximum deflection of the output meter. Reduce the oscillator output if the output meter goes off scale.
5. Repeat all four adjustments since the adjustment of each I.F. trimmer may effect the others to a certain extent.

R.F. AND OSCILLATOR ALIGNMENT:

1. Connect the oscillator output to the external loop antenna and closely couple to the loop antenna of the receiver.
2. Set the generator at 1500 KC and turn the gang condenser to 1500 on the dial. Adjust the oscillator trimmer for maximum output.
3. Set the generator at 1400 KC and turn the gang condenser to 1400 on the dial. Adjust the R.F. trimmer for maximum output while rocking the gang.
4. Set the generator at 600 KC and turn the gang to 600 KC on the dial and check for tracking.

MEGARD CORP.

SCHEMATIC DIAGRAM — HOLLYWOOD ELECTRONICS — MODEL HE-621



CAPACITORS

NO.	CAPACITY	TYPE	VOLTAGE
C1	.05 MFD.	PAPER	600
2	365 MMFD.	AIR	THREE SECTION
3	.1 MFD.	PAPER	200
4	.1 MFD.	PAPER	600
5	.05 MFD.	PAPER	600
6	.05 MFD.	PAPER	600
7	.05 MFD.	PAPER	600
8	600 MMFD.	MICA	DUAL PADDER
9	.004 MFD.	MICA	300
10	.1 MFD.	PAPER	200
11	50 MMFD.	MICA	500
12	.05 MFD.	PAPER	600
13	.05 MFD.	PAPER	600
14	.1 MFD.	PAPER	600
15	.03 MFD.	PAPER	600
16	.1 MFD.	PAPER	600
17	100 MMFD.	MICA	500
18	100 MMFD.	MICA	500
19	.01 MFD.	PAPER	600
20	.01 MFD.	PAPER	600
21	10 MFD.	ELECT.	25
22	.005 MFD.	PAPER	1000
23	.005 MFD.	PAPER	1000
24-1	20 MFD.	ELECT.	25
24-2	10 MFD.	ELECT.	450
24-3	10 MFD.	ELECT.	450
25	.005 MFD.	PAPER	1000

RESISTORS

NO.	OHMS	WATTAGE
R1	1,000,000	½
2	470	½
3	1,500	½
4	47,000	½
5	1,500	½
6	1,000,000	½
7	470	½
8	47,000	½
9	1,500	½
10	220	½
11	1,000,000	½
12	1,500	½
13	15,000	3
14	22,000	1
15	47,000	½
16	220,000	½
17	500,000	A. F. GAIN
18	4,700	½
19	500,000	TONE CONTROL
20	220,000	½
21	470,000	½
22	470	3

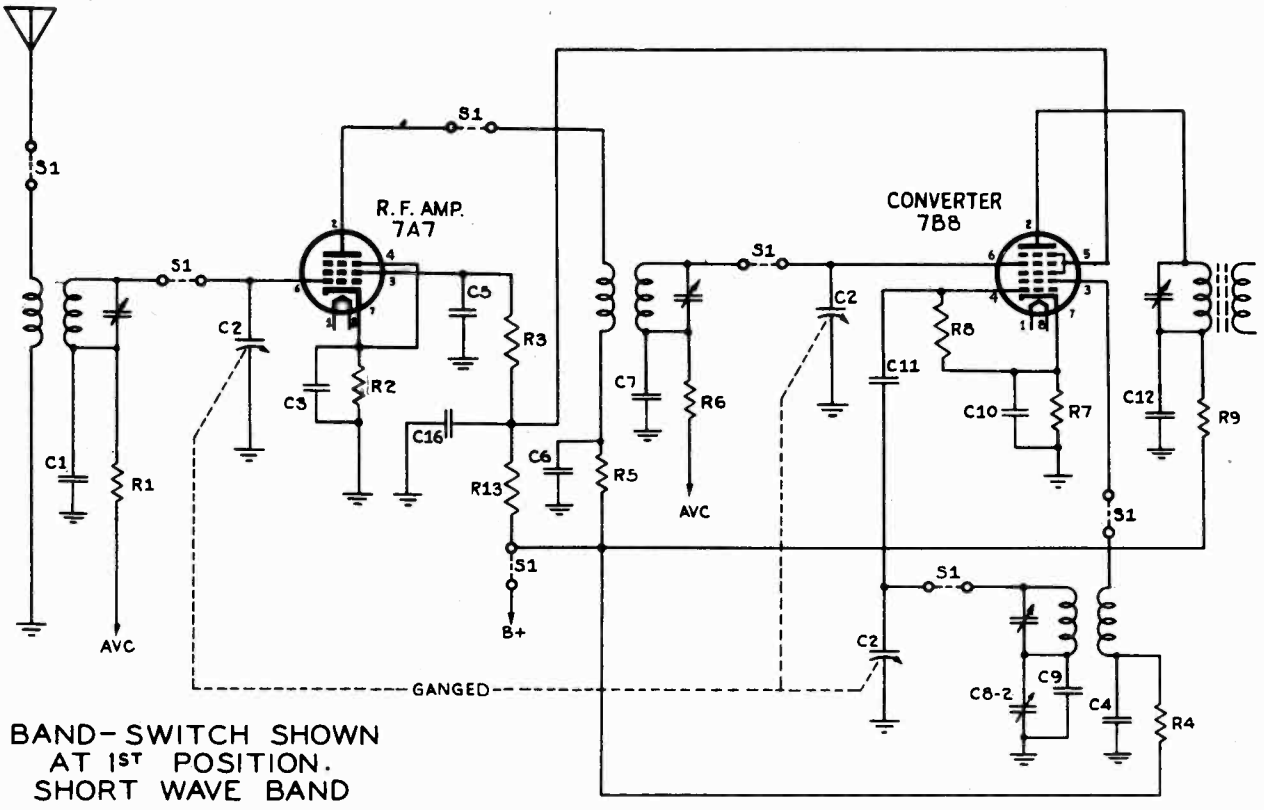
SWITCHES

S1 BAND CHANGE
2 AC ON-OFF (on tone control)

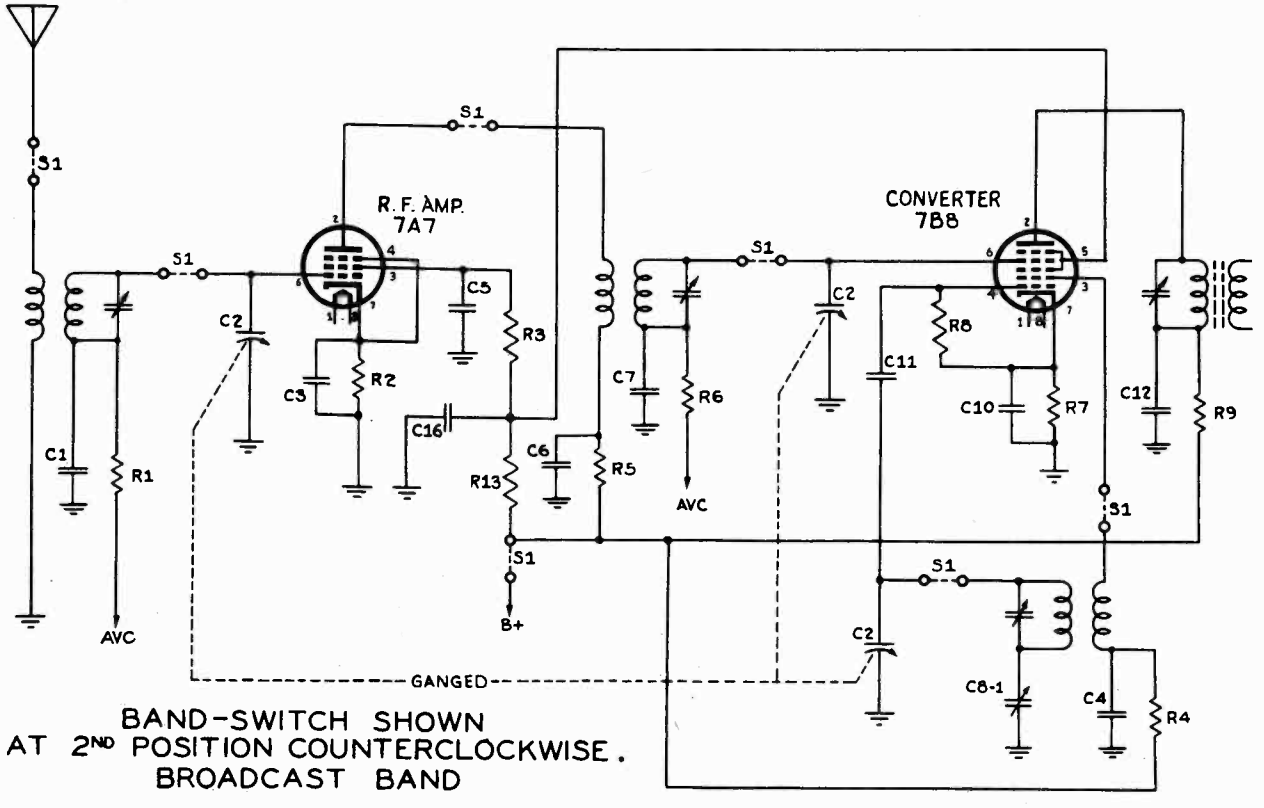
"clarified schematics"

MODEL HE-621

MEGARD CORP.



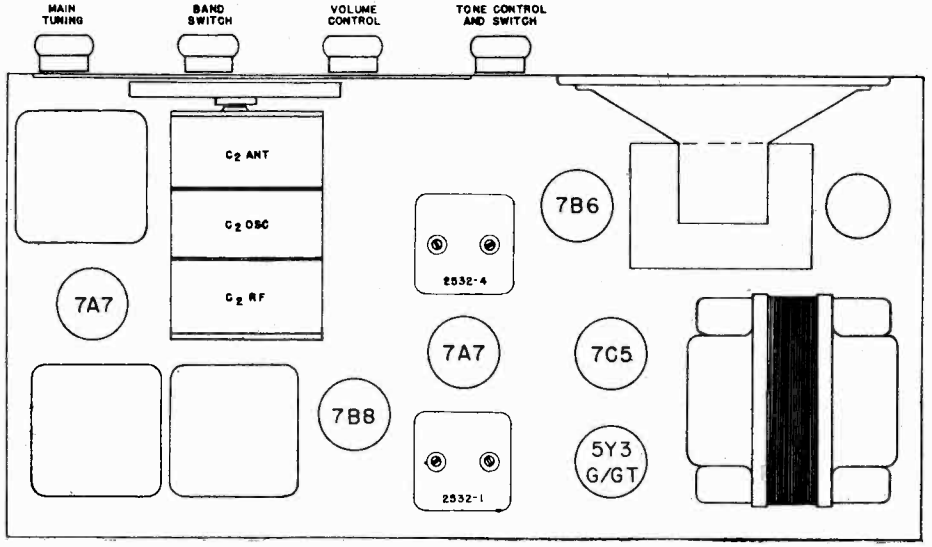
BAND-SWITCH SHOWN
AT 1ST POSITION.
SHORT WAVE BAND

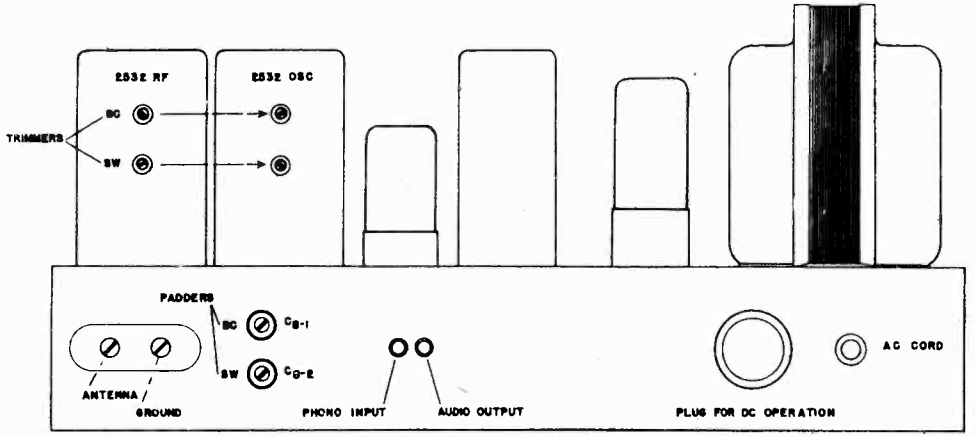


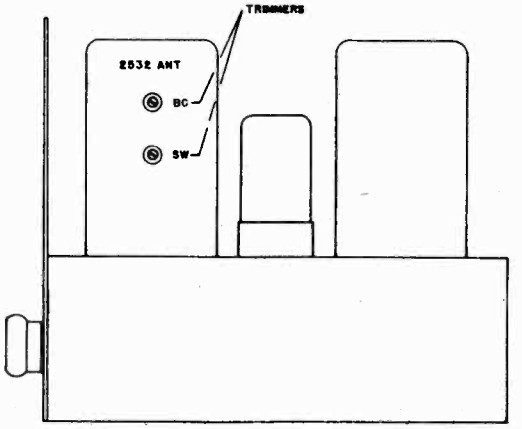
BAND-SWITCH SHOWN
AT 2ND POSITION COUNTERCLOCKWISE.
BROADCAST BAND

BATTERY OPERATION

The HE-621 is intended to be supplied from a 115 volt 50 to 60 cycle A.C. source but if desired the jumper wires of the plug located next to the A.C. cord on the rear apron of the chassis may be removed and the plug wired as indicated on the diagram to allow operation from batteries or a battery pack.







MODEL HE-621

MEGARD CORP.

INTERMEDIATE FREQUENCY ALIGNMENT

Prepare the receiver as follows:
Remove the antenna completely.
Band switch on "BC" or middle position.
Set dial to a point near the high frequency or 1500 Kc. end where no station is received.
Turn tone and volume controls to maximum clockwise rotation

Connect a signal generator to the stator connection of the tuning condenser section C2 RF or to the RF input grid (socket connection #6) of the 7B8 tube. If there is no blocking condenser in the output lead of the signal generator, the lead should be connected through a .1 Mfd. condenser instead of directly. Connect the ground of the signal generator to the chassis of the receiver or to the terminal on the antenna ground strip marked "G".

After the above connections have been made, set the signal generator for 455 Kc. 30% modulated signal output.

Now adjust the condensers on IF transformers 2532-1 and 2532-4 for exact resonance which will be indicated by maximum signal output. An output meter of the rectifier type should be used and may be connected through a suitable coupling condenser to the plate (socket connection #2) of the 7C5 output tube or to the voice coil leads of the speaker. When making the final adjustments to the IF tuning condensers, it is advisable to use as low an input signal level as possible.

RADIO FREQUENCY ALIGNMENT

Replace the .1 Mfd. condenser in series with the generator lead with a 400 ohm resistor. Connect the generator to the terminal marked "A" on the antenna-ground strip which is mounted on the rear apron of the chassis. All trimmer adjustments are for the high frequency ends of the bands and are located in the sides of the coil shield cans. The Broadcast band trimmer is the uppermost one in each case. All padder adjustments are for the low frequency ends of the bands and are located on the rear apron of the chassis. The padder for the Broadcast band is the uppermost one.

BROADCAST BAND.

Place band switch in the middle or BC position. Set generator to 1400 Kc. and adjust the oscillator trimmer to receive the signal at the proper calibration on the receiver dial. Adjust the "BC" RF and ANT trimmers for maximum signal. Re-set generator and receiver to 600 Kc. and adjust padder condenser C8-1 for proper calibration or maximum signal. If it should prove necessary to change the adjustment of padder C8-1 to any appreciable extent, it may also be necessary to re-adjust the oscillator trimmer condenser for exact calibration at the high frequency end of the band.

SHORT WAVE BROADCAST BAND.

Place band switch in the clockwise or "SW" position. Set generator and receiver dial to 15 Mc. and adjust oscillator trimmer for proper calibration. (More than one signal may be heard as the trimmer condenser is rotated. At least two major signals will be observed. The proper signal will be the one tuned nearest maximum anti-clockwise rotation of the trimmer condenser.) Re-set receiver and signal generator to approximately 13 Mc. and adjust "SW" RF and ANT trimmers for maximum signal. (Again more than one position of the trimmers may result in maximum signal. The one nearest maximum clockwise rotation is the correct one.) Re-set signal generator to 6 Mc. and adjust padder condenser C8-2 for maximum signal.

ANTENNA

The receiver should be used with as short an antenna as may be practical under the particular conditions of use. An antenna length of 6 to 15 feet is recommended for average conditions.

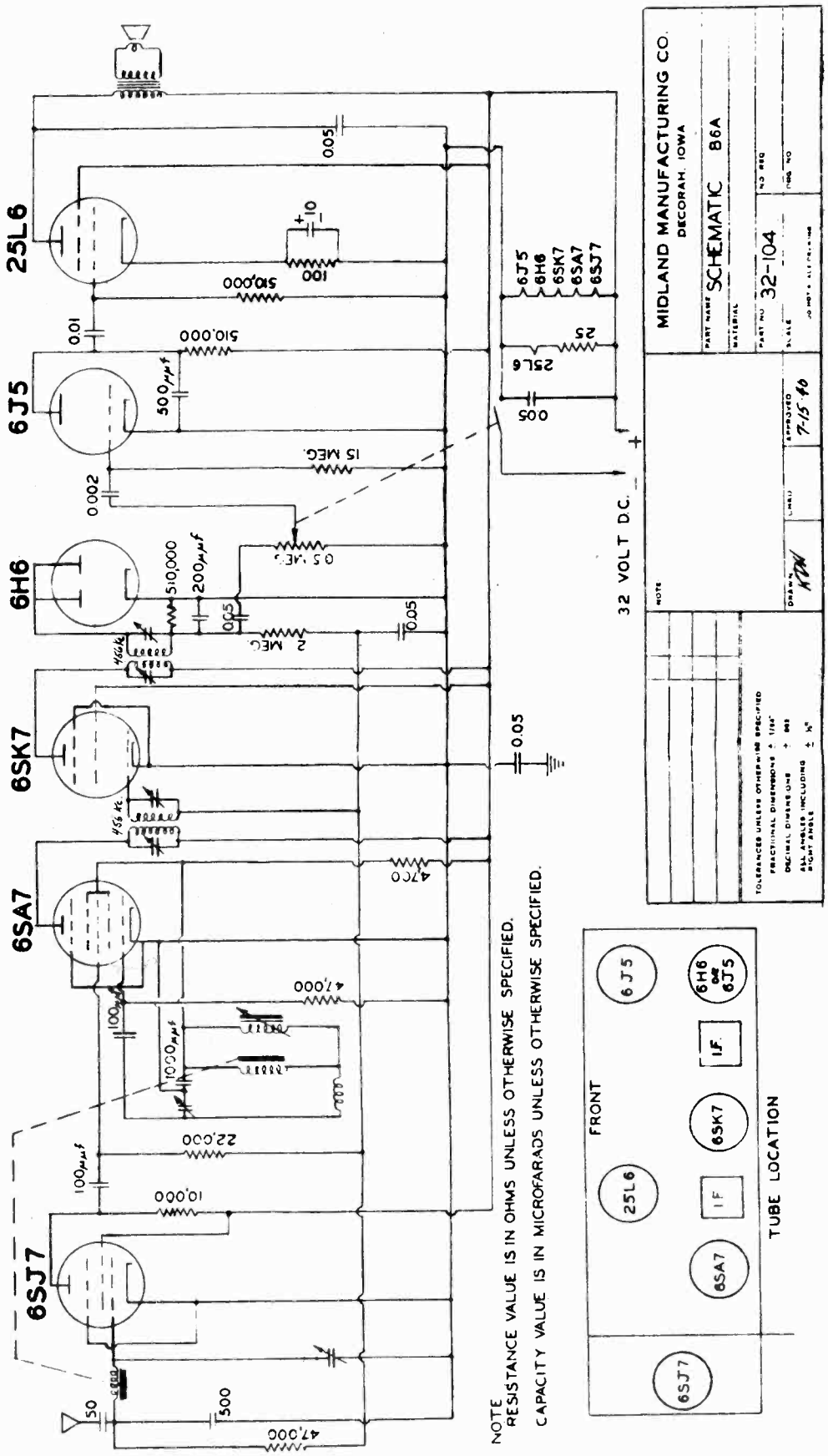
PHONO OR TUNER

To use the HE-621 receiver as a tuner to feed a public address amplifier etc., output may be obtained from the jack farthest from the antenna-ground strip on the rear apron of the receiver. An amplifier of high impedance input should be used.

To use the HE-621 as an amplifier for use with a record player turntable and pickup, the output of the pickup (which should be of the high impedance type) may be plugged into the jack nearest the antenna-ground strip on the rear apron of the chassis. The band change switch should be turned to its extreme counterclockwise or "PHONO" position

MODELS B6A, B6B

MIDLAND MFG. CO.

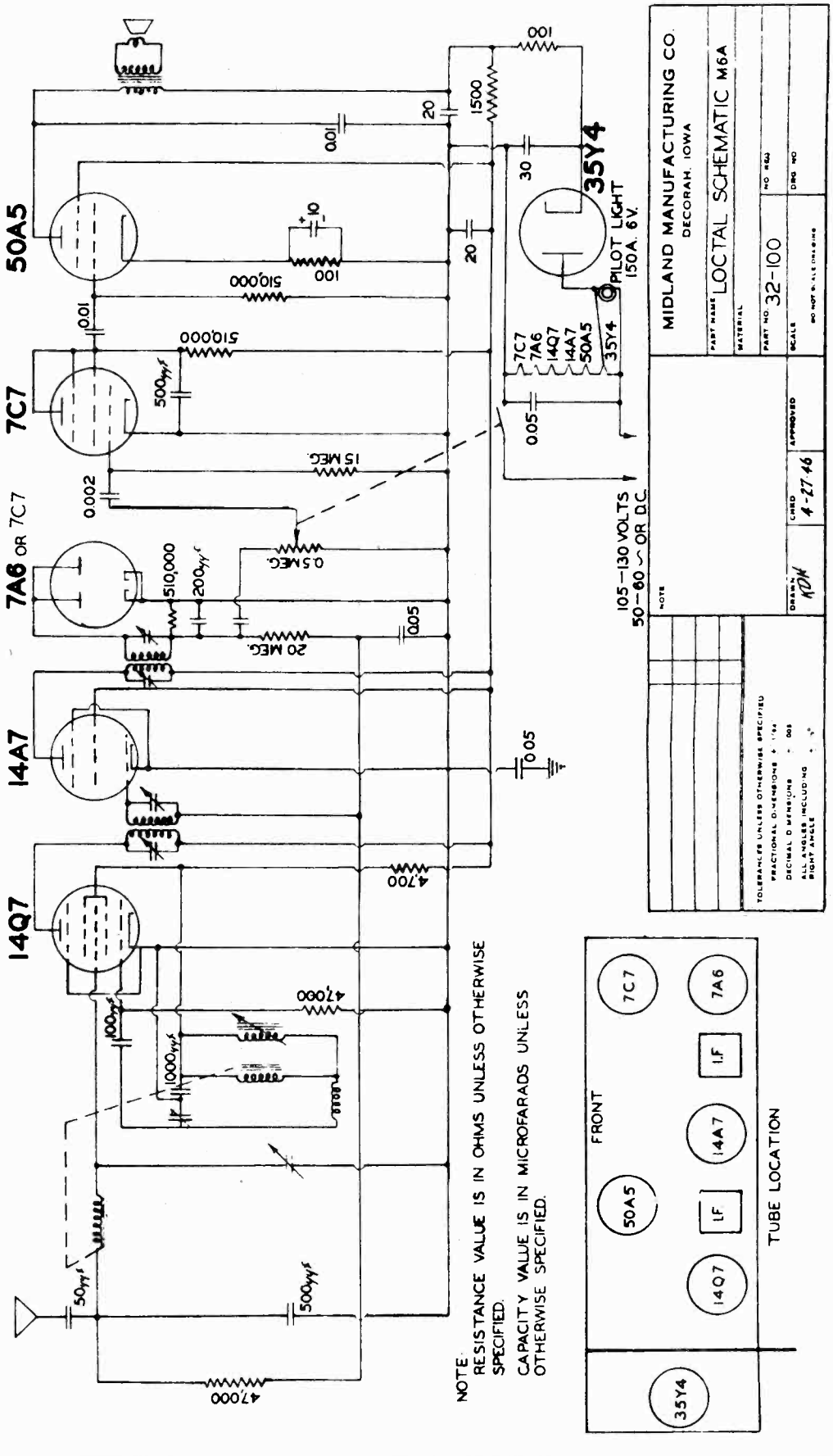


Model B6B is identical with B6A, except that a 28-D-7 tube is substituted for the 25L6 audio output tube. The plates and grids of the 28-D-7 are parallel connected.

IF PEAK 456 KC

MODELS M6A, M6D

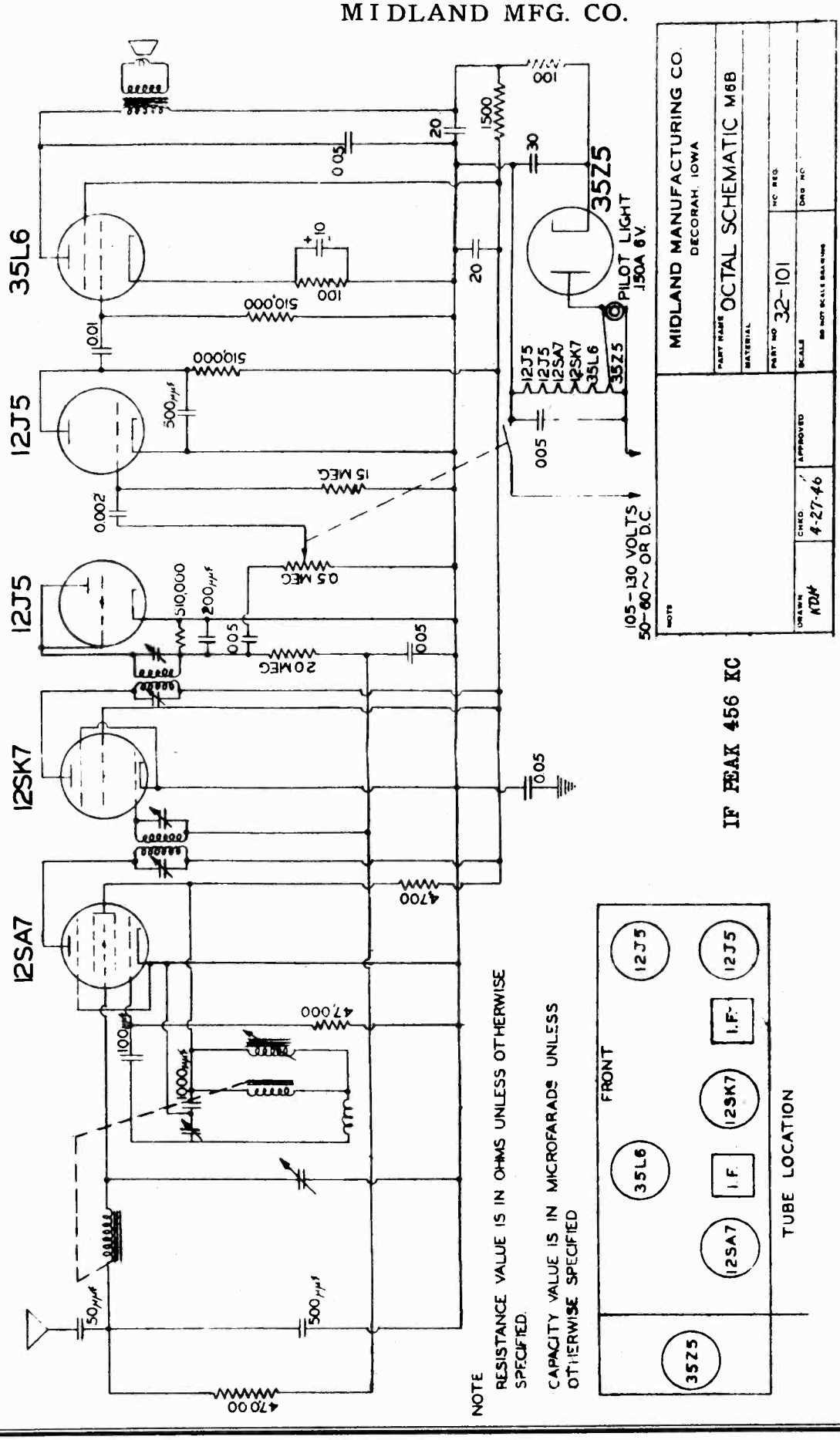
MIDLAND MFG. CO



Some receivers of this model will be found with 470,000 ohm resistor in the AVC return of the converter grid. This was subsequently changed to 47,000 ohms to reduce hum caused by incorrect polarity of line cord.

MODELS M6B, M6C

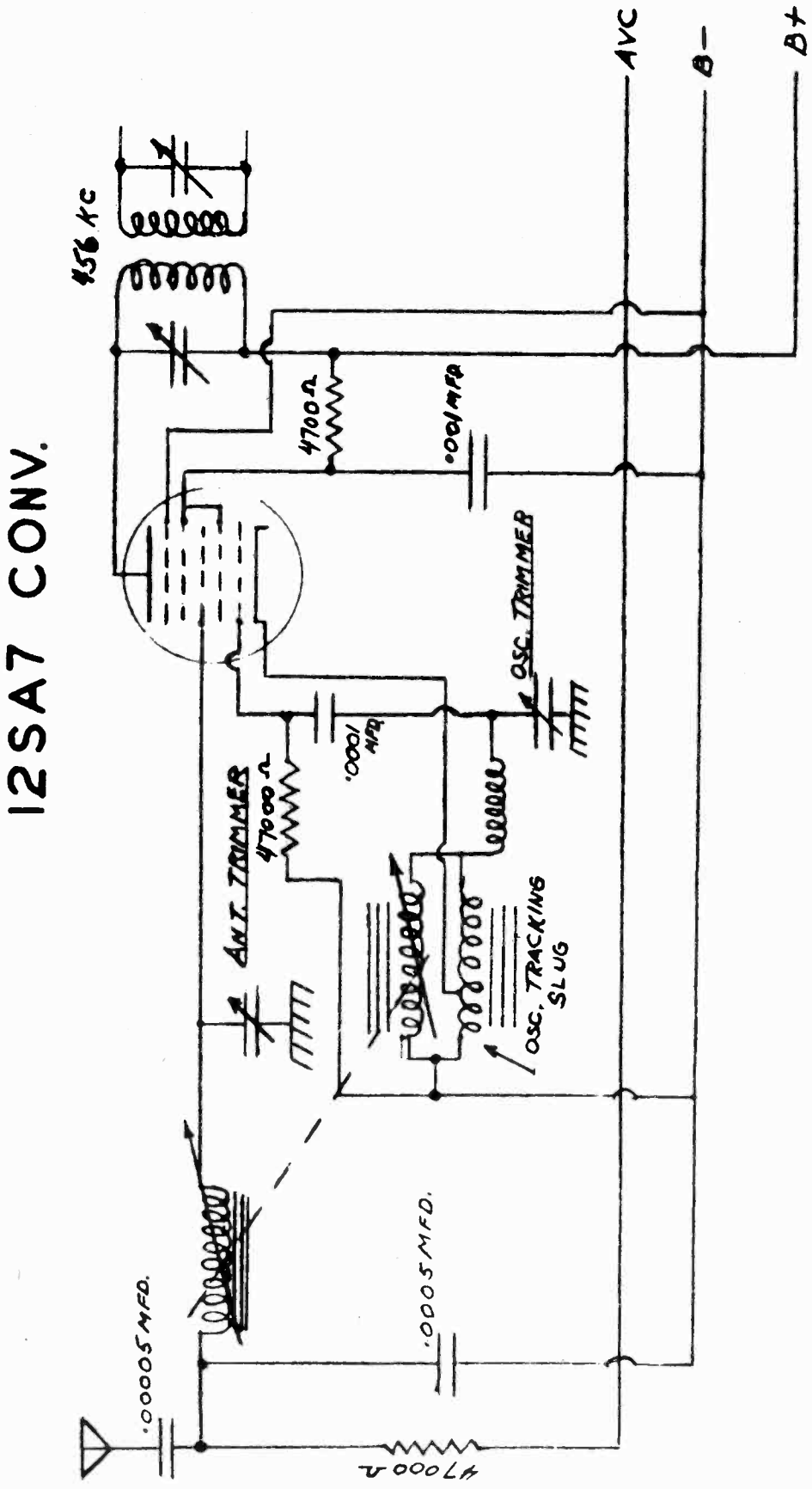
MIDLAND MFG. CO.



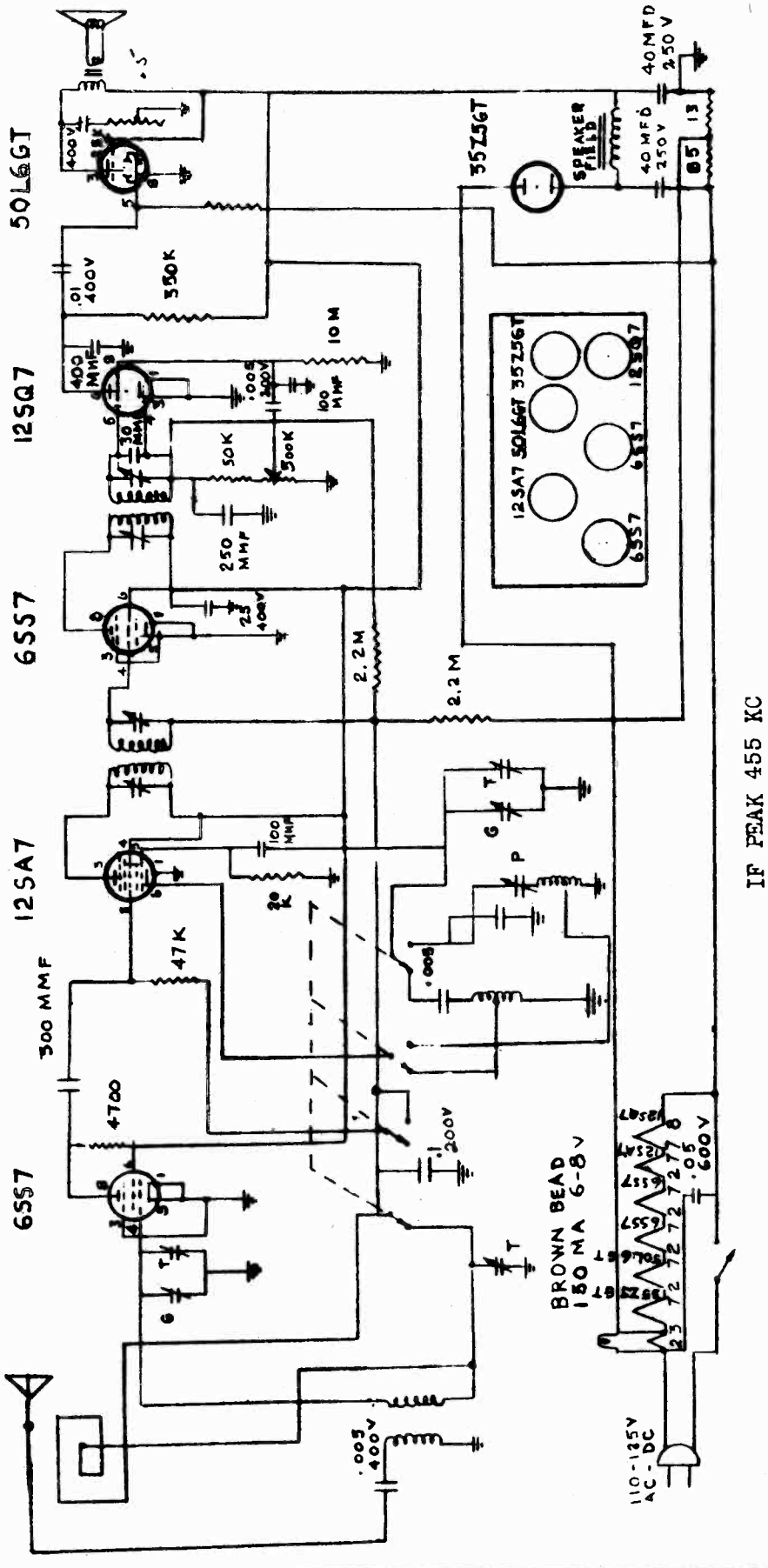
The 2nd Detector socket is wired for either a 12J5 or 12H6 tube.
The tuner may be either the one shown in the above schematic or that shown on the following page, P.15-4.

MODELS M6B, M6C

MIDLAND MFG. CO.

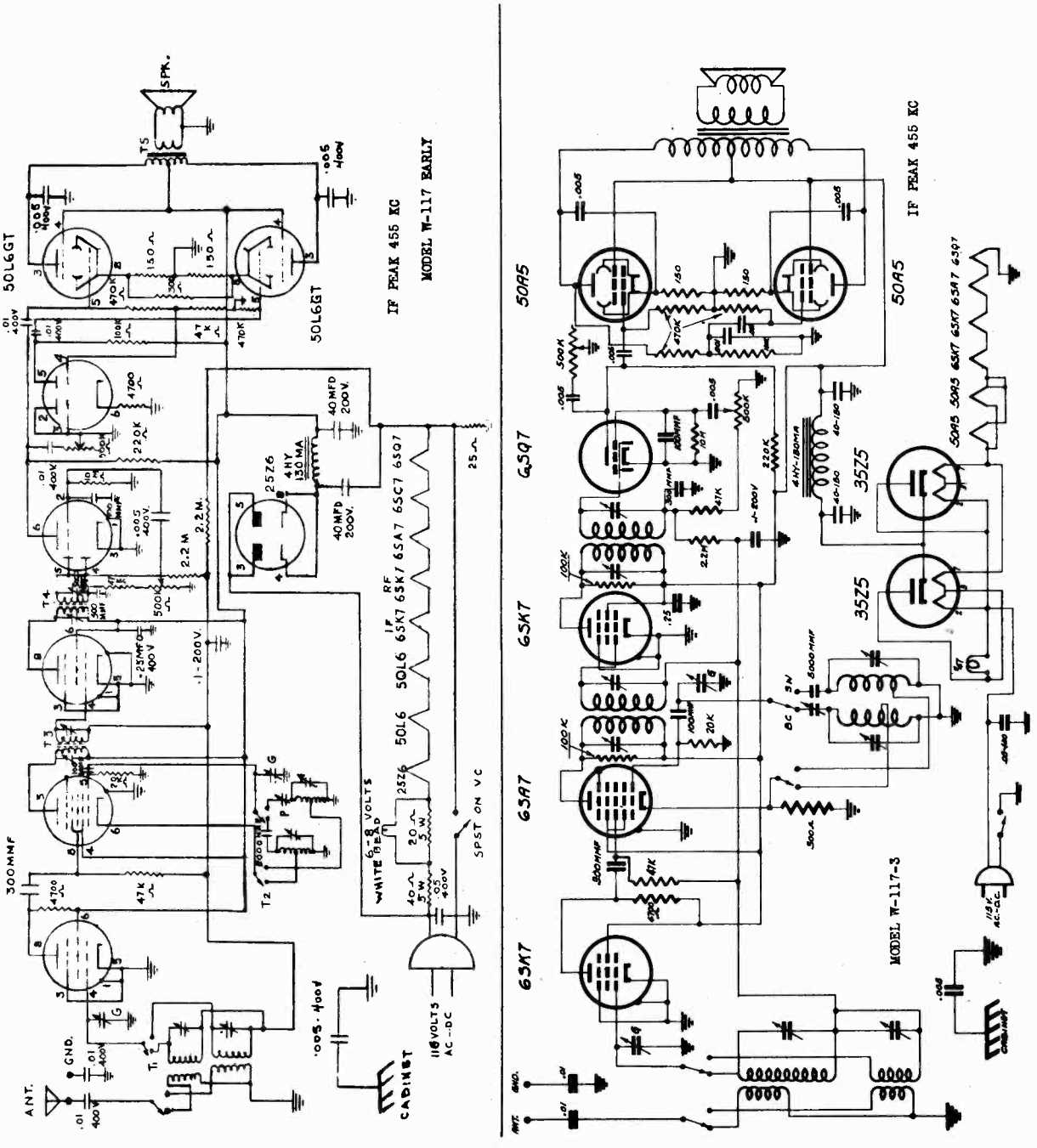


MINERVA CORP. OF AMERICA

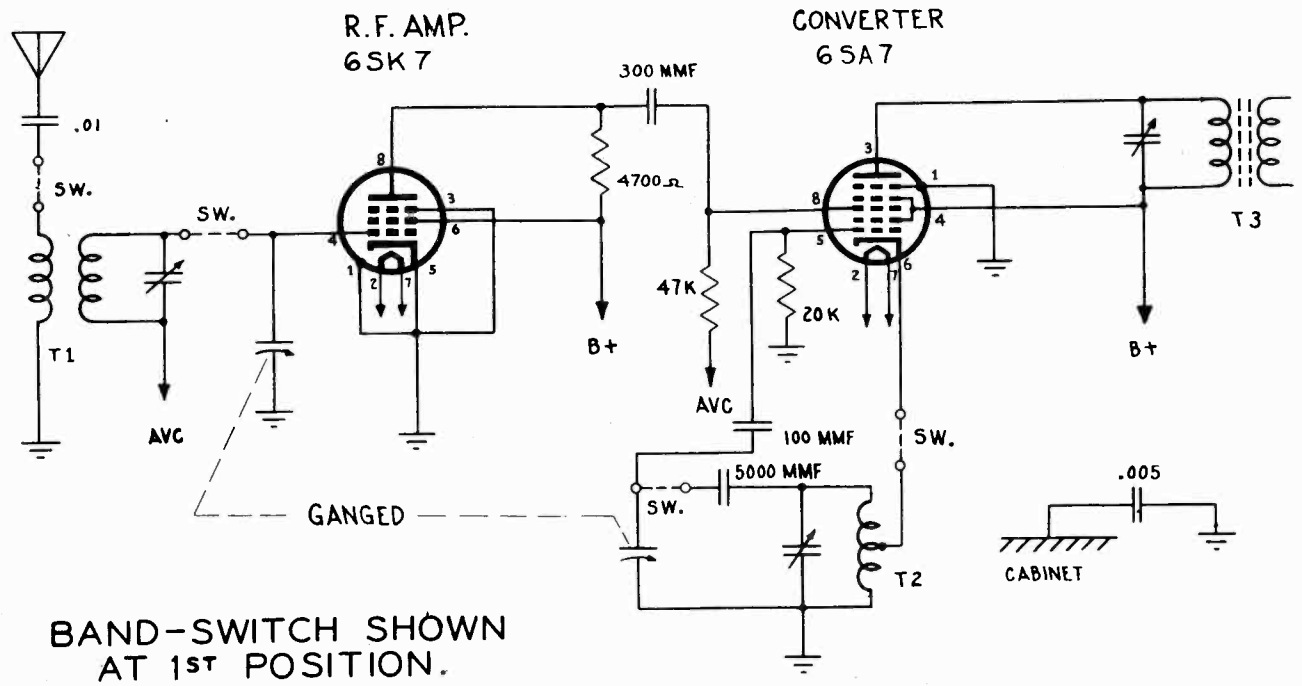


MODEL W117 Early
MODEL W117-3

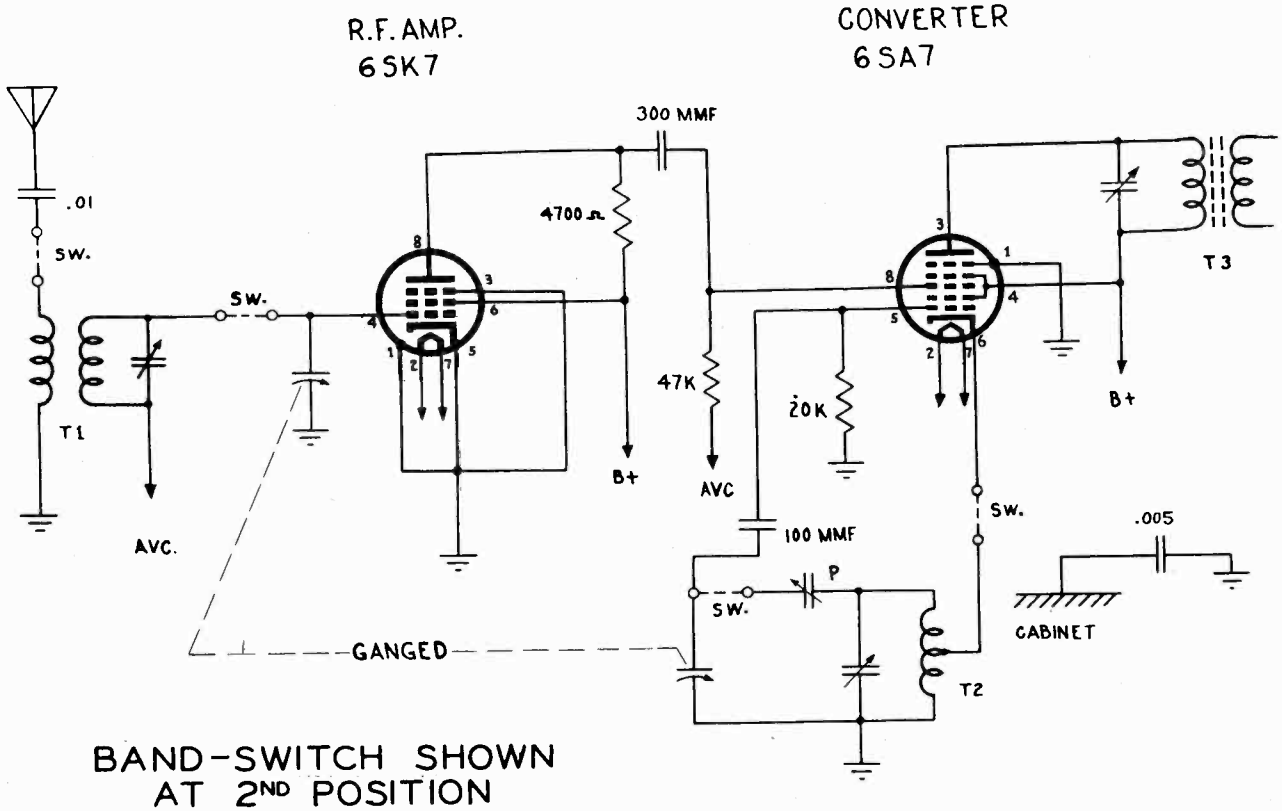
MINERVA CORP. OF AMERICA



MINERVA CORP. OF AMERICA



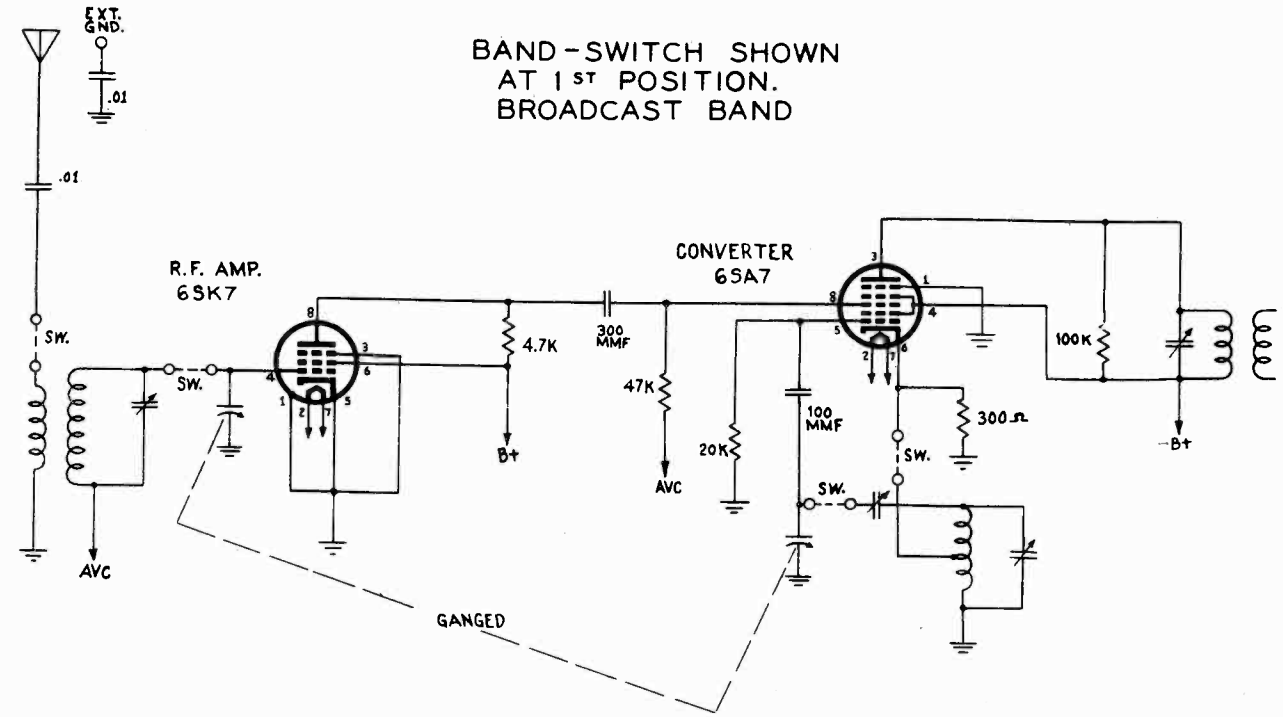
BAND-SWITCH SHOWN AT 1ST POSITION.



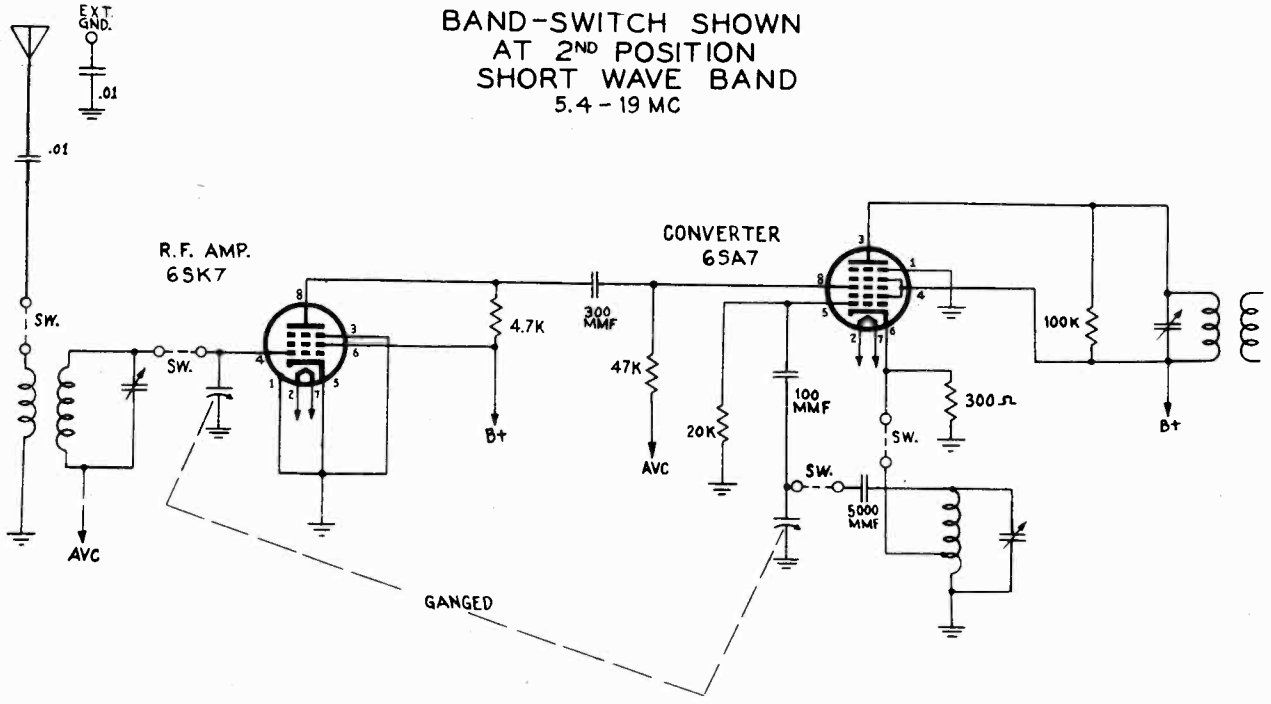
BAND-SWITCH SHOWN AT 2ND POSITION

MINERVA CORP. OF AMERICA

BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND

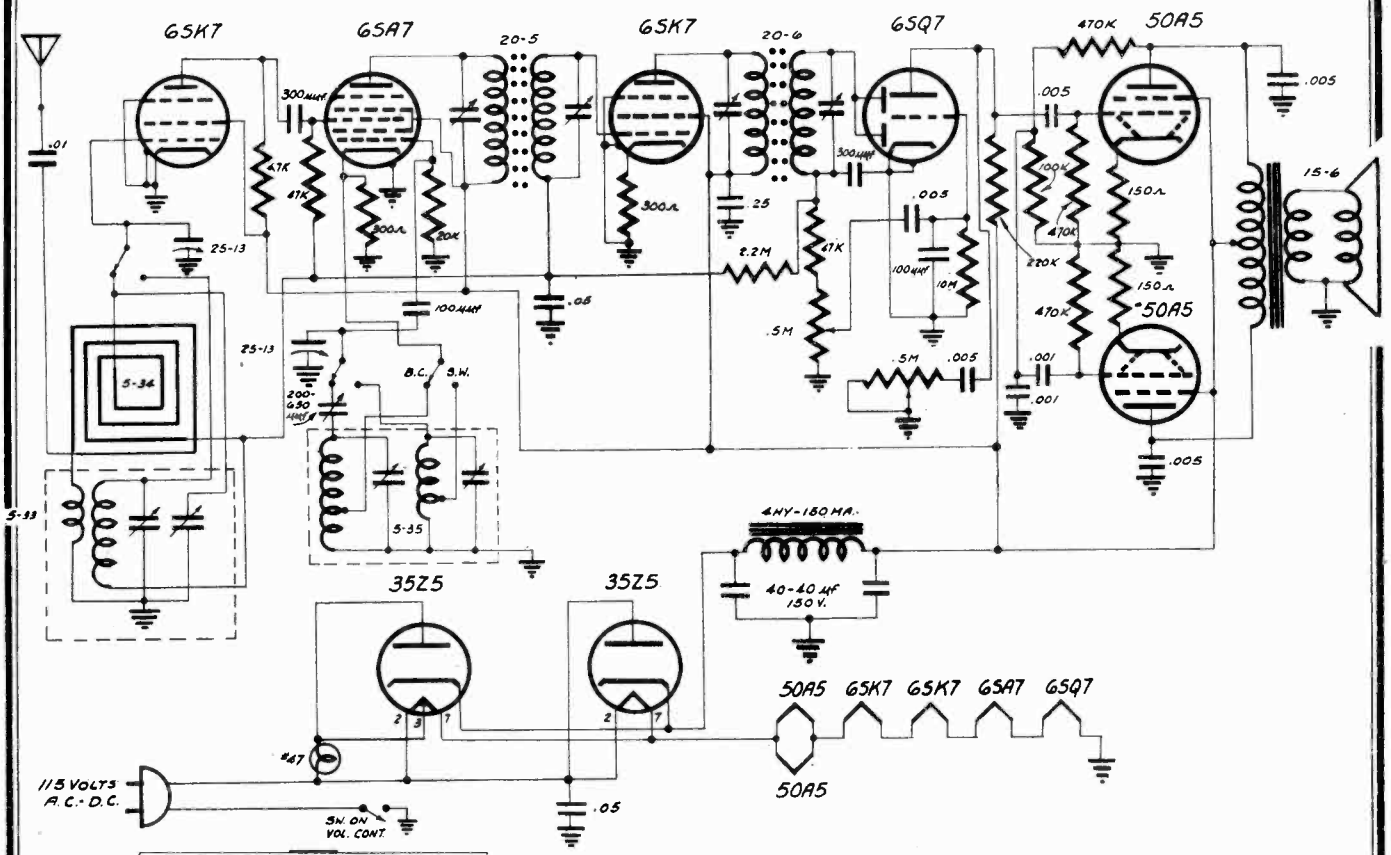


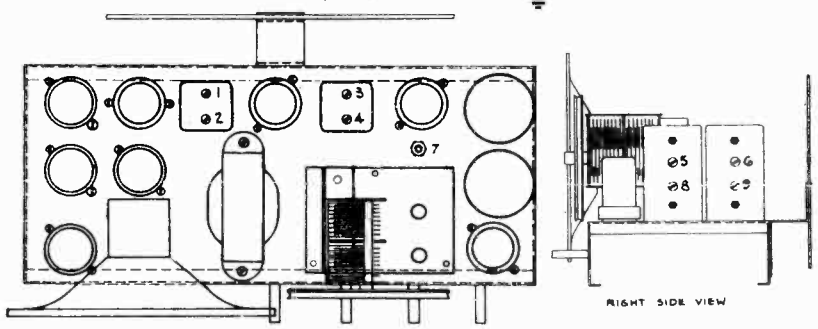
BAND-SWITCH SHOWN
AT 2ND POSITION
SHORT WAVE BAND
5.4 - 19 MC



MODEL W117 Late

MINERVA CORP. OF AMERICA





Tube Complement:—

1 — 6SK7 RF Amplifier
1 — 6SA7 Converter
1 — 6SK7 IF Amplifier
1 — 6SQ7 2nd Detector, AVC, 1st Audio
2 — 50A5 Power Amplifiers
2 — 35Z5 Rectifiers

GENERATOR CONNECTION	DUMMY ANT.	FREQ.	ADJ. TRIMMERS	OUTPUT
Stator front section	.1 MFD Cond.	455 KC	1, 2, 3, 4	Max.
Antenna Post	200 MMF Cond.	1500 KC	6, 5	Max.
Antenna Post	200 MMF Cond.	600 KC	7 rock gang	Max.
Antenna Post	200 MMF Cond.	1500 KC	6, 5	Max.
Antenna Post	400 ohm Res.	18 MC	9, 8	Max.

Tuning Range :

Standard Broadcast 540-1640 Kcs.

International Shortwave 5.5-19 Mcs.

Power Supply: 105-125 volts direct current or 50-60 cycle alternating current.

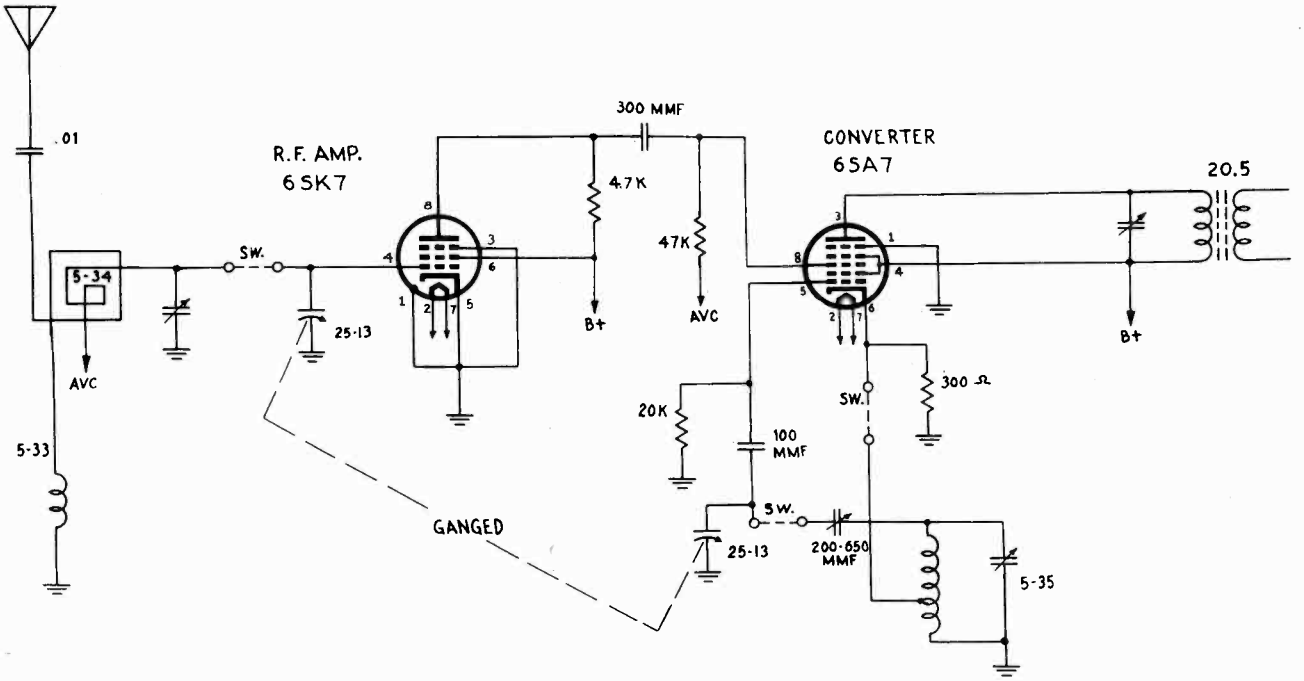
Power Consumption:-60 watts.

Volume control at maximum. Tone control at treble. Keep signal generator at lowest level consistent with readable output.

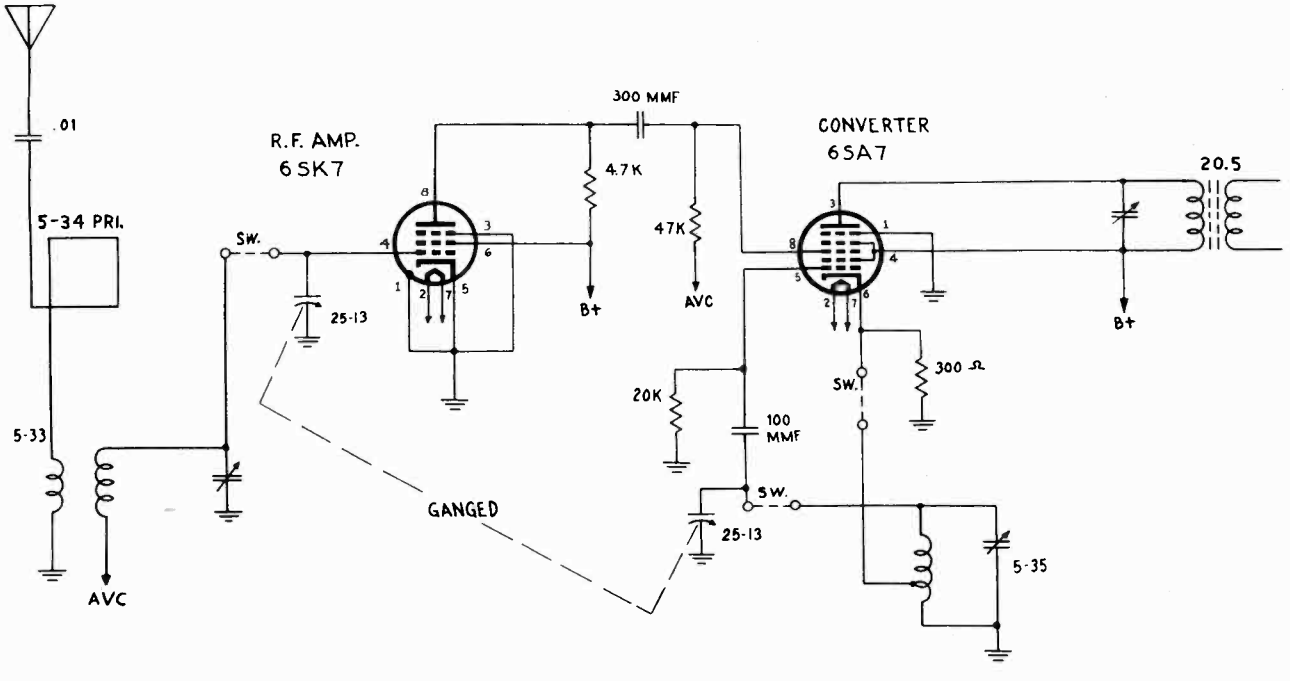
"clarified schematics"

MODEL W117 Late

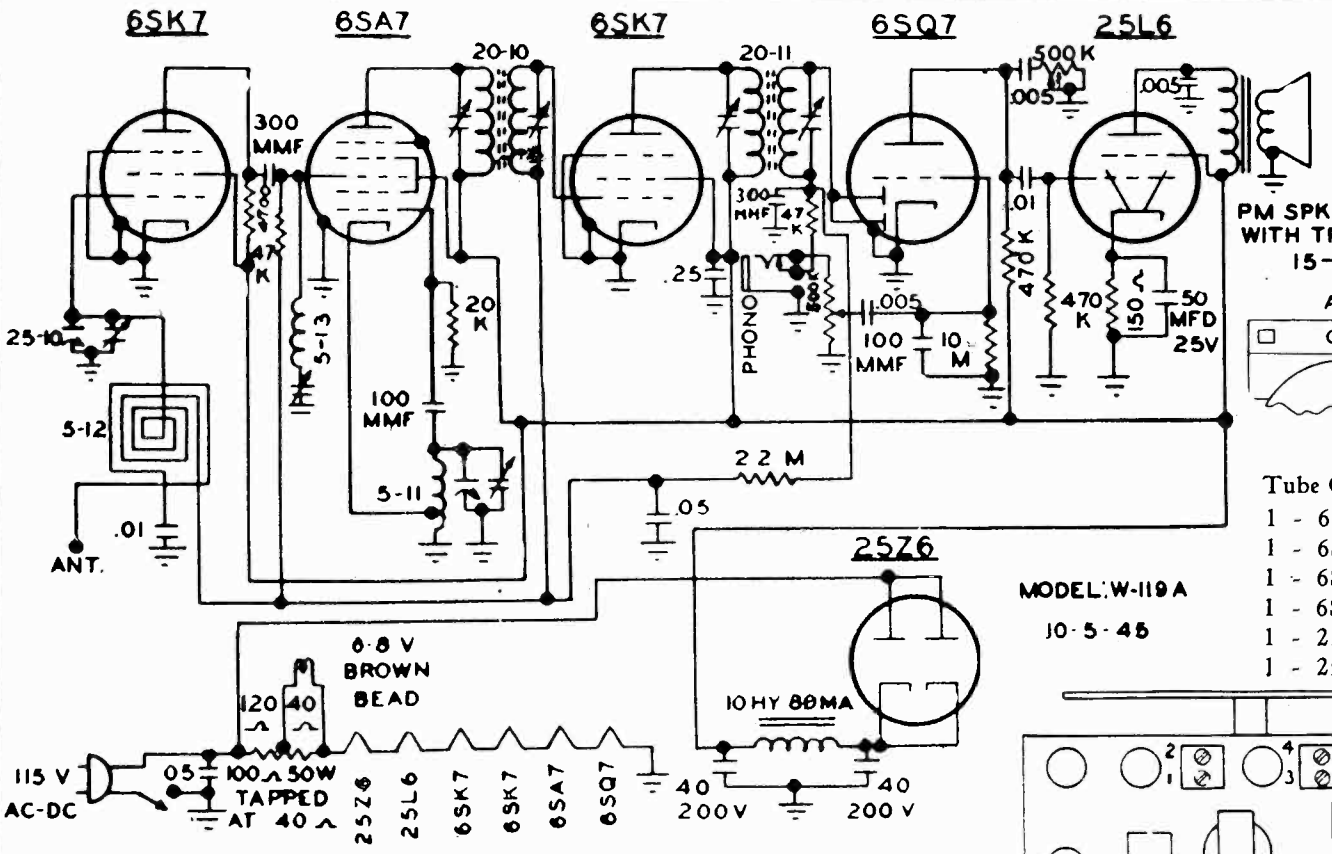
MINERVA CORP. OF AMERICA



BAND-SWITCH SHOWN
AT 1ST POSITION.
BROADCAST BAND
540-1640 KC.



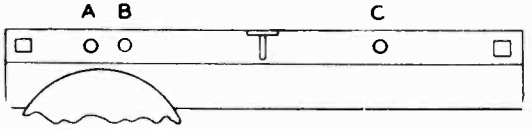
BAND-SWITCH SHOWN
AT 2ND POSITION.
SHORT WAVE BAND
5.5-19 MC



ALL RESISTORS 1/2 W
ALL CONDENSERS 400 V UNLESS OTHERWISE SPEC.
K = 1000 Ω
M = 1,000,000 Ω

PM SPKR. WITH TRANS. 15-8

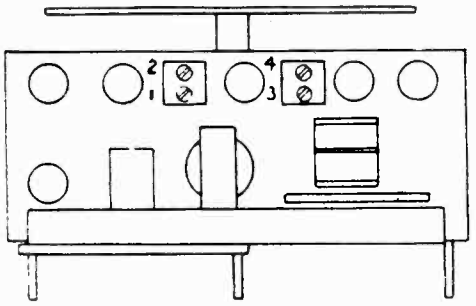
Pointer Settings:—
Gang Closed—Pointer Covers A
1400 KC —Pointer Covers C
600 KC —Pointer Covers B



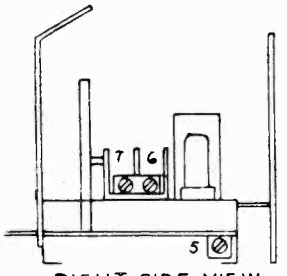
DIAL PLATE

MODEL W-119A
10-5-45

Tube Complement:—
1 - 6SK7 RF Amplifier
1 - 6SA7 Converter
1 - 6SK7 IF Amplifier
1 - 6SQ7 2nd Detector, AVC, 1st Audio
1 - 25L6 Power Amplifier
1 - 25Z6 Rectifier



TOP VIEW

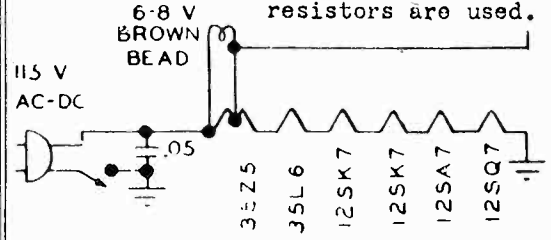


RIGHT SIDE VIEW

Power Supply—105 - 125 volts direct current or 50 - 60 cycle alternating current.

Tuning Range—Standard Broadcast 550 - 1600 KCS.

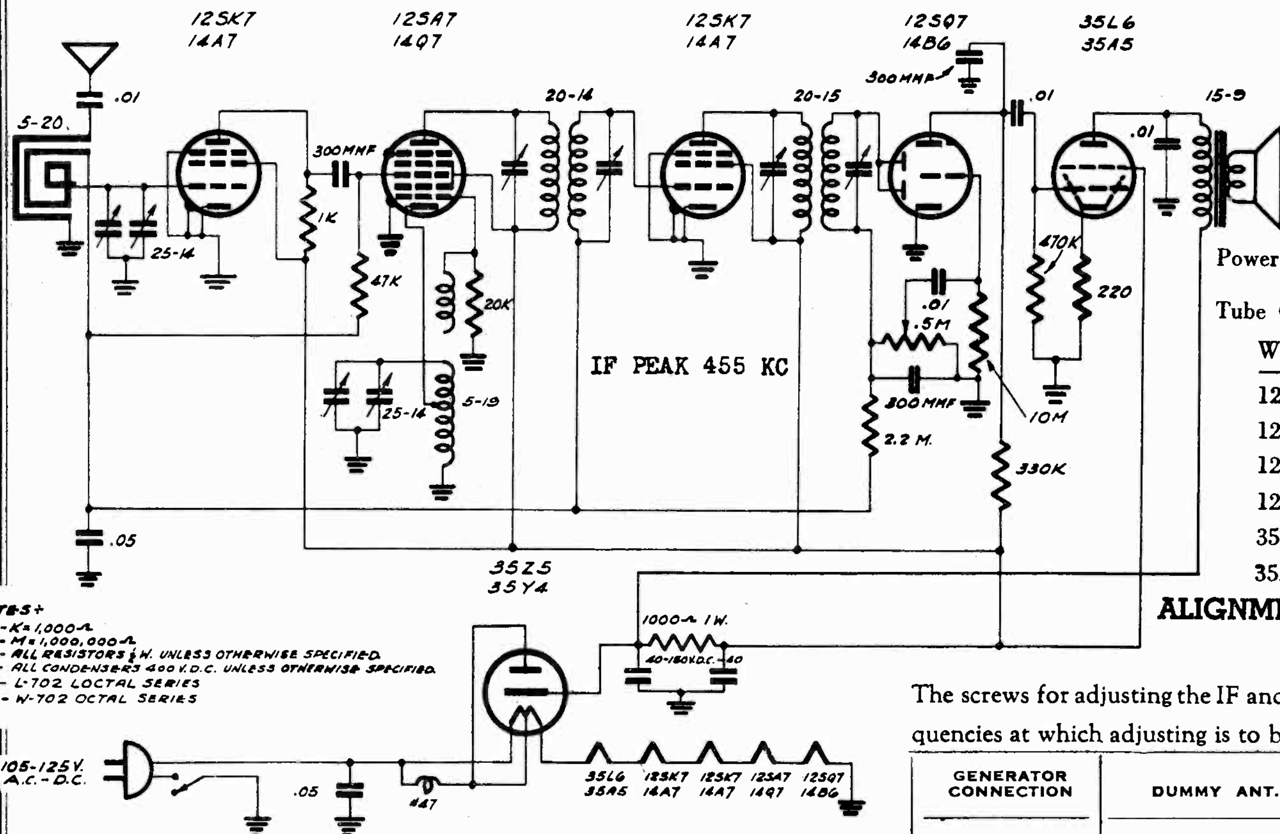
MODEL W-119 is the same as MODEL W-119A except that the following tubes and resistors are used.



Tube Complement:—
1 - 12SK7 RF Amplifier
1 - 12SA7 Converter
1 - 12SK7 IF Amplifier
1 - 12SQ7 2nd Detector, AVC, 1st Audio
1 - 35L6 Power Amplifier
1 - 35Z5 Rectifier

Generator Connection	Dummy Ant.	Freq.	Adj. Trimmers	Output
Stator front section gang open	Cond. .1 MFD	455 KC	1, 2, 3, 4	Max.
Antenna Post	200 MMF Cond.	455 KC	5	Min.
Antenna Post	200 MMF Cond.	1400 KC	6, 7	Max.

MINERVA CORP. OF AMERICA



NOTES:
1 - K = 1,000Ω
2 - M = 1,000,000Ω
3 - ALL RESISTORS ½W. UNLESS OTHERWISE SPECIFIED
4 - ALL CONDENSERS 400 V.D.C. UNLESS OTHERWISE SPECIFIED
5 - L-702 LOCTAL SERIES
6 - W-702 OCTAL SERIES

MINERVA CORP. OF AMERICA
SCHEMATIC DIAGRAM
MATERIAL
PART NO.
TOLERANCE
DRAWN BY
DATE May 1946
CHECKED BY
FINISH
SCALE
L-702
MODEL: W-702
No: 658

Power Consumption—30 watts.

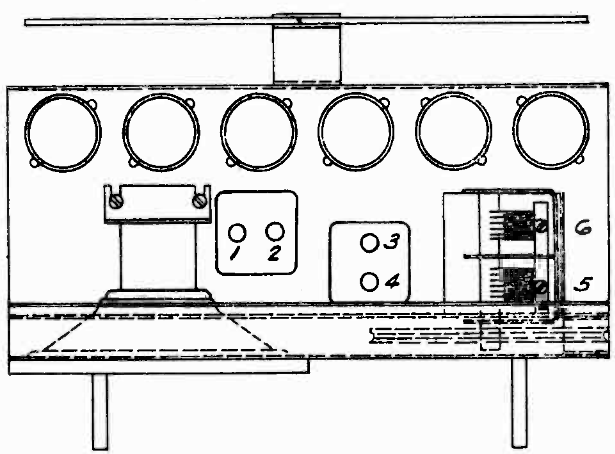
Tube Complements:—

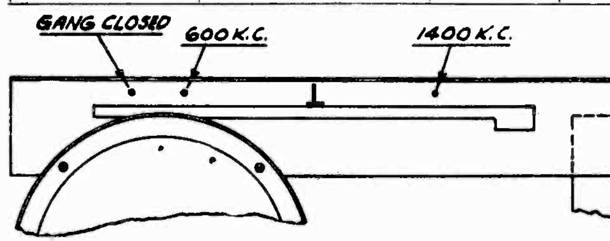
W-702	L-702	*Function*
12SK7	14A7	RF Amplifier
12SA7	14Q7	Converter
12SK7	14A7	IF Amplifier
12SQ7	14B6	2nd Det - AVC - 1st Audio
35L6	35A5	Power Amplifier
35Z5	35Y4	Rectifier

ALIGNMENT NOTES

The screws for adjusting the IF and RF Amplifiers, together with the frequencies at which adjusting is to be made, are shown in diagrams below

GENERATOR CONNECTION	DUMMY ANT.	FREQ.	ADJ. TRIMMERS	OUTPUT
Stator large section gang open	.1 MFD Cond.	455 KC	1, 2, 3, 4	Max.
Antenna Lead	200 MMF Cond.	1400 KC	5, 6	Max.





Pointer Settings:—As indicated above.

MODEL 04MF-1199A

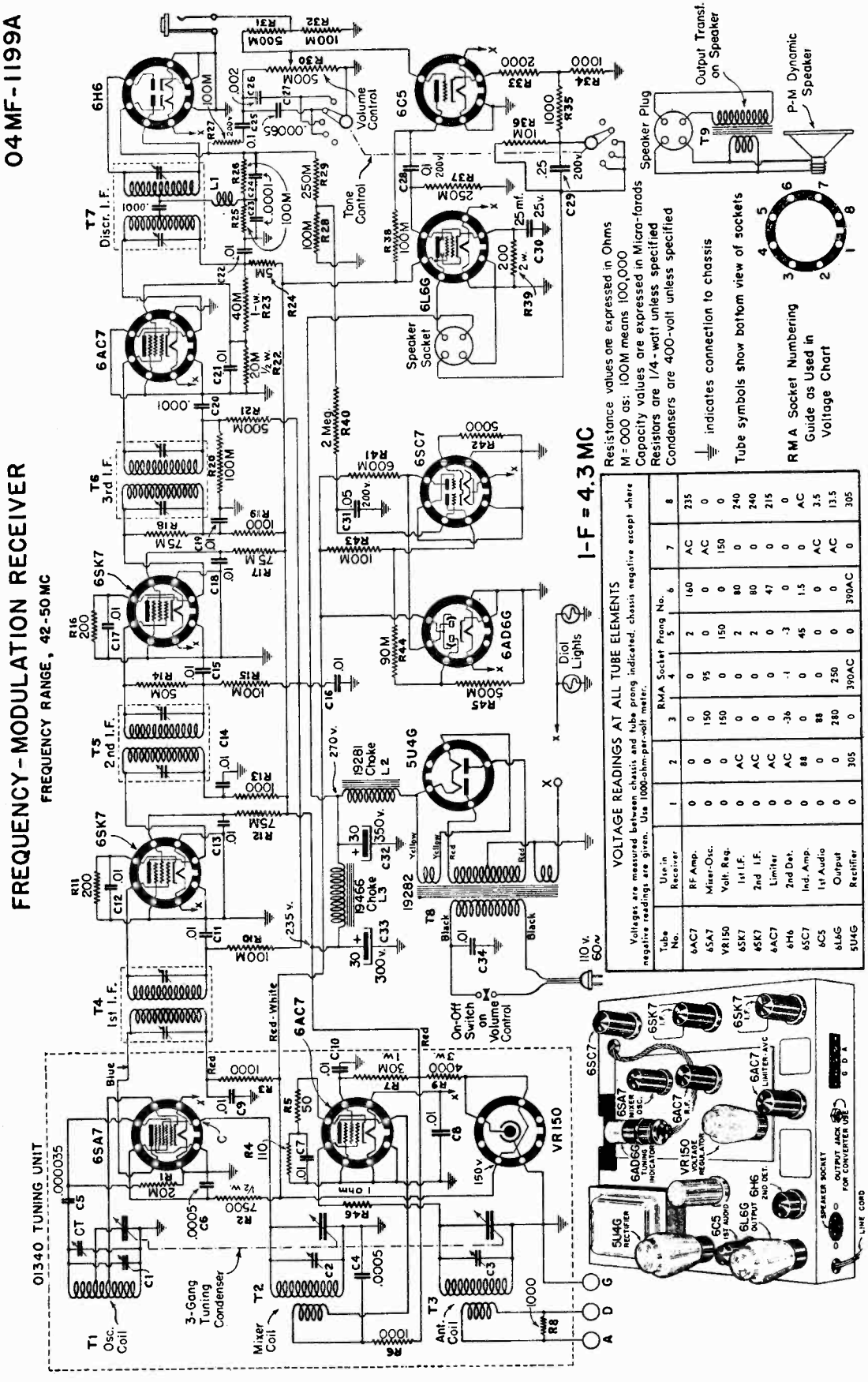
MONTGOMERY WARD

04MF-1199A

FREQUENCY-MODULATION RECEIVER

FREQUENCY RANGE, 42-50 MC

I-F = 4.3 MC



VOLTAGE READINGS AT ALL TUBE ELEMENTS

Voltages are measured between chassis and tube prong indicated, chassis negative except where negative readings are given. Use 1000-ohm-per-volt meter.

Tube No.	Use in Receiver	1	2	3	RMA Socket Prong No. 4	5	6	7	8
6AC7	RF Amp.	0	0	0	0	2	160	AC	235
6SA7	Mixer-Osc.	0	0	150	95	0	0	AC	0
VR150	Volt. Reg.	0	0	150	0	150	0	150	0
6SK7	1st I.F.	0	AC	0	0	2	80	0	240
6SK7	2nd I.F.	0	AC	0	0	2	80	0	240
6AC7	Limiter	0	AC	0	0	0	47	0	215
6H6	2nd Det.	0	AC	-36	-1	-3	0	0	0
6SC7	Ind. Amp.	0	88	0	0	45	1.5	0	AC
6C5	1st Audio	0	0	88	0	0	0	AC	3.5
6L6G	Output	0	0	280	250	0	0	AC	13.5
5U4G	Rectifier	0	305	0	390AC	0	390AC	0	305

REPLACEMENT PARTS LIST

MISCELLANEOUS

Part No.	Description	Selling Price
M25-8437	Molded Bakelite Octal Tube Socket (8-prong)	$0.10
M25-8209	Ceramic Octal Tube Socket (8-prong)	.30
M19235	Bakelite Speaker Socket (5-prong)	.06
M19588	Tuning Eye Socket Assembly with Cable	.53
	DIAL AND KNOBS	
M19581	Linear Dial Mechanism, Complete	1.50
M19586	Translucent Dial Scale	.60
M19262	Dial Lamp, 6 to 8 volt, No. 51	.10
	Dial Lamp Socket and Bracket	.15
M19591	Tone Control Knob, Bakelite	.06
M19594	Volume Control Knob, Bakelite	.06
M19592	Tuning Control Knob, Bakelite	.06
M19266	Escutcheon for Dial Scale	.74
M19590	Escutcheon for Tuning Eye	.15
	GENERAL	
M01340	42-50 MC Tuning Unit, Complete Assembly	9.50
M19587	8" P-M Dynamic Speaker with Cord and Plug	5.45
M19580	Tone Control Switch, 2-pole, 5-position	.49
M19470	Single Circuit Output Jack	.35
M12434	Line Cord and Plug Assembly	.26
M16738	A-D-G Antenna Terminal Strip	.04
M25-5732	Terminal Strip, 1 Insulated Lug, 1 Mounting Foot	.03
M25-5731	Terminal Strip, 2 Insulated Lugs, 1 Mounting Foot	.04
M25-6715	Terminal Strip, 3 Insulated Lugs, 1 Mounting Foot	.05
M25-6716	Terminal Strip, 4 Insulated Lugs, 1 Mounting Foot	.06

TRANSFORMERS AND COILS

Part No.	Code	Description	Selling Price
M01342	T1	Antenna Coil Assembly with Trimmer	$0.50
M01342	T2	Mixer Coil Assembly with Trimmer	.50
M01346	T3	Oscillator Coil Assembly	1.06
M01348	T4	1st I.F. Transformer	.53
M01348	T5	2nd I.F. Transformer	.53
M01348	T6	3rd I.F. Transformer	.53
M01350	T7	Discriminator I.F. Transformer	3.30
M19282	T8	Power Transformer, 117-volt, 60-cycle	2.59
M19-5582	L1	R. F. Choke	.40
M19281	L2	1st Filter Choke	.38
M19466	L3	2nd Filter Choke	.36

CONDENSERS

TUBULAR

Part No.	Code	Capacitance	Voltage	Selling Price
M14110	C7,C8	.01 mfd.	400	$0.06
M14110	C9,C10	.01 mfd.	400	.06
M14110	C11,C12	.01 mfd.	400	.06
M14110	C13,C14	.01 mfd.	400	.06
M14110	C15,C16	.01 mfd.	400	.06
M14110	C17,C18	.01 mfd.	400	.06
M14110	C19,C21	.01 mfd.	400	.06
M14110	C22,C34	.01 mfd.	400	.06
M15142	C25,C28	0.1 mfd.	200	.08
M16190	C29	.25 mfd.	200	.10
M14160	G31	.05 mfd.	200	.06
		ELECTROLYTIC		
M16184	C30	25 mfd.	50	.21
M17189	C32,C33	30 mfd.	300-350	.84
		MOLDED		
M14139	C4,C6	.0005 mfd.		.10
M15132	C5	35 mmfd.		.10
M14101	C20,C23,C24	.0001 mfd.		.06
M14152	C26	.002 mfd.		.12
M15137	C27	650 mmfd.		.12
		TRIMMER		
M17171	C1	5-Plate	Ceramic	.37
M22-5255	C2,C3	3-30 mmfd.	Ceramic	.10
		SPECIAL		
M17183	CT	26 mmfd. Temperature Comp.		.22
M17190		3-gang Tuning Condenser		2.38

RESISTORS

CARBON

Part No.	Code	Resistance	Wattage	Selling Price
M14169	R1	20,000 Ohm	0.25	$0.06
M16155	R2	7,500 Ohm	0.50	.08
M14191	R3,R6,R8	1,000 Ohm	0.25	.06
M17152	R4	110 Ohm	0.25	.08
M16143	R5	50 Ohm	0.25	.08
M15189	R7	30,000 Ohm	1.00	.12
M17180	R9	4,000 Ohm	3.00	.30
M17184	R10,R15	100,000 Ohm	0.25	.08
M17184	R20,R25	100,000 Ohm	0.25	.08
M17184	R26,R27	100,000 Ohm	0.25	.08
M17184	R28,R32	100,000 Ohm	0.25	.08
M17184	R38,R43	100,000 Ohm	0.25	.08
M15136	R11,R16	200 Ohm	0.25	.08
M14195	R12,R17,R18	75,000 Ohm	0.25	.06
M14191	R13,R19	1,000 Ohm	0.25	.06
M14191	R34,R35	1,000 Ohm	0.25	.06
M14151	R14	50,000 Ohm	0.25	.06
M14155	R21,R31,R45	500,000 Ohm	0.25	.06
M16132	R22	20,000 Ohm	0.50	.08
M15188	R23	40,000 Ohm	1.00	.10
M14179	R24,R42	5,000 Ohm	0.25	.06
M14150	R29,R37	250,000 Ohm	0.25	.06
M16117	R33	2,000 Ohm	0.25	.06
M14143	R36	10,000 Ohm	0.25	.06
M16115	R39	200 Ohm	3.00	.20
M17109	R40	2 Megohm	0.25	.06
M17133	R41	600,000 Ohm	0.50	.08
M17185	R44	90,000 Ohm	0.25	.06
M17153	R46	1 Ohm	0.50	.08
		VARIABLE		
M19579	R30	500,000 Ohm	With Switch	.48

Prices Subject to Change Without Notice.

SPECIFICATIONS

Power Consumption - 110 watts (At 117 volts 60 cycles)

Power Output - - - - - - - - 6 Watts Undistorted

Selectivity - - - - 170 KC Broad at 2 times Signal

Intermediate Frequency - - - - - - 4.3 Megacycles

Speaker - - - - - - - - - - 8" P-M Dynamic

Tuning Frequency Range - - - - 42 to 50 Megacycles

Sensitivity - - - - - - - - 10 Microvolts Average

ALIGNMENT

If distortion, weak reception or other type of unsatisfactory performance is thought to be due to improper alignment, do not attempt to align the I-F or R-F system. Because of the wide band accepted by the I-F system and the lack of suitable generators and test equipment required to do a satisfactory job, it is recommended that the chassis be sent to one of the main Montgomery Ward Service Shops.

VOLTAGES AT SOCKETS

The voltages that should be considered normal at each tube socket terminal are indicated in the table at the bottom of the schematic circuit diagram. All voltages indicated are measured between the socket terminal and ground (chassis). Readings shown are positive on the socket terminal with the chassis as the negative terminal except where a negative voltage reading is given in which case the chassis is positive. Readings marked "AC" indicate normal AC heater voltage and should not be read with a DC meter.

These voltages are read under the following conditions:

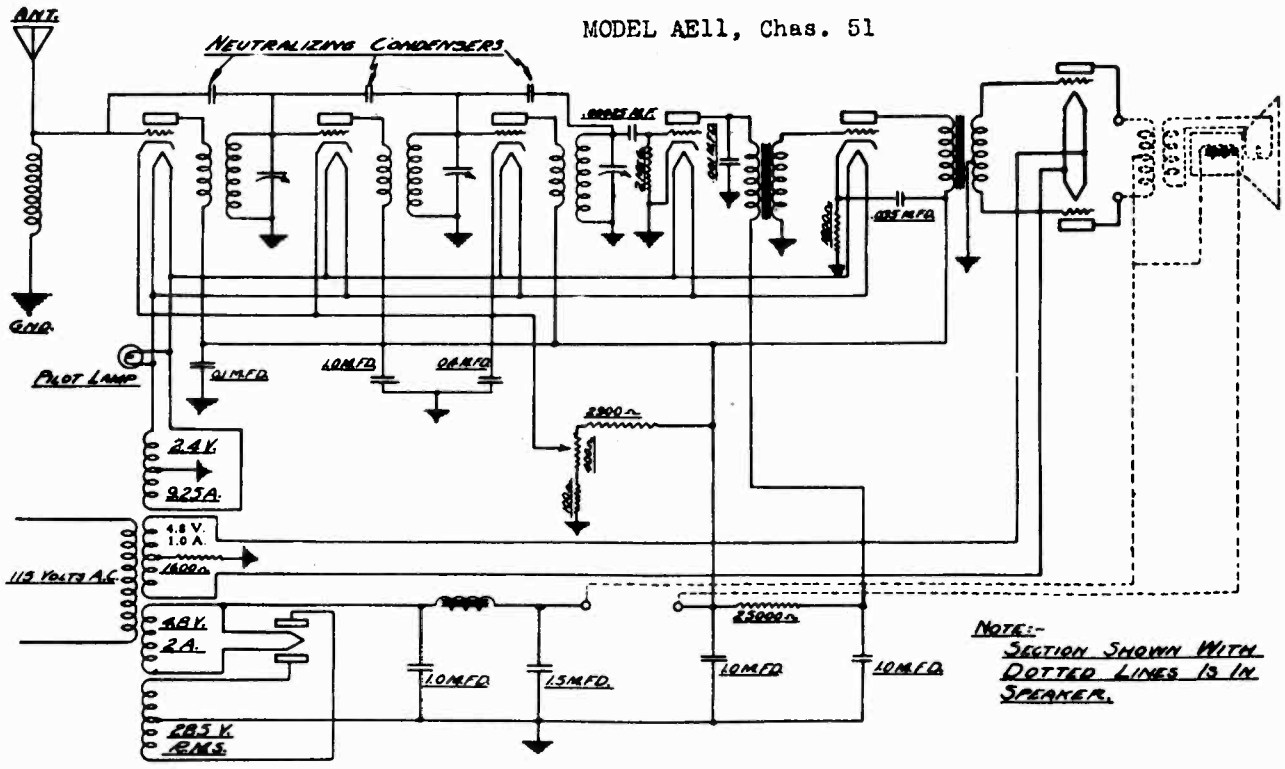
Line Voltage—117 volts
Volume Control—Maximum
No Signal Being Received

Readings are taken with a 1000-ohm-per-volt meter. Plate and screen voltages are read on the 500-volt scale. All readings under 50 volts are read on the 50-volt scale.

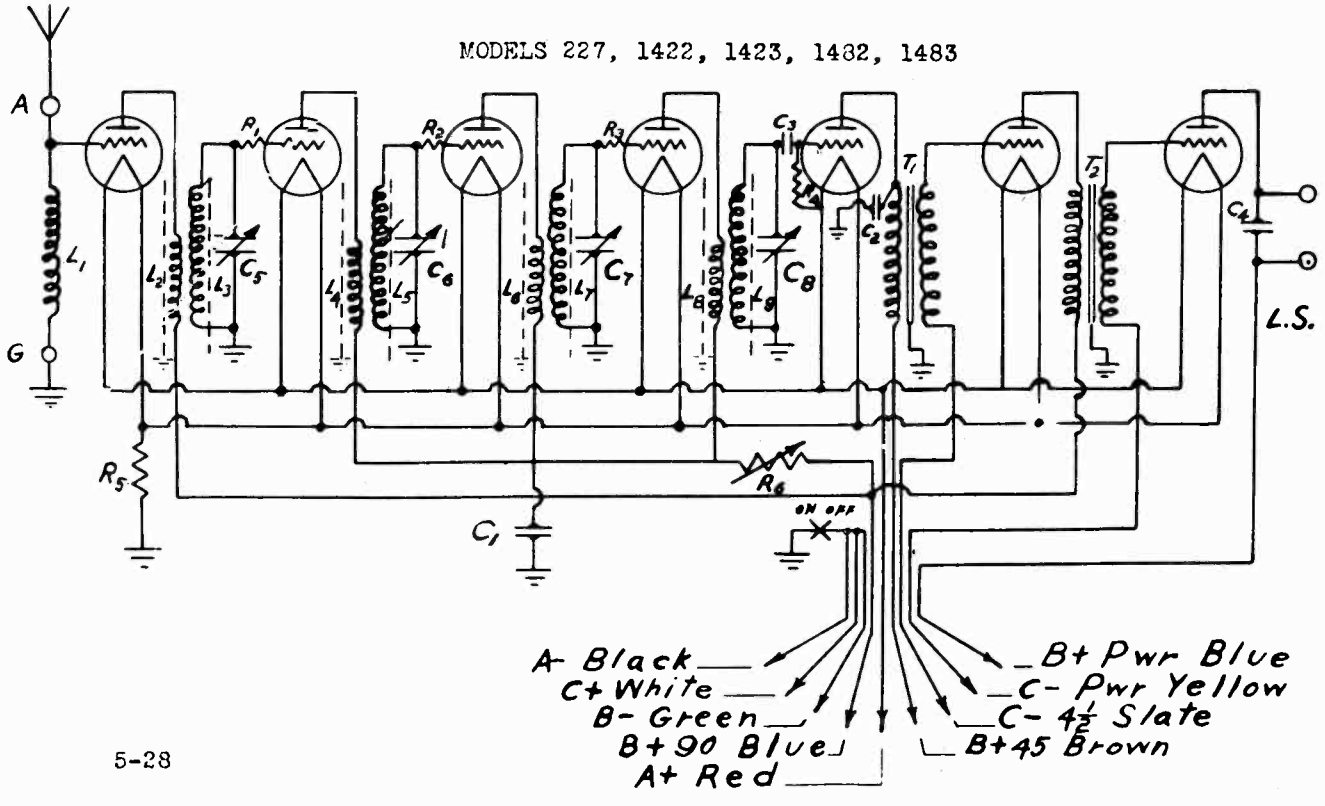
MONTGOMERY WARD

MODEL AE11, Ch. 81
MODELS 227, 1422, 1423, 1482, 1483

MODEL AE11, Chas. 51



MODELS 227, 1422, 1423, 1482, 1483



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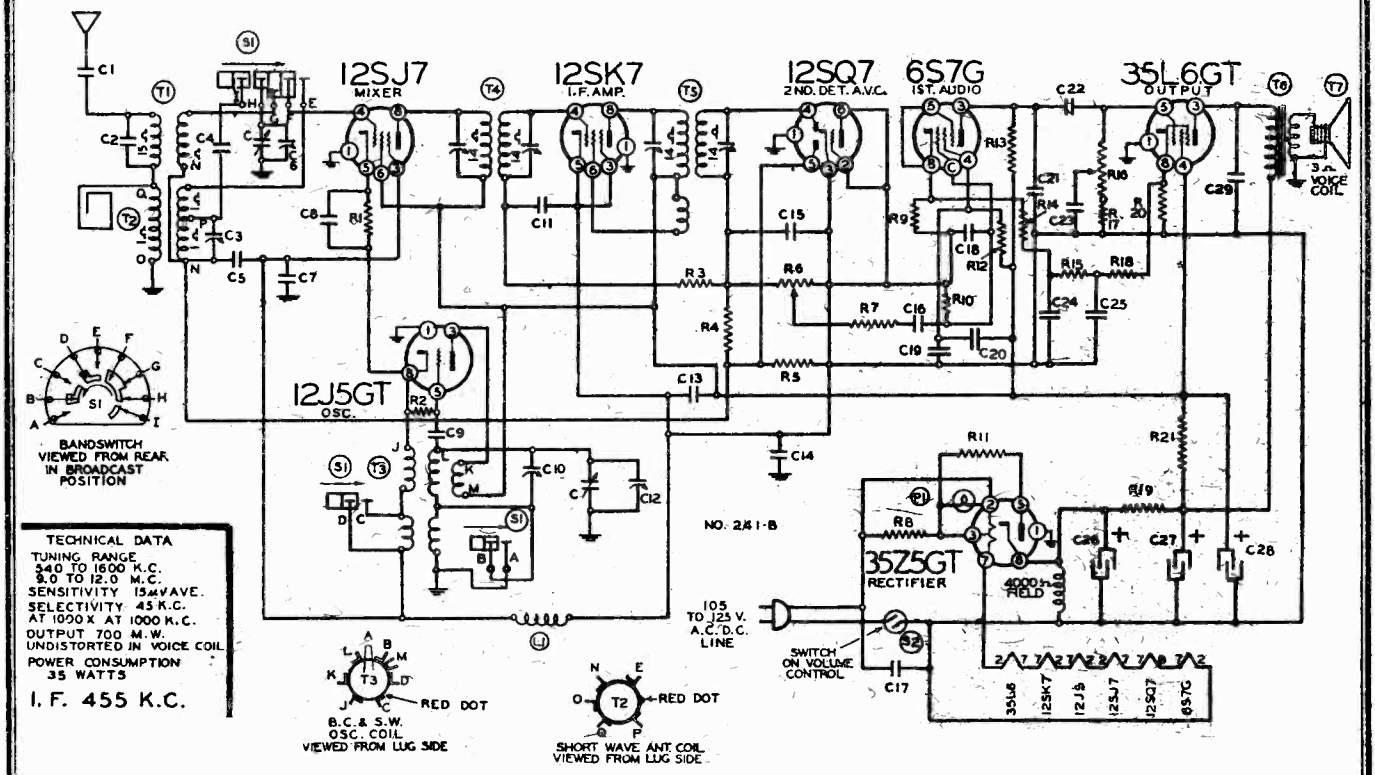
MODELS 14BR-734B, 14BR-735B

MONTGOMERY WARD



Part No.	Schematic Reference	Description	No. Used In Set	Selling Price Each
CONDENSERS				
BE100142	C20	.04 x 200 Volt Tubular Condenser	1	.12
BE100130	C21, C22	Dual Condenser—.00025 x .02 x 400 Volt	1	.24
BE10011	C29	.01 x 400 Volt Tubular Condenser	1	.12
BE1009	C11	.05 x 200 Volt Tubular Condenser	1	.12
BE10019	C16, C23	.006 x 600 Volt Tubular Condenser	2	.12
BE10020	C13, C19, C24, C25	.1 x 200 Volt Tubular Condenser	4	.12
BE10037	C1	.003 x 600 Volt Tubular Condenser	1	.12
BE100119	C7, C14	.1 x 400 Volt Tubular Condenser	2	.12
BE100127	C8	.01 x 120 Volt Tubular Condenser	1	.12
BE100128	C5	.05 x 120 Volt Tubular Condenser	1	.12
BE100138	C17	.03 x 400 Volt Tubular Condenser	1	.12
BE119129		Electrolytic Filter Cond. added for 25 cycle only. 40 mfd. x 150 Volts across C22 and 20 Mfd. x 150 Volts across C23		.70
BE119128	C26, C27, C28	Electrolytic Filter Condenser—40 mfd.—20 mfd.—20 mfd. x 150 Volts	1	.70
BE124139	C3, C10	S. W. Antenna and Oscillator Trimmer Condenser	2	.16
BE1295	C9, C18	.0001 Mica Type Condenser—20%	2	.12
BE12921	C15	.0002 Mica Type Condenser—20%	1	.12
BE12960	C2	.00015 Mica Type Condenser—10%	1	.12
BE129181	C4	.000445 Mica Type Condenser—3%	1	.18
BE12912	C19	.00025 Mica Type Condenser	1	.12
RESISTORS				
BE13012	R2, R7	50M ohm—½ Watt Resistor—20%	2	.10
BE13038	R4	2 Megohm—½ Watt Resistor—20%	1	.10
BE13084	R19	200 Ohm—½ Watt Resistor—20%	1	.10
BE130128	R11	20 Ohm—½ Watt Resistor—20%	1	.10
BE130166	R8, R26	150 Ohm—½ Watt Resistor—10%	2	.10
BE130218	R1	5M Ohm—½ Watt Resistor—10%	1	.10
BE130257	R10	5 Megohm—½ Watt Resistor—25%	1	.10
BE130287	R21	1200 Ohm—1 Watt Resistor—10%	1	.10
BE130350	R3, R5	3. 2 Megohm—½ Watt Resistor—20%	2	.10
BE13092	R9	1M Ohm—½ Watt Resistor	1	.10
BE130351	R12	525M Ohm—½ Watt Resistor	1	.10
BE130103	R13	100M Ohm—½ Watt Resistor	1	.10
BE130193	R14, R18	3M Ohm—½ Watt Resistor	2	.10
BE130355	R15	8M Ohm—½ Watt Resistor	1	.10
BE130100	R17	150M Ohm—½ Watt Resistor	1	.10
SOCKETS				
BE121210		Eight Prong Molded Octal Socket	6	.10
BE121273		Eight Prong Wafer Octal Socket—with Shield for Guide Pin	1	.10
SPEAKER				
BE114271	T7	Six Inch Electro Dynamic Speaker. Less Output Transformer.		
BE105134	T6	Output Transformer for Speaker	1	.50
COILS				
BE108206	T4	Input I. F. Coil Complete in Can	1	.76
BE108205	T5	Output I. F. Coil Complete in Can	1	.76
BE130184	T3	B. C. - S. W. Oscillator Coil	1	.60
BE111249	T2	S. W. Antenna Coil	1	.30
BE111250	T1	Loop Antenna Assembly	1	.90
BE12316	L1	Choke Coil	1	.18

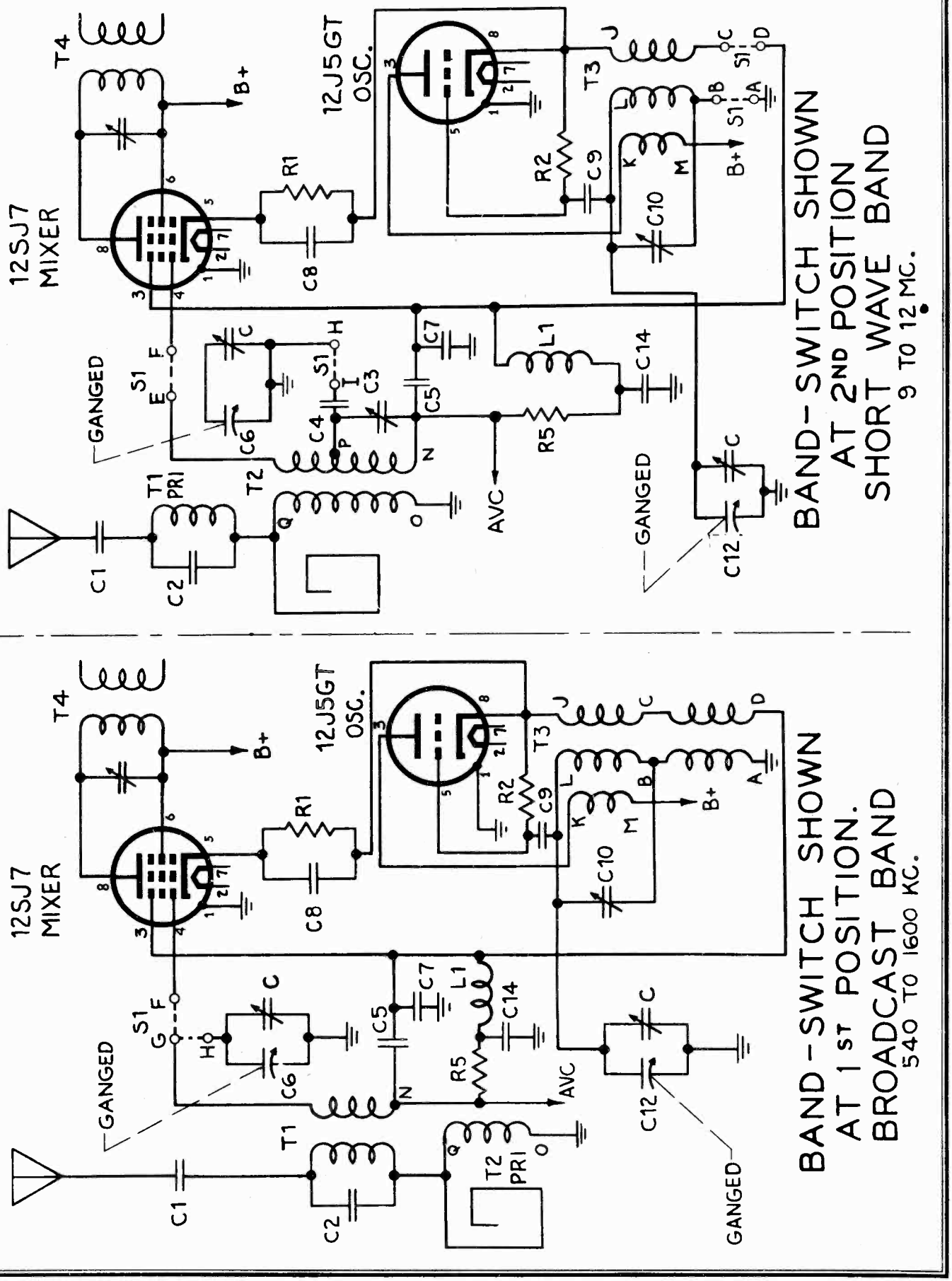
Part No.	Schematic Reference	Description	No. Used In Set	Selling Price Each
DIAL PARTS				
BE1121023		Dial Scale	1	.28
BE112964		Pointer	1	.06
BE112962		Crystal for Dial	1	.32
BE13143		Snap-in Rivets to Fasten Dial Scale	5	.02
BE112959		Dial Drum Pulley	1	.06
BE115757		Dial Support Plate with Idler Pulleys and 2 bearings	1	
BE117906		Tuning Shaft with Drive Pulley	1	.14
BE117910		Pointer Shaft	1	.06
BE120372		Coiled Tension Spring for Dial String	1	.02
BE120375		String for Dial	Yard	.12
MISCELLANEOUS				
BE101262	R6, S2	Volume Control and Switch (1 Megohm)	1	.62
BE101263	R11	Tone Control (500M Ohms)	1	.50
BE125167	S1	Band Switch	1	.40
BE102143B	C. C6, C12	Two Gang Variable Condenser with B. C. Antenna and Osc. Trimmers and 6 Button Automatic Tuner Assembly	1	5.00
BE10798D		Line Cord and Plug	1	.30
BE107249	P1	6-8 V. Pilot Lite Bulb, Type T-47	1	.10
BE107358		Socket Assembly for Pilot Lite	1	.10
BE128656-36		Walnut Bakelite Cabinet	1	3.60
BE128656-9		Ivory Color Bakelite Cabinet	1	4.40
BE131356		Snap-in Rivets to Fasten Back	5 Doz.	.10
BE132264		No. 8-18 x ¼ Chassis Mounting Screws	2	.02
BE112972		Wood Spacers for Loop	2	.02
BE131356		Snap-in Buttons to Mount Loop	5 Doz.	.10
BE134123		Rubber Bumpers for Bottom of Cab	4	.02
BE128717		Brown Cardboard Back for Cabinet	1	.08
BE112973		Set of Station Call Letters	1	.12
BE112979		Set of Celluloid Tabs (6)	1	.06
BE128699-36		Walnut Bakelite Buttons (left)	3	.08
BE128700-36		Walnut Bakelite Buttons (right)	3	.08
BE128686-37		Knob—Walnut—"Volume"	1	.12
BE128688-37		Knob—Walnut—"Tone"	1	.12
BE128687-37		Knob—Walnut—"Tuning"	1	.12
BE128683-37		Knob—Walnut—"Band SW"	1	.12
BE128686-8		Knob—Ivory—"Volume"	1	.12
BE128688-8		Knob—Ivory—"Tone"	1	.12
BE128687-8		Knob—Ivory—"Tuning"	1	.12
BE128683-8		Knob—Ivory—"Band SW"	1	.12
BE131383		Screw Driver	1	.06

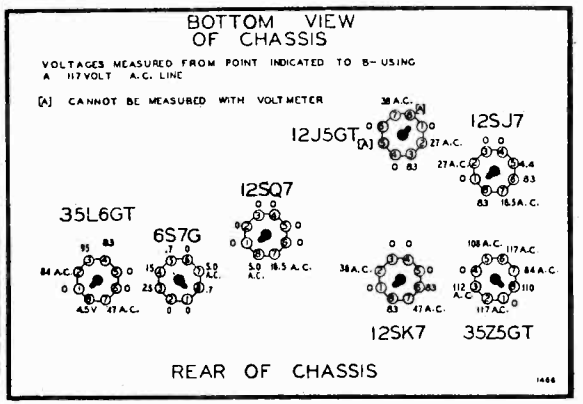
NOTICE—There is a model number label on the chassis. This model number identifies the radio as to year, manufacturer, chassis and issue number or letter. When ordering parts or writing, be sure to mention the complete model number.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

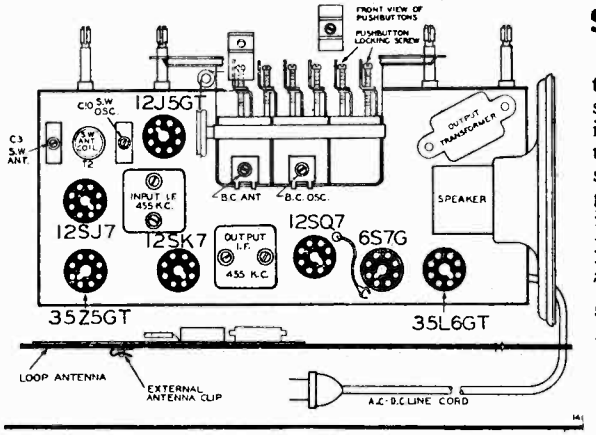
MODELS 14BR-734B
14BR-735B

MONTGOMERY WARD





Voltage Chart



Chassis View, showing Tube Location and the Outside Antenna Clip.

SETTING THE PUSHBUTTONS

Make a list of your 6 favorite stations—push out the call letters of these stations from the call letter sheets supplied. Next insert a long slim screw driver into the hole in front of one of the pushbuttons and unscrew the pushbutton locking screw (to the left) several turns. Now with the screw driver still engaged in the locking screw slot push it all the way in. Hold it in this position and tune in the station you want with the tuning knob. Now tighten up the pushbutton locking screw by turning it to the right. Tighten firmly. Continue setting each button in the same way. When you have set your stations insert the call letter of each station in the front of the proper button and put one of the celluloid tabs over the station call letter.

To change stations simply repeat the above procedure.

If you are unable to set a station on any particular button it is probably because the pushbutton locking screw has not been fully unloosened (turned to the left).

ALIGNMENT PROCEDURE

- Volume control—Maximum all adjustments.
- Connect B—of radio chassis to ground post of signal generator through .1 Mfd. condenser.

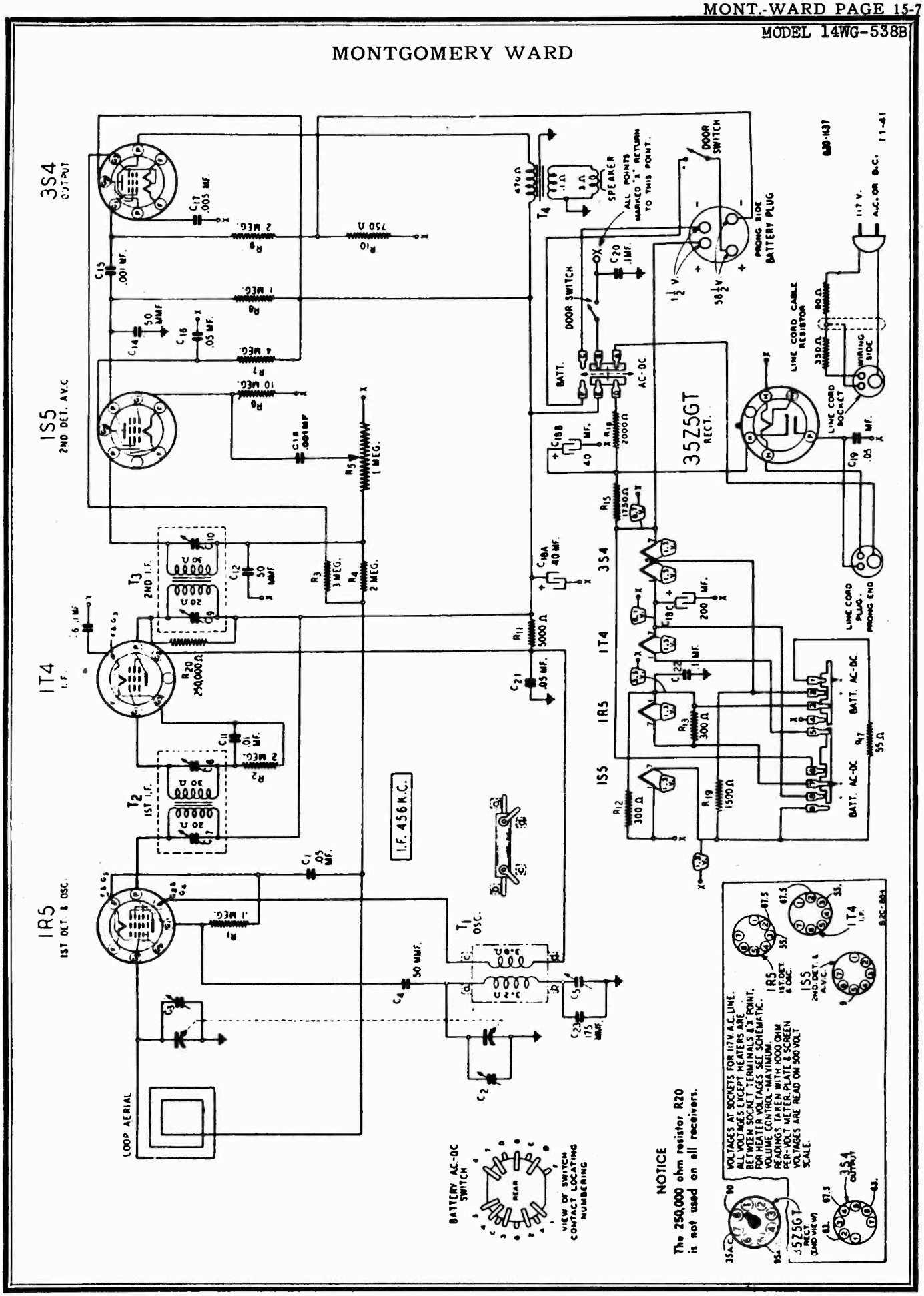
BAND	SIGNAL GENERATOR Frequency Setting	Dummy Antenna	Connection to Radio	Position of Band Switch	Variable Condenser Setting	Trimmers Adjusted to Maximum
I. F.	455 Kc.	.1 MFD.	Grid of 12SK7 I. F.	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 MFD.	Grid of 12SJ7 Mixer	Broadcast	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
SHORT WAVE BAND	12 Mc.	400 Ohms	External Antenna and B—	Short Wave	Set Dial at 12 Mc.	S.W. Osc. trimmer C10 S.W. Ant. trimmer C3
BROAD-CAST BAND	1600 Kc.	.1 mmf.	Grid of 12SJ7	Broadcast	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C12 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Broadcast	Set Dial at 1400 K. C.	B.C. Ant. trimmer C6

NOTE: The Oscillator Frequency is lower than the signal frequency and should be aligned accordingly.

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

MODEL 14WG-538B

MONTGOMERY WARD



MODEL 14WG-538B

MONTGOMERY WARD

SPECIFICATIONS

Input Voltages and Currents—Battery Operation

"A" Battery - - - - 1½ Volts—.25 Amp.

"B" Battery - - - - 88½ Volts—8. Ma.

Power Consumption - - - - - - 30 Watts (At 117 Volts AC Supply)

Power Output

Battery Operation - 55 Mw. Undistorted, 110 Mw. Maximum

AC Operation - - 80 Mw. Undistorted, 170 Mw. Maximum

Selectivity - 40 KC Broad at 1000 Times Signal

Intermediate Frequency - - - - - - 456 KC

Speaker - - - - - - - - - 4" P.M. Dynamic

Tuning Frequency Range - 535 to 1610 KC

Sensitivity - 400 Microvolts per Meter Average (For .05 Watt Output)

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

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

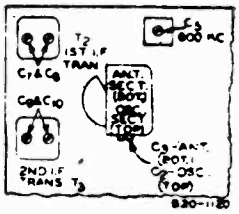
The following equipment is required for aligning:

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

Output Indicating Meter—Non-Metallic Screwdriver.

Use Loop for All Adjustments—See Note "A"

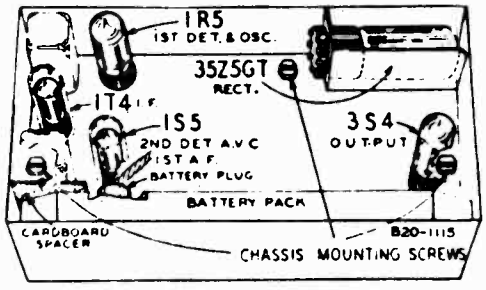
Signal Gen. FREQUENCY SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Turn Rotor to Full Open	1st I.F. (C7) & (C8) 2nd I.F. (C9) & (C10)
1610 KC	Turn Rotor to Full Open	Oscillator (C2)
1500 KC	Turn Rotor to Max. Output Set Knob to 1500 KC	Antenna (C3)
600 KC	Turn Rotor to Max. Output	600 KC (C5) Rock Rotor—See Note B
1500 KC	Turn Rotor to Max. Output	Antenna (C3)



NOTE A—Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 2 feet (6" for I.F. adjustment) from loop.

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

To replace the 35Z5GT rectifier tube, pull line cord plug out of case. Carefully pry off the 2 control knobs. Remove screw on the front panel above tuning knob at side of on-off switch plunger. Then take out the 3 chassis screws (shown in illustration) with a ¼ inch socket wrench. Carefully lift chassis, tilting it at the same time, as far as connecting wires permit. Insert a screwdriver between rectifier tube and socket and pry tube out of socket.



MISCELLANEOUS

Part No.	Description	Selling Price
12A388	4" P.M. Dynamic Speaker	$2.00
	Cone and Voice Coil Assembly (Specify part number and letters stamped on the above speaker)	.76
14X282	Grille Cloth for Speaker	.06
3A312	Tube Socket—Miniature Type	.06
3A314	Tube Socket—Octal (8 prong) Wafer Type	.06
32X221	Tube Shield	.04
13X453	"A" and "B" Battery Cable and Plug Assembly	.24
6A236	Four Prong Plug for above Battery Cable	.04
13X427	Line Cord and Plug Assembly	.76
6A235	Line Plug (on Chassis)	.08
2A201	On-Off Switch	.28
10A367	Knobs (Tuning Control and Volume Control)	.06
4X613	Front Panel Escutcheon	1.06
26A301	AC-DC—Battery Switch Assembly	.58
14X283	Speaker Grille	.28
26A346	Case Assembly complete with Door, Cover, Speaker Grille, Grille Cloth, Handle, and Loop Aerial	11.74
8X98	Rubber Feet (at Bottom of Case)	Doz. .06
4X663	Escutcheon	1.24

TRANSFORMERS AND COILS

9A1551	Loop Aerial only	.82
9A1552	T1 Oscillator Coil Assembly	.44
9A1413	T2 1st I.F. Transformer and Can Assembly	.90
9A1414	T3 2nd I.F. Transformer and Can Assembly	.90
61X94	T4 Output Transformer	.40

CONDENSERS

46X329	C1,C16,C21	.05 mf.	120 Volts	Tubular	$0.06
17A186	C5	30-120 mmf.		Trimmer	.16
47X56	C4,C12,C14	50 mmf.		Molded	.06
46X338	C6	.10 mf.	120 Volts	Tubular	.08
	C7, C8	Part of 1st I.F. Assembly			
	C9, C10	Part of 2nd I.F. Assembly			
46X328	C11	.01 mf.	120 Volts	Tubular	.06
46X334	C13,C15	.001 mf.	120 Volts	Tubular	.06
46X327	C17	.005 mf.	120 Volts	Tubular	.06
45X303	C18A	40 mf.	150 Volts	Dry Electrolytic	.66
	C18B	40 mf.	150 Volts	2 USED ON 25	
	C18C	200 mf.	12 Volts	CYCLE MODELS	
D66503	C19	.05 mf.	400 Volts	Tubular	.06
D66104	C20	.10 mf.	400 Volts	Tubular	.14
14A158		2 Section	Gang Condenser		4.50
B66104	C22	.10 mf.	200 Volts	Tubular	.15
47X184	C23	175 mmf.		Molded	.16

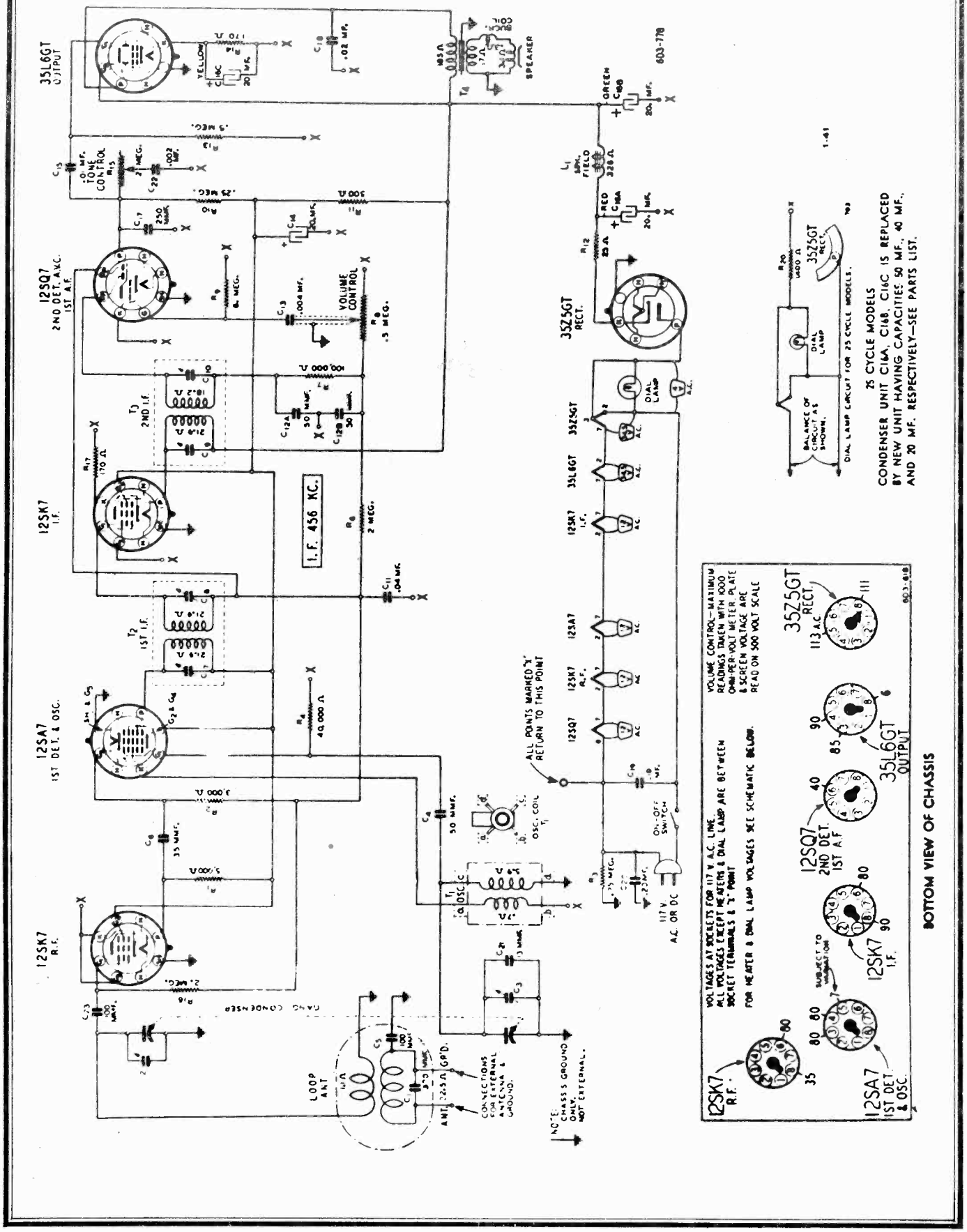
RESISTORS

A84104	R1	100,000 Ohm	0.2 Watt	Carbon	$0.08
A85505	R2	5 Megohm	0.2 Watt	Carbon	.06
A85205	R2	2 Megohm	0.2 Watt	Carbon	.06
A85305	R3	3 Megohm	0.2 Watt	Carbon	.06
A85205	R4,R9	2 Megohm	0.2 Watt	Carbon	.06
36X305	R5	1 Megohm	Volume Control		.30
A85106	R6	10 Megohm	0.2 Watt	Carbon	.06
A84405	R7	4 Megohm	0.2 Watt	Carbon	.08
A84105	R8	1 Megohm	0.2 Watt	Carbon	.08
A84751	R10	750 Ohm	0.2 Watt	Carbon	.08
A84502	R11	5000 Ohm	0.2 Watt	Carbon	.08
A84301	R12,R13	300 Ohm	0.2 Watt	Carbon	.08
A84901	R14	900 Ohm	0.2 Watt	Carbon	.08
43X107	R15	1750 Ohm	Wire Wound		.22
B94202	R16	2000 Ohm	0.5 Watt	Carbon	.08
A84550	R17	55 Ohm	0.2 Watt	Carbon	.08
A85605	R18	6 Megohm	0.2 Watt	Carbon	.06
A84152	R19	1500 Ohm	0.2 Watt	Carbon	.08
A85254	R20	250,000 Ohm	0.2 Watt	Carbon	.06

Prices Subject to Change Without Notice.

MODELS 14WG-610B, 14WG-611B

MONTGOMERY WARD



MODELS 14WG-610B, 14WG-611B

MONTGOMERY WARD

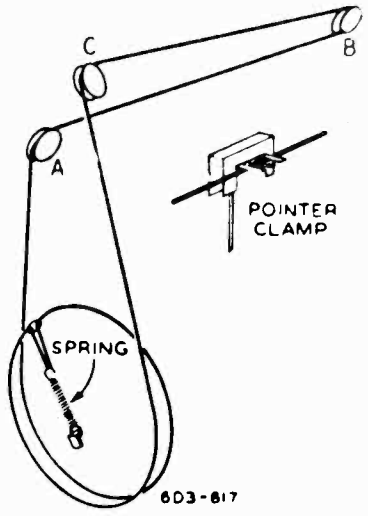
DRIVE CORD REPLACEMENT

Knot both ends of new drive cord to same loop on tension spring. The doubled drive cord should measure 16¼ inches. Turn gang condenser to full open position—See illustration.

Thread looped end of drive cord up through hole in rim of drive pulley. Pull spring flush against inside of rim. Wind right hand portion of drive cord (from drive pulley side of chassis) one turn clockwise around drive pulley. This turn should be on right side of pulley groove (from back of chassis).

Continue cord over pulleys A, B, and C as shown. Loop remaining portion of cord counter-clockwise (from spring) (drive pulley side of chassis) around drive pulley. Secure spring to hook on drive pulley—See illustration.

Calibration — Tune in a signal of known frequency. Set pointer at this frequency mark on the dial scale. Fasten pointer to drive cord —See illustration.



Power Consumption - 28 Watts (At 117 volts AC Supply)
Power Output - - - - - - - .8 Watt Undistorted
Selectivity - - 50 KC Broad at 1000 times Signal
Intermediate Frequency - - - - - - - - 456 KC
Speaker - - - - - - - - - 5" Electro Dynamic
Tuning Frequency Range - - - 528 to 1600 KC
Sensitivity (For .05 Watt Output)
External Antenna - - - - - - 10 Microvolts Average

CAUTION

The metal chassis is connected to one side of the line through a .2 mfd. condenser. Both AC and DC power lines are generally grounded on one side. If the side of the line not connected to the metal chassis through this condenser is grounded and the metal chassis comes in contact with an external ground, this condenser will be connected across the line and there will be an increase in hum.

Therefore, in any service work on the chassis, keep it on a wood or other insulated surface to avoid contacts with ground. The person working on the set should avoid getting in contact with any ground.

ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

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

The equipment in column at right is required for aligning:

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

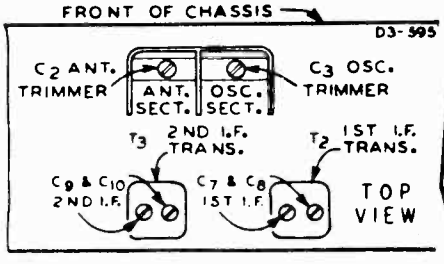
Output Indicating Meter; Non-Metallic Screwdriver.

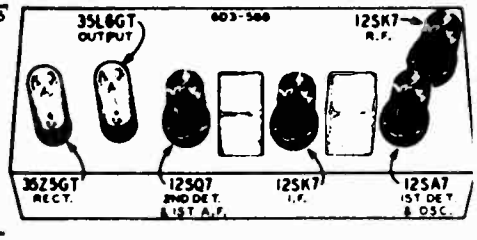
Dummy Antennas—.1 mf., 100 mmf.

SIGNAL GENERATOR					
FREQUENCY SETTING	ANTENNA CONNECTION	GROUND CONNECTION	DUMMY ANTENNA	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM (See Trimmer Illustration)
456 KC	Control Grid 12SK7—I.F.	Point "X" (12SK7—R.F. Prong No. 3)	.1 mf.	Turn Rotor to full open	2nd I.F. (C9) & (C10)
456 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	1st I.F. (C7) & (C8)
1600 KC	Control Grid 12SA7—1st Det.	Same As Above	.1 mf.	Turn Rotor to full open	Oscillator (C3)
1500 KC	External Antenna Clip On Loop —See Note A	External Ground Clip On Loop	100 mmf.	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note B	Antenna (C2)

NOTE A—By means of wooden blocks, stand the loop aerial assembly upright exactly 1¼ inches from the back of the chassis.

NOTE B—If the pointer is not at 1500 KC on the dial, tune in a 1500 KC signal. Set pointer at the 1500 KC mark on the dial scale.





MONTGOMERY WARD

MODELS 14WG-610B, 14WG-611B

PROCEDURE FOR SETTING THE STATION BUTTONS

SELECTING THE STATIONS TO BE SET

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers increase from left to right.

SETTING A STATION BUTTON

Pull the button at the left off the shaft. When this is done, the locking screw shaft will be exposed.

Insert a screwdriver in the slot of the locking screw and depress it by pressing in with the screwdriver. Loosen the locking screw by turning 3 or 4 turns in a counter-clockwise direction. Continue to press in firmly on the screwdriver, thus holding the locking screw shaft depressed. Select the first station from the list you have prepared and carefully tune in this station by means of the manual tuning control until the station is clearest and strongest.

Continue to press in firmly on the screwdriver and lock the mechanism by turning the locking screw in a clockwise direction. Tighten firmly but not excessively. The station is now set on this button.

Proceed in the same manner to set stations on any of the remaining buttons.

Remove the correct station call letter tab from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press this tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

Replace the button on its shaft with the lip at the bottom and the button placed so that the call letters are straight up and down.

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons.

