SPECIFICATIONS

MODELS 69, Ch. 100.20
1066, Ch. 100.202

FREQUENCY RANGES:
AM—540 to 1700 Kc.
FM— 88 to 108 Mc.

TUNING CAPACITOR:
6 section gang (3-AM and 3-FM); entire R.F. tuning assembly is rubber mounted.

I.F. FREQUENCY:
AM—455 Kc.
FM—10.7 Mc.

POWER SUPPLY:
117 volts A.C.
Radio — 85 watts
Phono—115 watts

POWER OUTPUT:
Undistorted—2.8 watts
Maximum —5.4 watts

SPEAKER:
12 inch P.M. Dynamic
Voice coil impedance—3.2 ohms

ANTENNAS:
AM—Low impedance loop
FM—Single ended half wave dipole

WEIGHT:
Packed—117 lbs.

DIMENSIONS:
Length—35 1/2"
Height—34"
Depth —17 3/4"

1066, utilizes Radio Chassis 100.202. The chassis is the same as Radio Chassis 100. 201. The only difference consists of a change in cabinet styling.

BROADCAST BAND—"AM"—ALIGNMENT PROCEDURE

1. Disconnect leads from FM-AM antenna terminal strip (labeled FM—FM—AM—AM) at back of chassis; also disconnect speaker leads and phono plugs. Remove chassis and speaker from cabinet. If desired, allow speaker to remain in cabinet and connect to receiver by extension leads.
2. Loop antenna leads (on cabinet) do not have to be connected to terminal strip on chassis while I.F. stages are being aligned. Before starting alignment of Ant., R.F., and Osc. stages, reconnect AM loop antenna leads to AM antenna terminal strip—do not attempt to use extension leads; place chassis as close as required to cabinet so that connections may be made direct to antenna terminal strip at back.
3. With the gang condenser fully meshed, dial pointer should be in the position indicated by the last division below 55 on the dial. If it is set incorrectly, hold tuning shaft steady and reposition pointer.
4. *Connect an output meter across speaker voice coil, or from plate* of 6V6GT tube to chassis through a 0.1 Mfd. condenser.
5. Connect ground lead of signal generator to the receiver chassis.
6. Set volume control to maximum volume position and use a weak signal from the signal generator.
7. Set band switch to the "AM" (middle) position.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
.1 MFD. Condenser	Lug on trimmer No. 6 at top of gang (see figure below for location of trimmer).	455 KC	Any point where it does not affect the signal.	1-2	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
260 MMFD. Mica Condenser	External Antenna Clip	1500 KC	1500 KC	5	Broadcast Oscillator	Adjust for maximum output.
260 MMFD. Mica Condenser	External Antenna Clip	1500 KC	Tune to 1500 Kc. generator signal.	6	Broadcast R.F.	Adjust for maximum output.
				7	Broadcast *Antenna*	Adjust for maximum output.
260 MMFD. Mica Condenser	External Antenna Clip	600 KC	Tune to 600 Kc. generator signal.	8	Adjustable core of Broadcast R.F. Coil.	Adjust for maximum output.
				9	Adjustable core of Broadcast Antenna Coil.	Adjust for maximum output.

Repeat adjustment of trimmers 6 & 7 and slugs 8 & 9 until one no longer detunes the other.

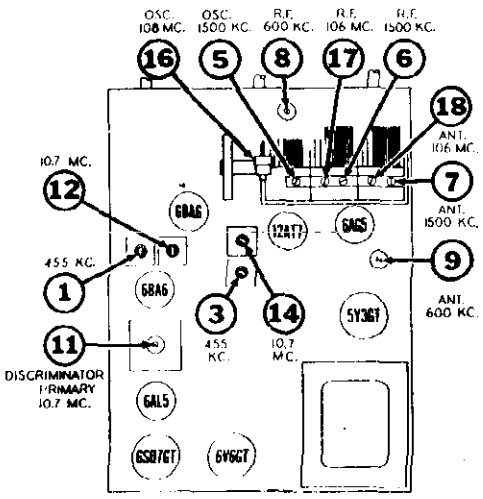


FIG. 1
Top View of Chassis

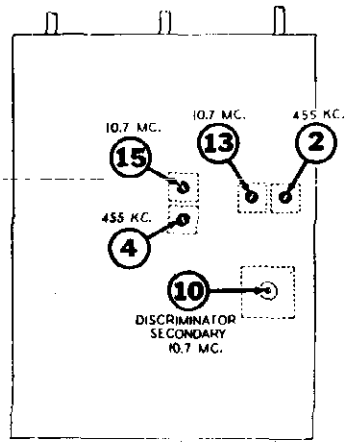
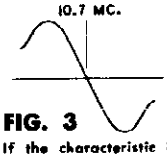


FIG. 2
Bottom View of Chassis

MODELS 69, Ch. 100.201;
1066, Ch. 100.202

FREQUENCY MODULATION—"FM"—ALIGNMENT PROCEDURE

1. If alignment of both AM and FM channels is required it is necessary to align the AM channel first, then align the FM channel as instructed in chart below (AM alignment procedure is given on the preceding page).
2. Disconnect all leads from antenna terminal strip (labeled FM—FM—AM—AM) at back of chassis; also disconnect speaker leads and phono plugs. Remove chassis and speaker from cabinet. If desired, allow speaker to remain in cabinet and connect to receiver by extension leads.
3. With the gang condenser fully meshed, dial pointer should be in the position indicated by the last division below 88 on the dial. If it is set incorrectly, hold tuning shaft steady and reposition pointer.
4. Set volume control at maximum volume position and use a weak signal from the signal generator.
5. Dress FM circuit leads as short and straight as possible, particularly those in the oscillator circuit. I.F. plate and grid leads should also be kept short and straight.
6. Set band switch to the FM (extreme counter-clockwise) position.

STANDARD SIGNAL GENERATOR		SWEEP GENERATOR		VTVM OR OUTPUT METER CONNECTIONS	OSCILLOSCOPE CONNECTIONS	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TYPE OF ADJUSTMENT AND OUTPUT INDICATION
CONNECTIONS	FREQUENCY	CONNECTIONS	FREQ.					
Connect high side to lug on trimmer #17 (see Fig. 1 for location of trimmer) using a .01 Mfd. condenser in series with generator lead. Connect ground lead to the receiver chassis in vicinity of gang condenser.	**10.7 MC.** Unmodulated	Not used.	———	Connect VTVM as shown in Fig. 4.	Not used.	Any position where it does not affect the signal.	**#10** Discriminator secondary **#11** Discriminator primary **#12-13** 2nd IF **#14-15** 1st IF	Adjust these trimmers for maximum meter reading — the output voltage will be of negative polarity.
Same as above.	Same as above.	Not used.	———	Connect VTVM as shown in Fig. 5.	Not used.	Same as above.	**#10** Discriminator secondary	Note that as slug #10 is rotated, a point will be found where the voltmeter will swing rather sharply from a positive to a negative reading or vice versa. The correct setting is obtained when the meter reads zero as the slug is moved thru this point.
Same as above.	Same as above. ——— Attenuate signal to prevent overload and distortion of response curve.	Connect high side to lug on trimmer #17 (see Fig. 1 for location of trimmer) using a .01 Mfd. condenser in series with generator lead. Connect ground lead to the receiver chassis in vicinity of gang condenser.	**10.7 MC** Sweeping ±300 Kc.	Not used.	Connect as shown in Fig. 5. ——— Set vertical amplifier of 'scope for maximum amplification. ——— Synchronize oscilloscope with sweep generator by connecting "horizontal input" terminals of 'scope to source of horizontal sweep modulating voltage on the sweep generator.	Same as above.	**#10** Discriminator secondary	A pattern similar to that shown in Fig. 3 should appear on the oscilloscope screen. Check for symmetry about the 10.7 Mc. center point and linearity of the slope.  10.7 MC. **FIG. 3** If the characteristic is not shaped properly, attempt to obtain symmetry by changing the setting of slug #10. Should that fail to produce the desired results, then a slight readjustment of slugs #11, 12, 13, 14 and 15 should be undertaken.

FREQUENCY MODULATION—"FM"—ALIGNMENT PROCEDURE (Continued)

STANDARD SIGNAL GENERATOR		SWEEP GENERATOR		VTVM OR OUTPUT METER CONNECTIONS	OSCILLOSCOPE CONNECTIONS	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TYPE OF ADJUSTMENT AND OUTPUT INDICATION
CONNECTIONS	FREQUENCY	CONNECTIONS	FREQ.					
Connect generator "high" side in series with a 270 ohm carbon resistor to end terminal marked "FM" on strip at back of chassis. Generator ground lead must connect to next terminal marked "GND."	**108 MC.** with 400 cycle AM Modulation.	Not used.	———	Connect VTVM as shown in Fig. 5.	Not used.	**108 MC.**	**#16** FM Oscillator	Set trimmer #16 to receive 108 Mc. signal as indicated by maximum meter reading.
Same as above.	**106 MC.** with 400 cycle AM Modulation.	Not used.	———	Same as above.	Not used.	Tune to 106 Mc. generator signal.	**#13** FM RF **#18** FM ANT.	Adjust trimmer for maximum meter reading.

Check calibration and tracking of receiver with input signals of 88, 98 and 106 MC. If difference between dial pointer setting and these frequencies does not exceed ±0.3 MC. and R.F. circuit is tracking properly, then alignment may be considered satisfactory and no further adjustment is necessary. Where the calibration error is greater than ±0.3 MC., it is advisable to make the following adjustments:

Tune receiver to an 88 MC. signal and note whether dial pointer is above or below correct calibration point. Then tune receiver so that dial pointer *is at the 88 MC. position. If generator signal was previously received at a* setting above 88 MC., it will be necessary to slightly spread the windings of the FM oscillator coil so that signal will now be received at the correct dial setting. On the other hand, if generator signal was received at a dial setting below 88 MC., then slightly compress the windings of the oscillator coil until the signal comes in at the correct calibration point.

Check calibration at 108 MC. and if it is in error by more than ±0.3 MC., readjust setting of trimmer #16. Then repeat adjustments of trimmers #17 and 18 at 106 MC. Repeat calibration adjustment at 88, 106 and 108 MC. until desired accuracy is obtained.

Observe dial calibration at 106 MC. If it is found to be incorrect by an *appreciable amount, then make a very slight adjustment in the spacing* of the gang condenser plates to receive the 106 MC. signal at the correct dial setting. Then check adjustment of R.F. trimmer #17 and ANT. trimmer #18 to obtain maximum output indication at 106 MC.

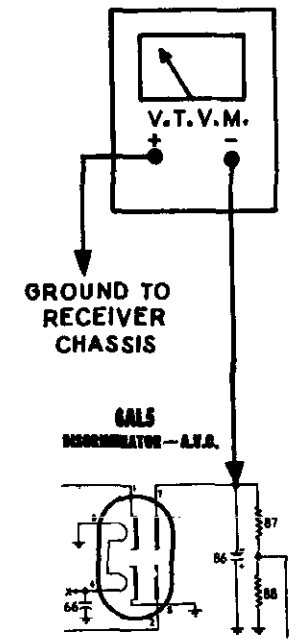


FIG. 4
VTVM Connections for I.F. Alignment

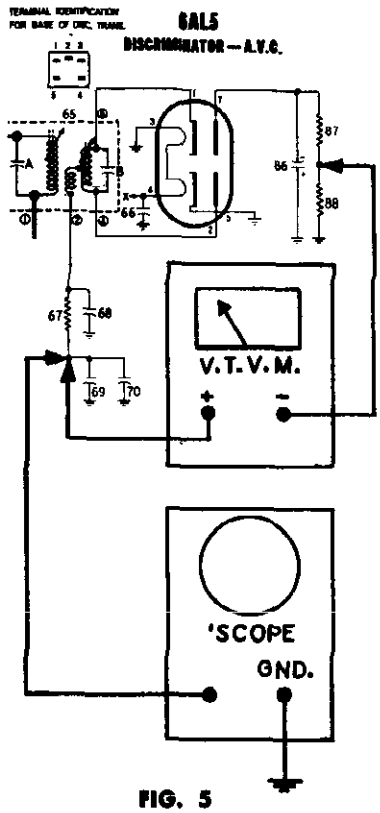


FIG. 5
VTVM and Oscilloscope Connections for Discriminator Alignment

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1066, Ch. 100.202

SOCKET VOLTAGES

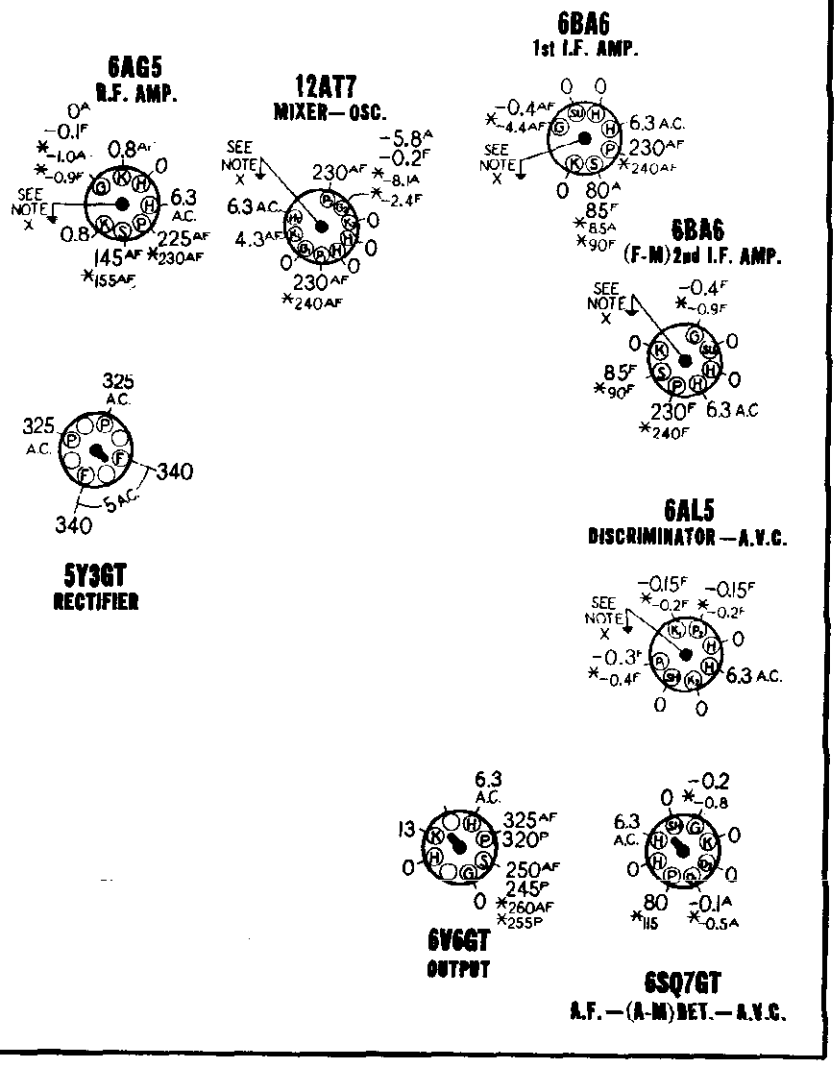
THE VOLTAGE SHOWN IN THIS CHART WERE MEASURED UNDER THE FOLLOWING CONDITIONS

1. Power Supply—117 volts 60 cycles A.C.
2. All voltages are measured between socket terminals and chassis unless otherwise indicated on the chart.
3. All measurements made with a voltmeter having a sensitivity of 1000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
4. Where a particular voltage is dependent upon band switch position, the value shown on the chart carries a letter suffix which is interpreted as follows (no suffix letter indicates that voltage is the same for any of the three switch positions).
   "A" indicates band switch set to "AM" (center) position.
   "F" indicates band switch set to "FM" (counter-clockwise) position.
   "P" indicates band switch set to "PHO" (clockwise) position.
5. When measuring FM voltages, receiver should be tuned to 88 Mc.
6. When measuring AM voltages, receiver should be tuned to 540 Kc.
7. All terminals on strip labeled "FM—FM—AM—AM" at rear of chassis are shorted together by using a jumper wire.
8. Volume control set to maximum position with no signal.
9. Tone control set to maximum clockwise position.

BOTTOM VIEW OF CHASSIS

117 VOLT 60 CYCLE A. C.
POWER SUPPLY USED
FOR THESE MEASUREMENTS.

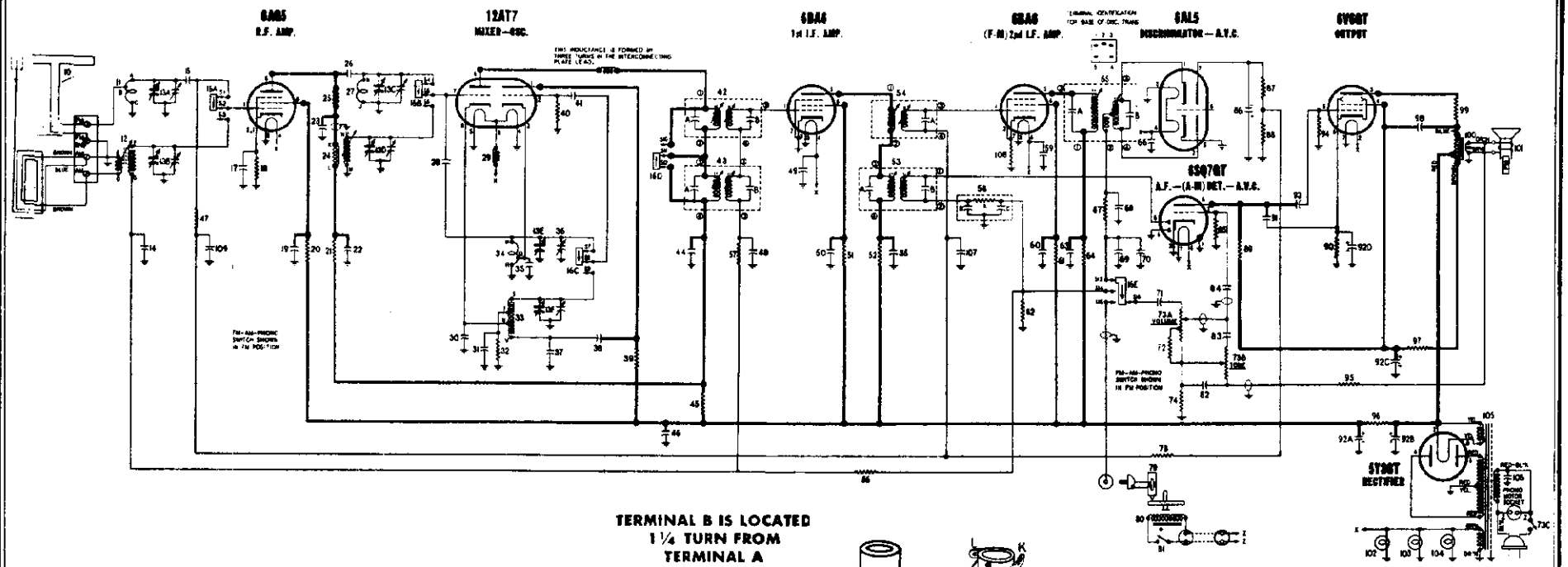
ALL VOLTAGES MEASURED BETWEEN
SOCKET TERMINALS AND CHASSIS
UNLESS OTHERWISE INDICATED.



REAR OF CHASSIS

NOTE X: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

WIRING DIAGRAM FOR SILVERTONE CHASSIS 100.201

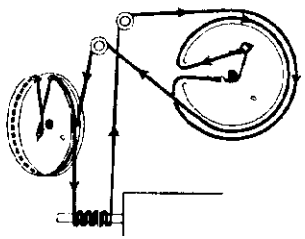


DIAL AND POINTER DRIVE CORD ARRANGEMENT

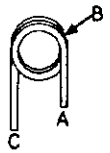
SIDE VIEW

To string dial cord, set gang condenser to fully open position and use the following parts:

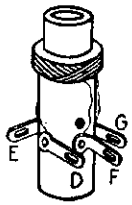
W114955 Clip on end of cord
W117057 Cord (3 feet)
W119087 Ring for dial cord
W505161 Tension spring



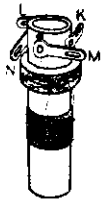
TERMINAL B IS LOCATED 1 ¼ TURN FROM TERMINAL A



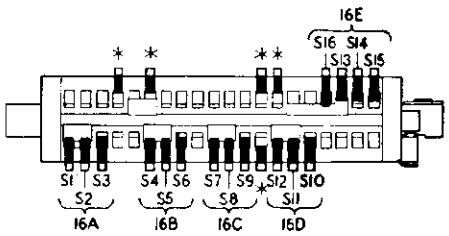
FM ANT. COIL W506353



AM ANT. COIL W506354



AM R.F. COIL W506345

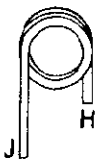


★ Not used; may serve as wiring junction point.

BAND SWITCH W506347

TERMINAL Q IS LOCATED ⅜ TURN FROM TERMINAL R

FM OSC. COIL



FM R.F. COIL

AM OSC. COIL

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

MODELS 69, Ch. 100.20
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MODELS 69, Ch. 100.201 1066, Ch. 100.202 HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
   (a) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
   (b) The CHASSIS NUMBER, which is 100.201, will be found on a metal plate at the rear of the chassis.
3. In all correspondence relating to cabinets, always mention the source code letter stamped into the upper rear rail of consoles or the bottom of table models, and the CATALOG NUMBER shown on the sticker on the back, bottom or inside of cabinet.

PARTS LIST FOR CHASSIS

Notice: Some parts listed below have special characteristics. Do not use substitutes for replacement purposes.

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
13-A to F	W506348	Condenser—variable gang (with drum)	$ 9.50
14	W512027	Condenser—.05 Mfd. 200 volt	.40
15	W513406	Condenser—ceramic 22 Mmfd. 500 volt (Temperature compensating)	.30
17	W513002	Condenser—ceramic 47 Mmfd. 500 volt	.24
19	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
22	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
23	W513002	Condenser—ceramic 47 Mmfd. 500 volt	.24
26	W513401	Condenser—ceramic 5 Mmfd. ± 10% 500 volt (Temperature compensating)	.50
28	W513000	Condenser—ceramic 1.0 Mmfd. 500 volt	.15
30	W513007	Condenser—ceramic 330 Mmfd. 500 volt	.25
31	W512009	Condenser—.01 Mfd. 200 volt	.25
35	W513429	Condenser—ceramic 10 Mmfd. ± 10% 500 volt (Temperature compensating)	.30
36	W506336	Condenser—trimmer; 3 to 30 Mmfd.	.75
37	W513442	Condenser—ceramic 10 Mmfd. ± 10% 500 volt (Temperature compensating)	.40
38	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
41	W513409	Condenser—ceramic 39 Mmfd. ± 5% 500 volt (Temperature compensating)	.30
42-A	W506080	Condenser—ceramic 33 Mmfd. (part of 1st FM I.F. transformer)	2.05
42-B	W506080	Condenser—ceramic 72 Mmfd. (part of 1st FM I.F. transformer)	2.05
43-A, B	W506333	Condenser—ceramic 330 Mmfd. (part of 1st AM I.F. transformer)	2.15
44	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
46	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
48, 49, 50	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
53-A	W505797	Condenser—ceramic 107 Mmfd. (part of 2nd AM I.F. transformer)	2.15
53-B	W505797	Condenser—ceramic 86 Mmfd. (part of 2nd AM I.F. transformer)	2.15
54-A	W505905	Condenser—ceramic 83 Mmfd. (part of 2nd FM I.F. transformer)	2.05
55	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
58-B, C	W506338	Condenser—ceramic 100 Mmfd. (part of diode filter unit)	.45
59, 60	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
63	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
65-A	W506332	Condenser—ceramic 8 Mmfd. (part of discriminator transformer)	4.20
65-B	W506332	Condenser—ceramic 47 Mmfd. (part of discriminator transformer)	4.20
66	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
68	W513007	Condenser—ceramic 330 Mmfd. 500 volt	.25
69	W512005	Condenser—.003 Mfd. 600 volt	.25
70	W513003	Condenser—ceramic 100 Mmfd. 500 volt	.24
71	W512027	Condenser—.05 Mfd. 200 volt	.40
82	W512033	Condenser—.1 Mfd. 200 volt	.30
83	W512001	Condenser—.001 Mfd. 600 volt	.22
84	W512009	Condenser—.01 Mfd. 200 volt	.25
86	W504937	Condenser—electrolytic 5 Mfd. 50 volt	.80
91	W513008	Condenser—ceramic 470 Mmfd. 350 volt	.30
92-A,B,C,D	W505908	Condenser—electrolytic A—30 Mfd. 450 volt B—40 Mfd. 450 volt C—10 Mfd. 450 volt D—20 Mfd. 25 volt	3.75
		RESISTORS—Continued	
93	W512009	Condenser—.01 Mfd. 200 volt	.25
98	W512001	Condenser—.001 Mfd. 600 volt	.22
106	W512256	Condenser—.01 Mfd. 600 volt	.30
107	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
109	W513013	Condenser—ceramic 5000 Mmfd. 450 volt	.36
		RESISTORS	
18	W510117	Resistor—carbon 82 Ohms ± 10% ½ watt	.12
20	W510164	Resistor—carbon 33,000 Ohms ½ watt	.12
21	W510237	Resistor—carbon 1000 Ohms 1 watt	.16
32	W510141	Resistor—carbon 1800 Ohms ± 10% ½ watt	$ .12
39	W510249	Resistor—carbon 4700 Ohms 1 watt	.16
40	W510155	Resistor—carbon 10,000 Ohms ½ watt	.12
45	W510237	Resistor—carbon 1000 Ohms 1 watt	.16
47	W510167	Resistor—carbon 47,000 Ohms ½ watt	.12
51	W510165	Resistor—carbon 39,000 Ohms ± 10% ½ w.	.12
52	W510237	Resistor—carbon 1000 Ohms 1 watt	.16
56	W510193	Resistor—carbon 2.2 Meg. ½ watt	.12
57	W510173	Resistor—carbon 100,000 Ohms ½ watt	.12
58-A	W506338	Resistor—carbon 47,000 Ohms (part of diode filter unit)	.45
61	W510165	Resistor—carbon 39,000 Ohms ± 10% ½ w.	.12
62	W510185	Resistor—carbon 470,000 Ohms ½ watt	.12
64	W510237	Resistor—carbon 1000 Ohms 1 watt	.16
67	W510159	Resistor—carbon 18,000 Ohms ± 10% ½ w.	.12
72	W510170	Resistor—carbon 68,000 Ohms ½ watt	.12
73-A,B,C	W508483	Volume and tone control A—2 Meg. B—2 Meg. C—"ON-OFF" switch	2.50
74	W510128	Resistor—carbon 330 Ohms ½ watt	.12
78	W510193	Resistor—carbon 2.2 Meg. ½ watt	.12
85	W510195	Resistor—carbon 4.7 Meg. ½ watt	.12
87, 88	W510153	Resistor—carbon 8200 Ohms ± 10% ½ watt	.12
89	W510179	Resistor—carbon 220,000 Ohms ½ watt	.12
90	W510128	Resistor—carbon 330 Ohms ½ watt	.12
94	W510185	Resistor—carbon 470,000 Ohms ½ watt	.12
95	W510148	Resistor—carbon 4700 Ohms ± 10% ½ watt	.12
96	W510732	Resistor—wire wound 2000 Ohms ± 10% 10 watts	.95
97	W510261	Resistor—carbon 22,000 Ohms 1 watt	.16
99	W510113	Resistor—carbon 47 Ohms ½ watt	.12
108	W510115	Resistor—carbon 68 Ohms ± 10% ½ watt	.12
		TRANSFORMERS AND COILS	
10	W508395	Antenna—built-in (FM)	.50
11	W506353	Coil—FM Antenna	.15
12	W506354	Coil—AM Antenna	2.20
	W506349	Slug core for AM antenna coil	.18
24	W506345	Coil—AM R.F.	2.25
	W506344	Slug core for AM R.F. coil	.18
25	W507935	Coil—choke	.40
27	W506351	Coil—FM* R.F.	.15
29	W507586	Coil—choke	.28
33	W506335	Coil—AM Oscillator	1.30
34	W506352	Coil—FM Oscillator	.15

*—This part is not supplied as a Service replacement item.

MODELS 69, Ch. 100.20
1066, Ch. 100.202

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	LIST PRICE
		OTHER ELECTRICAL PARTS—Continued	
42	W506080	Transformer—1st FM I.F.	2.05
43	W506333	Transformer—1st AM I.F.	2.15
53	W505797	Transformer—2nd AM I.F.	2.15
54	W505905	Transformer—2nd FM I.F.	2.05
65	W506332	Transformer—discriminator	4.20
	W508841	Slug core for primary or secondary of discriminator transformer	.20
100	W508486	Transformer—output	2.60
105	W506709	Transformer—power	11.00
		OTHER ELECTRICAL PARTS	
16-A to E	W506347	Switch—FM-AM-Phono	2.40
58-A,B,C	W506338	Diode filter unit A—Resistor-carbon 47,000 Ohms 1/5 watt B—Condenser-ceramic 100 Mmfd. 400 volt C—Condenser-ceramic 100 Mmfd. 400 volt	.45
79	W509160	Cartridge	8.60
80	W509301	Motor—115 volt 60 cycle	12.40
81	W509205	Switch—"ON-OFF" for record changer	.65
101	W505512	Speaker—P.M. Dynamic (12 inch)	15.75
102, 103, 104	W118921	Lamp—dial (Mazda 47) 6-8 volt 150 Ma.	$ .15
		CABINET PARTS	
	W508217	Bracket for mounting OFF-ON indicator lite at base of cabinet	.10
	W508487	Bracket—retains dial plate	.10
	W506757	Bracket—slide; retains radio compartment	.50
	W508991	Bracket—tie for record changer pull-out mechanism	.12
	W117131	Bull's-eye for OFF-ON indicator lite at base of cabinet	.50
	W508880	Cabinet	165.00
	W508499	Catch for record storage compartment	.65
	W508996	Door and radio tilt compartment assembly (less hardware)	26.50
	W508995	Door for record changer compartment (less hardware)	16.60
	W508997	Door for record storage compartment (less hardware)	17.00
	W508493	Escutcheon—dial	2.80
	W506380	Fastener for loop antenna	.02
	W508497	Handle for radio or record changer door	1.80
	W508998	Handle for record storage compartment door	1.80
	W506640	Hinge—for record storage compartment; per pair	.65
	W509046	Knob—"PHO. AM FM"	.40
	W509044	Knob—"TONE"	.30
	W509045	Knob—"TUNE"	.40
	W509043	Knob—"VOLUME-ON"	.25
	W170188	Nut—Wing #10-24; for tension adjustment of radio compartment tilt mechanism	.10
	W507809	Nut—wing #10-32; for tension adjustment on record changer pull-out mechanism	.15
	W508397	Pivot bolt for radio tilt compartment	.10
	W508981	Pull-out mechanism for record changer compartment (left side)	6.50
	W508982	Pull-out mechanism for record changer compartment (right side)	6.50

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	LIST PRICE
		CABINET PARTS—Continued	
	W509052	Record changer base assembly	16.50
	W508990	Rod—tie; for record changer pull-out mechanism	1.00
	W160496	Rubber pad between dial plate and retaining bracket	.08
	W160496	Rubber pad for mounting chassis	.08
	W118621	Rubber pad for record changer pull-out mechanism	.06
	W170167	Screw—#8-32x7/8"; for mounting chassis	.02
	W508480	Socket for indicator lamp at base of cabinet (with leads)	$ .55
	W506760	Spring—compression for record changer pull-out mechanism and radio compartment tilt mechanism	.05
	W506761	Spring—tension for radio compartment tilt mechanism	.35
	W507821	Spring—tension for record changer pull-out mechanism	.30
	W509028	Trim strip for record changer base	.65
		MISCELLANEOUS PARTS	
	W508986	Background for dial (foil)	.50
	W301270	Base for mounting electrolytic condenser	.06
	W505165	"C" washer for tuning shaft or pointer shaft	.02
	W508488	Clamp—retains dial scale	.10
	W506343	Clip for mounting AM antenna or R.F. coil	.08
	W505101	Clip for mounting I.F. transformer	.05
	W160326	Clip—retains dial background	.02
	W114955	Clip—retainer on end of dial cord	.01
	W117057	Cord—dial drive (3 ft. required) per ft.	.05
	W508985	Dial scale—glass	2.20
	W501031	Plug for phono, motor cable	.15
	W500966	Plug for phono, pick-up cable	.10
	W506370	Pointer	.15
	W119087	Ring for dial cord	.01
	W 38501	Rubber bushing for band switch	.03
	W116584	Rubber spacer for mounting dial scale	.04
	W503588	Shaft and drum for dial	.20
	W162148	Shaft and link assembly; Band switch	.65
	W508485	Shaft—tuning	.25
	W506349	Slug core for AM antenna coil	.18
	W506344	Slug core for AM R.F. coil	.18
	W508841	Slug core for primary or secondary of discriminator transformer	.20
	W505307	Socket and phono, motor cable	.30
	W506372	Socket—dial lamp; pair (with lead)	.50
	W504597	Socket—miniature (7 pin)	.30
	W506331	Socket—miniature (9 pin)	.60
	W116690	Socket—octal base	.15
	W160392	Socket—octal (rectifier)	.16
	W160039	Socket—phono. plug	.12
	W505161	Spring—dial cord tension	.08
	W505924	Terminal strip (FM-FM-AM-AM)	.25
	W111456	Washer—spring washer for tuning shaft or pointer shaft	.01

*—This part is not supplied as a Service replacement item.

PART NO.	DESCRIPTION	SELLING PRICE
W520145	Cabinet	$150.00
W520163	Door and radio tilt compartment (less hardware)	10.00
W520162	Door for record changer compartment (less hardware)	10.00
W520164	Door for record storage compartment (less hardware)	14.00
W520165	Handle for radio or record changer door	1.50
W520166	Handle for record storage compartment door	.45

MODEL 4,
Ch. 478. 233

ELECTRICAL SPECIFICATIONS

Power Supply	105-125 Volts D.C. or 105-125 Volts, 50-60 Cycles A.C., 30 Watts
Frequency Range	532.5 to 1620 kc.
Intermediate Freq.	455 kc.
Tuning	Two gang capacitor
Speaker	4 inch PM 3.2 ohm voice coil impedance
Power Output	1 watt undistorted 1.5 watt maximum
Sensitivity	800 Microvolts at 50 milliwatts Output
Selectivity	120 kc broad at 1000 times signal at 1000 kc.

ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection ..... Across 3.2 ohm speaker voice voil

Output meter reading to indicate 0.05 watt across speaker voice coil ..... 0.4 volt

Generator Modulation ..... 30%, 400 cycles

Position of volume control ..... maximum (fully clockwise)

Position of pointer with Rotor full open (Plates out of mesh) ..... slightly beneath the 1620 kc calibration mark on the dial (pointer horizontal to right)

Position of Tuner	SIGNAL GENERATOR				Trimmer Adjustments (In order shown)
	Frequency	Coupling Factor	Connection to Receiver	Ground Connection	
Rotor Full Open (Plates out of mesh)	455 kc.	.1 mfd	Grid of 12BE6 (Pin 7)	Chassis	Input and Output Trimmers on I.F Can T3 and T4
Rotor Full Open (Plates out of mesh)	1620 kc.	.1 mfd	Grid of 12BE6 (Pin 7)	Chassis	Oscillator Trimmer T2
1400 kc.	1400 kc.	75 mmf	Antenna Hank	Chassis	Antenna Trimmer T1
600 kc.	600	75 mmf	Antenna Hank	Chassis	(Check Point)*

**With a generator frequency of 600 Kc, tune the set to the point where maximum output is obtained, which should be approximately 600 Kc on the dial.*

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

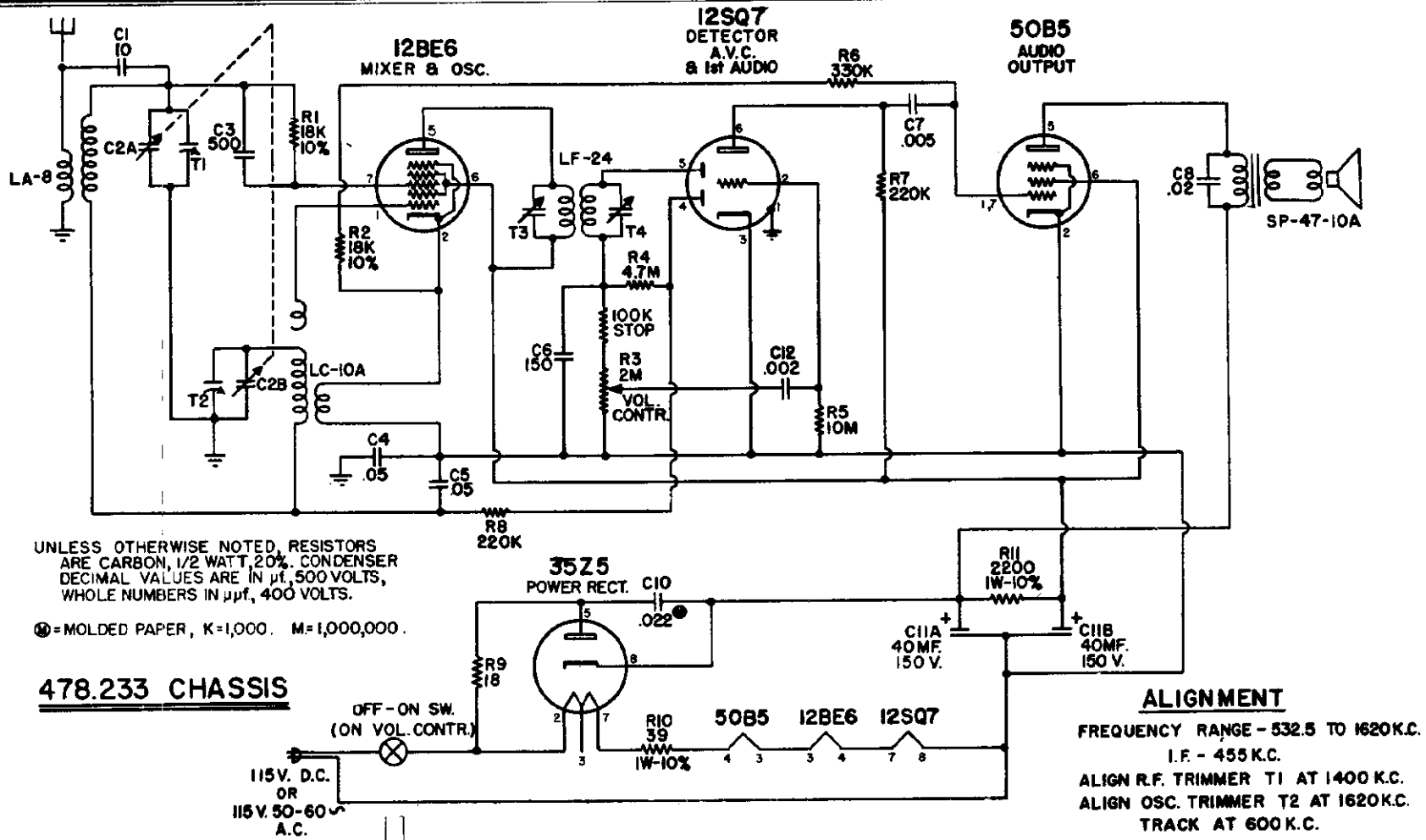
The alignment procedure should be done in the order given for greatest accuracy.

Always keep the output from the generator at its lowest possible value to prevent the AVC of the receiver from interfering with accurate alignment.

ANTENNA SYSTEM

This radio unit is equipped with a hank of antenna wire attached to the antenna coil. For normal reception, unhank the antenna wire and stretch it around the room or permit it to hang outside the window.

In areas where reception is poor due to weak signal strength, an additional external antenna can be connected to the antenna wire.



UNLESS OTHERWISE NOTED, RESISTORS ARE CARBON, 1/2 WATT, 20%. CONDENSER DECIMAL VALUES ARE IN μf., 500 VOLTS, WHOLE NUMBERS IN μμf., 400 VOLTS.

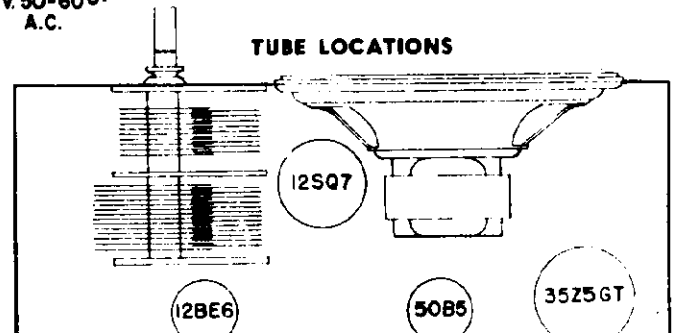
Ⓜ = MOLDED PAPER, K = 1,000. M = 1,000,000.

478.233 CHASSIS

ALIGNMENT

FREQUENCY RANGE – 532.5 TO 1620 K.C.
I.F. – 455 K.C.
ALIGN R.F. TRIMMER T1 AT 1400 K.C.
ALIGN OSC. TRIMMER T2 AT 1620 K.C.
TRACK AT 600 K.C.

TUBE LOCATIONS



TUBES

This receiver is shipped with tubes in their proper sockets. If for some reason tubes have been removed, make certain they are reinserted into their proper sockets as shown

MODEL 4. Ch.
478. 233

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
   (1) PART NUMBER (number printed on the part if different from that shown on this list) and DESCRIPTION for each part ordered. When no part is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
   (2) The CHASSIS NUMBER, is this found on a metal plate at the rear of the Chassis.

In all correspondence relating to cabinets, always mention the source code letter stamped into the upper rear rail of consoles or the bottom of table models, and the CATALOG NUMBER shown on the sticker on the back bottom or inside of cabinet.

REPAIR PARTS LIST

PART NUMBER	SCHEMATIC LOCATION	DESCRIPTION	SELLING PRICE
		RESISTORS	
RC 180-1	R 9	18 Ohms 1/2 Watt 20%	$ .14
RC 390-5	R 10	39 Ohms 1/2 Watt 10%	.31
RC 222-5	R 11	2,200 Ohms 1 Watt 10%	.31
RC 183-2	R 1,2	18,000 Ohms 1/2 Watt 10%	.14
RC 224-1	R 7,8	220,000 Ohms 1/2 Watt 20%	.14
RC 334-1	R 6	330,000 Ohms 1/2 Watt 20%	.14
RC 475-1	R 4	4.7 megohms 1/2 Watt 20%	.14
RC 106-1	R 5	10 megohms 1/2 Watt 20%	.14
VC 11	R 3	2 megohms Volume Control, 100K Stop	1.48
		CONDENSERS	
CM 100-1	C 1	10 mmf 500 Volts Mica (part of LA 8)	
CM 151-1	C 6	150 mmf 500 Volts Mica	.28
CM 501-1	C 3	500 mmf 500 Volts Mica	.22
CP 202-2	C 9	.002 mfd 400 Volts Paper	.27
CP 502-2	C 7	.005 mfd 400 Volts Paper	.27
CP 203-1	C 8	.02 mfd 400 Volts Paper	.27
CPM 203-1	C 10	.022 mfd 400 Volts Molded	.41
CP 503-1	C 4,5	.05 mfd 400 Volts Paper	.27
CE 15	C 11A,11B	2X40 mfd 150 Volts Electrolytic	1.62
CV 14	C 2A,2B	Variable Condenser	3.30
		COILS AND TRANSFORMERS	
LA 8		Antenna Coil	1.23
LC 10A		Oscillator Coil	1.05
LF 24		I. F. Transformer	2.11
CB 106-SE		Cabinet, Ebony	2.53
KN 20-2		Knob, Ivory	.11
KN 37		Large Knob, Ebony	.17
MP 9-D		Decorative Pistol	.20
MP 10-D		Cowboy and Horse	.44
BK 39		Cabinet Back	.14
HK 22		Antenna Wire Hank	.34
LD 65		Line Cord	.77
SO 17		Miniature Wafer Socket, 1 inch Mounting	.21
SO 11		Wafer Socket, 1 5/16 inch Mounting	.21
SP 47-10A		4" P. M. Speaker with Output Transformer	3.49

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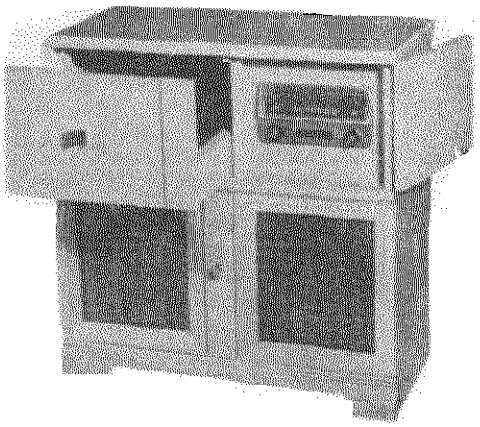
MODELS 1058, 1059, 10
1063, Ch. 101.860



CATALOGS 1058 - MAHOGANY
1059 - BLOND OAK

CATALOGS 1062 - WALNUT
1063 - MAHOGANY

GENERAL DESCRIPTION

The 101.860 chassis is an 8 tube, 2 band, A C type, AM-FM receiver.
1058 (Mahogany) and 1059 (Blonde Oak) have a 10" electromagnet speake
1062 (Walnut) and 1063 (Mahogany) have a 12" electromagnet speaker.

SPECIFICATIONS

POWER SUPPLY

All models 117 volts AC, 60 cycle unless otherwise specified. Power Consumption 105 watts.

FREQUENCY RANGE

Standard Broadcast	540-1600 KC.
Frequency Modulation (FM)	88-108 MC.

INTERMEDIATE FREQUENCIES

AM IF Carrier	455 K
FM IF Carrier	10.7 M

POWER OUTPUT

Undistorted	2.75 Wat
Maximum	4.50 Wat

ANTENNA EQUIPMENT

These models have a Silvertone built-in antenna system which will provide excellent local reception on both the AM and FM band
For locations where an outside antenna is nec
essary a special Silvertone AM-FM Antenn
Kit Catalog No. 6710 is available.

ALIGNMENT PROCEDURE

WARNING: No attempt should be made to adjust the alignment of this receiver without using t
following equipment: Signal Generator, FM Sweep Generator, Cathode Ray Oscilloscope, Outp
Meter, Insulated Screw Driver.

AM ALIGNMENT

Output meter connection	Across speaker voice c
Generator ground lead connection	Receiver chass
Generator modulation	30% 400 cycl
Position of volume control	Fully
Position of tone control	Fully counterclockwi
Position of FM-AM-PHO Switch	A

MODELS 1058, 1059, 1062,
1063, Ch. 101, 860

TUNER POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	CORE & TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	CORE OR TRIMMER FUNCTION
Open	455 KC.	0.1 Mfd.	Transl-Grid	T4-A, T4-B T2-A, T2-B	I. F.
1650 KC.	1650 KC.	50 Mmfd.	Ext. Ant.	C11	Osc.
1400 KC.	1400 KC.	50 Mmfd.	Ext. Ant.	C 5	Ant.

FM IF ALIGNMENT

Sweep generator frequency — 10.7 MC.
Sweep generator deviation — 300 KC.
Dummy antenna — 0.1 Mfd.
Sweep generator ground lead connection — Receiver chassis
Position of tuner — Open
Position of volume control — Fully on
Position of tone control — Fully counterclockwise
Position of FM-AM-PHO switch — FM

Make shielded probe shown in Figure 1 for use with Oscilloscope where indicated below.

GENERATOR CONNECTION	OSCILLOSCOPE CONNECTION	CORE ADJUSTMENTS	ADJUST FOR CURVE IN	CORE FUNCTION
FM - First IF grid	Probe - across T5 - Primary	T3-A, T3-B	Figure 2	IF
Trans-Grid	Probe - across T5 - Primary	T1-A, T1-B	Figure 2	IF
FM - Second IF grid	Across C35	T5-A, T5-B	Figure 3	Disc.

FM RF ALIGNMENT

Output meter connection — Across speaker voice coil
Sweep generator deviation — 22.5 KC.
Dummy antenna — Two 120 ohm resistors
Sweep generator connection — FM antenna board
Position of volume control — Fully on
Position of tone control — Fully counterclockwise
Position of FM-AM-PHO switch — FM

POSITION OF TUNER	GENERATOR FREQUENCY	TRIMMER & COIL ADJUSTMENT	TRIMMER OR COIL FUNCTION
Open	108.5 MC.	C10	Osc.
108MC.	108.0 MC.	C 9	Transl.
Closed	88.5 MC.	L 4	Osc.
88 MC.	88.0 MC.	L 3	Transl.

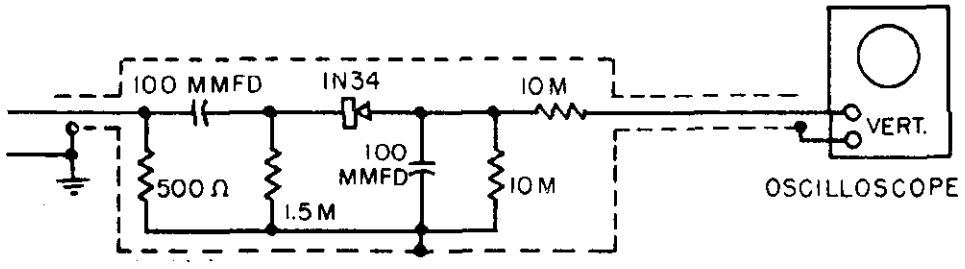


FIG. 1 - SHIELDED PROBE FOR FM I. F. ALIGNMENT

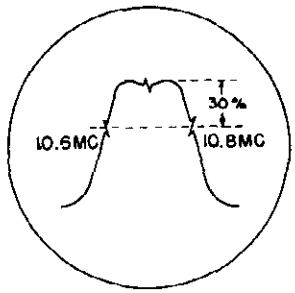


FIG. 2 - FM I. F. RESPONSE

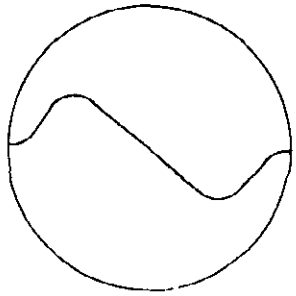


FIG. 3 - FM DISCRIMINATOR OUTPUT

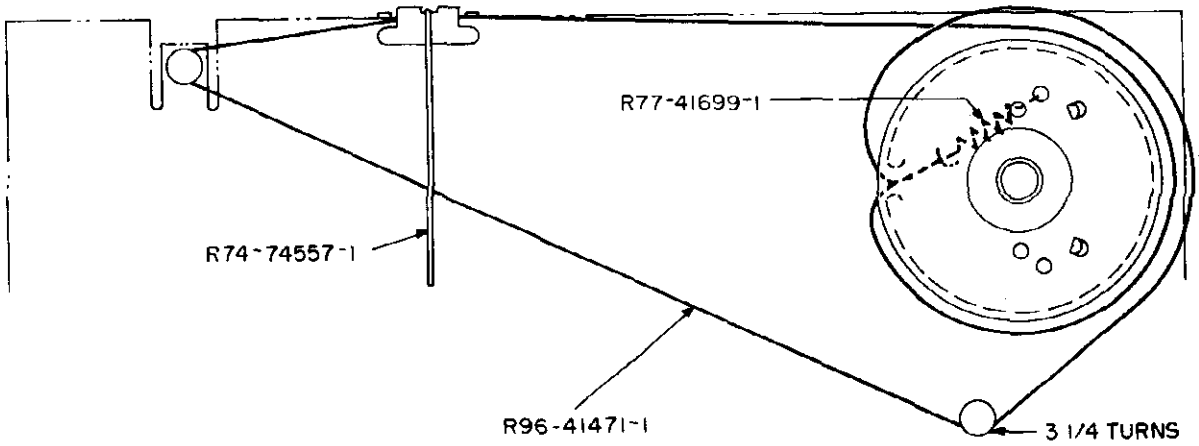


FIG. 4 - STRING AND POINTER HOOKUP

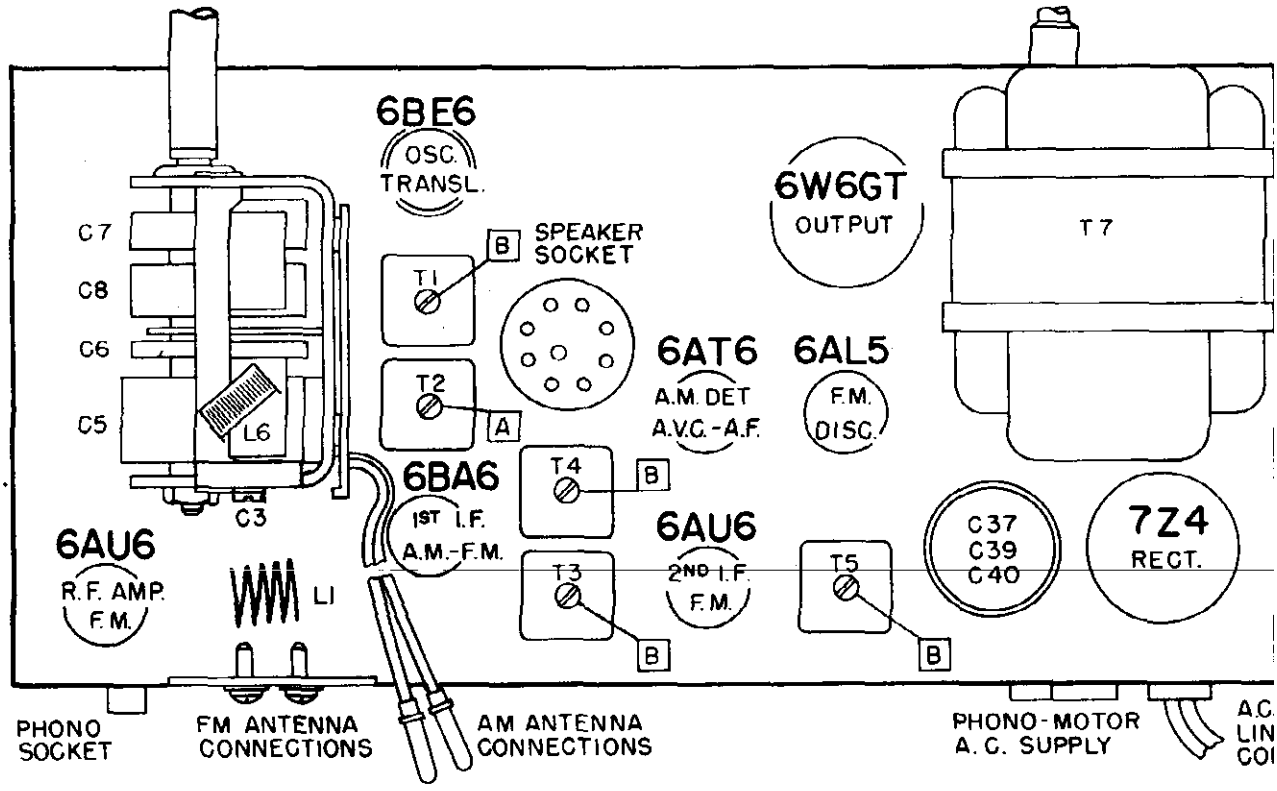
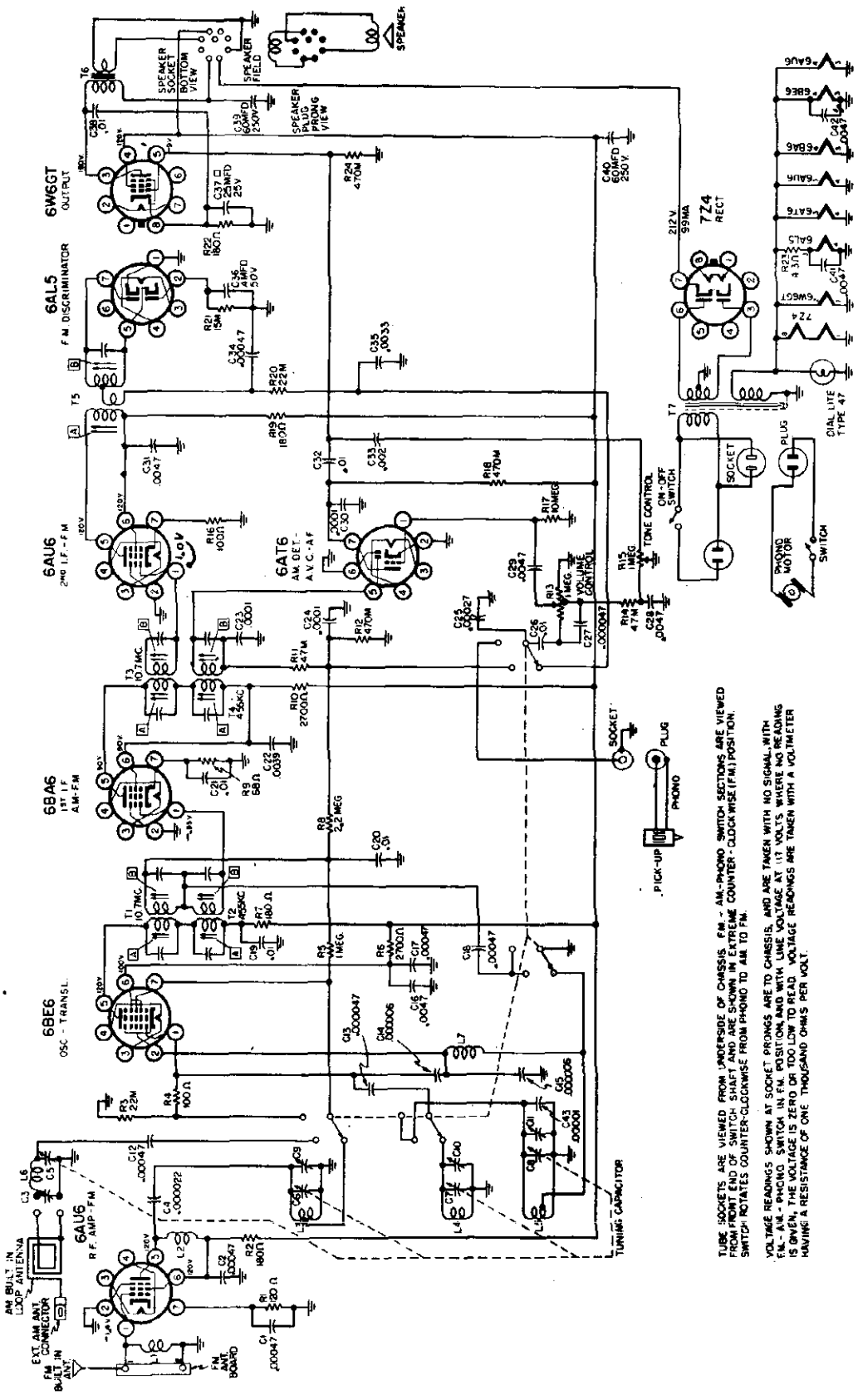


FIG. 5 - RADIO CHASSIS LAYOUT - TOP VIEW

MODELS 1058, 1059, 1062,
1063, Ch. 101.860



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS F-M - AM-PHONO SWITCH SECTIONS ARE VIEWED FROM FRONT END OF SWITCH SHAFT AND ARE SHOWN IN EXTREME COUNTER - CLOCKWISE (F-M) POSITION. SWITCH ROTATES COUNTER-CLOCKWISE FROM PHONO TO AM TO FM.

VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL. WITH F-M - AM - PHONO SWITCH IN F-M POSITION AND WITH LINE VOLTAGE AT 117 VOLTS WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT.

SCHEMATIC DIAGRAM FOR 101.860 RADIO CHASSIS

MODELS 1058, 1059, 106
1063, Ch. 101.860

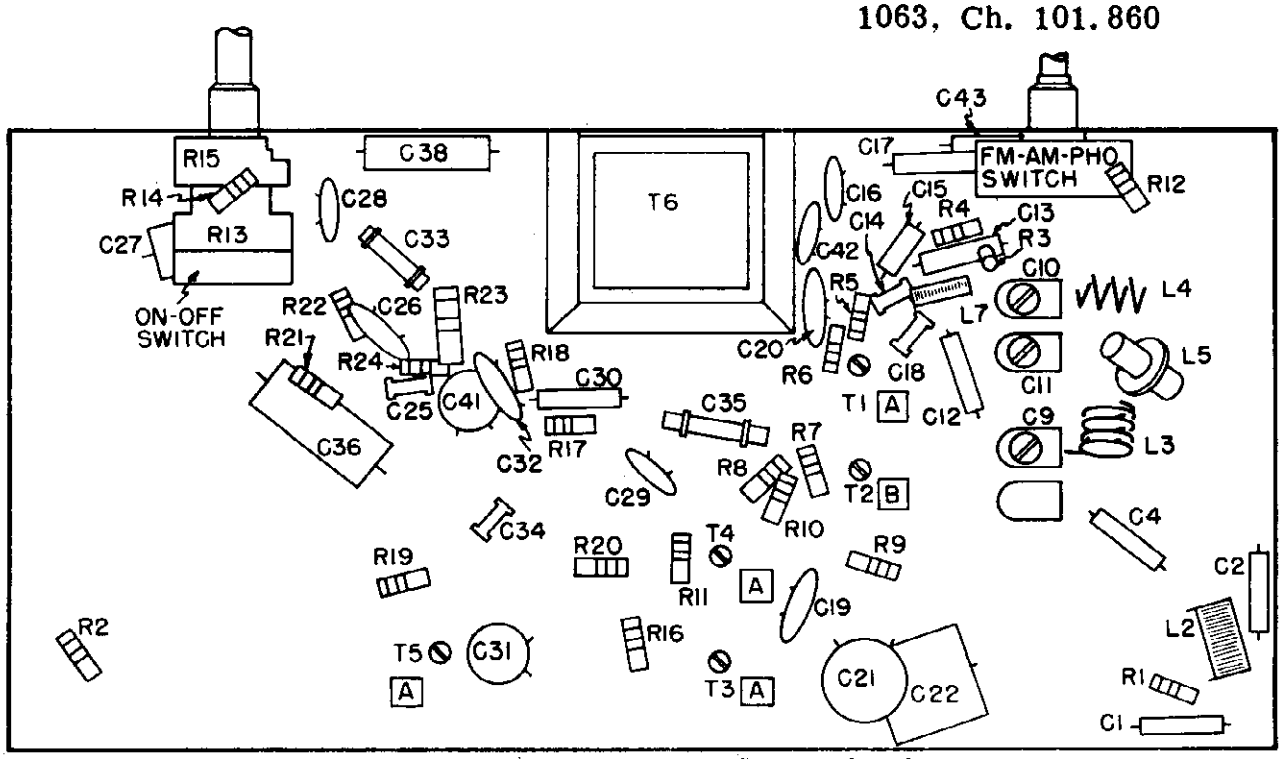


FIG. 6 - RADIO CHASSIS LAYOUT - BOTTOM VIEW

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
   (1) PART NUMBER (number printed on the part if different from that shown in this lis and DESCRIPTION for each part ordered. When no part number is assigned, order b description and rating. Also give PRICE of part (indicate if no selling).
   (2) The CHASSIS NUMBER, which is 101.860. This number is found on a metal plat at the rear of the chassis.

In all correspondence relating to cabinets, always mention the source code letter stampe into the upper rear rail of consoles or on the bottom of table models, and the Catalo Number shown on the sticker on the back, bottom or inside of the cabinet.

REPAIR PARTS LIST

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EA.
	R85-61164-1	Adapter - Record	$ .03
	R81-66167-1	Arm - Stop Assembly (1062, 1063)	.43
	R74-74742-1	Background - Dial	.46
	R73-74597-1	Board - Antenna - FM	.20
	R71-66224-1	Bushing - Line Cord	.06
	R86-74751-1	Bushing - Rubber	.06
	R71-65538-1	Button - Snap	.01
C38	R45-641032-1	Capacitor - .01 Mfd. - 400 V. - Molded Paper	.23
C14, C15	R43-74592-2	Capacitor - 6.0 Mmfd. - Ceramic	.29
C43	R43-74592-3	Capacitor - 10.0 Mmfd. - Ceramic	.29
C25	R43-602710-20	Capacitor - 270 Mmfd. - Ceramic	.20
C18, C34	R43-604710-20	Capacitor - 470 Mmfd. - Ceramic	.20
C33	R43-602020-36	Capacitor - .002 Mfd. - Ceramic	.23
C35	R43-603329-33	Capacitor - .0033 Mfd. - Ceramic	.29
C16, C28, C29, C31, C41, C42	R43-704726-62	Capacitor - .0047 Mfd. - Ceramic	.20
C19, C20, C21, C26, C32	R43-701036-63	Capacitor - .01 Mfd. - Ceramic	.23

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MODELS 1058, 1059, 1062,
1063, Ch. 101.860

REPAIR PARTS LIST (cont'd)

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EA
C4	R44-452202-20	Capacitor - 22 Mmfd. - Mica	.17
C13, C27	R44-454701-20	Capacitor - 47 Mmfd. - Mica	.17
C23, C24, C30	R44-351012-20	Capacitor - 100 Mmfd. - Mica	.17
C1, C2, C12, C17	R44-454712-20	Capacitor - 470 Mmfd. - Mica	.23
C22	R44-353921-30	Capacitor - .0039 Mfd. - Mica	.63
C36	R41-69193-1	Capacitor - Electrolytic 4 Mfd. - 50 V.	.83
	R41-74576-1	Capacitor - Electrolytic	2.85
C39		60 Mfd. - 250 V.	
C40		60 Mfd. - 250 V.	
C37		25 Mfd. - 25 V.	
C3	R42-61629-1	Capacitor - Trimmer - Loop	.26
	R42-74596-1	Capacitor - Variable - 4 Gang	3.75
	R71-67326-1	Clip - Transformer Mounting	.01
	R71-17319-1	Clip - Tuning Shaft Retaining	.02
L6	R50-74626-1	Coil - AM Antenna	.11
L5	R50-66184-1	Coil - AM Oscillator	1.05
L1	R50-74586-1	Coil - FM Antenna	.09
L4	R50-74586-1	Coil - FM Oscillator	$ .06
L7	R50-74589-1	Coil - FM Oscillator - Cathode Choke	.11
L2	R50-74626-1	Coil - FM RF - Plate Choke	.11
L3	R50-74591-1	Coil Assembly - FM RF Grid	.23
	R37-74577-1	Control - Dual	2.17
R13		Volume & On-Off	
R15		Tone	
	R19-74593-1	Cord - Line	.71
	R74-74746-1	Dial - Station - Lucite	.83
	R74-74555-1	Escutcheon	2.85
	R71-47266-1	Grommet	.03
	R74-74753-1	Knob - Function	.17
	R74-74752-1	Knob - ON-OFF & Volume	.17
	R74-67965-2	Knob - Outer	.23
	R30-20963-1	Lamp - Mazda #47	.15
	R05-72417-1	Leaflet - Instruction	.14
	R27-74729-1	Loop - Antenna - AM	2.17
	R74-74802-1	Nameplate	.20
	R73-67023-1	Plug - 2 Prong - Female	.26
	R74-74557-1	Pointer - Dial	.14
	R80-67187-1	Pulley	.03
R23	R36-67223-1	Resistor - 4.3 Ohm - 1/2 W.	.06
R9	R35-336801-1	Resistor - 68 Ohm - 1/2 W.	.15
R4, R16	R35-331011-1	Resistor - 100 Ohm - 1/2 W.	.15
R1	R35-331211-1	Resistor - 120 Ohm - 1/2 W.	.15
R2, R7, R19	R35-331811-1	Resistor - 180 Ohm - 1/2 W.	.15
R6, R10	R35-332721-1	Resistor - 2,700 Ohm - 1/2 W.	.15
R21	R35-331531-1	Resistor - 15,000 Ohm - 1/2 W.	.15
R3, R20	R35-332231-1	Resistor - 22,000 Ohm - 1/2 W.	.15
R11, R14	R35-334731-1	Resistor - 47,000 Ohm - 1/2 W.	.15
R12, R18, R24	R35-334741-1	Resistor - 470,000 Ohm - 1/2 W.	.15
R5	R35-331051-1	Resistor - 1 Megohm - 1/2 W.	.15
R8	R35-332251-1	Resistor - 2.2 Megohm - 1/2 W.	.15
R17	R35-331061-1	Resistor - 10 Megohm - 1/2 W.	.15
R22	R35-431811-1	Resistor - 180 Ohm - 1 W.	.21
	R71-66225-1	Retainer - Line Cord	.06
	R81-74553-1	Shaft - Tuning	.40
	R81-67091-1	Shield - Tube - Miniature	.09
	R73-44897-1	Socket - 1 Prong	.08

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REPAIR PARTS LIST (cont'd)

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EA.
	R73-74598-1	Socket - 8 Prong	.23
	R72-73227-1	Socket - Tube - 7 Prong - Miniature	.17
	R72-73227-2	Socket - Tube - 7 Prong - Miniature	.17
	R72-74694-1	Socket - Pilot Lamp	.31
	R72-61013-1	Socket - Tube - 8 Prong - Lock-in - Molded	.20
	R72-41542-1	Socket - Tube - 8 Prong - Octal	.13
	R12-74757-1	Speaker - 10" EM (1058, 1059)	8.77
	R73-64567-1	Plug - 8 Prong	.14
	R12-74762-1	Speaker - 12" EM (1062, 1063)	8.31
	R73-64567-1	Plug - 8 Prong	.14
	R77-41699-1	Spring - Drive String Tension	.06
	R77-66164-1	Spring - Tension - Stop Arm Actuating (1062, 1063)	.23
	R86-66173-1	Stop - Rubber (1062, 1063)	.01
	R96-41471-1	String - Drive (35")	.02
	R71-74763-1	Stud - Stop Arm Mounting (1062, 1063)	.17
	R33-74578-1	Switch - FM, AM, PHO	1.45
T2	R57-74580-1	Transformer - IF #1 - AM	1.97
T4	R57-74582-1	Transformer - IF #2 - AM	2.08
T1	R57-74579-1	Transformer - IF #1 - FM	1.57
T3	R57-74581-1	Transformer - IF #2 - FM	1.57
T5	R57-74583-1	Transformer - Discriminator - FM	1.68
T6	R56-74584-1	Transformer - Output	2.25
T7	R55-74585-1	Transformer - Power	5.00

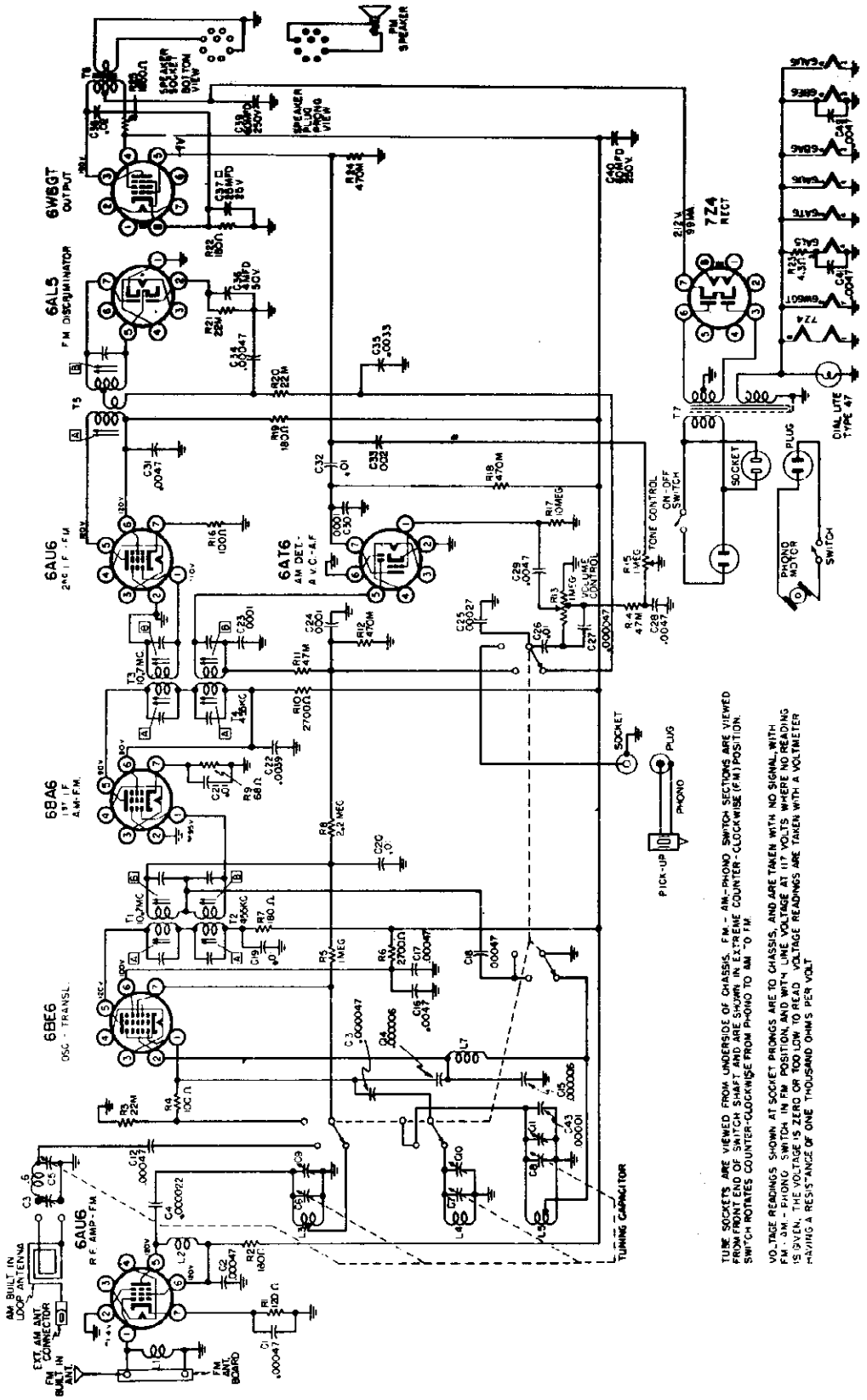
SUPPLEMENT NO. 1

Chassis 456.860-1 is the same as chassis 101.860 except that permanent magnet type speakers are used instead of electromagnetic types and the output circuit is revised accordingly.

Except for the Repair Parts listed below and the schematic diagram refer to 101.860 for all Service Information, Repair Parts, and Ordering Instructions.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SELLING PRICE EACH	MU CODE
C38	R45-642032-1	Capacitor - .02 Mfd. - 400 V.	$ .23	
R21	R35-332232-1	Resistor - 22,000 Ohm - 1/2 W.	.06	
R25	R36-62773-2	Resistor - 1,850 Ohm - 5 W.	.50	
	R12-74104-4	Speaker - 10" PM (1058, 1059)	5.50	B5
	R12-73651-4	Speaker - 12" PM (1062, 1063)	7.55	B5
T6	R56-74936-1	Transformer - Output	2.46	

MODELS 1058, 1059, 1062,
1063, Ch. 456.860-1



SCHEMATIC DIAGRAM FOR 456.860-1 RADIO CHASSIS

Chassis 101.860-1 is the same as chassis 101.860 except that permanent magnet type speakers are used instead of electromagnetic types and the output circuit is revised accordingly.

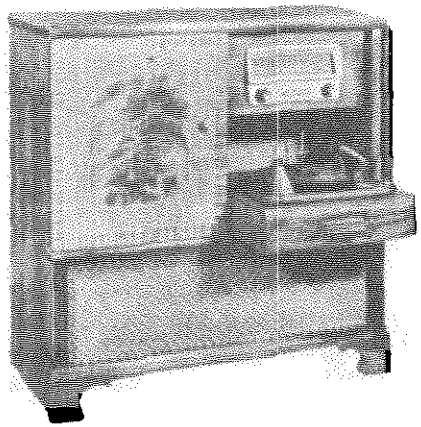
Except for the Repair Parts listed below and the schematic diagram on page below refer to Ch. 101.860 for all Service Information, Repair Parts, and Ordering Instructions.

SUPPLEMENT 2

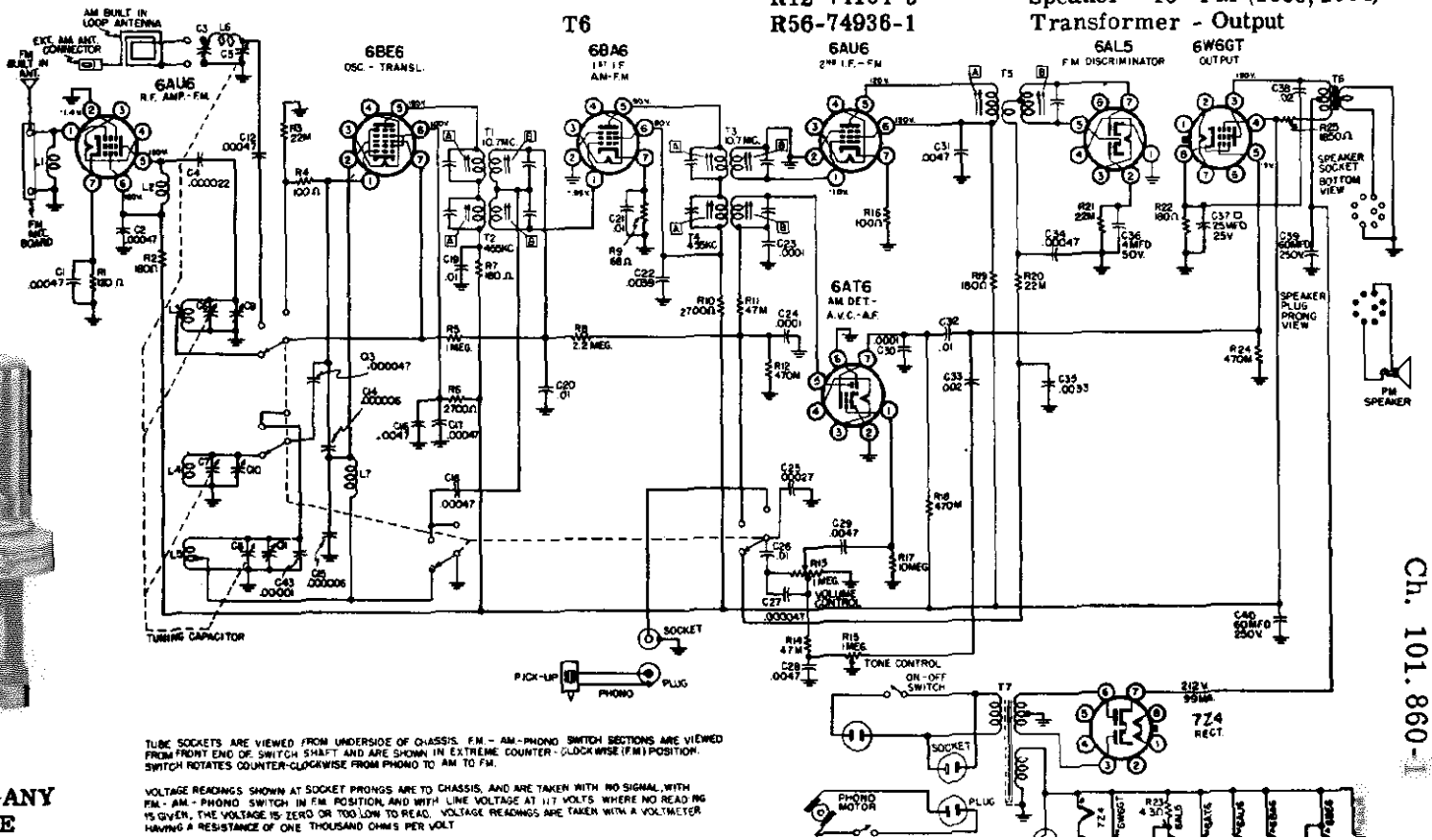
SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C38	R45-642032-1	Capacitor - .02 Mfd. - 400 V.
R21	R35-332232-1	Resistor - 22,000 Ohm - 1/2 W.
R25	R36-62773-2	Resistor - 1,850 Ohm - 5 W.
	R12-74104-4	Speaker - 10" PM
T6	R56-74936-1	Transformer - Output

SUPPLEMENT 3

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C38	R45-662232-1	Capacitor - .022 Mfd. - 600 V.
	R05-72570-1	Leaflet - Instruction
	R27-77452-1	Loop and Back Cover
R21	R35-332231-1	Resistor - 22,000 Ohm - 1/2 W.
R25	R36-62773-2	Resistor - 1,850 Ohm - 5 W.
	R12-74104-5	Speaker - 10" PM (2063, 2064)
T6	R56-74936-1	Transformer - Output



2063 - MAHOGANY
2064 - BLONDE



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. F.M. - AM - PHONO SWITCH SECTIONS ARE VIEWED FROM FRONT END OF SWITCH SHAFT AND ARE SHOWN IN EXTREME COUNTER - CLOCKWISE (F.M.) POSITION. SWITCH ROTATES COUNTER-CLOCKWISE FROM PHONO TO AM TO FM.

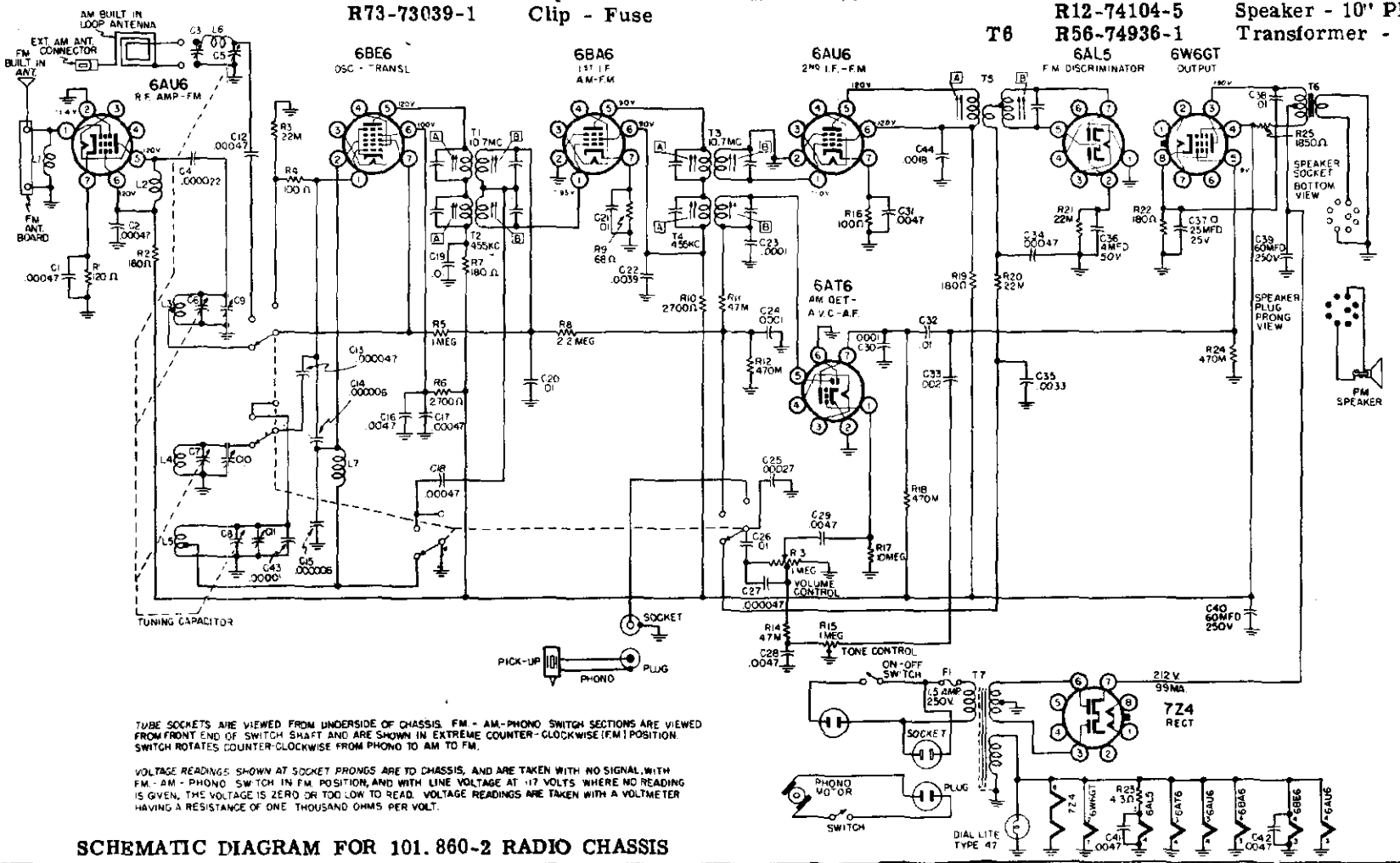
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL, WITH FM - AM - PHONO SWITCH IN FM POSITION, AND WITH LINE VOLTAGE AT 117 VOLTS WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT

SUPPLEMENT 4

Chassis 101.860-2 is the same as chassis 101.860 except that: C31 - .0047 Mfd. is relocated, C44 - .0018 Mfd. has been inserted in its place; a fuse is provided in the primary of the power transformer; a permanent magnet type speaker is used instead of electromagnetic type and the output circuit is revised accordingly.

Except for the Repair Parts listed below and the schematic diagram on page below refer to Ch. 101.860 for all Service Information, Repair Parts, and Ordering Instructions.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C38	R45-661032-1	Capacitor - .01 Mfd. - 600 V.
C44	R45-79037-1	Capacitor - .0018 Mfd. - 600 V.
	R73-73039-1	Clip - Fuse
F1	R29-73017-2	Fuse - 1.5 Amp. - 250 V.
	R05-72853-1	Leaflet - Instruction
	R27-77452-1	Loop and Back Cover
R21	R35-332231-1	Resistor -22,000 Ohm - 1/2 W.
R25	R36-62773-2	Resistor - 1,850 Ohm - 5 W.
	R12-74104-5	Speaker - 10" PM (2063, 2064)
T6	R56-74936-1	Transformer - Output



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. FM - AM - PHONO SWITCH SECTIONS ARE VIEWED FROM FRONT END OF SWITCH SHAFT AND ARE SHOWN IN EXTREME COUNTER-CLOCKWISE (FM) POSITION. SWITCH ROTATES COUNTER-CLOCKWISE FROM PHONO TO AM TO FM.

VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL, WITH FM - AM - PHONO SWITCH IN FM POSITION, AND WITH LINE VOLTAGE AT 117 VOLTS WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT.

SCHEMATIC DIAGRAM FOR 101.860-2 RADIO CHASSIS

MODELS 13, 1
Ch. 478.239

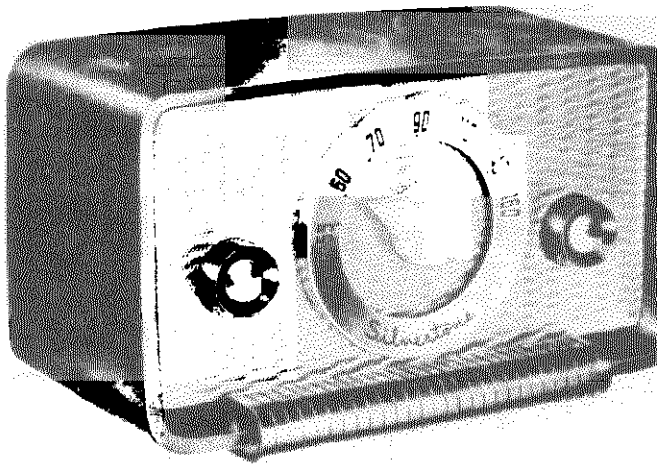
SPECIFICATIONS

Power Supply
117 Volts D.C., or 117 Volts, 50-60 Cycles A.C.

Frequency Range ..... 532.5 to 1620 kc.
Intermediate Frequency ..... 455 kc.
Tuning ..... Two gang capacitor
Speaker 4 inch PM, 3.2 ohm voice coil impedance
Power Consumption ..... 30 Watts
Power Output 1watt undistorted, 1.5 watt maximum
Sensitivity 200 uv/m at 50 milliwatts output
Selectivity 45kc. broad at 1000 times signal at 1000kc.

TUBE COMPLEMENT

12BE6 ..... Mixer and Oscillator
12BA6 ..... I.F. Amplifier
12AT6 ..... Detector, A.V.C. and 1st Audio
50C5 ..... Audio Output
35W4 ..... Power Rectifier



ALIGNMENT PROCEDURE

PRELIMINARY:

Output meter connection ..... across 3.2 ohm speaker voice coil
Output meter reading to indicate 50 MW across speaker voice coil ..... 0.4 volts
Generator modulation ..... 30%, 400 cycles
Position of volume control ..... maximum (fully clockwise)
Position of pointer with rotor full open (plates out of mesh). . . slightly below 160 Kc calibration mark on the cabinet dial (pointer horizontal to right)

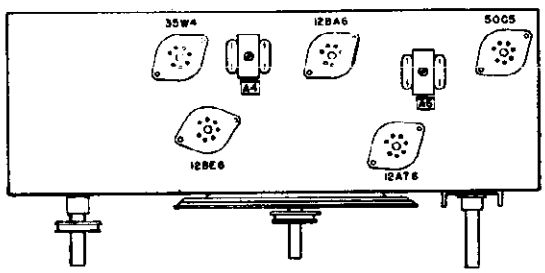
	Position of Variable	SIGNAL GENERATOR				Trimmer Adjustment (in order shown) f maximum output
		Frequency	Dummy Antenna	Connection to Receiver	Ground Connection	
IF	Rotor full open (plates out of mesh)	455 Kc	.05 Mfd.	Grid of 12BE6 (pin 7)	Chassis	Input & output trir mers on IF cans A A4 A5 A6
RF	Rotor full open (plates out of mesh)	1620 Kc		*Test Loop	*Test Loop	Oscillator Trimmer A
	1400 Kc	1400 Kc		*Test Loop	*Test Loop	Antenna Trimmer A
	600 Kc	600 Kc		*Test Loop	*Test Loop	(Check Point)**

*Connect generator lead to Hazeltine Test Loop, Model 1150, placed two feet from the set loop, or three turns of wire about six inches in diameter, placed about one foot from the set loop.

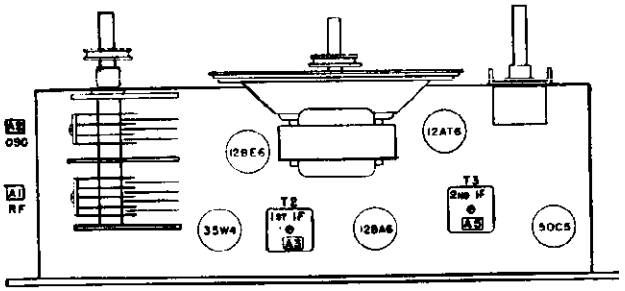
**With a generator signal of 600 Kc, turn the set to the point where maximum output is obtained, which should be approximately 600 Kc on the dial. Adjust antenna section plates of variable for maximum output.

The alignment procedure should be done in tl order given for greatest accuracy. Align for ma mum output. Reduce input to keep output near volts.

Always keep the output from the generator at lowest possible value to prevent the AVC of t receiver from interfering with accurate alignme

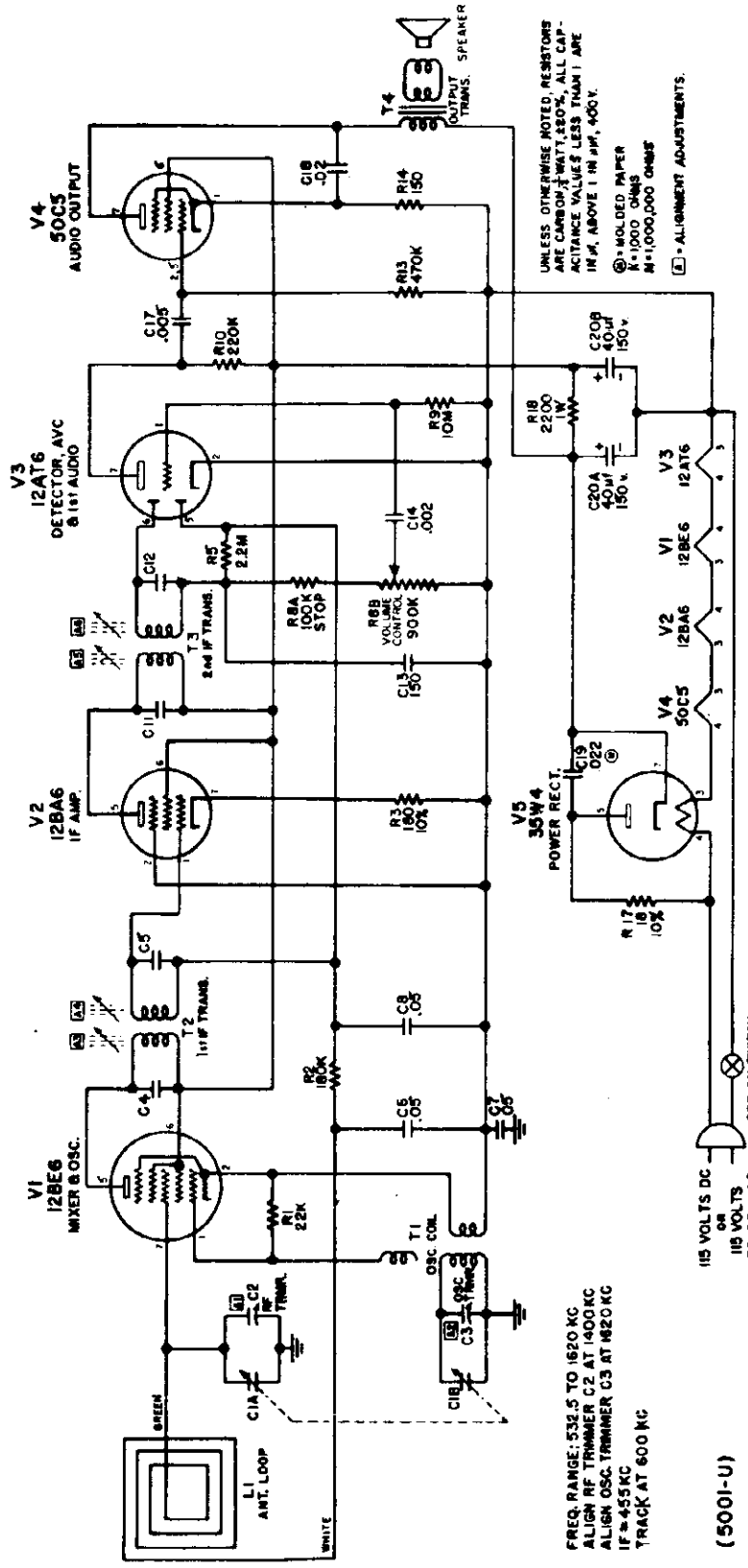


BOTTOM VIEW OF CHASSIS



TOP VIEW OF CHASSIS

MODELS 13, 14,
Ch. 478.239



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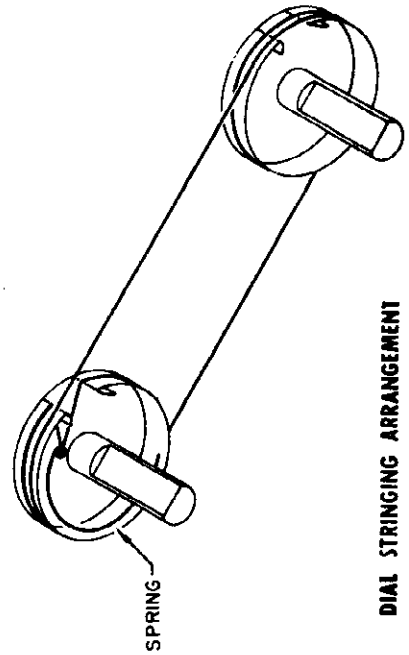
SCHEMATIC

478.239 CHASSIS



DIAL STRINGING ARRANGEMENT

HOW TO ORDER PARTS

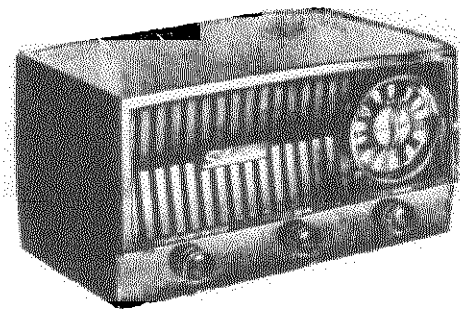
1— Use Correct Order Form.

2— On the Purchase Order always give the following information:
(1) PART NUMBER (number printed on the part if different from that shown on this list) and DESCRIPTION for each part ordered. When no part is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).

(2) The CHASSIS NUMBER, which is 478.239. This number is found on a metal plate at the rear of the chassis.

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	SELLING PRICE
		RESISTORS (Carbon, 1/2 Watt ± 20% Unless Otherwise Specified)	
R 17	RC-180-2	18 Ohms 1/2 Watt 10%	.14
R 14	RC-151-1	150 Ohms 1/2 Watt	.14
R 3	RC-181-2	180 Ohms 1/2 Watt 10%	.14
R 18	RC-222-4	2,200 Ohms 1 Watt	.31
R 1	RC-223-1	22,000 Ohms 1/2 Watt	.14
R 2	RC-184-1	180,000 Ohms 1/2 Watt	.14
R 10	RC-224-1	220,000 Ohms 1/2 Watt	.14
R 13	RC-474-1	470,000 Ohms 1/2 Watt	.14
R 5	RC-225-1	2.2 Megohms 1/2 Watt	.14
R 9	RC-106-1	10 Megohms 1/2 Watt	.14
R 8A,8B	VC-21	Off-On Switch and Vol. Control 1 Megohm with 100 K stop	1.65
		CONDENSERS	
C 13	CM-151-1	150 mmfd Mica	.29
C 14	CP-202-1	.002 mfd Paper	.29
C 17	CP-502-2	.005 mfd Paper	.26
C 18	CP-203-1	.02 mfd Paper	.26
C 19	CPM-203-1	.022 mfd Molded Paper	.40
C 6,7,8	CP-503-1	.05 mfd Paper	.26
C 20A,20B	CE-15	2x40 mfd 150 Volts Electrolytic	1.62
C 1A,1B	CV-22	Variable Condenser	2.70
C 2,3		Trimmers (part of C 1A,1B)	
C 4,5		(part of T 2)	
C 11,12		(part of T 3)	
		COILS & TRANSFORMERS	
T 2,3	LF-29	I. F. Transformers	1.94
T 1	LC-20-D	Oscillator Coil	.88
L 1	LP-12	Loop Antenna	2.31
		CABINET, HARDWARE & ACCESSORIES	
	CB-122-M	Cabinet, Magohany (Model 13) or	3.35
	CB-122-I	Cabinet, Ivory (Model 14)	3.35
	KN-33-3	Knobs, Mahogany (Model 13)	.54
	KN-33-2	or Knobs, Ivory (Model 14)	.54
	KN-32-2	Pointer Knob, Ivory	.34
	MS-124	Pointer Shaft Mounting Bracket	.14
	GR-38	Decorative Grille	2.31
	BF-19	Baffle	.20
	MS-141-D	Dial Ring	1.03
	SG-7	Dial Spring	.09
	CR-2	Drive Cord	.09
	SP-47-22	4" PM Speaker with output transformer, or	4.60
	SP-47-22A	4" PM Speaker with output transformer	4.60
	LD-65	Line Cord	.77
	IB-36-1-D	Customer Instruction Book	.15

MODELS 25, 27,
Ch. 478. 238



SPECIFICATIONS

Power Output
Undistorted—1.25 watts
Maximum—2.25 watts

Sensitivity
AM—250 uv/m average } for 50 MW output
FM— 50 uv average }

Selectivity
AM—49.5 Kc. broad at 1000 times signal at 455 Kc.
FM—810 Kc. broad at 1000 times signal at 10.7 Mc.

TUBE COMPLEMENT

V1 **6BJ6** —FM RF Amplifier
V2 **12AT7**—FM Mixer and Oscillator
V3 **6BJ6** —AM-FM IF Amplifier
V4 **12BA6**—FM IF Amplifier
V5 **19T8** —Ratio Detector, AM Detector and First Audio
V6 **12BE6**—AM Mixer and Oscillator
V7 **35C5** —Audio Output

Power Supply
105-125 V. D.C.
or 105-125 V., 50-60 cycles A.C.

Frequency Range
AM—530 Kc. to 1630 Kc.
FM— 87 Mc. to 109 Mc.

Intermediate Frequency
AM—455 Kc.
FM—10.7 Mc.

Antenna
AM—Loop
FM—External hank

Tuning
Clock dial, 4 section ganged variable

Speaker
4 inch Permanent Magnet type
Voice Coil impedance 3.2 ohms

Power
35 watts at 117 volt line

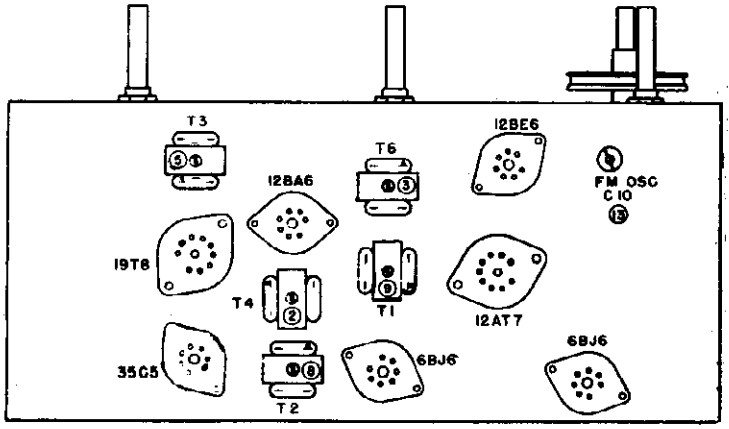


FIG. 2 — BOTTOM VIEW OF CHASSIS

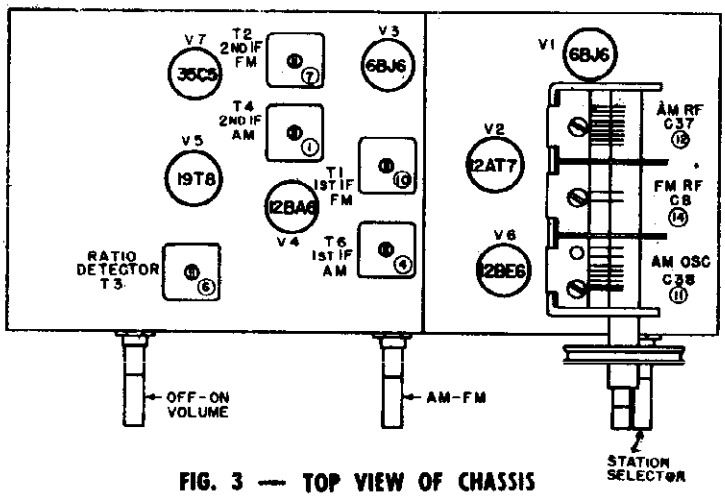


FIG. 3 — TOP VIEW OF CHASSIS

MODELS 25, 2
Ch. 478.238

ALIGNMENT PROCEDURE

PRELIMINARY —

Output meter connection ..... Across speaker voice coi
Output meter reading to indicate 500 MW (Standard Output) ..... 1.27 vol
Generator modulation ..... 30%—400 cycle
Position of volume control ..... Fully clockwis
Set Dial Pointer ..... Horizontal, variable condenser close
Set band switch ..... To left for AM alignment; to right for FM alignmen

AM ALIGNMENT

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION HIGH SIDE	GENERATOR CONNECTION GROUND LEAD	ADJUST TRIMMERS IN ORDER SHOWN FOR MAX. OUTPUT	TRIMMER FUNCTION
Open	455 Kc	.05 Mfd	Mixer grid	Chassis	(1)(2)(3)(4)	I. F.
1620 Kc	1620 Kc		*Test loop	Test loop	(11)	Oscillator
1400 Kc	1400 Kc		*Test loop	Test loop	(12)	Antenna
**600 Kc	600 Kc		*Test loop	Test loop	Check point	Antenna

*Connect generator lead to a Standard Hazeltine Test Loop, Model 1150, placed two feet from the set loop, or three turns o wire about six inches in diameter, placed about one foot from the set loop.

**With a generator signal of 600 Kc, tune the set to the point where maximum output is obtained, which should be approx mately 600 Kc on the dial. Adjust antenna section plates of variable for maximum output.

The alignment procedure should be repeated in the original order for greatest accuracy. Align for maximum output.

Always keep the output from the signal generator at its lowest possible value to make the A. V. C. action of the receiver ineffectiv

FM ALIGNMENT

1 — Connect two 100,000 ohm (±5%) resistors in series across R22.

2 — Connect minus lead from voltmeter to pin 2 of the 19T8 (V5); plus lead to chassis.

3 — Set FM generator to 10.7 Mc and connect high side through a .01 Mfd. condenser to pin 1 of the 12BA6 (V4); low side to chassis (Fig. 5).

4 — Adjust (5) for maximum voltage.

5 — Place minus lead of voltmeter at the junction of the two 100,000 ohm resistors in series across R22 used in step 1; plus lead to high side of Volume Control, R28 (Fig. 6).

6 — Adjust (6) for zero reading. A positive or negative reading will be obtained on either side of the correct setting.

7 — Connect high side of generator to mixer coil (L3), low side of generator to chassis.

8 — Short A.V.C. to chassis at junction of R21 and R9.

9 — Disconnect negative lead of electrolytic condenser C47 (Fig. 7).

10 — Connect vertical input of scope across R22. (Grounded terminal to chassis, ungrounded terminal to high side of R22.)

11 — Adjust (7), (8), (9) and (10) for greatest vertical sweep of pattern. Stagger tune so that pattern is as shown in Fig. 8.

12 — After alignment is completed resolder negative lead of electrolytic condenser C47.

DETECTOR AND IF ALIGNMENT USING SIGNAL GENERATOR AND OSCILLOSCOPE

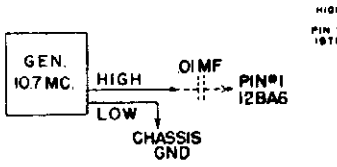


FIG. 5

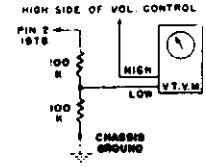


FIG. 6

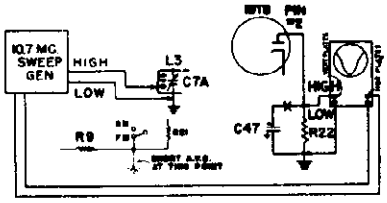


FIG. 7

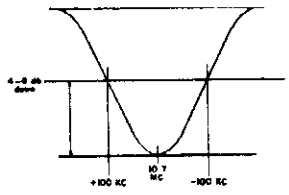


FIG. 8

RF ALIGNMENT

POSITION OF VARIABLE	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION HIGH SIDE	GENERATOR CONNECTION GROUND LEAD	ADJUST TRIMMERS IN ORDER SHOWN FOR MAX. OUTPUT	TRIMME FUNCTIO
Open	109 Mc	300 Ohm	FM Ant. Term. ("A")	Fm Ant. Term. ("G")	(13)	Oscillat
Closed	87 Mc	300 Ohm	FM Ant. Term. ("A")	Fm Ant. Term. ("G")	Spacing of L5	Oscillat

Repeat the above oscillator adjustments until proper coverage is obtained on both ends of band since the two adjustments affe each other.

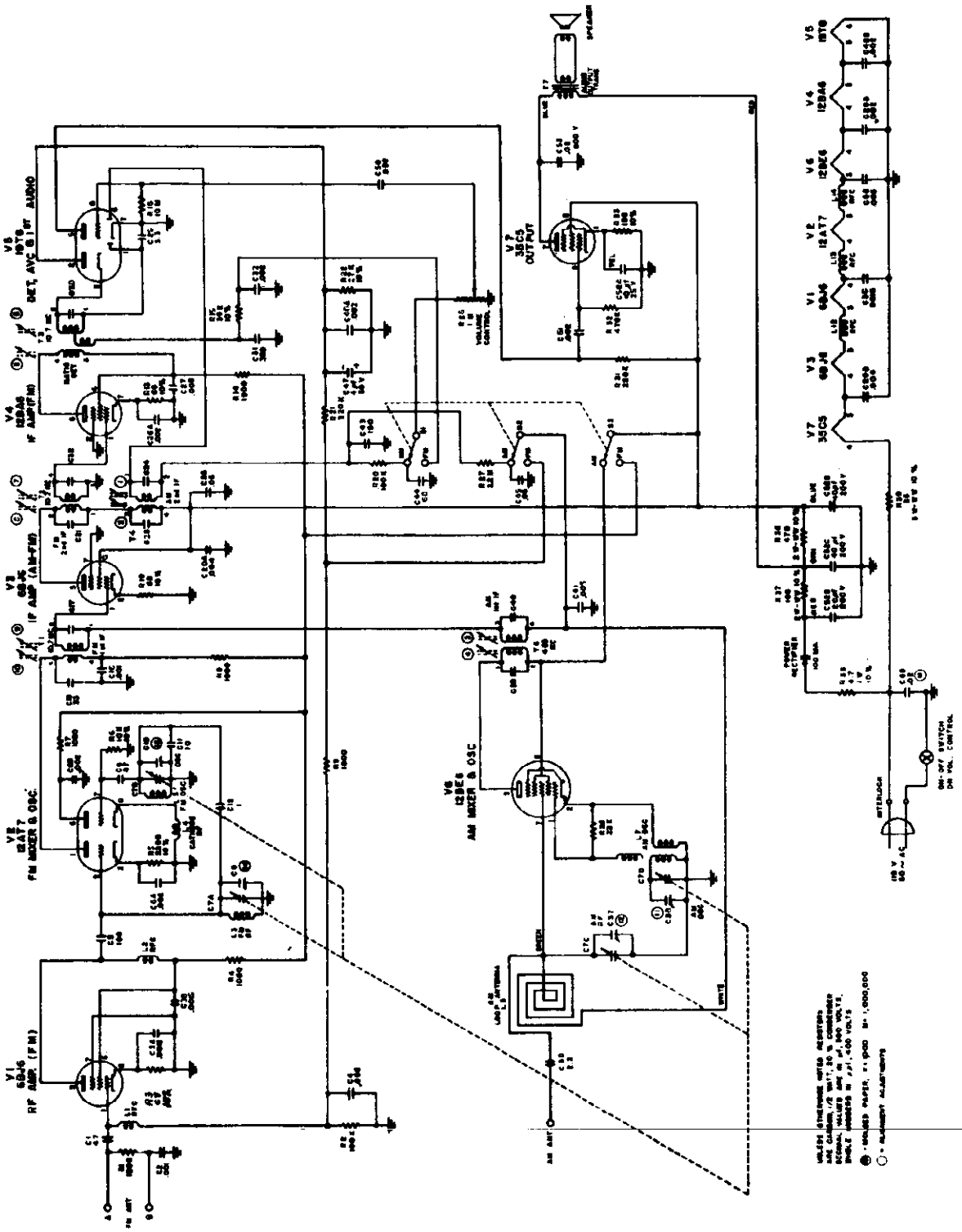
106 Mc	106 Mc	300 Ohm	FM Ant. Term. ("A")	Fm Ant. Term. ("G")	(14)	RF
90 Mc	90 Mc	300 Ohm	FM Ant. Term. ("A")	Fm Ant. Term. ("G")	Spacing of L3	RF

Repeat "RF and Oscillator adjustments until proper tracking is obtained at both 90 and 106 Mc, since tracking the set at one fr quency affects the tracking at the other frequency.

All RF trimmers are adjusted for maximum output, measured with output meter across speaker voice coil.

For RF alignment, use FM generator signal modulated with 400 cycles 45 Mc sweep (22.5 Kc deviation).

MODELS 25, 27,
Ch. 478.238



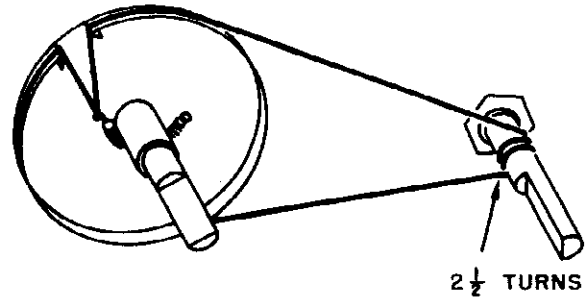


FIG. 4 — DIAL STRINGING ARRANGEMENT

HOW TO ORDER PARTS

1— Use Correct Order Form.

2— On the Purchase Order always give the following information:
(1) PART NUMBER (number printed on the part if different from that shown on this list) and DESCRIPTION for each part ordered. When no part is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).

(2) The CHASSIS NUMBER, which is 478.238. This number is found on a metal plate at the rear of the chassis.

PARTS LIST

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	SELLING PRICE
		RESISTORS (Carbon, 1/2 Watt ± 20% Unless Otherwise Specified)	
R 36	RC-47A-5	4.7 Ohm 1 Watt 10%	.31
R 3,10,13	RC-680-2	68 Ohm 1/2 Watt 10%	.14
R 39	RP-6	85 Ohm 5 Watt 10% W.W.	.63
R 37	RW-101-8	100 Ohm 2 Watt 10% W.W.	.29
R 33	RC-181-2	180 Ohm 1/2 Watt 10%	.14
R 38	RW-471-8	470 Ohms 2 Watts 10% W.W.	.29
R 1,4,7,8,9,14	RC-102-1	1,000 Ohms 1/2 Watt	.14
R 5	RC-222-2	2,200 Ohms 1/2 Watt 10%	.14
R 6	RC-103-2	10,000 Ohms 1/2 Watt 10%	.14
R 25	RC-223-1	22,000 Ohms 1/2 Watt	.14
R 22	RC-273-2	27,000 Ohms 1/2 Watt 10%	.14
R 15	RC-393-2	39,000 Ohms 1/2 Watt 10%	.14
R 2,20	RC-104-1	100,000 Ohms 1/2 Watt	.14
R 21,31	RC-224-1	220,000 Ohms 1/2 Watt	.14
R 32	RC-474-1	470,000 Ohms 1/2 Watt	.14
R 27	RC-225-1	2.2 Megohms 1/2 Watt	.14
R 16	RC-106-1	10 Megohms 1/2 Watt	.14
R 28	VC-23-D	Volume Control (1 Meg) & On-Off Switch	1.51
		CONDENSERS	
C 12	CSP-1	1 Mmfd Stackpole	.14
C 36	CC-2,2-7	2.2 Mmfd Ceramic	.14
C 29	CC-3,3-11	3.3 Mmfd Stackpole	.23
C 11	CMS-010-8	10 Mmfd Silver Mica 50 V.	.34
C 15	CMS-033-9	33 Mmfd Silver Mica	.29
C 1,9	CC-04708	47 Mmfd Ceramic	.23
C 44	CC-068-7*	68 Mmfd Ceramic	.23
C 5	CC-101-7	100 Mmfd Ceramic	.29
C 43	CM-151-1	150 Mmfd Mica	.29
C 31	CM-231-8	330 Mmfd Mica	.29
C 2,16	CC-102-9P	.001 Mfd Ceramic GMV	.29
C 3A,B,C	CC-3-0	3 x .0015 Mfd Herlec	.57
C 26A,B,6A,B C 43A,B	CC-2-1	2 x .002 Mfd Herlec	.43
C 32,50,51	CP-202-2	.002 Mfd Paper	.26
C 20A,B	CC-2,2	2 x .004 Mfd Herlec	.52
C 4,27,41,58	CC-1-1	.005 Mfd Herlec	.29
C 55	CPM-203-1	.02 400 V. Molded Paper	.40
C 53	CP-203-20	.02 Mfd 800 V. Paper	.37
C 25,45	CP-503-1	.05 Mfd 400 V. Paper	.26
C 47	CE-19	4 Mfd 50 V. Electrolytic	2.65

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	SELLING PRICE
		CONDENSERS (Continued)	
C 52A, C 52B, C 52C, C 52D	CE-23-D	10 Mfd 25 Volts, 20 Mfd 200 Volts, 40 Mfd 200 Volts, 40 Mfd 200 Volts — 4 Section Electrolytic	2.74
C 17		(part of T 1)	
C 21,22		(part of T 2)	
C 28		(part of T 3)	
C 23,24		(part of T 4)	
C 39,40		(part of T 6)	
C 8,37,38	Trimmers	(part of Variable Condenser C 7	
C 10	TA-3	F.M. Oscillator Trimmer	.63
C 7A,7B,7C,7D	CV-23-D	Variable Condenser	4.42
		COILS & TRANSFORMERS	
T 3	LF-33	Ratio Detector Transformer	2.85
T 1	LF-30	FM IF Transformer	2.42
T 2	LF-34	FM IF Transformer	1.94
T 6	LF-32	AM IF Transformer	2.78
T 4	LF-35	AM IF Transformer	1.94
L 1	LC-12	RF Coil	.14
L 5	LC-11	FM Oscillator Coil	.14
L 12,13,14	LC-13	Filament Choke	.46
L 2	LC-14	Plate Choke	.48
L 3	LC-15	Grid Choke	.46
L 4	LC-16	Cathode Choke	.46
L 7	LC-20	AM Oscillator Coil	.88
L 8	LP-23-D	Loop Antenna and Back	.91
		CABINET, HARDWARE & ACCESSORIES	
	SG-1	Dial Spring	.06
	CR-2	Dial Cord	.09
	SW-15D	AM-FM Switch	1.71
	SR-2-D	Selenium Rectifier	3.45
	CB-159-M	Cabinet, Mahogany (Model 25)	3.89
	KN-39-2-D	Station Indicator Knob, Ivory (Model 25) or	.29
	CB-159-I	Cabinet, Ivory (Model 27)	5.03
	KN-39-3-D	Station Indicator Knob, Mahogany (Model 27)	.29
	KN-40-D	Control Knobs	.20
	TLD-101	Interlock Cord	1.17
	TPL-150	Interlock Plug	.34
	SR-49-1-D	4" PM Speaker with output transformer	4.88
	IB-35-1-D	Customer Instruction Book	.15

MODEL 2061.
Ch. 101.861

SPECIFICATIONS

ANTENNA EQUIPMENT

This model has a Silvertone built-in antenna system which will provide excellent local reception under normal conditions.

For locations where an outside antenna is necessary, special noise reducing antenna kit, catalog #6705 is available. Where noise reduction is not required antenna kit, catalog #6703 may be used.

POWER SUPPLY

117 volts AC, 60 cycle unless otherwise specified. Power Consumption 105 watts.

INTERMEDIATE FREQUENCIES

AM-IF Carrier	455 KC.

FREQUENCY RANGE

Standard Broadcast	540-1600 KC.

POWER OUTPUT

Undistorted	2.4 Watts
Maximum	3.6 Watts

ALIGNMENT PROCEDURE

AM ALIGNMENT

Output meter connection	Across speaker voice coil
Generator ground lead connection	B- Buss
Generator modulation	30% 400 cycles
Position of volume control	Extreme clockwise
Position of tone control	Extreme counterclockwise
Position of AM-PHO Switch	AM

A Hazeltine loop may be used to radiate a signal into the receiver loop instead of the dummy antenna connections listed below.

TUNER POSITION	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	CORE & TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	CORE OR TRIMMER FUNCTION
Open	455 KC.	0.1 Mfd.	Converter Grid	T2-A, T2-B T1-C, T1-D	I.F.
1650 KC.	1650 KC.	50 Mmfd.	Ext. Ant.	C5	Osc.
1400 KC.	1400 KC.	50 Mmfd.	Ext. Ant.	C9 & C1	R.F. & Loop

Warning: No attempt should be made to adjust the alignment of this receiver without using the following equipment: Signal Generator, Output Meter, Insulated Screw Driver.

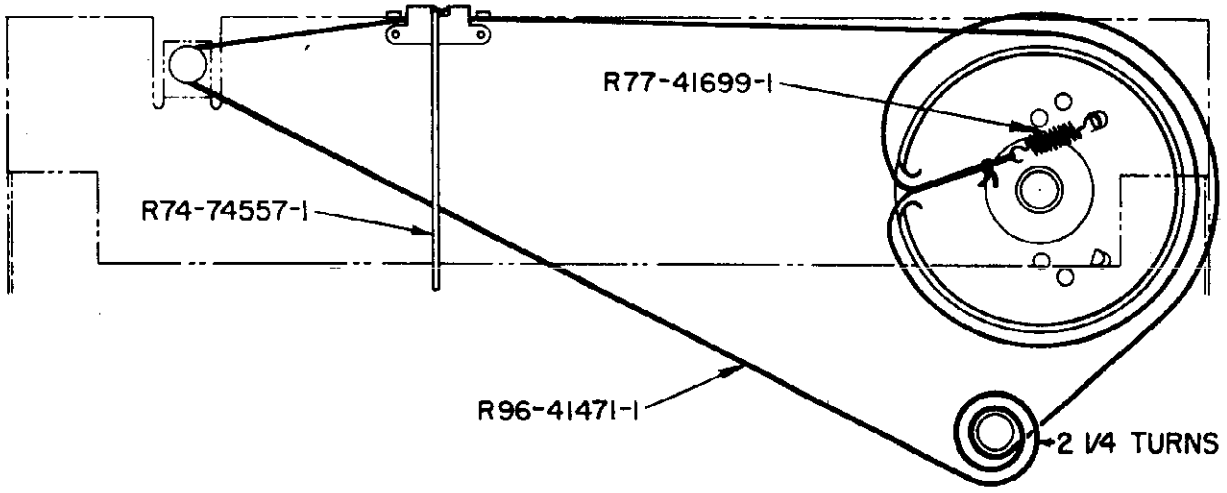


FIG. 1 - STRING AND POINTER HOOKUP

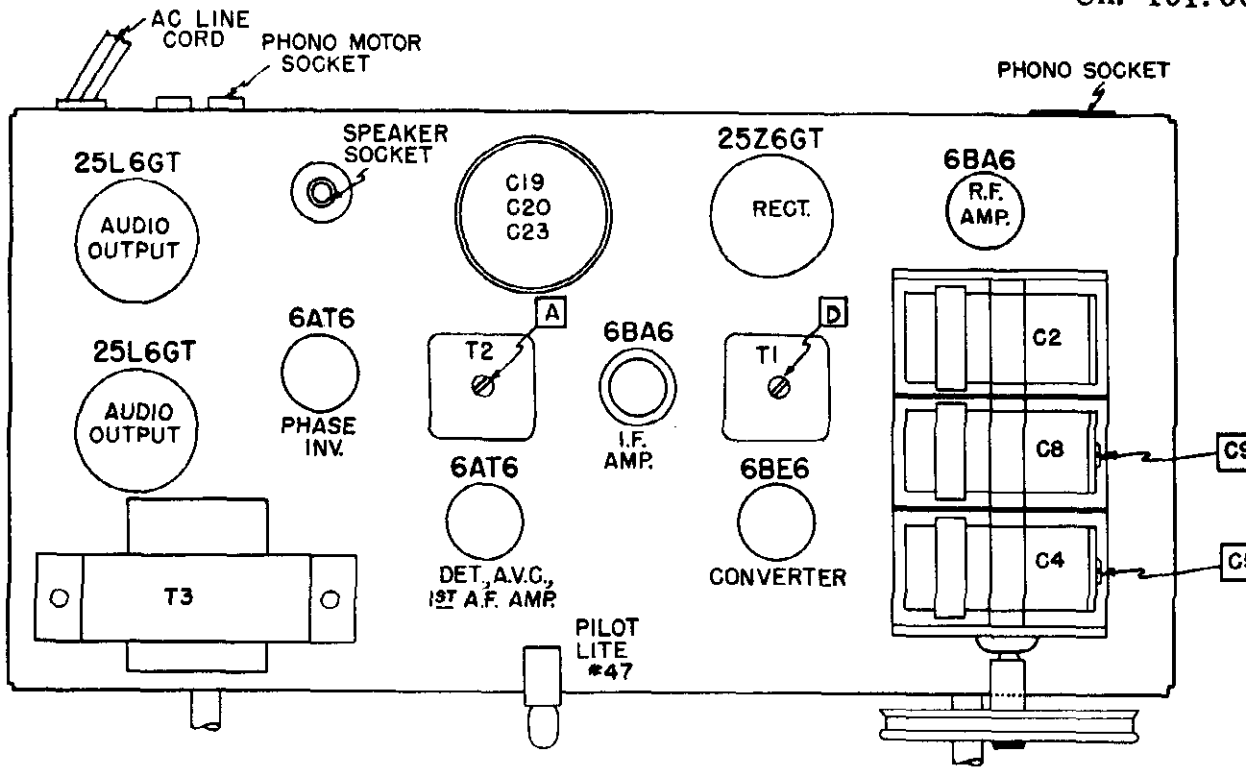


FIG. 2 - RADIO CHASSIS LAYOUT - TOP VIEW

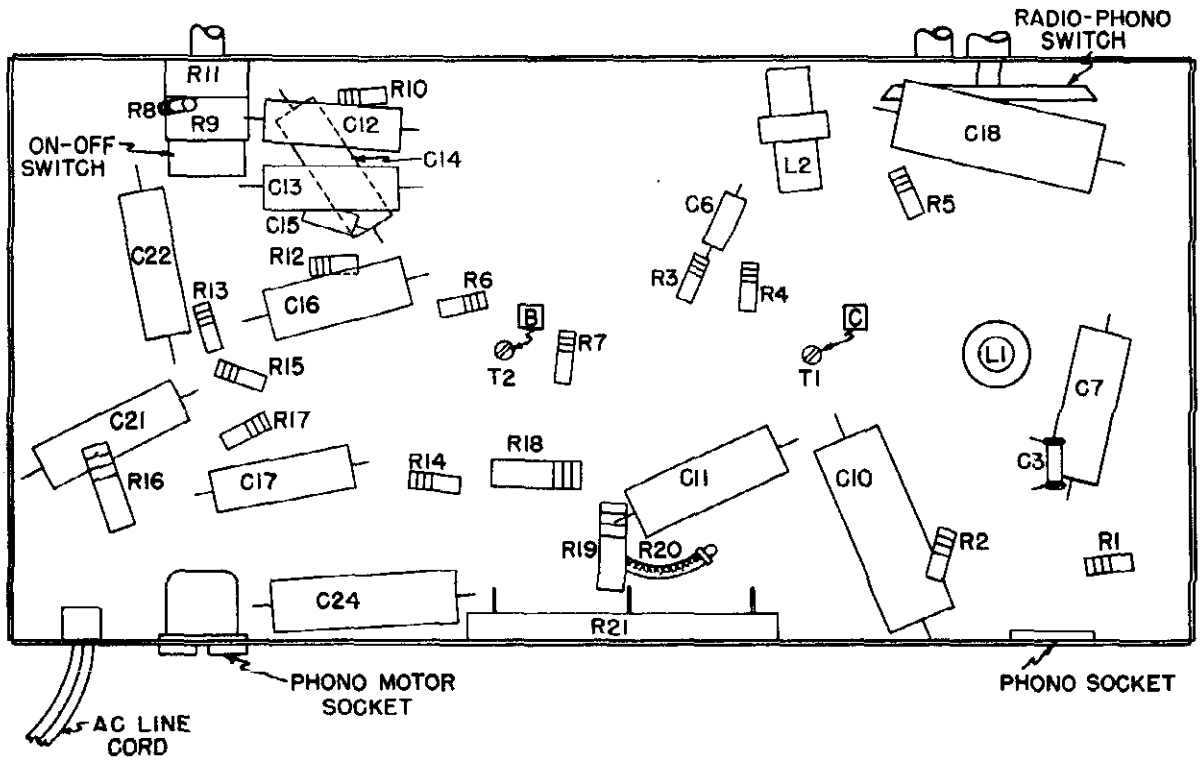


FIG. 3 - RADIO CHASSIS LAYOUT - BOTTOM VIEW

MODEL 2061,
Ch. 101.861

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
   (1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give **PRICE** of part (indicate if no selling).
   (2) The CHASSIS NUMBER, which is 101.861. This number is found on a metal plate at the rear of the chassis.

In all correspondence relating to cabinets, always mention the source code letter stamped into the upper rear rail of consoles or on the bottom of table models, and the Catalog Number shown on the sticker on the back, bottom or inside of the cabinet.

REPAIR PARTS LIST

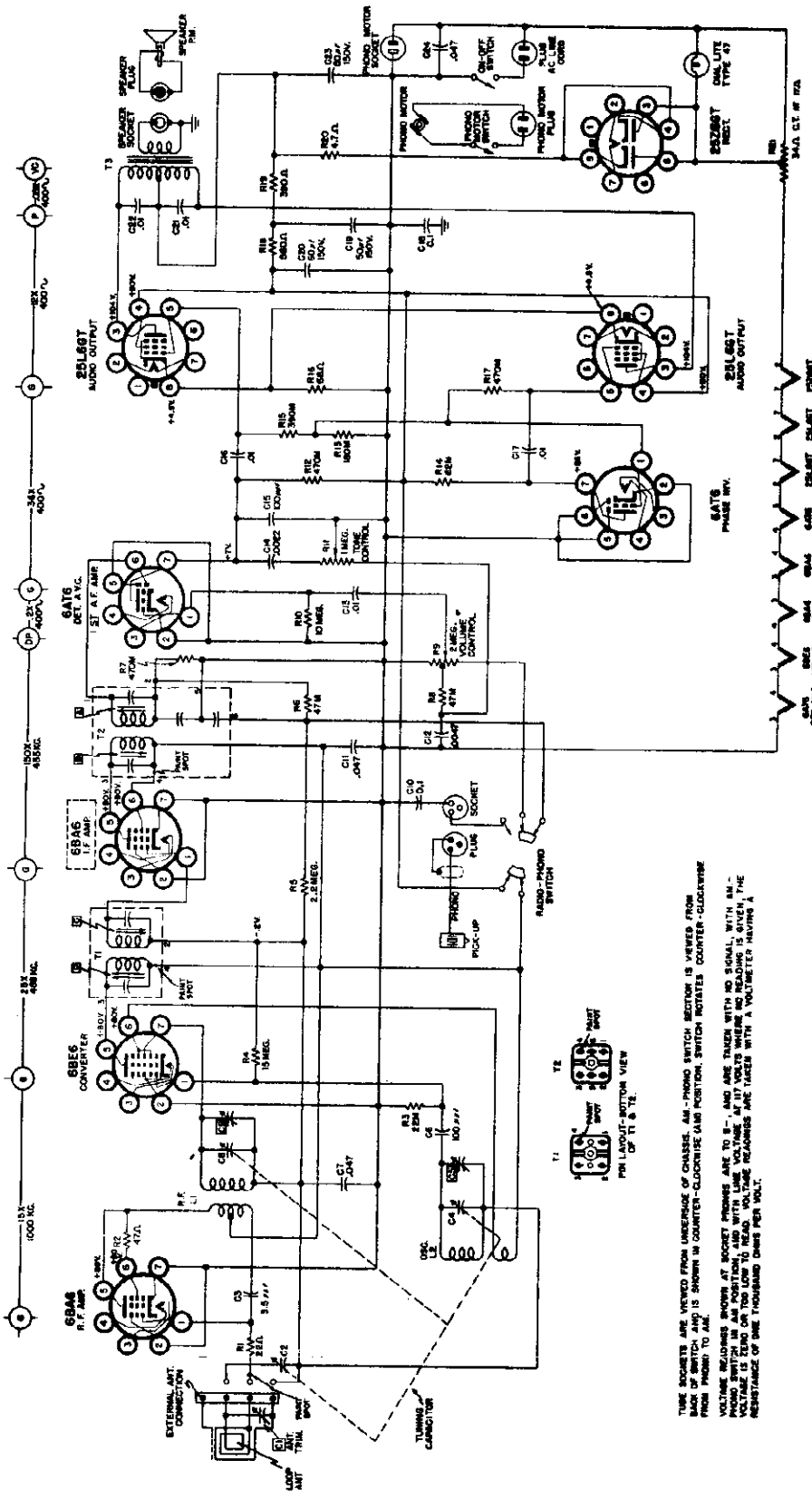
SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION	SUGGESTED SELLING PRICE EACH
	R85-61164-1	Adapter - Record	$ .06
	R74-74742-1	Background - Dial	.46
	R71-66224-1	Bushing - Line Cord	.06
	R86-74751-1	Bushing - Rubber	.06
	R71-65538-1	Button - Snap	.01
C13, C16, C17, C21, C22	R45-661032-1	Capacitor - .01 Mfd. - 600 V. - Molded	.26
C10, C18	R45-77212-1	Capacitor - .1 Mfd. - 600 V. - Molded	.17
C7, C11, C24	R45-664732-1	Capacitor - .047 Mfd. - 600 V. - Molded	.34
C14	R45-662222-1	Capacitor - .0022 Mfd. - 600 V. - Molded	.26
C12	R45-664722-1	Capacitor - .0047 Mfd. - 600 V. - Molded	.29
C3	R43-74592-4	Capacitor - 3.5 Mmfd. - Ceramic	.26
C6, C15	R43-401010-21	Capacitor - 100 Mmfd. - Ceramic	.17
	R41-77561-1	Capacitor - Electrolytic	2.85
C19		50 Mfd. - 150 V.	
C23		50 Mfd. - 150 V.	
C20		60 Mfd. - 150 V.	
C2, C4, C5, C8, C9	R42-77558-1	Capacitor - Variable - 3 Gang	3.50
	R71-67326-1	Clip - Transformer Mounting	.01
	R71-17319-1	Clip - Tuning Shaft Retaining	.02
L2	R50-77563-1	Coil - Oscillator	1.03
L1	R50-77564-1	Coil - R.F.	1.57
	R37-74577-1	Control - Dual	2.17
R9		Volume & ON-OFF - 2 Megohm	
R11		Tone - 1 Megohm	
	R19-60993-1	Cord - Line	.71
	R74-77596-1	Dial - Station - Lucite	1.97

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	R74-74555-2	Escutcheon
	R71-47266-1	Grommet
	R74-74753-1	Knob - Function
	R74-74752-1	Knob - ON-OFF & Volume
	R74-67965-2	Knob - Outer
	R30-20963-1	Lamp - Mazda #47
	R05-72626-1	*Leaflet - Instruction*
	R27-77566-1	Loop & Back Cover
C1		Capacitor - Antenna Trimmer
	R74-74802-1	Name Plate
	R73-67023-1	Plug - 2 Prong Female
	R74-74557-1	Pointer - Dial
	R80-67187-1	Pulley
R20	R36-62456-17	Resistor - 4.7 Ohm - FS - 1/2 W.
R1	R35-332201-1	Resistor - 22 Ohm - 1/2 W.
R2	R35-334701-1	Resistor - 47 Ohm - 1/2 W.
R3	R35-332231-1	Resistor - 22,000 Ohm - 1/2 W.
R6, R8	R35-334731-1	Resistor - 47,000 Ohm - 1/2 W.
R14	R35-338231-1	Resistor - 82,000 Ohm - 1/2 W.
R13	R35-331841-1	Resistor - 180,000 Ohm - 1/2 W.
R15	R35-333941-1	Resistor - 390,000 Ohm - 1/2 W.
R7, R12, R17	R35-334741-1	Resistor - 470,000 Ohm - 1/2 W.
R5	R35-332251-1	Resistor - 2.2 Megohm - 1/2 W.
R10	R35-331061-1	Resistor - 10 Megohm - 1/2 W.
R4	R35-331561-1	Resistor - 15 Megohm - 1/2 W.
R16	R35-436801-1	Resistor - 68 Ohm - 1 W.
R19	R35-433911-1	Resistor - 390 Ohm - 1 W.
R18	R35-435611-1	Resistor - 560 Ohm - 1 W.
R21	R36-77557-1	Resistor - *34 Ohm - 8 W. *Tapped at 17 ohms
	R71-66225-1	*Retainer - Line Cord*
	R81-74553-1	Shaft - Tuning
	R76-67091-1	Shield - Tube - Miniature
	R73-44897-1	Socket - 1 Prong
	R72-62405-2	Socket - Tube - 7 Prong - Min.
	R72-62460-1	Socket - Tube - 7 Prong - Min.
	R72-74694-2	Socket - Pilot Lamp
	R72-62407-1	Socket - Tube - 8 Prong - Octal
	R73-65722-1	*Socket - 3 Prong*

WHEN ORDERING SPEAKER PARTS ALWAYS GIVE THE PART NUMBER APPEARING ON THE SPEAKER

	R12-74104-7	Speaker - 10" PM
	R77-41699-1	Spring - Drive String Tension
	R96-41471-1	String - Drive (per foot)
	R33-77559-1	Switch - AM-PHO
T1	R57-77562-1	Transformer - IF #1
T2	R57-77554-1	Transformer - IF #2
T3	R56-77556-1	Transformer - Output

MODEL 2061,
Ch. 101.861



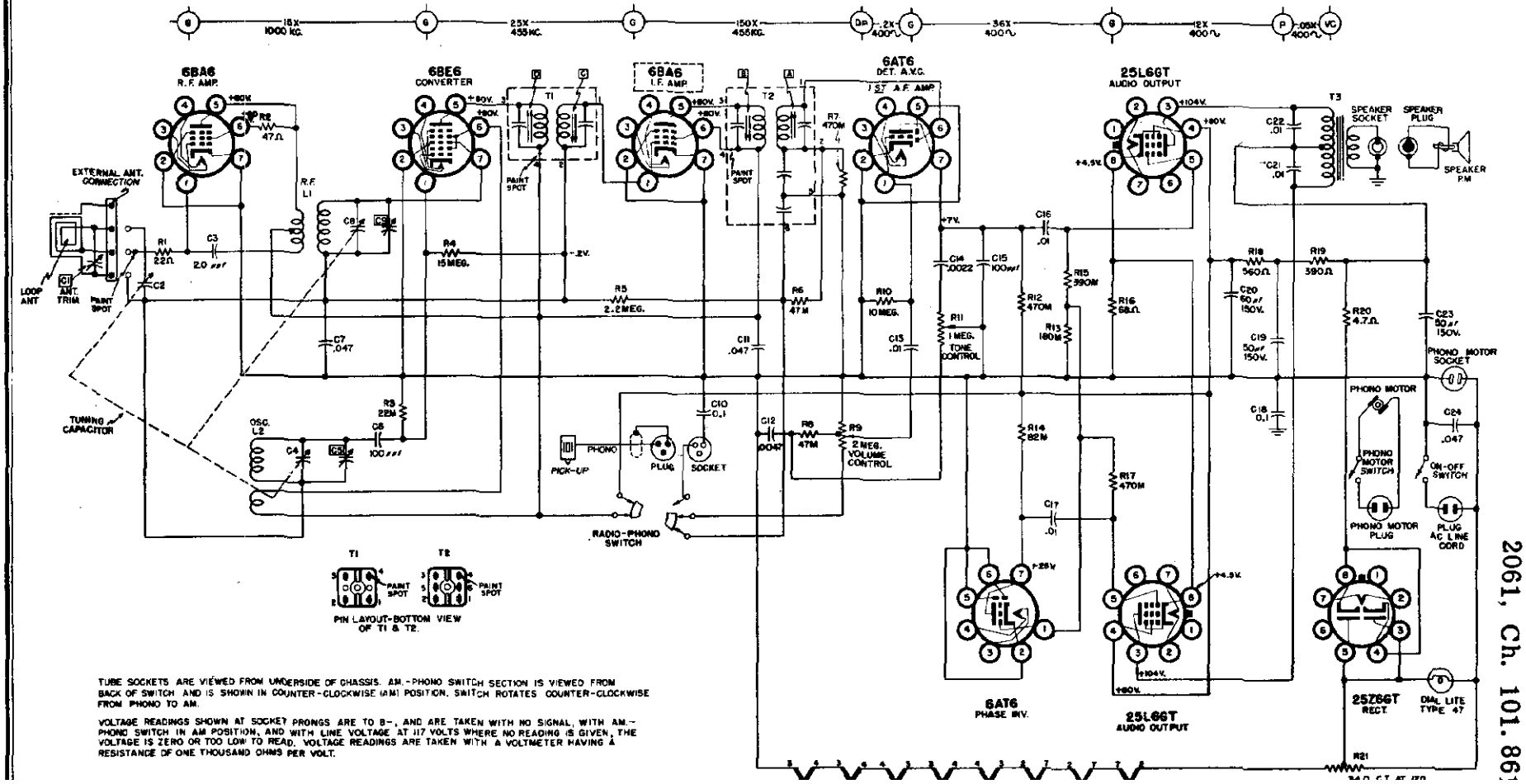
SCHEMATIC DIAGRAM FOR 101.861 RADIO CHASSIS

Chassis 101.861-1 is the same as 101.861 except for new IF Transformers and change in neutralizing capacitor.

Except for the Repair Parts listed below and the schematic diagram on page below refer to Ch. 101.861 for all Service Information, Repair Parts, and Ordering Instructions.

SUPPLEMENT 1

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
C3	R43-74592-5	Capacitor - 2 Mmfd. - Ceramic
T1	R57-78878-1	Transformer - IF #1
T2	R57-78879-1	Transformer - IF #2



TUBE SOCKETS ARE VIEWED FROM UNDERSIDE OF CHASSIS. AM.-PHONO SWITCH SECTION IS VIEWED FROM BACK OF SWITCH AND IS SHOWN IN COUNTER-CLOCKWISE (AM) POSITION. SWITCH ROTATES COUNTER-CLOCKWISE FROM PHONO TO AM.

VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO B-, AND ARE TAKEN WITH NO SIGNAL, WITH AM.-PHONO SWITCH IN AM POSITION, AND WITH LINE VOLTAGE AT 117 VOLTS WHERE NO READING IS GIVEN, THE VOLTAGE IS ZERO OR TOO LOW TO READ. VOLTAGE READINGS ARE TAKEN WITH A VOLTMETER HAVING A RESISTANCE OF ONE THOUSAND OHMS PER VOLT.

3061, 3062 SUPPLEMENT 2

Chassis 101.861-1 is the same as 101.861 except for new IF Transformers and change in neutralizing capacitor.

Except for the change in the Repair Parts listed below refer to Ch. 101.861 for all Service Information, Repair Parts and Ordering Instructions.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
		ADDITIONS
	R74-74742-2	Background - Dial
C3	R43-74592-5	Capacitor - 2 Mmfd. - Ceramic
	R74-83733-1	Dial - Station - Lucite
	R74-74555-4	Escutcheon
	R74-74752-3	Knob - Function
	R74-74752-2	Knob - ON - OFF & VOLUME
	R74-67965-3	Knob - Outer
	R05-72931-1	Leaflet - Instruction
T1	R57-78878-1	Transformer - IF #1
T2	R57-78879-1	Transformer - IF #2
		DELETIONS
	R74-74742-1	Background Dial
C3	R43-74592-4	Capacitor - 3.5 Mmfd. - Ceramic
	R74-77596-1	Dial - Station - Lucite
	R74-74555-2	Escutcheon
	R74-74753-1	Knob - Function
	R74-74752-1	Knob - ON - OFF & VOLUME
	R74-67965-2	Knob - Outer
	R05-72626-1	Leaflet - Instruction
T1	R57-77562-1	Transformer - IF #1
T2	R57-77554-1	Transformer - IF #2

MODELS 3004, 3005, 3006, Ch. 757.190

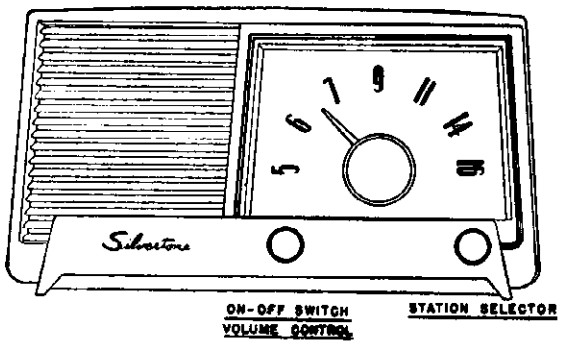
SPECIFICATIONS

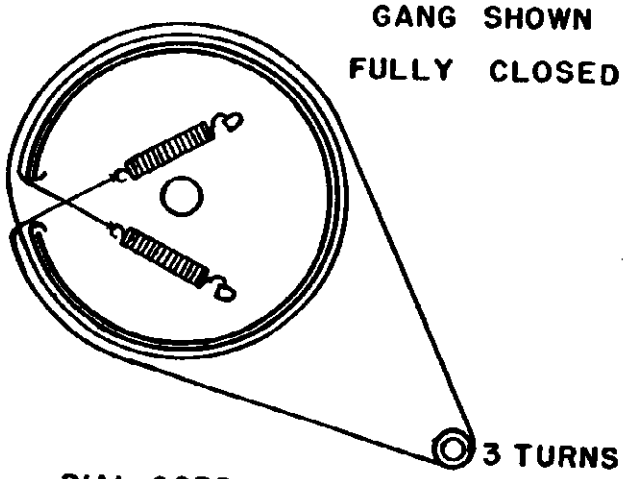
Power Supply
105-120 Volts AC-DC 35 Watts, 50-60 Cycles.

Frequency Range
Broadcast 535-1640 KC

Power Output
Undistorted 1.2 Watt
Maximum 2.2 Watt

Speaker Voice Coil Impedance 3.2 ohms





TECHNICAL INFORMATION FOR SERVICE MEN

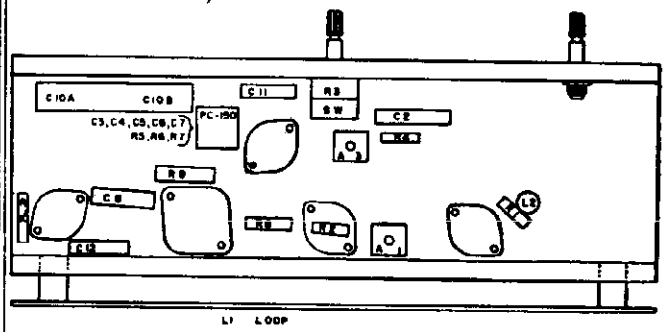
Tuning Range 535 Kc to 1640 Kc. Intermediate frequency—455 Kc. IF and RF measurements made at 0.5 watt output—approximately 1.27 volts on a rectifier type voltmeter connected across the voice coil.

Approximate inputs for .5 watt output: IF 50 uv, RF with standard loop: at 600 Kc, 500 uv/m; at 1000 Kc, 350 uv/m; at 1400Kc, 250 uv/m.

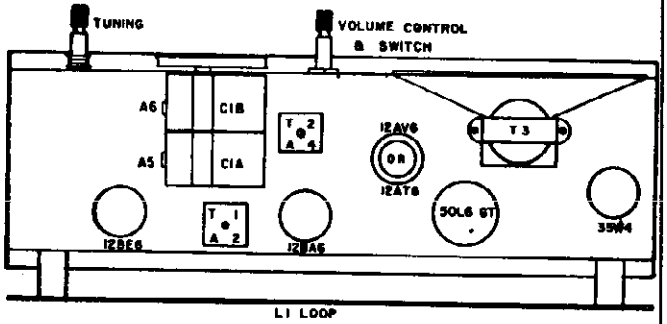
ALIGNMENT DATA

Position of Variable	*Generator Frequency*	*Dummy Ant.*	*Generator Connection (high)*	*Generator Connection (low)*	*Adjust Trimmers (in order shown)*	*Trimmer Function*
Open	455 Kc	.05 mfd	Mixed Grid	Float Gnd.	A4, A3, A2, A1	I.F.
Open (Fully)	1640 Kc	50 mmf	*	Float Gnd.	A6	Osc.
1400 Kc	1400 Kc	50 mmf	*	Float Gnd.	A5	Ant.
1000 Kc	1000 Kc	50 mmf	*	Float Gnd.	Check Point	
600 Kc	600 Kc	50 mmf	*	Float Gnd.	Check Point	

* A loop fashioned of several turns of wire radiating the signal into receiver's antenna or through the external antenna connection.

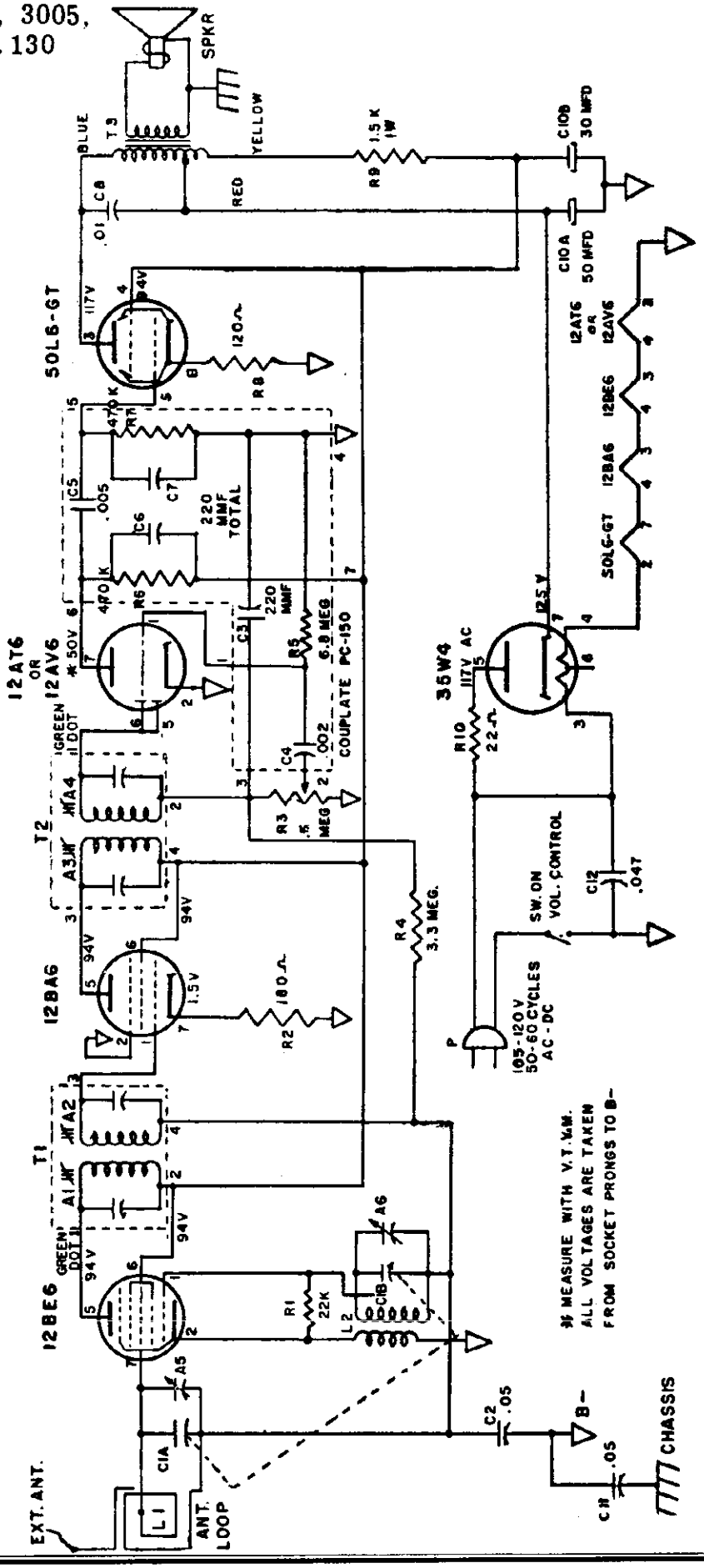


LOCATION OF PARTS UNDER CHASSIS



LOCATION OF TUBES AND TRIMMERS

MODELS 3004, 3005, 3006, Ch. 757.130



MODELS 3004, 300
3006, Ch. 757.130

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
   (1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
   (2) THE CHASSIS NUMBER, which is 757.130. This number is found on a metal plate at the rear of the chassis.

Schematic Location	Part No.	Description	List Price
	E7010	Cabinet, Brown	$5.00
	E7011	Cabinet, Ivory	7.00
	E7012	Cabinet, Green	7.70
L2	E619	Coil, Oscillator	1.01
C1A, C1B	E356	Condenser Variable, 2-Gang With Drum	3.12
C2, C11	E306	Condenser, P.T., .05 MFD, 400V.	.51
C3, C6, C7		Condenser, 220 MMF, Ceramic	
C4	E3015	Condenser, .002 Mfd. Ceramic	1.01
C5	(PC-150)	Condenser, .005 Mfd, Ceramic	
C8	E301	Condenser, P. T., .01 Mfd, 600V	.29
C10A, C10B	E325	Condenser Electrylytic 50-30 Mfd, 150V	1.71
C12	E342	Condenser, Molded Paper, .047 Mfd, 400V	.37
P	E894	Cord, Line, with Plug	.71
	E453	Cord, Dial	.14
	E4020	Dial Pan	1.57
	E509B	Knobs, Brown	.20
	E5091	Knobs, Ivory	.26
	E509G	Knobs, Green	.26
	E5922	Label, Identification	.14

Schematic Location	Part No.	Description	List Pri
	E5921	Leaflet, Instruction	$ .1
L1	E603	Loop, Antenna and Rear Cover Assembly	1.5
	E454	Pointer, Dial	.5
R1		Resistor, 22K Ohms, 1/2W	.1
R2		Resistor, 180 Ohms, 1/2W	.1
R3	E254	Resistor, .5 Meg. Ohms, Volume Control with Switch	1.4
R4		3.3 Meg. Ohms, 1/2W	.1
R5	E3015	Resistor, 6.8 Meg. Ohms	1.0
R6, R7	(PC-150)	Resistor, 470K Ohms	
R8		Resistor, 120 Ohms, 1/2W	.1
R9		Resistor, 1500 Ohms 1W	.3
R10		Resistor, 22 Ohms, 1/2W	.1
	E432	Shaft, Drive Assembly	.7
	E452	Spring, Dial	.1
T3	E105	Speaker Assembly, Includes 5 1/4" PM SPK., & 1/2 x 1/2 Output Transformer	5.2
T1, T2	E622	Transformers, I.F.	1.8
	E716	Window, Styrene	1.8

MODELS 3052,
3053, Ch. 132.053

SPECIFICATIONS

Power Supply
105-120 volts 60 cycle AC, 65 watts
Frequency Range
Broadcast - 1600 - 540 Kc.

Power Output
Undistorted .8 watts
Maximum 1.5 watts
Speaker Voice Coil Impedance 3.2 ohms

3052 and 3053 have three speed record changer 488.219-4.

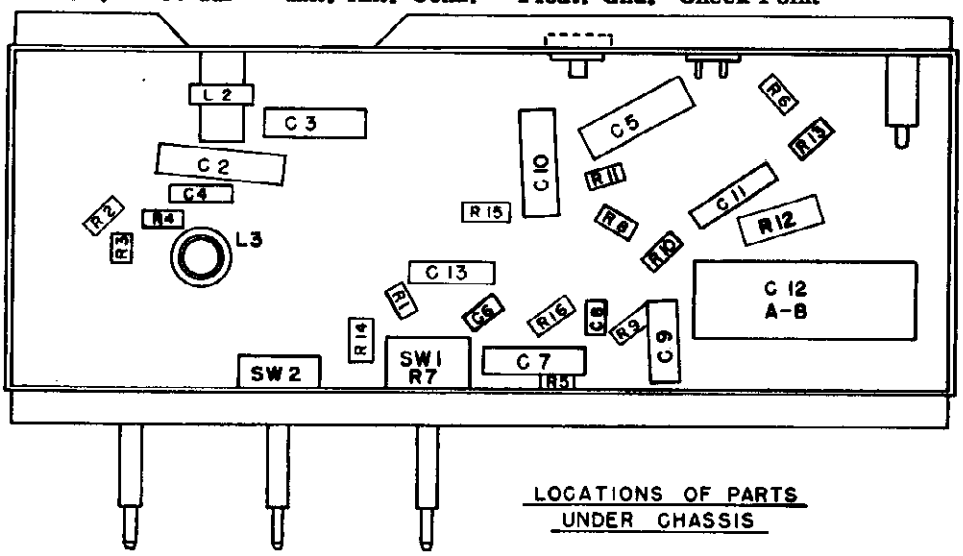
TECHNICAL INFORMATION FOR SERVICEMEN

Tuning range 540 Kc. to 1600 Kc. Intermediate frequency---455 Kc. I-F and r-f measurements made at .5 watt output---approximately 1.26 volts on a rectifier type voltmeter connected across the voice coil.

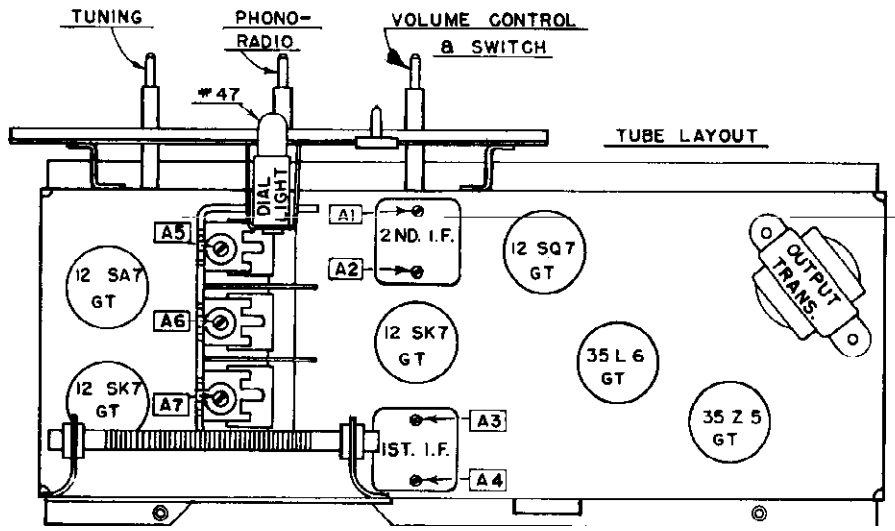
Approximate inputs for .5 watt output: I-F with standard loop: at 600 Kc 500 uv/m; at 1000 Kc. 400 uv/m; at 1400 Kc. 400 uv/m. R-F external antenna connection: at 600 Kc 250 uv; at 1000 Kc. 200 uv; at 1400 Kc. 200 uv.

ALIGNMENT PROCEDURE

Position of Variable	Generator Frequency	Dummy Ant.	Generator Connection (high)	Generator Connection (low)	Adjust Trimmers (in order shown)	Trimmer Function
Open	455 Kc.	.05 uf	Pin 8 of 12SA7	Float. Gnd.	A1, A2, A3, A4,	I. F.
Open	1650 Kc.	50 uuf	Ext. Ant. Conn.	Float. Gnd.	A5	Oscillator
1400 Kc.	1400 Kc.	50 uuf	Ext. Ant. Conn.	Float. Gnd.	A6, A7	R. F. Ant.
600 Kc.	600 Kc.	50 uuf	Ext. Ant. Conn.	Float. Gnd.	Check Point	



LOCATIONS OF PARTS
UNDER CHASSIS



HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order, always give the following information:
   (1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicated if no selling).
   (2) THE CHASSIS NUMBER, which is 132.053 for Radio Chassis and 488.219-4 for the three speed changer.

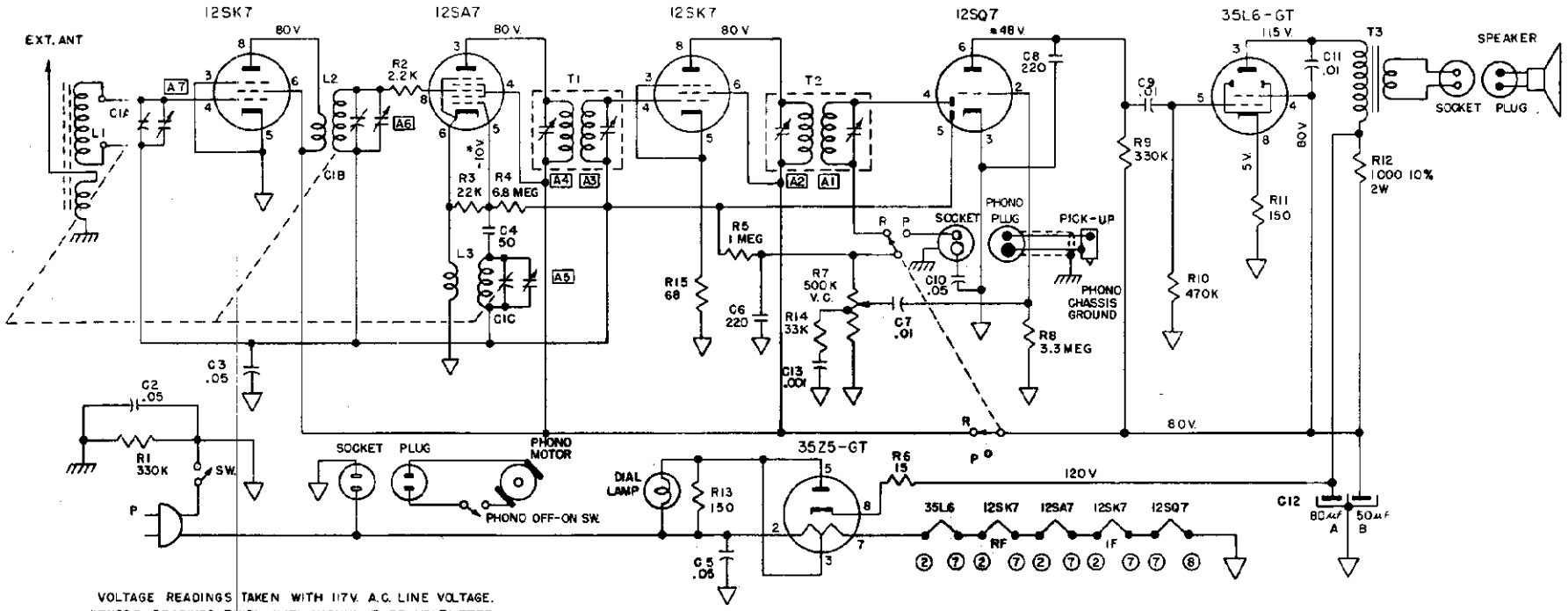
In all correspondence relating to cabinet, always mention the source code letter stamped into the upper rear rail of consoles or the bottom of table models, and the CATALOG NUMBER shown on the sticker on the back, bottom or inside of cabinet.

PARTS LIST

SCHEMATIC LOCATION	PART NO.	DESCRIPTION	LIST
		CAPACITORS	
C1A, B, C	N40761	Variable, 3-Gang	3.90
C2, C5		.05 uf, 400V. P.T.	.23
C3, C10		.05 uf, 200V. P.T.	.23
C4		50 uuf, 500V. Mica.	.23
C6, C8		220 uuf, 350V. Ceramic	.23
C7, C9, C11		.01 uf, 400V. P.T.	.23
C12A, B	N24249	Electrolytic, 80-50 uf, 150V.	2.22
C13		.001 uf, 200V. P.T.	.23
		RESISTORS	
R1, R9		330K ohms, 1/2W.	.15
R2		2200 ohms, 1/2W.	.15
R3		22K ohms, 1/2W.	.15
R4		6.8 megohms, 1/2W.	.15
R5		1 megohm, 1/2W.	.15
R6		15 ohms, 1/2W.	.15
R7, SW-1	N40801	500K ohms, Volume Control with Switch	1.25
R8		3.3 megohm, 1/2W.	.15
R10		470K ohms, 1/2W.	.15
R11, R13		150 ohms, 1/2W.	.15
R12		1000 ohms, 2W.	.20
R14		33K ohms, 1/2W.	.15
R15		68 ohms, 1/2W.	.15
		CHOKES, COILS & TRANSFORMERS	
L2	N25706-1	Coil, R.F.	.70
L3	N23751-1	Coil, Oscillator	.66
T1	N25728-1	Transformer, 1st I.F.	1.77
T2	N25729-1	Transformer, 2nd I.F.	1.91
T3	N23931-1	Transformer, Output	2.50

MISCELLANEOUS

N19132	Cord, Dial Drive	.06
N20138-15	Cord, Line, with Plug	.57
N23484	Cover, Rear Cabinet	1.00
N40775-1	Escutcheon & Dial Assembly	4.30
N40811	Dial Escutcheon (Part of N40775-1)	3.55
N40803	Dial Scale, Glass (Part of N40775-1)	2.00
N40799-1	Knob, On-Off-Volume, Tuning	.33
N40799-2	Knob, Radio-Phono Switch	.40
L	N19351 Lamp, Dial, Mazda, #47	.26
	N40821 Leaflet, Instruction	.28
	N40805 Pointer, Dial	.43
L1	N25657-1 Antenna Loop, Assy.	2.00
	N25663 Socket, Dial Light, with Leads	.23
	N19551 Socket, Phono Motor	.40
	N24212 Socket, Phono Input	.11
SPK	N24817 Speaker, 5 x 7 P.M.	5.10
	N19133 Spring, Dial Cord	.06
SW-2	N40781 Switch, Radio-Phono	1.19
	N22763 Weight, Cabinet	.75



VOLTAGE READINGS TAKEN WITH 117V. A.C. LINE VOLTAGE.
*THESE READINGS TAKEN WITH VACUUM TUBE VOLTMETER.
⏚ FLOATING GROUND.
⏚ CHASSIS GROUND.
CURVED LINE DENOTES OUTSIDE FOIL.

RESISTANCE VALUES ARE IN OHMS: K = 1,000, MEG = 1,000,000
CAPACITANCE VALUES LESS THAN (1) ARE IN MICROFARADS, (µf).
AND VALUES OF (1) OR GREATER ARE IN MICRO-MICROFARADS, (µµf),
UNLESS OTHERWISE INDICATED

SPECIFICATIONS

Power Supply: .....

Power Output:
Undistorted .....1.0 Watt
Maximum .....2.2 Watt

117 Volts, DC or 56-60 Cycles AC, 40 Watts

Frequency Range:
Broadcast .....535-1605 KC

ALIGNMENT PROCEDURE

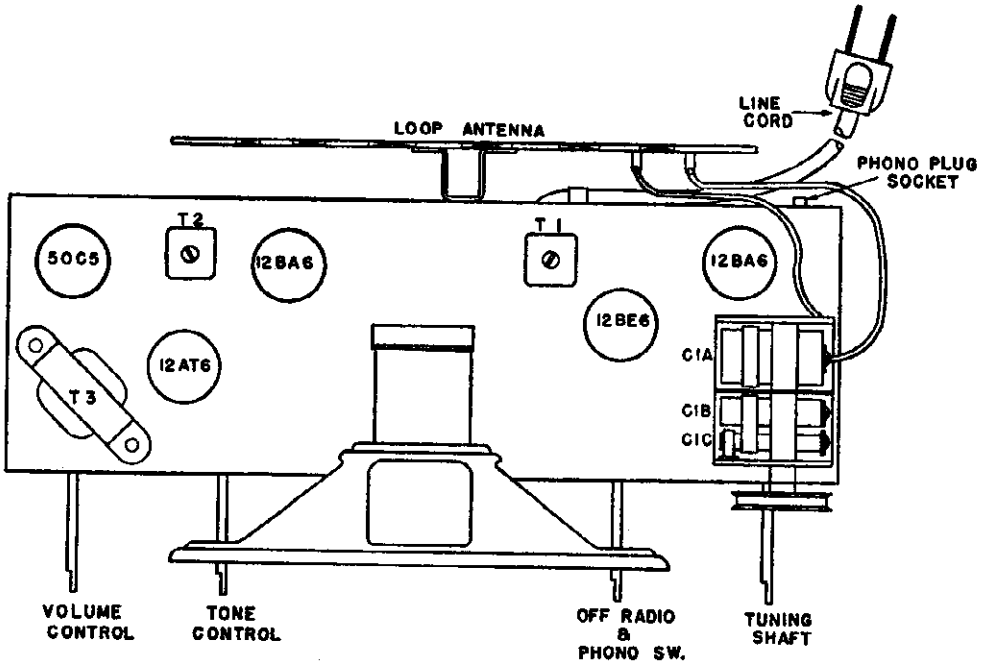
Output meter reading to indicate 0.05 watt across voice coil 0.4
Generator ground lead connected.....*To B- through 0.1 mfd. capacito*
Generator modulation .....30%, 400 cycl
Position of volume control.....Fully c
Position of pointer with tuner fully closed.....Pointer should be horizontal, pointin to left (9 o'clock).

Position of Tuner	Generator Frequency	Dummy Antenna	Generator Connection	Trimmer Adjustment	Trimmer Function
Open	455 KC	0.1 mfd.	pin 7 6BE6	T2 (top & bottom)	2nd I.F.
Open	455 KC	0.1 mfd.	pin 7 6BE6	T1 (top & bottom)	1st I.F.
Open	1610 KC	0.1 mfd.	pin 7 6BE6	C1C *(trimmer)*	Oscillator
1400 KC	1400 KC	Hazeltine test loop		C1B (trimmer)	R.F.
1400 KC	1400 KC	Hazeltine test loop		C1A (trimmer)	Antenna

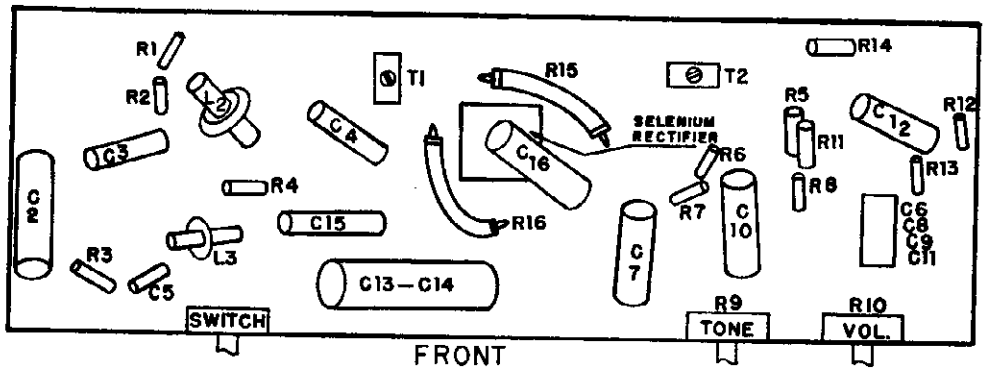
ALIGNMENT NOTES:

1. It is recommended that this set be connected to an isolation transformer when aligning on AC.
2. The alignment must be done in the order given above.
3. While making the above adjustments, keep the volume control set for maximum output and the signa generator output attenuated to avoid AVC action.