MISCELLANEOUS

SPEAKER

Stn No.	Part No.	Description	Selling Price
	12A347	5" Electro-Dynamic Speaker	$1.52
		Cone and Voice Coil Assembly (Specify part number of Speaker and letters preceding part number stamped on the speaker)	.90
	14X261	Grille Cloth for above Speaker—Ivory Cabinet	.86

GENERAL

	3A303	Tube Socket—Octal (8 prong)	.06
	10A297	Knobs (Volume Control and Tone Control)—Walnut Cabinet Ea.	.04
	10A300	Knobs (Volume Control and Tone Control)—Ivory Cabinet Ea.	.06
	13X328	Line Cord and Plug	.10
	28X266	Phosphor Bronze Ground Plate (For 2nd I.F. Can)	.06
	886	Bakelite Cabinet—Walnut	2.85
	887	Bakelite Cabinet—Ivory	3.90
	28X292	Snap Buttons (To hold Cardboard Back to Cabinet) Doz.	.12
	10A296	Tuning Control Drum—Walnut Cabinet	.06
	10A301	Tuning Control Drum—Ivory Cabinet	.10
	10A295	Station Buttons—Walnut Cabinet Ea.	.04
	10A302	Station Buttons—Ivory Cabinet Ea.	.06
	8X98	Rubber Feet (Bottom of Cabinet) Doz.	.04

TRANSFORMERS AND COILS

Stn No.	Part No.	Code	Description	Selling Price
	9A1246		Loop Antenna Assembly complete with Condensers and cardboard back—Walnut Cabinet	$1.02
	9A1239		Loop Antenna Assembly complete with Condensers and cardboard back—Ivory Cabinet	1.02
	9A1240	T1	Oscillator Coil Assembly	.20
	9A1241	T2	1st I. F. Transformer and Can Assembly	.46
	9A1242	T3	2nd I. F. Transformer and Can Assembly	.46
	61X78	T4	Output Transformer	.46

CONDENSERS

TUBULAR

Stn No.	Part No.	Code	Capacitance	Voltage	Selling Price
	46X250	C11	.04 mf.	180	$0.06
10888	44X284	C13	.004 mf.	180	.06
11256	44X249	C15	.01 mf.	180	.06
	44X306	C18	.02 mf.	200	.06
	44X307	C19	.10 mf.	200	.10
	44X304	C20	.20 mf.	180	.10
10934	44X248	C22	.002 mf.	180	.06

MOLDED

	47X150	C1	300 mmf.		
11338	47X256	C4	88 mmf.		.06
10876	47X57	C5,C23	100 mmf.		.06
10849	47X53	C6	35 mmf.		.06
	47X66	C17	250 mmf.		.10

ELECTROLYTIC

46X282	C14	20 mf.	150	Dry Electrolytic	.22
46X276	C16A	20 mf.	200	Dry Electrolytic 60 CYCLE MODELS	.48
	C16B	20 mf.	150		
	C16C	20 mf.	12		
46X276	C16A	80 mf.	200	Dry Electrolytic 25-40 CYCLE MODELS	.70
	C16B	40 mf.	150		
	C16C	20 mf.	12		

MISCELLANEOUS

	C2, C3, C7, C8	Part of Gang Condenser	
	C9, C10	Part of 1st I.F. Transformer Assembly	
	C12A, C12B	Part of 2nd I.F. Transformer Assembly	
47X112	C12A	50 mmf.	
	C12B	50 mmf.	Dual Mica .06
47X138	C21	13 mmf. Ceramic	.12

RESISTORS

CARBON

Stn No.	Part No.	Code	Resistance	Wattage	Selling Price
	A85502	R1	5,000 Ohm	0.2	$0.06
	A85302	R2	3,000 Ohm	0.2	.06
10971	A85254	R3, R10	250,000 Ohm	0.2	.06
11110	A85403	R4	40,000 Ohm	0.2	.06
11086	A85208	R6	2 Megohm	0.2	.06
	885104	R7	100,000 Ohm	0.5	.04
	A85608	R9	6 Megohm	0.2	.06
	885601	R11	600 Ohm	0.5	.06
10881	A85258	R12	25 Ohm	0.2	.06
11085	A85604	R13	600,000 Ohm	0.2	.06
	884171	R14	170 Ohm	0.5	.08
	885285	R16	2 Megohm	0.5	.06
	885171	R17	170 Ohm	0.5	.04

MISCELLANEOUS

34X279	R8	500,000 Ohm	Volume Control and On-Off Switch	.40
40X247	R15	2 Megohm	Tone Control	.30
43X104	R20	1,400 Ohm	12 Wire Wound (25 CYCLE MODELS)	.30

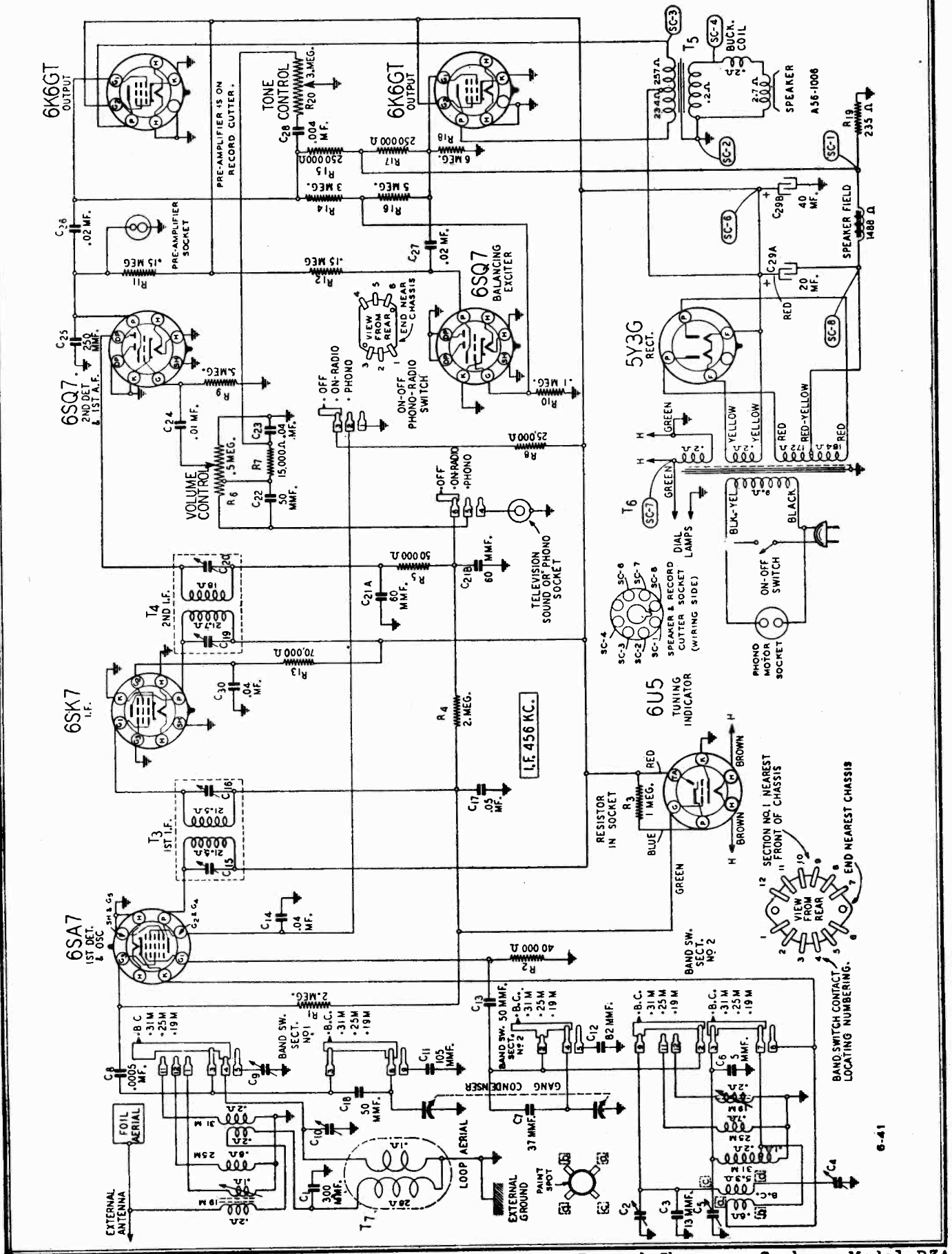
AUTOMATIC TUNING AND DIAL ASSEMBLY

Stn No.	Part No.	Description	Selling Price
	28A76	Automatic Tuning Assembly complete with Gang Condenser and Drive Pulley	$2.38
	20X326	Locking Screws for Automatic Tuning Assembly Doz.	.10
	26A344	Dial Scale Mounting Plate complete with Pulleys less Tone and Volume Controls	.24
	88X472	Dial Scale	.42
	88X473	Paper Background for Dial Scale	.04
	28X56	Clamp Buttons to hold Dial Scale and Dial Background to Mounting Plate Doz.	.06
	15X170	Pointer for Dial Scale	.06
		36" Drive Cord (18 lb. Test)	.04
	28X96	Tension Spring for above Drive Cord Doz.	.16
	7A114	Dial Lamp Socket and Cable complete with Bracket	.10
11122	7A32	Dial Lamp (No. 51)	.10
	26A166	Call Letter Sheets and Celluloid Tabs	.06
	88X93	Celluloid Tabs Doz.	.06

Prices Subject to Change Without Notice.

MODELS 14WG-808WA,
14WG-808MA

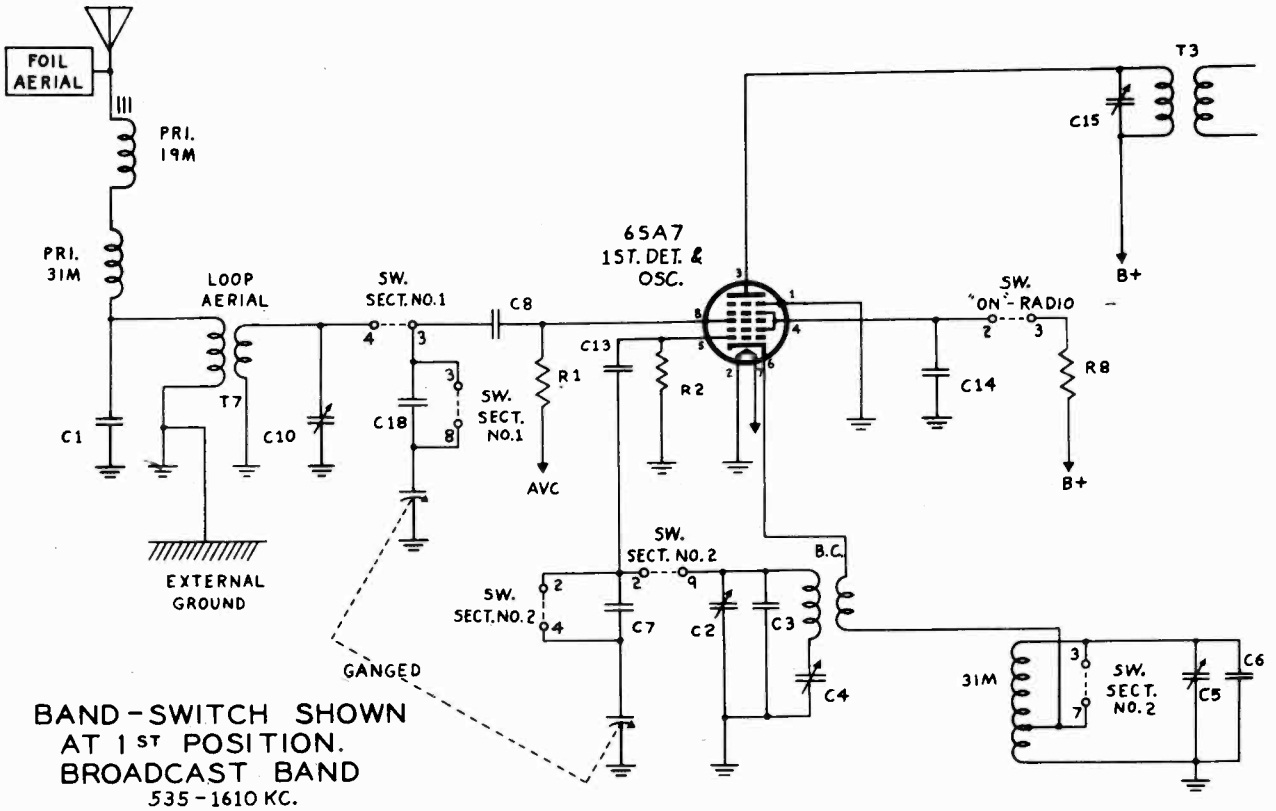
MONTGOMERY WARD



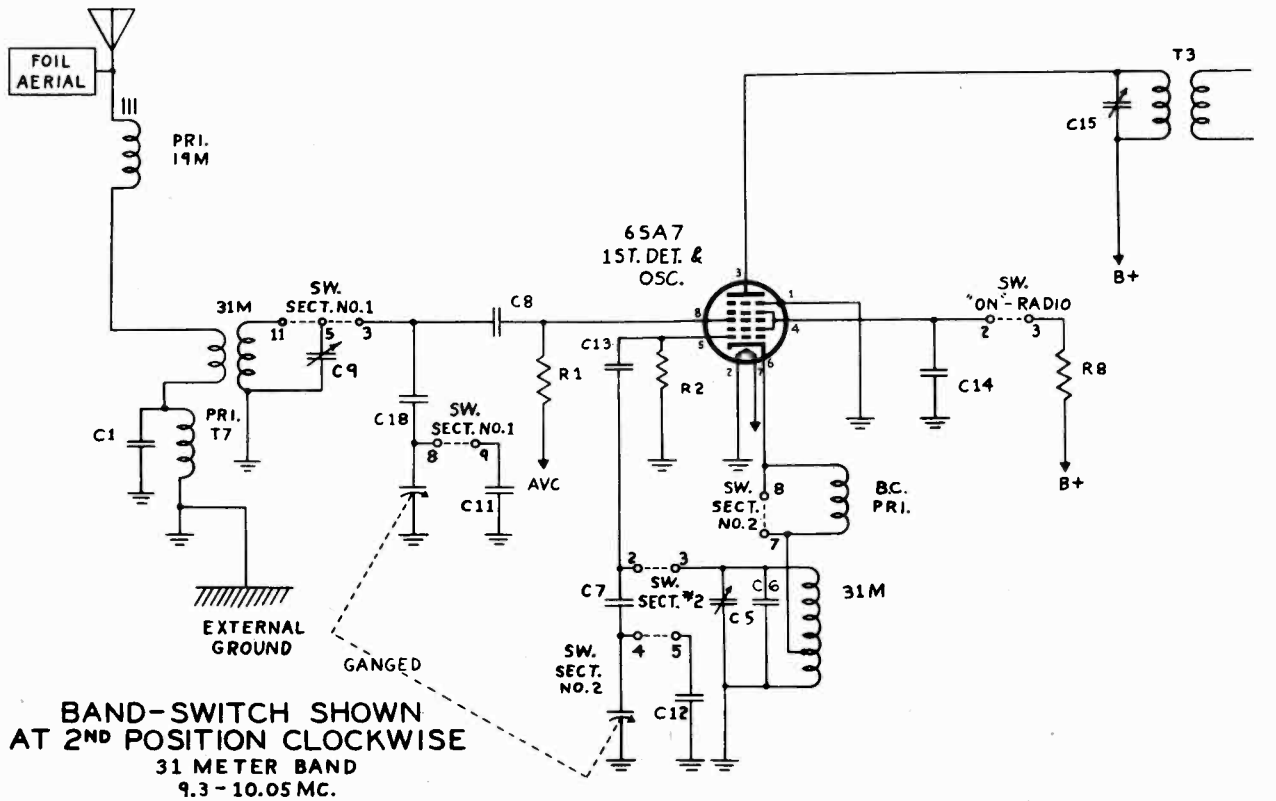
Record Changer: Seeburg Model B3A

MODELS 14WG-808WA, 14WG-808MA

MONTGOMERY WARD



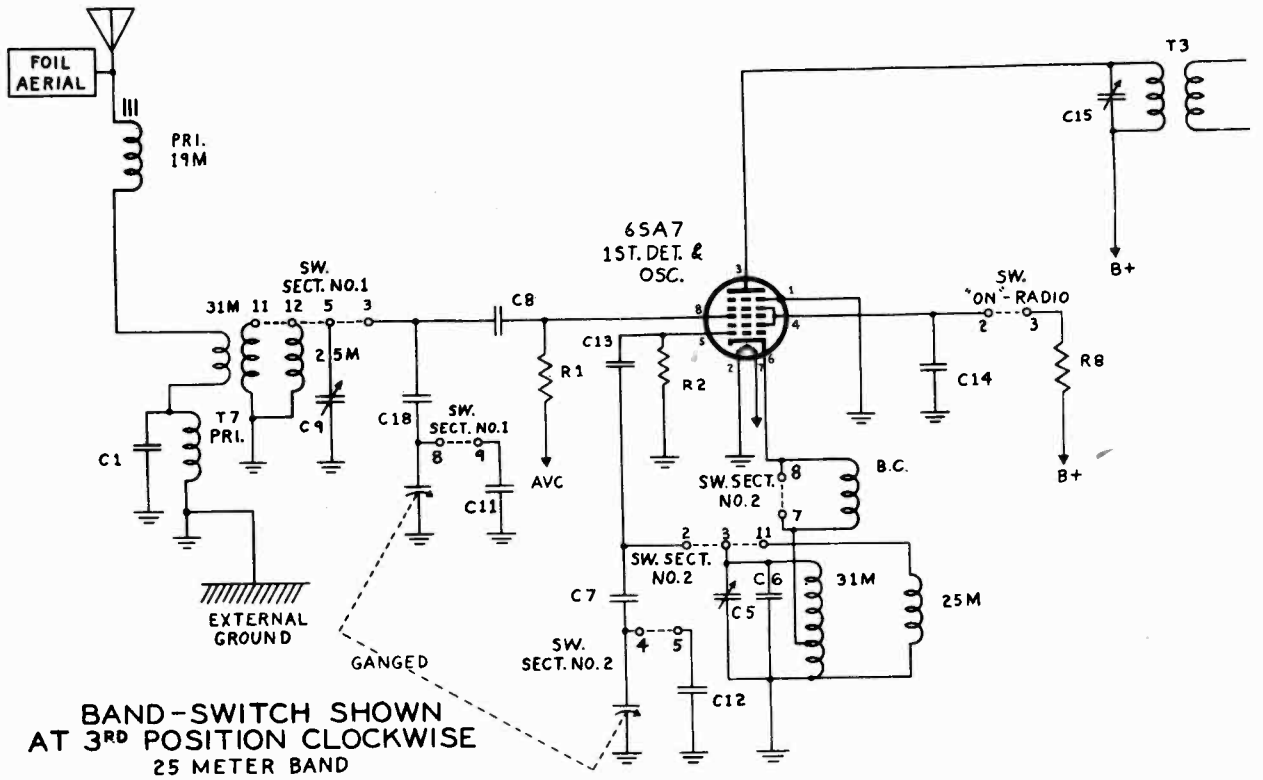
BAND-SWITCH SHOWN AT 1ST POSITION.
BROADCAST BAND
535 - 1610 KC.



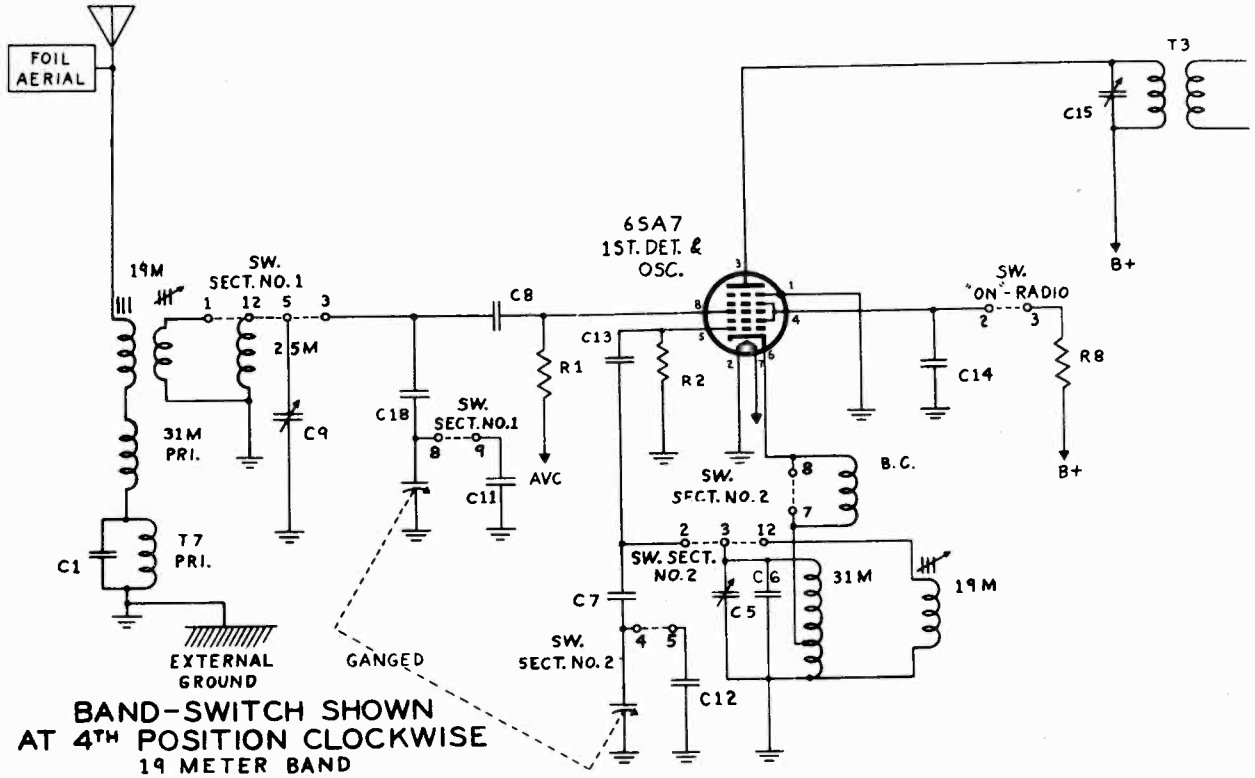
BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE
31 METER BAND
9.3 - 10.05 MC.

MODELS 14WG-808WA,
14WG-808MA

MONTGOMERY WARD



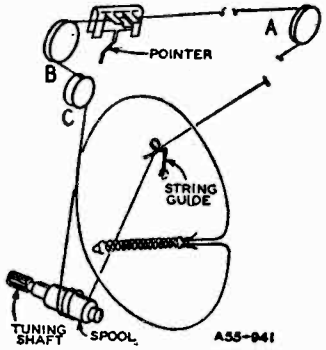
BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE
25 METER BAND
11.1-12.0MC.



BAND-SWITCH SHOWN
AT 4TH POSITION CLOCKWISE
19 METER BAND
14.6-15.8MC.

MONTGOMERY WARD

MODELS 14WG-808WA, 14WG-808MA



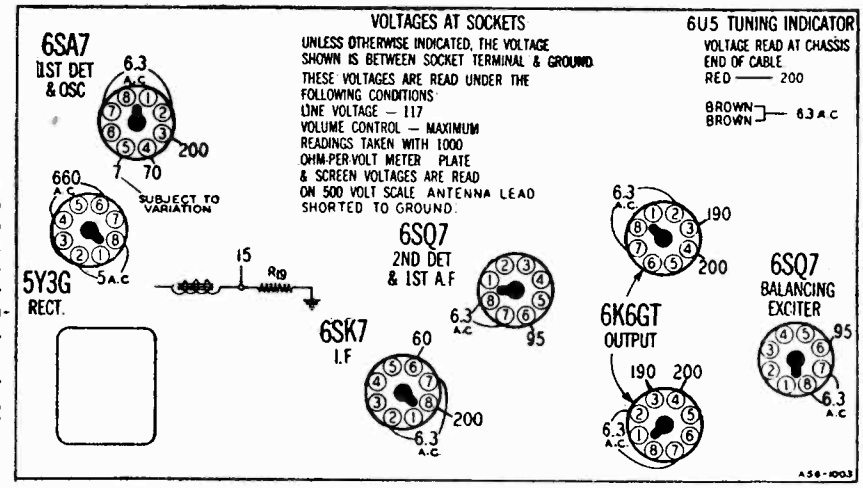
DRIVE CORD REPLACEMENT

Turn gang condenser to full closed position. Using a new drive cord 42 inches in length, tie one end to tension spring. Fasten other end of tension spring to hook on drive pulley. Pass drive cord through slot in drive pulley rim. Continue cord ½ turn counter-clockwise (from gang end of chassis) around drive pulley—See illustration. Wind 2½ turns, counter-clockwise (from rear of chassis), around wooden spool on tuning shaft. Turns should progress toward the rear of chassis.

Pass cord through wire string guide and around pulleys A, B, and C as shown. Continue cord ½ turn, counter-clockwise (from gang end of chassis) around drive pulley and pass through slot in pulley rim. Stretch tension spring and tie drive cord to tension spring.

Power Consumption	57 Watts (at 117 volts 60 cycles) 77 Watts (Phonograph Operating)
Power Output	3.0 Watts Undistorted 4.5 Watts Maximum
Selectivity	38 KC Broad at 1000 times Signal
Intermediate Frequency	456 KC
Speaker	10" Electro-Dynamic

Band	Tuning Frequency Range	Sensitivity External Antenna (For 0.5 Watt Output)
B Range	535 to 1610 KC	15 Microvolts Aver.
19 Meter	14.6 to 15.8 MC	26 Microvolts Aver.
25 Meter	11.1 to 12.0 MC	25 Microvolts Aver.
31 Meter	9.3 to 10.05 MC	22 Microvolts Aver.



PROCEDURE FOR SETTING THE STATION BUTTONS

Make a list of your six favorite stations, those which you tune in regularly. It is better to list the station with the highest kilocycle number first, the station with the next lower kilocycle number next, and so on.

Grasp the left-hand button at the sides (depress the adjacent button) and pull it out as far as it will go. A click will be heard. If it is impossible to depress the button which is adjacent to the button you are setting, rotate the tuning knob a few turns.

Select the first station from the list you have prepared. *Carefully* tune in this station by means of the manual tuning knob until the dark sector in the tuning eye is narrowest.

Now lock the mechanism by pushing the button all the way in until it is felt to lock into place.

Proceed in the same manner to set stations on any of the remaining buttons. Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers decrease from left to right.

Remove the correct station call letter tab from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press the tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

Changing the setting of one button will not affect the setting of any of the other buttons.

REPLACING BAND SPREAD COILS

It is not practicable to make field replacements of the individual antenna and oscillator coils in the Band Spread Assembly Unit.

Should one of these coils be damaged in any way, remove the Band Spread Assembly Unit (consisting of the 3 antenna and 4 oscillator coils, the right-angle mounting plate, and the band switch) from the chassis and return to the factory for replacement.

CAUTION—Two of the coils in the band spread coil assembly, the 19 Meter Antenna and Oscillator coils, have adjustable iron cores. One of the adjusting screws extends out from the front panel of the chassis base at the left of the band switch. The other adjusting screw extends up from the chassis base in front of the 1st I.F. Transformer.

DO NOT CHANGE THE POSITION OF THESE ADJUSTING SCREWS as they have been properly set at the factory and cannot be satisfactorily re-adjusted in the field.

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

NOTE A—If the pointer is not at 1400 KC on the dial, remove pointer from drive cord. Set pointer at the 1400 KC mark on the dial scale. Attach pointer to drive cord.

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

NOTE C—Reassemble chassis in cabinet.

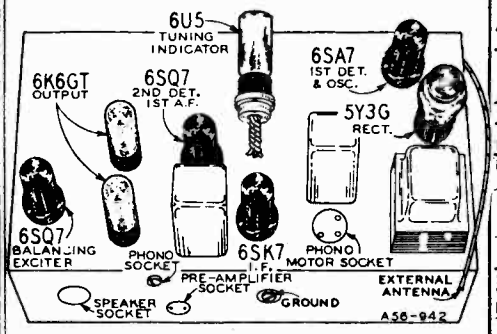
MODELS 14WG-808WA,
14WG-808MA

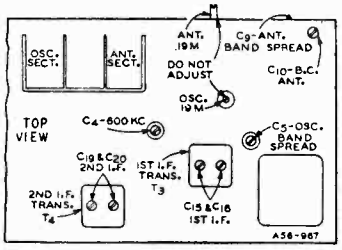
MONTGOMERY WARD

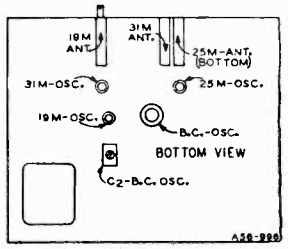
ANTENNA AND GROUND

Two built-in Air Wave Aerials are incorporated in the cabinet.

One of these, the loop aerial, is used for broadcast band reception. The other, a counterpoise foil aerial, is used for reception on the short wave band. For the reception of local or nearby stations, an outside antenna and ground are usually not required.







ALIGNMENT PROCEDURE

Volume Control—Maximum All Adjustments.

Connect Radio Chassis to Ground Post of Signal Generator with a Short Heavy Lead.

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

The following equipment is required for aligning: An All Wave Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed.

Output Indicating Meter—Non-Metallic Screwdriver.

Dummy Antennas—.1 mf., 100 mmf., and 400 ohms.

	SIGNAL GENERATOR FREQUENCY SETTING	CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
	Remove chassis from cabinet but do not disconnect leads to loop aerial.					
I.F.	456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C15) & (C16) 2nd I.F. (C19) & (C20)
RANGE B	1610 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C2)
	1400 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1400 KC—See Note A	Ant. Range B (C10)
	600 KC	Antenna Lead	100 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C4) Rock Rotor—See Note B
SHORT WAVE BANDS	9700 KC	Antenna Lead	400 Ohm	31 Meter	Turn Tuning Knob until Pointer is at 9.7 MC	Oscillator Band Spread (C5)
	9700 KC	Antenna Lead	400 Ohm	31 Meter	Leave Setting as above	Antenna Band Spread (C9)
LOOP RANGE B	1400 KC	Antenna Lead See Note C	100 mmf.	B Range	Turn Rotor to Max. Output	Ant. Range B (C10)

MISCELLANEOUS

Part No.	Description	Selling Price
12A399	10" Electro-Dynamic Speaker, Cone and Voice Coil Assembly (Specify part number and letters stamped on above Speaker)	$4.24 1.80
10A405	Knob (Tuning)—Mahogany Phono Combination	.12
10A406	Knob (Tone Control) — Mahogany Phono Combination	.08
10A407	Knob (Volume Control) — Mahogany Phono Combination	.10
10A408	Knob (Band Change Switch) — Mahogany Phono Combination	.10
10A409	Knob (Control Switch) — Mahogany Phono Combination	.10
10A372	Knob (Tuning)—Walnut Console and Phono Combination	.06
10A373	Knob (Tone Control)—Walnut Console and Phono Combination	.06
10A374	Knob (Volume Control) — Walnut Console and Phono Combination	.10
10A398	Knob (Band Change Switch) Walnut Console and Phono Combination	.10
10A404	Knob (Control Switch) Walnut Console and Phono Combination	.10
3A303	Tube or Speaker Socket—Octal (8 Prong) Molded Type	.06
3A315	Tube Socket—Octal (8 prong)—Wafer Type—6SA7 Tube	.10
3A305	Single Pin Tip Socket (Phono)	.06
3A304	Phono Motor Socket	.06
3A307	Microphone Amplifier Socket	.06
13X428	Tuning Eye Tube Socket and Cable Assembly	.28
2A209	On-Off—Radio-Phono Switch	.52
2A207	Band Change Switch	.84
8X23	Rubber Mounting Cushions (under Chassis) ea.	.04
13X328	Line Cord and Plug Assembly	.18
8X113	Rubber Mounting Cushions (at front of Chassis)—Phono Combinations only.....each	.06
25X826	Brackets for Cushions (at front of Chassis) —Phono Combinations only .....ea.	.04
8X83	Rubber Mounting Cushions (Under rear of Chassis) .....ea.	.04
25X655	Brackets for Rear Rubber Mounting Cushions	.02
26A231	Counterpoise Foil Aerial	.10

TRANSFORMERS AND COILS

Antenna & Oscillator Coils in Band Spread Assembly cannot be replaced individually—Entire Band Spread Assembly Unit must be ordered—See article "Replacing Band Spread Assembly"

26A323	Band Spread Assembly Unit complete with 3 Antenna Coils, 4 Oscillator Coils, Band Switch, Right-Angle Mounting Plate, and 4 Ceramic Condensers	$6.12
9A1461	Oscillator Coil Assembly—Broadcast Range	.18
9A1428	T3 1st I.F. Transformer and Can Assembly	.60
9A1429	T4 2nd I.F. Transformer and Can Assembly	.60
51X96	T5 Output Transformer	.72
53X245	T6 117 Volt, 60 Cycle Standard Power Transformer	2.44
53X246	T6 117 Volt 25 Cycle Standard Power Transformer	5.94
53X247	T6 117-234 Volt, 40-60 Cycle Universal Power Transformer	4.26
9A1457	T7 Loop Aerial Assembly—Broadcast Range	.78

CONDENSERS

47X150	C1	300 mmf.	Molded	$0.06
17A151	C2	2-25 mmf.	Oscillator—B Range Trimmer	.10
			Ceramic	.12
47X155	C3	13 mmf.		
17A155	C4	350-430 mmf.	600 K. C. Padder	.18
17A68	C5	1-12 mmf.	Oscillator Band Spread Trimmer	.18
47X156	C6	5 mmf.	Ceramic	.12
47X151	C7	37 mmf.	Ceramic	.12
D66501	C8	.0005 mf.	400 V. Tubular	.06
17A150	C9	2-25 mmf.	Antenna Band Spread Trimmer	.10
17A150	C10	2-25 mmf.	Ant. B Range Trimmer	.10
47X153	C11	105 mmf.	Ceramic	.12
47X152	C12	82 mmf.	Ceramic	.12
47X56	C13,C22	50 mmf.	Molded	.06
D66403	C14,C30 (C15) (C16)	.04 mf.	400 V. Tubular Part of 1st I.F. Can Assembly	.06
BG6503	C17	.05 mf.	200 V. Tubular	.06
47X154	C18 (C19) (C20)	50 mmf.	Ceramic Part of 2nd I.F. Can Assembly	.18
47X172	(C21A (C21B	60 mmf.) 60 mmf.)	Dual Mica	.10
B66403	C23	.04 mf.	200 V. Tubular	.06
B66103	C24	.01 mf.	200 V. Tubular	.06
47X65	C25	250 mmf.	Molded	.10
D66203	C26,C27	.02 mf.	400 V. Tubular	.06
B66402	C28	.004 mf.	200 V. Tubular	.06
45X305	(C29A (C29B	20 mf. 450 V.) 40 mf. 400 V.)	Dry Electrolytic 2 Section Gang Condenser (See "Automatic Tuning and Dial Assembly")	.84

RESISTORS

B95205	R1, R4	2.0 Megohm	0.5 W.	Carbon	$0.06
B95403	R2	40,000 Ohm	0.5 W.	Carbon	.06
B95503	R5	50,000 Ohm	0.5 W.	Carbon	.06
36X313	R6	500,000 Ohm	Volume	Control	.34
B94153	R7	15,000 Ohm	0.5 W.	Carbon	.08
D94253	R8	25,000 Ohm	2.0 W.	Carbon	.16
B95505	R9	5.0 Megohm	0.5 W.	Carbon	.06
B93104	R10	100,000 Ohm	0.5 W.	Carbon	.10
B95154	R11,R12	150,000 Ohm	0.5 W.	Carbon	.06
B94703	R13	70,000 Ohm	0.5 W.	Carbon	.08
B93305	R14	3.0 Megohm	0.5 W.	Carbon	.10
B95254	R15,R17	250,000 Ohm	0.5 W.	Carbon	.06
B94505	R16	5.0 Megohm	0.5 W.	Carbon	.08
B95605	R18	6.0 Megohm	0.5 W.	Carbon	.06
D932350	R19	235 Ohm	2.0 W.	Carbon	.20
40X261	R20	3.0 Megohm	Tone	Control	.30

AUTOMATIC TUNING AND DIAL ASSEMBLY

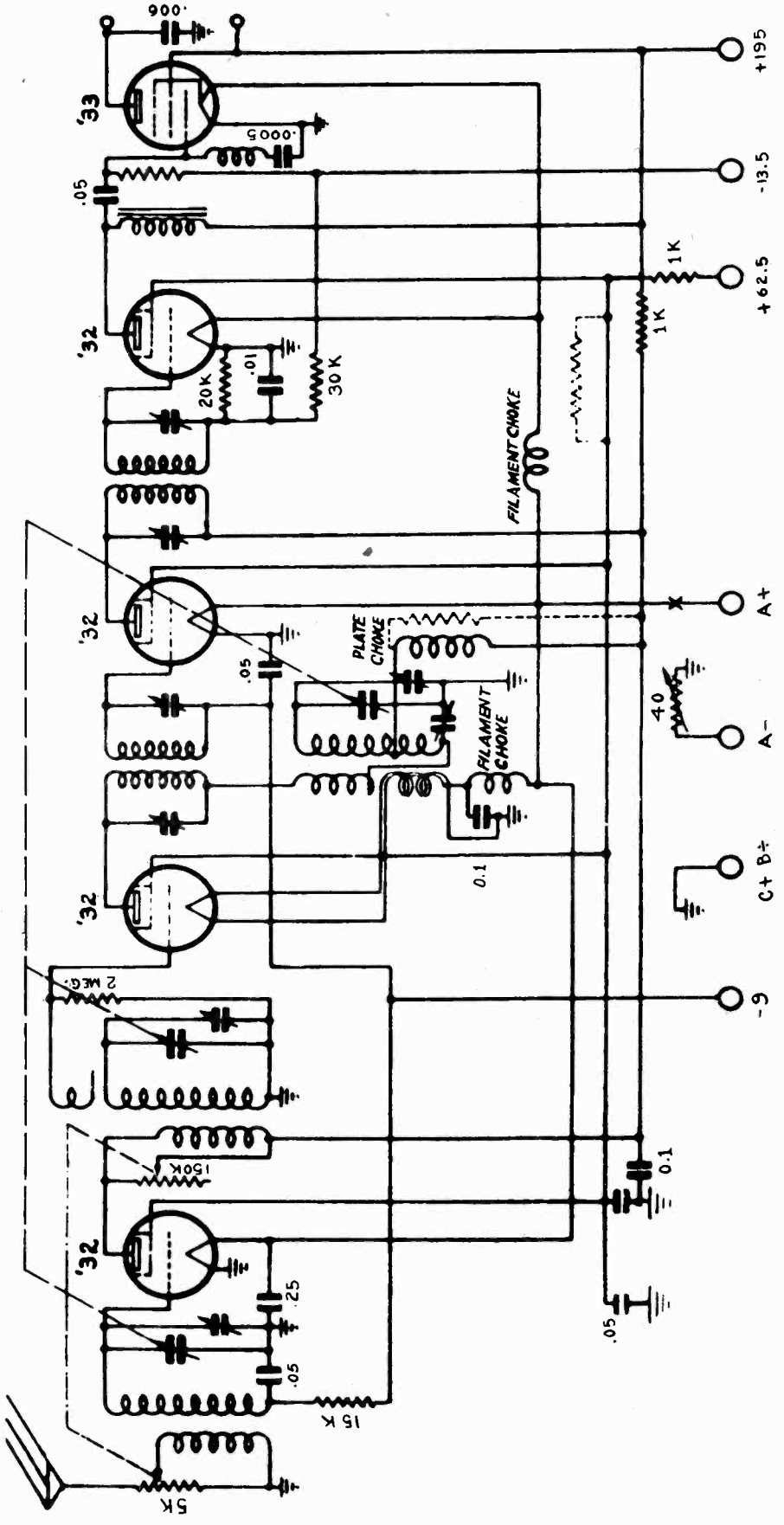
20A87	Automatic Tuning Assembly complete with Gang Condenser and Drive Pulley, less Tuner and Pulley Mounting Plate and Station Buttons	$3.90
26A322	Tuner and Pulley Mounting Plate Assembly complete with Tuning Eye Tube Clamp, Brace Bracket, String Guide, Idler Pulleys, Tuning Shaft and Bracket	1.00
58X542	Dial Scale Glass	.30
30X184	Clamps for Dial Scale Glass	.06
58X531	Cardboard Dial Background	.06
28X56	Snap Pins (To hold Dial Background to Mounting Plate) .....Doz.	.06
41X62	Lucite Light Intensifier	.54
4X619	Dial Escutcheon—Walnut Console and Phono Combination	.48
4X660	Dial Escutcheon — Mahogany Phono Combination	.52
15X193	Pointer for Dial Scale	.06
28X44	Tension Spring for Drive Cord	.02
19X192	"C" Washers for Tuning Shaft.....Doz.	.06
7A139	Dial Lamp Socket and Cable Assembly	.10
7A144	Pilot Light Socket and Cable Assembly — "On" Indicator	.16
7A32	Dial and "On" Indicator Lamps—No. 51	.10
7A147	"On" Indicator Jewel	.10
10A375	Station Buttons—Walnut Console and Phono Combination	.10
10A420	Station Buttons — Mahogany Phono Combination	.10
26A315	Set of Cali Letter Sheets and Celluloid Tabs	.12
58X540	Celluloid Tabs only (Sheet of 8).....Doz.	.18

TYPE S-28A65 AUTOMATIC RECORD CHANGER PARTS

SJ-22021	1/8" Snap Washer .....Doz.	$0.16
SH-20065	3/16" Snap Washer.....Doz.	.18
SB-27003	Tone Arm Lift Pin	.18
SB-27026	A.C. Switch	.36
SB-27355-A	Control Lever Assembly	1.06
SJ-22278	Turntable	1.62
SB-27079	Control Knob	.16
SB-27132-A	Selector Arm and Blade Assembly—No. 1 Nearest Tone Arm	.90
SB-27133-A	Selector Arm and Blade Assembly—No. 2	.90
SH-20014	Thrust Washer (used under Selector Arms) .....Doz.	.18
SB-27507	Tone Arm	1.30
SJ-22404	Tone Arm Cartridge with Sapphire Point Needle	8.36
	Retractable Pin for J-22278 Turntable	.10
SJ-22099	12" Selector Blade	.12
SB-27110	Motor Assembly—115 V., 60 cycles	4.06
SJ-22143	Motor Idler Wheel	.60
SB-27018	Switch Control Knob	.16
SB-27091	Plug Buttons .....Doz.	.72
	Idler Wheel Tension Spring	.10
SB-27020	Tone Arm Counter Balance Spring	.10
SB-27138	Tone Arm Bracket Assembly	1.50
SH-20143	Panel Mounting Spring	.10
SB-27545	Spring Mounting Stud	.06

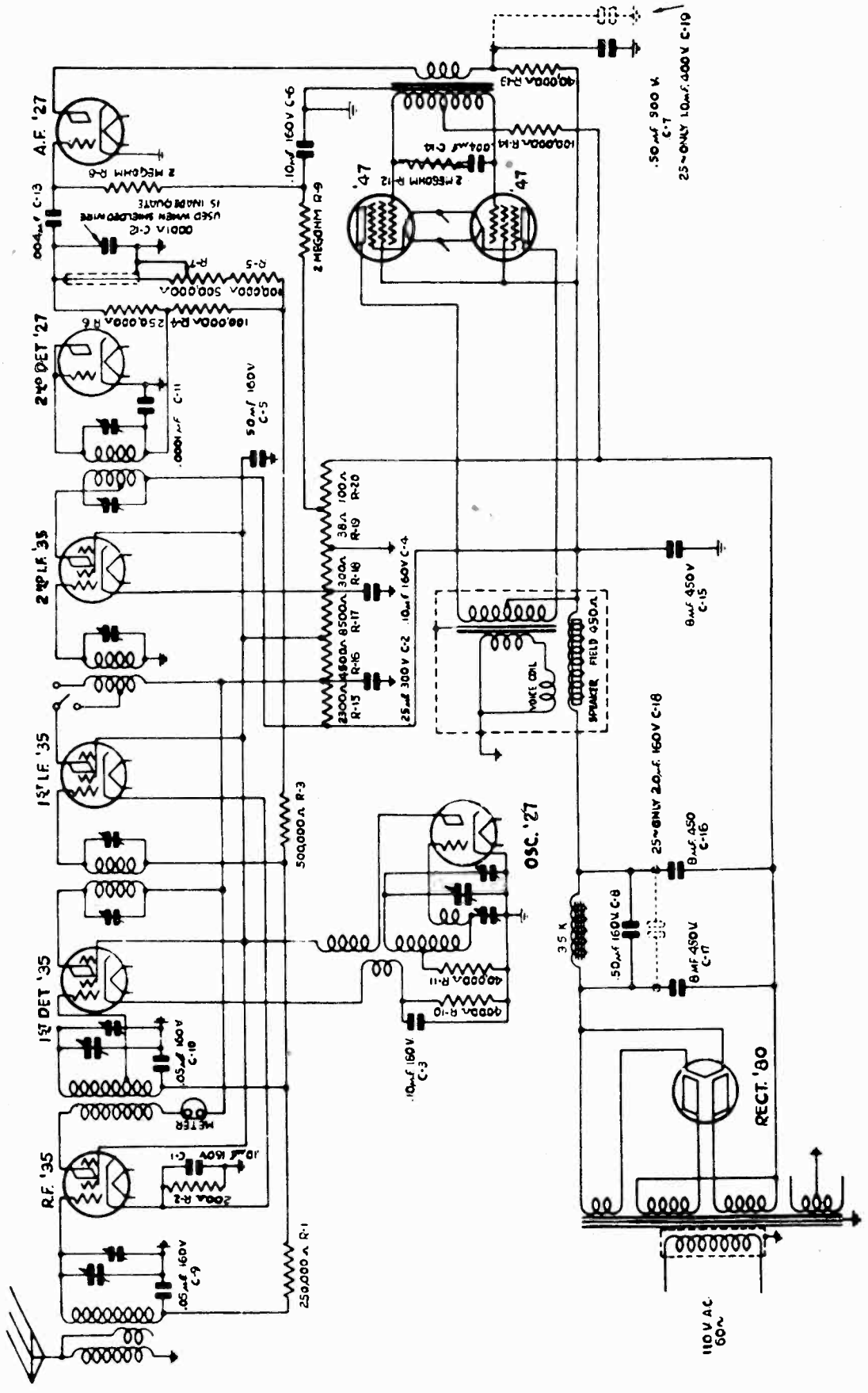
Prices Subject to Change Without Notice.

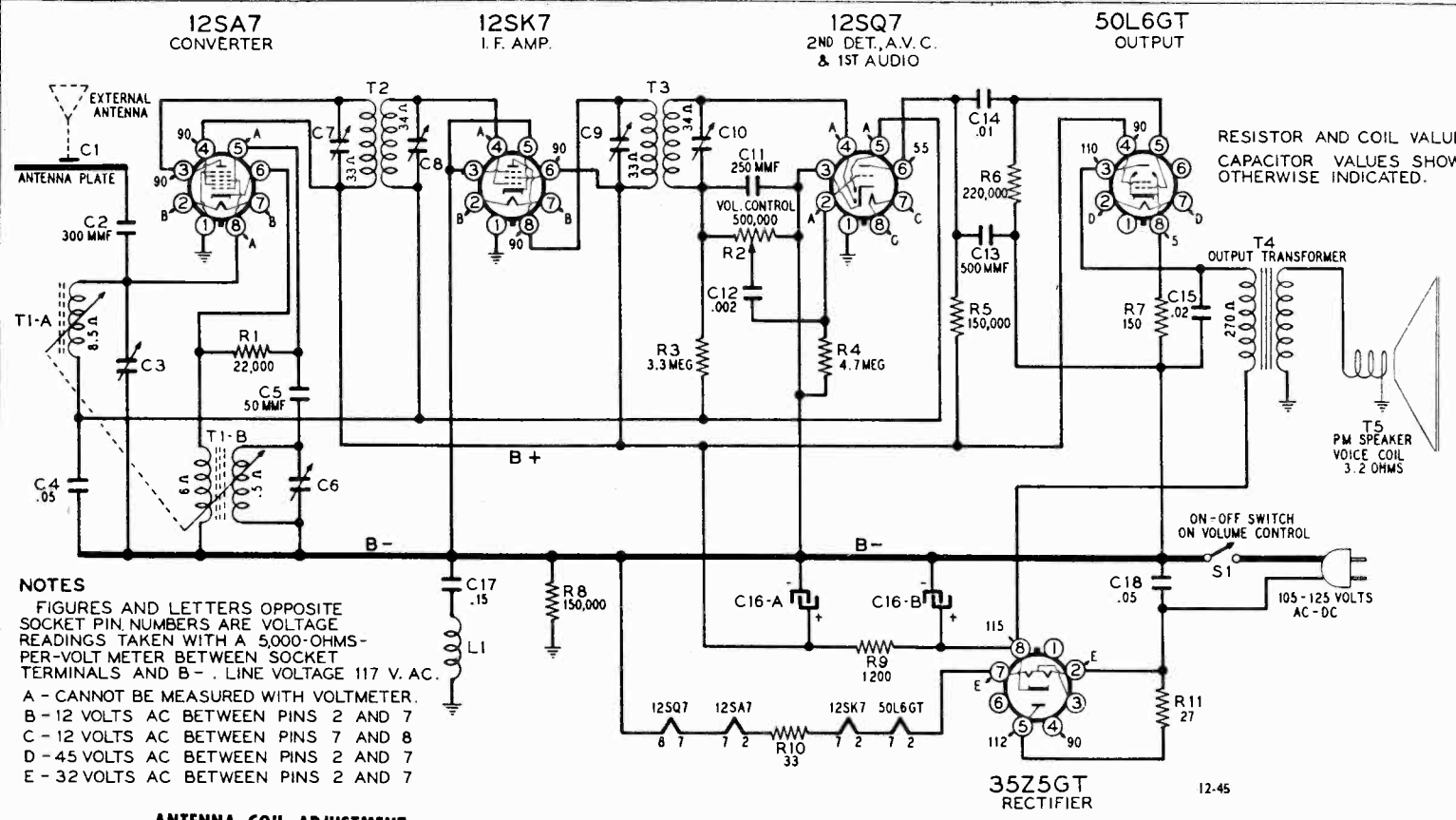
MONTGOMERY WARD



MODEL 24

MONTGOMERY WARD





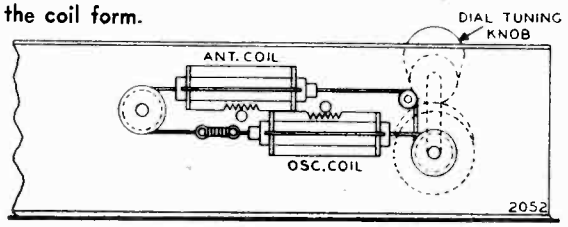
NOTES

FIGURES AND LETTERS OPPOSITE SOCKET PIN NUMBERS ARE VOLTAGE READINGS TAKEN WITH A 5,000-OHMS-PER-VOLT METER BETWEEN SOCKET TERMINALS AND B−. LINE VOLTAGE 117 V. AC.

A − CANNOT BE MEASURED WITH VOLTMETER.
B − 12 VOLTS AC BETWEEN PINS 2 AND 7
C − 12 VOLTS AC BETWEEN PINS 7 AND 8
D − 45 VOLTS AC BETWEEN PINS 2 AND 7
E − 32 VOLTS AC BETWEEN PINS 2 AND 7

ANTENNA COIL ADJUSTMENT

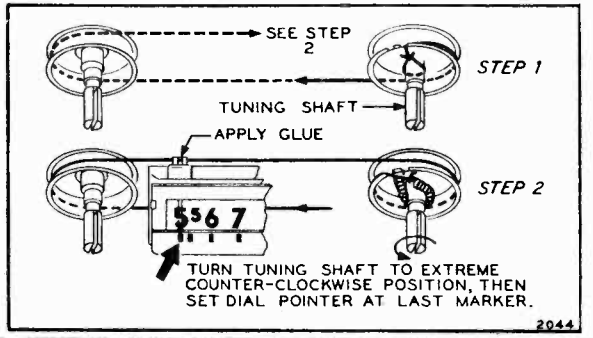
The antenna coil assembly (see illustration) is made so that it is movable left or right. When making the adjustment as required in the alignment procedure, move the coil assembly very slowly, either by hand or by pivoting one edge of the blade of a screwdriver in the hole and engaging the blade in the gear teeth of the coil form.



View of Tuning Coil Assembly.

NOTES ON DRIVE CORD REPLACEMENT

1. Eighteen inches (18″) of cord are required.
2. When tying the string to the tension spring (step 2), make sure that the spring takes up all slack.



ELECTRICAL SPECIFICATIONS

Power Supply	105 to 125 volts, DC or 50-60 cycle AC, 28 watts. Also made for 25-cycle AC.
Frequency Range	540 to 1720 kc.
Intermediate Freq.	455 kc.
Selectivity	At 1000 kc, 69 kc at 1000 x signal.
Sensitivity	28 microvolts average for .05 watt output.
Power Output	0.96 watts undistorted, 1.58 watts maximum.
Loud Speaker	4″, P.M., v.c. impedance 3.2 ohms.

MODELS 54BR-1501A,
54BR-1502A

MONTGOMERY WARD

Output meter across 3.2-ohm output load.
Volume control at maximum for all adjustments.

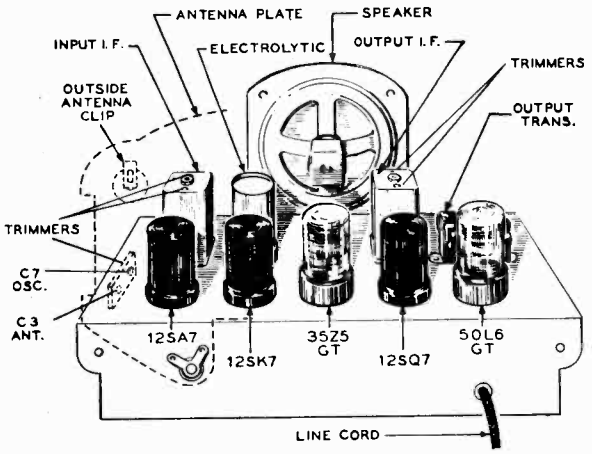
- Align for maximum output.
- Reduce input as needed to keep output near 0.4 volts.

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT in order shown
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Trimmers on output and input I.F. cans
1720 kc	.1 mf	Metal antenna plate	12SQ7 Pin 3	Iron cores all the way out	Oscillator trimmer C6
1720 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Iron cores all the way out	Antenna trimmer C3
1400 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1400 kc	Adjust position of ant. coil (see coil assembly view)
1720 kc	200 mmf	External antenna clip	12SQ7 Pin 3	Turn dial to 1720 kc	Antenna trimmer C3*

*After the antenna coil has been tracked at 1400 kc, it is necessary to check the antenna trimmer C3 again at 1720 kc. If no appreciable change in trimmer adjustment is necessary, the coil is in track. If the trimmer requires considerable change, the position of the antenna coil at 1400 kc must be readjusted. These two adjustments should be made several times, until no trimmer adjustment is required at 1720 kc.

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 volts AC across this resistor will be equivalent to a 50-milliwatt output with the 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.



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	12SQ7 Pin 3	28 microvolts
1000 kc	.1 mf	Converter 12SA7, pin 8	12SQ7 Pin 3	89 microvolts
455 kc	.1 mf	Converter 12SA7, pin 8	12SQ7 Pin 3	79 microvolts
455 kc	.1 mf	I.F. amplifier 12SK7, pin 4	12SQ7 Pin 3	4000 microvolts
400 cycles	.1 mf	Audio amplifier 12SQ7, pin 2	12SQ7 Pin 3	.05 volts
400 cycles	.1 mf	Power amplifier 50L6GT, pin 5	12SQ7 Pin 3	2.2 volts

MODELS 54BR-1501A, 54BR-1502A MODELS 54BR-1503A, 54BR-1504A

MONTGOMERY WARD

MODELS 54BR-1503B, 54BR-1504B

MODELS 54BR-1501A, 1502A

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C1		Washer capacitor mounted on antenna plate	1
C2	BE129114	300 mmf, 20%, mica, 500 volts	1
C3, C6	BE124137	Antenna and oscillator trimmers; dual mounted; C3 (ant.) range is 74 to 136 mmf; C6 (osc.) range is 95 to 175 mmf	1
C4	BE10009	.05 mf, 25%, 200 volts	1
C5	BE12939	50 mmf, 20%, mica, 500 volts	1
C7, C8		Primary and secondary trimmers in input IF can T2; dual mounted; range of each is 39 to 73 mmf	1
C9, C10		Primary and secondary trimmers in output IF can T3; dual mounted; range of each is 39 to 73 mmf	1
C11	BE12912	250 mf, 20%, mica, 500 volts	1
C12	BE10025	.002 mf, 25%, 600 volts	1
C13	BE1292	500 mmf, 20%, mica, 500 volts	1
C14	BE10011	.01 mf, 25%, 400 volts	1
C15	BE10026	.02 mf, 25%, 400 volts	1
C16-A, C16-B	BE11992	Dual electrolytic for 50-60 cycle models: 20 mf, 150 volts; 40 mf, 150 volts	1
	or		
	BE11993	Dual electrolytic for 25 cycle models: 40 mf, 150 volts; 60 mf, 150 volts	1
C17	BE10091	.15 mf, 25%, 400 volts	1
C18	BE10013	.05 mf, 25%, 400 volts	1
		RESISTORS*	
R1	BEA-9B1-78	22,000 ohms, 10%, ½ watt	1
R2, S1	BE101255	500,000-ohm volume control with on-off switch	1
R3	BEA-9B1-34	3.3 megohms, 20%, ½ watt	1
R4	BEA-9B1-35	4.7 megohms, 20%, ½ watt	1
R5, R8	BEA-9B1-26	150,000 ohms, 20%, ½ watt	2
R6	BEA-9B1-27	220,000 ohms, 20%, ½ watt	1
R7	BEA-9B1-52	150 ohms, 10%, ½ watt	1
R9	BEA-9B2-63	1200 ohms, 10%, 1 watt	1
R10	BEA-9B2-4	33 ohms, 20%, 1 watt	1
R11	BEA-9B1-43	27 ohms, 10%, ½ watt	1
		COILS AND TRANSFORMERS	
L1	BE105138	RF choke coil	1
T1-A, T1-B	BE13614	Antenna and oscillator coil tuning assembly complete with cores, drive cord, and tuning drive shaft	1
T2	BE108157H	Input IF transformer complete in can with trimmers	1
T3	BE108157I	Output IF transformer complete in can with trimmers	1
T4	BE105128B	Output transformer for speaker	1
		SPEAKER	
T5	BEB-18A-10251	4-inch P. M. speaker	1
		SOCKETS	
	BE121176	Octal wafer socket stamped "12SA7"	1
	BE121177	Octal wafer socket stamped "12SK7"	1
	BE121178	Octal wafer socket stamped "12SQ7"	1
	BE121318	Octal wafer socket stamped "50L6GT"	1
	BE121181	Octal wafer socket stamped "35Z5GT"	1
	BE121216	Bakelite socket for electrolytic capacitor	1
		DIAL AND TUNING PARTS	
	BEA-6D-10049-1	Dial scale, ivory	1
	BEA-6D-10049-2	Dial scale, walnut	1
	BEA-2D-10050	Dial background	1
	BE115731	Dial bracket	1
	BEA-2G-10051	Dial pointer	1
	BE120214	Dial pointer drive cord	18"
	BE120364	Coil spring for drive cord	1
	BE128660-9	Knob, "VOLUME", ivory	1
	BE128660-46	Knob, "VOLUME", walnut	1
	BE128661-9	Knob, "TUNING", ivory	1
	BE128661-46	Knob, "TUNING", walnut	1
		MISCELLANEOUS	
S1		On-off switch on volume control R2	1
	BE115597C	Antenna plate (back plate of cabinet, includes capacitor C1), ivory	1
	BE115597	Antenna plate (back plate of cabinet, includes capacitor C1), walnut	1
	BE131193	Cinch buttons, for fastening antenna plate to cabinet	4
	BE128652-9	Cabinet, bakelite, ivory	1
	BE128652-46	Cabinet, bakelite, walnut	1
	BE10798E	Line cord and plug	1
	BEA-2H-10715	Tube shield (12SA7, 50L6GT)	2
	BE134103	Rubber washers for mounting chassis	2
	BE131263	Offset washers for mounting chassis	2
	BE13220	Screws, 6—32 x 3/8", for mounting chassis	2

MODELS 54BR-1503A, 1504A

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C, C3, C4	B-210-10040	2-gang capacitor assembly, including antenna and oscillator trimmers	1
C1	C-8D-10761	.01 mf, 400 volts, 20%	1
C2, C8, C9	C-8F3-10	220 mmf, 500 volts, 20%, mica	3
C5, C7	C-8F3-8	100 mmf, 500 volts, 20%, mica	2
C6	C-8D-10770	.05 mf, 200 volts, 20%	1
C10	C-8D-10788	.004 mf, 600 volts, 20%	1
C11	C-8D-10772	.02 mf, 600 volts, 20%	1
C12, C16	C-8D-10760	.1 mf, 400 volts, +20—10%	2
C13, C14, C15	A-8C-10077	Electrolytic for 60 cycles; 40 mf x 150 volts, 20 mf x 150 volts, 20 mf x 150 volts	1
C13, C14, C15	A-8C-10946	Electrolytic for 25 cycles; 60 mf x 150 volts, 40 mf x 150 volts, 40 mf x 150 volts	1
C17	C-8D-10789	.002 mf, 600 volts, 20%	1
C18	C-8D-10771	.1 mf, 200 volts, +20—10%	1
		RESISTORS*	
R1	C-9B1-13	1000 ohms, ½ watt, 20%	1
R2	C-9B1-31	1 megohm, ½ watt, 20%	1
R3	C-9B1-78	22,000 ohms, ½ watt, 10%	1
R4, R9	C-9B1-90	220,000 ohms, ½ watt, 10%	2
R5	C-9B1-82	47,000 ohms, ½ watt, 10%	1
R6, S1	A-10A-10075	Volume control (500,000 ohms) and switch	1
R7	C-9B1-34	3.3 megohms, ½ watt, 20%	1
R8	C-9B1-37	10 megohms, ½ watt, 20%	1
R10	C-9B1-94	470,000 ohms, ½ watt, 10%	1
R11	C-9B1-52	150 ohms, ½ watt, 10%	1
R12	C-9B1-43	27 ohms, ½ watt, 10%	1
R13	C-9B2-53	180 ohms, 1 watt, 10%	1
R14	C-9B2-63	1200 ohms, 1 watt, 10%	1
R15	C-9B1-5	47 ohms, ½ watt, 20%	1
		TRANSFORMERS AND COILS	
L1	A-16A-10090	Choke coil	1
T1	C-212-10435	Loop antenna assembly, for walnut cabinet (includes loop, back, resistor R1, and capacitor C1)	1
T1	C-212-10435-1	Loop antenna assembly, for ivory cabinet (includes loop, back, resistor R1, and capacitor C1)	1
T2	A-13D-10089	Oscillator coil	1
T3	B-13B-10091	Input IF transformer, complete in can. (Range of trimmers: 45-85 mmf each)	1
T4	B-13B-10092	Output IF transformer, complete in can. (Range of trimmers: 43-80 mmf each)	1
T5	B-12C-10074	Output transformer for speaker	1
		SPEAKER	
T6	B-18A-10094	4-in. x 6-in. oval P.M. speaker	1
		DIAL AND TUNING PARTS	
	B-200-10447	Dial bracket assembly	1
	B-6D-10031	Dial scale (for walnut cabinet)	1
	B-6D-10031-1	Dial scale (for ivory cabinet)	1
	B-2M-7758	Cinch button, for fastening dial scale	7
	A-6J-10032	Crystal for dial	1
	A-2D-10036	Bracket for crystal	1
	A-2G-10095	Pointer	1
	B-2H-10039	Pointer guard (for walnut cabinet)	1
	B-2H-10039-1	Pointer guard (for ivory cabinet)	1
	A-53A-10576	Drive cord for dial pointer	36"
	A-49A-10078	Tension spring for dial drive cord	1
	A-46A-3560	Dial light bulb, 6-8 volts, type T-47	1
	A-55A-10093	Socket and bracket for dial light	1
	A-3A-10035	Tuning shaft	1
	B-29E-466	Spring washer, for tuning shaft	1
		MISCELLANEOUS	
	5C-10000-46	Cabinet, bakelite, walnut	1
	5C-10000-9	Cabinet, bakelite, ivory	1
	B-5B-10011-47	Knob, tenite, walnut	2
	B-5B-10011-8	Knob, tenite, ivory	2
	A-15B-10440	Socket, octal, for tubes	5
	B-14M-10088	Line cord and plug	1
	A-2M-10096	Stud, for fastening back to cabinet	4
	42A-10097	Screw, 8-18 x 7/8 hex head, for mounting chassis	3

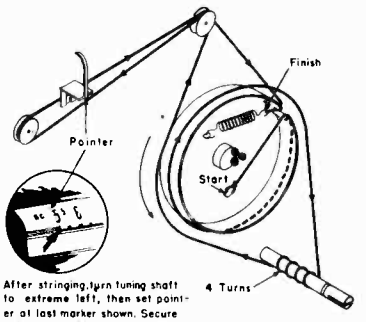
*The values of the resistors listed above are based on RMA standards. Due to conditions beyond our control some receivers have been shipped with resistors of pre-standardized values. This receiver will operate equally well with resistors of either group. An illustration of the difference follows:

Pre-standardized value—50,000 ohms, ±10%, ½ watt
RMA value—47,000 ohms, ±10%, ½ watt

NOTE ON TUBE REPLACEMENT

Replace a defective metal 12SK7 tube with another metal tube. Replace a glass 12SK7 tube with a metal tube or with an exact duplicate of the tube now in the set.

MODELS 54BR-1503B, 1504B



After stringing, turn tuning shaft to extreme left, then set pointer at last marker shown. Secure pointer to string with glue.

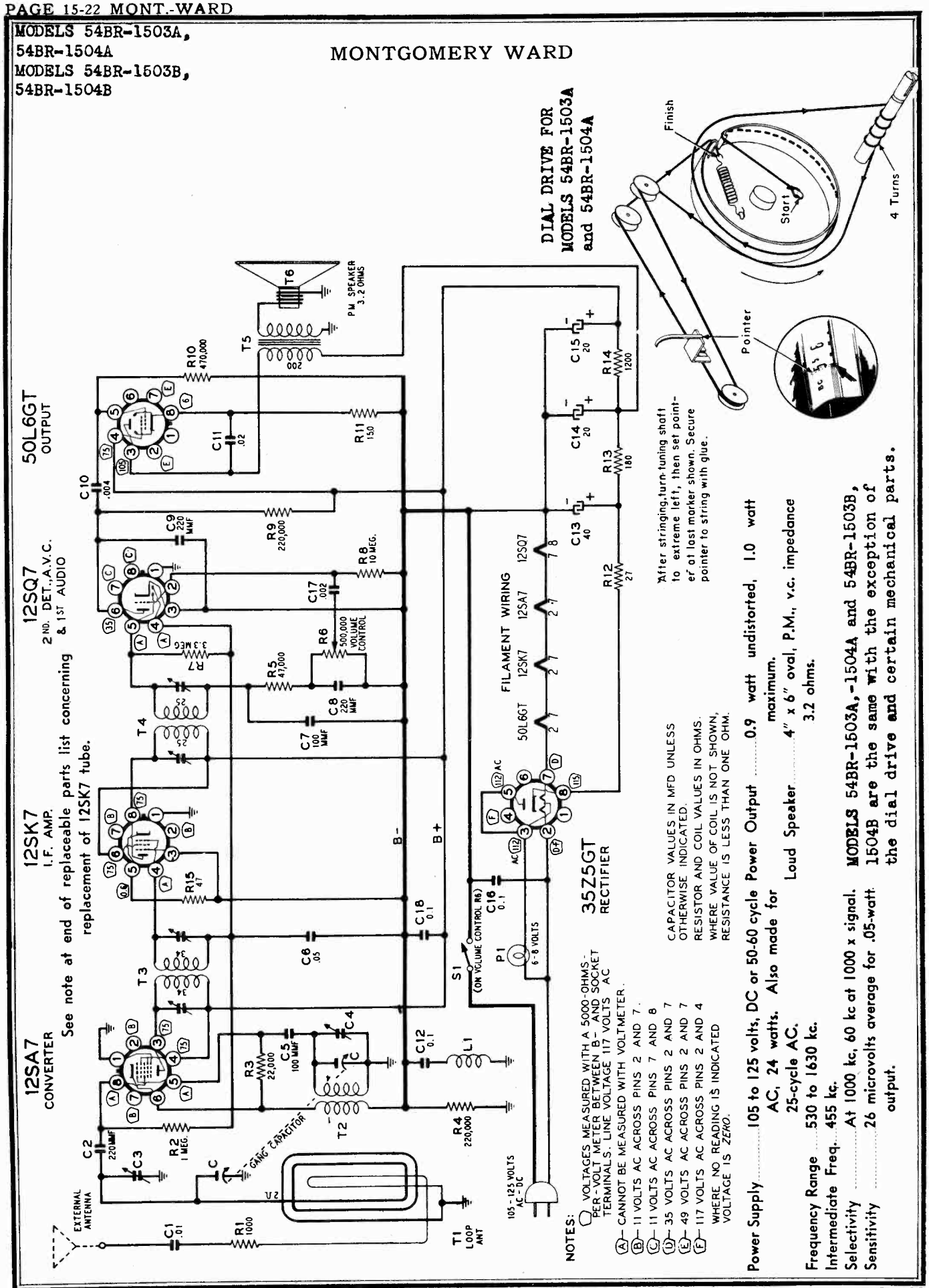
205-A

Dial Stringing Diagram

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C, C3, C4	B-210-10040	2-gang capacitor assembly, including antenna and oscillator trimmers	1
C1	C-8D-10761	.01 mf, 400 volts, 20%	1
C2, C8, C9	C-8F3-10	220 mmf, 500 volts, 20%, mica	3
C5, C7	C-8F3-8	100 mmf, 500 volts, 20%, mica	2
C6	C-8D-10770	.05 mf, 200 volts, 20%	1
C10	C-8D-10788	.004 mf, 600 volts, 20%	1
C11	C-8D-10772	.02 mf, 600 volts, 20%	1
C12, C16	C-8D-10760	.1 mf, 400 volts, +20—10%	2
C13, C14, C15	A-8C-10077	Electrolytic for 60 cycles; 40 mf x 150 volts, 20 mf x 150 volts, 20 mf x 150 volts	1
C13, C14, C15	A-8C-10946	Electrolytic for 25 cycles; 60 mf x 150 volts, 40 mf x 150 volts, 40 mf x 150 volts	1
C17	C-8D-10789	.002 mf, 600 volts, 20%	1
C18	C-8D-10771	.1 mf, 200 volts, +20—10%	1
		RESISTORS*	
R1	C-9B1-13	1000 ohms, ½ watt, 20%	1
R2	C-9B1-31	1 megohm, ½ watt, 20%	1
R3	C-9B1-78	22,000 ohms, ½ watt, 10%	1
R4, R9	C-9B1-90	220,000 ohms, ½ watt, 10%	2
R5	C-9B1-82	47,000 ohms, ½ watt, 10%	1
R6, S1	A-10A-10075	Volume control (500,000 ohms) and switch	1
R7	C-9B1-34	3.3 megohms, ½ watt, 20%	1
R8	C-9B1-37	10 megohms, ½ watt, 20%	1
R10	C-9B1-94	470,000 ohms, ½ watt, 10%	1
R11	C-9B1-52	150 ohms, ½ watt, 10%	1
R12	C-9B1-43	27 ohms, ½ watt, 10%	1
R13	C-9B2-53	180 ohms, 1 watt, 10%	1
R14	C-9B2-63	1200 ohms, 1 watt, 10%	1
R15	C-9B1-5	47 ohms, ½ watt, 20%	1
		TRANSFORMERS AND COILS	
L1	A-16A-10090	Choke coil	1
T1	C-212-10435	Loop antenna assembly, for walnut cabinet (includes loop, back, resistor R1, and capacitor C1)	1
	or		
	C-212-11058		
T1	C-212-10435-1	Loop antenna assembly, for ivory cabinet (includes loop, back, resistor R1, and capacitor C1)	1
	or		
	C-212-11058-1		
T2	A-13D-10089	Oscillator coil	1
T3	B-13B-10091	Input IF transformer, complete in can. (Range of trimmers: 45-85 mmf each)	1
T4	B-13B-10092	Output IF transformer, complete in can. (Range of trimmers: 43-80 mmf each)	1
T5	B-12C-10074	Output transformer for speaker	1
		SPEAKER	
T6	B-18A-10094	4-in. x 6-in. oval P.M. speaker	1
		DIAL AND TUNING PARTS	
	B-200-10447	Dial bracket assembly	1
	B-6D-10031	Dial scale (for walnut cabinet)	1
	B-6D-10031-1	Dial scale (for ivory cabinet)	1
	A-6A-11078	Diffuser	1
	B-2M-7758	Cinch button, for fastening dial scale	7
	A-6J-10032	Crystal for dial	1
	A-2D-10036	Bracket for crystal (walnut)	2
	A-2D-10036-1	Bracket for crystal (ivory)	2
	A-2G-10095	Pointer	1
	B-2H-10039	Pointer guard (for walnut cabinet)	1
	B-2H-10039-1	Pointer guard (for ivory cabinet)	1
	A-53A-10576	Drive cord for dial pointer	36"
	A-49A-10078	Tension spring for dial drive cord	1
	A-46A-3560	Dial light bulb, 6-8 volts, type T-47	1
	A-55A-10093	Socket and bracket for dial light	1
	A-3A-10035	Tuning shaft	1
	B-29E-466	Spring washer, for tuning shaft	1
		MISCELLANEOUS	
	5C-10000-46	Cabinet, bakelite, walnut	1
	5C-10000-9	Cabinet, bakelite, ivory	1
	B-5B-10011-17	Knob, tenite, walnut	2
	B-5B-10011-8	Knob, tenite, ivory	2
	A-15B-10440	Socket, octal, for all tubes but 12SK7	4
	121177	Socket, octal, for 12SK7	1
	B-14M-10088	Line cord and plug	1
	A-2M-10096	Stud, for fastening back to cabinet	4
	42A-10097	Screw, 8-18 x 7/8 hex head, for mounting chassis	3

MODELS 54BR-1503A,
54BR-1504A
MODELS 54BR-1503B,
54BR-1504B

MONTGOMERY WARD



NOTES:
- VOLTAGES MEASURED WITH A 5000-OHMS-PER-VOLT METER BETWEEN B- AND SOCKET TERMINALS. LINE VOLTAGE 117 VOLTS AC
- (A) CANNOT BE MEASURED WITH VOLTMETER.
- (B) 11 VOLTS AC ACROSS PINS 2 AND 7.
- (C) 11 VOLTS AC ACROSS PINS 7 AND 8
- (D) 35 VOLTS AC ACROSS PINS 2 AND 7
- (E) 49 VOLTS AC ACROSS PINS 2 AND 7
- (F) 117 VOLTS AC ACROSS PINS 2 AND 4

WHERE NO READING IS INDICATED VOLTAGE IS *ZERO*.

CAPACITOR VALUES IN MFD UNLESS OTHERWISE INDICATED.
RESISTOR AND COIL VALUES IN OHMS.
WHERE VALUE OF COIL IS NOT SHOWN, RESISTANCE IS LESS THAN ONE OHM.

Power Supply ..... 105 to 125 volts, DC or 50-60 cycle
Power Output ..... 0.9 watt undistorted, 1.0 watt maximum.
AC, 24 watts. Also made for 25-cycle AC.
Loud Speaker ..... 4" x 6" oval, P.M., v.c. impedance 3.2 ohms.
Frequency Range ..... 530 to 1630 kc.
Intermediate Freq. ..... 455 kc.
Selectivity ..... At 1000 kc, 60 kc at 1000 x signal.
Sensitivity ..... 26 microvolts average for .05-watt output.

MODELS 54BR-1503A,-1504A and 54BR-1503B, 1504B are the same with the exception of the dial drive and certain mechanical parts.

DIAL DRIVE FOR MODELS 54BR-1503A and 54BR-1504A

After stringing, turn tuning shaft to extreme left, then set pointer at last marker shown. Secure pointer to string with glue.

For Parts list, see P.15-21

MONTGOMERY WARD

MODELS 54BR-1503A, 54BR-1504A
MODELS 54BR-1503B, 54BR-1504B
MODELS 54BR-1503C, 54BR-1504C

ALIGNMENT PROCEDURE

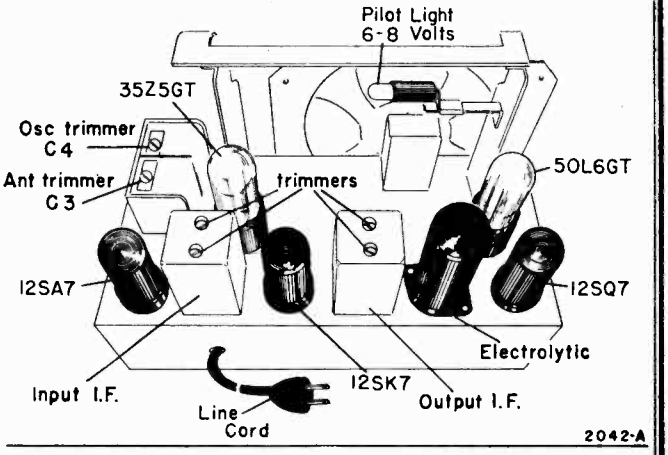
Output meter across 3.2-ohm output load.
Volume control at maximum for all adjustments.
Align for maximum output. Reduce input as needed to keep output near 0.4 volts.
Loop antenna should be connected to receiver and in its proper position when making adjustments.

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT in order shown
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	0.1 mf	Grid (pin 4) of 12SK7	Pin 3 of 12SK7 (B- of set)	Capacitor full open (plates out of mesh)	2 trimmers on output IF can
455 kc	0.1 mf	Grid (pin 8) of 12SA7	Pin 3 of 12SK7 (B- of set)	Capacitor full open (plates out of mesh)	2 trimmers on input IF can
1630 kc	0.1 mf	Grid (pin 8) of 12SA7	Pin 3 of 12SK7 (B- of set)	Capacitor full open (plates out of mesh)	Oscillator trimmer C4 on gang
1400 kc	200 mmf	External antenna clip	Pin 3 of 12SK7 (B- of set)	Set dial pointer at 1400 kc	Antenna trimmer C3 on gang

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 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.



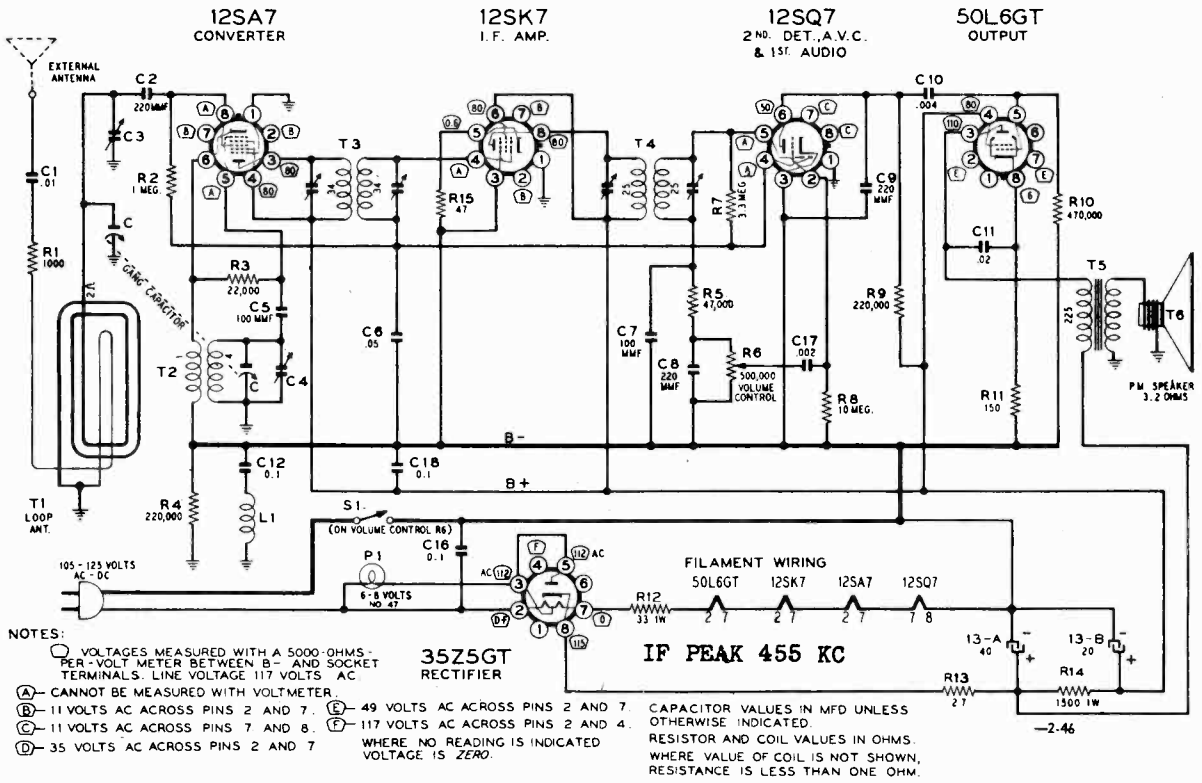
Chassis View, Showing Trimmer Location

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	Pin 3 of 12SK7 (B- of set)	24 microvolts
1000 kc	0.1 mf	Grid (pin 8) of converter (12SA7)	Pin 3 of 12SK7 (B- of set)	98 microvolts
455 kc	0.1 mf	Grid (pin 8) of converter (12SA7)	Pin 3 of 12SK7 (B- of set)	74 microvolts
455 kc	0.1 mf	Grid (pin 4) of I.F. amp. (12SK7)	Pin 3 of 12SK7 (B- of set)	3200 microvolts
400 cycles	0.1 mf	Grid (pin 2) of audio amp. (12SQ7)	Pin 3 of 12SK7 (B- of set)	.043 volts
400 cycles	0.1 mf	Grid (pin 5) of output amp. (50L6GT)	Pin 3 of 12SK7 (B- of set)	2.0 volts

MODELS 54BR-1503C,
54BR-1504C

MONTGOMERY WARD



NOTES:

VOLTAGES MEASURED WITH A 5000-OHMS-PER-VOLT METER BETWEEN B- AND SOCKET TERMINALS. LINE VOLTAGE 117 VOLTS AC

(A)— CANNOT BE MEASURED WITH VOLTMETER.
(B)— 11 VOLTS AC ACROSS PINS 2 AND 7.
(C)— 11 VOLTS AC ACROSS PINS 7 AND 8.
(D)— 35 VOLTS AC ACROSS PINS 2 AND 7
(E)— 49 VOLTS AC ACROSS PINS 2 AND 7.
(F)— 117 VOLTS AC ACROSS PINS 2 AND 4.

WHERE NO READING IS INDICATED VOLTAGE IS *ZERO*.

CAPACITOR VALUES IN MFD UNLESS OTHERWISE INDICATED.
RESISTOR AND COIL VALUES IN OHMS.
WHERE VALUE OF COIL IS NOT SHOWN, RESISTANCE IS LESS THAN ONE OHM.

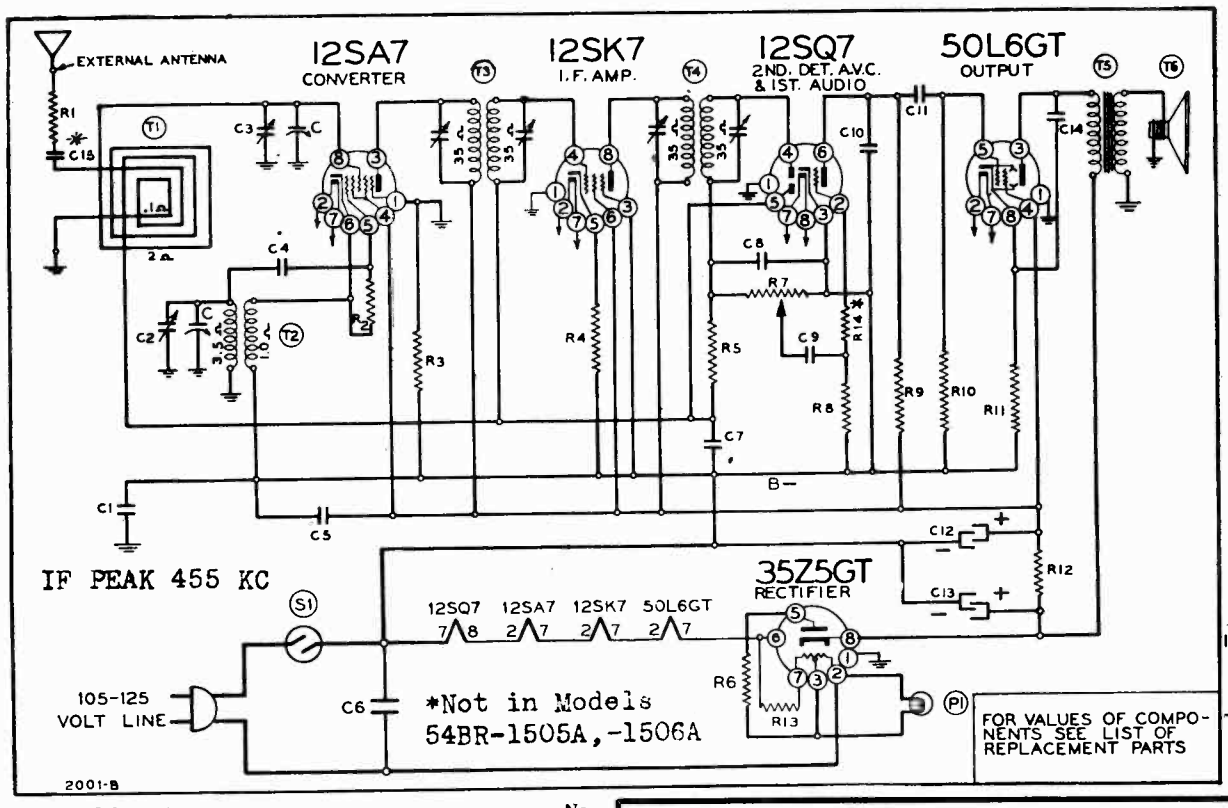
—2-46

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS*	
C, C3, C4	B-210-10040	2-gang capacitor assembly, including antenna and oscillator trimmers	1
C1	C-8D-10761	.01 mf, 400 volts, 20%	1
C2, C8, C9	C-8F3-10	220 mmf, 500 volts, 20%, mica	3
C5, C7	C-8F3-8	100 mmf, 500 volts, 20%, mica	2
C6	C-8D-10770	.05 mf, 200 volts, 20%	1
C10	C-8D-10788	.004 mf, 600 volts, 20%	1
C11	C-8D-10772	.02 mf, 600 volts, 20%	1
C12, C16	C-8D-10760	.1 mf, 400 volts, +20—10%	2
C13-A,-B	11992	Electrolytic for 60 cycles; 40 mf x 150 volts, 20 mf x 150 volts	1
C13-A,-B	11993	Electrolytic for 25 cycles; 60 mf x 150 volts, 40 mf x 150 volts	1
C17	C-8D-10789	.002 mf, 600 volts, 20%	1
C18	C-8D-10771	.1 mf, 200 volts, +20—10%	1
		RESISTORS*	
R1	C-9B1-13	1000 ohms, 1/2 watt, 20%	1
R2	C-9B1-31	1 megohm, 1/2 watt, 20%	1
R3	C-9B1-78	22,000 ohms, 1/2 watt, 10%	1
R4, R9	C-9B1-90	220,000 ohms, 1/2 watt, 10%	2
R5	C-9B1-82	47,000 ohms, 1/2 watt, 10%	1
R6, S1	A-10A-10075	Volume control (500,000 ohms) and switch	1
R7	C-9B1-34	3.3 megohms, 1/2 watt, 20%	1
R8	C-9B1-37	10 megohms, 1/2 watt, 20%	1
R10	C-9B1-94	470,000 ohms, 1/2 watt, 10%	1
R11	C-9B1-52	150 ohms, 1/2 watt, 10%	1
R12	C-9B2-44	33 ohms, 1 watt, 10%	1
R13	C-9B1-43	27 ohms, 1/2 watt, 10%	1
R14	C-9B2-64	1500 ohms, 1 watt, 10%	1
R15	C-9B1-5	47 ohms, 1/2 watt, 20%	1
		TRANSFORMERS AND COILS	
L1	A-16A-10090	Choke coil	1
T1	C-212-10435 or C-212-11058	Loop antenna assembly, for walnut cabinet (includes loop, back, resistor R1, and capacitor C1)	1
T1	C-212-10435-1 or C-212-11058-1	Loop antenna assembly, for ivory cabinet (includes loop, back, resistor R1, and capacitor C1)	1
T2	A-13D-10089	Oscillator coil	1

Ref. No.	Part No.	Description	Qty. Used in Set
T3	B-13B-10091	Input IF transformer, complete in can. (Range of trimmers: 45-85 mmf each)	1
T4	B-13B-10092	Output IF transformer, complete in can. (Range of trimmers: 43-80 mmf each)	1
T5	B-12C-10074	Output transformer for speaker	1
		SPEAKER	
T6	B-18A-10094	4-in. x 6-in. oval P.M. speaker	1
		DIAL AND TUNING PARTS	
	B-200-10447	Dial bracket assembly	1
	B-6D-10031	Dial scale (for walnut cabinet)	1
	B-6D-10031-1	Dial scale (for ivory cabinet)	1
	A-6A-11078	Diffuser	1
	B-2M-7758	Cinch button, for fastening dial scale	7
	A-6J-10032	Crystal for dial	1
	A-2D-10036	Bracket for crystal (walnut)	2
	A-2D-10036-1	Bracket for crystal (ivory)	2
	A-2G-10095	Pointer	1
	B-2H-10039	Pointer guard (for walnut cabinet)	1
	B-2H-10039-1	Pointer guard (for ivory cabinet)	1
	A-53A-10576	Drive cord for dial pointer	36"
	A-49A-10078	Tension spring for dial drive cord	1
	A-46A-3560	Dial light bulb, 6-8 volts, type T-47	1
	A-55A-10093	Socket and bracket for dial light	1
	A-3A-10035	Tuning shaft	1
	B-29E-466	Spring washer, for tuning shaft	1
		MISCELLANEOUS	
	5C-10000-46	Cabinet, bakelite, walnut	1
	5C-10000-9	Cabinet, bakelite, ivory	1
	B-5B-10011-17	Knob, tenite, walnut	2
	B-5B-10011-8	Knob, tenite, ivory	2
	A-15B-10440	Socket, octal, for all tubes but 12SK7	4
	121177	Socket, octal, for 12SK7	1
	B-14M-10088	Line cord and plug	1
	A-2M-10096	Stud, for fastening back to cabinet	4
	42A-10097	Screw, 8-18 x 7/8 hex head, for mounting chassis	3

For Alignment, see P.15-23

MONTGOMERY WARD MODELS 54BR-1505A, 54BR-1506A, MODELS 54BR-1505B, 54BR-1506B



Part No.	Schematic Diagram Reference	Description	No. Used In Set
		CONDENSERS	
BE100110	C1	.2 x 400 volt tubular condenser	1
BE12921	C4	.0002 mica type condenser, 20%	1
BE1009	C5, C7	.05 x 200 volt tubular condenser	2
BE1001	C6	.1 x 400 volt tubular condenser	1
BE1295	C8	.0001 mica type condenser, 20%	1
BE10025	C9	.002 x 600 volt tubular condenser	1
BE12912	C10	.00025 mica type condenser, 20%	1
BE100106	C11	.004 x 600 volt tubular condenser	1
BE11992	C12, C13	Electrolytic filter condenser, 50 to 60 cycles, 20 mfd.–40 mfd. x 150 volts	1
BE11993	C12, C13	Electrolytic filter condenser, 25 cycles, 40 mfd.–60 mfd. x 150 volts	1
BE10026	C14	.02 x 400 volt tubular condenser	1
BEC-8D-10778	C15 *	.002 x 600 volt tubular condenser	1
		RESISTORS*	
BEA-9B1-13	R1	1,000 ohm, ½ watt resistor, 20%	1
BEA-9B1-82	R2	47,000 ohm, ½ watt resistor, 10%	1
BEA-9B1-27	R3	220,000 ohm, ½ watt resistor, 20%	1
BEA-9B1-46	R4	47 ohm, ½ watt resistor, 10%	1
BEA-9B1-34	R5	3.3 megohm, ½ watt resistor, 20%	1
BEA-9B1-42	R6	22 ohm, ½ watt resistor, 10%	1
BEA-9B1-35	R8	4.7 megohm, ½ watt resistor, 20%	1
BEA-9B1-29	R9	470,000 ohm, ½ watt resistor, 20%	1
BEA-9B1-30	R10	680,000 ohm, ½ watt resistor, 20%	1
BEA-9B1-52	R11	150 ohm, ½ watt resistor, 10%	1
BEA-9B2-63	R12	1200 ohm, 1 watt resistor, 10%	1
BEA-9B2-4	R13	33 ohm, 1 watt resistor, 20%	1
BEA-9B1-23	R14 *	47,000 ohm, ½ watt resistor, 20%	1
		COILS	
BE108140K	T3	Input I.F. coil, complete in can	1
BE108141F	T4	Output I.F. coil, complete in can	1
BE110145	T2	Oscillator coil	1
BE111252B	T1	Loop antenna only (less back)	1
BE128724		Back for loop, brown	1
BE128724B		Back for loop, ivory	1

*SPECIAL NOTE ON RESISTORS: The values of all 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, ±10%, 1/3 watt
RMA value—47,000 ohms, ±10%, 1/2 watt

NOTE ON TUBE REPLACEMENT

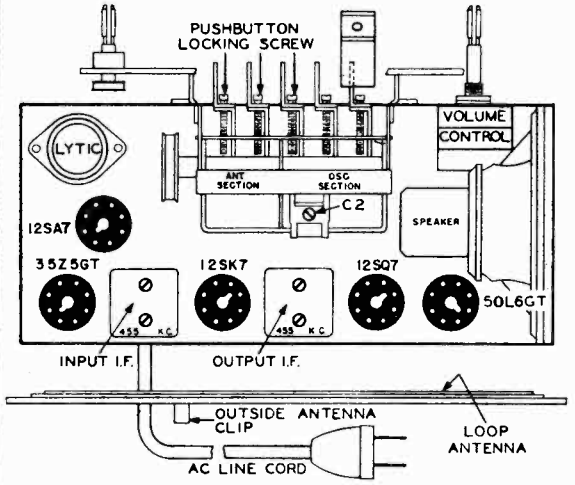
Replace a defective metal 12SK7 tube wtih another metal tube. Replace a glass 12SK7 tube with either a metal tube or with an exact duplicate of the tube now in the set.

Part No.	Schematic Diagram Reference	Description	No. Used in Set
		SPEAKER	
BE114248C	T6	Five-inch P.M. dynamic speaker (less utput transformer)	1
BE105108B	T5	Output transformer for speaker	1
		MISCELLANEOUS	
BE101265	R7, S1	Volume control and switch (1 megohm)	1
BEB-8A-10209	C, C2, C3	Two-gang variable condenser with 5-button automatic tuner assembly	1
BE107-98		Line cord and plug	1
BE121210		Eight-prong octal socket	5
BE107249	P1	6-8 volt pilot light bulb, type T-47	1
BE107358		Socket assembly for pilot light	1
BE132264		No. 8-18 x ¾ chassis mounting screw	1
BE134123		Rubber bumper for bottom of cabinet	4
BE128655-46		Bakelite cabinet, walnut	1
BE128655-9		Bakelite cabinet, ivory	1
		DIAL AND TUNING PARTS	
BE112945B		Dial plate	1
BEB-6D-10117		Dial scale (Model 54BR-1505A only)	1
BEB-6D-10117-1		Dial scale (Model 54BR-1506A only)	1
BEB-2G-10118		Pointer	1
BE112969		Crystal for dial	1
BEA-2M-7758		Button for fastening dial scale	2
BE120375		String for dial	3 ft.
BE120372		Coiled tension spring for dial string	1
BE112959		Pulley for dial	1
BE117910		Pointer shaft	1
BEA-3A-10119		Tuning shaft	1
BE117902		Rod for pushbuttons	1
BE128795-47		Pushbutton, left, walnut	2
BE128794-47		Pushbutton, right, walnut	3
BE128795-8		Pushbutton, left, ivory	2
BE128794-8		Pushbutton, right, ivory	3
BE112973		Set of station call letters	1 set
BE112979		Set of celluloid tabs	1 set
BE128686-47		Knob, "Volume," walnut	1
BE128687-47		Knob, "Tuning," walnut	1
BE128686-8		Knob, "Volume," ivory	1
BE128687-8		Knob, "Tuning," ivory	1
BE131383		Screwdriver	1

ALIGNMENT PROCEDURE

Volume control setting—Maximum (extreme clockwise) for all adjustments.
Connect ground lead of signal generator to B— of radio chassis through a 0.1 mfd. condenser.
The loop antenna should be connected to the radio and in its proper position when making all adjustments.

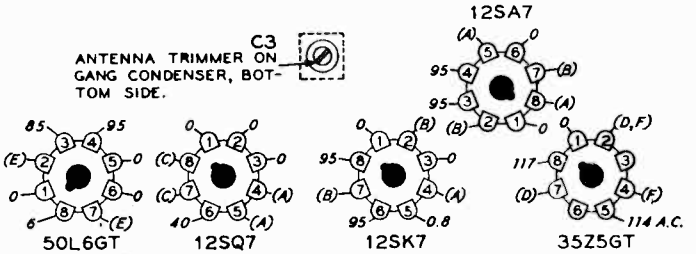
BAND	Signal Generator Frequency Setting	Dummy Antenna	Connection to Radio	Variable Condenser Setting	Trimmer Adjusted to Maximum
I. F.	455 Kc.	.1 mfd.	Grid of 12SK7 I. F.	Rotor full open (Plates out of mesh)	Two trimmers on top of Output I. F.
	455 Kc.	.1 mfd.	Grid of 12SA7 Mixer	Rotor full open (Plates out of mesh)	Two trimmers on top of Input I. F.
BROADCAST	1600 Kc.	200 mmf.	Grid of 12SA7	Rotor full open (Plates out of mesh)	B.C. Osc. trimmer C2 on Gang
	1400 Kc.	200 mmf.	External Antenna and B—	Set Dial at 1400 K. C.	B.C. Ant. trimmer C3 under Gang



A—CANNOT BE MEASURED BY VOLTMETER
B—11 VOLTS A.C. ACROSS PINS 2 AND 7
C—11 VOLTS A.C. ACROSS PINS 7 AND 8
D—33 VOLTS A.C. ACROSS PINS 2 AND 7
E—48 VOLTS A.C. ACROSS PINS 2 AND 7
F—117 VOLTS A.C. ACROSS PINS 2 AND 4

ALL VOLTAGES MEASURED WITH A 1000-OHMS/VOLT VOLTMETER BETWEEN TERMINAL INDICATED AND B-. LINE VOLTAGE 117 VOLTS A.C.

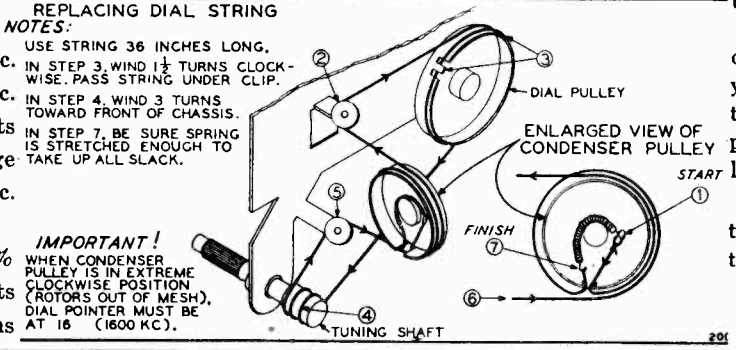
Voltages at tube socket terminals



Technical Data

Tuning range .....535 to 1600 Kc.
Intermediate Frequency .....455 Kc.
Power consumption .....35 watts
Sensitivity (for 0.05 watt output) 30 microvolts average
Selectivity .58 Kc. broad at 1000 times signal at 1000 Kc.
Power output (in voice coil)
Undistorted .....1.0 watt at 10%
Maximum .....1.7 watts
Voice coil impedance.....3.2 ohms

BOTTOM VIEW OF CHASSIS



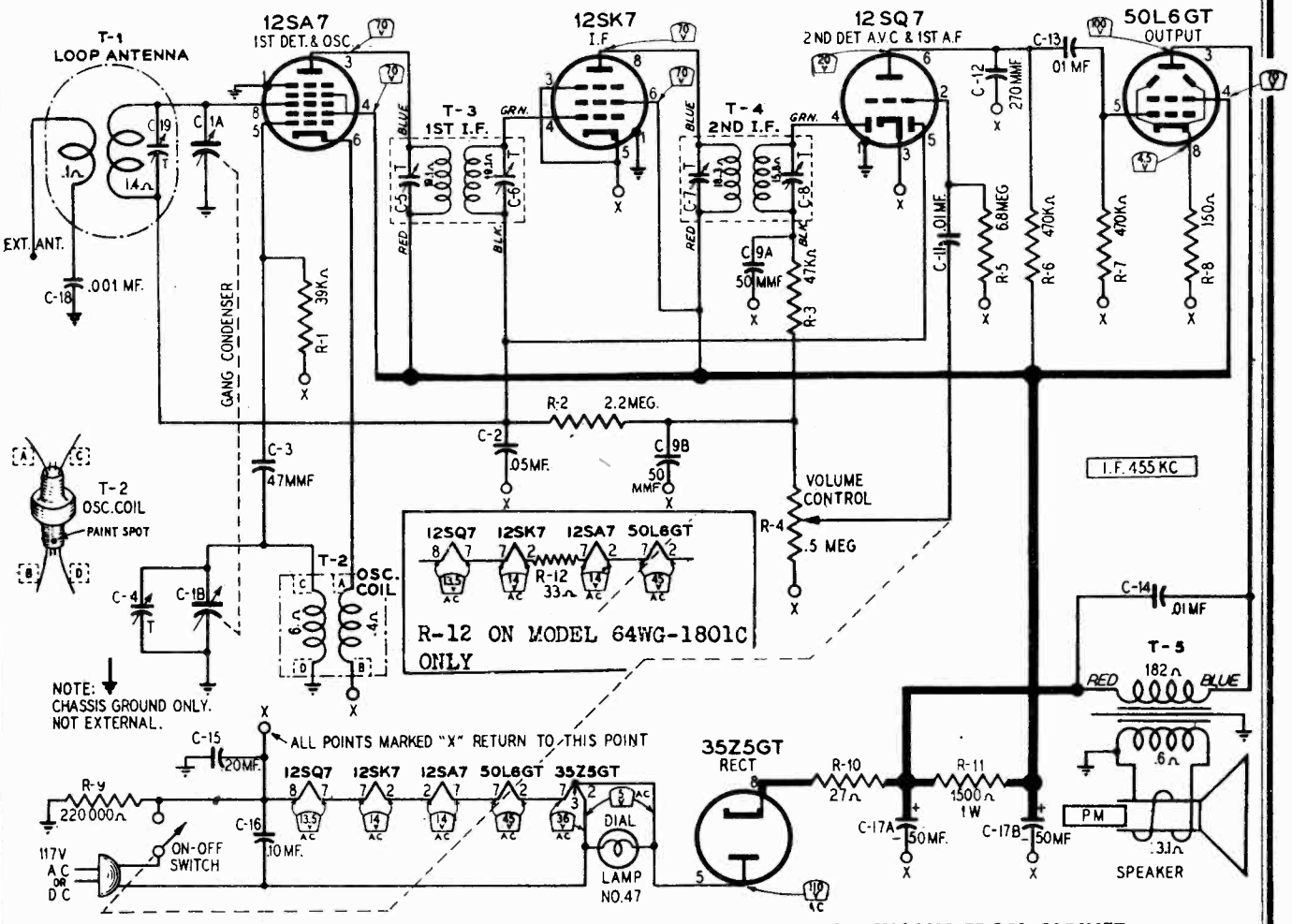
SETTING THE PUSHBUTTONS

The pushbuttons may be used, after adjustment, for the automatic tuning of any five stations which you select. They can be set up in any order.

1. Turn on the radio. Allow it to warm up for at least one minute.
2. Push out the call letters of the five stations from the sheets supplied with this manual.
3. Insert the long thin screwdriver (supplied with the set) into the hole in one of the pushbuttons and turn the pushbutton locking screw several turns to the left.
4. With the screwdriver still engaged in the locking screw slot, push the screw all the way in. Hold it in this position and with the tuning knob tune in the station you want.
5. Now turn the pushbutton locking screw to the right and **tighten it firmly.** Remove the screwdriver.
6. Press the pushbutton all the way in (this tunes in the station) and, by rotating the tuning dial back and forth, determine whether the button has been properly set. If it has not, repeat the procedure described above.
7. Insert the call letters for the station in the button and put one of the celluloid tabs over the letters.
8. Set each of the four other buttons, one for each station, in the same way. If you are unable to set a station on any particular button, it is probably because the pushbutton locking screw has not been loosened.
9. Any of the five stations may now be tuned in simply by pushing the proper button in as far as it will go.

MONTGOMERY WARD

MODELS 54WG-1801A, 54WG-1801B
MODEL 64WG-1801C



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

REMOVAL OF CHASSIS FROM CABINET

To remove the chassis from the cabinet it is necessary to pull the two control knobs and the dial pointer from their shafts. Remove the four screws in the bottom of the cabinet and the four snap pins that hold the cabinet back in place.

Care must be taken when removing the dial pointer that it is not damaged in such a manner that reinstallation will not be possible.

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 volts 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. Variations of plus or minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Freq.	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	200 mmf or RMA Dummy Antenna	Loop Antenna— external antenna clip	Chassis	24 microvolts
1000 kc	.05 mf	12SA7 1st Detector pin 8	Point "X" (12SK7 pin 3)	125 microvolts
455 kc	.05 mf	12SA7 1st Detector pin 8	Same as above	100 microvolts
455 kc	.05 mf	12SK7, I-F Amp. pin 4	Same as above	2500 microvolts
400 cycles	.05 mf	12SQ7, 1st AF, pin 2	Same as above	.042 volts
400 cycles	.05 mf	50L6GT Output, pin 5	Same as above	1.9 volts

MODELS 54WG-1801A,54WG-1801B
MODEL 64WG-1801C
MODEL 54WG-2007A,54WG-2007B

MONTGOMERY WARD

MODELS 54 WG-1801A,54 WG-2007A

Volume Control—Maximum All Adjustments.

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

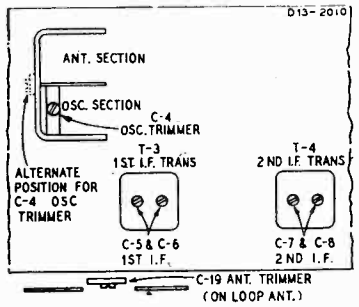
The equipment in column at right is required for aligning: Signal Generator which will provide an accurately calibrated signal at the test frequencies as listed. Output Indicating Meter; Non-Metallic Screwdriver. Dummy Antennas—.1 mf., 50 mf.

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 12SK7—I-F	Point "X" 12SK7—I-F Prong No. 3	Turn Rotor to full open	2nd I-F (C7) & (C8)
455 kc	.1 mf	Control Grid 12SA7—1st Det.	Same as above	Turn Rotor to full open	1st I-F (C5) & (C6)
1600 kc	.1 mf	Control Grid 12SA7—1st Det.	Same as above	Turn Rotor to full open	Oscillator (C4)
1400 kc	50 mmf	External Antenna Clip on Loop See Note A	Chassis	Turn Rotor to Max. Output Set Indicator to 1400 KC— See Note B	Antenna (C19)

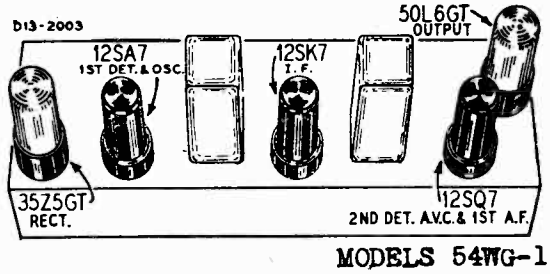
NOTE A—Re-assemble chassis in cabinet. Replace back on cabinet.

NOTE B—Tune in a 1400 KC signal. If pointer is not at the 1400 KC mark on the dial scale, pull pointer off shaft. Set pointer at the 1400 KC mark and push back on shaft.

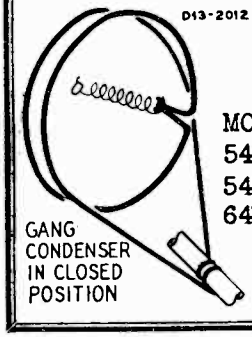
TRIMMER POSITIONS



Power Supply	105-125 volts AC—50-60 cycles—30 watts 105-125 volts DC
Frequency Range	535 to 1620 KC
Intermediate Frequency	455 KC
Selectivity	55.5 KC broad at 1000 times signal, 1000 KC
Sensitivity (for .05 watt output) with external antenna	25 microvolts average
Power Output	1.5 watts maximum, .9 watt (10% distortion)
Loud speaker	5" PM dynamic
Voice coil impedance	3.2 ohms at 400 cycles

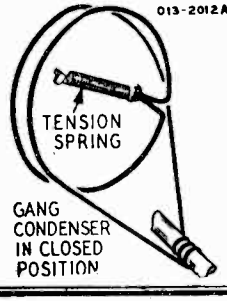


MODELS 54WG-1801B
64WG-1801C



DRIVE CORD DIAGRAM

MODELS
54WG-1801A
54WG-2007A
64WG-2007B



DRIVE CORD REPLACEMENT

MODELS 54 WG-1801A,54 WG-2007A

Turn the gang condenser to the fully closed position. Use a new drive cord 12 inches in length 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 one half turn, counterclockwise. Wind 2½ turns counterclockwise (from front of chassis) around tuning shaft. Turns should progress toward rear of chassis. (Wind 3 1/2 turns in tuning shaft for 54 WG-1801-B.) Wind cord counterclockwise around drive pulley in back of previous ½ turn. Pass cord through the slot in the pulley rim. Stretch tension spring and tie free end of cord to the spring. Cut off any excess string.

MONTGOMERY WARD

MODELS 54WG-1801A, 54WG-1801B
MODEL 64WG-1801C
MODELS 54WG-2007A, 64WG-2007B

MODELS 54 WG-1801A, 54 WG-1801B, 64WG-1801C

Ref. No.	Part No.	Description	Qty. Used in Set
CAPACITORS			
C-1A C-1B	14A176	Gang condenser with pulley	1
C-2	B66503	.05 mf 200 V Tubular	1
C-3 C-4 C-5 C-6 C-7 C-8	47X446	47 mmf Molded Part of C-1 Part of T-3 1st I-F Transformer Part of T-4 2nd I-F Transformer	1
C-9A C-9B	47X112	Dual mica condenser, 50 mmf	1
C-11 C-13 C-14	B66103	.01 mf 200 V Tubular	3
C-12	47X445	270 mmf Molded	1
C-15	B66204	.20 mf 200 V Tubular	1
C-16	D66104	.10 mf 400 V Tubular	1
C-17A C-17B	45X341	50 mf 150 V Dry electrolytic 50 mf 150 V condenser	1
C-18	D66102	.001 mf 400 V Tubular	
C-19	17A116	2.5-23 mmf Trimmer	1
RESISTORS			
		Ohms / Watts	
R-1	B84393	39,000 0.5 Carbon	1
R-2	B85225	2.2 meg 0.5 Carbon	1
R-3	B85473	47,000 0.5 Carbon	1
R-4	36X340	.5 meg Volume control and switch	1
R-5	B85685	6.8 meg 0.5 Carbon	1
R-6	B84474	470,000 0.5 Carbon	1
R-7	B85474	470,000 0.5 Carbon	1
R-8	B83151	150 0.5 Carbon	1
R-9	B85224	220,000 0.5 Carbon	1
R-10	B84270	27 0.5 Carbon	1
R-11	C85152	1500 1.0 Carbon	1
R-12	C85330	33 1.0 Carbon	1
TRANSFORMERS AND COILS			
T-1	9A1734	"B" Band Loop antenna	1
T-2	9A1805	Oscillator coil assembly	1
T-3	9A1782	1st I-F Transformer and can assembly	1
T-4	9A1783	2nd I-F Transformer and can assembly	1
T-5	51X123	Output Transformer	1
MISCELLANEOUS			
12A429		5" P.M. speaker	1
		Cone and voice coil assembly for the above speaker (specify part number and letters stamped on above speaker)	1
3A303		Tube socket—octal (8 prong) molded	5
10A297		Knob (on-off switch, volume control) tuning	2
28X292		Snap button (mounting loop to cabinet)	4
13X328		Line cord and plug assembly	1
DIAL AND DRIVE ASSEMBLY			
25X1380		Gang condenser mounting bracket	1
58X585		Dial	1
20X1444		Screws, dial	4
		Speed nuts, 2-56 No. 102	4
15X216		Pointer	1
		Clip No. 2401 (for pointer)	1
26X463		Drive shaft (tuning)	1
19X192		"C" washer for drive shaft	2
7A185		Pilot light cable & socket assembly	1
		No. 47 Pilot light bulb	1
28X310		Drive cord tension spring	1
		12" drive cord (18 lb. test)	1

MODEL 64WG-1801C ONLY

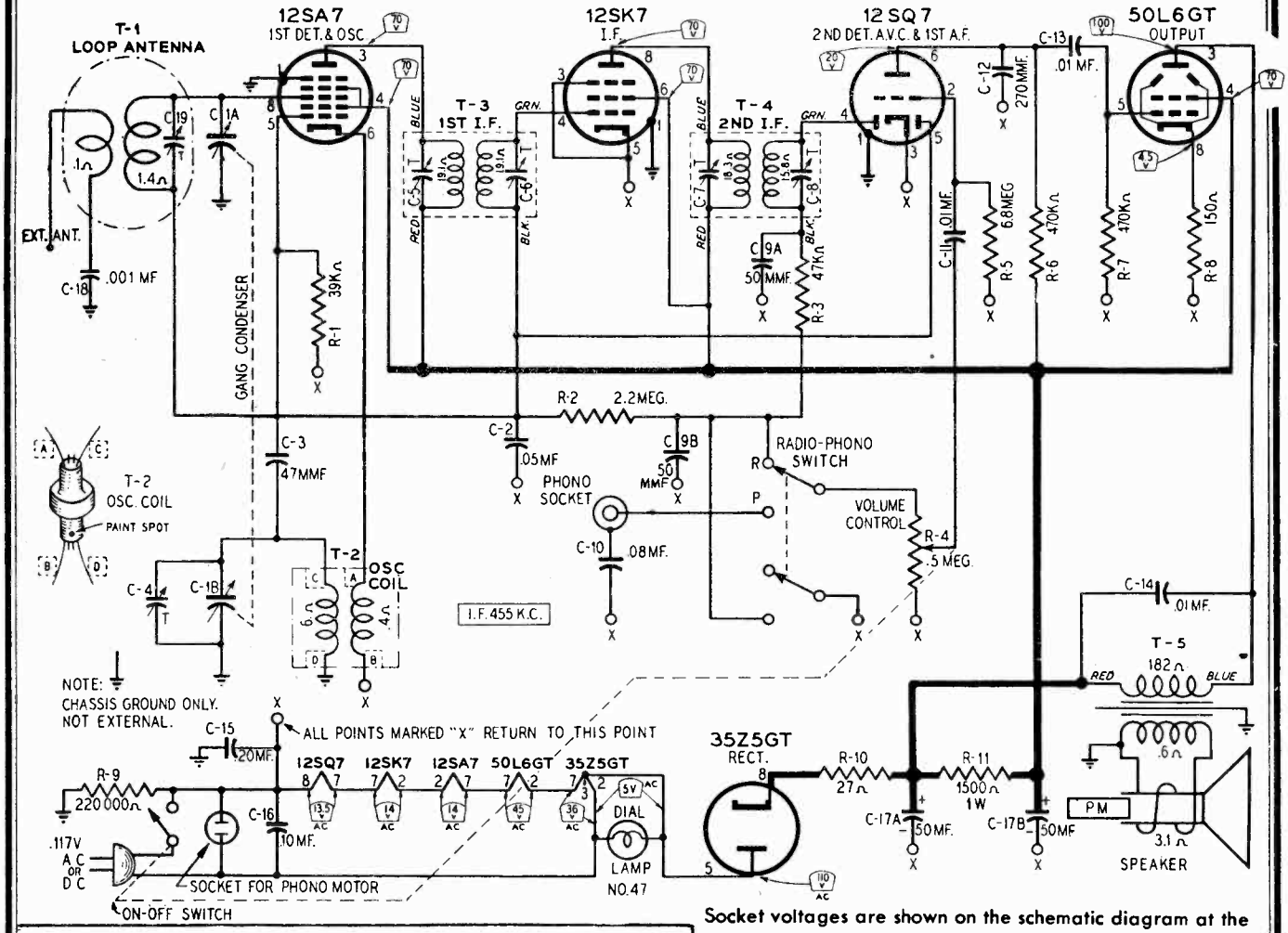
MODELS 54WG-2007A, 64WG-2007B

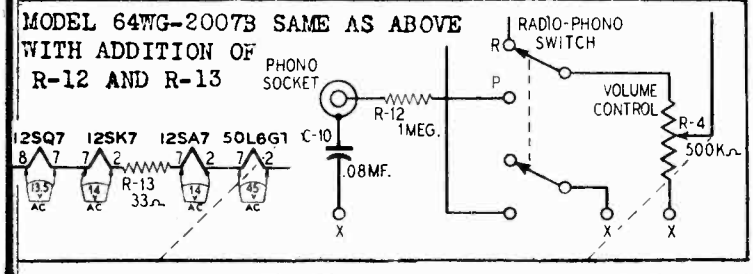
Ref. No.	Part No.	Description	Qty. Used in Set
CAPACITORS			
C-1A C-1B	14A176	Gang condenser with pulley	1
C-2	B66503	.05 mf 200 V Tubular	1
C-3 C-4 C-5 C-6 C-7 C-8	47X446	47 mmf Molded Part of C-1 Part of T-3 1st I-F Transformer Part of T-4 2nd I-F Transformer	1
C-9A C-9B	47X112	Dual mica condenser, 50 mmf	1
C-10 C-11 C-13 C-14	B66803 B66103	.08 mf 200 V Tubular .01 mf 200 V Tubular	1 3
C-12	47X445	270 mmf Molded	1
C-15	B66204	.20 mf 200 V Tubular	1
C-16	D66104	.10 mf 400 V Tubular	
C-17A C-17B	45X341	50 mf 150 V Dry electrolytic .50 mf 150 V condenser	1
C-18	D66102	.001 mf 400 V Tubular	
C-19	17A116	2.5-23 mmf Trimmer	1
RESISTORS			
		Ohms / Watts	
R-1	B84393	39,000 0.5 Carbon	1
R-2	B85225	2.2 meg 0.5 Carbon	1
R-3	B85473	47,000 0.5 Carbon	1
R-4	36X340	.5 meg Volume control and switch	1
R-5	B85685	6.8 meg 0.5 Carbon	1
R-6	B84474	470,000 0.5 Carbon	1
R-7	B85474	470,000 0.5 Carbon	1
R-8	B83151	150 0.5 Carbon	1
R-9	B85224	220,000 0.5 Carbon	1
R-10	B84270	27 0.5 Carbon	1
R-11	C85152	1500 1.0 Carbon	1
R-12*	B85105	1 meg 0.5 Carbon	1
R-13*	C85330	33 1.0 Carbon	1
T-1	9A1795	"B" Band Loop Antenna	1
T-2	9A1805	Oscillator coil assembly	1
T-3	9A1782	1st I-F Transformer and can assembly	1
T-4	9A1783	2nd I-F Transformer and can assembly	1
T-5	51X119	Output Transformer	1
MISCELLANEOUS			
	12A429	5" P.M. speaker	1
		Cone and voice coil assembly for the above speaker (specify part number and letters stamped on above speaker).	
	3A303	Tube socket—octal (8 prong) molded	5
	3A305	Single pin tip socket (Phono)	1
	10A297	Knob (on-off switch and volume control, tuning)	2
	10A526	Knob (Phono-Switch)	1
	28X292	Snap button (mounting loop to cabinet)	4
	13X328	Line cord and plug assembly	1
	2A355	Radio phono switch	1
	28A112	Phono-motor assembly	1
	2A170	Phono on-off switch	1
	6A227	Two prong motor plug	1
	28A113	Pickup arm	1
	13X542	Phono motor socket and cable assembly	1
DIAL AND DRIVE ASSEMBLY			
	25X1380	Gang condenser mounting bracket	1
	58X585	Dial	1
	20X1444	Screws, dial	4
		Speed nuts, 2-56 No. 102	4
	15X216	Pointer	1
		Clip No. 2401 (for pointer)	1
	26X463	Drive shaft (tuning)	1
	19X192	"C" washer for drive shaft	2
	7A185	Pilot light cable and socket assembly	1
		No. 47 Pilot light bulb	1
	28X310	Drive cord tension spring	1
		12" drive cord (18 lb. test)	1

* IN MODEL 64WG-2007B ONLY

MODELS 54WG-2007A, 64WG-2007B

MONTGOMERY WARD





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

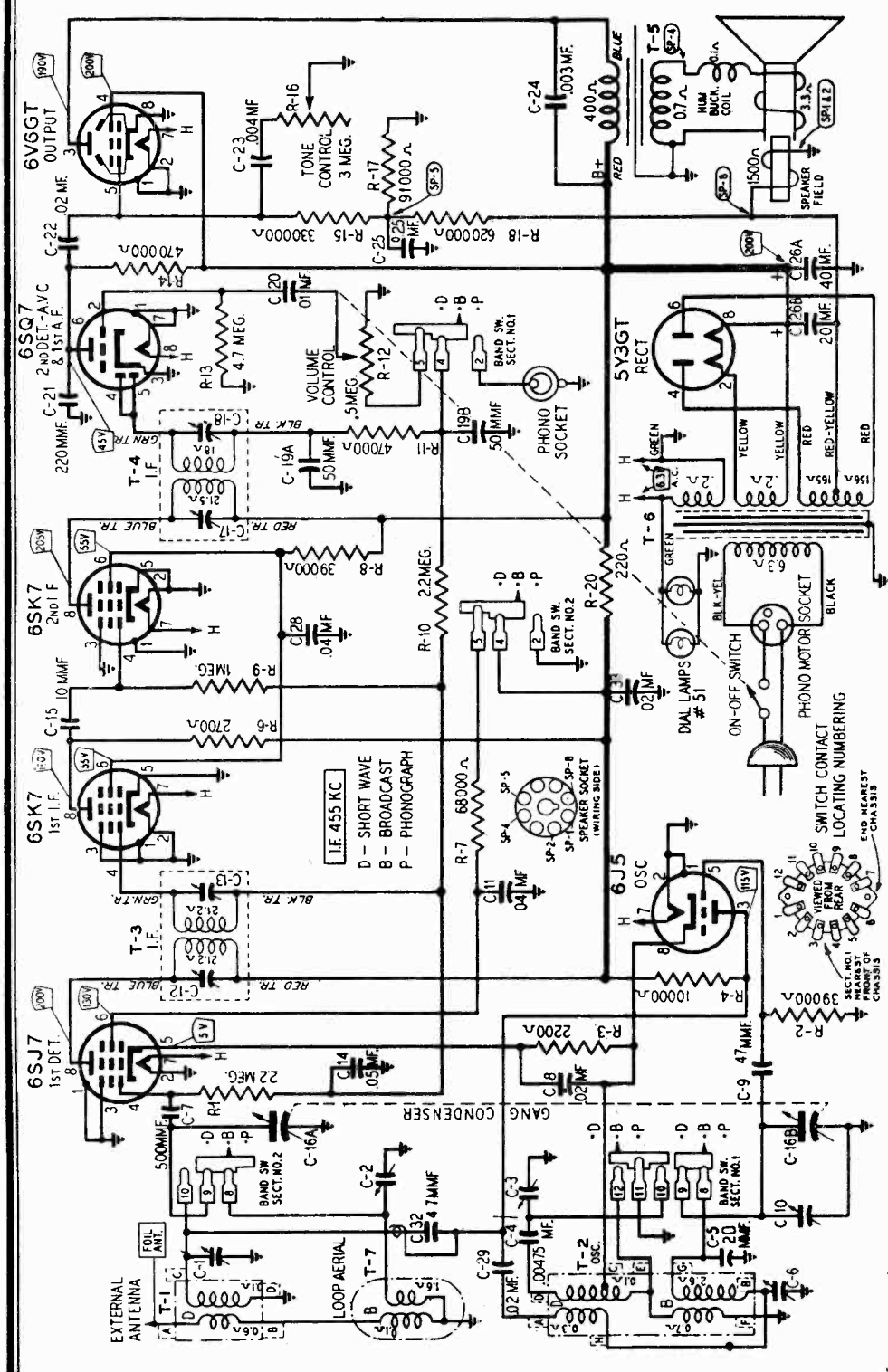
The table below lists the sensitivity at the input of each stage. All measurements are based on an output of 50 milliwatts. This may be measured by disconnecting the speaker voice coil and substituting a 3.2 ohm 5 watt resistor across the secondary winding of the output transformer. A reading of .4 volts 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. 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	24 microvolts
1000 kc	.05 mf	12SA7 1st Detector Pin 8	Point "X" (12SK7 Pin 3)	125 microvolts
455 kc	.05 mf	12SA7 1st Detector Pin 8	Same as above	100 microvolts
455 kc	.05 mf	12SK7, I-F Amp. Pin 4	Same as above	2500 microvolts
400 cycles	.05 mf	12SQ7, 1st A-F, Pin 2	Same as above	.042 volts
400 cycles	.05 mf	50L6GT Output, Pin 5	Same as above	1.9 volts

For Alignment, see P. 15-28

MONTGOMERY WARD

MODELS 54WG-2500A, 54WG-2700A,
64WG-2500B, 64WG-2700A



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:

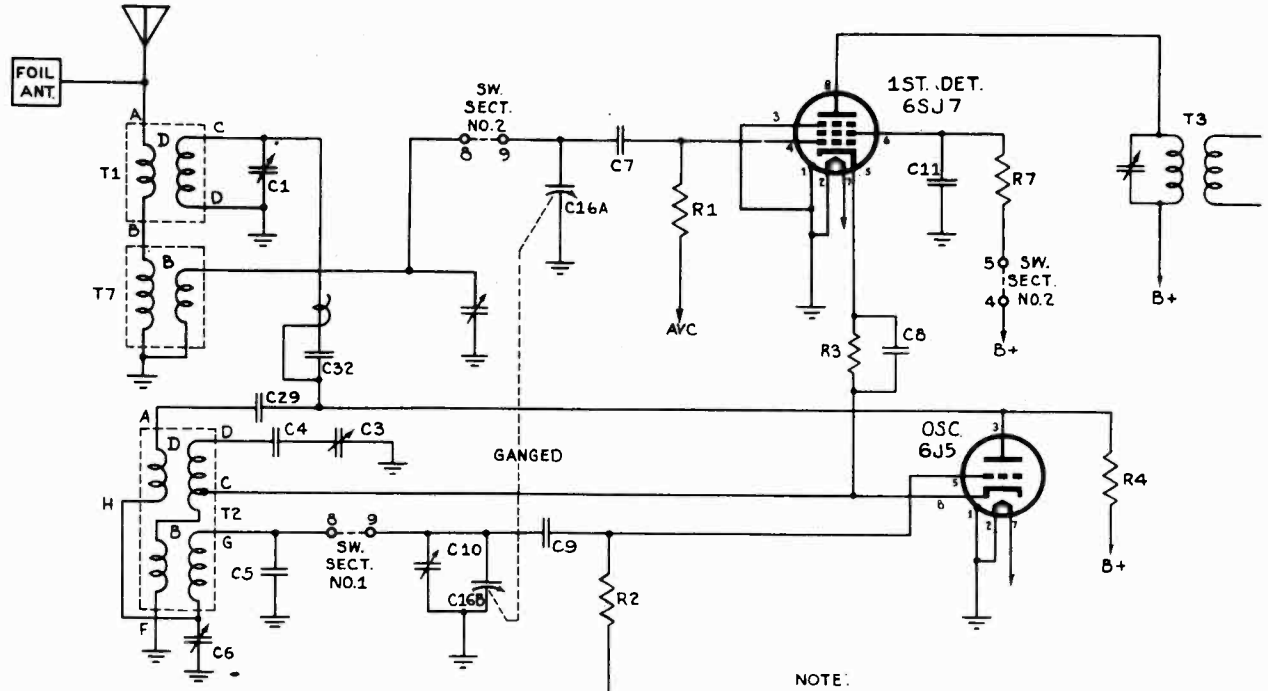
Line voltage.....117 volts AC
Volume control.....maximum
Signal input.....none

A variation of ±10% is usually permissible.

Record Changer for -2700A models: Webster Model 50

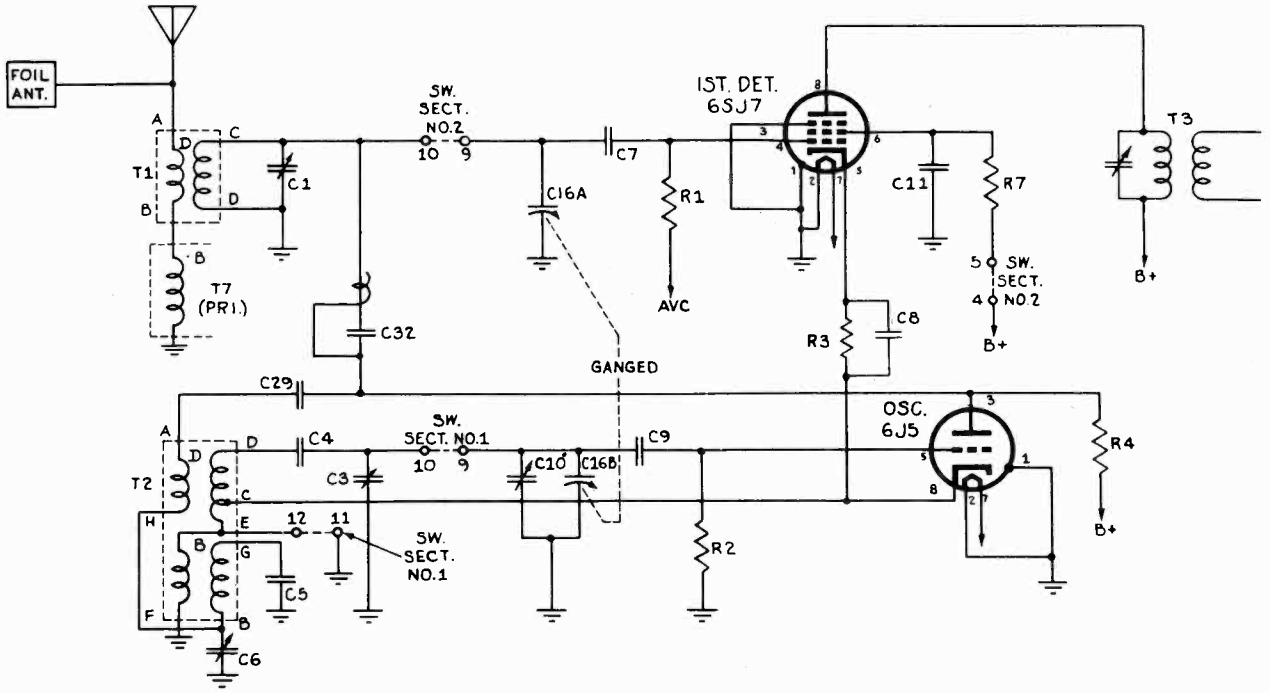
MODELS 54WG-2500A, 54WG-2700A,
64WG-2500B, 64WG-2700A

MONTGOMERY WARD



BAND-SWITCH SHOWN
AT 2ND POSITION CLOCKWISE.
BROADCAST BAND
528 - 1600 KC.

NOTE:
1ST. POSITION (PHONO)
DRAWING NOT SHOWN.



BAND-SWITCH SHOWN
AT 3RD POSITION CLOCKWISE.
SHORT WAVE BAND
5.75 - 18.3 MC.

MODELS 54WG-2500A, 54WG-2700A, RECEIVER STAGE SENSITIVITIES 64WG-2500B, 64WG-2700A

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 watts. 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 (white)	Chassis	2.3 microvolts
1000 kc	.05 mf	6SJ7 1st Detector, Pin 4	Same as above	17 microvolts
455 kc	.05 mf	6SJ7 1st Detector, Pin 4	Same as above	5.0 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 volts
400 cycles	.05 mf	6V6GT Output, Pin 5	Same as above	3.8 volts

ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts AC, 50-60 cycles,
MODEL 54 WG-2500A 55 watts.
MODEL 64WG-2500B
Power Supply.....105-125 volts AC, 60 cycles,
MODEL 54 WG-2700A 55 watts normal, 72 watts phono
MODEL 64WG-2700A operating

MODELS 54WG-2500A, 54WG-2700A, *64WG-2500B, 64WG-2700A

Frequency Range.....B range—528-1600 KC
D range—5.75 to 18.3 MC
Intermediate Frequency.455 KC
Selectivity.....43 KC broad at 1000 times signal, 1000 KC
Sensitivity.....(for .5 watt output) with external antenna
B range—2.5 microvolts average
D range—12 microvolts average
Power Output.....3.5 watts maximum
2 watts, 10% distortion
Loud Speaker.....8" electro dynamic
Voice Coil Impedance..3.2 ohms at 400 cycles

*MODEL 64WG-2500B uses a 10" speaker

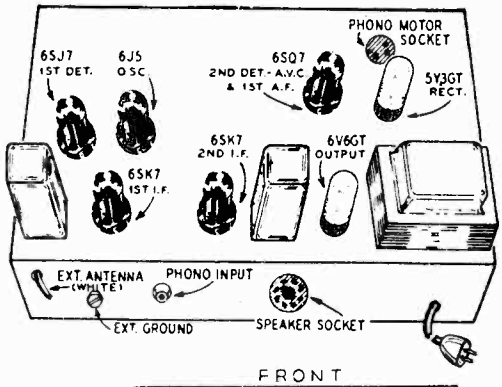
MODEL 64WG-2700A
MODEL 54 WG-2700A

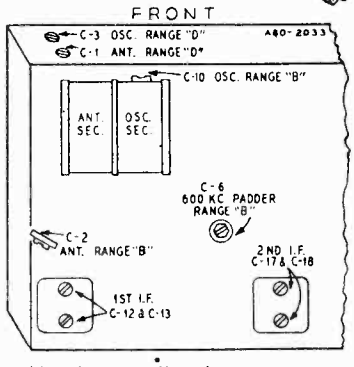
50 CYCLE OPERATION

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 of 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.

MODELS 54WG-2500A, 54WG-2700A
64WG-2500B, 64WG-2700A MONTGOMERY WARD

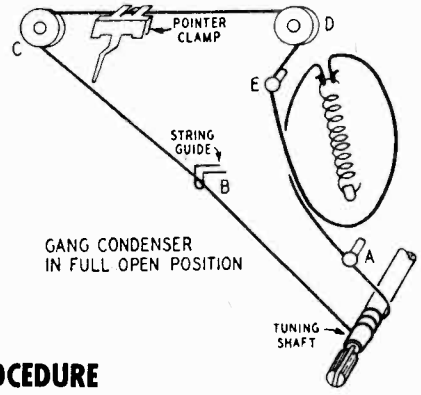




TRIMMER POSITIONS

DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new drive cord 40" 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 ¾ turn counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring. Cut off any excess string.



DRIVE CORD DIAGRAM

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.