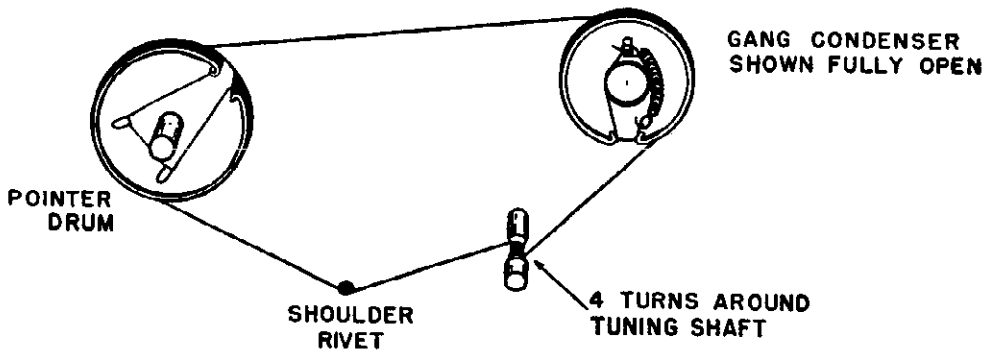
MODEL 1017,
Ch. 528.210



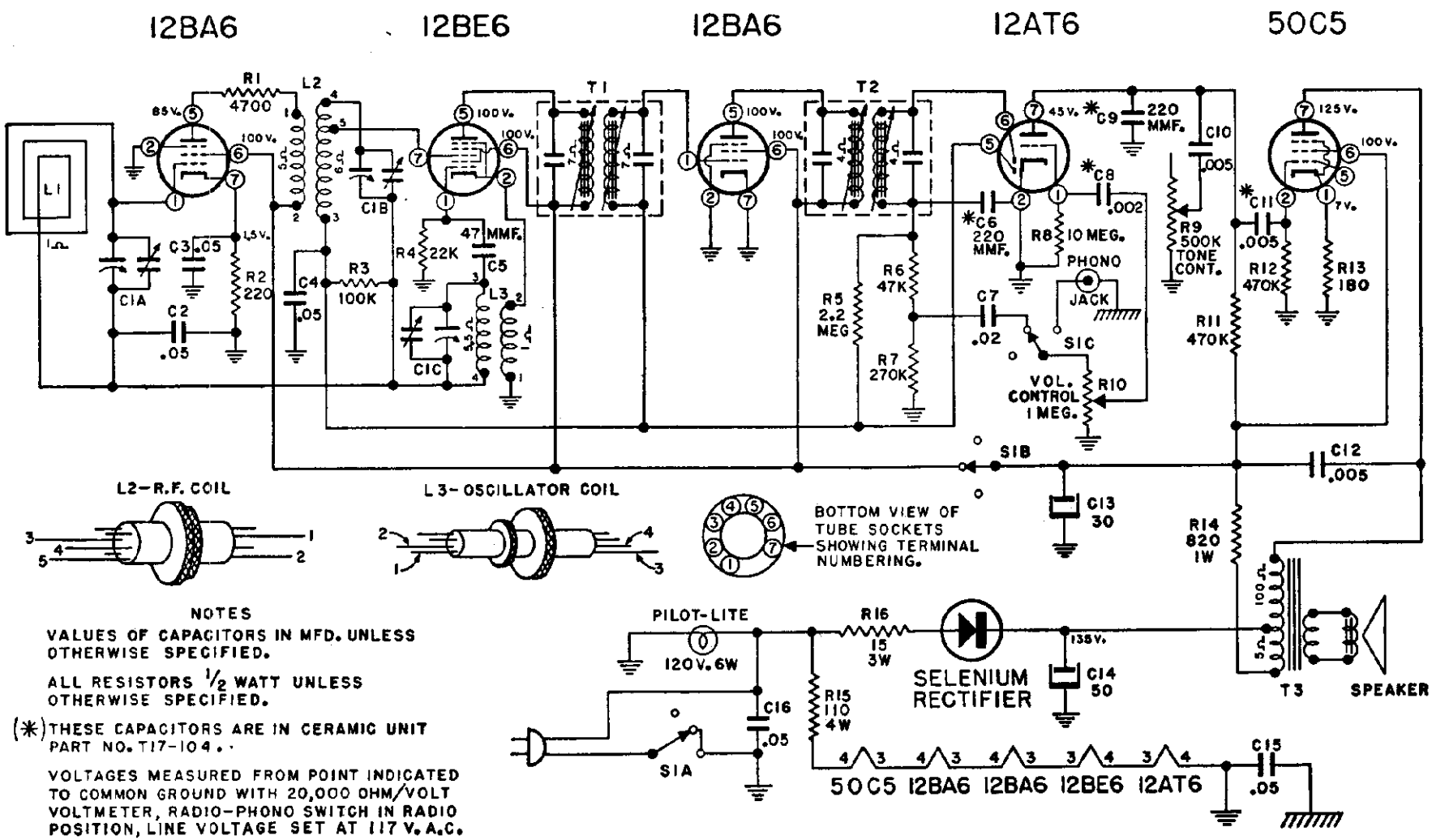
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW



DIAL STRINGING



NOTES

VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE SPECIFIED.

ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.

(*) THESE CAPACITORS ARE IN CERAMIC UNIT PART NO. T17-104.

VOLTAGES MEASURED FROM POINT INDICATED TO COMMON GROUND WITH 20,000 OHM/VOLT VOLTMETER, RADIO-PHONO SWITCH IN RADIO POSITION, LINE VOLTAGE SET AT 117 V. A.C.

HOW TO ORDER REPAIR PARTS

1. Use Correct Order Form.
2. On the Purchase Order always give the following information:
   (1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
   (2) The CHASSIS NUMBER, which is 528.210. This number is found on a metal plate at the rear of the chassis.

Schematic Location	Part Number	DESCRIPTION
	T83-713	Back, cabinet
	T44-20	Baffle, wood
	T72-56	Bushing, pulley
	T42-509	Cabinet
C1A, C1B, C1C	T19-215	Capacitor, variable (3 gang)
C2, C3, C4	T16-197	Capacitor, .05 mfd. 200 v.
C5	T15-229	Capacitor, 47 mfd. mica
C6, C8, C9, C11	T17-104	Capacitor, ceramic unit
C7	T16-150	Capacitor, .02 mfd. 400 v.
C10, C12	T16-190	Capacitor, .005 mfd. 600 v.
C13, C14	T18-304	Capacitor, electrolytic; 50-30 mfd. 150 v.
C15, C16	T16-189	Capacitor, .05 mfd. 400 v.
	T11-187	Clamp, power cord
	T83-421	Clip, IF transformer mounting
L2	T10-535	Coil, R.F.
L3	T10-573	Coil, oscillator
R9	T26-129	Control, TONE (500K)
R10	T24-199	Control, VOLUME (1 meg.)
	T23-151	Cord, power line
	T51-109	Cord, dial drive, approx. 18 in.
	T37-136	Cover, insulator (pilot lamp)
	T67-565	Dial scale, plate
	T98-23	Grille cloth, cabinet
	T98-24	Grille cloth, baffle
	T47-108	Grommet (gang mounting)
	T52-347	Knob, VOLUME
	T52-348	Knob, TONE
	T52-349	Knob, TUNING
	T52-350	Knob, OFF-RADIO-PHONO
	T88-321	Label, schematic, parts list, etc.
	T89-9	Lamp, pilot, 120 v. 6 w.
L1	T82-73	Loop, antenna
	T58-88	Pointer, lucite
	T39-290	Pulley, pointer drive
	T83-561	Rectifier, selenium (75 ma.)
R1	T60-759	Resistor, 4700 ohm, ½ w. 10%
R2	T60-753	Resistor, 220 ohm, ½ w. 10%

Schematic Location	Part Number	DESCRIPTION
R3	T60-727	Resistor, 100K ohm, ½ w.
R4	T60-659	Resistor, 22K ohm, ½ w.
R5	T60-726	Resistor, 2.2 megohm, ½ w.
R6	T60-730	Resistor, 47K ohm, ½ w.
R7	T60-747	Resistor, 270K ohm, ½ w. 10%
R8	T60-728	Resistor, 10 megohm, ½ w.
R11, R12	T60-731	Resistor, 470K ohm, ½ w.
R13	T60-774	Resistor, 180 ohm, ½ w. 10%
R14	T60-874	Resistor, 820 ohm, 1 w. 10%
R15	T60-876	Resistor, 110 ohm, 4 w. 10% wirewound
R16	T60-738	Resistor, 15 ohm, 3 w. 10% wirewound
	T74-195	Screw, #8-32 x 7/8 in. (chassis mounting)
	T74-266	Screw, #6-32 x 3/16 in. (fasten baffle to speaker)
	T74-176	Screw, #8-32 x 5/8 in. (dial plate mounting)
	T97-150	Screw, wood, #5 x 5/8 in. (back cover)
	T97-134	Screw, wood, #5 x 3/8 in. (pilot lamp cover)
	T75-85	Shaft, pointer and pulley
	T75-88	Shaft, tuning
	T71-54	Shield, pilot lamp
	T68-51	Socket, 7 pin, miniature
	T68-52	Socket, 7 pin, miniature, with tube shield
	T87-47	Socket, pilot lamp
	T22-133	Socket, phono
	T77-151	Spacer, gang mounting
	T79-394	Speaker, 5 in. x 7 in. P.M.
	T70-135	Spring, dial cord
S1A, S1B, S1C	T69-191	Switch, OFF-ON-RADIO-PHONO
T1	T10-521	Transformer, 1st I.F.
T2	T10-529	Transformer, 2nd I.F.
T3	T80-270	Transformer, output
	T86-51	Washer, "C", tuning shaft

SUPPLEMENT No. 1

Chassis 528.210-1 is the same as 528.210 except that an antenna coupling has been added to the loop.
The repair parts list for chassis 528.210-1 is the same as 528.210 except for the following changes:

Schematic Location	Part Number	DESCRIPTION
REMOVE:		
C1A, C1B, C1C	T19-215	Capacitor, variable (3 gang).....
L1	T82-73	Loop, antenna .....
L2	T10-535	Coil, R.F. .....
L3	T10-573	Coil, oscillator .....

ADD:		
C1, A, B&C	T19-217	Capacitor, variable (3 gang).....
	T83-517	Clip .....
L1	T82-78	Loop antenna .....
L2		(Part of Loop antenna)
L3	T10-535	Coil, R.F. .....
L4	T10-573	Coil, oscil'ator .....

Chassis 528.210-2 is the same as 528.210-1 except as follows:
The primary of L3 has been rewired so that Terminal No. 2 is now connected to Terminal No. 5 of the 12BA6 RF tube socket. R1 is connected between Terminal No. 1 of the RF coil and Terminal No. 6 of the 12BA6 socket.

The repair parts list for chassis 528.210-2 is the same as 528.210-1 except for the following change:

Part No. T60-759 (located on the schematic diagram at R1) Resistor, 4700 ohm, ½ w., 10% has been removed.

Part No. T60-786 (also located at R1 on the schematic diagram) Resistor, 6800 ohm, ½ w., 10% has been added.

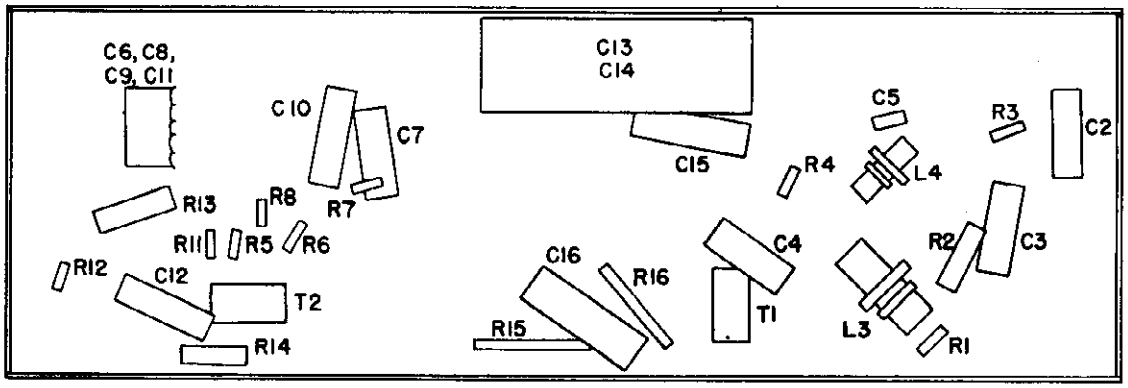
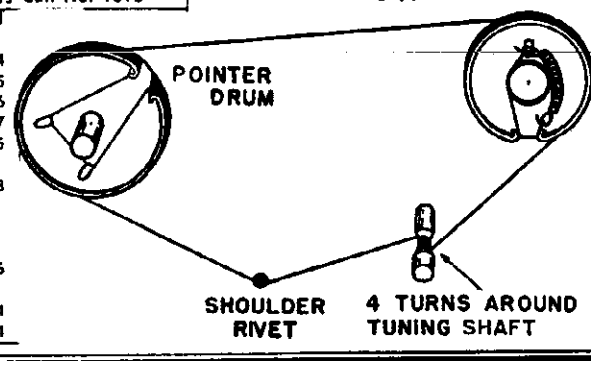


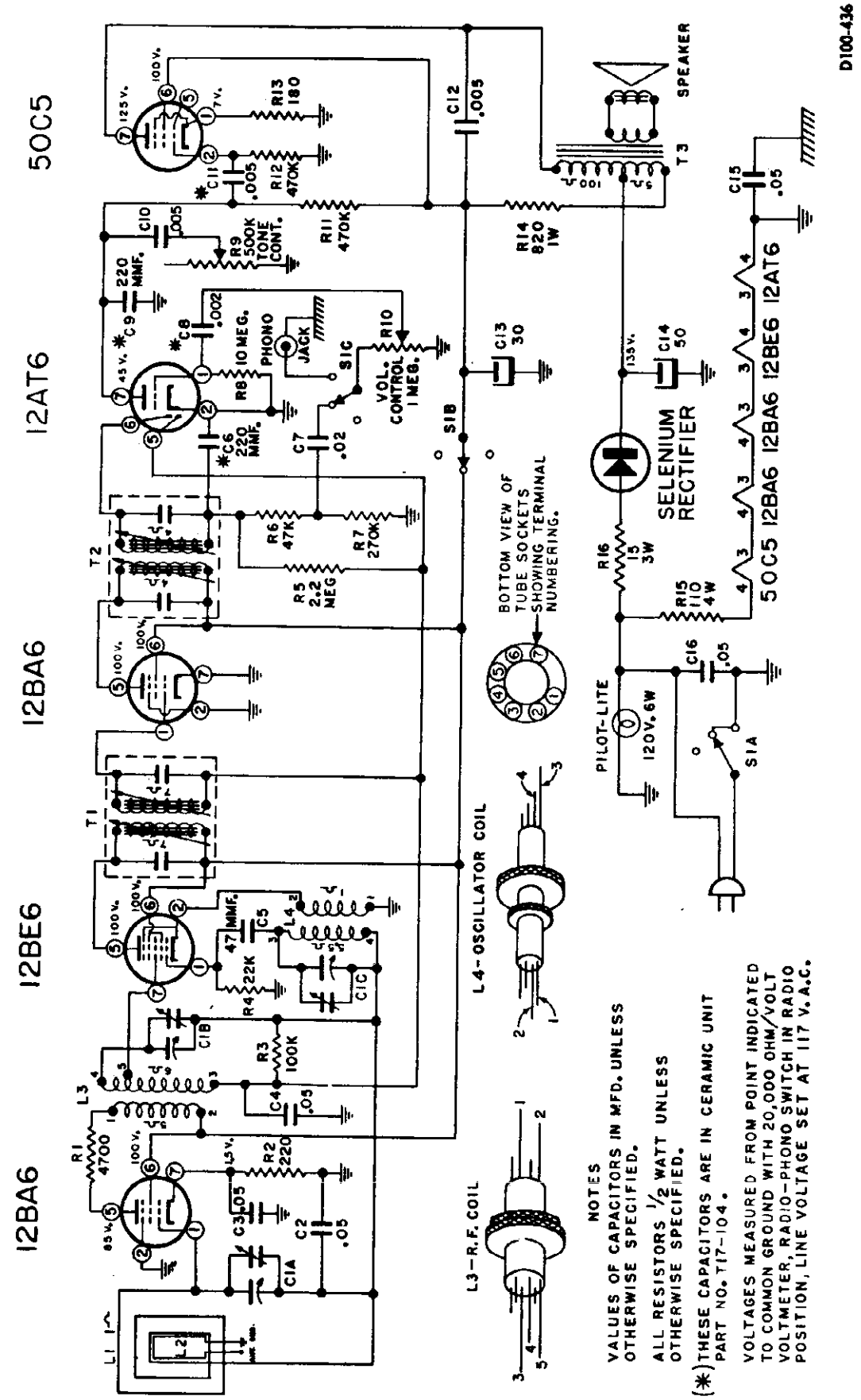
Fig. 1. Bottom View of Chassis 528.210-1 and Chassis 528.210-2

Complete cabinet lists for No. 1017 and 1018 follow.

PART NUMBER FOR MAHOGANY CABINET Sears Cat. No. 1017	DESCRIPTION	PART NUMBER FOR LIMED OAK CABINET Sears Cat. No. 1018
T42-509	Cabinet, wood, table	T42-521
T44-20	Baffle, wood	T44-20
T52-368	Knob—"Volume" control	T52-364
T52-369	Knob—"Tone" control	T52-365
T52-370	Knob—"Tuning" control	T52-366
T52-371	Knob—"Phono-Radio-Off" control	T52-367
T67-565	Dial Scale Plate	T67-565
T58-88	Pointer—Lucite	T58-88
T83-748	Back, cabinet	T83-748
T98-23	Grille cloth-cabinet	T98-32
T98-24	Grille cloth-speaker	T98-33
T71-57	Button, pointer	T71-57
T37-136	Cover, insulator, dial lamp	T37-136
T71-56	Shield, dial light	T71-56
T86-164	Washer, plate (cabinet base) (3)	T86-164
T97-134	Screw (6) No. 5x3/8 lg. bronze or blued	T97-134

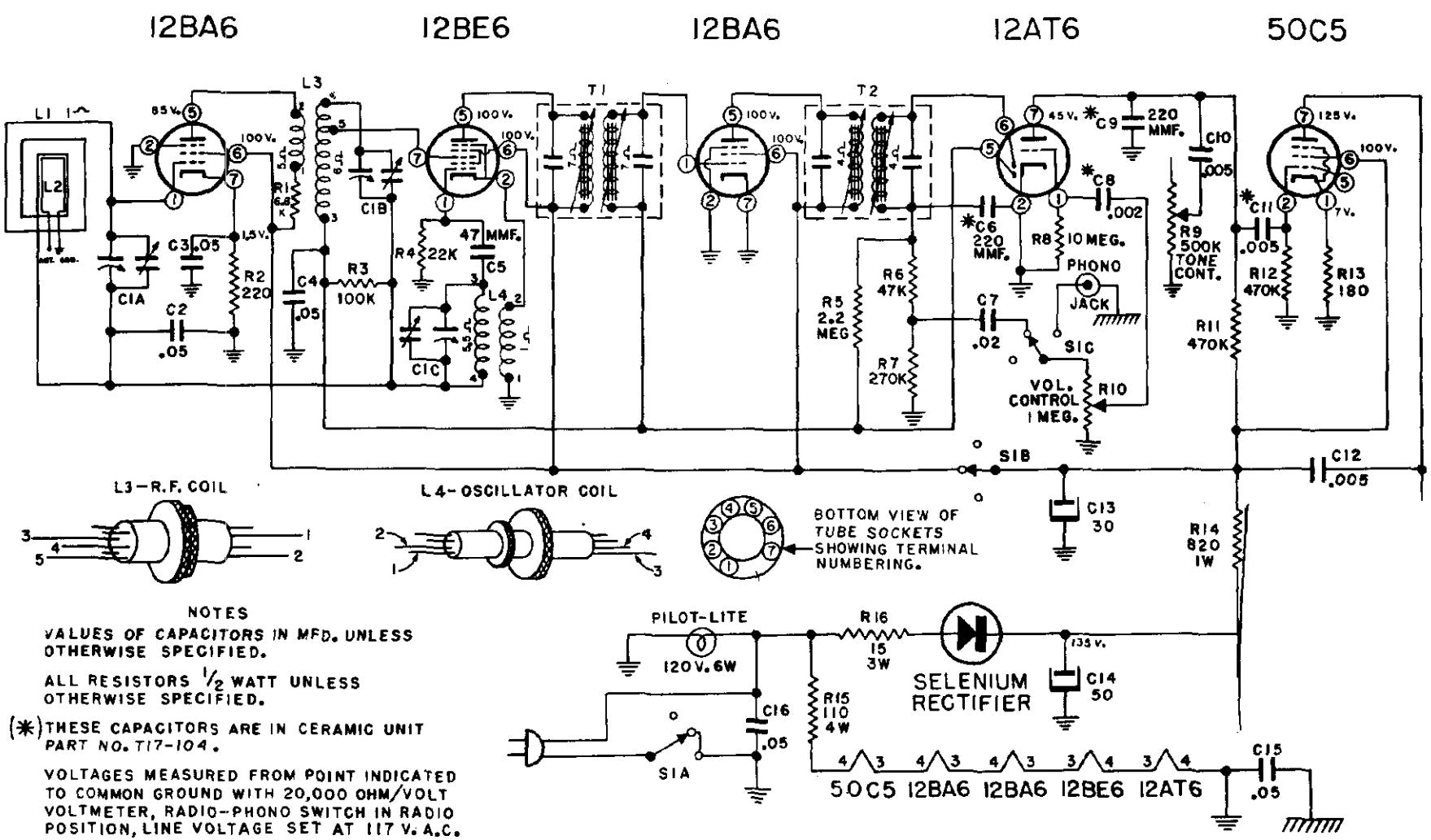


MODELS 1017, 1018,
Ch. 528.210-1



NOTES
VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.
(*) THESE CAPACITORS ARE IN CERAMIC UNIT PART NO. 117-104.
VOLTAGES MEASURED FROM POINT INDICATED TO COMMON GROUND WITH 20,000 OHM/VOLT VOLTMETER, RADIO-PHONO SWITCH IN RADIO POSITION, LINE VOLTAGE SET AT 117 V.A.C.

FIG. 3. SCHEMATIC DIAGRAM FOR CHASSIS 528.210-1



NOTES

VALUES OF CAPACITORS IN MFD. UNLESS OTHERWISE SPECIFIED.

ALL RESISTORS 1/2 WATT UNLESS OTHERWISE SPECIFIED.

(*) THESE CAPACITORS ARE IN CERAMIC UNIT PART NO. T17-104.

VOLTAGES MEASURED FROM POINT INDICATED TO COMMON GROUND WITH 20,000 OHM/VOLT VOLTMETER, RADIO-PHONO SWITCH IN RADIO POSITION, LINE VOLTAGE SET AT 117 V. A.C.

FIG. 4. SCHEMATIC DIAGRAM FOR CHASSIS 528.210-2

D100-575

MODELS 3001, 3002, Ch. 132.054

Power Supply
105-125 Volts
Frequency Range
Broadcast 540-1600

Power Output
Undistorted 0.8 Watts
Maximum 1.5 Watts

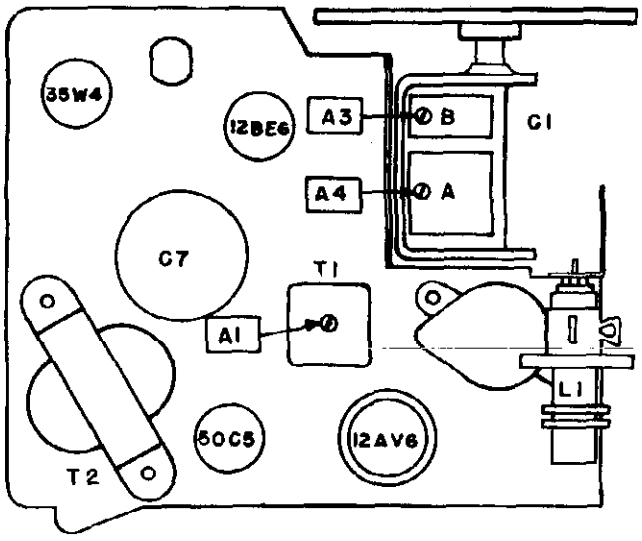
Speaker Voice Coil Impedance 3.2 ohms

Tuning range _____ diate frequency -455 Kc. Measurements at 500 milliwatts output - approximately 1.26 volt on a rectifier type voltmeter connected across the voice coil. Dummy load for I-F. .05 ufd capacitor in series with generator lead. For R-F, 50 uufd capacitor in series with generator lead. Connect generator ground to receiver floating ground.

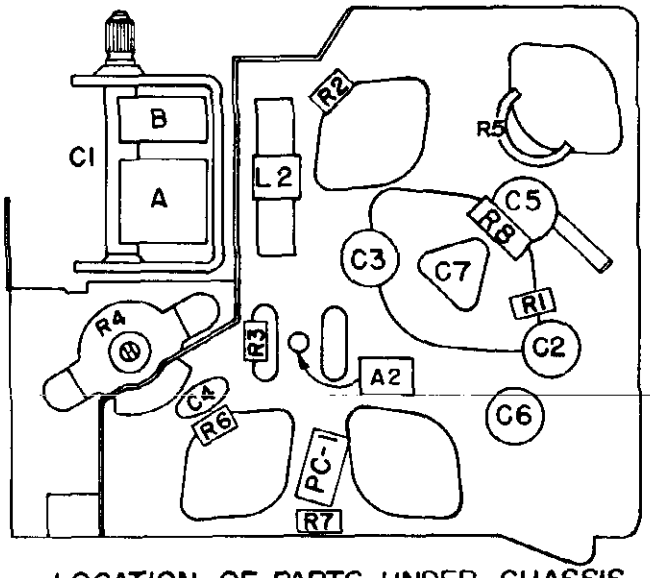
ALIGNMENT DATA

Position of Variable	Frequency of Generator	Dummy Antenna	Generator Output Lead	Adjust Trimmer For Maximum	Trimmer Function
Open	455 Kc.	.05 uf	Pin 7 of 12BE6	A1, A2	I. F.
Open	1720 Kc.	50 uuf	Ant. Coil*	A3	Oscillator
1400 Kc.**	1400 Kc.	50 uuf	Ant. Coil*	A4	Antenna
600 Kc.	600 Kc.	50 uuf	Ant. Coil*	Antenna Section Plate	Check Point

NOTES: * Disconnect hank during alignment.
** "A Rocking In" type of tuning is necessary while adjusting A3. (See RL 562).
Approximate inputs for 500 MW output: I-F, 300 uv. R-F at 1400 Kc., 780 uv, at 1000 Kc., 960 uv. at 600 Kc., 1380 uv.
CAUTION: Remove the electric or power cord from the wall of floor outlet before replacing tubes, removing, adjusting, or cleaning the chassis, or while connecting an antenna.

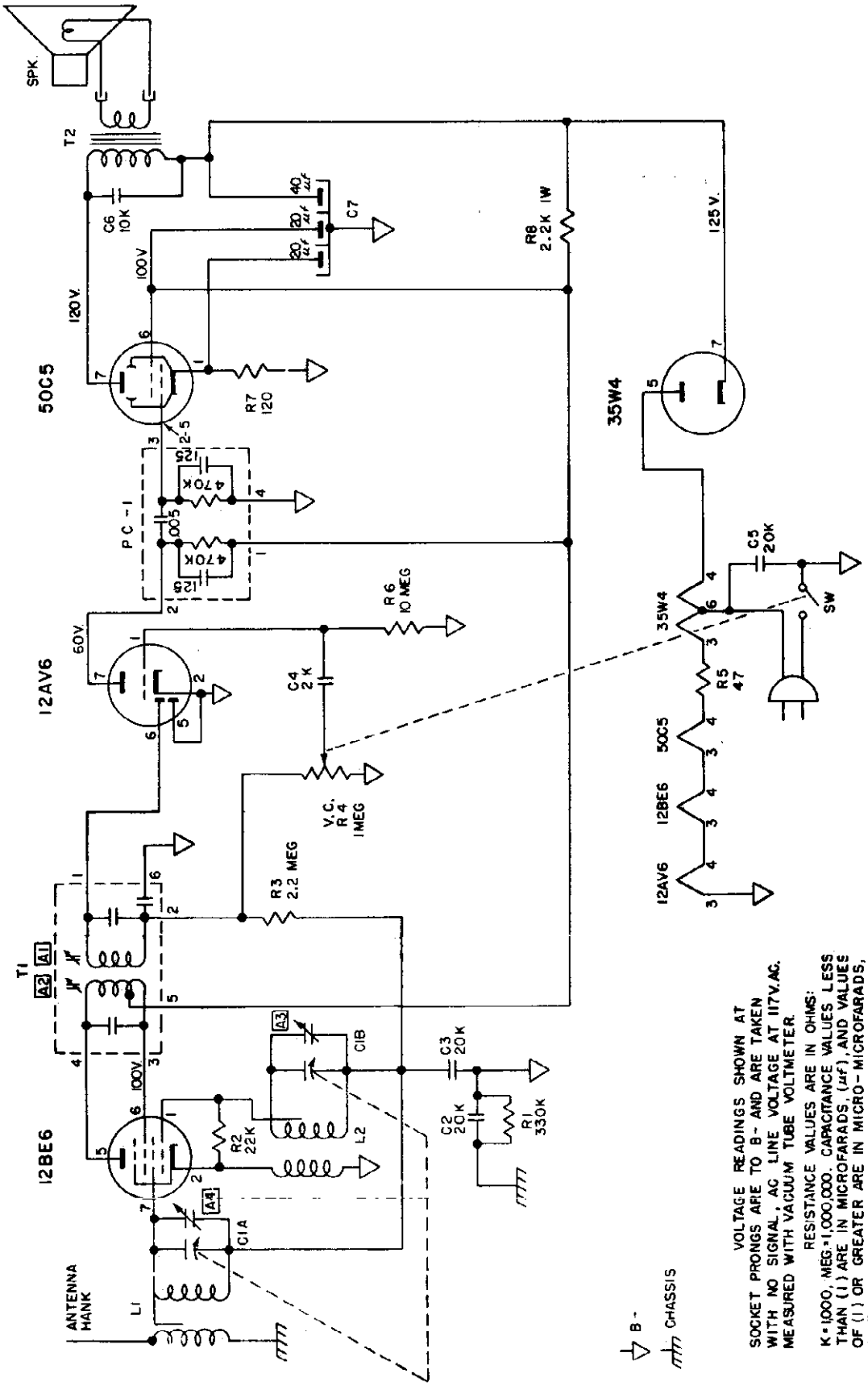


TUBE LAYOUT



LOCATION OF PARTS UNDER CHASSIS

MODELS 3001,
3002, Ch. 132.05



MODELS 3001,
3002, Ch. 132.054

HOW TO ORDER PARTS

1. Use Correct Order Form.
2. On the Purchase Order, always give the following information.
   (1) PART NUMBER (number printed on the part if different from that shown in this list) and DESCRIPTION for each part ordered. When no part number is assigned, order by description and rating. Also give PRICE of part (indicate if no selling).
   (2) THE CHASSIS NUMBER, which is 132.054 . This number is found on a metal plate at the rear of the chassis.

PARTS LIST

Schematic Location	Part No.	Description	List
		Capacitors	
C1A, B	N41089	Capacitor, Variable	2.85
C2, C3, C5		Capacitor, Disc. .02 uf	.23
C4		Capacitor, Disc. .002 uf	.23
C6		Capacitor, Disc. .01 uf	.23
C7	N41102	Capacitor, Electrolytic 40-20 uf 150V, 20 uf, 25V.	2.30
		Resistors	
R1		Resistor, 330K ohm, 1/2W, 20%	.15
R2		Resistor, 22000 ohm, 1/2W, 20%	.15
R3		Resistor, 2.2 meg., 1/2W, 20%	.15
R5		Resistor, 47 ohm, 1W, 10%	.15
R6		Resistor, 10 meg, 1/2W, 20%	.15
R7		Resistor, 120 ohm, 1/2W 10%	.15
R8		Resistor, 2200 ohm, 1W, 10%	.15
		Chokes, Coils & Transformers	
L1	N22864-1	Coil, Antenna Assy.	1.00
L2	N41106-1	Coil, Oscillator Assy.	.50
T1	N41168-2	Coil, I.F. Assy.	1.55
T2	N41119-1	Transformer, Output Assy.	1.30
		Miscellaneous	
PC-1	N25264	Printed Circuit(Centralab PC 70)	.57
	N41223-1	Grill Backing Assy.	.85
	N41110	Leaflet, Instruction	.20
	N22875	Speaker 4" P.M.	3.08
	N25781-1	Silvertone Name Plate	.43
R4	N41022	Volume Control 1 meg.	1.15
	N41519-1	Cabinet (Brown)	2.85
	N41519-2	Cabinet (Ivory)	3.25
	N41087-1	Knob, Volume (Ivory 3001)	.15
	N41087-2	Knob, Volume (Red 3002)	.15
	N41095-1	Knob, Dial (Ivory 3001)	.43
	N41095-2	Knob, Dial (Red 3002)	.43

POWER SUPPLY

THIS RADIO CAN BE OPERATED ON EITHER:

110 to 120 VOLTS DIRECT CURRENT
OR
110 to 120 VOLTS, 50 to 60 CYCLE, ALTERNATING CURRENT
OR
BATTERIES—WITH ONE 4½ VOLT "A" and ONE 90 VOLT "B"

LOOP AERIAL

This radio has a built-in rod antenna. Rod antennas are directional, therefore the volume of a weak station may be improved, or electrical noise may be reduced, by lifting and turning the radio to a different position after the station is tuned in. A trial will reveal position of best reception.

INSTALLATION OF REQUIRED BATTERIES

Diagram shows proper location and connections of the following required types of batteries:

One 4½ Volt "A" Battery, such as Eveready 746A, or Ray-O-Vac P83A or Eveready No. 736A, or equivalent.

One 90 Volt "B" Battery, such as Eveready Type No. 490B or equivalent.

TO INSTALL BATTERIES, GENTLY OPEN CABINET BACK AND CONNECT AND PLACE BATTERIES IN EXACT POSITION SHOWN ON THE DIAGRAM, THEN CLOSE BACK. BE CAREFUL NOT TO INJURE ANY OF THE EXPOSED RADIO PARTS.

BATTERY OPERATION

(A) Open cabinet back.

(B) Insert plug on end of radio line cord into the AC-DC receptacle as shown on the above diagram.

(C) Be sure to fold excess line cord and place on top and to the right of the receptacle before closing back.

ELECTRIC OPERATION

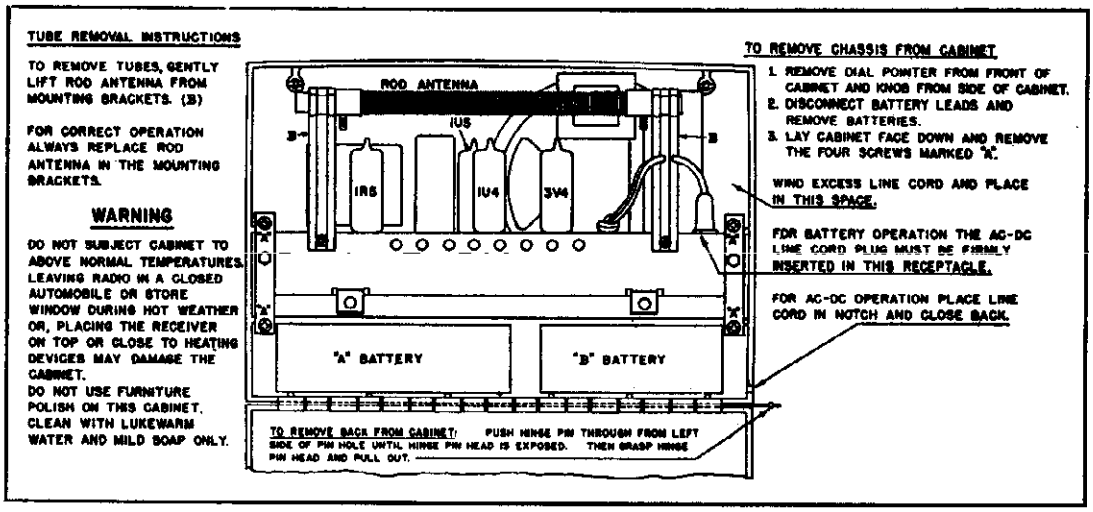
To operate the receiver on 110 to 120 Volt Direct Current, or 110 to 120 Volt, 50 to 60 cycle Alternating Current:

(A) Open cabinet back and take line cord out.

(B) Place the cord in notch in cabinet, CLOSE BACK, and insert plug into 110 to 120 Volt AC or DC electric power outlet.

SPECIAL INSTRUCTIONS FOR "DIRECT CURRENT" OPERATION

If the current supply is DIRECT CURRENT, and the radio does not play after it has been turned on for approximately one minute, simply reverse radio power cord plug in electric power receptacle.



ALIGNMENT PROCEDURE

Be sure to follow procedure carefully and in the order given—otherwise the receiver will be insensitive and the dial calibration incorrect. For alignment procedure, read tabulations from left to right. Make the adjustment marked (1) first, (2) next, (3) third.

IF RADIO HAS METAL PLATE ON BOTTOM OF CHASSIS BE SURE TO HAVE PLATE MOUNTED ON CHASSIS WHEN ALIGNING SET IN STEPS 2 AND 3.

Before starting alignment:

(A) Use an accurately calibrated test oscillator with some type of output measuring device.

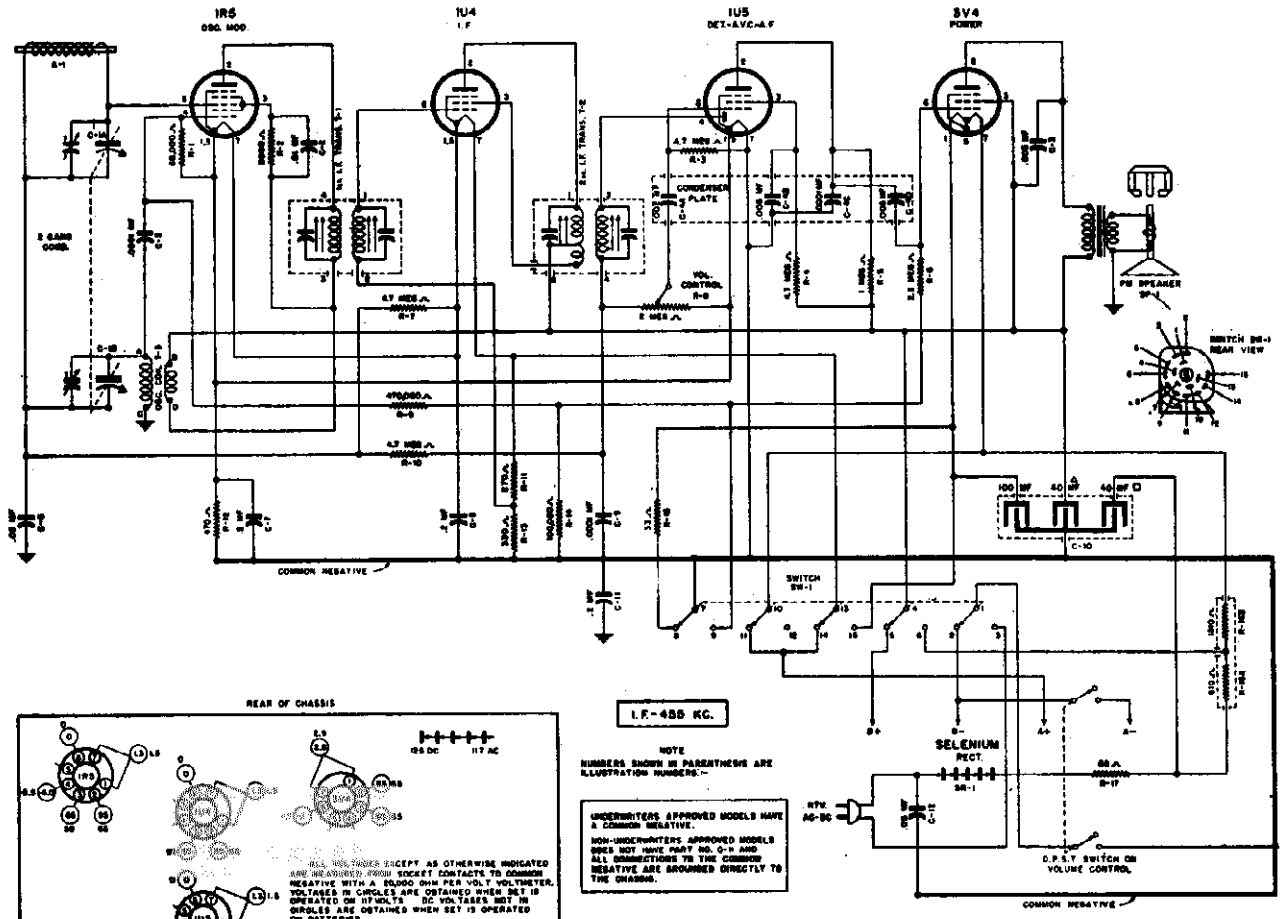
(B) WHEN ADJUSTING THE 1660 KC OSCILLATOR TRIMMER connect the high side of the test oscillator to the connection on the antenna rod closest to the tuning condenser. Connect the low side of the test oscillator to common negative.

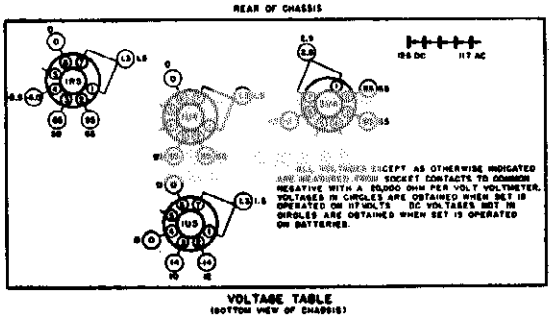
(C) THE 1400 KC ANTENNA TRIMMER should be adjusted only after all other adjustments have been made. When aligning the 1400 KC Antenna Trimmer, couple test oscillator to receiver by: (1) make loop consisting of five to ten turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio antenna. BE SURE THAT NEITHER LOOP NOR ANTENNA MOVES WHILE ALIGNING.

IMPORTANT: WHEN ADJUSTING THE I.F. TRIMMERS USE A THIN NON-METALLIC SCREWDRIVER.

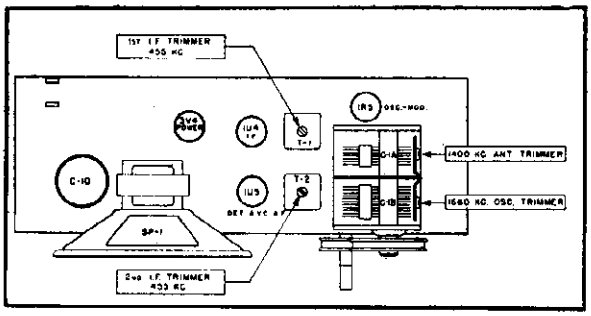
Steps	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to	
1	Any point where no interfering signal is received	Exactly 455 K. C.	0.2 Mfd. Condenser	High side to connection on antenna rod closest to the tuning condenser. Low side to common negative through a .02 MFD blocking condenser.	Adjust each of the 2nd I.F. transformer trimmer adjustment screws for maximum output, then adjust each of the 1st I.F. transformer trimmer adjustment screws for maximum output.
2	Rotate gang condenser to minimum capacity	Exactly 1660 K. C.	See paragraph (B) above	See paragraph (B) above	Adjust 1660 K. C. oscillator trimmer for maximum output.
3	Approximately 1400 K. C.	Approx. 1400 K. C.	See paragraph (C) above	See paragraph (C) above	Adjust 1400 K. C. antenna trimmer for maximum output.

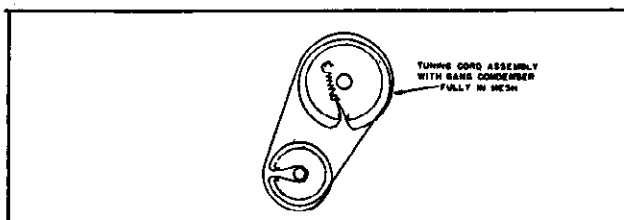
MODELS 345P
1U-345P

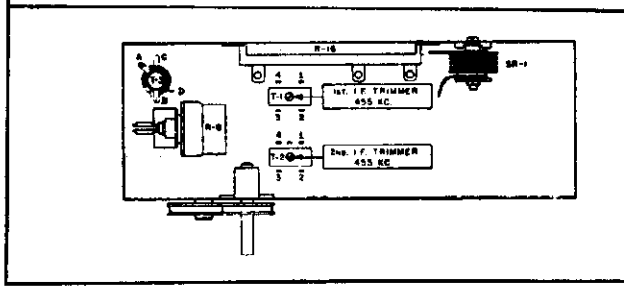




VOLTAGE TABLE
(BOTTOM VIEW OF CHASSIS)







WARNING—neglected batteries may damage the radio—remove batteries from cabinet if your radio is operated on AC or DC current exclusively or if the radio is to stand unused for a long period of time.

IMPORTANT— do not leave run-down batteries in your radio. Remove them immediately.

CAPACITORS

Illus. No.	Part No.	DESCRIPTION	List Price
C-1A, C-1B	24E59	Variable (2 Gang)	$2.81
C-2	23E2025-4	Fixed Ceramic, .01 MFD (Disc)	.24
C-3	23E2025	Fixed Ceramic, .005 MFD (Disc)	.31
C-4A, C-4B, C-4C, C-4D	23E2024	Ceramic Capacitor Plate	.75
C-5	23E24	Fixed Ceramic, .0001 MFD	.21
C-6	23E216	Tubular, .05 MFD 200 V.	.24
C-7	23E220	Tubular, .2 MFD 200 V.	.40
C-8	23E220	Tubular, .2 MFD 200 V.	.40
C-9	23E24	Fixed Ceramic, .0001 MFD	.21
C-10	25E29	Dry Electrolytic, 40-40 MFD, 150 V., 100 MFD, 10 V.	2.07
C-11	23E2021	Tubular, .2 MFD 400 V. (1U Models Only)	.35
C-12	23E416	Tubular, .05 MFD 400 V.	.28

RESISTORS

Illus. No.	Part No.	DESCRIPTION	List Price
R-1	27E683	Carbon, 68,000 Ohm 1/3 W.	.08
R-2	27E682	Carbon, 6800 Ohm 1/3 W.	.08
R-3	27E475	Carbon, 4.7 Megohm 1/3 W.	.07
R-4	27E475	Carbon, 4.7 Megohm 1/3 W.	.07
R-5	27E105	Carbon, 1 Megohm 1/3 W.	.07
R-6	27E225	Carbon, 2.2 Megohm 1/3 W.	.08
R-7	27E475	Carbon, 4.7 Megohm 1/3 W.	.07
R-8	28E83	Control, Volume with D.P.S.T. Switch, 2 Megohm	1.32
R-9	27E474	Carbon, 470,000 Ohm 1/3 W.	.09
R-10	27E475	Carbon, 4.7 Megohm 1/3 W.	.07
R-11	27E271	Carbon, 270 Ohm 1/3 W.	.09
R-12	27E471	Carbon, 470 Ohm 1/3 W.	.09
R-13	27E331	Carbon, 330 Ohm 1/3 W.	.09
R-14	27E104	Carbon, 100,000 Ohm 1/3 W.	.07
R-15	27E330-2	Carbon, 33 Ohm 1/2 W.	.08
R-16A, R-16B	27E1005	Wire Wound, 1810 and 610 Ohms 8 W.	1.04
R-17	27E680-3	Carbon, 68 Ohm 1 W.	.08

COILS AND TRANSFORMERS

Illus. No.	Part No.	DESCRIPTION	List Price
T-1	20E742	1st I.F. Transformer	1.67
T-2	20E743	2nd I.F. Transformer	1.89
T-3	20E744	Coil, Oscillator	.93

IMPORTANT: When ordering complete cabinet, or cabinet parts, BE SURE TO MENTION REQUIRED COLOR in addition to proper part number.

MISCELLANEOUS PARTS

Illus. No.	Part No.	DESCRIPTION	List Price
A-1	64E36	Antenna	2.01
Sp-1	1E29-2	Speaker P.M.	8.07
SR-1	57E14	Selenium Rectifier	2.10
SW-1	29E20	Switch, Change-Over	1.27
	20E747	Complete Cabinet Assembly with Handle and Cabinet Back, Walnut	12.16
	20E748	Cabinet Front Assembly With Handle (Walnut)	8.70
	7E314	Cabinet Back, Walnut	2.19
	52E89	Cabinet Handle, Walnut	.30
	37E73-3	Volume Knob, Walnut	.10
	20E747-2	Complete Cabinet Assembly with Handle and Cabinet Back, Green	12.16
	20E748-2	Cabinet Front Assembly with Handle, Green	8.70
	7E314-2	Cabinet Back, Green	2.19
	52E89-2	Cabinet Handle, Green	.30
	37E73-4	Volume Knob, Green	.10
	20E747-3	Complete Cabinet Assembly with Handle and Back, Ivory	12.16
	20E748-3	Cabinet Front Assembly with Handle, Ivory	8.70
	7E314-3	Cabinet Back, Ivory	2.19
	52E89-3	Cabinet Handle, Black	.30
	37E73-5	Volume Knob, Ivory	.10
	20E747-4	Complete Cabinet Assembly with Handle and Back, Maroon	12.16
	20E748-4	Cabinet Front Assembly with Handle, Maroon	8.70
	7E314-4	Cabinet Back, Maroon	2.19
	52E89-4	Cabinet Handle, Maroon	.30
	37E73-6	Volume Knob, Maroon	.10
	20E747-5	Complete Cabinet Assembly with Handle and Back, Black	13.49
	20E748-5	Cabinet Front Assembly with Handle, Black	9.22
	7E314-5	Cabinet Back, Black	2.70
	52E89-3	Cabinet Handle, Black	.30
	37E73-7	Volume Knob, Black	.10
	20E747-6	Complete Cabinet Assembly with Handle and Back, Yellow	13.49
	20E748-6	Cabinet Front Assembly with Handle, Yellow	9.22
	7E314-6	Cabinet Back, Yellow	2.70
	52E89-3	Cabinet Handle, Black	.30
	37E73-8	Volume Knob, Yellow	.10
	35E33	Dial Indicator Knob	1.05
	20E741	Dial Drive Shaft Assembly	.40
	20E745	Dial Drive Cord Assembly	.16
	65E2	Dial Drive Cord Tension Spring	.06
	41E4	Line Cord with Plug	.58
	20E249	B— Battery Connector	.35
	20E249-2	B+ Battery Connector	.35
	20E340-3	A Battery Connector	.23
	13E103-20	Cabinet Back Catch	2.79 /c
	15E239	Handle Bracket	.78
	46E21	Chassis Mounting Strap	.05
	47E13-3	Hinge Pin	.07
	55E60	Strap for Handle	.13
	15E238	Antenna Mtg. Bracket	.51

VOLTAGE RATING

THIS RADIO IS DESIGNED FOR USE ON EITHER:
110-120 VOLTS 50-60 CYCLES ALTERNATING CURRENT (AC)
OR
110-120 VOLTS DIRECT CURRENT (DC)

SPECIAL INSTRUCTIONS FOR "DIRECT CURRENT" OPERATION:

If the current supply is DIRECT CURRENT, and the radio does not play after it has been turned on for approximately one minute, simply reverse radio power cord plug in electric power receptacle.

LOOP AERIAL

THE LOOP AERIAL SUPPLIED with the radio should provide ample reception in average locations.

Loop aerials are directional—the volume of a weak station may be improved, or undesired electrical noise may be reduced, by lifting and turning the radio to a different position. A trial will reveal position of best reception with least interference.

FUNCTION OF CONTROLS ON RADIO

THE LEFT HAND KNOB controls the volume control and off-and-on switch.

THE RIGHT HAND KNOB is the station selector.

OPERATING INSTRUCTIONS

PLACE VOLUME CONTROL KNOB IN one-half to maximum volume position.

TURN TUNING CONTROL KNOB until the desired station is heard with greatest volume and clearest tone.

ALIGNMENT PROCEDURE

For alignment procedure read tabulations from left to right, and make the adjustment marked (1) first, (2) next, (3) third.

Before starting alignment:

(A) Check tuning dial adjustment by tuning gang condenser until plates touch maximum capacity stop (completely in mesh) at which point the dial needle must be exactly even with the last line at the low frequency end of the dial calibration. If dial needle does not point exactly to last line move to correct position.

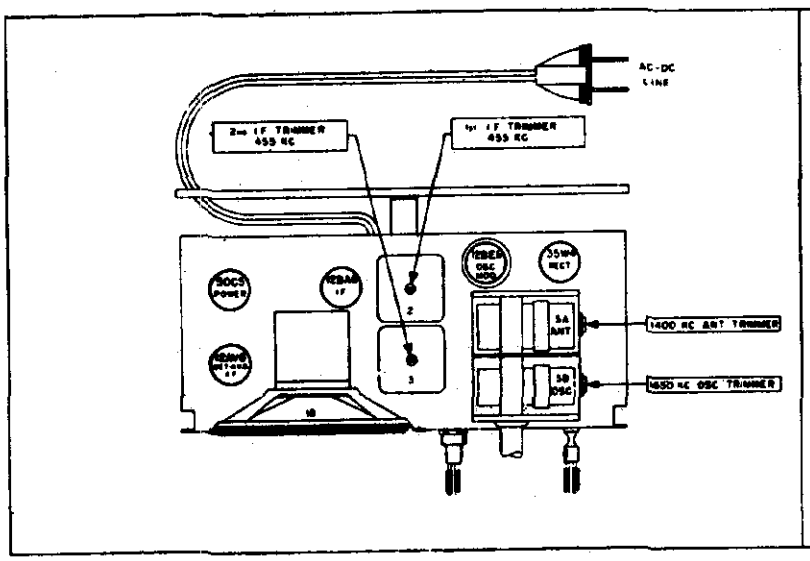
(B) Use an accurately calibrated test oscillator with some type of output measuring device.

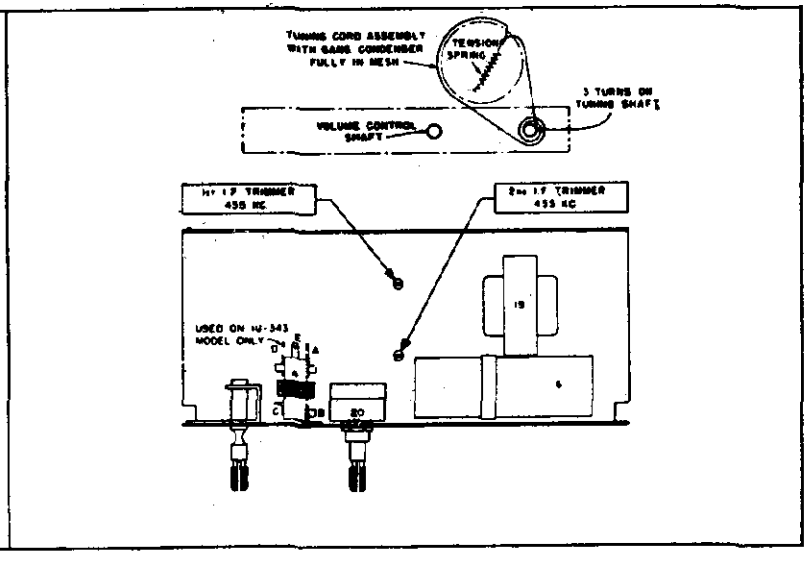
(C) WHEN ADJUSTING THE 1650 KC OSCILLATOR TRIMMER, remove chassis from cabinet and disconnect the loop connection wires from the loop. Attach a 1 megohm resistor across these connections and feed output of test oscillator across the 1 megohm resistor.

(D) THE 1400 KC LOOP ANTENNA TRIMMER should be adjusted only after all other adjustments have been made. PLACE LOOP ANTENNA IN THE SAME POSITION IT WILL BE IN WHEN THE SET IS IN THE CABINET — APPROXIMATELY ⅝" SPACE BETWEEN LOOP AND CHASSIS.

When aligning the 1400 KC Antenna Trimmer, couple test oscillator to receiver loop by: (1) make loop consisting of five to ten turns of No. 20 to No. 30 size wire, wound on a 2" or 3" form; (2) connect this loop across output of test oscillator; (3) place test oscillator loop near radio loop. BE SURE THAT NEITHER LOOP MOVES WHILE ALIGNING.

Steps	Set receiver dial to:	TEST OSCILLATOR			Refer to parts layout diagram for location of trimmers mentioned below:
		Adjust test oscillator frequency to:	Use dummy antenna in series with output of test oscillator consisting of:	Attach output of test oscillator to:	
1	Any point where no interfering signal is received.	455 K. C.	.02 MFD. condenser	High side to rear stator plates of tuning condenser. Low side to common negative on 1U343 or to frame of condenser on 343, through a .02 Mfd. blocking condenser.	Adjust each of the second I.F. transformer trimmers for maximum output—then adjust each of the first I.F. trimmers for maximum output.
2	Exactly 1650 K. C.	Exactly 1650 K. C.	See *paragraph* (C) above	See paragraph (C) above	Adjust 1650 K. C. oscillator trimmer for maximum output.
3	Approx. 1400 K. C.	Approx. 1400 K. C.	See paragraph (D) above	See paragraph (D) above	Adjust 1400 K. C. antenna trimmer for maximum output.





TO SERVICE TUBES, it is necessary to remove the cabinet back, and detach the two leads from the loop.

Before remounting the back on the cabinet, be sure to properly reconnect these leads. The green-white wire must be attached to the terminal which has the word "GREEN" printed close to it.

TO REMOVE CHASSIS FROM CABINET:

(A) Remove cabinet back.
(B) Unscrew the two screws holding the chassis to the rear of the cabinet.
(C) Remove pointer by gently pulling it away from cabinet.
(D) Pull knobs off of control shafts.
(E) Unscrew and remove hex nut on volume control shaft—accessible when knob is removed.
(F) Slide Chassis out of cabinet.

TO REINSTALL, reverse the above procedure. DO NOT tighten nut too much—otherwise, cabinet may crack.

PARTS LIST

Illus. No.	Part No.	Part Name	Description	List Price
1	7E304	Antenna	Loop and cabinet back	$1.10
2	20E732	Coil	1st I. F. Transformer	1.75
3	20E732	Coil	2nd I. F. Transformer	1.75
4	20E767	Coil	Oscillator	1.08
	OR			
4	20E772	Coil	Oscillator (used in 1U343 only)	
5	24E45	Condenser	Two Gang, Tuning	3.05
6	24E24	Condenser	Dry Electrolytic, 50-50 Mfd. 150 Volt	1.09
7	23E2041-2	Condenser	Ceramic, Coupling Plate	.92
8	23E2027	Condenser	Ceramic, .00025 Mfd. 500 V.	.29
9	23E411	Condenser	Tubular, .01 Mfd. 400 V.	.21
10	23E211	Condenser	Tubular, .01 Mfd. 200 V.	.24
11	23E216	Condenser	Tubular, .05 Mfd. 200 V.	.24
12	23E416	Condenser	Tubular, .05 Mfd. 400 V.	.28
13	27E151	Resistor	Carbon, 150 Ohm, 1/3 W.	.09
14	27E222-5	Resistor	Carbon, 2200 Ohm, 2 W.	.21
15	27E223	Resistor	Carbon, 22,000 Ohm, 1/3 W.	.09
16	27E335	Resistor	Carbon, 3.3 Megohm, 1/3 W.	.08
17	27E335	Resistor	Carbon, 3.3 Megohm, 1/3 W.	.08
18	1E32	Speaker	3½" P.M.	4.31
19	22E49	Transformer	Output	1.15
20	28E27	Volume Control	500,000 Ohm, with Switch	1.09
21	23E2027	Condenser	Ceramic, .00025 Mfd. 500 V. (used in 1U343 only)	.29
22	27E105	Resistor	Carbon, 1 Megohm, 1/3 W. (used in 1U343 only)	.07
23	23E2021	Condenser	Tubular, .2 Mfd. 400 V. (used in 1U343 only)	.35

IMPORTANT: When ordering complete cabinet or cabinet parts, be sure to mention required color in addition to part number.

MISCELLANEOUS PARTS

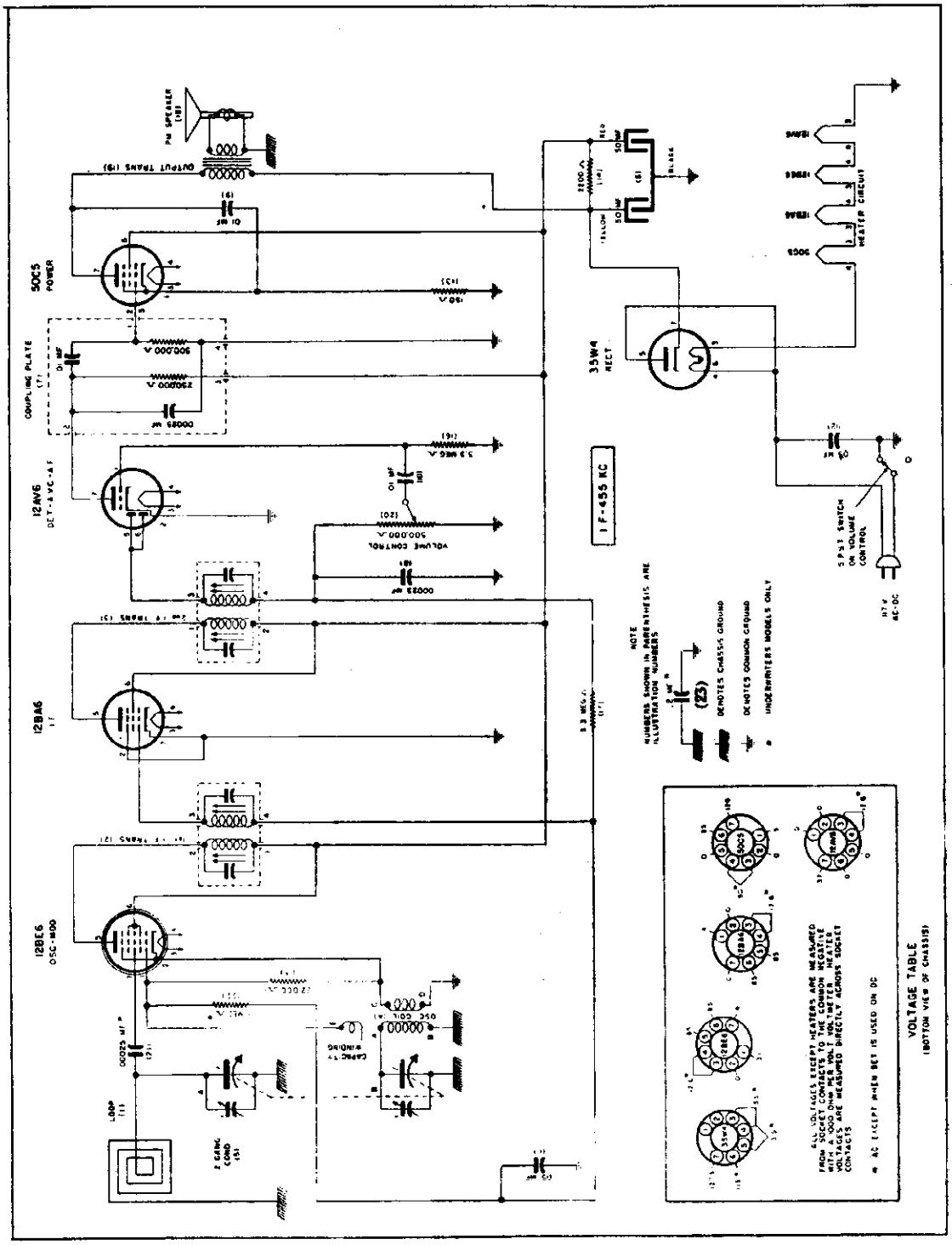
Part No.	Part Name	Description	List Price
7E302-2	Cabinet	Walnut Plastic	$5.40
7E302-3	Cabinet	Ivory Plastic	7.40
7E302-4	Cabinet	Red Plastic	6.20
41E13	Line Cord	5 Ft. Rubber Line Cord	.46
20E253-25	Dial Cord	Dial Drive Cord	.17
20E348-3	Dial Shaft Assembly	Dial Drive Shaft with Bracket	.58
35E31-2	Dial Pointer	Dial Indicator for Walnut Cabinet	.63
35E31-3	Dial Pointer	Dial Indicator for Ivory Cabinet	.63
35E31-4	Dial Pointer	Dial Indicator for Red Cabinet	.66
33E99	Pointer Insulator	Plastic, used to mount and insulate Pointer from Chassis	.84
13E103-8	Pointer Tension Clip	Tension Spring for 33E99 Pointer Insulator	2.84/C
65E2	Dial Spring	Tension Spring for Dial Cord	.06
37E75	Knob	For Walnut Cabinet	.11
37E75-2	Knob	For Ivory and Red Cabinet	.11
7E303	Baffle	Baffle Assembly with Grille Cloth	.64
19E34	Nut	Hex Head, used to hold Chassis to Cabinet	.18

Above Prices Effective 6-1-52

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

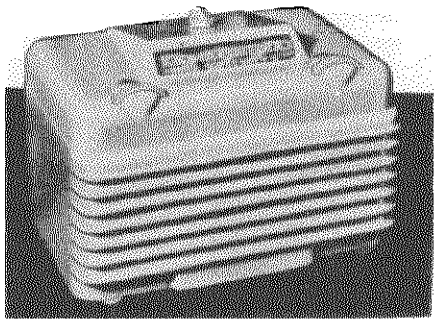
Printed 6-52

MODELS 343, 1U-343



NOTE 1: Connected as shown in Model 1U343 only. Loop return connected to A.V.C. at point X in Model 343.

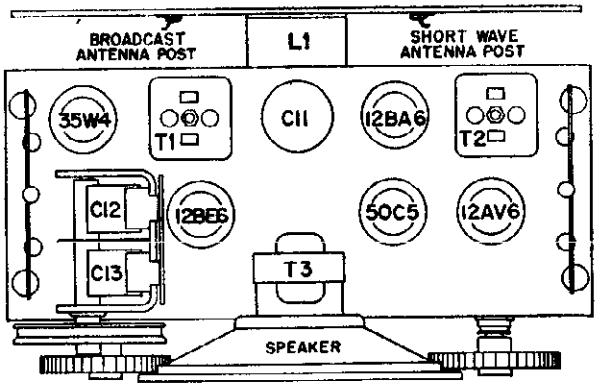
NOTE 2: Items with illustration numbers (21), (22) and (23) used in 1U343 only. Loop and gang connected directly to pin #7 on 12BE6 in Model 343.



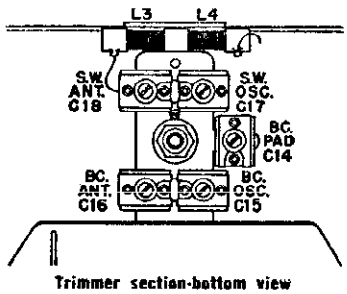
SPECIFICATIONS:

- Cabinet colors: Ivory and Walnut
- Short wave: 6-20 Megacycles
- Standard Broadcast: 535-1650 Kilocycles
- 115 Volt AC DC
- Full 5" P.M. Dynamic Speaker
- Improved filtering for hum-free reception (Equipped with sealed "long life" filter condenser)
- Automatic volume control
- Large built-in loop antenna
- External Antenna connections
- Tubes: 1-12BE6, 1-12BA6, 1-12AV6, 1-50C5
- 1-35W4 Rectifier

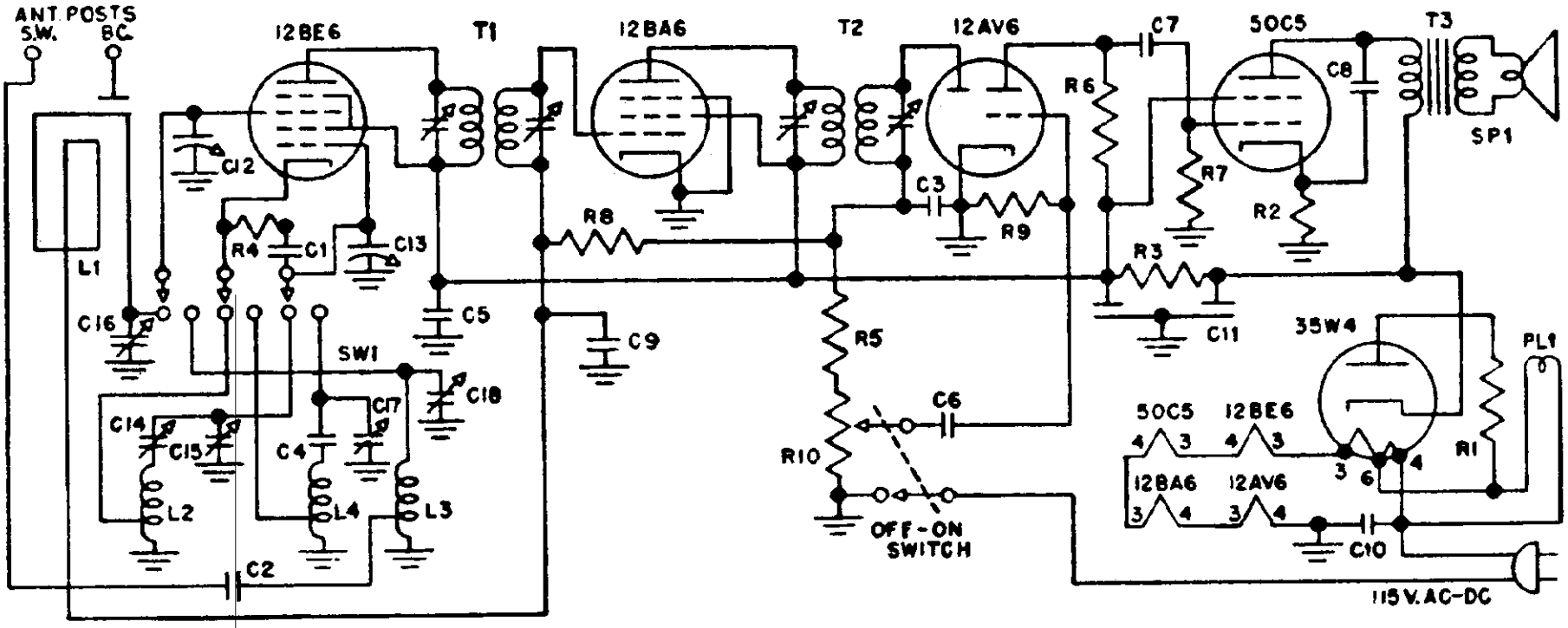
IF ALIGNMENT- 456 KC (Connect to antenna connector on loop).
Align S.W. antenna coil at 17 MC. Bend gang capacitor plates for tracking at 7 MC.
Align B.C. loop antenna at 1400 KC.
Adjust oscillator padder at 600 KC.
Dial pointer alignment-538 KC. with fully closed capacitor.



Top view of chassis and tube location



Trimmer section-bottom view



R 1 - 24 OHM 1/2 WATT RESISTOR
R 2 - 180 " " " "
R 3 - 1200 " " " "
R 4 - 22K " " " "
R 5 - 22K " " " "
R 6 - 470K " " " "
R 7 - 1 MEGOHM " " "
R 8 - 2.2 " " " "
R 9 - 4.7 " " " "
R10 - 500K OHM POT. WITH SWITCH
C 1 - 100 MMF MICA OR DISC 500 V. CAPACITOR
C 2 - SAME AS C1

C 3 - 250 MMF MICA OR DISC - 500V. CAPACITOR
C 4 - .0047 MFD MICA - TOL. 5% " "
C 5 - .01 MFD CERAMIC DISC - " "
C 6 - .01 " " " " "
C 7 - .01 " " " " "
C 8 - .01 " " " " "
C 9 - .047 MFD MOLDED TUBULAR - 400V. "
C10 - .047 " " " " "
C11 - 50+50 MFD ELECTROLYTIC - 150V. "
C12 & C13 - GANG CAPACITOR
C14 - 100-580 MMF PADDER CAPACITOR
C15 - 3-30 MMF TRIMMER CAPACITOR
C16 - 3-30 " " "

C17 - 3-30 MMF TRIMMER CAPACITOR
C18 - 3-30 " " "
L 1 - LOOP ANTENNA NO. X13
L 2 - OSCILLATOR COIL B.C. - NO. 416-C
L 3 - ANTENNA COIL S.W. } NO. X13
L 4 - OSCILLATOR COIL S.W. }
T 1 - 455 K.C. I.F. COIL - NO. 298
T 2 - 455 K.C. I.F. COIL - NO. 298
T 3 - OUTPUT TRANSFORMER NO. 416A
PL1 - NO. 44 PILOT LIGHT
SP1 - 5" P.M. SPEAKER
SW1 - 3 POLE - 2 POSITION SWITCH

Schematic Diagram Model X13

INSTALLATION AND OPERATION INSTRUCTION
for
SUPERHETERODYNE RADIO RECEIVER

Model No. 389 Mahogany
Model No. 390 White

CONNECTING THE SET

POWER SUPPLY This receiver is designed to operate on any alternating current supply (AC) rangin from 110 to 120 volts, 50 to 60 cycles; or on any direct current supply (DC) ranging from 110 to 120 volts

SPECIAL INSTRUCTIONS FOR DC OPERATION When operating from a DC (direct current) power supply it may be necessary to reverse the power cord plug in the wall socket before the receiver will function due to the polarity condition of a direct current supply. If the receiver fails to perform after being turne on one minute, simply reverse the power plug.

GROUND No ground connection should be used when operating this receiver. The receiver gets its groun connection through the power line and any external connection to the chassis may cause a short circuit an consequent damage.

CAUTION: Do not place receiver on hot objects such as stoves, radiators, etc. Heat will damage th internal components of the receiver.

CONTROLS AND OPERATION

LEFT HAND KNOB (Manual Volume Control and "On-Off" Switch). Turn this knob to the extreme right Wait about a minute for tubes to become heated. When signal comes in adjust volume as desired.

RIGHT HAND KNOB (Station Selector). Move the knob over a narrow range of the dial at a point wher the desired station is located until the station is received with maximum volume; then readjust the volum control to the proper level. Never use the station selector to adjust the volume as this practice result in distorted tone quality and deficient bass response. The Volume Control only is to be used for thi purpose. For maximum clarity the indicator should be adjusted to the center of the area covered by th station being tuned.

TUNING RANGE

This receiver is designed to operate over the standard broadcast band which extends from 535 to 162 Kilocycles (KC).

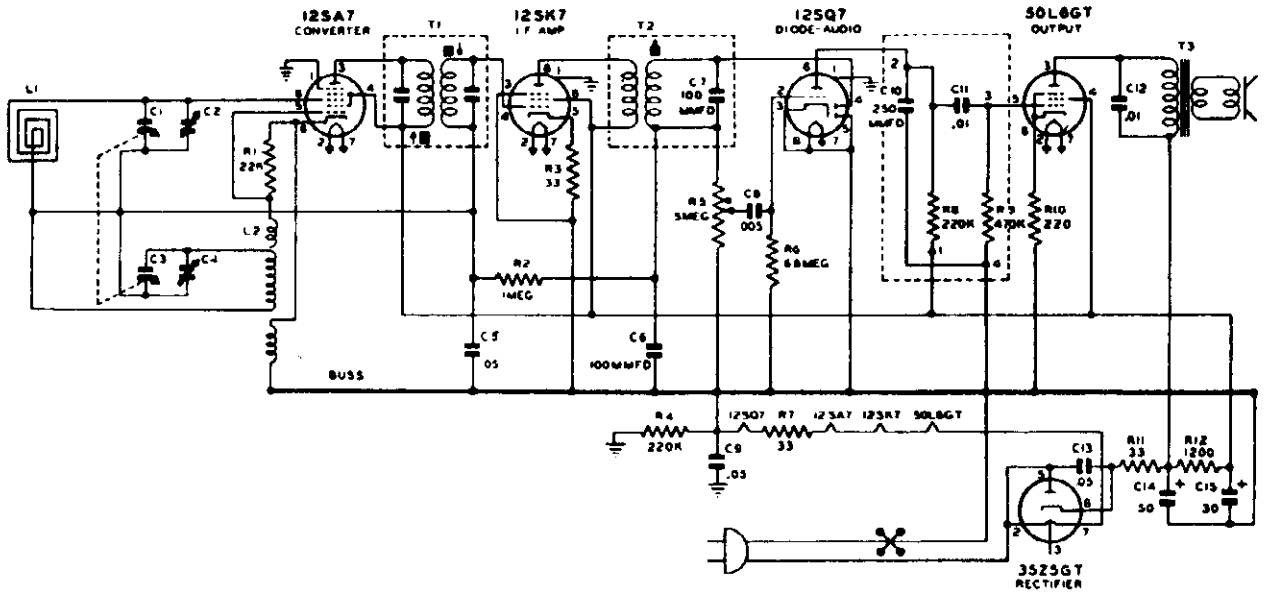
AERIAL SYSTEM

This receiver has a built-in "loop" aerial. Its excellent design is such as to increase pick-up from sta tions having wide variations in signal strength. The efficiency and selectivity of the loop provide outstand ing reception without the use of an external aerial. The "loop" aerial used on this receiver is somewha directional so reception from weak stations can be improved by turning the set in the proper directio

MODELS 389, 390

ALIGNMENT

Step No.	Position of Gang	Signal Generator Frequency	Generator Connection	Dummy Antenna	Adjustment	Type of Adjustment
1	Open	455 KC. 455 KC.	Rear Gang Terminal	.1 Mfd.	I.F. Slugs	Adjust for Maximum Output
2	Open	1620 KC.	Dummy Antenna	2 Turns of Hookup Wire 6" in Dia.(Place Approx. a Foot from & parallel to loop.)	Front Gang Trimmer	Adjust for Maximum Output
3	1400 KC.	1400 KC.			Rear Gang Trimmer	Adjust for Maximum Output
4	600 KC.	600 KC.				Check Gang Align-ment



ILLUS. NO.	PART NO.	PART NAME	DESCRIPTION
C1,C3	N-8745	Condenser	Gang Tuning with Pulley
C2,C4	--	Trimmers	Gang
C5,C9	N-1345	Condenser	Paper .05 MFD. 200 Volts
C6	N-6015	Condenser	Ceramic 100 MMFD. 500 V. 20%
C7	PART OF N-8150	Condenser	100 MMFD. 500 Volt 10%
C8	N-4894	Condenser	Paper .005 MFD. 600 Volts
*C10	N-6488	Condenser	Ceramic 259 MMFD. 500 V. 20%
*C11	N-1344	Condenser	Paper .01 MFD. 400 Volts
C12	N-1344	Condenser	Paper .01 MFD. 400 Volts
C13	N-1346	Condenser	Paper .05 MFD. 400 Volts
C14) C15)	N-7889	Condenser	Electrolytic (50 MFD. 150 V.) (30 MFD. 150 V.)

ILLUS. NO.	PART NO.	PART NAME	DESCRIPTION
R1	N-4025	Resistor	Carbon 22,000 Ohm 1/2W. 20%
R2	N-1262	Resistor	Carbon 1.0 Megohm 1/2W. 20%
R3,R11	N-4022	Resistor	Carbon 33 Ohm 1/2 Watt 20%
R4	N-4026	Resistor	Carbon 220,000 Ohm 1/2W. 20%
R5	N-8732	Volume Control	With Switch - 500,000 Ohms
R6	N-4028	Resistor	Carbon 6.8 Megohm 1/2W. 20%
R7	N-4068	Resistor	Carbon 33 Ohm 1.0 Watt 20%
*R8	N-4026	Resistor	Carbon 220,000 Ohm 1/2W. 20%
*R9	N-4027	Resistor	Carbon 470,000 Ohm 1/2W. 20%
R10	N-4024	Resistor	Carbon 220 Ohm 1/2 Watt 10%
T1	N-7981	Transformer	1ST I.F.
T2	N-8150	Transformer	2ND I.F.
	N-7824	Speaker	4 "PM With Transformer
L1	N-8906	Coil	Loop Antenna & Cabinet Back
L2	N-8709	Coil	Oscillator

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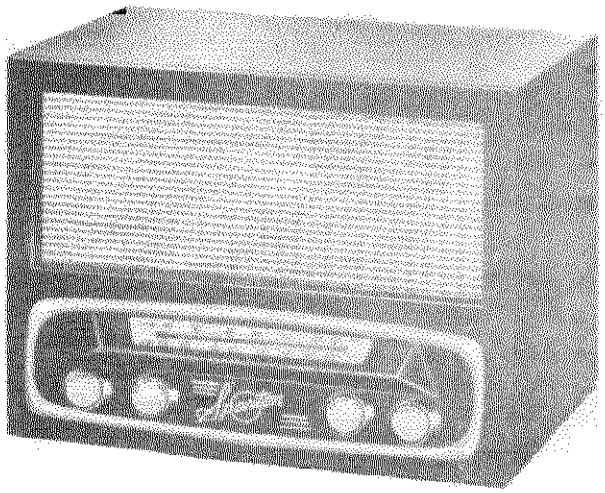
MODELS 241, 242,
1210, 1211, Ch. 8W10

Sparton MODEL 1210 MAHOGANY
MODEL 1211 BLONDE
AM-FM RADIO-PHONOGRAPH COMBINATION



Sparton TABLE RADIO
MODEL 241 MAHOGANY
MODEL 242 BLONDE
8 TUBE, AM - FM

BRIEF DESCRIPTION

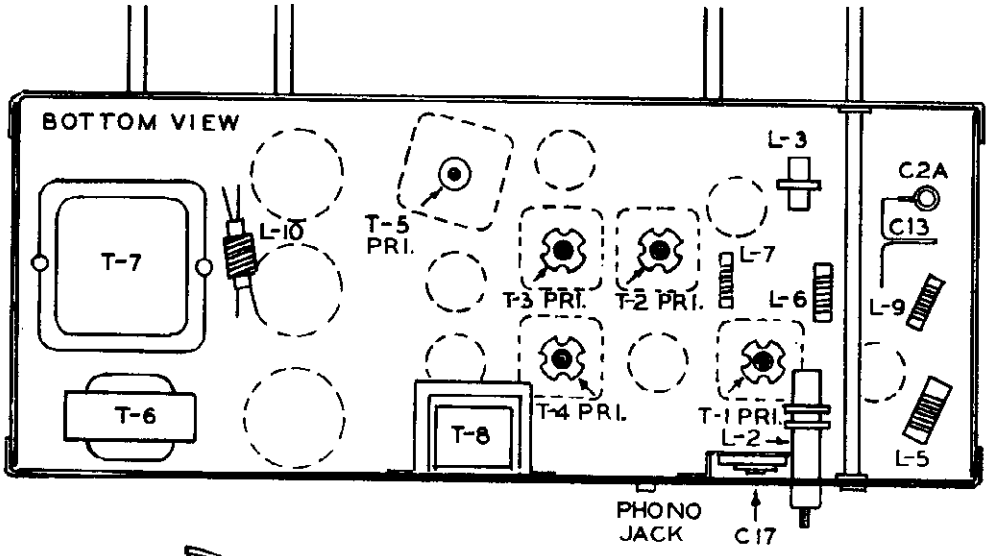
MODEL 1210 in Mahogany and 1211 in Blond are Radio-Phonograph combinations incorporating the 8W10 radio chassis and an automatic record changer.

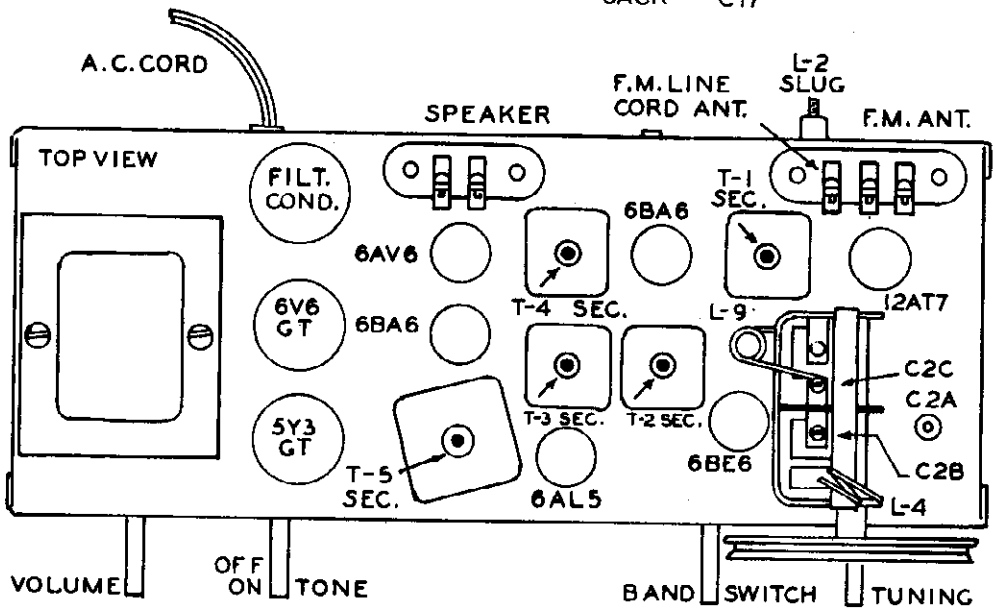
RADIO CHASSIS 8W10: is an eight-tube A.M.-F.M. Super-Heterodyne receiver. This compact receiver contains a built-in line cord antenna for local F.M. reception and full range tone control.

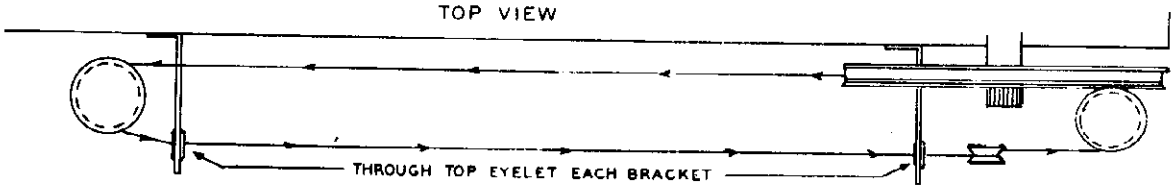
AUTOMATIC RECORD CHANGER: The record changer in these models is a VM-950 Tri-o-matic three-speed changer.

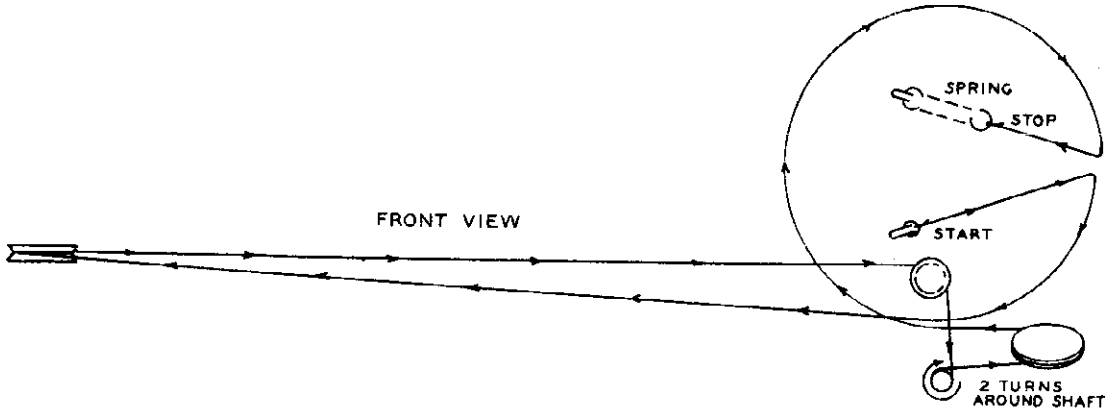
MODELS 241, 242,
1210, 1211, Ch. 8W10

CHASSIS DIAGRAM









MODELS 241, 242,
1210, 1211, Ch. 8W1

ALIGNMENT DATA

OPER-ATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANT.	GENERATOR FREQUENCY	BAND SWITCH SETTING	TUNING COND SETTING	TRIMMER OR SLUG	REMARKS
1.	Set Dial pointer even with left-hand stop line with condenser gang closed.							
2.	Connect output meter across speaker terminals.							
3.	A.M.-I.F.	Pin #7 of 6BE6 Conv. Tube	.02 MFD Cond.	456 KC.	A.M.	Open	T4 Sec. Slug	Max. Reading
							T4 Pri. Slug	Max. Reading
							T2 Sec. Slug	Max. Reading
							T2 Pri. Slug	Max. Reading
4.	Repeat Operation #3.							
5.	A.M.-R.F.	A.M. Ant. On Cabinet	*	1500 KC.	A.M.	1500 KC	C2B Osc.Tri.	Peak Accurately
6.				1500 KC.		1500 KC	C17 Ant. Tri.	Peak Accurately
7.	A.M.-R.F.	On Cabinet	*	600 KC.	A.M.	600 KC	L-2 Slug	Max. Reading
8.	Repeat operations #5, #6 and #7.							
9.	Check Calibrations at 600, 1000 and 1500 KC.							
10.	SPECIAL NOTE: For complete F.M.-I.F. Visual Alignment instructions please refer to Pages 5-							
11.	F.M.-I.F. Alignment using an A.M. Generator and Output Meter.							
12.	T5 F.M. Ratio Det.	Pin #1 of 2nd 6BA6 Tube	.02 MFD. Cond.	10.7 MC.	F.M.	Open	T5 Sec. Slug	Max. Reading
							T5 Pri. Slug	Max. Reading
13.	NOTE: Operations 11, 12, 14, 15, 18 and 19 must be made with generator output as low as possible, consistent with usable output meter reading.							
14.	T3 2nd. F.M.-I.F.	Pin #1 1st 6BA6 Tube	.02 MFD. Cond.	10.7 MC.	F.M.	Open	T3 Sec. Slug	Max. Reading
							T3 Pri. Slug	Max. Reading
15.	T1 1st F.M.-I.F.	Pin #8 on 12AT7 Mixer Tube	.02 MFD. Cond.	10.7 MC.	F.M.	Open	T1 Sec. Slug	Max. Reading
							T1 Pri. Slug	Max. Reading
16.	Adjust secondary slug on T5 ratio detector transformer to minimum deflection or dip on output meter. Under certain conditions it is possible to adjust T5 sec.slug to minimum noise with the receiver tuned to a weak station. This operation is very critical and the receiver must be tuned to the center response only.							
17.	F.M.-R.F. alignment using an A.M. Generator with frequencies of 88 to 108 MC. and a vacuum tube voltmeter or D.C. voltmeter. (20,000 Ohms per volt).							
18.	Place meter across C36 elect. condenser. (Meter reading approximately 1 volt)							
19.	F.M.-R.F.	F.M. Ant.	Match Gen. TO 300 Ohm	106 MC.	F.M.	106 MC.	C2A Osc. Tri.	Max. Reading
							C2C Ant. Tri.	Peak Accurately
20	Check Calibration at 88 MC.							

* Use standard dummy antenna as described on Page 4.

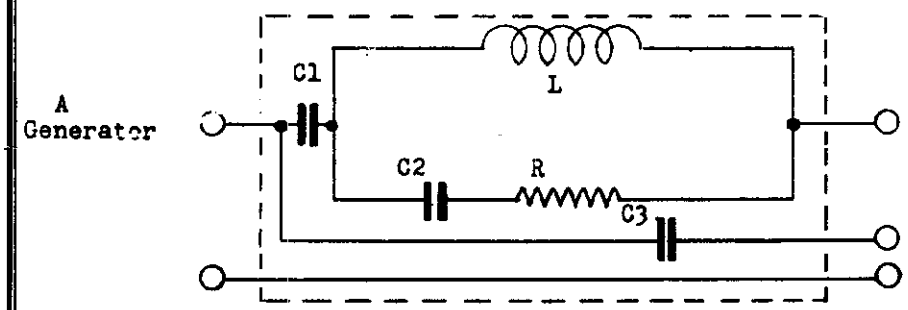
VOLTAGE CHART

Line Voltage: 117 Volts AC		Position of volume control: Full with set tuned to quiet channel. Position of band switch A.M.								
TUBE	FUNCTION	Voltage of Sockets Prongs to Ground See Prong Nos.on Schematic.								
		No.1	No. 2	No. 3	No. 4	No. 5	No.6	No.7	No. 8	No. 9
6BE6	A.M. Conv. & F.M. Osc.	-2.5	0	0	6.3*	90	80	**		
12AT7X	F.M. -R.F. & Mixer	135	-.6	0	0	0	150	-1	1.2	6.3*
6BA6	I. F. Amp.	-.1	0	6.3*	0	235	100	1.0		
6BA6X	Ratio Det. Driver	-.5	0	6.3*	0	95	90	1.2		
6AL5	Ratio Det.	0	-.25	5.6*	0	0	0	0		
6AV6	1st A.F.-A.M. Det.& A.V.C.	-.1	0	6.3*	0	-.1	-.1	95		
6V6GT	Power Amplifier	0	0	250	260	0	240	6.3*	14	
5Y3GT	Rectifier	0	270		260*		260*		270	

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greater deflection within scale limits. All D. C. measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.

* AC Volts
** Cannot be measured with 20,000 ohms per volt voltmeter.
X Band switch on F.M.

DUMMY ANTENNA



C1 - 200 mmf. Condenser 400 V.D. C.
C2 - 400 mmf. Condenser 400 V.D.C.
C3 - .02 mmf. Condenser 400 V.D.C.
R - 100 ohms Resistor 1/4 Watt
L - Choke Coil

----Case Shield

Choke Coil Specification
Tubing - 3/8" diameter Bakelite
Wire- No. 38 Enameled
Turns- 59 Closely Wound (Impregnated)

NOTE: When using this dummy antenna the generator output impedance should be 10 ohms or lower.

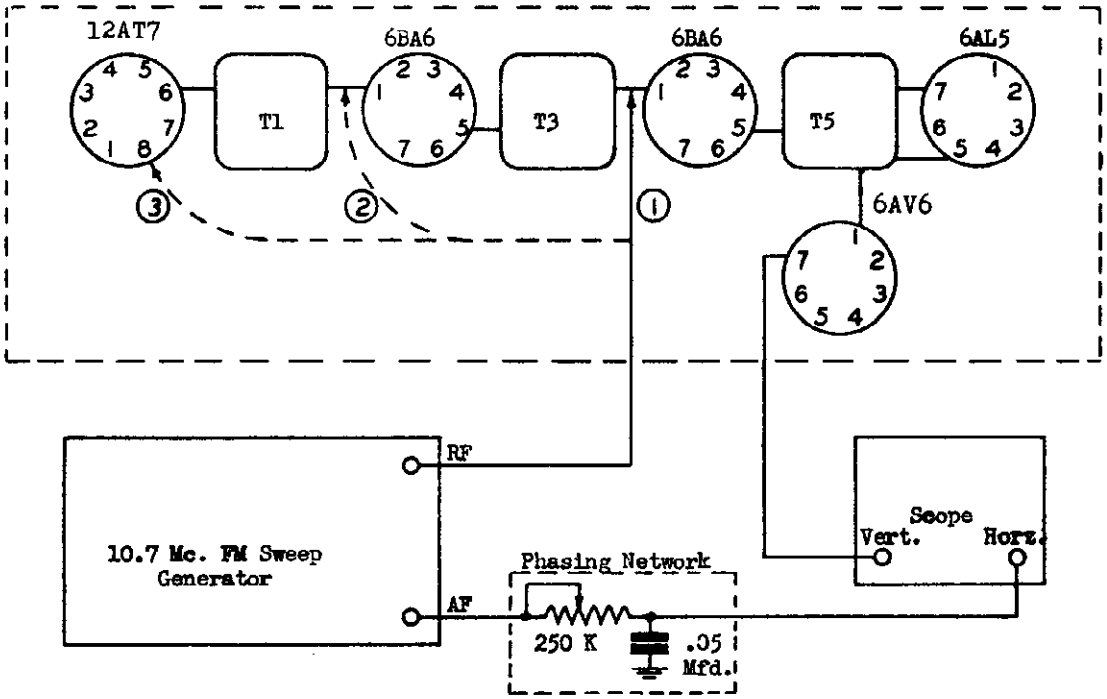
MODELS 241, 24
1210, 1211,
Ch. 8W10

VISUAL I. F.-F. M. ALIGNMENT DATA

WARNING: Do not proceed with any of the following alignment instructions unless it is certain that the AM-IF is in accurate alignment. If not, align the AM-IF system according to the step by step alignment procedure.

1. DESCRIPTION OF CIRCUIT USED:

A 6AL5 is employed as a ratio detector. This tube is preceeded by a 6BA6 ratio detector driver and a stage of amplification at 10.7 Mc. also utilizing a 6BA6 tube. The 2nd section of the 12AT7 tube is used as the FM mixer. All IF coupling uses individual slug tuned transformers.



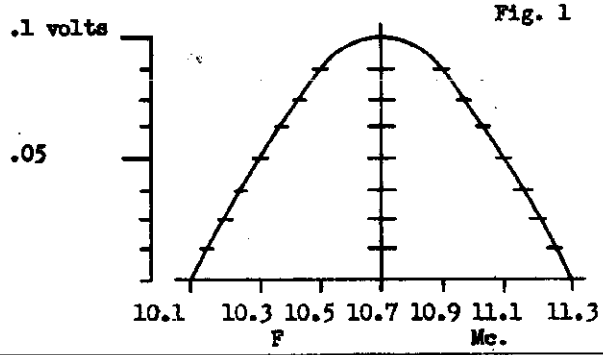
Gen. & Scope Position	Adjust
1	T-5
2	T-3
3	T-1

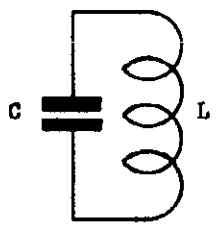
2. THEORY OF VISUAL ALIGNMENT.

One of the characteristics of a tuned circuit is the fact that when it is excited or driven by a generator such as a vacuum tube or another tuned circuit, the voltage developed across it will vary with slight changes in frequency. This voltage will be greatest when the frequency is equal to the resonant frequency of the circuit and will be less if the frequency is higher or lower than the resonant frequency.

Thus if we were to shift the frequency from high to low or low to high across the resonant frequency and make a record of the voltage across the tuned circuit, we could plot the voltage against frequency and obtain a curve which might look like Fig. 1.

Fig. 1





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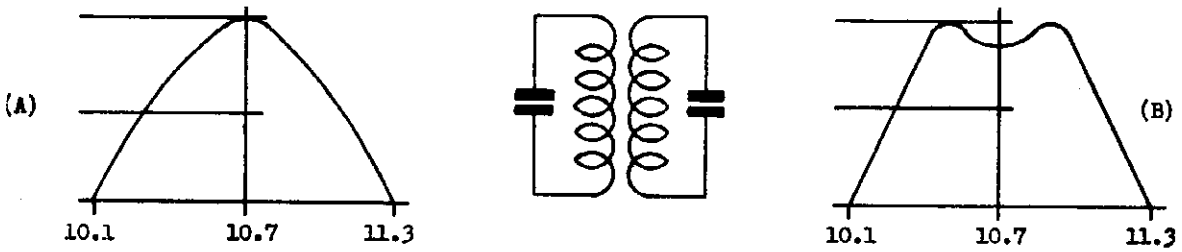
This is the selectivity curve or response curve for the circuit under discussion. This type of circuit may be aligned or adjusted to resonance by simply changing either L or C until maximum voltage is obtained at the resonant frequency. Now if another circuit tuned to the same resonant frequency is coupled to the simple case above, a number of things can happen. First current flowing in one circuit will induce current in the second circuit, the magnitude of this current depending on the degree or amount of coupling between the two circuits. This coupling may be in the form of mutual inductance, mutual capacitance or any impedance common to the two circuits. Now if we repeat the proceedure outlined for obtaining the response curve of a single tuned circuit using the voltage developed across the secondary of the coupled circuit while driving the primary, we may get either of two types of curves depending on the magnitude of the coupling, (a) in Fig. 2 is a typical curve for two circuits coupled below critical coupling and (b) is a representation of the curve for an over coupled circuit.

Fig. 2



Overcoupled circuits producing a response curve like (b) Fig. 2 are often employed where it is important that the response curve remain approximately flat over a narrow band of frequencies near the resonant frequency. They are also frequently combined with single peaked circuits to produce a response curve like Fig. 3.

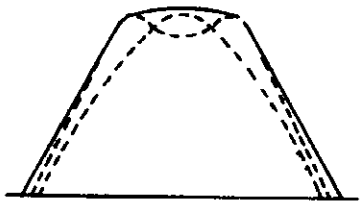


Fig. 3

The dotted lines indicate the curves of the individual circuits and the solid curve shows the overall response of the two or more pairs of coupled circuits. Circuits like the above or approaching them in form are desirable in an FM receiver where the pass band should be of the order of 200 Kc. Now from the above it is evident that simple peaking both sides of a circuit coupled below critical for maximum voltage will provide optimum alignment but if this proceedure is followed with an overcoupled circuit it is almost a certainty that the two circuits will not be tuned to the resonant frequency but will instead be aligned so that either one or the other is accentuated. The response curve will then look like Fig. 4 (a) or (b).

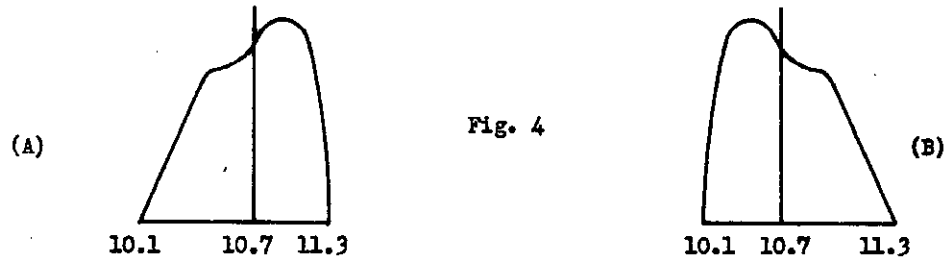
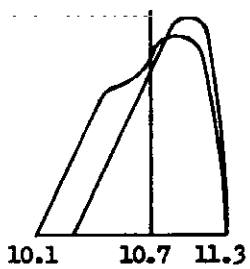


Fig. 4

Now if this overcoupled circuit is combined with a single peaked circuit (where the coupling is below critical), the misalignment becomes worse, something like Fig. 5.

Fig. 5



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VISUAL I. F.-F. M. ALIGNMENT DATA

From the above it appears that to properly align a receiver using overcoupled IF transformers it will be necessary to take a response curve of each stage and align the circuit so that the two peaks are symmetrical, that is, approximately equal in amplitude and displaced equally from the center frequency. To do this with a CW or AM signal would be laborious and time consuming whereas the use of visual equipment makes it nearly as simple as adjusting a simple single peaked amplifier.

Visual alignment test equipment performs the operation of plotting the response curve almost exactly as described above except that instead of manually changing the generator frequency, recording the voltage and then plotting the results, these operations are performed automatically and simultaneously by a combination of electronic circuits. The operation is briefly as follows.

In the signal generator a low AC voltage is applied to a reactance tube modulator which shifts the oscillator frequency from low to high or from high to low at a rate determined by the frequency of the AC voltage and by an amount determined by the AC voltage. The frequency at any instant is dependant on the AC voltage present at that instant of time. An oscilloscope is provided which may be considered a voltmeter used to read the voltage across the tuned circuit, provided a detector is used to convert the RF to a low audio frequency. This voltage is then applied to the vertical plates and results in a vertical displacement of the spot on the screen. Some of the voltage used to shift the oscillator frequency is also applied to the horizontal plates of the oscilloscope providing a means of displacing the spot horizontally. It is now evident that since for any given AC voltage only one frequency may be obtained and since that AC voltage will result in an exact amount of spot deflection on the scope we can read the voltage across the circuit under examination by noticing the position of the spot at this exact instant.

Now if we consider the frequency as shifting from low to high 60 times per second and remember that the spot is moving across the screen of the scope 60 times per second at exact synchronization with the change in frequency it is only necessary to apply the voltage from our circuit to the vertical plates to obtain a replica of the response curve on the face of the cathode ray tube. This curve will be repeated 60 times per second if our sweep frequency is 60 cycles. Adjustments to the circuit may now be made and the effect on the response curve noted instantaneously.

Although it is possible to observe the selectivity curves as shown in Fig. 1, 2, and 3 on the scope by the use of an auxiliary special detector coupled to the plate of the last IF tube, it is much more convenient to observe the effects of IF alignment upon the shape of the ratio detector output trace. When this is done the auxiliary detector is not necessary and a direct connection of the scope into the receiver circuits will provide all the necessary connections.

If the overall selectivity curve is not "flat-topped" (solid line in Fig. 3) the ratio detector curve cannot be linear (straight) throughout the center section, symmetrical and have sufficient band width (Fig. 6).

Under these conditions it would not be possible to receive a signal without distortion and higher than normal noise, the degree of distortion and abnormal noise dependent upon the extent to which the center of the ratio detector trace departs from a straight line and the extent to which the entire trace departs from true symmetry.

After a pattern similar to Fig. 6 is obtained with connection #1 shown in the block diagram, the generator lead may be moved ahead through the IF system one tube at a time and the intervening transformer aligned for maximum output but at all times a curve very similar to Fig. 6 must be maintained.

3. EQUIPMENT REQUIRED.

(a) A sweep signal generator with a center frequency of 10.7 Mc. and a total sweep width of at least 400 Kc. Examination of the block diagram will reveal a variable resistor-capacitor circuit inserted in the lead between the FM sweep generator and the horizontal amplifier of the oscilloscope This control should be adjusted so that the dual trace observed on the oscilloscope will blend into a single trace and thereby eliminate any confusion due to the two traces.

(b) An Oscilloscope with either a 3" or 5" tube equipped with both vertical and horizontal amplifiers.

4. ALIGNMENT OF THE 10.7 I.F.

Turn the wave band switch to F.M. and the generator to 10.7 Mc. Connect the F.M. signal generator output lead to the grid of the ratio detector driver tube and the scope to the 1st audio plate. Now proceed to align the ratio detector transformer for maximum linearity and output, being careful to maintain as symmetrical a trace as possible. Note that the adjustment of the secondary circuit, controls to a large extent, the linearity and symmetry of the pattern, and adjustment of the primary will influence the gain of the circuit. Fig. 6 represents a linear detector curve properly aligned.

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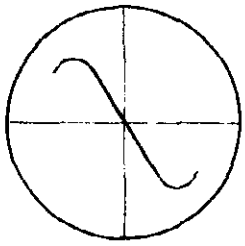
MODELS 241, 242, 1210, 1211, Ch. 8W10

It is important that the generator sweep a sufficiently wide band of frequencies so that the curves on both ends of the straight portion can be seen. Maximum linearity of alignment will result when these curves are symmetrically shaped and as previously stated this will result in minimum distortion and noise.

Fig. 6



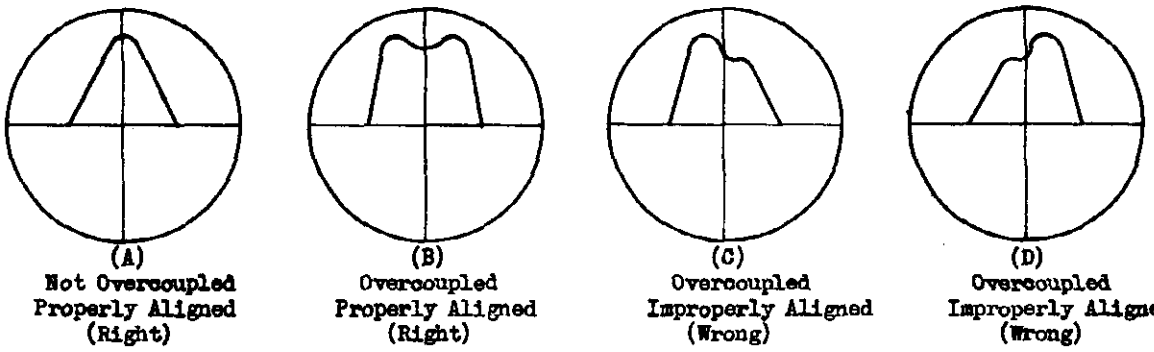
Connect the generator output lead to the grid of the I.F. amplifier. Align primary and secondary of the I.F. transformer being careful to maintain the same basic ratio detector trace as just described.

Observe that by alternately adjusting the primary and secondary, the vertical amplitude can be increased without the response curve becoming distorted. At all times it is important to reduce the signal generator output to maintain the scope picture on the screen. This will avoid overload and possible misalignment therefrom.

Move the generator lead to the grid of the converter tube and align No. 1 I.F. transformer following the same proceedure as above.

Fig. 7, (A), (B), (C), and (D) represent typical selectivity curves of an overall I.F. Amplifier. Fig. 7, (AA), (BB), (CC), and (DD) represent the corresponding ratio detector curves.

Fig. 7

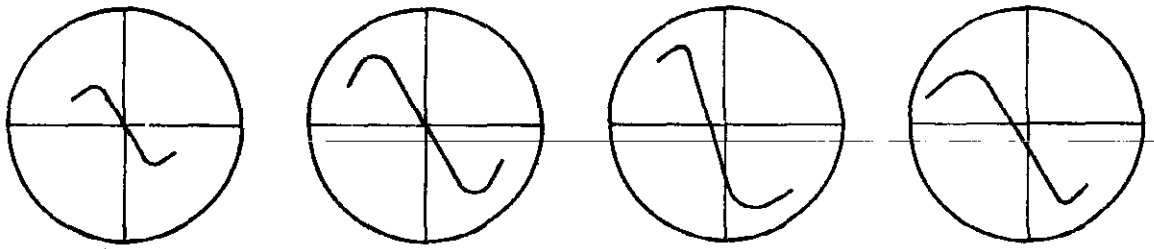


(A) Not Overcoupled Properly Aligned (Right)

(B) Overcoupled Properly Aligned (Right)

(C) Overcoupled Improperly Aligned (Wrong)

(D) Overcoupled Improperly Aligned (Wrong)



(AA) Narrow Bandpass

(BB) Proper Alignment

(CC) Overcoupled

(DD) IF Transformer Improperly Aligned

Should the trace appear unsatisfactory, a very slight readjustment of the detector secondary alignment may be made at this time as the need for any but a slight correction is an indication of incorrect alignment in one of the other stages. This is permissible only if the degree of correction necessary is slight. If this is not the case the entire alignment procedure should be repeated.

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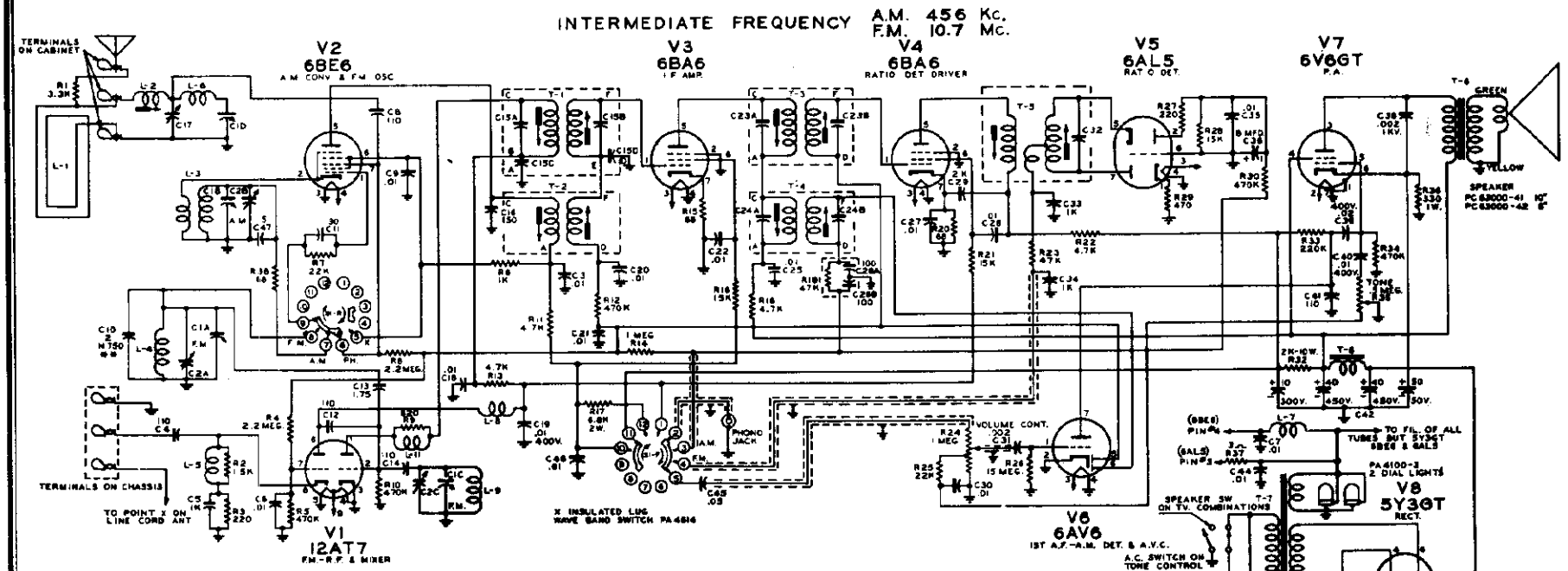


* SPECIAL NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.
** REPLACE ONLY WITH TEMPERATURE COEFFICIENT AS INDICATED.

	DESCRIPTION	PART NO.
C1A, C1C	F.M. GANG CONDENSER	PC65002-3
C1B, C1D	A.M. GANG CONDENSER	
C2C	TRIMMER ON F.M. GANG	
C2B	TRIMMER ON A.M. GANG	
C2A	F.M. OSC. TRIMMER	PA4366
C3	.01 MFD. CERAMIC DISC.	PA4334-2
C4	110 MFD. CERAMIC DISC.	CC30H-111A
C5	1000 MMF. CERAMIC DISC.	HK35H-102
C6	.01 MFD. CERAMIC DISC.	PA4334-2
C7	.01 MFD. CERAMIC DISC.	PA4334-2
C8	110 MMF. CERAMIC	CC30H-111A
C9	.01 MFD CERAMIC DISC.	PA4334-2
C10	2 MMF. CERAMIC N750 **	CC30H-020K
C11	30 MMF. CERAMIC	CC30H-300K
C12	110 MMF. CERAMIC	CC30H-111A
C13	1.75 MMF. BIFILAR WIRE CAPACITOR	PA4344-1
C14	110 MMF. CERAMIC	CC30H-111A
C15A, C(F.M.PRI.)C15B,D(F.M.SEC)I.F.CAPACITORS *		
C16	150 MMF. CERAMIC	CC30G-151F
C17	3-35 MMF. A.M.-R.F. TRIMMER	PA4368-1
C18	.01 MFD. CERAMIC DISC.	PA4334-2
C19	.01 MFD. 400V. TUBULAR	PC40HL-103
C20	.01 MFD. CERAMIC DISC.	PA4334-2
C21	.01 MFD. CERAMIC DISC.	PA4334-2
C22	.01 MFD. CERAMIC DISC.	PA4334-2
C23A (F.M.PRI.)C23B(F.M.SEC.)I.F.CAPACITORS *		
C24A (A.M. PRI.)C24B(A.M.SEC.)I.F.CAPACITORS *		
C25	.01 MFD. CERAMIC DISC.	PA4334-2
C26A,B	100 MMF. C & R UNIT	PA4329-1

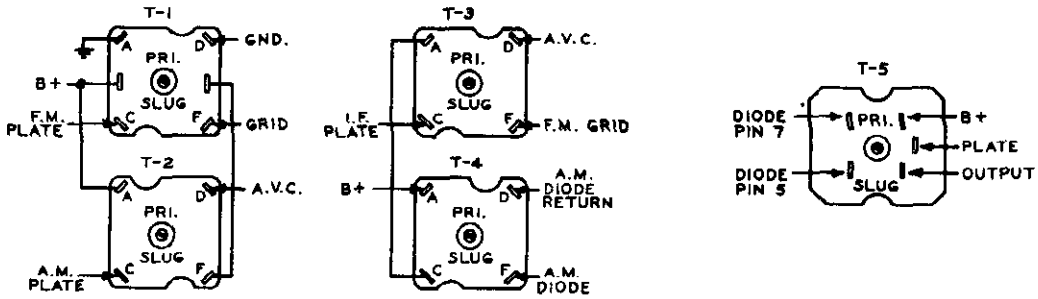
	DESCRIPTION	PART NO.
C27	.01 MFD. CERAMIC DISC	PA4334-2
C28	.01 MFD. CERAMIC DISC.	PA4334-2
C29	.002 MFD.CERAMIC DISC.	HK35E-202
C30	.01 MFD. CERAMIC DISC.	PA4334-2
C31	.002 MFD.CERAMIC DISC.	HK35E-202
C32	33 MMF. MICA CAPACITOR RATIO DET. *	
C33	1K MMF. CERAMIC	HK35H-102
C34	1K MMF. CERAMIC	HK35H-102
C35	.01 MFD. CERAMIC DISC.	PA4334-2
C36	8 MFD. 50V. ELECT.	PA4303-7
C38	.002 MFD. 1000V. TUBULAR	PC40GN-202
C39	.02 MFD. 400V. TUBULAR	PC40HL-203
C40	.01 MFD. 400V. TUBULAR	PC40HL-103
C41	110 MMF. CERAMIC	CC30H-111A
C42	10-40-40-50 MFD. ELECT.	PA4307-4
C43	110 MMF. CERAMIC	CC30H-111A
C44	.01 MFD. CERAMIC DISC.	PA4334-2
C45	.05 MFD. 200V. TUBULAR	PC40GK-503
C46	.01 MFD. CERAMIC DISC.	PA4334-2
C47	15 MMF. CERAMIC	CC30H-150K

R1	3.3K OHMS	1/2W.	BR12S-332
R2	1.5K OHMS(IN L-5)	2W.	PA4203-4
R3	220 OHMS	1/2W.	BR12S-221
R4	2.2 MEG. OHMS	1/2W.	BR12S-225
R5	470K OHMS	1/2W.	BR12S-474
R6	1K OHMS.	1/2W.	BR12S-102
R7	22K OHMS.	1/2W.	BR12S-223
R8	2.2 MEG. OHMS	1/2W.	BR12S-225
R9	820 OHMS (IN L-11)	1/2W.	PA4203-5
R10	470K OHMS	1/2W.	BR12S-474
R11	4.7K OHMS	1/2W.	BR12S-472
R12	470K OHMS	1/2W.	BR12S-474
R13	4.7K OHMS	1/2W.	BR12S-472
R14	1 MEG. OHMS	1/2W.	BR12S-105
R15	68 OHMS	1/2W.	BR12S-680
R16	15K OHMS	1/2W.	BR12S-153
R17	6.8K OHMS	2W.	DR12S-682
R18	4.7K OHMS	1/2W.	BR12S-472
R19	47K OHMS C & R UNIT	1/2W.	PA4329-1
R20	68 OHMS	1/2W.	BR12S-680
R21	15K OHMS	1/2W.	BR12S-153
R22	4.7K OHMS	1/2W.	BR12S-472
R23	47K OHMS	1/2W.	BR12S-473
R24	1 MEG. OHMS VOLUME CONT.		PA4408-2
R25	22K OHMS	1/2W.	BR12S-223
R26	15 MEG. OHMS	1/2W.	BR12S-156
R27	220 OHMS.	1/2W.	BR12S-221
R28	15K OHMS	1/2W.	BR12S-153
R29	470 OHMS	1/2W.	BR12S-471
R30	470K OHMS	1/2W.	BR12S-474
R32	2K OHMS WIREWOUND	10W.	PA4200-10
R33	220K OHMS	1/2W.	BR12S-224
R34	470K OHMS	1/2W.	BR12S-474
R35	.5 MEG. OHMS TONE CONT.		PA4449
R36	330 OHMS	1W.	CR12S-331
R37	3 OHMS WIREWOUND	1/2W.	PA4207-1
R38	68 OHMS WIREWOUND	1/2W.	BRW12S-680

MODELS 241, 242, 1210, 1211, Ch. 8W10; 380, 381, 1304, 1305, Ch. 8L3

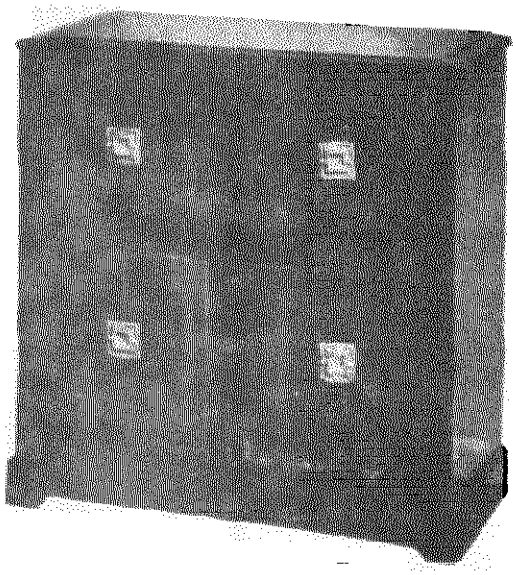
	DESCRIPTION	PART NO.
L-1	LOOP ANTENNA	PA5250-3,4 or 7
L-2	LOOP LOADING COIL	AA6616-1
L-3	B.C.OSC. COIL	AA6665-3
L-4	F.M.OSC. COIL	PA5200-8
L-5	100 MC.CHOKE COIL (1500Ω FORM	AA6798-3
L-6	CHOKE COIL	AA6769-2
L-7	CHOKE COIL	AA6798-6
L-8	CHOKE COIL	AA6769-2
L-9	F.M. R.F. COIL	PA5200-9
L-10	LINE CORD ANT. CHOKE	AA6664-1
L-11	CHOKE COIL	AA6798-7
T-1	NO. 1 I.F. F.M. TRANS.	AA6667-1
T-2	NO. 1 I.F. A.M. TRANS.	AA6668-5
T-3	NO. 2 I.F. F.M. TRANS.	AA6667-3
T-4	NO. 2 I.F. A.M. TRANS.	AA6668-1
T-5	RATIO DETECTOR	AA6684-1
T-6	OUTPUT TRANS.	AB44061-2
T-7	POWER TRANS.	AB44013-1
T-8	FILTER CHOKE	AB47004-1

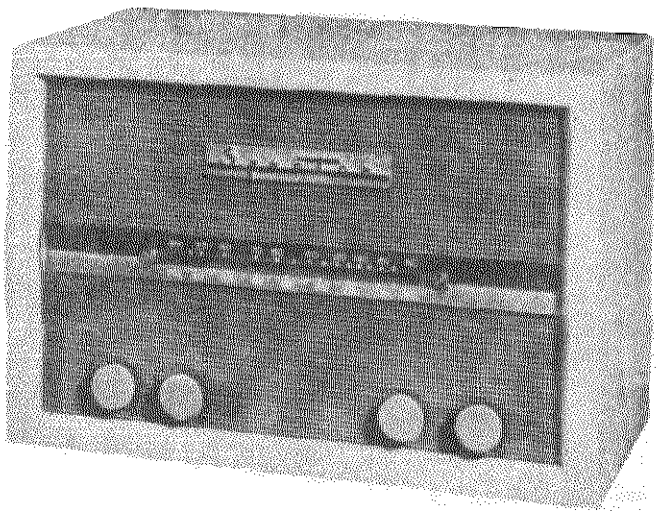
KNOB-VOLUME	PA5654-1
KNOB-TONE-ON/OFF	PA5654-2
KNOB-BAND SWITCH	PA5654-3
KNOB-TUNING	PA5654-4
DIAL SCALE	PB30017
ESCUTCHEON-MODEL 1210	PD93027-1
ESCUTCHEON-MODEL 1211	PD93027-2
RECORD PLAYER-VM950	PD93110



BOTTOM VIEW, TERMINAL HOOKUP FOR T-1, T-2, T-3, T-4 & T-5

ELECTRICAL CHARACTERISTICS OF CHASSIS TYPE 8L3 ARE IDENTICAL TO THAT OF CHASSIS TYPE 8W10



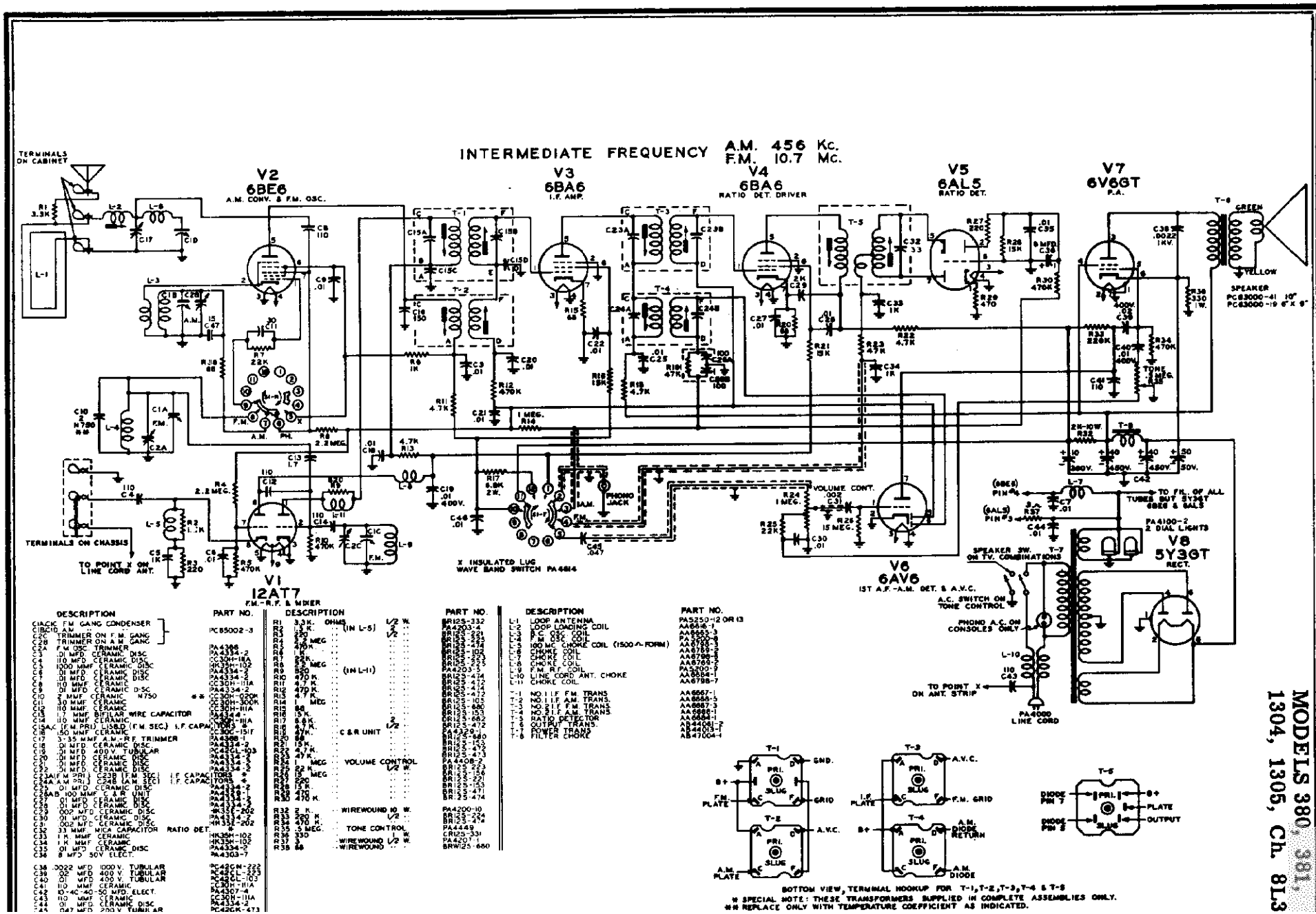


Sparton MODEL 1304
MAHOGANY RADIO-PHONO COMB.
8 TUBE AM-FM RADIO;
3-SPEED RECORD PLAYER

Sparton MODEL 1305
GOLDEN WHEAT RADIO-PHONO COMB.
8 TUBE AM-FM RADIO;
3-SPEED RECORD PLAYER

Sparton MODEL 380
GENUINE MAHOGANY
8 TUBE AM-FM WITH PHONO JACK
AND 8L3 CHASSIS

Sparton MODEL 381
GOLDEN WHEAT
8 TUBE AM-FM WITH PHONO JACK
AND 8L3 CHASSIS



DESCRIPTION	PART NO.
C1A,C,F,M GANG CONDENSER	PC85002-3
C1B,D,E,M GANG CONDENSER	
C2C TRIMMER ON F.M. GANG	
C2B TRIMMER ON A.M. GANG	
C2A F.M. OSC. TRIMMER	PA4398
C3 .01 MFD. CERAMIC DISC	PA4334-2
C4 110 MFD. CERAMIC DISC	CC30H-110
C5 1000 MMF. CERAMIC DISC	PA4334-3
C6 .01 MFD. CERAMIC DISC	PA4334-2
C7 .01 MFD. CERAMIC DISC	PA4334-2
C8 110 MMF. CERAMIC	CC30H-111A
C9 .01 MFD. CERAMIC DISC	PA4334-2
C10 2 MMF. CERAMIC N750 **	CC30H-020K
C11 30 MMF. CERAMIC	CC30H-300K
C12 110 MMF. CERAMIC	CC30H-111A
C13 1.7 MMF. BIFILAR WIRE CAPACITOR	PA4344
C14 110 MMF. CERAMIC	CC30H-111A
C15A,C (F.M. PRI.) C15B,D (F.M. SEC.) I.F. CAPAC.	PC30C-151F
C16 150 MMF. CERAMIC	CC30H-151F
C17 3-35 MMF. A.M.-R.F. TRIMMER	PA4396-1
C18 .01 MFD. CERAMIC DISC	PA4334-2
C19 .01 MFD. 400 V. TUBULAR	PC42CL-103
C20 .01 MFD. CERAMIC DISC	PA4334-2
C21 .01 MFD. CERAMIC DISC	PA4334-2
C22 .01 MFD. CERAMIC DISC	PA4334-2
C23A,F M. PRI.) C23B (F.M. SEC.) I.F. CAPAC.	TC969 *
C24A,E A.M. PRI.) C24B (A.M. SEC.) I.F. CAPAC.	TC970 *
C25 .01 MFD. CERAMIC DISC	PA4334-2
C26A,B 100 MMF. C. & R. UNIT	PA4353-1
C27 .01 MFD. CERAMIC DISC	PA4334-2
C28 .01 MFD. CERAMIC DISC	PA4334-2
C29 .002 MFD. CERAMIC DISC	HK35F-202
C30 .01 MFD. CERAMIC DISC	PA4334-2
C31 .002 MFD. CERAMIC DISC	HK35F-202
C32 33 MMF. MICA CAPACITOR RATIO DET. **	
C33 1 K MMF. CERAMIC	HK35H-102
C34 1 K MMF. CERAMIC	HK35H-102
C35 .01 MFD. CERAMIC DISC	PA4334-2
C36 8 MFD. 50V ELECT.	PA4303-7
C38 .0022 MFD. 1000 V. TUBULAR	PC42CN-222
C39 .02 MFD. 400 V. TUBULAR	PC42CL-203
C40 .01 MFD. 400 V. TUBULAR	PC42CL-103
C41 110 MMF. CERAMIC	CC30H-111A
C42 10-40-40-50 MFD. ELECT.	PA4307-1
C43 110 MMF. CERAMIC	CC30H-111A
C44 .01 MFD. CERAMIC DISC	PA4334-2
C45 .047 MFD. 200 V. TUBULAR	PC42CK-473

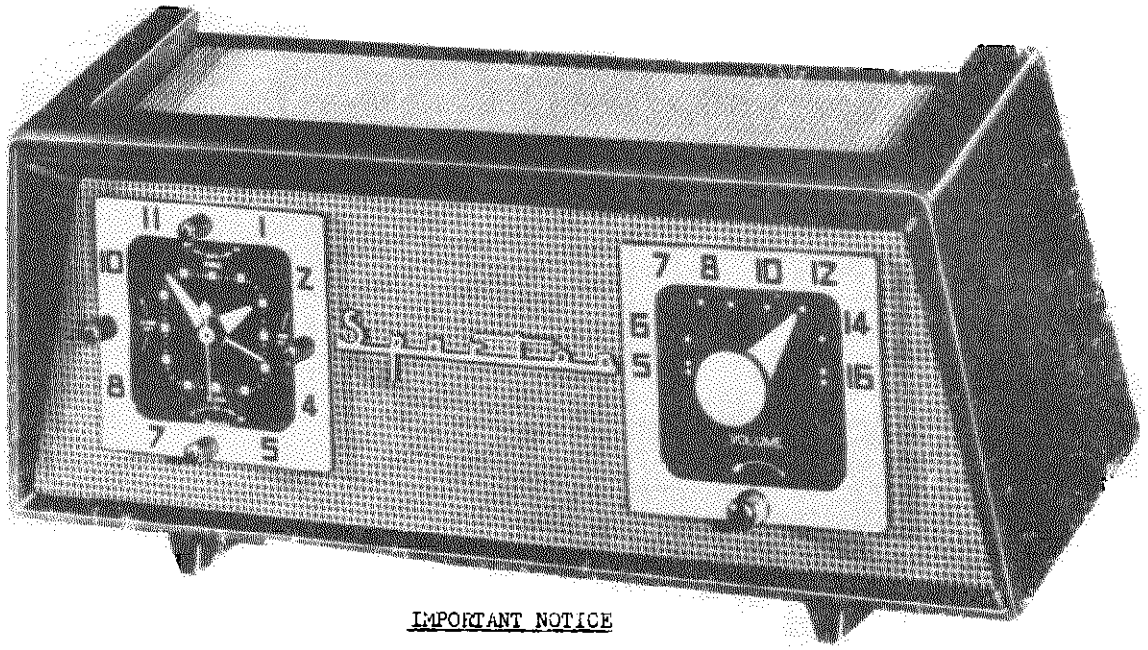
DESCRIPTION	PART NO.
R1 3.3K OHMS (IN L-5) 1/2 W.	BR125-332
R2 15 K. " " 1/2 "	PA4203-6
R3 220 " " 1/2 "	BR125-221
R4 2.2 MEG " " "	BR125-225
R5 470 K " " "	BR125-474
R6 1 " " "	BR125-105
R7 22 K. (IN L-11) " "	BR125-223
R8 2.2 MEG " " "	BR125-225
R9 330 " " "	PA4203-3
R10 470 K " " "	BR125-474
R11 4.7 K " " "	BR125-472
R12 470 K " " "	BR125-474
R13 4.7 K " " "	BR125-472
R14 1 MEG " " "	BR125-105
R15 68 " " "	BR125-680
R16 15 K. " " "	BR125-153
R17 6.8 K 2 W. C & R UNIT	BR125-682
R18 4.7 K. " " 1/2 "	BR125-472
R19 4.7 K. " " "	PA4329
R20 68 " " "	BR125-680
R21 15 K. " " "	BR125-153
R22 4.7 K. " " "	BR125-472
R23 47 K. " " "	BR125-473
R24 1 MEG VOLUME CONTROL 1/2 W.	PA4408-2
R25 22 K " " "	BR125-223
R26 15 MEG " " "	BR125-156
R27 220 " " "	BR125-221
R28 15 K " " "	BR125-153
R29 470 K " " "	BR125-471
R30 470 K " " "	BR125-474
R32 2 K. WIREWOUND 10 W.	PA4200-10
R33 200 K. " 1/2 "	BR125-284
R34 470 K. " " "	BR125-474
R35 .5 MEG. TONE CONTROL	PA4449
R36 330 1 W.	CR125-331
R37 3 WIREWOUND 1/2 W.	PA4207-1
R38 68 WIREWOUND " "	BRW125-680

DESCRIPTION	PART NO.
L1 LOOP ANTENNA	PA5250-12 OR 13
L2 LOOP LOADING COIL	AA6616-1
L3 F.M. OSC. COIL	AA6663-3
L4 F.M. OSC. COIL	PA5302-3
L5 100 MC CHOKE COIL (1500 Ω FORM)	AA6788-5
L6 CHOKE COIL	AA6789-6
L7 CHOKE COIL	AA6790-5
L8 CHOKE COIL	AA6769-2
L9 F.M. R.F. COIL	PA5202-5
L10 LINE CORD ANT. CHOKE	AA5584-1
L11 CHOKE COIL	AA6798-7
T-1 NO. 1 I.F. F.M. TRANS.	AA6667-1
T-2 NO. 1 I.F. A.M. TRANS.	AA6668-5
T-3 NO. 2 I.F. F.M. TRANS.	AA6667-3
T-4 NO. 2 I.F. A.M. TRANS.	AA6668-1
T-5 RATIO DETECTOR	AA6684-1
T-6 OUTPUT TRANS.	AB44081-2
T-7 POWER TRANS.	AB44013-1
T-8 FILTER CHOKE	AB47004-1

BOTTOM VIEW, TERMINAL HOOKUP FOR T-1, T-2, T-3, T-4 & T-5

* SPECIAL NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.
** REPLACE ONLY WITH TEMPERATURE COEFFICIENT AS INDICATED.

MODELS 320C, 321C, 325C, 329C, Ch. 5B3C



IMPORTANT NOTICE

A. All defective clocks used on Sparton radios must be returned to our Factory for replacement.

B. Clock parts will not be stocked or shipped to the field for clock repair by dealer servicemen.

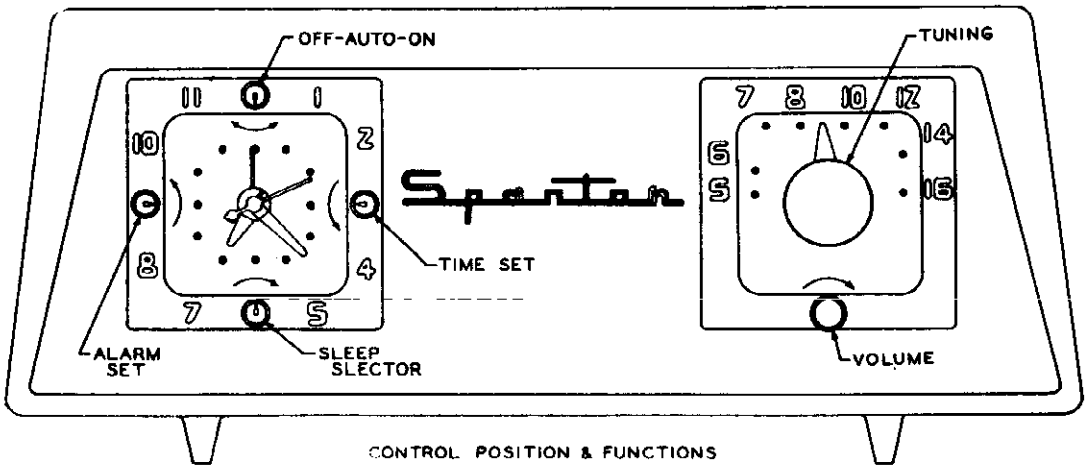
C. To remove the defective clock for shipment to our Factory, the following procedure must be used.

1. Remove clock by removing the two (2) screws on the back of housing. Do not return clock housing.

2. Do not cut, but unsolder the three clock lead wires at their points of connection on the chassis base.

3. Defective clocks must be properly tagged with defective material tag and properly packed to prevent transportation damage.

D. Violation of this procedure will automatically void the warranty on the defective clock.

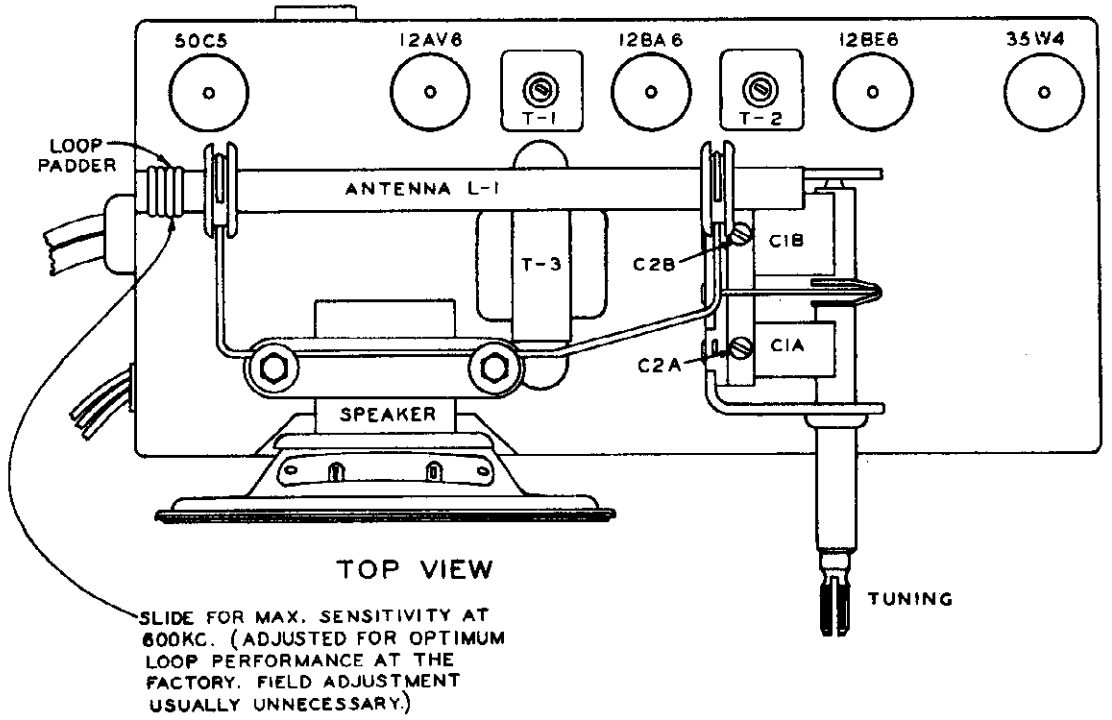


CONTROL POSITION & FUNCTIONS

© John F. Rider

MODELS 320C, 321C,
325C, 329C, Ch. 5B3C

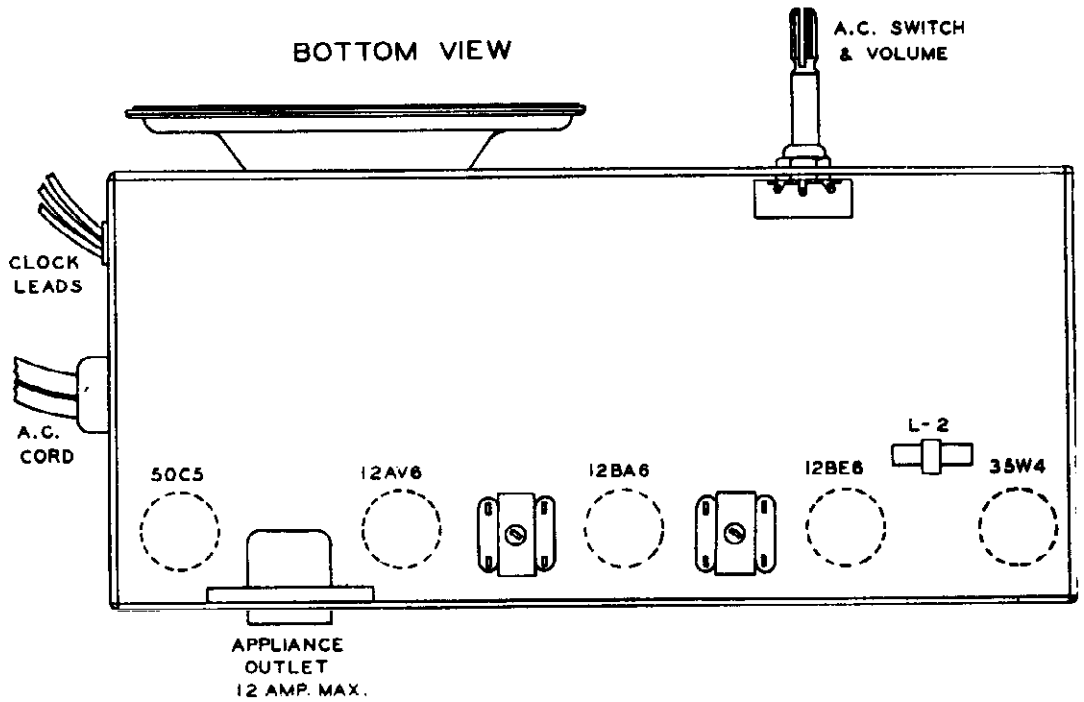
CHASSIS TYPE 5B3C



TOP VIEW

SLIDE FOR MAX. SENSITIVITY AT 600KC. (ADJUSTED FOR OPTIMUM LOOP PERFORMANCE AT THE FACTORY. FIELD ADJUSTMENT USUALLY UNNECESSARY.)

BOTTOM VIEW



MODELS 320C, 321C, 325C, 329C, Ch. 5B3C

VOLTAGE CHART

Line Voltage: 117 Volts AC		Position of volume control:Full with set tuned to quiet channel.							
TUBE	FUNCTION	Voltage of Sockets Pronge to B- See Prong Nos. on Schematic.							
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
12BE6	Converter	**	0	23*	11.5*	95	95	**	
12BA6	I.F. Amp.	**	0	23*	34.5*	95	93	0.55	
12AV6	2nd Det. & Audio Amp.	**	0	11.5*	0	***	0	48	
50C5	Power Amp.	6.3	0	84.5*	34.5*	0	95	115	0
35W4	Rectifier	0	118	84.5*	117*	117*	108*	120	

NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.

* AC Volts.

** Cannot be measured with 20,000 ohms per volt voltmeter.

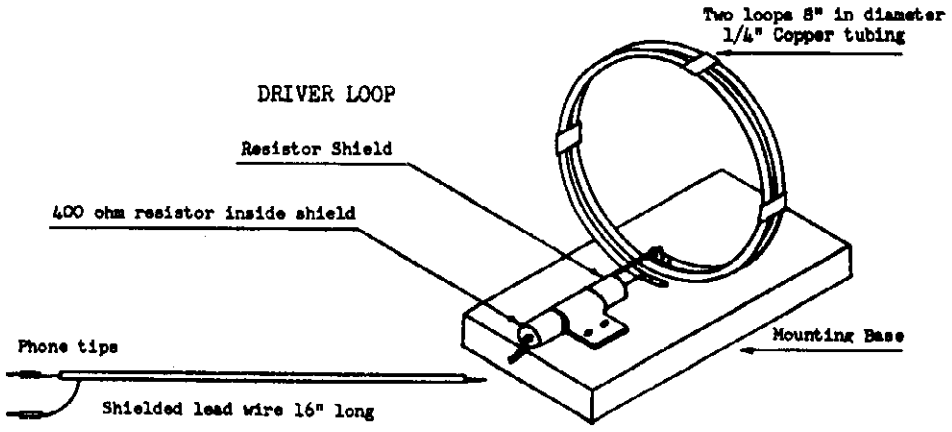
STEP BY STEP ALIGNMENT PROCEDURE

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1.	I.F.	Pin #7 on 12BE6	.02 MFD. Cond.	456 KC.	Fully Open	Slug T-2 Top & Bottom	Peak Accurately
						Slug T-1 Top & Bottom	Peak Accurately
2.	Broadcast	*	Driver Loop	1500 KC.	1500 KC.	C2A Osc. Tr.	Peak Accurately
						C2D Osc. Tr.	* *
						C2B Ant. Tr.	* * *
3.	Repeat operations 1 and 2						
4.	Check calibrations at 600, 1000 and 1500 KC.						

* Use driver loop as shown below.

** Trimmer C2D as shown on schematic is preset at factory and only on certain conditions will have to be re-adjusted in the field. This trimmer is located on bottom side of gang.

*** Rock dial while adjusting for maximum output.

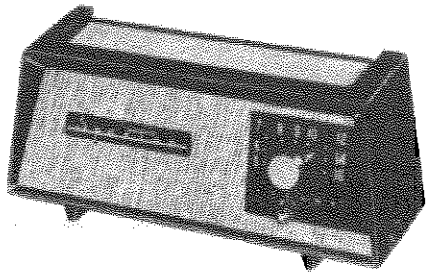


SPECIFICATIONS

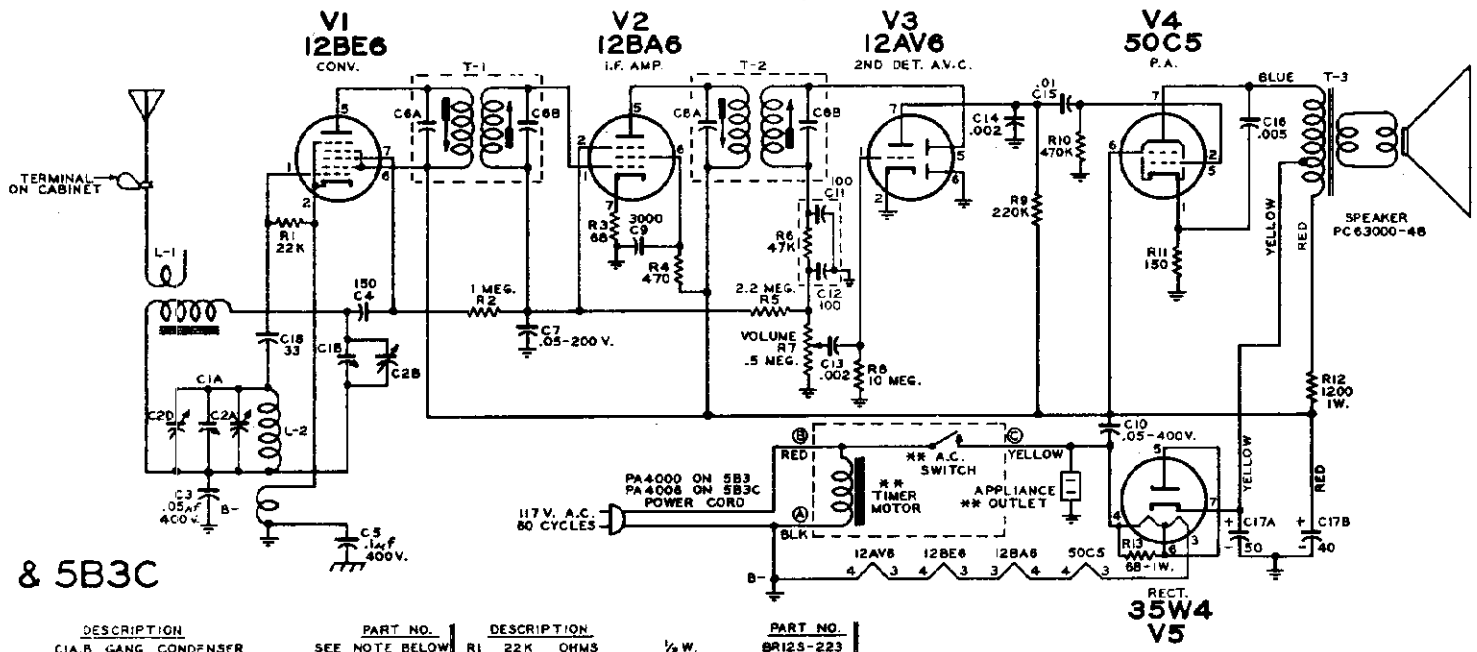
Two loops of 1/4" copper tubing 8" in diameter spaced 1/4" apart with 400 ohms resistor in series. Connecting cable and resistor must be shielded.
The loop should be spaced twice the diameter of the loop from the receiver being aligned to prevent an over modulated signal and poor alignment of the receiver.

MODELS 320C, 321C, 325C, 329C, Ch. 5B3C; 360, 361, 365, 369, Ch. 5B3

360 - CHARCOAL
361 - BROWN
365 - GREEN
369 - SAND



INTERMEDIATE FREQUENCY 456KC.



5B3 & 5B3C

DESCRIPTION	PART NO.
C1A,B GANG CONDENSER	SEE NOTE BELOW
C2A,B,D TRIMMERS ON GANG	
C3 .05 MFD. 400V. TUBULAR	PC40HL-503
C4 150 MMF. CERAMIC	PA4347-5
C5 .1 MFD. 400V. TUBULAR	PC40FL-104
C6A,B I.F. CAPACITORS	*
C7 .05 MFD. 200V. TUBULAR	PC40GK-503
C8A,B I.F. CAPACITORS	*
C9 3000 MMF. CERAMIC	HK35F-302
C10 .05 MFD. 400V. TUBULAR	PC40HL-503
C11 100 MMF. C & R UNIT	PA4329-1
C12 100 MMF. C & R UNIT	
C13 .2K MMF. CERAMIC	PA4334-3
C14 .2K MMF. CERAMIC	PA4334-3
C15 .01 MFD. CERAMIC	PA4334-2
C16 .005 MFD. CERAMIC	PA4334-1
C17A,B 40-50 MFD. ELECTROLYTIC	PA4311
C18 .33 MMF. CERAMIC	PA4347-2

NOTE:
C1A,B GANG COND. (MODEL 5B3C) PA4041B

DESCRIPTION			PART NO.
R1 22K OHMS		1/2 W.	BR12S-223
R2 1 MEG.	"	" "	BR12N-105
R3 68	"	" "	BR12S-680
R4 470	"	" "	BR12S-471
R5 2.2 MEG.	"	" "	BR12N-225
R6 47K C & R UNIT			PA4329-1
R7 VOLUME CONTROL			SEE NOTE BELOW
R8 10 MEG. OHMS		" "	BR12N-106
R9 220K	"	" "	BR12S-224
R10 470K	"	" "	BR12N-474
R11 150	"	" "	BR12S-151
R12 1200 OHMS		1 W.	CR12S-122
R13 68 OHMS		1 W.	CR12S-680
L1 LOOP ANT. ASSEMBLY			AB43592-1
L2 OSC. COIL ASSEMBLY			AA6797-5
T1 NO. 1 I.F. TRANSFORMER ASSEMBLY			PB42201-2
T2 NO. 2 I.F.	"	"	PB42201-3
T3 OUTPUT	"	"	AB44089-1

NOTE:
R7 VOLUME CONTROL (MODEL 5B3) PA4400-12

⏚ INDICATES CONNECTION TO B- BUSS, NOT CHASSIS.

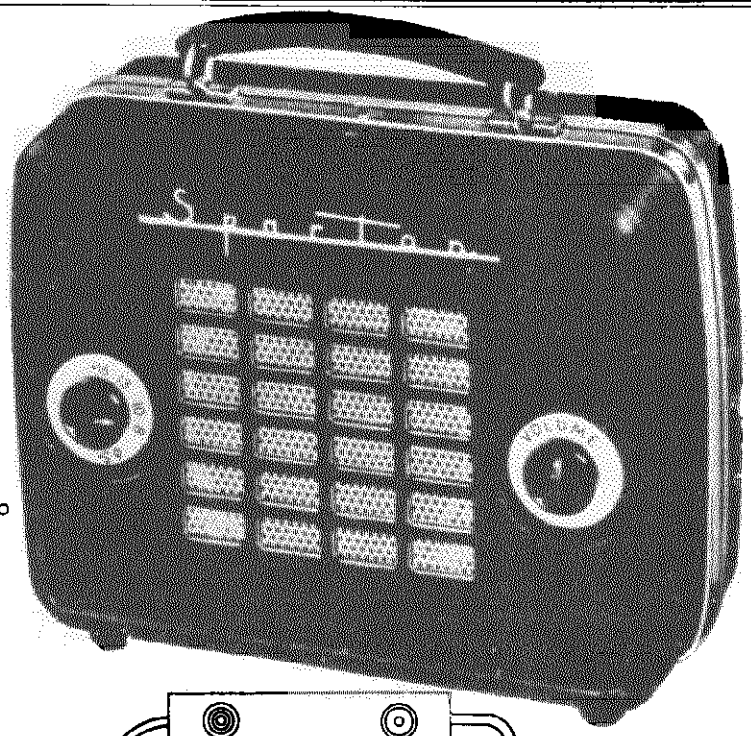
⏚ INDICATES CHASSIS CONNECTION.

* SPECIAL SERVICE NOTE: THESE TRANSFORMERS SUPPLIED IN COMPLETE ASSEMBLIES ONLY.

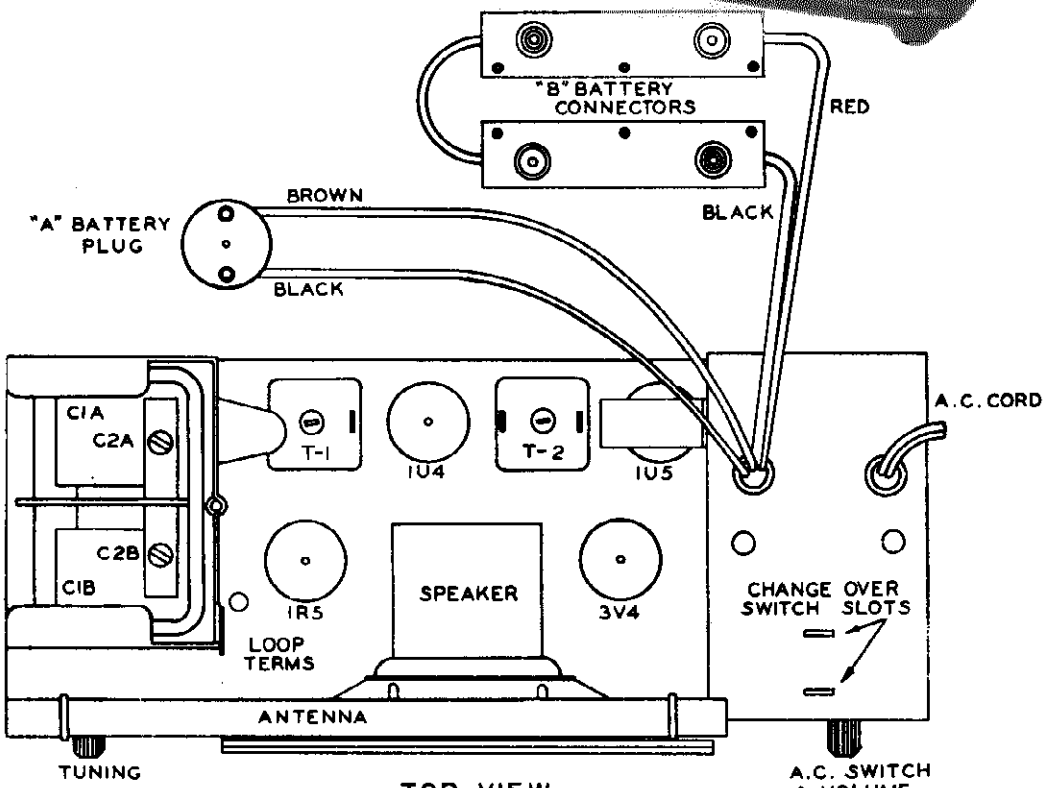
** TIMER UNIT & APPLIANCE OUTLET ON 5B3C ONLY.
A.C. SWITCH IN 5B3 ON VOLUME CONTROL.
A.C. SWITCH IN 5B3C IN TIMER UNIT.

KNOB	VOLUME	(Charcoal)	PA5657-1	CABINET	(Charcoal)	PD90121-1
KNOB	VOLUME	(Green)	PA5657-2	CABINET	(Green)	PD90121-2
KNOB	VOLUME	(Brown)	PA5657-3	CABINET	(Brown)	PD90121-3
KNOB	VOLUME	(Sand)	PA5657-4	CABINET	(Sand)	PD90121-4
KNOB	TUNING		PA5657			
*SPEAKER		5-Inch	PC63000-48		(KNOBS 5B3 ONLY)	

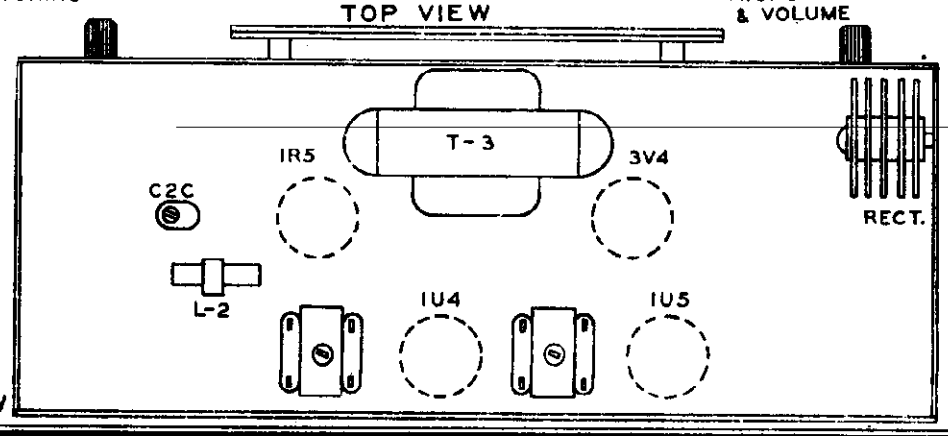
MODELS 301, 305, 309, Ch. 4E3



Sparton AC-DC PORTABLE RADIO
MODEL 301 - BROWN
MODEL 305 - GREEN
MODEL 309 - IVORY



TOP VIEW



BOTTOM VIEW

CHASSIS TYPE 4E3

VOLTAGE CHART

Line Voltage: 117 Volts AC		Position of volume control: Full with set tuned to quiet channel.						
TUBE	FUNCTION	Voltage of Sockets Prongs to -B See Prong Nos. on schematic.						
		No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7
1R5	Osc. Converter	1.37	93	60	**	1.37	0	2.7
1U4	I.F. Amplifier	2.7	93	93	0	2.7	0	4.1
1U5	Det. A.V.C. & 1st Audio	1.37	15	11.5	0	0	0	0
3V4	Output	4.1	93	93	0	5.9	0	7.5

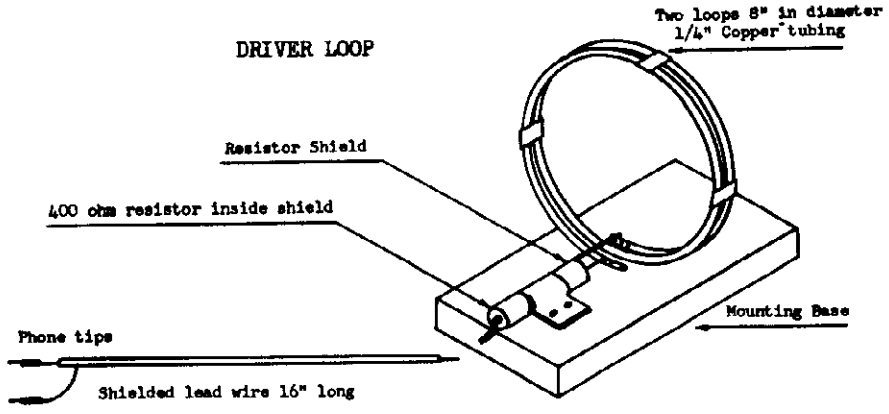
NOTES: Voltage readings are for schematic diagram in this bulletin. Allow 15% + or - on all measurements. Always use meter scale which will give greatest deflection within scale limits. All DC measurements made with 20,000 ohms per volt voltmeter. All AC voltages made with rectifier type voltmeter.

** Cannot be measured with 20,000 Ohms per volt voltmeter.

STEP BY STEP ALIGNMENT PROCEDURE

OPERATION	ALIGNMENT OF	GENERATOR CONNECTED TO	DUMMY ANTENNA	GENERATOR FREQUENCY	TUNING COND. SETTING	TRIMMER	REMARKS
1.	I.F.	Pin #6 1R5 Tube	.1 Mfd. Cond.	456 KC.	Open	Slug T-2 Top & Bottom	Peak accurately
						Slug T-1 Top & Bottom	Peak accurately
2.	Osc.	Separate Loop	*	1620 KC.	Open	C2B Osc.Tr.	Peak accurately
3.	R.F.		*	1500 KC.	1500 KC.	C2A Ant.Tr.	Peak accurately
4.	Repeat Operation #3.						
5.	Check calibration at 600 KC., 1000 KC. and 1500 KC.						
6.	Check Operations #1 to #6 inclusive.						

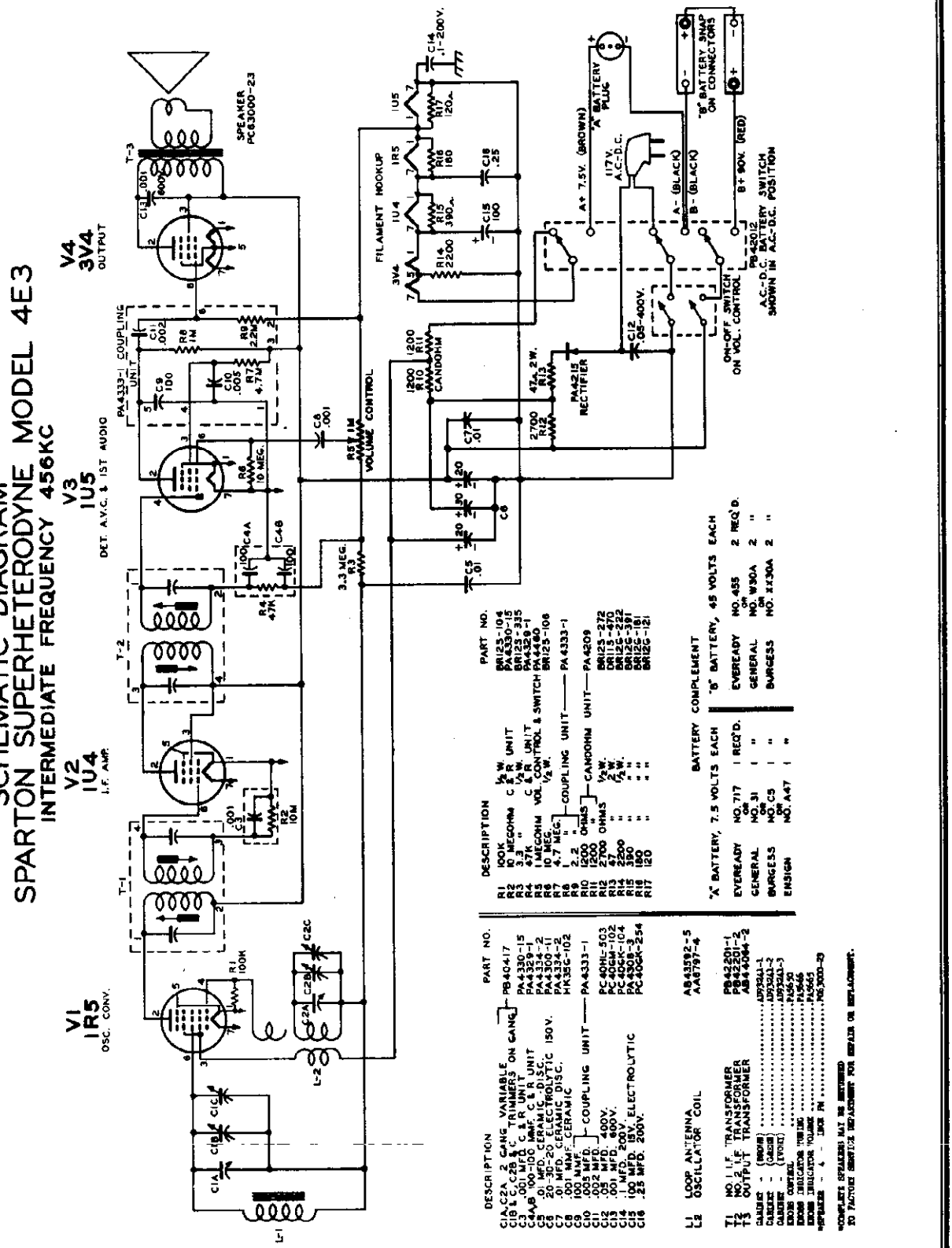
* Use driver loop as shown in this bulletin.
The generator must be connected to the dummy loop antenna and not to the loop of the receiver for R.F. alignments.
Trimmer C2C as shown on schematic is preset at factory and only on certain conditions will have to be moved. However, should it become necessary to adjust this trimmer on the bottom of the gang a cutout in the chassis base has been provided.



SPECIFICATIONS

Two loops of 1/4" copper tubing 8" in diameter spaced 1/4" apart with 400 ohms resistor in series. Connecting cable and resistor must be shielded.
The loop should be spaced twice the diameter of the loop from the receiver being aligned to prevent an over modulated signal and poor alignment of the receiver.

MODELS 301, 305,
309, Ch. 4E3



SPECIFICATIONS

Power Supply	105-125 volts 60 cycle AC only.
Power Consumption	65 Watts.
Frequency Range FM	88 to 108 MC.
Frequency Range AM	540 to 1600 KC.
I.F. Frequency FM	10.7 MC.
I.F. Frequency AM	455 KC.
Band width, FM, Ratio Detector	330 KC.
Band width, FM, 1st I.F.	280 KC.
Band width, FM, Converter	220 KC.

The tubes used are as follows:

12AT7	FM RF Amplifier, Converter
6BE6	FM Osc, Am Osc, Converter
6BA6	FM-AM, 1st I.F. Amplifier
6BA6	FM, 2nd I.F. Amplifier
6AL5	FM Detector
6AT6	AM Detector, AVC, Audio
6AQ5	Power Output
6X4	Power Rectifier
No. 44	Pilot Lights (2)

SERVICE NOTES

GENERAL

CAUTION: If realignment is necessary be sure the proper test equipment is available, as listed below, before proceeding with the alignment procedure

Due to the high frequencies at which FM signals are received the service man must use great care when servicing these sets. Extreme caution must be used regarding the moving of component parts in the R.F. and oscillator circuits of the receiver as those circuits can be detuned in this manner.

If it becomes necessary to replace components such as resistors and condensers they must be replaced with parts of the same size, type, voltage rating and tolerance as called for in the parts list.

When installing new parts they should be placed in the same position as the original, and the leads should be cut to the same length.

ALIGNMENT NOTES

This receiver has been thoroughly inspected and tested at the factory, using the most modern test equipment available such as FM sweep generators and oscilloscopes. All R.F. and I.F. circuits have been accurately adjusted at the factory and no attempt should be made to realign these circuits unless it is absolutely necessary.

EQUIPMENT USED FOR ALIGNMENT

Vacuum tube voltmeter.
AM Signal generator
FM Sweep generator.
Oscilloscope.
Insulated screw driver.
Dummy antenna:
.1 MFD condenser
.00025 MFD mica condenser
150 ohm resistor (2)
Output meter.