MONTGOMERY WARD

MODELS 54WG-2500A, 54WG-2700A, 64 WG-2500B, 64 WG-2700A

MODELS 54 WG-2500A, *54 WG-2700A, ×64 WG-2500B, *64 WG-2700A

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C-1	17A163	2-25 mmf Ant. "D" Range Trimmer..	1
C-3		2-25 mmf Osc. "D" Range Trimmer.	
C-2	17A149	1.2-12 mmf Loop aerial trimmer.....	1
C-4	46X289	.00475 180 V Tubular.....	1
C-5	47X482	20 mmf Molded.....	1
C-6	17A234	250-525 mmf 600 kc Padder.....	1
C-7	D66501	.0005 mf 500 V Tubular.....	1
C-8, C-29	B66203	.02 mf 200 V Tubular.....	2
C-9	47X463	47 mmf Molded.....	1
C-10		Part of gang condenser C-16.....	
C-11, C-28	D66403	.04 mf 400 V Tubular.....	2
C-12, C-13		Part of 1st I-F Assembly	
C-14	B66503	.05 mf 200 V Tubular.....	1
C-15	47X477	10 mmf Molded.....	1
C-16	14A185	2 section gang condenser complete with drive pulley.....	1
C-17, C-18		Part of 2nd I-F Assembly.....	
C-19-A, C-19B	47X112	50 mmf Dual Mica..... 50 mmf	1
C-20	B66103	.01 mf 200 V Tubular.....	1
C-21	47X468	220 mmf Molded.....	1
C-22, C-33	D66203	.02 mf 400 V Tubular.....	2
C-23	B66402	.004 mf 200 V Tubular.....	1
C-24	D66302	.003 mf 400 V Tubular.....	1
C-25	B66254	.25 mf 200 V Tubular.....	1
C-26A, C-26B	45X277	40 mf 400 V Dry electrolytic.. 20 mf 450 V	1
C-32	47X478	4.7 mmf Molded.....	1
		RESISTORS	
		Ohms Watts	
R-1, R-10	B85225	2.2 meg. 0.5 Carbon.....	2
R-2	B84393	39,000 0.5 Carbon.....	1
R-3	B84222	2200 0.5 Carbon.....	1
R-4	C84103	10,000 1.0 Carbon.....	1
R-6	B84272	2700 0.5 Carbon.....	1
R-7	B84683	68,000 0.5 Carbon.....	1
R-8	C84393	39,000 1.0 Carbon.....	1
R-9	B85105	1.0 meg. 0.5 Carbon.....	1
R-11	B85473	47,000 0.5 Carbon.....	1
R-12	36X311	500,000 Volume control, ON-OFF switch.....	1
R-13	B85475	4.7 meg. 0.5 Carbon.....	1
R-14	B85474	470,000 0.5 Carbon.....	1
R-15	B85334	330,000 0.5 Carbon.....	1
R-16	40X259	3. meg. Tone control.....	1
R-17	B83913	91,000 0.5 Carbon.....	1
R-18	B83624	620,000 0.5 Carbon.....	1
R-20	B85221	220 0.5 Carbon.....	1

Ref. No.	Part No.	Description	Qty. Used in Set
		TRANSFORMERS AND COILS	
T-1	9A1451	Antenna transformer assembly "D" range.....	1
T-2	9A1452	Oscillator coil assembly.....	1
T-3	9A1810	1st I-F transformer and can assembly.	1
T-4	9A1811	2nd I-F transformer and can assembly	1
T-5	51X97	Output transformer.....	1
T-6	53X235	117 volt, 60 cycle standard power transformer.....	1
T-6	53X237	117 volt, 25 cycle standard power transformer.....	1
T-6	53X236	117-234 volt, 40-60 cycle Universal power transformer.....	1
T-7	9A1453	"B" Band loop antenna.....	1
		MISCELLANEOUS	
	12A398	8" Electra dynamic speaker.....	1
		Cone and voice coil assembly (specify part number and letter stamped on above speaker).....	1
	3A303	Tube socket—octal (8 prong) molded	7
	3A293	Speaker socket—octal (8 prong) molded.....	1
	3A304	Phono motor socket.....	1
	3A305	Single pin-tip socket (phono).....	1
	10A530	Knob (volume control).....	1
	10A531	Knob (tuning).....	1
	10A532	Knob (tone control).....	1
	10A533	Knob (band change switch).....	1
	13X328	Line cord and plug assembly.....	1
	2A177	Band and phono switch.....	1
	9A1229	Counterpoise antenna foil.....	1
	8X99	Rubber chassis cushions (chassis to cabinet).....	4
		DIAL AND DRIVE ASSEMBLY	
	25X839	Gang mounting bracket.....	1
	6X26	Rubber grommets (Mounting gang condenser and bracket to chassis)	4
	20X347	Con. cushion studs (Mounting gang condenser and bracket to chassis)	4
	19X163	Flat washer (Mounting gang condenser and bracket to chassis)	4
	24X360	Idler pulley.....	2
	20X268	Idler stud.....	4
	25X841	Brace bracket.....	1
	58X593	Dial scale glass.....	1
	30X475	Glass clamp.....	2
	58X601	Dial background.....	1
	25X838	Dial bracket.....	1
	4X871	Dial escutcheon.....	1
		No. 2 x 3/8 Phillips Fr. oval hd. Stat. bronze (screws for escutcheon mounting).....	2
		No. 2 x 3/8 Phillips Fr. oval hd. Stat. bronze (screws for escutcheon mounting).....	2
	15X225	Pointer for dial scale.....	1
		40" drive cord (18 lb. test).....	1
	28X44	Tension spring for drive cord.....	1
	26X336	Drive shaft (tuning).....	1
	25X580	Drive shaft bracket.....	1
	19X192	"C" washers for drive shaft.....	2
	7A142	Pilot light socket assembly.....	2
		Dial lamp (No. 51).....	2
	41X75	Light shield.....	2

*The parts listed in the second column apply to all models with the following exceptions for MODELS 54 WG-2700A and 64 WG-2700A:

T-6	53X235	117 volt, 60 cycle standard power transformer.....	1
T-7	9A1395	"B" Band loop antenna.....	1
	26A382	Pulley Mtg. Plate Assem. Complete with idler pulleys, idler studs, brace brackets, string guide and dial background.....	1
	12A401	8" Electro dynamic speaker.....	1
	9A1842	Counterpoise antenna foil.....	1

TYPE W-28111 RECORD CHANGER PARTS

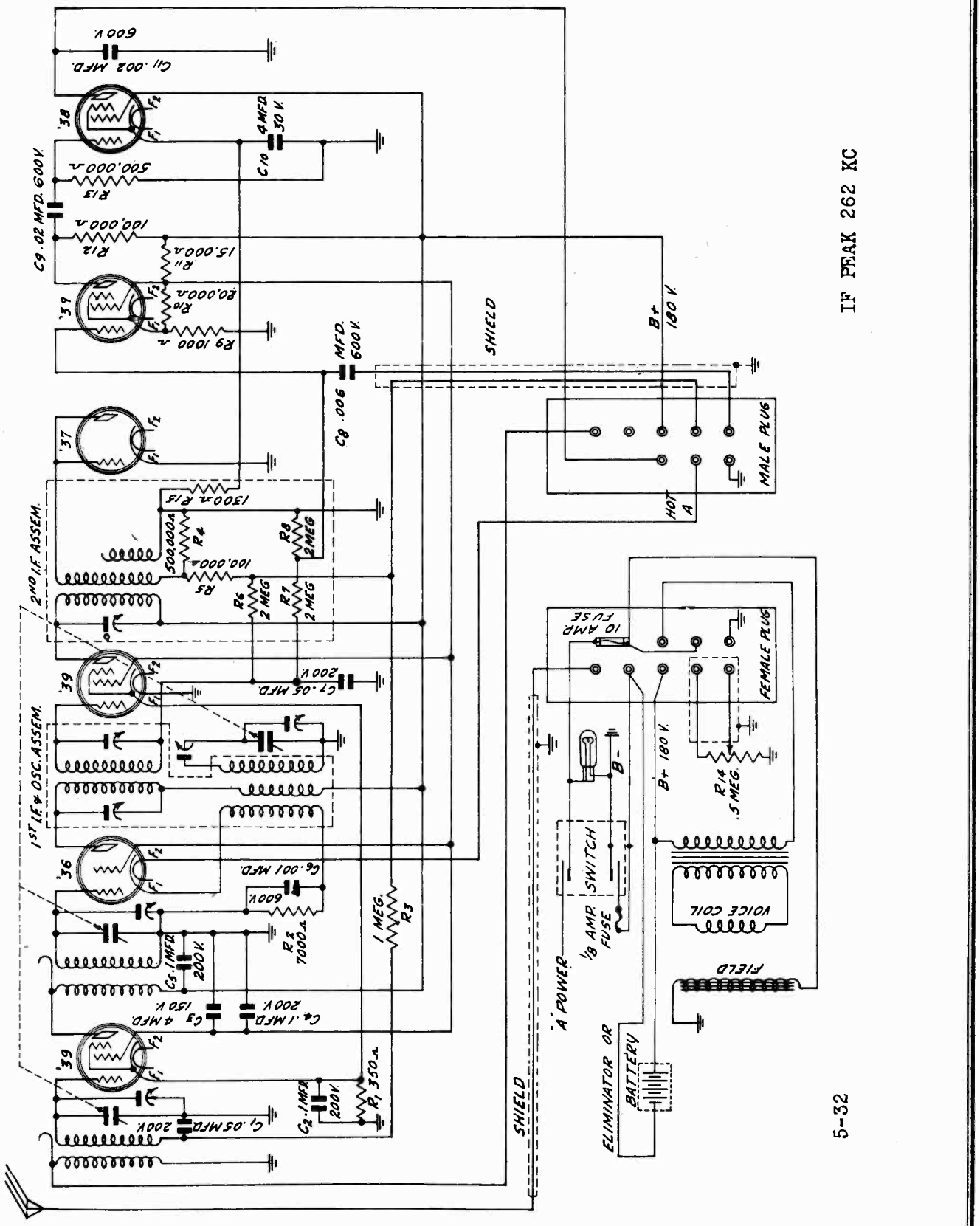
W-15X084-6	Motor assembly, 60 cycle, 115 volt...	1
Astatic L-75	Crystal cartridge.....	1
41P544-4	50 cycle drive pulley.....	1

× The parts listed in the second column apply to all models with the following exceptions for MODEL 64 WG-2500B:

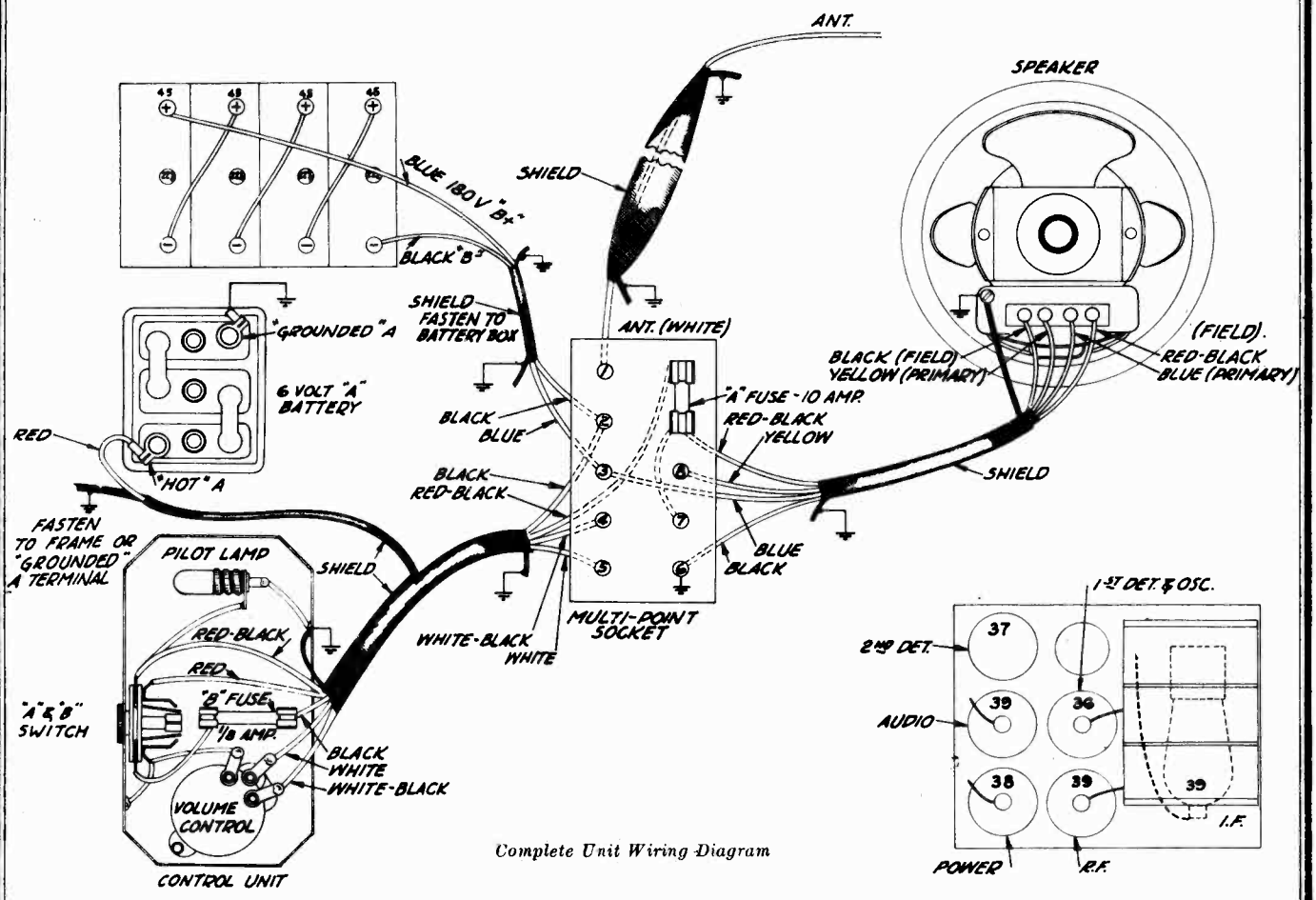
C-7	D67501	.0005 mf 400 V Tubular.....	1
	9A1842	Counterpoise antenna foil.....	1
	12A399	10" Electro dynamic speaker.....	1

MODEL 62 Series

MONTGOMERY WARD



MONTGOMERY WARD



Complete Unit Wiring Diagram

Voltages at Sockets

In the following chart are given the voltages at the sockets. Before checking the voltages at the sockets, a convenient point, in some cases, to check the applied "A" and "B" voltages is at the speaker terminal strip. A high resistance voltmeter should be used.

CAUTION—Do not check the "A" and "B" voltages at the multi-point socket on the cable head, as the pilot light may be burned out when the switch is turned off. This is due to the high inductance of the speaker field, which will increase the voltage at the break of the circuit. Also, when the cable head and multi-point socket is taken off, the connections between the chassis and power unit are open so that readings are not made under load conditions.

To read the voltages at the sockets, the chassis box, in most cases, will have to be taken off of its mounting. In some instances, the cables, which may be attached to the dash or at other points, will have to be taken off. The voltages can be read at the sockets with a long plug or with a pair of long, insulated test prods. If these are not available, it will be necessary to remove the chassis from the box. The multi-point socket on the cable head is then re-connected to the multi-point plug on the chassis. Considerable care must be taken when the chassis is out of the case in this manner to prevent accidental short circuits of plus "B" or plus "A" points to ground.

All tubes must be inserted and all units connected. A signal will effect the control voltages on the R. F., I. F., and first audio tubes. If signals are received, ground the antenna and remove the second detector tube to make the other readings.

Type of Tube	*Function*	*Across Heater*	*Plate to Cathode*	*Screen to Cathode*	*Grid to Cathode*	*Normal Plate MA*
'39	R. F.	6.	177	80	3	3.6
'36	1st Det.	6.	173	76	7(1)	.9(1)
'39	I. F.	6.	177	80	3	3.6
'37	2nd Det.	6.	0		0	0
'39	1st Audio	6.	54	77	6	1.2
'38	Output	6.	159	165	15.5	10

(1) Will vary with dial setting.

NOTE: All bias voltages must be read from cathode to ground.

CHASSIS PARTS

Part No.	Description	Cost Price	Selling Price
P-1531	No. 39 Tube Socket (Long Lug)	$0.03	$0.08
P-1556	No. 39 Tube Socket (Short Lug)	.04	.10
P-1530	No. 38 Tube Socket (Long Lug)	.03	.08
P-1529	No. 37 Tube Socket (Long Lug)	.03	.08
P-1555	No. 36 Tube Socket (Short Lug)	.04	.10
P-5021	First I.F. and Oscillator Assembly, Complete with Trimmer Condensers and can	.83	2.08
P-5022	Second I.F. Transformer Assembly, Complete with Trimmer Condenser, Resistors and Can	.91	2.28
P-5023	Antenna and Interstage R. F. Transformer Assembly, Complete with Can	.53	1.33
P-5024	Antenna R.F. Transformer	.24	.60
P-5025	Interstage R.F. Transformer	.24	.60
P-1539	Oscillator 600 K. C. Tracking Condenser	.11	.28
P-1560	Drive Gear Hub (for Gang Condenser)	.04	.10
P-30376	Condenser Drive Bushing	.03	.08
P-10224	Rubber Drive Pinion	.02	.05
P-1092	Grid Cap & Wire	.02	.05
P-1532	Multi-Point Plug	.06	.15
P-1543	Multi-Point Socket	.12	.30
P-10211	Long Rubber Bumper (for top of tubes)	.02	.05
P-10210	Short Rubber Bumper (for top of tubes)	.02	.05
P-20516	6-32 Wing Nuts (for Chassis box cover)	.02	.05

Resistors

Part No.	Key No.	Resistance	Type	Cost Price	Selling Price
P-A-90953	R-1	350 Ohms	Carbon	$0.06	$0.15
P-A-90979	R-2	7,000 Ohms	Carbon	.06	.15
P-A-90948	R-3	1 Megohm	Carbon	.06	.15
P-A-90929	R-4	500,000 Ohms	Carbon	.06	.15
P-A-90912	R-5	100,000 Ohms	Carbon	.06	.15
P-A-90949	R-6	2 Megohm	Carbon	.06	.15
P-A-90949	R-7	2 Megohm	Carbon	.06	.15
P-A-90949	R-8	2 Megohm	Carbon	.06	.15
P-A-91023	R-9	800 Ohms	Carbon	.05	.13
P-A-90930	R-10	10,000 Ohms	Carbon	.05	.13
P-A-90930	R-10-A	10,000 Ohms	Carbon	.05	.13
P-B-91020	R-11	15,000 Ohms	Carbon	.06	.15
P-A-90954	R-12	250,000 Ohms	Carbon	.06	.15
P-A-90948	R-13	1 Megohm	Carbon	$0.06	$0.15
P-91009	R-14	0—500,000 Ohms	Volume Control	.22	.55
P-A-91022	R-15	900 Ohms	Carbon	.05	.13
P-91013	R-16	0—150,000 Ohms	Tone Control	.21	.53

Condensers

Part No.	Key No.	Capacity	Type	Cost Price	Selling Price
P-80907	C-12	.02 mfd.	Metal Case (for tone Control)	$0.13	$0.33
P-80902-D	C-10 4.0 mfd. C-3 4.0 mfd. C-1 .05 mfd.		Electrolytic Condenser Block	.53	1.33
P-80903-D	C-9 .02 mfd. C-7 .05 mfd. C-5 .10 mfd. C-2 .10 mfd. C-4 .10 mfd.		Block	.42	1.05
P-80808	C-11	.002 mfd.	Molded	.07	.18
P-80822	C-8	.006 mfd.	Molded	.17	.43
P-80821	C-6	.001 mfd.	Molded	.06	.15
P-80904	Three-Gang Variable Condenser			1.05	2.63

CONTROL UNIT PARTS

Part No.	Description	Cost Price	Selling Price
P-91009	R-14 Volume Control	$0.22	$0.55
P-1567	⅛ amp. "B" Fuse	.03	.08
P-1544	Lock Switch	.24	.60
P-1563	8 Volt Pilot Lamp	.06	.15
P-1562	Control Knob	.04	.10
P-1591	Pilot Lamp Socket & Clip	.04	.10
P-1592	Dial Strip & Gear Assembly	.06	.15
P-10224	Rubber Drive Pinion	.02	.05

SHIELDED CABLES

Part No.	Description	Cost Price	Selling Price
P-70723	Shielded Antenna Cable	$0.20	$0.50
P-70724	Control Box Shielded Cable	.40	1.00
P-70725	Shielded Speaker Cable	.24	.60
P-70726	Shielded "B" Supply Cable	.34	.85

Part No.	*Description*	*Cost Price*	*Selling Price*
62-5421	Generator Condenser—*Carry 6 in stock*	$0.21 ea.	$0.49 ea.
62-5423	Distributor Suppressor—*Carry 6 in stock*	.12 ea.	.39 ea.
62-5424	Spark Plug Suppressor—*Carry 12 in stock*	.12 ea.	.39 ea.
P-1550	Flexible Drive Shaft—14 inches—*Carry 1 in stock*	.22 ea.	.55 ea.
P-1551	Flexible Drive Shaft—34 inches—*Supplied with set*	.40 ea.	1.00 ea.
P-1552	Flexible Drive Shaft—45 inches—*Carry 1 in stock*	.49 ea.	1.23 ea.
P-1566	"A" Fuse, 10 Amperes—*Carry 3 in stock*	.02 ea.	.05 ea.
P-1567	"B" Fuse, ⅛ Ampere—*Carry 3 in stock*	.03 ea.	.08 ea.
62-5400	"B" Battery Eliminator (Vibrator Type)	7.85	17.95
62-5411	Underslung Antenna	.60	1.69
261-9099	Champion Spark Plugs with built-in noise suppressors	.68	1.15

(In One Package)—Supplied with each set.

P-10216	6 Felt Strips	.04 doz.	.10 doz.
P-20514-B	Dash Mounting Plate (A)	.06 ea.	.15 ea.
P-20496	Chassis Mounting Base (D)	.10 ea.	.25 ea.
P-20495	Chassis Mounting Clamp (D)	.06 ea.	.15 ea.
P-10223	12 feet 5/16" Loom (G)	.22 ea.	.55 ea.

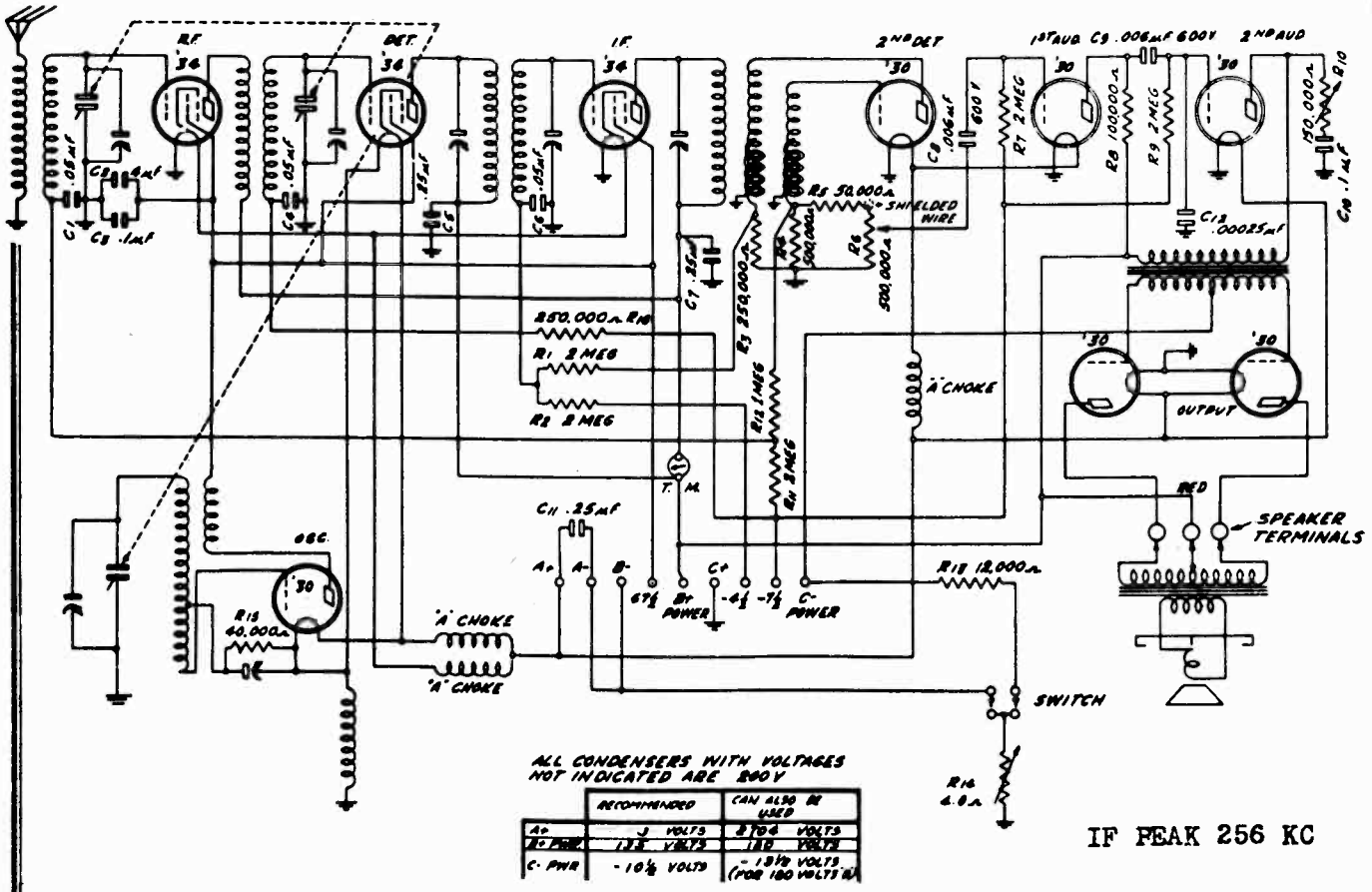
(In One Bag)—Supplied with each set.

Quantity			
3	¼"—20 x 3" Special Square Head Bolts (A)	.10 doz.	.25 doz.
9	¼"—20 Square Nuts (A)	.03 doz.	.08 doz.
8	¼" x 1" Steel Washers, No. 266 (A)	.03 doz.	.08 doz.
4	¼" Lockwashers (A)	.03 doz.	.08 doz.
4	Flat Washers, No. 10 x ½ OD (A)	.03 doz.	.08 doz.
5	6-32 x ¼" Blued Finish Fillister Head Screws (B)	.03 doz.	.08 doz.
5	No. 6 Lockwashers (B)	.03 doz.	.08 doz.
6	No. 10213 Rubber Bands (C)	.04 doz.	.10 doz.
10	10-32 x ⅜" Blued Finish Fillister Head Screws (D)	.03 doz.	.08 doz.
10	No. 10 Lockwashers (D)	.03 doz.	.08 doz.
2	¼" Headless Cup Point Set Screw (D)	.10 doz.	.25 doz.
2	8-32 Headless Cup Point Set Screw (E)	.05 doz.	.13 doz.
4	8-32 x ⅜" Blued Finish Fillister Head Screws (E)	.03 doz.	.08 doz.
4	No. 8 Lockwashers (E)	.03 doz.	.08 doz.
2	Radio Switch Keys	.06 ea.	.15 ea.
1	No. 20511-B Steering Post Clamp (E)	.04 ea.	.10 ea.
4	Carpet Tacks (F)	.03 doz.	.08 doz.

(A)—Used for Mounting Chassis to Dash
(B)—Used for Attaching Cable Head to Chassis
(C)—For Tubes
(D)—Used for Mounting Chassis on Steering Column
(E)—Used for Mounting Control Unit
(F)—Used to Tack Back on Speaker
(G)—Used to Cover "B" Cable if Cable Is Under Car Body

Prices subject to change without notice.

MONTGOMERY WARD



IF PEAK 256 KC

Part No.	Description	Cost Price	Selling Price
P-20388	Condenser Shield (for 3-Gang Condenser)	$ .05	$ .13
P-20406	Tube Shield	.03	.08
P-20408	Tube Shield Base	.02	.05
P-1472	No. 34 Tube Socket	.03	.08
P-1471	No. 30 Tube Socket	.03	.08
P-70733	Nine-Wire Battery Cable	.24	.60
P-1520-A	Off-On Switch	.18	.45
P-1647	Small Walnut Knob	.04	.10
P-1646	Large Walnut Knob	.04	.10
P-1508	Black Bakelite Knob for Filament Control	.05	.13
P-5041	Antenna R.F. Transformer Assembly	.16	.40
P-5040	Interstage R.F. Transformer Assembly	.18	.45
P-5042	Oscillator Coil Assembly	.24	.60
P-5043	1st I.F. Assembly, complete with can	.46	1.15
P-5044	2nd I.F. Assembly, complete with can	.48	1.20
P-5018	Filament Choke Coil	.09	.23
P-5061	Oscillator Series Filament Choke Coil	.07	.18
P-50551	Audio Transformer	.58	1.45
P-40413	Can for R.F. and Oscillator Assemblies	.05	.13
P-1627	Tuning Meter	.58	1.45
P-1393	Pointer Assembly	.06	.15
P-1382	Drive Disc Hub and Fulcrum Assembly	.07	.18
P-20434-A	Bracket for Dial Strip	.02	.05
P-1510	White Celluloid Dial Strip	.06	.15
P-20555	Tension Spring (Tone control pointer)	.02	.05
P-20556	Tension Spring (Volume control pointer)	.02	.05
P-30374	Bushing for Rubber Pinion	.03	.08
P-10224	Rubber Pinion	.02	.05
P-1634	Permanent Magnet Dynamic Speaker	3.85	9.63

RESISTORS

Part No.	Code	Resistance	Type	Cost Price	Selling Price
P-A-90949	R-1	2 Megohms	Carbon	$ .06	$ .15
P-A-90949	R-2	2 Megohms	Carbon	.06	.15
P-A-90954	R-3	250,000 ohms	Carbon	.06	.15
P-A-90929	R-4	500,000 ohms	Carbon	.06	.15
P-A-90941	R-5	50,000 ohms	Carbon	.06	.15
P- 91027	R-6	500,000 ohms	Volume Control	.24	.60
P-A-90949	R-7	2 Megohm	Carbon	.06	.15
P-A-90912	R-8	100,000 ohms	Carbon	.06	.15
P-A-90949	R-9	2 Megohm	Carbon	.06	.15
P- 91028	R-10	150,000 ohms	Tone Control	.19	.48
P-A-90949	R-11	2 Megohm	Carbon	.06	.15
P-A-90948	R-12	1 Megohm	Carbon	.06	.15
P-A-90982	R-13	12,000 ohms	Carbon	.06	.15
P- 90996	R-14	4 ohm	Filament Control	.18	.45
P-A-90916	R-15	40,000 ohms	Carbon	.06	.15
P-A-90954	R-16	250,000 ohms	Carbon	.06	.15

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Cost Price	Selling Price
P-80862-B	C-1	.05 mfd.	200 V.	Tubular	$ .07	$ .18
P-80878-A	C-2	4.0 mfd.	150 V.	Electrolytic	.19	.48
P-80864-C	C-3	.1 mfd.	200 V.	Tubular	.07	.18
P-80862-B	C-4	.05 mfd.	200 V.	Tubular	.07	.18
P-80888	C-5	.25 mfd.	200 V.	Tubular	.10	.25
P-80862-B	C-6	.05 mfd.	200 V.	Tubular	.07	.18
P-80888	C-7	.25 mfd.	200 V.	Tubular	.10	.25
P-80898	C-8	.006 mfd.	600 V.	Molded	.04	.10
P-80898	C-9	.006 mfd.	600 V.	Molded	.04	.10
P-80864-C	C-10	.1 mfd.	200 V.	Tubular	.07	.18
P-80888	C-11	.25 mfd.	200 V.	Tubular	.10	.25
P-80897	Three-Gang Variable Condenser				1.42	3.55
P-1385	Oscillator 600 K.C. Trim Cond.				.20	.50

Prices subject to change without notice.

MODELS 62-43, 62-43X

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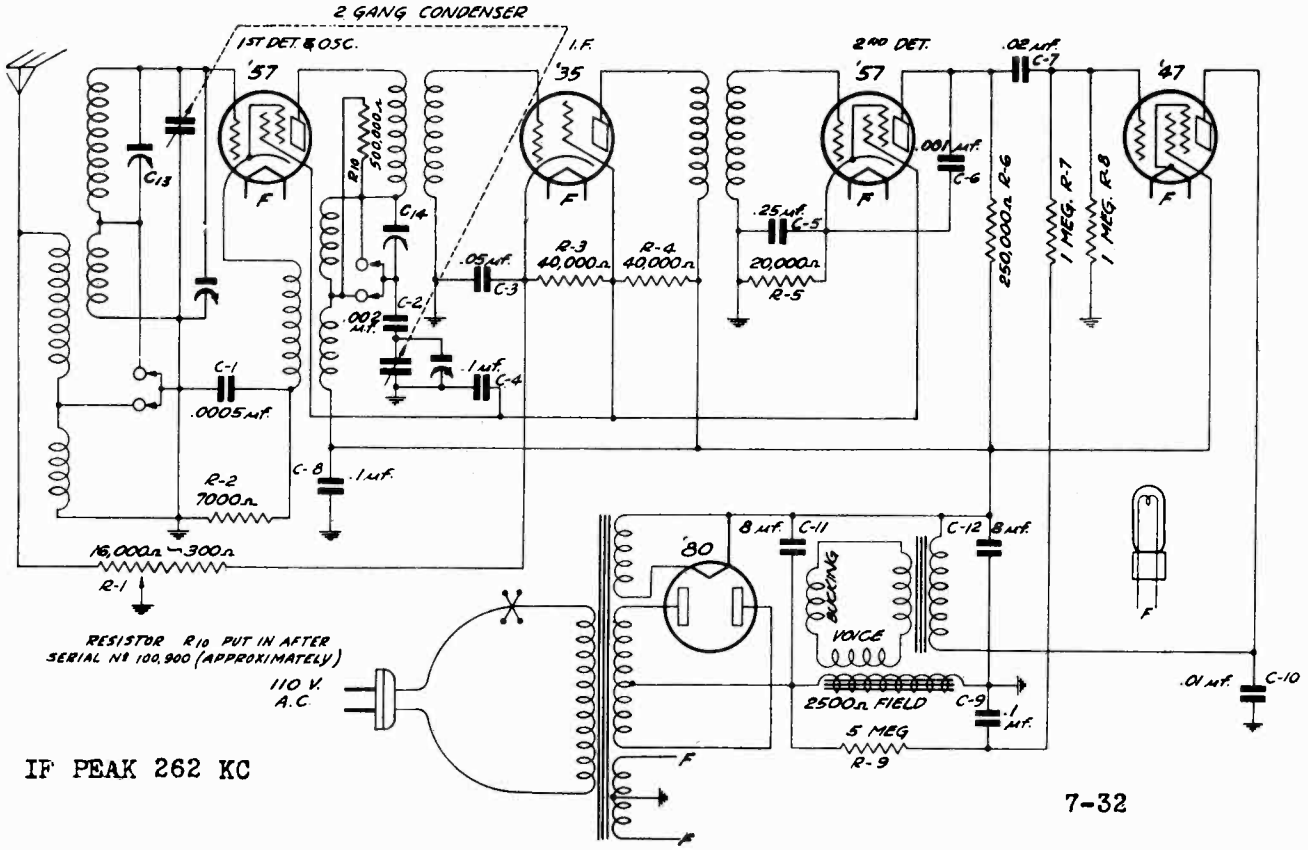


RESISTORS

Part No.	Code	Resistance	Type	Cost Price	Selling Price
P-91019	R-1	Volume Control & 110 V. A.C. Switch		.34	.85
P-A-90979	R-2	7,000 ohm	Carbon	.06	.15
P-B-91021	R-3	40,000 ohm	Carbon	.06	.15
P-B-91021	R-4	40,000 ohm	Carbon	.06	.15
P-A-90959	R-5	20,000 ohm	Carbon	.05	.13
P-A-90954	R-6	250,000 ohm	Carbon	.05	.13
P-A-90948	R-7	1,000,000 ohm	Carbon	.06	.15
P-A-90948	R-8	1,000,000 ohm	Carbon	.06	.15
P-A-91015	R-9	5,000,000 ohm	Carbon	.06	.15
P-A-90929	R-10	500,000 ohm	Carbon	.06	.15

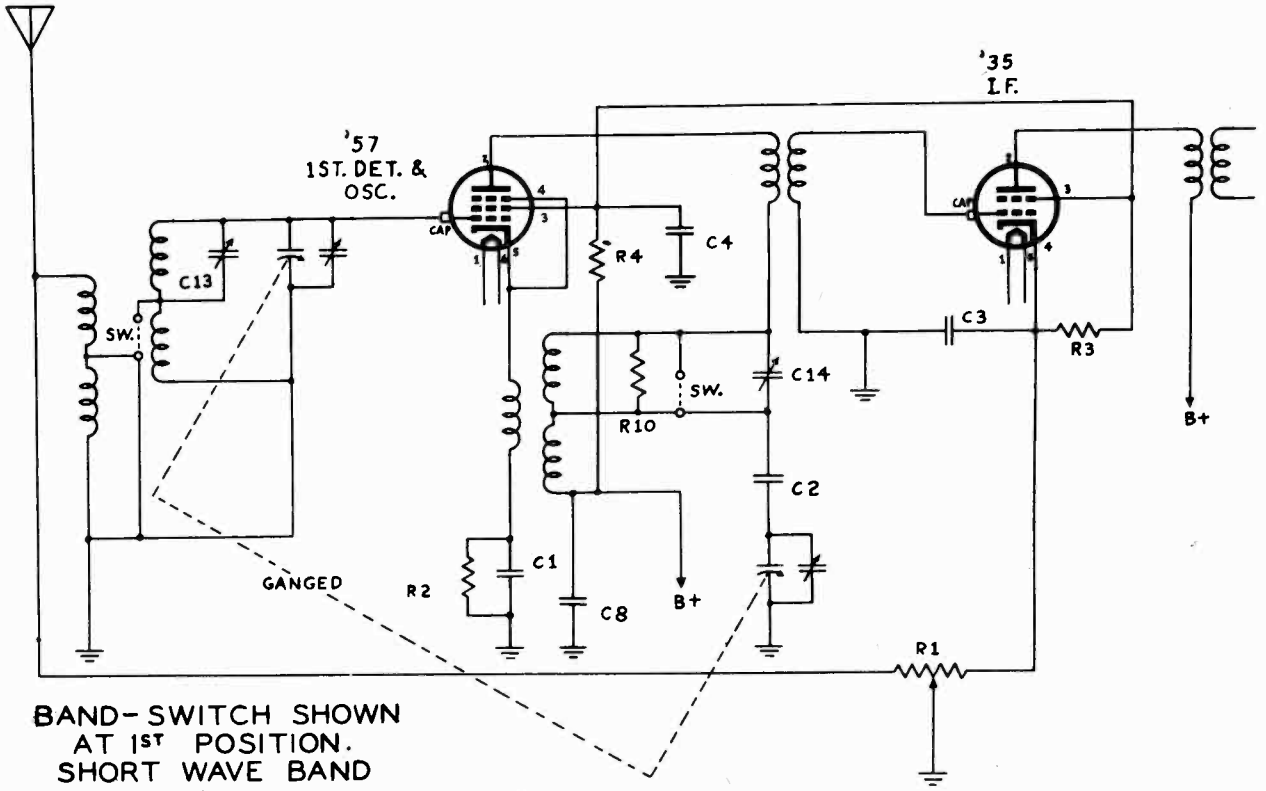
CONDENSERS

Part No.	Code	Capacity Voltage	Type	Cost Price	Selling Price
P-80867	C-1	.0005 mfd., 600 V.	Moulded	.05	.13
P-80808	C-2	.002 mfd., 600 V.	Moulded	.07	.18
P-80890	C-3	.05 mfd., 400 V.	Tubular	.05	.13
P-80887	C-4	.10 mfd., 400 V.	Tubular	.10	.25
P-80888	C-5	.25 mfd., 200 V.	Tubular	.10	.25
P-80905	C-6	.001 mfd., 400 V.	Tubular	.04	.10
P-80868	C-7	.02 mfd., 600 V.	Tubular	.06	.15
P-80887	C-8	.10 mfd., 400 V.	Tubular	.10	.25
P-80864	C-9	.10 mfd., 200 V.	Tubular	.07	.18
P-80872	C-10	.01 mfd., 600 V.	Tubular	.06	.15
P-80894	C-11	8.0 mfd., 450 V.	Electrolytic Block	.69	1.73
	C-12	8.0 mfd., 450 V.			
		2 Neg. leads, green, Pos. lead yellow, common			
P-1575	C-13	Short Wave Adjusting Condenser		.09	.23
P-1442	C-14	Oscillator 600 K.C. Trimmer Condenser		.12	.30
P-80910		Two Gang Variable Condenser		.72	1.80

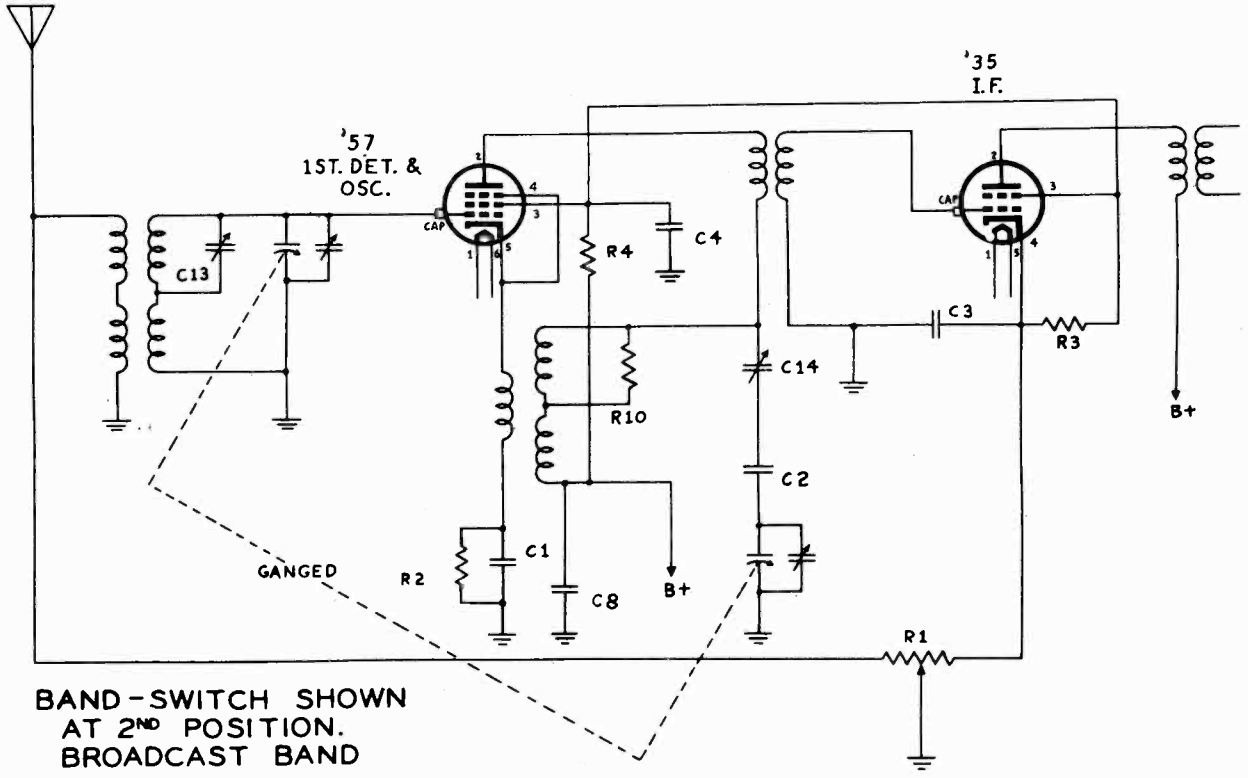
Part No.	Name	Cost Price	Selling Price
P-50548	110 V. 60 Cycle Power Transformer	$0.76	$1.90
P-50558	110 V. 25 Cycle Power Transformer	1.68	4.20
P-1474	'80 Tube Socket	.04	.10
P-1464	'35 Tube Socket	.04	.10
P-1468	'47 Tube Socket	.04	.10
P-1580	'57 Tube Socket	.04	.10
P-1273	Pilot Light, 2.5 V.	.06	.15
P-20479	Mounting Strap for Electrolytic Condenser	.04	.10
P-70702	Attachment Cord and Plug	.23	.58
P-20513	L. Bracket for Broadcast Short-Wave Switch	.02	.05
P-1578	Broadcast Short-Wave Switch	.40	1.00
P-1441	Two-Terminal Mounting Strip	.02	.05
P-1515	Small Knob	.04	.10
P-1516	Large Knob	.05	.13
P-5037	R.F. Transformer Assembly	.30	.75
P-5038	1st I.F. and Oscillator Assembly, Complete with Can	.69	1.73
P-5039	2nd I.F. Assembly, Complete with Can	.53	1.33
P-30374	Bushing for Rubber Pinion	.03	.08
P-10224	Rubber Pinion	.02	.05
P-1590	Dial Strip	.06	.15
P-1497	Pilot Light Bracket & Drive Disc Assembly	.11	.28
P-1383	Drive Bracket Bearing Assembly	.07	.18
P-1478	Escutcheon	$0.13	$0.33
P-20460	Drive Shaft	.02	.05
P-20406	Tube Shield	.03	.08
P-20408	Tube Shield Base	.02	.05
P-1588-A	Electrodynamic Speaker	1.76	4.40

Prices subject to change without notice.

MONTGOMERY WARD



BAND-SWITCH SHOWN
AT 1ST POSITION.
SHORT WAVE BAND
1.6-4 MC.



BAND-SWITCH SHOWN
AT 2ND POSITION.
BROADCAST BAND

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated. A signal generator that will provide accurately calibrated signals over the broadcast band and an output indicating meter are desirable. The procedure is as follows:

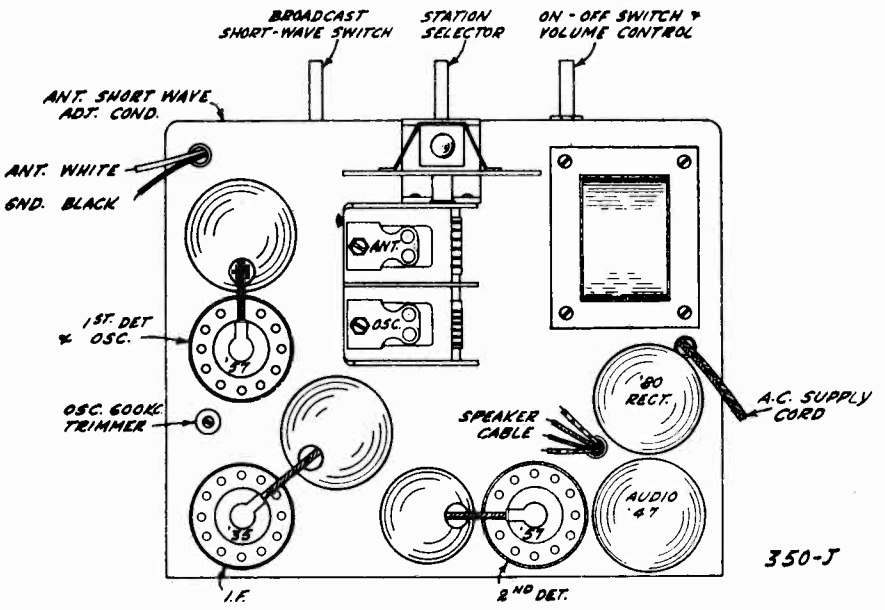
As the I.F. stages are self-tuned, no I.F. aligning at the intermediate frequency of 262 K.C. is required.

First set the signal generator for a signal of exactly 1400 K.C. Connect the antenna lead from the signal generator to the antenna lead of the receiver and the ground lead of the signal generator to the ground of the receiver. Then turn the tuning condenser rotor until the marker is at 1400 K.C. on the dial scale. In order to do this, it will be necessary to put the chassis back in the cabinet. Adjust the two trimmers on the tuning condenser for maximum output adjusting the oscillator trimmer first (section nearest back of receiver).

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. This adjusting screw is between the 1st detector '57 and I.F. '35 sockets and is reached from the top of the chassis. A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.

The last step is to adjust the antenna short-wave adjusting condenser. Turn the Broadcast Short-Wave switch to the short-wave position. Set the signal generator for a signal of 1700 K.C. If the generator does not cover that frequency the 2nd harmonic of an 850 K.C. signal is satisfactory. Set the signal generator for a signal of 850 K.C. and the 2nd harmonic of this signal will be 1700 K.C., the required frequency. Turn the tuning condenser rotor until maximum output is obtained. Then adjust the antenna short-wave trimmer condenser to maximum output. The adjusting nut for this condenser is reached from the front of the chassis at the right hand side. A No. 4 Spintite wrench is necessary.



Voltages at Sockets

LINE VOLTAGE 115—VOLUME CONTROL AT MAXIMUM—ANT. SHORTED TO GND.

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA
'57	1st Det.	2.15	225	90	4	.5
'35	I.F.	2.15	230	90	3.2(1)	6.2
'57	2nd Det.	2.15	170	90	4.3	.2
'47	Audio	2.15	225	240	14(2)	23.
'80	Rect.	4.75	620 volts plate to plate			20. per plate

(1) If read with cord and plug, ground the control grid.
(2) Computed figure—cannot be accurately read with ordinary voltmeter. Voltage consists of drop across 1 megohm resistor, R 8.

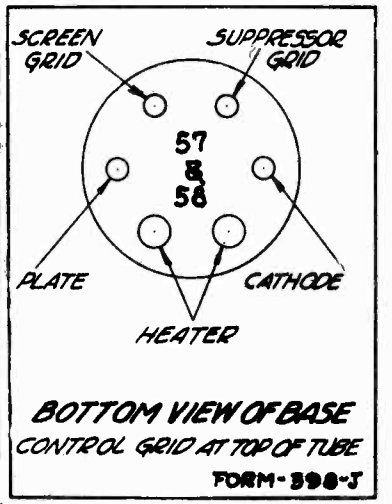
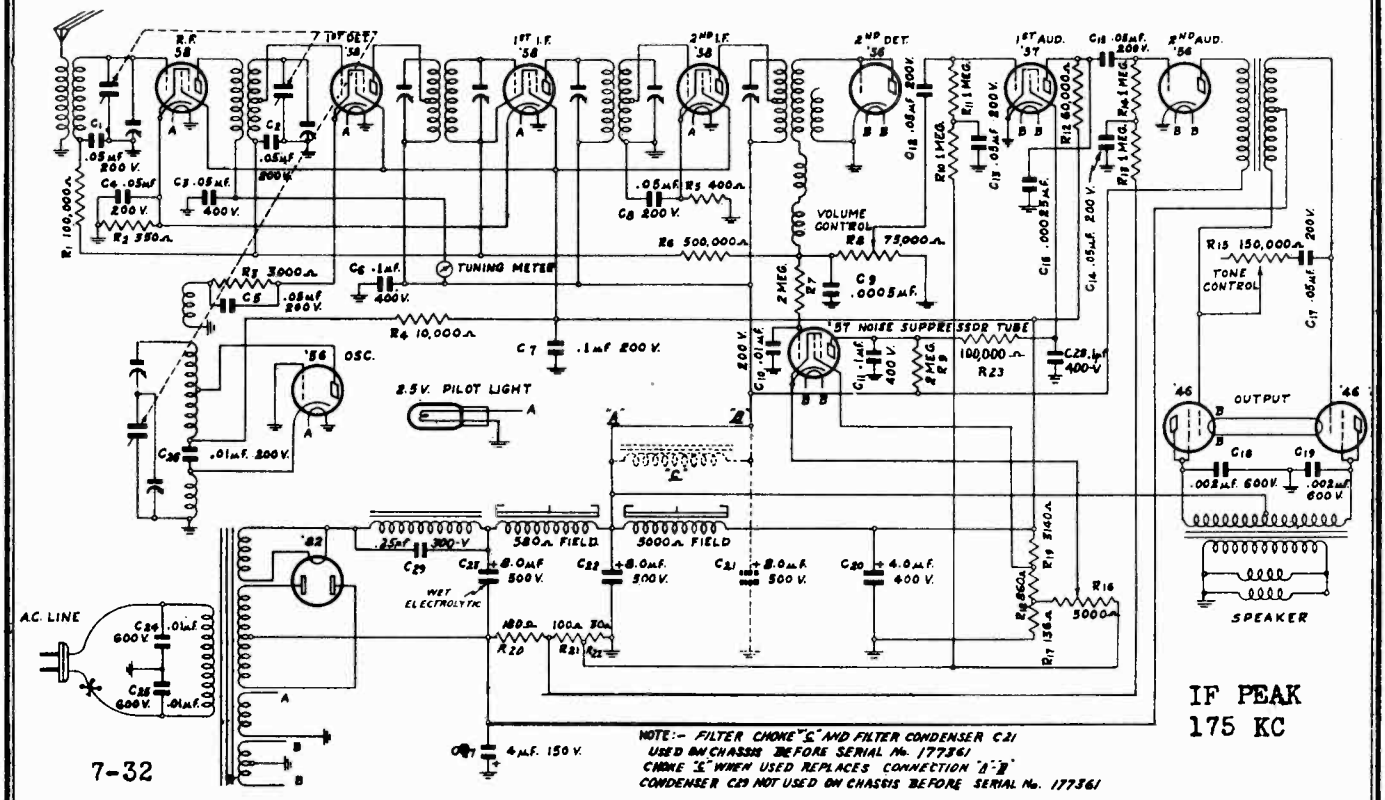


Fig. 3—Terminal Arrangement of 57 and 58 Tubes

MODELS 62-51, 62-64, 62-64X

MONTGOMERY WARD



Differences in Early Models

In the first models of this receiver a slightly different filter system was used in the power unit. Condenser C-29, which tunes the separate choke, was not used. Condenser C-21, shown with dashed lines and the choke shown with dashed lines above the 5,000 ohm speaker field in Fig. 1 were used.

In the first models of this receiver individual tubular condensers were used instead of Condenser Block No. 80922. The condensers which make up this block are shown in the parts list. If replacements of any of the condensers are required, it is recommended that the individual tubular condensers be used.

In the early models, a vitreous enamel, six-section voltage divider resistor was used instead of the wire wound type used at the present time.

Setting the Noise Suppressor

The action of the noise suppressor is to establish a certain signal strength level below which all signals are cut out, and above which all signals come through without being reduced in intensity.

The general method of using the noise suppressor is to first turn the knob to the "Power" or right hand position. At this point there is usually considerable noise received. Turn the knob to the left until the noise is eliminated, and then continue to tune the set in the regular manner to whatever stations are wanted.

When tuning for far, distant stations, the knob should be turned to the extreme right hand or "Power" position, as the weak station signals may be cut out along with the noise signals if the noise suppressor is used.

When tuning in local stations the knob may be turned well toward the left hand or "Quiet" position, as the station signals are very powerful compared with the noise signals.

If the signal of a station is distorted, turn the noise suppressor knob to the right until the signal becomes clear.

Voltages at Sockets

LINE VOLTAGE 115—ANTENNA SHORTED TO GROUND—NOISE SUPPRESSOR AT MAXIMUM CLOCKWISE POSITION

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
58	R.F.	2.4	242	90	4(1)	4
58	1st Det.	2.4	250	86	7(1)	2
56	Osc.	2.4	24		0	8
58	1st I.F.(2)	2.4	252	90	4(1)	4
58	2nd I.F.(2)	2.4	254	91	3	5.7
56	2nd Det.	2.4	0		0	0
57	1st Audio	2.4	65	55	4(3)	.4
57	NoiseSup.	2.4	55	20	3(1)	0
56	2nd Audio	2.4	255		14(4)	3.3
46	Power	2.4	260	260	34	23
82	Rectifier	2.4	880 volts plate to plate			53 per plate

(1) Read from cathode to ground.
(2) If I.F. readings are made with a cord and plug, ground the control grid through a condenser to prevent oscillation and motor boating.
(3) Read across 30 ohm section of voltage divider.
(4) Read across 30 ohm and 100 ohm section of voltage divider.

MODELS 62-51, 62-64, 62-64X

MONTGOMERY WARD

Condenser Alignment

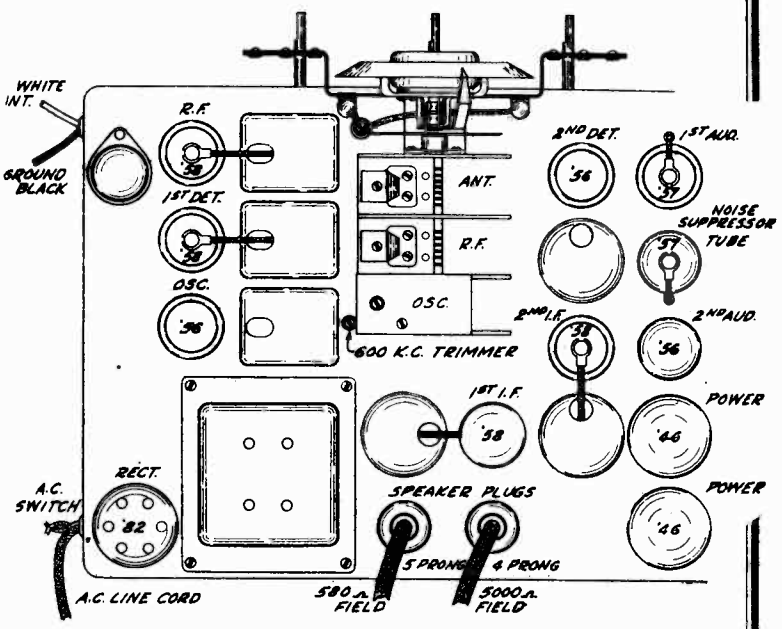
Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are desirable. The procedure is as follows:

Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. Then adjust the five intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the tuning condenser and the coil cans. A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condenser rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.



Part No.	Name	Cost Price	Selling Price
P-10224	Rubber Drive Pinion	.02	.05
P-30374	Bushing for Rubber Drive	.03	.08
P-1657	Tuning Meter	.58	1.45
P-1415	Pilot Lamp Socket and Clip	.04	.10
P-1273	Pilot Lamp, 2.5 V.	.06	.15
P-1540	Knob	.05	.13
P-20425-B	Chassis Bottom Plate	.11	.28
P-40412-A	Aluminum Coil Cans	.06	.15
P-10240	Rubber Cushions (in tube shields)	.02	.05
P-1054	On-Off Switch	.18	.45
P-1504	Insulated Terminal Strip with 8 lugs	.03	.08
P-1661	Dynamic Speaker (5,000 ohm field)	1.70	4.25
P-1662	Dynamic Speaker (580 ohm field)	1.77	4.43

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Cost Price	Selling Price
P-80862-P	C-1	.05 mfd.	200 V.	Tubular	$ .07	$ .18
P-80862-L	C-2	.05 mfd.	200 V.	Tubular	.07	.18
P-80890	C-3	.05 mfd.	400 V.	Tubular	.05	.13
P-80862-B	C-4	.05 mfd.	200 V.	Tubular	.07	.18
P-80862-B	C-5	.05 mfd.	200 V.	Tubular	.07	.18
P-80887-A	C-6	.10 mfd.	400 V.	Tubular	.10	.25
P-80864-C	C-7	.10 mfd.	200 V.	Tubular	.07	.18
P-80862-B	C-8	.05 mfd.	200 V.	Tubular	.07	.18
P-80855	C-9	.0005 mfd.	600 V.	Molded	.06	.15
P-80917	C-10	.01 mfd.	200 V.	Tubular	.05	.13
P-80887-A	C-11	.10 mfd.	400 V.	Tubular	.10	.25
P-80862-B	C-12	.05 mfd.	200 V.	Tubular	.07	.18
P-80862-B	C-13	.05 mfd.	200 V.	Tubular	.07	.18
P-80862-B	C-14	.05 mfd.	200 V.	Tubular	.07	.18
P-80862-B	C-15	.05 mfd.	200 V.	Tubular	.07	.18
P-80919	C-16	.00025 mfd.	600 V.	Molded	.05	.13
P-80862-B	C-17	.05 mfd.	200 V.	Tubular	.07	.18
P-80914	C-18	.002 mfd.	600 V.	Tubular	.05	.13
P-80914	C-19	.002 mfd.	600 V.	Tubular	.05	.13
*P-80915	C-20	4.0 mfd.	400 V.	Electrolytic Block	.83	2.08
	C-21	8.0 mfd.	500 V.			
	C-22	8.0 mfd.	500 V.			
†P-80924	C-20	4.0 mfd.	400 V.	Electrolytic Block	.57	1.43
	C-22	8.0 mfd.	500 V.			
P-80916	C-23	8.0 mfd.	500 V.	Wet Electrolytic	.36	.90
P-80918	C-24	.01 mfd.	600 V.	Dual Tubular	.09	.23
	C-25	.01 mfd.	600 V.			
P-80917	C-26	.01 mfd.	200 V.	Tubular	.05	.13
P-80891	C-27	4.0 mfd.	150 V.	Electrolytic	.20	.50

P-50552	Power Transformer Assembly—60 cycle	$1.95	$ 4.88
P-50563	Power Transformer Assembly—25 cycle	4.45	11.13
P-50560	Large Filter Choke Assembly	.54	1.35
P-50554	Small Filter Choke Assembly	.36	.90
P-50555	Audio Input Transformer Assembly	.72	1.80
P-50556	Audio Output Transformer Assembly	.46	1.15
P-5050	Antenna R.F. Transformer Assembly	.23	.58
P-5051	Interstage R.F. Transformer Assembly	.23	.58
P-5052	Oscillator Coil Assembly	.22	.55
P-5046	Double R.F. Choke	.16	.40
P-5047	First I.F. Transformer Assembly complete with can	.48	1.20
P-5048	Second I.F. Transformer Assembly complete with can	.50	1.25
P-5049	Third I.F. Transformer Assembly complete with can	.50	1.25
P-1636	No. 56 Tube Socket	.03	.08
P-1635	No. 46 Tube Socket	.03	.08

P-80887-A	C-28	.10 mfd.	400 V.	Tubular	.10	.25
†P-80925	C-29	.25 mfd.	300 V.	Tubular	.07	.18
P-80913	Three Gang Condenser				1.04	2.60
P-1442	Oscillator 600 K.C. Trimmer Condenser				.12	.30

‡P-80922

Lead Color				
C-10	.01 mfd.	200 V.	White	Bypass Cond. Block .40 1.00
C-14	.05 mfd.	200 V.	White-Red	
C-8	.05 mfd.	200 V.	White-Red	
C-6	.10 mfd.	400 V.	Yellow	
C-28	.10 mfd.	400 V.	Green	
C-11	.10 mfd.	400 V.	Red	
C-13	.05 mfd.	200 V.	White-Green	

(The first four condensers in the Condenser Block List have one side grounded to the can. The last three have a common black lead.)

RESISTORS

Part No.	Code	Resistance	Type	Cost Price	Selling Price
P-A-90912	R-1	100,000 ohm	Carbon	$0.06	$0.15
P-A-90953	R-2	350 ohm	Carbon	.06	.15
P-A-91034	R-3	3,000 ohm	Carbon	.05	.13
P-B-91037	R-4	10,000 ohm	Carbon	.06	.15
P-A-91035	R-5	400 ohm	Carbon	.05	.13
P-A-90929	R-6	500,000 ohm	Carbon	.06	.15
P-A-90949	R-7	2 Megohm	Carbon	.05	.15
P-91030	R-8	75,000 ohm	Volume Control	.24	.60
P-A-90949	R-9	2 Megohm	Carbon	.06	.15
P-A-90948	R-10	1 Megohm	Carbon	.06	.15
P-A-90948	R-11	1 Megohm	Carbon	.06	.15
P-A-91036	R-12	60,000 ohm	Carbon	.05	.13
P-A-90948	R-13	1 Megohm	Carbon	.06	.15
P-A-90948	R-14	1 Megohm	Carbon	.06	.15
P-91031	R-15	150,000 ohm	Tone Control	.19	.48
P-91032	R-16	5,000 ohm	Noise Suppressor	.19	.48
P-91033	R-17	136 ohm	Armored Wire Wound Resistor	.29	.73
	R-18	860 ohm			
	R-19	3140 ohm			
	R-20	180 ohm			
	R-21	100 ohm			
	R-22	30 ohm			
P-A-90912	R-23	100,000 ohm	Carbon	.06	.15

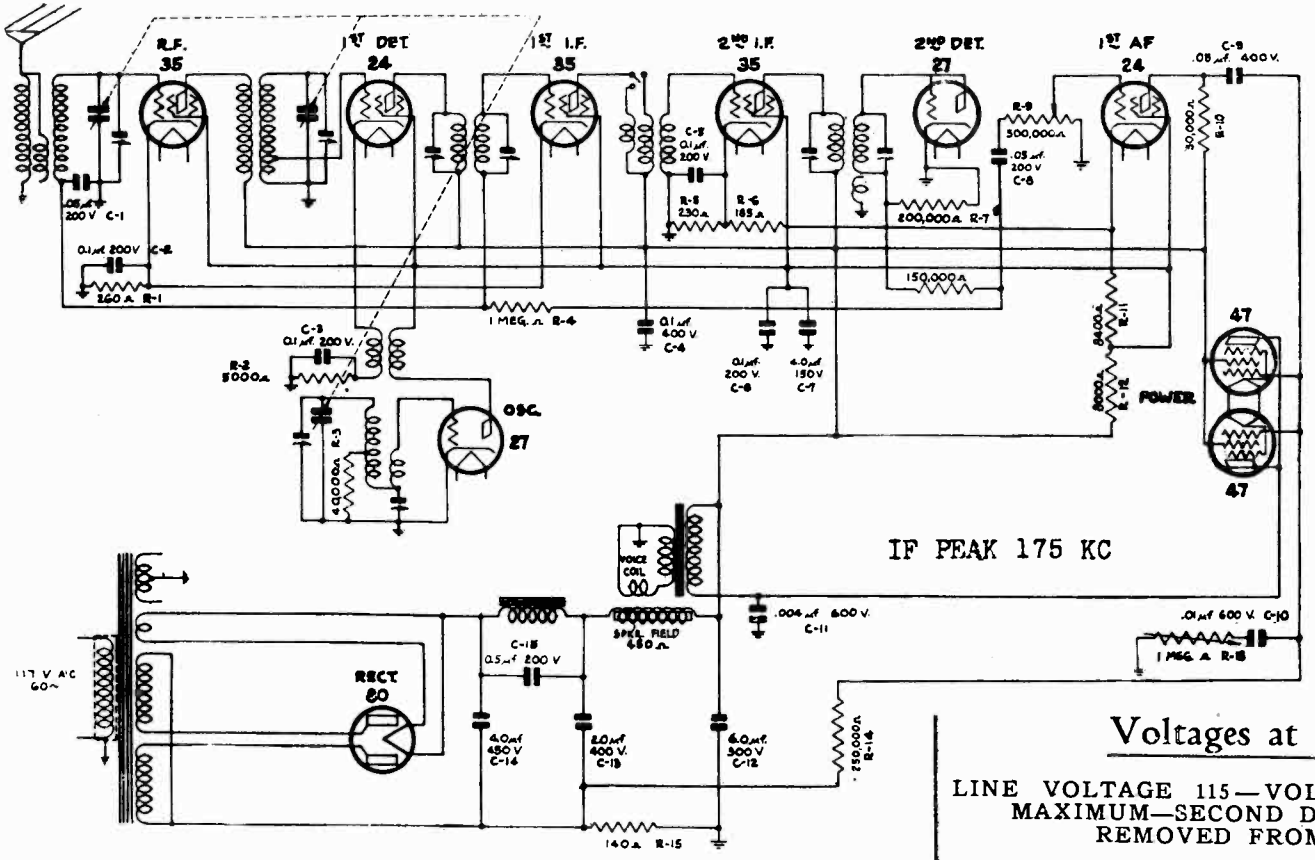
* Used on Models before Serial No. 177361 Only.

† Used on Models after Serial No. 177361 Only.

‡ Early models used separate condensers as shown in list. In later models block replaces condensers as shown in code list.

P-1640	Speaker Socket—Four-prong	.03	.08
P-1637	Speaker Socket—Five-prong	.03	.08
P-1670	No. 82 Tube Socket	.03	.08
P-1648	No. 58 Tube Socket	.04	.10
P-1649	No. 57 Tube Socket	.04	.10
P-40420	Tube Shield	.05	.13
P-40423	Tube Shield Cap	.03	.08
P-40424	Tube Shield Base	.02	.05
P-10142	Rubber Washer, ½" long (cond. mtg.)	.01	.02
P-10143	Rubber Washer, ¾" long (cond. mtg.)	.01	.03
P-20555	Pointer Tension Spring (Right Hand)	.02	.05
P-20556	Pointer Tension Spring (Left Hand)	.02	.05
P-1393	Dial Pointer Assembly	.05	.13
P-1389	Celluloid Dial Strip	.06	.15
P-20554	Drive Shaft	.02	.05
P-30398	Brass Take-up Collar	.03	.08
P-1382	Drive Disc and Hub Assembly	.07	.18

Prices subject to change without notice.



Replacing Rubber Drive

You will note that the Vernier tuning drive on this chassis uses a rubber pinion. Under normal operating conditions this rubber will last for a number of years. Should it become worn it can be readily replaced by loosening the set screw of the brass bushing located next to the rubber pinion and pulling out the station selector shaft. Place a new bushing in position, slip the station selector shaft in place and tighten the set screw.

Voltages at Sockets

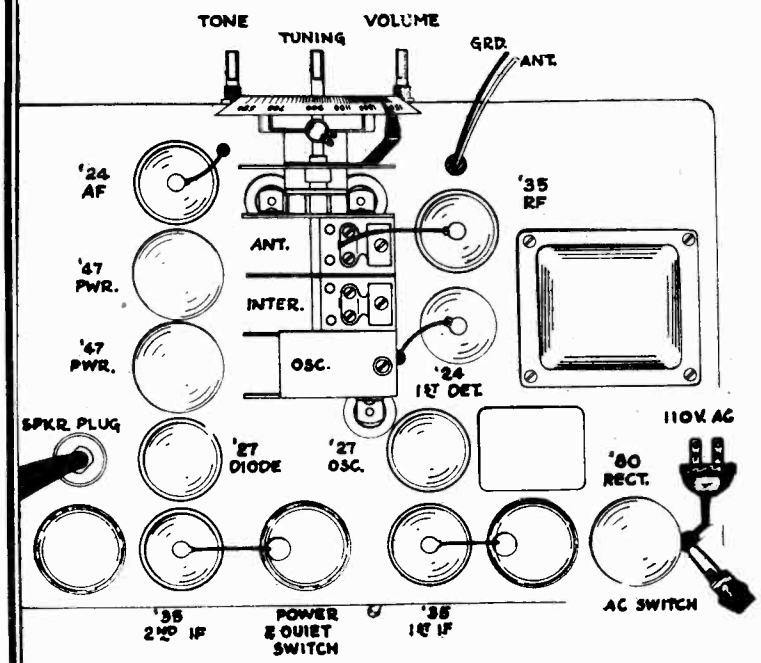
LINE VOLTAGE 115—VOLUME CONTROL AT MAXIMUM—SECOND DETECTOR TUBE REMOVED FROM SOCKET

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA
'35	R.F.	2.2	260	103	3.8(1)	6.5
'24	1st. Det.	2.2	252	98	9.	2.2
'27	Osc.	2.2	100		8. (2)	7. (2)
'35	1st. I.F.	2.2	260	103	3.8(1)	6.5
'35	2nd. I.F.	2.2	257	100	4.5	4.7
'24	1st. Audio	2.2	200	97	7. (3)	1.
'47	2nd. Audio	2.2	240	260	18. (4)	31.
'80	Rect.	4.8	725 volts plate to plate			65 per plate

(1) Read from cathode to ground.
(2) Subject to variation with dial setting.
(3) Read across 230 and 185 ohm sections of voltage divider.
(4) Read across 140 ohm section of voltage divider resistor.
NOTE:—All readings, except heater, for second detector tube are zero.

MODEL 62-52

MONTGOMERY WARD



Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are desirable. The procedure is as follows:

Set the signal generator for 175 K.C. Disconnect the grid cap from the first detector tube. Connect the antenna lead from the signal generator to the grid terminal of this tube. The ground lead goes to the ground connection. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next, set the signal generator for a signal of 1400 K.C. The input in this instance is made to the antenna lead of the receiver. Replace the grid cap on the first detector tube. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Then, set the signal generator for a signal of 600 K.C. The oscillator 600 K. C. trimmer condenser is underneath the chassis but the adjusting screw is reached from the top of the chassis and is adjacent to the oscillator coil can. Adjust this oscillator 600 K.C. trimmer condenser for maximum output, turning the rotor slowly back and forth over the 600 K.C. setting until highest output is obtained. A recheck may then be made of the alignment at 1400 K.C.

Part No.	Name	Cost Price	Selling Price
P-1468	No. 47 Tube Socket	.04	.10
P-1474	No. 80 Tube Socket	.04	.10
P-1521	Speaker Socket	.04	.10
P-1504	Terminal Strip (8 lugs)	.03	.08
P-1273	Pilot Lamp (2.5 v.)	.06	.15
P-1407	Pilot Light Socket (less bulb)	.06	.15
P-20408	Tube Shield Base	.01	.03
P-20406	Tube Shield	.03	.08
P-20430	Mtg. Strap for 2, 4, and 6 mfd. Electrolytic Condenser Block	.03	.08
P-20476	Mtg. Strap for 4 mfd. electrolytic cond.	.02	.05
P-70702	Attachment Cord and Plug	.23	.58
P-1540	Plain Walnut Knob	.05	.13
P-1509	Escutcheon Plate	.16	.40
P-1326	Rectangular Coil Can (Antenna)	.08	.20
P-1327	Rectangular Coil Can (Interstage)	.08	.20
P-1328	Oscillator Assembly Can	.06	.15
P-80889	Three-gang Condenser	1.43	3.58
P-10142	½" Rubber Cushions	.01	.03
P-10143	¼" Rubber Cushions	.01	.03
P-20473	Drive Shaft	.01	.03
P-30374	Rubber Drive Bushing	.03	.08
P-10182	Rubber Drive Pinion	.02	.05
P-1394	Dial Strip and Bracket Assembly	.10	.25
P-20483	Dial Strip Support Plate	.02	.05
P-1382	Drive Disc and Hub	.07	.18
P-1383	Drive Bracket and Bearing	.07	.18
P-1393	Indicator Assembly	.05	.13
P-20425	Bottom Plate	.11	.28
P-20235	J. Bolt for Chassis	.01	.03
P-1534	Electrodynamic Speaker with Cord	1.82	4.55
P-1535	Electrodynamic Speaker	1.70	4.25
P-50547	Output Transformer Assembly	$ .42	$1.05
P-50534	Power Choke Assembly	.34	.85
P-50532	Power Transformer Assembly (60 cycle)	1.66	4.15
P-1433	First I. F. Transformer assembly with can	.50	1.25
P-5032	Second I. F. Transformer assembly with can	.47	1.18
P-5033	Third I. F. Transformer assembly with can	.54	1.35
P-1502	Interstage R. F. Coil assembly less can	.24	.60
P-5036	Antenna R. F. Coil assembly less can	.28	.70

RESISTORS

Part No.	Key No.	Resistance	Type	Cost Price	Selling Price
P-90965	R2	5,000 Ohms	Carbon	$ .06	$ .15
P-90916	R3	40,000 Ohms	Carbon	.06	.15
P-90933	R4	1 Megohm	Carbon	.08	.20
P-90995	R7	200,000 Ohms	Carbon	.05	.13
P-90963-C	R8	150,000 Ohms	Carbon	.06	.15
P-90941-B	R10	50,000 Ohms	Carbon	.05	.13
P-90954-B	R14	250,000 Ohms	Carbon	.05	.13
P-90980-B	R9	0-500,000 Ohms	Volume Control	.32	.80
P-90986-B	R13	0-1 Megohm	Tone Control	.23	.58
P-91007	R1	260 Ohm	Vitreous Enamel	.35	.88
	R15	140 Ohm			
	R5	230 Ohm			
	R6	185 Ohm			
	R11	8400 Ohm			
	R12	8000 Ohm			

CONDENSERS

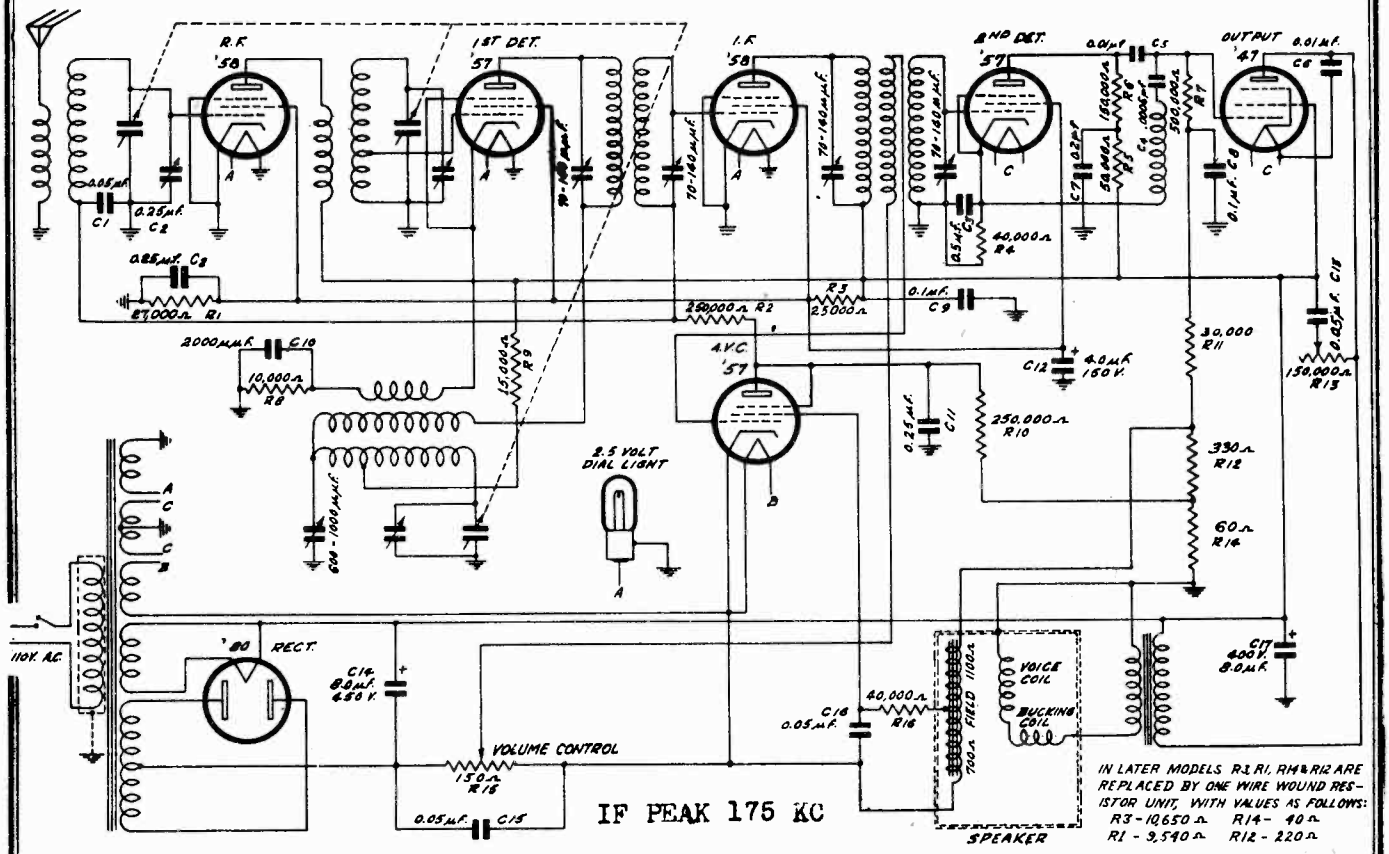
Part No.	Key No.	Capacity	Type	Voltage Rating	Cost Price	Selling Price
P-80862-B	C1	0.05 mfd.	Tubular	200 V.	$ .07	$ .18
P-80864-C	C2	0.1 mfd.	Tubular	200 V.	.07	.18
P-80864-C	C3	0.1 mfd.	Tubular	200 V.	.07	.18
P-80887-A	C4	0.1 mfd.	Tubular	400 V.	.10	.25
P-80864-C	C5	0.1 mfd.	Tubular	200 V.	.07	.18
P-80864-C	C6	0.1 mfd.	Tubular	200 V.	.07	.18
P-80878	C7	4.0 mfd.	Electrolytic	150 V.	.19	.48
P-80862-B	C8	0.05 mfd.	Tubular	200 V.	.07	.18
P-80890	C9	0.05 mfd.	Tubular	400 V.	.05	.13
P-80872	C10	0.01 mfd.	Tubular	600 V	.06	.15
P-80863	C11	0.004 mfd.	Tubular	600 V	.06	.15
P-80896 Electrolytic Block	C12	2.0 Green-Yellow +		300 V.	.62	1.55
	C13	4.0 Green-Red +		400 V.		
	C14	6.0 Blue-Brown +		450 V.		
P-80827	C15	0.5 mfd.	Metal Can	200 V.	.13	.33

P-1400-A	Oscillator Coil Assembly less can	.35	.88
P-1385-B	Oscillator 600 K. C. Trimmer condenser	.20	.50
P-1011-A	Quiet-Power Switch	.15	.38
P-1054	Off-On Switch	.18	.45
P-1462	No. 27 Tube Socket	.04	.10
P-1464	No. 35 Tube Socket	.04	.10
P-1461	No. 24 Tube Socket	.04	.10

Prices subject to change without notice.

MODELS 62-53, 62-71, 62-74, 62-74X

MONTGOMERY WARD



September, 1932

Part No.	Name	Cost Price	Selling Price
P-1677	No. 57 Tube Socket	$ .04	$ .10
P-1678	No. 58 Tube Socket	.04	.10
P-1468	No. 47 Tube Socket	.04	.10
P-1474	No. 80 Tube Socket	.04	.10
P-1479	Speaker Socket	.04	.10
P-40420	Aluminum Tube Shield	.05	.13
P-40425	Tube Shield Base	.02	.05
P-40411	Aluminum Coil Shield—R.F. Coils	.05	.13
P-1476	Three-Lug Insulated Terminal Strip	.03	.08
P-1513	Eleven-Lug Insulated Terminal Strip	.04	.10
P-1054	"On-Off" Switch	.18	.45
P-20529	Drive Shaft	.02	.05
P-10224	Rubber Drive Pinion	.02	.05
P-30374	Brass Bushing for Rubber Pinion	.03	.08
P-1273	Pilot Lamp 2.5 Volt	.06	.15
P-5062	Antenna R.F. Transformer Assembly	.19	.48
P-5057	Interstage R.F. Transformer Assembly	.19	.48
P-5058	Oscillator Coil Assembly	.23	.58
P-5059	1st I.F. Transformer Assembly, complete with can	.54	1.35
P-5060	2nd I.F. Transformer Assembly, complete with can	.60	1.50
P-50541	Output Transformer Assembly	.42	1.05
P-50542	Power Transformer, 60 cycle, 110 volt	1.26	3.15
P-50543	Power Transformer, 25 cycle, 110 volt	2.05	5.13
P-1497	Pilot Light Bracket and Drive Gear Assembly	.11	.28
P-1383-C	Drive Bracket and Bearing	.07	.18
P-1684	Celluloid Dial Strip	.05	.13
P-1525	Dynamic Speaker	1.32	3.30
P-1526	Dynamic Speaker—With plug	1.50	3.75

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Cost Price	Selling Price
P-80862-C	C-1	.05 mfd.	200 V.	Tubular	$ .07	$ .18
P-80888-A	C-2	.25 mfd.	200 V.	Tubular	.10	.25
P-80886-C	C-3	.5 mfd.	200 V.	Block	.38	.95
	C-7	.2 mfd.	400 V.			
	C-11	.25 mfd.	200 V.			
P-80867	C-4	.0005 mfd.	600 V.	Molded	.06	.15
P-80872-B	C-5	.01 mfd.	600 V.	Tubular	.06	.15
P-80872-B	C-6	.01 mfd.	600 V.	Tubular	.06	.15
P-80864-D	C-8	.1 mfd.	200 V.	Tubular	.06	.15

Prices subject to change without notice.

P-80887-B	C-9	.1	mfd.	400 V.	Tubular	.10	.25
P-80914	C-10	.002	mfd.	600 V.	Tubular	.05	.13
P-80891-B	C-12	4.0	mfd.	150 V.	Electrolytic	.20	.50
P-80890-B	C-13	.05	mfd.	400 V.	Tubular	.05	.13
P-80894-B	C-14	8.0	mfd.	450 V.	Electrolytic Block	.69	1.73
	C-17	8.0	mfd.	450 V.			
P-80862-C	C-15	.05	mfd.	200 V.	Tubular	.07	.18
P-80862-C	C-16	.05	mfd.	200 V.	Tubular	.07	.18
P-80849		8.0	mfd.	450 V.	Wet Electrolytic (25 Cycle only)	.53	1.33
P-1385-B	600 K.C Trimmer Condenser					.20	.50
P-80882	Three-Gang Condenser					1.37	3.43

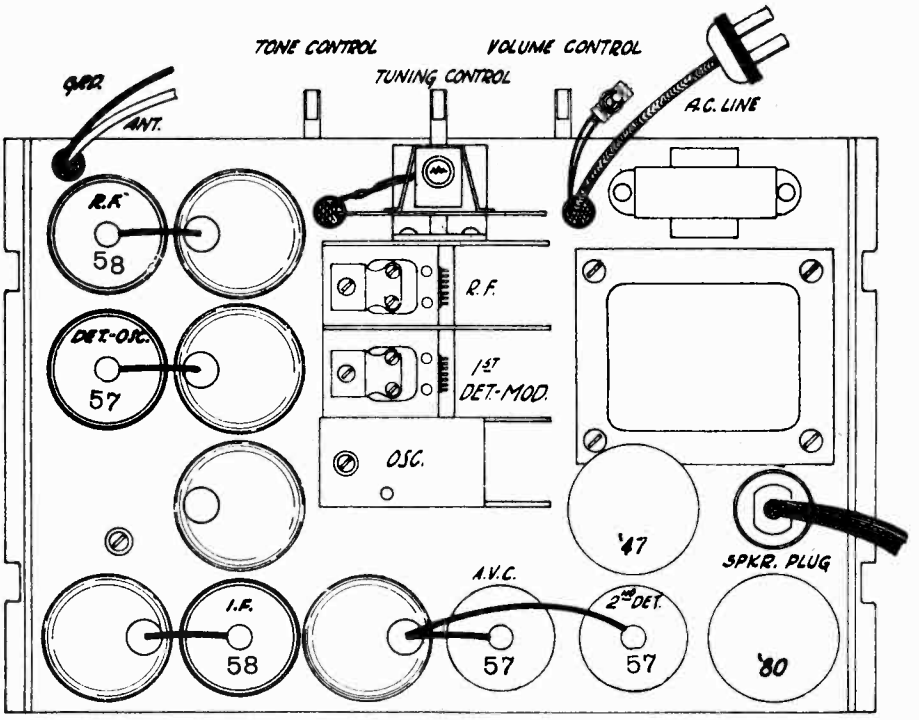
RESISTORS

Part No.	Code	Resistance	Wattage	Type	Cost Price	Selling Price
*P-91003	R-1	27,000 ohms	.5 Watts	Carbon	$ .06	$ .15
P-90954	R-2	250,000 ohms	.2 Watts	Carbon	.06	.15
*P-91002	R-3	25,000 ohms	1.0 Watts	Carbon	.06	.15
P-90916	R-4	40,000 ohms	.2 Watts	Carbon	.06	.15
P-90941	R-5	50,000 ohms	.2 Watts	Carbon	.06	.15
P-90963	R-6	150,000 ohms	.2 Watts	Carbon	.06	.15
P-90929	R-7	500,000 ohms	.2 Watts	Carbon	.06	.15
P-90930	R-8	10,000 ohms	.2 Watts	Carbon	.05	.13
P-90905	R-9	15,000 ohms	.2 Watts	Carbon	.06	.15
P-90954	R-10	250,000 ohms	.2 Watts	Carbon	.06	.15
P-90956	R-11	30,000 ohms	.2 Watts	Carbon	.06	.15
*P-91040	R-12	330 ohms		Vitreous Enamel	.12	.30
	R-14	60 ohms				
P-90993	R-13	150,000 ohms		Tone Control	.22	.55
P-91041	R-15	150 ohms		Volume Control	19	.48
P-90916	R-16	40,000 ohms	.2 Watts	Carbon	.06	.15
†P-91048	R12	220 ohm	1.0 Watts	Armored Wire-wound Resistor	.25	.63
	R14	40 ohm	.2 Watts			
	R1	9540 ohm	1.0 Watts			
	R3	10650 ohm	2.5 Watts			

* Used in early models—in later models these resistors are replaced by resistor P-91048.
† See above.

MODELS 62-53, 62-71, 62-74, 62-74X

MONTGOMERY WARD



Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are desirable. The procedure is as follows:

Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the I.F. and oscillator coil cans.

A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condensor rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.

Voltages at Sockets

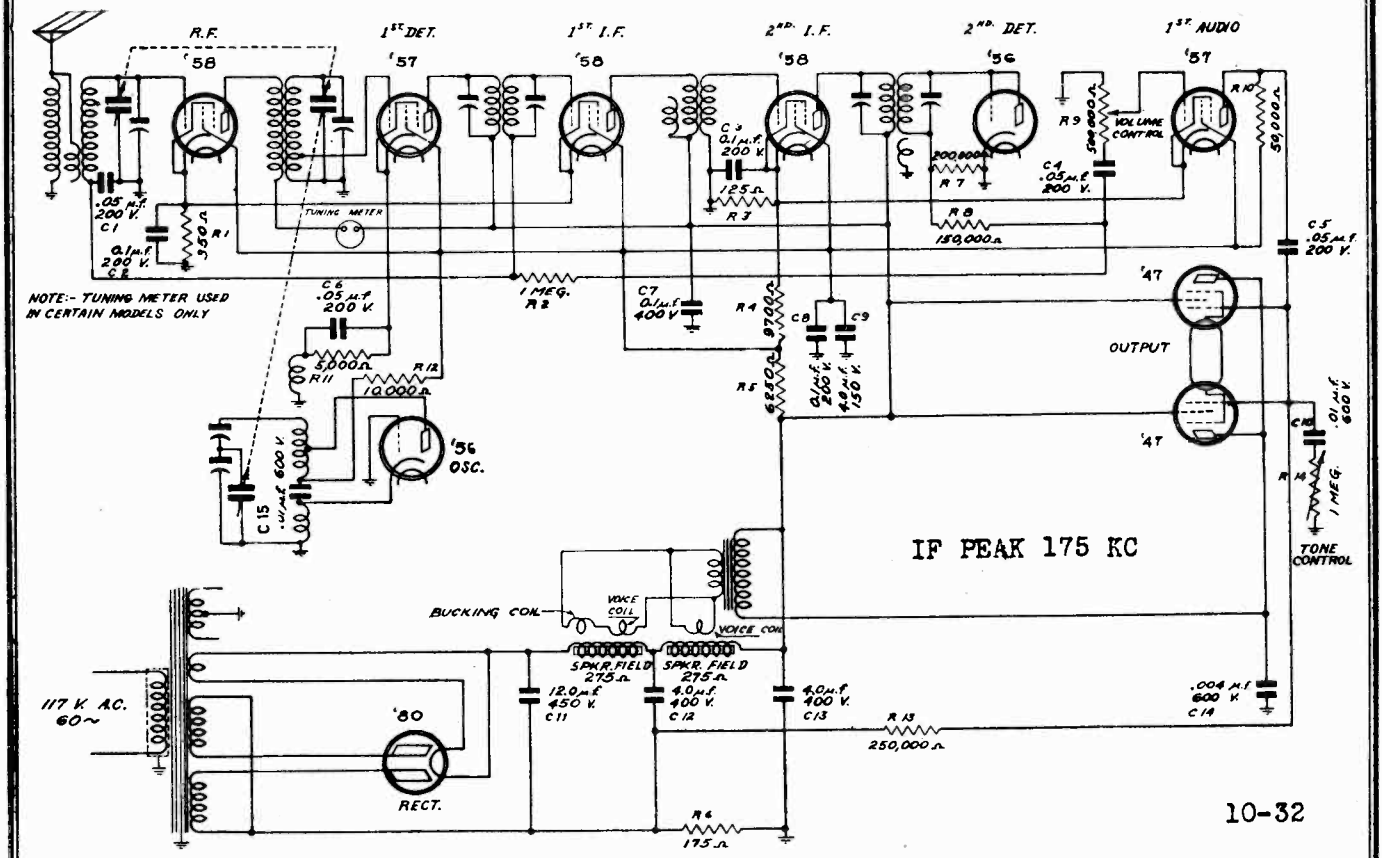
LINE VOLTAGE 115—ANTENNA LEAD SHORTED TO GROUND—VOLUME CONTROL AT MAXIMUM

			For early Models with 2-section vitreous enamel resistor.				For later Models with 4-section armoured wire-wound resistor.			
Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M. A.
'58	R.F.	2.4	282	107	4(1)	8.	258	106	2.8(1)	8.0
'57	1st Det.	2.4	270	100	5	.4	250	103	5	.4
'58	I.F.(2)	2.4	282	107	4(1)	8.	258	106	2.8(1)	8.0
'57	A.V.C.	2.4	90	40	9.5	0	103	45	10	0
'57	2nd Det.	2.4	207	98	6	.15	190	101	6	.15
'47	Audio	2.4	262	280	24(3)	31	242	260	17(3)	30
'80	Rect.	4.8				30 per plate				34 per plate

(1) Read Across R-14.
(2) If I.F. readings are made with a cord and plug, ground the control grid through a condenser to prevent oscillation.
(3) Read Across R12 and R14

MODELS 62-55, 62-76, 62-76X

MONTGOMERY WARD



Voltages at Sockets

LINE VOLTAGE, 115 — ANTENNA LEAD SHORTED TO GROUND

Type of Tube	Function	Across Filament or Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate M.A.
58	R.F.	2.4	275	100	4.2(1)	5.2
57	1st Det.	2.4	265	99	5.4	.9
56	Osc.	2.4	28		0	8.6
58	1st I.F.	2.4	275	100	4.2(1)	5.2
58	2nd I.F.	2.4	275	102	3.0	8.5
56	2nd Det.	2.4	0		0	0
57	1st Audio	2.4	12	102	3.0(1)	1.8
47	Output	2.4	265	280	18.5(2)	30.0
80	Rect.	4.9				55.0 per plate

(1) Measured from cathode to ground.
(2) Measured across Resistor R6.

Voltages

Check the voltages at the sockets to see if correct voltages are being delivered to the tubes. The antenna and ground should be disconnected and the antenna and ground leads from the set connected together.

All of the D.C. voltage readings as shown on the chart are read with a 1,000 ohm per volt meter. As high a range as possible should be used. In general, the higher the resistance of the meter, the more accurate the reading will be.

Owing to the high resistance in the grid circuits of the R.F., 1st I.F., 1st audio and output tubes, the bias voltage cannot be read between the control grid and cathode of these tubes but must be read across the points as indicated in the references under the chart.

If a cable and plug are used to read the voltages, when making the readings at the I.F. socket, ground the control grid through a condenser to prevent oscillation.

The voltage chart gives the voltages with all tubes in, the speaker connected and the set in operating condition. These voltages are typical of the sets but will vary slightly with variations in individual receivers and variations in tube characteristics. All voltages in the chart are taken with a line voltage of 115. Differences in line voltage as well as differences in test equipment used will introduce other variations in the voltage readings.

MODELS 62-55, 62-76, 62-76X

MONTGOMERY WARD

Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are desirable. The procedure is as follows:

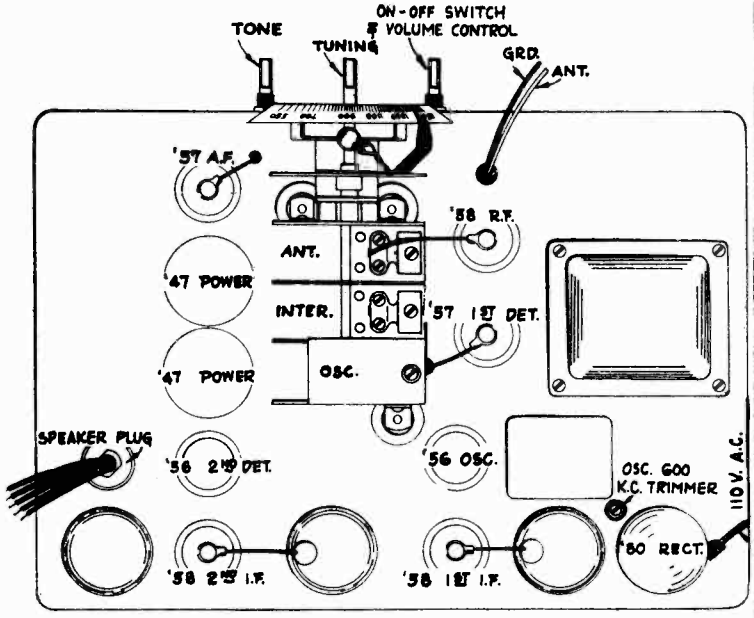
Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the I.F. and oscillator coil cans.

A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condensor rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.



Replacing Rubber Drive

You will note that the Vernier tuning drive on this chassis uses a rubber pinion. Under normal operating conditions this rubber will last for a number of years. Should it become worn it can be readily replaced by loosening the set screw of the brass bushing located next to the rubber pinion and pulling out the station selector shaft. Place a new bushing in position, slip the station selector shaft in place and tighten the set screw.*

Dual Speaker Connections

Two speakers are used in this model. The fields of these speakers are connected in series and the voice coils in parallel. The resistance of each speaker field is 275 ohms

Part No.	Name	Cost Price	Selling Price
P-1703	No. 47 Tube Socket	$ .04	$ .10
P-1706	No. 56 Tube Socket	.04	.10
P-1699	No. 57 Tube Socket	.04	.10
P-1700	No. 58 Tube Socket	.04	.10
P-1696	No. 80 Tube Socket	.04	.10
P-1704	Speaker Socket	.04	.10
P-40425	Tube Shield Base	.02	.05
P-40420	Tube Shield	.05	.13
P-20425-B	Bottom Plate	.11	.28
P-40426	R.F. Coil Shields	.06	.15
P-10142	½" Rubber Washer for Gang Condenser	.01	.03
P-10143	¼" Rubber Washer for Gang Condenser	.01	.03
P-10240	Tube Cushions	.02	.05
P-40412	Oscillator Coil Shield	.06	.15
P-20461	Gang Condenser Shield	.03	.08
P-1273	2.5 V. Pilot Lamp	.06	.15
P-20473	Drive Shaft	.01	.03
P-1382-A	Drive Disc Hub and Fulcrum	.07	.18
P-1389-C	Celluloid Dial Strip	.06	.15
P-1393	Pointer Assembly	.05	.13
P-1383-C	Drive Bracket	.07	.18
P-10224	Rubber Drive Pinion	.02	.05
P-30374	Brass Bushing for Rubber Pinion	.03	.08
P-1415	Pilot Light Socket	.04	.10
P-1691	Dynamic Speaker with Plug	1.74	4.35
P-1692	Dynamic Speaker	1.56	3.90
P-50562	Power Transformer, 60 cycle, 110 Volt	1.66	4.15
P-50565	Power Transformer, 25 cycle, 110 Volt	3.14	7.85
P-50561	Output Transformer	.42	1.05
P-5067	Antenna R.F. Transformer	.24	.60
P-5066	Interstage R.F. Transformer	.24	.60
P-5052	Oscillator Coil Assembly	.22	.55
P-1433	1st I.F. Transformer Assembly, complete with can	.50	1.25
P-5068	2nd I.F. Transformer Assembly, complete with can	.50	1.25
P-5033	3rd I.F. Transformer Assembly, complete with can	.54	1.35
P-1540	Knobs	.05	.13

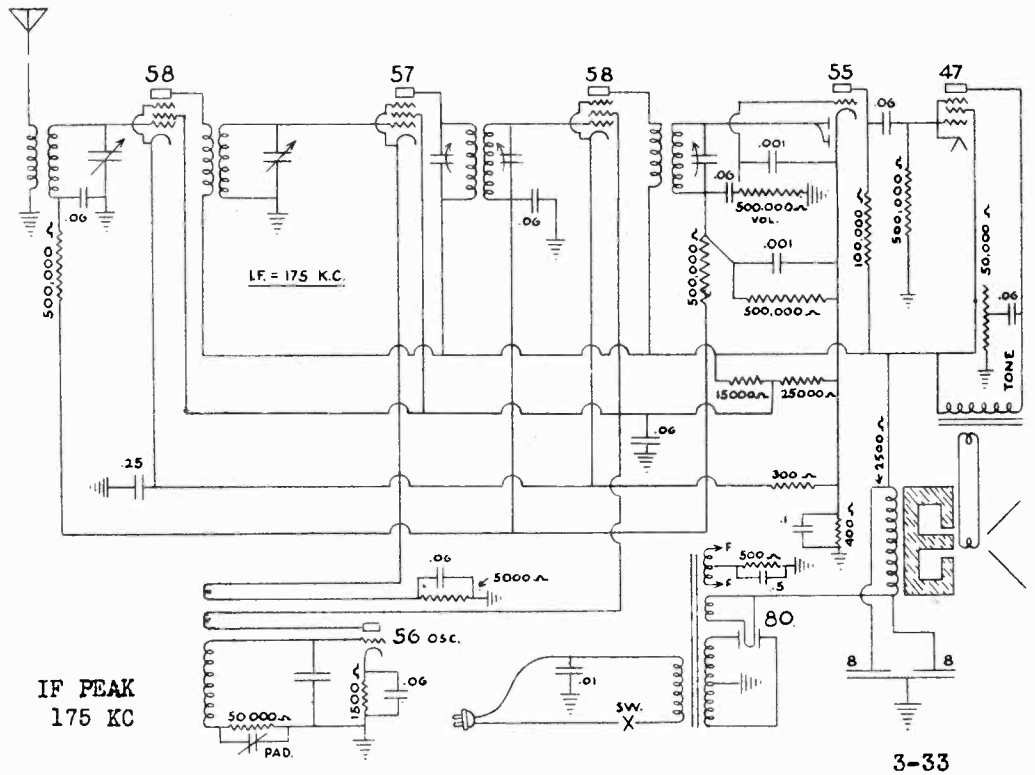
CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Cost Price	Selling Price
P-80862	C-1	.05 mfd.	200 V.	Tubular	$ .07	$ .18
P-80864	C-2	.1 mfd.	200 V.	Tubular	.07	.18
P-80864	C-3	.1 mfd.	200 V.	Tubular	.07	.18
P-80862	C-4	.05 mfd.	200 V.	Tubular	.07	.18
P-80862	C-5	.05 mfd.	200 V.	Tubular	.07	.18
P-80862	C-6	.05 mfd.	200 V.	Tubular	.07	.18
P-80887	C-7	.1 mfd.	400 V.	Tubular	.10	.25
P-80864	C-8	.1 mfd.	200 V.	Tubular	.07	.18
P-80878	C-9	4.0 mfd.	150 V.	Electrolytic	.19	.48
P-08872	C-10	.01 mfd.	600 V.	Tubular	.06	.15
P-80923	C-11	12.0 mfd	450 V.	Electro-	.57	1.43
	C-12	4.0 mfd.	400 V.	lytic Block		
P-80873-D	C-13	1.0 mfd.	400 V.	Electrolytic	.28	.70
P-80863	C-14	.004 mfd.	600 V.	Tubular	.06	.15
P-80872	C-15	.01 mfd.	600 V.	Tubular	.06	.15
P-1442	600 K.C. Trimmer				.12	.30
P-80889	Three-Gang Variable Condenser				1.43	3.58

RESISTORS

Part No.	Code	Resistance	Wattage	Type	Cost Price	Selling Price
P-A-90953	R-1	350 ohm	.2 Watts	Carbon	$ .06	$ .15
P-A-90948	R-2	1 Megohm	.2 Watts	Carbon	.06	.15
P-91044	R-3	125 ohm		Armored		
	R-4	9700 ohm				
	R-5	6250 ohm		Wire Wound	.25	.63
	R-6	175 ohm				
P-A-90995	R-7	200,000 ohm	.2 Watts	Carbon	.05	.13
P-A-90963	R-8	150,000 ohm	.2 Watts	Carbon	.06	.15
P-91043	R-9	500,000 ohm	Vol. Control & Switch		.33	.83
P-A-90941	R-10	50,000 ohm	.2 Watts	Carbon	.05	.13
P-A-90965	R-11	5,000 ohm	.2 Watts	Carbon	.06	.15
P-B-91037	R-12	10,000 ohm	.5 Watts	Carbon	.06	.15
P-A-90954	R-13	250,000 ohm	.2 Watts	Carbon	.06	.15
P-90986-C	R-14	1 Megohm		Tone Control	.23	.58

Prices subject to change without notice.



3-33

Circuit Description And Aligning Procedure

The tubes employed are as follows, and are operated at rated voltages and biases:

R.F.	58	Osc.	56
1st Det.	57	2nd Det.	55
I.F.	58	Audio	47

Rectifier 80

The second detector is the new dual diode triode, the diode portion operating as a detector and providing automatic volume control—acting on the grids of the R.F. and I.F. stages. The triode portion of this tube is operated as an individually biased A.F. amplifier.

In aligning, it is first desirable to see that the I.F. transformers are properly set. Both are on top of the base, the first having two adjustments, the second but one adjustment. The intermediate frequency is 175 K.C. Couple test oscillator into grid of first detector. Use an output meter.

The tuning condenser may be adjusted for alignment or "tracking" of the tuned circuits by means of an oscillator and output meter, also. The oscillator should cover the band from 550 to 1500 K.C. The energy from the oscillator should be coupled weakly into the antenna circuit. The receiver and oscillator are first tuned to approximately 1500 K.C., and, by watching the output meter the three condenser trimmers are adjusted for maximum output. These three trimmers must then be left untouched for all further aligning.

The next step is to tune both receiver and oscillator to some point near 550 K.C. Here the alignment is made by adjusting the oscillator "pad" condenser for maximum response. It may be reached through hole in base between 1st detector and oscillator tubes. If necessary to adjust the two R.F. condenser sections it may be done by bending the slotted condenser rotor end plates. If necessary to align at points other than the ends of the "band" it may be done by bending portions of these slotted plates. Alignment of the two ends of the scale is usually quite sufficient.

IMPORTANT: It is desirable to move the dial back and forth across the signal while making the above alignments. This is particularly necessary when altering any capacities connected with the oscillator circuit. Use an insulated or bakelite screw driver.

Be certain that good tubes are used in all sockets.

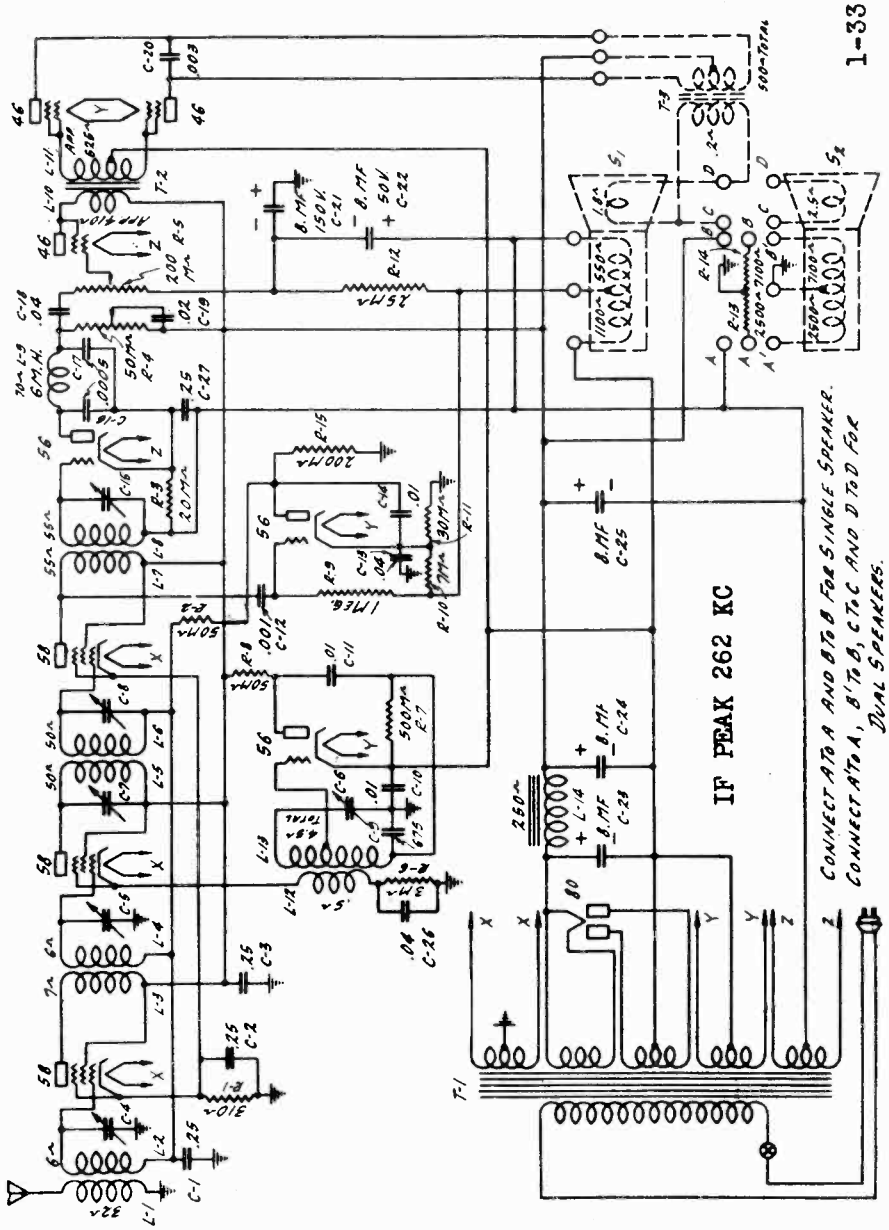
		Net Price Each	Selling Price
SOCKETS			
K-2-2-509	57 socket	$0.03	$0.08
K-3-2-509	58 socket	.03	.08
K-4-2-509	55 socket	.03	.08
K-4-7-514	56 socket	.03	.08
K-2-7-514	47 socket	.03	.08
K-2-4-508	80 socket	.03	.08
K-3-7-514	Unnumbered 5 prong socket	.03	.08
CONDENSERS			
K-3-4-301	3 gang var. tuning condenser	1.00	2.50
K-1-10-302	Dual 8 mfd. filter cond.	.53	1.33
K-2-4-226	.01 mfd. cond. 400 volt	.04	.10
K-1-6-226	.5 mfd. cond. 200 volt	.08	.20
K-2-3-226	.06 mfd. cond. 400 volt	.05	.13
K-1-3-226	.06 mfd. cond. 200 volt	.045	.11
K-1-5-226	.25 mfd. cond. 200 volt	.065	.16
K-1-3-306	.1 mfd. cond. 200 volt	.05	.13
K-3-3-474	.001 mfd. cond. molded bakelite	.06	.15
K-3-3-462	Adjustable padding cond. 1500 mmfd. max.	.15	.38
RESISTORS			
K-4-2-476	500 ohm Wire Wound Resistors, Flex	$0.04	$0.10
K-1-3-172	300 ohm ½ watt Carbon Resistor	.05	.13
K-1-2-172	400 ohm ½ watt Carbon Resistor	.05	.13
K-1-1-4175	1500 ohm ½ watt Carbon Resistor	.05	.13
K-1-1-7366	25M ohm ½ watt Carbon Resistor	.05	.13
K-1-1-4224	50M ohm ½ watt Carbon Resistor	.05	.13
K-1-1-8484	100M ohm ½ watt Carbon Resistor	.05	.13
K-1-1-4225	500M ohm ½ watt Carbon Resistor	.05	.13
K-2-1-173	15M ohm 1 watt Carbon Resistor	.05	.13
K-2-1-172	5M ohm 1 watt Carbon Resistor	.05	.13
COILS			
K-1-6-601	Antenna Coil Assembly	.20	.50
K-1-4-602	R. F. Coil Assembly	.15	.38
K-3-3-450	Oscillator Coil Assembly	.15	.38
TRANSFORMERS			
K-6-7-201	Power Transformer 60 cycle	$1.15	$2.88 ea
K-4-5-963	No. 1 I.F. Transformer Assembly	.50	1.25 "
K-5-5-963	No. 2 I.F. Transformer Assembly	.50	1.25 "

		Net Price	Selling Price
SHIELDS			
K-0-5-103	Coil Shields	.03	.08 ea.
K-3-5-103	I.F. Transformer Shield	.04	.10 "
K-1-1-744	Inter Coil Shield for Sub Base	.50	1.25 C
K-1-8-219	Variable Cond. Shield	.10	.25 ea.
K-1-3-364	6-32 St. Spade Screws for Coil Shield	2.00	5.00 M
TERMINAL STRIPS			
K-1-1-F538	Large Term. Strip	.02	.05 ea.
K-1-2-531	Small Term. Strip	.01	.03 "
K-1-10-419	Insulator for Small Term. Strip	.50	1.25 C
K-1-2-F419	Insulator for Large Term. Strip	.50	1.25 "
K-1-1-4430	Small Double Solder Lugs	1.00	2.50 M
K-1-1-3504	200 Short Eyelets	.50	1.25 "
MISCELLANEOUS PARTS			
K-1-5-457	Tube Shield Base	$0.01	$0.03 ea.
K-1-7-101	Sub Base	.15	.38 "
K-4-4-122	Dial Assembly with Strip	.31	.78 "
K-2-6-320	Var. Cond. Mtg. Bracket, Front	.03	.08 "
K-1-6-320	Var. Cond. Mtg. Bracket, Rear	.03	.08 "
K-1-3-416	Dial Mtg. Strap	.02	.05 "
K-1-3-114	Dial Lamp Socket	.03	.08 "
K-1-1-3154	2.5 volt Dial Lamp	.07	.18 "
K-2-3-4167	Control Grid Clips	.50	1.25 C
K-2-4-116	Power Cord Set	.12	.30 ea.
K-5-7-406	Volume Control	.30	.75 "
K-4-5-369	Tone Control	.23	.58 "
K-1-3-396	⅜" Internal Tooth Shakeproof Washers	.15	.38 C
K-1-4-411	⅜" Volume Control Nut	.40	1.00 "
K-1-2-409	Large Bakelite Pattern Washer for C. Con.	.75	1.88 "
K-1-1-3410	Large Fiber Extruded Washer for Vol. Con.	.70	1.75 "
K-1-1-127	Brass Cond. Spacer (front mtg.)	.01	.03 ea.
K-1-2-127	Brass Cond. Spacer (rear mtg.)	.01	.03 "
K-2-1-3124	¼" Gum Rubber Grommets	.50	1.25 C
K-2-1-3123	⅜" Gum Rubber Grommets	.50	1.25 "
K-1-3-437	I.F. Transformer Hold-down Clamp	.50	1.25 "
K-0-4-104	Tube Shield	.04	.10 ea.
K-0-1-635	Tube Shield Cap	.02	.05 "
K-1-7-132	Escutcheon Plate	.10	.25 "
K-1-8-134	Small Control Knob	.03	.08 "
K-2-8-134	Large Control Knob	.04	.10 "

Prices subject to change without notice.

MODELS 62-79,62-84,62-84X,
62-94,62-94X

MONTGOMERY WARD



VOLTAGES AT SOCKETS—LINE VOLTAGE 115—VOLUME CONTROL AT MAXIMUM

Type of Tube	Position of Tube	Function	"A" Volts	"B" Volts	Control Grid "C" Volts	Screen Volts	Screen Current MA	Cathode Volts	Plate Current MA	Grid Test M.A.
58	1	R.F.	2.35	125	-3(1)	125	1.3	5.0	5.6	9.6
58	2	1st Det.	2.35	115	5.0(2)	115	.6	10.0	2.9	3.5
58	3	I.F.	2.35	125	-3(1)	125	1.3	5.0	5.6	9.6
56	4	2nd Det.	2.30	170	12.0			12.0	.6	.6
46	5	Driver	2.25	215	18.0(4)				18.0	21.0
56	6	Osc.	2.30	130	7-15(4)			0(4)	3.7	3.8
56	7	AVC	2.25	60(5)	2.0(6)			85.0	0	0
46	8	Class B	2.25	310	0				6.0(7)	13.0
46	9	Class B	2.25	310	0				6.0(7)	13.0
280	10	Rect.	4.2						41 Per Plate	

(1) Actual Voltage measured across 310 ohm biasing resistor—5.0 volts.
(2) Actual Voltage measured across 3,000 ohm bias resistor—10 Volts.
(3) Read with Volume Control at minimum.
(4) Varies as shown with frequency. Actual voltage measured across 500,000 ohm bias resistor—15 to 35 Volts.
(5) Actual Voltage measured across 30,000 ohm voltage divider resistor —92 Volts.
(6) Actual Voltage measured across 7,000 ohm voltage divider resistor —22 Volts.
(7) Plate current at no signal.

MONTGOMERY WARD

MODELS 62-79, 62-84, 62-84X, 62-94, 62-94X
MODEL 62-83

Model No. 62-83

"B" POWER UNIT PARTS

Part No.			Cost Price	Selling Price
P-80929-B	C10	.5 mfd. 160 V.	$ .13	$ .33
P-80931-A	C11	3.5 mfd. 500 V. Electrolytic	.28	.70
P-50580		"A" Choke Assembly for Dynamotor	.23	.58
P-1735		Celotex Box (Dynamotor "B" Supply)	.47	1.18
P-1745		Dynamotor (without Rubber Mountings)	6.98	17.45
P-10253		Male Rubber Dynamotor Cushion	.02	.05
P-10254		Female Rubber Dynamotor Cushion	.02	.05
P-10255		Moulded Sponge Rubber (Celotex Box)	.02	.05
P-20596		Dynamotor Base Plate	.05	.13

CONDENSERS

Part No.	Code	Capacity	Voltage	Type	Cost Price	Selling Price
P-80928-A	C1	.05 mfd.	200 V.	Bypass Cond. Block	$0.40	$1.00
	C2	.006 mfd.	600 V.			
	C3	.05 mfd.	160 V.			
	C4	.001 mfd.	600 V.			
	C5	.1 mfd.	160 V.			
	C7	.1 mfd.	300 V.			
	C8	.1 mfd.	300 V.			
P-80891-B	C6	4 mfd.	150 V.	Electrolytic	.20	.50
P-80914	C9	.002 mfd	600 V.	Tubular	.05	.13
P-1442		Oscillator 600 K.C. Trimmer Condenser			.12	.30
P-80882		Three Gang Condenser Assembly			.94	2.35

RESISTORS

Part No.	Code	Resistance	Type	Cost Price	Selling Price
P-91054-A	R1	10,000-40,000 ohm	Tone Control	$0.21	$0.53
P-A-90929	R2	500,000 ohm	Carbon	.06	.15
P-A-90948	R3	1.0 megohm	Carbon	.06	.15
P-A-90912	R4	100,000 ohm	Carbon	.06	.15
P-90980-B	R5	0-500,000 ohm	Volume Control	.32	.80
P-A-91055	R6	260 ohm	Carbon	.05	.13
P-A-90979	R7	7,000 ohm	Carbon	.06	.15
P-A-90905	R8	15,000 ohm	Carbon	.06	.15
P-A-90953	R9	350 ohm	Carbon	.06	.15
P-C-91049	R10	10,000 ohm	Carbon	.05	.13
P-91053-A	R11	340 ohm	Armored Wire Wound Resistor	.13	.33
	R12	144 ohm			

Part No.	Description	Cost Price	Selling Price
P-50578	Audio Input Transformer Assembly	$0.48	$1.20
P-50579	Audio Output Transformer Assembly	.36	.90
P-50538-A	"B" Power Filter Choke Assembly	.46	1.15
P-5072	Oscillator Coil Assembly	.22	.55
P-5059	First I.F. Transformer Complete with Can	.54	1.35
P-5071	Second I.F. Transformer Complete with Can	.51	1.28
P-5070	Antenna R.F. Transformer Assembly	.18	.45
P-5057	Interstage R.F. Transformer Assembly	.19	.48
P-1734	"B" PWR Socket Four-Prong	$ .03	$0.08
P-1704	Speaker Socket Five-Prong	.04	.10
P-1733	'36 Socket	.03	.08
P-1732	'39 Socket	.03	.08
P-1731	'41 Socket	.03	.08
P-40420	Tube Shield	.05	.13
P-40425	Tube Shield Base	.02	.05
P-1684	Dial Strip	.05	.13
P-1497	Dial Light & Bracket and Drive Disc Assembly	.11	.28
P-30374	Bushing for Rubber Drive	.03	.08
P-10224	Rubber Drive Pinion	.02	.05
P-4563-A	Dial Lamp	.06	.15
P-20460	Drive Shaft	.02	.05
P-1540	Knob	.05	.13
P-1054	On-Off Switch with Leads	.18	.45
P-10240	Rubber Cushions (in tube shield)	.02	.05
P-40411	Aluminum Coil Cans	.05	.13
P-1736	Dynamic Speaker	1.92	4.80
P-20456	Bottom Plate Chassis	.13	.33

INTERFERENCE ELIMINATION PARTS

Part No.		Price Cost	Price Selling
62-5424	Spark Plug Suppressor	.12	.19
P-80933	Dual .5 Mfd. Generator Condenser	.24	.50

No. 62-79 62-84 62-84X 62-94 62-94X

Alignment

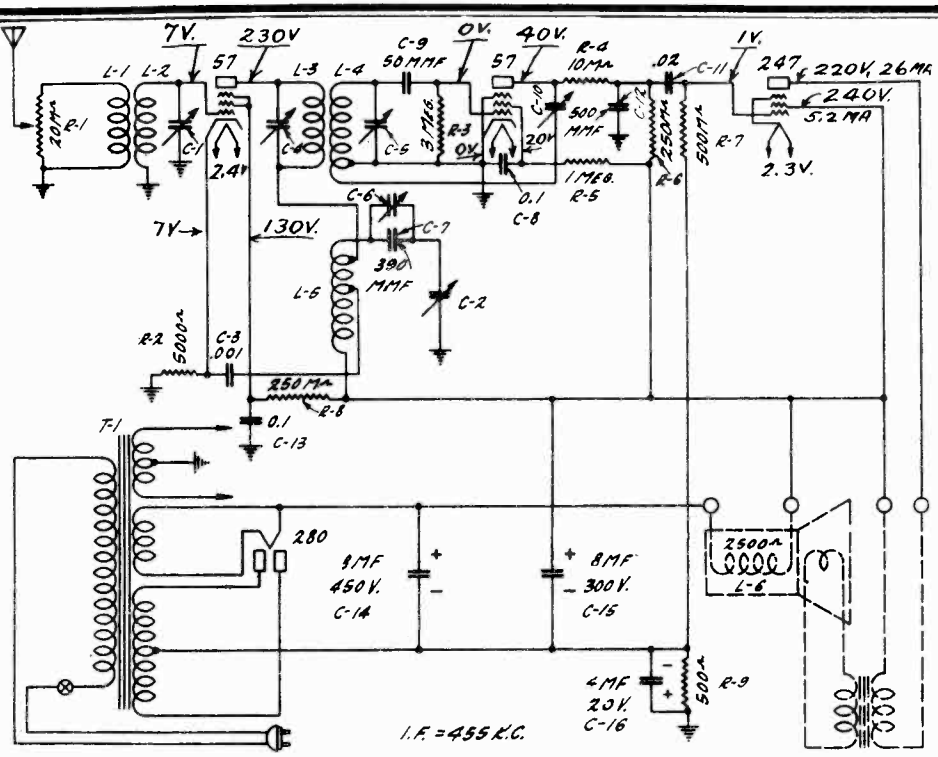
This receiver may be aligned on a broadcasting station or oscillator It is advisable, however, to insert a dummy 56 tube which has one filament prong removed in the AVC socket, to prevent any AVC action from making determination of the output peak difficult. The intermediate frequency is 262 K. C. and the I. F. trimming condenser adjusting screws are accessible from beneath the chassis.

These chassis may be easily distinguished by keeping in mind that the No. 62-84 uses dual dynamic speakers, while the No. 62-94 uses a single dynamic. The No. 62-79 is the same in all respects as the No. 62-84, with the exception that this chassis uses chromatic tuning and, therefore, a different tuning condenser assembly and drive. The tone, volume, and noise suppressor control are also of slightly different values.

Part No.	Description	No. Used in Set	Cost Price Each	List Price Each
U4472	Tube Shield Can—58	3	$0.04	$0.10
U4473	Tube Shield Cap—58	3	.03	.08
U4492	Tube Shield—56	1	.05	.13
U5137	Tuning Condenser Drive Assembly with Pilot Lamp	1	.32	.80
U5138	Drive Plate and Dial Chart	1	.09	.23
U5139	1st Detector Transformer (L-3, L-4)	1	.16	.40
U5143	Power Transformer, 105-125 Volts, 60 Cycles (T-1)	1	1.42	3.55
U5145	Tuning Condenser Assembly (C-4, C-5, C-6)	1	1.05	2.51
U5148	Volume Control, 200,000 Ohm with Power Switch (R-5)	1	.35	.88
U5276	Power Transformer, 105-125 Volts, 25 Cycles (T-1)	1	2.35	5.95
U5295	Tone Control, 50,000 Ohm (R-4)	1	.28	.70
U5402	Condenser, .003 Mfd., 500 Volt (C-20)	1	.05	.13
	SPEAKERS AND SPEAKER PARTS			
	Dual 8-inch Speakers			
U4247	8" Electrodynamic Speaker without Input Transformer	1	1.69	4.23
U5159	8" Electrodynamic Speaker with Input Transformer	1	2.08	5.20
U4741	Speaker Plug—6 Prong	1	.09	.23
U4742	Terminal Strip for U5159 Speaker	1	.13	.33
U4743	Input Transformer for U5159 Speaker	1	.75	1.88
U4744	Terminal Strip Cover for U5159 Speaker	1	.13	.33
	SUPPLEMENTARY PARTS LIST FOR NO. 62-94 CHASSIS			
	Add to No. 62-84 Parts List			
U4132	Resistor, 310-2500-7100 Ohm, Candohm (R-1, R-13, R-14)	1	.24	.60
U4245	8" Electrodynamic Speaker with Input Transformer	1	2.08	5.20
U4740	Input Transformer for U4245 Speaker	1	.75	1.88
U4741	Speaker Plug—6 Prong	1	.09	.23
	Omit from No. 62-84 Parts List			
U4243	Resistor, 310 Ohm, Candohm (R-1)	1	.05	.13
	Omit All Speakers and Speaker Parts on No. 62-84 Chassis Parts List			
	SUPPLEMENTARY PARTS LIST FOR NO. 62-79 CHASSIS			
	Add to No. 62-84 Parts List			
U5703	Tone Control		.28	.70
U5705	Volume Control		.35	.88
U5706	Noise Suppressor Control		.27	.68
U5708	Tuning Condenser Assembly complete with Drive		1.63	4.08
	Omit from No. 62-84 Parts List			
U3404	Condenser Drive Disc Assembly		.10	.25
U5137	Tuning Condenser Drive Assembly		.32	.80
U5138	Drive Plate and Dial Chart		.09	.23
U5145	Tuning Condenser Assembly		1.05	2.51
U5148	Volume Control		.35	.88
U5295	Tone Control		.28	.70

Part No.	Description	No. Used in Set	Cost Price Each	List Price Each
U 115	Pilot Light Lamp	1	$0.06	$0.15
U 678	Ground Binding Post	1	.01	.03
U 701	Tube Socket—280	1	.04	.10
U 705	Resistor, 25,000 Ohm, Carbon, 1 Watt (R-12)	1	.09	.23
U 861	A.C. Cord and Plug	1	.10	.25
U 929	Resistor, 50,000 Ohm, Carbon, 1 Watt (R-8)	1	.08	.20
U 962	Grid Cap Only	4	.01	.03
U1312	Horizontal Insulated Terminal	1	.01	.03
U1346	Resistor, 7,000 Ohm, Carbon, 1 Watt (R-10)	1	.09	.23
U1349	Resistor, 500,000 Ohm, Carbon, 1 Watt (R-7)	1	.09	.23
U1751	Resistor, 200,000 Ohm, Carbon, 1 Watt (R-15)	1	.09	.23
U2266	Resistor, 1 Megohm Carbon, 1 Watt (R-9)	1	.09	.23
U2333	Antenna Binding Post	1	.02	.05
U2716	Condenser, .01 Mfd., 400 Volt (C-10, C-11, C-14)	3	.09	.23
U2830	1st I. F. Transformer (L-5, L-6)	1	.38	.95
U2851	Condenser, .04 Mfd., 400 Volt (C-13, C-18, C-26)	3	.06	.15
U3063	Resistor, 30,000 Ohm, Carbon, 1 Watt (R-11)	1	.08	.20
U3087	Resistor, 3,000, Ohm, Candohm (R-6)	1	.05	.13
U3119	I. F. Shield	1	.01	.03
U3178	Dual R. F. Shield Can	1	.12	.30
U3358	Vertical Insulated Terminal	3	.01	.03
U3404	Condenser Drive Disc, Assembly with Hub and Set Screws	1	.10	.25
U3568	Detector Plate Choke Assembly (L-9)	1	.11	.28
U3644	2nd I. F. Transformer (L-7, L-8)	1	.28	.70
U3853	Resistor, 50,000 Ohm, .1 Watt (R-2)	1	.06	.15
U4074	Oscillator Transformer (L-12, L-13)	1	.15	.38
U4075	Antenna Transformer (L-1, L-2)	1	.19	.48
U4085	Oscillator Series Condenser, 675 Mmf. (C-9)	1	.08	.20
U4116	Filter Condenser, Dual 8 Mfd., 450 Volt (C-23, C-24)	1	.59	1.48
U4118	Tube Socket—58	3	.04	.10
U4128	Electrolytic Condenser Clamp	1	.01	.03
U4129	Tube Socket—46	3	.04	.10
U4130	Tube Socket—56	3	.04	.10
U4131	Speaker Socket, 6 Contact	1	.04	.10
U4197	Condenser, .25 Mfd., 200 Volt (C-1, C-2, C-3, C-27)	4	.07	.18
U4199	Condenser, 8 Mmd., 450 Volt Electrolytic (C-25)	1	.38	.95
U4243	Resistor, 310 Ohm, Candohm (R-1)	1	.05	.13
U4248	Walnut Knob, small	3	.05	.13
U4249	Walnut Knob, large	1	.06	.15
U4254	Condenser, 1000 Mmf. (C-12)	1	.07	.18
U4255	Condenser, 500 Mmf. (C-16, C-17)	2	.06	.15
U4263	Audio Transformer (T-2)	1	.54	1.35
U4317	Resistor, 20,000 Ohm, Carbon, 1 Watt (R-3)	1	.07	.18
U4321	Filter Choke (L-14)	1	.29	.73
U4351	Condenser, Dual 8 Mfd., Bypass (C-21, C-22)	1	.34	.85
U4397	Oscillator Transformer Shield Can	1	.05	.13
U4435	Condenser, .02 Mfd. 400 Volt (C-19)	1	.05	.13
U4471	Tube Shield Base—56 and 58	4	.02	.05

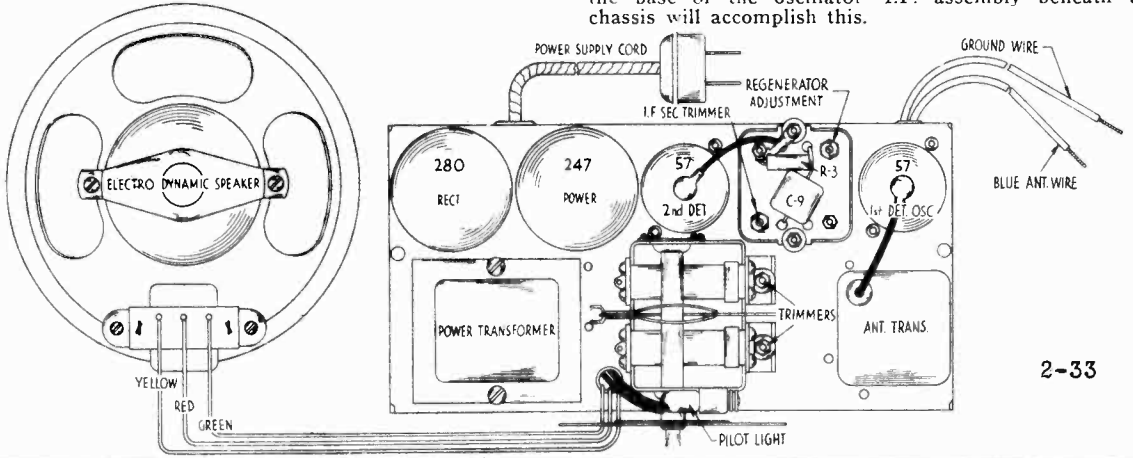
Prices subject to change without notice.



The chassis may be aligned either on the oscillator or a broadcasting station

When any defects are located in the Oscillator I.F. assembly, other than simple wiring breaks which are easily repaired, the entire unit should be replaced rather than attempting to replace any of the component parts. The replacement assembly will be supplied as a unit but none of the component parts can be supplied separately.

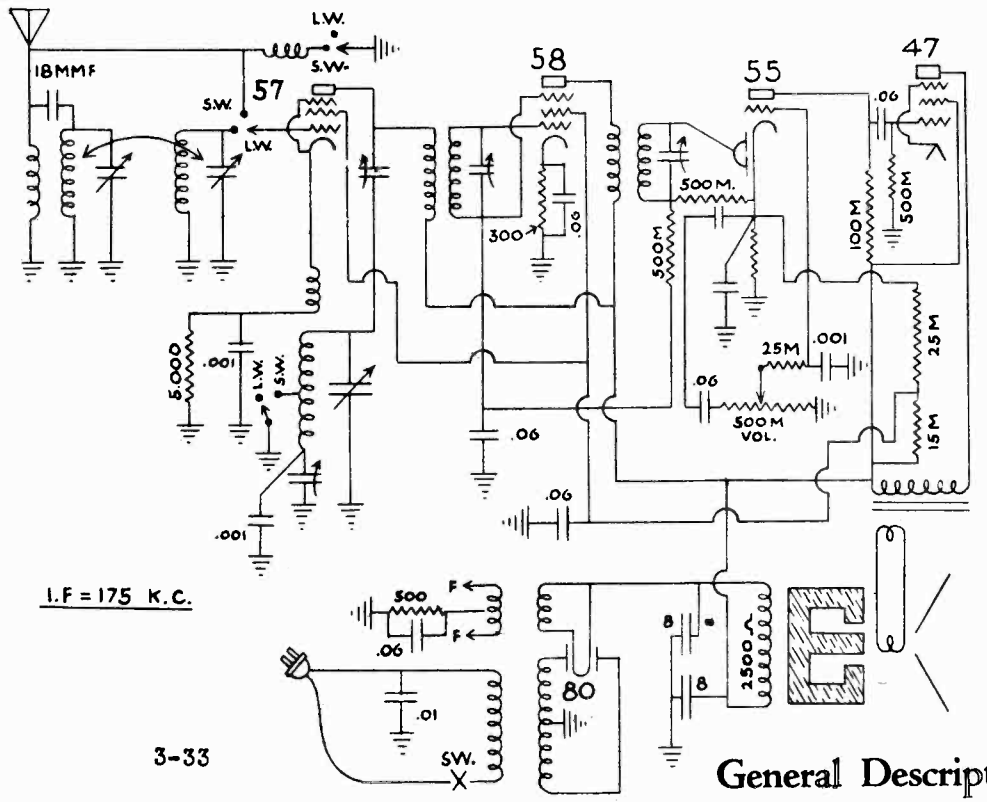
Aligning I.F. Condensers. During I.F. alignment, the oscillator should be rendered inoperative by shorting a portion of the oscillator coil. Connecting a wire jumper between the two vertical insulated terminals located near the base of the oscillator—I.F. assembly beneath the chassis will accomplish this.