VOLTAGE CHART

	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
6BE6 FM & AM OSC AM CONV	0	0	0	6 AC	155	125	0		
12AT7 FM RF AMP & CONV	170	0	1.5	0	0	155	0	1	6 AC
6BA6 1st IF AM & FM	0	0	0	6 AC	150	100	0		
6BA6 2nd IF FM	0	0	0	6 AC	155	110	1		
6AL5 FM DETECTOR	0	0	0	6 AC		0	0		
6AT6 AM DETECTOR, AVC, AUDIO	—.5	0	0	6 AC	0	0	60		
6AQ5 POWER OUTPUT	0	7.5	0	6 AC	215	170	0		
6x4 POWER RECTIFIER	230 AC		0	6 AC	235	230 AC	235		

Band Switch on AM position. Dial 1600 KC. No Signal.

All voltage readings are taken from tube pin to chassi

All measurements are made with no signal, using a 20,00 ohm per volt meter.

AC input voltage must be maintained at 117 volts f accurate readings.

AC voltages shown are at 1000 ohms per volt.

All voltages shown are approximate.

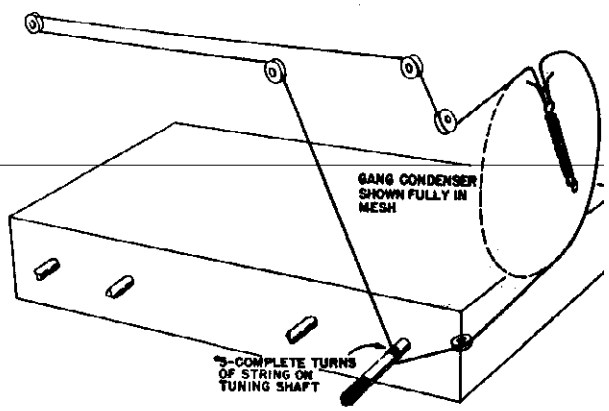


FIG. 4 DIAL CORD STRINGING

ALIGNMENT PROCEDURE

STEPS	RECEIVER DIAL SETTING	BAND SWITCH POSITION	SIGNAL GENERATOR FREQUENCY	DUMMY ANTENNA	SIGNAL GENERATOR CONNECTIONS	OUTPUT INDICATOR	TRIMMER ADJUSTMENT	TRIMMER FUNCTION	REMARKS
1	Minimum capacity	AM	455 KC 400 cycle AM	.1 MFD	High side—grid of AM converter tube (6BE6) Low side—chassis	Output Meter across voice coil	T2 & T4	AM I.F.	Adjust for maximum output
2	"	"	1600 KC 400 cycle AM	"	"	"	AM OSC	AM Oscillator	"
3	1400 KC	"	1400 KC 400 cycle AM	.00025 MFD	High side—One ant. terminal Low side—Other ant. terminal	"	Ant Loop	AM Antenna	"
4	Any position where there is no station interference.	FM	10.7 MC unmodulated .1 volt output.	.1 MFD	High side—grid of 2nd I.F. amplifier tube (6BA6) Low side—chassis	Connect V.T.V.M. to plate of Ratio Detector tube, pin 7 (6AL5)	Top T5	Ratio detector primary	Adjust for maximum negative voltage
5	"	"	10.7 MC 400 cycle 250 KC Deviation	"	"	Connect scope to audio take-off point (across vol. cont.)	Bottom T5	Ratio detector secondary	Adjust for a balanced pattern on scope. See Fig. 2
6	"	"	10.7 MC 400 cycle 80 KC Deviation	"	High side—grid of 1st I.F. amplifier tube (6BA6) Low side—chassis	"	T3	FM 2nd I.F.	Adjust for maximum gain and best pattern on scope. See Fig. 2
7	"	"	"	"	High side—grid (pin 7) of FM converter tube (12AT7) Low side—chassis	"	T1	FM 1st I.F.	"
8	108.5 MC	"	108.5 MC 400 cycle 30% modulation (22.5 KC deviation)	300 ohms in high side	High side—ant. terminal Low side—chassis	Connect output meter across voice coil	FM OSC.	FM oscillator	Adjust for maximum output
9	105 MC	"	105 MC 400 cycle 30% modulation (22.5 KC deviation)	"	"	"	FM RF	FM R.F.	"

NOTE A: When aligning the FM I.F. circuits, keep the out put from the signal generator as low as possible.

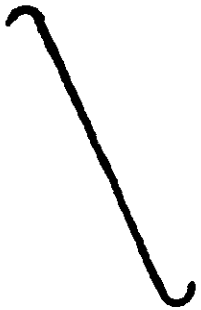
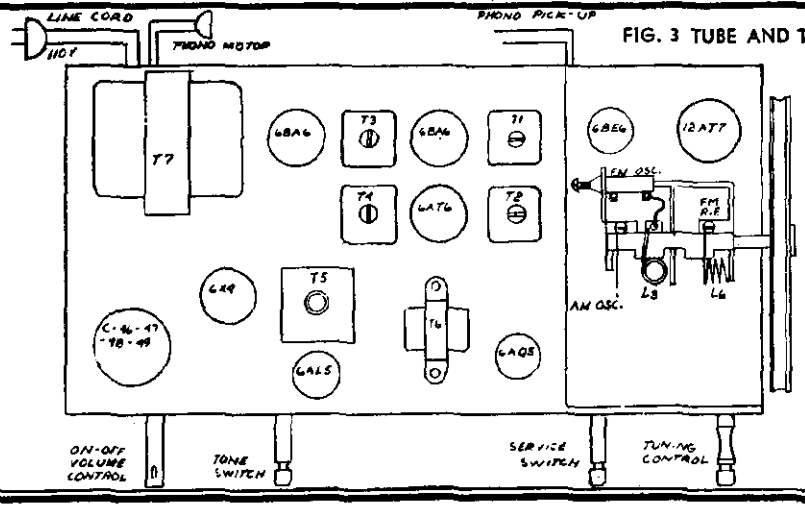


FIGURE 2

FIG. 3 TUBE AND TRIMMER LOCATIONS



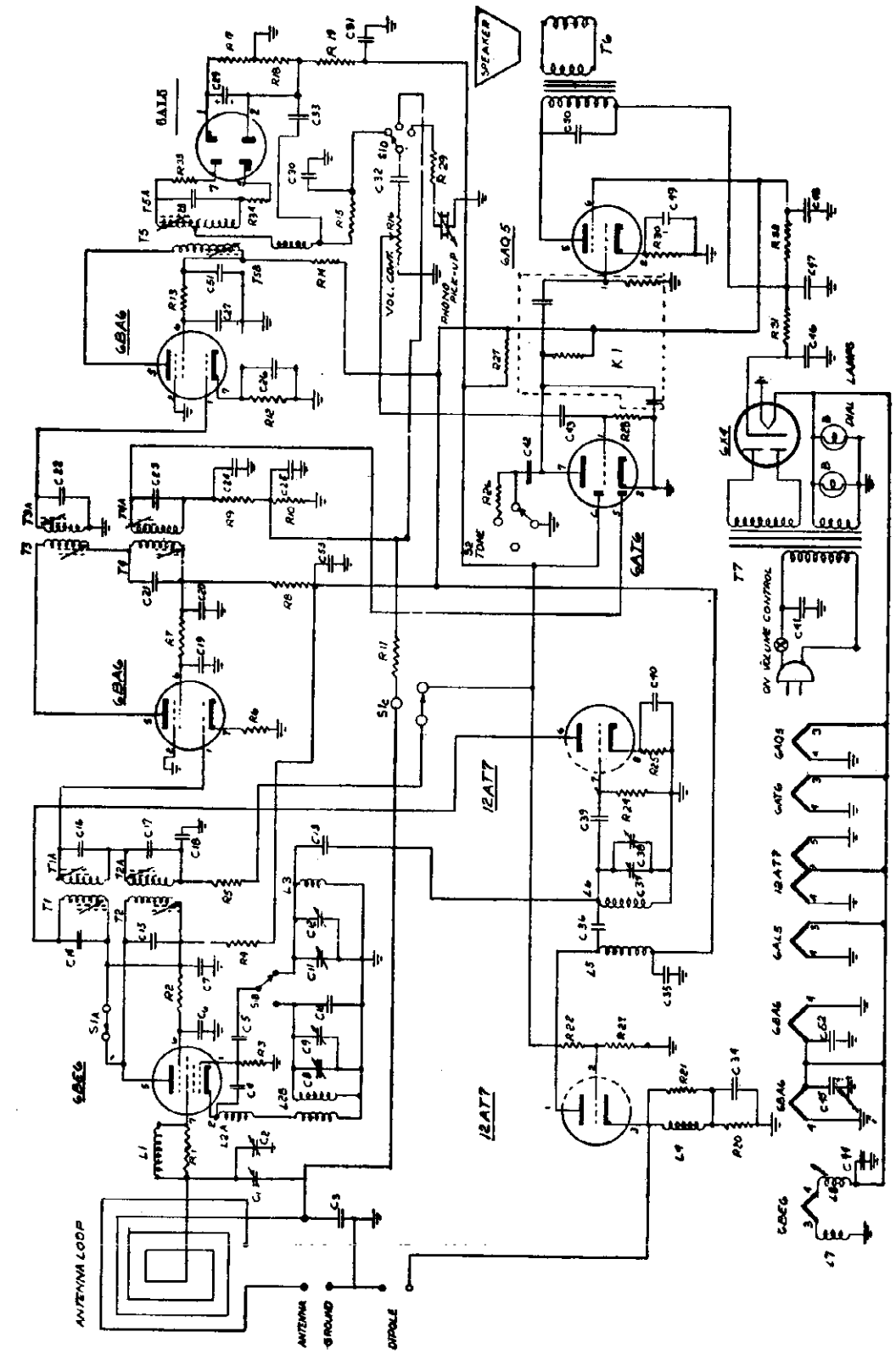


FIG. 1 SCHEMATIC DIAGRAM

PARTS LIST

Schematic Diagram Reference	Description	Price
C1	Loop Trimmer	.35
C2	Variable Cond.	2.55
C8, C9 C11, C37 C38	.05-200V Condenser	.15
C3	2.2 MMF Gimmick Cond.	.15
C4	33 MMF (Erie Style A N14004)	.15
C5		
C6, 18 C19, 27 C26, C30 C42, C45, 51 C50, C52	5000 MMFD GMV ea.	.15
C10	15 MMFD + or − 10% O° T.C. (Erie)	.15
C12	FM Osc Trimmer	.25
C13	1.5 MMFD (Erie Style "A")	.15
C14, 15, 16, 17 21, 22, 23, 24, 28	XFMRS Integral part of respective IF	
C31, 32, 53, 7, 20	10,000 MMFD GMV ea.	.15
C25, 33 36, 39	100 MMF ceramic cond. ea.	.15
C29	4 - 50V Lytic condenser	.40
C34, 35 40, 44	1000 MMFD GMV condenser ea.	.15
C41	.1 - 400V condenser	.15
C43	.01 - 200V condenser	.15
C46, 47 48, 49	40-350V, 30-300V FP Lytic Condenser 30-300V, 10-25V	2.30
R2	4.7K ohm Resistor	.10
R3, R15	22K ohm Resistor	.10
R4, R8, R14	1K ohm Resistor	.10
R5, R19	100K ohm Resistor	.10
R6, R12	68 ohm Resistor	.10
R7, R13	10K ohm Resistor	.10
R9, R26	47K ohm Resistor	.10
R10, R23, R24	470K ohm Resistor	.10
R11, R22	2.2M ohm Resistor	.10
R16	.5M Vol. Cont. — SPST	1.20
R17, R18	12K Resistor	.10
R20 R33 R34	220 ohm Resistor ea.	.10
R25	2.2K ohm	.10
R27	3.3M ohm	.10
R28	6.8M ohm	.10
R30	270 ohm — 1 Watt	.15
R31	100 ohm — 1 Watt	.15
R32	1000 ohm — 5 Watt	.30
K1	CRL Triode couplate	.50
L1	AM Grid Choke on R1	.30
L2A, B	AM Osc. Coil	.30
L3	FM Osc. Coil	.30
L4	FM Cathode choke on R21	.30
L5	FM plate choke	.30
L6	FM RF Coil	.30
L7, 8	Filament choke	.30
T1	1st FM IF	1.50
T2	1st AM IF	1.50
T3	2nd FM IF	1.50
T4	2nd AM IF	1.50
T5	Ratio Detector	2.00
T6	Out Put XFMR	1.25
T7	Power XFMR	4.50
	Loop Ant.	1.50
B	No. 44 Pilot Light	.20
	Line cord	.25
	300 ohm Line Di-Pole Ant.	1.50

HOW TO ORDER REPAIR PARTS

Always give the part No. (No. printed on the part if different from that shown on this list), and the name of the part. When No. is not available, give complete description of part. Be sure to always give the Model No. and Catalog No. The Model No. will be found on a printed label which will be found at the back of the cabinet.

K=1000
M=1,000,000
All Resistors ½ Watt unless otherwise noted.

Values of Capacitors in MFD. unless otherwise stated.
Tolerance on Capacitors and Resistors + or − 20% unless otherwise stated.
All above prices subject to change without notice.

OPERATION

This Aircastle 3-way portable radio is designed to operate on self-contained batteries or 110-120 volt, 60 cycle AC or DC current.

It has a high efficiency built-in antenna; no outside aerial or ground is necessary. Because this type antenna is highly directional and to obtain the best possible reception with a minimum of noise, it may be necessary to turn the set to a position whereby the antenna is at a 90° degree angle to the direction of the station - this is the position of the clearest and best reception.

Do not place near a hot radiator or stove. Give set reasonable care and it will add many happy hours to your listening pleasure -- at home or away.

TO OPERATE ON AC OR DC HOUSE CURRENT: Plug power cord into wall outlet in normal manner. Turn on-off volume control until click is heard - this turns on the power. Continue turning control about half way of range. Adjust tuning control to the station of your choice for best clarity of reception. Re-adjust volume to desired level.

NOTE: If slight hum is heard when operating with AC current, or if no signal is heard when operating on DC current, reverse power plug into power outlet.

TO OPERATE ON BATTERY: Plug power cord into slot at back of chassis. Operation of set is then same as operating on house current. Caution: To get the most service from your battery, turn off set when not being used.

BATTERY PACK REPLACEMENT

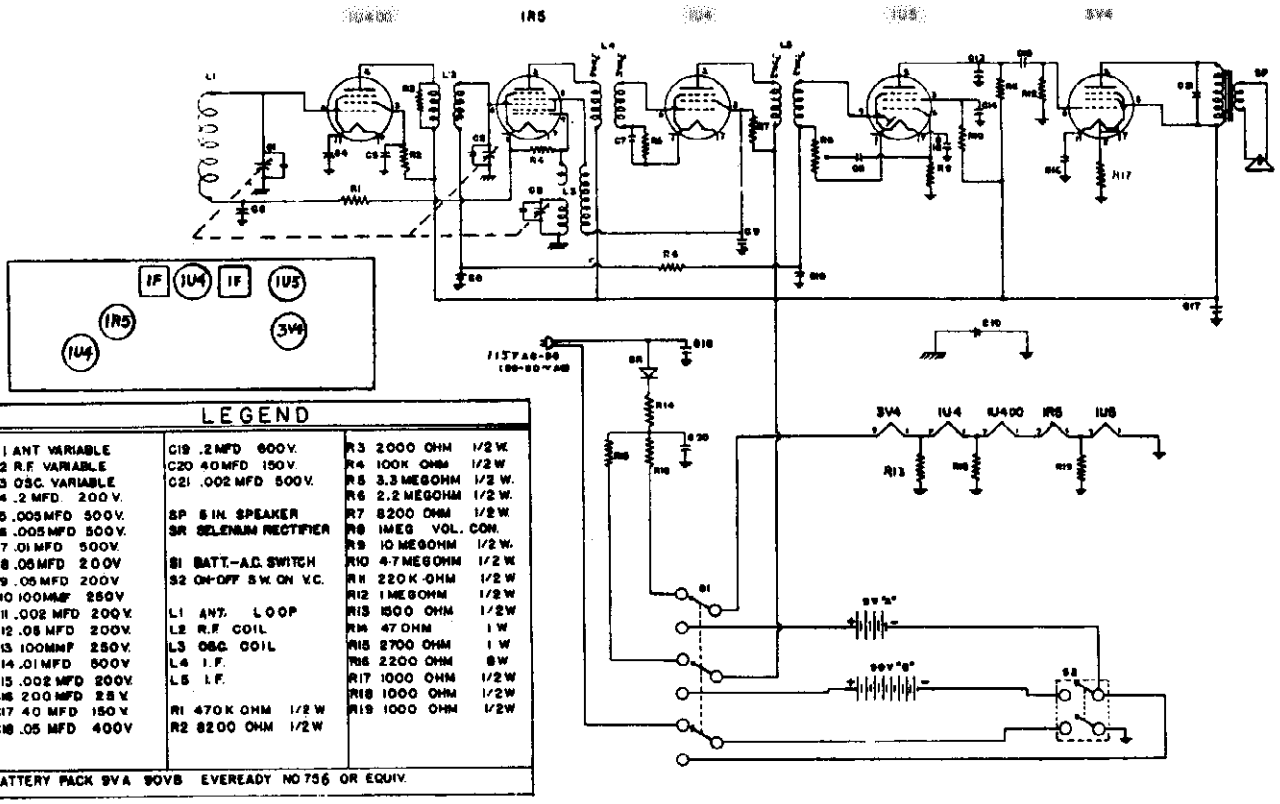
This set used type 90V-9V battery pack. When replacing, it is suggested that you observe how old battery is placed and connect new battery pack in same manner.

ALIGNMENT DATA

Step	Connect high side of Signal Generator to:	Signal Generator output	Dial Pointer Setting	Adjust for Maximum output
#1	1R5 pin #7 through 0.1 mfd condenser	455 KC	To high end of dial where signal is unaffected	1st IF Transformer (L4)
				2nd IF Transformer (L5)
#2	Couple to receiver loop with several turns of wire.	1620 KC	Minimum capacity	Oscillator trimmer
#3	Same as above	1400 KC	Tune to signal	RF Transformer (L2)
				Antenna section trimmer

a) Measure output with output meter across speaker voice coil.

b) Signal Generator output should be kept as low as convenient to give reading without overload and without AVC action.



LEGEND

C1 ANT VARIABLE	C19 .2 MFD 600V.	R3 2000 OHM 1/2 W.
C2 R.F. VARIABLE	C20 40 MFD 150V.	R4 100K OHM 1/2 W
C3 OSC. VARIABLE	C21 .002 MFD 500V.	R5 3.3 MEGOHM 1/2 W.
C4 .2 MFD. 200 V.		R6 2.2 MEGOHM 1/2 W.
C5 .005 MFD 500V.	SP 6 IN. SPEAKER	R7 8200 OHM 1/2 W.
C6 .005 MFD 500V.	SR SELENIUM RECTIFIER	R8 1MEG VOL. CON.
C7 .01 MFD 500V.		R9 10 MEGOHM 1/2 W.
C8 .05 MFD 200V	S1 BATT.-A.C. SWITCH	R10 4.7 MEGOHM 1/2 W
C9 .05 MFD 200V	S2 ON-OFF SW. ON V.C.	R11 220 K OHM 1/2 W
C10 100MMF 250V		R12 1 MEGOHM 1/2 W
C11 .002 MFD 200V.	L1 ANT. LOOP	R13 1500 OHM 1/2W
C12 .05 MFD 200V.	L2 R.F. COIL	R14 47 OHM 1 W
C13 100MMF 250V.	L3 OSC. COIL	R15 2700 OHM 1 W
C14 .01 MFD 500V	L4 I.F.	R16 2200 OHM 8W
C15 .002 MFD 200V.	L5 I.F.	R17 1000 OHM 1/2W
C16 200 MFD 25 V.		R18 1000 OHM 1/2W
C17 40 MFD 150 V.	R1 470 K OHM 1/2 W	R19 1000 OHM 1/2W
C18 .05 MFD 400V	R2 8200 OHM 1/2W	

BATTERY PACK 9V A 90VB EVEREADY NO 756 OR EQUIV.

HOW TO ORDER PARTS

Always specify the following on your order blank:

ITEM FOR WHICH PART IS ORDERED	MODEL NUMBER	PART NUMBER	DESCRIPTION	QUANTITY	PRICE

PARTS LIST

SYMBOL NO.	PART NO.	DESCRIPTION	PRICE*
C1,C2,C3	CV-29	Variable Condenser	2.30
C17,C20	CE-1003C	Electrolytic 40mfd/150V	1.20
Any condenser, paper, (specify value)			.15
Any Discap condenser (specify value)			.15
	CCT-100-25	Ceramic Tubular condenser	.12
Any resistor, carbon, (specify value)			.15
R16	RW1951	Resistor, wire wound	.60
T	TR103	Output Transformer	1.40
SP	SP42A	Speaker less/trfr	3.60
L1	LPFE-11A	Loop Antenna	.80
L2	LC12	RF Coil	.60
L3	LC11	Oscillator Coil	.60
L4,L5	LF24	IF Transformer	.90
S1	SWSS-6	Slide Switch	.60
SR	SE1000	Selenium Rectifier	1.20
	CB-6P2E	Cabinet for model 652.6P2E	3.60
	KNV-6P2	Knob, Volume, on, off	.60
	KNT-6P2	Knob, Tuning	..60
R8	VC-53	Volume Control	1.20

*Prices subject to change without notice

INSTALLATION

Your new Aircastle AM-FM receiver is designed for use on AC 60 cycle or DC current of 105-120 volt. I you are in doubt of the current supply in your locality, consult your power company.

When operating on DC current source, it is necessary to insert the power plug with the proper polarity If the set fails to function after an interval sufficient for the tubes to reach their operating tempera ture, reverse the power plug in the outlet.

If operating on AC current and a slight hum is heard, reverse the power plug in the outlet as this may b pick-up interference from your power source.

Do not use an external ground with this receiver. Do not place receiver near a hot stove or radiator a it might damage set.

ANTENNA

This receiver has a high efficiency built-in AM antenna. For most locations and under normal receivin conditions, this antenna will be adequate to provide excellent results.

For FM reception, this set has a line antenna which will provide satisfactory reception in most locali- ties.

However, for best possible reception regardless of location from stations, an external FM antenna shoul be used. Any FM antenna with a 300 ohm line may be used and should be placed as high as possible to ove come any obstruction that might impair reception. The two-lead-in wires of the antenna should be attache (one lead to each screw) to the terminal strip located on the cabinet back after detaching the small wir that was between the two screws on terminal block when set was shipped.

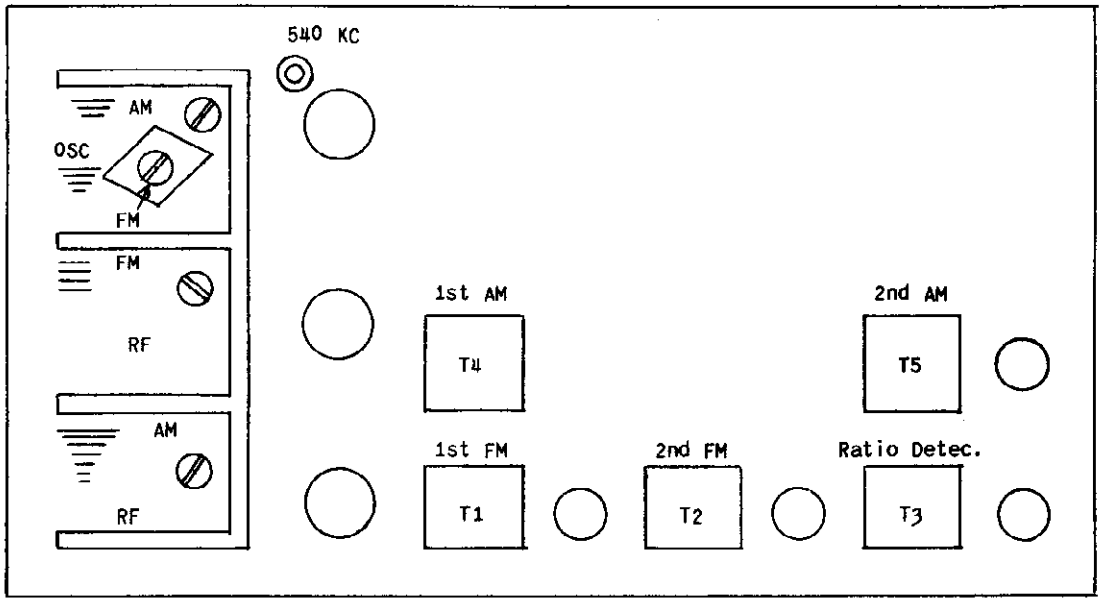
TO OPERATE

To turn the receiver on, rotate on-off volume switch (outer-most knob) until it clicks. Continue ro tating knob to about half of its range allowing set to reach its operating temperature. Then turn sta tion selector knob to the desired station. It is always recommended that you tune the station with th volume control set low as this enables you to get the exact point where the station comes with maximu volume and clarity - this is particularly true of FM reception.

To select the AM or FM band, it is necessary to turn the inner-most knob located on the volume control t the right for the AM band; to the left for FM band.

SERVICE NOTES

When installing new parts they should be placed in the same position as the original, and the lead should be cut to the same length. Lack of sensitivity and poor tone quality may be due to any one or combination of causes, such as weak or defective tubes or speaker, open or grounded resistors, or bypas condensers. Never attempt to realign the set until all other possible sources of trouble have been firs thoroughly investigated and definitely proved not to be the cause. It will be necessary to follow th procedure outlined below and to use recommended equipment for satisfactory results.



FM Oscillator and RF coils directly below associated section of variable condenser.

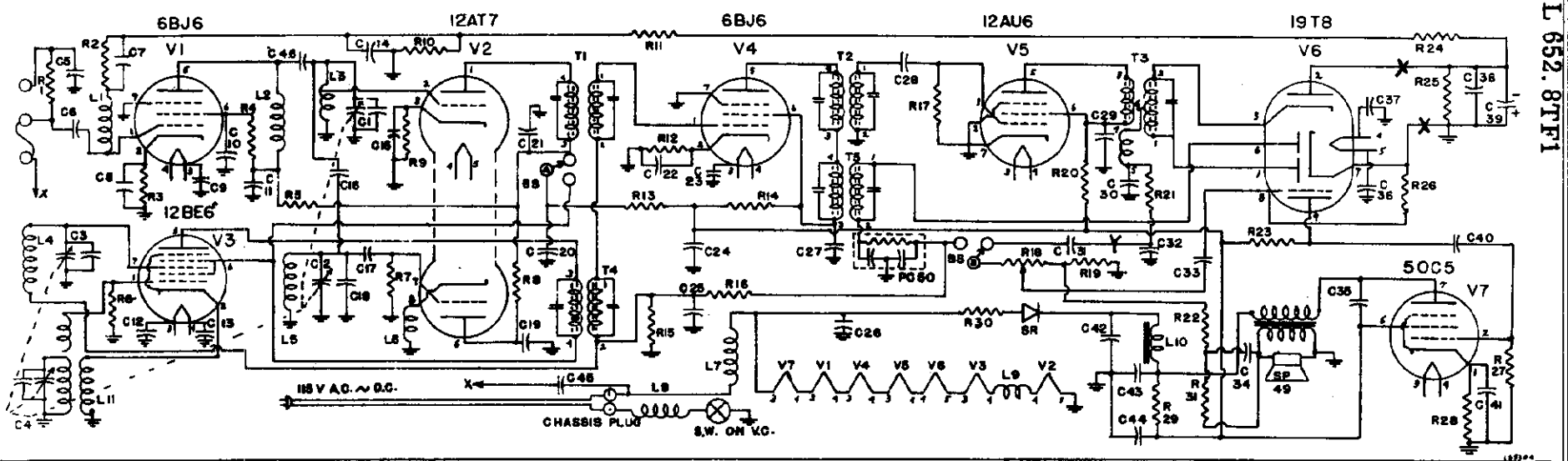
AM ALIGNMENT PROCEDURE

Measure output across speaker voice coil with output meter.

Step	Connect high side of signal generator to:	Signal Generator setting:	Dial Pointer Setting	Adjust for maximum output
#1	128E6, pin #7 through 0.1 mfd condenser	455 KC	At high end of dial where signal is unaffected	2nd AM IF transformer T5
				1st AM IF transformer T4
#2	Couple to receiver loop antenna with several turns of wire.	1620 KC	Minimum capacity	AM oscillator trimmer condenser
#3	Same as above	540 KC	Maximum capacity	Adjust slug in 540 KC coil
#4	RECHECK	Step #2		
#5	Same as above	1400 KC	Tune to signal	AM antenna section trimmer condenser

FM ALIGNMENT PROCEDURE

	Step	Connect high Side of Signal Generator	Signal Generator Setting	VTVM Connection	Adjustment	Output indication	Remarks	
IF ALIGNMENT	1	12AT7 pin #2 through 0.1 mfd condenser	10.7MC	19T8 pin #2	2nd FM IF Transformer T2 1st FM IF Transformer T1 Bottom slug only of ratio detector trans. T3	Adjust for maximum output indication on VTVM	Reduce signal generator output that no more than 2.0 volts output measured on VTVM Refer to tube lay chart and schemat for location of trimmers.	
	2	Make up network of two 6.8K resistors as shown on schematic and connect across points X–X as indicated.						
	3	Same as in step #1	10.7MC	High side to point "Z" on schematic. Low side to point labeled "Y".	Top slug only of ratio detector trans. T3	Adjust for zero reading on VTVM.		
	4	Remove resistor network of step 2					Tune Receiver	Rem
RF ALIGNMENT	5	Connect sweep generator to FM antenna terminals of receiver with 150 ohm resistor in series with each lead.	87.6 MC ± 75KC deviation 400 cps.	Output meter across speaker voice coil.	Expand or compress oscillator coil.	Adjust until max. signal is obtained on output meter	Maximum capacity (fully meshed)	
	6	"	108.4MC ± 75KC @ 400cps	"	FM oscillator trimmer condenser	Adjust for maximum signal	Minimum capacity	Rec ste
	7	"	90 MC ± 75KC @ 400 cps	"	FM-RF coil expand or compress	Adjust for maximum signal	Tune to signal	
	8	"	105 MC ± 75 KC @ 400 cps	"	FM-RF trimmer condenser	Adjust for maximum signal	Tune to signal	Rec Ste

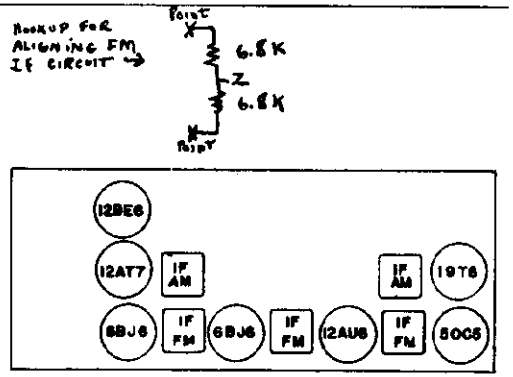


PARTS LIST

C 1,2,3,4	VARIABLE CONDENSER			R 1	1500 OHM	10%	1/2 W
C 5,6,7,17,28 46.	100 mmf	500 V		R 2	100 K OHM	10%	1/2 W
				R 3, 12	68 OHM	10%	1/2 W
C 8,15	1500 mmf	500 V		R 4, 5	220 OHM	10%	1/2W
C9,10,12,13, 14,21,23,24,				R 6, 25	22 K OHM	10%	1/2W
				R 7	22 K OHM	5%	1/2W
35,36,37,38	.005 mfd	500V		R8,13,14,20	470 OHM	10%	1/2W
C11,19,20,22 27,29,31,33,				R9, 11, 19	1K OHM	10%	1/2W
				R 10, 31	10K OHM	10%	1/2W
40	.01 mfd	500V		R 15	3.3 MEGOHM	10%	1/2W
C 16	2 mmf	G A type		R 16	2.2 MEGOHM	10%	1/2W
C 18	3-12 mfd	SILVER MICA TRIMMER		R 17, 27	470K OHM	10%	1/2W
C 25, 26	.05 mfd	400 V		R 18	0.5 MEGOHM	Volume control	
C 30	390 mmf	500 V		R 21	27 K ORM	10%	1/2W
C 32	.002 mfd	500 V		R 22	6.8 K OHM	10%	1/2W
C 34	.1 mfd	400 V		R 23	390K OHM	10%	1/2W
C 39	4 mfd	Electrolytic 25V		R 24	220K OHM	10%	1/2W
C 41	10 mfd	" 25V		R 26	4.7 MEGOHM	10%	1/2W
C 42,43	40 mfd	" 200 V		R 28	150 OHM	10%	1 W
C 44	20 mfd	" 200V		R 29	470 OHM	10%	1 W
C 45	10 mmf	500 V		R 30	22 OHM	10%	1 W

PC 50	100 mmf cap. (2) 470 K ohm res. (1)		
L 1,2,6,9	R.F. CHOKE	10 Ph (LC22)	
L 3	R.F COIL F. M.		
L 4	LOOP ANTENNA		
L 5	OSC COIL F.M.		
L 7,8	R.F. CHOKE	2.7 Ph (LC33)	
L 10	CHOKE	70 Ph	
L 11	OSC COIL A.M.		
T 1,2, 3	I.F. F.M.	51, 52, 53	
T 4, 5	I.F. A.M.	55	
SR	100 Ma. SEL. RECT.		
BS	A.M ~ F.M. Band switch on V.C.		
SP49	SPEAKER W/x former		

TUBE LAYOUT



HOW TO ORDER PARTS

ALWAYS SPECIFY The following information on your repair part order blank.

Item for Which Part is Ordered	Model No.	Part No.	Description Of Part And Finish	Quantity Wanted	Price of Each Part	Total Price

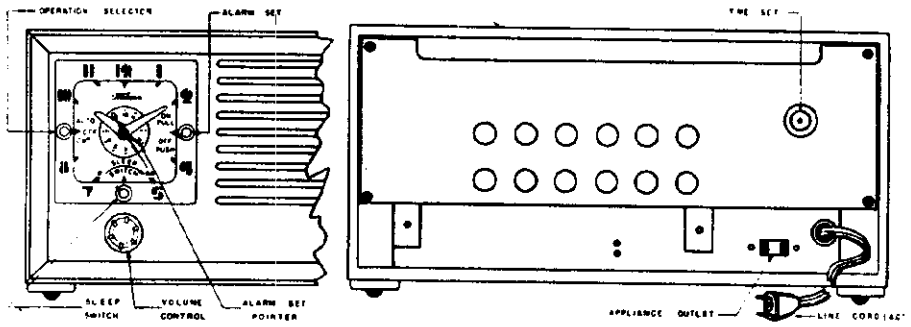
PARTS LIST

SYMBOL NO.	PART NO.	DESCRIPTION	PRICE
C1, -2, -3, -4	CV 24	Variable condenser	$ 3.00
C 39	CE-1008	Electrolytic, 4mfd, 25V	.60
C 41	CE-1009	Electrolytic, 10mfd, 25V	.60
C42, C43, C44	CE-101AC	Electrolytic, 40-40-20mfd/150V	1.20
PC 50	PC 50	Filpac	.12
Any Condenser, Paper, Mica, Ceramic (Specify Value)			.15
Any Resistor (Specify Value Desired)			.12
R 18	VC 40	Volume Control/W Switch	2.60
SR	SE 1001	Selenium Rectifier	1.60
SP	SP 49	Speaker W/Transformer	4.40
L4		AM Loop Antenna	.80
L11	LC 32	AM Oscillator Coil	.43
L3	LC 29	RF Coil, FM	.30
LS	LC 28	FM Oscillator Coil	.30
T1	IF 51	IF Transformer (FM)	
T2	IF 52	" " "	
T4, T5	IF 55	IF Transformer (AM)	
T3	IF 53	Ratio Detector Transformer Cabinet (Mahogany) Specify for Model 652.8TF1M	3.60
	CC-8TF1	Grille Cloth	.60
	DL 71	Dial Scale	1.20
	M5 D11	Decorative Panel Strip	.45
		Knobs (Specify - Band Switch, Volume or Tuning)	.30
V1, V4		6BJ6	2.10
V2		12AT7	2.90
V3		12BE6	1.90
V5		12AU6	1.80
V6		19T8	2.90
V7		50C5	2.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

INSTALLATION: Your new Aircastle Clock-Radio is ready to operate when plugged into any 105-125 volt 60 cycle AC only power line. The newly designed "Magna-Loop" antenna built right into the radio will pick up radio signals in almost any location. Do not connect a ground to the radio at any time.

CLOCK-RADIO OPERATIVE CONTROLS



AS A CLOCK: Your clock starts automatically when the plug is inserted into the proper outlet. The knob extending through the hole at the back of the set provides a convenient means of setting the clock. To set the time turn the knob to the right. Your clock should not require readjustment except when removed from the outlet or in case of failure of the electric power.

AS A RADIO:

1. Turn the OPERATION SELECTOR knob, located at the left hand side of the clock face, to the "ON" position. Allow a few seconds for the radio to warm up.

2. The VOLUME CONTROL knob is located directly below the clock. Turn the knob to the right for increased volume. Turning the VOLUME CONTROL knob to the left decreases the volume. The volume should never be reduced by detuning the TUNING CONTROL knob.

3. Select your favorite program by turning the TUNING CONTROL knob, located at the right hand side of your clock-radio. The numbers on the dial above the TUNING CONTROL knob correspond to the frequency of the standard broadcasting stations. The last two numbers of the frequency have been omitted for simplicity.

4. Shut the radio off by turning the OPERATION SELECTOR knob at the left hand side of the clock face to "OFF."

WAKE UP TO MUSIC:

1. Set the radio dial for the program you wish to hear in the morning and adjust the sound volume for pleasant listening.

2. Pull out the ALARM SET knob at the right hand side of the clock face. This knob is marked "ON PULL" and "OFF PUSH." Turning the ALARM SET knob to the left rotates the numbered disk underneath the clock hands. Just turn the knob until the small pointer opposite the hour hand is over the time you would like the radio to wake you in the morning.

3. After setting the alarm you may continue normal radio listening by turning the OPERATION SELECTOR switch to the "ON" position. At bedtime turn the OPERATION SELECTOR switch so that the knob pointer is turned to "AUTO." Your radio will then be turned on automatically at the time selected.

4. A buzzer alarm will sound a few minutes after the radio goes on and will continue to sound until the ALARM SET knob is pushed in. You may push in the ALARM SET knob at any time if you do not want the buzzer alarm to sound.

AS AN ALARM CLOCK: Your AIRCASTLE Clock-Radio can be used as a regular alarm clock. Set the "ALARM SET" pointer several minutes ahead of the time you wish the buzzer to sound. Leave the ALARM SET knob pulled out and set the OPERATION SELECTOR to the "OFF" position upon retiring. When the alarm buzzer sounds it may be turned off by simply pushing the ALARM SET knob inward.

GO TO SLEEP WITH MUSIC:

1. Select the program you would like to go to sleep to and adjust the volume.
2. A scale marked from 0 to 60 and a "SLEEP SWITCH" are located at the bottom of the clock face. Set the "SLEEP SWITCH" by turning the knob pointer to whatever fraction of an hour you want to keep the radio playing. The radio will be turned off in one hour when the pointer is turned all the way to 60. Thirty minutes would be one-half way. To turn the radio off in 15 minutes set the knob pointer one-quarter of the distance from 0 to 60.
3. Turn the "OPERATION SELECTOR" to "AUTO" if you wish to go to sleep and wake up to music. If you do not want the clock-radio to awaken you turn the "OPERATION SELECTOR" to the "OFF" position.

TO TURN ON APPLIANCES AUTOMATICALLY: A convenient outlet plug has been provided at the back of your AIRCASTLE Clock-Radio to turn on any of your appliances, such as a toaster, coffee maker, etc., not exceeding 1100 watts.

1. Turn the "ALARM SET" pointer to the time you would like your appliance to start operating. If the alarm buzzer is not desired, push the ALARM SET knob inward.
2. Turn the OPERATION SELECTOR knob to the "AUTO" position.
3. Insert the plug of your electrical appliance into the outlet plug on the back of your AIRCASTLE Clock-Radio.
4. Turn on your electrical appliance switch.

AS AN ELECTRICAL APPLIANCE TIMER: Your AIRCASTLE Clock-Radio can be used to time appliances, such as coffee makers, electric roasters, television receivers, etc.

1. Plug the electric appliance into the appliance outlet on the back of your clock-radio.
2. Adjust the ALARM SET pointer to the time the appliance is to be turned on within a 12-hour period. If you wish the alarm buzzer to sound leave the ALARM SET knob pulled out.
3. Turn OPERATION SELECTOR knob pointer to "AUTO."
4. Turn on the switch of your electrical appliance.
5. As soon as the appliance starts, set the SLEEP SWITCH for whatever period between one and 60 minutes that you would like the appliance to continue operating. Then turn the OPERATION SELECTOR to the "OFF" position.

AROUND THE CLOCK WITH YOUR CLOCK-RADIO: You will also find countless other ways to time your cooking and appliance operations all through the day ... Your clock-radio is fully AUTOMATIC...An electronic helper in your home...saving you many minutes every minute of the day.

ELECTRICAL SPECIFICATIONS

Power Supply.....105 to 125 volts 60 cycles AC only

Frequency Range...538 to 1650 KC

This receiver contains the following tubes:

1-12BE6...Mixer
1-12BA6...I.F. Amplifier
1-12AT6...Detector-AVC-1st Audio
1-50C5....Power Output
1-35W4....Rectifier

SERVICE NOTES

Voltages taken from different parts of the circuit to the common ground above chassis are measured with volume control in maximum position, all tubes in their sockets, no signal applied, and with a voltmeter having a resistance of 20,000 ohms per volt. All voltages should be measured with an input voltage of 118 volts AC only. To check for open bypass condensers, shunt each condenser with a known good condenser of the same capacity and voltage rating.

ALIGNING INSTRUCTIONS

Never attempt any adjustments on this receiver unless it becomes necessary to replace a coil or transformer, or the adjustments have been tampered with in the field. Always make certain that other components, such as tubes, resistors, condensers, etc., are normal before proceeding with re-alignment. If re-alignment is necessary follow the instructions on page 6 under the heading "Alignment Procedure." After the re-alignment has been completed, repeat the procedure as a final check.

To remove the chassis for servicing, remove the three chassis screws from the bottom of the cabinet and remove the cabinet back, volume control knob and tuning knob. Remove the bracket securing the clock to the cabinet and slide out the chassis and clock.

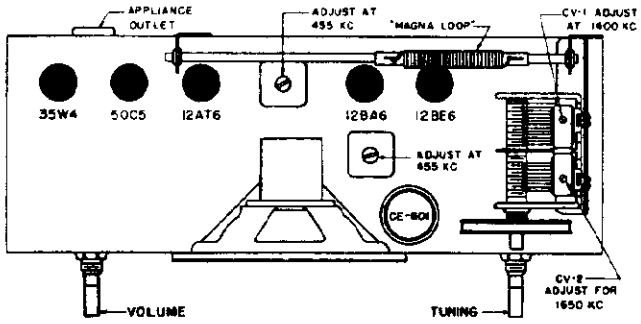
DIAL SETTING	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	TRIMMER REFERENCE	TRIMMER ADJUSTMENT	TRIMMER FUNCTION
1. Fully open	455KC	.1 MFD	12BE6 Grid	L3 Top & Bot.	Maximum	Output I.F.
2. Fully open	455KC	.1 MFD	12BE6 Grid	L2 Top & Bot.	Maximum	Input I.F.
3. Fully open	1650KC	.1 MFD	12BE6 Grid	CV2	Maximum	Oscillator
4. Tune in signal from generator	1400KC		Loosely couple signal generator to "Magna Loop"	CV1	Maximum	Antenna R.F. Trimmer

ALIGNMENT PROCEDURE

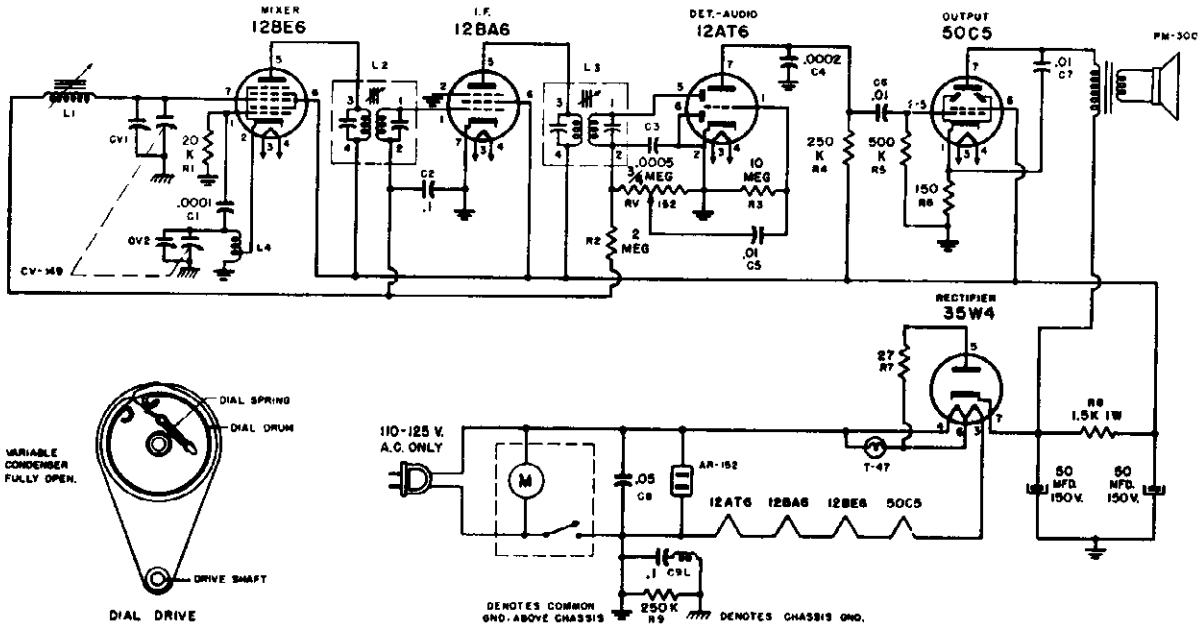
Volume Control -- Maximum, all adjustments. No signal applied to antenna.
Power Input -- 105 to 125 volts, 60 cycle AC.
Connect dummy antenna in series with output lead of signal generator.
Connect ground lead of signal generator to common ground above chassis.
Repeat alignment procedure as a final check.

The following equipment is necessary for proper alignment.
Signal generator that will provide the test frequencies as listed, modulated 400 cycles, 30%.
Non-metallic screwdriver.
Output meter.
Dummy antenna -- .1 MFD condenser.
For alignment points refer to Schematic Diagram

TUBE PLACEMENT AND ALIGNMENT CHART



MODELS 610. CL152
610. CL152M



DIAL DRIVE

PARTS LIST

SCHEMATIC NUMBER	PART NUMBER	DESCRIPTION	PRICE
		CONDENSERS	
C1	CC200	100 MMFD Ceramic	$ .25
C2	C208	.1 MFD 400 volt	.35
C3	CC500	500 MMFD Ceramic	.25
C4	CC201	200 MMFD Ceramic	.25
C5, C6, C7	C206	.01 600 volt	.30
C8	C204	.05 400 volt	.35
C9L	C14L	.1 MFD 400 volt condenser-choke assbly.	.50
CE-601	CE-601	Dual 50 MFD 150 volt electrolytic	2.50
CV1, CV2	CV-149	2 section variable	2.75
		RESISTORS	
R1	R306	20 K ohm ½ watt 20%	.10
R2	R310	2 megohm ½ watt 20%	.10
R3	R311	10 megohm ½ watt 20%	.10
R4, R9	R307	250 K ohm ½ watt 20%	.10
R5	R308	500 K ohm ½ watt 20%	.10
R6	R320	150 K ohm ½ watt 20%	.20
R7	R321	27 ohm ½ watt 20%	.10
R8	R314	1.5 K ohm 1 watt 20%	.10
RV-152	RV-152	⅛ megohm volume control	1.00
		COILS AND TRANSFORMERS	
L1	L-A51	Magna-Loop Antenna Coil	1.50
L2	1655-16	1st I.F. Transformer	2.00
L3	1655-16	2nd I.F. Transformer	2.00
L4	L201	R.F. Oscillator Coil	1.00
		MISCELLANEOUS	
T-47	T-47	Pilot Light	.15
PM-300	PM-300	Speaker, 5" PM, includes Output Transformer	6.40
	M-100	Cabinet	6.00
	M-101	Knob	.20
M	C57G27-	Electric Clock	7.50
AR-152	AR-152	Appliance Socket	.40
		DIAL PARTS	
	M-102	Dial Pointer	.35
	M-103	Dial Pulley	.05
	M-152	Dial Window	.30
	M-104	String, Dial Drive	.05
	M-105	Spring, Dial Drive String Tension	.10

ALL ORDERS SUBJECT TO PRICES AT TIME OF SHIPMENT

MODEL 472, 400

HOW TO INSTALL THE RECEIVER

Your new Radio is a seven tube (plus rectifier) superhetrodyne FM-AM radio receiver designed for use on 105-125 volts 60 cycle AC only.

It covers the standard AM broadcast frequency range, 540-1600 kilocycles (KC), and the FM frequency range from 88 to 108 megacycles (MC).

This receiver is shipped from the factory complete with 2 built-in loop antennae for standard AM broadcast reception, and FM stations. These antennas will be satisfactory for good reception under normal conditions. Terminals are provided at the back of the radio for connecting external AM and FM antennas, wherever this is found to be desirable as explained below.

When the receiver is to be used under difficult conditions, such as in buildings constructed mainly of steel, or those with steel lath, or, when large buildings, mountains or other objects are between the receiver and the station to be received, it may be necessary to use an external dipole antenna. Remember too, FM reception is limited as to distance and when used outside the primary service area of the transmitter, an outside antenna is very necessary.

The type of dipole to be used depends on the signal strength of the station in that particular area, as well as conditions of reception as outlined above. There are three types of FM dipole available; the single dipole, the folded dipole and the non directional dipole. The single dipole is bi-directional and will receive stations located within a range of 10 to 15 miles in front or in back of the antenna. The non-directional dipole may be used, as the name implies, when the stations to be received are located in several different directions within a 10 to 15 mile range. The folded dipole with reflector gives maximum efficiency in any one direction and in many instances will double the distance over which satisfactory reception can be had.

SPECIFICATIONS

Power Supply	**105-125 volts 60 cycle AC only.**
Power Consumption	**65 Watts.**
Frequency Range FM	**88 to 108 MC.**
Frequency Range AM	**540 to 1600 KC.**
I.F. Frequency FM	**10.7 MC.**
I.F. Frequency AM	**455 KC.**
Band width, FM, Ratio Detector	**330 KC.**
Band width, FM, 1st I.F.	**280 KC.**

The tubes used are as follows:

12AT7	**FM RF Amplifier, Converter**
6BE6	**FM Osc, Am Osc, Converter**
6BA6	**FM-AM, 1st I.F. Amplifier**
6BA6	**FM, 2nd I.F. Amplifier**
6AL5	**FM Detector**
6AT6	**AM Detector, AVC, Audio**
6AQ5	**Power Output**
6X4	**Power Rectifier**

SERVICE NOTES

GENERAL

CAUTION: If realignment is necessary be sure the proper test equipment is available, as listed below, before proceeding with the alignment procedure as given

Due to the high frequencies at which FM signals are received the service man must use great care when servicing thes sets. Extreme caution must be used regarding the moving of component parts in the R.F. and oscillator circuits of the receiver as those circuits can be detuned in this manner.

If it becomes necessary to replace components such as resistors and condensers they must be replaced with parts of the same size, type, voltage rating and tolerance as called for in the parts list.

When installing new parts they should be placed in the same position as the original, and the leads should be cut to the same length.

ALIGNMENT NOTES

This receiver has been thoroughly inspected and tested at the factory, using the most modern test equipment available, such as FM sweep generators and oscilloscopes. All R.F. and I.F. circuits have been accurately adjusted at the factory and no attempt should be made to realign these circuits unless it is absolutely necessary.

EQUIPMENT USED FOR ALIGNMENT

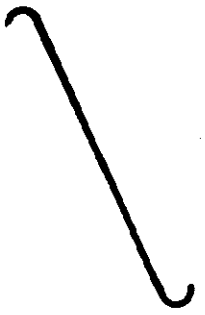
Vacuum tube voltmeter.
AM Signal generator
FM Sweep generator.
Oscilloscope.
Insulated screw driver.
Dummy antenna:
- .1 MFD condenser
- .00025 MFD mica condenser
- 150 ohm resistor (2)

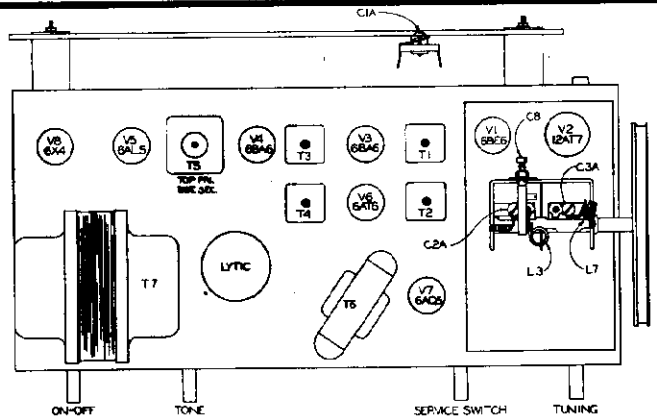
Output meter.

ALIGNMENT PROCEDURE

STEPS	RECEIVER DIAL SETTING	BAND SWITCH POSITION	SIGNAL GENERATOR FREQUENCY	DUMMY ANTENNA	SIGNAL GENERATOR CONNECTIONS	OUTPUT INDICATOR	TRIMMER ADJUSTMENT	TRIMMER FUNCTION	REMARKS
1	Minimum capacity	AM	455 KC 400 cycle AM	.1 MFD	High side—grid of AM converter tube (6BE6) Low side—chassis	Output Meter across voice coil	T2 & T4	AM I.F.	Adjust for maximum output
2	"	"	1620 KC 400 cycle AM	"	"	"	C 2A	AM Oscillator	"
3	1400 KC	"	1400 KC 400 cycle AM	.00025 MFD	High side—One ant. terminal Low side—Other ant. terminal	"	C 1A	AM Antenna	"
4	Any position where there is no station interference.	FM	10.7 MC unmodulated .1 volt output.	.1 MFD	High side—grid of 2nd I.F. amplifier tube (6BA6) Low side—chassis	Connect V.T.V.M. to plate of Ratio Detector tube, pin 2 (6AL5)	Top T5	Ratio detector primary	Adjust for maximum negative voltage,
5	"	"	10.7 MC 400 cycle 250 KC Deviation	"	"	Connect scope to audio take-off point (across vol. cont.)	Bottom T5	Ratio detector secondary	Adjust for a balanced pattern on scope. See Fig. 2
6	"	"	10.7 MC 400 cycle 80 KC Deviation	"	High side—grid of 1st I.F. amplifier tube (6BA6) Low side—chassis	"	T3	FM 2nd I.F.	Adjust for maximum gain and best pattern on scope. See Fig. 2
7	"	"	"	"	High side—grid (pin 7) of FM converter tube (12AT7) Low side—chassis	"	T1	FM 1st I.F.	"
8	108.5 MC	"	108.5 MC 400 cycle 30% modulation (22.5 KC deviation)	300 ohms in high side	High side—ant. terminal Low side—chassis	Connect output meter across voice coil	C 8	FM oscillator	Adjust for maximum output
9	105 MC	"	105 MC 400 cycle 30% modulation (22.5 KC deviation)	"	"	"	C 3A	FM R.F.	"

NOTE: When aligning circuits, keep the output from the signal generator as low as possible.





VOLTAGE CHART

Tube	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	PIN 9
V1 - 6BE6	-9.5	0	0	6.3 AC	158	107	-0.3		
V2 - 12AT7	170	0	2.1	0	0	158	0	3.5	6.3 AC
V3 - 6BA6	-0.1	0	6.3 AC	0	158	120	1.1		
V4 - 6BA6	0	0	6.3 AC	0	158	115	1.4		
V5 - 6AL5	0.1	-0.6	6.3 AC	0	-0.2	0	-0.2		
V6 - 6AT6	-0.4	0	6.3 AC	0	-0.5	-0.1	50		
V7 - 6AQ5	0	8.6	6.3 AC	0	205	170	0		
V8 - 6X4	220 AC	0	6.3 AC	0	0	220 AC	230		

Band Switch on AM position. Dial 1600 KC. No Signal.

All voltage readings are taken from tube pin to chassis.

All measurements are made with no signal, using a 20,000 ohm per volt meter.

AC input voltage must be maintained at 117 volts for accurate readings.

AC voltages shown are at 1000 ohms per volt.

All voltages shown are approximate.

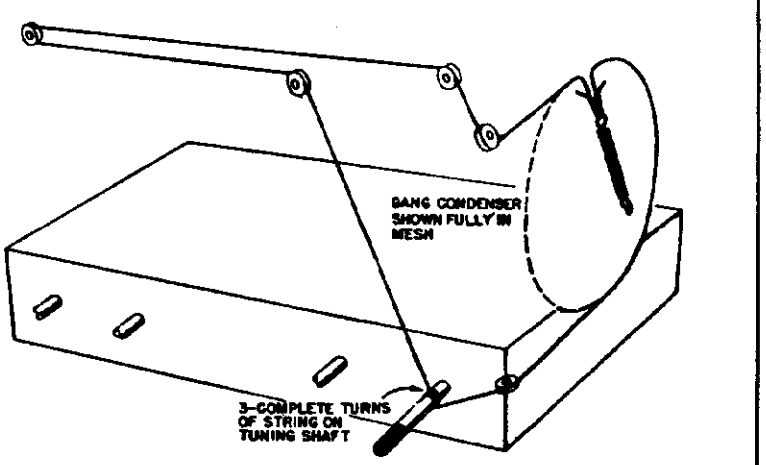
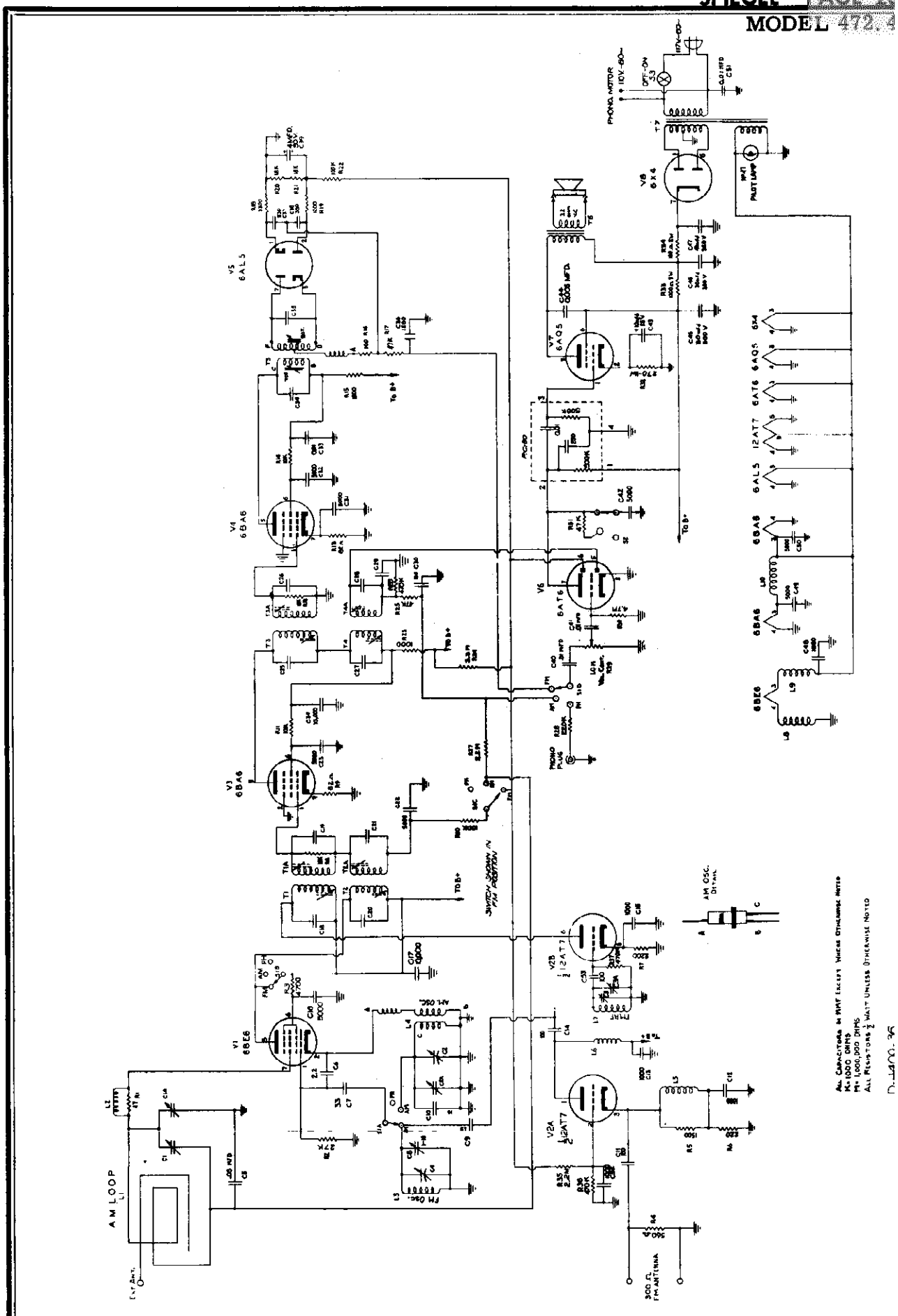


FIG. 4 DIAL CORD STRINGING

HOW TO ORDER REPAIR PARTS

Always give the part No. (No. printed on the part if different from that shown on this list), and the name of the part. When No. is not available, give complete description of part. Be sure to always give the Model No. and Chassis No. The Model No. will be found on a printed label which will be found at the back of the cabinet.


V1 6BE6
V2 12AT7
V3 6BA6
V4 6BA6
V5 6AL5
V6 6AT6
V7 6X4
V8 6AQ5
AM LOOP
PHONO MOTOR
PILOT LAMP
SWITCH SHOWN IN FM POSITION
All Capacitors in MMF Except Where Otherwise Noted
K=1000 OHMS
M=1,000,000 OHMS
All Resistors ½ Watt Unless Otherwise Noted

MODEL 472.400

CAPACITORS

Reference No.	Part No.	Description
C1, C2, C3, C4	A-1201-6	Tuning Gang
C1A	— — — —	Trimmer on loop
C2A	— — — —	Trimmer on gang
C3A	— — — —	Trimmer on gang
C5	CWZ02503M	.05 mfd-200V paper
C6	CCG05022D	2.2 mmf ±.5 mmf GP ceramic
C7	CCC05330K	33 mmf ±10% NPO ceramic
C8	CVP070ST	1-10 mmf Trimmer
C9	CCG05015D	1.5 mmf ±.5 mmf GP ceramic
C10	CCC05150K	15 mmf ±10% NPO ceramic
C11	CCG05101M	100 mmf ±20% GP ceramic
C12	CCG05102Y	1000 mmf GP ceramic
C13	CCG05102Y	1000 mmf GP ceramic
C14	CCG05101M	100 mmf ±20% GP ceramic
C15	CCG05102Y	1000 mmf GP ceramic
C16	CDZ05502Y	5000 mmf GMV ceramic
C17	CDZ05103Y	10,000 mmf GMV ceramic
C18	— — — —	Part of T1
C19	— — — —	Part of T1
C20	— — — —	Part of T2
C21	— — — —	Part of T2
C22	CDZ05502Y	5000 mmf GMV ceramic
C23	CDZ05502Y	5000 mmf GMV ceramic
C24	CDZ05103Y	10,000 mmf GMV ceramic
C25, C26	— — — —	Part of T3
C27, C28	— — — —	Part of T4
C29	— — — —	Part of T4
C30	CCG05101M	100 mmf ±20% GP ceramic
C31	CDZ05502Y	5000 mmf GMV ceramic
C32	CDZ05502Y	5000 mmf GMV ceramic
C33	CDZ05103Y	10,000 mmf GMV ceramic
C34, C35	— — — —	Part of T5
C36	CMA05152M	1500 mmf ±20% mica or ceramic
C37	CMA05331M	330 mmf ±20% mica or ceramic
C38	CMA05331M	330 mmf ±20% mica or ceramic
C39	CES0405	4 mfd-50 volt electrolytic
C40	CWZ02103M	.01 mfd-200V paper
C41	CWZ02103M	.01 mfd-200V paper
C42	CWZ06502M	.005 mfd-600V paper
C43	CFQ433C35	10 mfd @25V lytic *
C44	CWZ06502M	.005 mfd-600V paper
C45	CFQ433C35	30 mfd-300V lytic *
C46	CFQ433C35	30 mfd-300V lytic *
C47	CFQ433C35	40 mfd-350V lytic *
C48	CCG05102Y	1000 mmf GP ceramic
C49	CDZ05502Y	5000 mmf GMV ceramic
C50	CDZ05502Y	5000 mmf GMV ceramic
C51	CDZ05103Y	10,000 mmf GMV ceramic
C52	CCG05102Y	1000 mmf GP ceramic
C53	CCG05101M	100 mmf ±20% ceramic

*C43, C45, C46, C47 are quadruple section electrolytic.

RESISTORS

R1	— — — —	Part of L2
R2	RCC273K	27K ±10% 1/2W
R3	RCC472M	4700 ±20% 1/2W
R4	RCC561M	560 ±20% 1/2W

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RESISTORS—Continued

Reference No.	Part No.	Description
R5	— — — —	Part of L5
R6	RCC221M	220 ±20% ½W
R7	RCC222M	2200 ±20% ½W
R8	RCC183K	18K ±10% ½W
R9	RCC820K	82 ±10% ½W
R10	RCC104M	100K ±20% ½W
R11	RCC103M	10K ±20% ½W
R12	RCC183K	18K ±10% ½W
R13	RCC820K	82 ±10% ½W
R14	RCC103M	10K ±20% ½W
R15	RCC102M	1000 ±20% ½W
R16	RCC101M	100 ±20% ½W
R17	RCC473M	47K ±20% ½W
R18	RCC332K	3300 ±10% ½W
R19	RCC122K	1200 ±10% ½W
R20	RCC183K	18K ±10% ½W
R21	RCC183K	18K ±10% ½W
R22	RCC104M	100K ±20% ½W
R23	RCC102M	1000 ±20% ½W
R24	RCC335M	3.3M ±20% ½W
R25	RCC473M	47K ±20% ½W
R26	RCC474M	470K ±20% ½W
R27	RCC225M	2.2M ±20% ½W
R28	RCC224M	220K ±20% ½W
R29	RVC400S	1.0M volume control with switch
R30	RCC475M	4.7M ±20% ½W
R31	RCC473M	47K ±20% ½W
R32	RCF271M	270 ±20% ½W
R33	RWJ102K	1000 ±10% 5W
R34	RCF101M	100 ±20% 1W
R35	RCC225M	2.2M ±20% ½W
R36	RCC474M	470K ±20% ½W
R37	RCC474M	470K ±20% ½W
PC80	A-1376-6F	Centralab PC80 couplate

K=1000 OHMS M=1,000,000 OHMS

COILS

L1	A-1473-10	Loop Antenna (includes C1A)
L2	A-1499-10	AM grid choke (includes R1)
L3	A-1497-10	FM oscillator coil
L4	A-1498-10	AM oscillator coil
L5	A-1474-10	FM cathode choke (includes R5)
L6	A-1495-10	FM-RF plate choke
L7	A-1496-10	FM-RF coil
L8	A-1494-10	RF filament choke
L9	A-1494-10	RF filament choke
L10	A-1481-10	IF filament choke

TRANSFORMERS

T1	A-1488-10	10.7 MC input IF
T2	A-1490-10	455 KC input IF
T3	A-1489-10	10.7 MC interstage IF
T4	A-1491-10	455 KC output IF
T5	A-1487-10	10.7 MC ratio detector
T6	A-1654-13	Audio output Transformer
T7	A-1655-13	Power Transformer

SWITCHES

S1	A-2002-17	Function switch
S2	A-2003-17	Tone switch
S3	— — — —	Part of R29

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MODELS 652.5975,
652.5985

INSTALLATION

Your Aircastle radio-phonograph needs no special outside aerial. You may locate it anywhere it is convenient to an outlet. Do not place it near a radiator or heater for the extreme heat may damage the cabinet.

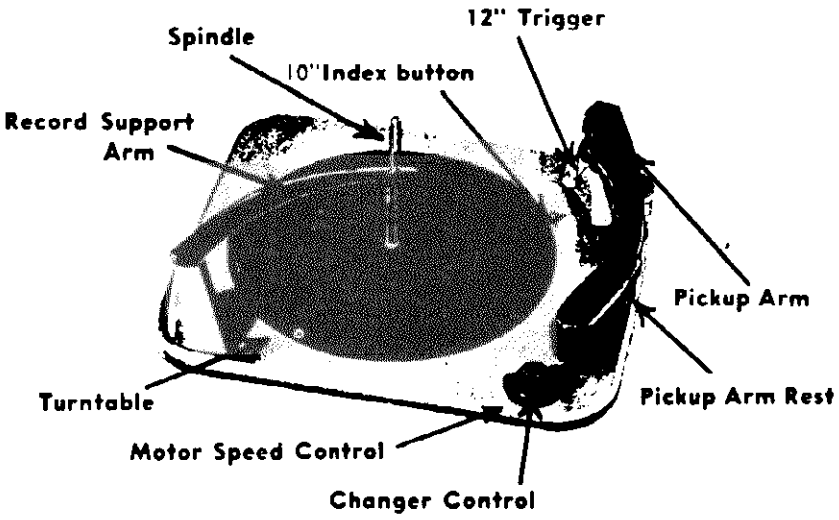
Your radio-phonograph operates on 105-120 volts, 60 cycles, AC only. Do not connect to a supply other than specified or the Guarantee is invalid. If you are not sure of the power supply, your local utility company will supply the information.

THE RADIO

All the controls for your radio are conveniently located at the front of the cabinet. At the extreme left is the radio-phonograph control knob. When it is set at the first position, the radio will play; the second position turns the phonograph on and automatically starts the turntable. The middle knob is the on-off volume control. At the right is the tone control knob which may be adjusted from treble to bass tones. The station selector is above the radio dial.

HOW TO OPERATE THE RECORD CHANGER

Your Aircastle phonograph is equipped with a Tri-O-Matic record changer and an all-groove, all-speed needle. This means that you can play any size record, any speed record. You may also play any assortment of 10- and 12-inch records of the same speed. Your Tri-O-Matic changer automatically selects the right "set-down" position for 7-10- or 12-inch records.



Loosen the two mounting bolts until the changer floats free on mounting springs.

LOADING: First lift the record support arm off the spindle and swing toward the back. Place the records (up to ten 12-inch or twelve 10- and 7-inch records) on the spindle and lower to the off-set shelf. Holding the records level, return the record support to spindle.

AUTOMATIC OPERATION: Now set the MOTOR SPEED CONTROL to proper speed for the records to be played (33-1/3, 45 or 78 RPM). As long as you play the same speed record, you can mix 10- and 12-inch records. The 10 and 12-inch index levers will automatically determine the "set-down" position. All you have to do is set the motor speed control.

With the records on the spindle, the motor speed control set, turn the changer control knob to REJ (reject) and release. The Tri-O-Matic changer will automatically play all the records on the spindle. After the last record has been played, the changer automatically shuts off, pick-up arm returns to rest, and the turntable stops.

REPEATING AND REJECTING

If you wish to repeat any particular record, place it on the turntable (not the off-set shelf). Do not swing record support over the spindle. Turn the CHANGER CONTROL to REJ and release. The 7- or 10-inch record will automatically repeat until the CHANGER CONTROL is turned to OFF.

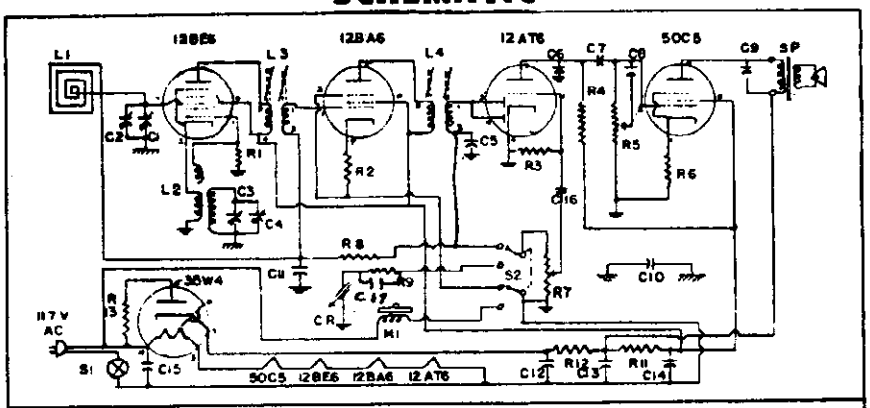
Records may be rejected (that is, removing the pick-up arm from the record) at any time by simply turning the CHANGER CONTROL to REJ.

To turn off the phonograph, turn the CHANGER CONTROL to OFF. However, never turn off the phonograph while it is in the changing cycle. Do not attempt to force the pick-up arm back to the arm rest.

MANUAL OPERATION

Before you place any records on th turntable, place the record support arm c the spindle and turn CHANGER CONTROL t REJ. Allow the changer to automaticall shut off. Then lift the record suppor arm and swing to the back, away from th turntable. Place your record (again yo can play any size, any speed) on the turn table and set the CHANGER CONTROL to ON Be careful not to turn past the ON posi-tion. With the turntable spinning, plac the pick-up arm on the record on the lead in groove of the record. When you wish t resume automatic operation, set th CHANGER CONTROL to REJ. Then, as outline above, load records on the spindle.

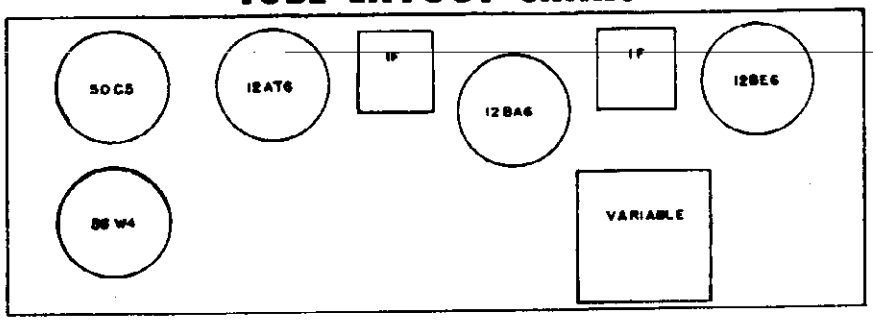
SCHEMATIC



LEGEND

C1	Ant. Variable	R1	22K OHM 1/2 W.	L1	Loop Ant.
C2	Ant. Trimmer	R2	220 OHM 1/2 W.	L2	Osc. Coil
C3	Osc. Variable	R3	10 MEG. OHM 1/2 W.	L3	1st I.F.
C4	Osc. Trimmer	R4	220K OHM 1/2 W.	L4	2nd I.F.
C5	200 MMF. Mica	R5	500K O. Tone Control		
C6	200 MMF. Mica	R6	150 OHM 1/2 W.	S1	AC Switch on V.C.
C7	.01 MFD. 400 V.	R7	1 Meg. Vol. Con. W/SW	S2	Radio-Phono Switch
C8	.002 MFD. 400 V.	R8	2.2 Meg. 1/2 W.		
C9	.01 MFD. 600 V.	R9	1.0 Meg. 1/2 W.	CR	Pick Up
C10	.1 MFD. 400 V.	R11	2200 OHM 1 W.		
C11	.05MFD 400V.	R12	330 OHM 1 W.	M1	Phono Motor
C12	40MFD 150V. Electrolytic	R13	18 OHM 1/2 W.		
C13	40 MFD. 150 V.			SP	5in. Speaker
C14	20 MFD. 150 V.				
C15	.01 MFD. 400 V.				
C16	.01 MFD. 400 V.				
C17	200 MMFD.				

TUBE LAYOUT CHART



MODELS 652.5975,
652.5985

ALIGNMENT PROCEDURE

Receiver Dial Setting	Signal Generator Frequency	Dummy Antenna	Signal Generator Connections	Output Indicator	Trimmer Adjustment	Trimmer Function	Remarks
Minimum capacity	455 KC 400 cycle AM	.1MFD	High side-grid converter tube 12BE6 Low side-chassis	Output Meter across voice coil	L3 & L4	I.F.	Adjust for maximum output
"	1600 KC 400 cycle AM	"	"	"	C-4 OSC	Oscillator	"
1400 KC	1400 KC 400 cycle AM	.00025 MFD	High side-one ant. terminal Low side-Other ant. terminal	"	C-2 Ant.Loop	Antenna	"

HOW TO ORDER PARTS

The following information is needed to properly handle your repair part order. ALWAYS SPECIFY on your order blank –

Item for which Part is Ordered	Model No.	Serial No. (When Given)	Part No.	Description Of Part	Quantity Wanted	Price of Each Part	Total Price	Shipping Weight
RADIO-PHONOGRAPH								

PARTS LIST
FOR MODELS 652.5975 and 652.5985

ILLUSTRATION NUMBER	PART NUMBER	DESCRIPTION OF PART	PRICE EACH
C1-C2-C3-C4	CV-20	Var. Cond. Two gang Tuning	$ 1.70
C5-C6-C17	CM-221	Mica Cond. 200 mmfd	.20
C7-C15-C16	CP-103-4	Tubular Cond. .01 mfd – 400V	.20
C8	CP-202-4	Tubular Cond. .002 mfd – 400V	.20
C9	CP-103-6	Tubular Cond. .01 mfd – 600V	.20
C10	CP-104-4	Tubular Cond. .1 mfd – 400V	.20
C11	CP-503-4	Tubular Cond. .05 mfd – 400V	.20
C12-C13-C14	CE-1000	Elect. Cond. 40 x 40 x 20 mfd/150V	1.20
R1	RC-223-1	Carbon Res. 22K ohm 1/2W 20%	.20
R2	RC-221-1	Carbon Res. 220 ohm 1/2W 20%	.20
R3	RC-106-1	Carbon Res. 10 meg ohm 1/2W 20%	.20
R4	RC-224-1	Carbon Res. 220K ohm 1/2W 20%	.20
R5	VC-19	Tone Cont 500K ohm	.80
R6	RC-151-1	Carbon Res. 150 ohm 1/2W 20%	.20
R7	VC-18	Vol. Cont W/S 1 meg ohm	.80
R8	RC-225-1	Carbon Res. 2.2 meg ohm 1/2W 20%	.20
R9	RC-105-1	Carbon Res. 1.0 meg ohm 1/2W 20%	.20
R11	RC-222-4	Carbon Res. 2200 ohm 1W 20%	.20
R12	RC-331-4	Carbon Res. 330 ohm 1W 20%	.20
R13	RC-180-1	Carbon Res. 18 ohm 1/2W 20%	.20
L1	LP-510	Loop Ant.	1.00
L2	LC-10	Osc. Coil	1.00
L3	IFT 50	1st I.F.	1.60
L4	IFT 50	2nd I.F.	1.60
S2	SW12	Switch, Radio & Phono	.60
CR	Astatic LT5-AG	Crystal	6.00
B55		Fidelitone Needle or equivalent	1.00
M1	VM-950-26	VM Changer	50.00
SP	SP-100	5" Speaker W/output XFMR	5.00
		Tube 12BE6	1.80
		Tube 12BA6	1.80
		Tube 12AT6	1.50
		Tube 50C5	2.00
		Tube 35W4	1.25

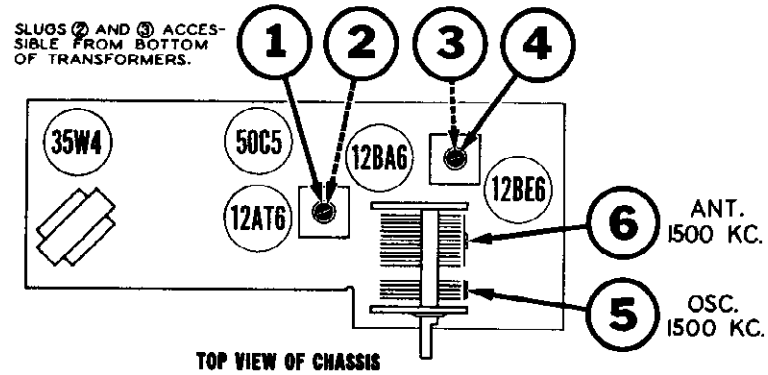
ALL ORDERS ARE SUBJECT TO PRICES AT TIME OF SHIPMENT

ALIGNMENT PROCEDURE

MODELS 9160-A, -B
-C, -D, -E

1. During the alignment of this receiver, the Tuning and Pointer knob will have to be set to a specific frequency. Since the dial scale is an integral part of the cabinet, the receiver chassis must be in the cabinet for correct positioning of the gang condenser and pointer. Before removing chassis from cabinet it will first be necessary to take off Volume Control knob, to pry off the two retaining clips at top of cabinet back and to remove the two chassis mounting screws which are accessible through slot openings at each side of cabinet back. (NOTE: Do not disturb the two externally mounted screws at bottom of cabinet back; these screws serve to mount loop and back to chassis frame.) Then turn the Tuning and Pointer knob to the desired position for alignment and, taking care not to change this setting, pull Tuning and Pointer knob from gang condenser shaft. N chassis can be withdrawn from cabinet without disturbing posit of condenser.
2. Couple the signal generator to the receiver by connecting its out to several turns of wire formed in a circular shape so that it n be placed adjacent and parallel to the receiver loop antenna.
3. Connect an output meter across the speaker voice coil or from plate of the 50C5 tube to chassis through a 0.1 Mfd. conden
4. Set volume control at maximum volume position and use a weak nal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER AND SLUG NUMBER	TRIMMER AND SLUG DESCRIPTION	TYPE OF ADJUSTMEN
NONE	Connect directly to coupling turn as described in step 2 above.	**455 KC** 400 cycle Modulation	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum outp Then repeat adjustment.
				3-4	1st I.F.	
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	1500 KC	**5**	Broadcast Oscillator	Adjust for maximum outp
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	Tune to 1500 KC generator signal	**6**	Broadcast Antenna	Adjust for maximum outp



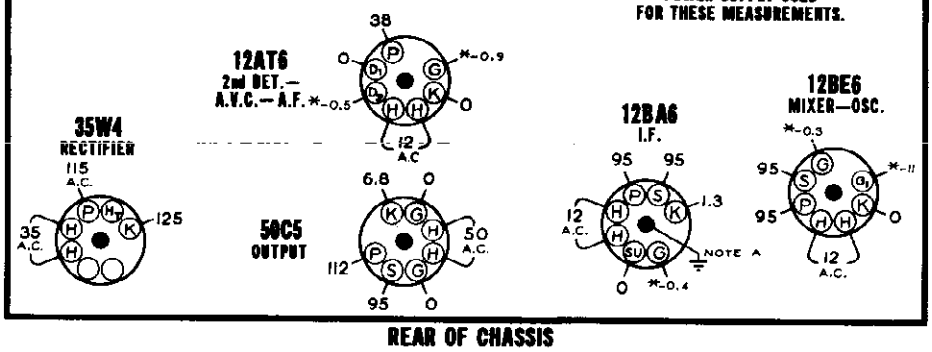
TOP VIEW OF CHASSIS

SOCKET VOLTAGES

1. All measurements made with a voltmeter having a sensitivity of 20,000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
2. Dial tuned to maximum counter-clockwise position.

ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND CHASSIS UNLESS OTHERWISE INDICATED. 117 VOLT 60 CYCLE A.C. POWER SUPPLY USED FOR THESE MEASUREMENTS.