2-33

Part No.	Description	No. Used in Set	Cost Price	Selling Price
U 115	Pilot Light Lamp	1	$0.06	$0.15
U 701	Tube Socket—280	1	.04	.10
U 861	Attachment Cord and Plug	1	.10	.25
U 962	Grid Cap Only	2	.01	.03
U1612A	Condenser, .006 Mfd., 400 Volt	1	.05	.13
U2757	Tube Socket—247	1	.04	.10
U2857	Resistor, 10,000 Ohm Carbon, 1 Watt (R-4)	1	.08	.20
U2858	Resistor, 1 Megohm, .1 Watt (R-5)	1	.08	.20
U2927	Condenser, .1 Mfd., 200 Volt (C-8, C-13)	2	.06	.15
U3358	Vertical Insulated Terminal	2	.01	.03
U3849	Resistor, 500,000 Ohm, .1 Watt (R-7)	1	.06	.15
U3998	Resistor, 250,000 Ohm, .1 Watt (R-6, R-8)	2	.06	.15
U4117	Tube Socket—57	2	.04	.10
U4254	Condenser, 1,000 Mmf. (C-3)	1	.07	.18
U4255	Condenser, 500 Mmf. (C-12)	1	.06	.15
U4256	Condenser, 390 Mmf. (C-7)	1	.06	.15
U4257	Bakelite Knob, Station Selector	1	.05	.13
U4258	Bakelite Knob, Volume Control	1	.03	.08
U4355	Condenser, 50 Mmf. (C-9)	1	.06	.15
U4435	Condenser, .02 Mfd., 400 Volt (C-11)	1	.05	.13
U4471	Tube Shield Base—57	1	.02	.05
U4472	Tube Shield Can—57	1	.04	.10
U4473	Tube Shield Cap—57	1	.03	.08
U4786	Resistor, 3 Megohm, .1 Watt (R-3)	1	.06	.15
U4789	Condenser, 4 Mfd., 20 Volt Electrolytic (C-16)	1	$0.16	$0.40
U5298	Power Transformer, 105-125 Volts, 60 Cycle (T-1)	1	.60	1.50
U5319	Escutcheon Plate, "U.S. Radio"	1	.07	.18
U5321	Dual 8 Mfd. Filter Condenser (C-14, C-15)	1	.53	1.33
U5331	Resistor, 500 Ohm Candohm (R-9)	1	.06	.15
U5338	Dial Plate and Chart	1	.08	.20
U5350	Volume Control, 0–20,000 Ohm, with Power Switch (R-1)	1	.26	.65
U5356	Antenna Transformer (L-1, L-2)	1	.14	.35
U5358	Oscillator—I. F. Assembly (L-3, L-4, L-5)	1	.91	2.28
U5359	Tuning Condenser Assembly (C-1, C-2)	1	.61	1.53
U5361	Pilot Light Socket and Mounting Bracket	1	.05	.13
U5368	Speaker Cable	1	.04	.10
U5369	Antenna Transformer Shield Can	1	.07	.18
U5373	Antenna and Ground Leads	1	.04	.10
U5374	Resistor, 5,000 Ohm Candohm (R-2)	1	.08	.20
U5399	Power Transformer, 105-125 Volts 25 Cycles	1	1.07	2.68
	ELECTRODYNAMIC SPEAKER			
U5333	6-inch Electrodynamic Speaker with Input Trans.	1	1.78	4.45
U5962	Input Transformer (T-2)	1	.38	.95

Prices subject to change without notice



General Description and Aligning Procedure

The tubes employed are as follows, and are operated at rated voltages and biases:

Oscillator and Mixer	57
Intermediate Frequency	58
Second Detector	55
Output	247
Rectifier	280

This receiver employs a combination oscillator and first detector, or mixer. The second detector is the new dual diode-triode, the diode portion acting as detector and providing automatic volume control—acting on the grid of the type 58 I.F. tube. The triode portion of the second detector is operated as an individually biased A.F. amplifier.

The first two variable tuned circuits are not electrically coupled. They are mutually coupled by being placed close together and left unshielded. In all other respects the circuits are entirely conventional.

In aligning, it is first desirable to see that the I.F. transformers are properly set. The First I.F. transformer is on top of the base and has two adjustments. The second is inside the base but its single adjustment may be reached through a hole in the rear-center of the base. The intermediate frequency is 175 K.C.

The tuning condenser may be adjusted for alignment or "tracking" of the tuned circuits by means of an oscillator and output meter. The oscillator should cover the band from 550 to 1500 K.C. The energy from the oscillator is coupled weakly into the antenna circuit—a simple means being to place the oscillator near the antenna wire. The receiver and oscillator are first tuned to approximately 1500 K.C., and by watching the output indicator, the three condenser trimmers are adjusted for maximum output. These three trimmers must then be left untouched for all further aligning.

The next step is to tune both receiver and oscillator to some point near 550 K.C. Here the alignment is made by adjusting the oscillator "pad" condenser for maximum response. It may be reached through hole in base near the first I.F. transformer. If necessary to adjust the two R.F. condenser sections, it may be done by bending the condenser end plates. If necessary to align at points other than the ends of the "band" it may be done by bending portions of the slotted end plates of the condenser rotor sections. Alignment of the two ends of the scale is usually quite sufficient.

		Net Price	Selling Price
SOCKETS			
K-2-2-509	57 Socket	$0.03	$0.08 ea
K-3-2-509	58 Socket	.03	.08 "
K-4-2-509	55 Socket	.03	.08 "
K-2-7-514	47 Socket	.03	.08 "
K-2-4-508	80 Socket	.03	.08 "
CONDENSERS			
K-3-3-301	3 gang Var. Tuning Condenser	.95	2.38 "
K-2-10-302	Dual 8 mfd. 450 volt Condenser (Less mtg. flanges, mounted to base horiz.)	.52	1.30 "
K-1-10-302	Dual 8 mfd. 450 volt Filter Condenser (With mtg. flanges mounted to base vert.)	.53	1.33 "
K-1-6-226	.5 mfd. Condenser 200 volt	.08	.20 "
K-2-4-226	.01 mfd. Condenser 400 volt	.04	.10 "
K-1-3-226	.06 mfd. Condenser 200 volt	.045	.11 "
K-1-3-306	.1 mfd. Condenser 200 volt	.05	.13 "
K-3-3-462	Adjustable Padding Cond. 1500 mmfd. max.	.15	.38 "
K-3-3-474	.001 mfd. Molded Bakelite Condenser	.06	.15 "
RESISTORS			
K-4-2-476	500 ohm Wire Wound Flex Resistor	$0.04	$0.10 ea.
K-1-3-172	300 ohm ½ watt Resistor	.05	.13 "
K-1-2-172	400 ohm ½ watt Carbon Resistor	.05	.13 "
K-1-1-4215	5M ohm ½ watt Carbon Resistor	.05	.13 "
K-1-1-7366	25M ohm ½ watt Carbon Resistor	.05	.13 "
K-1-1-8484	100M ohm ½ watt Carbon Resistor	.05	.13 "
K-1-1-4225	500M ohm ½ watt Carbon Resistor	.05	.13 "
K-2-1-173	15M ohm 1 watt Carbon Resistor	.05	.13 "
K-5-7-406	Volume Control and Switch	.30	.75 "
COILS			
K-1-8-601	Antenna Coil Assembly	.20	.50 "
K-1-6-602	Int. Coil Assembly R. F.	.15	.38 "
K-3-4-450	Oscillator Coil Assembly	.15	.38 "
K-1-6-170	Antenna Choke Coil Assembly	.50	.13 "
TRANSFORMERS		Net Price	Selling Price
K-2-12-201	Power Transformer 60 cycle	$0.85	$2.13 ea.
K-3-5-963	No. 1 175 KC IF Transformer Assy	.50	1.25 "
K-2-5-963	No. 2 175 KC IF Transformer Assy	.50	1.25 "
STRIPS			
K-1-1-F538	Large Anchor Strip	.02	.05 "
K-1-2-531	Small Anchor Strip	.01	.03 "
K-1-2-F419	Insulator for Large Anchor Strip	.50	1.25 C
K-1-10-419	Insulator for Small Anchor Strip	.50	1.25 "
K-1-1-4430	Small Double Solder Lugs for above	1.00	2.50 M
K-1-1-3504	200 Short Eyelets for above	.50	1.25 C
MISCELLANEOUS			
K-1-5-457	Tube Shield Base	$0.01	$0.03 ea.
K-1-7-103	Coil Shield for RF Coils	.03	.08 "
K-1-3-364	6-32 St. Spade Screws for Coil Shield	2.00	5.00 M
K-1-1-F114	Dial Lamp Socket	2.50	6.25 C
K-1-1-3154	2.5 volt Dial Lamp	.07	.18 ea.
K-1-7-122	Dial Assembly	.21	.53 "
K-6-6-468	4 point Coil Switch	.15	.38 "
K-2-4-116	Power Cord Set	.12	.30 "
K-1-2-4168	Wire Anchor Strap	.50	1.25 C
K-1-3-437	I.F. Transformer Clamp	.50	1.25 "
K-1-3-186	No. 6x¼ Self Tapping Screws	2.50	6.25 M
K-1-1-3410	Large Extruded Fiber Washer for Vol. Cont.	.70	1.75 C
K-0-4-104	Tube Shield	.04	.10 ea.
K-0-1-635	Tube Shield Caps	.02	.05 "
K-1-8-149	Dial Strip	.03	.08 "
K-1-9-416	Chassis Hold-down Strap	.01	.03 "
K-1-8-134	Small Control Knob	.03	.08 "
K-2-8-134	Large Control Knob	.04	.10 "
K-2-3-4167	Control Grid Clip	.50	1.25 C
K-1-5-186	No. 8x1" Self Tapp. Chassis Mtg. Screws	.40	1.00 "

Prices subject to change without notice.

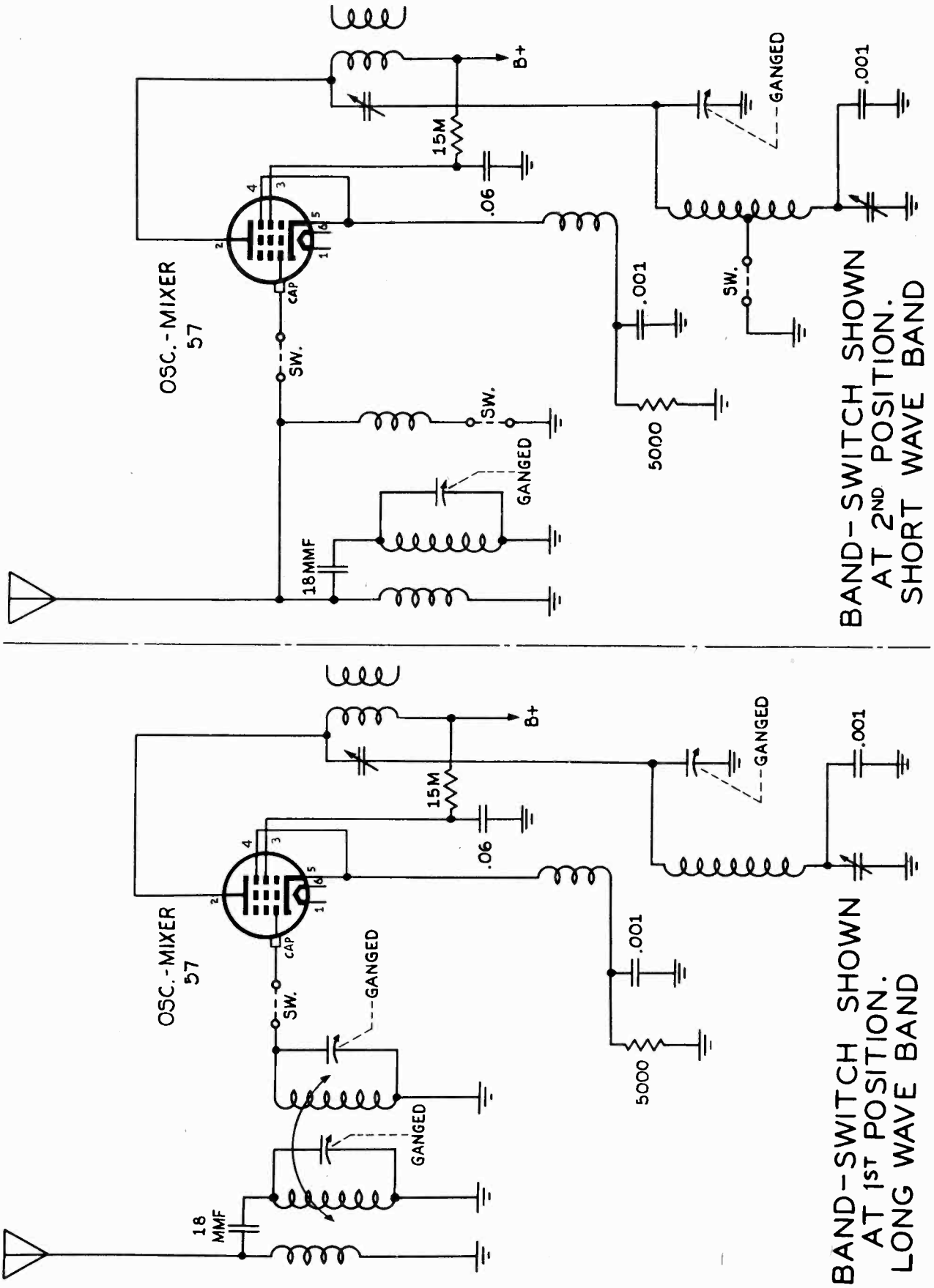
IMPORTANT: It is desirable to move the dial back and forth across the signal while making the above alignments. This is particularly necessary when altering any capacities connected with the oscillator circuit. Use an insulated or bakelite screw driver. No aligning, other than the I.F. transformers, is necessary for the short wave band (75 to 200 meters) as no attempt has been made to tune more than the oscillator.

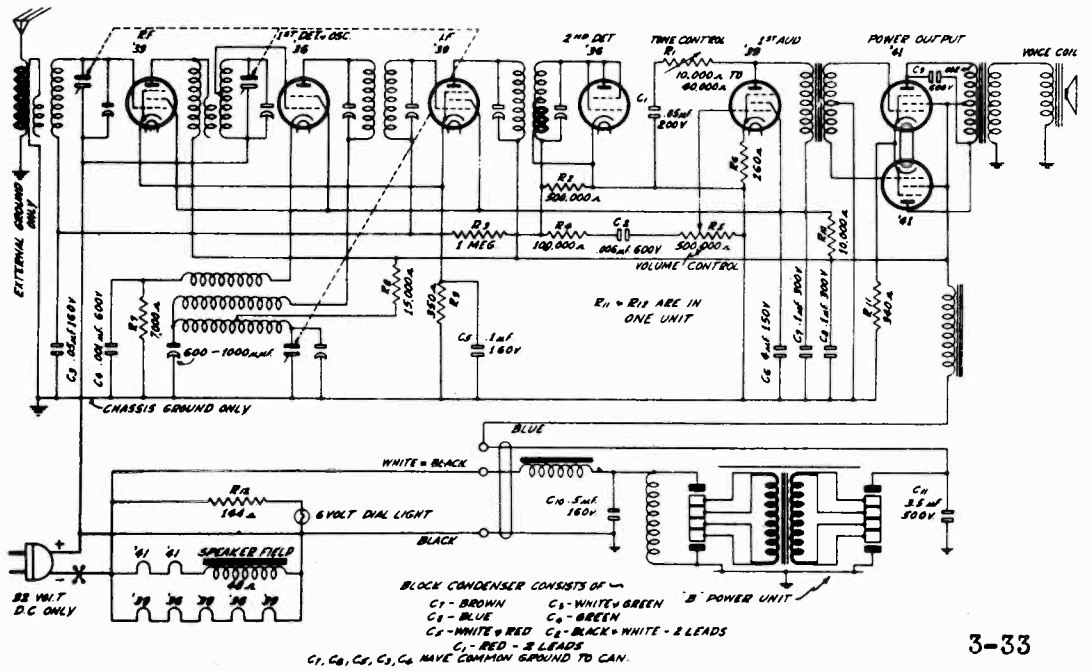
Be certain that a good 57 tube is used in the first socket.

"clarified schematics"

MODEL 62-82

MONTGOMERY WARD





3-33

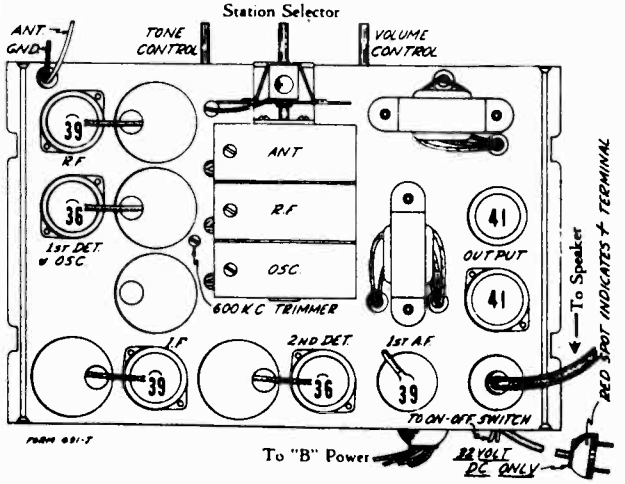
Voltages at Sockets

INPUT 32 VOLTS—GROUND R.F. GRID

Type of Tube	Function	Heater	Plate to Cathode	Screen to Cathode	Grid to Cathode	Normal Plate MA
'39	R.F.	6.4	190	90	3.0(1)	5.0
'36	1st Det. & Osc.	6.4	170	86	6.5(2)	.6
'39	I.F.	6.4	190	90	3.0(1)	5.0
'36	2nd Det.	6.4	0	0	0	0
'39	1st A.F.	6.4	70	90	1.75(1)	6.0
'41	Output	6.4	180	185	14.0	18.0

(1) Cathode to Ground.

(2) Subject to Variation with dial setting.



Condenser Alignment

Misalignment or mistracking of condensers generally manifests itself in broad tuning and lack of volume at portions or all of the broadcast band. The receivers are all properly aligned at the factory with precision instruments and realignment should not be attempted unless all other possible causes of the faulty operation have first been investigated and unless the service technician has the proper equipment. A signal generator that will provide an accurately calibrated signal of 175 K.C. and accurately calibrated signals over the broadcast band, and an output indicating meter are desirable. The procedure is as follows:

Set the signal generator for 175 K.C. Connect the signal lead from the signal generator to the grid of the 1st detector tube through a .05 mfd. condenser. Turn the tuning condenser rotor until the plates are completely out. The ground lead from the signal generator goes to the ground lead of the receiver. Then adjust the four intermediate frequency condensers for maximum output. The adjusting screws for these condensers are reached from the bottom of the chassis.

Next set the signal generator for a signal of exactly 1400 K.C. The antenna lead from the signal generator is, in this instance, connected to the antenna lead of the receiver. Keep the signal weak enough to prevent action of the A.V.C. Set the dial pointer on the 1400 K.C. mark on the dial scale and adjust the three trimmer condensers on the gang tuning condenser for maximum output, adjusting the oscillator trimmer first.

Next set the signal generator for a signal of 600 K.C. and adjust the oscillator 600 K.C. trimmer. The adjusting screw for this condenser is reached from the top of the chassis and is between the I.F. and oscillator coil cans.

A non-metallic screwdriver is necessary for this adjustment. Turn the tuning condensor rotor until maximum output is obtained. Then turn the rotor slowly back and forth over this setting, at the same time adjusting the 600 K.C. trimmer screw until the highest output is obtained.

Then set the signal generator again for a signal of 1400 K.C. and check the adjustment of the tuning condenser trimmers at this frequency for maximum output.

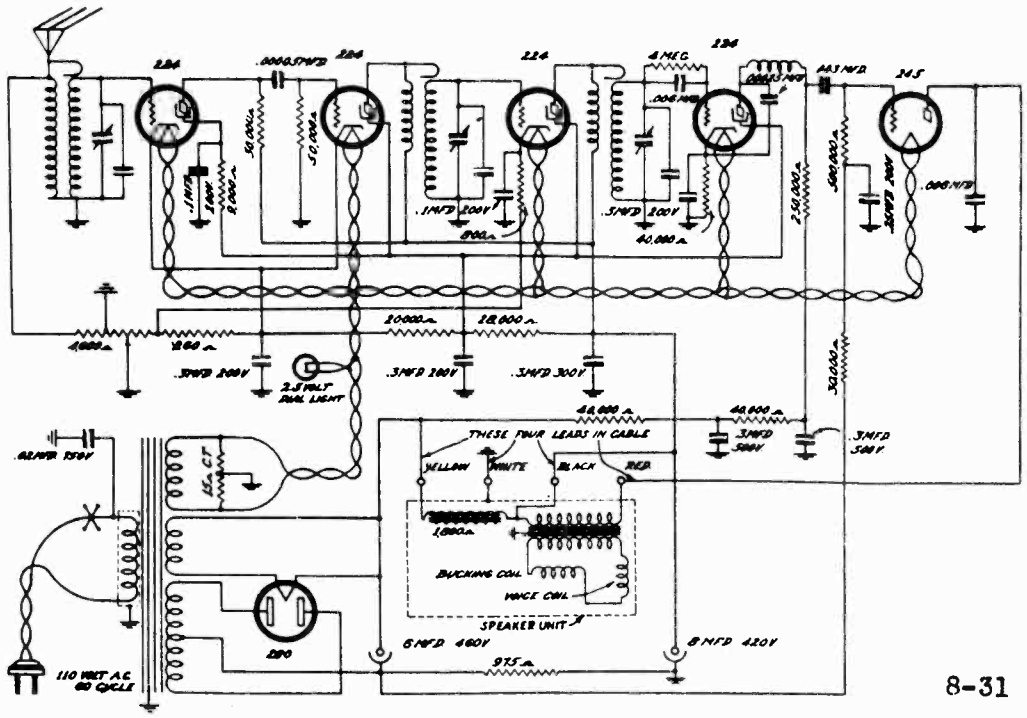
Line Voltage Range

The receiver will operate satisfactorily within a line voltage range of 28 to 36 volts. If the line voltage runs higher, it will have to be cut down and one method of doing this is to use a series resistor. Let us say the line voltage is 40. The receiver uses 1.55 amps. at 32 volts. A resistance of 5.16 ohms, therefore, capable of dissipating 12.4 watts will be required in the receiver line to cut the voltage down to 32. If the line voltage varies a variable resistor may be required.

IMPORTANT—POLARITY OF THE POWER SUPPLY TO THE RECEIVER MUST BE OBSERVED. There is a red mark on the plug. The prong of the plug at which the red mark is placed must be plugged into the positive side of the line. Use a receptacle on the 32 volt line from which the plug will not have to be removed after it has once been correctly inserted.

For Parts list, see P.15-53

MONTGOMERY WARD



When ordering repair parts, be sure to state the stock number of the part, the serial number of the chassis, and the identification number or color of the part.

Part No.	Name	Cost Price	Selling Price
RESISTORS			
P-90942	Volume Control (R1)	$ .41	$ 1.64
P-90967	Candohm Resistor Unit (R2, R3, R4)	.13	.52
P-90916	40,000 Ohm Carbon Resistor (R11, R15, R16)	.08	.32
P-90954	25,000 Ohm Carbon Resistor (R12)	.08	.32
P-90959	20,000 Ohm Carbon Resistor (R8)	.08	.32
P-90970	28,000 Ohm Carbon Resistor (R9)	.08	.32
P-90941	50,000 Ohm Carbon Resistor (R7)	.08	.32
P-90956	30,000 Ohm Carbon Resistor (R14)	.08	.32
P-90972	4 Megohm Carbon Resistor (R10)	.08	.32
P- 1094	Resistor Mounting Strip	.02	.08
P-90968	Center Tapped Resistor	.06	.24
P-90946	30,000 Ohm Carbon Resistor (R6)	.08	.32
P-90971	9,000 Ohm Carbon Resistor (R5)	.08	.32
CONDENSERS			
P-80851	Filter Condenser Block (C1, C2, C4 C5, C6, C8, C11, C13, C14, C17)	1.32	5.28
P-80849	8 Mfd. Electrolytic Condenser 460 volt	.53	2.12
P-80848	6 Mfd. 420 Volt Electrolytic Condenser	.50	2.00
P-80807	.002 Mfd. Moulder Condenser (C9)	.06	.24
P-80822	.006 Mfd. Moulded Condenser (C10)	.16	.64
P-80853	.003 Mfd. Moulded Condenser (C12)	.11	.44
P-80829.A	.00005 Mfd. Moulded Condenser (C3)	.06	.24
P-80852	3-Gang Condenser and Shield	1.54	6.16
P- 1279	Detector Overload Control Assembly	.25	1.00
COILS AND TRANSFORMERS			
P-5052A	25 Cycle Power Transformer Assem.	2.41	9.64
P-50525	Power Transformer Assembly	1.50	6.00
P- 1290	Complete Set Shielded R.F. Coils	1.69	6.76
P- 1284	Shielded Antenna Coil Assembly	.46	1.84
P- 1283	Shielded Interstage Coil Assembly	.48	1.92
P- 1293	Shielded Detector Coil Assembly	.76	3.04
P- 1189	Coil Shield Assembly	.08	.32
P- 1282	R.F. Resistance Coupling Unit Ass'y	.26	1.04
P- 1171	R.F. Choke Coil	.13	.52
P- 1092	Grid Clip Assembly	.02	.08
SOCKETS			
P- 1047	224 Tube Socket	.04	.16
P- 1052	245 Tube Socket	.04	.16
P- 1062	280 Tube Socket	.04	.16
P-10131	4 Prong Socket Shield	.01	.04
P-10124	5 Prong Socket Shield	.01	.04

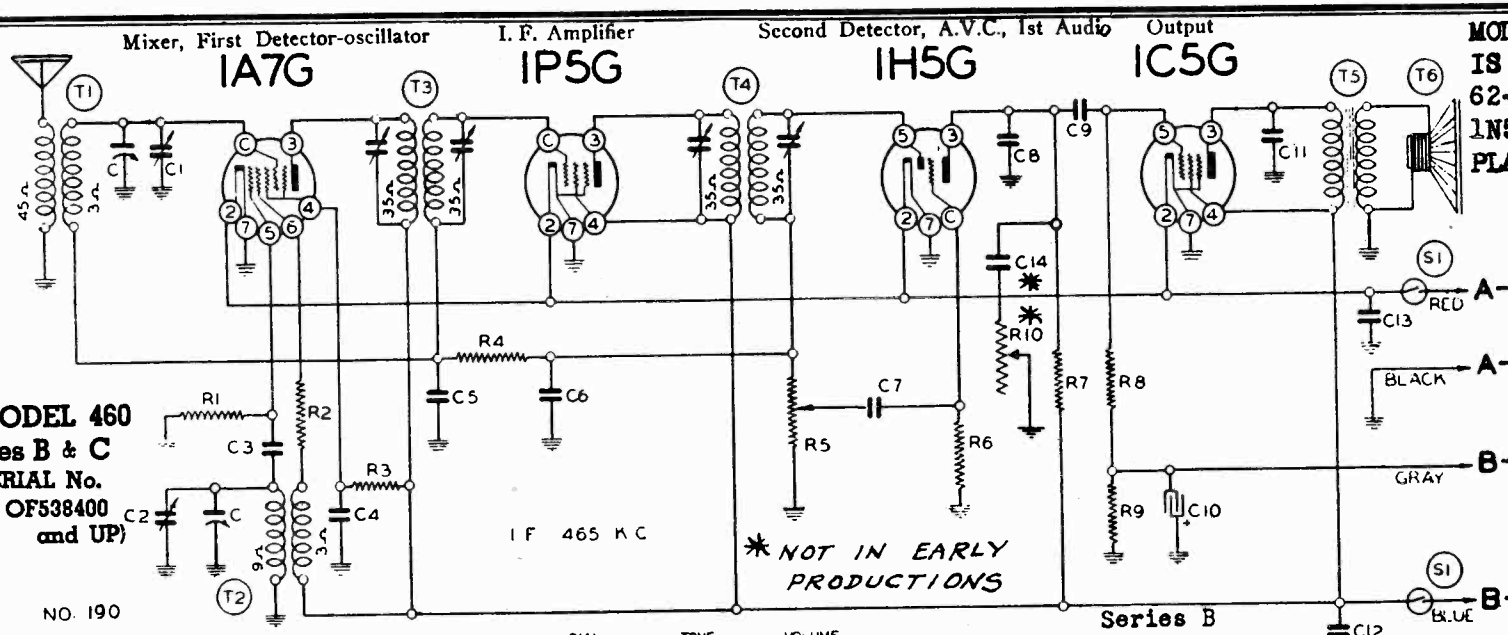
Tube Voltages

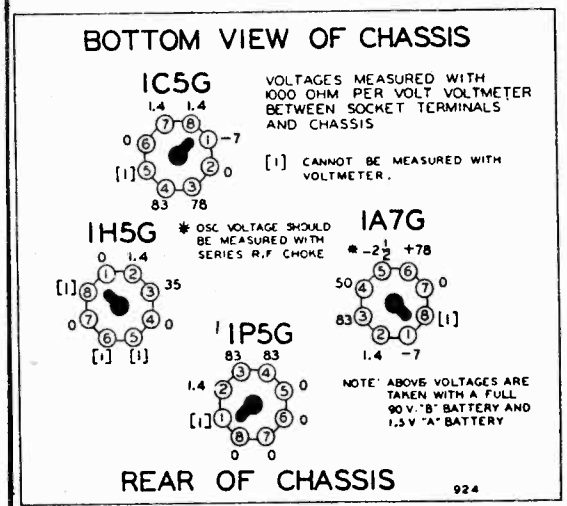
All D.C. voltages taken with a 1000 ohm per volt meter on the scale indicated in column headed "Meter Scale." Turn on the volume control all the way and connect the antenna and ground leads together. The grid, plate, and screen grid voltages are measured to cathode of the heater tubes and to filament of the 245 tube.

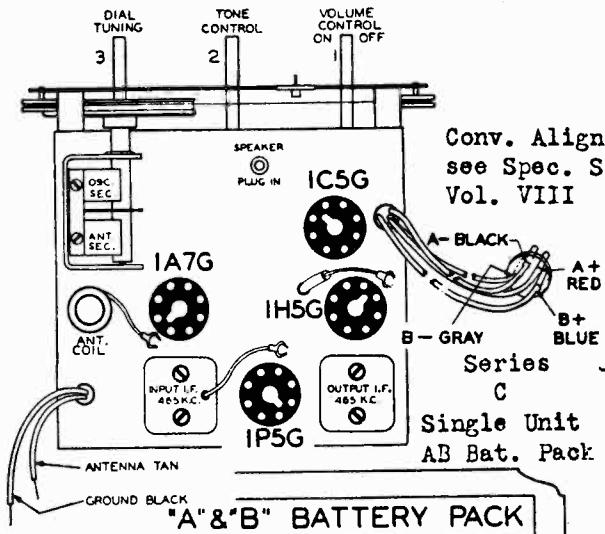
Tube	Circuit	Meter Scale	90 V.	100 V.	110 V.	120 V.	130 V.
1st R. F. 224	Grid	0—10	.2	2.3	2.6	3	3.3
	Screen-Grid	0—100	52	58	63	68	73
	Plate	0—250	133	142	155	167	178
2nd R. F. 224	Grid	0—10	.4	.5	.6	.7	.8
	Screen-Grid	0—100	60	67	72	78	83
	Plate	0—1000	190	210	230	250	278
3rd R. F. 224	Grid	0—10	2	2.3	2.6	3	3.3
	Screen-Grid	0—100	60	67	72	78	83
	Plate	0—1000	190	210	230	250	278
Detec 224	Grid	0—10	.08	.09	.1	.11	.12
	Screen-Grid	0—100	48	54	59	63	67
	Plate	0—100	58	66	72	78	87
Audio 245	Grid	0—100	23	27	31	35	40
	Plate	0—1000	202	222	242	262	282
280 Rect.	Plate Current	0—100	40 mils.	45 mils.	50 mils.	56 mils.	64 mils.
280 Rect.	Filament to Ground	0—1000	265	298	330	358	392

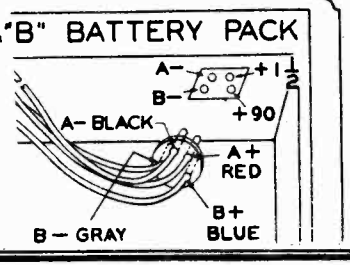
MISCELLANEOUS			
P-70710	Dynamic Speaker Cord and Terminal Strip Assembly	.19	.76
P-70702	Attachment Cord and Plug Assembly	.23	.92
P-20384	Tube Shield	.23	.92
P- 1278	Tube Shield Clip Assembly	.02	.08
P- 1287	Pilot Lamp Assembly	.06	.24
P- 1059	Control Knob	.06	.24
P- 1280	Escutcheon Plate	.10	.40
P- 1190	A. C. Switch	.14	.56
P-10143	¼ Inch Rubber Cushion	.01	.04
P-10142	¼ Inch Rubber Cushion	.01	.04
P- 1194	Dial and Drive Assembly	.11	.44
P- 1277	Dynamic Speaker	2.59	10.36

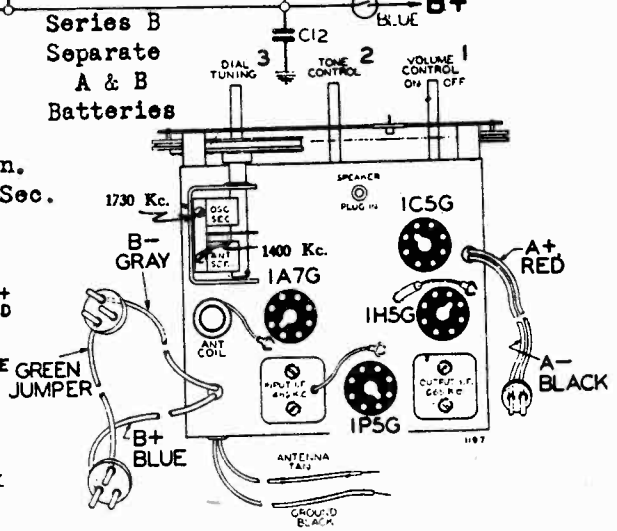
Prices subject to change without notice.











Ref. No.	Part No.	RESISTORS			CONDENSERS
R1	130266	200M ohm—½ w.	C	102110	2 gang variable condenser
R2	13018	4M ohm—½ w.	C1		Antenna Trimmer on gang
R3	1307	40M ohm—½ w.	C2		Oscillator trimmer on gang
R4	1304	3 megohm—½ w.	C3	12912	.00025 mica
R5	101175	1 megohm volume control	C4	1009	.05 x 200 v.
R6	130257	5-megohm—½ w.	C5	1009	.05 x 200 v.
R7	1303	500M ohm—½ w.	C6	1295	.0001 mica
R8	13019	1 megohm—½ w.	C7	10012	.003 x 600 v.
R9	130200	700 ohm—½ w.	C8	1295	.0001 mica
R10 *	101119	Tone Control (1 Megohm)	C9	10011	.01 x 400 v.

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

PARTS

Power Output—
150 Milliwatts Undistorted,
270 Milliwatts Maximum

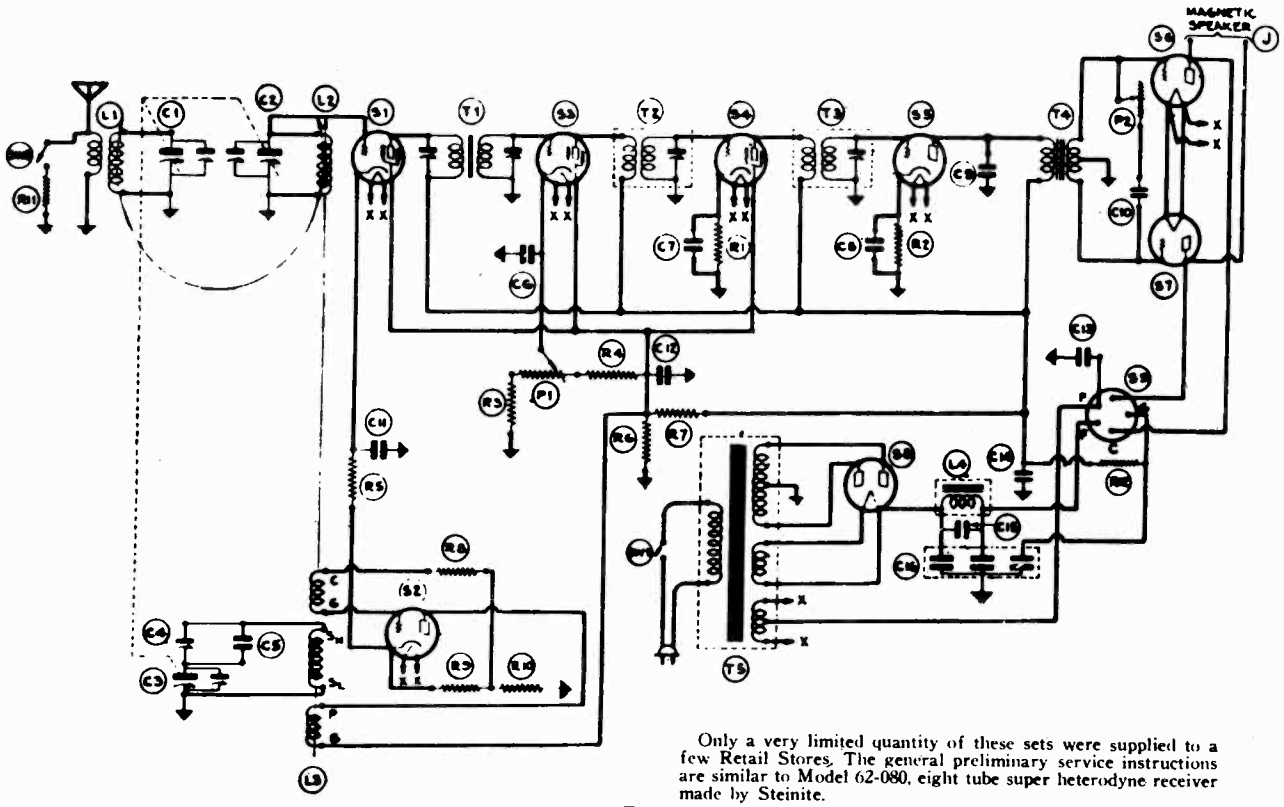
FREQUENCY RANGE
535 to 1730KC

AUGUST 1940

MONTGOMERY WARD

MODELS 62-460, 93BR-460
MODEL 62-1459

MONTGOMERY WARD



Only a very limited quantity of these sets were supplied to a few Retail Stores. The general preliminary service instructions are similar to Model 62-080, eight tube super heterodyne receiver made by Steinite.

Design Data

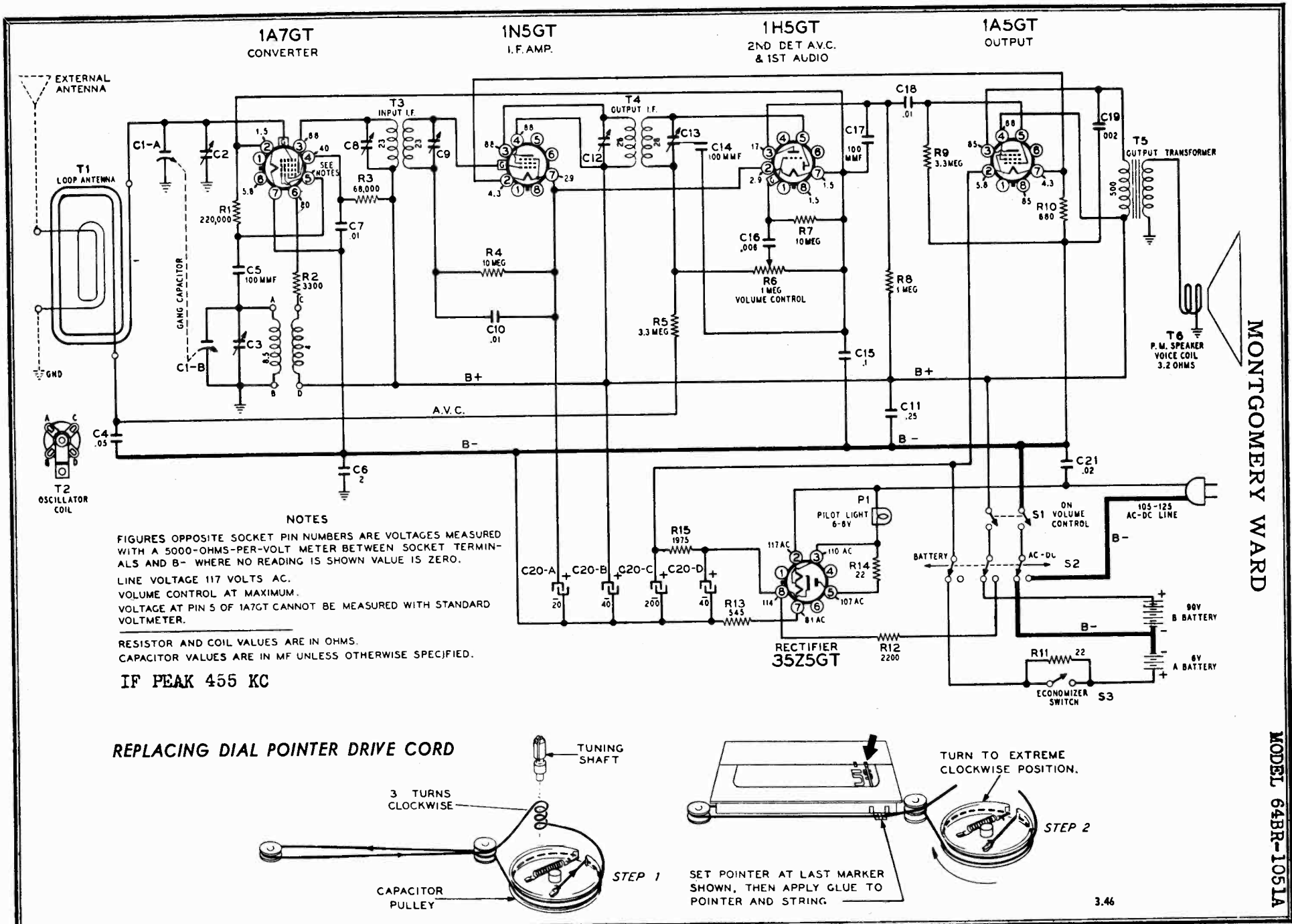
L1—161 Coil
L2—160 Coil
L3—163 Oscillator Coil
L4—339U Choke
T1—1st I.F. Transformer
T2—2nd I.F. Transformer
T3—3rd I.F. Transformer
T4—A-270 Audio Transformer
T5—360 Power Transformer
C1-C2-C3 —425 Mmfd. Max., 417 nominal
C4 —Variable 250-600 Mmfd.
C5 —750 Mmfd. Nominal 10% (Mica)
C6 —0.1 Mfd.
C7 —0.1 Mfd.
C8 —1.0 Mfd. 150 V.
C9 —.001 Mfd. Mica
C10—.003 Mfd.
C11—0.1 Mfd.
C12—1.0 Mfd. 150 V.
C13—0.1 Mfd.
C14—1.0 Mfd. 300 V.
C15—.25 Mfd.
C16—Three 4 Mfd. Units (Dry Electrolytic)

Prices subject to change without notice.

R1 —750 ohms wire wound
R2 —25,000 ohms 1 watt
R3 —200 ohms wire wound
R4 —25,000 ohms 1 watt
R5 —10,000 ohms 1 watt
R6 —10,000 ohms 1 watt
R7 —3500 ohms 3 watt
R8 —400 ohms wire wound
R9 —100 ohms—wire wound, tapped at 100 ohms
R10—1000 ohms
R11—100 ohms
R12—4000 ohms 2 watt
S1-S3-S4—'24 tubes
S2-S5—'27 tubes
S6-S7—'45 tubes
S8—'80 tube
S9—SPKR
J—Twin tip jack for magnetic speaker
P1—10,000 ohm wire wound pot.
P2—½ megohm variable tapered res.
SW1——Operating switch (on-off)
SW2—Local-Distance switch

Part No.	Description	Cost Price	Selling Price
SM 6443	Osc. Trimmer and Condenser Assem.	$ .30	$1.20
SM 4432	"Ant" B. P.	.02	.08
SM 4422	"Gnd" B. P.	.02	.08
SM 360S	Transformer (T5)	2.44	9.76
SM 6433	160 and 163 Osc. Coil Assem. (L3)	.89	3.56
SM 1040	Set I. F. Trans. (T1, T2, T3)	1.27	5.08
SM 5485	A.C. Switch (SW1)	.25	1.00
SM 3351	10' C. and P. Cable	.30	1.20
SM 4492	10,000 Ohm Pot (P1)	.25	1.00
SM 13124	3 Gang 1040 Cond.	1.76	7.04
SM 3220	1/10 Mfd. Cond. (C11, C13)	.11	.44
SM 13120	Filter Condenser (C16)	1.36	5.44
SM 7114	.25 Mfd. Condenser (C15)	.20	.80
SM 339U	Filter Choke (L4)	.68	2.72
SM 4789	10,000 Ohm 3 Watt	.15	.60
SM 4697	25,000 Ohm 1 Watt (R4)	.09	.36
SM 4786	750 Ohm Wire Wound (R1)	.09	.36
SM 4787	4,000 Ohm 2 Watt (R12)	.12	.48

Part No.	Description	Cost Price	Selling Price
SM 3333	.025 Mfd. Condenser	.15	.60
SM 4768	1100 Ohm Tapped Resistor	.12	.48
SM 270U	Input Transformer (T4)	1.18	4.72
SM 6449	161 Antenna Coil (L1)	.67	2.68
SM 6436	100 Ohm Resistor (R9)	.30	1.20
SM 3819	Knobs, Small	.06	.24
SM 3820	Knobs, Large	.075	.30
SM 637	Tube Shield and Base	.15	.60
SM 4786	1100 Ohm Resist.	.11	.44
SM 7039	.001 Mfd. Cond. (C9)	.08	.32
SM 3311	.002 Mfd. Cond.	.09	.36
SM 4507	½ Meg. Pot (P2)	.30	1.20
SM 4743	RU100 Resistor (R11)	.06	.24
SM 6389	Local Distance Switch Assem.	.30	1.20
SM 6167	Grid Cap Assem.	.08	.32
SM 4367	Resist. Strip Insulator	.01	.04
SM 16018	Dial Drum and Scale Assem.	.27	1.08
SM-227-245-224-28	Sockets	.075	.30



NOTES

FIGURES OPPOSITE SOCKET PIN NUMBERS ARE VOLTAGES MEASURED WITH A 5000-OHMS-PER-VOLT METER BETWEEN SOCKET TERMINALS AND B- WHERE NO READING IS SHOWN VALUE IS ZERO.

LINE VOLTAGE 117 VOLTS AC.

VOLUME CONTROL AT MAXIMUM.

VOLTAGE AT PIN 5 OF 1A7GT CANNOT BE MEASURED WITH STANDARD VOLTMETER.

RESISTOR AND COIL VALUES ARE IN OHMS.

CAPACITOR VALUES ARE IN MF UNLESS OTHERWISE SPECIFIED.

IF PEAK 455 KC

REPLACING DIAL POINTER DRIVE CORD

3.46

MONTGOMERY WARD

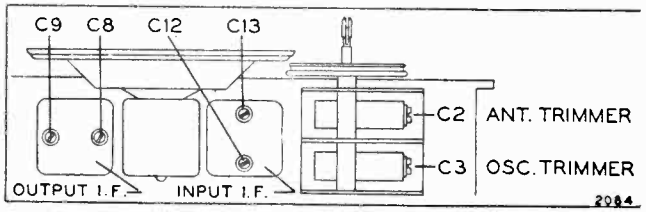
MONT.-WARD PAGE 15-61

MODEL 64BR-1051A

MODEL 64BR-1051A

MONTGOMERY WARD
ALIGNMENT PROCEDURE

- Output meter across 3.2 ohm output load.
- Volume control at maximum for all adjustments.
- Align for maximum output.
- Reduce input as needed to keep output near 0.4 volts.



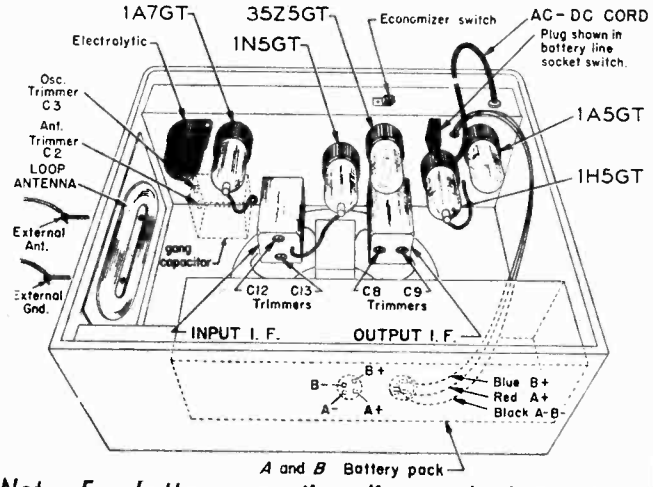
SIGNAL GENERATOR					
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection	DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT in order shown
455 kc	.1 mf	1A7GT grid cap*	1A7GT Pin 7	Rotor full open (plates out of mesh)	Input and output trimmers on IF cans
1650 kc	.1 mf	1A7GT grid cap*	1A7GT Pin 7	Rotor full open (plates out of mesh)	Osc. trimmer on gang (see trimmer view)
1400 kc	200 mmf	External antenna clip	External ground clip	1400 kc	Ant. trimmer on gang (see trimmer view)

*For these adjustments insert a 1 megohm resistor between loop antenna and 1A7GT grid cap.

RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivities 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 volts AC across this resistor will be equivalent to a 50 milliwatt output with 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.



Note: For battery operation, line cord plug must be inserted in battery-line socket switch as shown; switch contacts are automatically moved.

SIGNAL GENERATOR				
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection	INPUT FOR 50 MILLIWATT OUTPUT
1000 kc	200 mmf or RMA dummy antenna	External antenna clip	External ground clip	25 microvolts
1000 kc	.05 mf	Converter (1A7GT) grid cap	1A7GT Pin 7	140 microvolts
455 kc	.05 mf	Converter (1A7GT) grid cap	1A7GT Pin 7	100 microvolts
455 kc	.05 mf	IF amp. (1N5GT) grid cap	1A7GT Pin 7	4500 microvolts
400 cycles	.05 mf	AF amp. (1H5GT) grid cap	1A7GT Pin 7	.06 volts
400 cycles	.05 mf	Power amp. (1A5GT) grid (pin 5)	1A7GT Pin 7	3 volts

MONTGOMERY WARD

MODEL 64BR-1051A
MODELS 64BR-1205A, 64BR-1206A

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C1-A, C1-B	BEB-8A-10113	Two-gang variable capacitor	1
C2		Antenna trimmer on gang	1
C3		Oscillator trimmer on gang	1
C4	BE100-128	.05 mf, 25%, 120 volts	1
C5, C17	BE129-5	100 mmf, 20%, mica	2
C6	BE100-110	.2 mf +30%—10%, 400 volts	1
C7, C10	BE100-127	.01 mf, 25%, 120 volts	2
C8		Primary trimmer on input IF transformer, range 53 to 97 mmf	1
C9		Secondary trimmer on input IF transformer, range 53 to 97 mmf	1
C11	BE100-135	.25 mf, 25%, 120 volts	1
C12		Primary trimmer on output IF transformer, range 39 to 71 mmf	1
C13		Secondary trimmer on output IF transformer, range 39 to 71 mmf	1
C14		100 mmf +30%—10%, part of output IF can	1
C15	BE100-133	.1 mf, 25%, 120 volts	1
C16	BE100-134	.006 mf, 25%, 120 volts	1
C18	BE100-78	.01 mf, 25%, 200 volts	1
C19	BE100-25	.002 mf, 25%, 600 volts	1
C20-A, C20-B, C20-C, C20-D	BE119-126	Dry electrolytic for 50-60 cycles: 20 mf, 150 volts; 40 mf, 150 volts; 200 mf, 10 volts; 40 mf, 150 volts	1
	or		
	BE-119-133	Wet electrolytic for 25 cycles; 10 mf, 150 volts; 80 mf, 150 volts; 200 mf, 10 volts; 80 mf, 150 volts	1
C21	BE100-26	.02 mf, 25%, 400 volts	1
		RESISTORS*	
R1	BEA-9B1-27	220,000 ohms, 20%, ½ watt	1
R2	BEA-9B1-16	3,300 ohms, 20%, ½ watt	1
R3	BEA-9B1-84	68,000 ohms, 10%, ½ watt	1
R4, R7	BEA-9B1-37	10 megohms, 20%, ½ watt	2
R5, R9	BEA-9B1-34	3.3 megohms, 20%, ½ watt	2
R6, S1	BE101-258	1 megohm volume control with switch	1
R8	BEA-9B1-31	1 megohm, 20%, ½ watt	1
R10	BEA-9B1-60	680 ohms, 10%, ½ watt	1
R11, R14	BEA-9B1-42	22 ohms, 10%, ½ watt	2
R12	BEA-9B1-66	2,200 ohms, 10%, ½ watt	1
R13	BE130-343	545 ohms, 5%, 14 watts, wire-wound	1
R15	BE130-344	1,975 ohms, 5%, 6 watts, wire-wound	1
		COILS AND TRANSFORMERS	
T1	BEB-13E-10240	Loop antenna assembly	1
T2	BEA-13D-10239	Oscillator coils	1
T3	BE108-201B	Input IF transformer complete in can with trimmers	1
T4	BE108-200B	Output IF transformer complete in can with trimmers and C14	1
T5	BE105-132	Output transformer	1
		SPEAKER	
T6	BE114-246B	5" P.M. speaker	1
		SOCKETS	
	BE121-171	Octal wafer socket	5
	BE121-243	Bakelite socket base for filter capacitor	1
		DIAL AND TUNING PARTS	
	BEB-6D-10115	Dial scale	1
	BEB-6D-10116	Dial calibration	1
	BE112-949	Pointer	1
	BE120-143	Coiled tension spring for dial string	1
	BE120-9	String for dial	2½'
	BE115-741	Plate for dial, with pulleys	1
	BE117-896	Tuning shaft	1
	BE131-210	"C" washer	1
	BE128-660-39	Knob, "Volume"	1
	BE128-661-39	Knob, "Tuning"	1
P1	BE107-249	Pilot bulb, 6-8 volt, No. T-47	1
	BE107-371	Pilot light socket assembly	1
		MISCELLANEOUS	
S1		On-off switch on volume control	1
S2	BE125-161	Line-battery socket switch	1
S3	BE125-166	Battery economizer switch	1
	BE120-416	Battery cable assembly	1
	BEB-2K-10114	Grill screen	1
	BE128-673-1	Grill cloth	1
	BE112-947	Escutcheon for dial	1
	BE107-370	Line cord and plug	1
	BE115-396	Tube shield	1

MODEL 64BR-1051A

ELECTRICAL SPECIFICATIONS

Power Supply	105-125 volts DC or 50-60 cycle AC, 30 watts. Also made for 25 cycle AC. Battery: Wards Battery Pack No. 62-30 Size: 10-9/16" by 2¾" by 4¼". "A"—6 volts, 50 milliamperes. "B"—90 volts, 8.5 milliamperes.
Frequency Range	530 to 1650 kc.
Intermediate Freq.	455 kc.
Selectivity	At 1000 kc, 48 kc at 1000 x signal.
Sensitivity	40 microvolts average for .05 watt output.
Power Output	80 milliwatts undistorted. 180 milliwatts maximum.
Loud Speaker	5", P.M., v.c. impedance 3.2 ohms.
Tube Complement	35Z5GT rectifier. 1A7GT converter. 1N5GT I.F. amplifier. 1H5GT detector, AVC, audio amplifier. 1A5GT output amplifier. T-47 pilot lamp, 6-8 volts.

MODELS 64BR-1205A, 1206A

ELECTRICAL SPECIFICATIONS

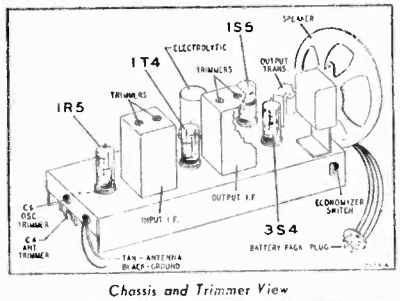
Power Supply	Battery: Wards Battery Pack 62-59 Size: 10¾"x 2⅝"x 6¼". "A"- 1½-volts, 250 milliamperes "B"- 90 volts, 10.5 milliamperes
Frequency Range	540 to 1700 kc.
Intermediate Freq.	455 kc.
Selectivity	At 1000 kc, 49 kc at 1000 x signal
Sensitivity	40 microvolts average for 50-milliwatt output.
Power Output	0.120 watt undistorted. 0.140 watt maximum.
Loud Speaker	5-inch; P. M.; voice coil impedance 3.2 ohms.
Tube Complement	1R5, converter 1T4, I. F. amplifier 1S5, detector, AVC, audio 3S4, output amplifier

ALIGNMENT PROCEDURE

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

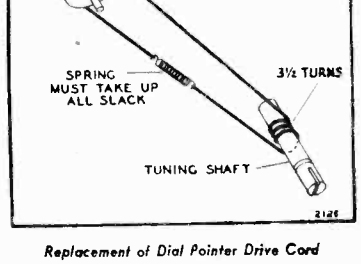
SIGNAL GENERATOR			TUNER SETTING	ADJUST FOR MAXIMUM OUTPUT (in order shown)
Frequency	Coupling Capacitor	Connection to Radio		
455 kc	.1 mf	Grid (pin 6) of 1R5	Iron cores all the way out	Trimmers on output and input I. F. cans
1700 kc	.1 mf	Grid (pin 6) of 1R5	Iron cores all the way out	Oscillator trimmer C6
1700 kc	200 mmf	Antenna lead	Iron cores all the way out	Antenna trimmer C4
1400 kc	200 mmf	Antenna lead	Turn dial to 1400 kc	Adjust position of ant. coil (see coil view)*

*This adjustment and the previous adjustment are interlocking; therefore repeat the two adjustments alternately for best results.



Chassis and Trimmer View

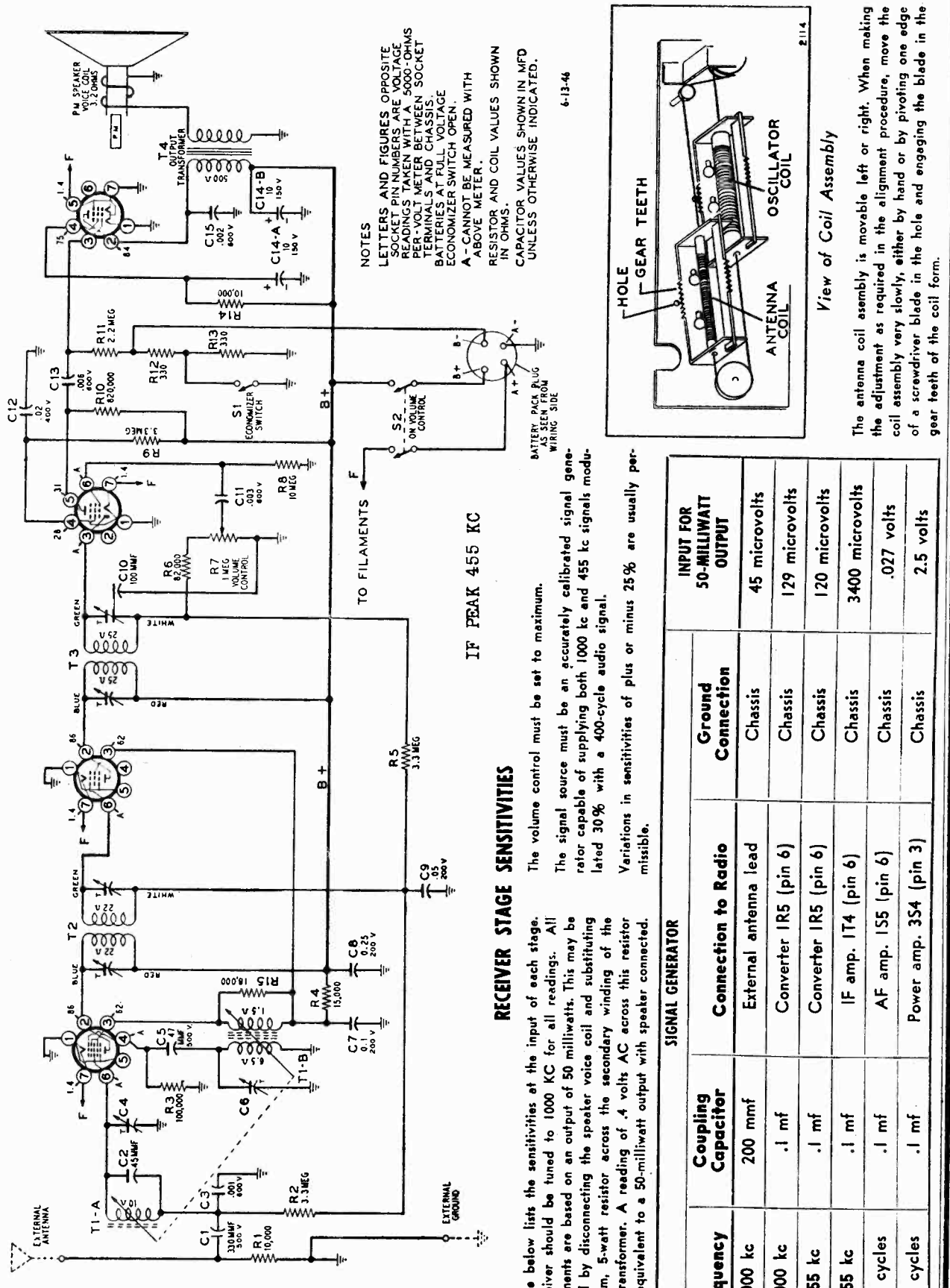
Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS*	
C1	BEC-8F3-11	330 mmf, 500 volts, 20%, mica	1
C2	BEB-8G-10426	45 mmf, 10%, ceramic	1
C3	BEC-8D-10787	.001 mf, 600 volts, 20%	1
C4, C6	BEA-8H-10320	Dual trimmer, antenna and oscillator. Range of each: 84-156 mmf each	1
C5	BEC-8F3-6	47 mmf, 500 volts, 20%, mica	1
C7	BEC-8D-10771	.1 mf, 200 volts, +20%—10%	1
C8	BEC-8D-10775	.25 mf, 200 volts, +20%—10%	1
C9	BEC-8D-10770	.05 mf, 200 volts, 20%	1
C10		Approx. 100 mmf. Part of I.F. can.	
C11	BEC-8D-10786	.003 mf, 600 volts, 20%	1
C12	BEC-8D-10774	.02 mf, 400 volts, 20%	1
C13	BEC-8D-10785	.006 mf, 600 volts, 20%	1
C14-A, -B	BEA-8C-10258	Dual electrolytic, 10 mf x 150 volts each section	1
C15	BEC-8D-10784	.002 mf, 600 volts, 25%	1
		RESISTORS*	
R1, R14	BEC-9B1-74	10,000 ohms, ½ watt, 10%	2
R2, R5, R9	BEC-9B1-34	3.3 megohms, ½ watt, 20%	3
R3	BEC-9B1-86	100,000 ohms, ½ watt, 10%	1
R4	BEC-9B1-76	15,000 ohms, ½ watt, 10%	1
R6	BEC-9B1-85	82,000 ohms, ½ watt, 10%	1
R7, S2	BEA-10B-10368	Volume control (1 megohm) and on-off switch	1
R8	BEC-9B1-37	10 megohms, ½ watt, 20%	1
R10	BEC-9B1-97	820,000 ohms, ½ watt, 10%	1
R11	BEC-9B1-33	2.2 megohms, ½ watt, 20%	1
R12, R13	BEC-9B1-56	330 ohms, ½ watt, 10%	2
R15	BEC-9B1-77	18,000 ohms, ½ watt, 10%	1
		COILS AND TRANSFORMERS	
T1-A, -B	BEC-2I1-10403	Tuner assembly complete, including antenna and oscillator coils	1
T2	BEB-13A-10333	Input I. F. transformer, complete in can. Range of trimmers: 53-97 mmf each	1
T3, C10	BEB-13B-10334	Output I. F. transformer, complete in can. Range of trimmers: 39-71 mmf each	1
T4	BEB-12C-10328	Output transformer	1
		MISCELLANEOUS	
	BEB-18A-10294	Speaker, 5-inch, P.M.	1
	BEA-15B-10326	Tube socket	4
S1	BEA 20C-10317	Economizer switch	1
	BEB-14A-10386	Battery cable assembly	1
	BEB-6D-10287	Dial scale (for brown cabinet)	1
	BEB-6D-10287-1	Dial scale (for ivory cabinet)	1
	BEB-6D-10290	Dial crystal	1
	BEB-2G-10118	Pointer	1
	BEA-53A-10576	Cord for dial pointer drive	14'
	BEA-49A-10078	Spring for drive cord	1
	BEB-2M-7758	Snap-in rivet for dial scale	2
	BE5C-10108-46	Cabinet, brown	1
	BE5C-10108-9	Cabinet, ivory	1
	BEA-5B-10373-17	Knob, volume, brown	1
	BEA-5B-10373-8	Knob, volume, ivory	1
	BEB-5B-10377-17	Knob, tuning, brown	1
	BEB-5B-10377-8	Knob, tuning, ivory	1
	BE134101	Rubber foot for cabinet	4



Replacement of Dial Pointer Drive Cord

MODELS 64BR-1205A,
64BR-1206A

MONTGOMERY WARD



NOTES

LETTERS AND FIGURES OPPOSITE SOCKET PIN NUMBERS ARE VOLTAGE READINGS TAKEN WITH A 5000-OHMS PER-VOLT METER BETWEEN SOCKET TERMINALS AND CHASSIS.
BATTERIES AT FULL VOLTAGE
ECONOMIZER SWITCH OPEN.
A - CANNOT BE MEASURED WITH ABOVE METER.
RESISTOR AND COIL VALUES SHOWN IN OHMS.
CAPACITOR VALUES SHOWN IN MFD UNLESS OTHERWISE INDICATED.

6-13-46

View of Coil Assembly

The antenna coil asembly is movable left or right. When making the adjustment as required in the alignment procedure, move the coil assembly very slowly, either by hand or by pivoting one edge of a screwdriver blade in the hole and engaging the blade in the gear teeth of the coil form.

RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivities 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 volts AC across this resistor will be equivalent to a 50-milliwatt output with 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.

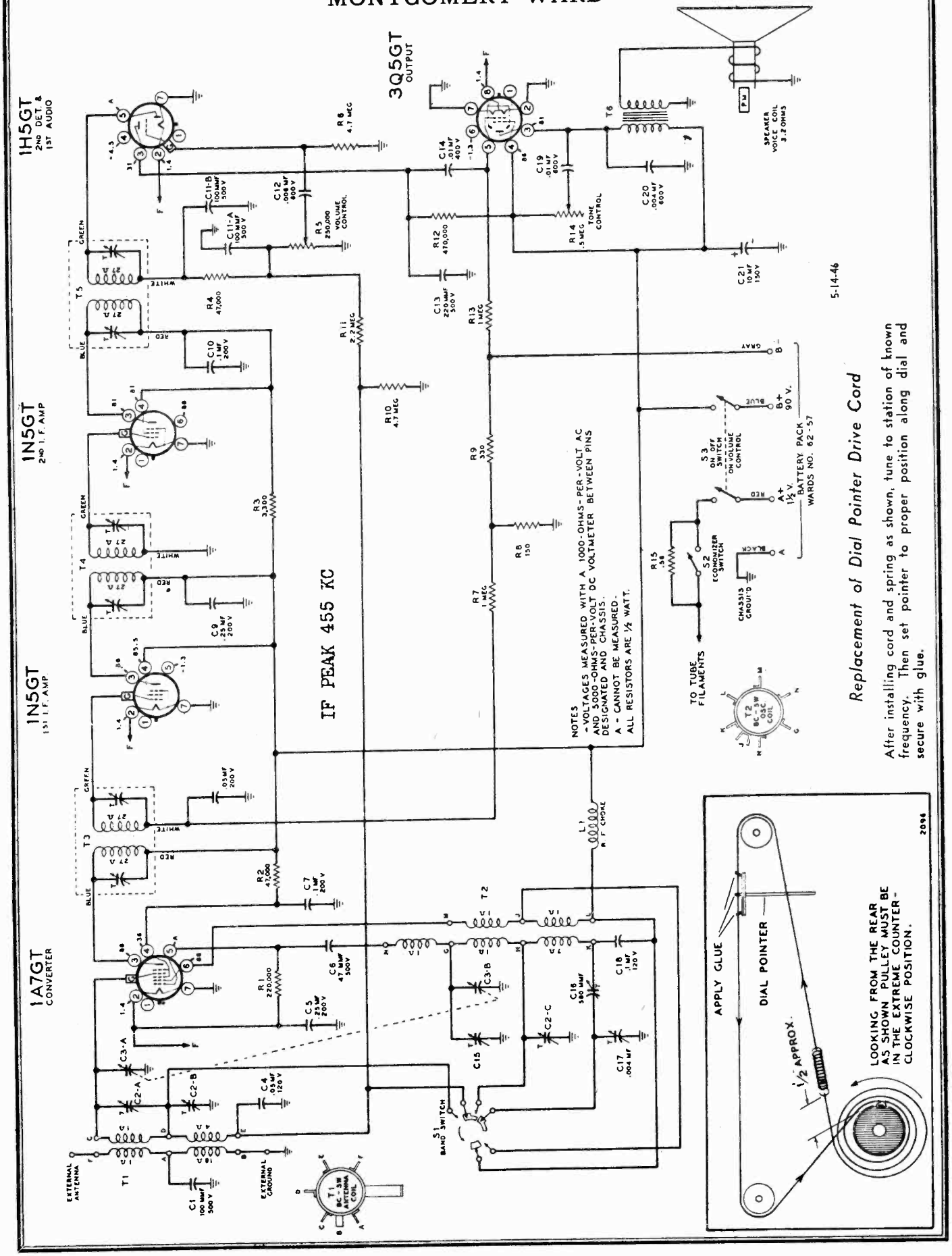
Variations in sensitivities of plus or minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR 50-MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection	
1000 kc	200 mmf	External antenna lead	Chassis	45 microvolts
1000 kc	.1 mf	Converter 1R5 (pin 6)	Chassis	129 microvolts
455 kc	.1 mf	Converter 1R5 (pin 6)	Chassis	120 microvolts
455 kc	.1 mf	IF amp. 1T4 (pin 6)	Chassis	3400 microvolts
400 cycles	.1 mf	AF amp. 1S5 (pin 6)	Chassis	.027 volts
400 cycles	.1 mf	Power amp. 3S4 (pin 3)	Chassis	2.5 volts

For other data, see P.15-63

MODELS 64BR-1208A,
64BR-2200A

MONTGOMERY WARD



5-14-46

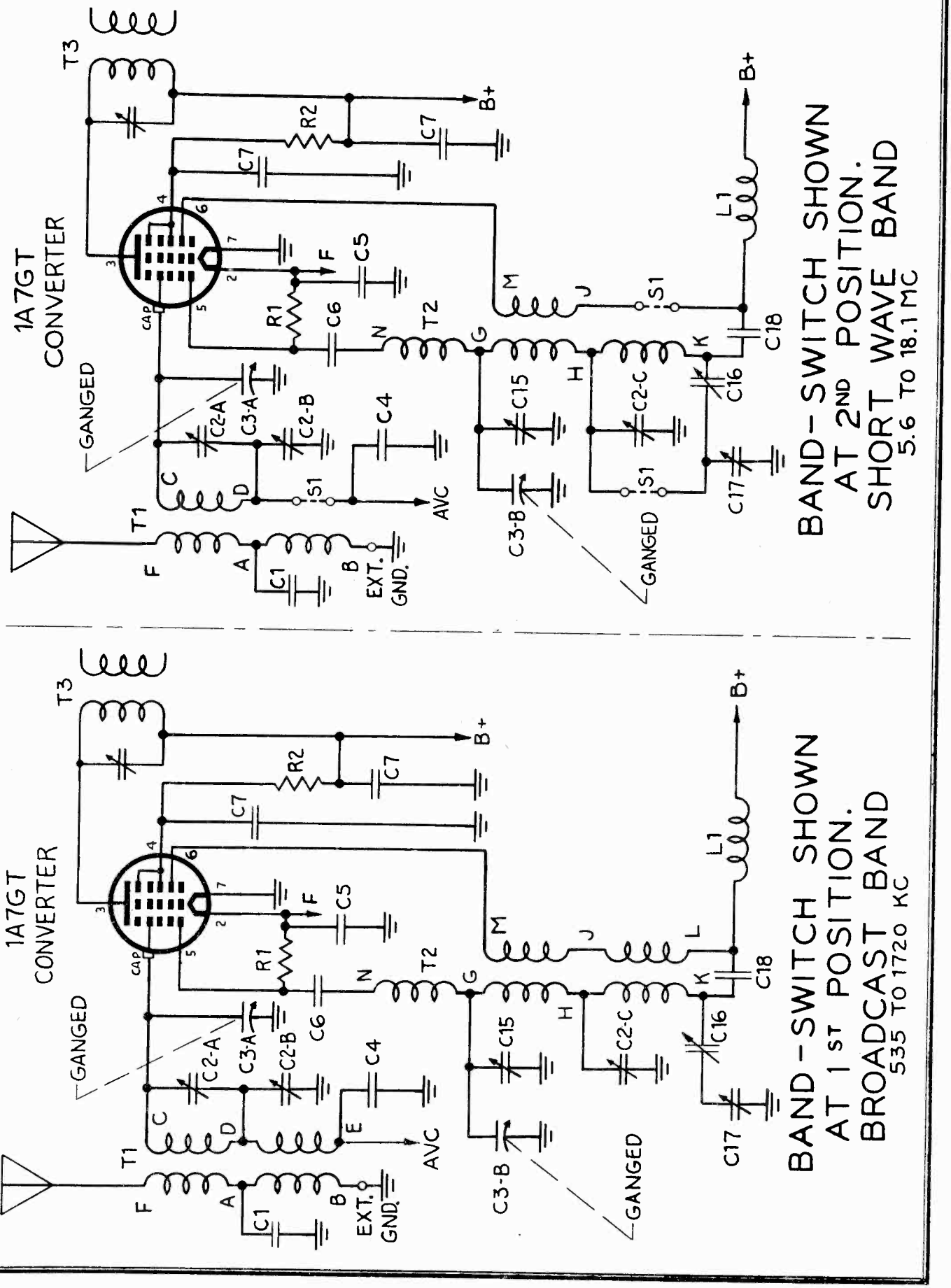
Replacement of Dial Pointer Drive Cord

After installing cord and spring as shown, tune to station of known frequency. Then set pointer to proper position along dial and secure with glue.

"clarified schematics"

MODELS 64BR-1208A,
64BR-2200A

MONTGOMERY WARD

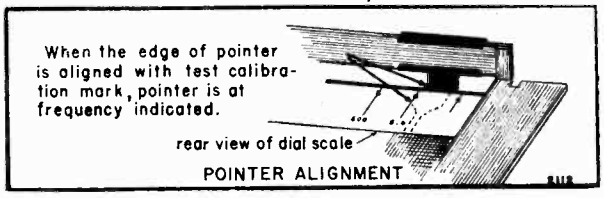


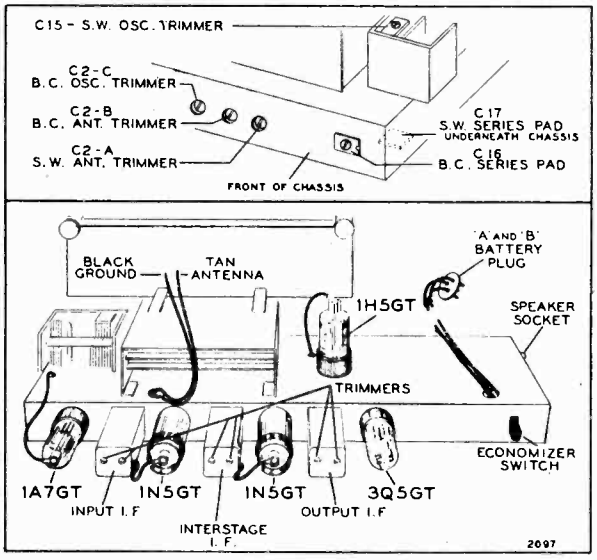
MONTGOMERY WARD

MODELS 64BR-1208A, 64BR-2200A

ELECTRICAL SPECIFICATIONS

Power Supply	Wards Battery Pack No. 62-57. Size: 16" x 6⅝" x 4½". "A"- 1½ volts, 300 ma. "B"- 90 volts, 13 ma.
Frequency Range	Broadcast—535 to 1720 kc. Short Wave—5.6 to 18.1 mc.
Intermediate Freq.	455 kc.
Selectivity	At 1000 kc, 36 kc at 1000 x signal.
Sensitivity	10 microvolts average for 50-milliwatt output.
Power Output	150 milliwatts undistorted. 250 milliwatts maximum.
Speaker	6" (1208A) or 8" (2200A). P.M., v.c. impedance 3.2 ohms.





View of Chassis and Trimmers

ALIGNMENT PROCEDURE

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

BAND SWITCH SETTING	SIGNAL GENERATOR Frequency	Coupling Capacitor	Connection to Radio	TUNER SETTING	ADJUST TO MAXIMUM OUTPUT (in order shown)
BROADCAST *(counter-clockwise)*	455 kc	.1 mf	Second I.F. (1N5GT) grid cap	Rotor full open (plates out of mesh)	Trimmers on top of output I.F. can
	455 kc	.1 mf	First I.F. (1N5GT) grid cap	Rotor full open (plates out of mesh)	Trimmers on top of interstage I.F. can
	455 kc	.1 mf	Converter (1A7GT)	Rotor full open (plates out of mesh)	Trimmers on top of input I.F. can
SHORT WAVE *(clockwise)*	18.1 mc	400 ohms	Antenna lead	Rotor full open (plates out of mesh)	S.W. osc. trimmer C15
	16 mc	400 ohms	Antenna lead	16 mc* (see below for pointer alignment)	S.W. ant. trimmer C2-A
	6 mc	400 ohms	Antenna lead	6 mc (see below for pointer alignment)	S.W. osc. series pad C17†
BROADCAST *(counter-clockwise)*	1720 kc	200 mmf	Antenna lead	Rotor full open (plates out of mesh)	B.C. osc. trimmer C2-C
	1500 kc	200 mmf	Antenna lead	1500 kc (see below for pointer alignment)	B.C. ant. trimmer C2-B
	600 kc	200 mmf	Antenna lead	600 kc (see below for pointer alignment)	B.C. osc. series pad C16†

* First set signal generator to 16 mc; then, with gang all the way out, approach 16 mc by slowly rotating gang inward. The first signal is the one on which the alignment should be made. The next signal is the image; do not align on this signal.

† Turn the dial back and forth slightly (rock) and adjust padder until peak output is obtained. After this adjustment check previous adjustments for interlocking effects.

MODELS 64BR-1208A, 64BR-2200A

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 on the standard broadcast band and to 10 mc for the short-wave 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 speaker connected.

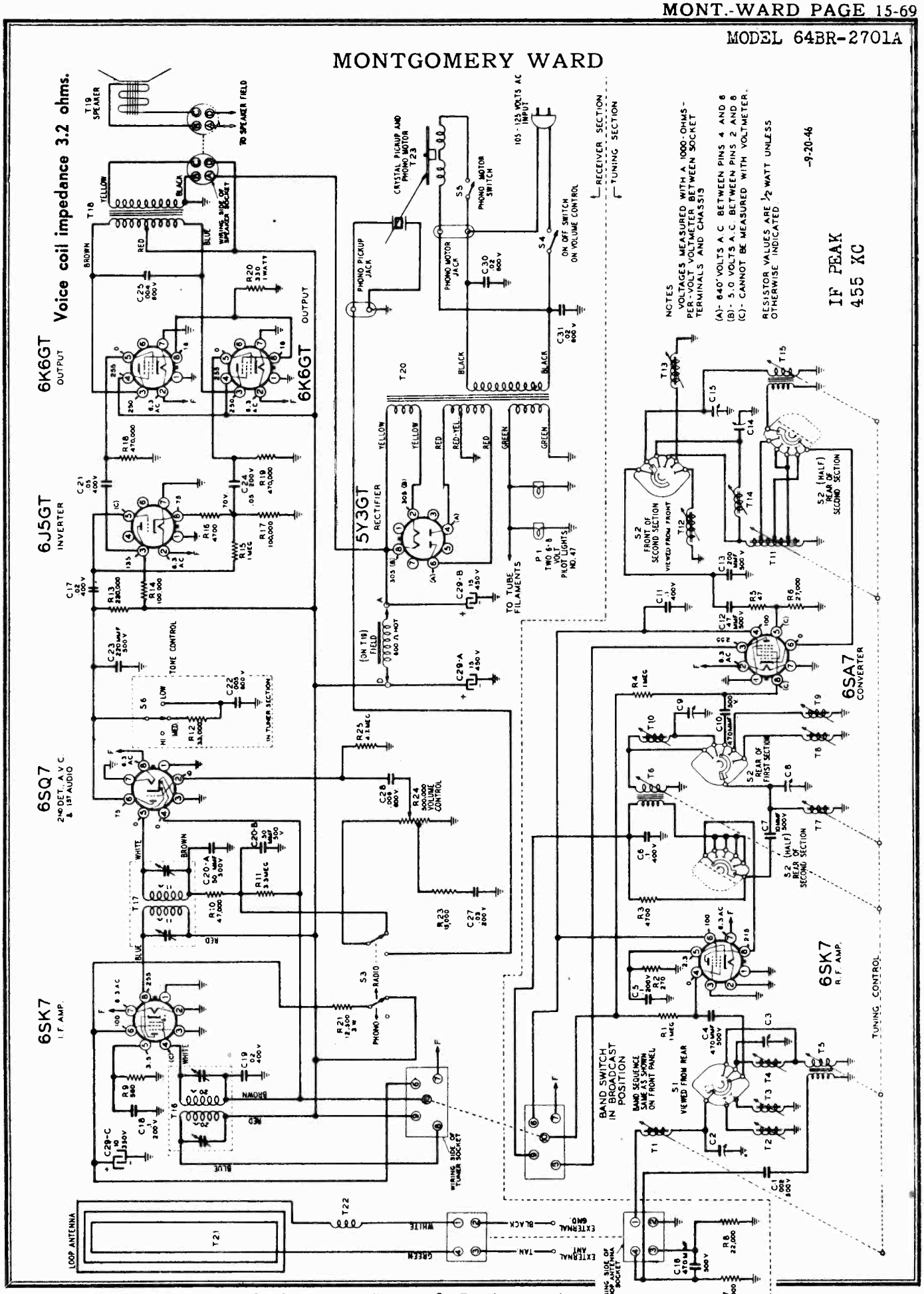
The signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycle audio signal. Variations in sensitivities of plus or minus 25% are usually permissible.

The volume control should be set at maximum, and the tone control at maximum treble.

SIGNAL GENERATOR				INPUT FOR 50-MILLIWATT OUTPUT
Frequency	Coupling Capacitor	Connection to Radio	Ground Connection	
10 mc	400 ohms	Antenna lead	Ground lead	18 microvolts
1000 kc	200 mmf	Antenna lead	Ground lead	10 microvolts
10 mc	.1 mf	Converter (1A7GT) grid cap	Ground lead	32 microvolts
1000 kc	.1 mf	Converter (1A7GT) grid cap	Ground lead	35 microvolts
455 kc	.1 mf	Converter (1A7GT) grid cap	Ground lead	32 microvolts
455 kc	.1 mf	First I.F. (1N5GT) grid cap	Ground lead	630 microvolts
455 kc	.1 mf	Second I.F. (1N5GT) grid cap	Ground lead	.01 volt
400 cycles	.1 mf	Audio amp. (1H5GT) grid cap	Ground lead	.06 volt
400 cycles	.1 mf	Power amp. (1A5GT) grid (pin 5)	Ground lead	3 volts

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C1	BE1295	100 mmf, mica, 20%	1
C2-A,-B, -C	BE124171	Triple trimmer; S.W. antenna, C2-A; B.C. antenna, C2-B; B.C. oscillator, C2-C. Range of each is approx. 4-30 mmf	1
C3-A,-B C15	BEB-8A-10243	Two-gang variable capacitor, including S.W. oscillator trimmer	1
C4	BE100128	.05 mf, 120 volts, 25%	1
C5, C9	BE1006	.25 mf, 200 volts, 20%	2
C6	BE12939	50 mmf, mica, 20%	1
C7, C10	BE10020	.1 mf, 200 volts, 25%	2
C8	BE10022	.05 mf, 200 volts, 25%	1
C11-A,-B	BE129161	Dual, mica, 100 mmf each section	1
C12	BE10019	.006 mf, 600 volts, 25%	1
C13	BE12921	200 mmf, mica, 20%	1
C14	BE10011	.01 mf, 400 volts, 25%	1
C16	BE124173	B.C. series padder; range 420-780 mmf	1
C17	BE129125	S.W. series padder; mica, 4000-4350 mmf	1
C18	BE100133	.1 mf, 120 volts, 25%	1
C19	BE10087	.01 mf, 600 volts, 25%	1
C20	BE10071	.004 mf, 600 volts, 25%	1
C21	BE119130	10 mf, 150 volts, electrolytic	1
		RESISTORS*	
R1	BEA-9B1-27	220,000 ohms, 1/2 watt, 20%	1
R2, R4	BEA-9B1-23	47,000 ohms, 1/2 watt, 20%	2
R3	BEA-9B1-16	3300 ohms, 1/2 watt, 20%	1
R5, S3	BE101257	Volume control (250,000 ohms) and on-off switch	1
R6, R10	BEA-9B1-35	4.7 megohms, 1/2 watt, 20%	2
R7, R13	BEA-9B1-31	1 megohm, 1/2 watt, 20%	2
R8	BEA-9B1-8	150 ohms, 1/2 watt, 20%	1
R9	BEA-9B1-10	330 ohms, 1/2 watt, 20%	1
R11	BEA-9B1-33	2.2 megohms, 1/2 watt, 20%	1
R12	BEA-9B1-29	470,000 ohms, 1/2 watt, 20%	1
R14	BE101264	Tone control (500,000 ohms)	1
R15	BE130346	.56 ohms, 1/3 watt, 10%, wirewound	1
		COILS AND TRANSFORMERS	
T1	BE111248	Broadcast and S.W. antenna coil	1
T2	BE110183	Broadcast and S.W. oscillator coil	1
T3	BE108204	Input I.F. coil complete in can. Range of trimmers: 80-150 mmf each	1
T4	BE108204B	Interstage I.F. coil complete in can. Range of trimmers: 80-150 mmf each	1
T5	BE108188B	Output I.F. coil complete in can. Range of trimmers: 80-150 mmf each	1
T6	BE105119B	Output transformer	1
L1	BE1233	R.F. choke coil	1
		MISCELLANEOUS	
	BE114245	Speaker, 6-inch, P.M. (1208A)	1
	BEC-18A-11471	Speaker, 8-inch, P.M. (2200A)	1
	BE121280	Socket, for speaker plug	1
	BE121171	Socket, for tubes	5
S1	BE125160	Band switch	1
S2	BE12588B	Battery economizer switch	1
	BE107377	Battery cable assembly	1
	BE115396	Tube shield	2
	BE134128	Rubber grommet for mounting speaker	4
	BEB-6D-10043	Dial scale	1
	BED-5C-10007-37	Escutcheon	1
	BE112530	Clip for mounting escutcheon	4
	BE128686B-37	Knob, volume	1
	BE128681-37	Knob, tuning	1
	BE128680-37	Knob, tone	1
	BE128683-37	Knob, band switch	1
	BE112961	Station call letters	1 set
		TUNER ASSEMBLY PARTS	
	BE117907	Tuning shaft	1
	BE117798	Pinion gear on tuning shaft	1
	BEB-2C-7245	Gear segment	1
	BE115618	Drive link and drive link bushing	1
	BE115617	Driven link and collar	1
	BE115616	Connecting link	1
	BE120372	Spring for connecting link assembly	1
	BE128678-37	Pushbutton	6
	BE112819	Pushrod assembly, complete	6
	BEA-49A-7186	Spring for pushrod return	6
	BE112974	Paper background for dial	1
	BE112806	Drive pulley and bushing	1
	BE112971	Pointer	1
	BE120214	Cord for dial pointer drive	2 ft.
	BE120377	Spring for pointer drive cord	1

MODEL 64BR-2701A



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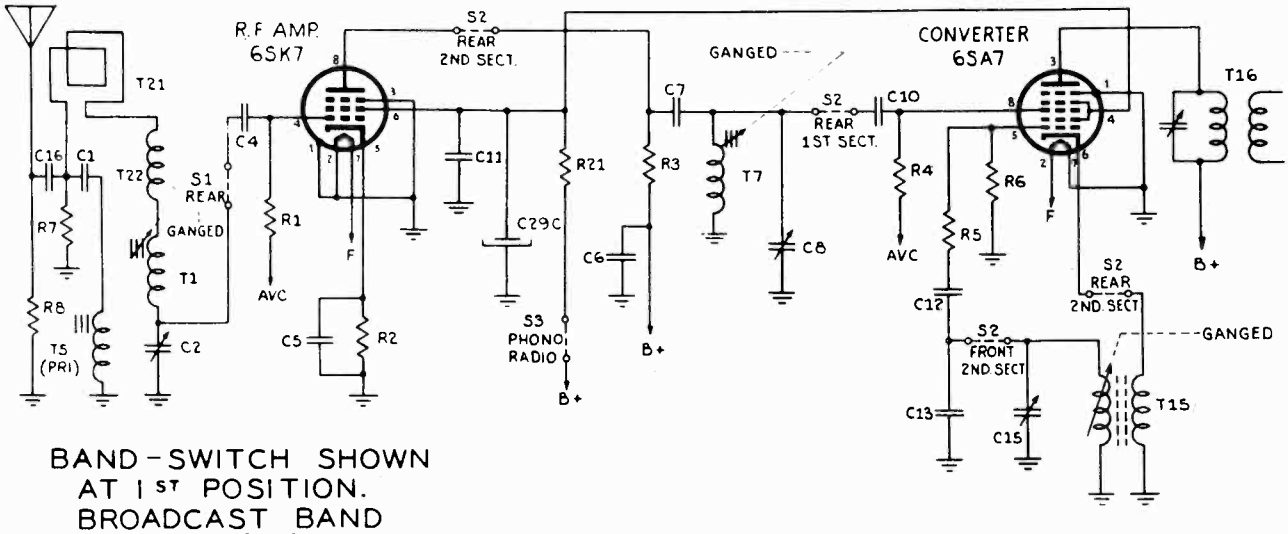
Model 205

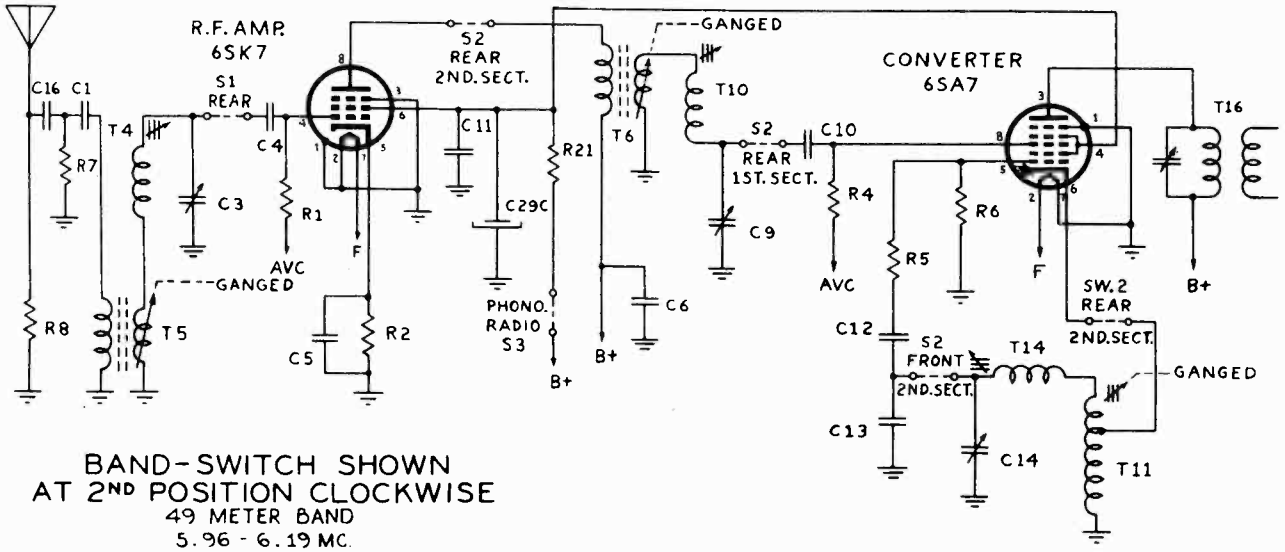
"clarified schematics"

MODEL 64BR-2701A

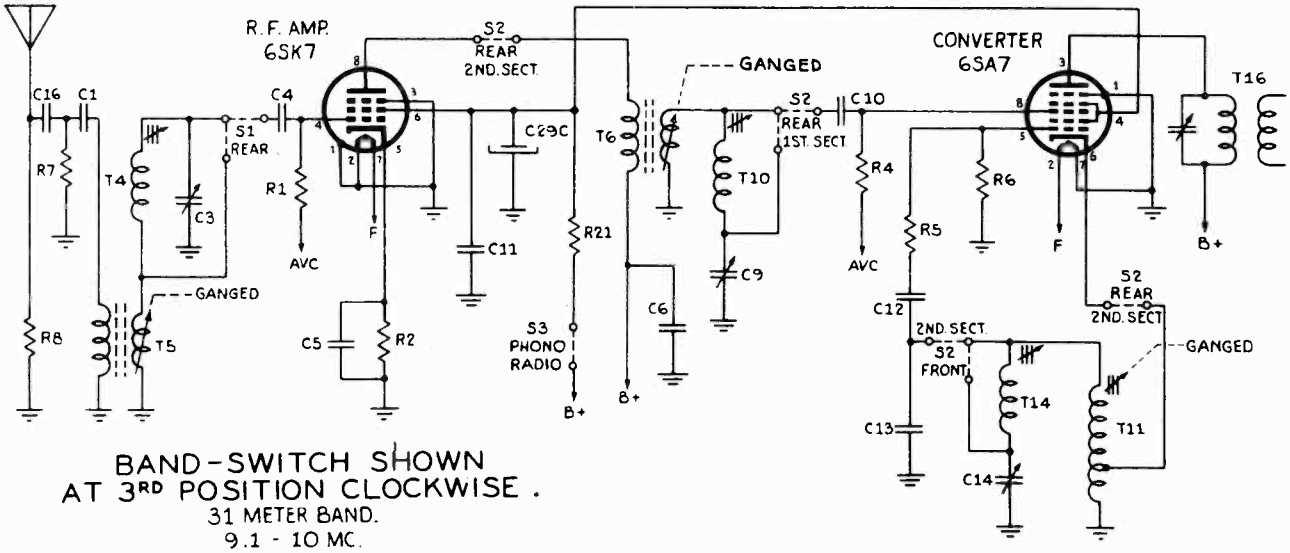
MONTGOMERY WARD



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND 540-1600 KC



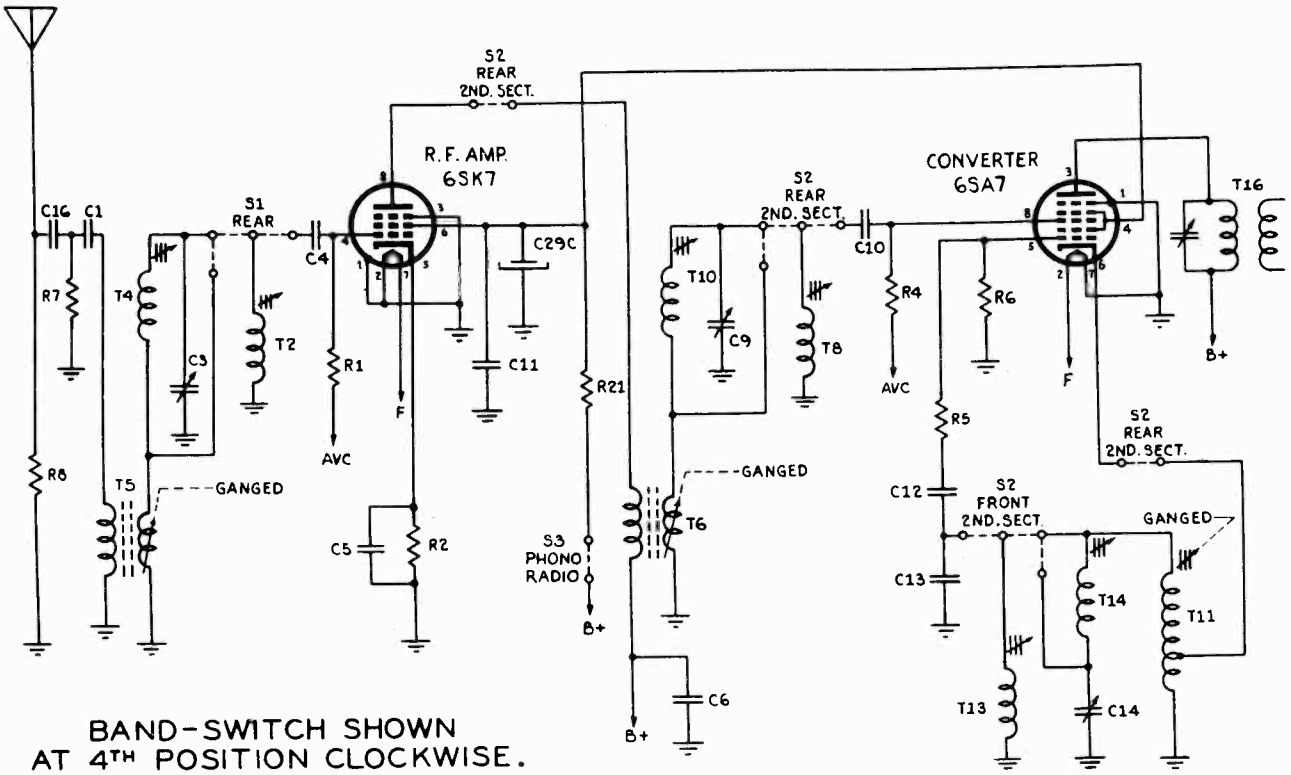
BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE 49 METER BAND 5.96 - 6.19 MC.



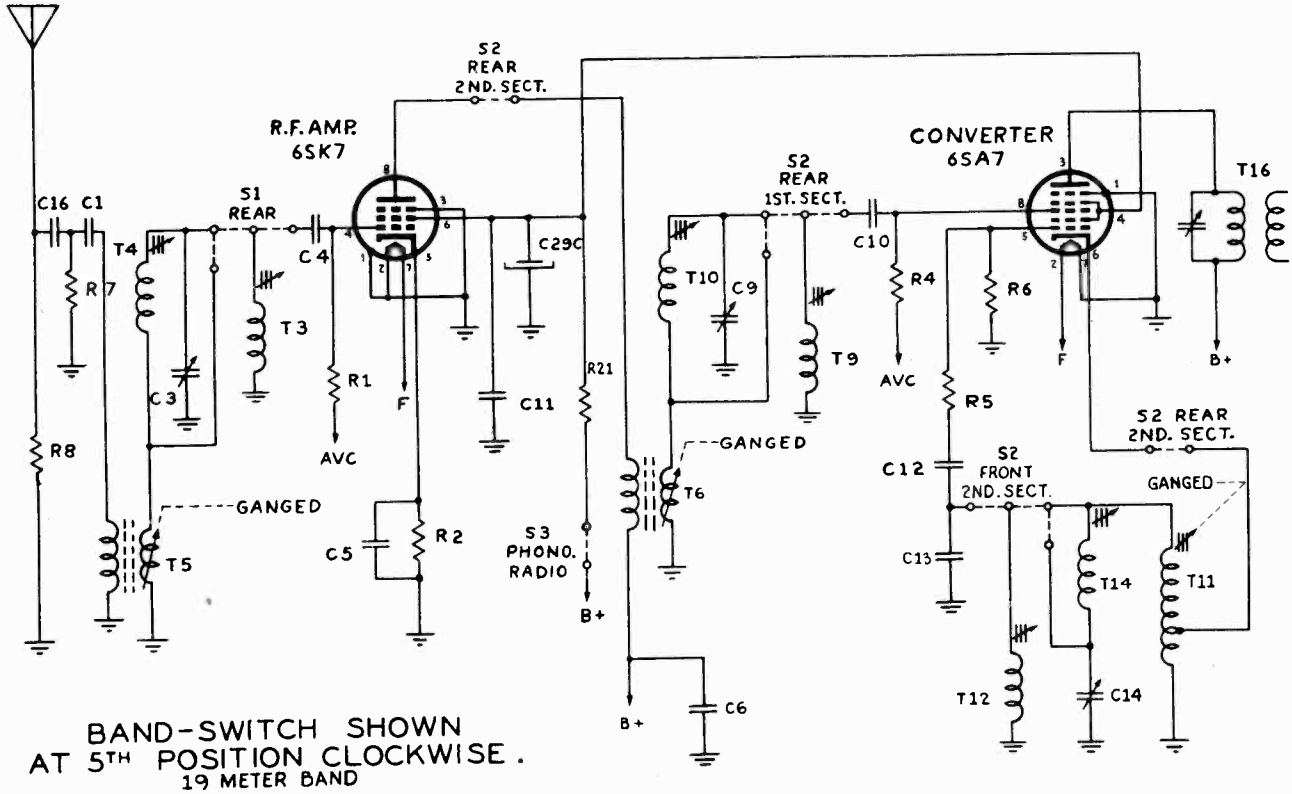
BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE. 31 METER BAND. 9.1 - 10 MC.

MODEL 64BR-2701A

MONTGOMERY WARD



BAND-SWITCH SHOWN AT 4TH POSITION CLOCKWISE.
25 METER BAND
11.45 - 12.16MC.



BAND-SWITCH SHOWN AT 5TH POSITION CLOCKWISE.
19 METER BAND
14.94 - 15.46 MC.

MODEL 64BR-2701A

MONTGOMERY WARD

ALIGNMENT PROCEDURE

MECHANICAL ADJUSTMENT—The core tuning bar (see illustration of coils below) and dial pointer must be adjusted mechanically before any electrical alignment is attempted. Rotate the manual tuning control until the core bar is farthest from the coils. For proper adjustment the bar should be approximately 1/32 of an inch from the two rod guide angles.

With the core bar in this position, adjust the dial pointer to coincide with 1600 kc on the dial scale

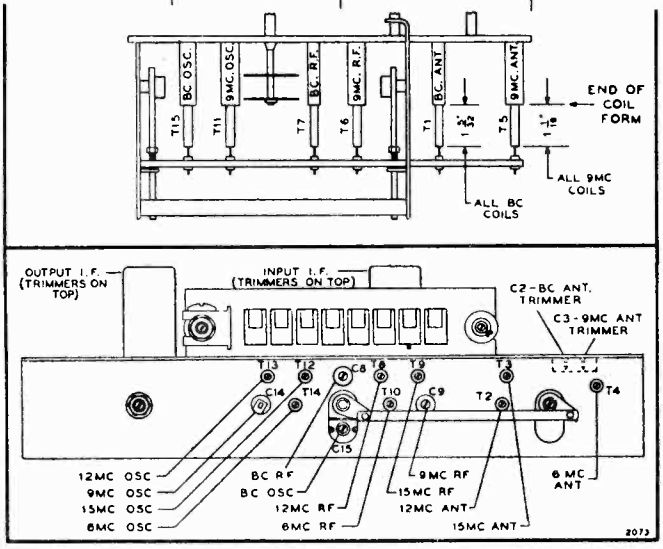
Rotate the core of each of the three broadcast coils (see illustration) until the end of the core is 1-5/32" from the end of the coil form. Rotate the three 9-mc cores until this dimension is 1-1/6" for these coils. After these adjustments have been made, the unit can be aligned electrically.

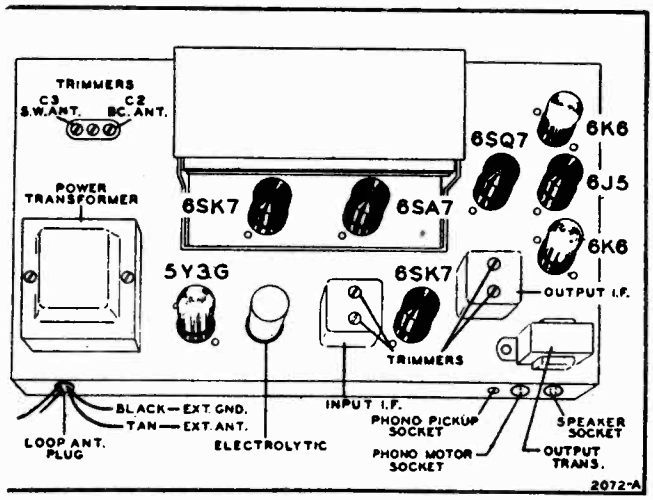
ELECTRICAL ADJUSTMENT—To align the set make the following preliminary adjustments: Set the tone pushbutton for treble tone; set the volume control at maximum; connect the ground post of the signal generator to the radio chassis; connect the output meter across a 3.2-ohm output load; and allow the receiver and signal generator to warm up for several minutes.

Align the set according to the sequence given in the chart. The indicated coupling capacitor is to be connected in series between the signal generator output lead and the receiver. Adjust the set for maximum output; reduce the input as needed to keep the output near 1.3 volts.

Locations of all the trimmers and coils are shown in the illustrations below. After adjustment, seal the coil cores with collodion or a similar substance (do not use cement).

BAND SWITCH SETTING	SIGNAL GENERATOR			DIAL POINTER SETTING	ADJUST TO MAXIMUM OUTPUT IN ORDER SHOWN
	Frequency	Coupling Capacitor	Connection to Receiver		
Broadcast (for I. F.)	455 kc	.1 mf	Grid (pin 8) of converter (6SA7)	1600 kc	Trimmers on output and input I. F. cans
Broadcast	1600 kc	200 mmf	Antenna lead	1600 kc	BC Osc. trimmer C15 BC R. F. trimmer C8 BC Ant. trimmer C2
	1400 kc	200 mmf	Antenna lead	1400 kc	Rotate cores of BC R. F. coil T7 and BC Ant. coil T1
31 Meter	9.6 mc	400 ohms	Antenna lead	9.6 mc	9 mc Osc. trimmer C14 9 mc R. F. trimmer C9 9 mc Ant. trimmer C3
49 Meter	6.1 mc	400 ohms	Antenna lead	6.1 mc	6 mc Osc. coil T14 6 mc R. F. coil T10 6 mc Ant. coil T4
25 Meter	11.8 mc	400 ohms	Antenna lead	11.8 mc	12 mc Osc. coil T13 12 mc R. F. coil T8 12 mc Ant. coil T2
19 Meter	15.2 mc	400 ohms	Antenna lead	15.2 mc	15 mc Osc. coil T12 15 mc R. F. coil T9 15 mc Ant. coil T3

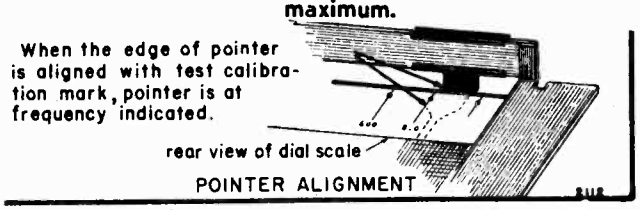


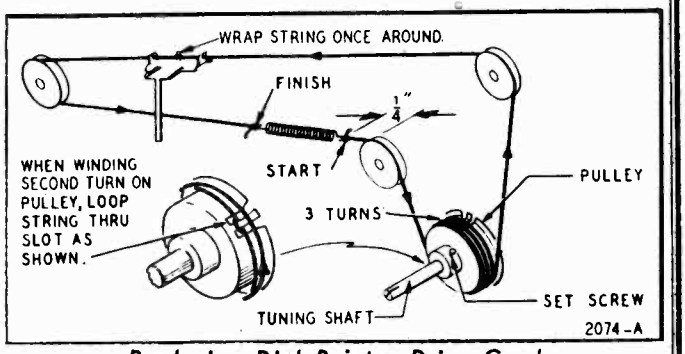


MODEL 64BR-2701A

MONTGOMERY WARD

Frequency Ranges.....Broadcast band—540 to 1600 kc.
49-meter band—5.96 to 6.19 mc.
31-meter band—9.1 to 10 mc.
25-meter band—11.45 to 12.16 mc.
19-meter band—14.94 to 15.46 mc.
Intermediate Freq....455 kc.
Selectivity.....at 1000 kc, 35 kc at 1000 x signal
Sensitivity.....3.75 microvolts average for 1/2 watt output.
Power Output.....5.5 watts undistorted, 7.5 watts maximum.





Replacing Dial Pointer Drive Cord

After stringing, spring must be 1/4" from idler when tuning shaft is in extreme counterclockwise position. To do this: Loosen set screw; hold tuning shaft firm and turn pulley by hand until spring is 1/4" from idler; tighten screw.

RECEIVER STAGE SENSITIVITIES

The table below lists the sensitivities at the inputs of various stages. All measurements 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 signal source must be an accurately calibrated signal generator capable of supplying the frequencies designated, modulated 30% with a 400-cycle audio signal. Variations in sensitivities of plus or minus 25% are usually permissible.

BAND	SIGNAL GENERATOR				INPUT FOR 500-MILLIWATT OUTPUT
	Frequency	Dummy Antenna	Connection to Receiver	Ground Connection	
Broadcast	1000 kc	200 mmf	External Antenna clip	Chassis	3.5 microvolts
	1000 kc	.1 mf	Grid (pin 4) of R. F. amp. (6SK7)	Chassis	8.9 microvolts
	1000 kc	.1 mf	Grid (pin 8) of Converter (6SA7)	Chassis	125 microvolts
	455 kc	.1 mf	Grid (pin 8) of Converter (6SA7)	Chassis	100 microvolts
	455 kc	.1 mf	Grid (pin 4) of I. F. amp. (6SK7)	Chassis	4500 microvolts
	400 cycles	.1 mf	Grid (pin 2) of Audio amp. (6SQ7)	Chassis	.1 volt
	400 cycles	.1 mf	Grid (pin 5) of Inverter (6J5GT)	Chassis	4.8 volts
31 meter*	9.6 mc	400 ohms	External Antenna clip	Chassis	1.6 microvolts
49 meter*	6.1 mc	400 ohms	External Antenna clip	Chassis	3.0 microvolts
25 meter*	11.8 mc	400 ohms	External Antenna clip	Chassis	5.0 microvolts
19 meter*	15.2 mc	400 ohms	External Antenna clip	Chassis	9.0 microvolts

*Average sensitivity on short-wave bands at grid (pin 4) of R. F. amplifier is 8.5 microvolts.

MODEL 64BR-2701A

MONTGOMERY WARD

REMOVABLE TUNER ASSEMBLY

CAPACITORS*

Ref. No.	Part No.	Description	Qty. Used In Set
C1	BEB-8F-10767	.002 mf, 500 volts, 10%, mica	1
C2, C3	BE-124143	Dual, broadcast (67-123 mmf) and 9 mc (95-175 mmf) ant. trimmers	1
C4, C10	BEB-8F3-121	470 mmf, 500 volts, 10%, mica	2
C5	BEC-8D-10771	.1 mf, 200 volts, +20%—10%	1
C6, C11	BEC-8D-10760	.1 mf, 400 volts, +20%—10%	2
C7	BEB-8F5-101	10 mmf, 500 volts, 10%, silver mica	1
C8	BEA-8G-7205	Broadcast RF trimmer (120-220 mmf)	1
C9	BEA-8G-7206	9 mc RF trimmer (60-110 mmf)	1
C12	BEB-8F3-109	47 mmf, 500 volts, 10%, mica	1
C13	BEB-8F-10763	200 mmf, 500 volts, 3%, silver mica	1
C14	BE-124145	9 mc oscillator trimmer (7-35 mmf)	1
C15	BE-124144	Broadcast oscillator trimmer (15-27 mmf)	1
C22	BEC-8D-10935	.005 mf, 600 volts, +40%—15%	1

RESISTORS*

R1, R4	BEC-9B1-31	1 megohm, 1/2 watt, 20%	2
R2	BEC-9B1-55	270 ohms, 1/2 watt, 10%	1
R3	BEC-9B1-70	4700 ohms, 1/2 watt, 10%	1
R5	BEC-9B1-46	47 ohms, 1/2 watt, 10%	1
R6	BEC-9B1-79	27,000 ohms, 1/2 watt, 10%	1
R12	BEC-9B1-22	33,000 ohms, 1/2 watt, 20%	1

COILS (complete with cores)

T1	BE-111195	Broadcast antenna coil	1
T2	BE-111191	12 mc antenna coil	1
T3	BE-111192	15 mc antenna coil	1
T4	BE-111189	6 mc antenna coil	1
T5	BE-111190	9 mc antenna coil	1
T6	BE-10959	9 mc RF coil	1
T7	BE-10962	Broadcast RF coil	1
T8	BE-10960	12 mc RF coil	1
T9	BE-10961	15 mc RF coil	1
T10	BE-10958	6 mc RF coil	1
T11	BE-110157	9 mc oscillator coil	1
T12	BE-110159	15 mc oscillator coil	1
T13	BE-110158	12 mc oscillator coil	1
T14	BE-110156	6 mc oscillator coil	1
T15	BE-110161	Broadcast oscillator coil	1

MISCELLANEOUS

S1	BEB-20A-10526 or BEB-20A-11053	Band switch, antenna	1
S2	BEB-20A-10527 or BEB-20A-11054	Band switch, oscillator and RF	1
S3	BE-125129	Radio-phono switch	1
S6	BEA-20F-7322-2	Tone switch, 3-position	1
	BE-121210	Socket, octal, molded (6SA7)	1
	BE-121171	Socket, laminated (6SK7GT)	1
	BEA-3A-10476	Tuning shaft	1
	BE-117798	Pinion gear on tuning shaft	1
	BE-120393	Spring, intermediate link, under ends of treadle bar	2
	BE-131251	Washer, "C," on slug tuning bar	4
	BEB-2C-7245	Gear segment	1
	BEA-2J-7439	Spring clip, for coils	9
	BE-131316B	Washer, "C", for 9 mc coils	3
	BE-134134	Grommet for core mounting (all broadcast and 9 mc coils)	6
	BE-134126	Grommet for coil mounting (broadcast RF and antenna coils)	2
	BE-134125	Grommet for coil mounting (broadcast oscillator coil)	1
	BEA-25A-7619	Grommet for all 9 mc coils	3
	BE-115659B	Pushrod, tone switch	1
	BE-115670	Pushrod, radio-phono switch	1
	BEB-202-10475	Pushrod assembly, station selectors	6
	BE-120366	Spring, pushrod return	6
	BEA-2J-7176	Cam-locking spring on pushrod ass'y	6
	BEA-2J-7627-1	Retainer spring on pushrod ass'y	6
	BE-121281	Plug, 5-prong	1
	BE-128678-37	Pushbutton	8
	BE-131210	Washer, "C," on end plate	2

MAIN CHASSIS

CAPACITORS*

Ref. No.	Part No.	Description	Qty. Used In Set
C16	BEC-8F3-12	470 mmf, 20%, mica	1
C17, C19	BEC-8D-10774	.02 mf, 400 volts, 20%	2
C18	BEC-8D-10771	.1 mf, 200 volts, +20% —10%	1
C20-A, C20-B	BE-129165B	Dual, 50 mmf each section, mica, 20%	1
C21	BEC-8D-10813	.05 mf, 400 volts, 20%	1
C23	BEC-8F3-10	220 mmf, 20%, mica	1
C24	BEC-8D-10770	.05 mf, 200 volts, 20%	1
C25	BEC-8D-10788	.004 mf, 600 volts, 20%	1
C27	BEC-8D-10992	.03 mf, 200 volts, 20%	1
C28	BEC-8D-10785	.006 mf, 600 volts, 20%	1
C29-A, -B, -C	BE-119109	Electrolytic, 15 mf x 450 volts, 15 mf x 450 volts, 10 mf x 350 volts	1
C30, C31	BEC-8J-11321	.02 mf, 600 volts, 20%	2

RESISTORS*

R7, R8	BEC-9B1-21	22,000 ohms, 1/2 watt, 20%	2
R9	BEC-9B1-59	560 ohms, 1/2 watt, 10%	1
R10	BEC-9B1-23	47,000 ohms, 1/2 watt, 20%	1
R11	BEC-9B1-34	3.3 megohms, 1/2 watt, 20%	1
R13	BEC-9B1-27	220,000 ohms, 1/2 watt, 20%	1
R14, R17	BEC-9B1-86	100,000 ohms, 1/2 watt, 10%	2
R15	BEC-9B1-31	1 megohm, 1/2 watt, 20%	1
R16	BEC-9B1-70	4700 ohms, 1/2 watt, 10%	1
R18, R19	BEC-9B1-29	470,000 ohms, 1/2 watt, 20%	2
R20	BEC-9B2-56	330 ohms, 1 watt, 10%	1
R21	BE-10662	12,500 ohms, 3 watts, 10%	1
R23	BEC-9B1-20	15,000 ohms, 1/2 watt, 20%	1
R24, S4	BEA-10A-10832	Volume control (500,000 ohms) and on-off switch	1
R25	BEC-9B1-35	4.7 megohms, 1/2 watt, 20%	1

COILS AND TRANSFORMERS

T16	BE-108177	Input IF coil complete in can (Range of trimmers: 110-210 mmf)	1
T17	BE-108176	Output IF coil complete in can (Range of trimmers: 80-140 mmf)	1
T18	BEB-12C-10234	Output transformer	1
T20	BE-104202B	Power transformer, for 50-60 cycles (for 25 cycles, 104203B) (for 40 cycles, 104205B)	1

SOCKETS

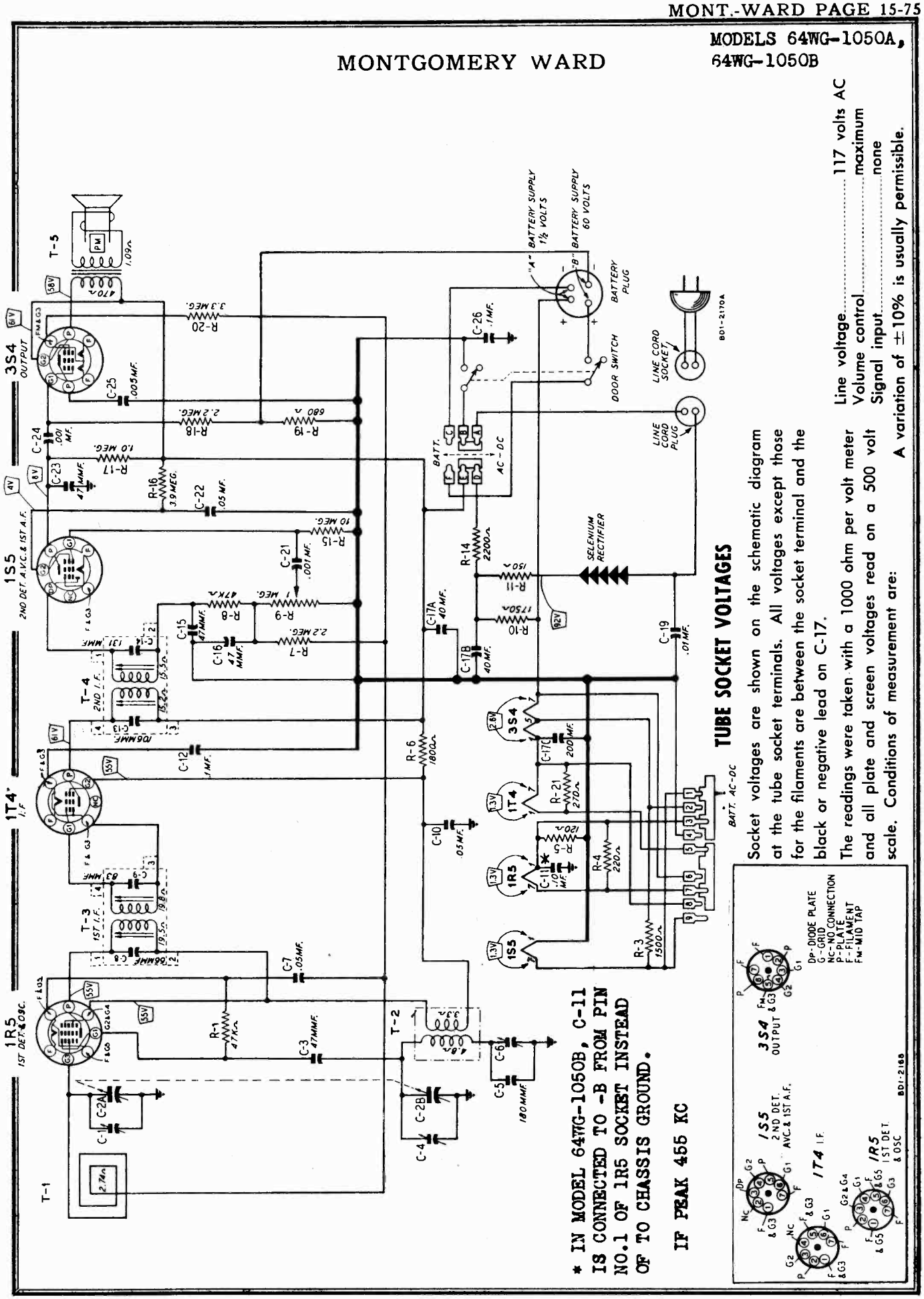
	BE-121200	Socket, 4-terminal, for loop ant.	1
	BE-121279	Socket, 5-terminal, for tuner	1
	BEA-15B-11538	Socket, 4-terminal, for speaker	1
	BE-121199	Socket, 2-terminal, for phono motor	1
	BE-121210	Socket, octal, molded (all tubes except 6SK7, IF amp.)	5
	BE-121273	Socket, octal, laminated (for 6SK7, IF amplifier)	1
	BE-121280	Socket, 1-terminal, for phono pickup	1
	BEB-47A-10808-1	Socket assembly for dial light	1

MISCELLANEOUS

T19	BEB-18B-10616	Speaker, 12" electrodynamic	1
	BEA-19A-11539	Plug on speaker leads	1
T21	BE-14MA-11066	Loop antenna (ribbon only)	1
T22	BEA-16A-11045	Choke on loop terminal board	1
	BEA-19A-11322	Plug on loop antenna leads	1
	BE-107401	Phono motor cable assembly	1
P1	BE-10724	Plug on phono pickup leads	1
	BEC-6D-10897	Dial scale	1
	BE-10794	Dial light, 6-8 volts, type 44	2
	BEB-2G-10511	Dial pointer	1
	BEB-53A-10989	String for dial pointer	32"
	BE-120377	Tension spring for dial pointer string	1
	BEB-5C-10269-48	Escutcheon, for pushbuttons	1
	BEB-5C-10257-48	Escutcheon, for dial scale	1
	BE128683-37	Knob, band switch	1
	BEB-5B-10377-37	Knob, tuning	1
	BEB-5B-10376-37	Knob, volume	1
	BE-107266	Line cord and plug	1
	BEA-2L-11293	Band switch link	1
	BE-112961	Station call letters	1 set

MONTGOMERY WARD

MODELS 64WG-1050A,
64WG-1050B



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 the black or negative lead on C-17.

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.

* IN MODEL 64WG-1050B, C-11 IS CONNECTED TO -B FROM PIN NO.1 OF 1R5 SOCKET INSTEAD OF TO CHASSIS GROUND.

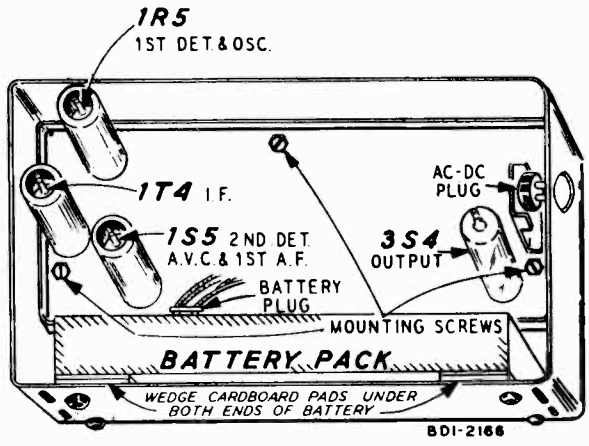
IF PEAK 455 KC

MODELS 64WG-1050A,
64WG-1050B

MONTGOMERY WARD

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 volts 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. Variations of plus or minus 25% are usually permissible.



SIGNAL GENERATOR				INPUT FOR 50 MILLIWATT OUTPUT
Freq.	Coupling Capacitor	Connection to Receiver	Ground Connection	
1000 kc	.05 mf	1R5 Mixer Pin 6	C-17 Black Lead	148 microvolts
455 kc	.05 mf	1R5 Mixer Pin 6	Same as above	118 microvolts
455 kc	.05 mf	1T4 IF Amp. Pin 6	Same as above	5000 microvolts
400 cycles	.05 mf	1S5 2nd Det. Pin 6	Same as above	.068 Volts
400 cycles	.05 mf	3S4 Output Pin 3	Same as above	4.2 volts

Volume Control — Maximum All Adjustments.

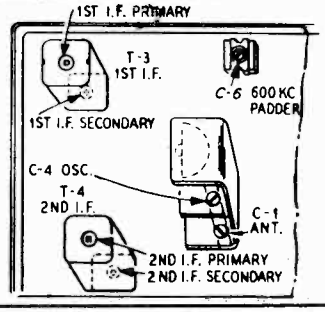
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

The following equipment is required for aligning.

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

Output Indicating Meter — Non-Metallic Screwdriver.

Dummy Antenna—.1 mf.



SIGNAL GENERATOR				RECEIVER	
Frequency Setting	Coupling Capacitor	Connection to Radio	Ground Connection	Condenser Setting	Adjust for maximum output. See trimmer illustration.
Remove chassis from case (See paragraph Removal of Chassis From Case) and temporarily solder a 50,000 ohm resistor across the two antenna leads on the chassis.					
455 kc	.1 mf	Control Grid 1R5—Pin 6	Chassis	Rotor to full open	1st IF Pri. & Sec. 2nd IF Pri. & Sec.
Remove temporary resistor, replace chassis in case and solder antenna leads to hinges.					
1610 kc	.1 mf	Door Hinge Above Tuning Control	Chassis	Rotor to full open	Oscillator (C-4)
1500 kc	.1 mf	Door Hinge Above Tuning Control	Chassis	Turn Rotor to Maximum Output	Set Tuning Knob at 1500 kc
1400 kc		Loop See Note A	Loop See Note A	Turn Rotor to Maximum Output	Antenna (C-1)
600 kc		Loop See Note A	Loop See Note A	Turn Rotor to Maximum Output	600 kc (C-6) Rock Rotor—See Note B
1400 kc		Loop See Note A	Loop See Note A	Turn Rotor to Maximum Output	Antenna (C-1)

NOTE A: Connect a loop approximately one foot in diameter across the antenna and ground posts of the signal generator. Place radio approximately 2 feet from loop.

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

MODEL 64WG-1050A

To remove the chassis from the case it will be necessary to remove the line cord if connected, and the back panel from the case. Open the front cover and carefully remove the two control knobs and the screw on the front panel above the tuning knob at the side of the ON-OFF switch plunger. Withdraw the battery pack from the case and disconnect the plug connecting to the battery pack. Then remove the 3 chassis mounting screws protruding above the chassis as shown in the tube position illustration. Carefully lift the chassis, and move it over into the battery space. Unsolder the two antenna wires at the door hinges.

OPERATING VOLTAGES—Chassis for Model 64WG-1050A are available for operation on the following power supplies:

Power Line — 105-125 Volts AC 50-60 Cycles or 105-125 Volts DC

Battery — Wards Battery Pack No. 62-32 { A Section 1.5 Volts; B Section 60 Volts

Ref. No.	Part No.	Description			Qty. Used in Set
		CAPACITORS			
C-1, C-4		Part of C-2 (Gang Capacitor)			
C-2A, C-2B	14A158	Gang Capacitor			1
C-3, C-15, C-16, C-23	47X495	47 mmf		Ceramic	4
C-5	47X486	180 mmf		Silvered Mica	1
C-6	17A186	30-120 mmf		Trimmer	1
C-7, C-10, C-22	B66503	.05 mf	200 V	Tubular	3
C-8		66 mmf Part of T-3 (1st I-F Transformer)			
C-9		83 mmf Part of T-3 (1st I-F Transformer)			
C-11	B66104	.10 mf	200 V	Tubular	1
C-12	46X330	.10 mf	120 V	Tubular	1
C-13		106 mmf Part of T-4 (2nd I-F Transformer)			
C-14		131 mmf Part of T-4 (2nd I-F Transformer)			
C-17A, C-17B, C-17C	45X350	40 mf / 40 mf / 200 mf	150 V / 150 V / 12 V	Dry Electrolytic	1
C-19	B66103	.01 mf	200 V	Tubular	1
C-21	46X334	.001 mf	120 V	Tubular	1
C-24	B67102	.001 mf	200 V	Tubular	1
C-25	B66502	.005 mf	200 V	Tubular	1
C-26	D67104	.10 mf	400 V	Tubular	1
		RESISTORS			
		OHMS	WATTS		
R-1, R-8	B84473	47 K	0.5	Carbon	2
R-3	B84152	1500	0.5	Carbon	1
R-4	B84221	220	0.5	Carbon	1
R-5	B84121	120	0.5	Carbon	1
R-6	B84182	1800	0.5	Carbon	1
R-7, R-18	B85225	2.2 meg	0.5	Carbon	2
R-9	36X305	1.0 meg	Volume	Control	1
R-10	43X107	1750	4.0	Wire wound	1
R-11	D84151	150	2.0	Carbon	1
R-14	B84222	2200	0.5	Carbon	1
R-15	B85106	10 meg	0.5	Carbon	1
R-16	B84395	3.9 meg	0.5	Carbon	1
R-17	B85105	1.0 meg	0.5	Carbon	1
R-19	B84681	680	0.5	Carbon	1
R-20	B85335	3.3 meg	0.5	Carbon	1
R-21	B84271	270	0.5	Carbon	1

ELECTRICAL SPECIFICATIONS

Power Supply	A Battery Supply 1.5 volts, .050 amps. B Battery Supply 60 volts, 8 MA or 105-125 volts AC, 50-60 cycles, 10 watts or 105-125 volts DC
Battery Pack	Wards Battery Pack No. 62-32
Frequency Range	540-1600 kc
Intermediate Frequency	455 kc
Selectivity	At 1000 kc, 40 kc wide at 1000 times signal
Sensitivity	300 microvolts per meter average (for .05 watt output)
Power Output	.130 watt maximum .070 watt 10% distortion
Loud Speaker	4" PM Dynamic
Voice Coil Imp.	3.2 ohms at 400 cycles

Tube Complement
1 1R5 Mixer
1 1T4 IF Amplifier
1 1S5 2nd Detector AVC and 1st AF Amplifier
1 3S4 Output

Ref. No.	Part No.	Description	Qty. Used in Set
		TRANSFORMERS AND COILS	
T-1	9A1551	"B" Band Loop Antenna	1
T-2	9A1552	Oscillator Coil Assembly	1
T-3	9A1823	1st I-F Transformer and Can Assembly	1
T-4	9A1824	2nd I-F Transformer and Can Assembly	1
T-5	51X94	Output Transformer	1
		MISCELLANEOUS	
	12A447	4" P.M. Dynamic Speaker	1
		Cone and Voice Coil Assembly (Specify Part Number and Letters Stamped on Speaker)	1
	66X7	Selenium Rectifier	1
	14X351	Metal Grille (Speaker)	1
	3A312	Tube Socket—Miniature Type	4
	32X221	Tube Shield—Miniature	3
	13X453	"A" and "B" Battery Cable and Plug Assembly	1
	2A201	On-Off Switch	1
	26A409	Change-Over Switch Assembly	1
	13X545	Line Cord and Socket Assembly	1
	6A299	Line Plug (on Chassis)	1
	10A590	Knob	2
	26A407	Case and Cover Assembly Complete with Loop, Loop Cover and Back, Escutcheon and Speaker Grille	1
	26A408	Case Bottom Assembly	1
	4X939	Wraparound	1
	4X940	Rear Panel Cover	1
	4X941	Front Panel Cover	1
	67X33	Wrench (for I-F Transformer Alignment)	

MODEL 64 WG-1052A

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
Battery Pack	Ward's Battery Pack No. 62-35
Frequency Range	540-1600 KC
Intermediate Frequency	455 KC
Selectivity	At 1000 KC, 53 KC wide at 1000 times signal
Sensitivity	(for .05 watt output with external antenna) 20 microvolts average
Power Output	0.3 watts maximum 0.125 watt 10% distortion
Loud Speaker	5¼" PM dynamic
Voice Coil Impedance	3.2 ohms at 400 cycles

Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C-2	17A123	1.0 mmf-12 mmf Trimmer	1
C-3	14A186	Gang Capacitor with Drive Pulley	1
C-4, C-10, C-17	47X476	100 mmf Moulded	3
C-5	47X463	47 mmf Moulded	1
C-6, C-7, C-8		Part of T-3 (1st I-F Transformer)	
C-28, C-29	B66403	.04 mf 200 V Tubular	3
C-11A, C-11B	45X348	20 mf 150 V / 50 mf 55 V Dry electrolytic	1
C-12		Part of T-4 (2nd I-F Transformer)	
C-13			
C-14	47X112	50 mmf Dual Mica	1
C-15, C-16, C-18	B66502	.005 mf 200 V Tubular	2
C-19, C-23	B66503	.05 mf 200 V Tubular	2
C-20	D66502	.005 mf 400 V Tubular	1
C-21	D66603	.06 mf 400 V Tubular	1
C-22	B66104	.1 mf 200 V Tubular	1
C-24	B66254	.25 mf 200 V Tubular	1
C-25A, C-25B, C-25C	45X347	200 mf 35 V / 40 mf 150 V / 40 mf 150 V Dry electrolytic	1
C-27	D67104	.1mf 400 V Tubular	1
		RESISTORS	
		Ohms / Watts	
R-1, R-7	B85225	2.2 meg. 0.5	2
R-2	B85104	100 K 0.5	1
R-4	B84123	12 K 0.5	1
R-5, R-14	B85335	3.3 meg. 0.5	2
R-6	B84153	15 K 0.5	1
R-8, R-25	B84152	1500 0.5	2
R-9	B85473	47 K 0.5	1
R-10	36X307	500 K Volume control	1
R-11, R-12	B85475	4.7 meg. 0.5	2
R-13	B85105	1.0 meg. 0.5	1
R-15, R-17	B84121	120 0.5	2
R-16	B84391	390 0.5	1
R-18	B84102	1000 0.5	1
R-19	B84821	820 0.5	1
R-20	B85330	33 0.5	1
R-21	B84471	470 0.5	1
R-22	43X215	1900 Shielded W. W. Resistor (Ballast tube)	1
R-23	D84101	100 2.0	1

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.