BOTTOM VIEW OF CHASSIS



REAR OF CHASSIS

NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

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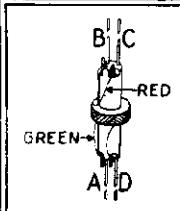
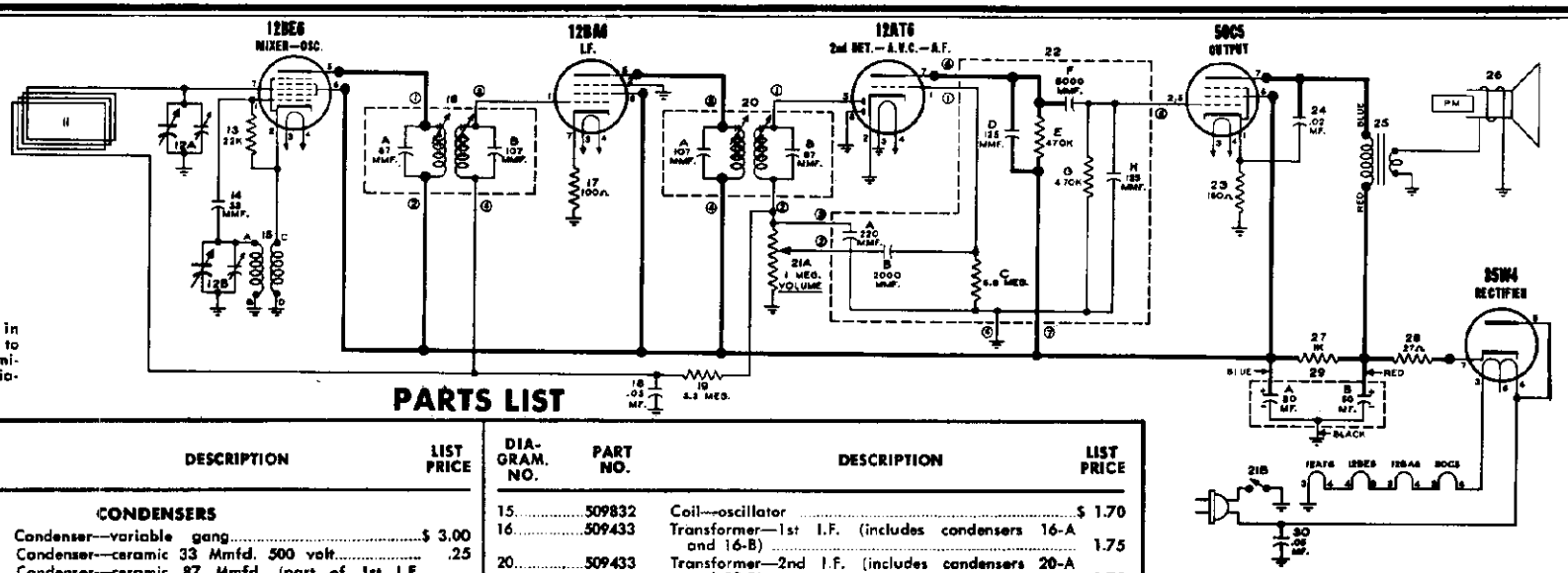


OSC. COIL 509832

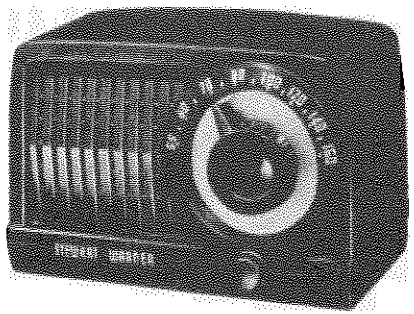
Lettered terminals in illustration correspond to similarly lettered terminals on the circuit diagram.



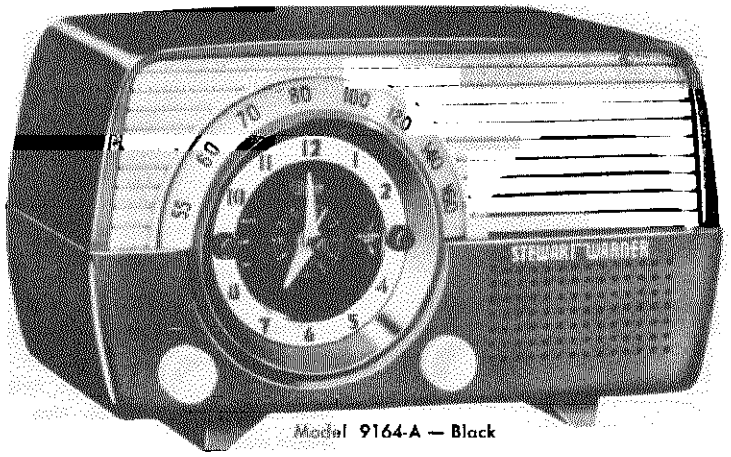
PARTS LIST

DIA-GRAM. NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
12-A, B	509827	Condenser—variable gang	$ 3.00
14	513028	Condenser—ceramic 33 Mmfd. 500 volt	.25
16-A	509433	Condenser—ceramic 87 Mmfd. (part of 1st I.F. Transformer)	1.75
16-B	509433	Condenser—ceramic 107 Mmfd. (part of 1st I.F. Transformer)	1.75
18	512028	Condenser—.05 Mfd. 400 volt	.25
20-A	509433	Condenser—ceramic 107 Mmfd. (part of 2nd I.F. Transformer)	1.75
20-B	509433	Condenser—ceramic 87 Mmfd. (part of 2nd I.F. Transformer)	1.75
22-A	509836	Condenser—ceramic 220 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-B	509836	Condenser—ceramic 2000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-D	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-F	509836	Condenser—ceramic 5000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-H	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
24	512016	Condenser—.02 Mfd. 400 volt	.25
29-A, B	509837	Condenser—electrolytic A—30 Mfd. 150 volt B—50 Mfd. 150 volt	2.00
30	512028	Condenser—.05 Mfd. 400 volt	.25
		RESISTORS	
13	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
17	510119	Resistor—carbon 100 Ohms ½ watt	.12
19	510194	Resistor—carbon 3.3 Meg. ½ watt	.12
21-A, B	509830	Volume Control—1 Meg. (with OFF-ON switch)	1.25
22-C	509836	Resistor—carbon 6.8 Meg. 1/5 watt (part of audio coupling unit)	1.00
22-E	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
22-G	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
23	510122	Resistor—carbon 150 Ohms ½ watt	.12
28	510108	Resistor—carbon 27 Ohms ± 10% ½ watt	.12
27	510237	Resistor—carbon 1000 Ohms 1 watt	.16
		COILS AND TRANSFORMERS	
11	509833	Loop antenna and cabinet back	1.25
15	509832	Coil—oscillator	$ 1.70
16	509433	Transformer—1st I.F. (includes condensers 16-A and 16-B)	1.75
20	509433	Transformer—2nd I.F. (includes condensers 20-A and 20-B)	1.75
25	509826	Transformer—output	2.00
		OTHER ELECTRICAL PARTS	
22-A to H	509836	Audio Coupling Unit A—Condenser—ceramic 220 Mmfd. 500 v. B—Condenser—ceramic 2000 Mmfd. 500 v. C—Resistor—carbon 6.8 Meg. 1/5 w. D—Condenser—ceramic 125 Mmfd. 500 v. E—Resistor—carbon 470,000 Ohms 1/5 w. F—Condenser—ceramic 5000 Mmfd. 500 v. G—Resistor—carbon 470,000 Ohms 1/5 w. H—Condenser—ceramic 125 Mmfd. 500 v.	1.00
26	509828	Speaker—P.M. dynamic (4")	5.00
		MISCELLANEOUS PARTS	
	509833	Back for cabinet (includes loop antenna)	1.25
	520215	Background for pointer knob used on Models 9160-D and 9160-E	.10
	509840-A	Cabinet for Model 9160-A (Mahogany)	4.00
	509840-B	Cabinet for Model 9160-B (Yellow)	4.00
	509840-C	Cabinet for Model 9160-C (Blue)	4.00
	520342	Cabinet for Model 9160-D (Rust)	4.25
	520343	Cabinet for Model 9160-E (Tan)	4.25
	505101	Clip for mounting 1st and 2nd I.F. Transformers	.05
	500497	Clip—retainer for cabinet back	.02
	509874	Clip—retains speaker	.03
	509839-A	Knob—Pointer for Models 9160-A and 9160-D (Tan)	.40
	509839-B	Knob—Pointer for Model 9160-B (Green)	.40
	509839-C	Knob—Pointer for Model 9160-C (Blue)	.40
	509839-E	Knob—Pointer for Model 9160-E (Rust)	.40
	509841-A	Knob—Volume for Models 9160-A and 9160-D (Tan)	.12
	509841-B	Knob—Volume for Model 9160-B (Green)	.12
	509841-C	Knob—Volume for Model 9160-C (Blue)	.12
	509841-E	Knob—Volume for Model 9160-E (Rust)	.12
	509829	Rubber spacer for mounting speaker	.02
	170820	Screw—#8-32 x ½"; retains chassis	.02
	507595	Socket—miniature	.20
	509876	Stud for mounting speaker	.01

I.F. 455 KC.



ALL PRICES ON THIS PARTS LIST ARE SUBJECT TO CHANGE WITHOUT NOTICE



Model 9164-A — Black

Model 9164-B—Grey and Yellow

SPECIFICATIONS

FREQUENCY RANGE:

540 Kc. to 1600 Kc.

TUNING METHOD:

2 section ganged condenser; solid mounting.

TUNING INDICATOR:

"GLOW LITE" illuminates tuned frequency thru translucent dial.

I.F. FREQUENCY:

455 Kc.

POWER SUPPLY:

117 volts A.C.

SPEAKER:

4 inch PM Dynamic
Voice coil impedance—3.2 ohms

POWER OUTPUT:

Undistorted—.7 watt
Maximum—1.1 watt

ANTENNA:

High impedance loop

WEIGHT: (Packed)

7 lbs.

DIMENSIONS:

Length—11⅜"
Height—6¾"
Depth—5⅞"

CLOCK DIAL:

Easy to read Black and Gold numer
and gold hands.

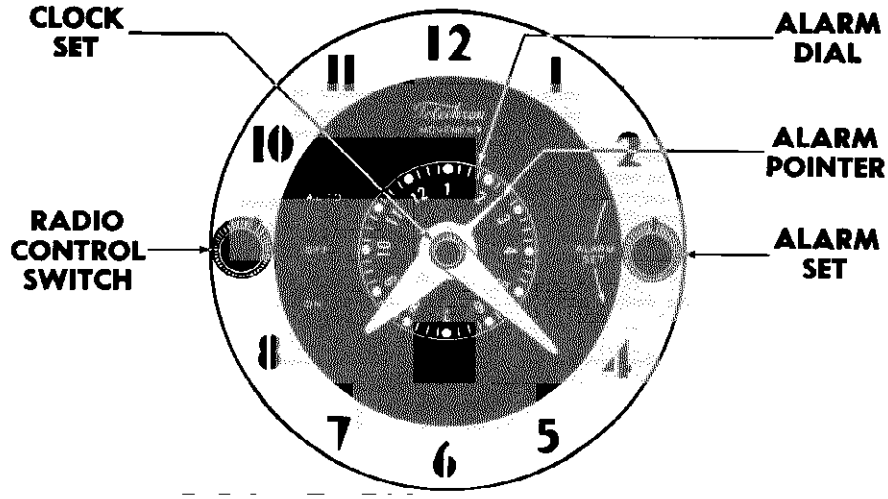
CLOCK SET:

Conveniently accessible at front of cloc

ALARM:

Turns radio on at a pre-set time.

CLOCK OPERATION



The clock in this combination receiver is self-starting and therefore when the receiver plug is inserted into the wall outlet the clock will automatically start. Should there be a temporary stoppage of current, due to a power failure or other causes, the clock will automatically be turned on again after power has been restored. Resetting of the clock hands will then be required to make-up for the time the power was off.

SETTING THE CLOCK HANDS: To set the clock hands to the correct time merely use the Clock Set knob and rotate hands until they indicate the correct time.

SETTING CLOCK AND RECEIVER FOR AUTOMATIC OPERATION: Tune the radio to the desired station and set the volume to the proper level. Turn Radio Control Switch to the "AUTO" position.

To set the Starting Time, rotate Alarm Set knob **only in the direction indicated by the "ALARM" arrow** until the Alarm Pointer on the hour hand indicates the desired time on the Alarm Dial. Radio will automatically be turned on at this pre-set time and will continue to play until receiver is turned off **manually.** Clock can not be again set for automatic operation until Radio Control Switch has been turned manually to the "OFF" position.

MODELS 9164-A,
9164-B

REMOVING AND REPLACING CLOCK KNOBS AND CRYSTAL

KNOBS: The Radio Control Switch knob, or the Alarm Set knob may be taken off by prying them forward. The Clock Set knob is screwed on and must be removed by rotating it in a counterclockwise direction while at the same time holding the shaft steady with a fine pair of long nose pliers—**WARNING: Place a piece of paper between pliers and the dial crystal to avoid damage to this part.**

CRYSTAL: In order to service this part, it will be necessary to remove receiver chassis from cabinet, and to withdraw clock unit from chassis.

To remove receiver chassis from cabinet first take off the Volume and Tuning knobs. Next pry off the two retaining clips at top of cabinet back and remove the two chassis mounting screws which are accessible through slot openings at each side of cabinet back. (NOTE: Do not disturb the two externally mounted screws at bottom of cabinet back; these screws serve to mount loop and back to chassis.) Chassis can now be withdrawn from cabinet.

To remove the clock, first slip the "Glow Lite" from its bracket. Next, remove the fibre shield around top of clock by prying off the two retaining clips located on each end of shield. Unsolder all leads coming from radio chassis to the clock. Now take off the three mounting screws that retain clock mounting bracket and entire unit can be withdrawn from receiver chassis. Remove the clock knobs as indicated in previous section.

Next, bend out the four retaining ears that hold bezel in position and remove it from clock. The bezel background and crystal can now be taken off.

PARTS REPLACEMENT

Should it be desired to replace any other parts than those listed in the receiver parts list, they may be obtained by writing to:

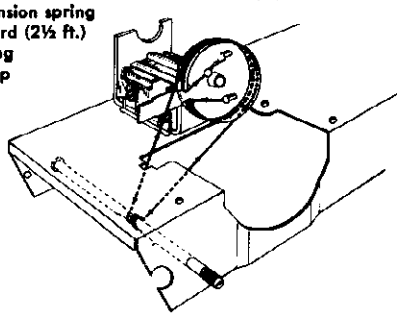
Telechron Dept.
General Electric Co.
Ashland, Mass.

Please specify that unit for which parts are wanted is a C408g10 Switch Timer.

"GLOW LITE" DRIVE CORD ARRANGEMENT

Stringing of drive cord can be greatly facilitated if removal of the clock is undertaken. To string drive cord, turn the gang condenser drum to maximum counterclockwise position and use the following parts:

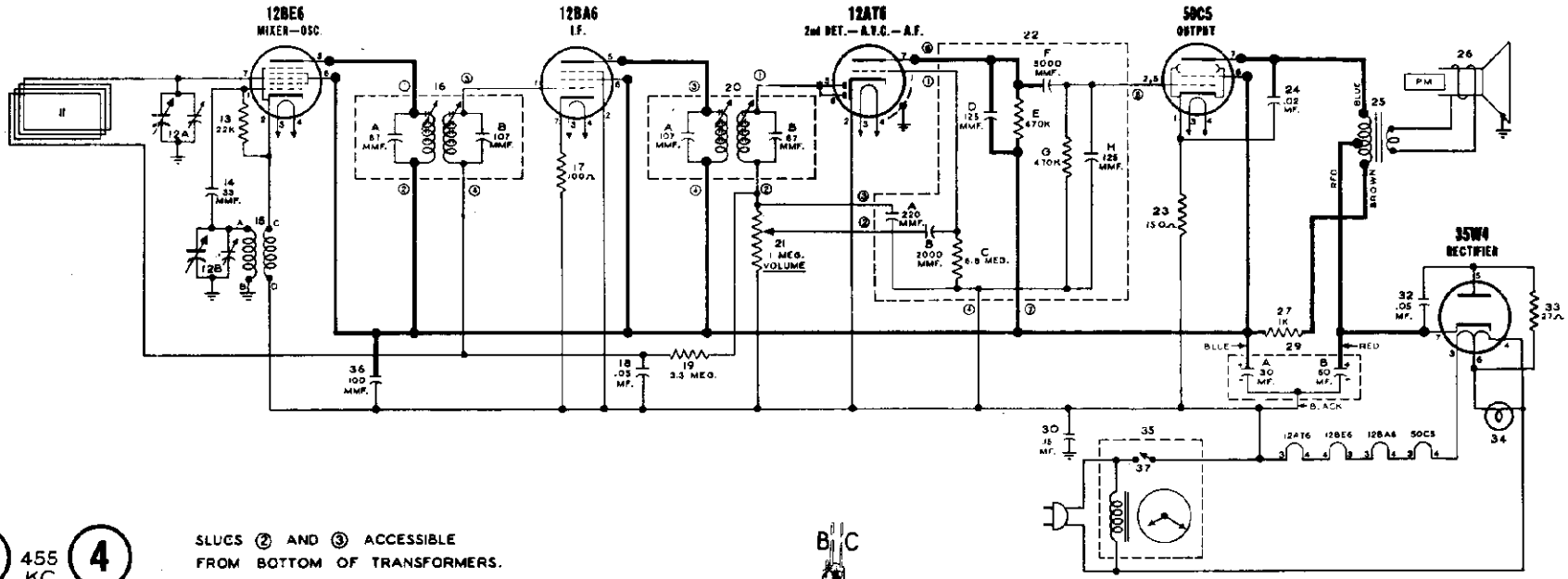
505161 Tension spring
117057 Cord (2½ ft.)
119087 Ring
114955 Clip

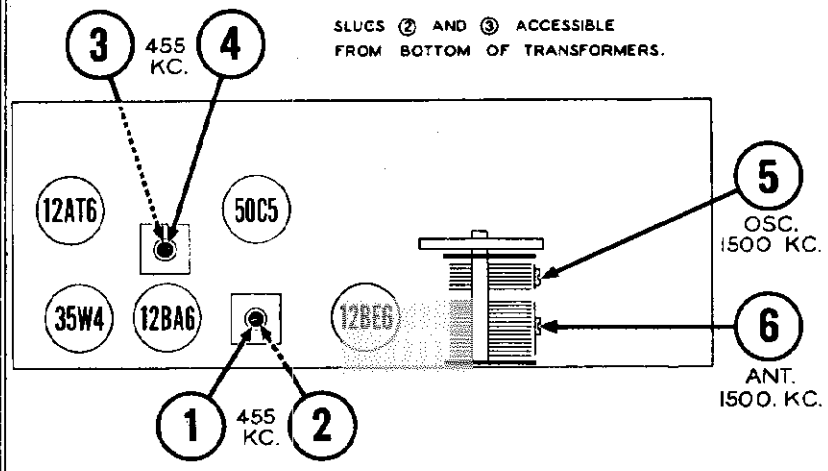


ALIGNMENT PROCEDURE

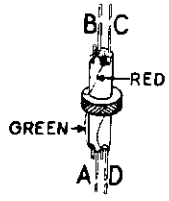
1. During the alignment of this receiver, the "GLOW LITE" tuning indicator will have to be set to a specific frequency. Since the dial scale is an integral part of the cabinet, the receiver chassis must be in the cabinet for correct positioning of the gang condenser and pointer. Before removing chassis from cabinet it will first be necessary to take off Volume Control knob, to pry off the two retaining clips at top of cabinet back and to remove the two chassis mounting screws which are accessible through slot openings at each side of cabinet back. (NOTE: Do not disturb the two externally mounted screws at bottom of cabinet back; these screws serve to mount loop and back to chassis frame.) Then turn the Tuning knob to the desired position for alignment and, taking care not to change this setting, pull Tuning knob from shaft. Now chassis can be withdrawn from cabinet without disturbing position of condenser.
2. Couple the signal generator to the receiver by connecting its output to several turns of wire formed in a circular shape so that it may be placed adjacent and parallel to the receiver loop antenna.
3. Connect an output meter across the speaker voice coil or from the plate of the 50C5 tube to B— lug through a 0.1 Mfd. condenser.
4. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER AND SLUG NUMBER	TRIMMER AND SLUG DESCRIPTION	TYPE OF ADJUSTMENT
NONE	Connect directly to coupling turn as described in step 2 above.	**455 KC** 400 cycle Modulation	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	1500 KC	**5**	Broadcast Oscillator	Adjust for maximum output.
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	Tune to 1500 KC generator signal	**6**	Broadcast Antenna	Adjust for maximum output.





TRIMMER LOCATIONS



OSC. COIL 509832

Lettered terminals in illustration correspond to similarly lettered terminals on the circuit diagram.

I.F. 455 KC.

PRODUCTION CHANGES

The following change was incorporated to meet an underwriter's request and receivers incorporating this change are stamped "SERIES A" on the cabinet back.

1. Resistor 31 (330 Ohms) was removed. It formerly was wired in parallel with "GLOW LITE" 34.

The following change was incorporated to eliminate hum modulation and receivers incorporating this change are stamped "SERIES B" on the cabinet back.

1. A.V.C. condenser 18 (.05 Mfd) was disconnected from chassis ground and reconnected to B—.

MODELS 9164-A, 9164-B

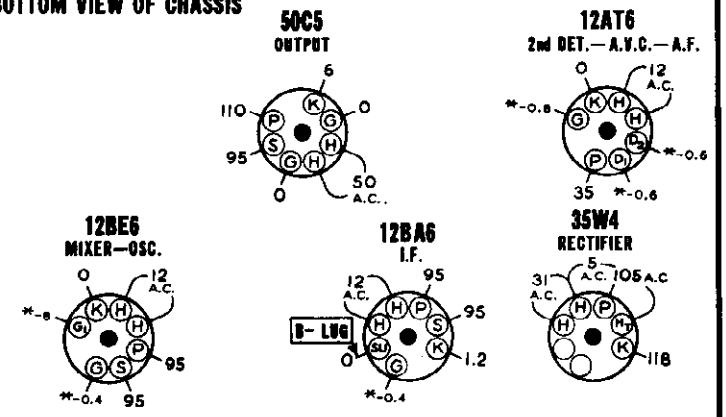
SOCKET VOLTAGES

1. All measurements made with a voltmeter having a sensitivity of 20,000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
2. Dial tuned to maximum counter-clockwise position.

117 VOLT 60 CYCLE A. C. POWER SUPPLY USED FOR THESE MEASUREMENTS.

ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND B- LUG UNLESS OTHERWISE INDICATED.

BOTTOM VIEW OF CHASSIS



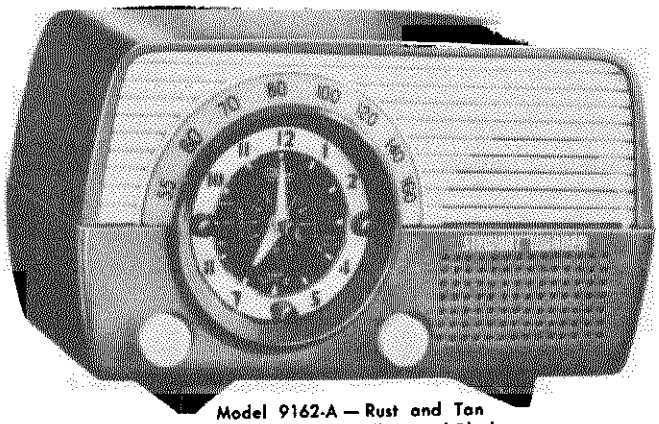
REAR OF CHASSIS

PARTS LIST

DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
12-A, B	520266	Condenser—variable gang (includes drum and "GLOW LITE" mtg. bracket)	$ 3.00
14	513028	Condenser—ceramic 33 Mmfd. 500 volt	.25
16-A	509433	Condenser—ceramic 87 Mmfd. (part of 1st I.F. Transformer)	1.75
16-B	509433	Condenser—ceramic 107 Mmfd. (part of 1st I.F. Transformer)	1.75
18	512029	Condenser- .05 Mfd. 400 volt	.35
20-A	509433	Condenser—ceramic 107 Mmfd. (part of 2nd I.F. Transformer)	1.75
20-B	509433	Condenser—ceramic 87 Mmfd. (part of 2nd I.F. Transformer)	1.75
22-A	509836	Condenser—ceramic 220 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-B	509836	Condenser—ceramic 2000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-D	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-F	509836	Condenser—ceramic 5000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-H	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
24	512017	Condenser—.02 Mfd. 400 volt	.28
29-A, B	520261	Condenser—electrolytic A—30 Mfd. 150 volt B—50 Mfd. 150 volt	1.75
30	512040	Condenser—.15 Mfd. 400 volt	.35
32	512029	Condenser—.05 Mfd. 400 volt	.35
36	512503	Condenser—mica 100 Mfd. 400 volt	.25
		RESISTORS	
13	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
17	510119	Resistor—carbon 100 Ohms ½ watt	.12
19	510194	Resistor—carbon 3.3 Meg. ½ watt	.12
21	520263	Volume Control—1 Meg	.85
22-C	509836	Resistor—carbon 6.8 Meg. 1/5 watt (part of audio coupling unit)	1.00
22-E	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
22-G	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
23	510122	Resistor—carbon 150 Ohms ½ watt	.12
27	510237	Resistor—carbon 1000 Ohms 1 watt	.16
31	510128	Resistor—carbon 330 Ohms ½ watt	.12
33	510108	Resistor—carbon 27 Ohms ± 10% ½ watt	$ .12
		COILS AND TRANSFORMERS	
11	520374	Loop antenna and cabinet back	1.50
15	509832	Coil—oscillator	1.70
16	509433	Transformer—1st I.F. (includes condensers 16-A and 16-B)	1.75
20	509433	Transformer—2nd I.F. (includes condensers 20-A and 20-B)	1.75
25	520432	Transformer—output	2.25

DIA-GRAM. NO.	PART NO.	DESCRIPTION	LIST PRICE
		OTHER ELECTRICAL PARTS	
22-A to H	509836	Audio Coupling Unit A—Condenser—ceramic 220 Mmfd. 500 v. B—Condenser—ceramic 2000 Mmfd. 500 v. C—Resistor—carbon 6.8 Meg. 1/5 w. D—Condenser—ceramic 125 Mmfd. 500 v. E—Resistor—carbon 470,000 Ohms 1/5 w. F—Condenser—ceramic 5000 Mmfd. 500 v. G—Resistor—carbon 470,000 Ohms 1/5 w. H—Condenser—ceramic 125 Mmfd. 500 v.	1.00
26	520264	Speaker—P.M. dynamic (4")	5.25
34	118921	"GLOW LITE" Lamp (Mazda #47) 6-8 v. 150 Ma.	.15
35	520333-A	Clock, complete	12.00
37	520539	Switch, Radio Control (mounted on clock)	1.20
		MISCELLANEOUS PARTS	
	520374	Back for cabinet (includes loop antenna)	1.50
	507593	Base for tube shield	.20
	505165	"C" washer for pointer shaft	.02
	520250-C	Cabinet for Model 9164-A (Black) (less dial scale)	6.25
	520250-D	Cabinet for Model 9164-B (Grey and Yellow) (less dial scale)	6.25
	520372	Clip for mounting clock shield	.05
	508257	Clip for mounting electrolytic condenser	.10
	505101	Clip for mounting I.F. transformers	.05
	500497	Clip—retainer for cabinet back	.02
	114955	Clip—retainer on end of dial cord	.01
	520277	Clip, retains dial scale	.05
	509874	Clip, retains speaker	.03
	117057	Cord—dial drive (2½ ft. required)—per ft.	.05
	520564	Crystal for clock face	1.00
	520251	Dial scale	.70
	520539	Knob; Alarm Set or Radio Control Switch	.10
	520538	Knob; Time Set	.30
	520252-B	Knob; volume or tuning for Model 9164-A (Black)	.15
	520252-C	Knob; volume or tuning for Model 9164-B (Yellow)	.15
	520423	Pointer and shield for "GLOW LITE"	.35
	119087	Ring for dial cord	.01
	509829	Rubber spacer for mounting speaker	.02
	170988	Screw—#8-18 x ½" plastic thread cutting; retains chassis	.02
	520265	Shaft-tuning	.40
	520257	Shield for clock	.10
	507594	Shield, tube	.15
	520272	Socket for "GLOW LITE"	.50
	507595	Socket—miniature (7 pin)	.20
	505161	Spring—tension dial cord tension	.08
	509876	Stud for mounting speaker	.01
	111456	Washer—spring washer for tuning shaft	.01

ALL PRICES ON THIS PARTS LIST ARE SUBJECT TO CHANGE WITHOUT NOTICE



Model 9162-A — Rust and Tan
Model 9162-B — Yellow and Black

SPECIFICATIONS

FREQUENCY RANGE:

540 Kc. to 1600 Kc.

TUNING METHOD:

2 section ganged condenser; solid mounting.

TUNING INDICATOR:

"GLOW LITE" illuminates tuned frequency thru translucent dial.

I.F. FREQUENCY:

455 Kc.

POWER SUPPLY:

117 volts A.C.

SPEAKER:

4 inch PM Dynamic
Voice coil impedance—3.2 ohms

CLOCK SET:

Conveniently accessible at front of clock.

ALARM:

Turns radio on at a pre-set time. "Buzzer Alarm" can be set to sound ten minutes after radio has been "turned on" automatically.

SLEEP SWITCH:

Turns radio off automatically up to one hour after being set.

UTILITY SOCKET:

Accommodates a 117 volt A.C. type appliance whose rating does not exceed 1100 watts.

POWER OUTPUT:

Undistorted—.7 watt
Maximum—1.1 watt

ANTENNA:

High impedance loop

WEIGHT: (Packed)

7 lbs.

DIMENSIONS:

Length—11⅜"
Height—6¾"
Depth—5⅞"

CLOCK DIAL:

Easy to read Black and Gold numerals with luminescent hour markers and hands.

CLOCK OPERATION

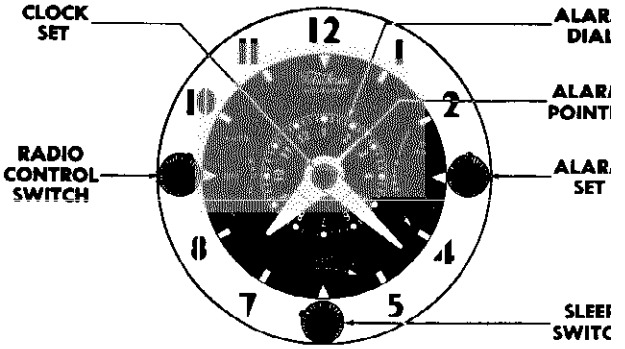
The clock in this combination receiver is self-starting and therefore when the receiver plug is inserted into the wall outlet the clock will automatically start. Should there be a temporary stoppage of current, due to a power failure or other causes, the clock will automatically be turned on again after power has been restored. Resetting of the clock hands will then be required to make-up for the time the power was off.

SETTING THE CLOCK HANDS: To set the clock hands to the correct time merely use the Clock Set knob and rotate hands until they indicate the correct time.

SETTING CLOCK AND RECEIVER FOR AUTOMATIC OPERATION: Tune the radio to the desired station and set the volume to the proper level. Turn Radio Control Switch to the "AUTO" position.

To set the Starting Time, pull the Alarm Set knob forward. Then rotate this knob **only in the direction indicated by the "ALARM" arrow** until the Alarm Pointer on the hour hand indicates the desired time on the Alarm Dial. Radio will automatically be turned on at this pre-set time and will continue to play until receiver is turned off **manually**. Clock can not be again set for automatic operation until Radio Control Switch has been turned manually to the "OFF" position.

If you wish to hear the "buzzer alarm," leave the Alarm Set knob the "out" position and the buzzer will sound approximately 10 minu



after radio has been turned on. To shut buzzer off, merely push in t Alarm Set knob.

If you do not wish the "buzzer alarm" to sound, push Alarm Set kn in after completing the setting of the Starting Time.

MODELS 9162-A, 9162-B

USING "BUZZER ALARM" INDEPENDENTLY OF THE RADIO OPERATION: If you wish to use the clock as an alarm only, independent of the radio, merely set alarm as described in paragraph entitled "To set the Starting Time." Set the Alarm Dial approximately 10 minutes ahead of desired Alarm Time. To shut the buzzer off, push in the Alarm Set knob.

SETTING CLOCK AND RECEIVER FOR AUTOMATIC SHUT-OFF: If radio has been previously turned on automatically, it will first be necessary to momentarily set Radio Control Switch to the "OFF" position before setting it to either of the following positions. Place the Radio Control Switch in either the "OFF" or "AUTO" position. **THE TWO PRECEEDING PROCEDURES ARE VERY IMPORTANT!** Setting the control to the "AUTO" position will allow the receiver to subsequently be turned on automatically at a pre-set time.

Now, turn the Sleep Switch in the direction of the "SLEEP" arrow. Rotating this knob all the way clockwise to the "60" position will allow the radio to operate for approximately one hour from the time the Sleep Switch has been set.

Setting this switch to any intermediate point will allow the receiver to operate for a proportional part of the hour.

CONNECTING THE APPLIANCE: Insert the power plug of the appliance into the utility socket provided at rear of the receiver. **This appliance must have a wattage rating that does not exceed 1100 watts.** If this wattage is exceeded, damage to either the timing mechanism or the radio could occur.

AUTOMATIC STARTING OF THE APPLIANCE: To start the appliance automatically, turn the "ON-OFF" Switch of the appliance to the "ON" position and set the clock as described in paragraph entitled "To set the Starting Time." The radio and utility socket are energized simultaneously and therefore the radio can not be turned on while the instrument is pre-set for automatic operation of an appliance. But, once the appliance is on, the radio can be used in the normal manner.

If you do not wish to hear the radio when the appliance is automatically turned on, turn the Volume Control fully counter-clockwise.

When you have finished using the appliance and wish to use the radio independently of it, either turn the appliance's "ON-OFF" Switch to the "OFF" position or remove the appliance plug from the utility socket at rear of receiver.

AUTOMATIC SHUT-OFF OF AN APPLIANCE: An appliance can be shut-off automatically by connecting it to the utility socket in the same manner as described above.

The setting for automatic shut-off is the same as described in paragraph entitled "Setting Clock and Receiver for Automatic Shut-off."

As the sleep Switch has no accurate calibration the setting of this switch must be approximate. This instrument is not recommended when accurate shut-off time is required.

REMOVING AND REPLACING CLOCK KNOBS AND CRYSTAL

KNOBS: The Radio Control Switch knob, Alarm Set knob, or the Sleep Switch knob may be taken off by prying them forward. The Hand Set knob is screwed on and must be removed by rotating it in a counter-clockwise direction while at the same time holding the shaft steady with a fine pair of long nose pliers—**WARNING: Place a piece of paper between pliers and the dial crystal to avoid damage to this part.**

CRYSTAL: In order to service this part, it will be necessary to remove receiver chassis from cabinet, and to withdraw clock unit from chassis.

To remove receiver chassis from cabinet first take off the Volume and Tuning knobs. Next pry off the two retaining clips at top of cabinet back and remove the two chassis mounting screws which are accessible through slot openings at each side of cabinet back. (NOTE: Do not disturb the two externally mounted screws at bottom of cabinet back; these screws serve to mount loop and back to chassis.) Chassis can now be withdrawn from cabinet.

To remove the clock, first slip the "Glow Lite" from its bracket. Next, remove the fibre shield around top of clock by prying off the two retaining clips located on each end of shield. Unsolder all leads coming from radio chassis to the clock. Now take off the three mounting screws that retain clock mounting bracket and entire unit can be withdrawn from receiver chassis. Remove the clock knobs as indicated in previous section.

Next, bend out the four retaining ears that hold bezel in position and remove it from clock. The bezel background and crystal can now be taken off.

SERVICING CLOCK MECHANISM

Should service of the clock mechanism be required contact your Stewart Warner Distributor for the name and address of the nearest Telechron Service Depot.

PARTS REPLACEMENT

Should it be desired to replace any other parts than those listed in the receiver parts list, they may be obtained by writing to:

Telechron Dept.
General Electric Co.
Ashland, Mass.

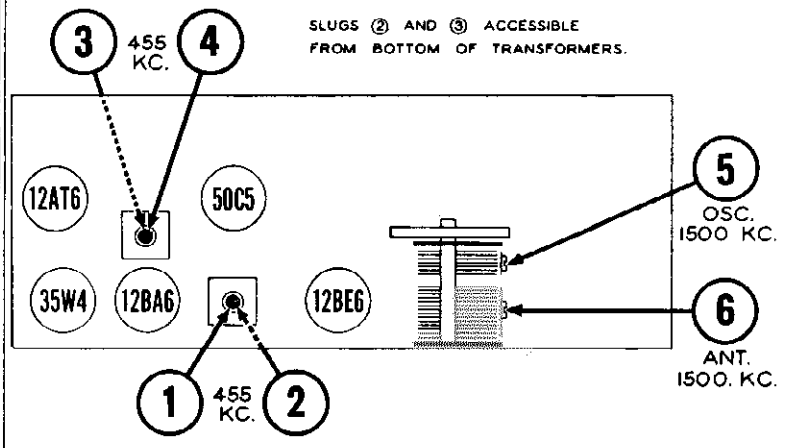
Please specify that unit for which parts are wanted is a C57g107 Switch Timer.

©John F. Rider

ALIGNMENT PROCEDURE

1. During the alignment of this receiver, the "GLOW LITE" tuning indicator will have to be set to a specific frequency. Since the dial scale is an integral part of the cabinet, the receiver chassis must be in the cabinet for correct positioning of the gang condenser and pointer. Before removing chassis from cabinet it will first be necessary to take off Volume Control knob, to pry off the two retaining clips at top of cabinet back and to remove the two chassis mounting screws which are accessible through slot openings at each side of cabinet back. (NOTE: Do not disturb the two externally mounted screws at bottom of cabinet back; these screws serve to mount loop and back to chassis frame.) Then turn the Tuning knob to the desired position for alignment and, taking care not to change this setting, pull Tuning knob from shaft. Now chassis can be withdrawn from cabinet without disturbing position of condenser.
2. Couple the signal generator to the receiver by connecting its output to several turns of wire formed in a circular shape so that it may be placed adjacent and parallel to the receiver loop antenna.
3. Connect an output meter across the speaker voice coil or from the plate of the 50C5 tube to B— lug through a 0.1 Mfd. condenser.
4. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER AND SLUG NUMBER	TRIMMER AND SLUG DESCRIPTION	TYPE OF ADJUSTMEN
NONE	Connect directly to coupling turn as described in step 2 above.	**455 KC** 400 cycle Modulation	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum out Then repeat adjustment.
				3-4	1st I.F.	
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	1500 KC	**5**	Broadcast Oscillator	Adjust for maximum out
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	Tune to 1500 KC generator signal	**6**	Broadcast Antenna	Adjust for maximum out

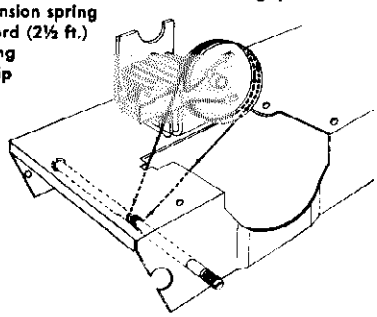


TRIMMER LOCATIONS

"GLOW LITE" DRIVE CORD ARRANGEMENT

Stringing of drive cord can be greatly facilitated if moval of the clock is undertaken. To string drive co turn the gang condenser drum to maximum count clockwise position and use the following parts:

505161 Tension spring
117057 Cord (2½ ft.)
119087 Ring
114955 Clip



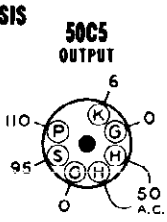
SOCKET VOLTAGES

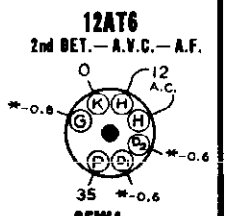
1. All measurements made with a voltmeter having a sensitivity of 20,000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
2. Dial tuned to maximum counter-clockwise position.

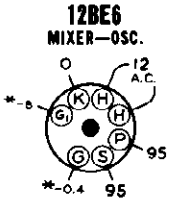
BOTTOM VIEW OF CHASSIS

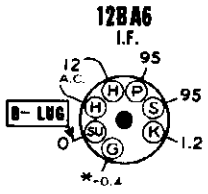
117 VOLT 60 CYCLE A.C. POWER SUPPLY USED FOR THESE MEASUREMENTS.

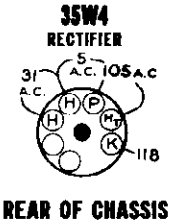
ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND B- LUG UNLESS OTHERWISE INDICATED.

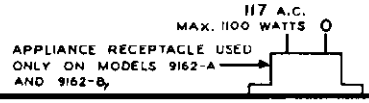




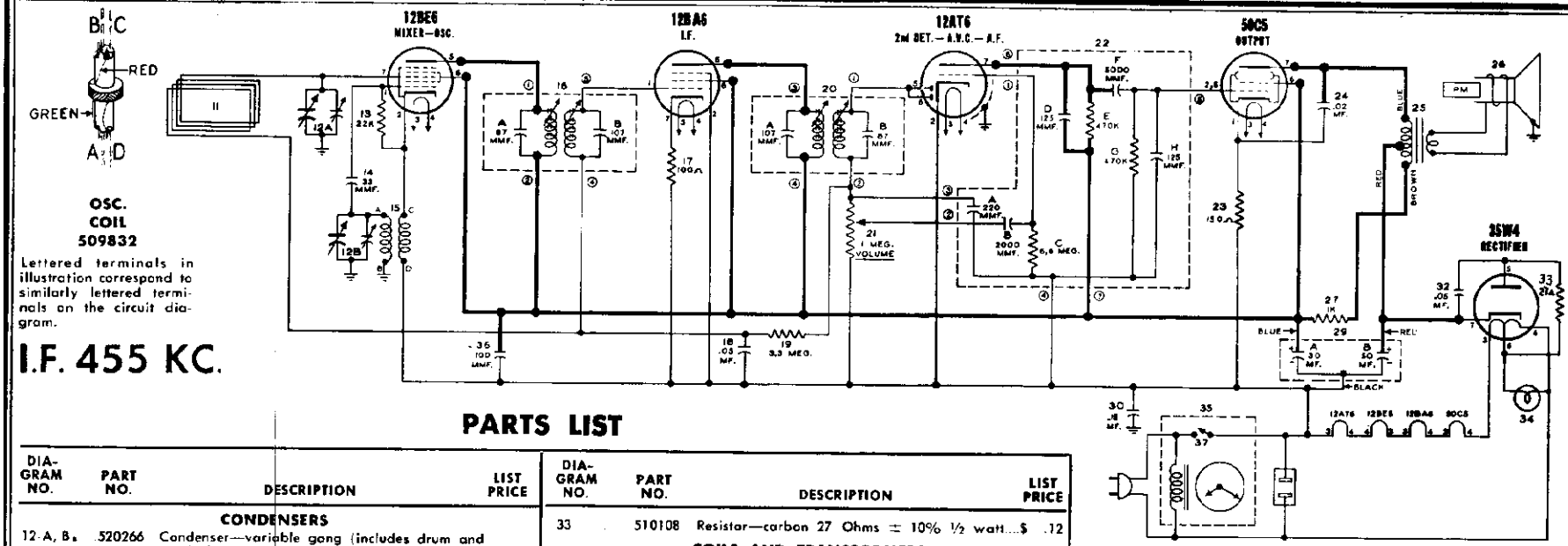








REAR OF CHASSIS



OSC. COIL 509832

Lettered terminals in illustration correspond to similarly lettered terminals on the circuit diagram.

I.F. 455 KC.

PARTS LIST

DIAGRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
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16-A	509433	Condenser—ceramic 87 Mmfd. (part of 1st I.F. Transformer)	1.75
16-B	509433	Condenser—ceramic 107 Mmfd. (part of 1st I.F. Transformer)	1.75
18	512029	Condenser—.05 Mfd. 400 volt	.35
20-A	509433	Condenser—ceramic 107 Mmfd. (part of 2nd I.F. Transformer)	1.75
20-B	509433	Condenser—ceramic 87 Mmfd. (part of 2nd I.F. Transformer)	1.75
22-A	509836	Condenser—ceramic 220 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-B	509836	Condenser—ceramic 2000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-D	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-F	509836	Condenser—ceramic 5000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-H	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
24	512017	Condenser—.02 Mfd. 400 volt	.28
29-A, B	520261	Condenser—electrolytic A—30 Mfd. 150 volt B—50 Mfd. 150 volt	1.75
30	512040	Condenser—.15 Mfd. 400 volt	.35
32	512029	Condenser—.05 Mfd. 400 volt	.35
36	512503	Condenser—mica 100 Mfd. 400 volt	.25
		RESISTORS	
13	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
17	510119	Resistor—carbon 100 Ohms ½ watt	.12
19	510194	Resistor—carbon 3.3 Meg. ½ watt	.12
21	520263	Volume Control—1 Meg.	.85
22-C	509836	Resistor—carbon 6.8 Meg. 1/5 watt (part of audio coupling unit)	1.00
22-E	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
22-G	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
23	510122	Resistor—carbon 150 Ohms ½ watt	.12
27	510237	Resistor—carbon 1000 Ohms 1 watt	.16
31	510128	Resistor—carbon 330 Ohms ½ watt	.12
33	510108	Resistor—carbon 27 Ohms ± 10% ½ watt	$ .12
		COILS AND TRANSFORMERS	
11	520270	Loop antenna and cabinet back	1.50
15	509832	Coil—oscillator	1.70
16	509433	Transformer—1st I.F. (includes condensers 16-A and 16-B)	1.75
20	509433	Transformer—2nd I.F. (includes condensers 20-A and 20-B)	1.75
25	520432	Transformer—output	2.25
		OTHER ELECTRICAL PARTS	
22-A to H	509836	Audio Coupling Unit A—Condenser—ceramic 220 Mmfd. 500 v. B—Condenser—ceramic 2000 Mmfd. 500 v. C—Resistor—carbon 6.8 Meg. 1/5 w. D—Condenser—ceramic 125 Mmfd. 500 v. E—Resistor—carbon 470,000 Ohms 1/5 w. F—Condenser—ceramic 5000 Mmfd. 500 v. G—Resistor—carbon 470,000 Ohms 1/5 w. H—Condenser—ceramic 125 Mmfd. 500 v.	1.00
26	520264	Speaker—P.M. dynamic (4")	5.25
34	118921	"GLOW LITE" Lamp (Mazda #47) 6-8 v. 150 Ma.	.15
35	520255-A	Clock, complete	12.50
37	520539	Switch, Radio Control (mounted on clock)	1.20
		MISCELLANEOUS PARTS	
	520270	Back for cabinet (includes loop antenna)	1.50
	507593	Base for tube shield	.20
	505165	"C" washer for pointer shaft	.02
	520250-A	Cabinet for Model 9162-A (Rust and Tan) (less dial scale)	6.25
	520250-B	Cabinet for Model 9162-B (Yellow and Black) (less dial scale)	6.25
	520372	Clip for mounting clock shield	.05
	508257	Clip for mounting electrolytic condenser	.10
	505101	Clip for mounting I.F. transformers	.05
	500497	Clip—retainer for cabinet back	.02
	114955	Clip—retainer on end of dial cord	.01
	520277	Clip, retains dial scale	.05
	509874	Clip, retains speaker	.03
	117057	Cord—dial drive (2½ ft. required) per ft.	.05
	520564	Crystal for clock face	1.00
	520251	Dial scale	.70

PRODUCTION CHANGES

The following change was incorporated to meet an underwriter's request and receivers incorporating this change are stamped "SERIES A" on the cabinet back.

1. Resistor 31 (330 Ohms) was removed. It formerly was wired in parallel with "GLOW LITE" 34.

The following change was incorporated to eliminate hum modulation and receivers incorporating this change are stamped "SERIES B" on the cabinet back.

1. A.V.C. condenser 18 (.05 Mfd) was disconnected from chassis ground and reconnected to B—.

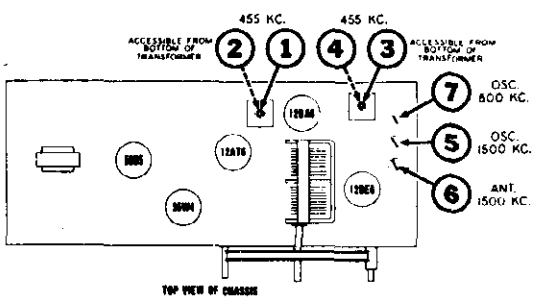
DIAGRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
	520539	Knob; Alarm Set, Radio Control Switch or Sleep Switch	$ .10
	520538	Knob; Time Set	.30
	520252-A	Knob; volume or tuning for Model 9162-A (Tan)	.15
	520252-B	Knob; volume or tuning for Model 9162-B (Black)	.15
	520423	Pointer and shield for "GLOW LITE"	.35
	119087	Ring for dial cord	.01
	509829	Rubber spacer for mounting speaker	.02
	170988	Screw—#8-18 x ½" plastic thread cutting; retains chassis	.02
	520265	Shaft-tuning	.40
	520257	Shield for clock	.10
	507594	Shield, tube	.15
	520272	Socket for "GLOW LITE"	.50
	520262	Socket (2 pin) for appliance receptacle	.35
	507595	Socket—miniature (7 pin)	.20
	505161	Spring—tension dial cord tension	.08
	509876	Stud for mounting speaker	.01
	111456	Washer—spring washer for tuning shaft	.01

ALIGNMENT PROCEDURE

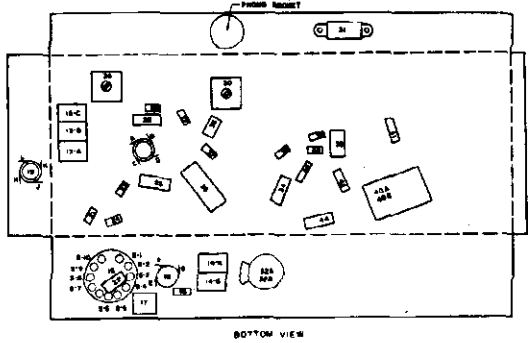
MODEL 915

1. Remove chassis and loop antenna (mounted to chassis) from cabinet—allow loop to remain attached to chassis.
2. Replace the dial scale on the shaft of the gang condenser.
3. Since the "position indicator" for the dial scale is an integral part of the cabinet, it becomes necessary to install a "temporary pointer" when the ch is removed from the cabinet. This can readily be accomplished by securing a piece of heavy wire to the dial light bracket and shaping the free of the wire so that it can be placed in a vertical position between the dial scale and the dial light. With the gang condenser fully meshed, "temporary pointer" should appear at the edge of the broadcast band dial scale base line.
4. Connect ground lead of signal generator to B—.
   CAUTION: If your test oscillator is designed with an AC-DC power supply, connect ground lead of signal generator to B— through a .25 condenser.
5. Connect an output meter across the speaker voice coil or from the plate of the 50B5 tube to B— through a 0.1 Mfd. condenser.
6. Set volume control at maximum volume position and use a weak signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
200 MMFD. Mica Condenser	Terminal "C" of Short Wave Antenna Coil	**455 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum output. Th repeat adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	External antenna terminal	**1500 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	1500 KC	**5**	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	External antenna terminal	**1500 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	Tune to 1500 KC Generator Signal	**6**	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	External antenna terminal	**600 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	Tune to 600 KC Generator Signal	**7**	Broadcast Oscillator (Series Pad)	Adjust for maximum output. Try increase output by detuning tri mer and retuning receiver dial til maximum output is obtain
200 MMFD. Mica Condenser	External antenna terminal	Repeat adjustment of trimmers 5 and 6 at 1500 Kc. Then re-check adjustment of trimmer 7 at 600 Kc.					
400 OHM Carbon Resistor	External antenna terminal	**15 MC** 400 cycle AM Modulated	Short Wave (clockwise)	15 MC	**8**	Short Wave Oscillator	Adjust for maximum output. Ch to see if proper peak was obtain by tuning in image at approx. 1 MC. If image does not appear, align at 15 MC. with trimmer scr farther out. Recheck image.
400 OHM Carbon Resistor	External antenna terminal	**15 MC** 400 cycle AM Modulated	Short Wave (clockwise)	Tune to 15 MC Generator Signal	**9**	Short Wave Antenna	Adjust for maximum output. Try increase output by detuning tri mer and retuning receiver dial til maximum output is obtain



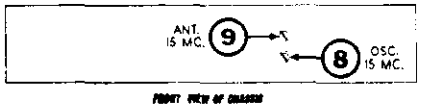
TOP VIEW OF CHASSIS



BOTTOM VIEW

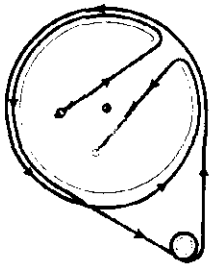
BAND SWITCH SET TO "SW" POSITION

DIAL TUNED TO MAXIMUM COUNTER-CLOCKWISE POSITION



FRONT VIEW OF CHASSIS

DRIVE CORD ARRANGEMENT



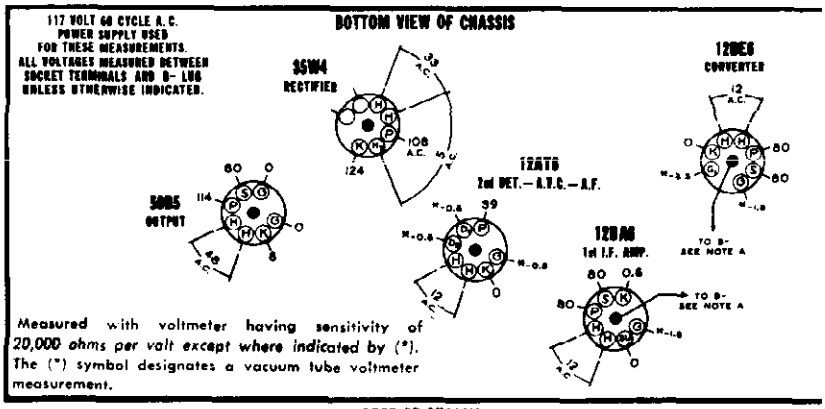
To string dial cord, turn the main drive drum to maximum counter-clockwise position and use following parts:

114955 Clip on end of cord

502773 Cord (3½ feet)

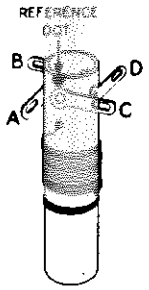
119087 Ring

161384 Tension Spring

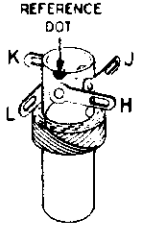


REAR OF CHASSIS

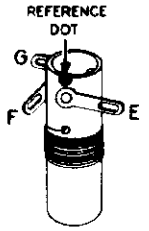
NOTE A: The center stud of this tube must be connected to B— to reduce capacity coupling between other pins. Oscillation may result if this connection is omitted.



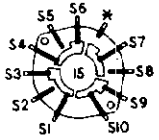
S.W. ANT. COIL 509428



BC. OSC. COIL 509432



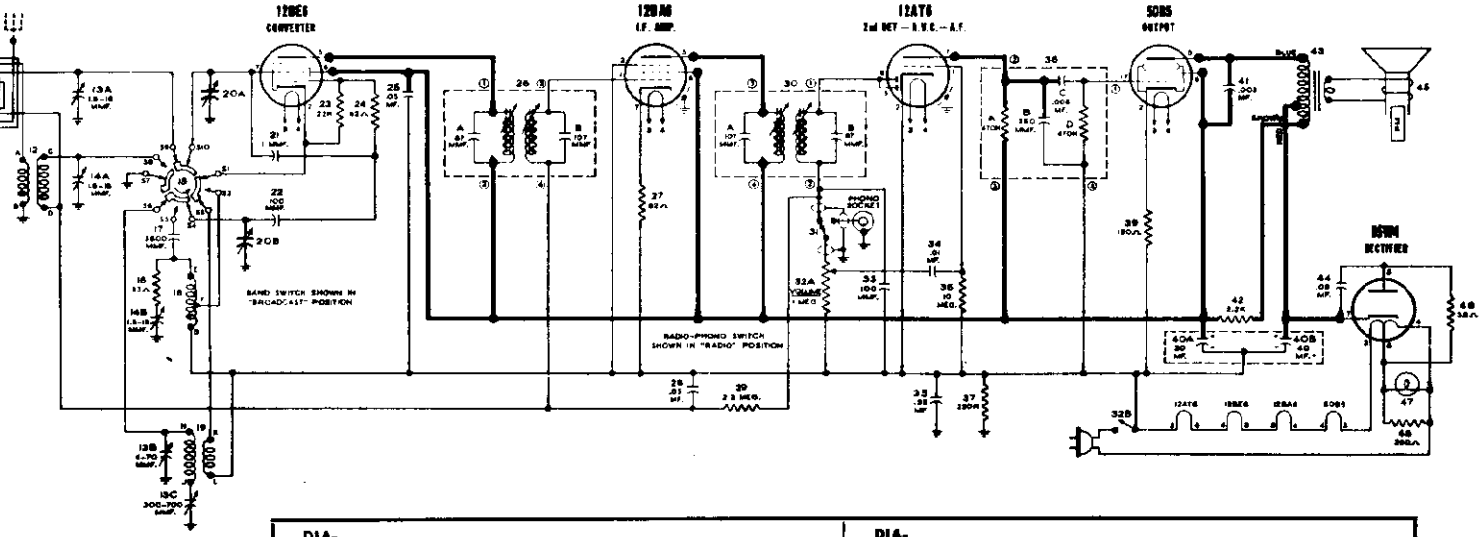
S.W. OSC. COIL 509430



BAND SWITCH 509437

REAR VIEW

*Not used; may serve as wiring junction point.



Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.

I.F. 455 KC.

PARTS LIST

DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
13-A,B,C	509418	Condenser—trimmer assembly A—1.6 to 18 Mmfd. B—4 to 70 Mmfd. C—300 to 700 Mmfd.	$ 1.20
14-A, B	509422	Condenser—trimmer assembly A—1.6 to 18 Mmfd. B—1.6 to 18 Mmfd.	.65
17	512523	Condenser—mica 5600 Mmfd. ±2% 500 volt	1.50
20-A, B	509417	Condenser—variable gang (with drum)	5.00
21	513000	Condenser—ceramic 1.0 Mmfd. 500 volt	.15
22	512503	Condenser—mica 100 Mmfd. 500 volt	.25
25	512029	Condenser—.05 Mfd. 400 volt	.35
26-A	509433	Condenser—ceramic 87 Mmfd. part of 1st I.F. transformer)	1.75
26-B	509433	Condenser—ceramic 107 Mmfd. (part of 1st I.F. transformer)	1.75
28	512029	Condenser—.05 Mfd. 400 volt	.35
30-A	509433	Condenser—ceramic 107 Mmfd. (part of 2nd I.F. transformer)	1.75
30-B	509433	Condenser—ceramic 87 Mmfd. (part of 2nd I.F. transformer)	$ 1.75
33	512503	Condenser—mica 100 Mmfd. 500 volt	.25
34	512011	Condenser—.01 Mfd. 400 volt	.25
35	512047	Condenser—.25 Mfd. ±10% 400 volt	.45
38-B	505858	Condenser—ceramic 250 Mmfd. 450 volt; (part of Audio Coupling Unit)	.80
38-C	505858	Condenser—ceramic .005 Mfd. 450 volt; (part of Audio Coupling Unit)	.80
40-A,B	509426	Condenser—electrolytic A—30 Mfd. 150 volt B—40 Mfd. 150 volt	2.00
41	512007	Condenser—.005 Mfd. 600 volt	.25
44	512031	Condenser—.05 Mfd. 600 volt	.35
		RESISTORS	
16	510110	Resistor—carbon 33 Ohms ½ watt	.16
23	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
24	510117	Resistor—carbon 82 Ohms ±10% ½ watt	.12
27	510117	Resistor—carbon 82 Ohms ±10% ½ watt	.12
29	510193	Resistor—carbon 2.2 Meg. ½ watt	.12
32-A, B	509436	Volume Control—1 Meg. (with ON-OFF switch)	1.25
36	510197	Resistor—carbon 10 Meg. ½ watt	.12
37	510179	Resistor—carbon 220,000 Ohms ½ watt	.12
38-A	505858	Resistor—carbon 470,000 Ohms ⅕ watt; (part of Audio Coupling Unit)	.80
38-D	505858	Resistor—carbon 470,000 Ohms ⅕ watt; (part of Audio Coupling Unit)	.80
39	510122	Resistor—carbon 150 Ohms ½ watt	.12
42	510243	Resistor—carbon 2200 Ohms 1 watt	.16
46	510129	Resistor—carbon 390 Ohms ±10% ½ watt	.12
48	510210	Resistor—carbon 33 Ohms 1 watt	.16
		COILS & TRANSFORMERS	
11	509434	Loop Antenna	2.10
12	509428	Coil—short wave antenna	1.25
18	509430	Coil—short wave oscillator	1.25
19	509432	Coil—broadcast oscillator	1.25
26-A, B	509433	Transformer—1st I.F.	1.75
30-A, B	509433	Transformer—2nd I.F.	1.75
43	509424	Transformer—output	2.75
		OTHER ELECTRICAL PARTS	
15	509437	Switch—band	$ 2.00
31	116896	Switch—"Radio-Phono"	.20
38-A to D	505858	Audio Coupling Unit A—Resistor—carbon 470,000 Ohms ⅕ watt B—Condenser—ceramic 250 Mmfd. 450 volt C—Condenser—ceramic .005 Mfd. 450 volt D—Resistor—carbon 470,000 Ohms ⅕ watt	.80
45	509435	Speaker—P.M. Dynamic (5")	5.50
47	118921	Lamp—dial; (Mazda #47) 6-8 volt 150 Ma.	.15
		MISCELLANEOUS	
	508244	Back for cabinet	.30
	505368	Base for tube shield	.06
	509623	Cabinet	11.00
	505101	Clip for mounting I.F. transformer	.05
	508149	Clip for mounting loop antenna	.02
	114955	Clip—retainer on end of dial cord	.01
	508235	Clip—retains cabinet back	.03
	506431	Clip—retains tuning sleeve	.12
	502773	Cord—dial drive (3½ ft. required) per ft.	.05
	509447	Dial scale	1.50
	508248	Escutcheon for controls	1.40
	509445	Knob—"OFF-VOLUME-ON"	.45
	509444	Knob—"SW-BC"	.30
	508239	Knob—"TUNE"	.30
	500966	Plug for phono pick-up cable	.10
	509446	Pointer and dial background	.30
	119087	Ring for dial cord	.01
	18785	Screw—#8 x 7/8" for chassis mounting	.01
	505367	Shield—tube; miniature	.15
	509425	Socket—dial light	.45
	507364	Socket—miniature (7 pin)	.24
	160039	Socket—phono. input	.12
	161384	Spring—dial cord tension	.06

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNMENT PROCEDURE

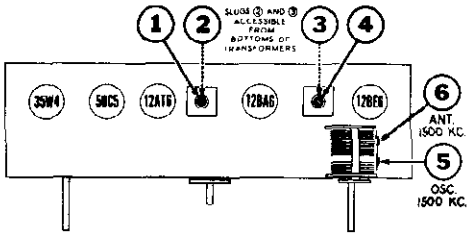
1. During the alignment of this receiver, the pointer will have to be set to a specific frequency. Since the dial scale is an integral part of the cabinet, the receiver chassis must be in the cabinet for correct positioning of the gang condenser and pointer.

   Before setting the pointer to the desired frequency, it will be necessary to check the position of pointer with respect to the gang condenser. To accomplish this, rotate tuning knob fully counter-clockwise until gang condenser is fully meshed. With gang in this position, pointer should be directly over the third dot or depression located on the first left hand vertical bar of the speaker grill. (See picture of the receiver on front side of this data sheet).

   If the pointer is not properly positioned, hold the Tuning Knob steady and move the pointer manually to the proper place.

2. Before removing chassis from cabinet, it will be necessary to take off the Volume Control knob and Tuning knob, to pry off the two retaining clips at top of cabinet back and to remove the two chassis mounting screws which are accessible through openings at bottom corners of cabinet back. (NOTE: Do not disturb the two externally mounted screws at bottom of cabinet back; these screws serve to mount loop antenna and back to chassis frame). Then turn the tuning shaft until pointer is set to desired frequency for alignment and taking care not to change this setting, withdraw chassis from cabinet. The cabinet grill will hold the pointer, allowing it to be pulled from its shaft as chassis is withdrawn.
3. Couple the signal generator to the receiver by connecting its output to several turns of wire formed in a circular shape so that it may be placed adjacent and parallel to the receiver loop antenna.
4. Connect an output meter across the speaker voice coil or from the plate of the 50C5 tube to B— (see voltage chart for convenient connection point) through a 0.1 Mfd. condenser.
5. Set volume control at maximum volume position and use a weak signal from the signal generator.
6. After alignment has been completed and chassis reassembled in cabinet and pointer properly positioned, check calibration over entire dial and should the calibration error be objectionable, repeat procedure, exercising greater precaution in the initial setting of the pointer.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER AND SLUG NUMBER	TRIMMER AND SLUG DESCRIPTION	TYPE OF ADJUSTMENT
NONE	Connect directly to coupling turn as described in step 2 above.	**455 KC** 400 cycle Modulation	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	1500 KC	**5**	Broadcast Oscillator	Adjust for maximum output.
NONE	Connect directly to coupling turn as described in step 2 above.	**1500 KC** 400 cycle Modulation	Tune to 1500 KC generator signal	**6**	Broadcast Antenna	Adjust for maximum output.

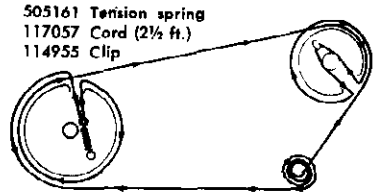


TRIMMER LOCATIONS

POINTER AND DRIVE CORD ARRANGEMENT

To string dial cord, turn the gang condenser drum to maximum counter-clockwise position and position pointer drum as shown in illustration and use the following parts:

505161 Tension spring
117057 Cord (2½ ft.)
114955 Clip



POINTER REPLACEMENT

In order to replace the pointer, it will first be necessary to remove the chassis from the cabinet as outlined in step 2 in the Alignment Procedure.

A new pointer may now be installed by inserting it, from the rear of the cabinet, into the recess at the front base of cabinet.

Final positioning of pointer can only be done after chassis has been reinserted into cabinet and pointer has engaged pointer shaft. The setting must be accomplished in accordance with directions given in the second paragraph of step 1 of the Alignment Procedure.

SOCKET VOLTAGES

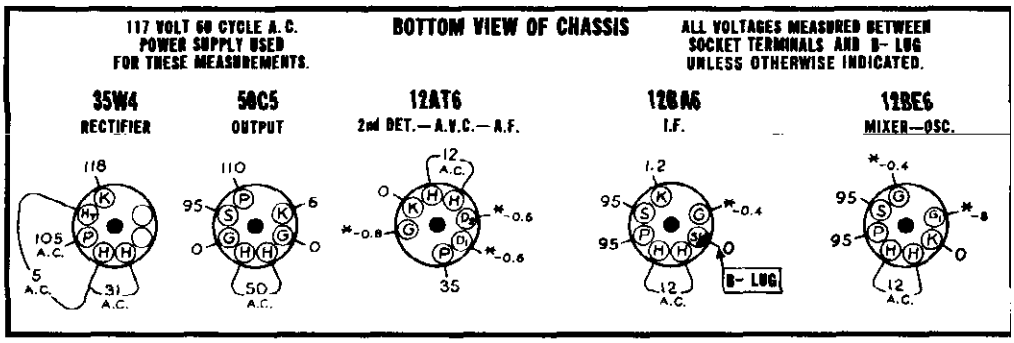
1. All measurements made with a voltmeter having a sensitivity of 20,000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.
2. Dial tuned to maximum counter-clockwise position.

NOTE A: Grounding of center stud on tube socket is necessary to reduce capacity coupling between other pins. Oscillation may result if this ground is omitted.

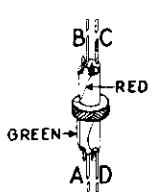
117 VOLT 60 CYCLE A.C. POWER SUPPLY USED FOR THESE MEASUREMENTS.

BOTTOM VIEW OF CHASSIS

ALL VOLTAGES MEASURED BETWEEN SOCKET TERMINALS AND B- LUG UNLESS OTHERWISE INDICATED.

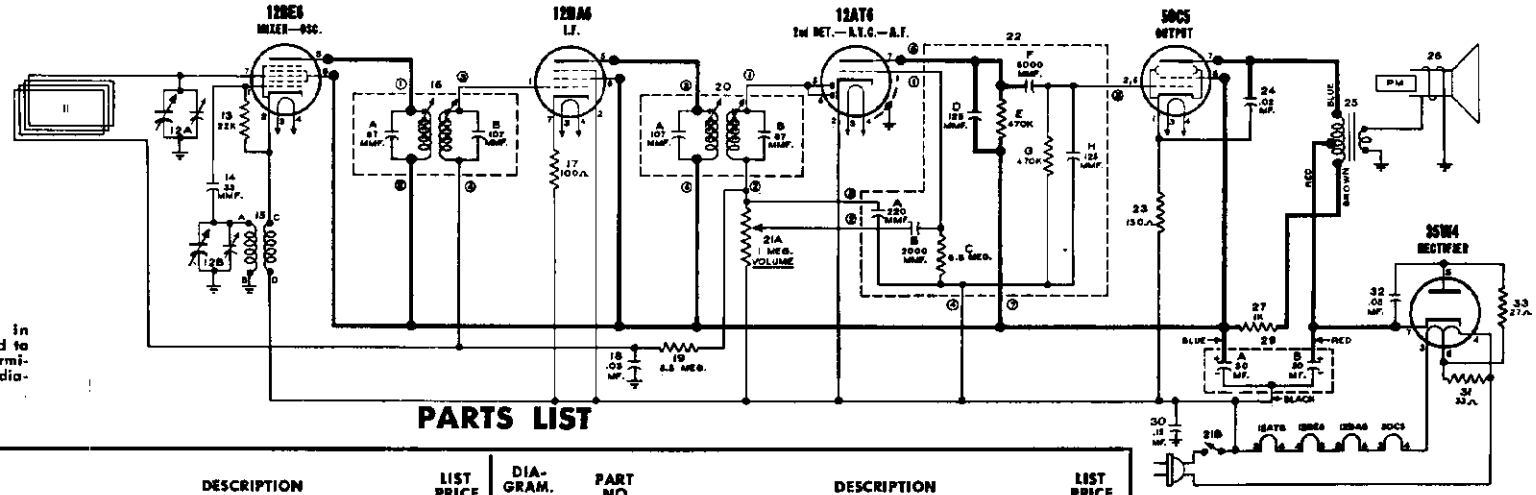


REAR OF CHASSIS



OSC. COIL 509832

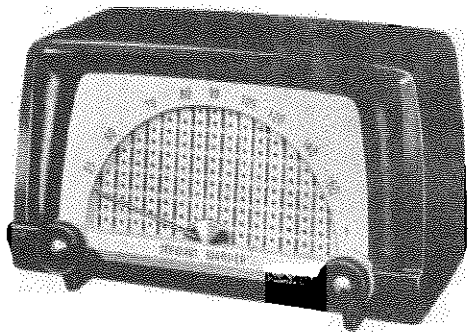
Lettered terminals in illustration correspond to similarly lettered terminals on the circuit diagram.



PARTS LIST

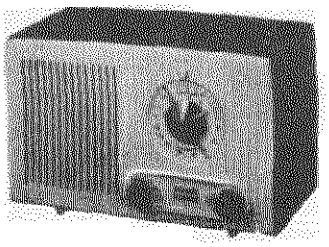
DIAGRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
12-A, B	520117	Condenser—variable gang (includes drum)	$ 3.75
14	513028	Condenser—ceramic 33 Mmfd. 500 volt	.25
16-A	509433	Condenser—ceramic 87 Mmfd. (part of 1st I.F. Transformer)	1.75
16-B	509433	Condenser—ceramic 107 Mmfd. (part of 1st I.F. Transformer)	1.75
18	512028	Condenser—.05 Mfd. 400 volt	.25
20-A	509433	Condenser—ceramic 107 Mmfd. (part of 2nd I.F. Transformer)	1.75
20-B	509433	Condenser—ceramic 87 Mmfd. (part of 2nd I.F. Transformer)	1.75
22-A	509836	Condenser—ceramic 220 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-B	509836	Condenser—ceramic 2000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-D	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-F	509836	Condenser—ceramic 5000 Mmfd. 500 volt (part of audio coupling unit)	1.00
22-H	509836	Condenser—ceramic 125 Mmfd. 500 volt (part of audio coupling unit)	1.00
24	512016	Condenser—.02 Mfd. 400 volt	.25
29-A, B	509837	Condenser—electrolytic A—30 Mfd. 150 volt; B—50 Mfd. 150 volt	2.00
30	512040	Condenser—.15 Mfd. 400 volt	.35
32	512028	Condenser—.05 Mfd. 400 volt	.25
		RESISTORS	
13	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
17	510119	Resistor—carbon 100 Ohms ½ watt	.12
19	510194	Resistor—carbon 3.3 Meg. ½ watt	.12
21-A, B	520118	Volume Control—1 Meg. (with OFF-ON switch)	1.25
22-C	509836	Resistor—carbon 6.8 Meg. 1/5 watt (part of audio coupling unit)	1.00
22-E	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
22-G	509836	Resistor—carbon 470,000 Ohms 1/5 watt (part of audio coupling unit)	1.00
23	510122	Resistor—carbon 150 Ohms ½ watt	.12
27	510237	Resistor—carbon 1000 Ohms 1 watt	.16
31	510209	Resistor—carbon 33 Ohms ± 10% 1 watt	.16
33	510108	Resistor—carbon 27 Ohms ± 10% ½ watt	.12
		COILS AND TRANSFORMERS	
11	520119	Loop antenna and cabinet back	1.75
15	509832	Coil—oscillator	1.70
16	509433	Transformer—1st I.F. (includes condensers 16-A and 16-B)	$ 1.75
20	509433	Transformer—2nd I.F. (includes condensers 20-A and 20-B)	1.75
25	520116	Transformer—output	2.00
		OTHER ELECTRICAL PARTS	
22-A to H	509836	Audio Coupling Unit: A—Condenser—ceramic 220 Mmfd. 500 v.; B—Condenser—ceramic 2000 Mmfd. 500 v.; C—Resistor—carbon 6.8 Meg. 1/5 w.; D—Condenser—ceramic 125 Mmfd. 500 v.; E—Resistor—carbon 470,000 Ohms 1/5 w.; F—Condenser—ceramic 5000 Mmfd. 500 v.; G—Resistor—carbon 470,000 Ohms 1/5 w.; H—Condenser—ceramic 125 Mmfd. 500 v.	1.00
26	509828	Speaker—P.M. dynamic (4")	5.00
		MISCELLANEOUS PARTS	
	510119	Back for cabinet (includes loop antenna)	1.75
	507593	Base for tube shield	.20
	520115	Bracket for pointer shaft	.10
	520114	Bracket for tuning shaft	.10
	505165	"C" Washer for tuning or pointer shaft	.02
	520170-A	Cabinet for Model 9161-A (Black body, Yellow dial)	6.00
	520170-B	Cabinet for Model 9161-B (Blue)	6.00
	520170-C	Cabinet for Model 9161-C (Yellow body, Black dial)	6.00
	505101	Clip for mounting I.F. transformer	.05
	114955	Clip—retainer on end of dial cord	.01
	500497	Clip—retains cabinet back	.02
	509874	Clip—retains speaker	.03
	520416	Clip—spring for tuning shaft	.05
	117057	Cord—dial drive (2½ ft. required) per ft.	.05
	520155-A	Knob for Model 9161-A (Black)	.40
	520155-B	Knob for Model 9161-B (Blue)	.40
	520155-C	Knob for Model 9161-C (Yellow)	.40
	520123-A	Pointer for Models 9161-B and 9161-C (Gold)	.90
	520123-B	Pointer for Model 9161-A (Black)	.35
	509829	Rubber spacer for mounting speaker	.02
	170988	Screw—#8-18 x ½" plastic thread cutting; retains chassis	.02
	520152	Shaft and drum for pointer	.30
	520121	Shaft, tuning	.25
	507594	Shield, tube	.15
	507595	Socket—miniature	.20
	505161	Spring—dial cord tension	.03
	509876	Stud for mounting speaker	.01
	520473	Washer, felt; fits between pointer and grill	.05

I.F. 455 KC.

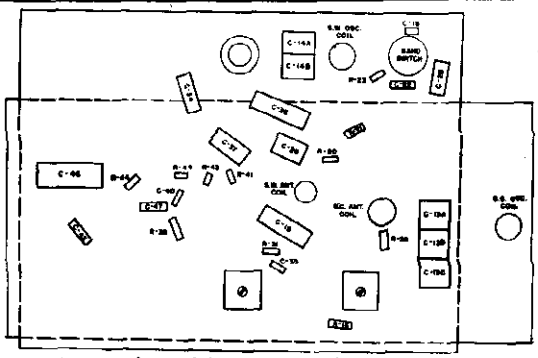


ALL PRICES ON THIS PARTS LIST ARE SUBJECT TO CHANGE WITHOUT NOTICE

MOD
9159



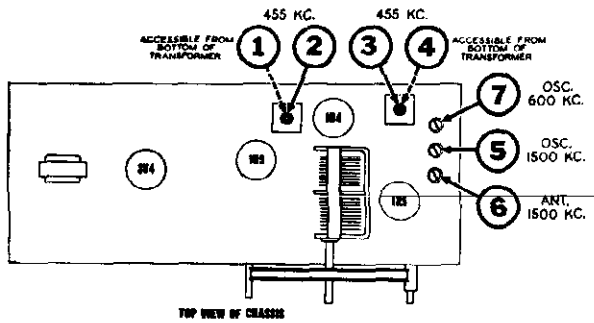
ALIGNMENT PROCEDURE



1. With the gang condenser fully meshed, the dial pointer should be in a horizontal position, parallel to the bottom edge of the cabinet. If it is set incorrectly, merely hold tuning control shaft steady and turn pointer to correct position.
2. During the alignment of this receiver, the dial pointer will have to be set to several different frequencies. Since the dial scale is an integral part of the cabinet, the receiver chassis must be in the cabinet for correct positioning of the gang condenser and pointer. To remove chassis from cabinet, first remove cabinet back, all knobs, and the two chassis mounting screws. Turn dial pointer to desired position for alignment and hold tuning shaft firmly in one hand. Then carefully remove pointer from gang condenser shaft. Chassis can now be withdrawn from cabinet without disturbing positio condenser.

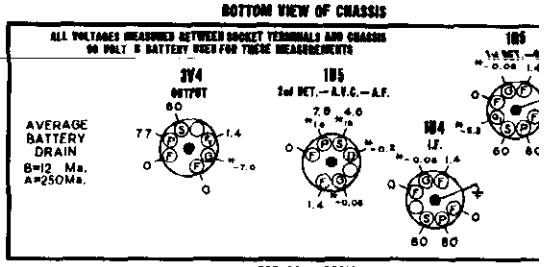
   NOTE: During the alignment of the Broadcast R.F. and Oscil stages of this receiver, it will not be necessary to remove ch from cabinet as trimmers 5, 6 and 7 can be adjusted by the of a short screwdriver.
3. Connect ground lead of signal generator to receiver chassis.
4. Connect an output meter across the speaker voice coil or from plate of the 3V4 tube to chassis through a .01 Mfd. condenser.
5. Set volume control at maximum volume position and use a signal from the signal generator.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POSITION	RECEIVER DIAL SETTING	TRIMMER NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMEN
.2 Mfd. Condenser	Terminal "C" of Broadcast Antenna Coil	**455 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum output. repeat adjustment.
					3-4	1st I.F.	
200 MMFD. Mica Condenser	External antenna lead (blue)	**1500 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	1500 KC	**5**	Broadcast Oscillator (Shunt)	Adjust for maximum output.
200 MMFD. Mica Condenser	External antenna lead (blue)	**1500 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	Tune to 1500 KC Generator Signal	**6**	Broadcast Antenna	Adjust for maximum output.
200 MMFD. Mica Condenser	External antenna lead (blue)	**600 KC** 400 cycle AM Modulated	Broadcast (counter-clockwise)	Tune to 600 KC Generator Signal	**7**	Broadcast Oscillator (Series Pad)	Adjust for maximum output. increase output by detuning mer and retuning receiver di til maximum output is obt
200 MMFD. Mica Condenser	External antenna lead (blue)	Repeat adjustment of trimmers 5 and 6 at 1500 Kc. Then re-check adjustment of trimmer 7 at 600 Kc.					
400 OHM Carbon Resistor	External antenna lead (blue)	**15 MC** 400 cycle AM Modulated	Short Wave (clockwise)	15 MC	**8**	Short Wave Oscillator	Adjust for maximum output. to see if proper peak was ob by tuning in image at appro MC. If image does not appe align at 15 MC. with trimmer farther out. Recheck image.
400 OHM Carbon Resistor	External antenna lead (blue)	**15 MC** 400 cycle AM Modulated	Short Wave (clockwise)	Tune to 15 MC Generator Signal	**9**	Short Wave Antenna	Adjust for maximum output. increase output by detuning mer and retuning receiver di til maximum output is ob



SOCKET VOLTAGES

1. All measurements made with a voltmeter having a sen of 20,000 ohms per volt except where indicated by (*) (*) symbol designates a vacuum tube voltmeter measur
2. Band switch set to "BC" position.
3. Dial tuned to maximum counter-clockwise position.



NOTE A: Grounding of center stud on tube socket is necess reduce capacity coupling between other pins. Oscillation may if this ground is omitted.

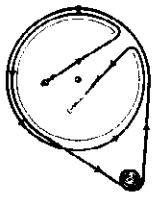
MODEL 9159-A

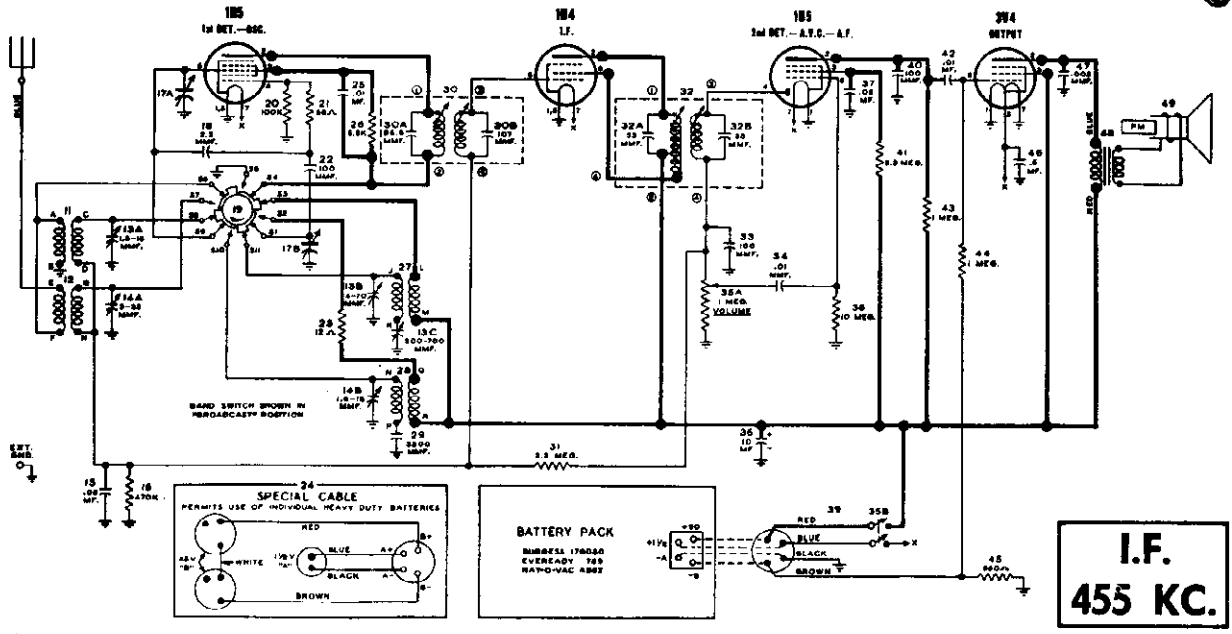
SQUEALING OR INOPERATIVE 9159-A RADIOS

Because of inadequate plating on some 9159-A chassis, it was impossible to effect a good soldered ground connection. Over a period of time, these solder joints may develop a high resistance to ground, causing the receiver to operate improperly, or become entirely inoperative. All chassis solder connections should be prodded with a screw driver to see if they will break loose. If they do, the chassis should be cleaned and the connection resoldered, using a good soldering flux.

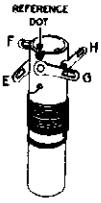
To string dial cord, turn the main drive drum to maximum counter-clockwise position and use following parts:

114955 Clip on end of cord
502773 Cord (3½ feet)
119087 Ring
161384 Tension Spring



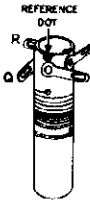


B.C. ANT. COIL 509871

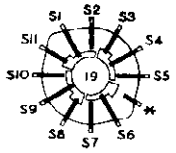


S.W. ANT. COIL 509868

B.C. OSC. COIL 509867



S.W. OSC. COIL 509865



BAND SWITCH 509863

REAR VIEW

Lettered and numbered terminals in illustrations correspond to similarly lettered and numbered terminals on the circuit diagram.

*Not used; may serve as wiring junction point.

PARTS LIST

DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
13-A, B, C	509418	Condenser—trimmer assembly A—1.6 to 18 Mmfd. B—4 to 70 Mmfd. C—300 to 700 Mmfd.	$ 1.20
14-A, B	509864	Condenser—trimmer assembly A—3 to 35 Mmfd. B—1.6 to 18 Mmfd.	.75
15	512029	Condenser—.05 Mfd. 400 volt	.35
17-A, B	509861	Condenser—variable gang (includes drum)	6.30
18	513001	Condenser—ceramic 2.2 Mmfd. 500 volt	.20
22	513003	Condenser—ceramic 100 Mmfd. 500 volt	.24
25	512011	Condenser—.01 Mfd. 400 volt	.25
29	512520	Condenser—mica 3,300 Mmfd. ±2% 500 volt	1.30
30-A	509433	Condenser—ceramic 86.6 Mmfd. ±5% (Part of 1st IF transformer)	1.75
30-B	509433	Condenser—ceramic 107 Mmfd. ±5% (Part of 1st IF transformer)	1.75
32-A,B	509889	Condenser—ceramic 33 Mmfd. (Part of 2nd IF transformer)	2.00
33	513003	Condenser—ceramic 100 Mmfd. 500 volt	.24
34	512011	Condenser—.01 Mfd. 400 volt	.25
36	505174	Condenser—electrolytic 10 Mfd. 150 volt	.90
37	512031	Condenser—.05 Mfd. 600 volt	.35
40	513003	Condenser—ceramic 100 Mmfd. 500 volt	.24
42	512011	Condenser—.01 Mfd. 400 volt	.25
46	512051	Condenser—.5 Mfd. ±10% 200 volt	.45
47	512003	Condenser—.002 Mfd. 600 volt	.25
		RESISTORS	
16	510185	Resistor—carbon 470,000 Ohms ½ watt	.12
20	510173	Resistor—carbon 100,000 Ohms ½ watt	.12
21	510116	Resistor—carbon 68 Ohms ½ watt	.12
23	510102	Resistor—carbon 12 Ohms ±10% ½ watt	.16
26	510150	Resistor—carbon 5600 Ohms ±10% ½ watt	.12
31	510193	Resistor—carbon 2.2 Meg. ½ watt	.12
35-A, B	509862	Volume Control 1 Meg. (with OFF-ON switch)	1.40
38	510197	Resistor—carbon 10 Meg. ½ watt	.12
41	510194	Resistor—carbon 3.3 Meg. ½ watt	.12
43	510191	Resistor—carbon 1 Meg. ½ watt	.12
44	510191	Resistor—carbon 1 Meg. ½ watt	.12
45	510132	Resistor—carbon 560 Ohms ±10% ½ watt	.12
		COILS & TRANSFORMERS	
11	509871	Coil—Bc. Antenna	1.50
12	509868	Coil—S.W. Antenna	1.25
27	509867	Coil—Bc. Oscillator	1.20
28	509865	Coil—S.W. Oscillator	1.25
30	509433	Transformer—1st I.F. (Includes condensers 30-A and 30-B)	1.75
32	509889	Transformer—2nd I.F. (Includes condensers 32-A and 32-B)	2.00
48	509859	Transformer—output	2.25
		OTHER ELECTRICAL PARTS	
19	509863	Switch—band	2.00
24	116566	Battery cable for use with individual batteries	1.60
39	509873	Battery cable	1.00
49	509435	Speaker—PM dynamic (5")	5.50
		MISCELLANEOUS PARTS	
	509879	Back for cabinet	.50
	520124	Cabinet	8.50
	505101	Clip for mounting I.F. transformer	.05
	114955	Clip retainer on end of dial cord	.01
	508235	Clip—retains cabinet back	.03
	506431	Clip—retains tuning sleeve	.12
	502773	Cord—dial drive (3½' required) Per ft.	.05
	509445	Knob—"OFF-VOLUME-ON"	.45
	509444	Knob—"SW-BC"	.30
	508239	Knob—"TUNE"	.30
	509878	Pointer	1.20
	119087	Ring for dial cord	.01
	509423	Sleeve—tuning	1.00
	507364	Socket—miniature (7 pin)	.24
	161384	Spring—dial cord tension	.06

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

ALIGNMENT PROCEDURE

1. During the alignment of this receiver, the pointer will have to be set to a specific frequency. Since the dial scale is an integral part of the cabinet, the receiver chassis must be in the cabinet for correct positioning of the gang condenser and pointer.

   Before setting the pointer to the desired frequency, it will be necessary to check the position of pointer with respect to the gang condenser. To accomplish this, rotate tuning knob fully counter-clockwise until gang condenser is fully meshed. With gang in this position, pointer should be **parallel** with base of cabinet.

   If the pointer is not properly positioned, hold the Tuning Knob steady and move the pointer manually to the proper place.

2. Before removing chassis from cabinet, it will be necessary to take off the Volume Control knob, Tone knob, Tuning knob and cabinet back and to remove the two chassis mounting screws at bottom of cabinet. Then turn the tuning **shaft** until pointer is set to desired frequency for alignment and taking care not to change this setting, remove pointer.

3. Connect an output meter across the speaker voice coil or from the plate of the 35C5 tube to B— (see voltage chart for convenient connection point) through a 0.1 Mfd. condenser.

4. Connect ground lead of signal generator to B— lug.

   CAUTION: If your signal generator is designed with an AC-DC power supply, connect ground lead to B— lug through a .25 Mfd. condenser. (See voltage chart for convenient B— connection.)

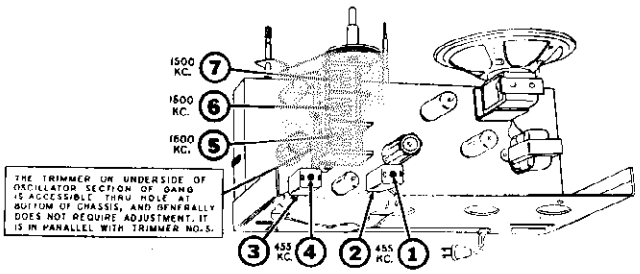
5. Set tone control to its maximum clockwise position.

6. Set volume control at maximum volume position and use a weak signal from the signal generator.

7. After alignment has been completed and chassis reassembled in cabinet and pointer properly positioned, check calibration over entire dial and should the calibration error be objectionable, repeat procedure, exercising greater precaution in the initial setting of the pointer.

DUMMY ANT. IN SERIES WITH SIGNAL GENERATOR	SIGNAL GENERATOR CONNECTION	SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER AND SLUG NUMBER	TRIMMER AND SLUG DESCRIPTION	TYPE OF ADJUSTMENT
0.1 Mfd. Condenser	Lug on R.F. Trimmer #6	**455 KC** 400 cycle Modulation	Any point where it does not affect the signal.	**1-2**	2nd I.F.	Adjust for maximum output. Then repeat adjustment.
				3-4	1st I.F.	
200 Mmfd. Mica Condenser	External Antenna Terminal on Loop Frame	**1600 KC** 400 cycle Modulation	1500 KC	**5**	Broadcast Oscillator	Adjust for maximum output.
200 Mmfd. Mica Condenser	External Antenna Terminal on Loop Frame	**1500 KC** 400 cycle Modulation	Tune to 1500 KC generator signal	**6**	Broadcast R.F.	Adjust for maximum output.
200 Mmfd. Mica Condenser	External Antenna Terminal on Loop Frame	**1500 KC** 400 cycle Modulation	Tune to 1500 KC generator signal	**7**	Broadcast Antenna	Adjust for maximum output.

TRIMMER LOCATION CHART



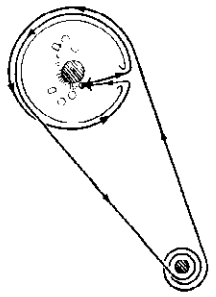
POINTER AND DRIVE CORD ARRANGEMENT

To string dial cord, turn the main drive drum to maximum counter-clockwise position and use following parts:

114955 Clip on end of cord

117057 Cord (2 feet)

505161 Tension Spring



SOCKET VOLTAGES

1. All measurements made with a voltmeter having a sensitivity of 20,000 ohms per volt except where indicated by (*). The (*) symbol designates a vacuum tube voltmeter measurement.

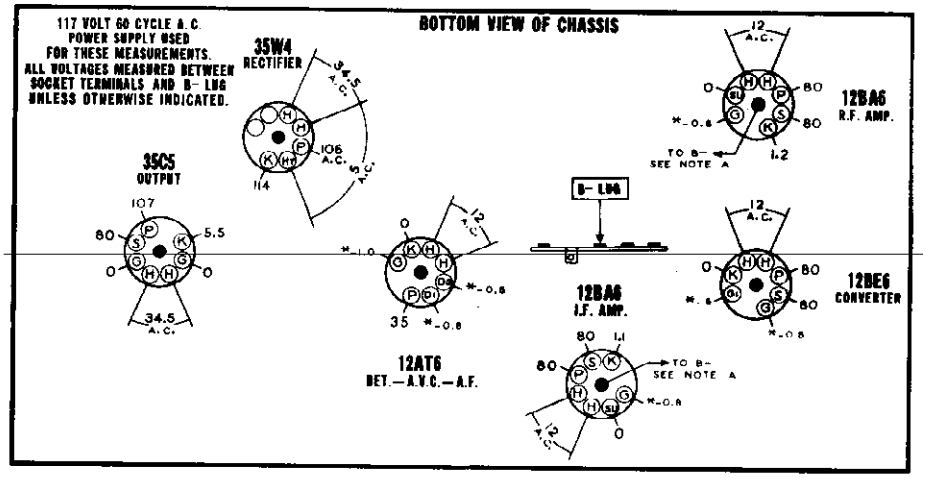
2. Terminals on loop antenna are shorted together to minimize noise signal pickup.

3. Dial tuned to 540 Kc.

4. Volume control set to maximum with no signal.

5. Tone control set at its maximum clockwise position.

NOTE A: The center stud of this tube must be connected to B— to reduce capacity coupling between pins. Oscillation may result if this connection is omitted.

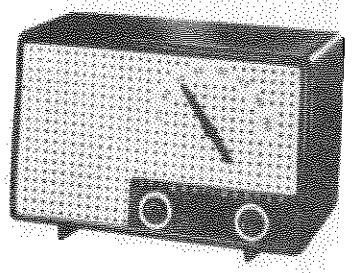


PARTS LIST

DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
12-A,B,C	520388	Condenser—variable gang (includes drum)	$ 4.50
14	512016	Condenser—.02 Mfd. 400 volt	.25
15	513405	Condenser—ceramic 15 Mmfd. 500 volt (Temperature Compensating)	.25
19	512503	Condenser—mica 100 Mmfd. 500 volt	.25
21-A	505867	Condenser—ceramic 66 Mmfd. (Part of 1st I.F. transformer)	2.15
21-B	505867	Condenser—ceramic 83 Mmfd. (Part of 1st I.F. transformer)	2.15
23	512016	Condenser—.02 Mfd. 400 volt	.25
25-A	505867	Condenser—ceramic 83 Mmfd. (Part of 2nd I.F. transformer)	2.15
25-B	505867	Condenser—ceramic 66 Mmfd. (Part of 2nd I.F. transformer)	2.15
28,29	512503	Condenser—mica 100 Mmfd. 500 volt	.25
30	512002	Condenser—.002 Mfd. 600 volt	.20
32	512002	Condenser—.002 Mfd. 600 volt	.20
33-B	505858	Condenser—ceramic 250 Mmfd. 450 volt (Part of Audio Coupling Unit)	.80
33-C	505858	Condenser—ceramic 5000 Mmfd. 450 volt (Part of Audio Coupling Unit)	.80
34	512040	Condenser—.15 Mfd. 400 volt	.35
37	512006	Condenser—.005 Mfd. 600 volt	.25
39-A,B	508147	Condenser—electrolytic A—20 Mfd. 150 v. B—30 Mfd. 150 v.	1.40
41	512030	Condenser—.05 Mfd. 600 volt	.30
		RESISTORS	
13	510125	Resistor—carbon 220 Ohms ½ watt	.12
17	510185	Resistor—carbon 470,000 Ohms ½ watt	.12
18	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
22	510121	Resistor—carbon 150 Ohms ± 10% ½ watt	.16
24	510191	Resistor—carbon 1 Meg. ½ watt	.12
26	510164	Resistor—carbon 33,000 Ohms ½ watt	.12
27-A,B,C	520390	Volume and Tone control (includes ON-OFF switch) A—Volume control; 1 Meg. B—Tone control; 1 Meg. C—On-Off switch (If this component is mounted on an auxiliary bracket, remove this bracket and mount new control directly to side of chassis.)	2.25
31	510197	Resistor—carbon 10 Meg. ½ watt	.12

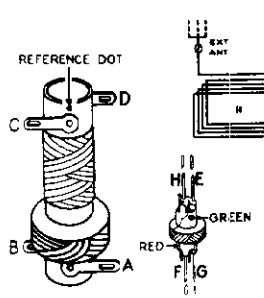
DIA-GRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		RESISTORS—Continued	
33-A	505858	Resistor—carbon 470,000 Ohms ⅕ watt (Part of Audio Coupling Unit)	.80
33-D	505858	Resistor—carbon 470,000 Ohms ⅕ watt (Part of Audio Coupling Unit)	.80
35	510179	Resistor—carbon 220,000 Ohms ½ watt	.12
36	510121	Resistor—carbon 150 Ohms ± 10% ½ watt	.16
38	510240	Resistor—carbon 1500 Ohms 1 watt	.16
43,44	510210	Resistor—carbon 33 Ohms 1 watt	.16
		COILS AND TRANSFORMERS	
11	508740	Loop antenna	2.65
16	508692	Coil—R.F.	1.60
20	506094	Coil—oscillator	1.50
21	505867	Transformer—1st I.F. (Includes condensers 21-A and 21-B)	2.15
25	505867	Transformer—2nd I.F. (Includes condensers 25-A and 25-B)	2.15
40	508146	Transformer—output	2.10
		OTHER ELECTRICAL PARTS	
33-A to D	505858	Audio Coupling Unit A—Resistor—carbon 470,000 Ohms ⅕ w. B—Condenser—ceramic 250 Mmfd. 450 v. C—Condenser—ceramic 5000 Mmfd. 450 v. D—Resistor—carbon 470,000 Ohms ⅕ w.	.80
42	508699	Speaker—P.M. Dynamic (5")	4.80
		MISCELLANEOUS	
	508244	Back for cabinet	.30
	505368	Base for tube shield (miniature)	.06
	505165	"C" washer for tuning shaft	.02
	520391	Cabinet (complete) for Model 9165-A (Black and Yellow)	10.00
	520392	Cabinet (complete) for Model 9165-B (Rust and Tan)	10.00
	520383-A	Cabinet body for Model 9165-A (Black)	6.00
	520383-B	Cabinet body for Model 9165-B (Rust)	6.00
	520382-A	Cabinet front for Model 9165-A (Black and Yellow)	3.50
	520382-B	Cabinet front for Model 9165-B (Rust and Tan)	3.50
	505101	Clip for mounting I.F. transformer	.05
	500473	Clip for mounting front panel to cabinet body	.02
	508149	Clip for mounting loop antenna	.02
	112745	Clip for mounting R.F. coil	.01
	114955	Clip—retainer on end of dial cord	.01

PART NO.	DESCRIPTION	LIST PRICE
	MISCELLANEOUS—Continued	
508235	Clip—retains cabinet back	.03
117057	Cord—dial drive (2 ft. required) per ft.	.05
520387-A	Knob—"TONE" for Model 9165-A (Yellow)	.30
520387-B	Knob—"TONE" for Model 9165-B (Tan)	.30
520385-A	Knob—"TUNING" for Model 9165-A (Black and Yellow)	.40
520385-B	Knob—"TUNING" for Model 9165-B (Rust and Tan)	.40
520386-A	Knob—"VOLUME ON" for Model 9165-A (Black)	.25
520386-B	Knob—"VOLUME ON" for 9165-B (Rust)	.25
520384-A	Pointer for Model 9165-A (Black)	.35
520384-B	Pointer for Model 9165-B (Rust)	.35
520186	Rubber washer for mounting front panel to cabinet body	.05
18785	Screw—#8 - ⅞" chassis mounting	.02
170819	Screw—#8 - 32 x ⅜" plastic thread cutting; mounts clip for cabinet back	.05
170820	Screw—#8 - 32 x ½" plastic thread cutting; retains cabinet back	.02
520389	Shaft—tuning	.35
505367	Shield—tube; miniature	.15
507364	Socket—miniature (7 pin)	.24
505161	Spring—dial cord tension	.08
520394	Instruction Book	N/C
520395	Service Data Sheet	N/C



I.F. 455 K.C.

ALL PRICES ON THIS LIST ARE SUBJECT TO CHANGE WITHOUT NOTICE

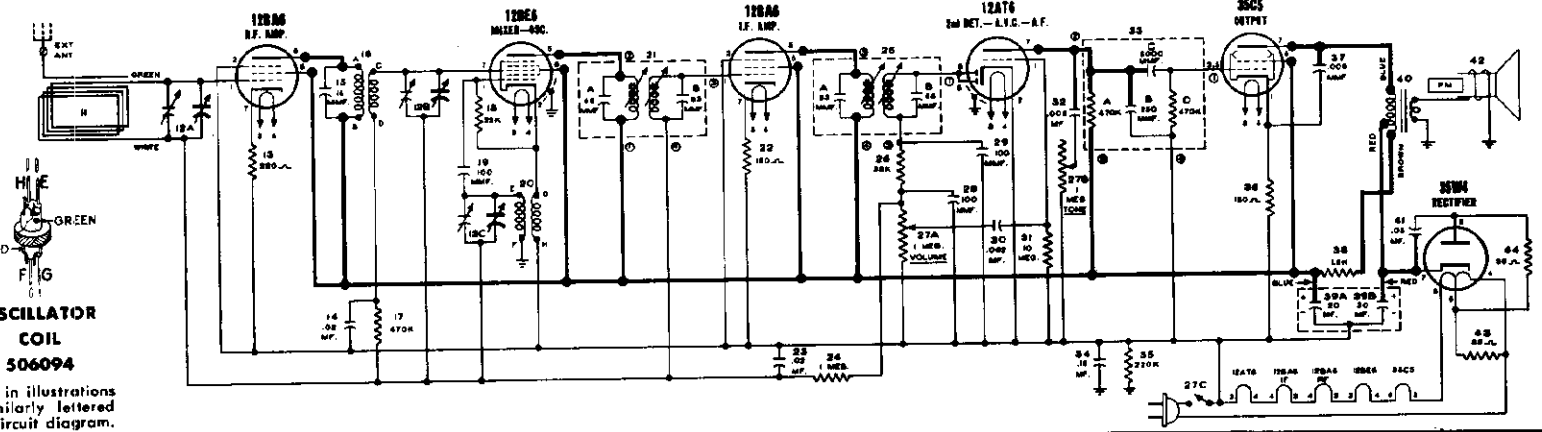


OSCILLATOR COIL

R.F. COIL 508692

506094

Lettered terminals in illustrations correspond to similarly lettered terminals on the circuit diagram.



MODELS 9170-
9170-C, 9170-I

REMOVING CHASSIS FROM CABINET

1. Raise the carrying handle until Latch Button is exposed. Press down on the button and simply separate the back and front halves of the cabinet while holding the latch button down.
2. Disconnect back retaining cord by removing center screw on receiver chassis.
3. Remove the four chassis mounting screws (see Trimmer Location Chart) and lift chassis from cabinet.
4. Disengage one end of handle from escutcheon by squeezing gether the wire retaining clip.
5. Remove the escutcheon by taking out the cross slotted screws.
6. Control knobs may now be removed by pulling them straight up.

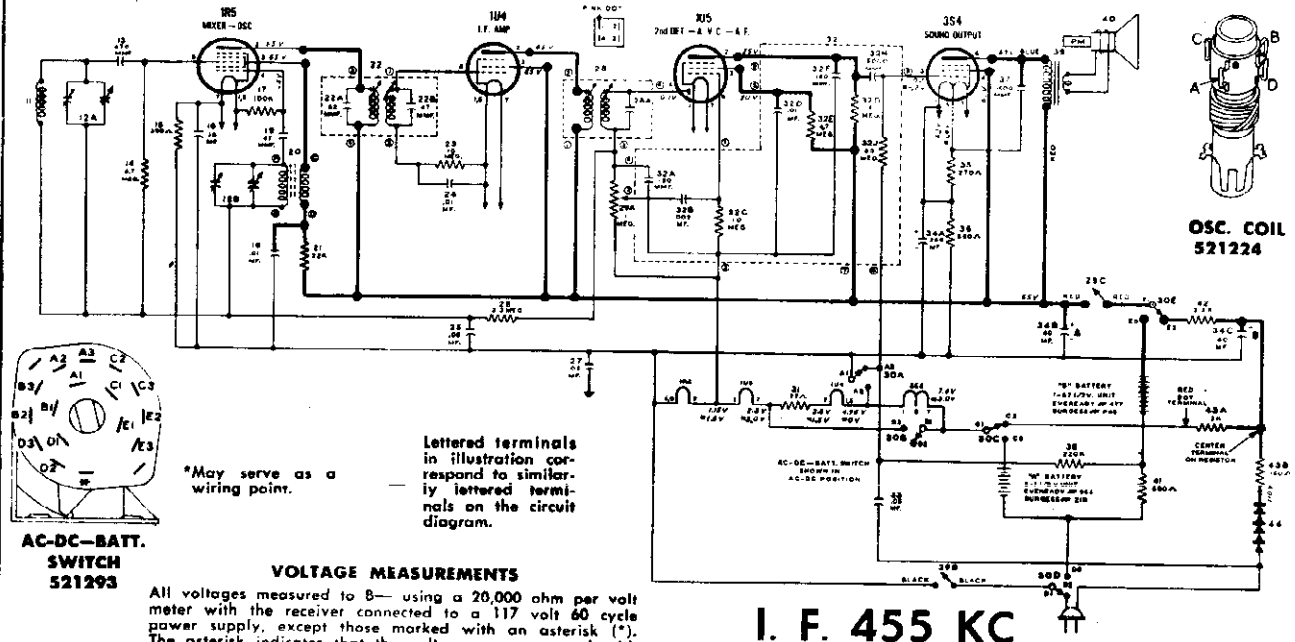
ALIGNMENT PROCEDURE

1. Remove chassis from cabinet by following procedure described above.
2. Connect an output meter across the speaker voice coil or from the plate of the 354 tube to chassis through a 0.1 Mfd. condenser.
3. Set volume control at maximum and use a weak signal from t signal generator.
4. Operate the receiver from a 117 volt AC or DC line.

SIGNAL GENERATOR CONNECTIONS		SIGNAL GENERATOR FREQUENCY	RECEIVER DIAL SETTING	TRIMMER OR SLUG NUMBER	TRIMMER DESCRIPTION	TYPE OF ADJUSTMENT
CONNECT HIGH SIDE OF SIGNAL GENERATOR TO	CONNECT GROUND LEAD OF SIGNAL GENERATOR TO					
Lug on trimmer #6 at side of gang (see chart below for location of trimmer).	Any B— terminal in chassis. CAUTION If your signal generator is designed with an AC-DC type power supply, connect ground lead of signal generator to receiver through a .25 Mfd. condenser.	455 KC	Any point where it does not affect the signal.	1 and 2	2nd I.F.	Adjust for maximum output. The repeat adjustment.
				3 and 4	1st I.F.	

IMPORTANT: Before undertaking alignment of the oscillator and antenna trimmers it is necessary to reassemble the chassis in the cabinet. The tuning knob should be installed on the gang condenser shaft so that when the condenser is fully meshed, the dot under the smaller 5 of the 55 on dial scale is directly opposite the pointer (gold mark on cabinet). As battery position slightly affects R.F. alignment, it is preferable to have batteries in proper place. To gain access to oscillator and antenna trimmers, it will be necessary to open back of cabinet. In order to provide a coupling for the signal generator, during this part of the procedure, wind several turns of wire in a circular shape to form a radiating loop that may be placed adjacent (axes parallel) to the loop antenna. Now complete the alignment procedure as follows.

Connect directly to radiating loop. (See above for instructions on radiating loop.) Rotate and adjust loop for maximum input.	1600 KC	1600 KC	5	Broadcast Oscillator	Adjust for maximum output.
Same as above.	1500 KC	Tune to 1500 Kc. generator signal.	6	Broadcast Antenna	Adjust for maximum output.



OSC. COIL
521224

AC-DC—BATT. SWITCH 521293

*May serve as a wiring point.

Lettered terminals in illustration correspond to similarly lettered terminals on the circuit diagram.

VOLTAGE MEASUREMENTS

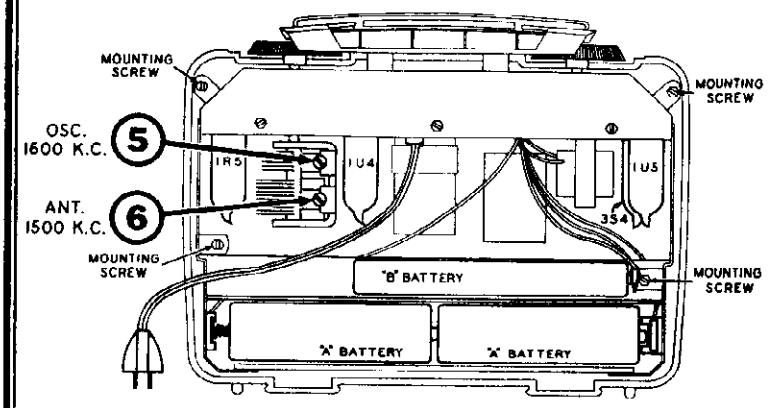
All voltages measured to B— using a 20,000 ohm per volt meter with the receiver connected to a 117 volt 60 cycle power supply, except those marked with an asterisk (*). The asterisk indicates that the voltage was measured with the receiver powered by its self contained batteries.

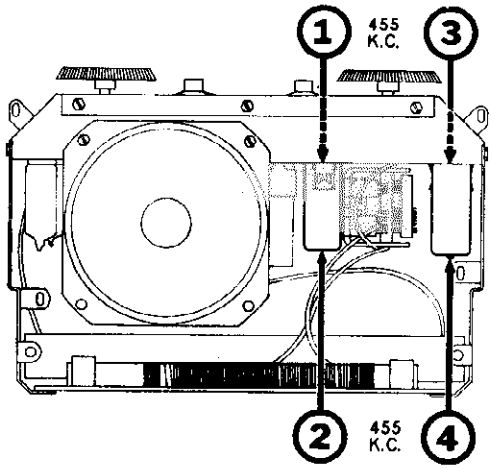
Loop terminals shorted together.

No voltage reading at a tube element indicates zero voltage or voltage which cannot be accurately measured with a 20,000 ohm per volt meter.

I. F. 455 KC

MODELS 9170-B, 9170-C, 9170-D

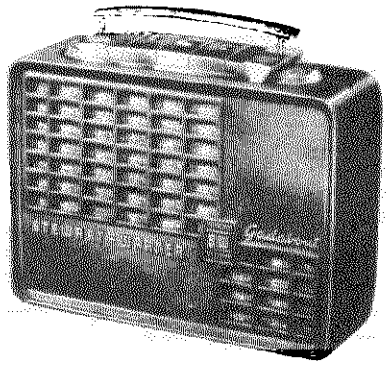




TRIMMER LOCATION CHART

PARTS LIST

DIAGRAM NO.	PART NO.	DESCRIPTION	LIST PRICE
		CONDENSERS	
12-A, B	521294	Condenser—variable gang	2.50
13	513008	Condenser—ceramic 470 Mmfd. 350 volt	.30
16	512217	Condenser—.1 Mfd. 400 volt	.50
18	513022	Condenser—ceramic .01 Mfd. 450 volt	.34
19	513002	Condenser—ceramic 47 Mmfd. 500 volt	.24
22-A	521318	Condenser—ceramic 62 Mmfd. (Part of 1st I.F. transformer)	1.50
22-B	521318	Condenser—ceramic 47 Mmfd. (Part of 1st I.F. transformer)	1.50
24	513022	Condenser—ceramic .01 Mmfd. 450 volt	.34
25	512214	Condenser—.05 Mfd. 400 volt	.30
27	512214	Condenser—.05 Mfd. 400 volt	.30
28-A	521319	Condenser—ceramic 20 Mmfd. (Part of 2nd I.F. transformer)	1.50
32-A	521305	Condenser—ceramic 150 Mmfd. 500 volt (Part of Audio Coupling Unit)	1.25
32-B	521305	Condenser—ceramic .002 Mfd. 500 volt (Part of Audio Coupling Unit)	1.25
32-D	521305	Condenser—ceramic .01 Mfd. 500 volt (Part of Audio Coupling Unit)	1.25
32-F	521305	Condenser—ceramic 150 Mmfd. 500 volt (Part of Audio Coupling Unit)	1.25
32-H	521305	Condenser—ceramic 5000 Mmfd. 500 volt (Part of Audio Coupling Unit)	1.25
33	512214	Condenser—.05 Mfd. 400 volt	.30
34-A,B, C	521193	Condenser—electrolytic (less mounting bracket) A—250 Mfd. 15 volt; B—40 Mfd. 150 volt; C—40 Mfd. 150 volt	2.50
37	513010	Condenser—ceramic 1500 Mmfd. 350 volt	.30
		RESISTORS	
14	510195	Resistor—carbon 4.7 Meg. ½ watt	.12
15	510129	Resistor—carbon 390 Ohms ±10% ½ watt	.12
17	510173	Resistor—carbon 100,000 Ohms ½ watt	.12
21	510161	Resistor—carbon 22,000 Ohms ½ watt	.12
23	510197	Resistor—carbon 10 Meg. ½ watt	.12
26	510194	Resistor—carbon 3.3 Meg. ½ watt	.12
29-A,B	521218	Volume control—1 Meg. (with On-Off switch)	1.25
31	510108	Resistor—carbon 27 Ohms ± 10% ½ watt	.12
32-C	521305	Resistor—carbon 10 Meg. ⅕ watt (Part of Audio Coupling Unit)	1.25
32-E	521305	Resistor—carbon 4.7 Meg. ⅕ watt (Part of Audio Coupling Unit)	1.25
32-G	521305	Resistor—carbon 1 Meg. ⅕ watt (Part of Audio Coupling Unit)	1.25
32-J	521305	Resistor—carbon 3.3 Meg. ⅕ watt (Part of Audio Coupling Unit)	1.25
35	510126	Resistor—carbon 270 Ohms ± 10% ½ watt	.12
36	510133	Resistor—carbon 680 Ohms ± 10% ½ watt	.12
38	510179	Resistor—carbon 220,000 Ohms ½ watt	.12
41	510133	Resistor—carbon 680 Ohms ± 10% ½ watt	.12
42	510146	Resistor—carbon 3300 Ohms ½ watt	.12
43-A,B	521210	Resistor—wire wound (include mounting bracket) A—2000 Ohms ± 5% 7 watt; B—150 Ohms ± 10% 3 watt (fuse type)	1.00
		COILS & TRANSFORMERS	
11	521375	Antenna—rod type (included mounting board)	2.00
20	521224	Coil—oscillator	
22	521318	Transformer—1st I.F. (includes condensers 22A and 22B)	1.50
28	521319	Transformer—2nd I.F. (includes condenser 28-A)	1.50
39	521266	Transformer output	1.75



		OTHER ELECTRICAL PARTS	
30-A to E	521293	Switch—AC-DC—Battery	
32-A to J	521305	Audio Coupling Unit (included condensers and resistors 32-A thru J)	1.25
40	521365	Speaker—P. M. dynamic (4")	4.00
44	508305	Selenium rectifier	1.65
		CABINET PARTS	
	521669	Cabinet, back section; Model 9170-B—Green	$ 4.00
	521671	Cabinet, back section; Model 9170-C—Gray	4.00
	521673	Cabinet, back section; Model 9170-D—Maroon	4.00
	521668	Cabinet, front section; Model 9170-B—Green (includes latch and baffle)	5.25
	521670	Cabinet, front section; Model 9170-C—Gray (includes latch and baffle)	5.25
	521672	Cabinet, front section; Model 9170-D—Maroon (includes latch and baffle)	5.25
	521268	Clip, hinge; for front and back section of cabinet	.03
	521256	Clip, retains handle	.03
	521263	Escutcheon plate	1.75
	521273	Handle, plastic	.30
	521351	Knob, "OFF" and volume	.25
	521350	Knob, Tuning and Dial Scale	.25
	521259	Latch	.05
	521257	Latch button	.10
		MISCELLANEOUS PARTS	
	505101	Clip for mounting I.F. transformers	.05
	505314	"C" washer for latch button	.02
	521228	Clip, coil mounting	.05
	521230	Clip, retains mounting stud	.05
	521426	Clip, retains "A" battery holder	.02
	521337	Connector, "B" battery	.45
	521238	Contact, "A" battery; leaf type	.03
	521239	Contact, "A" battery; spring type	
	521236	Holder, "A" battery; for leaf contact (less contact)	.15
	521237	Holder, "A" battery; for spring contact (less contact)	.15
	521261	Screw, #6x3/8 (plastic thread cutting); retains chassis	.02
	521315	Screw, #8-32x1", philips oval head; retains escutcheon plate	.05
	522014	Spring, coil; for latch button	.02
	507364	Socket—miniature (7 pin)	.24
	521297	Stud, mounts escutcheon plate (fiber)	.25
	89027	Washer; spring washer for latch button	.05

ALL PRICES ON THIS PARTS LIST ARE SUBJECT TO CHANGE WITHOUT NOTICE.

SPECIFICATIONS

Voltage Rating	117 Volts, 60 Cycle
Type of Circuit	Superhetrodyne
Tuning Range	540 KC to 1650 KC
Maximum Appliance Load	1100 Watts
Intermediate Frequency	455 KC

TUBE COMPLEMENT

1	12BE6	Oscillator and Converter
1	12BA6	IF Amplifier
1	12AT6	Detector-Audio Amplifier
1	50C5	Power Output
1	35W4	Rectifier

ALIGNMENT PROCEDURE

- Output meter across voice coil (3.2 ohm).
- Volume control at maximum for all adjustments.
- Align for maximum output. Reduce input as needed to k output near 1.28 volts (0.5 watt).

SIGNAL GENERATOR				TUNER SETTING	ADJUST TRIMMERS TO MAXIMUM OUTPUT (in order shown)
Frequency	Coupling Capacitor	Connections to Receiver	Ground Connection		
455 kc	0.1 mfd.	12BE6 grid	B —	Rotor full open (Plates out of mesh)	Input and output slugs of IF cans
1650 kc	0.1 mfd.	12BE6 grid	B —	Rotor full mesh (Plates in mesh)	Oscillator trimmer A2
1500 kc.		Radiating Loop		1500 kc	Antenna trimmer A1

PARTS LIST

CAPACITORS

Circuit Symbol	S-C Part No.	Description
C-1	81778	Variable Condenser (30-39)
C-2	81779	40-40-20 MF——150 V Electro. (31-38)
C-3	110724	.1 MF — 400 V (32-57)
C-4	110801	.05 MF — 400 V (32-5)
C-5	110801	.05 MF — 400 V (32-4)
C-6	110291	100 MMF — 500 V (35-4)
C-7	110542	.02 MF — 400 V (32-3)
C-8	110805	.005 MF — 200 V (32-20)
C-9	110801	.05 MF — 400 V (32-5)
C-10	110291	100 MMF — 500 V (35-4)

COILS

L-1	81781	Oscillator coil (60-3)
T-2	81782	Input IF transformer (61-11)
T-3	81782	Output IF transformer (61-11)
LP-1	81783	Back Panel with Loop (125-50)

RESISTORS

Circuit Symbol	S-C Part No.	Description
R-1	149134	1500 ohms — 1 W — 20% (20-152-41
R-2	149125	10 megohms—½ W—20% (20-106-11
R-3	149096	150 ohms—½ W—20% (20-151-31
R-4	149096	150 ohms—½ W—20% (20-151-31
R-5	149121	2.2 megohms—½ W—20% (20-225-31
R-6	149109	22K ohms—½ W—20% (20-223-11
R-7	149091	22 ohms—½ W—20% (20-220-31
R-8	81780	.5 megohms—Potentiometer (50-35
R-9	149095	100 ohms—½ W—20% (20-101-31

MISCELLANEOUS

X-1	81797	Couplate (CRL-400-001K) (36-3
	81784	4" Speaker (80-14
	81785	Knob — Volume Control (122-56
	81786	Knob — Tuning (122-58
	81776	Knob — Clock Control
	81777	Cabinet (120-70
	81775	Clock Dial Glas

SERVICING OF TELECHRON MOVEMENT

Telechron has established service stations which are prepared to service the movement unit when delivered i itself — that is when physically removed from the radio receiver case. Under no circumstances will the cloc be serviced when not removed from the cabinet.

To take the clock movement out of the cabinet follow the instructions given below. Remove the following:

1. Line cord from power line.
2. Tuning knob — volume control knob.
3. Back panel and chassis from cabinet.
4. Three nuts holding clock clamp shield around clock.
5. Unsolder the black, blue and green wires connected to the clock after pulling back the clock shield.
6. Before the clock can be removed from the cabinet, the slumber switch must be in the full 60 minute positi and the operation selector knob must be in the "on" position.
7. Remove the clock movement by slightly turning the rim so the movement parts can pass thru the cabinet openin

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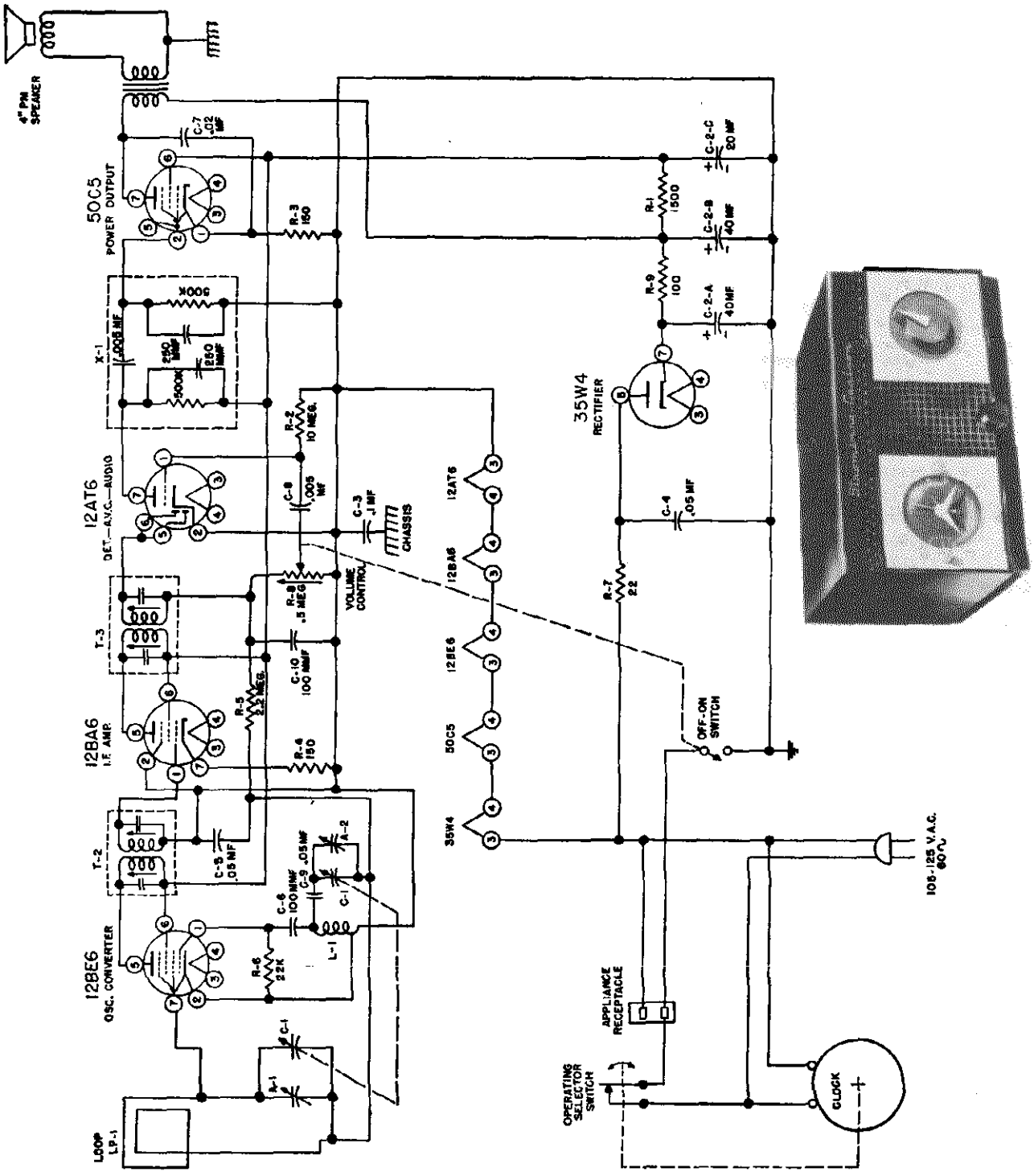
MODEL C-1


4" PM SPEAKER
50C5
POWER OUTPUT
12AT6
DET.—A.V.C.—AUDIO
12BA6
I.F. AMP.
12BE6
OSC. CONVERTER
35W4
RECTIFIER
VOLUME CONTROL
CHASSIS
OFF-ON SWITCH
APPLIANCE RECEPTACLE
OPERATING SELECTOR SWITCH
CLOCK
LOOP
105-125 V.A.C. 60~

MODELS 400RPM, 400RP
400RPO, Custom

ALIGNMENT CHART

An accurate, calibrated signal generator and d-c vacuum tube voltmeter are necessary in order to align this radio. A sweep frequency signal generator a an oscilloscope may be used if available, but are not required. Any attempt to align without the required equipment is certain to result in failure. The chart li the various alignment steps. Location of the alignment points is shown on the tube location and part identification chart.

Observe the following precautions:

(A) Make all adjustments in order given.
(B) Use a non-metallic screw driver and light pressure for slug adjustments.
(C) The standard 300-ohm dummy antenna comprises a pair of resistors, one connected in series with each terminal of signal generator, of such value that total impedance between terminals, including signal generator is 300 ohms.
(D) To use signal generator with sweep oscillator and oscilloscope, substitute steps 2A, 3A and 4A for steps 2, 3 and 4.

Band and Pointer	Signal Generator	Meter Connection	Adjustments and Notes
1. —	—	—	With tuning capacitor fully meshed: Adjust dial pointer marker at top left of dial; adjust f-m tuning slugs flush w bottom of glass coil-forms.
2. AM HF; low (540 kc) end of dial.	455 kc, no modulation, high side to pin 7 (grid) of V-10 (6BE6) thru .01 uf capacitor, low side to chassis.	D-c VTVM to terminal 4 of L-10 and chassis. (AGC voltage).	Use least input signal to provide —1 to —1.5 volts —3-volt scale. Adjust secondary (top) of T-3, T-5, T-7 maximum negative voltage with 1000-ohm resistor ac primary winding of transformer being adjusted. Ad primary (bottom) of T-3, T-5, T-7 for maximum negat voltage with 1000-ohm resistor across secondary winding transformer being adjusted.
3. FM AFC OFF; low end of dial.	10.7 mc, no modulation; high side to high side of L-1 thru .01 uf capacitor, low side to chassis.	Same as step 2.	Use least input signal to provide —1 to —1.5 volts —3-volt scale. Adjust secondary (top), primary (bottom) T-6 for maximum negative voltage. Leave signal gener output set to provide —2 volts, the correct signal l for step 4.
4. Same as step 3.	Same as step 3.	D-c VTVM to junction R-17 and R-18 and to chassis.	Use —3-volt scale. Adjust secondary (top) of T-6 for voltage between positive and negative voltage.
5. FM AFC OFF; 108 mc.	108 mc, 400 cps modulation to terminals FM and G thru 300-ohm dummy antenna (note C).	D-c VTVM to terminal 4 of L-10 and chassis. (AGC voltage).	Use least input signal to provide —1 to —1.5 volts —3-volt scale. Adjust C-29 (FM osc.) for maximum nega voltage.
6. FM AFC OFF; 88 mc.	88 mc; otherwise same as step 5.	Same as step 5.	Check dial calibration. If incorrect, change position of in relation to L-6 (osc. coil) to obtain correct dial cali tion of 88 mc and repeat steps 5 and 6 until dial cali tion is correct at 108 mc and at 88 mc.
7. FM AFC OFF; 108 mc.	108 mc; otherwise same as step 5.	Same as step 5.	Use least input signal to provide —1 to —1.5 volts —3-volt scale. Adjust C-7 (RF) C-1 (ant.) for maxi negative voltage. While adjusting C-7, rock signal gen tor slowly, returning to 108 mc. Recheck C-29.
8. FM AFC OFF; 100 mc.	100 mc; otherwise same as step 5.	Same as step 5.	Check dial calibration.
9. FM AFC OFF; 90 mc.	90 mc; otherwise same as step 5.	Same as step 5.	Check dial calibration. If steps 8 or 9 show incorrect calibration, repeat steps 1, 5, 6, 7, 8 and 9.
10. AM HF; 1650 kc.	1650 kc, 400 cps modulation to LOOP terminals through 50-ohm resistor.	Same as step 5.	Use least input signal to provide —1 to —1.5 volts —3-volt scale. Adjust C-42C (AM osc.) for maximum n tive voltage.
11. AM HF; 1400 kc.	1400 kc; otherwise same as step 10.	Same as step 5.	Use least input signal to provide —1 to —1.5 volt —3-volt scale. Adjust C-42A (ant.) and C-42B (RF) maximum negative voltage.
12. AM HF; 600 kc.	600 kc; otherwise same as step 10.	Same as step 5.	Use least input signal to provide —1 to —1.5 volt —3-volt scale. Adjust L-9 (low-frequency antenna) slug maximum negative voltage.
13. AM HF; 1000 kc.	Same as step 11.	Same as step 5.	Repeat step 11.
14. AM HF; 1000 kc.	1000 kc, 10 kc modulation; otherwise same as step 10.	A-c voltmeter across output connector TB-3.	Rock tuning slowly to center of dip in meter reading increasing signal input to provide readable indication.
15. Same as step 14.	Same as step 14.	Same as step 14.	Adjust C-50 to center of dip in meter reading. Inc signal input if necessary to obtain readable indicatio 3-volt or lower scale.

Alternate steps 2, 3 and 4 for use with sweep oscillator and oscilloscope

Band and Pointer	Signal Generator	Meter and Scope Connection	Adjustments and Notes
2A. AM HF; low (535 kc) end of dial.	455 kc, swept at 22.5 kc. High side to pin 7 (grid) of V-10 (6BE6) thru .01 uf capacitor. Low side to chassis.	D-c VTVM to terminal 4 of L-10 and chassis. (AGC voltage). Scope to pin 2 of T-5 (3rd IF, AM) and chassis.	Use least input signal to provide —1 to —1.5 volt —3-volt scale of VTVM. Adjust primary (bottom) secondary (top) of T-3, T-5 and T-7 for best double-curve.
3A. FM AFC OFF; low end of dial.	10.7 mc swept at 150 kc. High side to high side of L-1 thru .01 uf capacitor. Low side to chassis.	D-c VTVM same as step 2A. Scope to pin 2 of V-6 (6AL5) with C-22 disconnected.	Use least input signal to provide —1 to —1.5 volt —3-volt scale of VTVM. Adjust primary (bottom) secondary (top) of T-1, T-2, T-4 and primary (botton T-6 for best double-trace curve. Reconnect C-22 b step 4A.
4A. Same as step 3A.	Same as step 3A.	D-c VTVM same as step 2A. Scope to junction of R-17 and R-18.	Use least input signal to provide —1 to —1.5 volt —3-volt scale of VTVM. Adjust secondary (top) of T- crossover.

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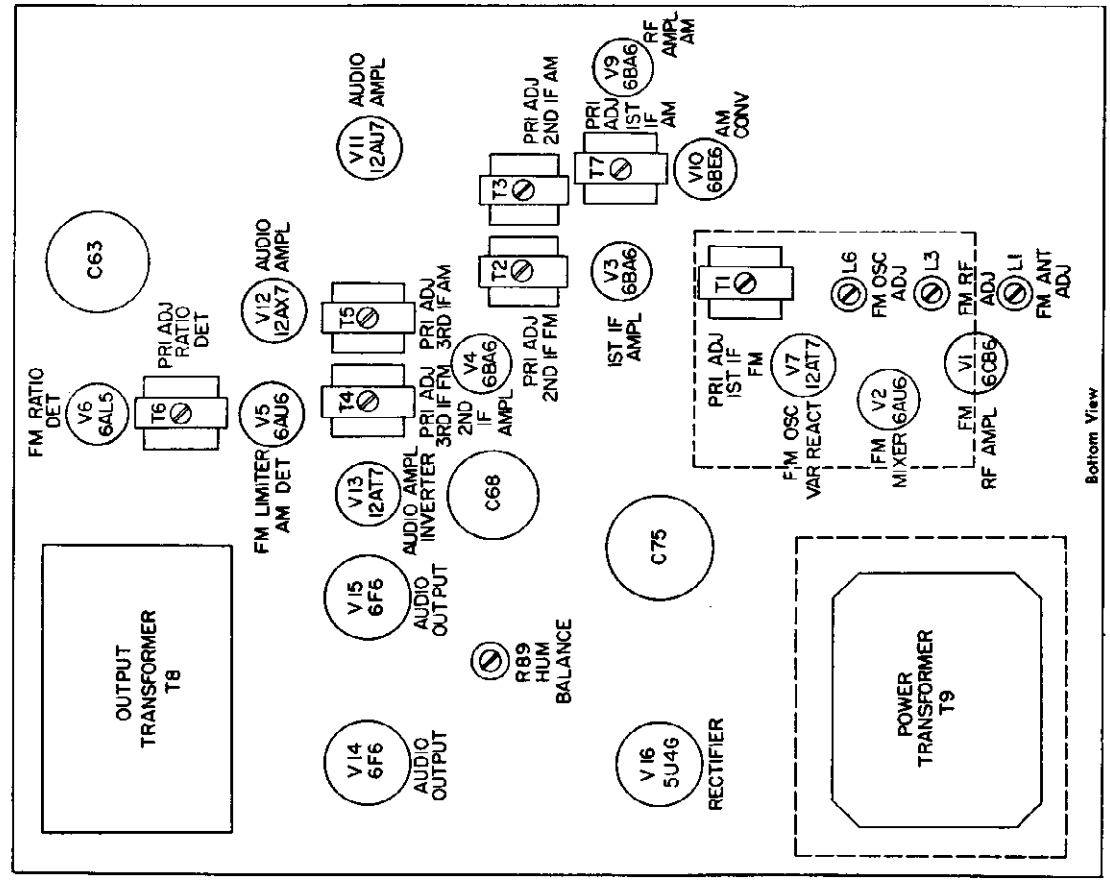
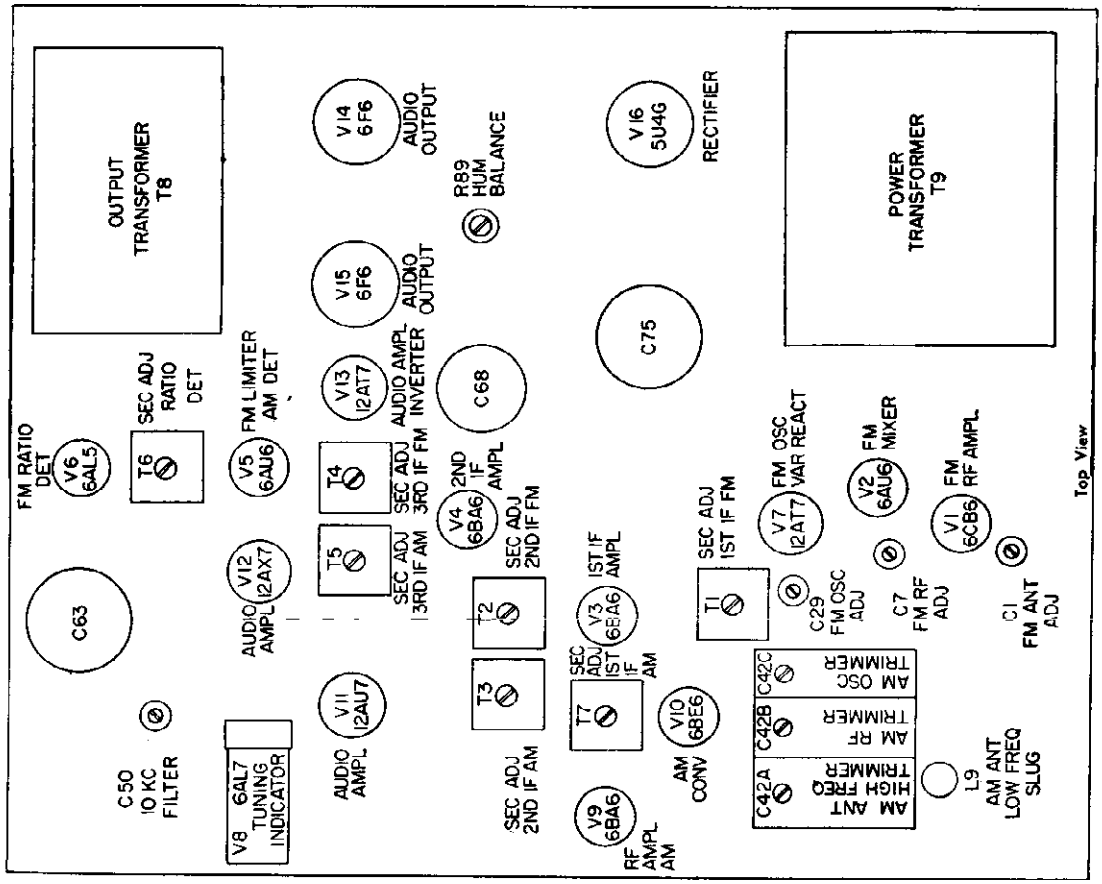
MODELS 400RPM, 400RPM2,
400RPO, Custom





VOLTAGE CHART

SELECTOR SWITCH POSITION	TUBE SYMBOL	TUBE TYPE	TUBE FUNCTION	TERMINAL 1	2	3	4	5	6	7	8	9
FM	V-1	6CB6	FM-RF Ampl.	—.1	0	0	AC 6.3	170	150	0	—	—
FM	V-2	6AU6	FM Mixer	0	0	0	AC 6.3	200	200	4.8	—	—
Any	V-3	6BA6	1st IF Ampl.	—.1	0	0	AC 6.3	190	140	1.0	—	—
Any	V-4	6BA6	2nd IF Ampl.	0	1.8	0	AC 6.3	190	140	2.5	—	—
FM	V-5	6AU6	FM Limiter AM Detector	—.5	0	0	AC 6.3	90	20	0	—	—
FM	V-6	6AL5	FM Ratio Det.	.9	.9	0	AC 6.3	0	0	0	—	—
FM	V-7	12AT7	FM Osc., Var. Reactance	130	0	2.5	0	0	175	—2	0	AC 6.3
FM	V-8	6AL7	Tuning Indic.	0	0	350	—.8	—.8	—.8	AC 6.3	.6	—
AM	V-9	6BA6	AM-RF Ampl.	0	0	AC 6.3	0	190	110	1	—	—
AM	V-10	6BE6	AM Converter	—10	0	0	AC 6.3	190	110	—.5	—	—
FR-AES	V-11	12AU7	AF Amplifier	22	—.4	0	30	30	20	—.4	0	30
Any	V-12	12AX7	AF Amplifier	200	0	21	30	30	250	0	2.4	30
Any	V-13	12AT7	AF Amplifier Phase Inv.	200	100	100	301	30	100	0	.2	30
Any	V-14	6F6	Power Output	0	30	400	340	0	0	30	30	—
Any	V-15	6F6	Power Output	0	30	400	30	0	0	30	30	—
Any	V-16	5U4G	Rectifier	NC	400	NC	AC 380	NC	AC 380	NC	400	—

NOTES: No signal input. Power supply 117 volts, 60 cps. Tuning capacitor fully meshed—540 kc end of dial. Voltages measured to chassis (ground). A-c voltages measured using 1000 ohm-per-volt voltmeter. D-c voltages measured using vacuum-tube voltmeter. NC indicates no connection. Variations of ±10% in voltage readings may be obtained due to variation in tubes, resistors, etc.

V-11, V-12, V-13 heater voltage 6.3 volts AC measured between terminals 4 or 5 and 9; V-14, V-15 heater voltages 6.3 volts AC measured between terminals 2 and 7; V-16 filament voltage 5.0 volts AC measured between terminals 2 and 8.

GENERAL ASSEMBLY

	R.P.O.	RPM	RPM2
BAFFLE — SPEAKER	102012	102012	102012
CABINET ASSEMBLY	108301	108321	108335
CABLE ASSEM. — SPEAKER	109054	109054	109054
CHASSIS ASSEMBLY	112621	112621	112621
DOORS (PAIR)	81888	81924	
ESCUTCHEON	125607	125607	125607
KNOB — LOUDNESS	134625	134625	134625
KNOB — TUNING	134625	134625	134625
KNOB — SELECTOR	134624	134624	134624
KNOB — BASS	134626	134626	134626
KNOB — TREBLE	134627	134627	134627
LOCK WASHER — SPKR. MTG.	526081	526081	526081
PILOT LAMP	29956	29956	29956
LAMP CAP — (RED)	801401	801401	801401
RECORD CHANGER	100941	100941	100941
SCREW CHASSIS MTG.	203549	203549	203549
SCREW — ESCUTCHEON	163653	163653	163653
SCREW — SPKR. MTG.	511991	511991	511991
SPKR. ASSEMBLY	100942	100942	100942
WASHER — SPEAKER MTG.	525571	525571	525571

MODELS 400RPM, 400RPM2, 400RPO, Custom

TUBE COMPLEMENT

Circuit Symbol	S-C Part No.	Description
V-1	162092	6CB6 FM-RF Amp.
V-2	162032	6AU6 FM Mixer
V-3	162012	6BA6 1st I.F. Amp.
V-4	162012	6BA6 2nd I.F. Amp.
V-5	162032	6AU6 FM Limiter and AM Det.
V-6	162022	6AL5 FM Ratio Det.
V-7	162067	12AT7 FM Osc. and Var. Reactance
V-8	162064	6AL7 Tuning Ind.
V-9	162012	6BA6 AM-RF Amp.
V-10	162013	6BE6 AM Converter
V-11	162042	12AU7 AM Amp.
V-12	162070	12AX7 AF Amp.
V-13	162067	12AT7 AF Amp. and Phase Det.
V-14	162112	6F6 Power Output
V-15	162112	6F6 Power Output
V-16	162107	5U46 Rectifier

CAPACITORS

Circuit Symbol	S-C Part No.	Description	Voltage
C-1	110045	1-12 uuf	
C-2	110410	27 uuf, NPO	400
C-3	110694	100 uuf, GP	500
C-5	110818	1000 uuf	500
C-6	110694	100 uuf, GP	500
C-7	110045	1-12 uuf	
C-8	110471	22 uuf, NPO	500
C-9	110694	100 uuf, GP	500
C-10	110818	1000 uuf	500
C-11	110586	5000 uuf	450
C-12	110540	.01 uf	400
C-13	110540	.01 uf	400
C-14	110586	5000 uuf	450
C-15	110540	.01 uf	400
C-16	110540	.01 uf	400
C-17	110586	5000 uuf	450
C-18	110540	.01 uf	400
C-19	110817	2200 uuf	400
C-20	110463	330 uuf, GP	350
C-21	110586	5000 uuf	450
C-22	111093	5 uf	50
C-23	110463	330 uuf, GP	350
C-24	110463	330 uuf, GP	350
C-25	110815	1000 uuf	500
C-26	110818	1000 uuf	500
C-27	110818	1000 uuf	500
C-28	110439	2.2 uuf, NPO	500
C-29	110045	1-12 uuf	
C-30	110584	5 uuf, NPO	500
C-31	110407	33 uuf, NPO	400
C-32	110816	33 uuf, N220	400
C-33	110458	47 uuf, GP	500
C-34	110818	1000 uuf	500
C-35	110453	220 uuf, GP	500
C-36	110439	2.2 uuf, GP	500
C-37	110818	1000 uuf	500
C-38	110694	100 uuf, GP	500
C-39	110815	1000 uuf	500
C-40	110815	1000 uuf	500
C-41	110548	.22 uf	400
C-42	110121	AM Tuning Variable	
C-43	110661	.1 uf	200
C-44	110586	5000 uuf	450
C-45	110540	.01 uf	400
C-46	110661	.1 uf	200
C-47	110413	5 uuf, N750	400
C-48	110694	100 uuf, GP	500
C-49	110540	.01 uf	400
C-50	110056	30-270 uuf	350
C-51	110458	47 uuf, GP	500
C-52	110661	.1 uf	200
C-53	110544	.047 uf	400
C-54 Radio*	110540	.01 uf	400
C-55	110543	.033 uf	400
C-56	110538	4700 uuf	400
C-57	110676	750 uuf	500
C-58	110544	.047 uf	400
C-59	110542	.022 uf	400
C-60	110676	750 uuf, GP	350
C-61	110410	27 uuf, NPO	400
C-62	110543	.033 uf	400
C-63	111609	(20 uf	25
		(20 uf	25
		(20 uf	450
		(15 uf	450
C-64	110543	.033 uf	400
C-65	110410	27 uuf, NPO	400
C-66	110538	4700 uuf	400
C-67	110455	470 uuf	350
C-68	35590	(30 uf	350
		(40 uf	450
		(50 uf	50
		(15 uf	300
C-69	110455	470 uuf	350
C-70	110538	4700 uuf	400
C-71	110661	.1 uf	200
C-72	110546	.1 uf	400
C-73	110546	.1 uf	400
C-74	110555	.01 uf	600
C-75	46320	(30 uf	500
		(30 uf	500
C-54 SR-405*	110661	.1 mf	200

RESISTORS

Circuit Symbol	S-C Part No.	Resistance	Watt	Tol.
R-1	149119	1 Megohm	½ W	20%
R-3	149400	6800 ohms	1 W	10%
R-4	149113	100K ohms	½ W	20%
R-5	28162	2200 ohms	½ W	10%
R-6	149101	1K ohms	½ W	20%
R-7	28144	68 ohms	½ W	10%
R-8	28170	10K ohms	½ W	10%
R-9	149101	1K ohms	½ W	20%
R-10	28144	68 ohms	½ W	10%
R-11	28148	150 ohms	½ W	10%
R-12	149108	15K ohms	½ W	20%
R-13	149101	1K ohms	½ W	20%
R-14	28177	47K ohms	½ W	10%
R-15	28184	270K ohms	½ W	10%
R-16	149385	100K ohms	½ W	10%
R-17	149095	100 ohms	½ W	20%
R-18	149234	22K ohms	½ W	5%
R-19	28168	6800 ohms	½ W	10%
R-20	28168	6800 ohms	½ W	10%
R-21	28187	470K ohms	½ W	10%
R-22	149101	1K ohm	½ W	20%
R-23	149402	10K ohms	1 W	10%
R-24	149107	10K ohms	½ W	20%
R-25	149101	1K ohm	½ W	20%
R-26	28152	330 ohms	½ W	10%
R-27	28150	220 ohms	½ W	10%
R-28	149113	100K ohms	½ W	20%
R-29	149058	27K ohms	2 W	10%
R-30	149101	1K ohm	½ W	20%
R-31	28164	3300 ohms	½ W	10%
R-32	149119	1 Megohm	½ W	20%
R-33	28144	68 ohms	½ W	10%
R-34	149051	4700 ohms	2 W	10%
R-35	28162	2200 ohms	½ W	10%

MODELS 400RPM, 400RPM 400RPO, Custom

Circuit Symbol	S-C Part No.	Resistance	Watt	Tol.
R-36	149095	100 ohms	½ W	20%
R-37	149109	22K ohms	½ W	20%
R-38	28166	4700 ohms	½ W	10%
R-39	149121	2.2 Megohms	½ W	20%
R-40	28183	220K ohms	½ W	10%
R-41	28183	220K ohms	½ W	10%
R-42	28179	68K ohms	½ W	10%
R-43	28190	820K ohms	½ W	10%
R-44	149122	3.3 Megohms	½ W	20%
R-45	28177	47K ohms	½ W	10%
R-46	28187	470K ohms	½ W	10%
R-47	28177	47K ohms	½ W	10%
R-48	149122	3.3 Megohms	½ W	20%
R-49	28179	68K ohms	½ W	10%
R-50	28183	220K ohms	½ W	10%
R-51*	149385	100K ohms	½ W	10%
R-52	28174	27K ohms	½ W	10%
R-53	149385	100K ohms	½ W	10%
R-54	149122	3.3 Megohms	½ W	20%
R-55	149122	3.3 Megohms	½ W	20%
R-59	28177	47K ohms	½ W	10%
R-60	28187	470K ohms	½ W	10%
R-61	145627	Loudness Control		
R-62	149385	100K ohms	½ W	10%
R-63	149107	10K ohms	½ W	20%
R-64	28174	27K ohms	½ W	10%
R-65	28163	2700 ohms	½ W	10%
R-66	28175	33K ohms	½ W	10%
R-67	28187	470K ohms	½ W	10%
R-68	28187	470K ohms	½ W	10%
R-69	145628	5 Megohms	Dual Pot.	
R-71	28177	47K ohms	½ W	10%
R-72	28177	47K ohms	½ W	10%
R-73	28164	3300 ohms	½ W	10%
R-74	149386	150K ohms	½ W	10%
R-75	28184	270K ohms	½ W	10%
R-76	28171	12K ohms	½ W	10%
R-77	28163	2700 ohms	½ W	10%
R-78	28177	47K ohms	½ W	10%
R-79	149108	15K ohms	½ W	20%
R-80	28166	4700 ohms	½ W	10%
R-81	28177	47K ohms	½ W	10%
R-82	28183	220K ohms	½ W	10%
R-83	28183	220K ohms	½ W	10%
R-84	46369	350 ohms	5 W	
R-85	28156	680 ohms	½ W	10%
R-86	28177	47K ohms	½ W	10%
R-88	149402	10K ohms	1 W	10%
R-89	46486	100 ohms	2 W	
R-90	149612	(750 ohms	6 W	
		(2500 ohms	11.9 W	
R-91	149424	2.7 ohms	1 W	10%
R-92	149424	2.7 ohms	1 W	10%
R-93	149086	47K ohms	2 W	20%
R-94*	149113	100 ohms	½ W	20%

*R-51 and R-94 used on Custom 400—omitted on SR 405

COILS

Circuit Symbol	S-C Part No.	Description
L-1	114097	Antenna coil (FM)
L-2	114693	RF Choke
L-3	114098	RF Coil (FM)
L-4	114707	RF Choke
L-5	114618	RF Choke
L-6	114098	Osc. Coil (FM)
L-7	114620	RF Coil
L-8	114707	RF Choke
L-9	114122	Ant. Coil (FM)
L-10	114095	RF Coil (AM)
L-11	114123	Osc. Coil (AM)
L-12	161044	(10kc filter) Reactor

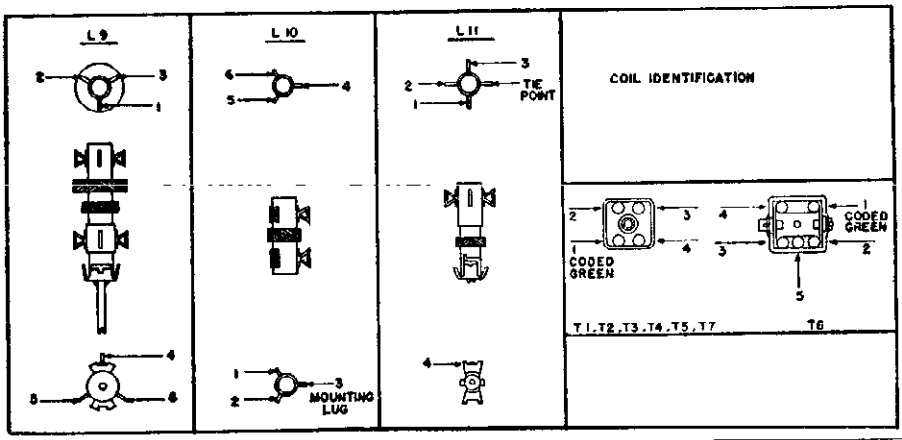
TRANSFORMERS

Circuit Symbol	S-C Part No.	Description
T-1	114363	First IF-FM
T-2	114363	Second IF-FM
T-3	114414	Second IF-AM
T-4	114363	Third IF-FM
T-5	114414	Third IF-AM
T-6	114404	Ratio Detector
T-7	114414	First IF-AM
T-8	161337	Output transformer
T-9	161776	Power transformer

MISCELLANEOUS

Circuit Symbol	S-C Part No.	Description
F-1	25156	Fuse, 3 amp., 3AG
FL-1	110478	Filter assembly
I-1	30933	Dial Lamp
I-2	30933	Dial Lamp
J-1	31539	Twin input jack
J-2	31539	Twin input jack
J-3	31539	Twin input jack
J-4	152038	A-c socket
J-5	152033	Relay Power Jack
J-6	34421	Cabinet Lamp Jack
P-1	30224	Plug used for J1, J2, J3 and J6
S-1	158652	Selector switch

A.C. Cord and Plug	46302
Dial Bracket—Right	105715
Dial Bracket—Left	105716
Dial Glass	122600
Grommet—A.C. Cord	131024
Grommet—Dial Glass	131015
Pointer—Dial	144602
Tuning Shaft Assembly—Flywheel	150604



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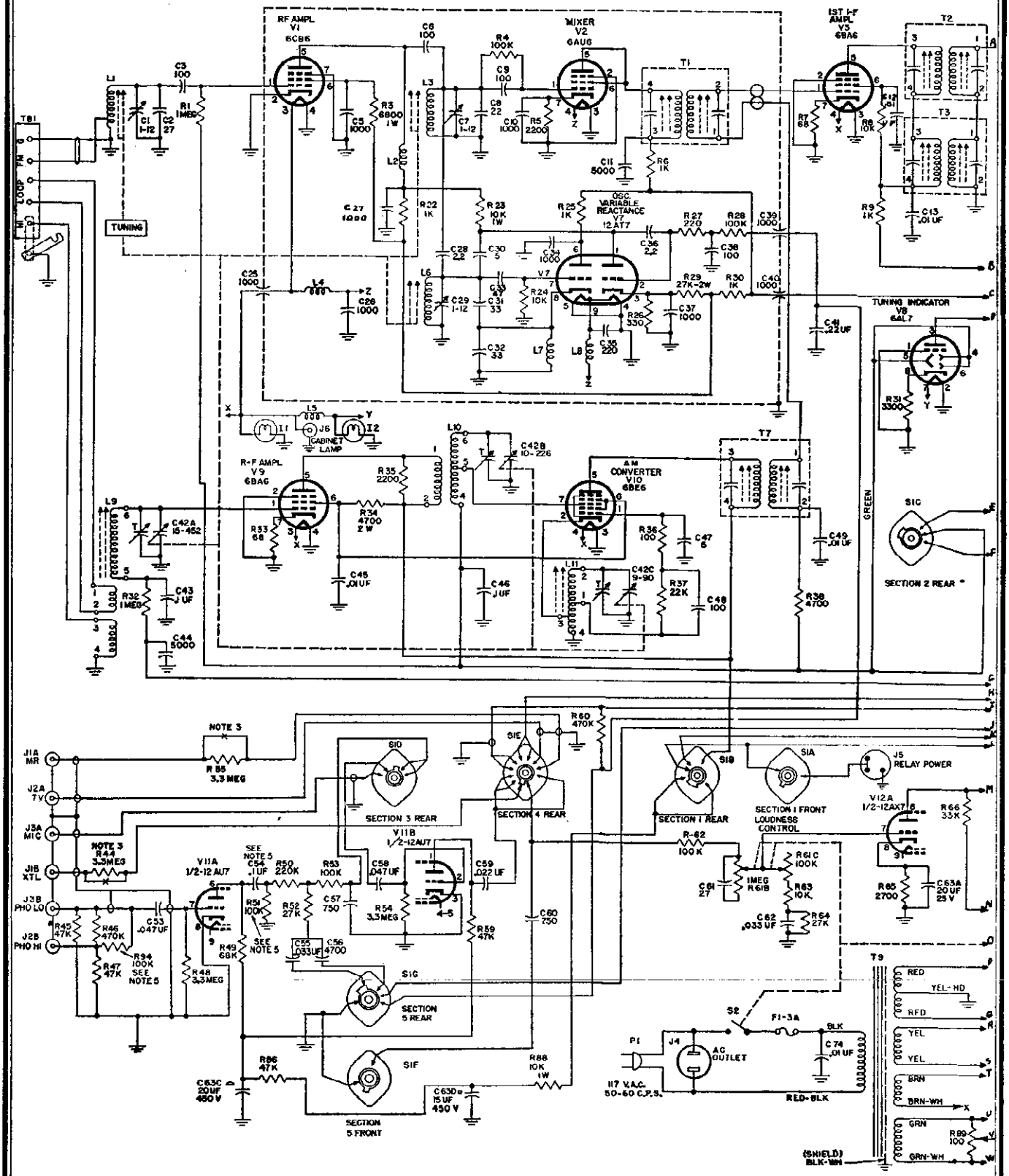
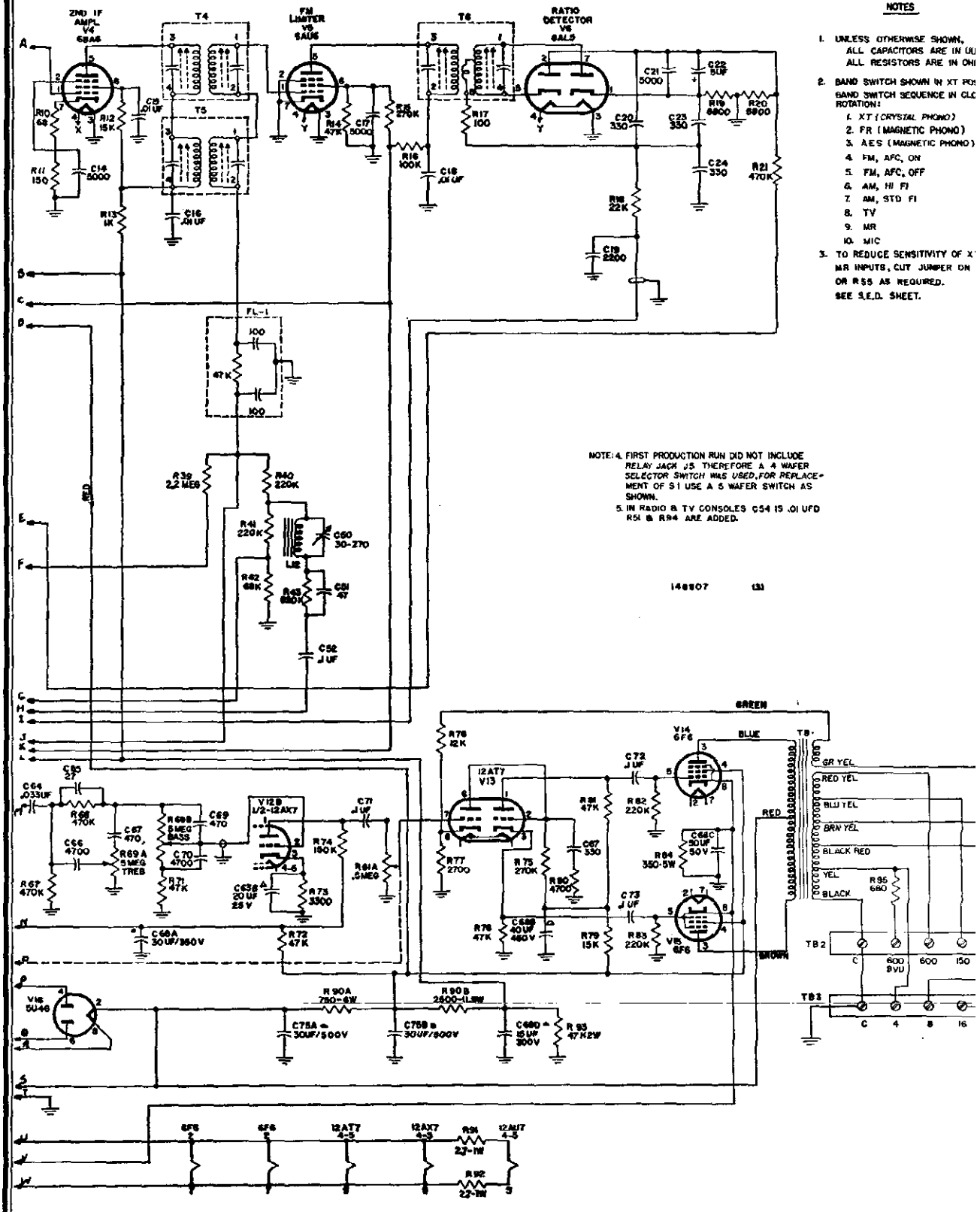
MODELS 400RPM, 400RPM2,
400RPO, Custom



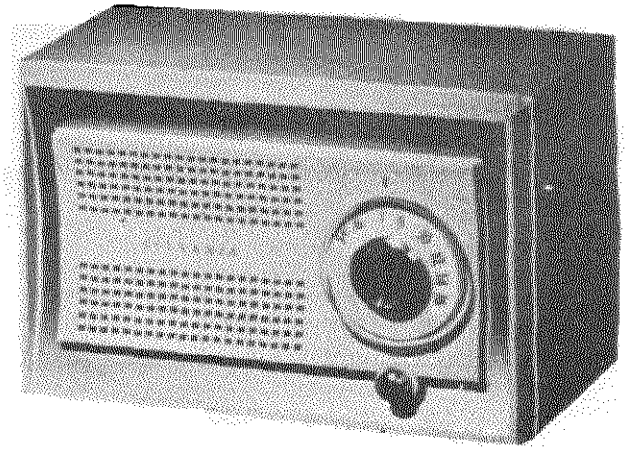
MODELS 400RPM, 400RI
400RPO, Custom



NOTES

1. UNLESS OTHERWISE SHOWN, ALL CAPACITORS ARE IN UF ALL RESISTORS ARE IN OHI
2. BAND SWITCH SHOWN IN XT PO
   BAND SWITCH SEQUENCE IN CLO ROTATION:
   1. XT (CRYSTAL PHONO)
   2. FR (MAGNETIC PHONO)
   3. AES (MAGNETIC PHONO)
   4. FM, AFC, ON
   5. FM, AFC, OFF
   6. AM, HI FI
   7. AM, STD FI
   8. TV
   9. MR
   10. MIC
3. TO REDUCE SENSITIVITY OF X MR INPUTS, CUT JUMPER ON OR R55 AS REQUIRED.
   SEE S.E.D. SHEET.

MODELS 511B, 511
511M, 512BR, 512C
512GR, 512RE, 512
Ch. 1-601-1



SPECIFICATIONS

POWER SUPPLY

105-125 Volts AC or DC, 35 Watts

FREQUENCY RANGE .....540-1650 Kc.

INTERMEDIATE FREQUENCY .....455 Kc.

LOUDSPEAKER....5" P.M., 1.47 Oz. Magnet

SYLVANIA TUBE COMPLEMENT

Function	Ty
Oscillator-Mixer	12E
I.F. Amplifier	12E
Detector - A.V.C. - 1st A.F.	12A
Audio Output	5C
Rectifier	35

ALIGNMENT PROCEDURE

PRELIMINARY INSTRUCTIONS

Allow chassis and signal generator several minutes warm-up.

Connect an A.C. Voltmeter across voice coil terminals and set volume control to full volume position.

Keep generator output at lowest useable level to prevent A.V.C. action from interfering with accurate alignment.

I.F. ALIGNMENT

1. Set the variable tuning capacitor to a point near 1,000 Kc. where no signals are heard.
2. Tune amplitude modulated signal genera to 455 Kc. Connect generator output le to "Neg. B" and through a 0.1 Mfd. pacitor to pin 7 (control grid) of the 12B Oscillator-Mixer tube.
3. Align I.F. transformers T1 and T2 adjusting first the cores accessible fr under the chassis, then the top cor Repeat this operation until a maxim meter reading is obtained.

R.F. ALIGNMENT

1. Turn variable tuning capacitor count clockwise to minimum capacity setting

MODELS 511B, 511H, 511M,
512BR, 512CH, 512GR, 512RE,
512YE, Ch. 1-601-1

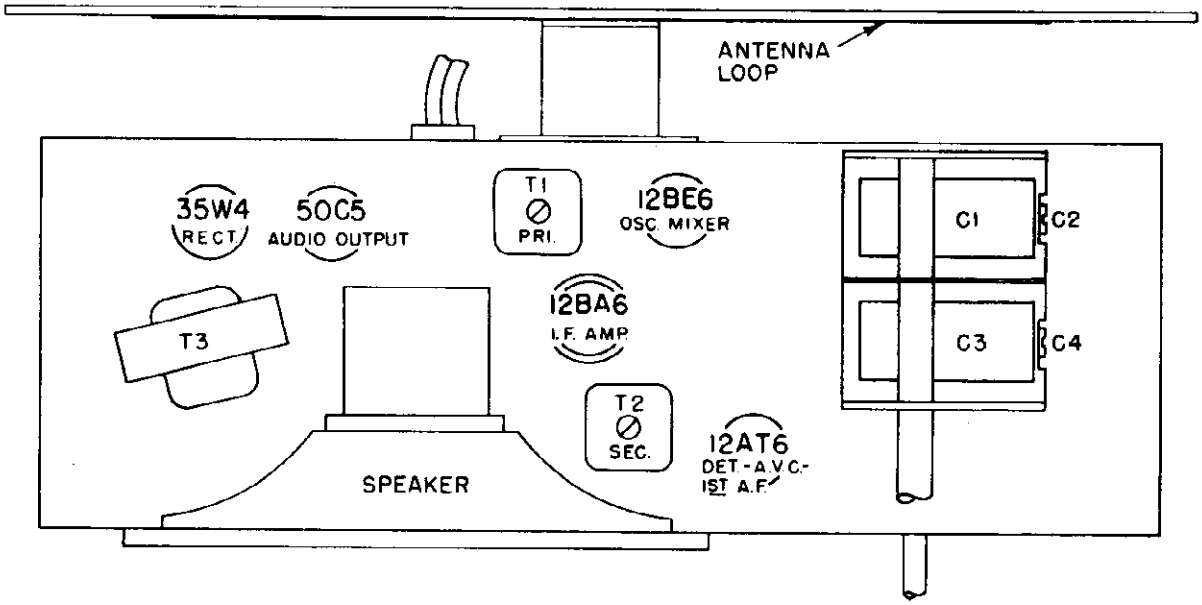
2. Tune generator, connected as above, to 1650 Kc.

3. Adjust oscillator trimmer C4 for maximum output.

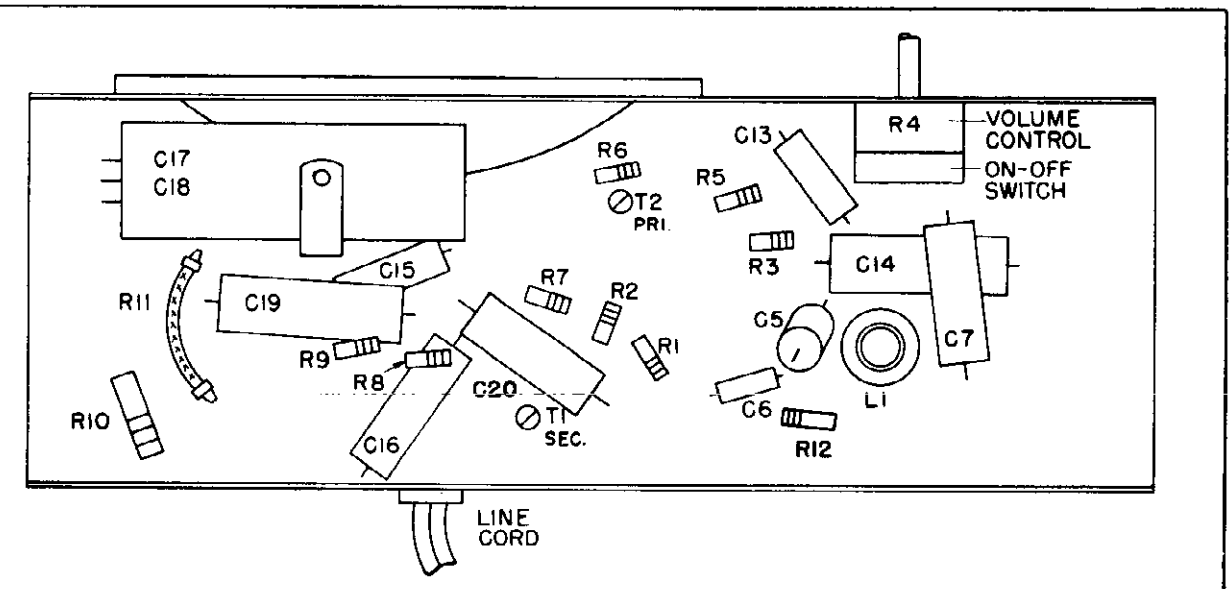
4. Connect generator to a Hazeltine loop so as to radiate a 1450 Kc. signal into the receiver.