Tube Complement
1 1R5 Mixer
2 1U4 I-F Amplifier
1 1S5 2nd Detector, AVC and 1st A-F Amplifier
1 3Q4 Power Output

OPERATING VOLTAGES—Chassis for Model 64WG-1052A are available for operation on the following power supplies:

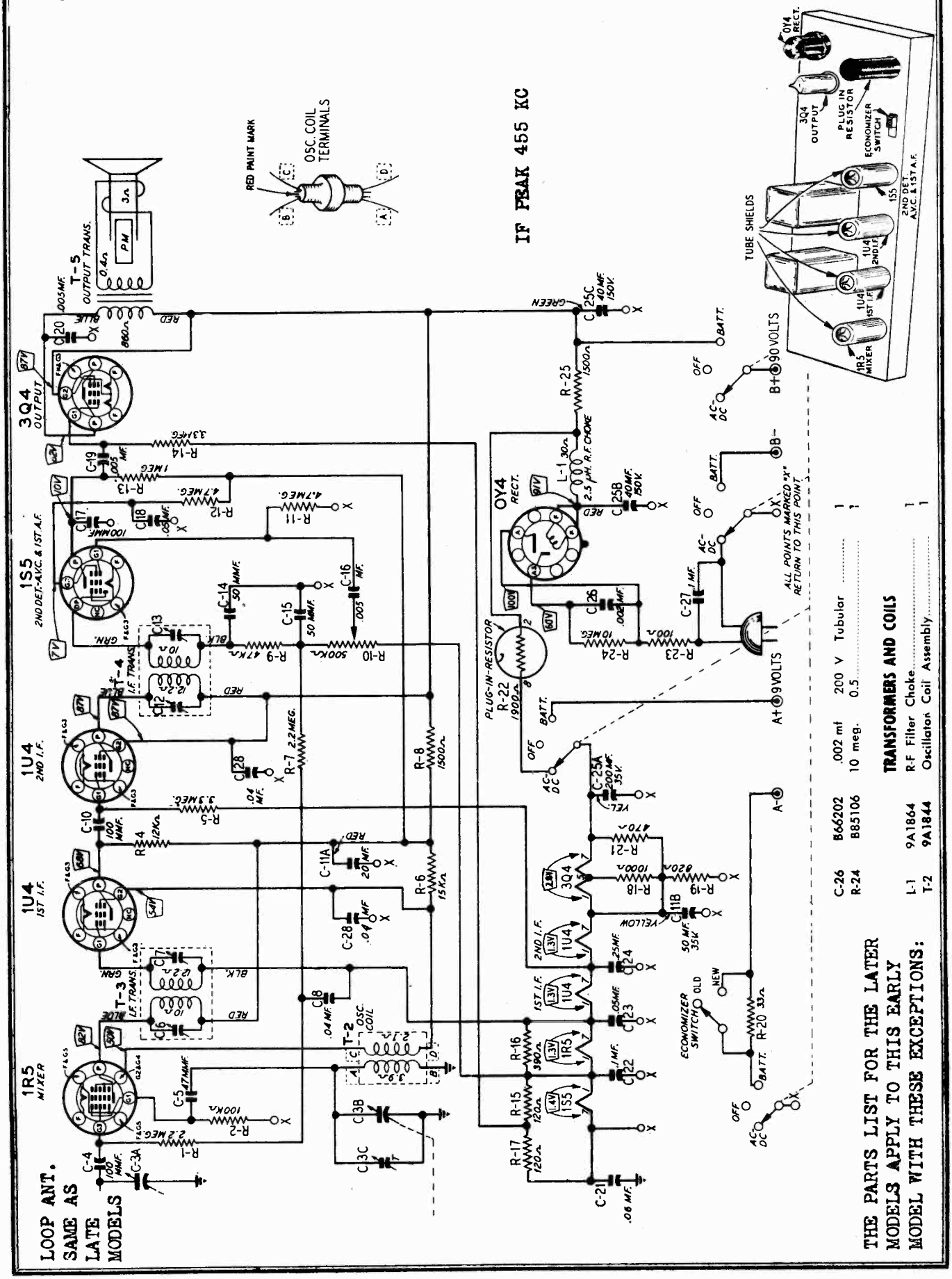
Power Line — 105-125 Volts AC 50-60 Cycles or 105-125 Volts DC

Battery — Wards Battery Pack No. 62-35 { A Section 9 Volts; B Section 90 Volts

Ref. No.	Part No.	Description	Qty. Used in Set
		TRANSFORMERS AND COILS	
T-1	9A1843	"B" Range Loop Antenna	1
T-2	9A1896	Oscillator Coil Assembly	1
T-3	9A1840	1st I-F Transformer and Can Assem.	1
T-4	9A1841	2nd I-F Transformer and Can Assem.	1
T-5		Output Transformer (See Miscellaneous)	1
		DIAL AND DRIVE ASSEMBLY	
	26A381	Dial Scale Mounting Plate Assembly Complete with Idler Pulleys and Bracket for Drive Shaft Less Dial Scale, Brace Bracket, Drive Shaft and Gang Capacitor	1
	25X1504	Dial Brace Bracket	1
	58X633	Dial Scale	1
	28X56	Snap Button (Mtg. Dial Scale & Celluloid Crystal to Dial Bracket)	6
	17X65	Celluloid Crystal	1
	15X191	Pointer for Dial Scale	1
	25X832	Gang Capacitor Mounting Bracket	1
	6X21	Rubber Grommet (Mounting Gang Mounting Plate)	3
	57X176	Mounting Plate (Capacitor Cond. Cushion Stud)	1
	20X329		3
	28X95	Drive Cord Tension Spring	1
		23" Drive Cord (18 lb. test)	1
	4X942	Escutcheon	1
	26X489	Drive Shaft	1
	19X192	"C" Washer for Drive Shaft	2
		MISCELLANEOUS	
	12A443	5¼" 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
	25A1019	Selenium Rectifier and Housing Assembly	1
	3A303	Socket-Octal (8 prong) Moulded	1
	3A312	Tube Socket (Miniature)	5
	32X221	Tube Shield	4
	2A175	On-Off Switch (Economizer)	1
	2A203	Changeover Switch (AC-DC, Battery Switch)	1
	13X429	Battery Cable and Plug Assembly	1
		Grille Cloth 4¾"x6½" (426W)	1
	10A595	Knob, Switch	1
	10A596	Knob, Tuning	1
	10A597	Knob, Volume	1
	13X328	Line Cord and Plug Assembly	1
	11X117	Shield, Volume Control and Switch (Paper)	1
	32X368	Shield, Volume Control and Switch (Metal)	1

MODEL 64WG-1052A,
Early

MONTGOMERY WARD



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.

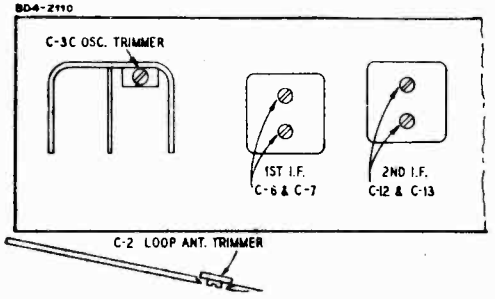
Dummy Antenna—.1 mf., 50 mmf.

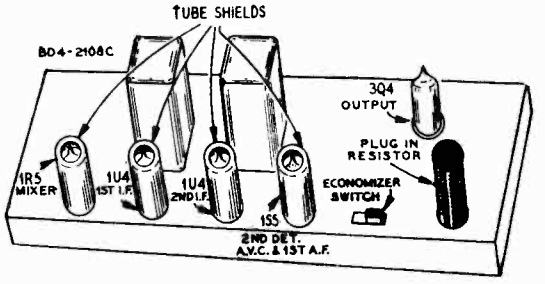
SIGNAL GENERATOR				CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM See Trimmer Illustration
Frequency Setting	Coupling Capacitor	Connection to Radio	Ground Connection		
455 kc	.1 mf	Control Grid 1U4—1st I-F Pin 6	Point "X" At Electrolytic Capacitor Black Lead	Turn Rotor to full open	2nd I-F (C13) & (C12)
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)

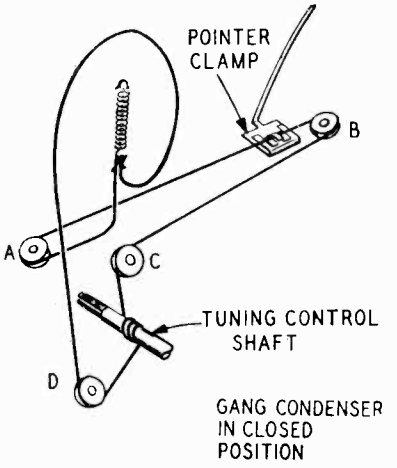
NOTE A—Re-assemble chassis in cabinet and close the cabinet back before making adjustment.

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.





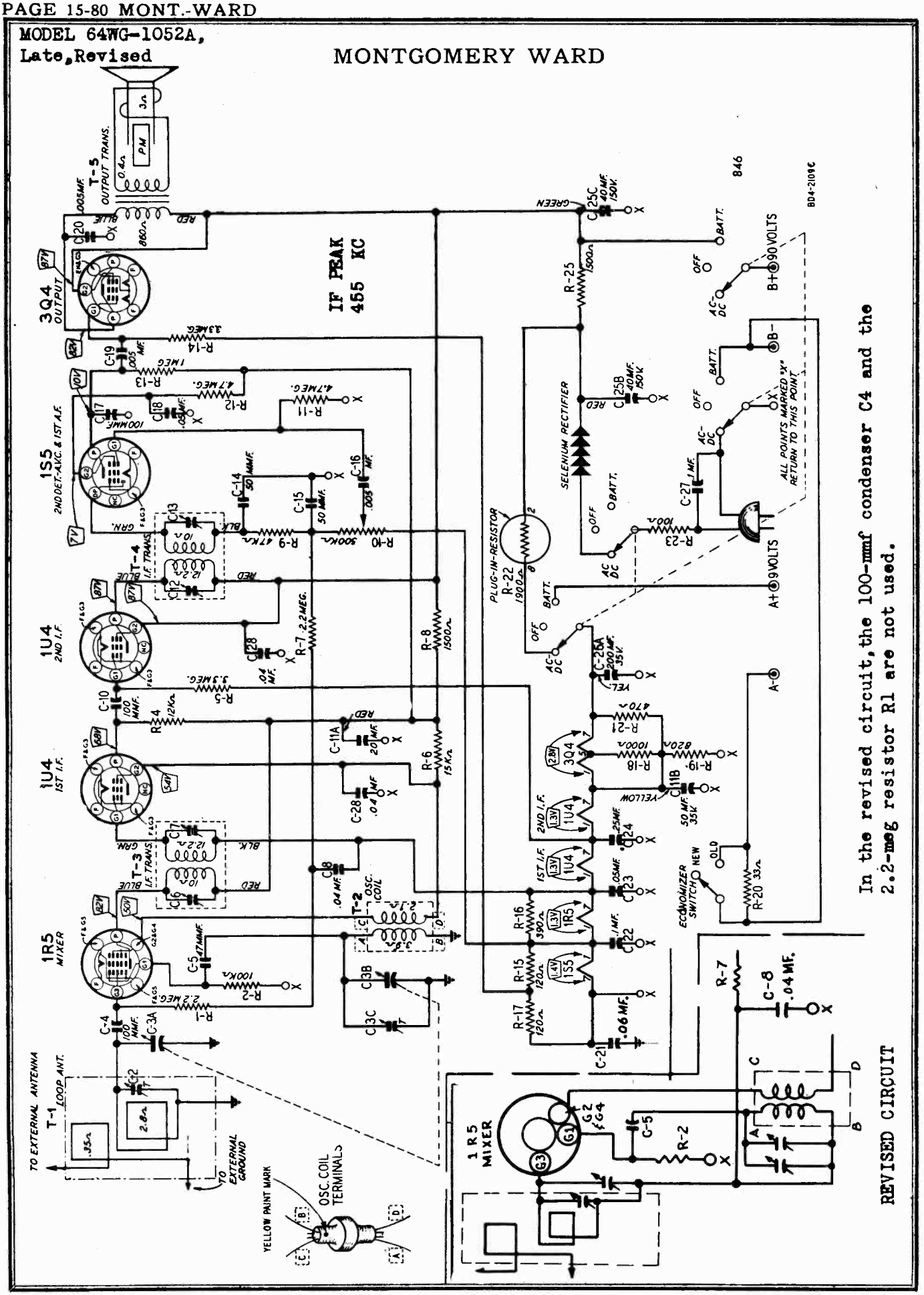


DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully closed position. Use a new cord 23" 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 ¼ 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 ¾ 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 it. Cut off any excess string.

MODEL 64WG-1052A,
Late, Revised

MONTGOMERY WARD



In the revised circuit, the 100-mmf condenser C4 and the 2.2-meg resistor R1 are not used.

REVISED CIRCUIT

MODEL 64 WG-1052A

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 volts 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 volts
400 cycles	.05 mf.	3Q4 Output—Pin 3	Same as above	1.8 volt

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

MODEL 54 WG-2007A

ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts AC—60 cycles—30 watts (42 watts Phono Operating)

Frequency Range.....535 to 1620 KC

Intermediate Frequency.....455 KC

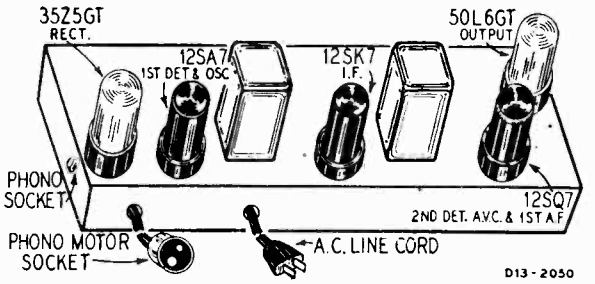
Selectivity.....55.5 KC broad at 1000 times signal, 1000 KC

Sensitivity (for .05 watt output) with external antenna.....25 microvolts average

Power Output.....1.5 watts maximum, .9 watt (10% distortion)

Loud speaker.....5" PM dynamic

Voice coil impedance.....3.2 ohms at 400 cycles



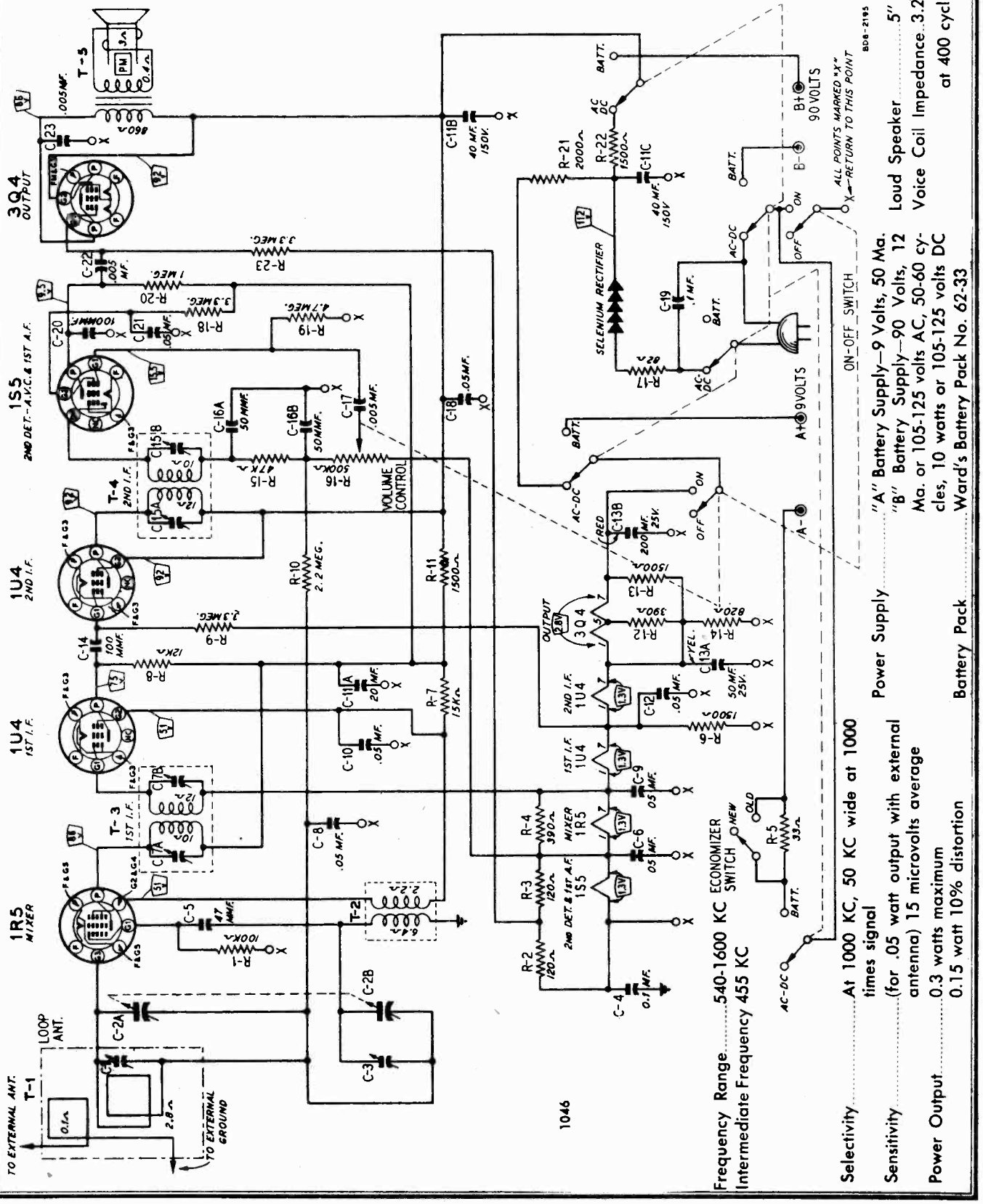
REMOVAL OF CHASSIS FROM CABINET

To remove the chassis from the cabinet it is necessary to pull the two control knobs and the dial pointer from their shafts. Remove the four screws in the bottom of the cabinet and the four snap pins that hold the cabinet back in place.

Care must be taken when removing the dial pointer that it is not damaged in such a manner that reinstallation will not be possible.

MODEL 64WG-1054A

MONTGOMERY WARD



Frequency Range.....540-1600 KC
Intermediate Frequency 455 KC

Selectivity.....At 1000 KC, 50 KC wide at 1000 times signal

Sensitivity.....(for .05 watt output with external antenna) 15 microvolts average

Power Output.....0.3 watts maximum
0.15 watt 10% distortion

Power Supply.....
"A" Battery Supply—9 Volts, 50 Ma.
"B" Battery Supply—90 Volts, 12 Ma. or 105-125 volts AC, 50-60 cycles, 10 watts or 105-125 volts DC

Battery Pack.....Ward's Battery Pack No. 62-33

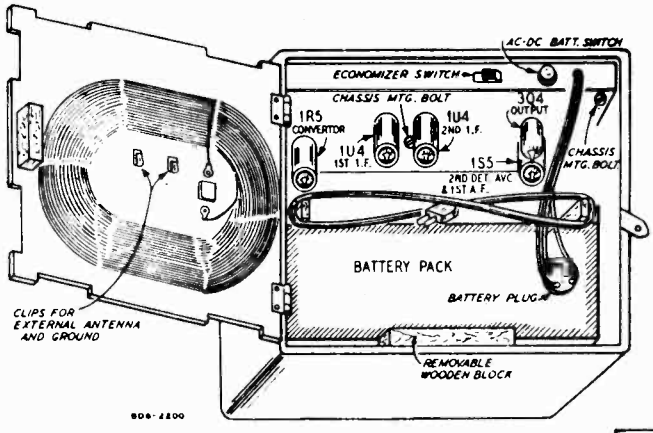
Loud Speaker.....5" PM dynamic
Voice Coil Impedance..3.2 ohms at 400 cycles

MODEL 64WG-1054A

MONTGOMERY WARD

REMOVAL OF CHASSIS FROM CABINET

To remove the chassis from the cabinet, it is necessary to pull off the 2 control knobs, disconnect the battery and then unscrew the 2 screws fastening the chassis to the cabinet. (The 2nd I-F Tube must be removed in order to reach the mounting screw in the center of the chassis.) See the tube position illustration for the location of these screws. After these screws have been removed, carefully pull out the chassis taking care not to damage the connections to the loop antenna.



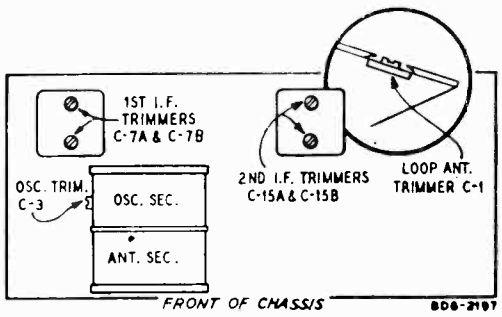
TUBE SOCKET VOLTAGES

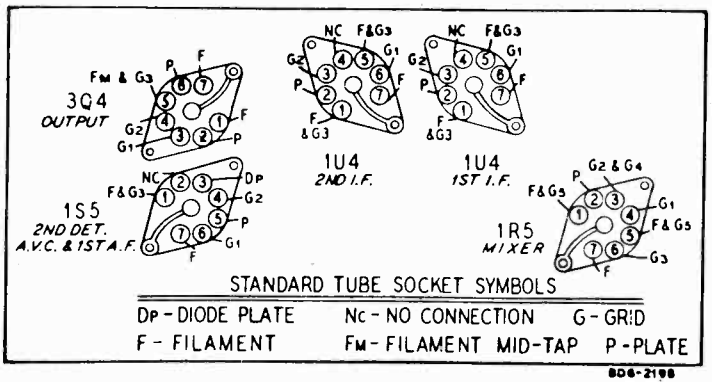
Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the filaments are between the socket terminal and "X" point.

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.





SIGNAL GENERATOR				CONDENSER SETTING	ADJUST TRIMMER 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 (C-15A) & (C-15B)
455 kc	.1 mf	Antenna Wire connecting to Stator of Antenna Section of Tuning Condenser	Same as above	Turn Rotor to full open	1st I-F (C-7A) & (C-7B)
1620 kc	.1 mf		Sume as above	Turn Rotor to full open	Oscillator (C-3)
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 (C-1)

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, pull pointer off shaft. Set pointer at the 1400 KC mark and push back on shaft.

MODEL 64WG-1054A

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 volts AC across this resistor will be equivalent to a 50 milliwatt output. The volume control must be set to maximum.

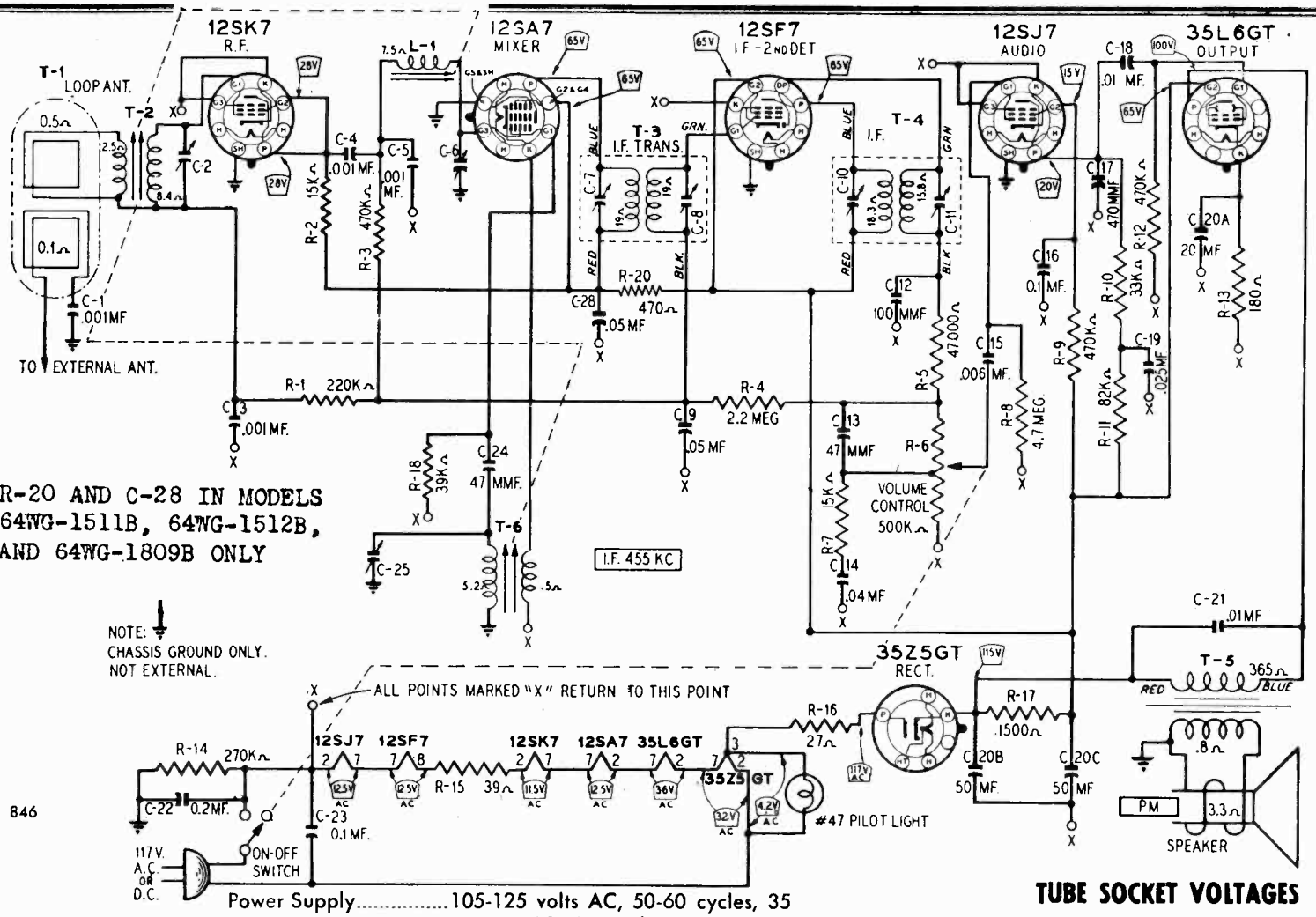
The signal source must be an accurately calibrated signal generator capable of supplying both 1000 KC and 455 KC signals modulated 30% with a 400 cycle audio signal. Variations in sensitivity of Plus or minus 25% are usually permissible.

SIGNAL GENERATOR				INPUT FOR 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	15 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	20 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 volts
400 cycles	.05 mf.	3Q4 Output—Pin 3	Same as above	2.2 volt

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
		CAPACITORS	
C-1	17A123	1.0-12 mmf Trimmer	1
C-2	14A192	Gang Condenser	1
C-3		Part of C-2 Gang Condenser	
C-4 C-19	D67104	.10 mf 400 V Tubular	2
C-5	47X643	47mmf Molded	1
C-6 C-8 C-9 C-10 C-12 C-18 C-21	B66503	.05 mf 200 V Tubular	7
C-7A C-7B		Part of T-3 1st I-F Transformer	
C-11A	45X353	20 mf 150 V Dry	
C-11B		40 mf 150 V Electrolytic	1
C-11C		40 mf 150 V	
C-13A	45X354	50 mf 25 V Dry	
C-13B		200 mf 25 V Electrolytic	1
C-14 C-20	47X476	100 mmf Molded	2
C-15A C-15B		Part of T-4 2nd I-F Transformer	
C-16A C-16B	47X112	50 mmf Dual Mica	1
C-17 C-22	B66502	.005 mf 200 V Tubular	2
C-23	D66502	.005 mf 400 V Tubular	1
		RESISTORS	
		Ohms *Watts* *Material*	
R-1	B84104	100k 0.5 Carbon	1
R-2 R-3	B84121	120 0.5 Carbon	2
R-4 R-12	B84391	390 0.5 Carbon	2
R-5 R-6	B85330	33 0.5 Carbon	1
R-11 R-13 R-22	B84152	1500 0.5 Carbon	4
R-7	B84153	15k 0.5 Carbon	1
R-8	B84123	12k 0.5 Carbon	1
R-9 R-18 R-23	B85335	3.3 meg 0.5 Carbon	3
R-10	B85225	2.2 meg 0.5 Carbon	1
R-14	B84821	820 0.5 Carbon	1
R-15	B85473	47k 0.5 Carbon	1
R-16	36X310	500k Volume Control and Switch	1
R-17	D84820	82 2.0 Carbon	1
R-19	B85475	4.7 meg 0.5 Carbon	1
R-20	B84105	1.0 meg 0.5 Carbon	1
R-21	43X220	2000 7.0 W.W.	1
		TRANSFORMERS & COILS	
T-1	26A430	Loop Antenna Assembly	1
T-2	9A1893	Oscillator Coil Assembly	1
T-3	9A1889	1st I-F Transformer & Can Assembly	1
T-4	9A1890	2nd I-F Transformer & Can Assembly	1
T-5	51X130	Output Transformer	1
		MISCELLANEOUS	
	12A446	5" P.M. Speaker	1
		Cone and Voice Coil Assembly. (Specify port number and letters stamped on speaker)	
	25A1019	Selenium Rectifier and Housing Assembly	1
	3A312	Miniature Tube Socket	5
	32X221	Tube Shield	4
	11X131	Shield, Volume Control	1
	2A368	Change over Switch (AC-DC, Battery Switch)	1
	2A175	On-Off Switch (Economizer)	1
	13X328	Line Cord and Plug Assembly	1
	30X132	Line Cord Clamp	1
	13X550	Battery Cable & Plug Assembly	1
	4X954	Escutcheon & Grille Assembly	1
	10A598	Knob (Volume)	1
	10A421	Knob (Change over Switch)	1
	10A300	Knob (Tuning)	1
	15X235	Pointer Disc	2
	19X446	Cup Washers	2
	6X52	Rubber Grommet (Mtg. Gang. Cond.)	



* R-20 AND C-28 IN MODELS 64WG-1511B, 64WG-1512B, AND 64WG-1809B ONLY

Power Supply	105-125 volts AC, 50-60 cycles, 35 watts or 105-125 volts DC
Frequency Range	540-1600 KC
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

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.

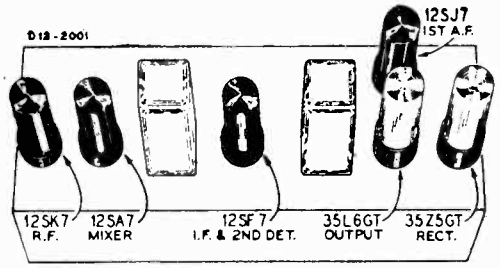
The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale. Conditions of measurement are:

Line voltage	117 volts AC
Volume control	maximum
Signal input	none

A variation of ±10% is usually permissible.

MODELS 64WG-1511A,-1511B,
64WG-1512A,-1512B,
64WG-1809A,-1809B

MONTGOMERY WARD

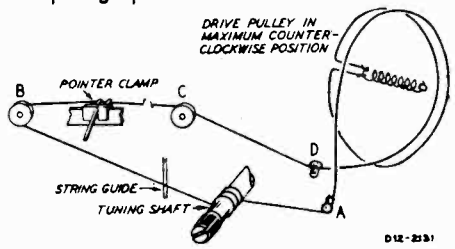


DRIVE CORD REPLACEMENT

Turn the large drive pulley counterclockwise to the stop position. Use a new drive cord 36" 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 and continue around pulley 1¼ turns counterclockwise. Pass cord around stud A and wind three turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Run the cord in front of the string guide, then pass cord around pulleys B and C and stud D. Pass cord under drive pulley and wind ¾ turn counterclockwise around drive pulley. Stretch tension spring and tie free end of cord to spring. Cut off any excess string.

Note: On sets having a black vinylite sleeve on the tuning shaft wind only two turns clockwise around the tuning shaft.

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

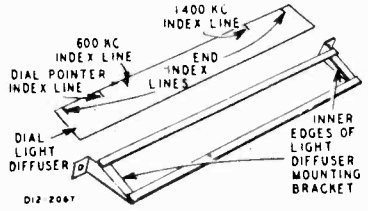


DIAL CALIBRATION

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, adjust the radio to the stop position at the low frequency end of the dial. The dial pointer should be directly over the dial pointer index line (see illustration). If not, move the pointer along the drive cord until it is directly over the index line.

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



TUNING ASSEMBLY SERVICE

Exacting requirements in the tuning assembly make it impractical to replace the drive cord, coils and components in this assembly other than the trimmer condensers. Should the drive cord break, or components other than the trimmer condensers require service, the entire assembly must be ordered and replaced as a unit.

ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibaration paragraph.

Volume Control—Maximum All Adjustments.

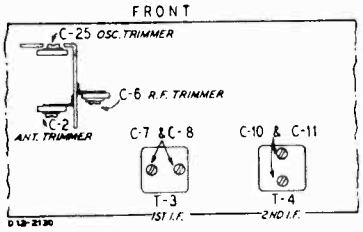
Allow Chassis and Signal Generator to "Heat Up" for several minutes.

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.



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

SIGNAL GENERATOR			Coupling Capacitor	DIAL SETTING	ADJUST TRIMMERS TO MAXIMUM OUPUT 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	1600 kc	2nd I-F (C10) & (C11)
455 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	1600 kc	1st I-F (C7) & (C8)
1400 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	1400 kc Index Line. See Note A	Oscillator (C25)
1400 kc	External Antenna Clip on Loop	Chassis	50 mmf	1400 kc Index Line. See Note A	R-F (C-6) Antenna (C-2)

MONTGOMERY WARD

MODELS 64WG-1511A,-1511B,
64WG-1512A,-1512B,
64WG-1809A,-1809B

RECEIVER STAGE SENSITIVITIES — SIGNAL GENERATOR

Frequency	Coupling Capacitor	Connection to Receiver	Ground Connection	INPUT FOR 50 MILLIWATT OUTPUT
1000 kc	200 mmf or RMA Dummy Antenna	Loop Antenna—External antenna clip	Chassis	15 microvolts
1000 kc	.05 mf.	12SA7 Mixer—Pin 8	Point "X" (12SK7 Pin 3)	100 microvolts
455 kc	.05 mf.	12SA7 Mixer—Pin 8	Same as above	80 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 volts
400 cycles	.05 mf.	35L6GT Output—Pin 5	Same as above	1 volt

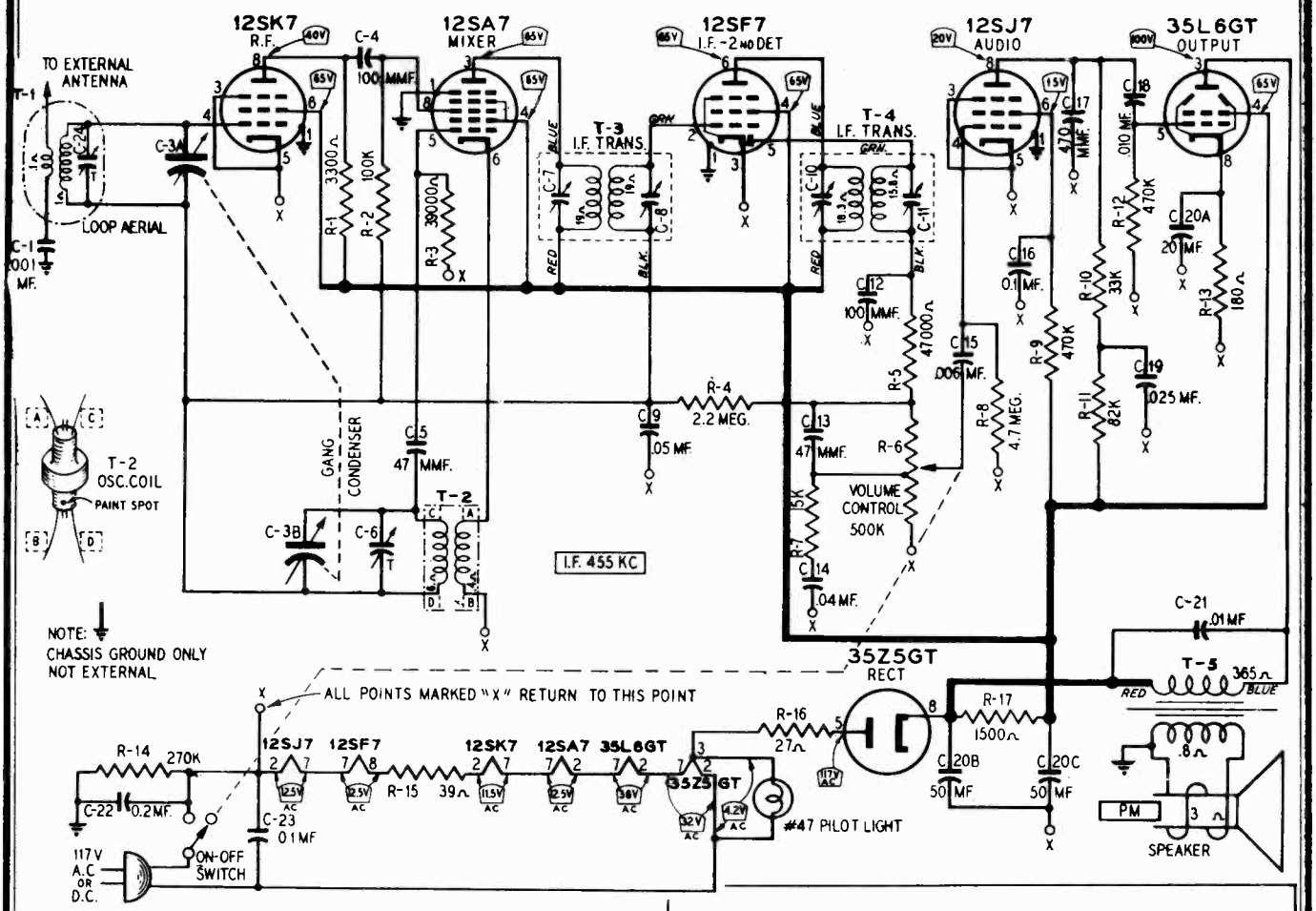
Ref. No.	Part No.	Description	Qty. Used in Set
		CAPACITORS	
C-1	D67102	.001 mf 400 V Tubular	1
C-2	17A238	4-70 mmf Trimmer	1
C-3, C-4, C-5	B67102	.001 mf 200 V Tubular	3
C-6	17A243	4-70 mmf Trimmer	1
C-7, C-8		Part of T-3, 1st I-F Transformer	
C-9	B66503	.05 mf 200 V Tubular	1
C-10, C-11		Part of T-4, 2nd I-F Transformer	
C-12	47X476	100 mmf Molded	1
C-13	47X463	47 mmf Molded	1
C-14	B67403	.04 mf 200 V Tubular	1
C-15	B67602	.006 mf 200 V Tubular	1
C-16	B66104	0.1 mf 200 V Tubular	1
C-17	47X467	470 mmf Molded	1
C-18, C-21	B66103	.01 mf 200 V Tubular	2
C-19	B67253	.025 mf 200 V Tubular	1
C-20A	45X344	20 mf 25 V Dry electrolytic capacitor	1
C-20B		50 mf 150 V	
C-20C		50 mf 150 V	
C-22	B67204	0.2 mf 200 V Tubular	1
C-23	D67104	0.1 mf 400 V Tubular	1
C-24	47X446	47 mmf Molded	1
C-25	17A239	40-370 mmf Trimmer	1
*C-28	B67503	.05 mf Tubular	1
		RESISTORS	
		OHMS WATTS	
R-1	B85224	220,000 0.5 Carbon	1
R-2, R-7	B84153	15,000 0.5 Carbon	2
R-3, R-12	B85474	470,000 0.5 Carbon	2
R-4	B85225	2.2 meg. 0.5 Carbon	1
R-5	B85473	47,000 0.5 Carbon	1
R-6	36X347	500,000 Volume control and switch	1
R-8	B85475	4.7 meg. 0.5 Carbon	1
R-9	B84474	470,000 0.5 Carbon	1
R-10	B84333	33,000 0.5 Carbon	1
R-11	B84823	82,000 0.5 Carbon	1
R-13	B83181	180 0.5 Carbon	1
R-14	B84274	270,000 0.5 Carbon	1
R-15	D84390	39 2.0 Carbon	1
R-16	B84270	27 0.5 Carbon	1
R-17	C84152	1500 1.0 Carbon	1
R-18	B84393	39,000 0.5 Carbon	1
*R-20	B85471	470 0.5 Carbon	1

Ref. No.	Part No.	Description	Qty. Used in Set
		TRANSFORMERS AND COILS	
L-1		Part of tuning assembly	
T-1	9A1803	"B" Range loop antenna (for ivory plastic cabinet)	1
T-1	9A1773	"B" Range loop antenna (for walnut plastic cabinet)	1
T-1	9A1863	"B" Range loop antenna (for walnut wood cabinet)	1
T-2		Part of tuning assembly	
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
T-6		Part of tuning assembly	
		DIAL AND DRIVE ASSEMBLY	
	20A97	Tuning assembly complete with coils, trimmers, etc.	1
	11X119	Fibre shield (tuner housing)	1
	28X518	Trimount stud (mtg. fibre shield)	5
	26X464	Drive shaft	1
	28X512	Ground spring (drive shaft)	1
	19X192	"C" washer	2
	25X1384	Pointer bracket	1
	24X446	Idler pulley	2
	41X78	Dial light diffuser	1
	25X1385	Holder, light diffuser	1
	15X217	Pointer	1
	25X1398	Pilot light bracket	1
		3 ft. drive cord (18 lb. test)	1
	28X95	Drive cord tension spring	1
	7A192	Pilot light socket assembly	1
		Pilot light No. 47	1
	58X645	Dial (for ivory plastic cabinet)	1
	58X646	Dial (for walnut plastic cabinet)	1
	58X650	Dial (for walnut wood cabinet)	1
	25X1461	Dial Bracket (for walnut wood cabinet only)	1
	4X884	Escutcheon (for walnut wood cabinet only)	1
	25X1460	Escutcheon Mtg. Bracket (for walnut wood cabinet only)	2
		MISCELLANEOUS	
	12A431	4" x 6" speaker with mounting bracket	1
		Cone and voice coil assembly for speaker (specify part number and letters stamped on speaker)	1
	3A303	Tube socket—octal (8 prong) molded	5
**	26A426	Tube socket and shield assembly	1
	10A297	Knob, volume control and line switch; tuning (for walnut cabinets)	2
	10A300	Knob, volume control and line switch; tuning (for ivory plastic cabinet)	2
	28X292	Snap button (mtg. loop to cabinet)	2
		6 x ¼" slotted hex head P-K type "Z" screw (mtg. loop to chassis)	2
	55X249	Cabinet (ivory plastic)	1
	55X264	Cabinet (walnut plastic)	1
	13X328	Line cord and plug assembly	1

* IN MODELS 64WG-1511B,64WG-1512B,64WG-1809B ONLY
** PART NO. 3A421 IN MODELS 64WG-1511A,64WG-1512A,64WG-1809A

MODEL 64WG-1804A

MONTGOMERY WARD

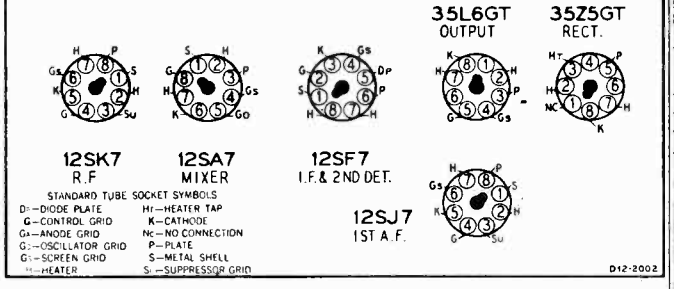


Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages except those for the heater and dial lamp are between the socket terminal and "X" point.

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.



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 volts AC across this resistor will be equivolent 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. 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	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 volts
400 cycles	.05 mf	35L6GT Output—Pin 5	Same as above	1 volt

MODEL 64WG-1804A

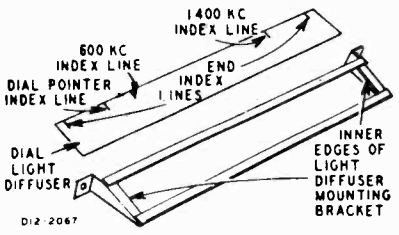
MONTGOMERY WARD

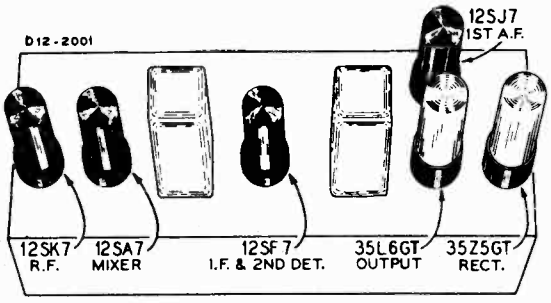
Power Supply.....105-125 volts AC, 50-60 cycles, 35 watts or 105-125 volts DC
Frequency Range.....535-1620 KC
Intermediate Frequency.455 KC
Selectivity.....At 1000 KC, 50 KC wide at 1000 times signal
Sensitivity.....(for .05 watt output with external antenna) 15 microvolts average
Power Output.....1.3 watts maximum
.75 watt 10% distortion
Loud Speaker.....4"x 6" PM dynamic
Voice Coil Impedance...3.2 ohms at 400 cycles

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)

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

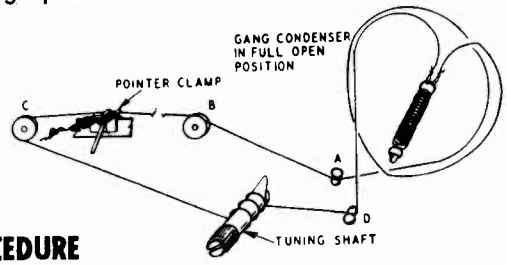




DRIVE CORD REPLACEMENT

Turn the gang condenser to the fully open position. Use a new drive cord 36" 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 and continue around pulley ½ turn counterclockwise. Pass cord around stud D and wind three turns clockwise (from front of chassis) around the tuning shaft. Turns must progress away from chassis. Pass cord around pulleys C and B and stud A. Pass cord under drive pulley and wind 1½ turns counterclockwise around drive pulley. Stretch tension spring and tie free end of cord to spring. Cut off any excess string.

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



ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.

Volume Control—Maximum All Adjustments.

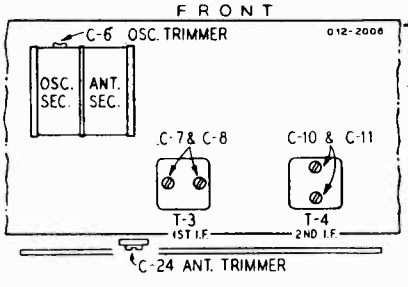
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

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.



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

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)
1400 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Some as above	.1 mf	Turn Rotor to 1400 kc Index Line. See Note A	Oscillator (C6)
1400 kc	External Antenna Clip on Loop	Chassis	50 mmf	Turn Rotor to 1400 kc Index Line. See Note A	Antenna (C24)

MODEL 64WG-1804A

MONTGOMERY WARD

CAPACITORS

Ref. No.	Part No.	Description	Qty. Used in Set
C-1	D66102	.001 mf 400 V Tubular	1
C-2, C-6		Part of C-3	
C-3A, C-3B	14A179	Gang condenser with pulley	1
C-4, C-12	47X476	100 mmf Molded	2
C-5	47X446	47 mmf Molded	1
C-7, C-8		Part of T-3, 1st I-F Transformer	
C-9	B66503	.05 mf 200 V Tubular	1
C-10, C-11		Part of T-4, 2nd I-F Transformer	
C-13	47X463	47 mmf Molded	1
C-14	B66403	.04 mf 200 V Tubular	1
C-15	B66602	.006 mf 200 V Tubular	1
C-16	B66104	.1 mf 200 V Tubular	1
C-17	47X467	470 mmf Molded	1
C-18, C-21	B66103	.01 mf 200 V Tubular	2
C-19	B64253	.025 mf 200 V Tubular	1
C-20A	45X344	20 mf 25 V Dry electrolytic condenser	1
C-20B		50 mf 150 V	
C-20C		50 mf 150 V	
C-22	B66204	0.2 mf 200 V Tubular	1
C-23	D66104	.1 mf 400 V Tubular	1
C-24	17A116	2.5-23 mmf Trimmer	1

RESISTORS

Ref. No.	Part No.	Ohms	Watts	Description	Qty. Used in Set
R-1	B84332	3300	0.5	Carbon	1
R-2	B85104	100,000	0.5	Carbon	1
R-3	B84393	39,000	0.5	Carbon	1
R-4	B85225	2.2 meg.	0.5	Carbon	1
R-5	B85473	47,000	0.5	Carbon	1
R-6	36X347	500,000		Volume control and switch	1
R-7	B84153	15,000	0.5	Carbon	1
R-8	B85475	4.7 meg.	0.5	Carbon	1
R-9	B84474	470,000	0.5	Carbon	1
R-10	B84333	33,000	0.5	Carbon	1
R-11	B84823	82,000	0.5	Carbon	1
R-12	B85474	470,000	0.5	Carbon	1
R-13	B83181	180	0.5	Carbon	1
R-14	B85274	270,000	0.5	Carbon	1
R-15	D84390	39	2.0	Carbon	1
R-16	B84270	27	0.5	Carbon	1
R-17	C84152	1500	1.0	Carbon	1

TRANSFORMERS AND COILS

Ref. No.	Part No.	Description	Qty. Used in Set
T-1	9A1804	"B" Range loop antenna (wood mantel)	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

DIAL AND DRIVE ASSEMBLY

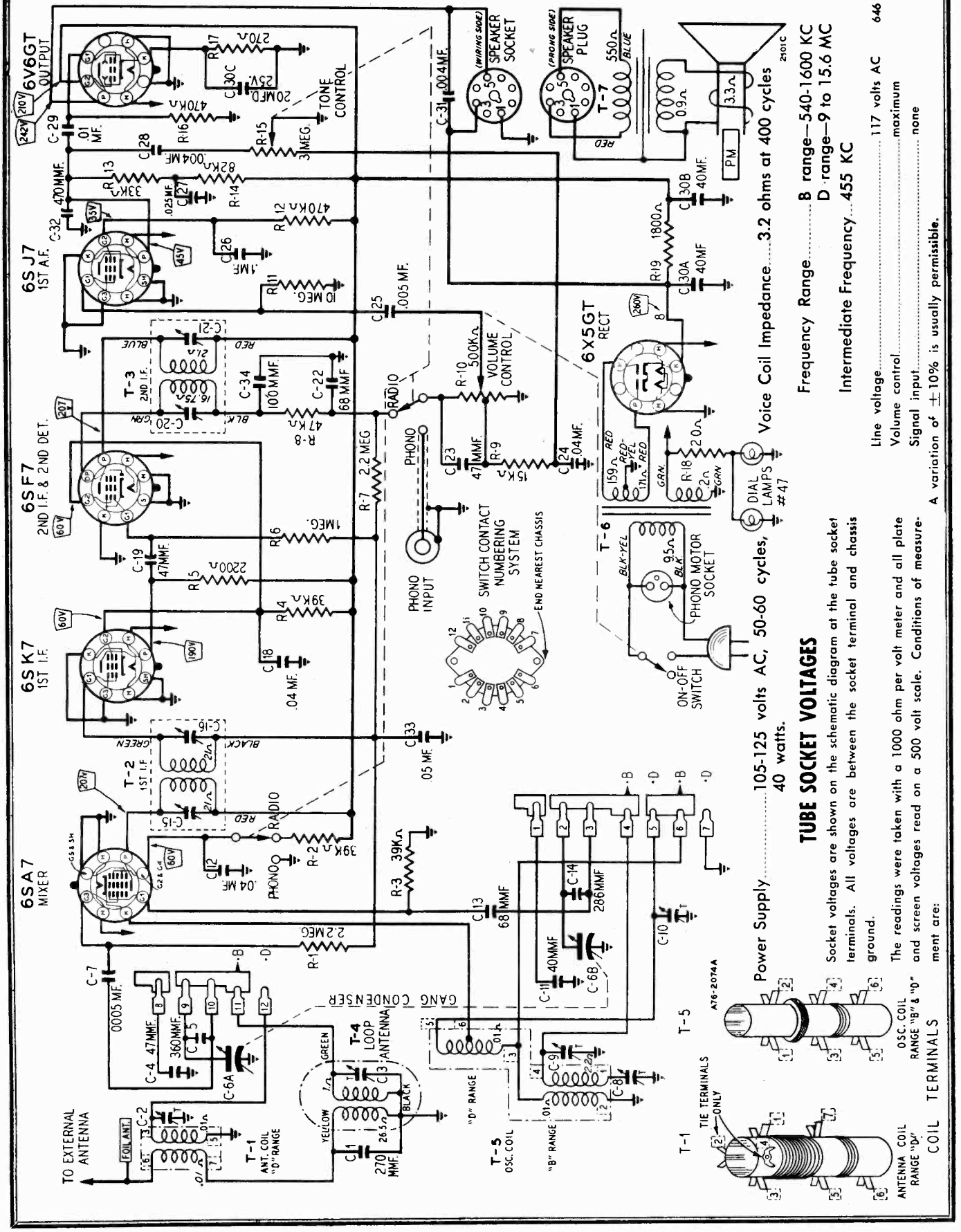
Part No.	Description	Qty. Used in Set
24X446	Idler pulley	2
25X1382	Idler bracket	1
6X21	Rubber grommets (Gang condenser mounting)	3
57X176	Mounting plate (Gang condenser mounting)	1
20X329	Cond. cushion stud (Gang condenser mounting)	3
58X594	Dial (for wood mantel)	1
25X1461	Dial bracket (for dial 58X594)	1
25X1384	Pointer bracket	1
15X217	Pointer	1
25X1398	Pilot light bracket	1
7A192	Pilot light socket assembly	1
	Pilot light No. 47	1
	3 ft. drive cord (18 lb. test)	1
28X44	Drive cord tension spring	1
26X464	Drive shaft (tuning)	1
19X192	"C" washer for above drive shaft	2
41X69	Dial light diffuser	1
25X1385	Holder, light diffuser	1
4X884	Escutcheon (wood mantel only)	1
25X1460	Escutcheon mounting bracket	2

MISCELLANEOUS

Part No.	Description	Qty. Used in Set
12A431	4" x 6" speaker with mounting bracket	1
	Cone and voice coil assembly for the above speaker (specify part number and letters stamped on above speaker)	1
3A303	Tube socket—octal (8 prong) molded	5
3A421	Tube socket—octal (8 prong) with shield	1
10A297	Knob (walnut) on-off switch, volume control and tuning	2
28X292	Snap button (mounting loop to cabinet)	2
	6 x ¼" slotted hex head P-K type "Z" screw (mounting loop to chassis)	2
13X328	Line cord and plug assembly	1

MODEL 64WG-1807A

MONTGOMERY WARD



Frequency Range.....B range—540-1600 KC
D range—9 to 15.6 MC

Intermediate Frequency...455 KC

Power Supply.....105-125 volts AC, 50-60 cycles, 40 watts.

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

A variation of ±10% is usually permissible.

TUBE SOCKET VOLTAGES

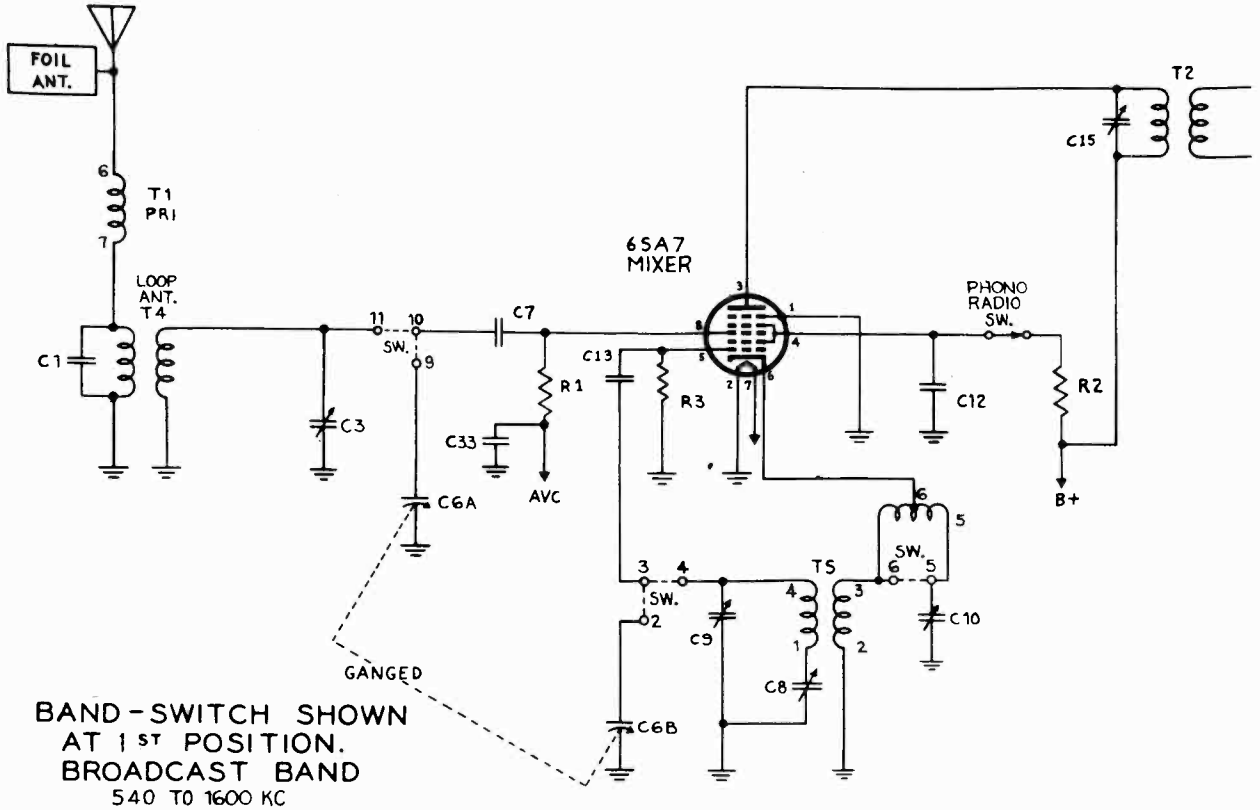
Socket voltages are shown on the schematic diagram at the tube socket terminals. All voltages are between the socket terminal and chassis ground.

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:

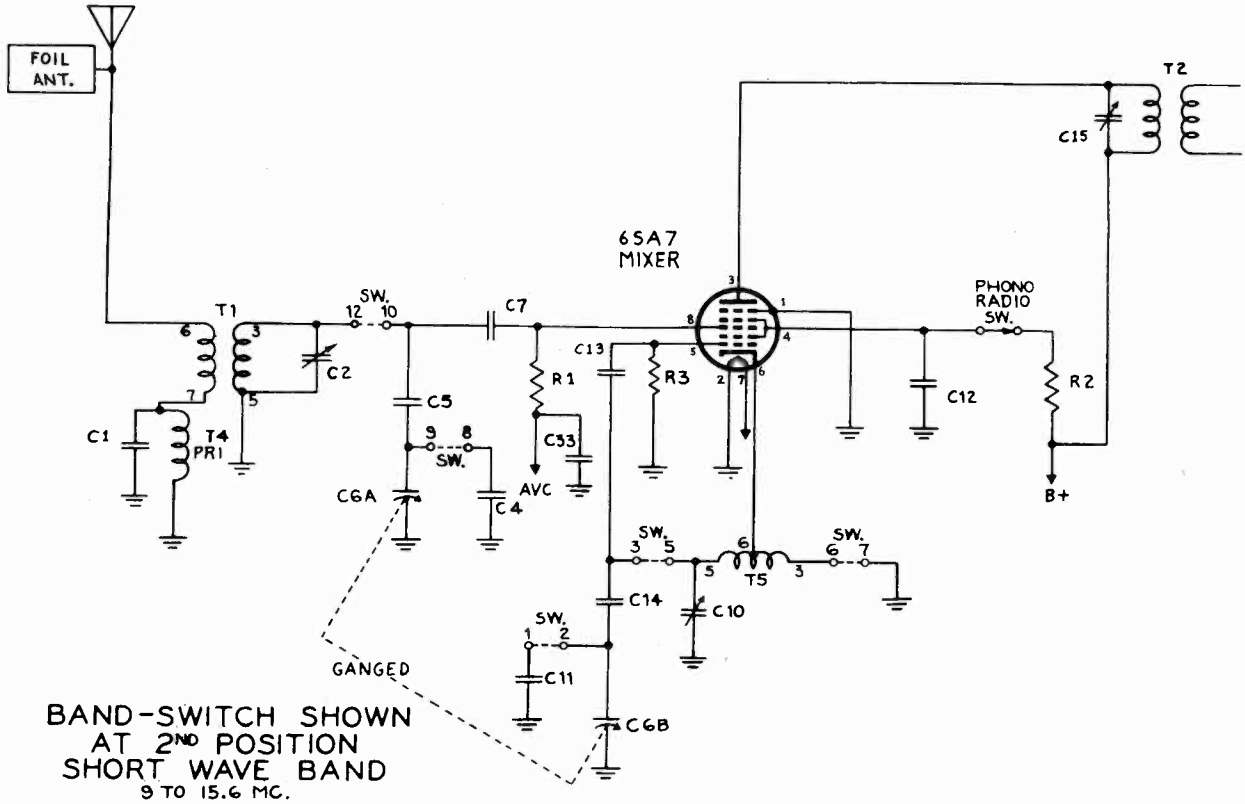
"clarified schematics"

MODEL 64WG-1807A

MONTGOMERY WARD



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND
540 TO 1600 KC



BAND-SWITCH SHOWN AT 2ND POSITION SHORT WAVE BAND
9 TO 15.6 MC.

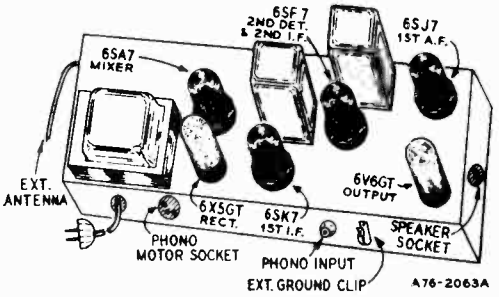
MONTGOMERY WARD

MODEL 64WG-1807A

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

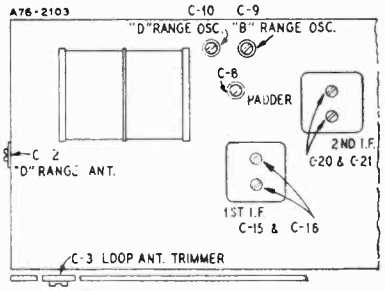
Power Output.....4 watts maximum
2.3 watts, 10% distortion

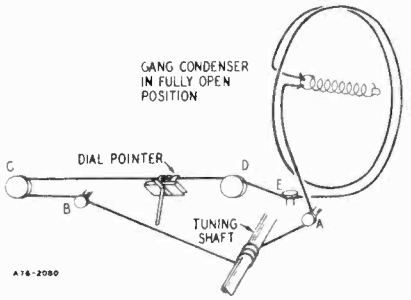


DRIVE CORD REPLACEMENT

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 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 over idler stud B, around pulleys C and D and around idler stud E. Wrap cord counterclockwise around drive pulley, stretch the tension spring and tie free end of the cord to spring. Cut off any excess string.

TRIMMER POSITIONS





DRIVE CORD DIAGRAM

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	6SA7, Pin 8	.1 mf	B Range	Turn Rotor to Full Open	2nd I-F (C-20) & (C21) 1st I-F (C15) & (C16)
RANGE B	1620 kc	Antenna Lead	100 mmf	B Range	Turn Rotor to Full Open	Oscillator Range B (C9)
	1400 kc	Antenna Lead	100 mmf	B Range	Tune Rotor to Max. Output Set Indicator to 1400 KC See Note A	Antenna Range B (C3)
	600 kc	Antenna Lead	100 mmf	B Range	Tune Rotor to Max. Output	600 kc (C8) Rock Rotor—See Note B
Repeat above oscillator adjustments at 1620 and 600 KC until readjusting the oscillator Range B Trimmer (C9) causes no further improvement in output.						
RANGE D	15.6 mc	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
	14 mc	Antenna Lead	400 Ohm	D Range	Tune Rotor to Max. Output	Antenna Range D (C2) Rock Rotor—See Note B
LOOP RANGE B	Reassemble chassis in cabinet. 1400 kc	Antenna Lead	100 mmf	B Range	Tune Rotor to Max. Output	Antenna Range B (C3)

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.

MODEL 64 WG-1807A 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 watts. 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 (white)	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 volts
400 cycles	.05 mf	6V6GT Output, Pin 5	Same as above	3.75 volts

Ref. No.	Part No.	Description			Qty. Used in Set
CAPACITORS					
C-1	47A445	270 mmf		Moulded	1
C-2	17A164	5-30 mmf		Trimmer	1
C-3	17A123	1.0-12 mmf		Trimmer	1
C-4	47X473	47 mmf		Silvered Mica	1
C-5	47X474	360 mmf		Silvered Mica	1
C-6A, C-6B	14A178	Gang Condenser with Drive Pulley			1
C-7	866501	.0005 mf	200 V	Tubular	1
C-8	17A155	350-430 mmf		Trimmer	1
C-9, C-10	17A109	2.5-35 mmf		Dual Trimmer Condenser	1
C-11	47X472	40 mmf		Silvered Mica	1
C-12, C-18	D66403	.04 mf	400 V	Tubular	2
C-13	47X466	68 mmf		Moulded	1
C-14	47X481	286 mmf		Silvered Mica	1
C-15	Part of T-2 (1st I-F Coil Assembly)				
C-16, C-19, C-23	47X463	47 mmf		Moulded	2
C-20, C-21	Part of T-3 (2nd I-F Coil Assembly)				
C-22	47X471	68 mmf		Moulded	1
C-24	D64403	.04 mf	480 V	Tubular	1
C-25	D66502	.005 mf	400 V	Tubular	1
C-26	D67104	.10 mf	400 V	Tubular	1
C-27	D64253	.025 mf	400 V	Tubular	1
C-28, C-31	D66402	.004 mf	400 V	Tubular	2
C-29	D66103	.01 mf	400 V	Tubular	1
C-30A	45X346	40 mf	450 V	3 Section Electrolytic	1
C-30B		40 mf	450 V		
C-30C		20 mf	25 V		
C-32	47X505	470 mmf		Moulded	1
C-33	B66503	.05 mf	200 V	Tubular	1
C-34	47X476	100 mmf		Moulded	1
RESISTORS					
		Ohms	Watts		
R-1, R-7	B85225	2.2 meg.	0.5	Carbon	2
R-2, R-4	C84393	39 K	1.0	Carbon	2
R-3	B84393	39 K	0.5	Carbon	1
R-5	B84222	2200	0.5	Carbon	1
R-6	B85105	1 meg.	0.5	Carbon	1
R-8	B85473	47 K	0.5	Carbon	1
R-9	B84153	15 K	0.5	Carbon	1
R-10	36X354	500 K		Volume Control and Line Switch	1
R-11	B85106	10 meg.	0.5	Carbon	1
R-12, R-16	B85474	470 K	0.5	Carbon	2
R-13	B84333	33 K	0.5	Carbon	1
R-14	B84823	82 K	0.5	Carbon	1
R-15	*40X275	3.0 meg.		Tone Control and Radio Phono Switch	1
R-17	C84271	270	1.0	Carbon	1
R-18	43X213	2.0	0.5	Wire Wound	1
R-19	D84182	1800	2.0	Carbon	1

Ref. No.	Part No.	Description	Qty. Used in Set
TRANSFORMERS AND COILS			
T-1	9A1812	"D" Range Antenna Coil Assembly	1
T-2	9A1814	1st I-F Coil Assembly	1
T-3	9A1815	2nd I-F Coil Assembly	1
T-4	9A1791	"B" Range Loop Antenna	1
T-5	9A1813	"B" Range and "D" Range Oscillator Coil Assembly	1
T-6	53X282	117 Volt, 60 Cycle, Standard Power Transformer	1
T-6	53X283	117 Volt, 25 Cycle, Standard Power Transformer	1
T-6	53X284	117-234 Volt, 40-60 Cycle, Universal Power Transformer	1
T-7		Output Transformer (See Miscellaneous)	
DIAL AND DRIVE ASSEMBLY			
	26A383	Dial Bracket Assembly Complete with Idler Pulleys	1
	6X21	Rubber Grommet	4
	20X329	Cond. Cushion Stud, Mtg. Gang Cond.	3
	58X596	Dial Background	1
	58X597	Dial Glass	1
	30X504	Dial Cord	2
		No. 4 x 3/16" Slotted Hex Hd. P-K Type "Z" Screw (Mtg. 58X596—58X597—30X504)	4
	26X470	Drive Shaft	1
	19X192	"C" Washer (For Drive Shaft)	2
	15X222	Pointer	1
	28X113	Drive Cord Tension Spring	1
		46" Drive Cord (18 lb. Test)	1
	7A195	Pilot Light Socket Assembly	1
		No. 47 Pilot Light Bulb	2
	17X89	Crystal (For Light Shield)	1
MISCELLANEOUS			
	†12A435	6" 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
	3A303	Tube Socket—Octal (8 prong) Moulded	7
	3A304	Phono Motor Socket	1
	3A305	Phono Socket—Single Pin Tip	1
	2A345	Band Change Switch	1
	13X328	Line Cord and Plug Assembly	1
	28X292	Snap Button (Mtg. Loop to Cabinet)	4
	10A578	Knob (Tuning)	1
	10A579	Knob (Off-On, Volume)	1
	10A580	Knob (SW-BC)	1
	10A581	Knob (Tone-R.P.)	1
	9A1832	Counterpoise Antenna	1

SUBSTITUTE PARTS

The following parts are used in some receivers only. Check part number on old part before ordering and order part originally used in receiver.

*40X280	Tone Control (Substitute for 40X275)
*25X1539	Radio-Phono Switch Lever (When 40X280 is used)
*2A161	D.P.D.T. Switch (When 40X280 is used)
†12A461	6" P.M. Speaker Complete with Output Transformer

MODEL 64 WG-2009A 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 volts 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. 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	15 microvolts
1000 kc	.05 mf.	12SA7 Mixer—Pin 8	Point "X" (12SK7 Pin 3)	100 microvolts
455 kc	.05 mf.	12SA7 Mixer—Pin 8	Same as above	80 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 volts
400 cycles	.05 mf.	35L6GT Output—Pin 5	Same as above	1 volt

REPLACEMENT PARTS LIST

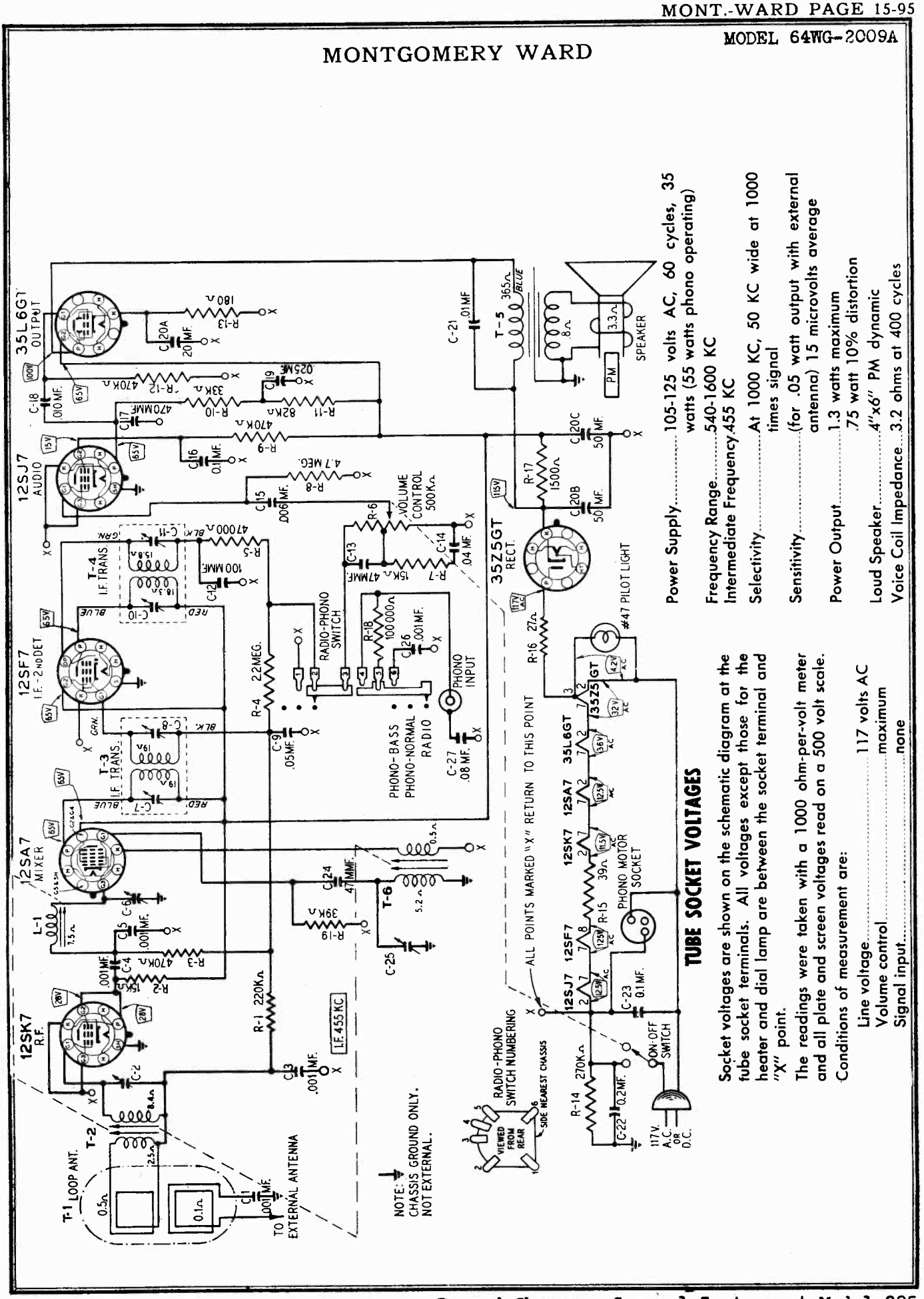
Use only genuine factory tested parts to insure service jobs you can depend on and to obtain original set performance

Ref. No.	Part No.	Description			Qty. Used in Set
CAPACITORS					
C-1	D66102	.001 mf	400 V	Tubular	1
C-2	17A238	4-70 mmf		Trimmer	1
C-3, C-4, C-5	B66102	.001 mf	200 V	Tubular	3
C-6	17A243	4-70 mmf		Trimmer	1
C-7, C-8	Part of T-3, 1st I-F Transformer				
C-9, C-10, C-11	B66503	.05 mf	200 V	Tubular	1
	Part of T-4, 2nd I-F Transformer				
C-12	47X476	100 mmf		Molded	1
C-13	47X463	47 mmf		Molded	1
C-14	B64403	.04 mf	200 V	Tubular	1
C-15	B66602	.006 mf	200 V	Tubular	1
C-16	B66104	0.1 mf	200 V	Tubular	1
C-17	47X467	470 mmf		Molded	1
C-18, C-21	B66103	.01 mf	200 V	Tubular	2
C-19	B64253	.025 mf	200 V	Tubular	1
C-20A	45X345	20 mf	25 V	Dry electrolytic capacitor	1
C-20B		50 mf	150 V		
C-20C		50 mf	150 V		
C-22	B67204	0.2 mf	200 V	Tubular	1
C-23	D66104	0.1 mf	400 V	Tubular	1
C-24	47X446	47 mmf		Molded	1
C-25	17A239	40-370 mmf		Trimmer	1
C-26	B64102	.001 mf	200 V	Tubular	1
C-27	B64803	.08 mf	200 V	Tubular	1
RESISTORS					
		Ohms	Watts		
R-1	B85224	220,000	0.5	Carbon	1
R-2, R-7	B84153	15,000	0.5	Carbon	2
R-3, R-12	B85474	470,000	0.5	Carbon	2
R-4	B85225	2.2 meg.	0.5	Carbon	1
R-5	B85473	47,000	0.5	Carbon	1
R-6	36X347	500,000	Volume control and switch		1
R-8	B85475	4.7 meg	0.5	Carbon	1
R-9	B84474	470,000	0.5	Carbon	1
R-10	B84333	33,000	0.5	Carbon	1
R-11	B84823	82,000	0.5	Carbon	1
R-13	B83181	180	0.5	Carbon	1
R-14	B84274	270,000	0.5	Carbon	1
R-15	D84390	39	2.0	Carbon	1
R-16	B84270	27	0.5	Carbon	1
R-17	C84182	1500	1.0	Carbon	1
R-18	B85104	100,000	0.5	Carbon	1
R-19	B84393	39,000	0.5	Carbon	1

Ref. No.	Part No.	Description	Qty. Used in Set
TRANSFORMERS AND COILS			
L-1		Part of tuning assembly	
T-1	9A1817	"B" Range loop antenna	1
T-2		Part of tuning assembly	
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
T-6		Part of tuning assembly	
DIAL AND DRIVE ASSEMBLY			
	20A97	Tuning assembly, complete with coils, trimmers, etc.	1
	11X119	Fibre shield (tuner housing)	1
	28X518	Trimount stud (mtg. fibre shield)	5
	26X464	Drive shaft	1
	28X512	Ground spring (drive shaft)	1
	19X192	"C" washer	2
	25X1384	Pointer bracket	1
	24X446	Idler pulley	2
	41X78	Dial light diffuser	1
	25X1385	Holder, light diffuser	1
	15X217	Pointer	1
	25X1398	Pilot light bracket	1
		40" drive cord (18 lb. test)	1
	28X95	Drive cord tension spring	1
	7A196	Pilot light socket assembly	1
		Pilot light No. 47	1
	58X651	Dial	1
	30X518	Dial clamp, upper	1
	30X519	Dial clamp, lower	1
MISCELLANEOUS			
	12A437	4" x 6" speaker with mounting bracket	1
		Cone and voice coil assembly for speaker (specify part number and letters stamped on speaker)	1
	3A303	Tube socket—octal (8 prong) molded	5
	3A421	Tube socket—octal (8 prong) with shield	1
	3A305	Phono socket—single pin tip	1
	3A422	Phono motor socket	1
	2A357	Radio-phono switch	1
	10A297	Knob, volume control and line switch, tuning	2
	10A582	Knob, radio-phono	1
	13X328	Line cord and plug assembly	1
TYPE G-28A115 RECORD CHANGER PARTS			
	G-56-72092	Motor, 60 cycle 117V	
	G-56-72096	Motor, 60 cycle 117V	
	Astatic L-75	Crystal cartridge	
	G-25-72438	50 cycle adaptor bushing	
	G-33-72435	50 cycle adaptor spring bushing	
	G-33-72436	50 cycle adaptor spring bushing	

MODEL 64WG-2009A

MONTGOMERY WARD



Power Supply.....105-125 volts AC, 60 cycles, 35 watts (55 watts phono operating)
Frequency Range.....540-1600 KC
Intermediate Frequency.455 KC
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"x6" PM dynamic
Voice Coil Impedance...3.2 ohms at 400 cycles

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.

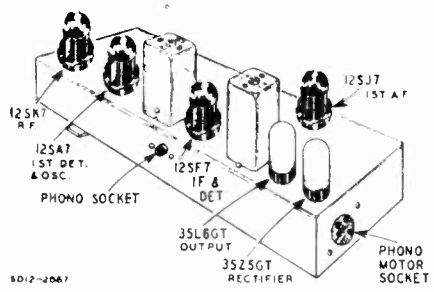
The readings were taken with a 1000 ohm-per-volt meter and all plate and screen voltages read on a 500 volt scale.

Conditions of measurement are:

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

Record Changer: General Instrument Model 205

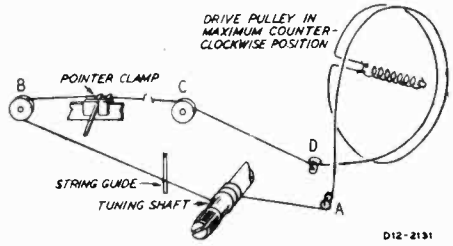
MONTGOMERY WARD



DRIVE CORD REPLACEMENT

The illustration below shows the method of stringing the drive cord. Use a new drive cord 40" 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 in the pulley rim and continue counter-clockwise around the pulley as shown. Three turns must be wound around the tuning shaft in a clockwise direction with the turns progressing away from the chassis. (On sets with a black vinylite sleeve on the tuning shaft, wind only two turns around the shaft).

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

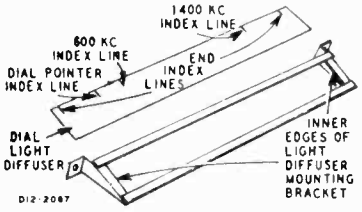


DIAL CALIBRATION

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 to prevent movement of the diffuser strip. To position the dial pointer, adjust the radio to the "stop" position at the low frequency end of the dial. The dial pointer should be directly over the dial pointer index line. (See illustration.) If not, move the pointer along the drive cord until it is directly over the index line.

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



TUNING ASSEMBLY SERVICE

Exacting requirements in the tuning assembly make it impractical to replace the drive cord, coils and components in this assembly other than the trimmer condensers. Should the drive cord break, or components other than the trimmer condensers require service, the entire assembly must be ordered and replaced as a unit.

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 install a new bushing on the motor shaft and to wire a 70 ohm, 20 watt resistor in series with the motor and the AC supply.

To install the new bushing, align the upper part of the center spindle with the lower part of the spindle and turn the record shelf to the 12" position. Lift the turntable off the record changer. On record players having a turned metal bushing fastened on with a set screw, loosen the set screw holding the old bushing to the motor shaft, remove the old pulley and install the new bushing No. G-25-72438.

On record players having a spring bushing on the motor shaft, remove the old spring bushing and install a new spring bushing No. G-33-72435.

On record players having no bushing on the motor shaft, install a spring bushing No. G-33-72436.

When replacing the turntable on the record player, make certain that the turntable rim is placed over both of the rubber drive puileys.

ALIGNMENT PROCEDURE

Check dial pointer position, see Dial Calibration paragraph.

Volume Control—Maximum All Adjustments.

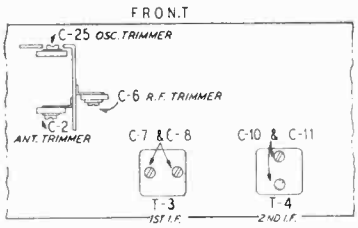
Allow Chassis and Signal Generator to "Heat Up" for several Minutes.

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.



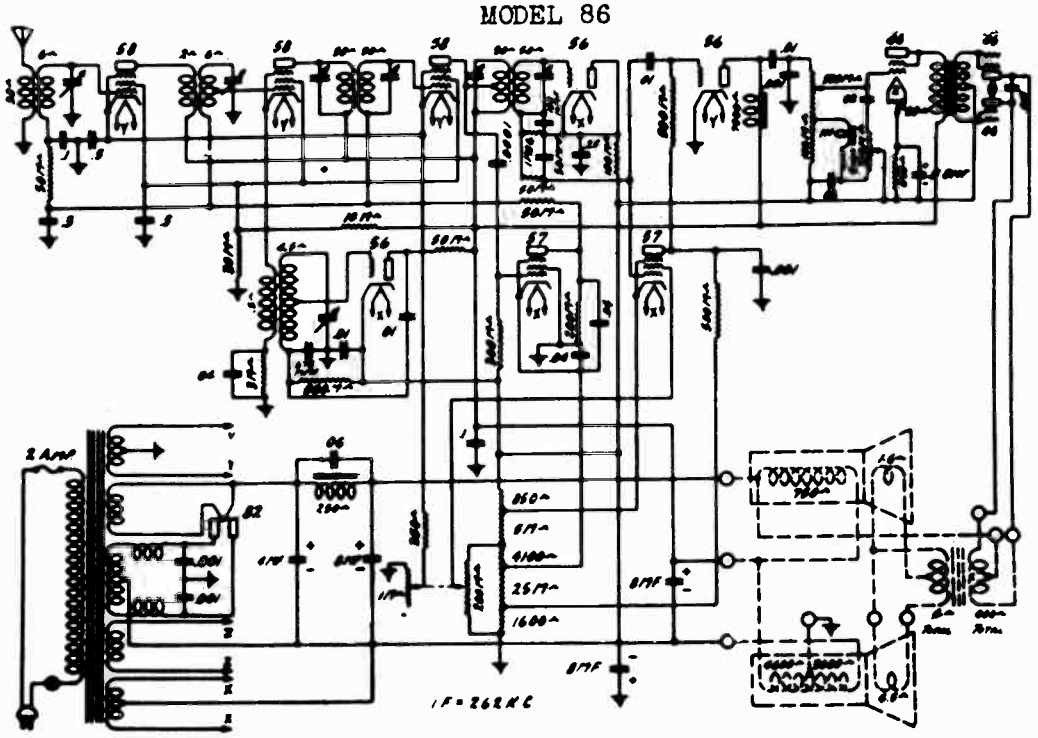
NOTE A:—Index line is on dial light diffuser strip. See DIAL CALIBRATION paragraph.

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	1600 KC	2nd I-F (C10) & (C11)
455 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	1600 KC	1st I-F (C7) & (C8)
1400 kc	Control Grid 12SA7—1st Det. (Prong No. 8)	Same as above	.1 mf	1400 kc Index Line. See Note A	Oscillator (C25)
1400 kc	External Antenna Clip on Loop	Chassis	50 mmf	1400 kc Index Line. See Note A	R-F (C-6) Antenna (C2)

MONTGOMERY WARD

MODELS 86,3035,3037, 3065,3067

MODEL 86



MODELS 3035, 3037, 3065, 3067

R.F. Coils

Four coils are used in the chassis, and although they appear to be the same, there are three types and they cannot be interchanged.

To remove any one of the coils, remove the condenser shield, unsolder the wire leading from the condenser stator to the coil lug, remove the bottom plate of the chassis and bend out the three clips which hold the coil shield. Unsolder the leads to the coil and bend the clips holding the coil so that it may be removed. Handle any radio frequency coils carefully so the inside primary coil is not bent out of position. If this happens the receiver will oscillate. You will notice a white wire wound one-quarter turn around the grid end of the secondary having one end soldered to the plate side of the primary. This wire acts as an R.F. coupling condenser and is shown in the schematic diagram Fig. 1 as a condenser. Unless the chassis is damaged it is very rarely that an R.F. coil has to be replaced.

Part No.	Part Name	Selling Price	Your Cost
115	Pilot light bulb	$ 0.25	$ 0.07
1728	Knobs	.25	.07
1727	Knobs	.25	.07
1284	Bottom plate	1.00	.24
1838	Filter shield assembly	.35	.08
1839	R.F. shield assembly	.90	.22
2027	Insulator	.05	.01
701	Tube socket—280	.25	.06
703	Tube socket—227	.25	.06
685	Tube socket—245	.25	.06
963	Tube socket—224	.25	.06
1786	Speaker socket	.30	.07
964A	Bypass condensers	1.68	.43
1752	Shunt resistor	1.35	.34
1757	Bypass condenser	2.00	.50
1753	250-ohm resistor, Candohm	.25	.07
1754	250-ohm resistor, Candohm	.15	.04
1836	Pilot light bracket	.20	.05
1314	Dial drum assembly, less chart	.35	.08
1818	Dial chart	.20	.05
982A	Tube shield—227	.20	.04
951A	Tube shield—224	.20	.04
1571	Tone control rheostat	1.75	.42
883	Ant-Grd. binding post	.50	.13
1810	Condenser assembly	13.00	3.25
1313	Drive drum assembly	.35	.08
1740	Drive shaft assembly	.25	.06
1372	Push pull transf. assembly	3.30	.82
1306	Filter choke assembly	2.30	.57
1312	Insulated terminal assembly	.10	.01
1809	Filter condenser assembly	10.00	2.37
1749	Electrolytic condenser	2.75	.68
1748	Power transformer	12.00	2.94
1812	R.F. transformer assembly, 2nd and 3rd	1.25	.29
1813	Ant. transformer assembly, 1st	1.25	.27
1886	R.F. transformer assembly, 4th	1.25	.29
1815	Volume control and switch assembly	1.75	.43
1755	Volume control	1.25	.28
1775	Toggle switch	.60	.15
1371	R.F. plate choke assembly	.30	.07

Part No.	Part Name	Selling Price	Your Cost
1358	.04 mfd. condenser	.40	.10
861	Attachment cord	.60	.15
1816	Chassis harness	1.00	.27
1817	R.F. harness	.20	.05
675	.1 condenser	.75	.14
1612	.006 condenser	.40	.09
123	.001 mfd. condenser	.35	.08
1758	15,000-ohm resistor, green and white	.50	.09
1348	100,000-ohm resistor, red and white	.50	.09
1349	500,000-ohm resistor, blue and white	.50	.09
929	50,000-ohm resistor, white	.50	.09
1751	200,000-ohm resistor, red and green	.50	.09
1814	R.F. shield can, 2nd-3rd	.20	.05
725	R.F. shield can, 1st-4th	.20	.05
1882	Grid cap assembly	.05	.01
562	Volume control washer	.05	.01
563	Volume control insulating disc	.05	.01
564	Toggle switch hex nut	.05	.01
565	Volume control hex nut	.05	.01
566	Volume control insulating bushing	.05	.01
567	Toggle switch washer	.05	.01
568	Toggle switch knurl nut	.05	.01
726	Sheet metal screw	.05	.01
1742	Dynamic speaker	25.00	6.34
1709	Escutcheon—Airline	.40	.10
1873	Escutcheon—Tone Control	.20	.05

NOTE—The part numbers in the list above should be used when ordering 25-cycle parts with the exception of the power transformer and choke condenser. Part 1-1772 and 1-1375 shown below should be substituted.

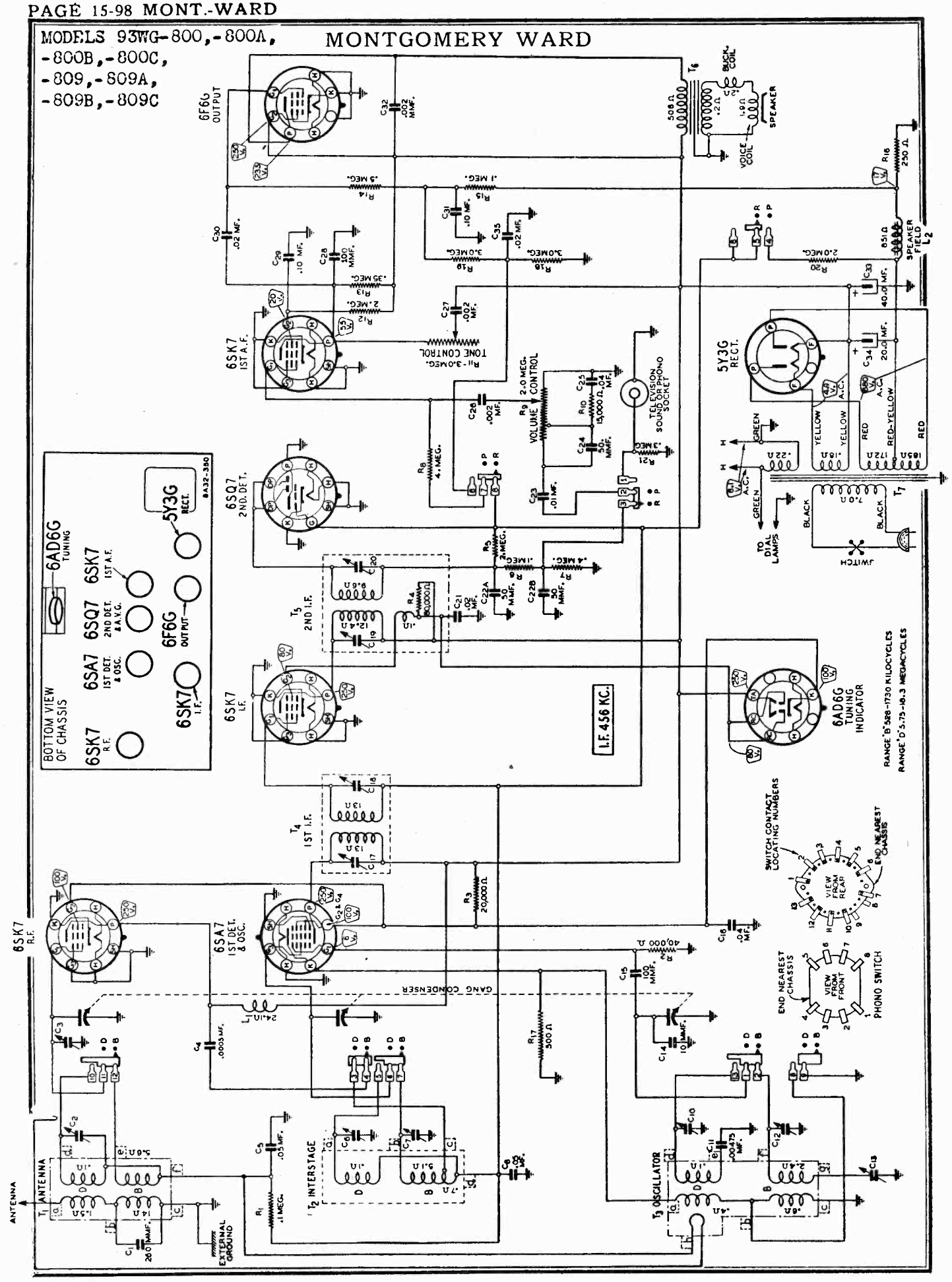
25-Cycle

Part No.	Part Name	Selling Price	Your Cost
1-1772	Power transformer, 110-volt, 25-cycle	$15.00	$ 3.94
1-1375	.45 condenser	.80	.20

Prices subject to change without notice.

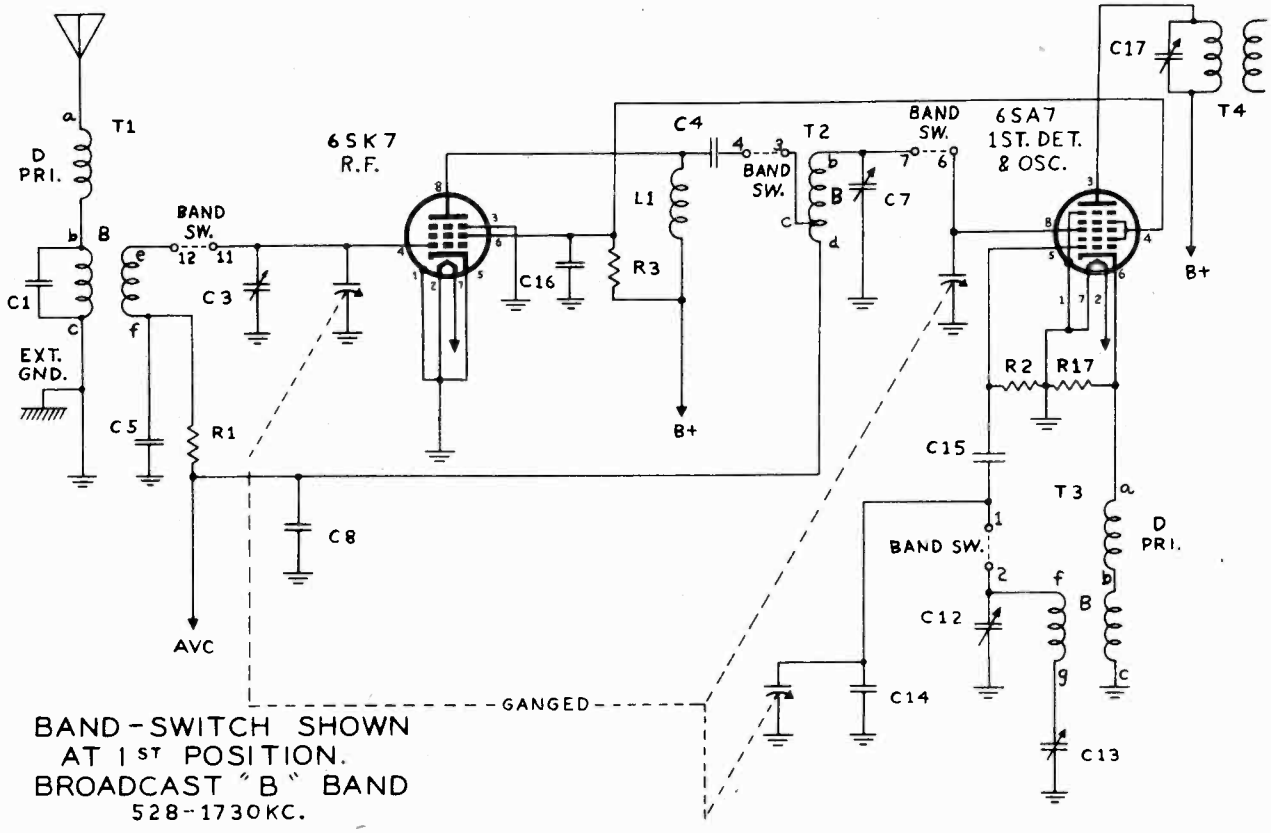
MODELS 93WG-800,-800A,
-800B,-800C,
-809,-809A,
-809B,-809C

MONTGOMERY WARD

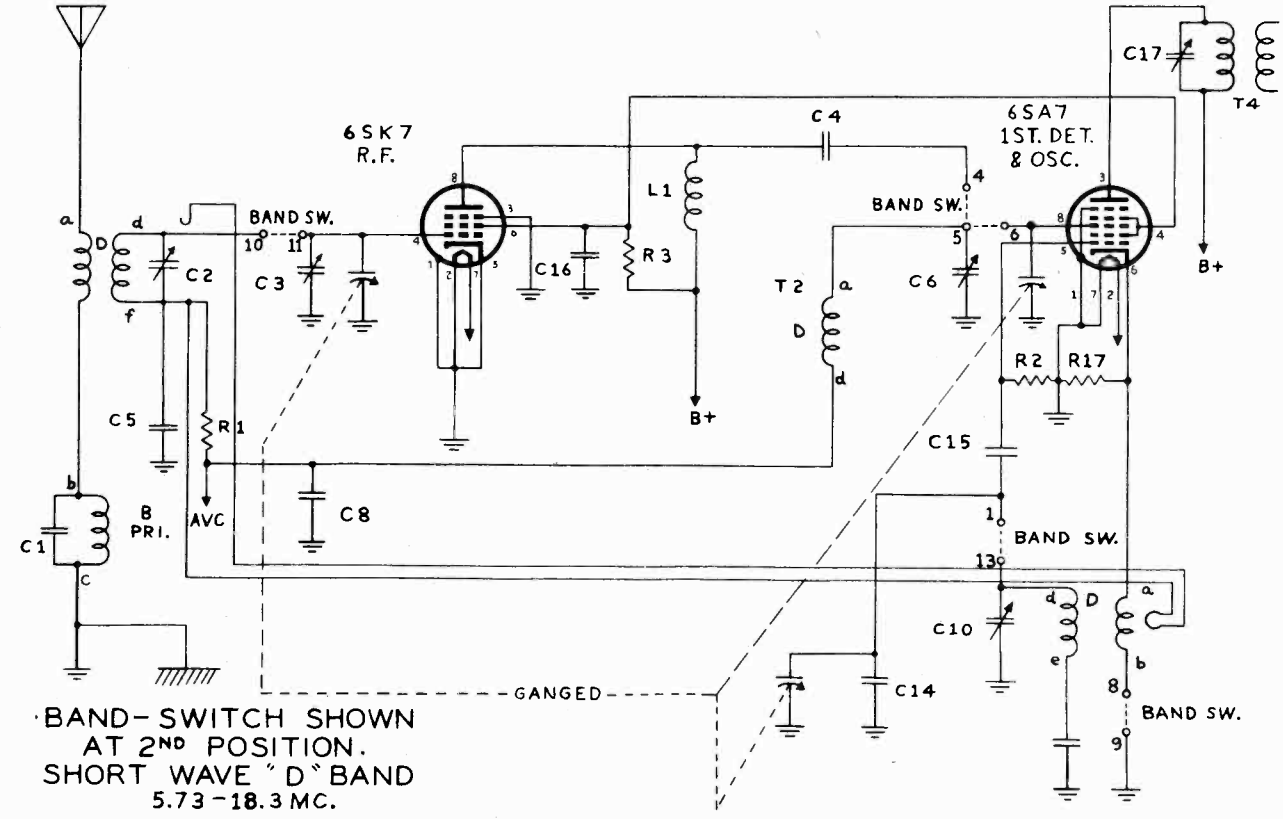


MONTGOMERY WARD

MODELS 93WG-800,-800A, -800B,-800C,-809, -809A,-809B,-809C



BAND-SWITCH SHOWN AT 1ST POSITION.
BROADCAST "B" BAND
528-1730KC.



BAND-SWITCH SHOWN AT 2ND POSITION.
SHORT WAVE "D" BAND
5.73-18.3 MC.

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.

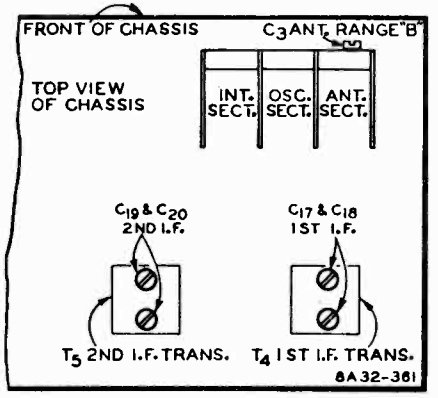
Dummy Antennas—.1 mf., 200 mmf., and 400 ohms.

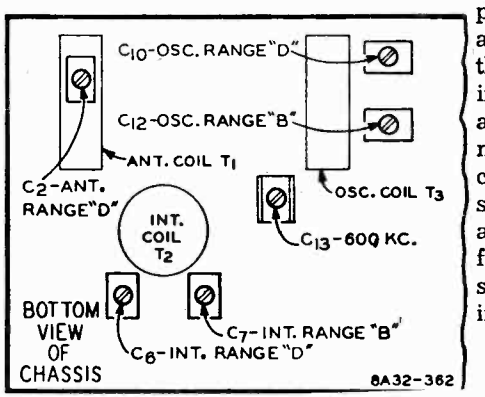
SIGNAL GENERATOR FREQUENCY SETTING	SIGNAL GENERATOR CONNECTION AT RADIO	DUMMY ANTENNA	BAND SWITCH SETTING	CONDENSER SETTING	ADJUST TRIMMERS TO MAXIMUM
I. F.					
456 KC	Grid of 1st Det.	.1 mf.	B Range	Turn Rotor to Full Open	1st I.F. (C17) & (C18) 2nd I.F. (C19) & (C20)
RANGE B					
1730 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Full Open	Oscillator Range B (C12)
1500 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output Set Indicator to 1500 KC— See Note A	Ant. Range B (C3) Int. Range B (C7)
600 KC	Antenna Lead	200 mmf.	B Range	Turn Rotor to Max. Output	600 KC (C13) Rock Rotor—See Note B
RANGE D					
18,300 KC	Antenna Lead	400 Ohm	D Range	Turn Rotor to Full Open	Oscillator Range D (C10)
18,300 KC	Antenna Lead	400 Ohm	D Range	Keep Rotor at Full Open Position	Ant. Range D (C2) Int. Range D (C6) Rock Rotor—See Note B

Attenuate the signal from the signal generator to prevent the leveling-off action of the AVC.

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

NOTE A—If the indicator is not at 1500 KC, it will be necessary to re-calibrate. Loosen the set screw on the dial hub near the volume control drum. Hold the tuning control drum stationary and at the same time turn the dial drum the necessary amount in the required direction. Retighten the set screw.





Tubes

The type and position of each tube are shown in the illustration.

To replace the tuning eye tube, BE SURE THE RADIO IS TURNED OFF. Pull out the escutcheon cap which partially covers this tube. First loosen the tuning eye tube in its socket by moving it up and down and from one side to the other. At the back of the cabinet will be seen a "U" shaped tube puller attached to a cord. Place the open ends of the tube puller over the tuning eye tube and push the puller in as far as it will go. Compress the puller until the hooked end grips under the base of the tube and then pull the tube out.

Power Supply

CAUTION — Unless otherwise marked, this radio must be operated on a 117 volt, 60-cycle AC supply only. Do not insert the plug of the power cord in the receptacle unless all tubes and the speaker plug are in their proper sockets. The power rating of this radio is shown on the tube arrangement label. Receivers of this model which are to be used on 25 cycle, 230 volt, or other service are so marked on this label. If there is any doubt regarding the voltage and frequency of the power supply, consult the local power company before inserting the plug.

MONTGOMERY WARD

MODELS 93WG-800,-800A, -800B,-800C,-809, -809A.-809B, -809C

Procedure for Setting the Station Buttons

Selecting the Stations to be Set

There are 6 buttons on the automatic tuning dial by means of which 6 stations may be set for quick tuning.

Make a list of your favorite stations, those which you tune in regularly. There may be any number up to and including 6 in this list.

It is better to list the station with the lowest kilocycle number first, the station with the next higher kilocycle number next, and so on.

Any button may be used for any station you can receive, although it will be more convenient to set the stations so that the kilocycle numbers increase from left to right.

Setting a Station Button

Turn the manual tuning control so that the dial moves toward 1700 KC until the stop is reached.

At the right side of the escutcheon (from the front) will be seen a cap which covers a hole in the escutcheon —See illustration. Pull off this cap.

At the end of the tube in back of the hole in the escutcheon is the locking screw. Using a small handle screwdriver, unlock the mechanism by turning this screw in a counter-clockwise direction several turns.

TO SET STATIONS ACCURATELY, DO NOT JAR THE RADIO OR BUTTONS WHILE THE MECHANISM IS UNLOCKED.

Select the first station from the list you have prepared, and carefully tune in this station by means of the manual tuning control using the tuning eye as a guide.

With one hand, hold the manual tuning control to prevent it from turning and with the other hand, push one of the station buttons shown in the illustration *all the way in.* It is better to start with button No. 1.

Hold *this* button all the way *in.* With the other hand, see whether or not this station is still accurately tuned in by moving the tuning control a slight amount back and forth while observing the tuning eye. *Be sure to hold the button all the way in.*

Release the button slowly after the station is tuned in.

CAUTION—Do not touch this button again while the mechanism is unlocked as the setting may be altered.

Carefully tune in the second station on your list. Then hold the tuning control and push the second button slowly and firmly all the way in. Check for accurate tuning.

Proceed in the same manner to set any additional stations on your list on the remaining station buttons.

After all the stations are set, it will be necessary to lock the mechanism so that the settings will not change. Turn the manual tuning control so that the dial moves toward 1700 KC until the stop is reached. Then, with a SMALL HANDLE screwdriver, turn the locking screw in a clockwise direction until it is tight. Tighten the locking screw firmly but not excessively to avoid stripping the threads. Replace the cap over the hole.

Remove the correct station call letter tabs from the sheets supplied by bending the sheet back and forth at the score mark until the tab can be broken off. Press the tab all the way to the bottom of the space provided in the button. Cover the call letter tab with a celluloid tab, pressing this in until it snaps into place.

If at any time you wish to change the setting of a button from one station to another, repeat the above procedure. Changing the setting of one button will not affect the setting of any of the other buttons.

SPECIFICATIONS

Power Consumption 71 Watts (At 117 volts 60 cycles)

Power Output - - - - - - - 3.0 Watts Undistorted, 4.5 Watts Maximum

Selectivity - - 35 KC Broad at 1000 times Signal

Intermediate Frequency - - - - - - - 456 KC

Speaker - - - - - - - - 8" Electro dynamic

Tuning Frequency Range

B Range..... 528 to 1730 KC

D Range.....5750 to 18300 KC

Sensitivity (For 0.5 watt output)

B Range.....2.0 Microvolts Average

D Range.....4.0 Microvolts Average

Voltages at Sockets

The voltages at sockets are shown on the schematic circuit diagram. Unless otherwise specified, the voltage indicated is between the socket terminal and ground.

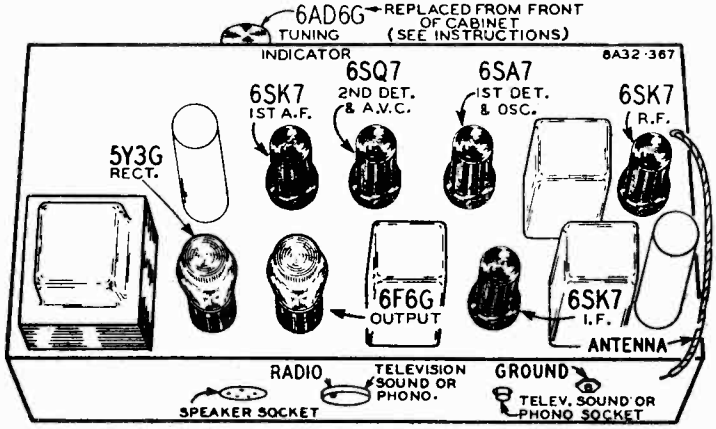
These voltages are read under the following conditions:

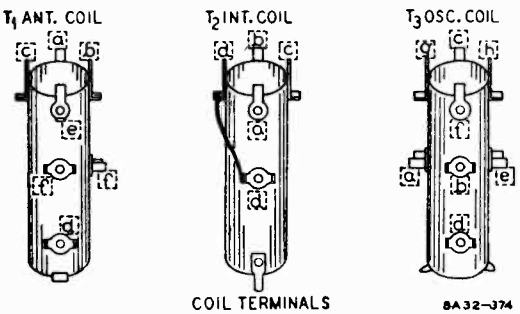
Line Voltage—117.

Volume Control—Maximum.

Antenna Shorted to Ground.

Readings taken with 1000 ohm-per-volt meter. Plate and screen voltages are read on 500 volt scale.





MODELS 93WG-800,-800A, -800B,-800C,-809,-809A; -809B,-809C MONTGOMERY WARD

Replacement Parts List

MISCELLANEOUS

SOCKETS

Bin No.	Part No.	Description	Selling Price
	3A293	Tube Socket—Octal (8 prong)	$0.08
	3A294	Speaker Socket (5 prong)	.06
	3A299	Single Pin Tip Socket (Phono Connection)	.06
	3A280	Tube Socket for Tuning Eye—Octal (8 prong—Wafer Type)	.06

SPEAKER

When ordering parts for speakers, specify part number of speaker and letters preceding part number stamped on the speaker.

	12A334	8" Electro Dynamic Speaker	3.60
		Cone and Voice Coil Assembly for above Speaker	1.48
		Field Coil for above Speaker (L2)	1.50
		Output Transformer only (T6)	1.00

KNOBS AND BUTTONS

10143	10A249	Band Switch Knob	.06
10142	10A241	Tone Control Knob	.06
	10A233	Station Buttons Ea.	.04
	10A220	Phono-Radio Knob	.06

GENERAL

	13X80	Line Cord and Plug	.20
	4A92	Terminal Strip (3 insulated Lugs—1 Mounting Foot)	.04
	4A123	Terminal Strip (5 Lugs—4 Lugs insulated)	.04
	4A84	Terminal Strip (2 insulated Lugs—1 Mounting Foot)	.04
	4A86	Terminal Strip (1 Insulated Lug—1 Mounting Foot)	.04
	2X289	Felt Washers (Used behind Knobs) Doz.	.04
10565	8X23	Rubber Cushions (Mounted under Chassis) Ea.	.04
	8X86	Rubber Cushions (Mounted at rear of Chassis) Ea.	.04
	25X655	Mounting Brackets for Rear Rubber Cushions Ea.	.02
	2A151	Band Change Switch	.38
	2A154	Phono-Radio Switch	.24
	28X247	Tube Puller for Tuning Eye Tube	.04

TRANSFORMERS AND COILS

Bin No.	Part No.	Code	Description	Selling Price
	9A1128	T1	Antenna Transformer Assembly	$0.60
	9A1129	T2	R.F. Interstage Transformer Assembly	.72
	9A1130	T3	Oscillator Coil Assembly	.58
	9A1131	T4	1st I.F. Transformer and Can Assembly	.64
	9A1132	T5	2nd I.F. Transformer and Can Assembly	.68
		T6	Output Transformer (See "Speaker")	
	53X201	T7	117 Volt, 60 Cycle, Standard Power Transformer	1.88
	53X202	T7	117 Volt, 25 Cycle, Standard Power Transformer	3.24
	53X203	T7	117-234 Volt, 40-60 Cycle, Universal Power Transformer	2.68
	9A1115	L1	R.F. Plate Reactor	.18
		L2	Field Coil (See "Speaker")	

CONDENSERS

TUBULAR

Bin No.	Part No.	Code	Capacitance	Voltage	Selling Price
	46X282	C4	.0005 mf.	360	$0.06
11106	46X253	C5,C8	.05 mf.	180	.06
	46X289	C11	.00475 mf.	Polystyrene Type—5% Tolerance	.14
10943	46X269	C16	.04 mf.	360	.06
	46X260	C21,C30	.02 mf.	360	.06
11256	46X249	C23	.01 mf.	180	.06
11539	46X250	C25	.04 mf.	180	.06
	46X248	C26	.002 mf.	180	.06
10934	46X268	C27,C32	.002 mf.	600	.06
	46X261	C29	.10 mf.	360	.08
10927	46X254	C31	.10 mf.	180	.06
	46X267	C35	.02 mf.	180	.06

MOLDED

10928	47X69	C1	250 mmf.	.08
10876	47X57	C15,C28	100 mmf.	.06
10625	47X56	C24	50 mmf.	.06

TRIMMER

17A115	C2	2.5-35 mmf.	Antenna Range D	.08
	C3	Part of Gang	Condenser	
17A113	C6	1.4-12 mmf.	Interstage Range D	.12
	C7	1.4-12 mmf.	Interstage Range B	
17A113	C10	1.4-12 mmf.	Oscillator Range D	.12
	C12	1.4-12 mmf.	Oscillator Range B	
17A81	C13	300-600 mmf.	600 KC Padder	.14
17A57	C17	50-120 mmf.	1st I.F.	.18
	C18	50-120 mmf.		
17A80	C19	50-120 mmf.	2nd I.F.	.14
	C20	85-185 mmf.		

ELECTROLYTIC

9151	44X40	C33	40 mf.	300 Wet .46
9150	44X39	C34	20 mf.	390 Wet .46

MISCELLANEOUS

47X138	C14	13 mmf.	Ceramic	
47X112	C22A	50 mmf.	Dual Mica	.06
	C22B	50 mmf.		
14A107		3 Section	Gang Condenser	1.62

RESISTORS

CARBON

Bin No.	Part No.	Code	Resistance	Wattage	Selling Price
10968	A85104	R1,R6,R15	100,000 Ohm	0.2	$0.06
	A85403	R2	40,000 Ohm	0.2	.06
11550	D94203	R3	20,000 Ohm	2.0	.16
11549	A84803	R4	80,000 Ohm	0.2	.08
11086	A85105	R5	1 Megohm	0.2	.06
11057	A84404	R7	400,000 Ohm	0.2	.08
11130	A85405	R8	4 Megohm	0.2	.06
11094	A84153	R10	15,000 Ohm	0.2	.08
11086	A84205	R12	2 Megohm	0.2	.08
	A84354	R13	350,000 Ohm	0.2	.08
11085	A85504	R14	500,000 Ohm	0.2	.06
	D94251	R16	250 Ohm	2.0	.16
	A85501	R17	500 Ohm	0.2	.06
	A84305	R18,R19	3 Megohm	0.2	.08
	A85205	R20	2 Megohm	0.2	.06
	A85304	R21	300,000 Ohm	0.2	.06

VARIABLE

10430	36X267				.28
~~9295~~	~~36X268~~	R9	2 Megohm	Volume Control	.38
9294	40X241	R11	3 Megohm	Tone Control	.26

AUTOMATIC TUNING AND DIAL ASSEMBLY

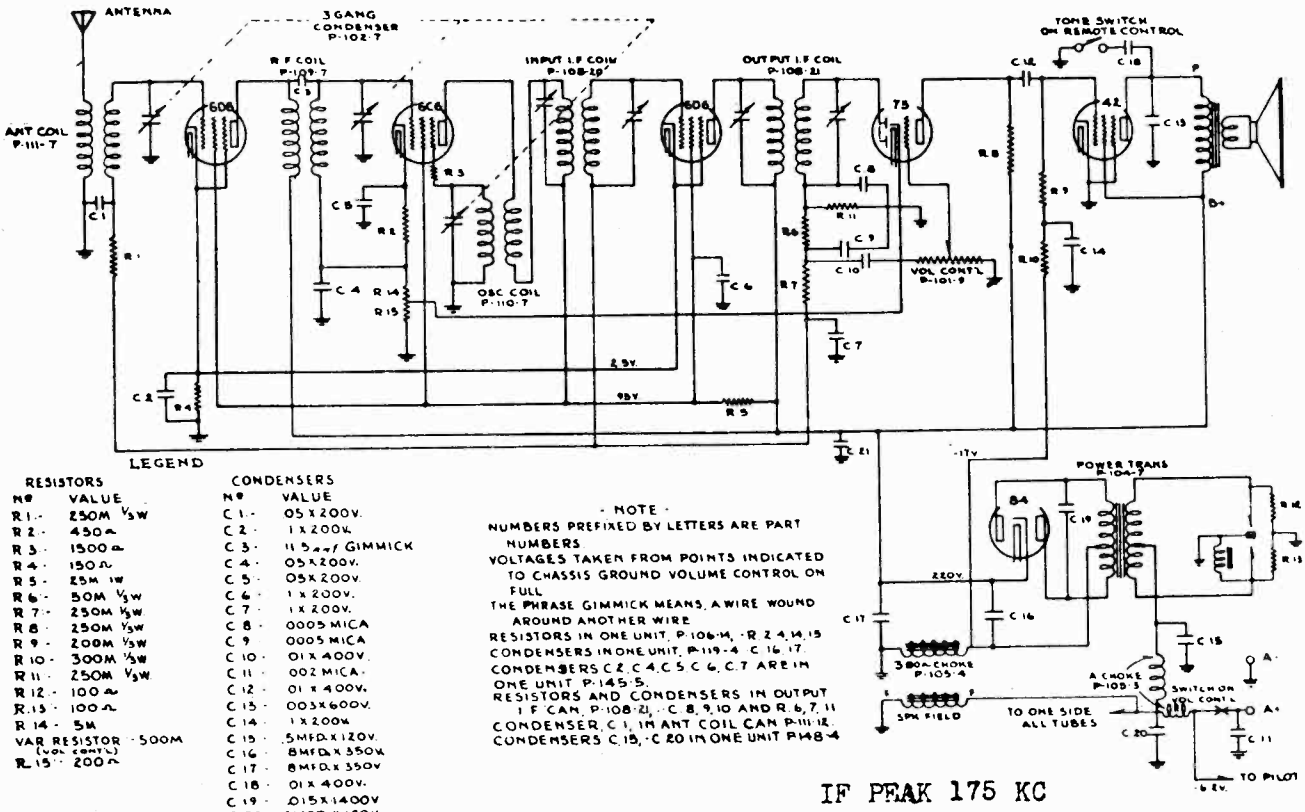
Bin No.	Part No.	Description	Selling Price
	20A63	Automatic Tuning Assembly complete with Drive Gear Hub and Coupling Arm less Gang Condenser, On-Off Switch and Bracket, Locking Screw Guide, and Drive Gear	$1.74
	24X395	Drive Gear on Tuner	.02
	25X627	Guide for Locking Screw	.04
	2A153	On-Off Switch	.16
	10A248	Extension for On-Off Switch Shaft	.04
	25X650	Mounting Bracket for On-Off Switch	.02
	25X653	Support Bracket for Dial Scale Assembly—Left	.06
	25X654	Support Bracket for Dial Scale Assembly—Right	.06
	37X170	Coupling Arm and Bushing for Gang Condenser	.12
	25X649	Mounting Bracket for Volume Control	.04
	10A247	Tuning Drum or Volume Control Drum	.10
	28X246	Spring Clamp to Hold Tuning Drum and Volume Control Drum to Shaft Doz.	.08
	58X406	Dial Scale Assembly complete with 2 Support Discs and Hub	.60
	26A174	Idler Gear and Mounting Bracket Assembly	.20
	26A172	Dial Scale Shaft and Gear Assembly	.12
	37X168	Link for Coupling Arms	.02
	28X248	Tension Spring for Coupling Arms Doz.	.10
	7A94	Dial Lamp Socket Assembly (2 Sockets with Wire)	.10
	41X34	Celluloid Light Diffuser	.02
7112		Dial Lamp—No. 51 Ea.	.08
10401	17X40	Celluloid Crystal	.40
	4X331	Escutcheon for Dial Scale	.40
	4X327	Escutcheon for Tuning Eye	.20
	4X328	Cap for Tuning Eye	.12
	28X244	Plug Button for Locking Screw opening or On-Off Switch Extension Ea.	.04
	26A166	Call Letter Sheet and Celluloid Tabs	.06
	26A182	Blank Call Letter Sheet (Export) and Celluloid Tabs	.06
	58X393	Celluloid Tabs only Doz.	.06

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

Prices Subject to Change Without Notice.

MODEL 102

MONTGOMERY WARD



LEGEND

RESISTORS		CONDENSERS	
No	VALUE	No	VALUE
R 1 -	250M ½W	C 1 -	.05 x 200V.
R 2 -	450Ω	C 2 -	1 x 200V.
R 3 -	1500Ω	C 3 -	11.5 mmf GIMMICK
R 4 -	150Ω	C 4 -	.05 x 200V.
R 5 -	25M 1W	C 5 -	.05 x 200V.
R 6 -	50M ½W	C 6 -	1 x 200V.
R 7 -	250M ½W	C 7 -	1 x 200V.
R 8 -	250M ½W	C 8 -	.0005 MICA
R 9 -	200M ½W	C 9 -	.0005 MICA
R 10 -	300M ½W	C 10 -	.01 x 400V.
R 11 -	250M ½W	C 11 -	.002 MICA
R 12 -	100Ω	C 12 -	.01 x 400V.
R 13 -	100Ω	C 13 -	.003 x 600V.
R 14 -	5M	C 14 -	1 x 200V.
VAR RESISTOR (VOL CONTL) R 15 -	500M 200Ω	C 15 -	.5 MFD. x 120V.
		C 16 -	8 MFD. x 350V.
		C 17 -	8 MFD. x 350V.
		C 18 -	.01 x 400V.
		C 19 -	.015 x 1400V.
		C 20 -	5 MFD. x 120V.
		C 21 -	.01 x 400V.

- NOTE -

NUMBERS PREFIXED BY LETTERS ARE PART NUMBERS

VOLTAGES TAKEN FROM POINTS INDICATED TO CHASSIS GROUND VOLUME CONTROL ON FULL

THE PHRASE GIMMICK MEANS, A WIRE WOUND AROUND ANOTHER WIRE

RESISTORS IN ONE UNIT, P-106-14, - R 2, 4, 14, 15

CONDENSERS IN ONE UNIT, P-119-4 - C 16, 17

CONDENSERS C 2, C 4, C 5 C 6, C 7 ARE IN ONE UNIT P-145-5.

RESISTORS AND CONDENSERS IN OUTPUT I F CAN, P-108-21, - C 8, 9, 10 AND R 6, 7, 11

CONDENSER, C 1, IN ANT COIL CAN P-111-12

CONDENSERS C 15, - C 20 IN ONE UNIT P148-4

IF PEAK 175 KC

DIAL ADJUSTMENT:

Mount control head to steering column by means of bracket and strap or under dash by means of bracket or to instrument panel (see illustrations). Attach cables as above. Tune set to some station of a known frequency (between 800 and 1200 K.C.), hold selector knob, then with a screw driver adjust the slotted screw on back of the control head, and in that way adjust the dial pointer to the correct frequency setting.

Part No.	Description	List Price Each
150-24	Selector Shaft—24"	1.50
151-2	Remote Control Head, less flexible shafts, less tone control and pilot assemblies, but with knobs and mounting hardware	4.50
152-1	Antenna cable	.40
152-2	Battery cable	.35
131-5	Black bakelite remote control knobs	.15
146-8	Die Cast Remote Control Mounting Bracket	.30
146-12	Steering Column Strap	.15
168-1	Spark-plug type suppressor	.30
168-2	Distributor plug-type suppressor	.50
168-3	Cable type suppressor	.40
168-4	Special Ford spark-plug suppressor	.35
	Unless otherwise listed, all Carbon Resistors	.20
	Unless otherwise listed, all Single Section Tubular Paper By-Pass Condensers	.25
	Unless otherwise listed, all Dual Section Tubular Paper By-Pass Condensers	.50
	Unless otherwise listed, all Molded Mica Condensers	.25
	All Sockets	.20
167-1	Dynamic Speakers	5.00
	Plate antenna (clamps to frame of car)	2.50

Note: Part No. 145-5 consisting of five separate sections can be replaced with tubular single section condensers at 25c each. It will not be necessary to replace the entire unit should any section thereof fail.

Vibrators can be reconditioned at a cost of $3.00 each, if the old unit is returned.

Part No.	Description	List Price Each
101-9	Volume Control with Switch	$1.35
101-12	Tone Control Assembly, complete	.35
102-7	Three Gang Geared Variable Condenser	4.00
104-6	Vibrator Transformer	3.00
105-3	"A" Choke—40T—No. 16E—½" Dia.	.10
105-4	380 Ohm Filter Choke	.85
106-6	200 Ohm Center Tapped Resistor	.25
106-14	5800 Ohm Metal Clad Resistor	.50
108-20	Input I. F. Transformer completely assembled in can (175 K. C.)	1.50
108-21	Output I. F. Transformer complete with can, but less resistor and Condenser Assembly (175 K. C.)	1.50
	Resistor and Condenser Assembly for 108-21	1.50
109-7	R. F. Coil	.65
110-7	Osc Coil & bracket	1.25
111-7	Antenna Coil	1.25
112-43	Volume Control Shaft complete with knob	.30
115-18	Special partition shield	.20
115-22	Tube shield	.15
116-5	6-8 Volt T-50 pilot lamp	.10
116-6	Pilot light assembly, complete, less bulb	.40
119-4	8-8 Mfd. x 350 Volt Electrolytic Filter Condenser	2.50
142-1	Plug-In Vibrator	5.00
145-5	.4 Mfd. By-Pass Block	1.00
146-14	Special bracket including battery antenna, pilot light and tone control cable fittings, but less antenna coil volume control	.50
148-4	Dual .5 Mfd. 120 Volt Condenser	.75
161-1	20 Ampere fuse	.05
147-1	Selector Control Coupling	.10
147-2	Bushing and bracket complete	.20
147-11	Volume control coupling	.10
135-5	⅜x3" carriage bolt	.05
140-3	Container complete with top and bottom	2.50
148-1	.5 Mfd. Generator Condenser	.50
148-3	.5 Mfd. Ammeter Condenser	.50
149-18	Volume Control Shaft—18"	1.25
149-24	Volume Control Shaft—24"	1.50
150-18	Selector Shaft—18"	1.25

Prices subject to change without notice.

MODEL 102

MONTGOMERY WARD

TUBE COMPLEMENT:

1—Type 6D6—remote cut-off pentode as an R. F. amplifier.
1—Type 6C6—pentode as an oscillator and first detector.
1—Type 6D6—remote cut-off pentode as an intermediate frequency amplifier (175 K.C.).
1—Type 75 —duplex diode triode second detector automatic volume control and first audio.
1—Type 42 —pentode output tube.
1—Type 84 —high vacuum full wave rectifier.

SERVICE NOTES:

Model 670 is a six tube superheterodyne receiver with an intermediate frequency of 175 kilocycles and a tuning range of from 530 to 1550 kilocycles.

This receiver has been carefully designed to facilitate servicing, the top and bottom covers are both removable, any part is replaceable without removing the chassis from the cabinet. All adjustments are made without removing the chassis from the cabinet.

Should it ever become necessary or desirable to re-align this receiver, the proper method is as follows:

I. F. ALIGNMENT:

1. With variable condenser at its maximum capacity position and with volume control full on, connect in series with a .1 mfd. condenser, an oscillator set at 175 kilocycles to the grid cap of the 6C6 tube.

2. Adjust trimming condensers of both input and output I. F. transformers, parts number 108-20 and 108-21 (see top view of chassis) to resonance with an oscillator, as indicated on an output meter connected across the primary terminals of the speaker input transformer or between the plate and screen terminals of the type 42 output tube. The connection to the tube can be made by means of an adapter. Maximum deflection on the output meter indicates resonance.

Note: Each I. F. transformer has two adjustments, both of these adjustments on both transformers are accessible through holes located in the back of the case between the two mounting plates and directly under the louvres.

R. F. ALIGNMENT:

1. Attach oscillator connected in series with a 200 mmfd. condenser to the antenna lead and with the variable condenser at its minimum capacity position (extreme right of its rotation) and with an oscillator set at 1550 kilocycles, adjust condenser trimmer of oscillator section (Front shaft end) to resonance.

2. Re-set oscillator to 1400 kilocycles, rotate variable condenser to pick up signal, adjust antenna (center section) and R. F. (rear section) trimmers to resonance.

3. Check alignment at 1500-1000-800-600-530 kilocycles by setting oscillator to these frequencies and picking up signal by rotating condenser.

4. Bend slotted plates of antenna and R. F. sections only if necessary. UNDER NO CIRCUMSTANCES BEND PLATES OF OSCILLATOR SECTION.

NOTES:

Voltages from chassis to different points are indicated on schematic circuit diagram, and should be measured with a voltmeter having a resistance of 1000 ohms per volt.

Failure to operate, noisy or weak reception, may be due to defective tubes or poor contact between cap on top of tube and grid clip.

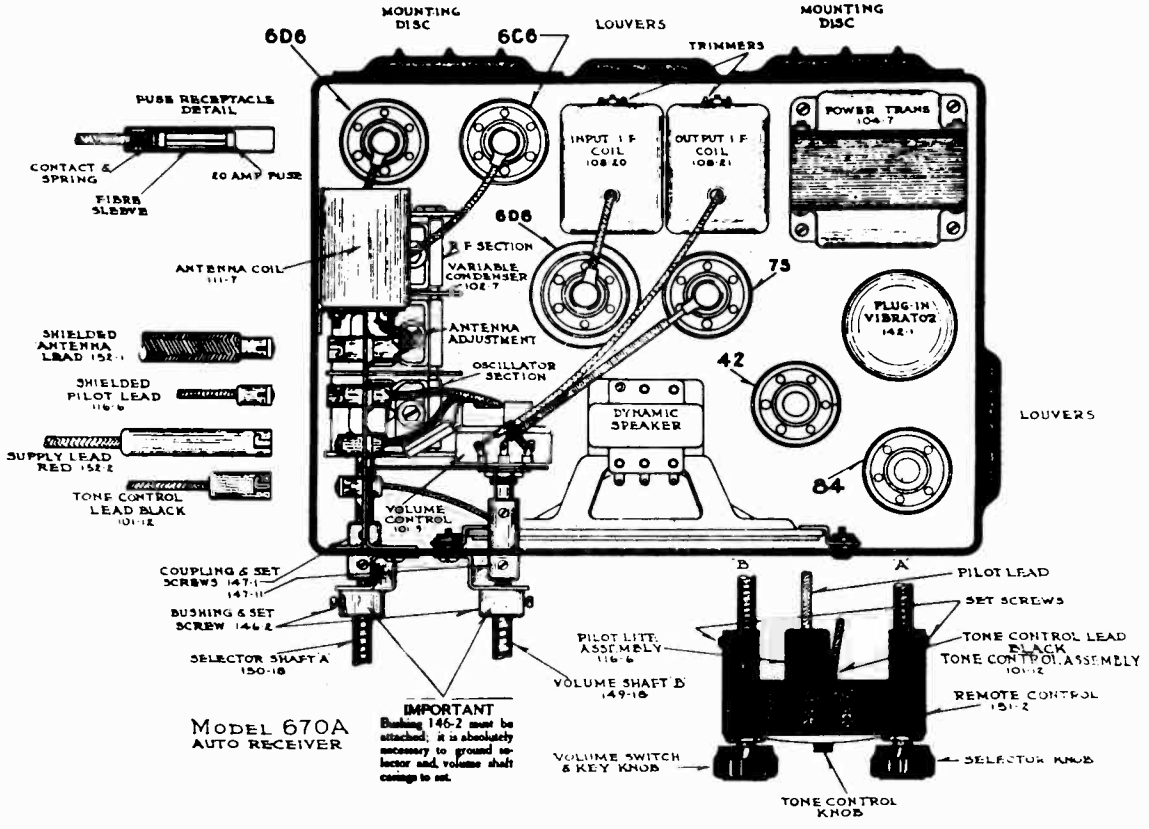
Tubes may be checked by replacing with another tube which is known to be good.

If fuse blows out frequently, and insulating sleeve has been properly placed over fuse, the trouble probably is in the vibrator and vibrator should be replaced.

NEVER ATTEMPT TO ADJUST VIBRATOR POINTS.

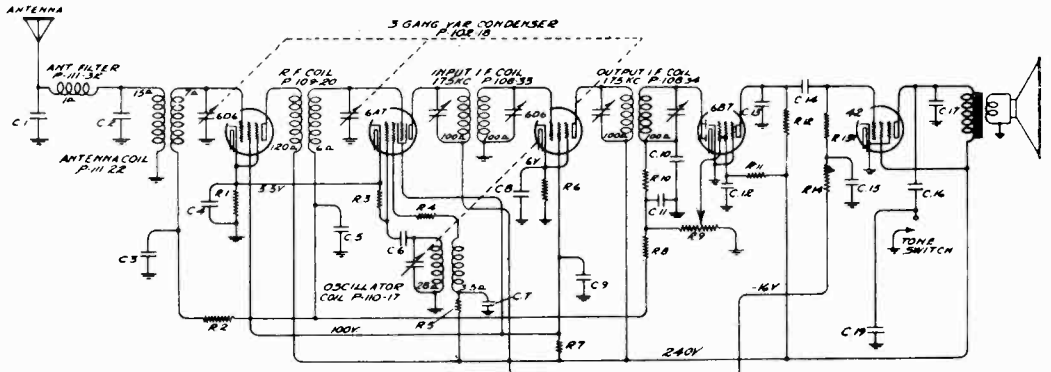
Case rattles may be due to one or more of the following:

Loose screws in top or bottom covers. Loose elements in tubes. Loose tube shield. Loose R. F. coil shield. Loose grill cloth.



MONTGOMERY WARD

MODEL 204



RESISTORS

No.	Value
R.1	500 ⅓ w
R.2	100M ⅓ w
R.3	50M ⅓ w
R.4	3500 ⅓ w
R.5	20M ½ w
R.6	1500 ⅓ w
R.7	25M 1w
R.8	500M ⅓ w
R.9	1 meg vol. control P-101-21
R.10	100M ⅓ w
R.11	1 meg ⅓ w
R.12	250M ⅓ w
R.13	301M ⅓ w
R.14	301m ⅓ w
R.15	100
R.16	100

CONDENSERS

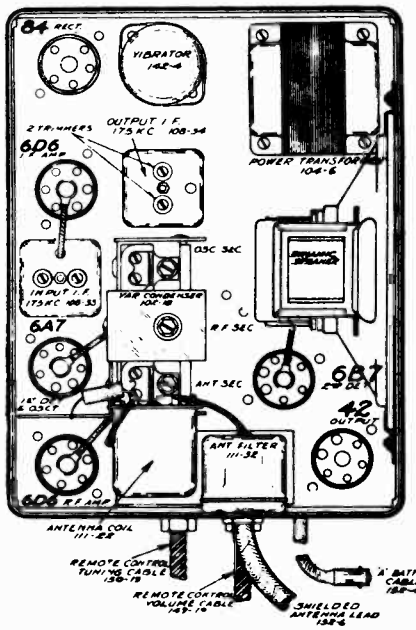
No.	Value
C.1	20 mmf mica
C.2	20 mmf mica
C.3	.01x400v
C.4	.1x200v
C.5	.05x200v
C.6	100 mmf mica
C.7	.1x200v
C.8	.1x200v
C.9	.1x200v
C.10	100 mmf mica
C.11	100 mmf mica
C.12	.1x200v
C.13	100 mmf mica
C.14	.01x400v
C.15	.25x400v
C.16	.025x400v
C.17	.006x600v
C.18	500 mmf mica
C.19	500 mmf mica
C.20	2000 mmf mica
C.21	1.0 mfdx120v
C.22	8 mfd x300v
C.23	.5 mfd x120v
C.24	.01x400v
C.25	8 mfd x300v
C.26	.01x400v

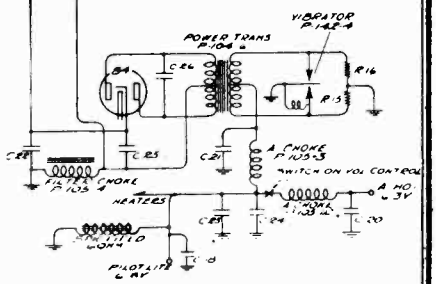
NOTE:

C.4 and C.9 are in one unit P-118-1
C.7 and C.8 are in one unit P-118-1
C.22 and C.25 are in one unit P-119-17
R.16 and R.15 are in one unit P-106-6
Numbers prefixed by letter "P" are part numbers.

Voltages taken from points indicated to chassis ground. Vol. control on full, no signal.

Serial No. 40001 up.





1935

ALIGNING INSTRUCTIONS:

All of the adjustments have been very carefully set with signal generators at the factory and require no further adjustment, unless it becomes necessary to replace a coil or transformer or if the adjustments have been tampered with in the field. Under no circumstances attempt any adjustments without first making certain that adjustment is necessary and only after voltages, tubes and condensers have been checked and found to be normal. To properly re-align this receiver, a test oscillator, as well as an output meter, must be used.

DUMMY ANTENNAS:

The dummy antennas referred to in the following instructions are:

"I.F. Dummy" —A .1 mfd. condenser connected in series with the test oscillator output lead.

"Broadcast Dummy"—A 200 mmfd. condenser connected in series with the output lead of the test oscillator.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and the screen of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

I.F. ALIGNMENT:

1. With variable condenser in its minimum capacity position (plates entirely out of mesh) and with volume control full on, connect test oscillator set at 175 K.C., in series with I.F. dummy antenna, to the grid cap of the type 6A7 tube.
2. Adjust trimmer condensers of both input (108-33) and output (108-34) I.F. transformers to resonance with oscillator. See top view for location of these transformers. There are two adjustments on each and they are accessible from the top of the transformer shield and should be adjusted with an insulated screw driver.

BROADCAST ALIGNMENT:

1. With variable condenser in its minimum capacity position, connect test oscillator set at 1550 K.C. and in series with broadcast dummy, to the antenna lead of receiver.
2. Adjust oscillator trimmer of variable condenser to resonance (this adjustment is on the end section of the three gang condenser—see top view).
3. Shift test oscillator to 1400 K.C. and pick up signal by rotating condenser and adjust R.F. (center) and antenna (front) trimmers to resonance, see top view.

(a) Check for sensitivity at 1000, 800 and 600 K.C. by setting test oscillator to these frequencies and picking up the signal by rotating variable condenser. Under no circumstances bend plates of oscillator section, bend R.F. and antenna plates only if absolutely necessary.

DIAL ADJUSTMENT:

Tune set to some station of a known frequency (between 800 and 1200 K.C.) hold selector knob, then with a screw driver adjust the slotted screw on the back of the control head, and in that way adjust the dial pointer to the correct frequency setting.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt. These voltages are clearly indicated on the circuit diagram.

In order to prevent signal from acting upon A.V.C. and affecting accuracy of voltage measurements, aerial and ground leads should be short circuited while making measurements.

All voltages are to be measured with 6.3 volts input to receiver. Resistances of coils and transformer windings are indicated in ohms on schematic circuit diagram.

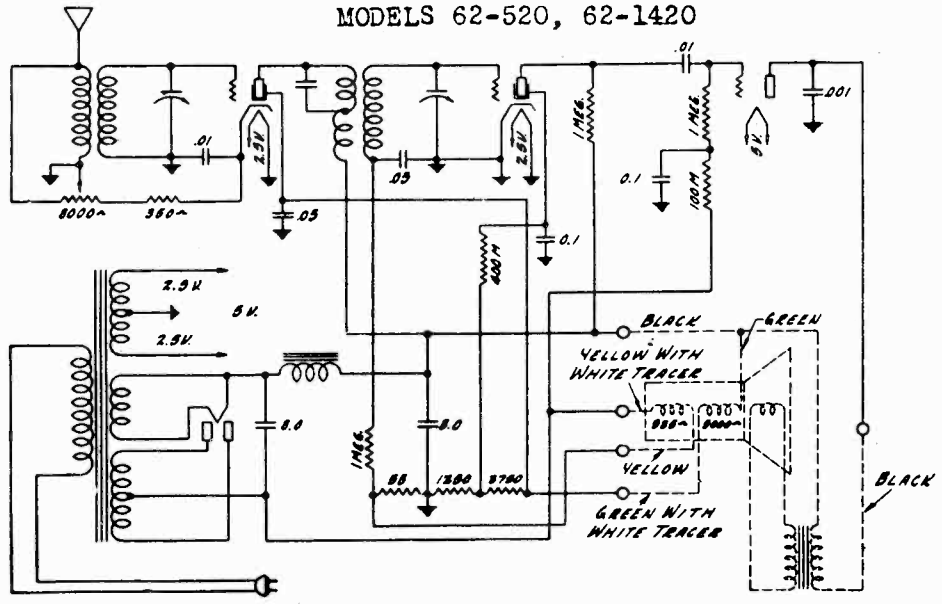
To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good. If fuse blows out frequently and insulating sleeve has been properly placed over fuse, the trouble is probably in the vibrator, it should be replaced. Do not attempt to make any adjustments on the vibrators.

MODEL 204
MODELS 62-520,
62-1420,Ch.20W

MONTGOMERY WARD

MODELS 62-520, 62-1420



DOTTED LINES SHOWN ARE IN SPEAKER.

2-31

The Model 20W chassis is the same in general design as the 26W chassis used in our five tube midgets, and the general servicing procedure is the same.

The tubes required are—

1—171 A power tube,
2—224 screen-grid tubes,
1—280 rectifier tube.

It is possible to substitute a 235 super control tube for the 224 tube used in the RF portion of this set. When this is done, the 235 super control tube should be used in the socket between the 280 rectifier and the 171 power tube.

No. 20W CHASSIS—VOLTAGES AT SOCKETS—VOLUME CONTROL AT MAXIMUM LINE VOLTAGE. 115—PLUG IN SOCKET OF RECEIVER—TUBE IN TEST SET

Type of Tube	Position of Tube	Function	"A" Volts	"B" Volts	Control Grid "C" Volts	Screen Volts	Screen Current MA	Cathode Volts	Plate MA	Grid Test MA
224	1	1st Radio	2.5	196	2.2	85	1.4	2.2	5.	7.1
224	2	Detector	2.5	95	2.3	17	.015		.1	.2
171A	3	1st Audio	5.1	191	43.				18.	20.
280	4	Rectifier	5.1						23. Per Plate	

MODEL 204

Part No.	Description	List Price Ea.
	CONDENSERS	
	Unless otherwise listed, all single section tubular paper by-pass condensers	$ .25
	Unless otherwise listed, all dual section tubular paper by-pass condensers	.50
	Unless otherwise listed, all molded mica condensers	.25
119-17	Dual 8 mfd. electrolytic filter condenser	2.25
148-1	.5 Mfd. Generator Condenser	.50
148-3	.5 Mfd. Ammeter Condenser	.40
148-2	1.0 Mfd. x 120 Volt Condenser	.60
148-6	Special Ford Ignition Coil Condenser	.60
	COILS	
105-12	"A" Choke - 28 Turns No. 12 Wire	.10
105-3	"A" Choke - 40 Turns No. 16 Wire	.10
108-33	Input I.F. Transformer Complete with Shield	1.50
108-34	Output I.F. Transformer Complete with Resistors and Condensers, Mounted in Shield	2.50
109-20	R.F. Coil Complete - Less Shield	1.00
110-17	Oscillator Coil Complete with Bracket	.75
111-22	Antenna Coil Complete - Less Shield	1.00
111-32	Antenna Filter Assembly Complete with Shield and Antenna Cable	1.50
	RESISTORS	
	Unless otherwise listed, all carbon resistors	.20
106-6	200 Ohm Center Tapped Resistor	.25
168-2	Distributor Suppressor	.40
168-3	Cable Type Suppressor	.40
	TRANSFORMERS	
104-6	Power Transformer	3.00
105-4	380 Ohm Filter Choke	.85
	MISCELLANEOUS	
101-21	Volume Control with Switch	1.35
102-18	Three Gang Variable Condenser	4.00
113-9	Two Lug Terminal Strip	.05
113-38	Terminal Strip	.05
115-34	Antenna and R.F. Coil Shield	.15
114-26	Speaker	5.50
128-9	Set Case less Covers	2.00
128-10	Top Cover	1.35
128-11	Bottom Cover	1.35
113-30	Terminal Strip Tone Control and Dial Light	.25
142-4	Plug-in Vibrator	4.50
147-19	Flexible Cable Control Bushing	.10
152-2	Battery Cable & Fuse Assembly	.35
152-3	Fuse Insulating Sleeve	.05
152-4	Chassis Battery Cable Assembly	.30
152-6	Antenna Cable	.50
160-11	Mounting Studs Complete with Nut & Washer	.05
169-1	15 Amp. Fuse (3AG-15)	.05
	All Sockets	.10
123-1	Dome Lite Filter	.90
	Plate Antenna	3.50

Part No.	Description	List Price Ea.
	REMOTE CONTROL PARTS	
112-39	Selector Control Shaft	.20
112-41	Idler Gear	.15
112-115	Pointer Shaft	.05
112-85	Volume Control Shaft	.10
112-45	Bezel (Crystal Retainer)	.15
112-46	Celluloid Dial Crystal	.15
112-48	Pointer Shaft Gear	.05
112-114	Glass Dial	.35
112-108	Metal Disc Pointer	.10
116-13	6-8 Volt, T-51 Bulb Bayonet Base	.10
116-9	Pilot Light Assembly	.45
116-11	Tone Control Assembly Unit Complete	.35
131-5	Black Bakelite Remote Control Knobs	.15
134-32	Fibre Dial Mask	.05
146-8	Die Cast Remote Control Mounting Bracket	.30
146-12	Steering Column Strap	.15
146-25	Dash Mounting Bracket	.15
147-3	Selector Control Bushing for 112-39 Shaft	.10
147-4	Volume Control Bushing for 112-43 Shaft	.10
148-25	Flexible Volume Control Cable - 24"	1.50
150-25	Flexible Selector Control Cable - 24"	1.50
151-6	Remote Control Head complete with Steering Column Bracket	5.00
	Dash Mounting Kit (specify make and year of car)	1.25
151-8	Special General Motors Control Head	5.00
112-50	1935 Chevrolet Dash Kit for 151-8	$1.50
112-54	1935 Pontiac Dash Kit for 151-8	$1.50
112-63	1935 Oldsmobile Dash Kit for 151-8	$1.75

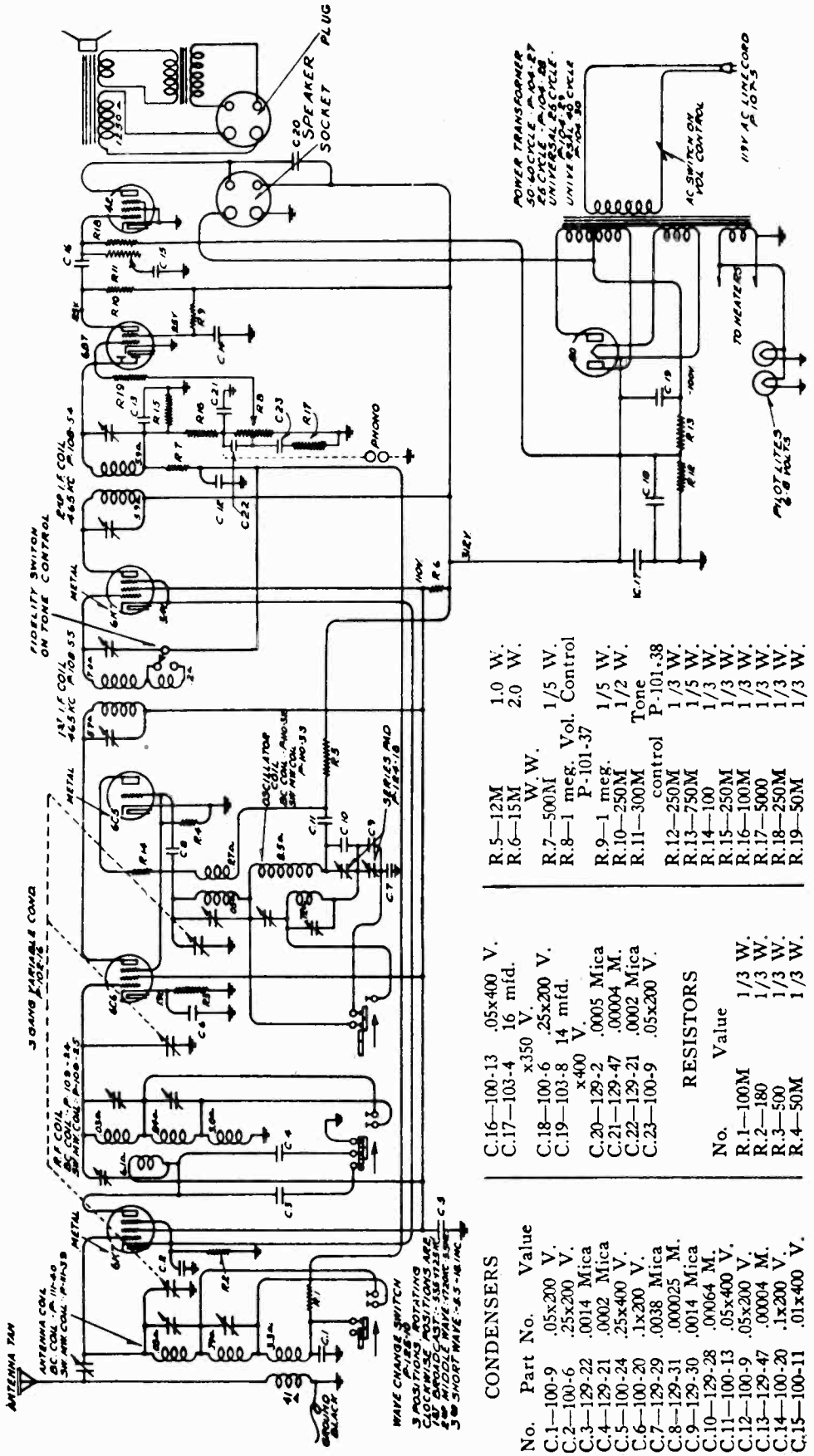
Vibrators can be reconditioned at a cost of $3.00 each, if the old unit is returned.
All resistors are RMA color coded - specify value and/or resistor number (per schematic diagram) and model number.
When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.
Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None.

All prices quoted are list and are subject to the usual trade discounts. Shipments are F.O.B. our Factory. When remitting in advance, please include postage.
WE CANNOT SUPPLY SPEAKER PARTS, CONES, TRANSFORMERS OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $1.50 NET, IF IT IS RETURNED TO OUR FACTORY TRANSPORTATION CHARGES PREPAID.
PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

MODEL 222

MONTGOMERY WARD



CONDENSERS

No.	Part No.	Value
C.1	100-9	.05x200 V.
C.2	100-6	.25x200 V.
C.3	129-22	.0014 Mica
C.4	129-21	.0002 Mica
C.5	100-24	.25x400 V.
C.6	100-20	.1x200 V.
C.7	129-29	.0038 Mica
C.8	129-31	.000025 M.
C.9	129-30	.0014 Mica
C.10	129-28	.00064 M.
C.11	100-13	.05x400 V.
C.12	100-9	.05x200 V.
C.13	129-47	.00004 M.
C.14	100-20	.1x200 V.
C.15	100-11	.01x400 V.
C.16	100-13	.05x400 V.
C.17	103-4	16 mfd. x350 V.
C.18	100-6	.25x200 V.
C.19	103-8	14 mfd. x400 V.
C.20	129-2	.0005 Mica
C.21	129-47	.00004 M.
C.22	129-21	.0002 Mica
C.23	100-9	.05x200 V.

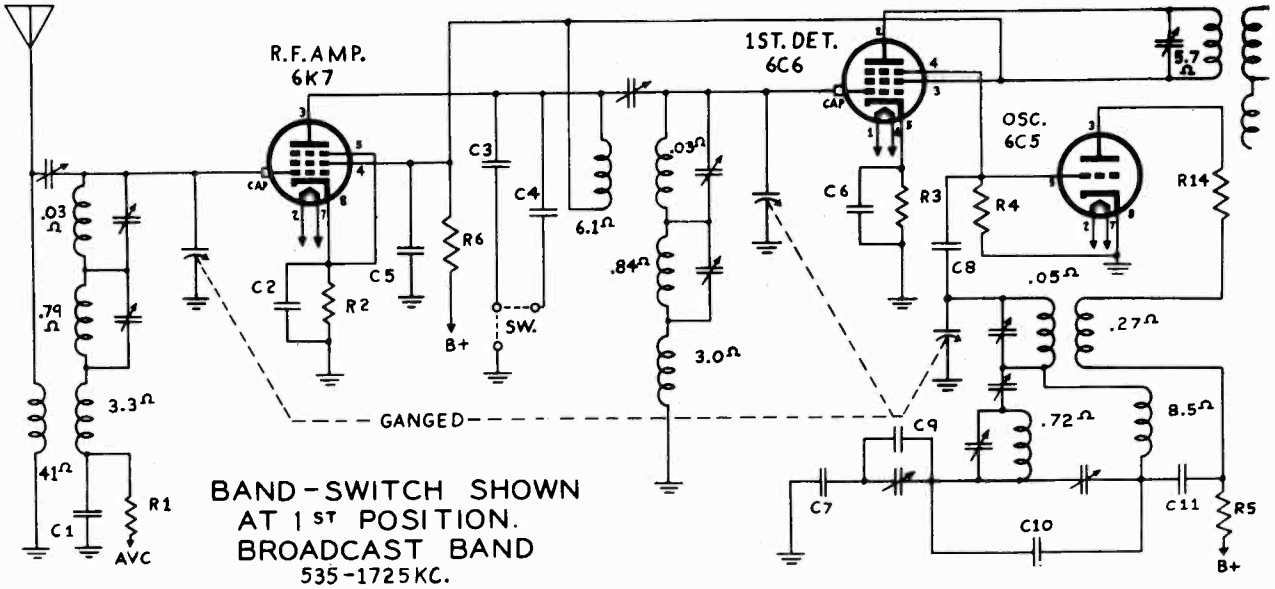
RESISTORS

No.	Value	
R.1	100M	1/3 W.
R.2	180	1/3 W.
R.3	500	1/3 W.
R.4	50M	1/3 W.
R.5	12M	1.0 W.
R.6	15M	2.0 W.
R.7	500M	1/5 W.
R.8	1 meg. Vol. Control P-101-37	
R.9	1 meg.	1/5 W.
R.10	250M	1/2 W.
R.11	300M Tone control	P-101-38
R.12	250M	1/3 W.
R.13	750M	1/5 W.
R.14	100	1/3 W.
R.15	250M	1/3 W.
R.16	100M	1/3 W.
R.17	5000	1/3 W.
R.18	250M	1/3 W.
R.19	50M	1/3 W.

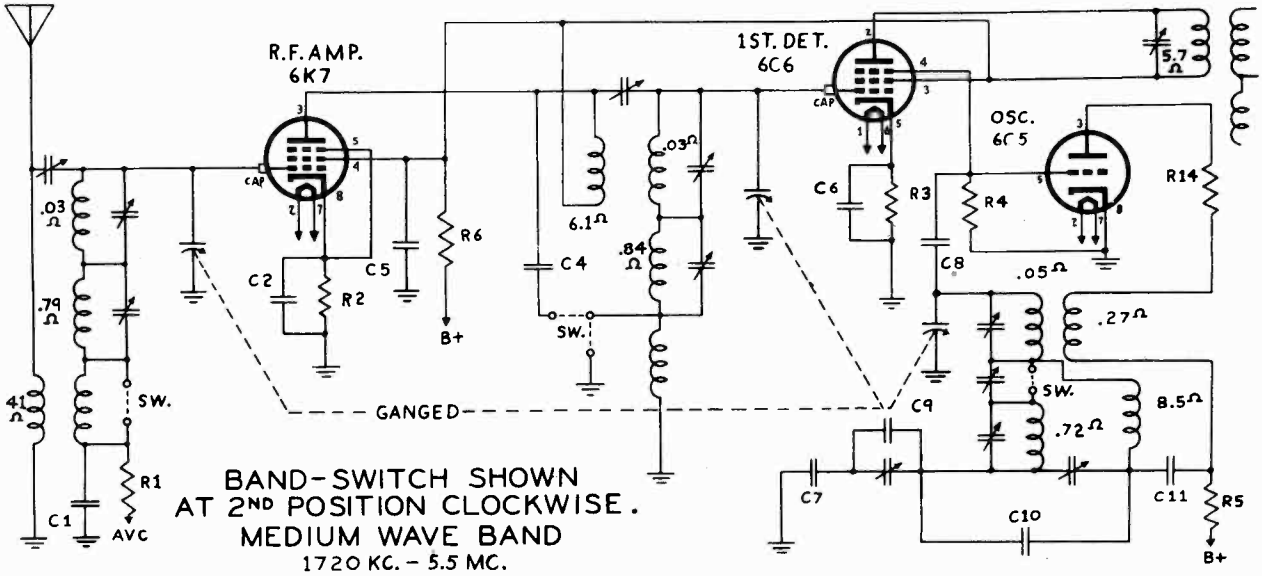
"clarified schematics"

MODEL 222

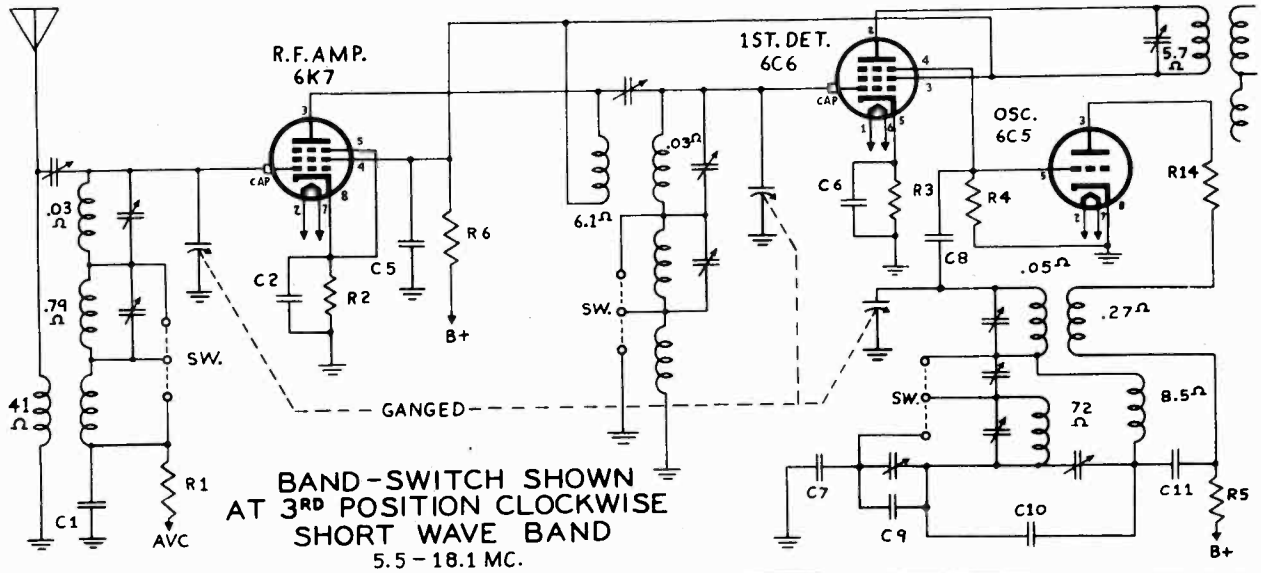
MONTGOMERY WARD



BAND-SWITCH SHOWN AT 1ST POSITION. BROADCAST BAND
535-1725 KC.



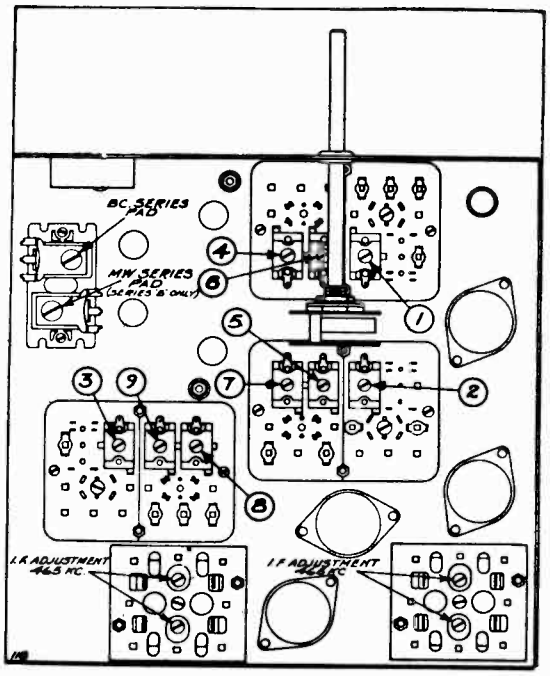
BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE.
MEDIUM WAVE BAND
1720 KC. - 5.5 MC.



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE
SHORT WAVE BAND
5.5 - 18.1 MC.

MONTGOMERY WARD

MODEL 222



ALIGNING INSTRUCTIONS

Dummy Antennas

The following dummy antennas are used in aligning and are referred to in the following alignment instructions as "Dummy 1", "Dummy 2", and "Dummy 3"

Dummy 1: (I.F.)—Consists of a .1 mfd. condenser connected in series with the external oscillator.

Dummy 2: (Broadcast)—Consists of a 200 mmfd. condenser and a 20 ohm resistor connected in series with each other and in series with the external oscillator.

Dummy 3: (Intermediate and Short Wave)—Consists of a .1 mfd. condenser and a 400 ohm resistor connected in series with each other and in series with the external oscillator.

Resonance Indicator:

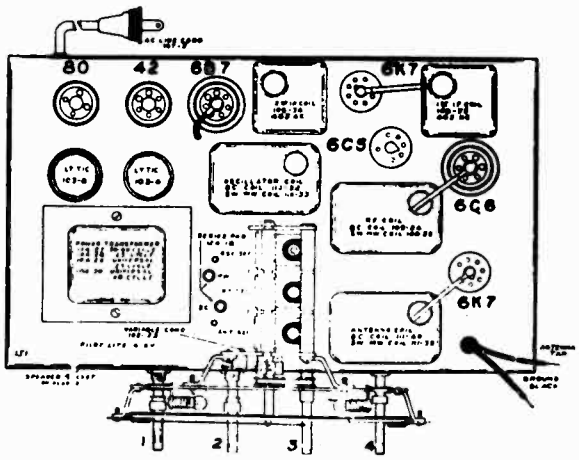
Use as a resonance indicator an output meter connected across the primary of the speaker input transformer or by means of an adapter between the plate and screen terminals of the type 42 output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS (465 K.C.)

Part No. 108-54 Output I.F. Transformer
Part No. 108-56 Input I.F. Transformer

These I.F. transformers have two adjustments, both of which are accessible from the underside of chassis (see bottom view).

1. With volume control full on, (the extreme right of its rotation), the wave changing switch in the broadcast position, (extreme left of its rotation), the tone control on "Hi" part of the sharp position (as much right rotation as possible without operating the Hi Fidelity switch), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with "Dummy 1", to the control grid cap of the type 6K7 tube, located between the two I.F. transformers, and adjust the output I.F. transformer to resonance.
   (b) With "Dummy 1" still connected, move oscillator output clip from grid of 6K7 to grid cap to 6C6 and adjust input I.F. transformer to resonance.
   (c) With oscillator still connected to 6C6, re-adjust output I.F. transformer.



ALIGNMENT PROCEDURE

The following adjustments to be made after the I.F.'s have been aligned as explained above.

BROADCAST BAND ALIGNMENT:

1. With wave changing switch in the broadcast position, extreme left of its rotation, and with external oscillator set at 600 kilocycles and connected in series with "Dummy 2" to the tan antenna and black ground lead, make the following adjustments:
   (a) Adjust broadcast series pad to resonance with oscillator. Keep set in tune with oscillator by slowly rocking to and fro the variable condenser until maximum output is obtained. Note: This adjustment is accessible from the top of the chassis and is located between the variable condenser and the electrolytic condenser. See top view.
   (b) Re-set external oscillator to 1400 K.C., move dial pointer to 1400 K.C. and adjust oscillator (adjustment number 3), R.F. (adjustment number 2) and antenna (adjustment number 1) to resonance. See bottom view for location of these adjustments.
   (c) Repeat adjustments "a" and "b" until sensitivity is at its maximum.

NOTE: IT IS EXTREMELY NECESSARY IN MAKING ALL OF THESE ADJUSTMENTS THAT THE FUNDAMENTAL OSCILLATOR SIGNAL BE TUNED IN AND NOT THE IMAGE FREQUENCY WHICH WILL FALL BELOW THE FUNDAMENTAL.

SHORT WAVE BAND ALIGNMENT:

1. With wave changing switch in the short wave position, extreme right of its rotation, and with external oscillator set at 17 megacycles and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Move dial pointer to 17 megacycles and adjust short wave oscillator (adjustment number 8), short wave R.F. (adjustment number 7) and short wave antenna (adjustment number 6) to resonance.
   (b) Re-set external oscillator to 6 megacycles and pick up signal by rotating variable condenser and check for sensitivity.

INTERMEDIATE BAND ALIGNMENT:

1. With wave changing switch in the intermediate wave position, center of its rotation, and with external oscillator set at 1800 K.C. and connected in series with "Dummy 3" to the tan antenna and black ground lead, make the following adjustments:
   (a) Rotate variable condenser to approximately 1800 K.C., tune in oscillator signal and adjust M.W. series pad (see top view) to resonance. Slowly rock condenser to and fro while making this adjustment to be sure maximum output is obtained.
   (b) Set external oscillator at 5 M.C., rotate condenser, pick up signal and adjust intermediate wave R.F. (adjustment number 5), intermediate wave antenna (adjustment number 4) and intermediate wave oscillator (adjustment number 9) to resonance.
   (c) Re-check broadcast alignment and if it is found necessary to re-adjust either R.F. or antenna trimmers, repeat the 17 M.C. short wave and 5 M.C. intermediate wave adjustments.

MODEL 222

MONTGOMERY WARD

The tube complement of this chassis is as follows:

1—Type 6K7—remote cut-off pentode R.F. amplifier.
1—Type 6C6—pentode first detector.
1—Type 6C5—oscillator.
1—Type 6K7—remote cut-off pentode I.F. amplifier (465 K.C.)
1—Type 6B7 duplex diode pentode second detector, A.V.C. and audio.
1—Type 42—pentode output.
1—Type 80—high vacuum rectifier.

TUNING RANGE—

Standard Broadcast Band 535-1725 Kilocycles.

Intermediate Band 1720-5500 Kilocycles

Short Wave Band 5.5-18.1 Megacycles.

Transformers are available and chassis are sometimes equipped with universal transformers for operation on 40 and 60 cycles and with primary taps for 108, 125, 150, 220 and 250 volts (see instructions) and also sometimes equipped with 25 cycle transformers with 105-115 volt or 220 volt primaries, not universals.

Serial No. 5J154150 and up

Part No.	DESCRIPTION	List Price Each
	CONDENSERS	
100-6	.25 x 200 Volt Tubular Condenser—with Bracket	$0.35
100-9	.05 x 200 Volt Tubular Condenser	.25
100-11	.01 x 400 Volt Tubular Condenser	.25
100-13	.05 x 400 Volt Tubular Condenser	.25
100-20	.1 x 200 Volt Tubular Condenser	.25
100-24	.25 x 400 Volt Tubular Condenser—with Bracket	.35
103-4	16 Mfd. x 350 Volt Electrolytic	1.35
103-8	14 Mfd. x 400 Volt Electrolytic	1.35
118-12	.1 - .25 x 200 Volt Dual Tubular	.50
129-2	.0005 Mica - Type MT - 20%	.25
129-21	.0002 Mica - Type MT - 20%	.25
129-22	.0014 Mica - Type MW - 5%	.25
129-28	.00064 Mica - Type MT - 5%	.25
129-29	.0038 Mica - Type MW - 2½%	.50
129-30	.0014 Mica - Type MW - 20%	.25
129-31	.000025 Mica - Type MT - 15%	.25
129-47	.00004 Mica - Type MT - 30%	.25
	RESISTORS	
130-3	500M Ohm - ½ Watt - 20% - 100 Volts - Carbon	.20
130-11	250M Ohm - ½ Watt - 20% - 50 Volts - Carbon	.20
130-19	1 Meg Ohm - ½ Watt - 20% - 100 Volts - Carbon	.20
130-20	100M Ohm - ½ Watt - 20% - 50 Volts - Carbon	.20
130-22	5M Ohm - ½ Watt - 20% - 10 Volts - Carbon	.20
130-37	750M Ohm - ½ Watt - 20% - 50 Volts - Carbon	.20
130-49	12M Ohm - 1 Watt - 20% - 150 Volts - Carbon	.20
130-52	50M Ohm - ½ Watt - 20% - 10 Volts - Carbon	.20
130-53	180 Ohm - ½ Watt - 10% - 10 Volts - Carbon	.20
130-54	500 Ohm - ½ Watt - 20% - 10 Volts - Carbon	.20
130-60	100 Ohm - ½ Watt - 20% - 10 Volts - Carbon	.20
130-61	15M Ohm - 2 Watt - 20% - 180 Volts - Wire Wound	.40
130-62	250M Ohm - ½ Watt - 20% - 50 Volts - Carbon	.20
	COILS	
108-54	Output I.F. Coil Assembly Complete - Less Can	1.50
108-55	Input I.F. Coil Assembly Complete - Less Can	2.50
109-24	Broadcast R.F. Coil Assembly Complete	.50
109-25	Mid-Wave & Short Wave R.F. Coil Assembly Complete—Less Can	1.50
110-32	Broadcast Oscillator Coil Assembly Complete—Less Can	.50
110-33	Mid-Wave & Short Wave Oscillator Coil Assembly Complete—Less Can	1.00
111-39	Mid-Wave & Short Wave Antenna Coil Assembly Complete—Less Can	1.00
111-40	Broadcast Antenna Coil Assembly Complete—Less Can	.75
	TRANSFORMERS	
104-27	50/60 Cycle Power Transformer	4.50
104-28	25 Cycle Power Transformer	7.00
104-29	Universal - 25 Cycle Primary	7.50
104-30	Universal - 40 Cycle Primary	7.00

Part No.	DESCRIPTION	List Price Each
	SOCKETS	
121-6	Six Prong Type "6C6"	.10
121-6	Six Prong Type "42"	.10
121-7	Seven Prong Type "6B7"	.10
121-9	Four Prong Type "Spkr"	.10
121-9	Four Prong Type "80"	.10
121-12	Seven Prong Type "6K7"	.10
121-17	Six Prong Type "6C5"	.10
	SPEAKER	
114-27	Eight Inch Dynamic Speaker	6.50
114-30	Ten Inch Dynamic Speaker	8.00
	MISCELLANEOUS	
101-37	Volume Control and Switch	1.35
101-38	Tone Control and Fidelity Switch	1.35
102-23	Three Gang Variable Condenser	5.00
107-5	Line Cord & Plug	.50
115-22	Tube Shield	.15
115-35	Antenna, Oscillator and R.F. Shield	.15
115-36	I.F. Shield	.15
124-18	J-5-4D Series Dual Pad	.60
125-16	Wave Change Switch	.90
128-15	Small Wood Knob with Spring	.15
128-16	Large Wood Knob with Set Screw	.20
128-17	Large Wood Knob with Spring	.15

All resistors and mica condensers are RMA color coded—specify value and/or resistor or condenser (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerance Percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More than 20%	None.

When ordering condensers, specify part number, model and/or capacitor (per schematic diagram) and model number.

When ordering parts, always specify part and model number as well as serial number of chassis.

All prices quoted are list and are subject to the usual trade discounts.

Prices subject to change without notice.

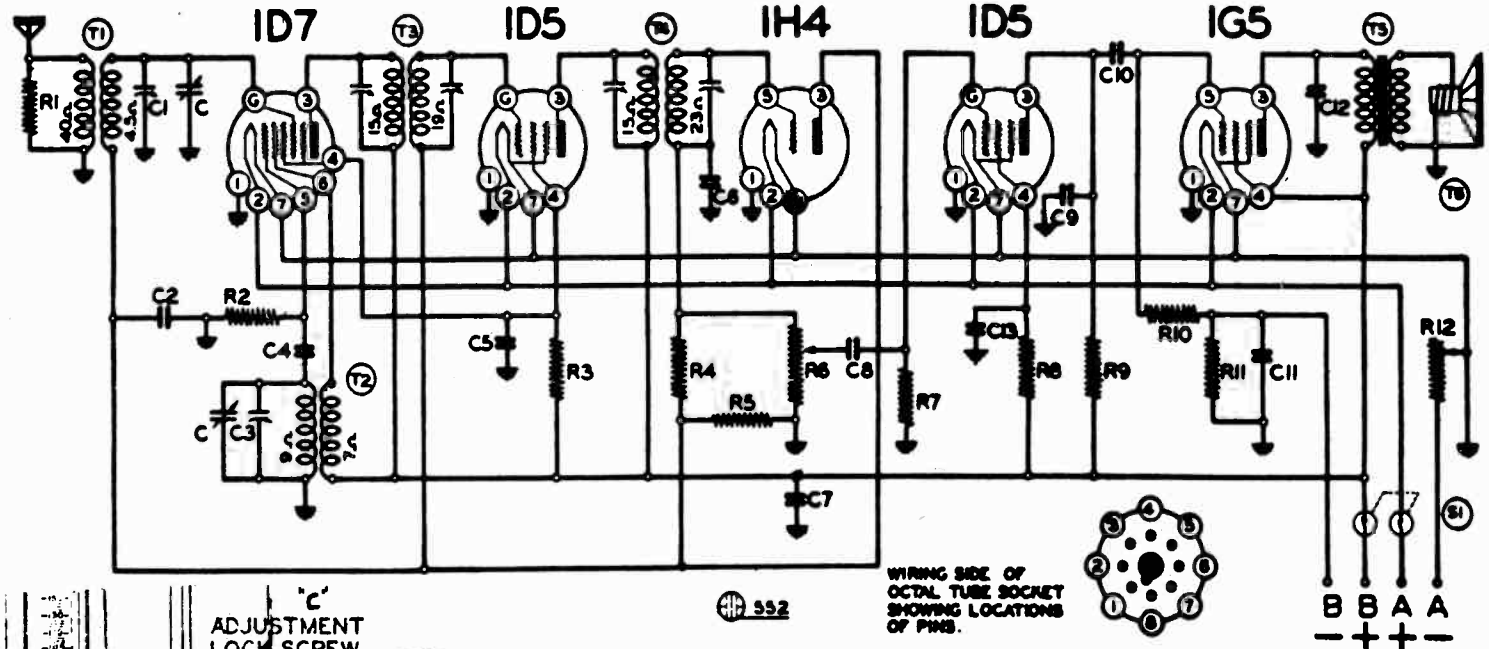
Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER PARTS, CONES, TRANSFORMERS OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $2.50 NET, IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

Part No.	DESCRIPTION	List Price Each
	ASSEMBLIES	
112-133	Belt Take-up Assembly—Including	.25
	1—No. 117-18 Take-up Arm	
	1—No. 117-21 Take-up Pulley	
	1—No. 117-24 Stud for Above	
	1—No. 117-22 Stud	
112-134	Switch Assembly—Including:	.65
	(Specify if Blue or Brown Desired)	
	2—No. 117-16 Band Indicator Arm	
	1—No. 117-15 Link	
	1—No. 117-14 Elbow	
	1—No. 117-13 Link	
	3—No. 117-23 Stud	
	3—No. 131-30 Spring Washer	
	1—No. 117-33 Threaded Stud	
	1—No. 117-22 Stud Red Cellulose	
112-135	Volume Indicator Assembly—Including:	.75
	(Specify if Blue or Brown Desired)	
	1—No. 112-121 Pointer Disc	
	1—No. 117-26 Bushing	
	1—No. 120-5 Spring Clip	
	1—No. 120-7 Coil Spring Fish Line	
	1—No. 117-28 Pulley	
	1—No. 115-15 Set Screw R Red Cellulose	
112-136	Tone Indicator Assembly—Including:	.75
	(Specify if Blue or Brown Desired)	
	1—No. 112-122 Pointer Disc	
	1—No. 117-26 Bushing	
	1—No. 120-5 Spring Clip	
	1—No. 120-7 Coil Spring Fish Line	
	1—No. 117-32 Pulley	
	1—No. 155-15 Set Screw Red Cellulose	
112-137	Dial Plate Assembly—Including:	1.25
	1—No. 117-17 Dial Plate	
	2—No. 117-11 Dial Bracket	
	4—No. 162-4 Rivets	
	2—No. 117-25 Volume & Tone Indicator Studs	
	1—No. 117-19 Bushing for Tuning Shaft	
112-138	Switch Arm Assembly—Including:	.25
	1—No. 117-12 Switch Arm	
	1—No. 147-15 Bushing	
	1—No. 154-4 Set Screw	

DIAL PARTS ONLY

112-117	Tuning Shaft	.05
112-118	Metal Oval Escutcheon Only	1.25
112-119	Dial Pointer with No. 132-8 Screw	.20
112-120	Band Spread Pointer Disc (Specify if Blue or Brown Desired)	.10
112-123	Oval Glass Crystal Only	.35
112-124	Glass Dial Scale	1.25
112-125	Drive Belt	.20
112-126	Pilot Light Socket	.10
112-127	Pilot Light Socket	.10
112-139	Oval Glass Retaining Ring	.10
116-5	6-8 Volt, T-50 Pilot Light	.10
117-20	Drive Belt Pulley and Set Screw	.10
117-29	Background Plate (Specify if Blue or Brown Desired)	.25
117-30	Reflector Plate	.25
120-4	Drive Belt Take-up Coil Spring	.05
131-33	Glass Retaining Clips	.025



INTERMEDIATE FREQUENCY 465 K.C.

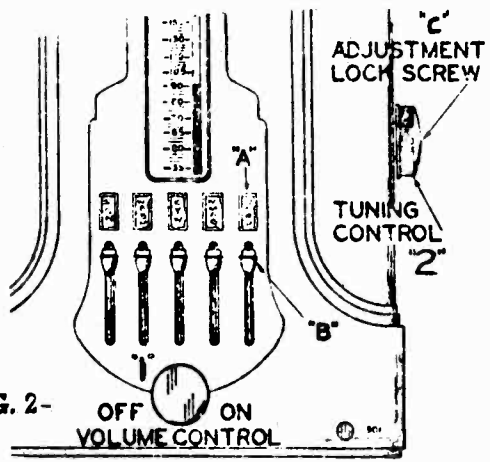


FIG. 2-

PROCEDURE FOR SETTING THE AUTOMATIC LEVERS:

There are five levers on the dial by means of which five stations may be selected, (See "B" Fig. 2).

Make a list of local stations you tune in regularly; any number up to and including five.

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

Above each automatic tuner lever an opening in the escutcheon is provided for inserting the call letter tabs (See "A" Fig. 2).

Insert the call letter tabs in the rectangular openings in the escutcheon above each of the automatic tuner levers. One of the small celluloid tabs supplied should be snapped into place over each of the station call letter tabs.

-6-38

Press DOWN ALL THE WAY any one of the automatic tuner levers. Holding it down FIRMLY, tune in by means of the tuning knob (No. 2) the station indicated on the station call letter tab above this lever. Turn the tuning knob very slowly back and forth (while still holding lever in downward position) until the signal is clearest. The station will then be accurately tuned in. Release the lever.

Press down another automatic tuner lever. Holding it down FIRMLY, carefully tune in the station indicated on the call letter tab above this lever. Release this lever.

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

Now hold tuning knob securely with left hand to prevent it from turning, or Rotate the tuning knob (No. 2) to the right (clockwise) as far is it will turn and with a coin (half dollar), tighten the special locking screw ("C") in the center of the tuning knob, (See Fig. 2).

It is VERY IMPORTANT that this locking screw is turned until it is ABSOLUTELY TIGHT.

This screw will lock in place all the stations you have selected on the automatic tuner levers. (Note: Locking screw "C" is loose when radio is shipped from factory).

MODEL 559 MONTGOMERY WARD

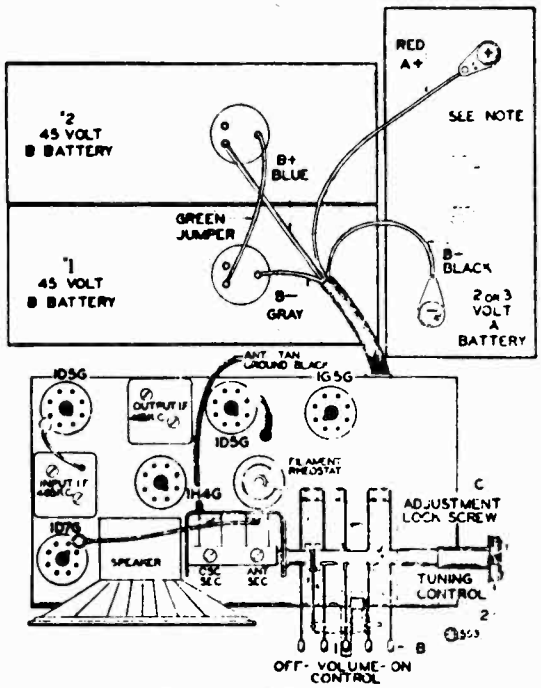


FIG. 1—TOP VIEW

Connecting "A" Battery

First—Place the A Battery as shown in Fig. 1, (Either the 2 volt Storage A or the 3 Volt Dry A).

Next—Connect the Red wire marked A plus (+) to the A plus (+) Red post on battery.

Now—Connect the Black wire marked A minus (—) to the A minus (—) post on battery.

CAUTION: Before connecting a 3-volt dry A Battery, read the instructions which are attached to the bottom of the cabinet. NOTE: A special connector plug is supplied for connecting the "A" leads to a 3-volt dry "A" battery which has socket connections, (see dotted lines on "A" battery in Fig. 1).

Connecting "B" Batteries

First—Place both B Batteries exactly as shown.

NEXT—Insert the special three-prong connector plugs into the sockets on the B batteries as shown in illustration.

NOTE:—The above procedure and illustration pertains to the new style B batteries which have sockets; however, the old style B batteries which have terminals can be used by connecting them as follows:

FIRST—Remove the special plugs by cutting the wires off at the plugs.

NEXT—Connect grey colored B minus (—) wire to minus (—) terminal of battery (marked Battery No. 1 in illustration).

NEXT—Connect one end of green connecting wire to plus (+45) terminal of battery No. 1 and other end to the minus (—) terminal of Battery No. 2.

NOW—Connect blue B plus (+) wire to the plus (+45) terminal of Battery No. 2.

DESCRIPTION:

TUBES:

The tube complement of this chassis consists of the following tubes:

1—Type 1D7G Pentagrid Mixer, First Detector-oscillator.

1—Type 1D5G. Remote Cut-off Pentode, I.F. Amplifier (465 K.C.)

1—Type 1H4G Triode Second Detector, A.V.C.

1—Type 1D5G First Audio Amplifier.

1—Type 1G5G Pentode Output Amplifier.

SERVICE NOTES:

Voltages taken from different points of circuit to chassis are measured with volume control full on, all tubes in their sockets and speaker connected, with a volt meter having a resistance of 1000 ohms per volt.

All voltages as indicated on diagram are measured with a new set of batteries.

Resistances of coil windings are indicated in ohms on the schematic circuit diagram.

To check for open by-pass condensers, shunt each condenser with another condenser of the same capacity and voltage rating, which is known to be good, until the defective unit is located.

The approximate current consumption is as follows:

"A"—300 ma., "B"—15 ma.

Failure to operate, noisy or weak reception is usually due to defective tubes, the tubes making poor contact with sockets or grid clips making poor contact with the caps of the tubes. Tubes may be checked very easily by replacing with other tubes which are known to be good.

ALIGNING INSTRUCTIONS:

CAUTION:—No aligning adjustments should be attempted without first thoroughly checking over all other possible causes of trouble, such as poor installations, open or grounded antenna systems, low battery voltage, defective tubes, condensers and resistors. In order to properly align this chassis, an oscillator (generator) is absolutely necessary. No aligning adjustments should be attempted with the chassis in the cabinet.

(See part 5, for instructions on how to remove chassis from cabinet).

All adjustments should be made with a non-metallic screw driver.

RESONANCE INDICATOR:

Use as a resonance indicator an output meter connected across the primary of the speaker input transformer, or by means of an adapter between the plate and screen terminals of the type 1G5G output tube. Maximum deflection of the meter indicates resonance. Use only enough signal to get a readily readable output. A low range output meter or the low scale of a multi-range meter should be used.

ALIGNING I.F. TRANSFORMERS: (465 K.C.):

Part No. 108112. Output I.F. Transformer.

Part No. 108111. Input I.F. Transformer.

These I.F. transformers have two adjustments, both of which are accessible from the top of chassis (see Fig. 1).

1. With volume control full on (the extreme right of its rotation), and with the variable condenser set to approximately 1400 kilocycles, make the following adjustments:
   (a) Connect external oscillator set at 465 kilocycles, in series with .1 mfd condensor, to the control grid cap of the type 1D5G I.F. tube, and adjust the output I.F. transformer (No. 108112) to resonance.
   (b) Move oscillator output clip from grid of 1D5G to grid of 1D7G and adjust input I.F. transformer (No. 108111) to resonance.
   (c) With oscillator still connected to 1D7G, readjust output I.F. transformer (108112) if necessary.

R. F. ALIGNMENT: (535-1720 K.C.)

1. With the gang condenser in its minimum capacity position, plates entirely out of mesh, connect an external oscillator in series with a 100 mmf. condensor to the antenna lead and chassis ground and make the following adjustments:
   (a) With external oscillator set at 1720 kilocycles, adjust oscillator trimmer to resonance. This adjustment is on the top of rear section of variable gang condenser. (See Fig 1).
   (b) Re-set external oscillator to 1400 kilocycles, rotate condenser, pick up oscillator signal and adjust antenna trimmer to resonance. (Top of front section of gang condenser).
   (c) Check sensitivity at 600 and 1000 kilocycles.

VOLTAGES AT SOCKETS

Volume Control: Maximum
Readings taken with 1000 ohm-per-volt meter

Antenna Shorted to Ground

		Voltage Between Socket Prong and Ground							
TUBE	FUNCTION	Prong No. 1	Prong No. 2	Prong No. 3	Prong No. 4	Prong No. 5	Prong No. 6	Prong No. 7	Prong No. 8
1D7G	Converter	0	+2	+83.5	+60	—15	+83.5	0	0
1D5G	I. F. Amplifier	0	+2	+83.5	+60	0	0	0	+83.5
1H4G	2nd Detector, AVC	0	+2	0	0	0	0	0	0
1D5G	1st Audio	0	+2	+30	+11	0	0	0	+83.5
1G9G	Output	0	+2	+80	+83.5	—2.5	0	0	— 6.5

LIST OF REPAIR PARTS (Serial No. 197000 and up)

Part No.	Circuit Diagram Reference	Description	List Price Each
		CONDENSERS	
1009	C5, C13	.05 x 200 Volt Tubular Condenser	.25
10011	C8, C10	.01 x 400 Volt Tubular Condenser	.25
10022	C2	.05 x 200 Volt Tubular Condenser	.25
10048	C7	.25 x 200 Volt Tubular Condenser (with Bracket)	.35
10071	C12	.004 x 400 Volt Tubular Condenser	.25
11952	C11	25MFD x 25W. Volt Electrolytic Condenser	.75
1292	C9	.005 Mica Type Condenser—20%	.25
1295	C6	.0001 Mica Type Condenser—20%	.25
12912	C4	.00025 Mica Type Condenser—20%	.25
		RESISTORS	
1309	R9	200M ohm - 1/3 Watt Resistor—20%	.20
13012	R2	50M ohm - 1/3 Watt Resistor—20%	.20
13017	R3	10M ohm - 1/3 Watt Resistor—20%	.20
13019	R7, R8, R10	1 megohm - 1/3 Watt Resistor—20%	.20
13021	R1	20M ohm - 1/3 Watt Resistor—20%	.20
13038	R4, R5	2 megohm - 1/3 Watt Resistor—20%	.20
13093	R11	450 ohm - 1/3 Watt Resistor—10%	.20
		COILS	
108111	T3	Input I. F. Coil Assembly Complete With Can	1.25
108112	T4	Output I. F. Coil Assembly Complete with Can	1.25
11085	T2	Oscillator Coil Assembly Complete	.50
11192	T1	Antenna Coil Assembly Complete	.60
		SOCKETS	
12193		Eight Prong Octal Sockets	.15
12194		Seven Prong Octal Sockets	.15
		SPEAKER	
114118	T6	Five Inch P. M. Dynamic Speaker	4.00
10557	T5	Output Transformer for Speaker	.90
		MISCELLANEOUS	
101116	R6, S1	Volume Control and Switch (1 Megohm)	1.00
101117	R12	Filament Rheostat Complete (4.75 ohms)	.50
10267	C	Two Gang Variable Condenser	3.00
10557	T5	Output Transformer for Speaker	.90
107168		Battery Connector Cable Complete	.75
11549		Goat Type Tube Shield Complete with 11548 Clamp	.15
117133B		Brass Bushings for Mounting Bottom Plate	.02
11848C		Bottom Cover Plate for Chassis	.35
12135		Plug for "B" Battery	.10
12198		Plug for "A" Battery	.10
13195		Battery Connector Lug Marked A—	.02
13196		Battery Connector Lug Marked A+	.02
128134E		Black Bakelite Volume Knob	.10
128134BR		Walnut Bakelite Volume Knob	.10
128134W		Ivory Bakelite Volume Knob	.10
128137E		Black Bakelite Tuning Knob	.15
128137BR		Walnut Bakelite Tuning Knob	.10
128137W		Ivory Bakelite Tuning Knob	.15
128142E		Black Bakelite Cabinet Complete Including Baffle, Grill Cloth and Carton	3.00
128142BR		Walnut Bakelite Cabinet Complete Including Baffle, Grill Cloth and Carton	3.00
128142W		Ivory Bakelite Cabinet Complete Including Baffle, Grill Cloth and Carton	5.00
128101		Baffle Board	.10
128129		Grill Cloth Back and Front	.15
128102B		Grill Cloth, For Side	.05
13282		No. 6 x 32 x ¼ Bottom Plate Mounting Screws, Doz.	.07
132144		No. 10 x 32 x ¾" Fibre Screw (Four used to Hold Chassis to Bottom Plate)	.10
13448B		Rubber Grommet (For Bottom Plate)	.03
13466E		Black Felt Shield for Lever Openings in Cabinet	.05
13466BR		Walnut Felt Shield for Lever Openings in Cabinet	.05
13466W		Ivory Felt Shield for Lever Openings in Cabinet	.05

Tubes are coded and guaranteed by the tube manufacturer.

Prompter service can be rendered on adjustments if defective tubes are returned direct to the tube manufacturer rather than through our factory.

All resistors are RMA color coded—specify value and/or resistor number (per schematic diagram) and model number.

When ordering condensers, specify part number, model number and/or capacitor (per schematic diagram) and model number.

Mica condensers are coded with an additional dot indicating tolerance:

Tolerence percent	Color of Dot
2½%	White
5%	Green
10%	Blue
15%	Yellow
20%	Red
More Than 20%	None

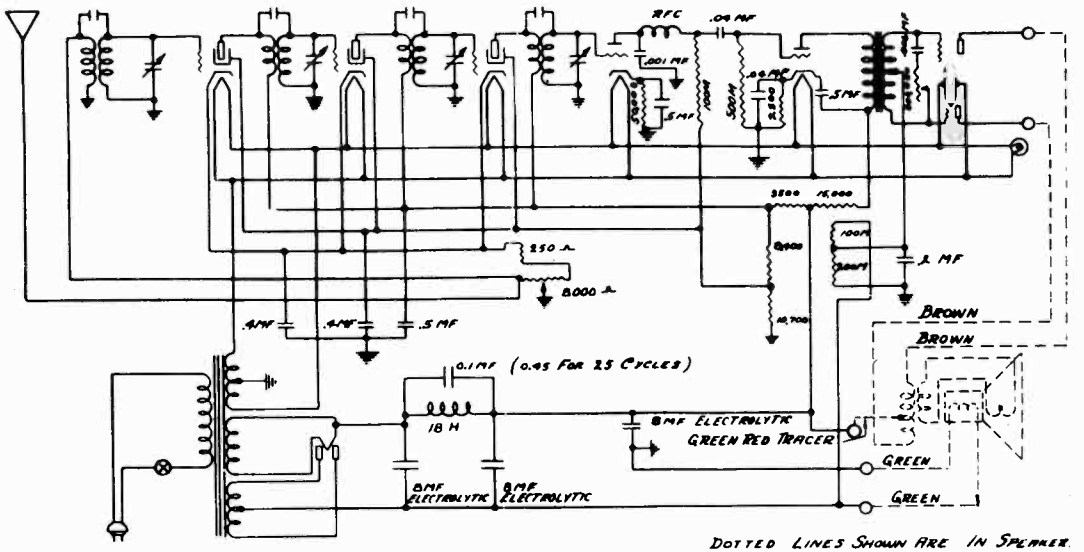
All prices quoted are list and are subject to the usual trade discounts. Shipments are F.O.B. our Factory. When remitting in advance, please include postage.

WE CANNOT SUPPLY SPEAKER CONES OR FIELDS SEPARATELY. WE CAN REPLACE OR REPAIR A DAMAGED SPEAKER FOR $1.25 NET, IF IT IS RETURNED TO OUR FACTORY, TRANSPORTATION CHARGES PREPAID.

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

DIAL PARTS LIST

112336		Clear Pyralin Tabs for Station Call Letter Tabs, Doz.	.10
112348		Set of 4 Sheets Station Call Letter Tabs, Set	.15
112370		Top and Bottom Wood Pulley Complete with 117287 Shaft for Indicator Film	.05
112371		Drive Drum for Indicator Film	.10
112372		Indicator Film	.05
112374		Center Wood Idler Pulley for Indicator Film	.03
112376		Dial Scale (Calibrated)	.35
115134		Support Bracket for Automatic Tuning Mechanism (Mounts to Variable Condenser)	.10
115135		Support Bracket for Automatic Tuning Mechanism (Right End of Mechanism)	.10
115136		Lever Complete with 117-290 Roller	.25
115144		Dial Bracket Housing (For Dial Scale)	.20
117256		Brass Spacer (Used on Cam Shaft Between Second and Third Tuner Cam on Left Side of Tuner Assembly)	.05
117257		Locking Screw for Tuning Knob	.10
117258		Tuner Cam	.05
117283		Locking Collar (For Right End of Cam Shaft)	.15
117359		Spacers (Used on Cam Shaft to Mount Dial Housing Assembly)	.05
117285		Brass Spacer (Used on Cam Shaft Between Drive Drum and Tuner Cam to Left of Drive Drum	.05
117286		Brass Spacer (Used on Cam Shaft Between Drive Drum and Tuner Cam to Right of Drive Drum)	.05
120156		Hair Pin Spring for Tuner Lever	.02
120163		Take-Up Spring for Indicator Film	.05
128128		Moulded Button Keys for Automatic Tuner Levers	.10
13143		Cinch Buttons (Used to Fasten Dial Scale to Dial Housing)	.03
131141		Compression Spring Washer (Used Between Locking Collar and first Tuner Cam on Right End of Cam Shaft)	.02
131157		Key Washers (Used on Each Side of Tuner Cams)	.02



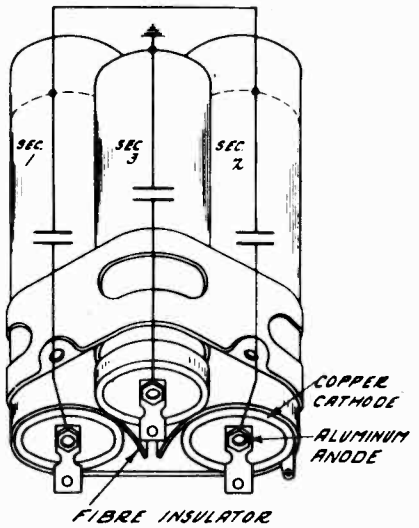


Figure 4

Condenser Block

This is of the electrolytic type having three sections of eight M.F.D. capacity respectively. Very little trouble should be experienced with this condenser as it is self healing in case it breaks down. The connections are shown in Fig. 4.

Loud Speaker

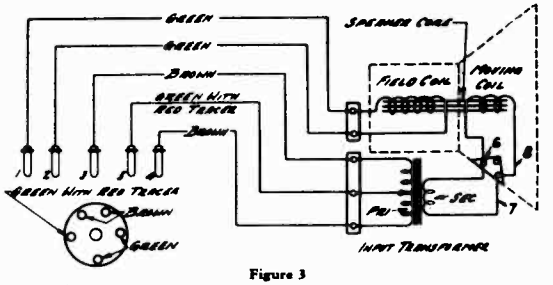


Figure 3

Fig. 3 shows the loud speaker connections and color code of wiring. The field has a resistance of 1000 ohms and is part of the filter circuit. It must therefore be connected at all times or the chassis will not operate. The speaker input transformer is mounted on the speaker chassis. The primary has a center tap connected to the positive high voltage side of the power pack and it is through this primary that the 245 tubes receive their plate supply. The secondary is a low impedance winding connecting to the voice coil of the speaker. The speaker and input transformer may be easily tested by temporarily connecting another speaker which is known to be good. Additional speakers may be used as explained on Page 7 of the instructions for the 2955 chassis, but this is not recommended.

Gang Condenser

The gang condenser is of heavy construction and all trimming condensers are aligned at the factory and set. Very seldom do they need adjustment, however, if you are positive they are out of line they may be adjusted by means of a small modulated oscillator or signal as explained on page 3 of the 2955 service manual. The trimming condensers are located directly beneath the four holes of the condenser shield. Begin by adjusting the condenser next to the tuning dial and adjust each one carefully, always making sure that your main tuning knob is adjusted to exact resonance. Align trimming condensers with the tuning dial as near 1400 kilocycles as possible. No trimming condenser adjustment is necessary for the detector stage.

Neutralizing

The screen grid tube has such a small capacity between grid and plate that no neutralizing is necessary. There is usually as much capacity between the grid and plate prongs of the tube socket and the wiring in the chassis as there is in the tube itself.

Volume Control

The volume control is wire wound and has a resistance of 8000-ohms. It is so connected as to serve a dual purpose by varying the amount of energy to the antenna input transformer and also controlling the grid bias on the three screen grid tubes. The on, off switch is also operated from the projecting stud attached to the arm of the control.

Pilot Light

The pilot is a 3.2-volt bulb, and is shown in the schematic diagram connected to the filament line supplying the heater tubes and 245s. A flickering pilot light is caused by a defective bulb, a poor socket, a loose connection in one of the leads, or by a poorly soldered joint.

Operating Voltages

VOLTAGES AT SOCKETS—VOLUME CONTROL AT MAXIMUM—LINE VOLTAGE, 115 PLUG IN SOCKET OF RECEIVER—TUBE IN TEST SET

Type of Tube	Position of Tube	Function	A Volts	B Volts	Control Grid C Volts	Screen Volts	Screen Current MA	Cathode Volts	Plate MA	Grid Test MA
224	1	1st Radio	2.25	178	3.0	86	.45	3.0	3.4	5.8
224	2	2nd Radio	2.25	178	3.0	86	.45	3.0	3.4	5.8
224	3	3rd Radio	2.25	178	3.0	86	.45	3.0	3.4	5.8
227	4	Detector	2.25	60	9			9	.25	.3
227	5	1st Audio	2.25	160	12			12	4.5	5.5
245	6	2nd Audio	2.35	246	40				25	30
245	7	2nd Audio	2.35	246	40				25	30
280	8	Rectifier	4.9					Per plate		37

25 Cycle Chassis No. 3067 and 3037

This chassis is the same as the 60 cycle with the exception of the power transformer and the filter choke condenser. A 0.45 M.F. condenser is connected across the choke in the 25 cycle chassis, instead of the 0.1 M.F. condenser as in the 60 cycle chassis. Service instructions are the same for both.

For Parts list, see P.15-97

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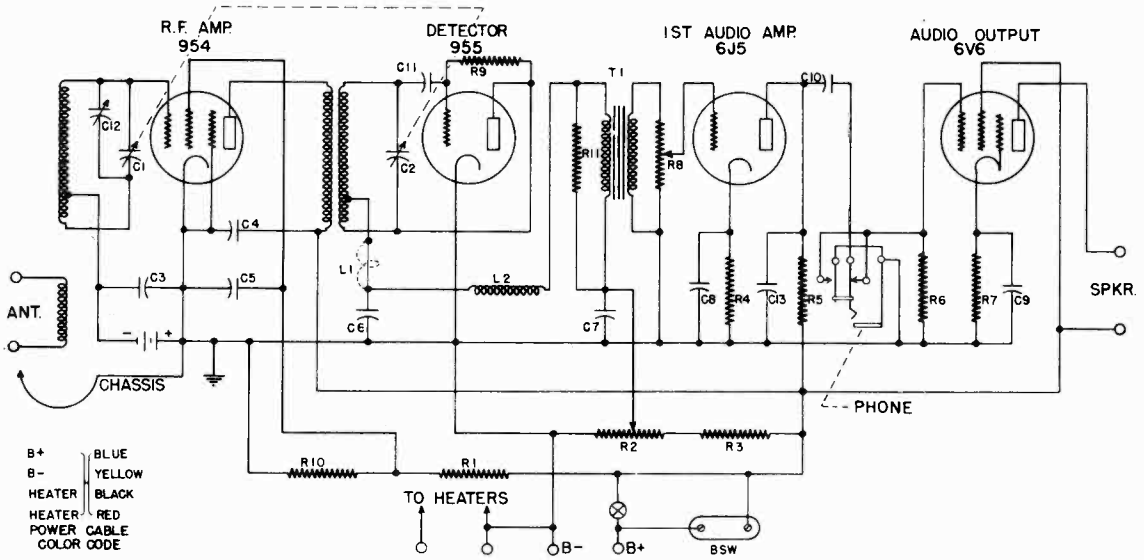

DWG. NO. 1 SCHEMATIC DIAGRAM—TYPE 1-10A RECEIVER

PARTS LIST

SYMBOL	FUNCTION	TYPE	RATING
C1	R.F. Tuning Capacitor.....	Air	15 mmf., max.
C2	Detector Tuning Capacitor.....	Air	15 mmf., max.
C3	R.F. Grid Return By-pass.....	Mica	0.003 mfd., 500 vdcw.
C4	R.F. Plate Return By-pass.....	Mica	0.003 mfd., 500 vdcw.
C5	Screen By-pass.....	Copper Plate	0.0005 mfd.
C6	Quench Frequency By-pass.....	Mica	0.003 mfd., 500 vdcw.
C7	Detector B+ By-pass.....	Elec.	8 mfd., 200 vdcw.
C8	1st Audio Cathode By-pass.....	Elec.	10 mfd., 50 vdcw.
C9	2nd Audio Cathode By-pass.....	Elec.	10 mfd., 50 vdcw.
C10	Audio Coupling Capacitor.....	Paper	0.1 mfd., 400 vdcw.
C11	Detector Grid Capacitor.....	Ceramic	50 mmf., 500 vdcw.
C12	R.F. Trimmer Capacitor.....	Air	5 mmf., max.
C13	Plate By-pass Capacitor.....	Mica	0.002 mfd., 500 vdcw.
R1	Screen Dropping Resistor.....	Fixed	33,000 ohms, 1/2 w.
R2	Regeneration Control.....	Variable	50,000 ohms
R3	Detector Plate Dropping.....	Fixed	22,000 ohms, 1 w.
R4	1st Audio Bias Resistor.....	Fixed	4,700 ohms, 1/2 w.
R5	1st Audio Plate Resistor.....	Fixed	0.1 megohm, 1/2 w.
R6	2nd Audio Grid Leak.....	Fixed	0.47 megohm, 1/2 w.
R7	2nd Audio Bias Resistor.....	Fixed	470 ohms, 1 w.
R8	Audio Gain Control.....	Comp. Var.	0.5 megohm
R9	Detector Grid Leak.....	Fixed	18 megohms, 1/2 w.
R10	Screen Bleeder.....	Fixed	47,000 ohms, 1/2 w.
R11	T1 Pri. Loading Resistor.....	Fixed	47,000 ohms, 1/2 w.
L1	Ultra-audion Choke.....	See Note #1	
L2	Quench Frequency Choke.....	Potted	250 millihenries
T1	Audio Transformer.....	Potted	4:1 ratio

Note #1: Used only on A, B and C Bands.

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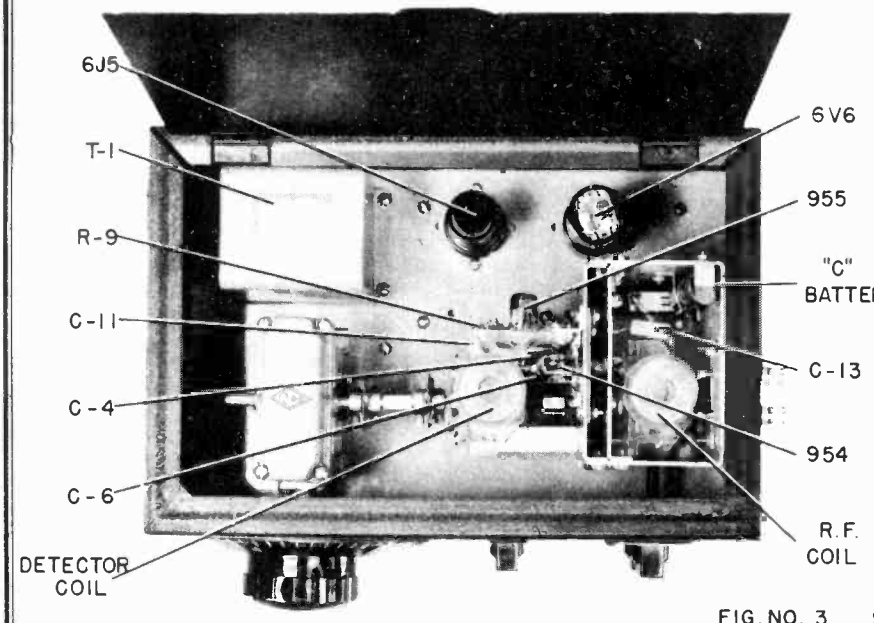
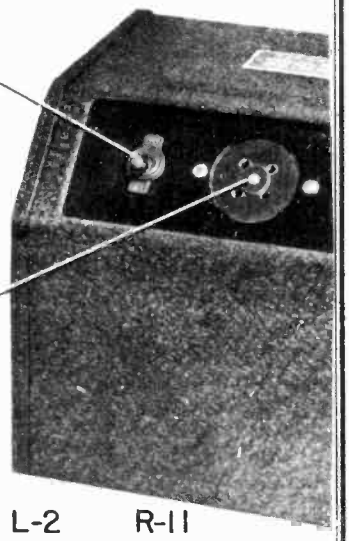


FIG. NO. 3



5886 POWER UNIT
FIG. NO. 4

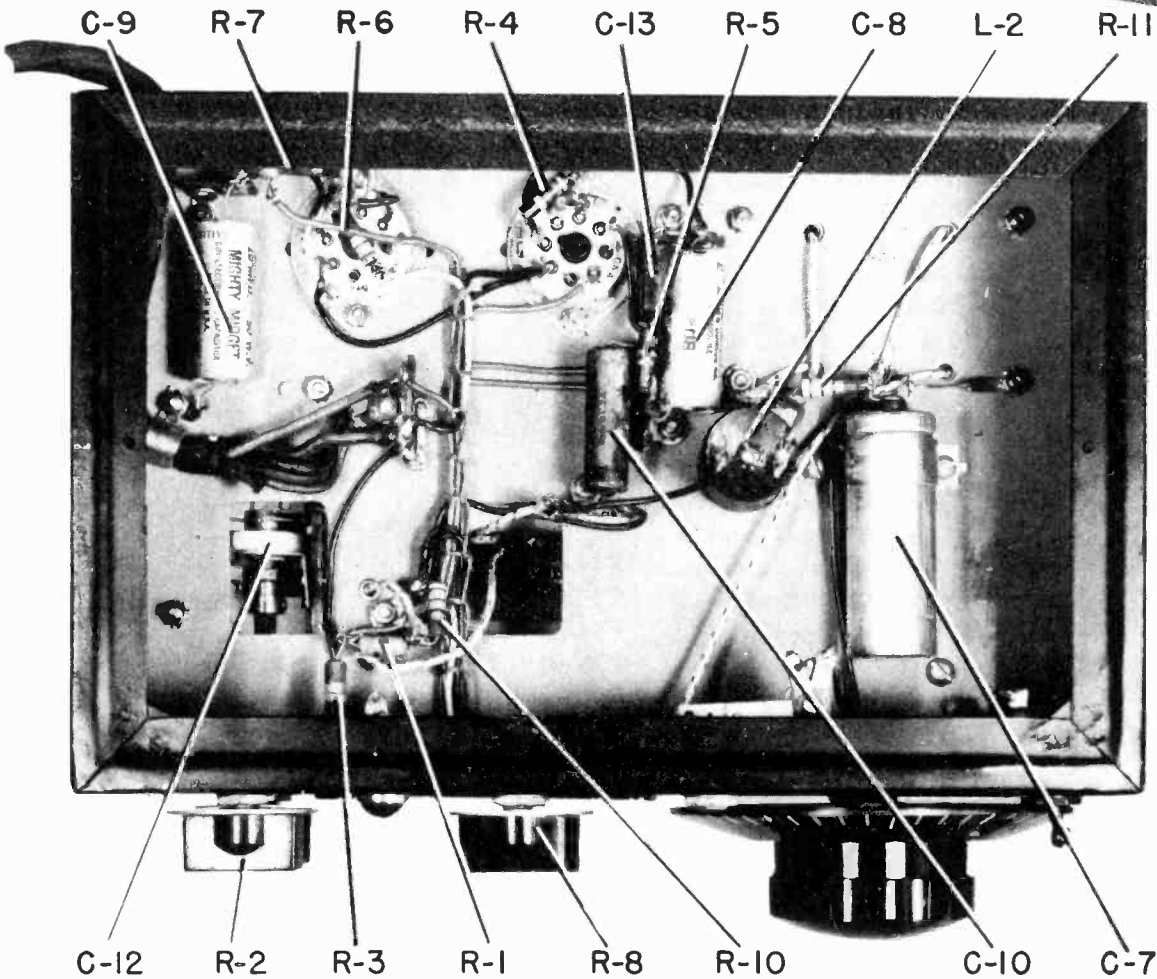


FIG. NO. 5

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THE 1-10A RECEIVER

A complete National 1-10A communications equipment consists of the 1-10A Radio Receiver, #5886 Power Supply, and a MCS 8" PM dynamic loud-speaker with matching transformer in matching cabinets for table mounting installation.

CIRCUIT

The 1-10A Receiver employs a 4-tube circuit, consisting of one stage of tuned R.F., a self-quenching superregenerative detector, transformer coupled to a first stage of audio which, in turn, is resistance coupled to a power output stage.

TUNING SYSTEM

The tuning capacitors C1 and C2 plus 6 pairs of plug-in type coils are used to tune the frequency range of the receiver in six tuning bands. The frequency coverage and calibration curve of each band is shown in Fwg. 2.

The various coils are stamped "A-1", "A-2", "B-1", "B-2" etc., definitely identifying each coil. These coils are used in pairs, the letter designating the band and the number indicates the circuit position. The coil sockets of the R.F. and detector stages are marked "1" and "2", respectively, to correspond with the coil designations. The location of these coils make them readily accessible for band changing. It should be borne in mind, however, that the high frequency coils, (particularly the "A-1"), must be pushed down in the socket as far as they will go. If they are not, the inductance of the primary and secondary circuits will be increased and the calibration of the circuit will be altered.

POWER SUPPLY

The 1-10A Receiver is designed for operation from National type 5886 power unit, all voltage dividers, etc., being built in so that but one B voltage lead is necessary. The 5886 power unit is designed for operation from a 105-120 volt, 50-60 cps A.C. supply source. This power supply furnishes six volts at 1.6 amperes to the heater circuit and 180 volts at 35 milliamperes to the plate and screen circuits. A 3 volt C battery is used to supply bias to the R.F. tube. This battery is mounted in the rear right-hand corner of the R.F. compartment, being held in place by a spring clip. Two Everready type 915 cells, or equivalent, are needed. They are mounted in a bakelite tube and the positive (center) terminal of the upper cell is grounded at the top by a retaining bracket.

The 1-10A Receiver may be operated from batteries permitting portable or emergency operation. The operator is cautioned that either the loud-speaker connection or a jumper across the output terminals be maintained at all times. Failure to do this breaks the B supply to the plate of the 6V6 tube and places excessive voltage on the screen of the tube. This may result in serious damage to the tube.

If remote stand-by control is desired make a connection from the terminal on the BSW terminal panel to an external switch or relay.

BATTERY OPERATION

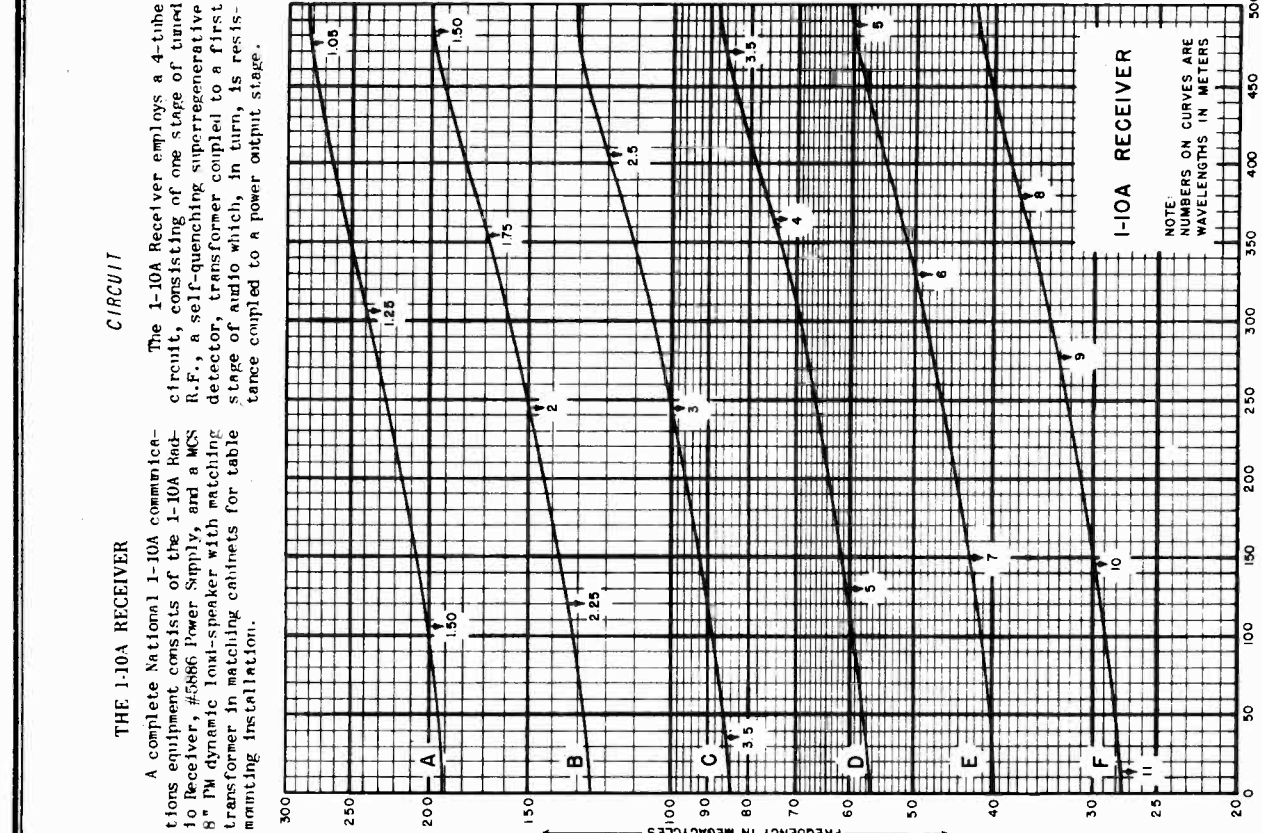
The 1-10A Receiver may be operated in portable or emergency service by connecting batteries to the pins of the 4 prong power plug. A 6 volt battery should be used to supply the heater circuits, (the two large prongs on the power plug), and the plate and screen circuit requirements from B batteries. To effect battery economy, the 6V6 may be removed from its socket and headphone operation used. Voltages in excess of 180 are not recommended and receiver performance will be unsatisfactory on the "A" range at voltages below 167. If lower voltages must be used, as in portable operation, resistors R1 and R3 may both be shorted out. This will allow the receiver to function normally with a maximum voltage of 90, but with reduced audio output.

In battery operation aging A and B batteries with a resultant decreasing voltage supply may render the receiver inoperative. This effect will first be noticed at the extreme ends of the "A" band.

The B supply "On/Off" Switch functions to break the positive B supply lead and in the "Off" position is useful for temporarily rendering the receiver inoperative during periods of transmission, or when changing coils, while permitting the heater circuits to remain closed. When using B battery plate supply, the switch should be thrown to the "Off" position at all times when the receiver is not in use, in order to avoid parasitic drain.

The Regeneration control functions to adjust the level at which the detector circuits go into superregeneration. This condition is indicated by a loud rushing or hissing noise. The hiss will drop down to a very low level or disappear entirely when a signal is tuned in, the reduction depending somewhat upon signal strength. Sensitivity will depend upon the adjustment of the Regeneration control, the maximum occurring just beyond the point where the hiss starts. The setting of the Regeneration control at which the detector goes into superregeneration will vary with different sets of coils and with the condition of the 6V6 detector tube. On the "A" range it may be necessary to advance the control to the full "On" position as the detector tube begins to wear out.

A BSW terminal panel is mounted at the rear of the receiver chassis. These terminals are connected in parallel with the B supply switch. If external (remote) stand-by control is desired, it can be accomplished by connecting a switch or relay to the terminals provided on the BSW terminal panel.



DWG. NO. 2 CALIBRATION CURVES

MODEL NC-2-40C

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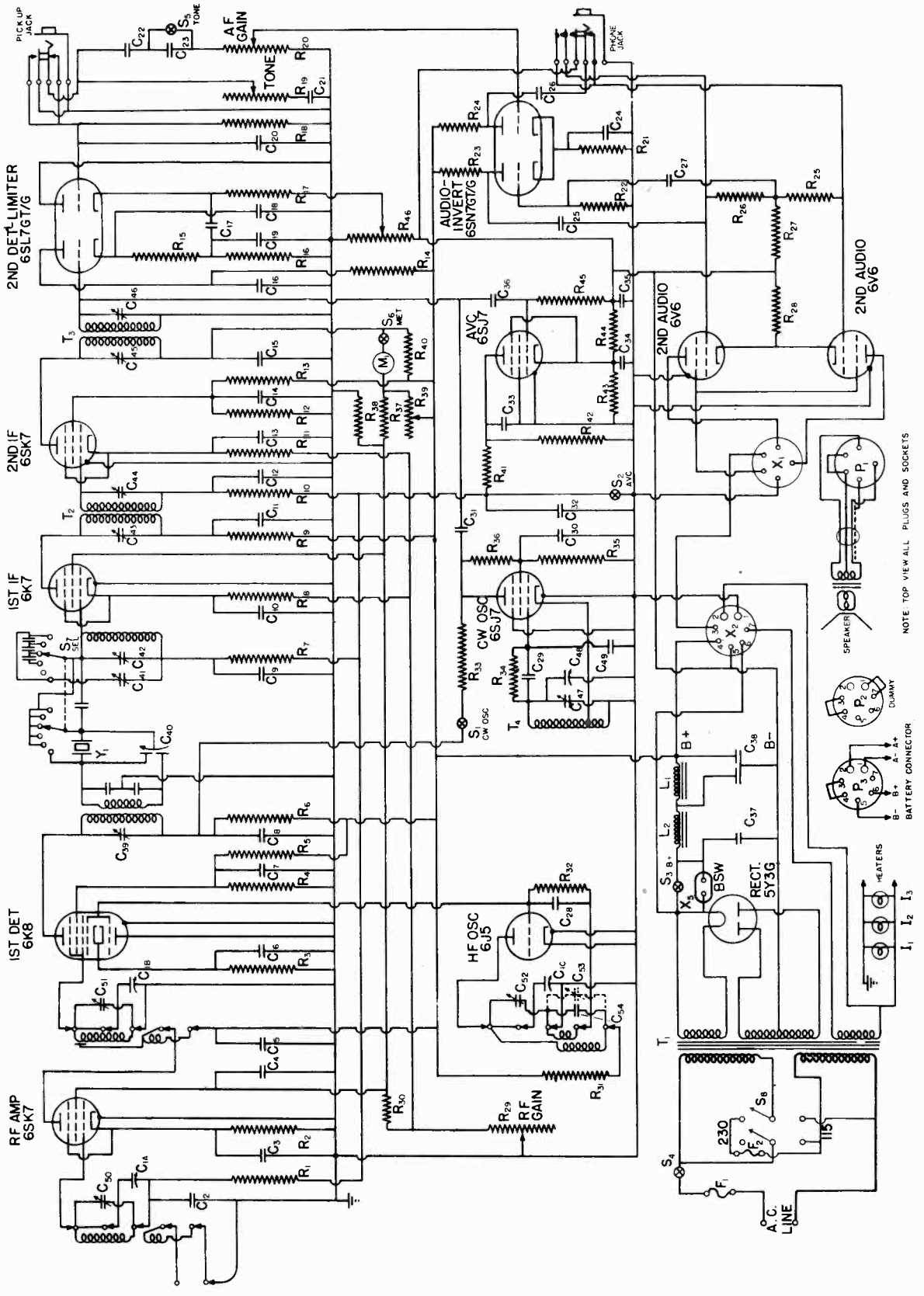

NC-2-40C
DWG. NO 4 SCHEMATIC DIAGRAM

IF PEAK 455 KC

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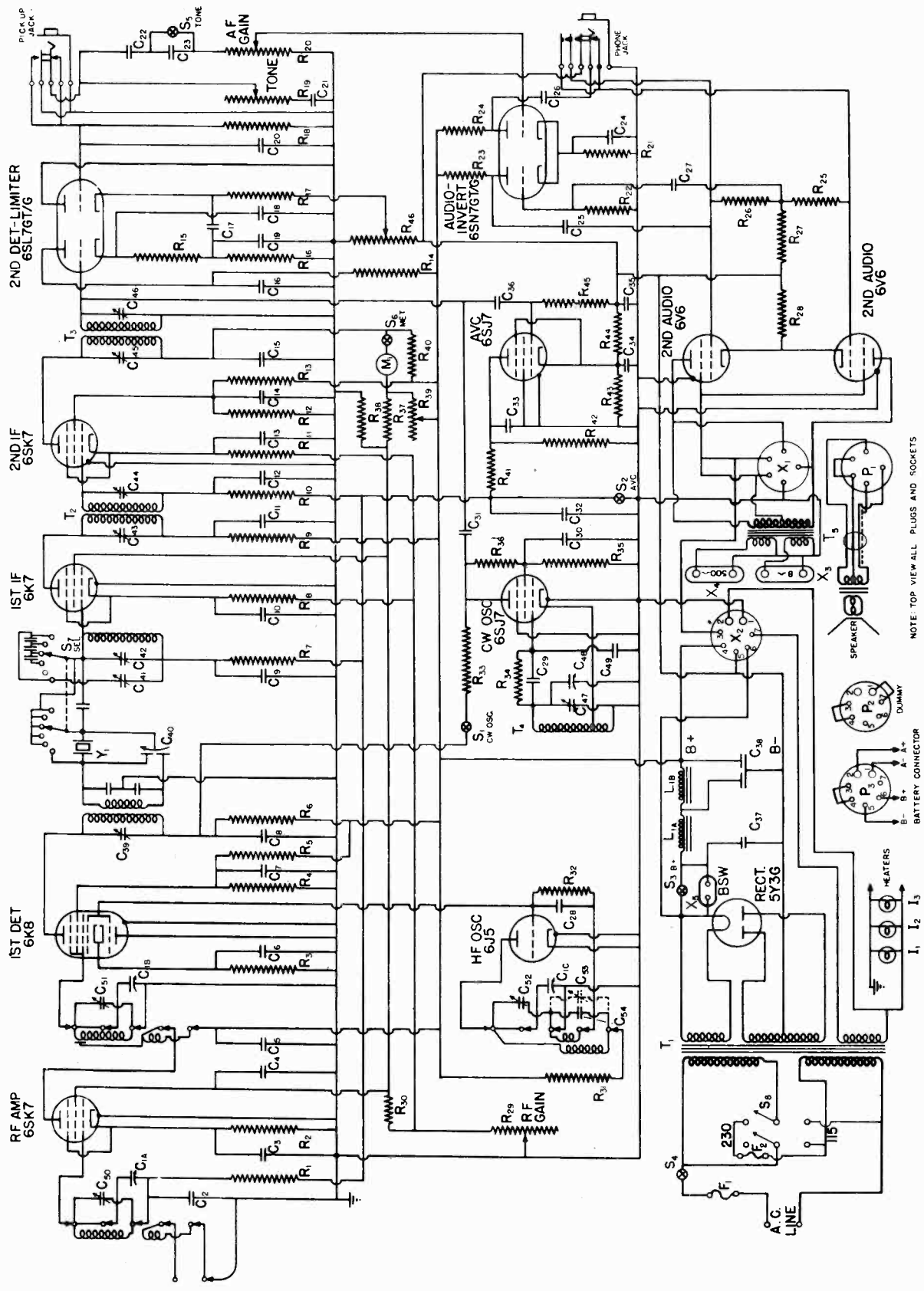

MODELS NC-2-40C,
NC-2-40CS

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1-1. *General*

The NC-2-40C RADIO RECEIVER is a twelve tube superheterodyne covering a continuous frequency range of from 490 to 30,000 kilocycles. The NC-2-40CS RADIO RECEIVER is identical with the NC-2-40C except for the frequency range covered and output terminations. The NC-2-40CS has a frequency range of from 200 to 400 and from 1,000 to 30,000 kilocycles.

Each equipment consists of a receiver and speaker built for either relay rack or table mounting and an instruction manual.

Throughout the text of this instruction manual all references to the NC-2-40C shall also apply to the NC-2-40CS except where indicated.

1-2. *Circuit*

The circuit employed on all bands consists of one stage of radio frequency amplification, a separate first detector and stabilized high frequency oscillator, two intermediate frequency stages, an infinite impedance second detector, a self-balancing phase inverter and audio amplifier, and a push-pull audio output stage.

The second detector utilizes one set of elements of a dual triode; the other set of elements is utilized for a series valve noise limiter. Separate tubes are used in the automatic volume control and beat frequency oscillator circuits. The latter is coupled to the second detector for C.W. reception.

A crystal filter is connected between the first detector and first I.F. amplifier tubes.

1-3. *Tube Complement*

The NC-2-40C is supplied complete with tubes which are tested in the receiver at the time of alignment.

1-4. *Tuning System*

The master tuning capacitor C-1 and six sets of coils are used to tune the frequency range of the receiver in six tuning bands.

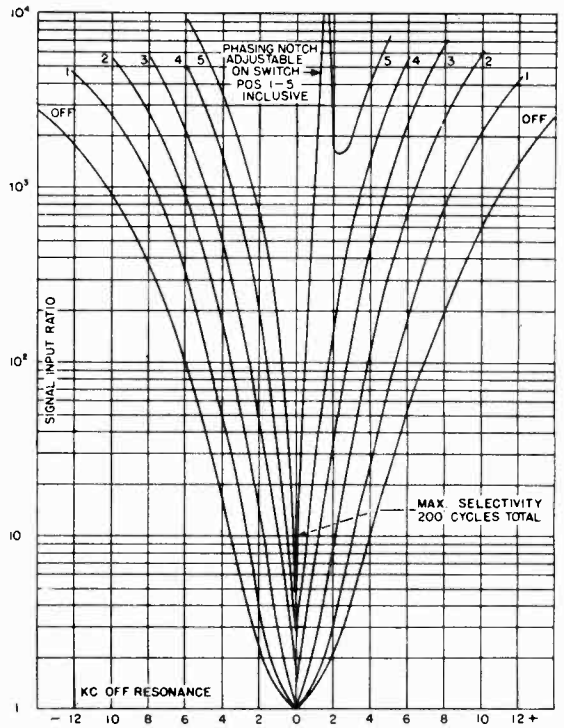
The frequency coverage of the six bands is as follows:

NC-2-40C		NC-2-40CS	
Band A	14.-30. MC	Band A	14.-30. MC
Band B	7.-14.4 MC	Band B	7.-14.4 MC
Band C	3.5-7.3 MC	Band C	3.5-7.3 MC
Band D	1.7-4. MC	Band D	1.7-4. MC
Band E	1.0-2.0 MC	Band E	1.0-2.0 MC
Band F	0.49-1. MC	Band F	200-400 KC

All transformer coils of the R.F. amplifier, first detector and H.F. oscillator stages with their associated padder and air-dielectric trimmer capacitors are mounted in a rigid aluminum casting which slides the length of the chassis, being moved by the MAIN TUNING control. The various coil assemblies are fitted with heavy contact pins which engage spring contactors mounted immediately under the variable tuning capacitor. This system permits thorough shielding of each individual coil while, at the same time, the coils in use are moved to the best position in the chassis, giving shortest leads to the tubes and master tuning capacitor, and all other coils are completely disconnected from the circuit.

1-5. *Crystal Filter*

Undoubtedly, the most efficient, flexible crystal filter yet designed is used in the NC-2-40C Receiver. Six uniform steps of selectivity, as shown in Dwg. No. 1, and a variable phasing control allow the receiver to be adjusted to almost any operating condition, a highly desirable feature for both short wave communication and broadcast band reception. The curves show that any degree of selectivity between that of full single signal operation and wide band broadcast reception is available, the ratio between the two being almost forty to one.



Dwg. No. 1. Typical Selectivity Characteristics

1-6. *Noise Limiter*

The noise limiter of the NC-2-40C Receiver is of the series valve type developed in the national laboratories. Its effectiveness and superior performance as compared to the more common types of 'silencers' were proved in the NHU and modernized NC-100 receivers. A threshold control on the front panel permits adjustment of the level at which limiting action starts.

1-7. *Tone Control*

The tone control is used to vary the frequency characteristic of the audio amplifier. The control is particularly helpful when receiving weak signals through interference, as explained in Section 3.

1-8. *Signal Strength Meter*

A 0 to 1 milliameter, serving as a signal strength meter, is front panel mounted. It is fitted with a scale in S-Units from 1 to 9 and in DB above S-9 from 0 to 40 DB. The bridge circuit, in which the meter is connected, makes possible accurate signal input readings from below 1 microvolt to 1,000 microvolts.

1-9. *Antenna Input*

Antenna input terminals are located at the rear of the receiver chassis near the center. The input circuit is suitable for use with a single wire antenna, a balanced feed-line or a low impedance concentric transmission line. Average input impedance is 500 ohms.

1-10. *Audio Output*

(1) A headphone jack is mounted on the front panel and is wired so as to silence the loud speaker when the phone plug is inserted. The correct load impedance for the headphone circuit is 20,000 ohms, this being the usual impedance of phones having a DC resistance of between 2,000 and 3,000 ohms. Maximum audio output available at the phone jack is 15 milliwatts.

(2) A five prong speaker socket (X-1) is provided at the rear of the receiver chassis. To this socket are brought the audio output leads. The proper load impedance (total) for the output circuit is 10,000 ohms. Maximum undistorted audio power output available is 8 watts.

(3) The NC-2-40CS is provided with an output transformer (T5) having a secondary with two windings which are connected to two terminal strips on the rear of the chassis. Both 8 ohm and 500 ohm terminations in addition to the speaker socket termination of 10,000 ohms are thus provided. The 8 and 500 ohm strips are the screw terminal type.

1-11. *Power Supply*

The standard NC-2-40C Receiver is designed for operation from a 110/120 volt, or 220/240 volt, 50/60 cycle power source. A toggle switch is provided in the dual primary circuit of the power transformer to permit operation from either voltage. Normal power consumption is approximately 100 volt-amps. The built-in power supply delivers all voltages required by the heater and B supply circuits-4.5 amperes at 6.3 volts and 100 milliamperes at 250 volts, respectively. One side of the AC input line is connected through a 2 ampere and a 1 ampere fuse each housed in an extractor post marked 'FUSE' which are mounted at the rear of the receiver chassis. The 2 ampere fuse is used in the circuit for 115 volt operation; both 2 and 1 ampere fuses are used for 230 volt operation.

All NC-2-40C Receivers are equipped with a seven prong plug and socket combination to permit portable or emergency operation from batteries; See Section 2-3.

1-12. *Loud Speaker*

The loud speaker supplied with the table model NC-2-40C receiver is of the permanent magnet field type having a nominal diameter of 10 inches. A coupling transformer, mounted on the loud speaker chassis, matches the voice coil to the output impedance of the receiver. A shielded three wire cable and plug is furnished for connection between the loud speaker and receiver.

1-13. *Pick-up Jack*

A pick-up jack mounted on the front panel of the receiver may be used to connect auxiliary apparatus, such as phonograph pick-up, to the audio system of the NC-2-40C Radio Receiver. This input circuit is high impedance and feeds into the 6F8G. Audio Amplifier-Phase Inverter tube. The TONE and AF GAIN controls are operative with this connection.

2-1. *Antenna Recommendations*

When using a single-wire antenna, the lead-in should be connected to one antenna input terminal and the short flexible lead, which is attached to the chassis, should be fastened to the other terminal. The dimensions of the single-wire antenna system are not critical, the recommended length, including lead-in, being from 75 to 100 feet, although any length between 25 and 200 feet may be used.

Feed-lines of doublet systems should be connected to the two input terminals. The flexible lead is not used.

The inner conductor of a concentric transmission line should be connected to one input terminal. The outer conductor and the flexible grounding lead should be connected to the other terminal.

An external ground connection to the chassis may or may not be necessary. It should be used unless it reduces signal strength.

2-2. *AC Operation*

Insert the dummy connector plug P-2 in the seven prong socket X-2.

Insert loud speaker plug P-1 in the five prong audio output socket X-1 of the Receiver.

Connect antenna feed line.

Set primary selector switch for line voltage to be used i.e. 115 or 230.

MODELS NC-2-40C
NC-2-40CS

NATIONAL CO. INC.

2-3. *Battery Operation*

The NC-2-40C may be operated in portable or emergency service by connecting batteries to the terminals of battery connector plug P-3 and inserting it in socket X-2, in place of plug P-2. See Fig. No. 1. For normal operation with somewhat reduced loud speaker output, a 6 volt heater supply (storage battery) should be connected to terminals 1 and 2 of plug P-3, and a 180 volt B supply should be connected to plug terminals 5 and 6. The jumper between terminals 3 and 4 (of P-3) completes the plate and screen supply circuits of the 6V6 output tubes. It may be omitted, with greater battery economy, when operation with head-

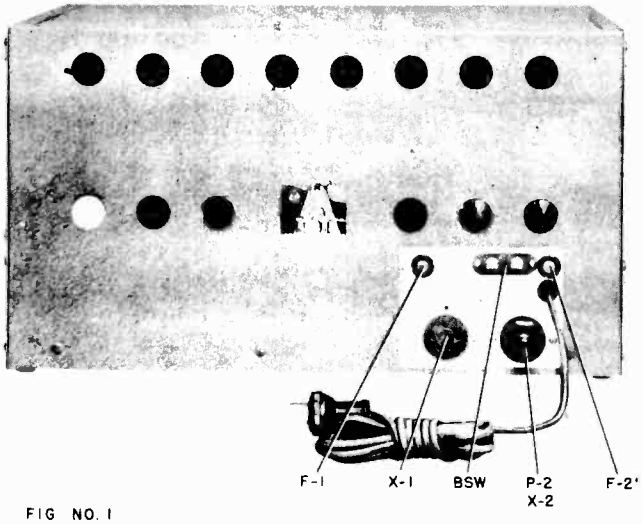


FIG NO. 1

phones only is desired. A suggested refinement is to connect a switch between terminals 3 and 4, thus permitting the 6V6 B supply to be opened at will. Alternatively, removal of speaker plug P-1 from socket X-1 will open the 6V6 B supply in the same manner, without harming the output tubes. A further economy of battery power may be effected by removing the 6V6 tubes from their sockets.

Do not attempt to use plug P-2 for battery connection, since the jumper between terminals 1 and 7 would be incorrect.

3-1. *Controls*

The MAIN TUNING control knob is located at the middle of the front panel and operates a three gang variable capacitor C-1 through approximately a 60 to 1 ratio reduction drive mechanism.

The accuracy of the calibration can be relied upon to be better than plus or minus 1%.

The tuning system of the NC-2-40C is truly single control; in fact, the MAIN TUNING control referred to above is used for band changing as well as tuning. To select any one of the six tuning bands, the MAIN TUNING control knob is pulled out about ¼ inch. When this is done, the dial and capacitor drive mechanism is disengaged and the knob is geared to the coil castings. As the knob is turned, the coil carriage is moved across the chassis until the proper coil pin contacts engage the circuit contactors, as indicated by the scale markers. Approximately one full turn of the MAIN TUNING knob is required to change from one tuning band to an adjacent tuning band. After the desired band has been selected, the tuning knob is pushed in to its original position, disengaging the coil carriage rack.

The LIMITER control, at the left-hand side of the receiver panel, is used to adjust the DC potential applied to the elements of the series valve noise limiter tube. The limiter circuit is thus provided with an adjustable threshold at which limiting starts. Any audio voltages, or peaks, in excess of this threshold are prevented from reaching the audio amplifier. With the LIMITER control set at 0, the limiter circuits will pass all but the strongest audio peak voltages; when the control is set at 10, the threshold is lowered to a point where the audio signal will be distorted due to suppression of the positive peaks.

The R.F. GAIN knob is located below and to the right of the LIMITER knob. It is used to adjust the amplification of the R.F. amplifier and two I.F. amplifier tubes. Amplification increases as the control is turned clockwise towards 9. With the knob set at 10, the meter switch is closed, connecting the signal strength meter. See Section 3-4 regarding meter use.

A CONTROL SWITCH is mounted above the R.F. GAIN control knob. In the AVC position, the automatic volume control circuits are in operation; in the MVC position, automatic volume control is turned off; in the CWO position, the beat frequency oscillator is turned on and the automatic volume control is turned off.

The POWER SUPPLY control knob is directly above the CONTROL SWITCH. In the counterclockwise position, OFF, the receiver is turned off, the primary circuit being opened by the AC line switch; in the mid-position B+ OFF, the AC line switch is turned on but the B supply circuits are incomplete since the B+ switch is opened; in the clockwise position, B+ ON, the B+ switch is closed, completing the B supply circuit. The B+ OFF position may thus be used for rendering the receiver inoperative, as may be required during transmission periods.

The PRIMARY SELECTOR SWITCH of the power transformer is mounted on the receiver chassis to the right of the power transformer. This switch selects the proper circuit arrangement of the dual primary for operation from either 115 or 230 volt power source. There is a shield provided to prevent unintentional throwing of the switch.

The A.F. GAIN control knob is located to the right of the MAIN TUNING control. It is used to adjust the audio amplification of the receiver.

Audio amplification increases as the control is turned towards 10 on the scale.

The PHASING and SELECTIVITY controls, located above the A.F. GAIN knob, are part of the crystal filter. When the SELECTIVITY control is set at OFF, the crystal is switched out of the circuit. With the crystal switched out, the phasing control has little influence on receiver performance. With the SELECTIVITY control knob set at anv point between 1 and 5, inclusive, the crystal filter is in operation, selectivity increasing as the knob is advanced to 5. The PHASING control is then used to balance the crystal bridge circuit and eliminate interferring signals or heterodynes. See Sections 3-2 and 3-3.

The C.W. OSC. control knob located to the right of the SELECTIVITY control is used for varying the frequency of the beat oscillator. At 0 on the C.W. OSC. scale, the beat oscillator is tuned to the intermediate frequency. See Section 3-3.

A TONE control knob is located above the C.W. OSC. knob and is used to vary the frequency characteristic of the audio amplifier as previously described.

A BSW terminal panel is mounted at the rear of the receiver chassis. The terminals are connected in parallel with the B+ switch. If external (remote) stand-by control is desired, it can be accomplished by connecting a switch or relay to these terminals.

3-2. *Phone Reception*

After the equipment is properly installed, in accordance with Section 2, it is placed in operation by turning the POWER SUPPLY switch to B+ ON. The LIMITER control should be set at 0. The CONTROL SWITCH should be set at AVC. The PHASING knob should be set at 0; the SELECTIVITY at OFF; the TONE control should be set to give the desired audio characteristic; the R.F. GAIN control should be advanced to some point between 8 and 10, depending upon receiving conditions; the A.F. GAIN control should be set at the point providing the desired audio volume. The receiver is now adjusted for the reception of phone signals and will tune to the frequency indicated by the MAIN TUNING dial. The C.W. OSC. knob has no influence on receiver performance under these conditions.

With the CONTROL SWITCH set in the AVC position, as recommended, the R.F. GAIN knob should be advanced as far as receiving conditions permit, or until background noise becomes objectionably loud. Audio output should be adjusted entirely by means of the A.F. GAIN knob. The operator must remember that automatic volume control action will be restricted unless the R.F. GAIN knob is fully advanced.

The CONTROL SWITCH may be set at MVC, in which case the operator must be careful not to advance the R.F. GAIN knob to a point where I.F. or audio amplifier overload occurs. Such overload is indicated by distortion. In general, the A.F. GAIN control may be set at about half way on, i.e., at 5 and the audio output adjusted by means of the R.F. GAIN control.

If a signal is weak and partially obscured by background noise and static, best signal-to-noise ratio will be obtained by turning the TONE control toward the LOW position. The most effective setting must be determined by trial as too much attenuation of high audio frequencies will impair the intelligibility of speech.

When a signal is accompanied by static peaks or noise pulses of high intensity and short duration, the best signal-to-noise ratio will be obtained by advancing the LIMITER control towards 10. The best setting must be determined by trial as too much limiter action will impair audio quality. If static peaks and noise pulses are extremely strong or if they are of fairly long duration, the effectiveness of the limiter will be best with the CONTROL SWITCH in the MVC position. In such cases both R.F. GAIN and LIMITER controls must be carefully adjusted for optimum signal-to-noise ratio.

The selectivity of the receiver may be adjusted by means of the crystal filter. The normal setting of the SELECTIVITY control in phone reception is at one of the positions affording broad selectivity. Positions 1 or 2 are recommended. Selectivity may be progressively increased by turning the SELECTIVITY control to positions 3, 4 and 5 although advancing the control too far will increase selectivity to a degree where phone signals become unintelligible.

The PHASING control is used to eliminate or attenuate heterodynes. The normal setting of the PHASING control in phone reception is at 0 on the scale. If, after a signal has been tuned in, an interfering signal causes a heterodyne or whistle, the PHASING control should be adjusted until the interference is reduced to a minimum. The setting of the PHASING control which provides maximum attenuation of the heterodyne will depend upon the pitch of the heterodyne whistle. If the beat note is above 1,000 cycles, the optimum PHASING control setting will be near 0; if the beat note is 300 or 400 cycles, the optimum PHASING control setting will be near one end of the scale or the other, depending upon whether the interfering signal has a higher or lower frequency than the desired signal.

It is recommended that the TONE control be set in the HIGH position when using the crystal filter in phone reception. The resulting attenuation of low audio frequencies tends to compensate for the side-band cutting action of the crystal filter.

3-3. *C.W. Reception*

The initial adjustment of the receiver for C.W. reception is as described in Section 3-2, except that the CONTROL SWITCH must be in the C.W.O. position. The C.W. OSC. control should be set at mid-scale.

The sensitivity of the receiver should be adjusted by means of the R.F. GAIN control, care being taken not to advance the control to the point where strong signals will cause I.F. or audio amplifier overload, as indicated by excessive thumping.

The action of the TONE and LIMITER controls will be similar to that described under Section 3-2. When receiving C.W. signals, it will be possible to advance both TONE and LIMITER controls considerably further than is possible in phone reception, since audio distortion is relatively unimportant.

Turning the C.W. OSC. control will change the characteristic pitch of the receiver background noise. The pitch will become higher as the beat frequency oscillator is detuned from the I.F. amplifier. With the C.W. OSC. control set at 2 or 3 (on either side of 0), the characteristic pitch of the receiver background noise will be in the neighborhood of 2,000 cycles. Under these conditions, the audio beat note of any C.W. signal will show a broad peak at approximately 2,000 cycles. This peak will appear on 'one side of the carrier' only and the other side, where the audio beat note is around 2,000 cycles, will be considerably weaker. This characteristic, known as 'semi-single signal', is helpful in receiving weak signals through interference.

As stated in Section 3-2, the selectivity of the receiver may be adjusted by means of the crystal filter, the action of the SELECTIVITY and PHASING controls in C.W. reception being similar to that described. It is possible, however, to utilize the full range of crystal filter selectivity in C.W. reception. Maximum selectivity is obtained with the SELECTIVITY control set at 5. With this setting the single-signal effect, outlined above, becomes very pronounced; in other words, the audio beat note is very sharply peaked at a definite audio frequency which is determined by the setting of the C.W. OSC. control. The operator may have difficulty in finding the audio-peak when first attempting to use the crystal filter. After a signal has been accurately tuned to give peak response, the R.F. GAIN control may need to be retarded in order to prevent I.F. or audio overloading. With the receiver tuned to crystal peak', an interfering signal may be attenuated by proper setting of the PHASING knob since this control does not appreciably affect the desired signal.

3-4. *Measurement of Signal Strength*

To make a measurement of signal strength by means of the S-meter, the R.F. GAIN control must be advanced to 10, and the CONTROL SWITCH set at the AVC position. The crystal filter should be turned OFF by means of the SELECTIVITY control; the PHASING knob set at 0. The TONE, LIMITER and A.F. GAIN controls do not affect the meter reading.

Tuning the receiver to a signal will cause the meter to read, indicating the signal input in S-units or in decibels above the S-9 level.

With no R.F. input to the receiver, or with the antenna disconnected, the S-meter should read 0, plus or minus 1 S-unit. If it does not, the S-meter circuit requires adjustment. See Section 5-5.

Measurement of the signal strength of C.W. signals cannot be made with the beat frequency oscillator in operation.

4-1. *Tube Failures*

Failure of a vacuum tube in the receiver may reduce the sensitivity, produce intermittent operation, or cause the equipment to be completely inoperative. In such cases, all tubes should be checked either in an analyzer or similar tube testing equipment, or by replacement with tubes of proven qualities. All tubes should be marked as they are removed from the receiver so that they may be returned to their original sockets thereby reducing the necessity for realignment.

Individual tubes of the same type will vary slightly in their characteristics and it is well to remember this fact when replacements become necessary. Even though the circuit is designed to reduce the effect of such variations to a minimum, the high frequency oscillator and I.F. tubes should be selected with some care. A replacement high frequency oscillator should be checked in the receiver to make sure that the inter-electrode capacities are the same as those of the tube originally employed. This is easily determined by noting any change in dial calibration.

Substitution of new tubes in the I.F. amplifier may possibly alter overall gain and selectivity characteristics. Instructions for realignment are given in detail in Section 5-2.

One other point should be checked when trying the new high frequency oscillator; a fairly strong steady signal should be tuned in, preferably on some frequency above 10 mc.; the beat frequency oscillator should be turned off; jarring the receiver, or lightly tapping the tube, should not show any evidence of noise in the output.

4-2. *Circuit Failures*

Even though all component parts of the receiver have an ample factor of safety, failure may occur in individual cases. Excluding tubes, the most common failure will probably be due to some defect in a capacitor or resistor. Measurement of voltage in accordance with Section 4-4 will no doubt show where failure has occurred.

4-3. *Stage Gain Measurements*

The sensitivity measurements listed below are made with the equipment set up as specified in Section 5-1. The CONTROL SWITCH should be set at MVC, the A.F. GAIN at 10, the SELECTIVITY at OFF

and the PHASING at 0. The signal generator should be adjusted to deliver a test signal of 455 plus or minus 2 kc. either modulated or unmodulated. The high output lead should be attached to the grid of the tube specified in the table below and the ground lead connected to the receiver chassis.

With 1 milliwatt output at the phone jack, the test signal should be within the limits specified below.

Terminal	Test Signal
First Det. Grid...	50 ± 10 Microvolts
First I.F. Grid...	250 ± 50 Microvolts
Sec. I.F. Grid....	50,000 ± 10,000 Microvolts
Sec. Det. Grid....	Over 1 volt

4-4. *Voltage Tabulation*

All measurements of voltages should be made with the equipment connected for normal operation with AC supply of 115 volt, 50/60 cycle or 230 volt, 50/60 cycle. Except as noted, the R.F. GAIN knob is at 9, the LIMITER knob set at 0 and the CONTROL SWITCH knob set at MVC. A DC Voltmeter of 1,000 ohms per volt sensitivity should be used. The following table must not be considered as a list of the actual operating voltages since loading effects of the measuring instrument will disturb many of the circuits and alter normal voltage distribution. All voltages are measured between specified terminal and chassis.

Tube Terminal	DC Volts ±15%
R.F. Amp. Grid.....	0
R.F. Amp. Cathode.....	3 A
R.F. Amp. Cathode.....	25 A*
R.F. Amp. Screen.....	80 B
R.F. Amp. Plate.....	230 B
First Det. Grid.....	0
First Det. Cathode.....	1 A
First Det. Screen.....	80 B
First Det. Plate.....	225 B
H.F. Osc. Grid.....	C
H.F. Osc. Cathode.....	0
H.F. Osc. Plate.....	90 B
First I.F. Grid.....	0
First I.F. Cathode.....	3 A
First I.F. Cathode.....	25 A*
First I.F. Screen.....	80 B
First I.F. Plate.....	225 B
Sec. I.F. Grid.....	0
Sec. I.F. Cathode.....	5 A
Sec. I.F. Cathode.....	25 A*
Sec. I.F. Screen.....	95 B
Sec. I.F. Plate.....	225 B
Sec. Det. Grid.....	0
Sec. Det. Cathode.....	8 A
Sec. Det. Plate.....	225 B
Limiter Grid.....	-3 A
Limiter Cathode.....	4.5 A
Limiter Cathode.....	0 D
Limiter Plate.....	0
AVC Grid.....	-25 AE
AVC Cathode.....	-45 AE
AVC Screen	0 E
AVC Plate.....	0 E
B.F. Osc. Grid.....	C
B.F. Osc. Cathode.....	0 F
B.F. Osc. Screen.....	10 AF
B.F. Osc. Plate.....	25 AF
Amp.-Inv. Grids.....	0
Amp.-Inv. Cathode.....	4.5 A
Amp.-Inv. Plates.....	115 B
Audio Grids.....	-20 A
Audio Cathodes.....	-40 A
Audio Screens.....	230 B
Audio Plates.....	215 B
B+ Common.....	230 B
B- Common.....	-50 B

A--0 to 50 volt meter scale
B--0 to 250 volt meter scale
C--Accurate measurement cannot be made
D--LIMITER knob set at 10
E--CONTROL SWITCH knob set at AVC
F--CONTROL SWITCH knob set at CWO
*--R.F. GAIN knob set at 0

The Power Output Tubes used in the NC-2-40C Radio Receiver may be the metal type 6V6 or the glass type 6V6GT/G. It is necessary, however, to provide glass type 6V6GT/G output tubes with metal shields to avoid oscillation in the audio amplifier. The recommended shield is Goat type G1222K with type G1004 connector.

5-1. *General*

All circuits are carefully aligned, before shipment, using precision crystal oscillators which insure close conformability to the dial calibration. No readjustment will be required, therefore, unless the receiver is tampered with or damaged.

To determine the necessity for realignment, the receiver should first be carefully checked against its normal performance as described in Section 3. In no case should realignment be attempted unless tests indicate that such realignment is necessary.

The coil group which is plugged into the circuit at any time is the one directly underneath the three gang master tuning capacitor. The coil nearest the front panel of the receiver is in the H.F. oscillator circuit, the middle coil is in the first detector circuit and the coil nearest the antenna input terminal panel is in the R.F. amplifier circuit. See Fig. No. 5.

All coils have individual trimmer capacitors. The H.F. oscillator circuits of tuning bands E & F

MODEL NC-2-40C

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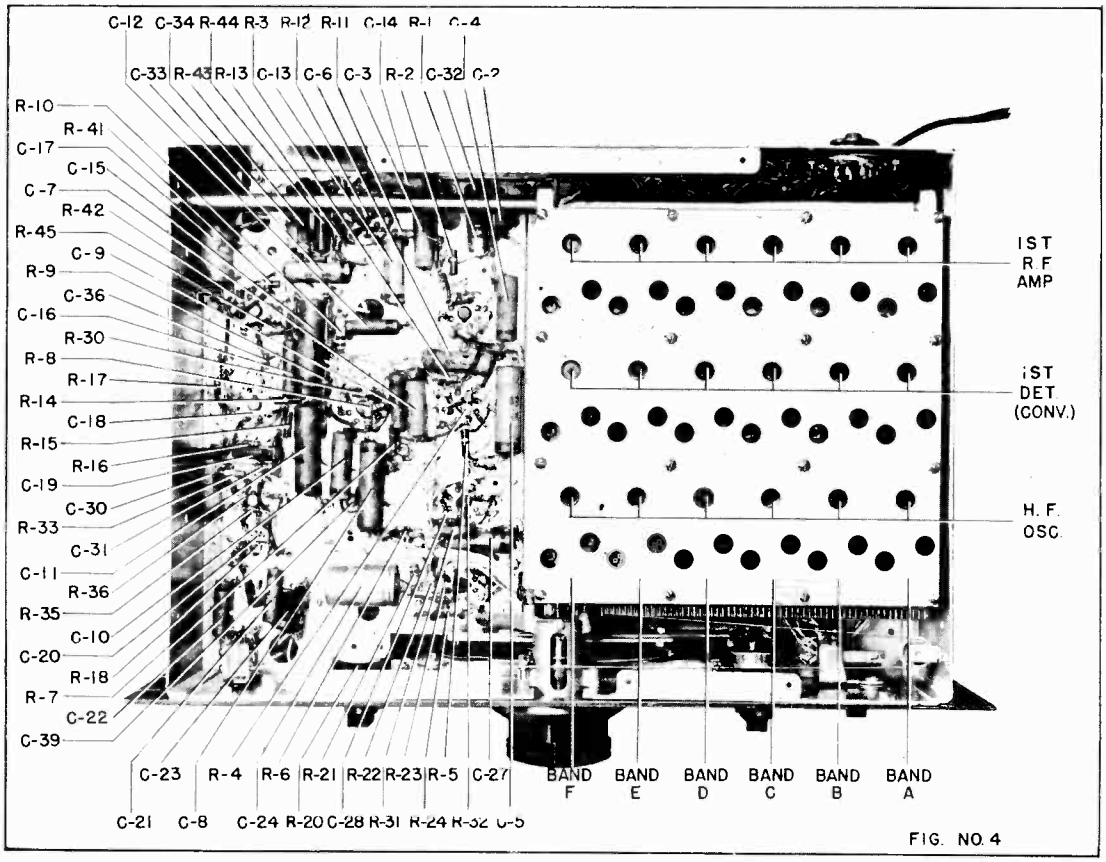

FIG. NO. 4

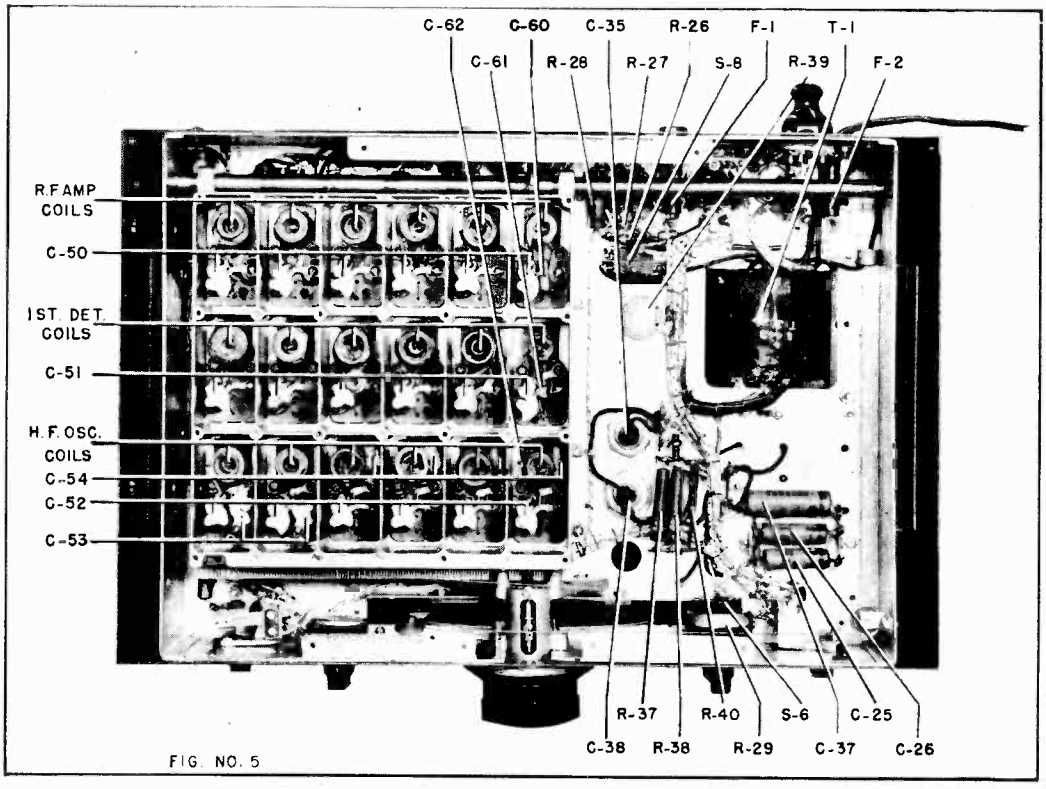

FIG. NO. 5

The two bottom views above show the NC-2-40C Receiver with the coil carriage at the extreme end of its travel. It will be noted that such construction makes all components readily accessible.

have, also, variable series padding capacitors. These capacitors are identified in Fig. No. 5.

A screwdriver having a metal shaft may be used to make adjustments in the high frequency circuits but capacity effects will be noticeable, and the shaft should not touch any part of the aluminum casting.

Before proceeding with the alignment of any circuit of the receiver, the equipment must be set up as specified in Section 2, except that the antenna lead-in or transmission line must be disconnected. An output meter having a 20,000 ohm resistor load should be connected to the phone output jack. The POWER SUPPLY knob should be set at B+ ON and the R.F. GAIN knob set at 9. The TONE control knob should be set at N and the LIMITER knob should be retarded to 0.

Alignment of the equipment may be divided into two major steps:

(1) I.F. Amplifier Alignment
(2) H.F. Circuits Alignment
  (a) H.F. Oscillator
  (b) First Detector and R.F. Amplifier
  (c) Tracking of H.F. Circuits

The circuits MUST be tuned in the above order when complete alignment is necessary.

5-2. *I.F. Amplifier Alignment*

The intermediate frequency of the NC-2-40C Receiver is 455 kilocycles, plus or minus 2 kilocycles. The exact frequency is determined by the quartz crystal resonator Y-1.

Tuning capacitors are provided on the crystal filter and on each I.F. transformer. These capacitors are designated by symbol numbers C-39 and C-41 to C-46, inclusive on Fig. Nos. 3 and 4.

The high output lead of an accurately calibrated signal generator should be connected to the grid terminal of the first detector tube and the grounded lead to any convenient point on the chassis. The flexible lead need not be disconnected from the grid of the tube. Connection is made directly from the output jack of the signal generator, the dummy antenna being omitted. The CONTROL SWITCH of the receiver should be in the CWO position and the modulation of the signal generator turned off to provide a steady C.W. test signal. The PHASING control of the receiver should be set at 0 and the SELECTIVITY control at 5. The A.F. GAIN control should be fully advanced.

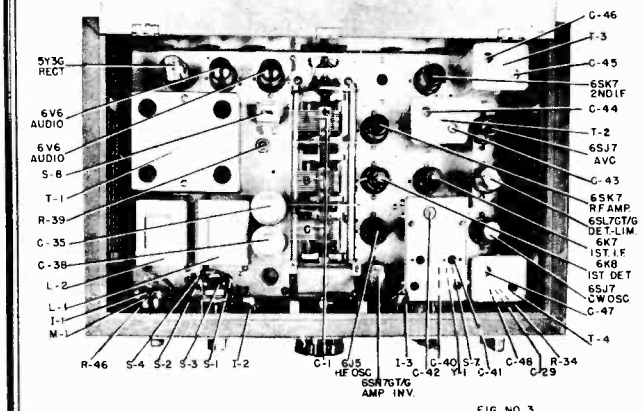

FIG. NO 3

Adjust the output attenuator of the signal generator to provide a signal of approximately 100 microvolts and vary the tuning control of the signal generator slowly between the frequencies of 453 and 457 kilocycles. At some frequency between these limits the I.F. amplifier of the receiver will show a very sharply peaked response, as indicated on the output meter. The output attenuator of the signal generator should be retarded after the signal generator has been tuned to the I.F. peak in order to avoid I.F. or audio overload; the C.W. OSC. control must be set to provide an audio beat note in the middle of the audio range (between 400 and 1,000 cycles).

The I.F. tuning capacitors C-39 and C-43 to C-46, inclusive, should each be carefully adjusted to give a maximum reading on the output meter. The order in which the adjustments are made is not important. While making I.F. amplifier adjustments, it will be necessary to retard the attenuator of the signal generator if the readjustment increases I.F. amplifier gain to the point where overload occurs.

The crystal filter SELECTIVITY knob should then be set at 1 and the signal generator detuned between 3 and 4 kilocycles either side of the crystal frequency. Capacitor C-42 should be tuned for maximum output meter reading. After this adjustment is made, the SELECTIVITY knob should be set at OFF and the signal generator retuned to exact crystal frequency. Compensator capacitor C-41 should then be adjusted for maximum reading on the output meter.

The performance of the I.F. amplifier and audio circuits may be checked against the stage gain data in Section 4-3 after alignment has been completed. Selectivity may be checked against the curves of Dwg. No. 1.

After alignment of the I.F. amplifier has been completed, the C.W. OSC. control should be set at 0 at which setting the C.W. oscillator should be at zero beat with the test signal. If zero beat does not occur at zero, readjust capacitor C-47 of transformer T-4, as shown in Fig. No. 3.

The quartz crystal resonator Y-1 may be checked at the conclusion of I.F. amplifier alignment as follows: the SELECTIVITY control should be set at 5 and the signal generator tuned to the crystal frequency. The output meter reading should be noted. When the SELECTIVITY knob is turned to OFF, the meter reading should decrease 1 to 2 db. provided the PHASING knob is at 0. An

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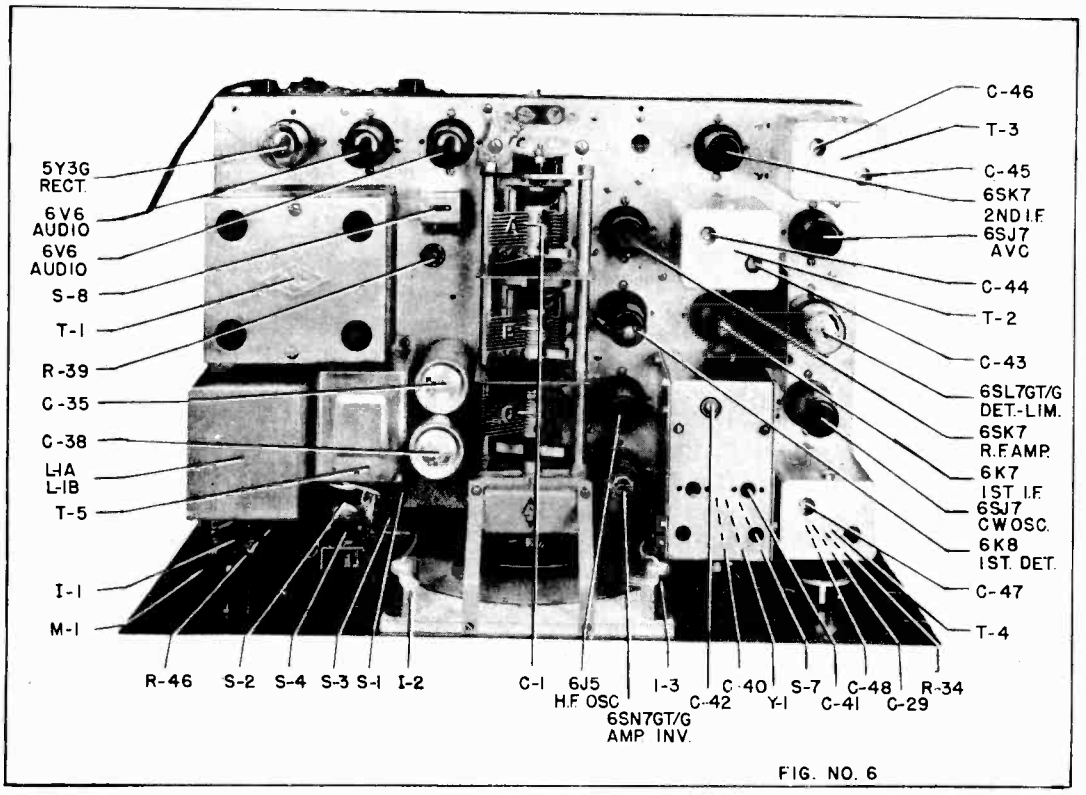

FIG. NO. 6

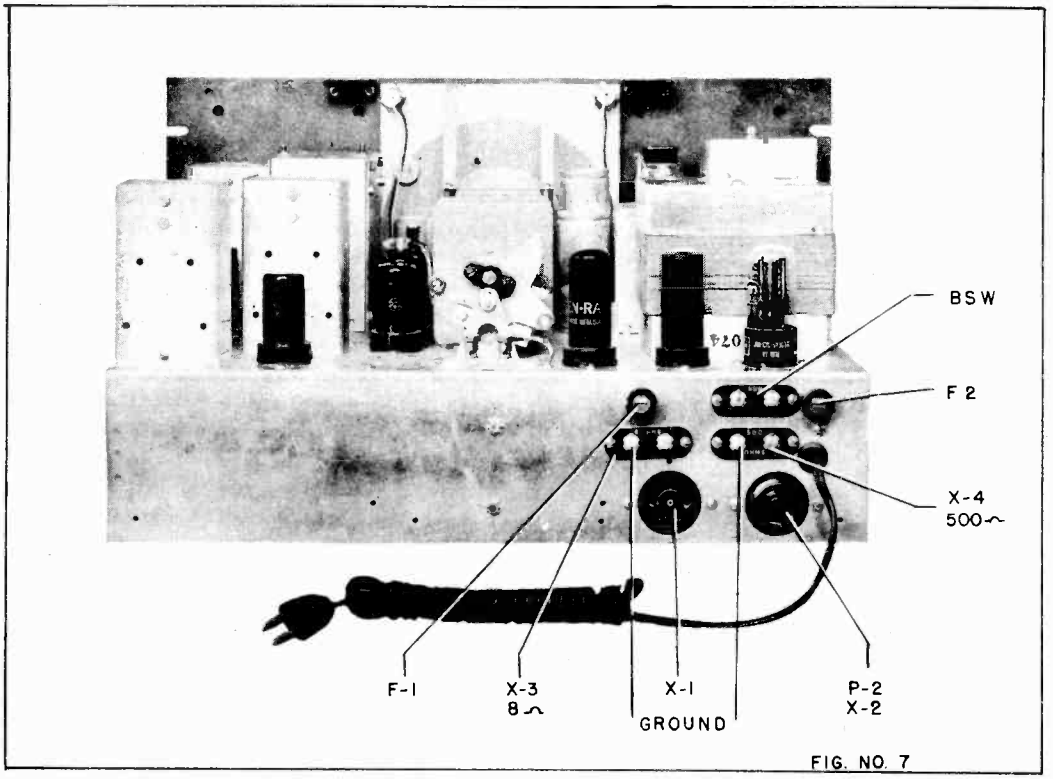

FIG. NO. 7

Top and rear views of NC-2-40CS receiver

increase in meter reading can, in most cases, be traced to an improper adjustment in the I.F. amplifier, since the crystal resonator is mounted in a sealed holder, and it is rather unlikely that trouble will be had from that source.

5-3. *General Coverage Alignment*

(a) H.F. oscillator

Alignment is effected as follows: with the coil range to be aligned connected in the circuit and with the receiver controls set as recommended in Section 5-1, the MAIN TUNING dial should be set near the high frequency end of the range. A signal generator should be connected to the antenna input terminal through a standard IRE dummy antenna and accurately tuned to deliver a signal of the same frequency as that indicated by the receiver dial setting. If, when this signal is tuned in, the dial reading is too high, the capacity of the H.F. oscillator trimmer C-52 should be decreased to make corrections. Conversely, low dial readings are corrected by increasing the capacity of trimmer C-52.

It is imperative that the high frequency oscillator circuits operate at a higher frequency than that of the first detector and R.F. amplifier circuits. This can be checked by tuning in the image signal, which should appear at a dial reading approximately 910 kilocycles below that of the real signal. The image signal should be considerably weaker if the R.F. amplifier is correctly aligned and a stronger test signal may be required before the image can be found. If the image does not appear at the lower frequency dial setting, the H.F. oscillator circuit is incorrectly adjusted and the capacity of the H.F. oscillator trimmer capacitor in question must be decreased until the real signal and image signal appear at the proper points on the dial.

(b) First Detector and R.F. Amplifier

With the signal generator adjusted to deliver a modulated signal near the high frequency limit of the band to be checked, the receiver should be tuned to give maximum output, as indicated by the output meter. The first detector and R.F. amplifier trimmer capacitors C-51 and C-50, respectively, should then be varied until the output meter reads maximum. On the highest frequency bands, adjustment of the first detector and R.F. amplifier trimmers may change the calibration of the high frequency oscillator, necessitating retuning of the MAIN TUNING dial. If these trimmers should require considerable realignment, it may be necessary to readjust the high frequency oscillator trimmer C-52 in order to maintain correct calibration.

A very simple and quick method of first detector and R.F. trimmer alignment may be used if a signal generator is not available. This method consists of setting the trimmers at the adjustment which provides maximum circuit or background noise. It will be found that trimmer settings under this method are sufficiently sharp to provide good alignment, although the adjustment must be made with care to avoid alignment to the image frequency.

(c) Tracking of H.F. Circuits

After the H.F. oscillator, first detector and R.F. amplifier trimmers have been properly set at the high frequency limit of the band, the receiver should be tuned to a frequency toward the low frequency end. Tracking at any point up to the low frequency limit may be checked by adjusting the signal generator to the proper frequency and testing the settings of the first detector and R.F. amplifier trimmers for maximum gain. Calibration may be checked also at these points. After such a test, all trimmers checked should be reset at the high frequency end of the band since their settings are most critical at this point.

Errors in tracking near the low frequency limits of the band can be caused by defects in any of three circuit elements.

(1) The tuning capacitor section.
(2) The circuit inductance.
(3) The H.F. oscillator series padding capacitor.

In order to determine if one or more sections of the master tuning capacitor C-1 are the cause of any mistracking present, it is necessary to make the check described above on two or more different bands. If the same tracking error appears on all bands, the master tuning capacitor is definitely at fault. The error should be corrected by permanently bending the rotor or stator plates to provide the proper capacity.

If the tracking error appears only in the R.F. amplifier or first detector stage of only one band, the inductance of the tuned circuit of the stage is incorrect. Should the tracking checks indicate that the H.F. oscillator circuit of a particular band is at fault, either the inductance of the circuit, the series padding capacitor or both may be responsible.

After any change or readjustment is made to any high frequency circuit inductance or series padding capacity, it will be necessary to relign the associated trimmer at the high frequency limit of the coil range. Tracking should then be rechecked.

5-4. *S-Meter Adjustment*

The S-meter balancing resistor R-39, shown in Fig. No. 3, is used to obtain zero meter reading in the absence of signal input to the receiver. The adjustment is as follows: Set the R.F. GAIN control at 10, CONTROL SWITCH at MVC, and disconnect the antenna leads; adjust R-39 until the S-meter reads zero.

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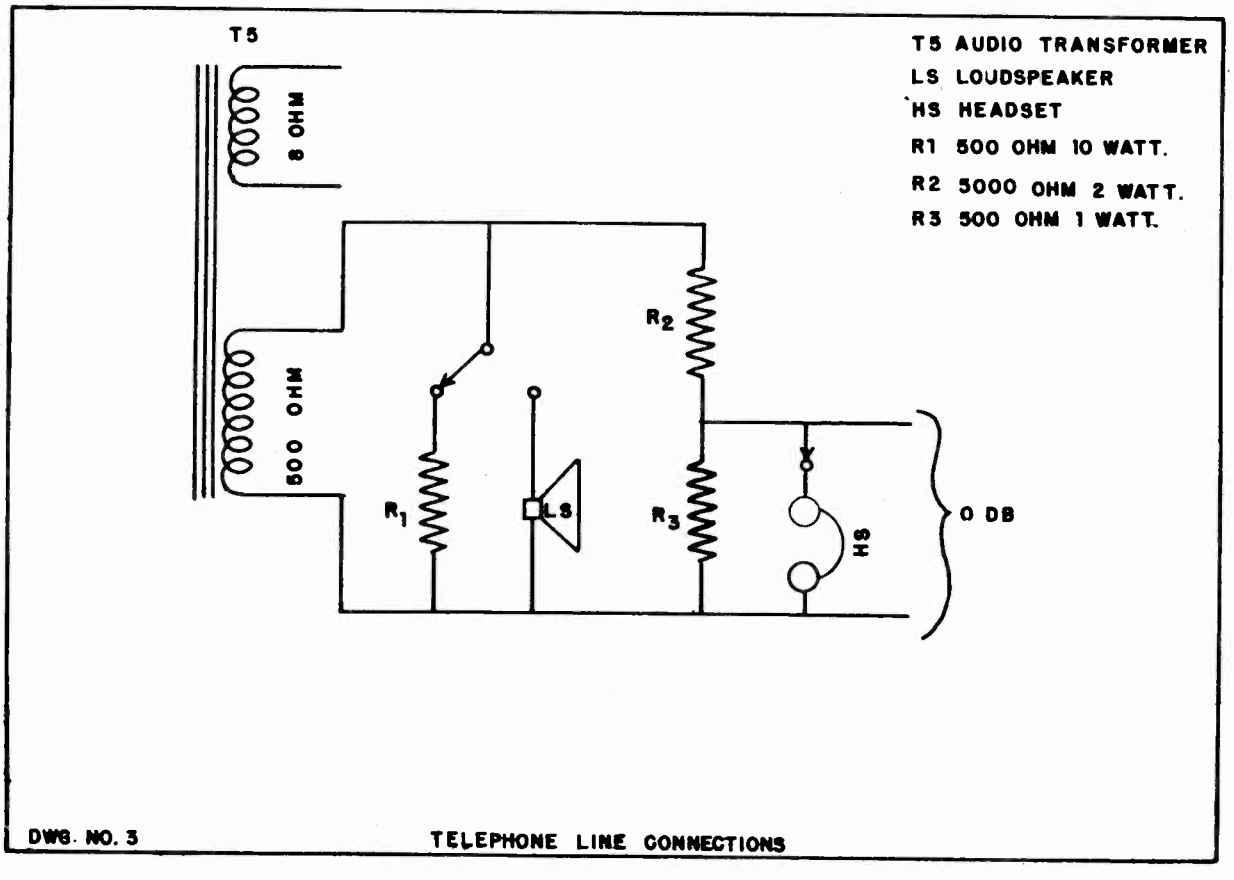
5-5. *Band Indicator Adjustment*

An adjustment for centering the band indicator markers in the horizontal slots of the dial face is located in back of the MAIN TUNING knob. It is recommended that the MAIN TUNING knob be pulled out to engage the band changing mechanism, and turned clockwise to the last position before the stop. The red band marker should then indicate the 14-30mc. tuning band. To make the adjustment, simply remove the tuning knob and set the ¼" hex-head screw as may be required. The screw is self-locking.

It is often found necessary in various communication services to provide a means for feeding the output of the receiver into a standard 500 ohm telephone transmission line at a 6 milliwatt or ODB level. Also means for monitoring the receiver and the telephone circuit may be required. The NC-2-40CS can be readily provided with a voltage divider and monitor circuit to fulfill these requirements. A suitable divider will consist of a 5000 ohm, 2 watt resistor connected in series with 500 ohm, 1 watt resistor across the 500 ohm termination of T5 (see X-4 in Fig. 7). In addition to the divider, the output circuit must be terminated at all times, either by use of a properly matched loud-speaker or a suitable load resistor. A loud-speaker or load resistor may be connected to any-one of the three output circuits, but the voltage divider mentioned above must be connected to the 500 ohm output circuit.

Drawing number 3 shows a possible circuit arrangement using a 500 ohm loud-speaker or a 500 ohm, 10 watt load resistor as the receiver load. The switch functions merely to silence the loud-speaker when required. If either a 10,000 ohm loud-speaker or an 8 ohm speaker is used no additional 500 ohm load is required across the 500 ohm receiver output circuit. Headphone monitoring connections should be made to the 500 ohm telephone line as shown because plugging the head-phones into the receiver phone jack disables the speaker output circuits. A high impedance headset is recommended for use across the 500 ohm telephone line. The total attenuation of the voltage divider is approximately 20 decibels. The power supplied to the 500 ohm telephone line corresponding to maximum receiver output is approximately 20 milliwatts.



DWG. NO. 3 TELEPHONE LINE CONNECTIONS

NC-2-40C AND NC-2-40CS RECEIVERS PARTS LIST

SYMBOL	FUNCTION	TYPE	RATING
	CAPACITORS		
C1A	R.F. Amplifier Tuning	Air	225 mmf. max.
C1B	First Detector Tuning	Air	225 mmf. max.
C1C	H.F. Oscillator Tuning	Air	225 mmf. max.
C2	R.F. Grid Filter	Mica	.005 mfd., 300 v.d.c.w.
C3	R.F. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C4	R.F. Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C5	R.F. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C6	First Det. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C7	First Det. Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C8	First Det. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C9	First I.F. Grid Filter	Paper	.01 mfd., 600 v.d.c.w.
C10	First I.F. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C11	First I.F. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C12	Sec. I.F. Grid Filter	Paper	.01 mfd., 600 v.d.c.w.
C13	Sec. I.F. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C14	Sec. I.F. Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C15	Sec. I.F. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C16	Sec. Det. Plate By-pass	Paper	.01 mfd., 600 v.d.c.w.
C17	Sec. Det. to Limiter Audio Coupling	Paper	1. mfd., 200 v.d.c.w.
C18	Sec. Det. Cathode By-pass	Ceramic	.00025 mfd., 500 v.d.c.w.
C19	Sec. Det. I.F. By-pass	Mica	.001 mfd., 500 v.d.c.w.
C20	Limiter Output By-pass	Ceramic	.00025 mfd., 500 v.d.c.w.
C21	Tone Control	Paper	.01 mfd., 600 v.d.c.w.
C22	Limiter to Inverter-Audio Coupling	Paper	.01 mfd., 600 v.d.c.w.
C23	Tone Control	Mica	.001 mfd., 500 v.d.c.w.
C24	Inverter-Audio Cathode By-pass	Elec.	10 mfd., 50 v.d.c.w.
C25	Inverter-Audio to Output Coupling	Paper	.1 mfd., 400 v.d.c.w.
C26	Inverter-Audio to Output Coupling	Paper	.1 mfd., 400 v.d.c.w.
C27	Inverter Feedback Coupling	Paper	.1 mfd., 400 v.d.c.w.
C28	H.F. Oscillator Grid	Ceramic	.0001 mfd., 500 v.d.c.w.
C29	Beat Oscillator Grid	Mica	.001 mfd., 500 v.d.c.w.
C30	Beat Oscillator Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C31	Beat Osc. to Sec. Det. Coupling	Ceramic	2 mmf., 500 v.d.c.w.
C32	AVC Output By-pass	Paper	.1 mfd., 400 v.d.c.w.
C33	AVC Plate By-pass	Paper	.1 mfd., 400 v.d.c.w.
C34	AVC Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C35	B Minus By-pass	Elec.	40 mfd., 200 v.d.c.w.
C36	AVC to Sec. Det. Coupling	Ceramic	.00005 mfd., 500 v.d.c.w.
C37	Power Supply Filter	Paper	.1 mfd., 600 v.d.c.w.
C38	Power Supply Filter	Elec.	8 and 8 mfd., 475 v.d.c.w.
C39	Crystal Filter Input Tuning	Air	6 to 85 mmf.
C40	Crystal Filter Phasing Control	Air	5 and 5 mmf.
C41	Crystal Filter Compensating	Ceramic	2 to 6 mmf.
C42	Crystal Filter Output Tuning	Air	6 to 85 mmf.
C43	T-2 Primary Tuning	Air	6 to 85 mmf.
C44	T-2 Secondary Tuning	Air	6 to 85 mmf.
C45	T-3 Primary Tuning	Air	6 to 85 mmf.
C46	T-3 Secondary Tuning	Air	6 to 85 mmf.
C47	T-4 Tuning	Air	6 to 85 mmf.

PARTS LIST (Continued)

SYMBOL	FUNCTION	TYPE	RATING
	CAPACITORS (Continued)		
C48	C.W. Osc. Control	Air	1 to 10 mmf.
C49	C.W. Osc. Compensating	Ceramic	10 mmf., 500 v.d.c.w.
C50	R.F. Amplifier Trimmer	Air	See Note No. 1
C51	1st Det. Trimmer	Air	See Note No. 1
C52	H.F. Osc. Trimmer	Air	See Note No. 1
C53	H.F. Osc. Padder	Air	See Note No. 1
C54	H.F. Osc. Padder	Mica	See Note No. 1
C55	R.F. Amplifier Fixed Trimmer	Ceramic	20 mmf., 500 v.d.c.w. *
C56	1st Detector Fixed Trimmer	Ceramic	20 mmf., 500 v.d.c.w. *
C57	1st Detector Pri. to Sec. Coupling	Ceramic	2 mmf. *
C58	H.F. Osc. Padder	Ceramic	100 mmf., 500 v.d.c.w. *
C59	H.F. Osc. Trimmer	Ceramic	25 mmf., 500 v.d.c.w. *
C60	R.F. Amplifier Padder	Mica	900 mmf., 500 v.d.c.w. **
C61	1st Detector Series Padder	Ceramic	16 mmf., 500 v.d.c.w. **
C62	H.F. Osc. Padder	Ceramic	20 mmf., 500 v.d.c.w. **
	RESISTORS		
R1	R.F. Grid Filter	Fixed	500,000 Ohm, ½ w.
R2	R.F. Cathode Bias	Fixed	500 Ohm, ½ w.
R3	First Det. Cathode Bias	Fixed	250 Ohm, ½ w.
R4	First Det. Screen Bleeder	Fixed	100,000 Ohm, ½ w.
R5	First Det. Screen Dropping	Fixed	50,000 Ohm, ½ w.
R6	First Det. Plate Filter	Fixed	2,000 Ohm, ½ w.
R7	First I.F. Grid Filter	Fixed	20,300 Ohm, ½ w.
R8	First I.F. Cathode Bias	Fixed	See Note No., 2, ½ w.
R9	First I.F. Plate Filter	Fixed	2,000 Ohm, ½ w.
R10	Sec. I.F. Grid Filter	Fixed	500,000 Ohm, ½ w.
R11	Sec. I.F. Cathode Bias	Fixed	See Note No., 2, ½ w.
R12	Sec. I.F. Screen Bleeder	Fixed	100,000 Ohm, ½ w.
R13	Sec. I.F. Screen Dropping	Fixed	70,000 Ohm, ½ w.
R14	Sec. Det. Plate Filter	Fixed	2,000 Ohm, ½ w.
R15	Sec. Det. I.F. Filter	Fixed	5,000 Ohm, ½ w.
R16	Sec. Det. Load	Fixed	25,000 Ohm, ½ w.
R17	Limiter Input	Fixed	100,000 Ohm, ½ w.
R18	Limiter Output	Fixed	50,000 Ohm, ½ w.
R19	Tone Control	Comp. Var.	500,000 Ohm, 1 w.
R20	A.F. Gain Control	Comp. Var.	500,000 Ohm, 1 w.
R21	Inverter-Audio Cathode Bias	Fixed	1,000 Ohm, ½ w.
R22	Inverter Grid	Fixed	500,000 Ohm, ½ w.
R23	First Audio Plate	Fixed	50,000 Ohm, ½ w.
R24	First Audio Plate	Fixed	50,000 Ohm, ½ w.
R25	Output Grid	Fixed	250,000 Ohm, ½ w.
R26	Output Grid	Fixed	250,000 Ohm, ½ w.
R27	Inverter Feedback Coupling	Fixed	250,000 Ohm, ½ w.
R28	Output Cathode Bias	Fixed	200, Ohm, 2 w.
R29	R.F. Gain Control With Switch	W. W. Var.	10,000 Ohm, 1½ w.
R30	R.F. Gain Bleeder	Fixed	50,000 Ohm, ½ w.
R31	H.F. Osc. B+ Dropping	Fixed	50,000 Ohm, 1 w.

PARTS LIST (Continued)

* These capacitors are used only in the 200-400 kc. band of the NC-2-40CS Receiver.

** These capacitors are used only in the A band.

MODELS NC-2-40C,
NC-2-40CS

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SYMBOL	FUNCTION	TYPE	RATING
NC-2-40C AND NC-2-40CS	RESISTORS (Continued)		
R32	H.F. Osc. Grid	Fixed	50,000 Ohm, ½ w.
R33	Beat Osc. Plate Filter	Fixed	250,000 Ohm, ½ w.
R34	Beat Osc. Grid	Fixed	50,000 Ohm, ½ w.
R35	Beat Osc. Screen Bleeder	Fixed	100,000 Ohm, ½ w.
R36	Beat Osc. Screen Dropping	Fixed	100,000 Ohm, ½ w.
R37	B+ Voltage Divider	Fixed	20,000 Ohm, 2 w.
R38	B+ Voltage Divider	Fixed	20,000 Ohm, 2 w.
R39	S-Meter Adjustment	W. W. Var.	1,000 Ohm, 1 w.
R40	S-Meter Bridge	Fixed	1,000 Ohm, ½ w.
R41	AVC Plate Filter	Fixed	500,000 Ohm, ½ w.
R42	AVC Plate	Fixed	500,000 Ohm, ½ w.
R43	AVC Voltage Divider	Fixed	1,500 Ohm, 2 w.
R44	AVC Cathode Bias	Fixed	500 Ohm, 2 w.
R45	AVC Grid	Fixed	5,000,000 Ohm, ½ w.
R46	Limiter Control	W. W. Var.	10,000 Ohm, 1½ w.
	MISCELLANEOUS		
F1	AC Line Fuse	Glass Encl.	2 Amp.
F2	AC Line Fuse	Glass Encl.	1 Amp.
I1	S-Meter Lamp	No. 40	6 v., .15 amp.
I2	Dial Lamp	No. 47	6 v., .15 amp.
I3	Dial Lamp	No. 47	6 v., .15 amp.
L1	Power Supply Filter Choke	Potted	17 h., 100 ma. (NC-2-40C only)
L2	Power Supply Filter Choke	Potted	17 h., 100 ma. (NC-2-40C only)
L1A°	Power Supply Filter Choke	Potted	17 h., 100 ma. (NC-2-40CS only)
L1B°	Power Supply Filter Choke	Potted	17 h., 100 ma. (NC-2-40CS only)
M1	Signal Strength Meter	'S' Scale	0 to 1 ma.
P1	Loud Speaker Connector Plug	Molded	5 prong
P2	Dummy plug for AC Operation	Molded	7 prong
P3	Battery Connector Plug	Molded	7 prong
S1 S2	Control Switch	Two Gang	SPST 250 v., 1 amp.
S3 S4	Receiver Off-On Switch	Two Gang	SPST 250 v., 1 amp.
S5	Tone Control Switch	Part of R-19	SPST
S6	S-Meter Switch	Part of R-29	SPST
S7	Selectivity Control Switch	Rotary	2 section, ganged
S8	T1 Primary Selection Switch	Toggle	DPDT 250 v., 3 amp.
T1	Power Transformer	150 Watt	115 volt, 60 cycle and 230 volt, 60 cycle
T2	IF Transformer	Air Tuned	455 kc.
T3	IF Transformer	Air Tuned	455 kc.
T4	Beat Osc. Transformer	Air Tuned	455 kc.
T5°	Audio Output Transformer	Shield Can	10 watts (NC-2-40CS only)
X1	Audio Output Socket	Bakelite	5 prong
X2	Battery Connector Socket	Bakelite	7 prong
X3°	8 Ohm Termination Strip	Bakelite	2 connector
X4°	500 ohm Termination	Bakelite	2 connector
X5	B Connector (BSW)	Bakelite	2 Connector
Y1	Crystal Resonator	Quartz	455 kc.

Note No. 1. Capacitor rating is different in each coil range and is individually adjusted as circuit conditions may require. Definite rating cannot be listed. C53 used in E and F bands only. C54 used in A,B,C and D bands only.

Note No. 2. Resistors R8 and R11 may have values between 300 and 5,000 ohms since they are chosen to meet the circuit requirements of the particular receiver. The resistance values are determined after careful laboratory tests and cannot be changed without impairing performance.

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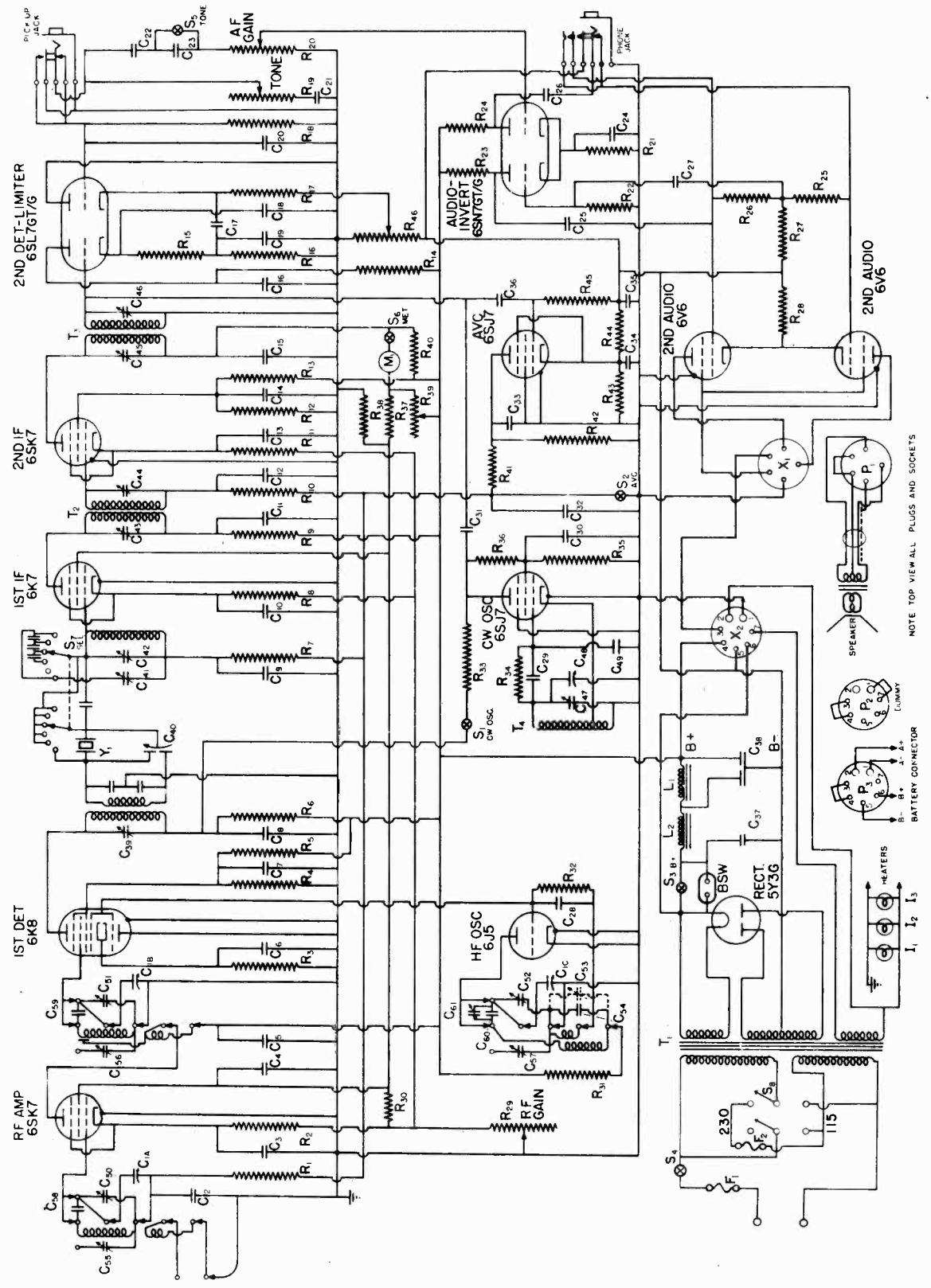

NC-2-40D
DWG. NO. 3 SCHEMATIC DIAGRAM

IF PEAK 455 KC

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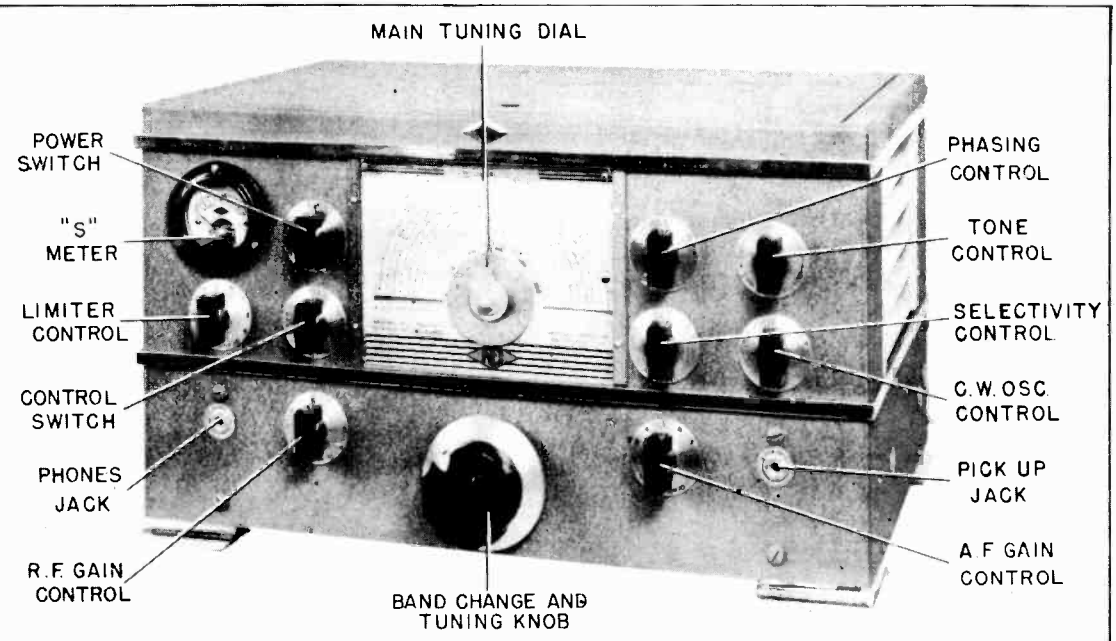
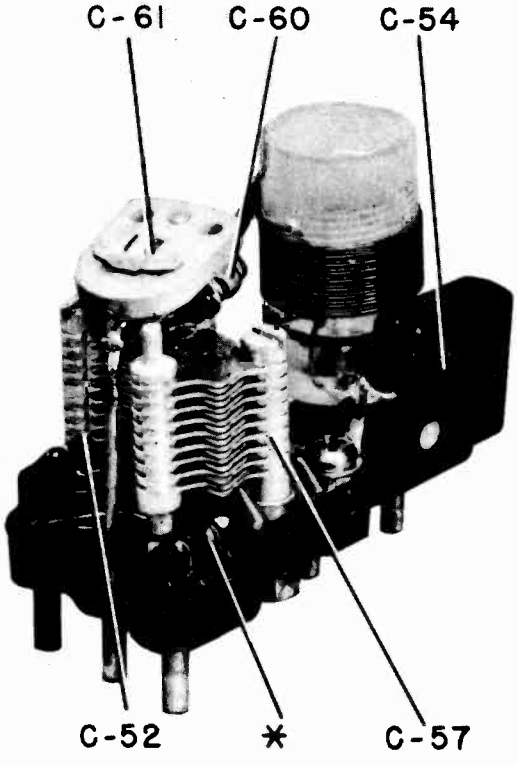
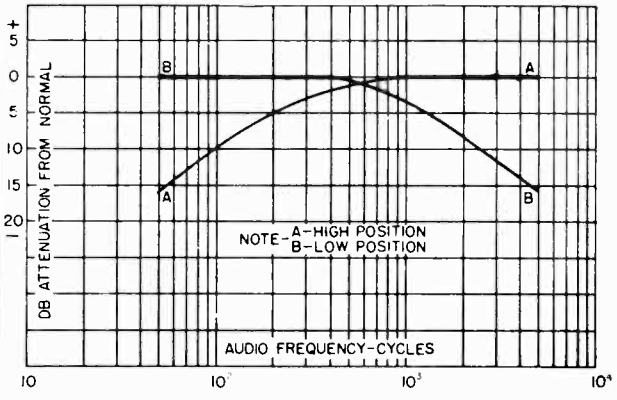


FIG. NO. 2



* FIXED BANDSPREAD TRIMMER, NOT USED ON ALL BANDS

Fig. No. 4. B-3 Coil--Typical H.F. Oscillator Bandspread Coil



Dwg. No. 2. Tone Control Action

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The circuit description, installation, operation, service and test data, and alignment data sections applying to Models NC-2-40C and NC-2-40CS (see page numbers below), also apply to Model NC-2-40D, with the exceptions of the following sections:

1-4. *Tuning System*

The master tuning capacitor C-1 and six sets of coils are used to tune the 490 to 30,000 kilocycle range of the receiver. By means of a highly developed band change mechanism, four of these same coil sets are made to spread the 10, 20, 40 and 80 meter amateur bands uniformly over the major portion of the tuning dial (HRO System). All ten ranges are calibrated

1-6. *Noise Limiter*

The noise limiter of the NC-2-40D Receiver is of the series valve type developed in the National Laboratories. Its effectiveness and superior performance as compared to the more common types of "silencers" were proved in the NHU and modernized NC-200 receivers. A threshold control on the front panel permits adjustment of the level at which limiting action starts.

1-7. *Tone Control*

The tone control is used to vary the frequency characteristic of the audio amplifier as shown in the accompanying curves, Dwg. No. 2. The control is particularly helpful when receiving weak signals through interference, as explained in Section 3.

1-13 *Pick-up Jack*

A pick-up jack mounted on the front panel of the receiver may be used to connect auxiliary apparatus, such as a phonograph pick-up, to the audio system of the NC-2-40D Radio Receiver. This input circuit is high impedance and feeds into the 6SN7GT/G Audio Amplifier-Phase Inverter tube. The TONE and A.F. GAIN controls are operative with this connection.

3-1. *Controls*

The tuning system of the NC-2-40D is truly single control; in fact, the MAIN TUNING control referred to above is used for band changing as well as tuning. To select either a general coverage or bandspread coil range, the MAIN TUNING control knob is pulled out about 1/4 inch. When this is done, the dial and capacitor drive mechanism is disengaged and the knob is geared to the coil casting. As the knob is turned, the coil carriage is moved across the chassis until the proper coil pin contacts engage the circuit contactors, as indicated by the scale markers. Approximately one full turn of the MAIN TUNING knob is required to change from one general coverage range to an adjacent general coverage range. Approximately one-quarter turn of the knob is required to shift from a general coverage range to the associated band-spread range near the high frequency end. The knob does not turn smoothly between ranges, but only a few minutes is required to become familiar with its action. After the desired range has been selected, the tuning knob is pushed in to its original position, engaging the capacitor drive and disengaging the coil carriage rack.

5-1. *General*

All coils have individual general coverage trimmer capacitors. The H.F. oscillator circuits of broadcast ranges E & F have, also, general coverage variable series padding capacitors. All coils of ranges A, B, C and D have band-spread trimmer capacitors. Variable series padding capacitors are used in all H.F. oscillator band-spread circuits. These capacitors are identified on Fig. No. 6.

Adjustment of general coverage circuits affects the alignment of the band-spread circuits. On the other hand, band-spread circuit adjustments have little effect on general coverage circuit alignment. This fact must be kept in mind when any high frequency circuit is adjusted.

Alignment of the equipment may be divided into three major steps:

(1) I.F. Amplifier Alignment
(2) General Coverage Alignment
  (a) H.F. Oscillator
  (b) First Detector and R.F. Amplifier
  (c) Tracking of H.F. Circuits
(3) Band Spread Alignment
  (a) H.F. Oscillator
  (b) First Detector and R.F. Amplifier
  (c) Tracking of H.F. Circuits

The circuits MUST be tuned in the above order when complete alignment is necessary.

5-4. *Band-Spread Alignment*

(a) H.F. Oscillator

The method of adjusting the H.F. oscillator band-spread trimmer C-57 of any band is the same as that described under Section 5-3 (a) above. As stated previously (Section 5-1), the adjustment of the general

MODEL NC-2-40D

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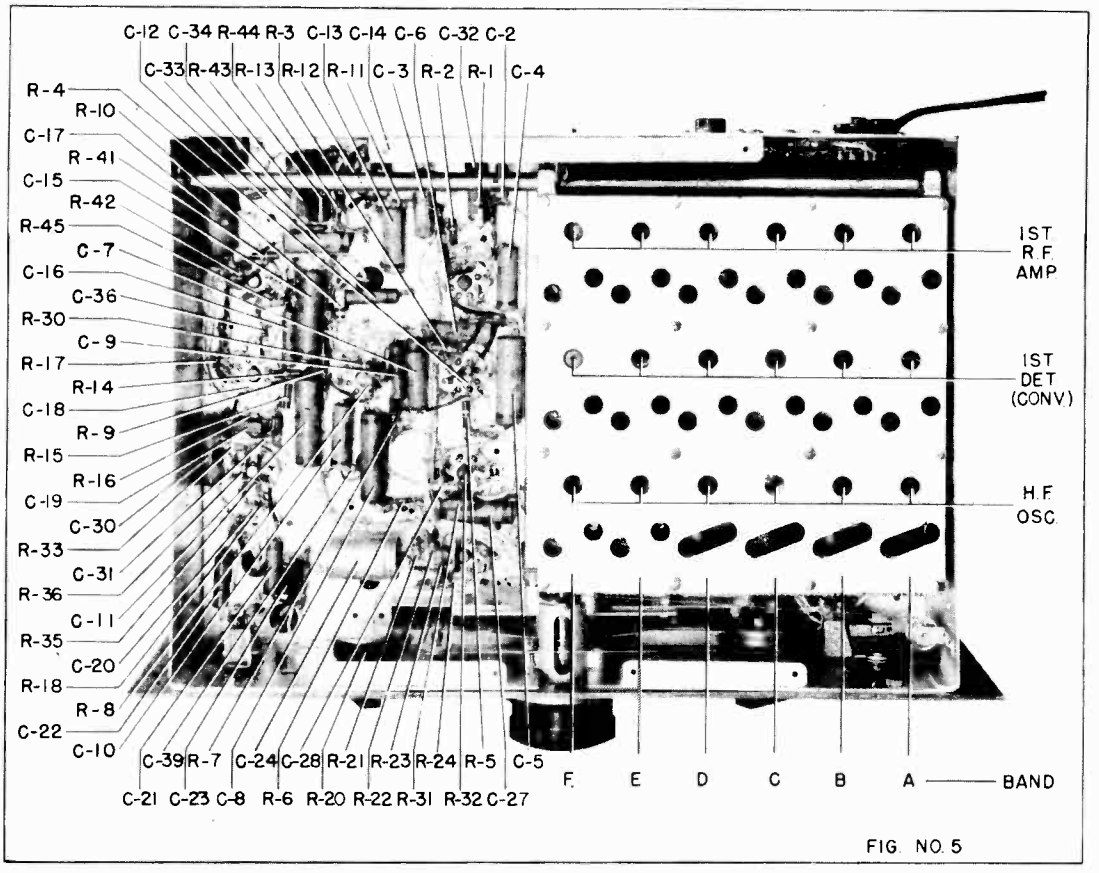


FIG. NO. 5

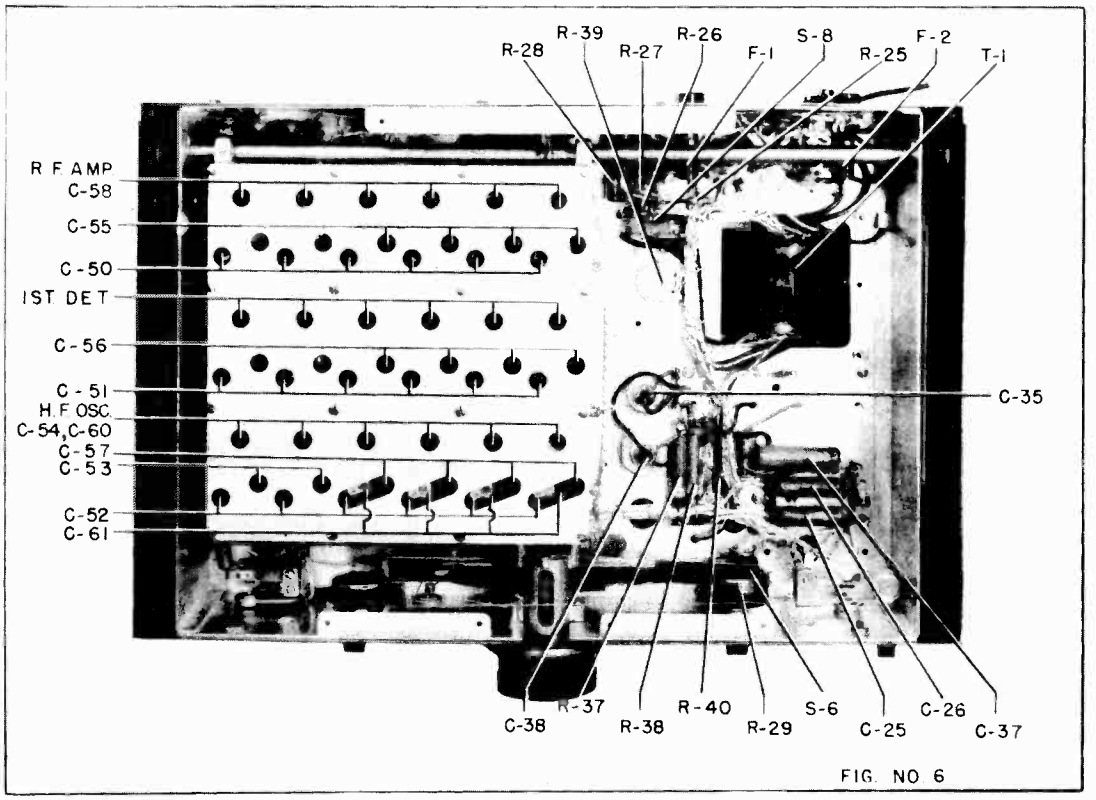


FIG. NO. 6

Band-spread Alignment (cont'd)

coverage trimmers must not be altered at this time.

(b) First Detector and R.F. Amplifier

The method of adjusting the band-spread trimmers C-59 and C-58 of the first detector and R.F. Amplifier circuits is the same as that described under Section 5-3 (b).

(c) Tracking of H.F. Circuits

After steps (a) and (b) have been completed, the MAIN TUNING control should be turned to the low frequency band limit, and the accuracy of the dial reading checked. If the dial reading is too low, the capacity of the series padding capacitor C-61 (See Fig. No. 6) should be increased until the dial reading is correct, and vice versa. The MAIN TUNING control should then be reset at the high frequency band limit, and step (a) repeated. Recheck the low frequency dial reading and repeat the whole procedure if necessary.

The detector and R.F. amplifier stages have fixed band-spread padding capacitors. These circuits will, therefore, track properly with the H.F. oscillator stage provided that the general coverage circuits are properly aligned and that the band-spread H.F. oscillator circuits are accurately tuned.

5-5. *S-Meter Adjustment*

The S-meter balancing resistor R-39, shown in Fig. No. 3, is used to obtain zero meter reading in the absence of signal input to the receiver. The adjustment is as follows: Set the R.F. GAIN control at 10, CONTROL SWITCH at MVC, and disconnect the antenna leads; adjust R-39 until the S-meter reads zero.

5-6. *Band Indicator Adjustment*

An adjustment for centering the band indicator markers in the horizontal slots of the dial face is located in back of the MAIN TUNING knob. It is recommended that the MAIN TUNING knob be pulled out to engage the band changing mechanism, and turned clockwise to the last position before the stop. The red band marker should then indicate 28 to 30 mc. (10 meter) band-spread. To make the adjustment, simply remove the tuning knob and set the 1/4" hex-head screw as may be required. The screw is self-locking.

Symbol	*Function*	*Type*	*Rating*
	CAPACITORS		
C1A	R.F. Amplifier Tuning	Air	225 mmf. max.
C1B	First Detector Tuning	Air	225 mmf. max.
C1C	H.F. Oscillator Tuning	Air	225 mmf. max.
C2	R.F. Grid Filter	Mica	.005 mfd., 300 v.d.c.w.
C3	R.F. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C4	R.F. Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C5	R.F. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C6	First Det. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C7	First Det. Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C8	First Det. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C9	First I.F. Grid Filter	Paper	.01 mfd., 600 v.d.c.w.
C10	First I.F. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C11	First I.F. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C12	Sec. I.F. Grid Filter	Paper	.01 mfd., 600 v.d.c.w.
C13	Sec. I.F. Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C14	Sec. I.F. Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C15	Sec. I.F. B+ By-pass	Paper	.1 mfd., 600 v.d.c.w.
C16	Sec. Det. Plate By-pass	Paper	.01 mfd., 600 v.d.c.w.
C17	Sec. Det. to Limiter Audio Coupling	Paper	1. mfd., 200 v.d.c.w.
C18	Sec. Det. Cathode By-pass	Ceramic	.00025 mfd., 500 v.d.c.w.
C19	Sec. Det. I.F. By-pass	Mica	.001 mfd., 500 v.d.c.w.
C20	Limiter Output By-pass	Ceramic	.00025 mfd., 500 v.d.c.w.
C21	Tone Control	Paper	.01 mfd., 600 v.d.c.w.
C22	Limiter to Inverter-Audio Coupling	Paper	.01 mfd., 600 v.d.c.w.
C23	Tone Control	Mica	.001 mfd., 500 v.d.c.w.
C24	Inverter-Audio Cathode By-pass	Elec.	10 mfd., 50 v.d.c.w.
C25	Inverter-Audio to Output Coupling	Paper	.1 mfd., 400 v.d.c.w.
C26	Inverter-Audio to Output Coupling	Paper	.1 mfd., 400 v.d.c.w.
C27	Inverter-Feedback Coupling	Paper	.1 mfd., 400 v.d.c.w.
C28	H.F. Oscillator Grid	Ceramic	.00025 mfd., 500 v.d.c.w.
C29	Beat Oscillator Grid	Mica	.001 mfd., 500 v.d.c.w.
C30	Beat Oscillator Screen By-pass	Paper	.1 mfd., 400 v.d.c.w.
C31	Beat Osc. to Sec. Det. Coupling	Ceramic	2 mmf., 500 v.d.c.w.
C32	AVC Output By-pass	Paper	.1 mfd., 400 v.d.c.w.
C33	AVC Plate By-pass	Paper	.1 mfd., 400 v.d.c.w.
C34	AVC Cathode By-pass	Paper	.1 mfd., 400 v.d.c.w.
C35	B Minus By-pass	Elec.	40 mfd., 200 v.d.c.w.
C36	AVC to Sec. Det. Coupling	Ceramic	.00005 mfd., 500 v.d.c.w.
C37	Power Supply Filter	Paper	.1 mfd., 600 v.d.c.w.
C38	Power Supply Filter	Elec.	8 and 8 mfd., 475 v.d.c.w.
C39	Crystal Filter Input Tuning	Air	6 to 85 mmf.
C40	Crystal Filter Phasing Control	Air	5 and 5 mmf.
C41	Crystal Filter Compensating	Ceramic	2 to 6 mmf.
C42	Crystal Filter Output Tuning	Air	6 to 85 mmf.
C43	T-2 Primary Tuning	Air	6 to 85 mmf.
C44	T-2 Secondary Tuning	Air	6 to 85 mmf.
C45	T-3 Primary Tuning	Air	6 to 85 mmf.
C46	T-3 Secondary Tuning	Air	6 to 85 mmf.
C47	T-4 Tuning	Air	6 to 85 mmf.
C48	C.W. Osc. Control	Air	1 to 10 mmf.

PARTS LIST (Continued)

Symbol	Function	Type	Rating
	CAPACITORS (Continued)		
C49	C.W. Osc. Compensating	Ceramic	10 mmf., 500 v.d.c.w.
C50	Gen. Cov. R.F. Amplifier Trimmer	Air	See Note No. 1
C51	Gen. Cov. 1st Det. Trimmer	Air	See Note No. 1
C52	Gen. Cov. H.F. Osc. Trimmer	Air	See Note No. 1
C53	Gen. Cov. H.F. Osc. Padder	Air	See Note No. 1
C54	Gen. Cov. H.F. Osc. Padder	Mica	See Note No. 1
C55	Band-Spread R.F. Amplifier Trimmer	Air	See Note No. 1
C56	Band-Spread 1st Det. Trimmer	Air	See Note No. 1
C57	Band-Spread H.F. Osc. Trimmer	Air	See Note No. 1
C58	Band-Spread R.F. Amplifier Padder	Ceramic	See Note No. 1
C59	Band-Spread 1st Det. Padder	Ceramic	See Note No. 1
C60	Band-Spread H.F. Osc. Padder	Ceramic	See Note No. 1
C61	Band-Spread H.F. Osc. Padder	Mica	3 to 30 mmf.
C62	Gen. Cov. R.F. Amplifier Padder	Mica	900 mmf., 500 v.d.c.w.*
C63	Gen. Cov. 1st Det. Series Padder	Ceramic	16 mmf., 500 v.d.c.w.*
C64	Gen. Cov. H.F. Osc. Padder	Ceramic	20 mmf., 500 v.d.c.w.*
	RESISTORS		
R1	R.F. Grid Filter	Fixed	500,000 Ohm, 1/2 w.
R2	R.F. Cathode Bias	Fixed	500 Ohm, 1/2 w.
R3	First Det. Cathode Bias	Fixed	250 Ohm, 1/2 w.
R4	First Det. Screen Bleeder	Fixed	100,000 Ohm, 1/2 w.
R5	First Det. Screen Dropping	Fixed	50,000 Ohm, 1/2 w.
R6	First Det. Plate Filter	Fixed	2,000 Ohm, 1/2 w.
R7	First I.F. Grid Filter	Fixed	20,000 Ohm, 1/2 w.
R8	First I.F. Cathode Bias	Fixed	See Note No. 2, 1/2 w.
R9	First I.F. Plate Filter	Fixed	2,000 Ohm, 1/2 w.
R10	Sec. I.F. Grid Filter	Fixed	500,000 Ohm, 1/2 w.
R11	Sec. I.F. Cathode Bias	Fixed	See Note No. 2, 1/2 w.
R12	Sec. I.F. Screen Bleeder	Fixed	100,000 Ohm, 1/2 w.
R13	Sec. I.F. Screen Dropping	Fixed	70,000 Ohm, 1/2 w.
R14	Sec. Det. Plate Filter	Fixed	2,000 Ohm, 1/2 w.
R15	Sec. Det. I.F. Filter	Fixed	5,000 Ohm, 1/2 w.
R16	Sec. Det. Load	Fixed	25,000 Ohm, 1/2 w.
R17	Limiter Input	Fixed	100,000 Ohm, 1/2 w.
R18	Limiter Output	Fixed	50,000 Ohm, 1/2 w.
R19	Tone Control	Comp. Var.	500,000 Ohm, 1 w.
R20	A.F. Gain Control	Comp. Var.	500,000 Ohm, 1 w.
R21	Inverter-Audio Cathode Bias	Fixed	1,000 Ohm, 1/2 w.
R22	Inverter Grid	Fixed	500,000 Ohm, 1/2 w.
R23	First Audio Plate	Fixed	50,000 Ohm, 1/2 w.
R24	First Audio Plate	Fixed	50,000 Ohm, 1/2 w.
R25	Output Grid	Fixed	250,000 Ohm, 1/2 w.
R26	Output Grid	Fixed	250,000 Ohm, 1/2 w.
R27	Inverter Feedback Coupling	Fixed	250,000 Ohm, 1/2 w.
R28	Output Cathode Bias	Fixed	200 Ohm, 2 w.
R29	R.F. Gain Control	W.W. Var.	10,000 Ohm, 1 1/2 w.
R30	R.F. Gain Bleeder	Fixed	50,000 Ohm, 1/2 w.
R31	H.F. Osc. B+ Dropping	Fixed	50,000 Ohm, 1 w.

Note No. 1. Capacitor rating is different in each coil range and is individually adjusted as circuit conditions may require. Definite rating cannot be listed. C-53 used in E and F bands only. C-54 to C-61, inclusive, used in A, B, C, and D bands only.

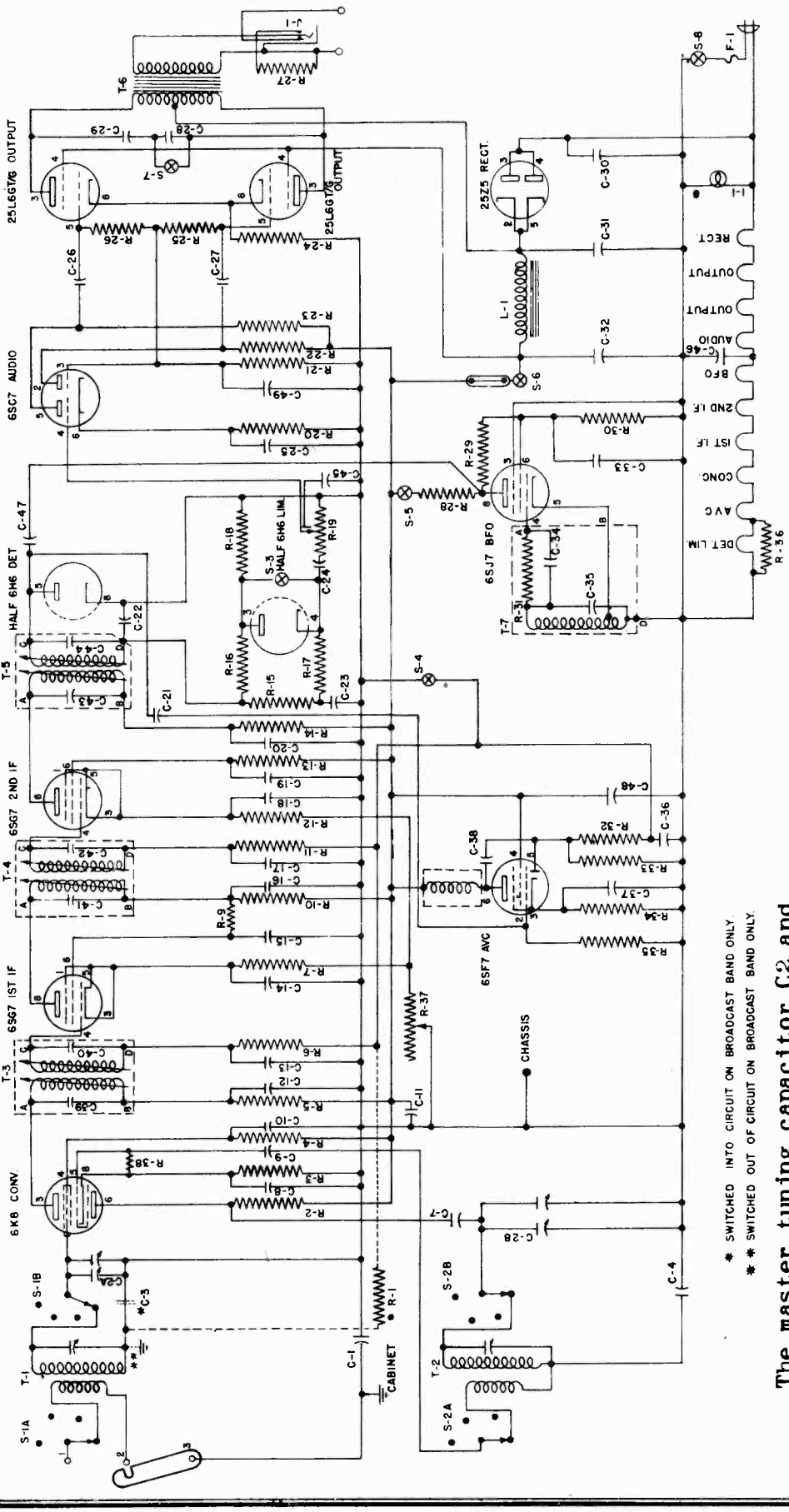
Symbol	Function	Type	Rating
	RESISTORS (Continued)		
R32	H.F. Osc. Grid	Fixed	50,000 Ohm, 1/2 w.
R33	Beat Osc. Plate Filter	Fixed	250,000 Ohm, 1/2 w.
R34	Beat Osc. Grid	Fixed	50,000 Ohm, 1/2 w.
R35	Beat Osc. Screen Bleeder	Fixed	100,000 Ohm, 1/2 w.
R36	Beat Osc. Screen Dropping	Fixed	100,000 Ohm, 1/2 w.
R37	B+ Voltage Divider	Fixed	20,000 Ohm, 2 w.
R38	B+ Voltage Divider	Fixed	20,000 Ohm, 2 w.
R39	S-Meter Adjustment	W.W. Var.	1,000 Ohm, 1 w.
R40	S-Meter Bridge	Fixed	1,000 Ohm, 1/2 w.
R41	AVC Plate Filter	Fixed	500,000 Ohm, 1/2 w.
R42	AVC Plate	Fixed	500,000 Ohm, 1/2 w.
R43	AVC Voltage Divider	Fixed	1,500 Ohm, 2 w.
R44	AVC Cathode Bias	Fixed	500 Ohm, 2 w.
R45	AVC Grid	Fixed	5,000,000 Ohm, 1/2 w.
R46	Limiter Control	W.W. Var.	10,000 Ohm, 1 1/2 w.
	MISCELLANEOUS		
F1	AC Line Fuse	Glass Encl.	2 Amp.
F2	AC Line Fuse	Glass Encl.	1 Amp.
I1	S-Meter Lamp	No. 40	6 v., .15 a.
I2	Dial Lamp	No. 47	6 v., .15 a.
I3	Dial Lamp	No. 47	6 v., .15 a.
L1	Power Supply Filter Choke	Potted	17 h., 100 ma.
L2	Power Supply Filter Choke	Potted	17 h., 100 ma.
M1	Signal Strength Meter	"S" Scale	0 to 1 ma.
P1	Loud Speaker Connector Plug	Molded	5 Prong
P2	Dummy Plug for AC Operation	Molded	7 Prong
P3	Battery Connector Plug	Molded	7 Prong
S1	Control Switch	Two Gang	SPST 250 v., 1 a.
S2			
S3	Power Supply Switch	Two Gang	SPST 250 v., 1 a.
S4			
S5	Tone Control Switch	Pt. of R-19	SPST
S6	S-Meter Switch	Pt. of R-29	SPST
S7	Selectivity Control Switch	Rotary	2 Section, Ganged
S8	T-1 Primary Selection Switch	Toggle	DPDT, 250 v., 3 a.
T1	Power Transformer	150 Watt	115 Volt, 60 Cycle, 230 Volt, 60 Cycle
T2	I.F. Transformer	Air Tuned	455 kc.
T3	I.F. Transformer	Air Tuned	455 kc.
T4	Beat Osc. Transformer	Air Tuned	455 kc.
X1	Audio Output Socket	Bakelite	5 Prong
X2	Battery Connector Socket	Bakelite	7 Prong
X5	B Connector (BSW)	Bakelite	2 Connector
Y1	Crystal Resonator	Quartz	455 kc.

Note No. 2. Resistors R8 and R11 may have values between 300 and 5000 Ohms since they are chosen to meet the circuit requirements of the particular receiver. The resistance values are determined after careful laboratory test and cannot be changed without impairing performance.

* These Capacitors used on the A band only.

MODEL NC-46

NATIONAL CO. INC.



NC-46 RECEIVER
DWG. NO. 1-SCHEMATIC DIAGRAM

IF PEAK 455 KC

The master tuning capacitor C2 and four sets of associated coils are used to tune the frequency range of the receiver in four tuning bands for both general coverage and bandspread operation.

The overall frequency coverage of the four bands is as follows:

Band A	11.5 -	30 0 MC
Band B	4.4 -	12.0 MC
Band C	1.55 -	4.6 MC
Band D	0.54 -	1.6 MC

The following bands in the short wave ranges are tunable by the bandspread capacitor and are spread as follows:

3.5 -	4.0 MC	65 Divisions
7.0 -	7.3 MC	50 Divisions
14.0 -	14.4 MC	56 Divisions
28.0 -	30.0 MC	40 Divisions

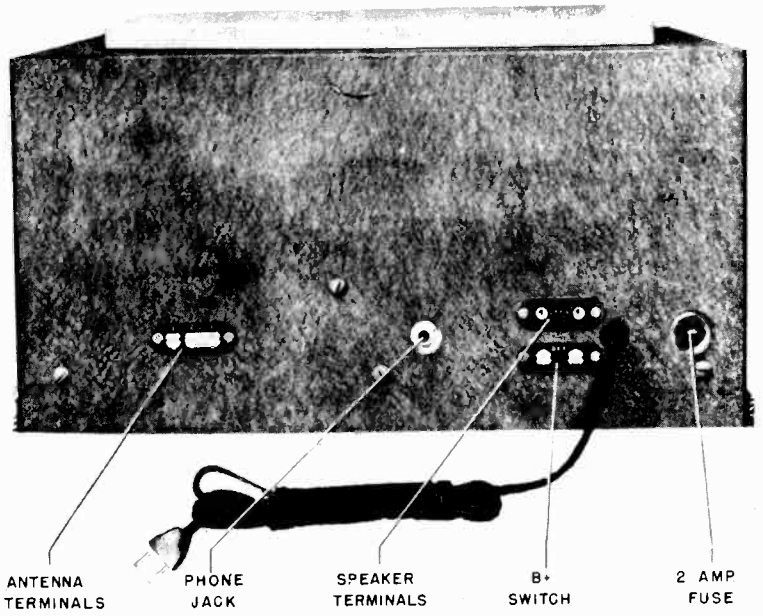


FIG. NO. 1

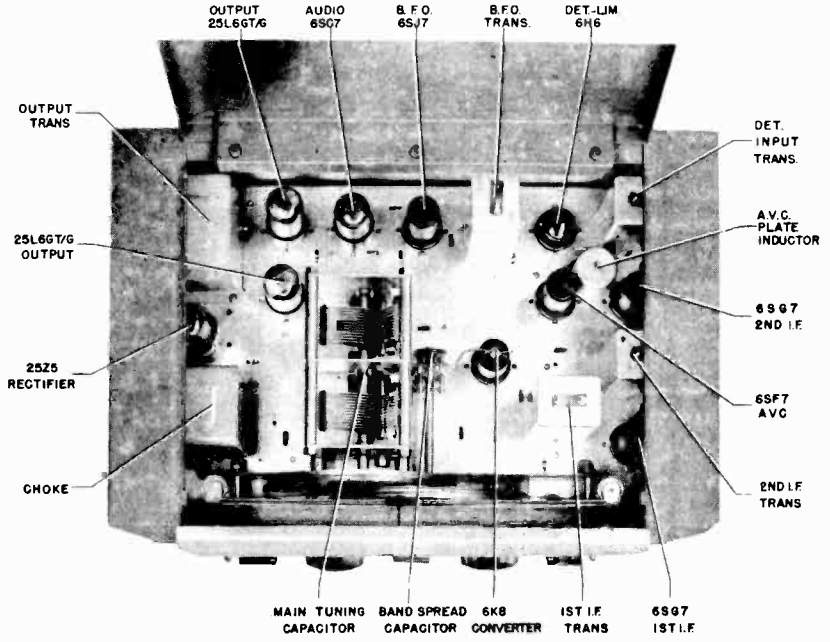


FIG. NO. 3

Circuit

The circuit employed in the NC-46 consists of a converter stage, two intermediate frequency stages, diode detector, limiter, beat frequency oscillator, AVC amplifier, phase inverter, push-pull output and rectifier stages.

The second detector utilizes one set of elements of a dual diode; the other set of elements is used for a noise limiter. Separate tubes are used in the automatic volume control and beat frequency oscillator circuits. The latter is coupled to the second detector for C.W. reception.

All voltages required by the receiver circuits are supplied by a built-in power supply.

Audio Output

Two audio output circuits are provided:

(1) A headphone jack is mounted on the rear of the receiver and is so wired as to silence the loudspeaker when the phone plug is inserted. The load impedance for the headphone output is not critical and any good set of headphones may be used.

(2) Tip-jack terminals are provided at the rear of the receiver for speaker connection. The output load impedance of the receiver is 10 ohms. This allows the use of a permanent magnet speaker with a voice coil of 8 to 10 ohms. The use of a matching output transformer is not required. Maximum undistorted audio power output available is approximately 4 watts.

Antenna Recommendations

There is an antenna terminal strip mounted at the rear of the receiver with three screw-type connections available marked #1, #2 and #3. Terminal #3 is the ground connection. The strip is furnished with a sliding link to short out terminals #2 and #3 for operation with a single wire antenna. Doublet antennae, directive arrays etc., having two wire feeder systems may be used connecting directly to terminals #1 and #2, terminal #3 and strap not being used. For general coverage a single wire antenna of approximately 50 to 100 feet will be found to give satisfactory results. To obtain peak performance on any particular desired channel the antenna length should be approximately an odd quarter-wave length of the band in use.

Controls

The MAIN TUNING control knob is located to the left of the center of the front panel. This knob operates a two gang variable capacitor through a 30 to 1 ratio reduction drive mechanism.

The ELECTRICAL BANDSPREAD control knob is located to the right of the center of the front panel. This knob operates a separate two gang variable capacitor to provide bandspread tuning.

The BAND SELECTOR switch is located at the center of the front panel and functions to select the tuning band desired. The band in use is indicated by the designating letters on this switch dial. The four tuning scales on the main tuning dial are marked at either end of the dial by these designating letters.

Tuning is accomplished by the following steps:

(a) Select the band to be used by means of the BAND SELECTOR switch.

(b) The frequency calibration of the main tuning dial will only be correct with the bandspread pointer set at 90. After this setting has been made the MAIN TUNING control knob is used to tune in the desired station. The bandspread pointer may then be used to give greater accuracy in logging.

The TONE CONTROL switch is located at the upper left-hand side of the receiver and functions to select the frequency characteristic of the audio amplifier as desired, i.e. HIGH or LOW. The HIGH position will give the better fidelity and the LOW a better signal to noise ratio.

The C.W.O. CONTROL switch is located to the right of the TONE CONTROL switch functioning to switch on or off the beat frequency oscillator.

The VOLUME control is located to the left of the MAIN TUNING knob functioning to adjust the audio amplification of the receiver. Part of this control is a stand-by switch permitting the A.C. line switch to remain on but with B supply circuit open.

The LIMITER CONTROL switch is located at the upper right-hand side of the front panel functioning to switch "On" or "Off" the noise limiter. This control is normally in the "Off" position

The A.V.C. CONTROL switch is located to the left of the LIMITER switch functioning to switch the automatic volume control circuits into or out of the receiver circuits.

The SENSITIVITY control is located to the right of the BANDSPREAD control knob and functions to adjust the amplification of the two I.F. amplifier tubes. Incorporated in this control is the power supply "ON" "OFF" switch; with this switch in the "Off" position the receiver is inoperative.

There is a B.S.W. terminal panel provided at the rear of the receiver to permit remote stand-by control. The terminals are connected in series with the B switch.

After the equipment is properly installed, it is placed in operation by turning the SENSITIVITY control to 10 and the VOLUME control to the point which provides the desired audio volume. The TONE control should be "On"; the C.W.O. control should be "Off"; the A.V.C. control should be "On"; the LIMITER should be "Off". The receiver is now adjusted for the reception of phone signals and can be tuned to the desired frequency and band by means of the MAIN TUNING control and BAND SELECTOR switch.

Individual tubes of the same type are apt to vary slightly in their characteristics and it is well to remember this fact when replacements become necessary. The circuit of the receiver has been designed to reduce the effect of such variations to a minimum but care should be taken in replacing the converter and I.F. amplifier tubes. A replacement converter tube should be checked in the receiver to make sure that the inter-electrode capacities are the same as those of the tube originally employed. This is readily checked by noting any change in the calibration at the high end of any tuning band. This change should not exceed two or three dial division.

Power Supply

The NC-46 Receiver is designed for operation from a 110/130 volt, A.C. or D.C. power source. Normal power consumption is approximately 65 watts. All voltages required for the heater and B supply circuits are delivered by a built-in power supply.

One side of the input power line is connected through a 2 ampere fuse to prevent any possible damage to the receiver due to a short-circuit or ground. This fuse is housed in an extractor post mounted at the rear of the receiver which permits ease in removal or inspection of the fuse.

Symbol	Type	Rating
CAPACITORS		
C1	Paper	0.1 mfd., 400 VDCW
C2A	Air	365 mmf. max.
C2B	Air	365 mmf. max.
C3	Paper	0.01 mfd., 400 VDCW
C4	Mica	See Note #1
C5	Air	See Note #1
C6	Air	See Note #1
C7	Mica	0.0047 mfd., 500 VDCW
C8	Paper	0.1 mfd., 400 VDCW
C9	Mica	100 mmf., 500 VDCW
C10	Paper	0.1 mfd., 400 VDCW
C11	Paper	1 mfd., 200 VDCW
C12	Paper	0.1 mfd., 400 VDCW
C13	Paper	0.01 mfd., 400 VDCW
C14	Paper	0.1 mfd., 400 VDCW
C15	Paper	0.01 mfd., 400 VDCW
C16	Paper	0.1 mfd., 400 VDCW
C17	Paper	0.01 mfd., 400 VDCW
C18	Paper	0.1 mfd., 400 VDCW
C19	Paper	0.01 mfd., 400 VDCW
C20	Paper	0.1 mfd., 400 VDCW
C21	Ceramic	50 mmf., 500 VDCW
C22	Mica	270 mmf., 500 VDCW
C23	Paper	0.1 mfd., 400 VDCW
C24	Paper	0.01 mfd., 400 VDCW
C25	Electrolytic	25 mfd., 50 VDCW
C26	Paper	0.01 mfd., 400 VDCW
C27	Paper	0.01 mfd., 400 VDCW
C28	Paper	0.02 mfd., 400 VDCW
C29	Paper	0.1 mfd., 400 VDCW
C30	Paper	0.1 mfd., 400 VDCW
C31	Electrolytic	40 mfd., 200 VDCW
C32	Electrolytic	40 mfd., 200 VDCW
C33	Paper	0.1 mfd., 400 VDCW
C34	Mica	270 mmf., 500 VDCW
C35	Mica	270 mmf., 500 VDCW
C36	Paper	0.1 mfd., 400 VDCW
C37	Paper	0.1 mfd., 400 VDCW
C38	Mica	0.001 mfd., 500 VDCW
C39	Mica	510 mmf., 500 VDCW
C40	Mica	510 mmf., 500 VDCW
C41	Mica	510 mmf., 500 VDCW
C42	Mica	510 mmf., 500 VDCW
C43	Mica	510 mmf., 500 VDCW
C44	Mica	510 mmf., 500 VDCW
C45	Paper	0.01 mfd., 400 VDCW
C46	Paper	0.1 mfd., 400 VDCW
C47	Bakelite	1 mmf., 400 VDCW

Symbol	Type	Rating
CAPACITORS (continued)		
C48	Paper	0.1 mfd., 400 VDCW
C49	Ceramic	270 mmf., 500 VDCW
Note #1. Capacitor ratings differ for each coil range and definite ratings cannot be listed.		
RESISTORS		
R1	Fixed	470,000 Ohms, 1/2 w
R2	Fixed	10,000 Ohms, 1/2 w
R3	Fixed	220 Ohms, 1/2 w
R4	Fixed	1,000 Ohms, 1/2 w
R5	Fixed	1,000 Ohms, 1/2 w
R6	Fixed	470,000 Ohms, 1/2 w
R7	Fixed	560 Ohms, 1/2 w
R8	Not Used	
R9	Fixed	22,000 Ohms, 1/2 w
R10	Fixed	1,000 Ohms, 1/2 w
R11	Fixed	470,000 Ohms, 1/2 w
R12	Fixed	560 Ohms, 1/2 w
R13	Fixed	22,000 Ohms, 1/2 w
R14	Fixed	2,200 Ohms, 1/2 w
R15	Fixed	1,000,000 Ohms, 1/2 w
R16	Fixed	470,000 Ohms, 1/2 w
R17	Fixed	1,000,000 Ohms, 1/2 w
R18	Fixed	470,000 Ohms, 1/2 w
R19	Variable	500,000 Ohms, 1 w
R20	Fixed	3,900 Ohms, 1/2 w
R21	Fixed	270 000 Ohms, 1/2 w
R22	Fixed	270,000 Ohms, 1/2 w
R23	Fixed	270,000 Ohms, 1/2 w
R24	Fixed	68 Ohms, 1/2 w
R25	Fixed	270,000 Ohms, 1/2 w
R26	Fixed	270,000 Ohms, 1 2 w
R27	Fixed W.W.	5 Ohms, 5 w
R28	Fixed	100,000 Ohms, 1/2 w
R29	Fixed	100,000 Ohms, 1/2 w
R30	Fixed	100,000 Ohms, 1/2 w
R31	Fixed	50,000 Ohms, 1/2 w
R32	Fixed	470,000 Ohms, 1/2 w
R33	Fixed	470,000 Ohms, 1/2 w
R34	Fixed	22,000 Ohms, 1/2 w
R35	Fixed	2,200,000 Ohms, 1/2 w
R36	Fixed	100 Ohms, 1/2 w
R37	Variable	10,000 Ohms, 1½ w
R38	Fixed	22,000 Ohms, 1/2 w
R39	Fixed	33,000 Ohms, 1/2 w

MODEL NC-46

NATIONAL CO. INC.

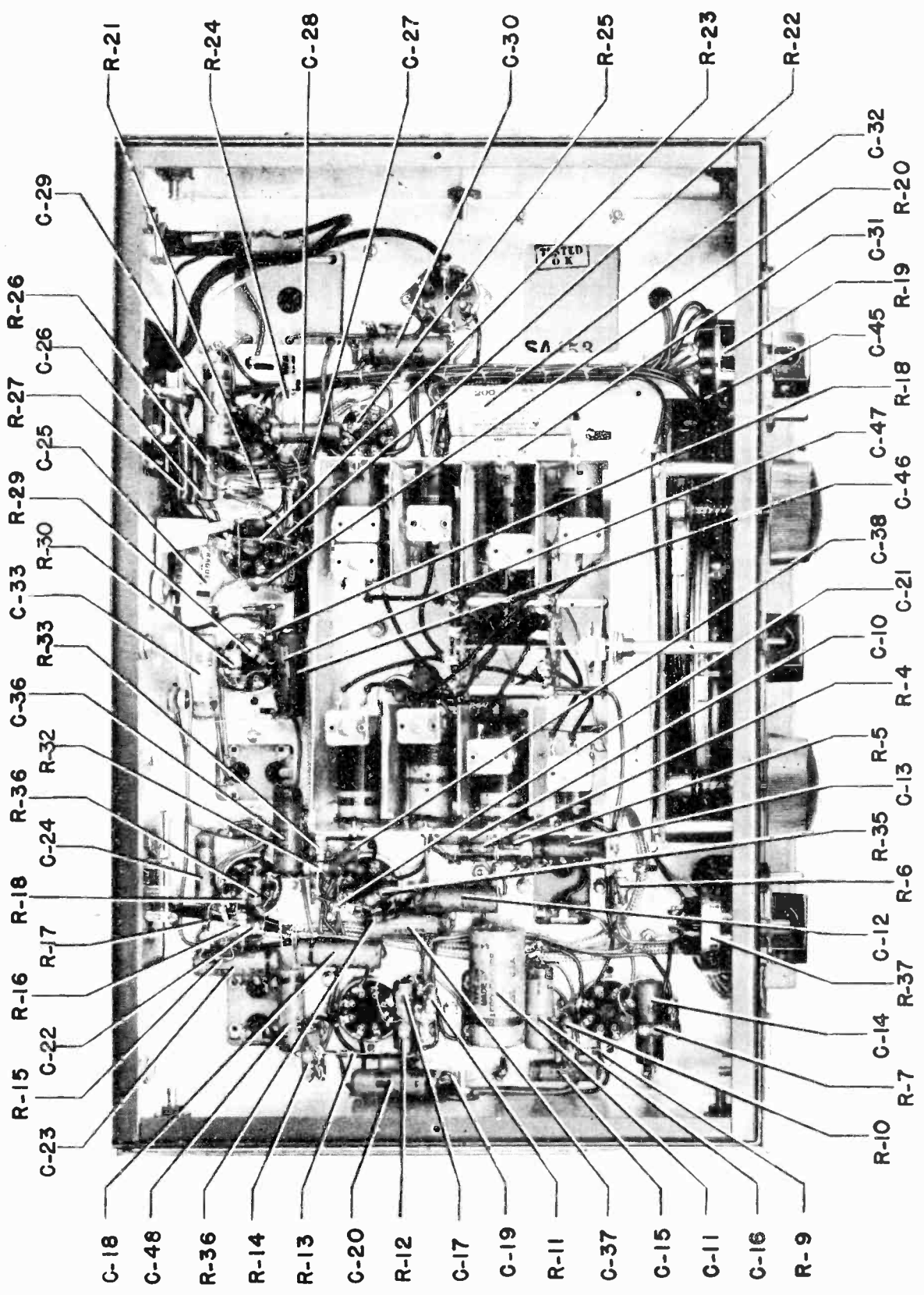


FIG. NO. 4

NATIONAL CO. INC.

The coil groups are mounted in a cadmium plated steel compartment which is directly below the main two gang variable capacitor. The oscillator coils are mounted nearest the left-hand side of the receiver with the first detector coils at the right. All coils have individual trimmer capacitors.

I.F. Amplifier Alignment

The intermediate frequency of the NC-46 Receiver is 455 kilocycles. The three I.F. transformers are of the permeability tuned iron-core type with primary and secondary adjustments.

The first I.F. transformer adjustments, the primary of the second I.F. transformer and the secondary of the third I.F. transformer adjustments are made from inside the cabinet; the secondary of the second I.F. transformer and the primary of the third I.F. transformer adjustments are made through holes in the top of the cabinet. These holes are concealed by means of sliding buttons.

To properly align the receiver the equipment should be set up as specified except that the antenna be disconnected and the A.V.C. switch turned to "Off", the VOLUME control turned to 10 and the TONE control be switched "Off" An output meter having a 10 ohm resistive load should be connected to speaker output terminals. The high output lead of an accurately calibrated signal generator should be connected to the grid terminal of the converter tube and the grounded lead to any convenient point on the chassis. Adjust the output attenuator of the signal generator to provide a signal of approximately 100 microvolts and vary the tuning control of the signal generator slowly between the frequencies of 452 and 458 kilocycles. At some frequency between these points the I.F. amplifier of the receiver will show a sharply peaked response as indicated on the output meter. The I.F. tuned iron cores should be carefully adjusted to give a maximum reading on the output meter. The order in which these adjustments are made is not important.

Coil Alignment

Controls should be set as outlined Alignment is effected as follows:

a. H.F. Oscillator alignment

(1) Set the MAIN TUNING dial to some frequency at the high end of the tuning band to be aligned.

(2) Connect a signal generator, accurately tuned to deliver a signal of the same frequency as that indicated by the receiver dial setting, to the antenna input terminals through a standard 500 ohm dummy antenna.

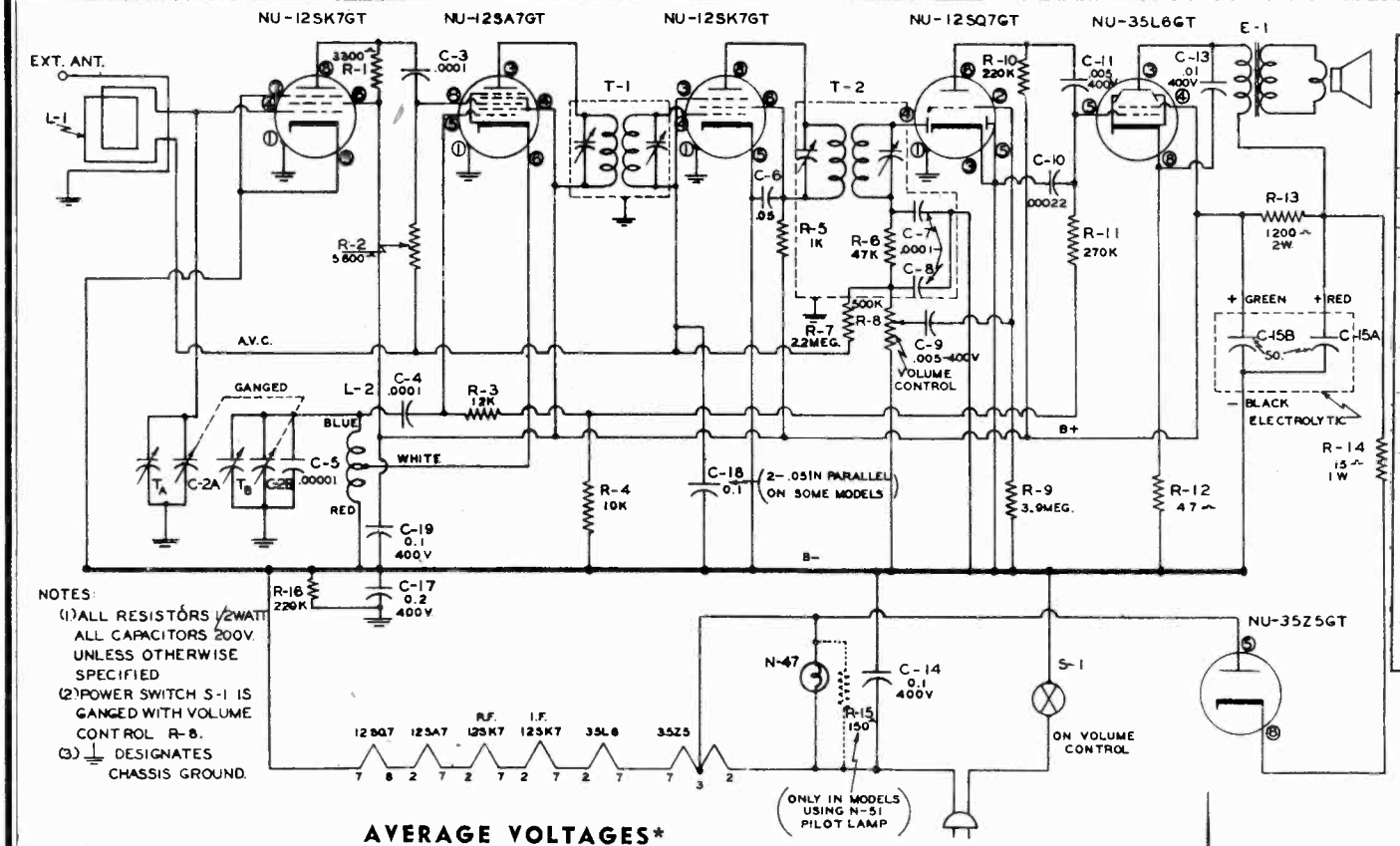
(3) By checking the calibration of the receiver against the signal delivered by the signal generator, the accuracy of the H.F. oscillator alignment can be observed. If the dial reading of the receiver is found to be high it can be corrected by decreasing the capacity of the H.F. oscillator trimmer capacitor; conversely, low dial readings can be corrected by increasing the capacity of the trimmer.

(4) Care should be taken to insure that the H.F. oscillator is tuned to the fundamental frequency and not the image. This can be checked by tuning to the image frequency which should appear 910 kilocycles below the fundamental frequency and should be considerably weaker. If the operator finds the receiver is tuned to the image signal the capacity of the H.F. oscillator trimmer capacitor should be decreased until the fundamental frequency appears at the proper dial setting.

b. 1st Detector alignment.

(1) With the signal generator adjusted to deliver a modulated signal near the high frequency limit of the tuning band to be checked, the receiver should be tuned to give maximum output, as indicated by the output meter. The 1st detector trimmer capacitor should then be adjusted to give a maximum reading on the output meter. If this trimmer requires considerable realignment it may necessitate the realignment of the H.F. oscillator trimmer to maintain correct calibration.

(2) An alternate method of aligning the 1st detector in the event a signal generator is not available is to set the trimmers at the setting giving the maximum background noise. It will be found that this method gives a sufficiently sharp indication to provide good alignment.



NOTES:
(1) ALL RESISTORS 1/2 WATT ALL CAPACITORS 200V. UNLESS OTHERWISE SPECIFIED
(2) POWER SWITCH S-1 IS GANGED WITH VOLUME CONTROL R-8.
(3) ⏚ DESIGNATES CHASSIS GROUND.

PARTS LIST

SYMBOL	DESCRIPTION	FACTORY PART NO.	NOTES
E-1	Complete Assembly (O.P. Transf. and P.M. Speaker)	EH6-1	Replacement of complete assembly is advisable if either part fails
Loop	Loop Antenna	LL-11	
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-CB may be used as a replacement
C2-A C2-B	2 Gang Variable Capacitor	CV-6	
C15A C15B	Electrolytic Capacitor 80-40/150	CE-81	
	Dial Lamp 6-8V./.20A, in early models		N-51
	6-8V./.15A, in later models		N-47
	Dial Scale (Glass)	ND-16-1	
	Dial Pointer	ND-1-2	
	Dial Lamp Socket	JS13-163	

I.F. 455 K.C.

AVERAGE VOLTAGES*

PIN NO.	R.F. 12SK7GT		CONV. 12SA7GT		I.F. 12SK7GT		DET. 12SQ7GT		POW. AMP. 35L6GT		RECT. 35Z5GT	
	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.	A.C.	D.C.
1	Zero		Zero		Zero		Zero		Zero		Zero	
2	25.0		13.0		37.0			—0.65	51.5		117.0	
3	Zero			72.0		—0.6	Zero			91.0	111.0	
4		—0.6		72.0		—0.6		—0.55		72.0	Zero	
5	Zero			—5.2	Zero		Zero			—0.4	111.0	
6		72.0	Zero			64.0		55.0		—2.1	Zero	
7	37.0		25.0		51.5		Zero		85.5		85.5	
8		43.0		—0.55		64.0	13.0			1.3		96.0

*Because of the many variables that may enter into voltage measurements it is impractical to indicate ABSOLUTE values of voltage. Readings must necessarily be AVERAGE voltages and even these are subject to a ±10% variation.

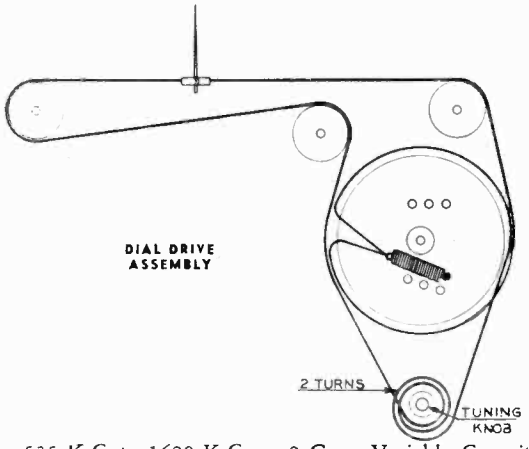
D.C. measurements shown are at 20,000Ω/volt.

A.C. measurements shown are at 1,000Ω/volt.

Readings are taken from SOCKET PINS TO COMMON NEGATIVE while viewing socket from the BOTTOM.

Volume Control set at MINIMUM.

Tuning Condenser set at Full Mesh (Maximum Capacity)



SERVICE NOTES

HUM MODULATION:

On Early Production runs Condenser C-18 consisted of two — .05 mfd. units. One ground terminal was connected to CHASSIS, the other to B—. Disconnect the CHASSIS terminal of the .05 Condenser now connected to Pin No. 1 of the NU-12SA7GT tube and connect this lead to Pin No. 5 of either of the NU-12SK7GTs or to any other convenient B— point. This effectively by-passes the A.C. Modulation hum to B— instead of to Chassis.

OSCILLATION:

Remove one side of Resistor R-2 (in grid circuit of 12SA7GT) now connected to A.V.C. bus and reconnect to cathode (#5 pin) of I.F.—12SK7GT.

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

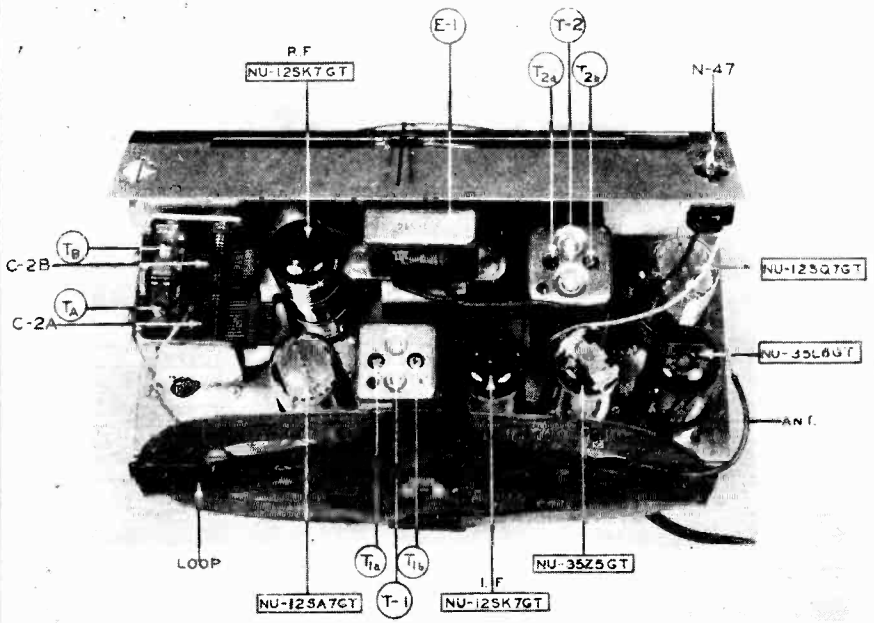


FIG. 1

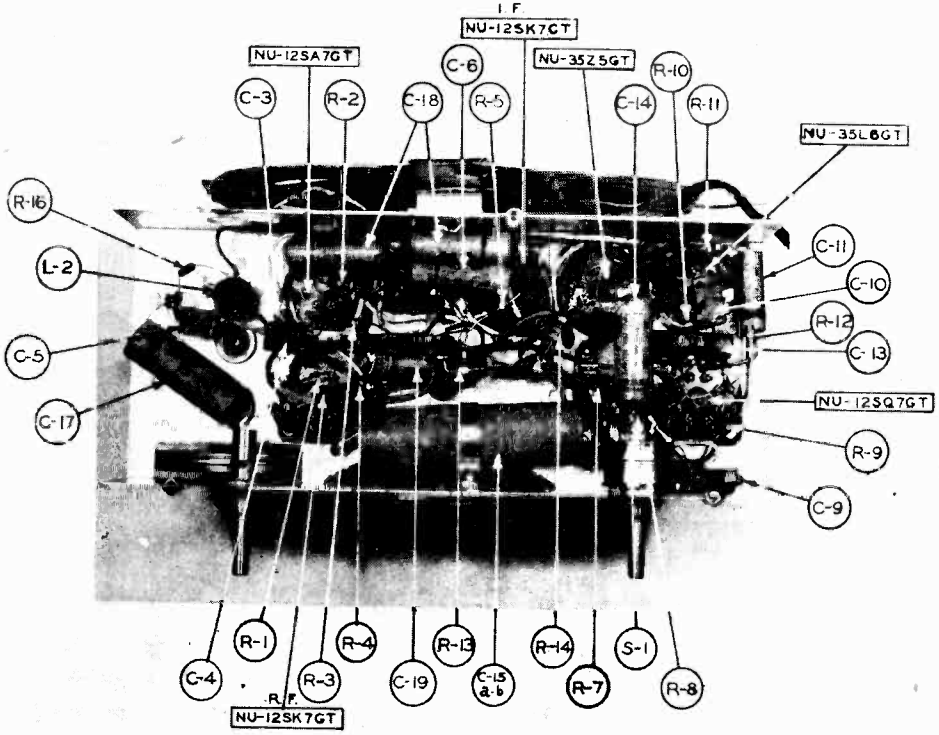


FIG. 2

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 (Fig. 1). Low side to B—	455 K.C.	T2a T2b T1a T1b (Fig. 1)	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.	Tb (Fig. 1)	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.	Ta (Fig. 1)	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
5	***REINSTALLING CHASSIS (AFTER ALIGNMENT):—*** (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.					

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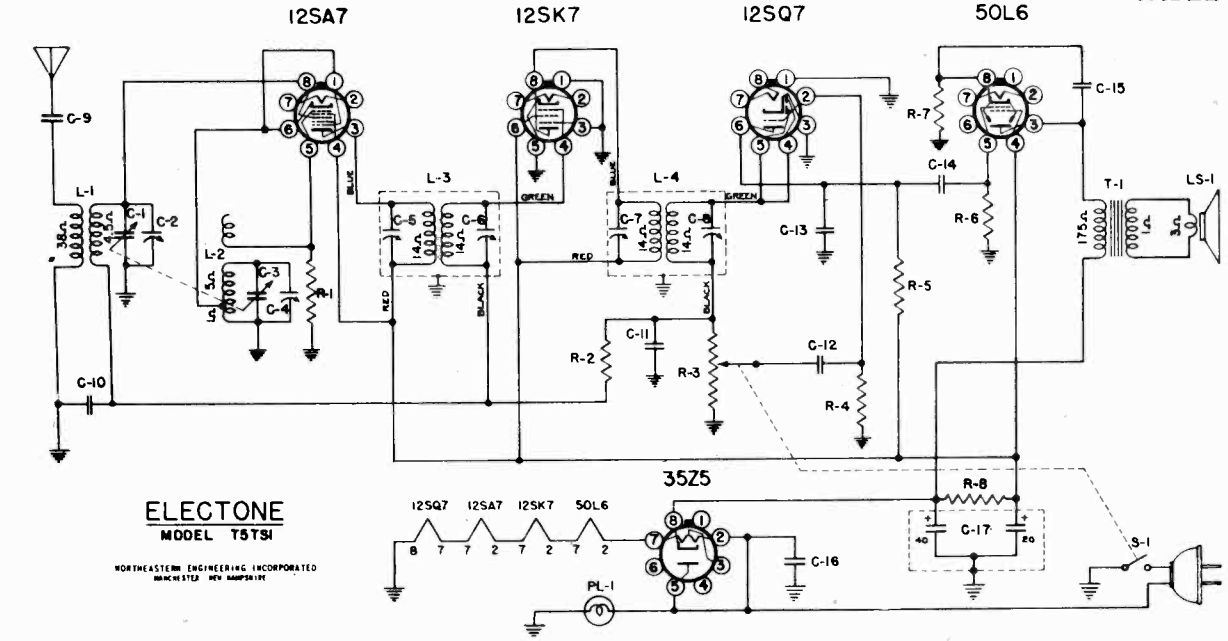
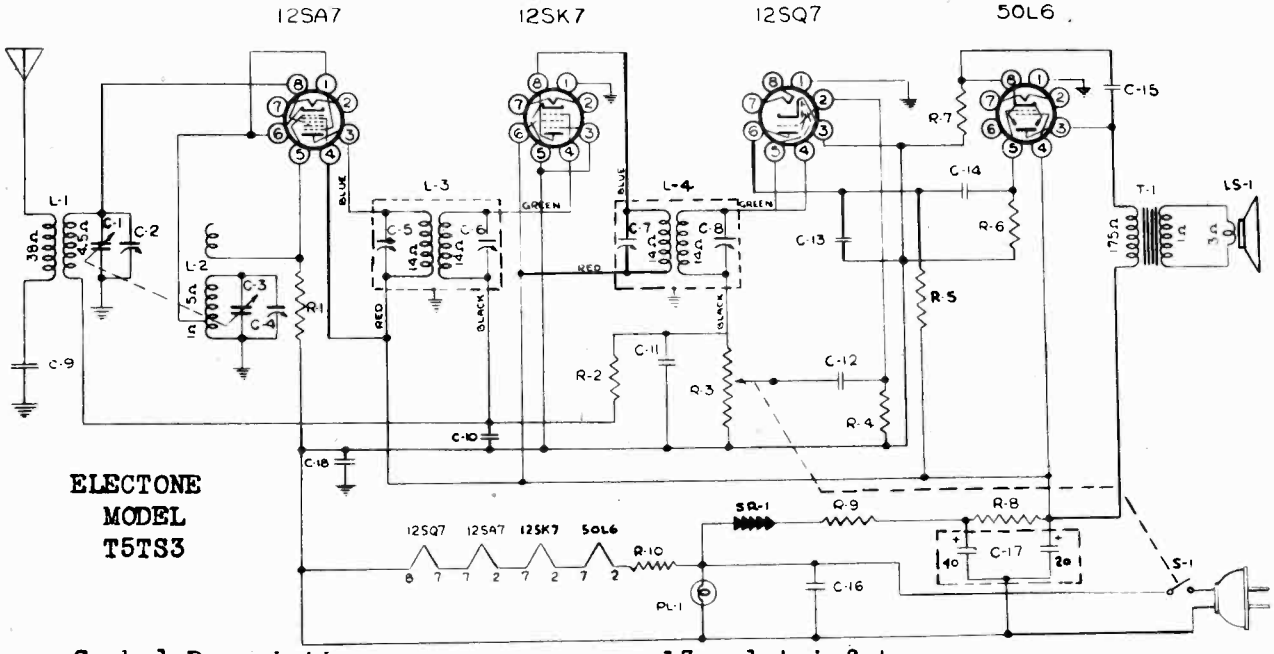
MODEL T5TS1
MODEL T5TS3





Symbol	Description
C1	Ant. Tuning cap. inc. C2
C3	Osc. tuning cap. inc. C4
C5, C6	1st i-f trimmer cap.
C7, C8	2nd i-f trimmer cap.
C9	Cap. 0.001 µfd,500 v,mica
C10	Cap. 0.05 µfd,200v,paper
C11	Cap. 0.00025 µfd,300v,mica
C12	Cap. 0.0002 µfd,600v,paper
C13	Cap. 0.00025 µfd,500v,mica
C14	Cap. 0.02 µfd,400v,paper
C15	Cap. 0.02 µfd,400v,paper
C16	Cap. 0.05 µfd,400v,paper
C17	Cap. 40/20 µfd,150v,electro
C18	Cap. 0.05 µfd,400v,paper
L1	Ant. coil
L2	Osc. coil
L3	1st i-f trans.
L4	2nd i-f trans.
LS1	Loudspeaker,5" PM
PL1	Pilot light,115v,6 watts
R1	20,000 ohms, 1/2 watt
R2	3.0 megohms, 1/2 watt
R3	Pot.amd switch (S1)500,000 ohms
R4	15.0 megohms,1/2 watt
R5	470,000 ohms,1/2 watt
R6	470,000 ohms,1/2 watt
R7	150,000 ohms,1/2 watt
R8	1,000 ohms, 5 watts
R9	75 ohms, type OW
R10	200 ohms, 10 watts
S1	Power switch (part of K3)
SR1	Selenium rectifier,100ma,5 plates
T1	Output trans.

MODEL T5TS1
MODEL T5TS3

NORTHEASTERN ENGINEERING INC.
Model T5TS1 Broadcast Receiver

GENERAL DESCRIPTION

The Model T5TS1 ELECTONE is a five tube superheterodyne broadcast entertainment receiver designed for operation from either a direct or alternating current power source. The circuit utilizes multi-unit tubes and incorporates automatic volume control. The chassis is enclosed in an all-metal cabinet of modern styling and having the following dimensions: Width 12"; Depth 7"; Height 7".

ELECTRICAL SPECIFICATIONS

Power Supply.....105-125 volts, 50-60 cycles, AC or 105-125 volts DC
Power Consumption.....30 watts
Frequency Range.....500-1700 Kcs.
Intermediate Frequency.....456 Kcs.
Audio Output.....1.5 watts

TUBE COMPLEMENT

Converter and Oscillator.....12SA7
I.F. Amplifier.....12SK7
Detector-AVC-Audio.....12SQ7
Power Output.....50L6GT
Rectifier.....35Z5GT
Dial Lamp.....Mazda #6S6

LOUDSPEAKER

Permanent Magnet.....5" Diameter

INSTALLATION FACILITIES PROVIDED

Power.....5' cord and plug
Antenna.....10' indoor type
Ground.....None required

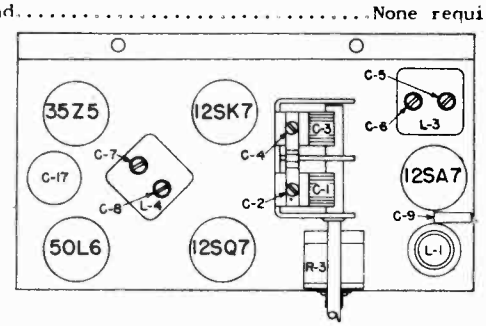


FIG. 1 - Tube and Trimmer Locations (Top View)

ALIGNMENT PROCEDURE

Alignment Frequencies:

I.F. .....456 Kcs.
R.F. .....1500 Kcs.

I. F. Alignment:

Connect output meter across the voice coil. Turn the receiver volume control to maximum. Connect high side of the alignment oscillator, through a .05 mfd. capacitor, to the converter grid.

Set alignment oscillator at 456 Kcs. and adjust output to give the lowest conveniently readable indication on the output meter. Adjust trimmers C-7 and C-8 in 2nd I.F. transformer to give maximum indication on output meter. Repeat this procedure for trimmers C-5 and C-6 in the 1st I.F. transformer. Repeat procedure to check accuracy.

R. F. Alignment:

Retain output meter connected as above and receiver volume control set at maximum. Connect alignment oscillator to antenna.

Set alignment oscillator at 1500 Kcs. and place in operation. Rotate receiver tuning capacitor (C-1 and C-3) to give maximum signal indication on output meter. Adjust output of alignment oscillator to give the lowest conveniently readable indication on the output meter. Adjust oscillator trimmer C-4 to peak the signal indication on output meter. Then, adjust antenna trimmer C-2 to further peak the signal. Repeat procedure to check accuracy.

Trimmer locations are shown in Figure 1.

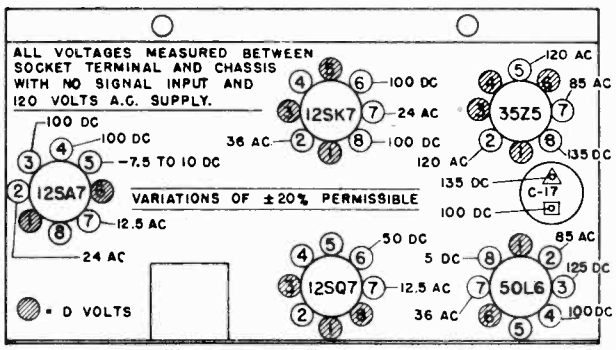


FIG. 2 - Socket Terminal Voltages (Bottom View)

NOTES:

An electronic voltmeter may be connected to the AVC bus and used for alignment indication in lieu of the output meter across the voice coil.

An electronic voltmeter or a voltmeter with a minimum resistance of 20,000 ohms per volt should be used for voltage measurements.

The polarity of the power connection must be correct when operating the receiver on direct current. If the receiver does not operate when the power plug is first inserted, remove and re-insert in opposite position. Reversal of plug position on alternating current supply may reduce hum in some cases.

CAUTION:

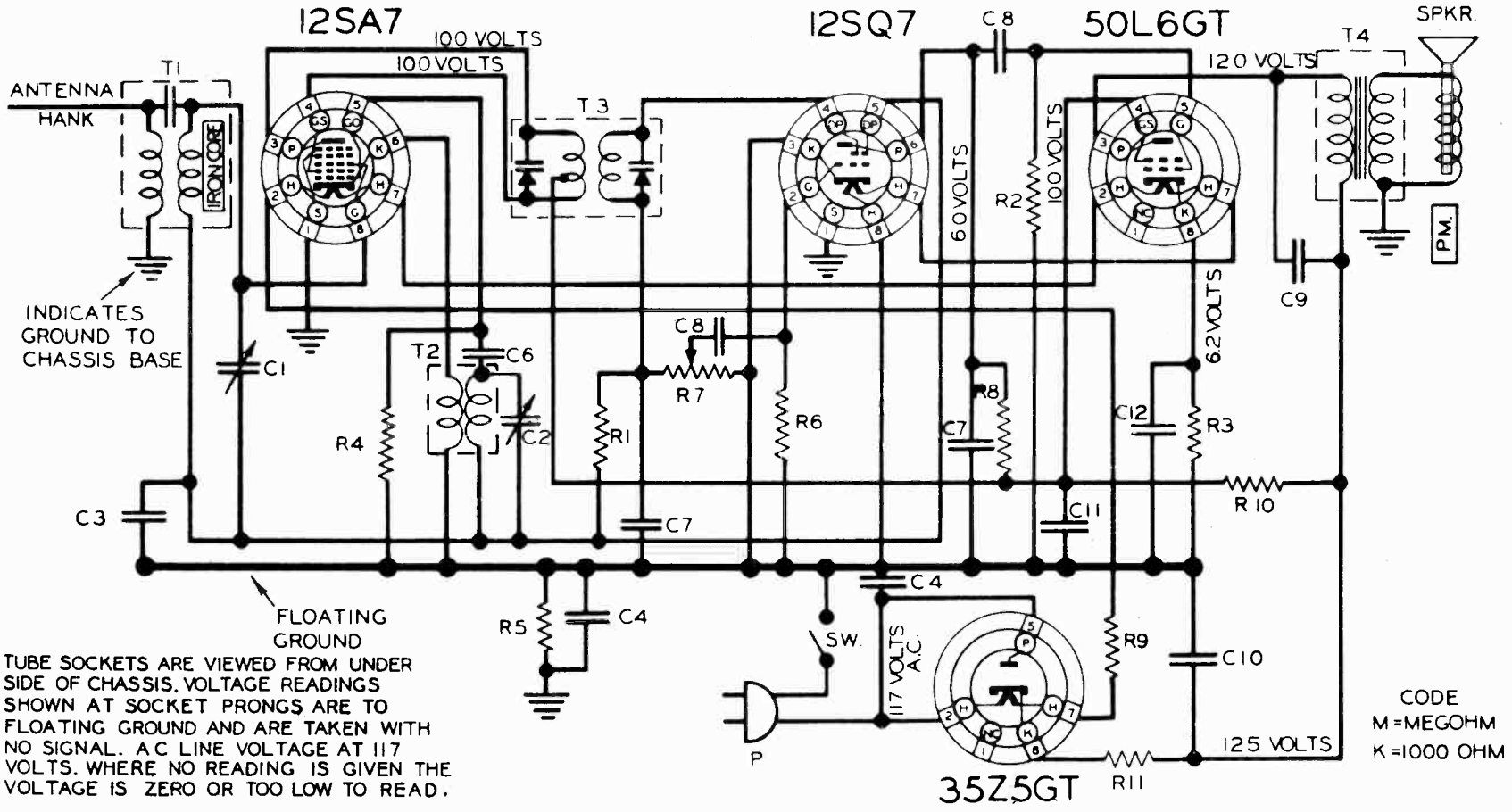
A direct ground connection should not be placed on the receiver at any time. Particular care should be exercised when removing and replacing chassis to insure that the insulators between chassis and cabinet are in position and that the insulation is complete and effective.

SB101-5-46-5M-W

LIST OF SYMBOLS

SYMBOL	DESCRIPTION
C-1	ANT. TUNING CAPACITOR including trimmer C-2
C-3	OSC. TUNING CAPACITOR including trimmer C-4
C-5,6	1st I.F. TRIMMER CAPACITORS
C-7,8	2nd I.F. TRIMMER CAPACITORS
C-9	CAPACITOR - 0.001 mfd. - 500 volts - Mica
C-10	CAPACITOR - 0.05 mfd. - 200 volts - Paper
C-11	CAPACITOR - 0.00025 mfd. - 500 volts - Mica
C-12	CAPACITOR - 0.002 mfd. - 600 volts - Paper
C-13	CAPACITOR - 0.00025 mfd. - 500 volts - Mica
C-14	CAPACITOR - 0.02 mfd. - 400 volts - Paper
C-15	CAPACITOR - 0.02 mfd. - 400 volts - Paper
C-16	CAPACITOR - 0.05 mfd. - 400 volts - Paper
C-17	CAPACITOR - 40/20 mfd. - 150 volts - Electrolytic

L-1	ANTENNA COIL
L-2	OSCILLATOR COIL
L-3	1st I.F. TRANSFORMER
L-4	2nd I.F. TRANSFORMER
LS-1	LOUDSPEAKER - 5" PM
PL-1	PILOT LAMP - 115 volts - 6 watts
R-1	RESISTOR - 20,000 ohms - 1/2 watt
R-2	RESISTOR - 3.0 Megohms - 1/2 watt
R-3	POTENTIOMETER AND SPST SWITCH (S-1) - 500,000 ohms
R-4	RESISTOR - 15.0 Megohms - 1/2 watt
R-5	RESISTOR - 470,000 ohms - 1/2 watt
R-6	RESISTOR - 470,000 ohms - 1/2 watt
R-7	RESISTOR - 150 ohms - 1/2 watt
R-8	RESISTOR - 1,000 ohms - 5 watts
S-1	POWER SWITCH (part of R-3)
T-1	OUTPUT TRANSFORMER



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS. VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL. AC LINE VOLTAGE AT 117 VOLTS. WHERE NO READING IS GIVEN THE VOLTAGE IS ZERO OR TOO LOW TO READ.

REFERENCE NO.	PART NO.	DESCRIPTION
R1		Resistor, 4.7 Megohms ½ watt
R2		Resistor, 1 Megohm ½ watt
R3		Resistor, 150 ohms ½ watt
R4		Resistor, 22,000 ohms ½ watt
R5		Resistor, 330,000 ohms ½ watt
R6		Resistor, 15 Megohms ½ watt
R7	B18587	Resistor, 2 Megohms Vol. control & Sw.
R8		Resistor, 470,000 ohms ½ watt
R9		Resistor, 47 ohms 1 watt
R10		Resistor, 2,200 ohms 1 watt
R11		Resistor, 15 ohms ½ watt
C1, Cw	B17115	Condenser, variable
C3		Condenser, .05 mfd, 200 volt
C4		Condenser, .05 mfd, 400 volt
C6		Condenser, .00005 mfd, 500 volt
C7		Condenser, .0001 mfd, 500 volt
C8		Condenser, .002 mfd, 500 volt
C9		Condenser, .01 mfd, 400 volt
C10		Condenser, 40 mfd, 150 volt
C11	A19176	Condenser, 20 mfd, 150 volt
C12		Condenser, 20 mfd, 25 volt
T1	AC18255-1	Coil, antenna
T2	AC18256-1	Coil, oscillator
T3	AC18157-1	Coil, i-f
T4	AC18258-1	Output transformer
	A18263	Dial scale emblem
	E18124-1	Cabinet, walnut
	E18124-2	Cabinet, ivory
	A18261-2	Knob, tuning, ivory
	A18262-2	Knob, tuning, ivory
Spk.	B17209	Speaker
C5		Condenser, .005 mfd, 400 volt

TUBES AND FUNCTIONS

12SA7 ..... Mixer-oscillator
12SQ7 ..... Detector-AVC-AF.
50L6GT ..... Output
35Z5GT ..... Rectifier

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

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

POWER SUPPLY

105-125 Volts, AC-DC, 35 Watts

POWER OUTPUT

Type: Beam tube
Undistorted ..... .6 Watts
Maximum ..... 2.5 Watts
Plate Load ..... 2000 Ohms

MODELS 444,444A
Chassis RE-200

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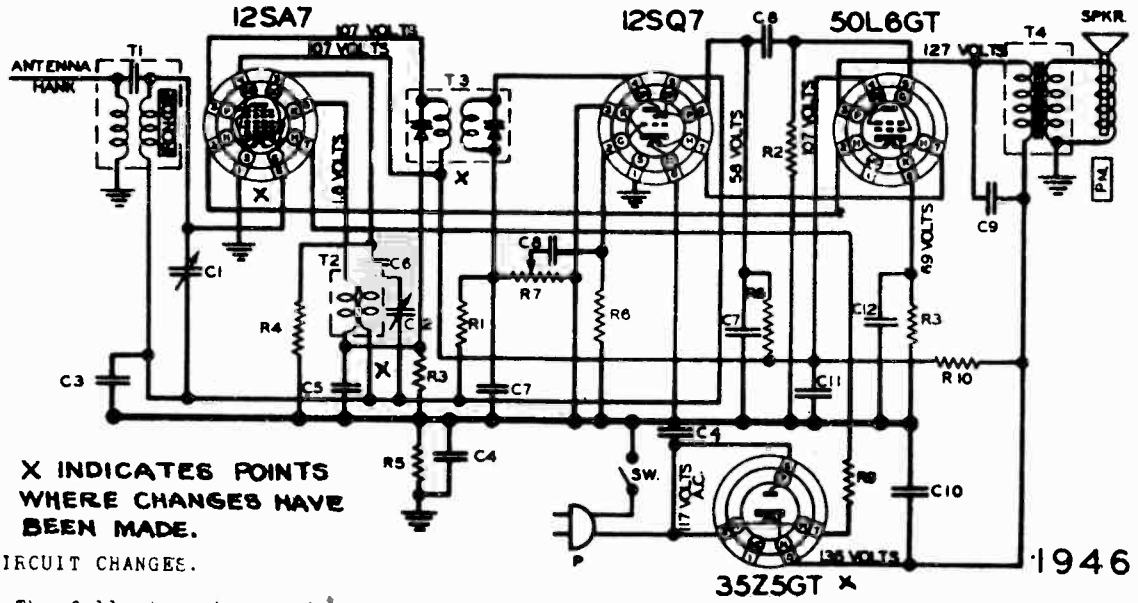


CIRCUIT CHANGES.

The following changes have been made in Chassis RE-200 since the start of production.

1. Connections to pins 2 & 7 have been interchanged on 12SA7 tube.
2. A 15 ohm resistor, R-11 has been added in B+ lead at Cathode of 35Z5GT tube.
3. .005 Condenser C-5 and 150 ohm Resistor R-3 have been deleted from oscillator circuit.
4. Tap has been added to Primary of IF transformer T-3 and trimmer connected directly across primary winding.

PRELIMINARY.

ALIGNMENT PROCEDURE

Output meter connection ..... Across loudspeaker voice coil
Output meter reading to indicate 200 milliwatts (standard output) ..... 0.8 volts
Dummy antenna to be in series with signal generator output ..... See chart below
Connection of generator ground lead ..... Floating ground
Generator modulation ..... 30% 400 cycles
Position of Volume Control ..... Fully clockwise
Position of pointer with variable fully closed ..... 54 on dial

Position of Variable	Generator Frequency	Dummy Antenna	Generator Output Connection	Trimmers Adjusted	Trimmer Function	Approximate Sensitivity
Open	455 Kc	.05 uf	12SA7 Grid (Stator of C-1)	2 trimmers on top of T-3	IF	3000 uv
1400 Kc	1400 Kc	.00005 uf	Antenna lead	**C-2	Oscillator	360 uv

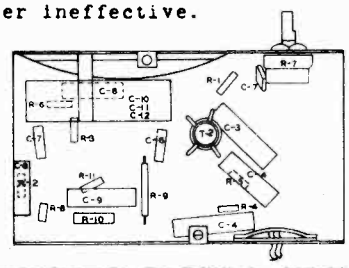
**Since the antenna section of the variable has no trimmer, the rotor of the variable should be rocked back and forth on both sides of 1400 Kc while adjusting the oscillator trimmer for maximum output. This is to obtain the combination of rotor and trimmer setting to give perfect tracking of the two sections of the variable condenser and consequently give maximum output.

Check sensitivity at 600 Kc. If weak, adjust antenna section plates for maximum output at 600 Kc. Tracking of the condenser at points other than 1400 Kc is accomplished by bending the outside plates on the variable condenser rotor, which are cut for this purpose. When bending plates to track the condenser at any given frequency, keep in mind the fact that this will effect the tracking at all frequencies below that point. A tuning wand is very helpful in checking the tracking of this condenser, to indicate whether more or less capacity is needed.

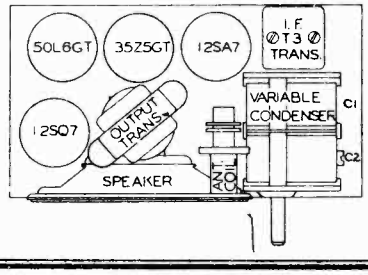
The alignment procedure should be repeated stage by stage in the original order for greatest accuracy.

Always keep the output from the test oscillator at its lowest possible value to make the AVC action of the receiver ineffective.

LOCATION OF PARTS UNDER CHASSIS



TUBE LAYOUT



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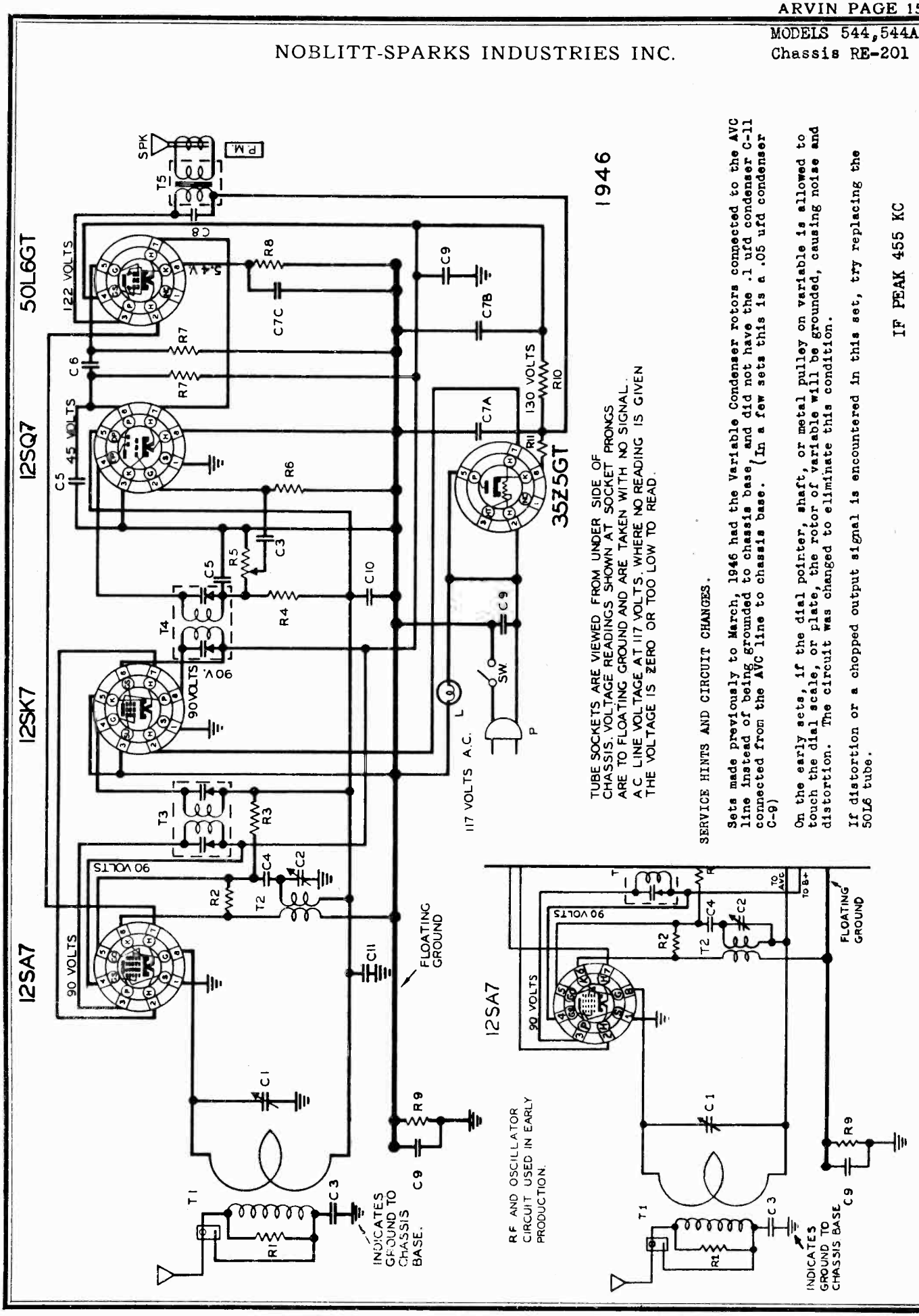
MODELS 544, 544A,
Chassis RE-201



SERVICE HINTS AND CIRCUIT CHANGES.

Sets made previously to March, 1946 had the Variable Condenser rotors connected to the AVC line instead of being grounded to chassis base, and did not have the .1 ufd condenser C-11 connected from the AVC line to chassis base. (In a few sets this is a .05 ufd condenser C-9)

On the early sets, if the dial pointer, shaft, or metal pulley on variable is allowed to touch the dial scale, or plate, the rotor of variable will be grounded, causing noise and distortion. The circuit was changed to eliminate this condition.

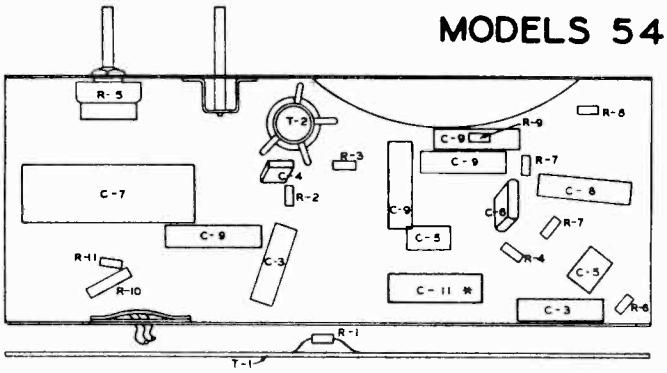
If distortion or a chopped output signal is encountered in this set, try replacing the 50L6 tube.

IF PEAK 455 KC

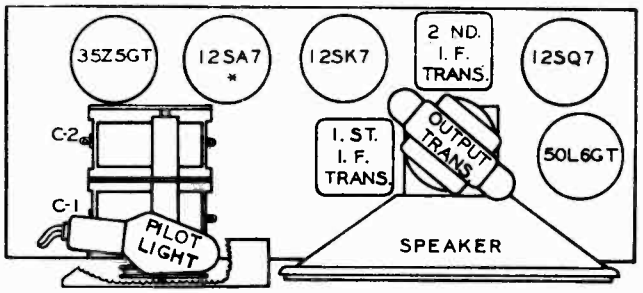
MODELS 544,544A,
Chassis RE-201

NOBLITT-SPARKS INDUSTRIES INC.

MODELS 544 & 544A



LOCATION OF PARTS UNDER CHASSIS



OUTLINE FOR TUBE LAYOUT

* ON SETS MADE PREVIOUS TO MAY 1946 THE 12SA7 TUBE WAS LOCATED BETWEEN THE VARIABLE CONDENSER AND 1ST I.F. TRANSFORMER

PRELIMINARY.

Output meter connection ..... Across loudspeaker 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 ..... Horizontal
Place the set loop in the same position with respect to the rear of 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	.01 mfd.	12SA7 Grid (Stator of front section of variable condenser)	Top of 2nd & 1st IF Trans.	IF
1400	1400	.00005 mfd.	Antenna Clip (With blue wire removed)	C2; C1, trimmers on Rear & Front sections of Variable Condenser	Osc. Ant.
600	600	.00005 mfd.	Antenna Clip (With blue wire removed)	**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 blue wire will be left in the antenna clip, and the approximate sensitivities should be 300 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. --------	3350 uv	Antenna 1000 Kc --------	50 uv
Mixer 455 Kc. --------	75 uv	Antenna 1400 Kc --------	25 uv
Mixer 1000 Kc.--------	60 uv	Antenna 600 Kc --------	50 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.

*A floating ground connection can be obtained on either of the lugs on the back of the AC switch or the black lead on the Volume Control.

**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

cont'd on next page

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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 600 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.

FREQUENCY RANGE

Broadcast	540-1600 kc
IF	455 kc

TUBES & FUNCTIONS

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

LOUD SPEAKER

Type: Permanent magnet
Size: 5 inch
Voice coil impedance ..... 3.2 ohms

POWER SUPPLY

105-125 Volts AC-DC, 35 Watts

POWER OUTPUT

Undistorted	.8 Watts
Maximum	2.5 Watts
Plate load	2000 ohms

Due to variations in tubes some sets which are equipped with 12SK7GT tubes may have a tendency to oscillate. This condition can usually be corrected by placing a shield on the 12SK7GT tube or replacing it with a 12SK7 metal tube. In some cases the IF transformers may need to be repeaked after changing this tube.

Several cases of weak sets have been caused by a defective 12SA7GT tube which will check good on the average tube tester. Alignment should be checked after changing this tube.

REF. NO.	PART NO.	DESCRIPTION	LIST PRICE
	E17232-1	Cabinet, Walnut	$2.38
	E17232-2	Cabinet, Ivory	2.50
	A17304	Dial Crystal	.24
	A19474-1	Knobs	.11
	A19125	Grille Cloth	.08
	A17296	Tuning Shaft	.11
	A18640-1	Dial Scale	.10
	A19132	Dial Drive Cord	.02
	A19133	Spring	.04
	A19205-3	Cap. Mtg. Clip	.03
	A19253-1	Socket	.12
	A18254-1	Socket	.12
	A19134-1	Dial Light Socket	.32
	A19135	Dial Light Bulb	.18
	A16492	Tube Shield	.06
	B20064-1	Line Cord & Plug Assy.	.75
C1 C2	B18869	Variable Condenser	3.43
C3	C20068-103	Cond., .01 mfd - 400 V P.T.	.17
C4	C20065-500	Cond., .00005 mfd - 500 V Mica	.20
C5	C20065-501	Cond., .0005 mfd - 500 V Mica	.26
C6	C20069-202	Cond., .002 mfd - 600 V P.T.	.40
C7	A19136	Cond., Electrolytic	1.34
C8	C20068-303	Cond., .03 mfd - 400 V P.T.	.18
C9	C20068-503	Cond., .05 mfd - 400 V P.T.	.19
C10	C20067-503	Cond., .05 mfd - 200 V P.T.	.17
C11	C20068-104	Cond., .1 mfd - 400 V P.T.	.22
R1	C20060-103	Resistor, 10,000 ohms ½ W	.05
R2	C20060-223	Resistor, 22,000 ohm ½ W	.05
R3	C20060-156	Resistor, 15 meg. ½ W	.05
R4	C20060-225	Resistor, 2.2 meg. ½ W	.05
R5	B17291	Volume Cont. & Sw., 1 meg.	.87
R6	C20060-475	Resistor, 4.7 meg. ½ W	.05
R7	C20060-474	Resistor, 470,000 ohm ½ W	.05
R8	C20060-151	Resistor, 150 ohm ½ W	.05
R9	C20060-334	Resistor, 330,000 ohm ½ W	.05
R10	C20070-152	Resistor, 1,500 ohm 1 W	.09
R11	C20060-150	Resistor, 15 ohm ½ W	.05
T1	AC18645-1	Antenna Loop Assy.	1.21
T2	AC18646-1	Oscillator Coil	.40
T3	AC18908-1	1st. I.F. Coil	1.04
T4	AC18909-1	2d. I.F. Coil	1.05
T5	AC18647-1	Output Transformer	.81
Spk.	C19114	Speaker	3.25
	A19473	Dial Pointer	.11
	A19141	Term. Strip	.07
	A19547	Two Conductor Shielded Leads	.12
	AC19193-1	Sp. & Trans. Assy.	3.58

MODELS 664 & 664 A

ALIGNMENT PROCEDURE

PRELIMINARY.

Output meter connection ..... Across loudspeaker 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 ..... Vertical

Place the set loop in the same position with respect to the rear of the chassis, and the same distance from the chassis, as it would be with the set mounted in the cabinet. This distance is 1 3/16" from the plate on back of chassis to back of the loop. If the position of the loop is not correct while adjustments are made on the antenna circuit, the antenna circuit will not track and the set will be weak, when placed in the cabinet.

MODELS 664,664A
Chassis RE-206

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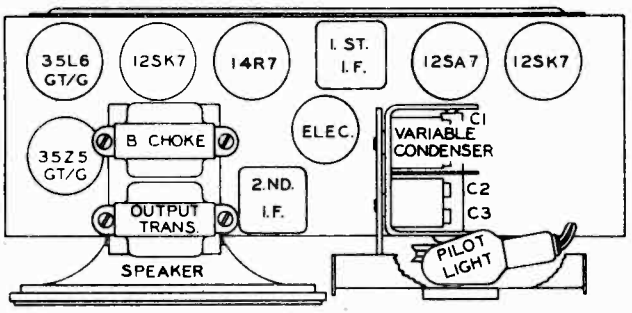
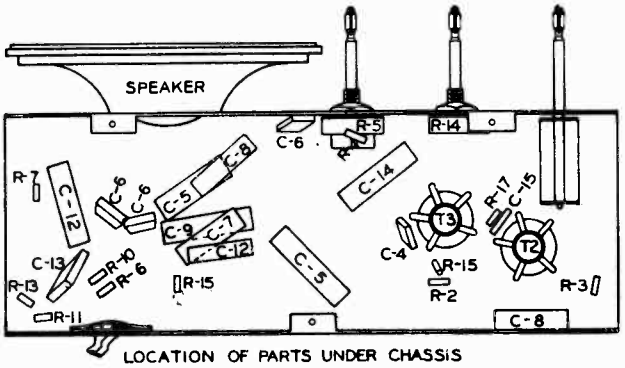


TUBE LAYOUT



LOCATION OF PARTS UNDER CHASSIS

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Connection	Trimmers adjusted in Order Shown for Max. Output	Function of Trimmer,
Open	455	.01 mfd.	12SA7 Grid or (Stator of center section of variable condenser)	Top of 2nd & 1st IF Trans.	IF
1400	1400	.00005 mfd.	Antenna Clip (With black wire removed)	*C3: C2: C1, trimmers on Variable Condenser	Osc. RF Ant.
600	600	.00005 mfd.	Antenna Clip (With black wire removed)	**Adj. plates of variable cond. for Max. output.	Osc. RF Ant.

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, and the approximate sensitivities should be 250 uv/m and 150 uv/m or less at 600 Kc and 1400 Kc respectively. Sets using glass 12SA7 tube may have slightly weaker sensitivities.

Approximate stage by stage sensitivities for 200 Milliwatt output.

IF. - 455 Kc. --------	10,000 uv	Antenna 1000 Kc --------	15 uv
Mixer 455 Kc. --------	150 uv	Antenna 1400 Kc --------	15 uv
Mixer 1000 Kc. --------	170 uv	Antenna 600 Kc --------	25 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.

*Trimmer C3 (oscillator) is located either on the top or bottom of the variable condenser, depending on the type variable used on any particular set.

**AS THE CONDENSERS ARE ALL TRACKED BEFORE LEAVING THE FACTORY IT IS NOT PROBABLE THAT THE PLATES WILL NEED TO BE ADJUSTED UNLESS WIDE VARIABIONS IN TUBES ARE ENCOUNTERED OR THE CONDENSER HAS BEEN DAMAGED. PLATE BENDING SHOULD NOT BE ATTEMPTED WITHOUT THE PROPER EQUIPMENT, OR BY ANYONE NOT EXPERIENCED AT TRACKING CONDENSERS.

The outside plates on the antenna & RF sections 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, or vice versa, 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.

Since the osc. section has much less capacity than the RF & antenna sections, plate bending will be much more effective in the osc. circuit, and a small change in or out in the plates of this section will have the same effect as a large change in the opposite direction in the other sections.

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 600 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.

SERVICE HINTS AND CIRCUIT CHANGES.

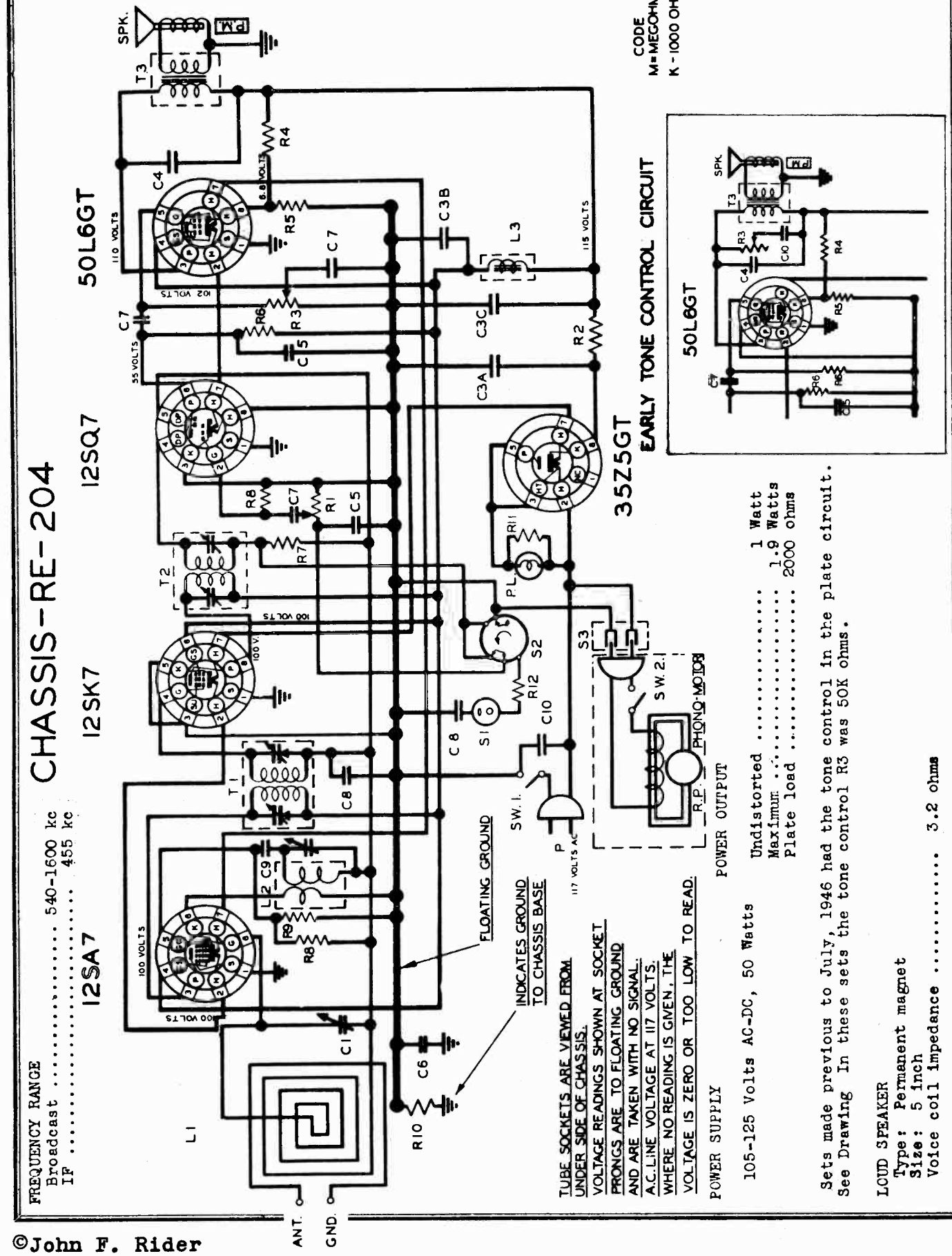
If the dial pointer is allowed to touch the dial scale, the rotor of the variable condenser, which is connected to the AVC Line, will be grounded, causing noise & distortion.

If the set has a tendency to be microphonic, check the rubber grommets on the Variable Condenser mounting, if these are hard replace them with soft rubber grommets.

C15 (14 mmf. cond.) was added to RF Circuit and R17 was changed from 3300 ohms to 6800 ohms, after start of production.

MODEL 558, Early
Late, Ch. RE-204

NOBLITT-SPARKS INDUSTRIES INC.



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

TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL.
A.C. LINE VOLTAGE AT 117 VOLTS.
WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ.

POWER SUPPLY

105-125 Volts AC-DC, 50 Watts

POWER OUTPUT

Undistorted	1 Watt
Maximum	1.9 Watts
Plate load	2000 ohms

Sets made previous to July, 1946 had the tone control in the plate circuit. See Drawing In these sets the tone control R3 was 50K ohms.

LOUD SPEAKER
Type: Permanent magnet
Size: 5 inch
Voice coil impedance ..... 3.2 ohms

MODEL 558,Early,
Late,Ch.RE-204

NOBLITT-SPARKS INDUSTRIES INC.

ALIGNMENT PROCEDURE

PRELIMINARY.

Output meter connection ..... Across loudspeaker 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 rear of 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
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.

*A floating ground connection can be obtained on either of the lugs on the back of the AC switch.

**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 600 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.

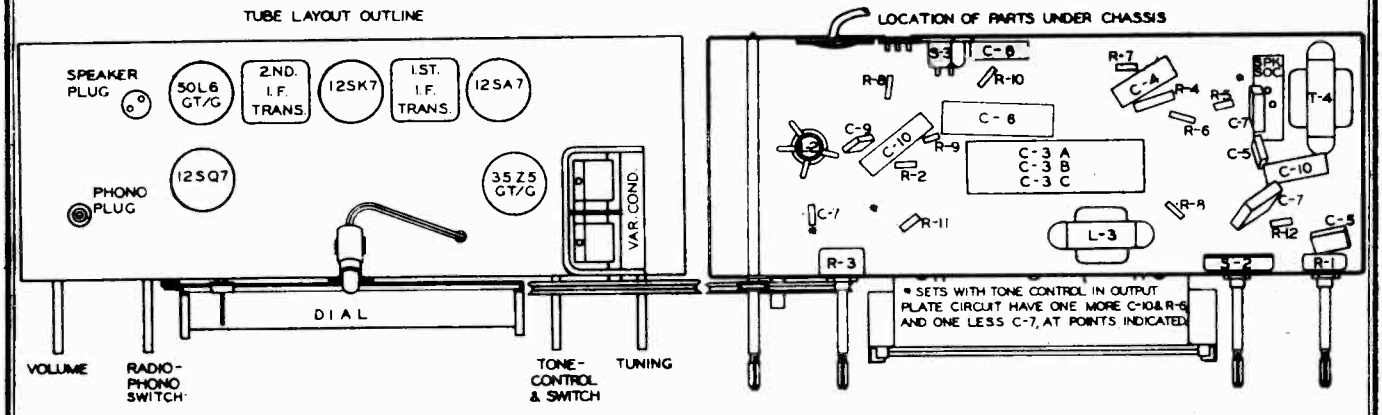
MODEL 558, Early, Late, Ch. RE-204

NOBLITT-SPARKS INDUSTRIES INC.

If a set is found to be microphonic when playing records, check for the presence of 4 felt washers under the chassis and a wood block 3¾" x 8" x ¾" mounted under the phono-motor board, in front of the center brace. If these are not present, installing them should correct the microphonic condition. The block should be glued to the under side of the motor board against the front side of the center brace, with two ¾" wood screws driven from the top side of the motor board into the block, to draw it up tight. Place the screws so the heads will be under the turntable.

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. Do not attempt to operate on DC.

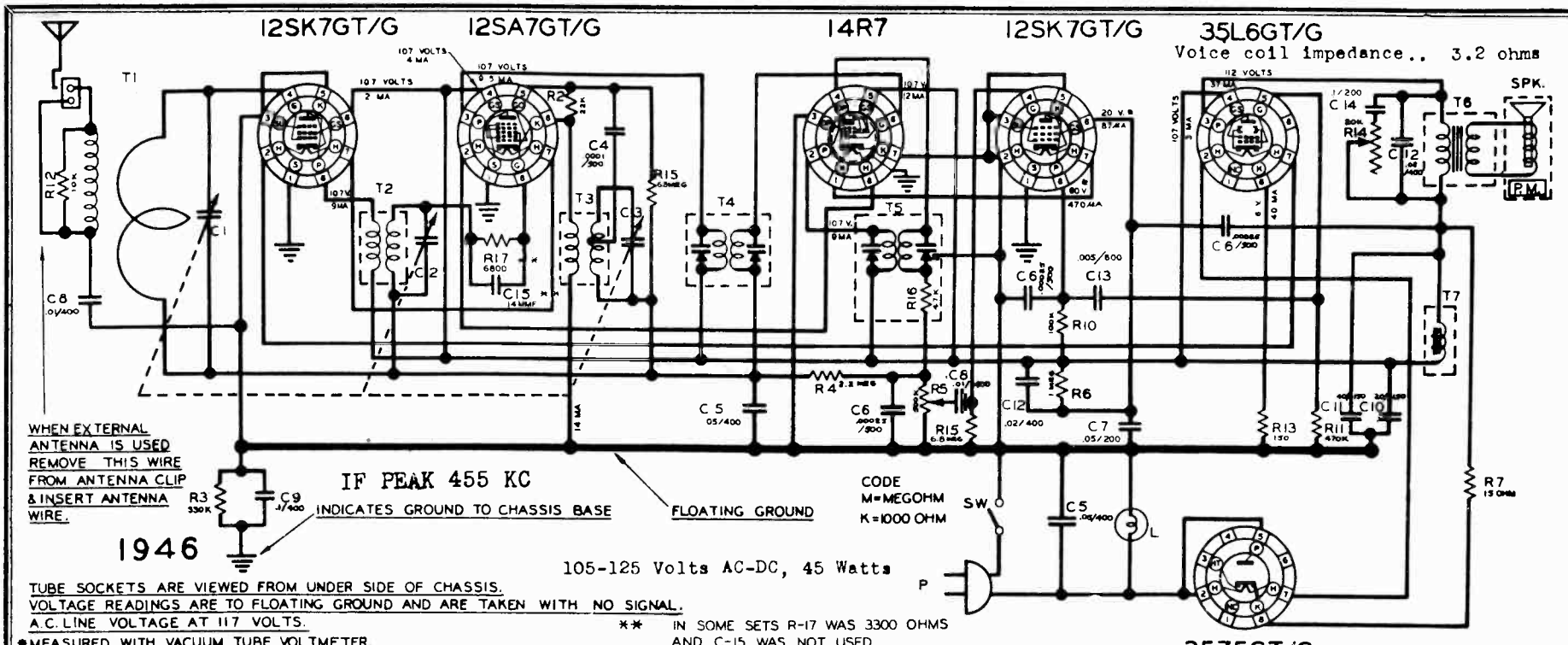


PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	LIST PRICE	REF. NO.	PART NO.	DESCRIPTION	LIST PRICE
R1	C19753	Volume Control	.65		A19628	Socket, Dial Lamp	.26
R2	C20060-150	Resistor, 15 ohms ½ W	.05		A19135	Dial Lamp	.18
R3	C19947	Tone Control 500 K ohms &		S2	C19754	Phono-Radio Switch	.83
	or	ON-OFF Sw.	.87		R19573	Cabinet	30.00
	*C19752	Tone Control 50 K ohms	.87	RP	E19475	Phono-Motor and Turntable	6.94
R4	C20070-123	Resistor, 12 K ohms 1 W	.08		C19594	Pick-up Arm	5.55
R5	C20060-151	Resistor, 150 ohms ½ W	.05		A19850	Needle, Semi-perm	.92
R6	C20060-474	Resistor, 470 K ohms ½ W	.05		C19572	Escutcheon	1.38
R7	C20060-225	Resistor, 2.2 meg. ½ W	.05		A19595	Escutcheon, On-Off Switch	.03
R8	C20060-156	Resistor, 15 meg. ½ W	.05		A19545	On-Off Switch - (Phono-Motor)	.15
R9	C20060-223	Resistor, 22 K ohms ½ W	.05		A19596	Rest, Pick-up arm	.14
R10	C20060-334	Resistor, 330 K ohms ½ W	.05		AE19585-1	Antenna Loop Assy.	1.33
R11	C20060-681	Resistor, 680 ohms ½ W	.04	L2	AC19586-1	Oscillator Coil Assy.	.37
R12	C20060-105	Resistor, 1 meg. ½ W	.05	T1	AC19587-1	1st I.F. Coil Assy.	1.12
C1-C2	C19584	Variable Condenser - 2 gang	3.82	T2	AC19588-1	2d. I.F. Coil Assy.	1.10
C3A		Elect. Cond. 10 mfd. 150 V		L3	AC19589-1	Choke Assy.	.69
C3B	A19780	Elect. Cond. 20 mfd. 150 V	1.17	T3	AC19591-1	Output Transformer	1.00
C3C		Elect. Cond. 40 mfd. 150 V			AA19593-2	Tuning Shaft & Pulley Assy.	.47
C4	C20068-203	Condenser, .02 uf 400 V	.18		AA19639-1	Dial Cord Guide Assy.	.03
C5	C20065-501	Condenser, .0005 uf 500 V	.26		A19578	Dial Pointer	.07
C6	A19765	Condenser, .2 uf 400 V	.29		C19615	Dial Glass	.75
C7	C20069	Condenser, .002 uf 600 V	.40		A19132	Cord, Dial Drive	.02
C8	C20067-503	Condenser, .05 uf 200 V	.18		A19295	Spring, Dial Cord	.04
C9	C20065-500	Condenser, .00005 uf 500 V	.20		B20064-10	Line Cord & Plug Assy.	.75
C10	C20068-503	Condenser, .05 uf 400 V	.19		C19597	Knob, Volume	.04
	A19141	Double Terminal Strip	.04		C19598	Knob, Tuning	.04
	A19800	Triple Terminal Strip	.04		C19599	Knob, Phono-switch	.04
	A18254-1	Tube Socket	.12		C19600	Knob, Tone Control	.04
	A19234	Socket, Antenna Loop	.07		A19554	Plug, One Prong	.05
	A19552	Socket, One Prong	.07		A19556	Plug, A.C.	.21
S3	A19551	Socket, Phono-motor	.21	Spk.	C19620	Speaker	4.86
	A19579	Socket, Speaker	.08				

*On sets having Tone Control in Output Plate Circuit.

MODELS 664, 664A, Chassis RE-206 NOBLITT-SPARKS INDUSTRIES INC.



TUBE SOCKETS ARE VIEWED FROM UNDER SIDE OF CHASSIS.
VOLTAGE READINGS ARE TO FLOATING GROUND AND ARE TAKEN WITH NO SIGNAL.
A.C. LINE VOLTAGE AT 117 VOLTS.
*MEASURED WITH VACUUM TUBE VOLTMETER.

** IN SOME SETS R-17 WAS 3300 OHMS AND C-15 WAS NOT USED

REF. NO.	PART NO.	DESCRIPTION	LIST PRICE
R2	C20060-223	Resistor, 22,000 ohm ½ W	.05
R3	C20060-334	Resistor, 330,000 ohm ½ W	.05
R4	C20060-225	Resistor, 2.2 megohm ½ W	.05
R5	C19244	Volume Cont. & Sw., 500,000 ohms	.94
R6	C20060-105	Resistor, 1 meg. ½ W	.05
R7	C20060-150	Resistor, 15 ohm ½ W	.05
R10	C20060-104	Resistor, 100,000 ohm ½ W	.05
R11	C20060-474	Resistor, 470,000 ohm ½ W	.05
R12	C20060-103	Resistor, 10,000 ohm ½ W.	.05
R13	C20060-151	Resistor, 150 ohm ½ W	.05
R14	C19279	Tone Control, 20,000 ohm	.64
R15	C20060-685	Resistor, 6.8 megohm ½ W	.05
R16	C20060-473	Resistor, 47,000 ohm ½ W	.05
R17	C20060-332	*Resistor, 6800 ohm ½ W	.05
C1	B18564		4.17
C2	or	**Variable Condenser, 3 gang	
C3	C19853		4.99
C4	C20065-101	Cond., .0001 uf. 500 V Mica	.20
C5	C20068-503	Cond., .05 uf. 400 V P.T.	.19
C6	C20065-251	Cond., .00025 uf. 500 V Mica	.23
C7	C20067-503	Cond., .05 uf. 200 V P.T.	.18
C8	C20068-103	Cond., .01 uf. 400 V P.T.	.17
C9	C20068-104	Cond., .1 uf. 400 V P.T.	.19
C10			
C11	A19239	Cond., Electrolytic 40-20 uf. 150 V	1.25
C12	C20068-203	Cond., .02 uf. 400 V P.T.	.18
C13	C20069-502	Cond., .005 uf. 600 V P.T.	.40
C14	C20067-104	Cond., .1 uf. 200 V P.T.	.19
C15	A19182	Cond., 14 mmf. 600 V Mica	.15
	A19674	Terminal Strip	.05
	A19138-1	Spacer Eyelet for Mtg. Var. Cond.	.01
	D18422-1	Cabinet, Walnut (Assy.)	$3.60
	D18422-2	Cabinet Assy., Ivory	3.75
	A18272	Dial Crystal	.28
	A16922	Handle	.36
	A19783-1	Knobs, Walnut	.05
	A19783-2	Knobs, Ivory	.05
	A19240	Grill Cloth	.08
	AC18579-1	Antenna Loop Assy.	1.40
	AC19860-1	R. F. Coil	.40
	AC18580-1	Oscillator Coil	.47
	AC18581-1	1st. I. F. Coil	1.30
	AC18578-1	2d. I. F. Coil	1.70
	AC18583-1	Iron Core Choke	1.52
	AC18582-1	Output Transformer	1.52
	AC19872-1	Speaker Assy. (Spk. with Trans. Mtg. Bracket)	6.36
Spk.	C18550	Speaker only	5.72
	A19293	Tuning Shaft	.14
	C18432	Dial Scale	.12
	A18572	Dial Pointer	.16
	A19132	Dial Drive Cord	.04
	A18254-1	Socket, tube, wafer type	.12
	A16668	Elect. Mtg. Wafer	.03
	A19234	Antenna Socket	.07
	A19134-2	Dial Light Socket	.32
	A19135	Dial Light Bulb, Mazda C7 Nite Lite, 7W	.18
	A19400-1	Socket, Loktal Type	.15
	B20064-8	Line Cord and Plug Assy.	.75
	A20077-3	Rubber Grommet for mtg. Var. Cond. B18564 & C19853	.01
	A19328-2	Rubber Grommet for mtg. Var. Cond. C19853 only	.02

*In a few sets R17 was 3300 ohm ½ W.
**When ordering a replacement Variable Condenser, be sure to use the part number which is stamped on the back of the original Condenser.

TUBES & FUNCTIONS

12SK7	RF Amp.
12SA7	Mixer-oscillator
14R7	IF Amp. DET-AVC
12SK7	AF Amp.
35L6	Output
35Z5GT	Rectifier

POWER OUTPUT

Undistorted	.8 Watts
Maximum	2.5 Watts
Plate load	2000 Ohms

For alignment see pp. 15-5, 15-6

OLDSMOBILE DIV.-GENERAL MOTORS

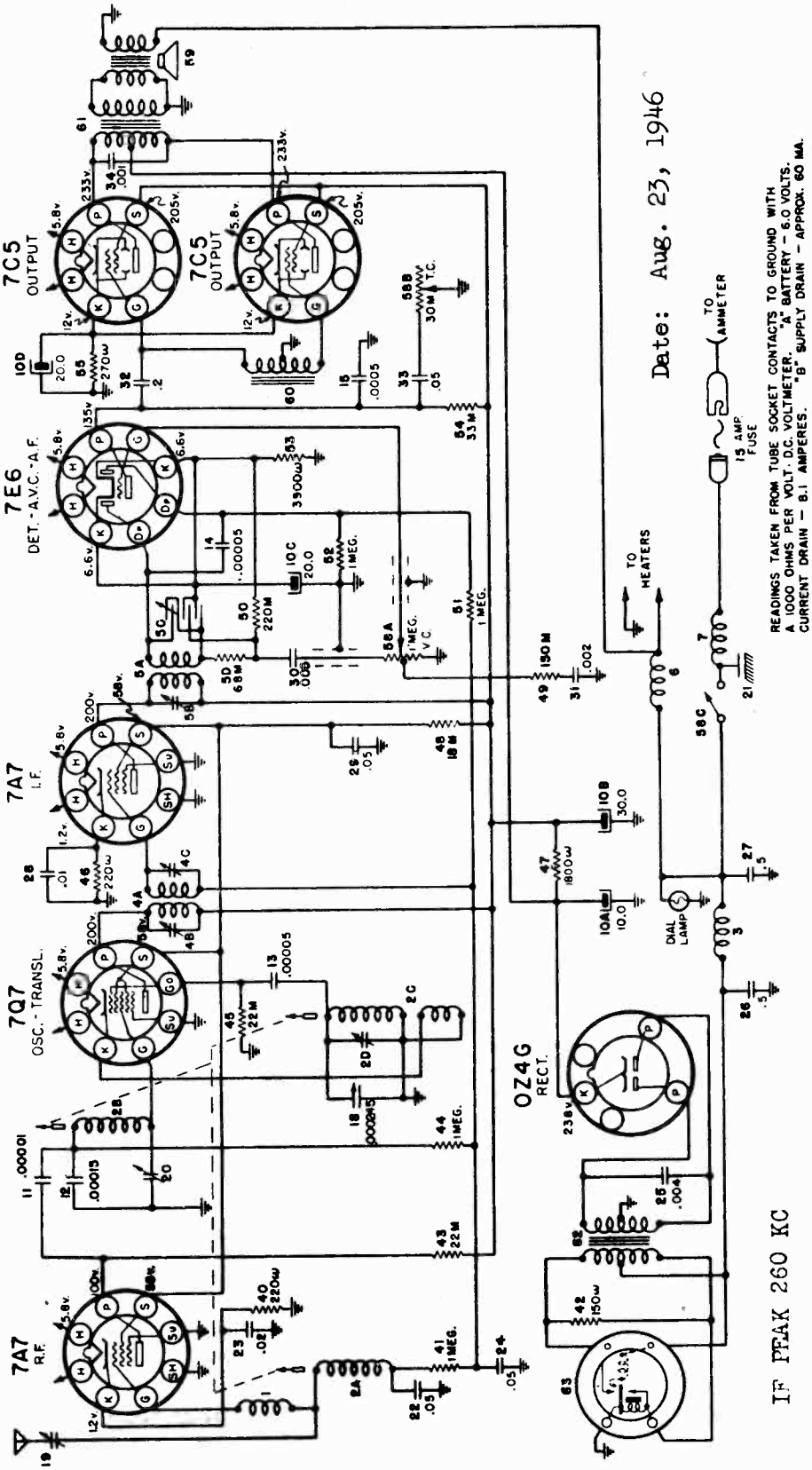


Fig. 3 - Circuit Diagram - 982375

The Oldsmobile model 982375 is a single unit DeLuxe Receiver with Automatic Push Button Tuning, in addition to Manual Tuning, Volume and Tone Controls.

The receiver was designed specifically for the 1946 Oldsmobiles. The push Button Assembly, Controls, Receiver and Speaker are built into a housing which is mounted directly behind the center of the instrument panel.

CIRCUIT ALIGNMENT

All of the adjustable condensers in this receiver are very accurately adjusted at the factory and will need no further adjustment (excepting antenna trimmer) unless tampered with or a defective coil has been replaced. If re-alignment is found to be necessary, the circuits can be properly adjusted only with the use of a calibrated test oscillator or signal generator and an output meter.

DO NOT ATTEMPT TO PEAK THE I-F STAGES OF THIS RECEIVER WITHOUT CAREFULLY NOTING THE FOLLOWING INSTRUCTIONS:

1. Aligning I-F Stages at 260 Kilocycles

   (a) Turn volume control to the maximum position.

   (b) Connect the signal lead of the test oscillator through a .1 mfd. condenser to terminal X (See Parts Layout), which is the grid prong of the 7Q7 tube.

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

   (d) Connect the output meter across the speaker voice coil at the terminal board mounted on the speaker. Connect between point "Z" and ground. This terminal is color coded green on strip. (See Parts Layout)

   (e) Set the test oscillator to exactly 260 Kilocycles.

   (f) Adjust the trimmers "A", "B", "C" and "D" on the I-F Transformers for maximum output. (See Parts Layout) The adjustments should be repeated several times and during alignment the test oscillator output should be kept to as low a value as is consistent with obtaining a readable indication on the output meter.

2. Aligning at 1610 Kilocycles

   (a) Remove the signal lead of the test oscillator from the grid of the 7Q7 tube and connect to the Antenna terminal of the receiver THROUGH a .00065 mfd. MICA CONDENSER connected in place of the .1 mfd. condenser previously used. (It is very important that a .00065 mfd. mica condenser be used when aligning the antenna stage of these receivers in order that this circuit can be made to track properly.)

   (b) Tune the receiver to the extreme high frequency end of the dial.

   (c) Set the test oscillator to 1610 Kilocycles.

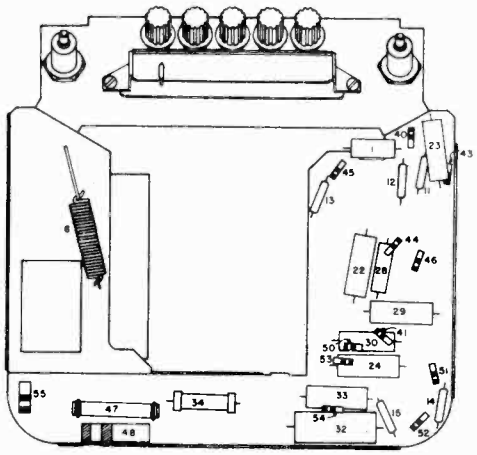
   (d) Adjust the Oscillator Trimmer Condenser "E" for maximum output. (See Parts Layout) (It is very important that this frequency be set accurately as a slight mis-setting will cause the receiver to be out of track over the high frequency end of the dial.)

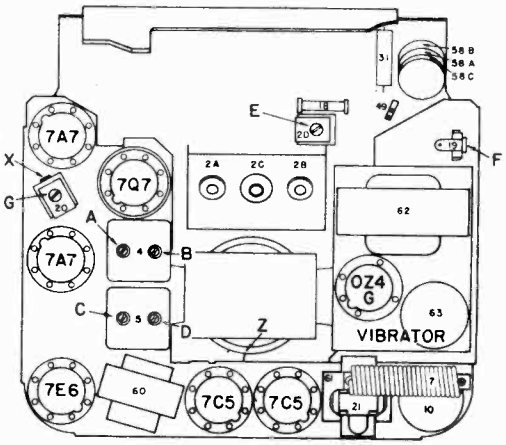
   (e) Adjust the Antenna Trimmer Condenser "F" for maximum output. (See Parts Layout)

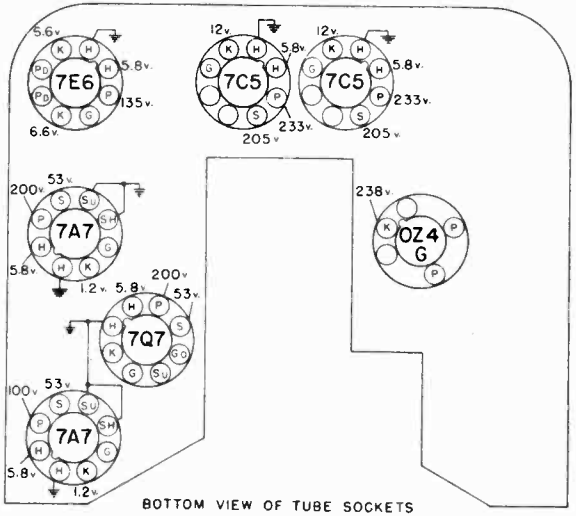
   (f) Adjust the R.F. Trimmer Condenser "G" for maximum output.

NOTE - With permeability tuning it is necessary to adjust the capacity at only one frequency. The coils are so wound that tracking is automatic and the usual low frequency adjustments are not necessary.

If the entire alignment procedure has been accomplished accurately, the receiver should be uniformly sensitive over the entire frequency range.







BOTTOM VIEW OF TUBE SOCKETS

READINGS TAKEN FROM TUBE SOCKET CONTACTS TO GROUND WITH A D.C. VOLTMETER HAVING A RESISTANCE OF 1000 OHMS PER VOLT "A" BATTERY 6.0 VOLTS. CURRENT DRAIN 8.1 AMPERES. "B" SUPPLY DRAIN APPROXIMATELY 60 MA. ALL READINGS ±10%.

RADIO DATA

MODEL NUMBER - 982375

SERIAL NUMBER - AND UP

TUBE COMPLEMENT - 7A7, 7Q7, 7A7, 7E6, 7C5, 7C5, 0Z4G

BATTERY CURRENT - 8.1 AMPERES

B+ VOLTS - 238

I.F. K.C. - 260

R.F. K.C. - 1610-535

VOICE COIL IMPEDANCE - 4 OHMS AT 400 CYCLES

VIBRATOR TYPE - NON SYNCHRONOUS

YEAR - 1946

OLDSMOBILE DIV.-GENERAL MOTORS

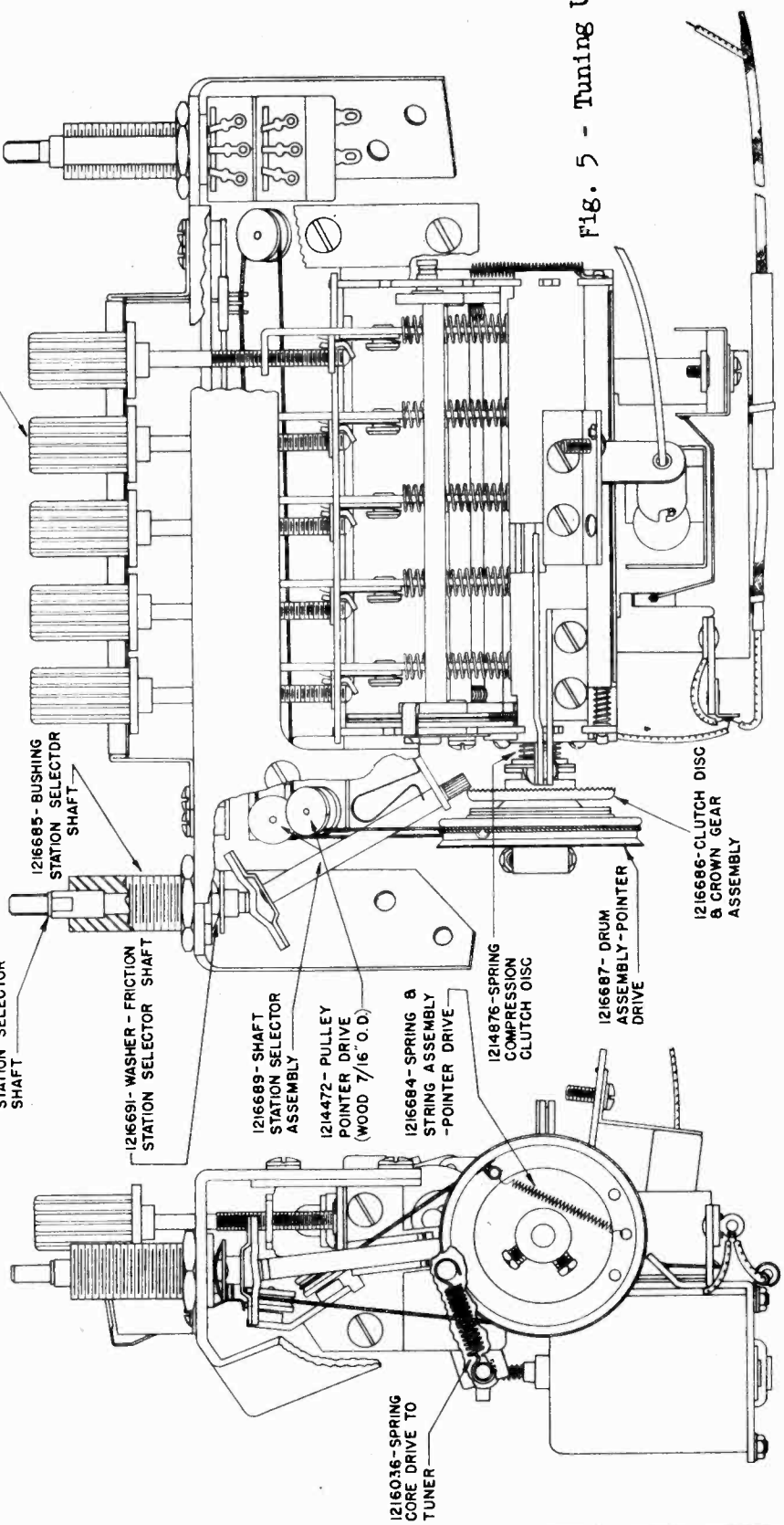


Fig. 5 - Tuning Unit

ANTENNA CIRCUIT

The Antenna Circuit is directly coupled to the antenna. A small adjustable condenser is provided for adjusting the antenna circuit to the antenna. This adjustment is made near the high frequency end of the band (1400 to 1600 KC.)

AUTOMATIC PUSH BUTTON TUNING

This is accomplished by a mechanical unit of rugged construction assuring accuracy. A special compensating condenser is employed in the oscillator circuit to minimize over-all receiver drift due to normal variation in car voltage and temperature ranges.

MODEL 982375

OLDSMOBILE DIV.-GENERAL MOTORS

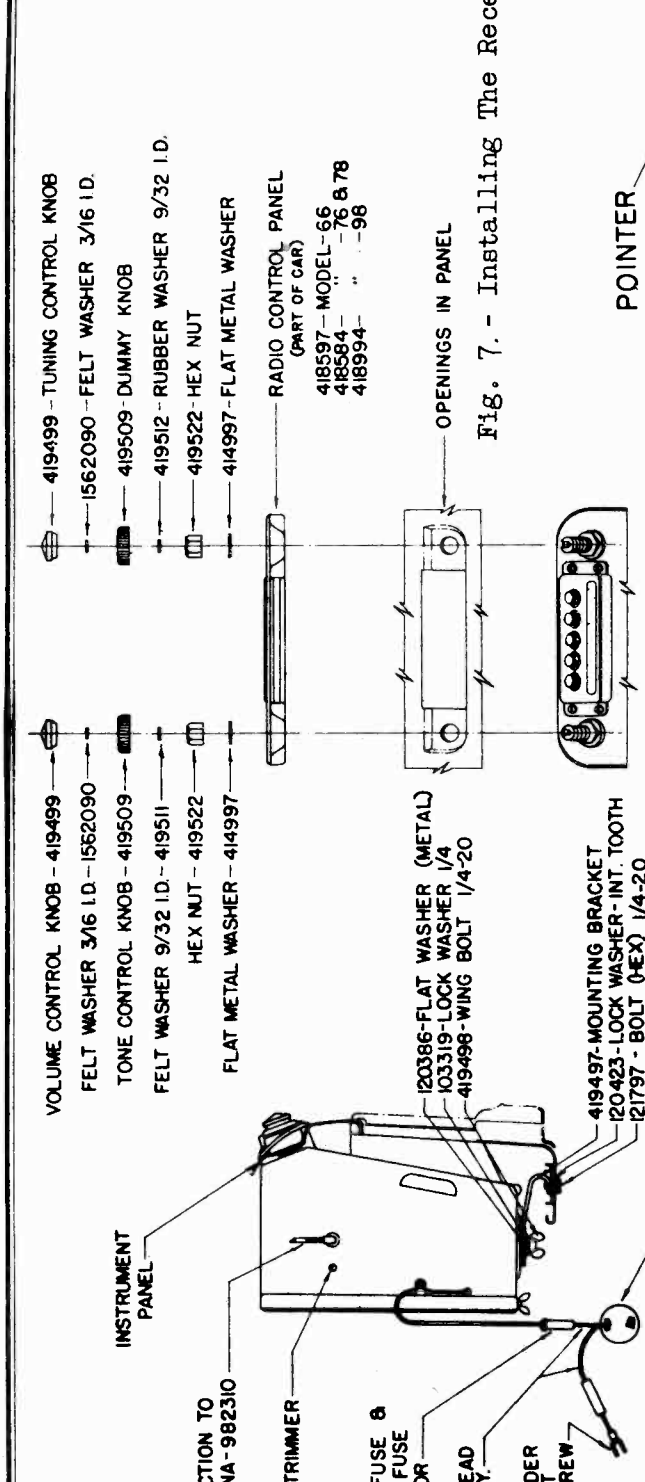


Fig. 7. - Installing The Receiver

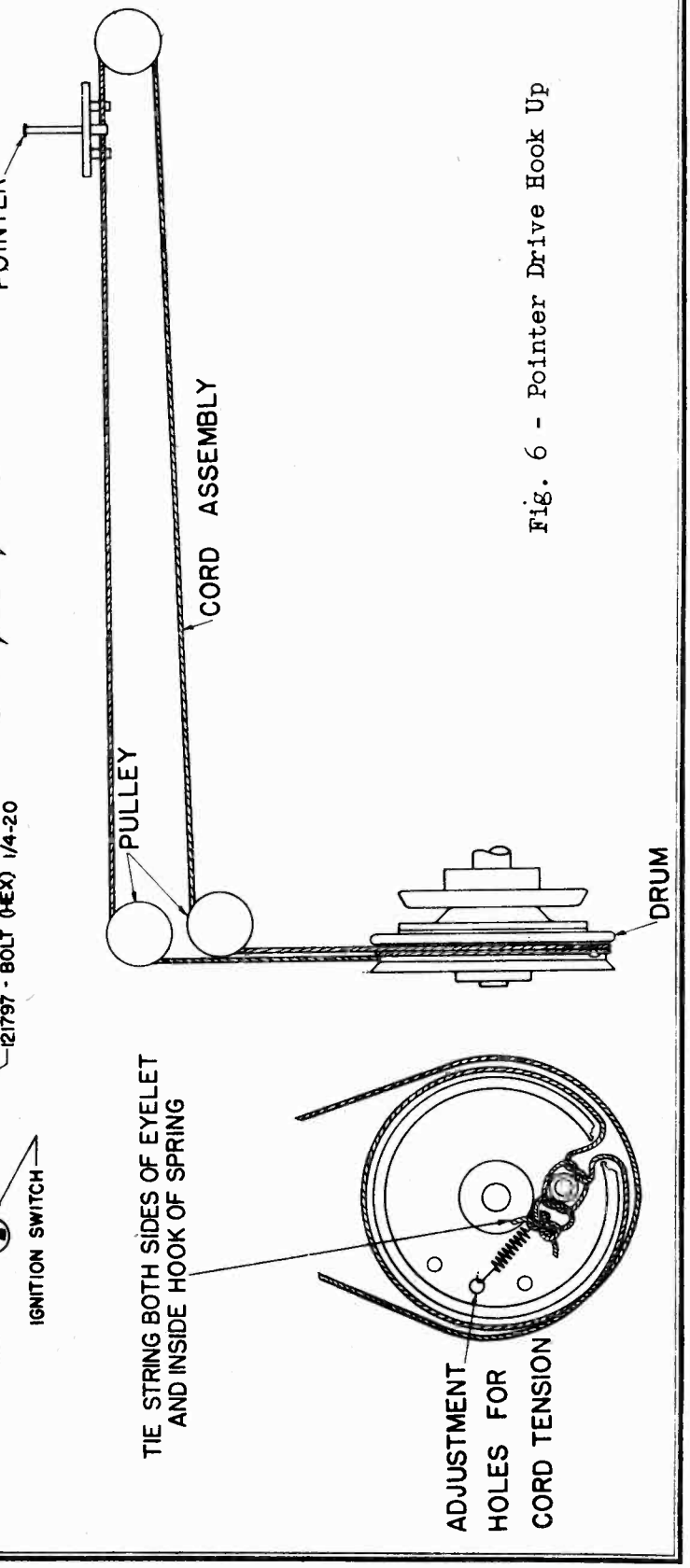


Fig. 6 - Pointer Drive Hook Up

CHASSIS ELECTRICAL PARTS LIST

PART NO.	PART NAME	DESCRIPTION	ILLUS. NO.
1214382	Coil	Antenna Choke	1
1216665	Coil	Tuning Coil & Core Assembly	2
	Sec. A	Antenna Coil	
	Sec. B	R. F. Coil	
	Sec. C	Oscillator Coil	
	Sec. D	Oscillator Trimmer	
1213663	Coil	Hash Choke	3
1216666	Coil	1st. I.F. Assembly	4
	Sec. A	I. F. Coil Assembly	
	Sec. B	Primary Trimmer	
	Sec. C	Secondary Trimmer	
1216667	Coil	2nd. I.F. Assembly	5
	Sec. A	I. F. Coil Assembly	
	Sec. B	Primary Trimmer	
	Sec. C	Secondary Trimmer and Coupling Condenser	
	Sec. D	Resistor, 68,000 ohm	
1216668	Coil	Filament Choke	6
1216669	Coil	Spark Choke Assembly	7
1214417	Condenser	Electrolytic	10
	Sec. A	10 mfd. 350 volt	
	Sec. B	30 mfd. 300 volt	
	Sec. C	20 mfd. 25 volt	
	Sec. D	20 mfd. 25 volt	
1215189	Condenser	.00001 mfd. moulded	11
1211227	Condenser	.00015 mfd. moulded	12
1207625	Condenser	.00005 mfd. moulded	13
1207625	Condenser	.00005 mfd. moulded	14
1207636	Condenser	.0005 mfd. moulded	15
1216670	Condenser	.000245 mfd. Compensating Condenser	
1216671	Condenser	Antenna Trimmer Condenser	18
1216672	Condenser	R. F. Trimmer Condenser	19
1212278	Condenser	Spark Condenser	20
7230592	Condenser	.05 mfd. 600 volt	21
1212099	Condenser	.02 mfd. 600 volt	22
7230592	Condenser	.05 mfd. 600 volt	23
1213854	Condenser	.004 mfd. 1500 volt	24
7240248	Condenser	.5 mfd. 100 volt	25
7240248	Condenser	.5 mfd. 100 volt	26
1208600	Condenser	.01 mfd. 600 volt	27
7230592	Condenser	.05 mfd. 600 volt	28
7233769	Condenser	.005 mfd. 800 volt	29
1209148	Condenser	.002 mfd. 800 volt	30
7234127	Condenser	.2 mfd. 200 volt	31
7233245	Condenser	.05 mfd. 600 volt	32
1212097	Condenser	.001 mfd. 800 volt	33
7237835	Resistor	220 ohm, 1/2 watt	34
1209885	Resistor	1 megohm 1/2 watt	40
1211005	Resistor	150 ohm, 1 watt	41
1214550	Resistor	22,000 ohm, 1/2 watt	42
1209885	Resistor	1 megohm, 1/2 watt	43
1214550	Resistor	22,000 ohm, 1/2 watt	44
7237835	Resistor	220 ohm, 1/2 watt	45
1214573	Resistor	1800 ohm, 2 watt	46
7239157	Resistor	18,000 ohm, 2 watt	47
1211163	Resistor	150,000 ohm, 1/2 watt	48
1214555	Resistor	220,000 ohm, 1/2 watt	49
1209885	Resistor	1 megohm, 1/2 watt	50
1209885	Resistor	1 megohm, 1/2 watt	51
1214546	Resistor	3900 ohm, 1/2 watt	52
1213845	Resistor	33,000 ohm, 1/2 watt	53
1213846	Resistor	270 ohm, 1 watt	54
1216673	Control	Control, Volume, Tone, "On-Off" Switch	55
	Sec. A	Volume, Control, 1 megohm	58
	Sec. B	Tone Control, 30,000 ohm	
	Sec. C	"On-Off" Switch	

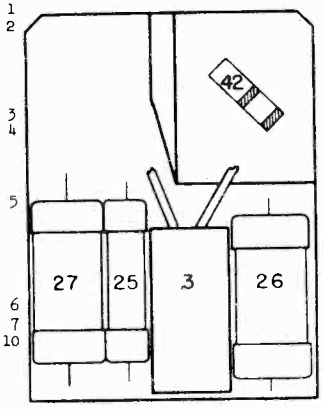


Fig. 2 - Bottom of Power Pack

PART NO.	PART NAME	DESCRIPTION	ILLUS. NO.
1216674	Speaker	6" x 9" Elliptical-Electro-Dynamic	59
1214405	Transformer	Audio Input	60
1216675	Transformer	Audio Output	61
1214411	Transformer	Power	62
1213671	Vibrator	Vibrator	63
1213583	7A7 Tube	R. F. Amplifier	
1213853	7Q7 Tube	Oscillator - Translator	
1213583	7A7 Tube	I. F. Amplifier	
1213582	7B6 Tube	Detector A.V.C. - Audio Driver	
1213586	7C5 Tube	Audio Output	
1213586	7C5 Tube	Audio Output	
7231596	0Z4G Tube	Rectifier	

CHASSIS PARTS - MISCELLANEOUS

1216676	Clip	Dial Retaining - L.H.
1216677	Clip	Dial Retaining - R.H.
1216678	Cover	Case Back
1216679	Dial Glass	Calibrated
1216680	Escutcheon	Including Dial
1216681	Gasket	Rubber, Speaker Seal
125588	Lamp, #55 Mazda	Pilot Light
1216682	Pointer	Dial
1216683	Socket and Lead Assy.	Pilot Light
7238455	Socket - Tube	8-prong Lock-in
1214420	Socket - Tube	4-prong Octal
1213684	Socket - Vibrator	4-prong
1216684	String Ass.	Pointer Drive (includes Spring)

TUNER PARTS

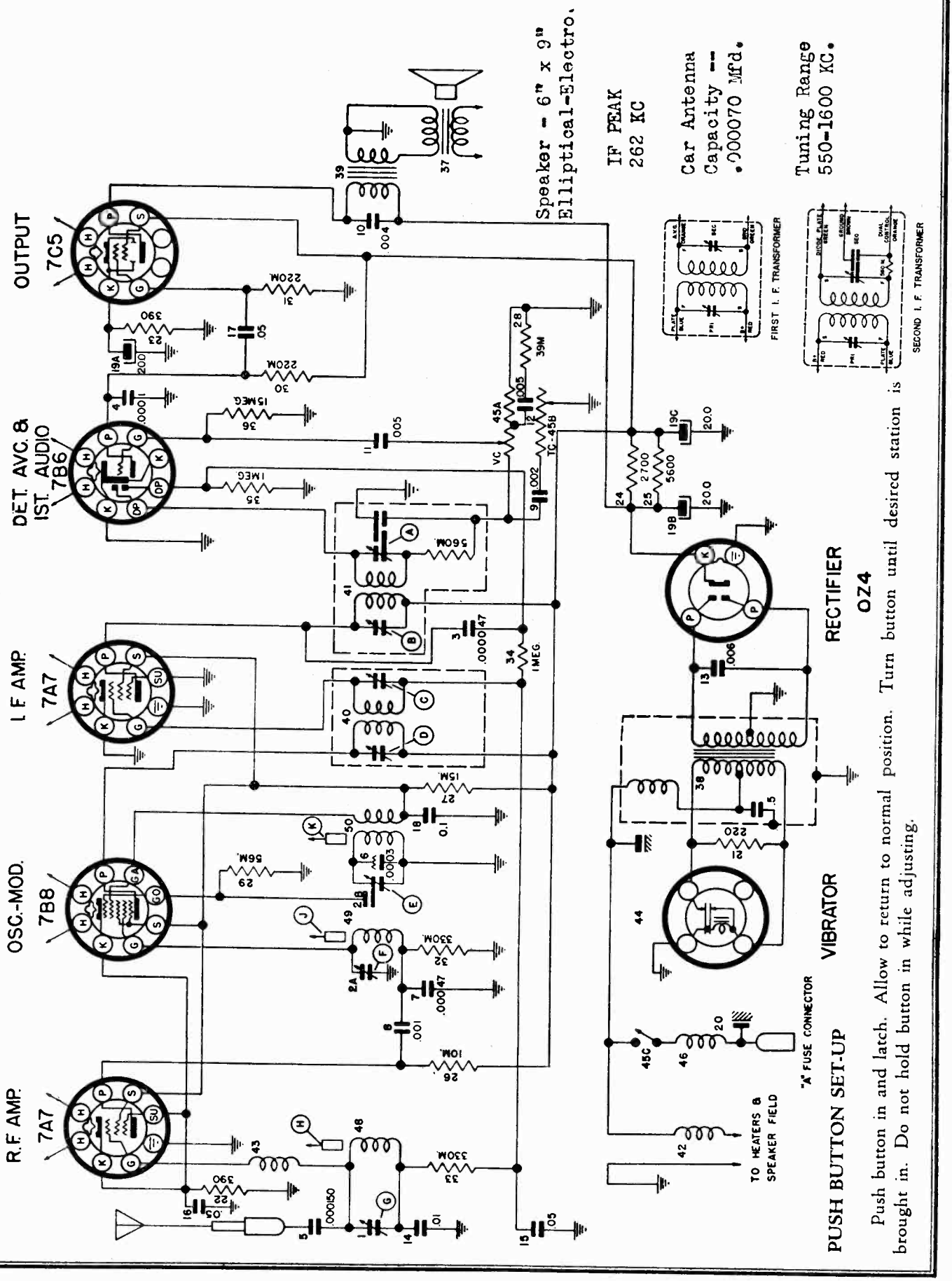
1216685	Bushing	Station Selector Shaft
1216686	Clutch Disc. and Crown Gear Assy.	
1216687	Drum Assembly	Pointer Drive
1214472	Pulley	Pointer Drive (wood 7/16" O.D.)
1216688	Push Button Assembly	
1216689	Shaft	Station Selector Assy. (Includes Coupling and Pinion Gear)
1214876	Spring	Compression - Clutch Disc
1216036	Spring	Core Drive to Tuner
1216684	Spring and String Assy.	Pointer Drive
1216690	Tuner Unit Assy.	Mechanical portion, Push Buttons included-less Manual Drive
1216691	Washer	Friction - Station Selector Shaft
1216692	Washer	"U" Retaining - Station Selector Shaft

PARTS MISCELLANEOUS

414997	Washer	Flat 33/64 I.D.
419522	Nut	#1/2-28 Hex.
419512	Washer	Rubber - 9/32 I.D. (Anti-Rattle) Dummy Control
419511	Washer	Felt - 9/32 I.D. (Anti-Rattle) Tone Control
419509	Knob	Tone and Dummy
1562090	Washer	Felt - 3/16 I.D. (Anti-Rattle) Tuning and Volume Control
419499	Knob	(Tuning & Volume Control) Includes Set Screw
419497	Bracket	Receiver Mounting
121797	Bolt	#1/4-20 x 3/8 long - Hex Head
419498	Bolt	#1/4-20 x 1/2 long - Wing Head
120386	Washer	Flat - 17/64 I.D. 5/8 O.D.
120423	Washer	Lock - (Internal Tooth)
103319	Washer	Lock #1/4 - (Split)
415640	"A" Lead Connector and Filter Condenser Assembly	
120151	Fuse	"A" Lead 15 Amp. 25V.
1845913	Tube	Fuse Insulator
1880659	Condenser	Generator - .5 mfd.
7239327	Distributor Suppressor	15,000 ohm.
1855686	Distributor Suppressor Adaptor	
415823	Static Collector	(Front Wheel)

MODEL 982376

OLDSMOBILE DIV.-GENERAL MOTORS



PUSH BUTTON SET-UP

Push button in and latch. Allow to return to normal position. Turn button until desired station is brought in. Do not hold button in while adjusting.

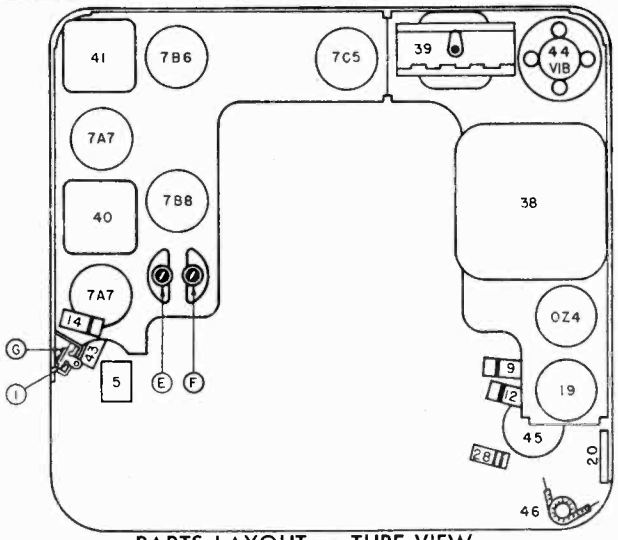
ALIGNMENT PROCEDURE

Volume Control Maximum — Tone Control on treble.

Signal Generator minimum for satisfactory output indication.

Series Condenser Or Dummy Antenna	Connect To	Signal Generator Frequency	Adjust Screws In Order
0.1 MFD	Grid side of Trimmer F	262 KC	A B C D
.000070 MFD	Antenna Terminal	1615 KC	E
.000070 MFD	Antenna Terminal	1430 KC	F G

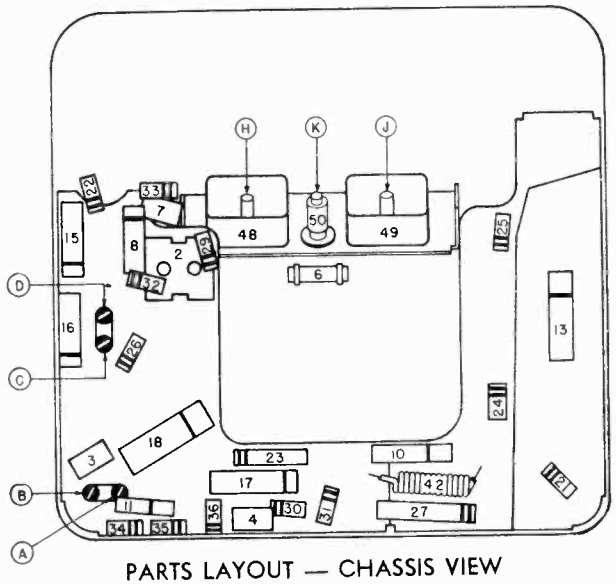
Adjust trimmer G to match car antenna (1430 KC) when radio is installed.



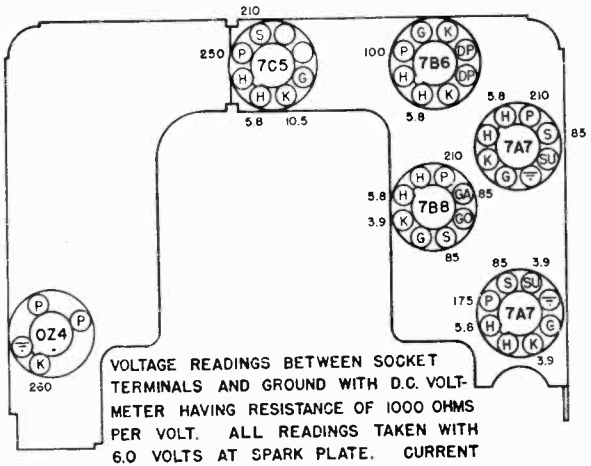
PARTS LAYOUT — TUBE VIEW

SPECIAL INSTRUCTIONS

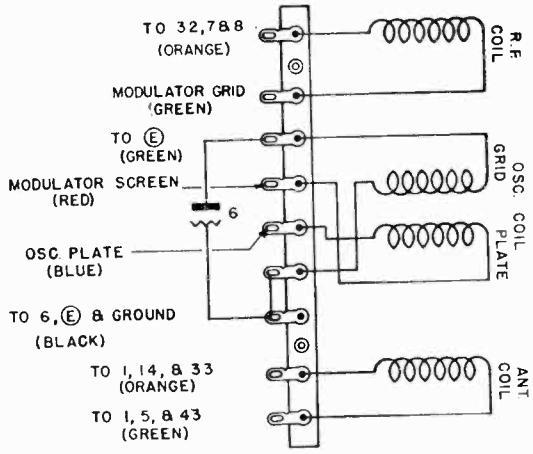
Mechanical alignment of iron cores. Tune to stop at H. F. end of dial. Adjust cores H, J, and K to extend $1\frac{5}{32}$" from end of coil form. Adjust trimmers E, F, and G, (1615 KC). Adjust cores H and J for maximum output at 1430 KC. Repeat alignment of trimmers E, F, and G at 1615 KC. Repeat alignment of cores H and J at 1430 KC. Align trimmers F and G at 1430 KC.



PARTS LAYOUT — CHASSIS VIEW

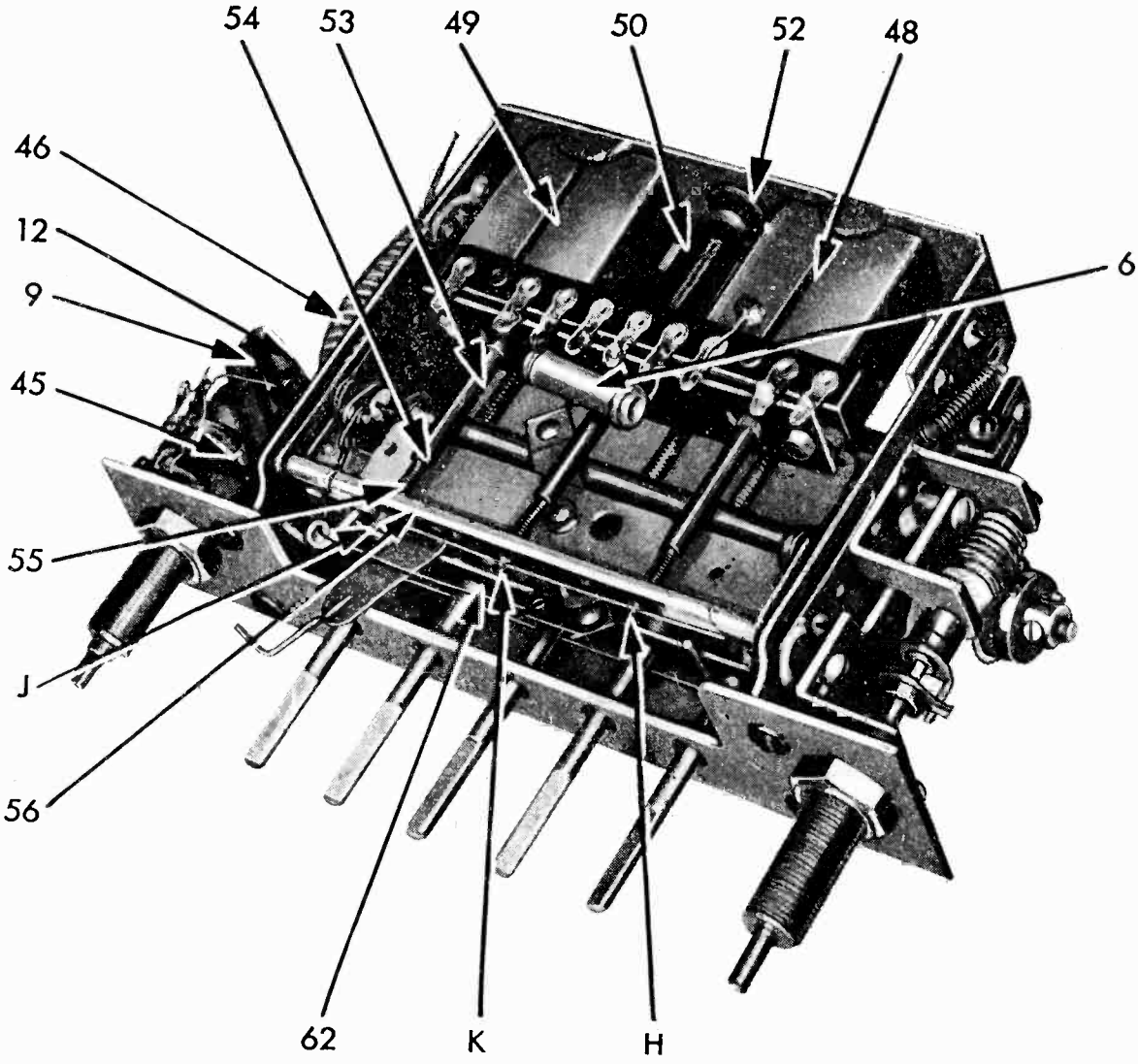


TUBE SOCKET VOLTAGE CHART

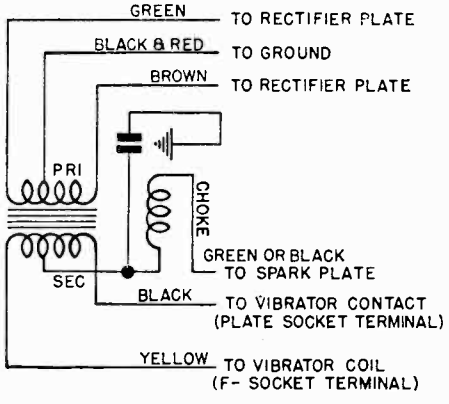


TUNER COILS

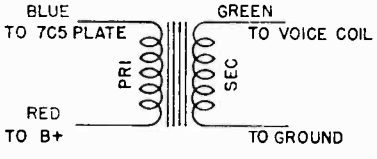
OLDSMOBILE DIV.-GENERAL MOTORS



TUNER PICTURE

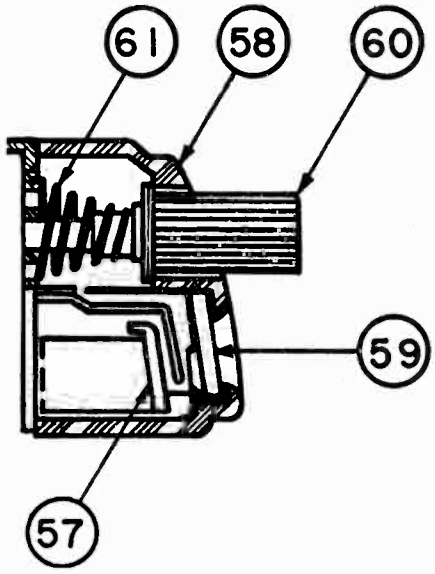


POWER TRANSFORMER



OUTPUT TRANSFORMER

TRANSFORMER CONNECTIONS



ESCUTCHEON CROSS SECTION

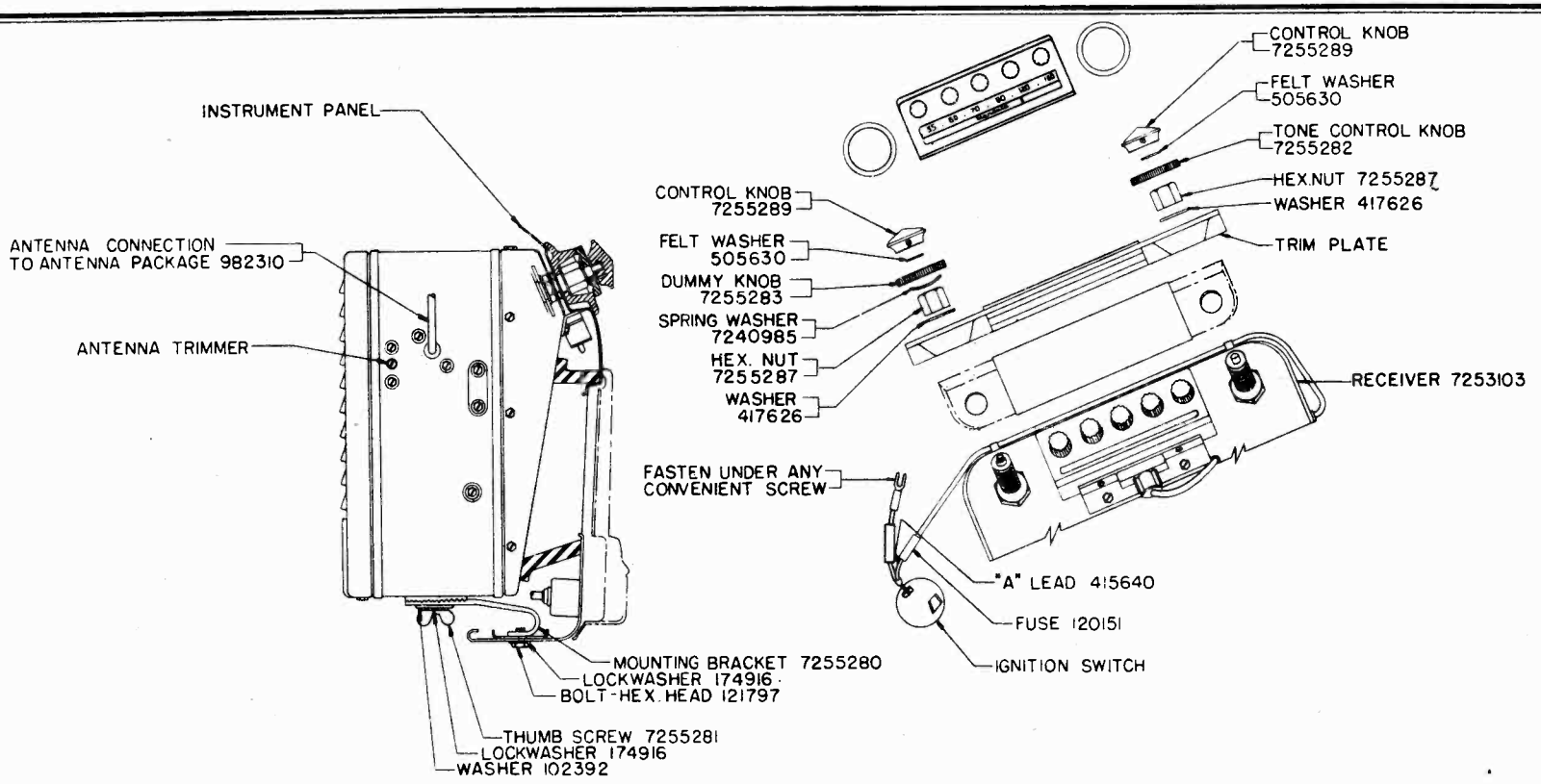


Fig. 7 - Installing The Receiver - 982376

AUTOMATIC PUSH BUTTON TUNER

The iron cored automatic tuner consists of three coils with iron cores actuated by a rugged mechanical device for varying the position of the cores in the coils. Changing the position of the cores changes the inductance of the antenna, R.F. and oscillator coils, and provides a means of tuning the radio over the entire broadcast band. A special compensating condenser is employed in the oscillator circuit to prevent the set from drifting off station due to normal variations in car and radio temperatures.

Illus. No.	Service Part No.	Description
		CONDENSERS
1	7255662	Antenna Trimmer and Bracket Assembly
2	7242322	Dual Trimmer
3	7233313	.000047 Mfd. Molded
4	1210275	.000100 Mfd. Molded
5	7230893	.000150 Mfd. 500 V. Mica
6	7255494	.000300 Mfd. Temp Compensating (Included in Tuner Assy. Part #7255487)
7	7238879	.000470 Mfd. Molded
8	1212097	.001 Mfd. 600 V. Tubular
9	1209148	.002 Mfd. 800 V. Tubular (Included in Tuner Assy. Part #7255487)
10	7233243	.004 Mfd. 800 V. Tubular
11	7230912	.005 Mfd. 600 V. Tubular
12	7230912	.005 Mfd. 600 V. Tubular (Included in Tuner Assy. Part #7255487)
13	7240906	.006 Mfd. 1600 V. Tubular (Buffer)
14	1208600	.01 Mfd. 600 V. Tubular
15	7230592	.05 Mfd. 600 V. Tubular
16	7230592	.05 Mfd. 600 V. Tubular
17	7230592	.05 Mfd. 600 V. Tubular
18	1207908	0.1 Mfd. 400 V. Tubular
19	7240724	Electrolytic 3 Section
19A		20.0 Mfd. 25 V.
19B		20.0 Mfd. 400 V.
19C		20.0 Mfd. 400 V.
20	7241259	Spark Plate
		RESISTORS
21	7237994	220 Ohms 1 W. Insulated
22	1213482	390 Ohms ½ W. Insulated
23	1216149	390 Ohms 1 W. Insulated
24	7242844	2700 Ohms 2 W. Insulated
25	7240918	5600 Ohms 1 W. Insulated
26	1211085	10,000 Ohms 1 W. Insulated
27	7233653	15,000 Ohms 2 W. Insulated
28	1213480	39,000 Ohms ½ W. Insulated (Included in Tuner Assy. Part #7255487)
29	1213267	56,000 Ohms ½ W. Insulated
30	1214555	220,000 Ohms ½ W. Insulated
31	1214555	220,000 Ohms ½ W. Insulated
32	1214557	330,000 Ohms ½ W. Insulated
33	1214557	330,000 Ohms ½ W. Insulated
34	1213282	1 Megohm ½ W. Insulated
35	1213282	1 Megohm ½ W. Insulated
36	1213289	15 Megohm ½ W. Insulated
		MISCELLANEOUS ELECTRICAL PARTS
37	7255527	Speaker — 6" x 9" Elliptical — Electro dynamic
38	7255881	Power Transformer Assembly Complete
39	7241056	Output Transformer Assembly
40	7242079	First I. F. Transformer Assembly Complete
41	7242918	Second I. F. Transformer Assembly Complete
42	7241708	"A" Filter Choke
43	7240251	Antenna Choke Coil
44	8638	Vibrator — Non-Synchronous
45	7255298	Volume, Tone Control, and Switch } Included in Tuner Assy. #7255487
46	7241701	"A" Spark Choke } Included in Tuner Assy. #7255487
	7241179	Volume Control Cable } Included in Tuner Assy. #7255487

		MISCELLANEOUS CHASSIS PARTS
	7255257	"A" Lead Assembly
	7233944	Vibrator Socket
	7236279	Octal Base Tube Socket
	7241356	Loktal Base Tube Socket
	7241273	Dial Light Assembly (Includes Bulb #187189)
	187189	Dial Light Bulb
		TUNER UNIT AND PARTS
	7255487	Tuner and Dual Control Assembly Complete
48	7255408	Antenna Coil Assembly
49	7255408	R. F. Coil Assembly
50	7255297	Oscillator Coil Assembly Complete
	7244021	Grommet (Ant. and R. F. Coil)
52	7244020	Grommet (Oscillator Coil)
	7256097	Iron Core Parts Package
53		Iron Core and Stud Assembly
54		Spring
55		Washer
56		Speed Nut
57	7255398	Dial Backplate
58	7255277	Escutcheon Assembly (Includes Dial Glass)
59	7255275	Dial Glass
60	7255402	Push Button
61	7255397	Spring-Return
62	7242368	Cord
	7242426	Latching Button
45	7255298	Volume, Tone Control and Switch
6	7255494	Condenser — .0003 Mfd. Temp. Compensating
	7241179	Volume Control Cable
9	1209148	Condenser — .002 Mfd. 800 V. Tubular
12	7230912	Condenser — .005 Mfd. 600 V. Tubular
28	1213480	Resistor — 39,000 Ohms ½ W. Insulated
46	7241701	"A" Spark Choke

	MOUNTING AND INSTALLATION PARTS
7255290	Control Knob Kit
	Tuning Knob Assy. (2)
	Tone Control Knob
	Dummy Knob
	Hex Nut (½ x 28 Special) (2)
	Washer — Felt (2)
	Washer-Radio Control Shaft (2)
	Control Washer — Metal Spring
415640	"A" Lead and Condenser Assembly (Includes Ammeter Cond. 1882784)
120151	Fuse — 15 Amp.
1845913	Tube — Fuse Connector
1880659	Generator Condenser .5 Mfd.
7239327	Distributor Suppressor, 15,000 Ohms
1853686	Suppressor Adapter
7240138	Static Collector Assembly
7255280	Mounting Bracket — Receiver
7255281	Thumb Screw ¼ x ⅜

MODELS 6-501, 6-502, 6-503

OLYMPIC RADIO & TELEV. INC.

Equipment Required:

Modulated R.F. signal generator; output meter; insulated screw-driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

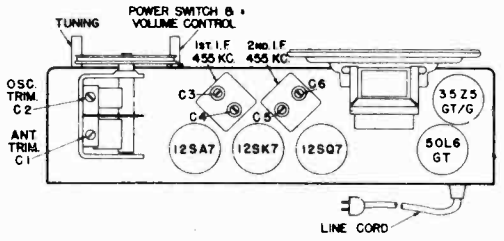
To align the receiver it is necessary to remove the chassis from the cabinet, check that the pointer is horizontal and coincides with the two horizontal reference lines on the dial. In this position the condenser should be completely closed. Connect the output meter and signal generator as follows:

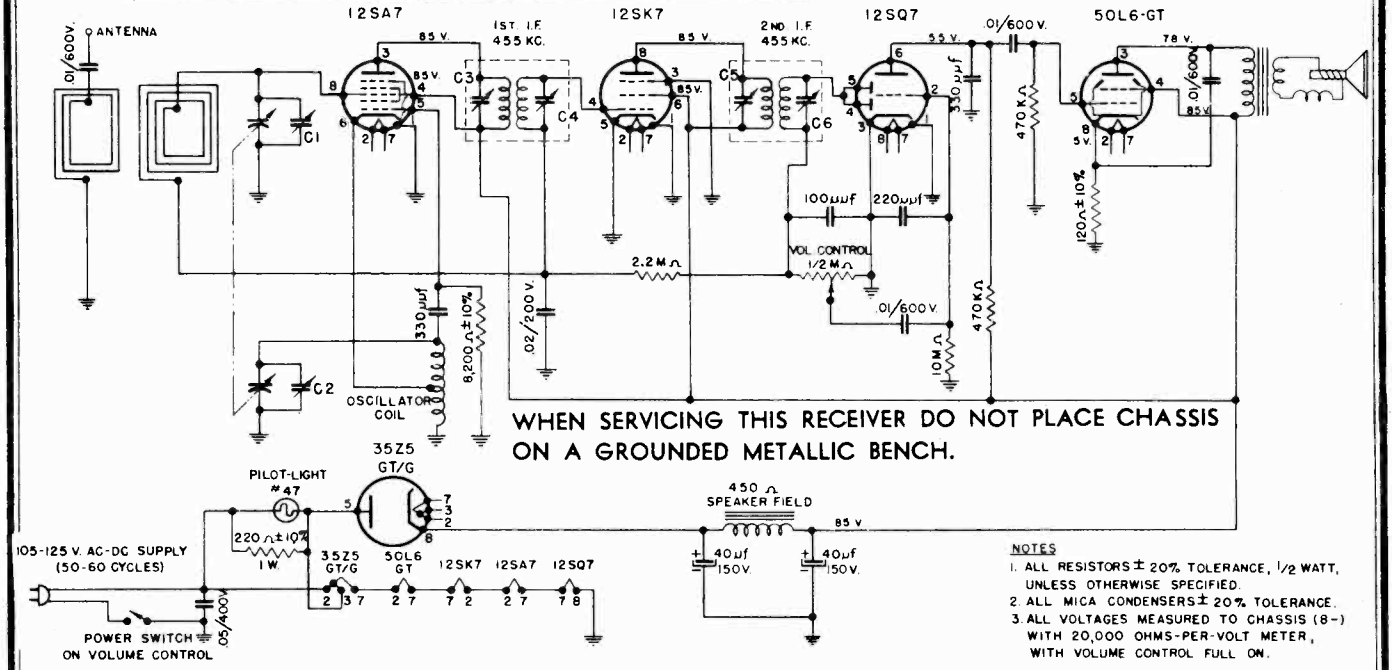
Output meter — Connect across voice coil and turn volume control to maximum.

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

ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN RECEIVER DIAL TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	ANTENNA SECTION TUNING CONDENSER IN SERIES WITH .1 MFD. COND.	455 KC.	FULL CLOCKWISE POSITION (CONDENSER PLATES FULLY OPEN.)	C6, C5, C4, C3 AND REPEAT IN SAME ORDER (1st. AND 2nd. I.F. TRANSFORMERS.)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1700 KC.	1700 KC (170 ON DIAL.)	C2 (OSCILLATOR)
3		1400 KC	MAXIMUM SIGNAL (APPROX. 140 ON DIAL.)	C1 (ANTENNA)
4		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 TO CHASSIS (8-) WITH 20,000 OHMS-PER-VOLT METER, WITH VOLUME CONTROL FULL ON.

Part No.	Description
BU-187	Pilot light bulb 6.3V (#47 Mazda)
CA-167W	Cabinet—Walnut bakelite cabinet
CA-167V	Cabinet—Ivory bakelite cabinet
CL-159	Coil—oscillator coil
CO-107	Capacitor—Electrolytic 40+40/150WV
CR-169	Crystal—dial crystal
CV-501	Condenser—2 gang variable tuning condenser
KN-352	Knob—Walnut knob
KN-353	Knob—Ivory knob
LP-163	Loop
PO-259	Pointer—moulded pointer
PT-102	Volume control and power switch
RCM20A101M	Capacitor—100 mmf ± 20% mica
RCM20A221M	Capacitor—220 mmf ± 20% mica
RCM20A331M	Capacitor—330 mmf ± 20% mica
RCP10W2203A	Capacitor—.02 mfd., 200 volts tubular
RCP10W4503A	Capacitor—.05 mfd., 400 volts tubular
RCP10W6103A	Capacitor—.01 mfd., 600 volts tubular
REB106M	Resistor— 10 meg., ± 20% 1/2 watt
REB121K	Resistor—120 ohms ± 10% 1/2 watt
REB225M	Resistor—2.2 meg., ± 20% 1/2 watt
REB474M	Resistor—470,000 ohms ± 20% 1/2 watt
REB822K	Resistor—8200 ohms ± 10% 1/2 watt
REC221K	Resistor—220 ohms ± 10% 1 watt
SK-110	Speaker—5" Dynamic with output transformer
SO-190	Socket—Dial light socket assembly
SP-191	Spring—Tuning drive lock spring
TR-186	Transformer—1st or 2nd I.F. transformer

MODELS 6-501W-U
6-501V-U, 6-502U

OLYMPIC RADIO & TELEV. INC.

Equipment Required:

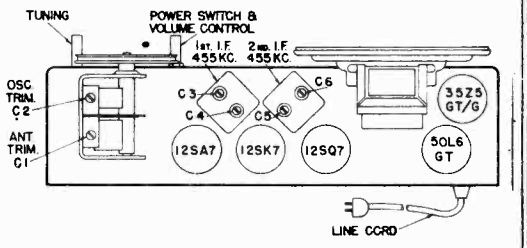
Modulated R.F. signal generator; output meter; insulated screw-driver; two .1 mfd 400 volt and one 50 mmfd 400 volt condensers.

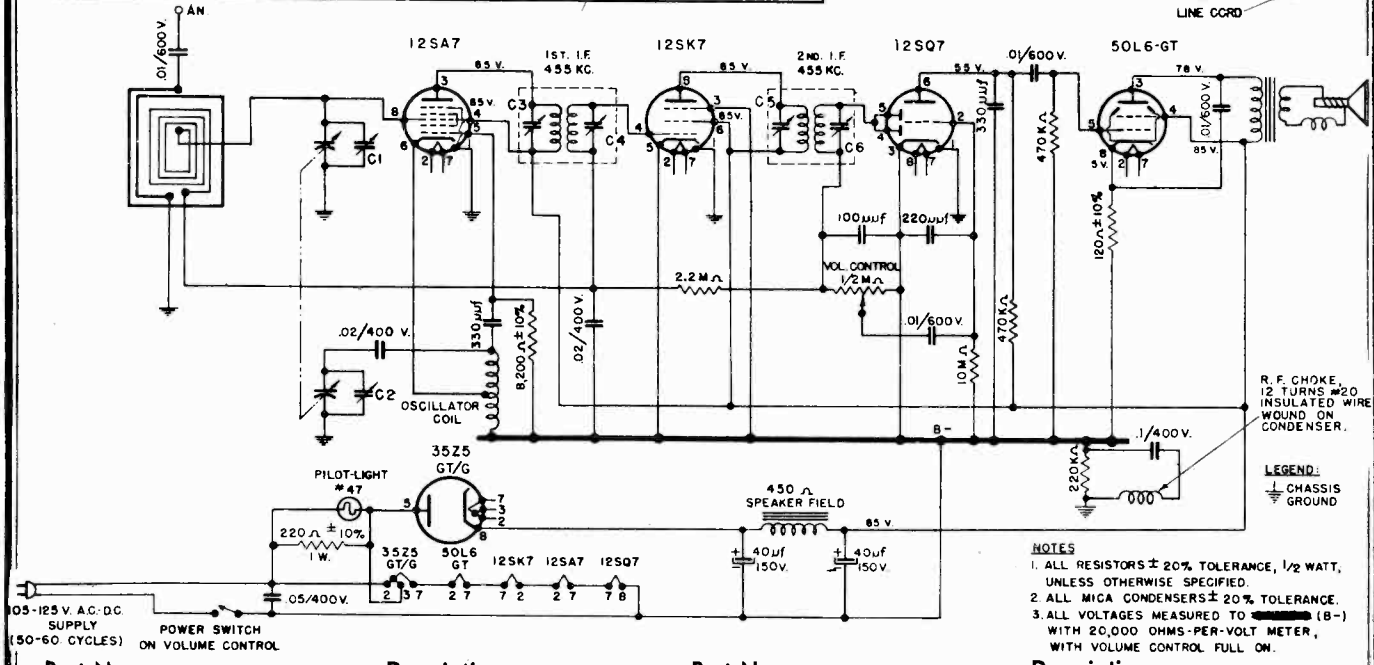
To align the receiver it is necessary to remove the chassis from the cabinet, check that the pointer is horizontal and coincides with the two horizontal reference lines on the dial. In this position the condenser should be completely closed. Connect the output meter and signal generator as follows:

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

Signal generator — Connect the low side of the signal generator to the common B-bus thru a .1 mfd condenser and keep the output as low as possible, then proceed in the sequence shown on the alignment chart.

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO -	SET SIGNAL GENERATOR TO -	TURN RECEIVER DIAL TO -	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	ANTENNA SECTION TUNING CONDENSER IN SERIES WITH .1 MFD. COND.	455 KC.	FULL CLOCKWISE POSITION. (CONDENSER PLATES FULLY OPEN)	C6, C5, C4, C3 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH	1700 KC.	1700 KC. (170 ON DIAL)	C2 (OSCILLATOR)
3		1400 KC	MAXIMUM SIGNAL (APPROX. 140 ON DIAL)	C1 (ANTENNA)
4	50 MMFD. COND.	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 TO [redacted] (B-) WITH 20,000 OHMS-PER-VOLT METER, WITH VOLUME CONTROL FULL ON.

Part No.	Description	Part No.	Description
BU-187	Pilot light bulb 6.3v (#47 Mazda)	RCM20A331M	Capacitor—330 mmf ±20% mica
CA-167W	Cabinet—Walnut bakelite cabinet	RCP10W4203A	.02/400 W. V. tubular paper condenser
CA-167V	Cabinet—Ivory bakelite cabinet	*RCP10W4104L	.1/400 W. V. tubular paper condenser
CL-569	Coil—oscillator coil	RCP10W4503A	.05/400 W. V. tubular paper condenser
CO-107	Capacitor—Electrolytic 40+40/150WV	RCP10W6103A	.01/600 W. V. tubular paper condenser
		REB106M	Resistor—10 meg., ±20% 1/2 watt
CR-169	Crystal—dial crystal	REB121K	Resistor—120 ohms ±10% 1/2 watt
CV-501	Condenser—2 gang variable tuning condenser	REB224M	Resistor—220,000 ohms ±20% 1/2 watt
		REB225M	Resistor—2.2 meg., ±20% 1/2 watt
DL-457-1	Dial—moulded, lucite dial	REB474M	Resistor—470,000 ohms ±20% 1/2 watt
KN-338	Knob—Walnut (for 6-502-U only)	REB822K	Resistor—8200 ohms ±10% 1/2 watt
KN-352	Knob—Walnut knob (for 6-501-U only)	REC221K	Resistor—220 ohms ±10% 1 watt
		SK-110	Speaker—5" Dynamic with output transformer
KN-353	Knob—Ivory knob		
LP-163	Loop—Antenna	SO-190	Socket—Dial light socket assembly
PO-259W	Pointer—moulded walnut pointer	SP-191	Spring—Tuning drive lock spring
PO-259V	Pointer—moulded ivory pointer	ST-255	Back—printed cardboard back (for 6-501-U only)
PT-102	Volume control and power switch		
RCM20A101M	Capacitor—100 mmf ±20% mica	ST-293-1	Back—printed cardboard back (for 6-502-U only)
RCM20A221M	Capacitor—220 mmf ±20% mica		
		TR-186	Transformer—1st or 2nd I.F. transformer

*When ordering specify "with r-f choke"

MODELS 6-504, 6-504L
MODELS 6-504-U, 6-504L-U

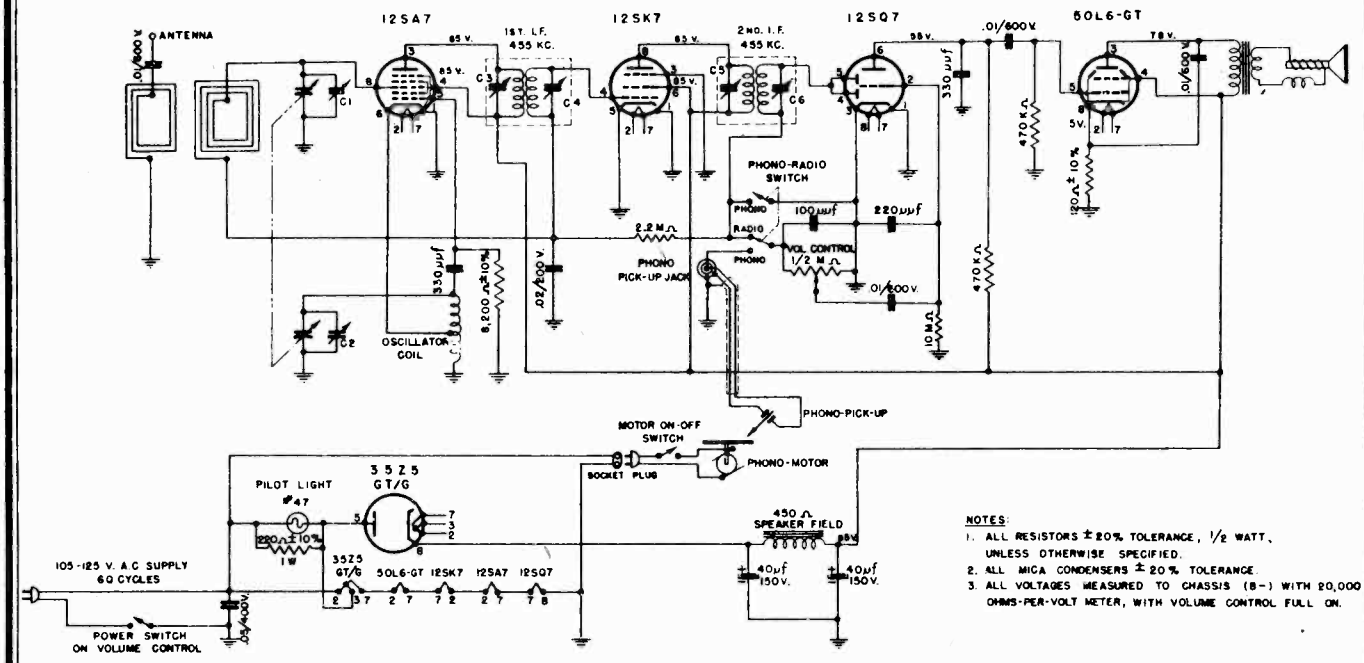
OLYMPIC RADIO & TELEV. INC.

Frequency Range of Receiver 535 - 1700 kc.

Power Requirement 105 - 125 volts 60 cycles Alternating Current (a-c) only

Power Consumption: Receiver 30 watts — Record Player 35 watts

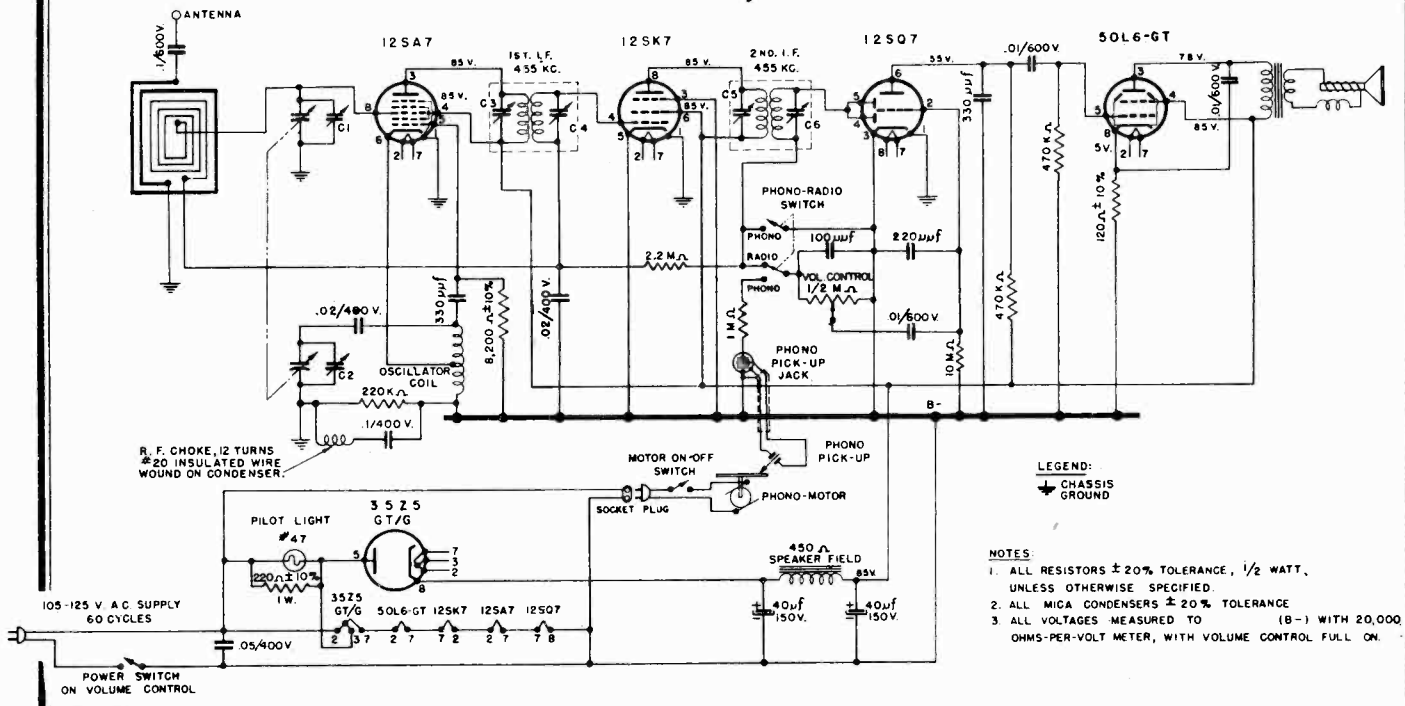
MODELS 6-504, 6-504L



NOTES:
1. ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL MICA CONDENSERS ±20% TOLERANCE.
3. ALL VOLTAGES MEASURED TO CHASSIS (B-) WITH 20,000 OHMS-PER-VOLT METER, WITH VOLUME CONTROL FULL ON.

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

MODELS 6-504-U, 6-504L-U



NOTES:
1. ALL RESISTORS ±20% TOLERANCE, 1/2 WATT, UNLESS OTHERWISE SPECIFIED.
2. ALL MICA CONDENSERS ±20% TOLERANCE
3. ALL VOLTAGES MEASURED TO (B-) WITH 20,000 OHMS-PER-VOLT METER, WITH VOLUME CONTROL FULL ON.

ALIGNMENT INSTRUCTIONS

Equipment Required:

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

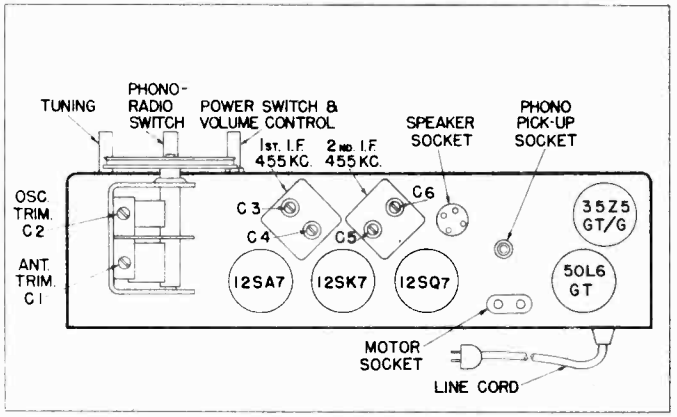
The receiver should be aligned with chassis and loop mounted in the cabinet. With the condenser completely closed the pointer should be checked so that it coincides with the two horizontal reference lines on the dial. Connect the output meter and signal generator as follows:

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 the output as low as possible, then proceed in the sequence shown on the alignment chart.

ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN RECEIVER DIAL TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	ANTENNA SECTION TUNING CONDENSER IN SERIES WITH .1 MFD. COND.	455 KC.	FULL CLOCKWISE POSITION. (CONDENSER PLATES FULLY OPEN.)	C6, C5, C4, C3 AND REPEAT IN SAME ORDER (1ST. AND 2ND. I.F. TRANSFORMERS.)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1700 KC	1700 KC. (170 ON DIAL.)	C2 (OSCILLATOR)
3		1400 KC.	MAXIMUM SIGNAL (APPROX. 140 ON DIAL.)	C1 (ANTENNA)
4		REPEAT STEPS 2 AND 3		



Models 6-504 and 6-504L REPLACEMENT PARTS

Part No.	Description
BU-187	Pilot light bulb 6.3v (#47 Mazda)
CL-159	Coil-oscillator coil
CO-107	Capacitor-Electrolytic 40-40/150WV
CR-170	Crystal-dial crystal
CV-501	Condenser-2 gang variable tuning condenser
KN-331	Knob-Walnut knob marked MOTOR OFF-ON
KN-339	Knob-Walnut knob marked TUNING
KN-340	Knob-Walnut knob marked OFF-ON
KN-341	Knob-Walnut knob marked RADIO-PHONO
LP-355	Loop
PO-259	Pointer-moulded pointer
PT-102	Volume control and power switch
RCM20A101M	Capacitor-100 mmf ± 20% mica
RCM20A221M	Capacitor-220 mmf ±20% mica
RCM20A331M	Capacitor-330 mmf ±20% mica
RCP10W2203A	Capacitor-.02 mfd., 200 volts tubular
RCP10W4503A	Capacitor-.05 mfd., 400 volts tubular
RCP10W6103A	Capacitor-.01 mfd., 600 volts tubular
REB106M	Resistor - 10 meg., ± 20% ½ watt
REB121K	Resistor - 120 ohms ± 10% ½ watt
REB225M	Resistor - 2.2 meg., ± 20% ½ watt
REB474M	Resistor - 470,000 ohms ±20% ½ watt
REB822K	Resistor - 8200 ohms ± 10% ½ watt
REC221K	Resistor - 220 ohms ± 10% 1 watt
SK-310	Speaker - 5" Dynamic with output transformer
SO-190	Socket - Dial light socket assembly
SP-191	Spring - Tuning drive lock spring
SW-243	Switch - Phono-Radio Switch
SW-330	Switch - s pst Rotary Switch
TR-186	Transformer - 1st or 2nd I.F. transformer

REPLACEMENT PARTS Models 6-504-U and 6-504L-U

Part No.	Description
BU-187	Pilot light bulb 6.3v (#47 Mazda)
CL-569	Coil-oscillator coil
CO-107	Condenser-40-40/150WV electrolytic condenser
CR-170	Crystal-dial crystal
CV-501	Condenser-2 gang variable tuning condenser
DL-457-2	Dial-molded lucite dial
KN-625	Knob-Walnut knob marked MOTOR OFF-ON
KN-626	Knob-Walnut knob marked TUNING
KN-627	Knob-Walnut knob marked OFF-ON-VOLUME
KN-628	Knob-Walnut knob marked RADIO-PHONO
LP-355	Loop-Antenna
PO-259W	Pointer-moulded pointer, walnut
PT-102	Volume control and power switch
RCM20A101M	Condenser-100 mmf ±20% mica condenser
RCM20A221M	Condenser-220 mmf ±20% mica condenser
RCM20A331M	Condenser-330 mmf ±20% mica condenser
*RCP10W4104L	Condenser-.1/400W.V. tubular paper condenser
RCP10W4203A	Condenser-.02/400W.V. tubular paper condenser
RCP10W4503A	Condenser-.05/400W.V. tubular paper condenser
RCP10W6103A	Condenser-.01/600W.V. tubular paper condenser
REB105M	Resistor-1 megohm ±20% ½ Watt Resistor
REB106M	Resistor-10 meg., ±20% ½ Watt Resistor
REB121K	Resistor-120 ohms ±10% ½ Watt Resistor
REB224M	Resistor-220,000 ohms ±20% ½ Watt Resistor
REB225M	Resistor-2.2 meg., ±20% ½ Watt Resistor
REB474M	Resistor-470,000 ohms ±20% ½ Watt Resistor
REB822K	Resistor-8200 ohms ±10% ½ Watt Resistor
REC221K	Resistor-220 ohms ±10% 1 Watt Resistor
SK-310	Speaker-5" Dynamic with output transformer
SO-190	Socket-Dial light socket assembly
SP-191	Spring-Tuning drive lock spring
ST-482	Back-Masonite Back
SW-243	Switch-Phono-Radio Switch
SW-330	Switch-s.p.s.t. Rotary Switch
TR-186	Transformer-1st or 2nd I.F. Transformer

* When ordering specify "with r-f choke"

MODELS 6-601W, 6-601V, 6-602

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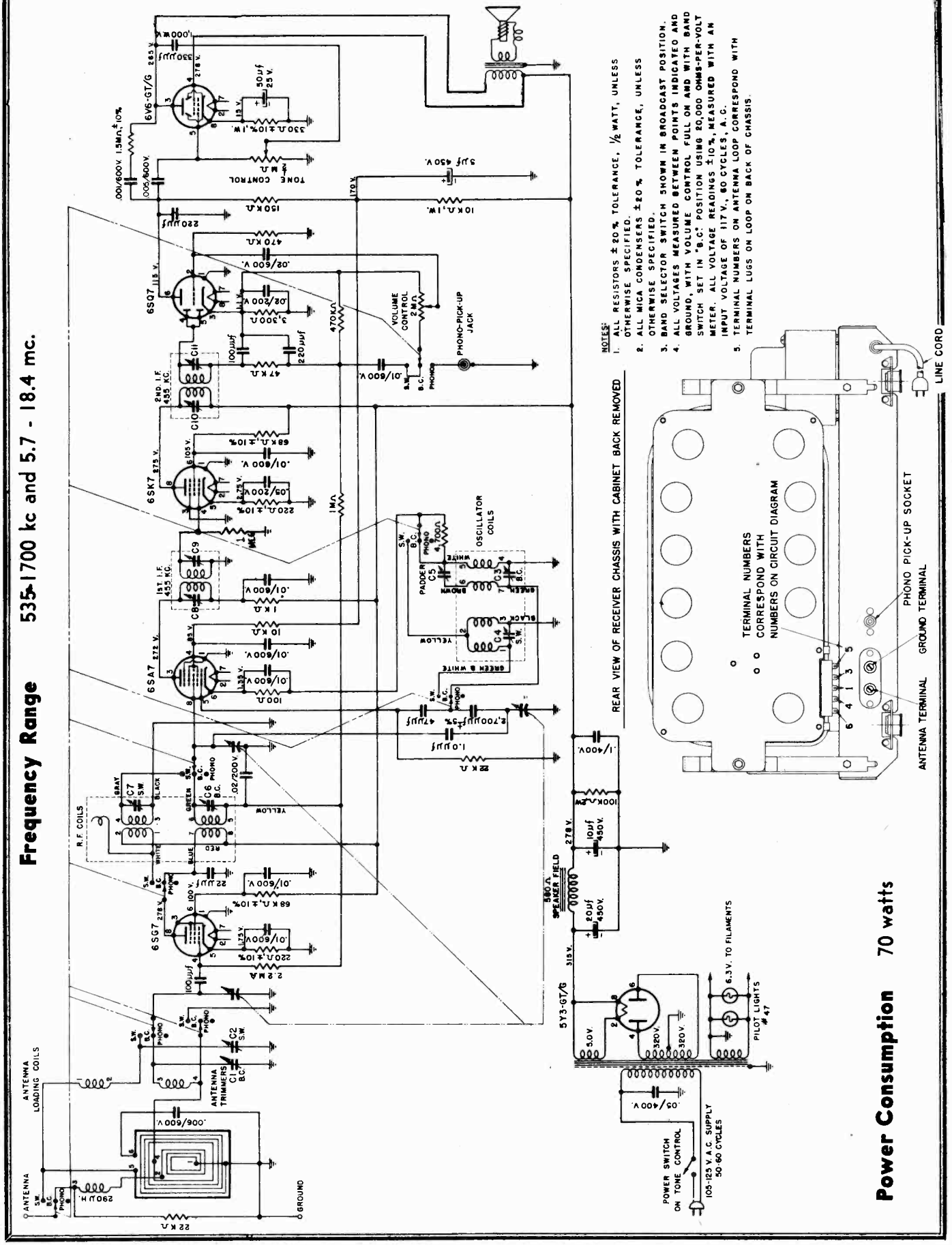
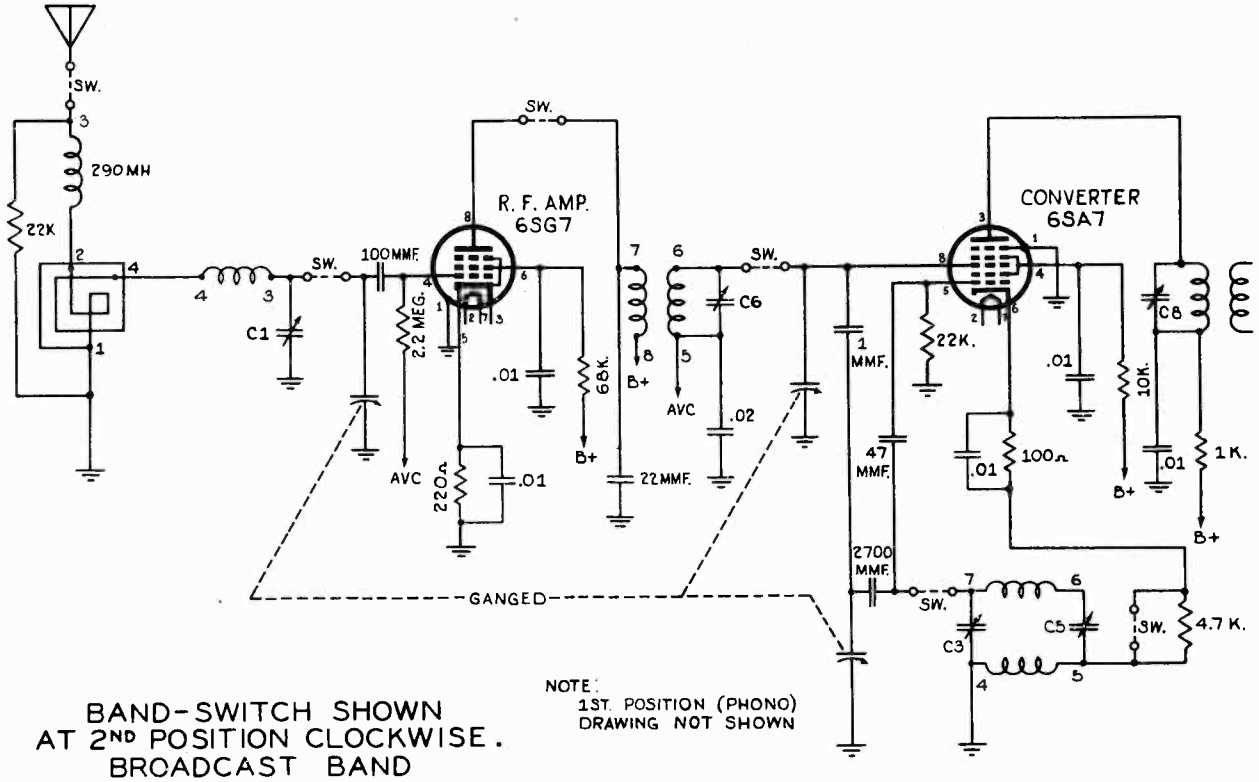


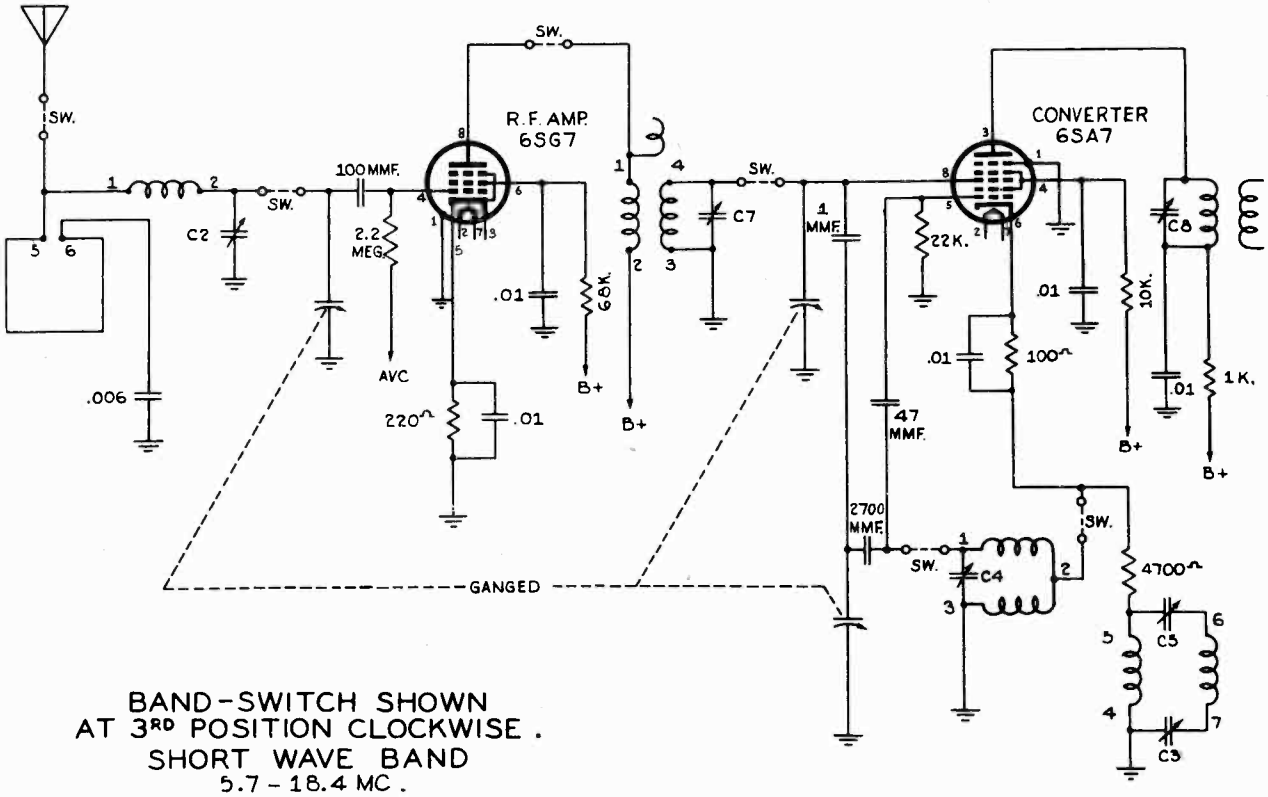
MODELS 6-601W, 6-601V, 6-602

OLYMPIC RADIO & TELEV. INC.



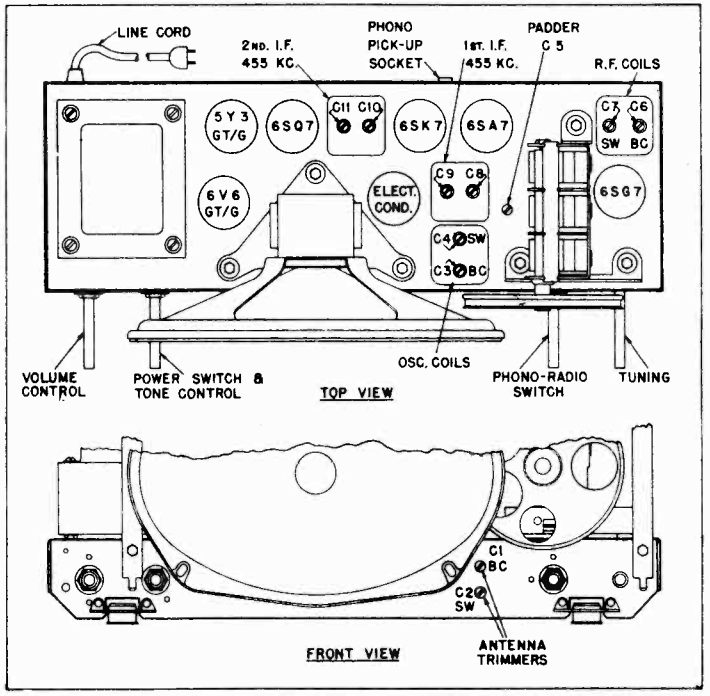
NOTE:
1ST. POSITION (PHONO)
DRAWING NOT SHOWN

BAND-SWITCH SHOWN AT 2ND POSITION CLOCKWISE.
BROADCAST BAND
535-1700KC.



BAND-SWITCH SHOWN AT 3RD POSITION CLOCKWISE.
SHORT WAVE BAND
5.7 - 18.4 MC.

TUBE AND TRIMMER LAYOUT



ALIGNMENT PROCEDURE CHART

STEP	SET BAND SWITCH ON	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE).
1	B.C.	R.F. SECTION OF VARIABLE CONDENSER OR PIN 4 OF THE 6SK7 TUBE IN SERIES WITH A .1 MFD, 400 VOLT CONDENSER.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN).	C11 AND C10 (2nd. I.F. TRANSFORMER)
2	B.C.	R.F. SECTION OF VARIABLE CONDENSER OR PIN 8 OF THE 6SA7 TUBE IN SERIES WITH A .1 MFD, 400 VOLT CONDENSER.	455 KC.	EXTREME RIGHT HAND POSITION. (CONDENSER PLATES FULLY OPEN).	C9 AND C8 (1st. I.F. TRANSFORMER)
3	B.C.	REPEAT STEPS 1 AND 2			
4	B.C.	USE RADIATED SIGNAL (CONNECT BOTH SIDES OF SIGNAL GENERATOR TO RADIATION LOOP).	1700 KC.	1700 KC. CALIBRATION POINT ON DIFFUSER PLATE.	C3 (OSCILLATOR TRIMMER)
5	B.C.		1400 KC.	RESONANCE, APPROXIMATELY 1400 KC. CALIBRATION POINT ON DIFFUSER PLATE.	C8 AND C1 (R.F. AND ANTENNA TRIMMERS)
6	B.C.		600 KC.	RESONANCE, APPROXIMATELY 600 KC. CALIBRATION POINT ON DIFFUSER PLATE.	C5 (PADDER) ROCK VARIABLE FOR MAXIMUM SIGNAL
7	B.C.		REPEAT STEPS 4, 5 AND 6		
8	S.W.		18 MC.	18 MC. CALIBRATION POINT ON DIFFUSER PLATE	C4 (OSCILLATOR TRIMMER) SECOND PEAK FROM TIGHT POSITION. C7 (R.F. TRIMMER) SECOND PEAK FROM TIGHT POSITION. C2 (ANTENNA TRIMMER)
9	S.W.		6 MC.	RESONANCE	CHECK THAT POINTER (AT RESONANCE) COINCIDES WITH 6 MC. CALIBRATION POINT. IF NOT REPEAT STEP 8.
10	S.W.		REPEAT STEPS 8 AND 9		

NOTE: In order to adjust the short wave oscillator trimmer and the short wave r-f trimmer accurately to the fundamental frequency and not to the image signal, turn the trimmers first to the maximum capacity position (fully tight). From this position loosen the trimmer through one peak indication on the outputmeter until a second peak is obtained. Adjust for maximum output on this second peak.

To check whether this procedure has been accurately performed, ascertain that an image signal can be received (much weaker) by tuning the signal generator to a frequency 910 kilocycles above the alignment frequency.

SERVICE AND ALIGNMENT INSTRUCTIONS

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".

Equipment required: Modulated r-f signal generator, output meter, insulated screw driver, one .1 mfd 400 volt condenser.

With the receiver removed from the cabinet, connect output meter across voice coil. Connect ground side of the signal generator to receiver chassis. Turn volume control fully on, and keeping the output of the signal generator as low as possible, proceed in the sequence as shown on the alignment chart.

To facilitate alignment of the receiver, when removed from cabinet, calibration points are provided on the light diffuser plate which is mounted on the chassis. These points are from left to right.

.(Dot, Reference point); 600 kc; 1000 kc; 1400 kc; 1700 kc for the broadcast band and .(Dot, reference point); 6 mc; 12 mc; 18 mc for the short wave band.

Before aligning close the variable condenser fully counterclockwise (plates fully closed) and check that pointer coincides with the reference dot (extreme left dot) on the diffuser plate.

MODELS 6-601W,6-601V,
6-602
MODELS 6-617,6-617U

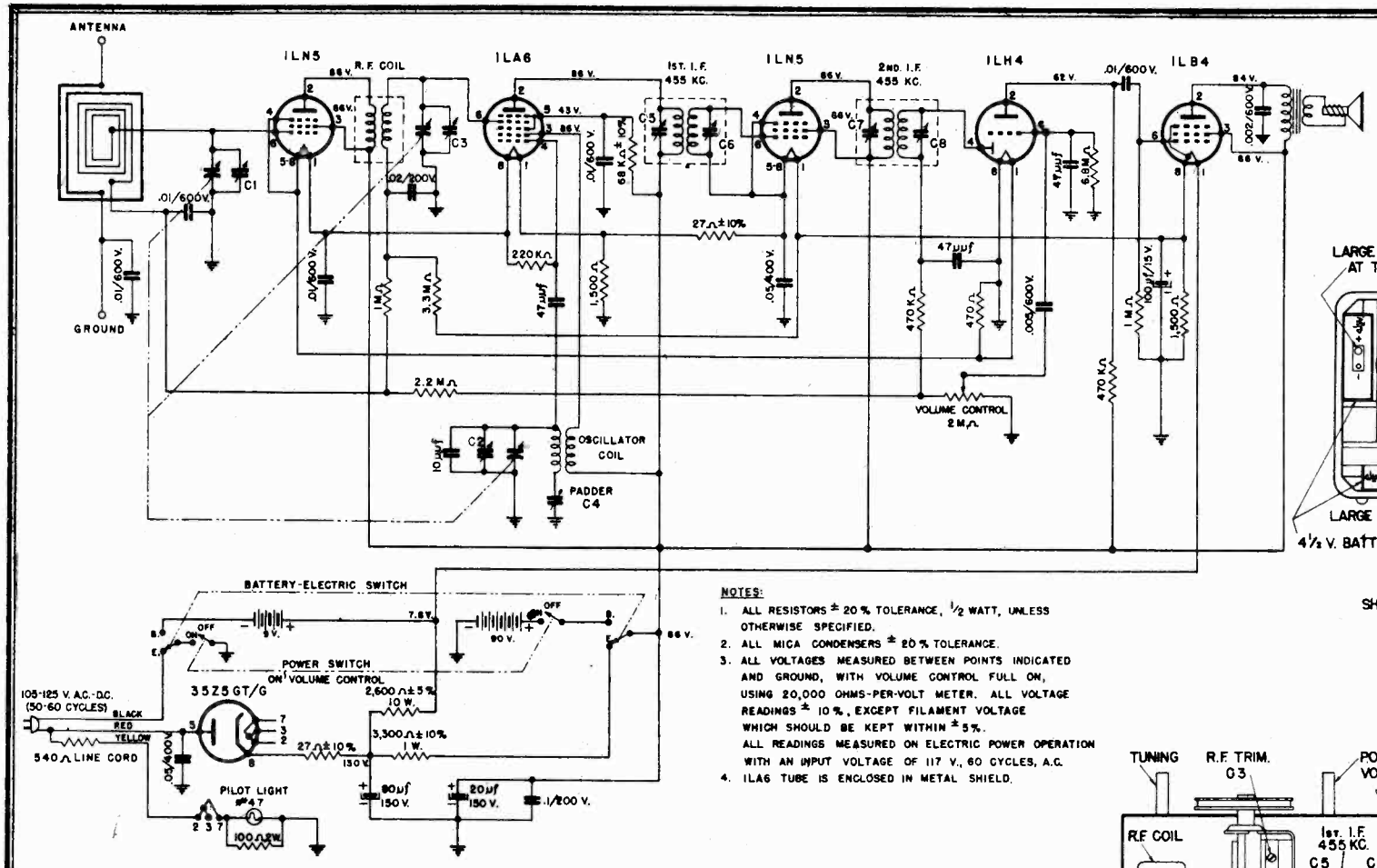
OLYMPIC RADIO & TELEV. INC.

MODELS 6-601W,6-601V,6-602

Part No.	Description
BU 187	Bulb—#47 Mazda 6.3V pilot light bulb
CA 143W	Cabinet—walnut bakelite cabinet
CA 143V	Cabinet—ivory bakelite cabinet
CA 152	Cabinet—wood (for 6-602 only)
CL 211	Coil—antenna loading coil
CL 212	Coil—oscillator coil, shielded
CL 224	Coil—R.F. coil, shielded (BC & SW)
CO 158	Condenser—20/10/5/450 W.V. & 50/25 W.V. electrolytic condenser
CO 311	Condenser—1.0 mmfd ±20% fixed condenser
CT 389	Condenser—3-35 mmfd dual trimmer condenser
CT 440	Condenser—350-780 mmfd padder condenser
CV 144	Condenser—3 gang variable condenser
DL 378	Dial—glass dial scale
KN 422	Knob—walnut knob marked "VOLUME" (for 6-601 W & 6-602)
KN 423	Knob—walnut knob marked "OFF-ON TONE" (for 6-601W & 6-602)
KN 425	Knob—walnut knob marked "TUNING" (for 6-601W & 6-602)
KN 430	Knob—walnut knob marked "SW-BC-PH" (for 6-601W & 6-602)
KN 426	Knob—ivory knob marked "VOLUME" (for 6-601V)
KN 427	Knob—ivory knob marked "OFF-ON TONE" (for 6-601V)
KN 429	Knob—ivory knob marked "TUNING" (for 6-601V)
KN 431	Knob—ivory knob marked "SW-BC-PH (for 6-601V)
LP 213	Loop—Antenna
PO 334	Pointer
PT 239	Control—2 megohm volume control (for model 6-602)
PT 240	Control—½ megohm tone control (with S.P.S.T. switch) (for model 6-602)
PT 435	Control—2 megohm volume control (for models 6-601W & 6-601V)
PT 436	Control—½ megohm tone control (with S.P.S.T. switch) (for models 6-601W & 6-601V)
RCM20A101M	Condenser—100 mmfd ±20% mica condenser
RCM20A220M	Condenser—22 mmfd ±20% mica condenser
RCM20A221M	Condenser—220 mmfd ±20% mica condenser
RCM20A470M	Condenser—47 mmfd ±20% mica condenser
RCM30B272J	Condenser—2700 mmfd ±5% mica condenser
RCM40A331M	Condenser—330 mmfd ±20% 1000 W.V. mica condenser
RCP10W2203A	Condenser—.02/200 W.V. tubular paper condenser
RCP10W2503A	Condenser—.05/200 W.V. tubular paper condenser
RCP10W4104L	Condenser—.1/400 W.V. tubular paper condenser
RCP10W4503A	Condenser—.05/400 W.V. tubular paper condenser
RCP10W6102A	Condenser—.001/600 W.V. tubular paper condenser
RCP10W6103A	Condenser—.01/600 W.V. tubular paper condenser
RCP10W6203A	Condenser—.02/600 W.V. tubular paper condenser
RCP10W6502A	Condenser—.005/600 W.V. tubular paper condenser
RCP10W6602K	Condenser—.006/600 W.V. tubular paper condenser
REB 101M	Resistor—100 ohms ±20% ½ watt resistor
REB 102M	Resistor—1000 ohms ±20% ½ watt resistor
REB 103M	Resistor—10,000 ohms ±20% ½ watt resistor
REB 105M	Resistor—1 megohm ±20% ½ watt resistor
REB 154M	Resistor—150,000 ohms ±20% ½ watt resistor
REB 155K	Resistor—1.5 megohms ±10% ½ watt resistor
REB 221K	Resistor—220 ohms ±10% ½ watt resistor
REB 223M	Resistor—22000 ohms ±20% ½ watt resistor
REB 225M	Resistor—2.2 megohms ±20% ½ watt resistor
REB 332M	Resistor—3300 ohms ±20% ½ watt resistor
REB 472M	Resistor—4700 ohms ±20% ½ watt resistor
REB 473M	Resistor—47,000 ohms ±20% ½ watt resistor
REB 474M	Resistor—470,000 ohms ±20% ½ watt resistor
REB 683K	Resistor—68,000 ohms ±10% ½ watt resistor
REC 103M	Resistor—10,000 ohms ±20% 1 watt resistor
REC 331K	Resistor—330 ohms ±10% 1 watt resistor
RED 104M	Resistor—100,000 ohms ±20% 2 watt resistor
SK 325	Speaker—6"x9" oval dynamic, 580 ohms with 5000 ohm output transformer
SO 188	Socket—Pilot light "U" socket ass'y.
SP 191	Spring—dial drive lock spring
ST 367	Back—printed cardboard back (for models 6-601W & 6-601V)
ST 368	Back—printed cardboard back (for model 6-602)
ST 385	Light Diffuser
SW 387	Switch—SW-BC-Phono 3 position, 3 wafer switch (for model 6-602)
SW 646	Switch—SW-BC-Phono 3 position, 3 wafer switch (for models 6-601W & 6-601V)
TR 112	Transformer—power transformer
TR 118	Transformer—1st & 2nd I.F. transformer 455KC

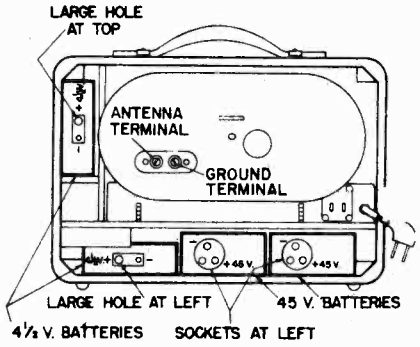
MODELS 6-617, 6-617U

Part No.	Description
BU-187	#47 pilot light bulb 6.3V (#47 Mazda)
CL-210	Coil—oscillator coil
CL-608	Coil—r-f coil
CL-609	Coil—antenna loading coil
CO-158	Condenser—20/10/5/450 WV & 50/25WV electrolytic condenser
CV-145	Condenser—3-gang variable condenser
DL-366	Dial—glass dial scale
KN-418	Knob—Walnut knob marked "VOLUME"
KN-419	Knob—Walnut knob marked "OFF-ON-TONE"
KN-420	Knob—Walnut knob marked "PHONO-RADIO"
KN-421	Knob—Walnut knob marked "TUNING"
LP-179	Loop—antenna
PO-181	Pointer
PT-105	Control—2 megohm volume control
PT-106	Control—½ megohm tone control with power switch S.P.S.T.
RCM20A101M	Condenser—100 mmfd ±20% mica
RCM20A220M	Condenser— 22 mmfd ±20% mica
RCM20A221M	Condenser—220 mmfd ±20% mica
RCM40A331M	Condenser—330 mmfd ±20% mica condenser, 1000 WV
RCM20A470M	Condenser— 47 mmfd ±20% mica
RCP10W2203A	Condenser—.02/200WV tubular paper
RCP10W2503A	Condenser—.05/200WV tubular paper
RCP10W4104L	Condenser—.1/400WV tubular paper
RCP10W4503A	Condenser—.05/400WV tubular paper
RCP10W6102A	Condenser—.001/600WV tubular paper
RCP10W6103A	Condenser—.01/600WV tubular paper
RCP10W6502A	Condenser—.005/600WV tubular paper
REB102M	Resistor—1000 ohms ±20% ½ watt resistor
REB105M	Resistor—1 megohm ±20% ½ watt resistor
REB154M	Resistor—150,000 ohms ±20% ½ watt resistor
REB155K	Resistor—1.5 megohm ±10% ½ watt resistor
REB221K	Resistor—220 ohms ±10% ½ watt resistor
REB223M	Resistor—22,000 ohms ±20% ½ watt resistor
REB224M	Resistor—220,000 ohms ±20% ½ watt resistor
REB331M	Resistor—330 ohms ±20% ½ watt resistor
REB332M	Resistor—3300 ohms ±20% ½ watt resistor
REB334M	Resistor—330,000 ohms ±20% ½ watt resistor
REB472M	Resistor—4700 ohms ±20% ½ watt resistor
REB473M	Resistor—47,000 ohms ±20% ½ watt resistor
REB474M	Resistor—470,000 ohms ±20% ½ watt resistor
REB683K	Resistor—68,000 ohms ±10% ½ watt resistor
REC103M	Resistor—10,000 ohms ±20% 1 watt resistor
REC331K	Resistor—330 ohms ±10% 1 watt resistor
RED473M	Resistor—47,000 ohms ±20% 2 watt resistor
SK-325	Speaker—6" x 9" oval dynamic speaker 580 ohms field coil with output transformer
SP-191	Spring—drive shaft retaining spring
SP-218	Spring—7/8" lg. pointer drive spring
ST-369	Back— Masonite back,
SW-141	Switch—phono-radio switch D.P.D.T.
TR-112	Transformer—power transformer
TR-118	Transformer—I.F. transformer, 1st & 2nd

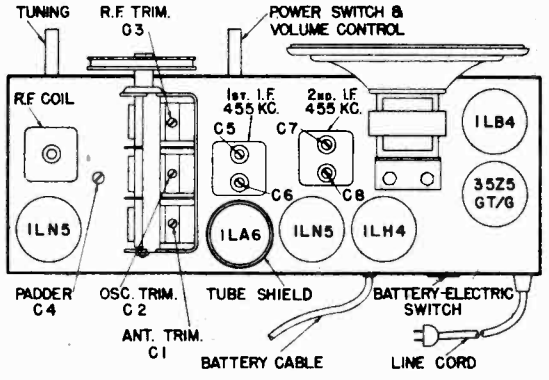


NOTES:

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.
4. 1LA6 TUBE IS ENCLOSED IN METAL SHIELD.



REAR VIEW OF CABINET
SHOWING PLACEMENT OF BATTERIES



TOP VIEW OF CHASSIS

NOTE: 1LA6 TUBE IS ENCLOSED IN METAL SHIELD.

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.)	C8, C7, C6, C5 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)	C2, C3, C1 OSCILLATOR, R.F. AND ANTENNA TRIMMERS
3		600 KC.	600 KC. (APPROX. 60 ON DIAL)	C4 PADDER ROCK DIAL FOR MAXIMUM SIGNAL
4		REPEAT STEPS 2 AND 3		

Power Consumption on electric operation — 20 watts

OLYMPIC RADIO & TELEV. INC.

SERVICE AND ALIGNMENT INSTRUCTIONS

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:

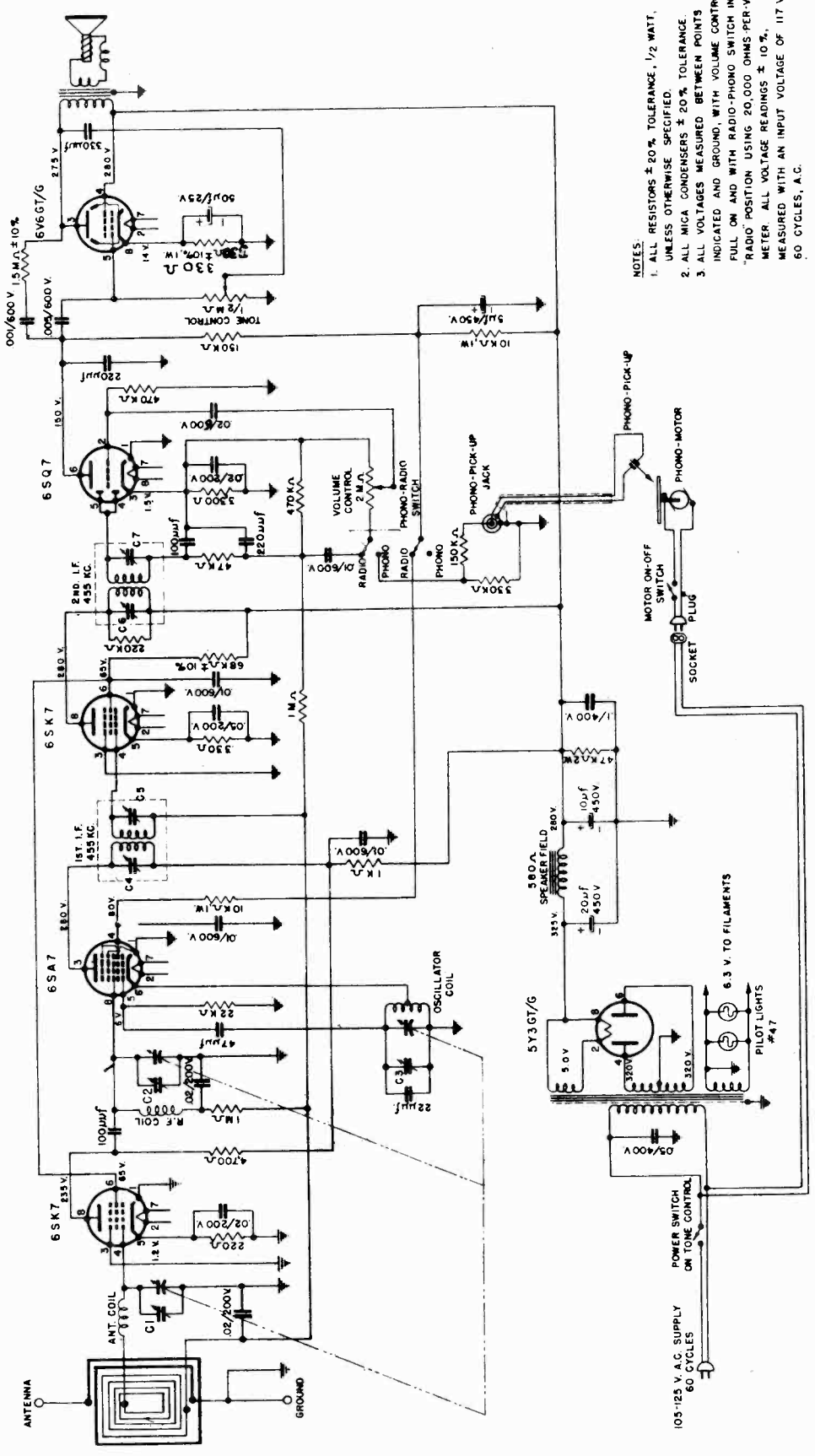
Output meter: Connect across voice coil and turn volume control to maximum.

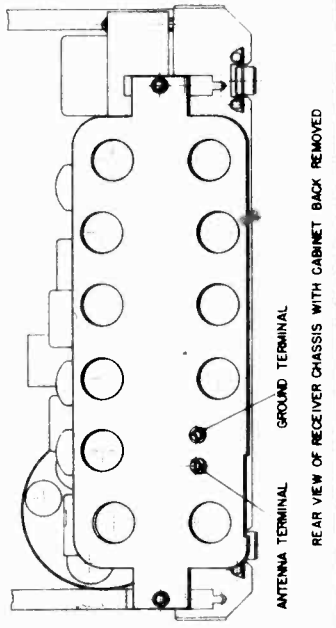
Signal generator: Connect the low side of the signal generator to the receiver chassis thru a .1 mfd condenser and keep output as low as possible, then proceed in the sequence shown on the alignment chart.

Part No.	Description
BK-405	Bracket-Resistor mounting bracket
BU-187	Bulb-pilot light bulb 6.3v (#47 Mazda)
CA-229	Cabinet-portable cabinet
CB-335	Cable-battery cable
CL-176	Coil-R.F. coil, shielded
CL-177	Coil-oscillator coil
CO-182	Condenser-80/20/150WV & 100/15WV electrolytic condenser
CR-299	Crystal-dial crystal
CT-388	Condenser-220-680 mmfd padder condenser
CV-146	Condenser-3 gang variable condenser (with pulley)
DL-391	Dial-metal dial scale
ES-274-1	Escutcheon-moulded escutcheon
KN-260	Knob-walnut knob
KN-261	Knob-walnut knob with dot
LC-315	Line Cord-540 ohms resistance line cord
LP-178	Loop-Antenna
PO-395	Pointer-dial pointer
PT-383	Control-volume control 2 megohms with D.P.S.T. switch
RCM20A100M	Condenser-10 mmfd ±20% mica condenser
RCM20A470M	Condenser-47 mmfd ±20% mica condenser
RCP10W2104A	Condenser-.1-200WV paper tubular condenser
RCP10W2203A	Condenser-.02/200WV paper tubular condenser
RCP10W4503A	Condenser-.05/400WV paper tubular condenser
RCP10W6103A	Condenser-.01/600WV paper tubular condenser
RCP10W6202M	Condenser-.002/600WV paper tubular condenser
RCP10W6502A	Condenser-.005/600WV paper tubular condenser
RE-407	Resistor-2600 ohms ±5% 10 watt resistor
REB105M	Resistor-1 megohm ±20% 1/2 watt resistor
REB152M	Resistor-1500 ohms ±20% 1/2 watt resistor
REB224M	Resistor-220,000 ohms ±20% 1/2 watt resistor
REB225M	Resistor-2.2 megohms ±20% 1/2 watt resistor
REB270K	Resistor-27 ohms ±10% 1/2 watt resistor
REB335M	Resistor-3.3 megohms ±20% 1/2 watt resistor
REB471M	Resistor-470 ohms ±20% 1/2 watt resistor
REB474M	Resistor-470,000 ohms ±20% 1/2 watt resistor
REB683K	Resistor-68,000 ohms ±10% 1/2 watt resistor
REB685M	Resistor-6.8 megohms ±20% 1/2 watt resistor
REC332K	Resistor-3 300 ohms ±10% 1 watt resistor
RED101M	Resistor-100 ohms ±20% 2 watt resistor
SD-607	Shield-Tube Shield
SK-156	Speaker-5" P.M. Speaker with output transformer
SO-572	Socket-pilot light socket assembly
SP-191	Spring-Drive shaft retaining spring
SW-185	Switch-battery-electric D.P.D.T. slide switch
TR-186	Transformer-I.F. 455 K.C. Transformer

MODELS 6-617, 6-617U

OLYMPIC RADIO & TELEV. INC.





REAR VIEW OF RECEIVER CHASSIS WITH CABINET BACK REMOVED

Frequency Range: 530 — 1700 K.C.

Power Requirement: 105 — 125 volts a-c 60 cycles

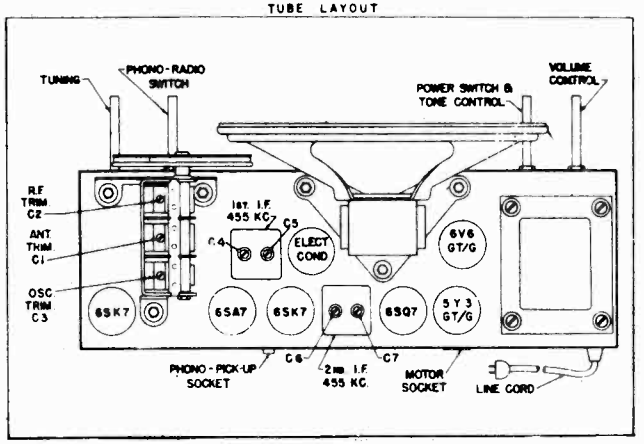
Power Consumption: Receiver 70 Watts

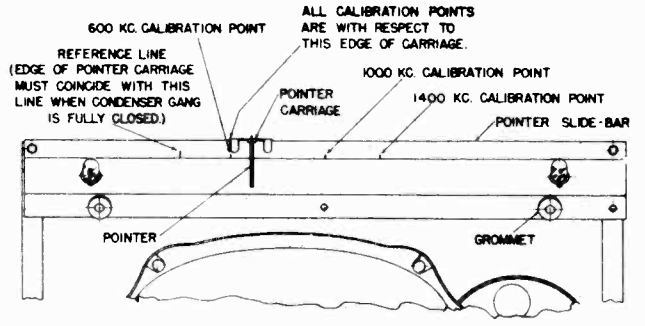
Receiver with Record-Changer 85 Watts

Record Changer: General Instruments Model 205, Seeburg K

For parts list, see P.15-8

TUBE LAYOUT





FRONT VIEW OF DIAL BACK-PLATE SHOWING CALIBRATION POINTS

SERVICE AND ALIGNMENT INSTRUCTIONS

ALIGNMENT PROCEDURE CHART

STEP	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO-	SET SIGNAL GENERATOR TO-	TURN POINTER TO-	ADJUST THE FOLLOWING FOR MAXIMUM OUTPUT. (KEEP SIGNAL FROM SIGNAL GENERATOR AS LOW AS POSSIBLE.)
1	R.F. SECTION OF THE VARIABLE COND. IN SERIES WITH A .1/400 MFD. COND.	455 KC.	EXTREME RIGHTHAND POSITION. (CONDENSER PLATES FULLY OPEN.)	C7, C6, C5, C4 AND REPEAT IN SAME ORDER (1st. AND 2nd. I.F. TRANSFORMERS.)
2	ANTENNA TERMINAL OF ANTENNA LOOP IN SERIES WITH 50 MMFD. COND.	1400 KC.	1400 KC. CALIBRATION POINT	C3, C2, C1.
3		600 KC.	RESONANCE	CHECK THAT POINTER EDGE AT RESONANCE COINCIDES WITH 600 KC. CALIBRATION POINT. IF DEVIATION IS TOO LARGE REPEAT STEP 2.

To service this receiver it is first necessary to remove the motorboard with the record changer and then remove the chassis through the top opening of the cabinet. To lift the entire motorboard with the changer, unfasten the six screws holding the motorboard in place, disconnect motor and pick-up plugs from chassis, and lift up. It is unnecessary to remove the screws holding the metal-shield in front. CAUTION: WHEN REMOVING THE CHANGER BE SURE TO PLACE IT IN A POSITION WHEREBY THE CHANGER MECHANISM WILL NOT BE DAMAGED.

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

With the receiver removed from the cabinet, connect output meter across voice coil. Connect ground side of the signal generator to chassis; turn volume control fully on, and keeping the output of the signal generator as low as possible, proceed in the sequence as shown on the alignment chart.

To facilitate alignment of the receiver when removed from cabinet, calibration points are provided on the pointer slide bar (see drawing).

Before aligning, close the variable condenser fully counterclockwise (plates fully closed) and check that pointer carriage coincides with the "reference line" on the pointer slide bar.