5. Tune receiver to 1450 Kc.

6. Tune antenna trimmer C2 to obtain maximum output.



TOP LAYOUT FOR 1-601-1 CHASSIS



BOTTOM LAYOUT FOR 1-601-1 CHASSIS

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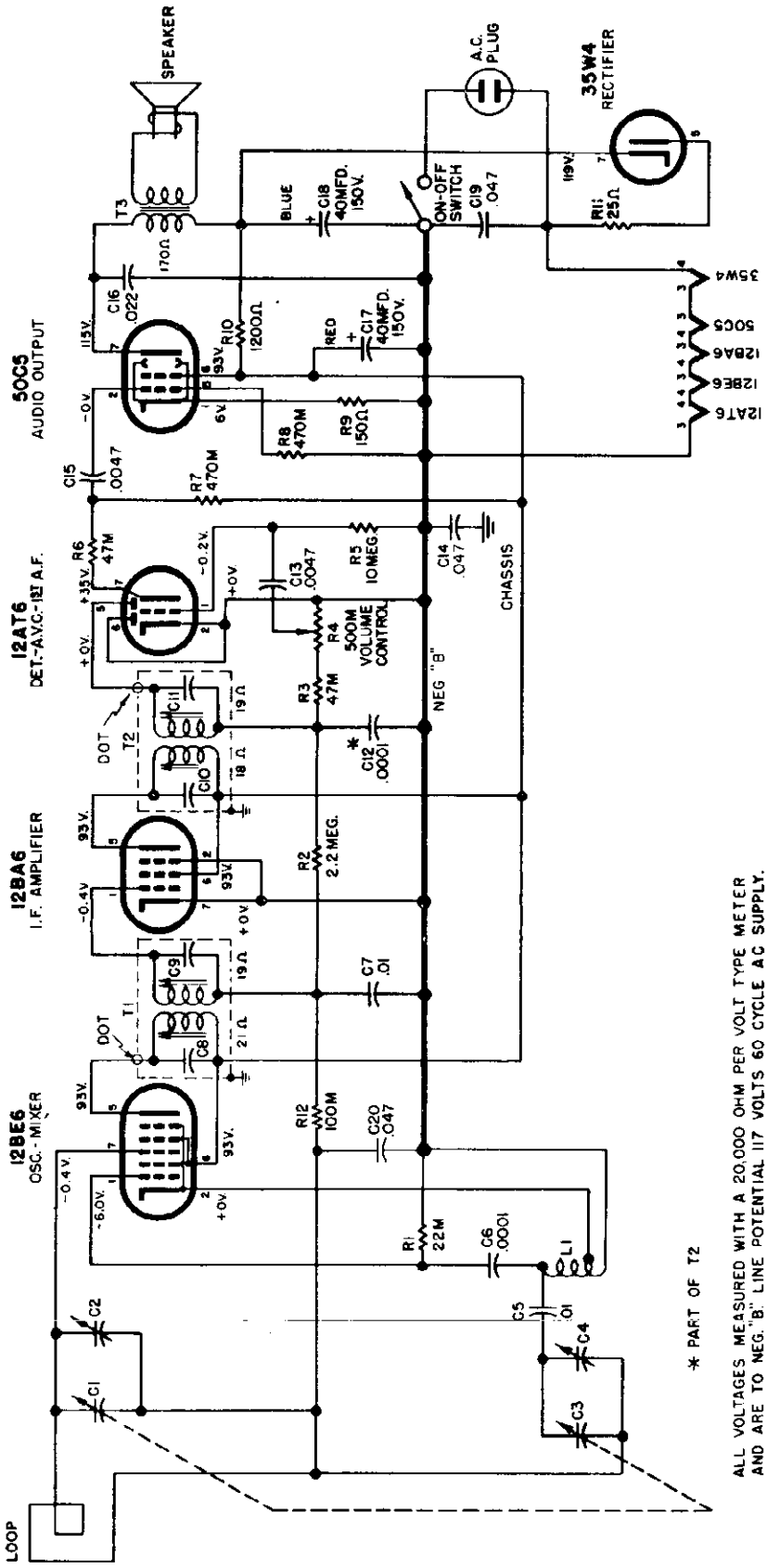
MODELS 511B, 511H, 511M,
512BR, 512CH, 512GR, 512RF
512YE, Ch. 1-601-1



SCHEMATIC DIAGRAM FOR 1-601-1 CHASSIS

ALL VOLTAGES MEASURED WITH A 20,000 OHM PER VOLT TYPE METER AND ARE TO NEG. "B" LINE POTENTIAL 117 VOLTS 60 CYCLE AC SUPPLY. MEASUREMENTS TAKEN WITH NO SIGNAL INPUT.
INTERMEDIATE FREQUENCY 455 KC

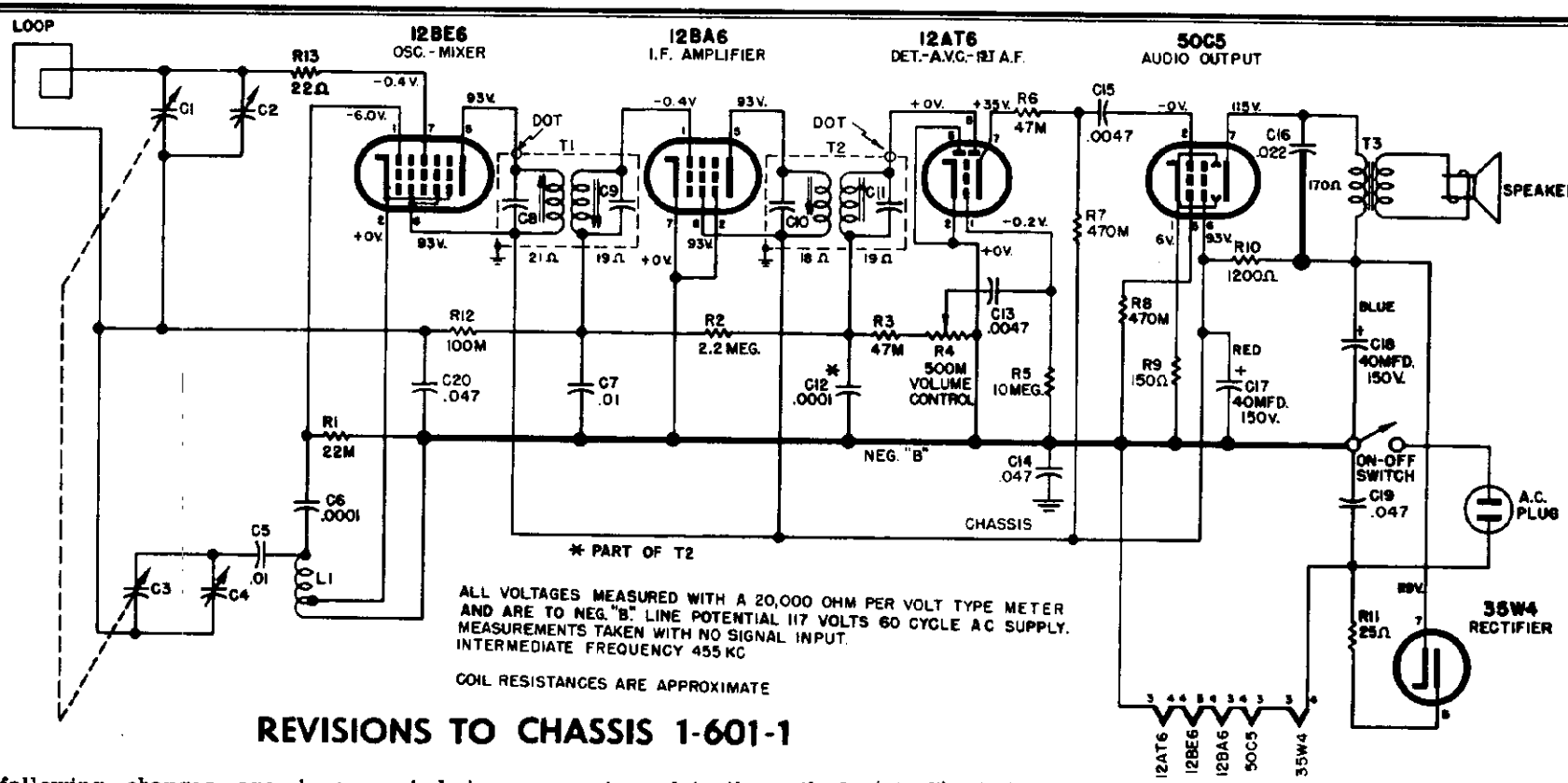
COIL RESISTANCES ARE APPROXIMATE

* PART OF T2

MODELS 511B, 511H, 511M,
512BR, 512CH, 512GR, 512RE,
512YE, Ch. 1-601-1

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
	582-0011	Antenna - Loop
	776-0004	Baffle - Speaker
	482-0002	Base - Miniature Tube Shield
	813-0007	Cabinet - Plastic - Black (511B)
	813-0017	Cabinet - Plastic - Brown (512BR)
	813-0019	Cabinet - Plastic - Chartreuse (512CH)
	813-0020	Cabinet - Plastic - Green (512GR)
	813-0022	Cabinet - Plastic - Ivory (511H)
	813-0009	Cabinet - Plastic - Mahogany (511M)
	813-0016	Cabinet - Plastic - Red (512RE)
	813-0018	Cabinet - Plastic - Yellow (512YE)
C6	166-0100P	Capacitor - Ceramic - .0001 Mfd. - 500 V.
C17	161-2002	Capacitor - Electrolytic - 40 Mfd. - 150 V.
C18		40 Mfd. - 150 V.
C13, C15	162-06247	Capacitor - Paper - .0047 Mfd. - 600 V.
C5, C7	162-0411M	Capacitor - Paper - .01 Mfd. - 400 V.
C16	162-04122	Capacitor - Paper - .022 Mfd. - 400 V.
C14, C19, C20	162-04147	Capacitor - Paper - .047 Mfd. - 400 V.
C1, C3	170-0006	Capacitor - Variable - 2 Gang
C2, C4		Trimmers (Part of 170-0006)
	487-0004	Clip - I. F. Transformer Mounting
L1	113-0015	Coil - Oscillator
R4	152-0012	Control - Volume with On-Off Switch
	195-0002	Cord - Line
	722-0019	Dial - Station Numerals (511B, 511M, 512BR, 512GR, 512RE)
	722-0021	Dial - Station Numerals (511H, 512CH, 512YE)
	740-0024	Knob - On-Off & Volume
R9	181-0151	Resistor - 150 Ohm - 1/2 W.
R1	181-0223	Resistor - 22,000 Ohm - 1/2 W.
R3, R6	181-0473	Resistor - 47,000 Ohm - 1/2 W.
R12	181-0104	Resistor - 100,000 Ohm - 1/2 W.
R7, R8	181-0474	Resistor - 470,000 Ohm - 1/2 W.
R2	181-0225	Resistor - 2.2 Megohm - 1/2 W.
R5	181-0106	Resistor - 10 Megohm - 1/2 W.
R11	189-0013	Resistor - 25 Ohm - 1 W. - W. W.
R10	182-0122	Resistor - 1,200 Ohm - 1 W.
	497-0005	Retainer & Bushing - Line Cord
	482-0003	Shield - Miniature Tube
	412-0015	Socket - 7 Prong - Miniature Tube
	539-0501	Speaker - 5" P.M.
T1	121-0013	Transformer - I. F. #1 (57-69301-1) - Matched Pair
T2	122-0013	Transformer - I. F. #2 (57-69302-1)
		or
T1	121-0016	Transformer - I. F. #1 (57-69303-1) - Matched Pair
T2	122-0016	Transformer - I. F. #2 (57-69304-1)
T3	143-0011	Transformer - Output
		Tube - 12AT6
		Tube - 12BA6
		Tube - 12BE6
		Tube - 35W4
		Tube - 50C5



REVISIONS TO CHASSIS 1-601-1

The following changes are incorporated in chassis 1-601-1:

1. R13, 22 ohm resistor is added in series with the control grid (pin 7) of the 12BE6 Oscillator Mixer tube. This addition which reduces noise, applies to receivers with serial numbers 38, 400 and up.

2. C16, the . 022 Mfd. plate by-pass capacitor for the 50C5 Audio Output tube is now returned to the cathode (pin 7) of the 35W4 Rectifier tube instead of to negative "B" as before. This revision reduces hum in the receiver. Models incorporating this change bear serial numbers 75, 800 and up.

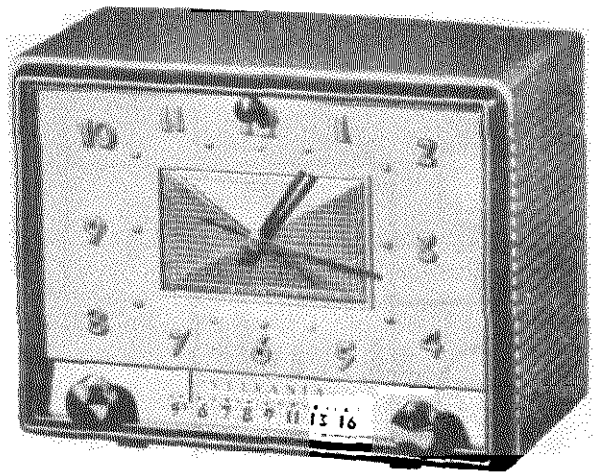
SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
	ADD	
R13	181-0229	Resistor, 22 Ohm, 1/2 W

MODELS 541B, H, M,
542BR, CH, GR, RE,
YE, Ch. 1-602-1

GENERAL DESCRIPTION

The clock on each radio may be used to:

(A) Provide accurate sweep second time.
(B) Turn radio off automatically after retiring.
(C) Turn radio program on for awakening.
(D) Awaken to music with appliance operating.
(E) Turn appliance on and off with radio on or off.



SPECIFICATIONS

POWER SUPPLY

105-125 Volts, 60 Cycle AC, 35 Watts

APPLIANCE OUTLET

Maximum Load ..... 1100 Watts

FREQUENCY RANGE ..... 540-1650 Kc.

INTERMEDIATE FREQUENCY ..... 455 Kc.

LOUDSPEAKER ... 5" P.M., 1.47 Oz. Magnet

SYLVANIA TUBE COMPLEMENT

Function	Type
Oscillator-Mixer	12BE6
I.F. Amplifier	12BA6
Detector - A.V.C. - 1st A.F.	12AT6
Output	50C5
Rectifier	35W4

CABINET DIMENSIONS (inches)

Width 10.2, Height 7.8, Depth 6.3

ALIGNMENT PROCEDURE

PRELIMINARY INSTRUCTIONS

Take chassis from cabinet as in step C page 8.

Insert temporary jumper between closely spaced pins of clock socket.

Allow chassis and signal generator several minutes warm-up.

Connect an AC Voltmeter across voice coil terminals and set volume control to full volume position.

Keep generator output at lowest useable level to prevent AVC action from interfering with accurate alignment.

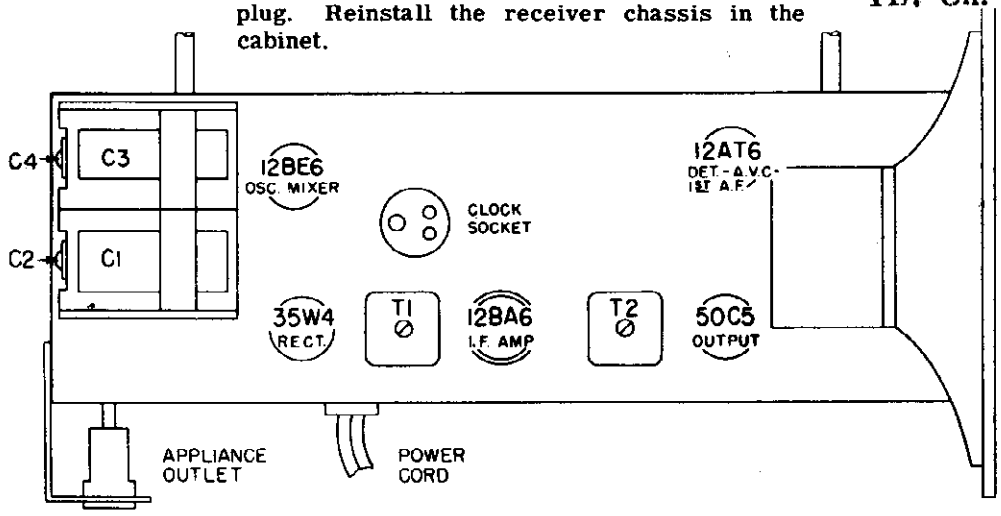
I.F. ALIGNMENT

1. Set the variable tuning capacitor to a point near 1,000 Kc. where no signals are heard.
2. Tune amplitude modulated signal generator to 455 Kc. Connect generator output to Negative "B" and through a 0.1 Mfd. capacitor to control grid (pin 7) of the 12BE6 Oscillator-Mixer tube.
3. Align I.F. transformers T1 and T2 by adjusting first the cores accessible from under the chassis, then the top cores. Repeat this operation until a maximum meter reading is obtained.

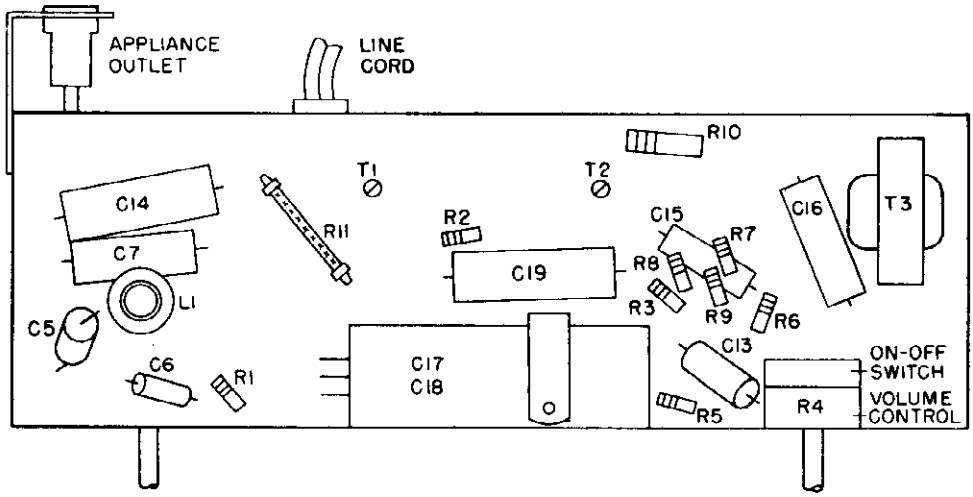
R.F. ALIGNMENT

1. Turn tuning shaft clockwise to minimum capacity setting of the variable capacitor.
2. Tune generator, connected as described above, to 1650 Kc.
3. Adjust oscillator trimmer C4 for maximum output.
4. Connect generator to a Hazeltine loop to radiate a 1450 Kc. signal into the receiver.
5. Tune the receiver to 1450 Kc.
6. Adjust antenna trimmer C2 to obtain maximum output.

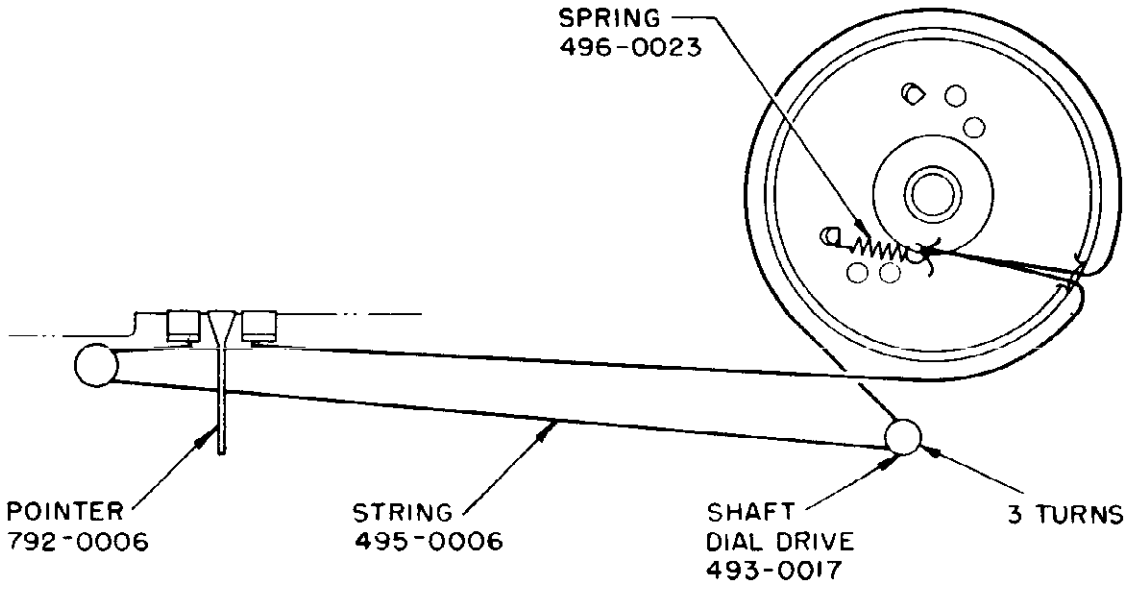
Remove the jumper from the closely spaced pins on the clock socket and replace the clock plug. Reinstall the receiver chassis in the cabinet.



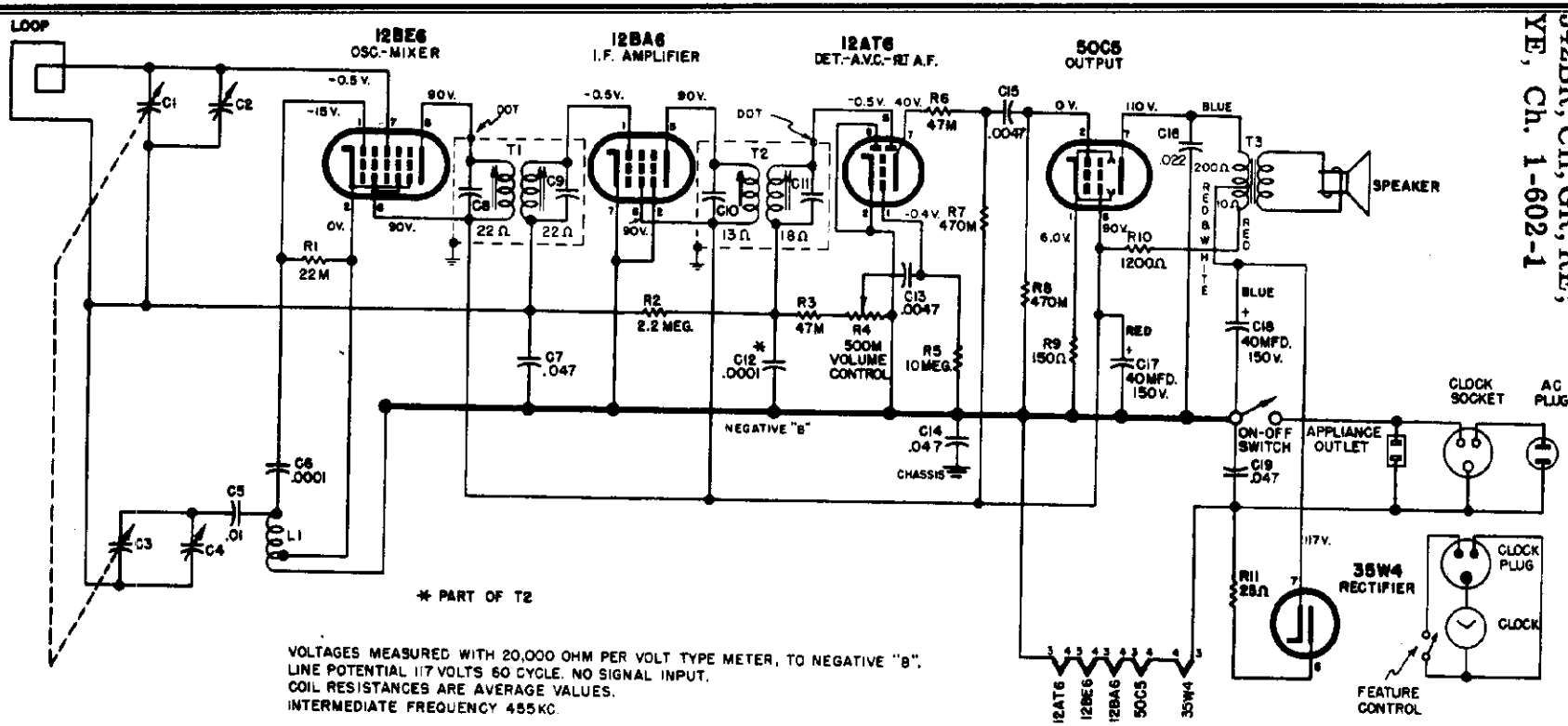
TOP LAYOUT FOR 1-602-1 CHASSIS



BOTTOM LAYOUT FOR 1-602-1 CHASSIS



DIAL CORD HOOKUP



TO REMOVE CLOCK FROM THE CABINET

A. Remove line cord from power socket.

B. Set the clock hands to 2 hours, 10 minutes, 10 seconds - (i.e. all hands toward the upper right hand corner of the rectangular gold plate).

C. Remove chassis from cabinet as follows:

1. Remove Volume Control and Tuning Control knobs.
2. Remove the upper two hex head screws on the back cover.
3. Remove the three chassis mounting screws from underside of the cabinet.
4. Pull chassis part way out of the cabinet and unplug the clock.
5. Remove chassis.

D. Unscrew Feature Control knob.

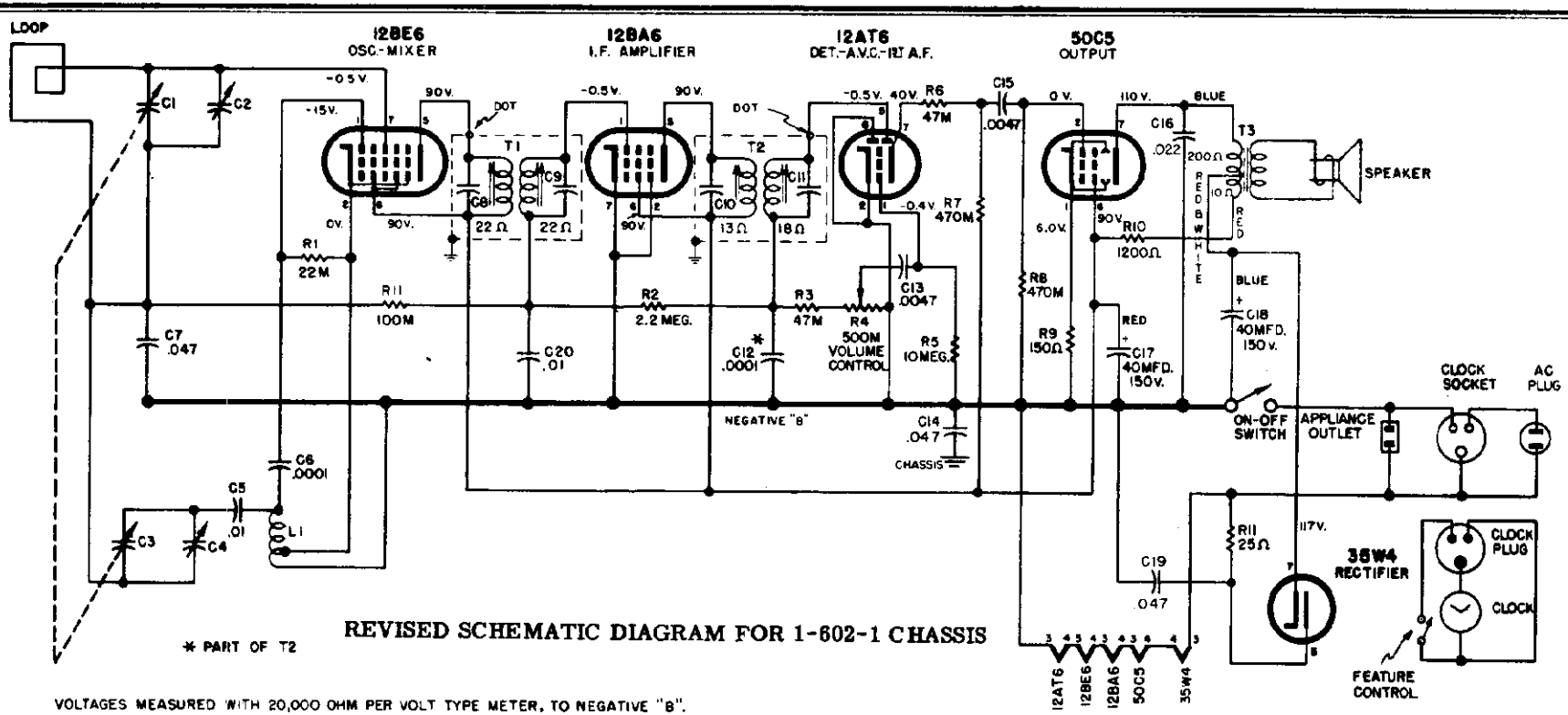
E. VERY CAREFULLY remove the four clock holding speed nuts from the plastic bosses.

F. Remove clock.

To replace clock make sure the hands are set as in Step B and reverse the above procedure.

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
	582-0013	Antenna - Loop
	482-0002	Base - Miniature Tube Shield
	813-0008	Cabinet - Plastic - Black (541B)
	813-0012	Cabinet - Plastic - Brown (542BR)
	813-0014	Cabinet - Plastic - Chartreuse (542CH)
	813-0013	Cabinet - Plastic - Green (542GR)
	813-0021	Cabinet - Plastic - Ivory (541H)
	813-0010	Cabinet - Plastic - Mahogany (541M)
	813-0011	Cabinet - Plastic - Red (542RE)
	813-0015	Cabinet - Plastic - Yellow (542YE)
C6	166-0100P	Capacitor - Ceramic - .0001 Mfd. - 500 V.
C17	161-2002	Capacitor - Electrolytic - 40 Mfd. - 150 V.
C18		40 Mfd. - 150 V.
C13, C15	162-06247	Capacitor - Paper - .0047 Mfd. - 600 V.
C5	162-0411M	Capacitor - Paper - .01 Mfd. - 400 V.
C16	162-04122	Capacitor - Paper - .022 Mfd. - 400 V.
C7, C14, C19	162-04147	Capacitor - Paper - .047 Mfd. - 400 V.
C1, C3	170-0007	Capacitor - Variable - 2 Gang
C2, C4		Trimmers (Part of 170-0007)
	487-0004	Clip - I.F. Transformer Mounting
L1	113-0015	Coil - Oscillator
R4	152-0013	Control - Volume & On-Off
	195-0002	Cord - Line
	715-0008	Cover - Front
	723-0003	Dial - Station Numerals
	749-0013	Knob - Feature Control
	740-0021	Knob - Tuning - Volume & On-Off
	552-5226	Nut - Speed Tuning Shaft
	552-0031	Nut - Speed - Clock Mounting
	792-0006	Pointer - Dial
	494-0007	Pully - Dial Drive
R9	181-0151	Resistor - 150 Ohm - 1/2 W.
R1	181-0223	Resistor - 22,000 Ohm - 1/2 W.
R3, R6	181-0473	Resistor - 47,000 Ohm - 1/2 W.
R7, R8	181-0474	Resistor - 470,000 Ohm - 1/2 W.
R2	181-0225	Resistor - 2.2 Megohm - 1/2 W.
R5	181-0106	Resistor - 10 Megohm - 1/2 W.
R11	189-0013	Resistor - 25 Ohm - 1 W. - W.W.
R10	182-0122	Resistor - 1,200 Ohm - 1 W.
	497-0005	Retainer & Bushing - Line Cord
	493-0017	Shaft - Tuning
	482-0003	Shield - Miniature Tube
	481-0014	Sleeve - Shaft Bearing
	419-0005	Socket - 2 Prong - Appliance
	419-0004	Socket - 3 Prong - Clock
	412-0015	Socket - 7 Prong - Miniature
	539-0501	Speaker - 5" P.M.
	496-0023	Spring - String Drive
	495-0006	String - Drive (Specify desired length when ordering)
T1	121-0016	Transformer - I.F. #1
T2	122-0018	Transformer - I.F. #2
T3	143-0019	Transformer - Output
		Tube - 12AT6
		Tube - 12BA6
		Tube - 12BE6
		Tube - 35W4
		Tube - 50C5



REVISED SCHEMATIC DIAGRAM FOR 1-602-1 CHASSIS

* PART OF T2

VOLTAGES MEASURED WITH 20,000 OHM PER VOLT TYPE METER, TO NEGATIVE "B".
LINE POTENTIAL 117 VOLTS 60 CYCLE. NO SIGNAL INPUT.
COIL RESISTANCES ARE AVERAGE VALUES.
INTERMEDIATE FREQUENCY 455KC.

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
	Add	
C20	162-0411M	Capacitor - Paper - .01 Mfd. - 400 V.
R11	181-0104	Resistor - 100,000 Ohm - 1/2 W.

Underwriters' Change in 1-602-1 Radio Chassis

Removal of Clock Holding Speed Nuts

The clock movement used with 1-602-1 chassis models is held in the cabinet by four "D" shaped bosses molded on the inside of the cabinet front. Over each boss is assembled a speed nut which fastens the unit in place. With the cabinet in its normal position, the speed nuts occupy a horizontal position. If the speed nuts are rotated to a vertical position, using a pair of pliers, they can be lifted from the bosses with only finger pressure.

To replace a speed nut, set it over the boss in a horizontal position and use a pair of long nose pliers to apply pressure to the two webs on either side of the diamond shaped cutout.

SPECIFICATIONS

Power Supply
AC/DC Operation 117 V. DC or AC 15 Watts
Battery Operation 7.5V."A", 75V. or 90V."B"
Frequency Range . . . 540 KC to 1650 KC
Intermediate Frequency . . . . . 455 KC
Speaker . . . . . 4" x 6" P.M.

TUBE COMPLEMENT

V1	Oscillator/Mixer	1R5
V2	IF Amplifier	1U4
V3	Detector, AVC, 1st AF	1U5
V4	Audio Output	3V4

ALIGNMENT PROCEDURE

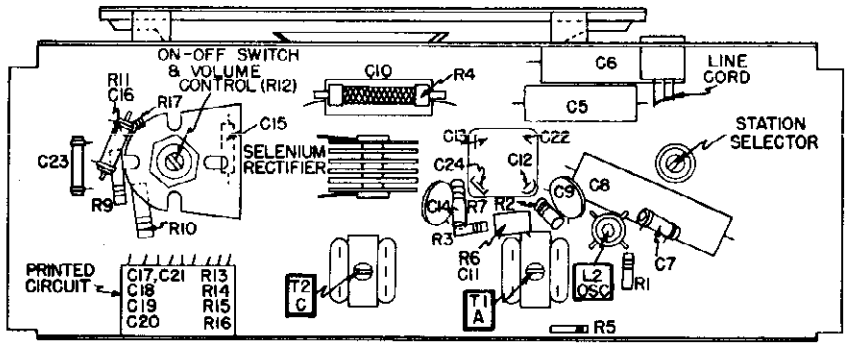
PRELIMINARY INSTRUCTIONS

1. Remove chassis from cabinet.
2. Allow chassis and signal generator several minutes warm up.
3. Keep generator output at lowest usable level to prevent AVC action from interferring with accurate alignment.
4. Connect AC voltmeter across voice coil.
5. Adjust volume control to full volume.

STEP	SIGNAL GENERATOR Frequency	SIGNAL GENERATOR Connection	RADIO DIAL SETTING	ADJUST	COMMENTS
1.	455 KC	Thru .01 Mfd. to pin 6 of 1R5.	Tuning cap. plates fully open.	T2 D T2 C T1 B T1 A	Connect ground lead of signal generator to negative "B" in receiver. Adjust T1 and T2 (IF transformers) for maximum output.
2.	1650 KC	Radiated to receiver thru a loop of several turns.	Tuning cap. plates fully open	C4 trimmer	Adjust C4 (high-end oscillator trimmer) for maximum output. Set variable tuning capacitor to minimum capacity.
3.	1400 KC to 1500 KC	Same as 2.	1400 KC to 1500 KC	C1 trimmer	Adjust C1 (antenna trimmer) for maximum output.
4.	600 KC	Same as 2.	Approx. 600 KC	L2 core	Adjust L2 (low-end oscillator adjustment) for maximum output while simultaneously "rocking" variable tuning capacitor.
5.	Repeat step 3.				

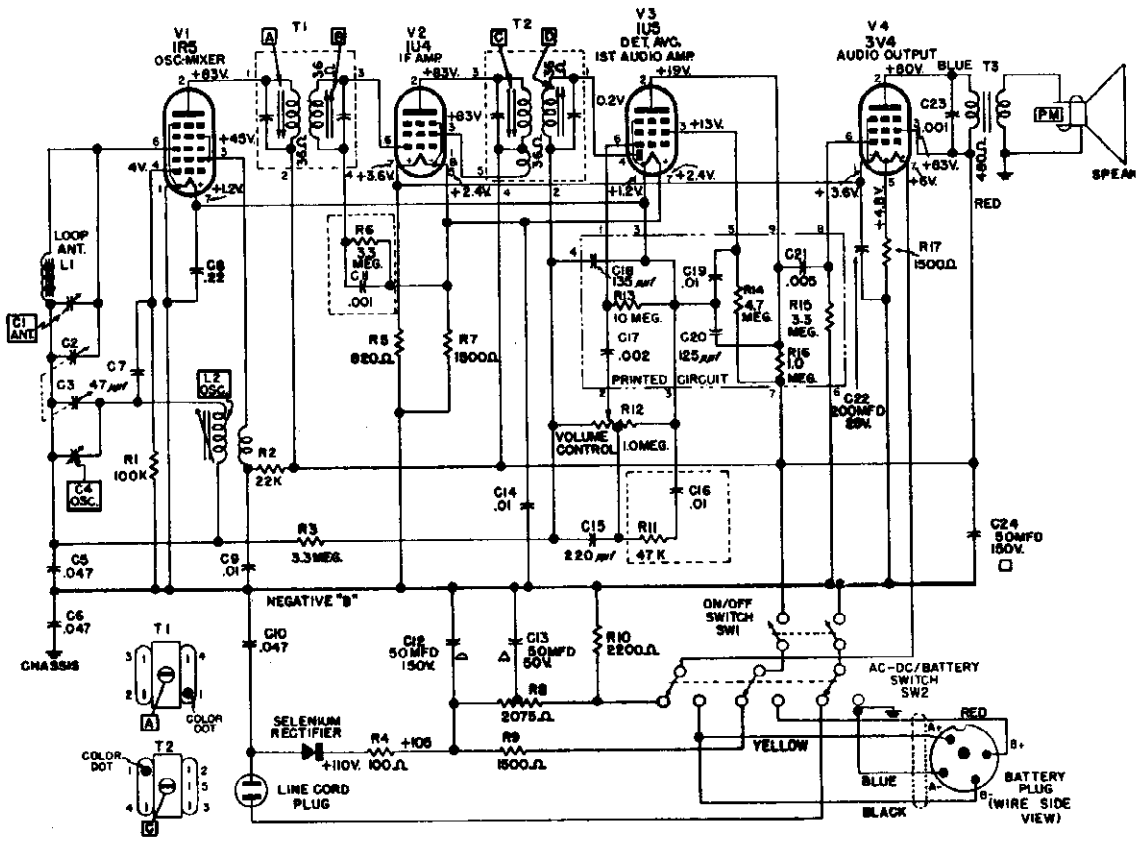
CHASSIS REMOVAL

1. Remove control knobs, station selector pointer and base. Remove station selector pointer by gripping it with either a bent wire hook or needle nose pliers inserted in the center slots.
2. Remove the four screws securing chassis and dial caps to the cabinet. Note assembly of the handle and dials, and that chassis slides through grooves in cabinet. The chassis may now be removed.
3. To facilitate calibration, turn volume control until it clicks "Off" and Station Selector until tuning capacitor is fully meshed. Line up indicator marks accordingly, and press on knobs.



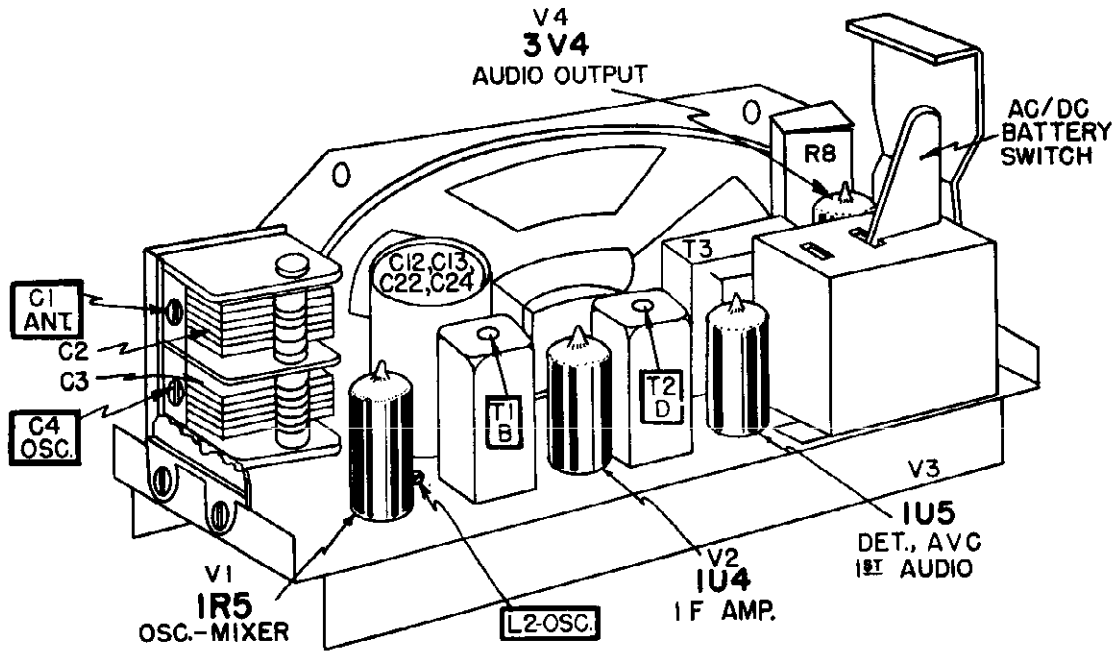
BOTTOM LAYOUT

MODEL 433, Ch. 1-604-1



NOTES:
1. VOLTAGES MEASURED WITH 20,000 OHM/VOLT METER TO NEGATIVE "B", SWITCH SW2 SET TO AC/DC POSITION, LINE VOLTAGE 117 V. AC, NO SIGNAL INPUT.
2. COIL RESISTANCES ARE AVERAGE VALUES. INTERMEDIATE FREQUENCY 455 KC.
3. BATTERY-EVEREADY NO.755 "AB" PACK OR EQUIVALENT SUPPLYING 7.5 V. "A" AND 75 V. "B". (NO. 756 "AB" PACK OR EQUIVALENT SUPPLYING 7.5 V. "A" AND 90 V. "B" IS OPTIONAL.)
4. VOLTAGES OR RESISTANCES NOT SHOWN WHERE TOO SMALL OR WIDELY VARIABLE.

SCHEMATIC DIAGRAM FOR 1-604-1 CHASSIS



TOP LAYOUT

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		CAPACITORS
C1		Trimmer (Part of C2)
C2	170-0011	Variable - 2 Gang (Antenna Section)
C3	170-0011	Variable - 2 Gang (Oscillator Section)
C4		Trimmer (Part of C3)
C5	160-02147	.047 Mfd. - 200 V. - Paper - Molded
C6	160-04147	.047 Mfd. - 400 V. - Paper - Molded
C7	166-0047N	47 Mmfd. - 500 V. - Ceramic
C8	160-02022	.22 Mfd. - 100 V. - Paper - Molded
C9	168-0002D	.01 Mfd. - 500 V. - Ceramic
C10	160-04147	.047 Mfd. - 400 V. - Paper - Molded
C11		Listed under "Miscellaneous Electrical Parts"
C12	161-4008	50 Mfd. - 150 V. - Electrolytic
C13	161-4008	50 Mfd. - 50 V. - Electrolytic
C14	168-0002D	.01 Mfd. - 500 V. - Ceramic
C15	163-0220	220 Mmfd. - 500 V. - Mica
C16, C17, C18 C19, C20, C21		Listed under "Miscellaneous Electrical Parts"
C22	161-4008	200 Mfd. - 25 V. - Electrolytic
C23	161-1000P	.001 Mfd. - 500 V. - Ceramic
C24	161-4008	50 Mfd. - 150 V. - Electrolytic
		CHOKES, COILS, AND TRANSFORMERS
L1	582-0016	Loop Antenna (includes mounting board)
L2	113-0025	Oscillator Coil
T1	121-0022	1st IF Transformer
T2	122-0024	2nd IF Transformer
T3	143-0027	Audio Output Transformer
		MISCELLANEOUS CABINET PARTS
	803-0012	Bar - Handle Frame
	813-0033	Cabinet - Plastic - Black (Model 433B)
	813-0035	Cabinet - Plastic - Green (Model 433GR)
	813-0034	Cabinet - Plastic - Ivory (Model 433H)
	813-0036	Cabinet - Plastic - Luggage (Model 433LU)
	813-0038	Cabinet - Plastic - Red (Model 433RE)
	813-0037	Cabinet - Plastic - Yellow (Model 433 YE)
	818-0012	Cap - Handle - Plastic (Model 433B)
	818-0013	Cap - Handle - Plastic (Model 433H)
	818-0014	Cap - Handle - Plastic (Model 433GR)
	818-0015	Cap - Handle - Plastic (Model 433LU)
	818-0017	Cap - Handle - Plastic (Model 433RE)
	818-0016	Cap - Handle - Plastic (Model 433YE)
	808-0013	Cover - Base
	723-0006	Dial - On/Off and Volume
	723-0005	Dial - Station Selector
	740-0043	Knob - On/Off and Volume
	740-0044	Knob - Station Selector
	818-0018	Nameplate - Sylvania
	792-0014	Pointer - Station Selector

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		MISCELLANEOUS CHASSIS PARTS
	473-0004	Arm - AC-DC/Battery Switch Actuating
	487-0004	Clip - IF Transformer Mounting
	476-0002	Insulator - Electrolytic Capacitor Mounting
	412-0015	Socket - 7 Prong - Miniature
		MISCELLANEOUS ELECTRICAL PARTS
	190-0011	Capacitor/Resistor Combination
C11		.001 Mfd. - 500 V.
R6		3.3 Megohm - 1/2 W.
	190-0006	Capacitor/Resistor Combination
C16		.01 Mfd. - 500 V.
R11		47,000 Ohm - 1/2 W.
R12	152-0020	Control - On/Off and Volume
	195-0002	Cord - Line
	190-0010	Printed Circuit - Detector/Audio Plate
C17		.002 Mfd. - 500 V.
C18		135 Mmfd. - 500 V.
C19		.01 Mfd. - 500 V.
C20		125 Mmfd. - 500 V.
C21		.005 Mfd. - 500 V.
R13		10 Megohm - 1/2 W.
R14		4.7 Megohm - 1/2 W.
R15		3.3 Megohm - 1/2 W.
R16		1 Megohm - 1/2 W.
	517-0005	Rectifier - Selenium
	539-0402	Speaker - 4" x 6" P.M.
	572-0003	Switch (AC-DC/Battery)
		RESISTORS
R1	181-0104	100,000 Ohm - 1/2 W.
R2	181-0223	22,000 Ohm - 1/2 W.
R3	181-0335	3.3 Megohm - 1/2 W.
R4	189-0033	100 Ohm - 2 W. - W.W.
R5	181-0821	820 Ohm - 1/2 W.
R6		Listed under "Miscellaneous Electrical Parts"
R7	181-0152	1,500 Ohm - 1/2 W.
R8	185-0004	2,150 Ohm - 6W. - W.W.
R9	182-0152	1,500 Ohm - 1W.
R10	182-0222	2,200 Ohm - 1W.
R11, R12, R13, R14, R15, R16		Listed under "Miscellaneous Electrical Parts"
R17	181-0152	1,500 Ohm - 1/2W.
		TUBE COMPLEMENT
V1		1R5 - Oscillator/Mixer
V2		1U4 - IF Amplifier
V3		1U5 - Detector. AVC. 1st Audio Amplifier

MODELS 513, 563, Ch.
1-601-2, 1-601-3

SPECIFICATIONS

Power Supply . . . . . 105-128 Volts
25 to 60 Cycle AC or DC, 35 Watts
Frequency Range . . . . 540 KC to 1650 KC
Intermediate Frequency . . . . . 455 KC
Loudspeaker . . . . . 5" P.M.

TUBE COMPLEMENT

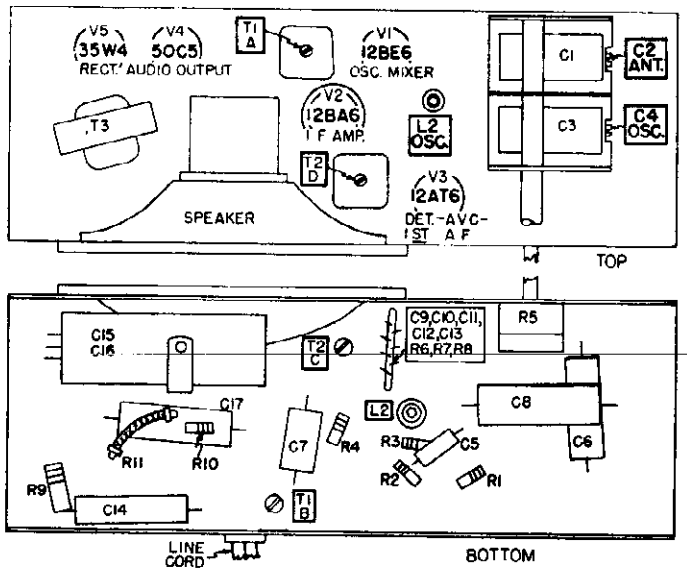
V1	Oscillator/Mixer	12BE6
V2	IF Amplifier	12BA6
V3	Detector, AVC, 1st AF	12AT6
V4	Audio Output	50C5
V5	Rectifier	35W4

ALIGNMENT PROCEDURE

PRELIMINARY INSTRUCTIONS

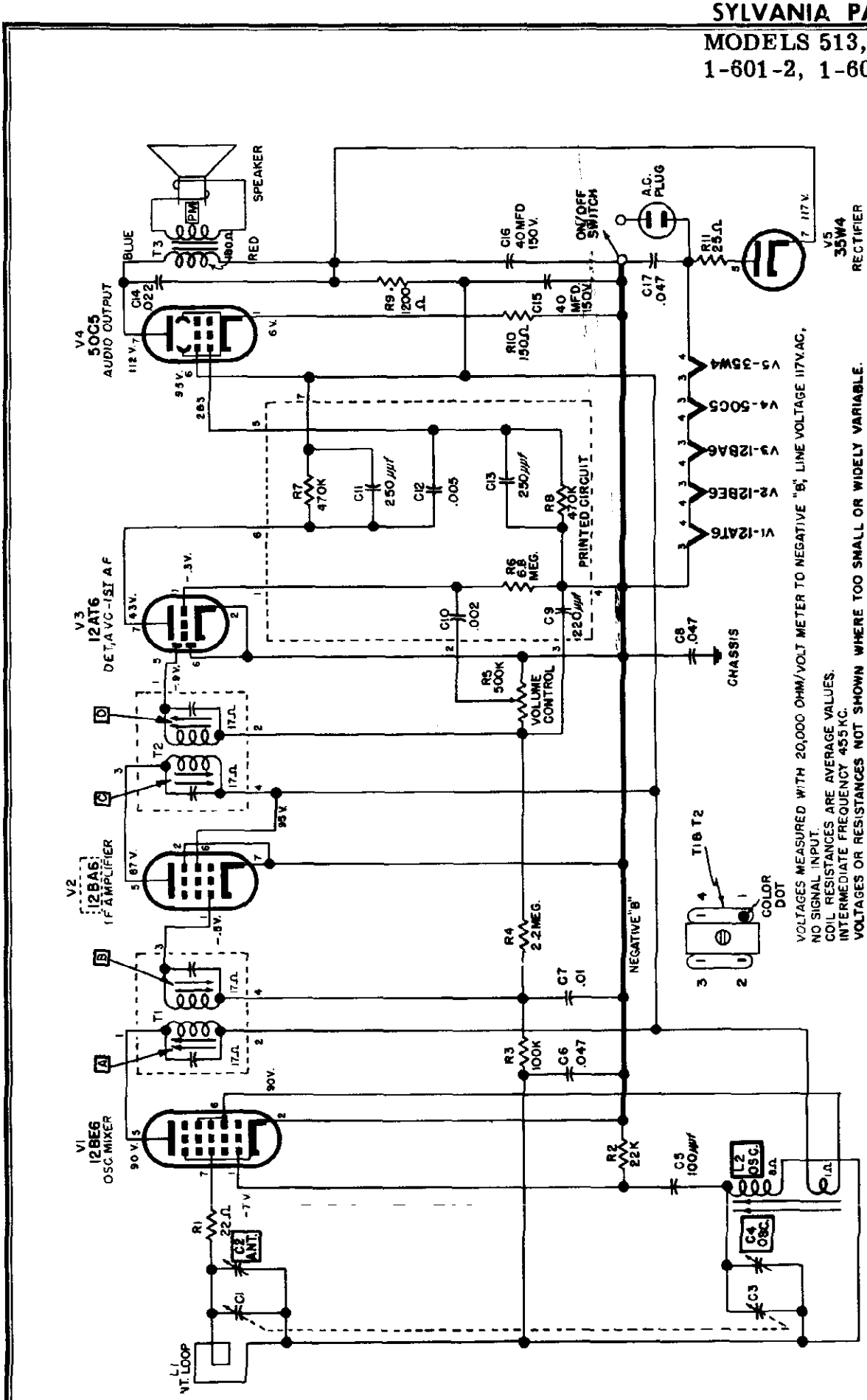
1. Remove chassis from cabinet.
2. Allow chassis and signal generator several minutes warm up.
3. Keep generator output at lowest usable level to prevent AVC action from interfering with accurate alignment.
4. Connect AC voltmeter across voice coil.
5. Adjust volume control to full volume.

STEP	SIGNAL GENERATOR Frequency	SIGNAL GENERATOR Connection	RADIO DIAL SETTING	ADJUST	COMMENTS
1.	455 KC	Thru 0.1 Mfd. to pin 7 of 12BE6.	1000 KC (Approx.)	T2 D T2 C T1 B T1 A	Connect ground lead of signal generator to negative "B" in receiver. Set radio dial to approximately 1000 KC where no signals are audible. Adjust T1 and T2 (IF transformers) for maximum output.
2.	1650 KC	Radiated to receiver thru a loop of several turns.	Tuning Cap. plates fully open	C4 trimmer	Adjust C4 (oscillator trimmer) for maximum output. Set variable tuning capacitor to minimum capacity.
3.	1400 KC to 1500 KC	Same as 2.	1400 KC to 1500 KC	C2 trimmer	Adjust C2 (antenna trimmer) for maximum output.
4.	600 KC	Same as 2	600 KC (Approx.)	L2 core	Adjust L2 (low-end oscillator adjustment) for maximum output while simultaneously "rocking" variable tuning capacitor.
5.	Repeat step 3.				



BOTTOM AND TOP LAYOUTS

MODELS 513, 563, C
1-601-2, 1-601-3



SCHEMATIC DIAGRAM FOR 1-601-2 AND 1-601-3 CHASSIS

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REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		CAPACITORS
C1	170-0006	Variable - 2 Gang (Antenna Section) (513 Models)
C1	170-0010	Variable - 2 Gang (Antenna Section) (Model 563B only)
C2		Trimmer (Part of C1)
C3	170-0006	Variable - 2 Gang (Oscillator Section) (513 Models)
C3	170-0010	Variable - 2 Gang (Oscillator Section) (Model 563B only)
C4		Trimmer (Part of C3)
C5	166-0100P	.0001 Mfd. - 500 V. - Ceramic
C6	160-02147	.047 Mfd. - 200 V. - Paper
C7	162-0411M	.01 Mfd. - 400 V. - Paper
C8	160-04147	.047 Mfd. - 400 V. - Paper
C9, C10, C11 C12, C13		Listed under "Miscellaneous Electrical Parts"
C14	162-04122	.022 Mfd. - 500 V. - Paper
C15	161-2002	40 Mfd. - 150 V. - Electrolytic
C16	161-2002	40 Mfd. - 150 V. - Electrolytic
C17	160-04147	.047 Mfd. - 400 V. - Paper
		CHOKES, COILS, AND TRANSFORMERS
L1	582-0011	Loop Antenna (513 Models)
L1	581-0002	Loop Antenna (Model 563B only)
L2	113-0026	Oscillator Coil
T1	121-0013	1st IF Transformer (57-69301-1) - Matched Pair
T2	122-0013	2nd IF Transformer (57-78799-1)
T1	121-0016	1st IF Transformer (57-69303-1) - Matched Pair
T2	122-0016	2nd IF Transformer (57-78798-1)
T3	143-0011	Audio Output Transformer
		MISCELLANEOUS CABINET PARTS
	776-0004	Baffle - Speaker
	813-0026	Cabinet - Plastic - Black (Model 563B)
	813-0007	Cabinet - Plastic - Black (Model 513B)
	813-0019	Cabinet - Plastic - Chartreuse (Model 513CH)
	813-0020	Cabinet - Plastic - Green (Model 513GR)
	813-0022	Cabinet - Plastic - Ivory (Model 513H)
	813-0009	Cabinet - Plastic - Mahogany (Model 513M)
	813-0025	Cabinet - Plastic - Red (Model 513RE)
	813-0018	Cabinet - Plastic - Yellow (Model 513YE)
	722-0031	Dial - Station (513 Models)
	722-0019	Dial - Station (Model 563B only)
	487-0018	Fastener - Snap (Loop antenna mounting)
	740-0037	Knob - On/Off Switch (513 Models)
	740-0005	Knob - On/Off Switch (Model 663B only)

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		MISCELLANEOUS CHASSIS PARTS
	482-0002	Base - Miniature Tube Shield
	487-0004	Clip - IF Transformer Mounting
	497-0005	Retainer and Bushing - Line Cord
	482-0003	Shield - Miniature Tube
	412-0015	Socket - 7 Prong Miniature
		MISCELLANEOUS ELECTRICAL PARTS
R5	152-0023	Control - Volume with On/Off Switch (513 Models)
R5	152-0004	Control - Volume with On/Off Switch (Model 563 only)
	195-0002	Cord - Line
	190-0009	Printed Circuit - Detector/Audio Plate
C9		220 Mmfd. - 500 V.
C10		.002 Mfd. - 500 V.
C11		250 Mmfd. - 500 V.
C12		.005 Mfd. - 500 V.
C13		250 Mmfd. - 500 V.
R6		6.8 Megohm - 1/2 W.
R7		470,000 Ohm - 1/2 W.
R8		470,000 Ohm - 1/2 W.
	539-0501	Speaker - 5" P.M.
		RESISTORS
R1	181-0220	22 Ohm - 1/2 W.
R2	181-0223	22,000 Ohm - 1/2 W.
R3	181-0104	100,000 Ohm - 1/2 W.
R4	181-0225	2.2 Megohm - 1/2 W.
R5, R6, R7, R8		Listed under "Miscellaneous Electrical Parts"
R9	182-0122	1,200 Ohm - 1 W.
R10	181-0151	150 Ohm - 1/2 W.
R11	189-0013	25 Ohm - 1 W. - W.W.
		TUBE COMPLEMENT
V1		12BE6 - Oscillator/Mixer
V2		12BA6 - IF Amplifier
V3		12AT6 - Detector, AVC, 1st Audio Amplifier
V4		50C5 - Audio Output
V5		35W4 - Rectifier

SPECIFICATIONS

Frequency Range	540 KC to 1650 KC
IF Frequency	455 KC
Power Supply	105 to 128 Volts 60 Cycle AC, 35 Watts
Appliance Outlet	Maximum Load 1100Watts
Loudspeaker	5" P.M.

TUBE COMPLEMENT

V1	Oscillator/Mixer	12BE6
V2	IF Amplifier	12BA6
V3	Detector, AVC, 1st AF Amplifier	12AT6
V4	Audio Output	50C5
V5	Rectifier	35W4

ALIGNMENT PROCEDURE

PRELIMINARY INSTRUCTIONS

1. Remove chassis from cabinet as in step C, under "Chassis Removal."
2. Insert temporary jumper between pins 4 and 5 on clock socket to complete AC circuit.
3. Allow chassis and signal generator several minutes warm-up.
4. Keep generator output at lowest usable level to prevent AVC action from interfering with accurate alignment.
5. Connect AC voltmeter across voice coil and set volume control to full volume.

STEP	SIGNAL GENERATOR Frequency	SIGNAL GENERATOR Connection	RADIO DIAL SETTING	ADJUST	COMMENTS
1.	455 KC	Thru .01 Mfd. to pin 7 of 12BE6	Extreme right hand side	T1 (Both cores) T2 (Both cores)	Connect ground lead of signal generator to negative "B" in receiver. Adjust T1 and T2 (IF transformers) for maximum output.
2.	1650 KC	Radiated to receiver thru a loop of several turns	Extreme right hand side	C5 trimmer	Set variable tuning capacitor to minimum capacity. Adjust C4 (high-end oscillator trimmer) for maximum output.
3.	1400 KC to 1500 KC	Same as 2.	1400 KC to 1500 KC	C2 trimmer	Adjust C2 (antenna trimmer) for maximum output
4.	600 KC	Same as 2.	Approx. 600 KC	L2 Core	Adjust L2 (low-end oscillator adjustment) for maximum output while simultaneously "rocking" variable tuning capacitor.
5.	Repeat step 3. Then remove clock socket jumper.				

REMOVAL OF CHASSIS AND TIMER MOVEMENT

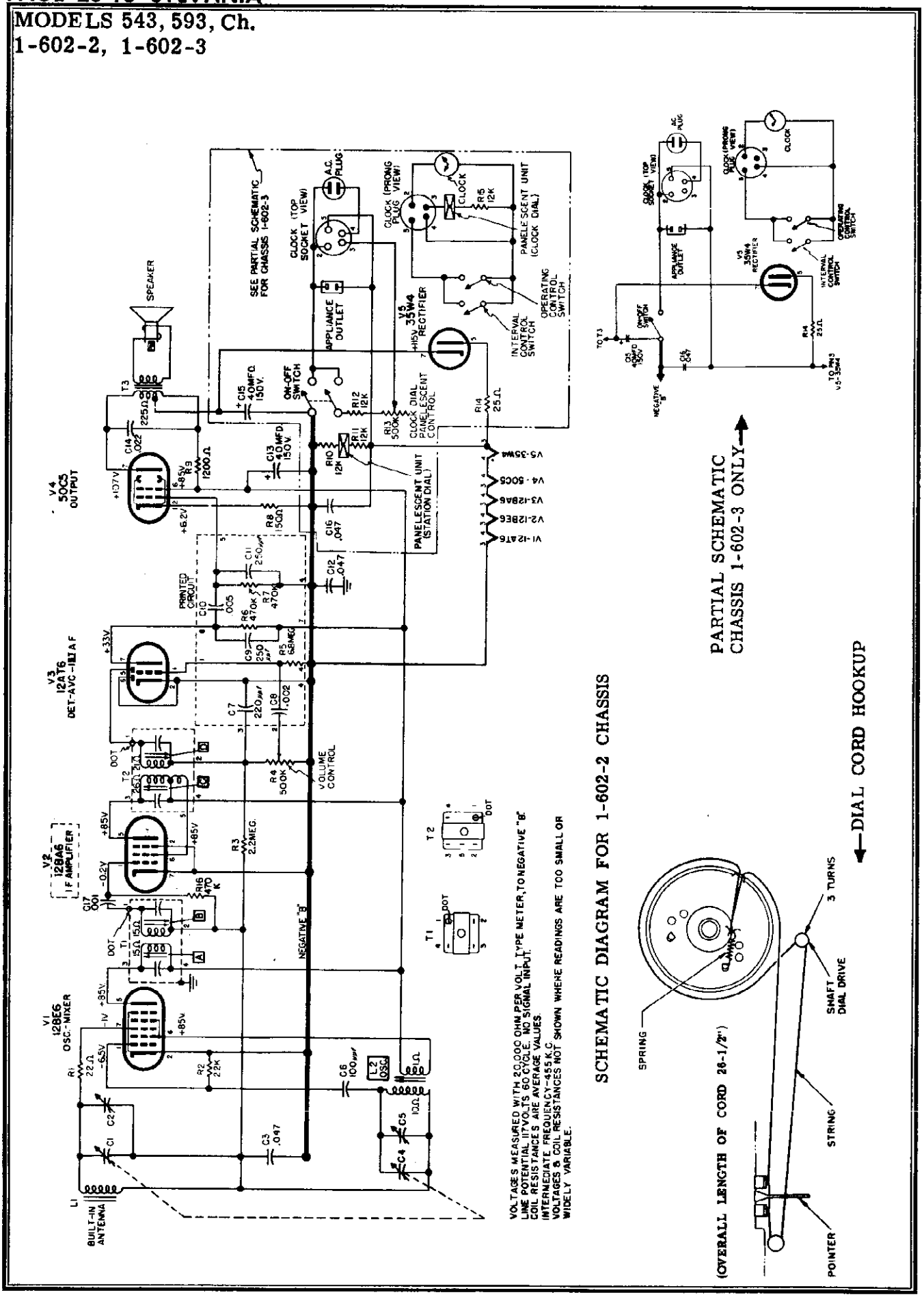
A. Remove line cord from power socket.
B. Set all clock hands toward upper right hand corner of clock face.
C. Remove chassis from cabinet as follows:
   1. Remove volume control and tuning control knobs.
   2. Remove the two upper clips on back cover.
   3. Remove three chassis mounting screws from the underside of cabinet.
   4. Pull chassis part way out of cabinet and disconnect four-prong clock plug.
   5. Remove chassis completely.
D. Remove clock from cabinet as follows:
   1. Remove two upper clock mounting screws.
   2. Loosen two lower clock mounting screws and lift clock assembly up and out from the cabinet.

NOTE: The panelescent clock face (on 543 models only) is an integral part of clock assembly. When replacement of panelescent unit becomes necessary, position all clock hands at either 12 o'clock or 6 o'clock. Remove clock hands with care to avoid bending them or enlarging mounting holde in hands. When installing, locate hands at same position as before removal.

SERVICING OF SESSIONS MOVEMENT

The Sessions clock-timer unit is warranted under normal use and service against defects in workmanship and material for a period of one year from date the timer is sold by Sessions. Sessions agrees to repair or replace without charge any part or parts proved to be defective within the warranty period. The clock-timer unit must be removed from the radio cabinet when repairs by Sessions are necessary. Sylvania distributors will supply name of the nearest Sessions service station.

MODELS 543, 593, Ch. 1-602-2, 1-602-3



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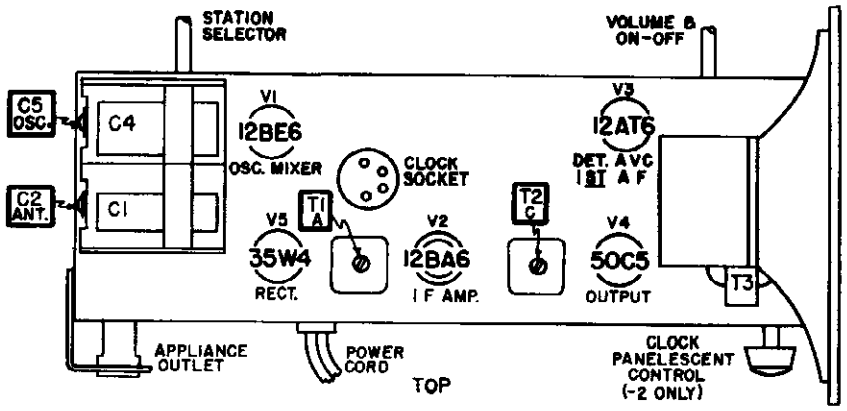
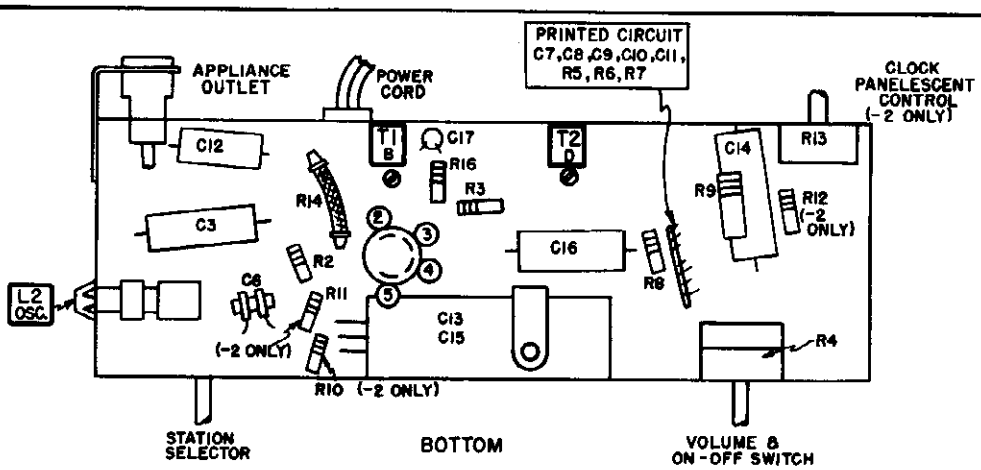


TOP LAYOUT FOR 1-602-2 & 1-602-3 CHASSIS



BOTTOM LAYOUT FOR 1-602-2 & 1-602-3 CHASSIS

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		CAPACITORS
C1	170-0009	Variable - 2 Gang (antenna section)
C2		Trimmer (part of C1)
C3	160-04147	.047 Mfd. - 400 V. - Paper
C4	170-0009	Variable - 2 Gang (Oscillator section)
C5		Trimmer (part of C4)
C6	166-0100P	100 Mmfd. - 500 V. - Ceramic
C7, C8, C9 C10, C11		Listed under "Miscellaneous Electrical Parts"
C12	160-04147	.047 Mfd. - 400 V. - Paper
C13	161-2002	40 Mfd. - 150 V. - Electrolytic
C14	162-04122	.022 Mfd. - 400 V. - Paper
C15	161-2002	40 Mfd. - 150 V. - Electrolytic
C16	160-04147	.047 Mfd. - 400 V. - Paper
C17	166-1000D	.001 Mfd. - 500 V. - Ceramic
		CHOKES, COILS, AND TRANSFORMERS
L1	582-0017	Loop Antenna (includes back cover)
L2	113-0023	Oscillator Coil
T1	121-0021	1st IF Transformer
T2	122-0023	2nd IF Transformer
T3	143-0028	Audio Output Transformer

MODELS 543, 593, Ch. 1-602-2, 1-602-3

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		MISCELLANEOUS CABINET PARTS
	714-0013	Bezel
	813-0026	Cabinet - Plastic - Black (Models 543B, 593B)
	813-0029	Cabinet - Plastic - Chartreuse (Models 543CH, 593CH)
	813-0030	Cabinet - Plastic - Green (Models 543GR, 593GR)
	813-0027	Cabinet - Plastic - Ivory (Models 543H, 593H)
	813-0028	Cabinet - Plastic - Mahogany (Models 543M, 593M)
	813-0024	Cabinet - Plastic - Red (Models 543R, 593R)
	813-0031	Cabinet - Plastic - Yellow (Models 543YE, 593YE)
	721-0009	Dial - Clock and Station (Glass)
	487-0018	Fastener - Snap (Loop antenna and back cover mounting)
	740-0038	Knob - Panalescent Dimmer Control (543 models only)
	740-0033	Knob - Tuning, Volume and On/Off
		MISCELLANEOUS CHASSIS PARTS
	482-0002	Base - Miniature Tube Shield
	492-0045	Bracket - Panelescent Station Dial
	487-0004	Clip - IF Transformer Mounting
	792-0010	Pointer - Station Dial
	494-0007	Pulley - Dial Drive
	497-0005	Retainer and Bushing - Line Cord
	496-0028	Shaft - Tuning
	482-0003	Shield - Miniature Tube
	419-0005	Socket - 2 Prong - Appliance
	419-0009	Socket - 4 Prong - Clock
	412-0015	Socket - 7 Prong - Miniature
	496-0023	Spring - String Drive
		MISCELLANEOUS ELECTRICAL PARTS
R4	152-0019	Control - Volume and On/Off
R13	153-0022	Control - Panelescent Dimmer (Chassis 1-602-2 only)
	195-0011	Cord - Line
	190-0009	Printed Circuit - Detector/Audio Plate
C7		220 Mmfd. - 500 V.
C8		.002 Mfd. - 500 V.
C9		250 Mmfd. - 500 V.
C10		.005 Mfd. - 500 V.
C11		250 Mmfd. - 500 V.
R5		6.8 Megohm - 1/2 W.
R6		470,000 Ohm - 1/2 W.
R7		470,000 Ohm - 1/2 W.
	539-0501	Speaker - 5" P.M.
	924-0003	Unit - Clock Motor (Sessions No. A742)
	477-0005	Unit - Panelescent Light (Clock dial) (Chassis 1-602-2 only)
	477-0004	Unit - Panelescent Light (Station dial) (Chassis 1-602-2 only)
		RESISTORS
R1	181-0220	22 Ohm - 1/2 W.
R2	181-0223	22,000 Ohm - 1/2 W.
R3	181-0225	2.2 Megohm - 1/2 W.
R4, R5, R6		Listed under "Miscellaneous Electrical Parts"
R7		
R8	181-0151	150 Ohm - 1/2W.
R9	182-0122	1,200 Ohm - 1 W.
R10	181-0123	12,000 Ohm - 1/2 W. (Chassis 1-602-2 only)
R11	181-0123	12,000 Ohm - 1/2 W. (Chassis 1-602-2 only)
R12	181-0123	12,000 Ohm - 1/2 W. (Chassis 1-602-2 only)
R13		Listed under "Miscellaneous Electrical Parts"
R14	189-0013	25 Ohm - 1W - W.W.
R15	181-0123	12,000 Ohm - 1/2 W. (Chassis 1-602-2 only)
R16	181-0474	470,000 Ohm - 1/2 W.
		TUBE COMPLEMENT
V1		12BE6 - Oscillator/Mixer
V2		12BA6 - IF Amplifier
V3		12AT6 - Detector, AVC, 1st Audio Amplifier
V4		50C5 - Audio Output
V5		35W4 - Rectifier

SPECIFICATIONS

Power Supply 105 to 128 V. 60 Cycle AC 80 Watts

Frequency Range

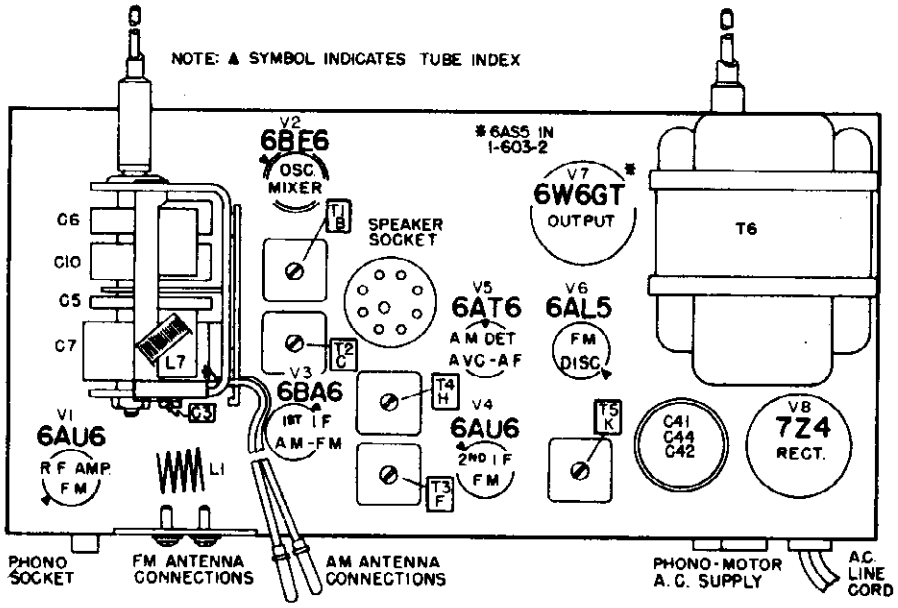
AM Broadcast . . .	540 KC to 1600 KC
FM Broadcast	88 MC to 108 MC

Intermediate Frequency

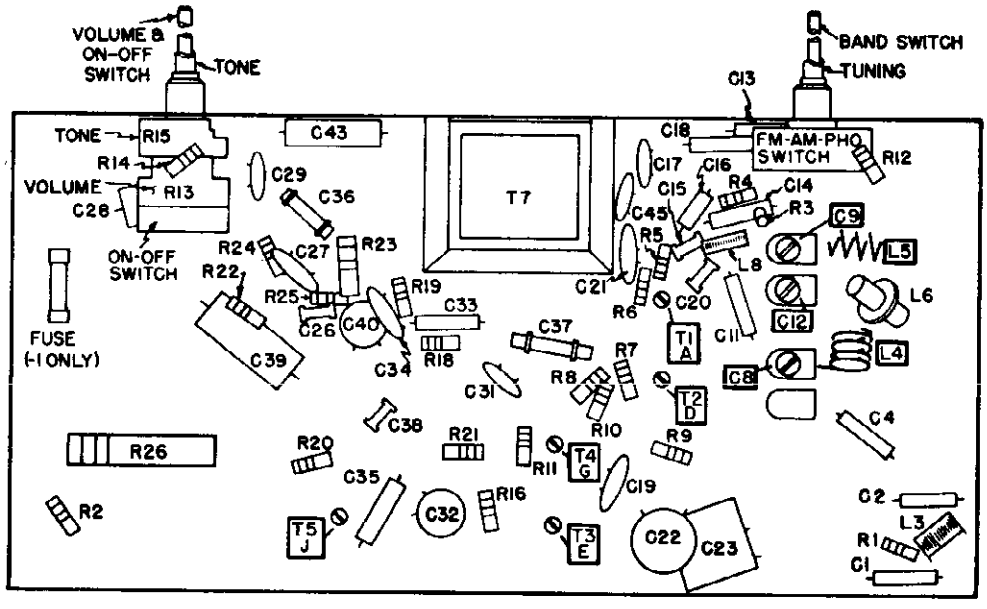
AM Carrier	455 KC
FM Carrier	10.7 MC

TUBE COMPLEMENT

V1	RF Amplifier - FM	6AU6
V2	Oscillator/Mixer	6BE6
V3	1st IF Amplifier - AM, FM	6BA6
V4	2nd IF Amplifier - FM	6AU6
V5	AM Detector, AVC, 1st AF	6AT6
V6	FM Discriminator	6AL5
V7	Audio Output (1-603-1)	6W6GT
V7	Audio Output (1-603-2)	6AS5
V8	Rectifier	7Z4



TOP LAYOUT



BOTTOM LAYOUT

MODELS 25-M, M-1, 75-B, B-1, -M, M-1, 178B, BU, M, MU, 373B, BU, M, MU, Ch. 1-603-1; 388B, BU, M, MU, Ch. 1-603-2

ALIGNMENT PROCEDURE

GENERAL PREALIGNMENT INSTRUCTIONS

1. Remove chassis from cabinet.
2. Allow receiver and test equipment to warm up for approximately 15 minutes before proceeding with alignment.
3. Use proper insulated alignment tool for powdered iron cores with slots.
4. When constructing FM alignment detector circuit, keep leads short.
5. Ground all test equipment unless otherwise stated.
6. Keep generator output as lowest usable level to prevent AVC action from interfering with accurate alignment.
7. Position FM/AM/PHONO switch as follows:

DESIRED POSITION	BAND SWITCH SETTING
FM	Full Counterclockwise
AM	Center

FM IF ALIGNMENT

STEP	SIGNAL GENERATOR Connection	Freq.	SWEEP GENERATOR Connection	Freq.	OSCILLOSCOPE CONNECTION	ADJUST	OUTPUT READING	COMMENTS
1.	Loosely couple marker to pin 1 of 1st IF Amp. - 6BA6	10.6MC 10.7MC 10.8MC	To pin 1 of 1st IF Amp. - 6BA6	10.7 MC	Thru detector circuit of Figure A to pin 5 of 2nd IF Amp. - 6AU6	T3 - F T3 - E	Response curve of Figure B	Connect 500 ohm resistor from pin 5 to pin 6 of 2nd IF Amp. - 6AU6. Obtain maximum vertical amplitude for response curve. Set sweep generator for approximately 500 KC to 1 MC sweep.
2.	Loosely couple marker to pin 7 of Osc. - Mixer - 6BE6.	10.6MC 10.7MC 10.8MC	To pin 7 of Osc. Mixer - 6BE6.	10.7 MC	Same as 1.	T1 - B T1 - A	Response curve of Figure B	Same as 1; reduce sweep generator output to avoid AVC distortion of response curve.
3.	Loosely couple marker to pin 1 of 2nd IF Amp. - 6AU6.	10.6MC 10.7MC 10.8MC	To pin 1 of 2nd IF Amp. - 6AU6	10.7 MC	Across de-emphasis capacitor, C37 .0033 Mfd.	T5 - K T5 - J	Response curve of Figure C	REMOVE 500 OHM RESISTOR ADDED FOR STEP 1. Center 10.7 MC marker. Obtain maximum linear output for response curve.

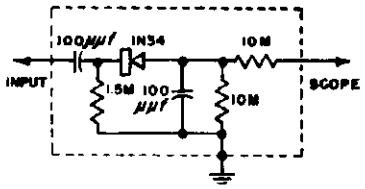


FIGURE A

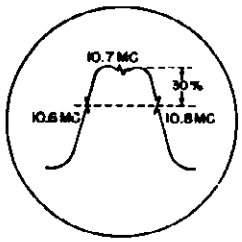


FIGURE B

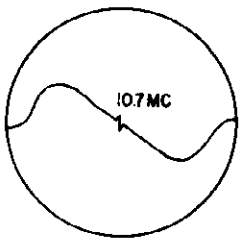


FIGURE C

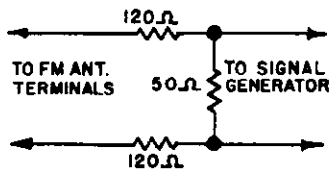


FIGURE D

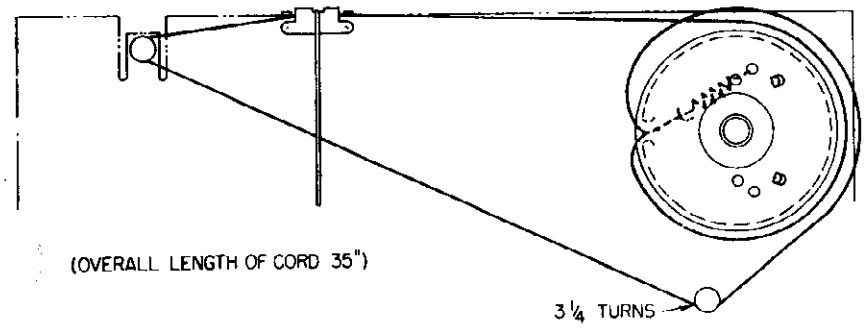
FM RF ALIGNMENT

STEP	SIGNAL GENERATOR Connection	Freq.	TUNING CAPACITOR POSITION	OUTPUT METER CONNECTION	ADJUST	OUTPUT READING	COMMENTS
1.	Thru resistor network of Figure D to FM antenna terminal board.	108. 5 MC	Fully open	Across speaker voice coil.	C9	Maximum	Set Volume control to full CW position and set Tone control to full CCW position. Use a 400 cycle modulated signal. Keep generator output at lowest usuable value. Leave AM loop antenna leads connected during FM RF alignment.
2.	Same as 1.	108 MC	108 MC	Same as 1.	C8	Maximum	Same as 1 using printed calibration dial on chassis assembly to properly position tuning capacitor.
3.	Same as 1.	87. 5 MC	Fully closed	Same as 1.	L5 coil	Maximum	Same as 1 "spiking" (squeezing or spreading turns of coil) L5 for maximum output reading. Use a non-metalic pick for this adjustment.
4.	Same as 1	88 MC	88 MC	Same as 1.	L4 coil	Maximum	Same as 2 "spiking" (squeezing or spreading turns of coil) L4 for maximum output reading. Use a non-metallic pick for this adjustment.

MODELS 25-M, M-1, 75-B, B-1, M, M-
178B, BU, M, MU, 373B, BU, M, MU, C
1-603-1; 388B, BU, M, MU, Ch. 1-603-

AM ALIGNMENT

STEP	SIGNAL GENERATOR Connection	Freq.	TUNING CAPACITOR POSITION	OUTPUT METER CONNECTION	ADJUST	OUTPUT READING	COMMENTS
1.	Thru .1 Mfd. capacitor to pin 7 of Osc.-Mixer - 6BE6.	455 KC	Fully open	Across speaker voice coil.	T4 - H T4 - G T2 - D T2 - C	Maximum	Set Volume control to full CW position and set Tone control t full CCW position. Use a 400 cycle modulated signa Keep generator output at lowest usuable value.
2.	Radiated to receiver thru a wire loop of several turns. or: Thru a 50 Mmfd. capacitor to AM antenna board.	1650 KC	1650 KC	Same as 1.	C12	Maximum	Same as 1 using printed calibr tion dial on chassis assembly properly position tuning capacit
3.	Same as 2.	1400 KC	1400 KC	Same as 1.	C3	Maximum	Same as 2.



DIAL CORD HOOKUP

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		CAPACITORS
C1	163-0470	470 Mmfd. - 500 V. - Mica
C2	163-0470	470 Mmfd. - 500 V. - Mica
C3	172-0031	Trimmer - AM Loop Antenna
C4	163-0032	22 Mmfd. - 500 V. - Mica
C5	170-0008	Variable - 4 Gang (FM RF Section)
C6	170-0008	Variable - 4 Gang (FM Oscillator Section)
C7	170-0008	Variable - 4 Gang (AM Antenna Section)
C8		Trimmer (Part of C5)
C9		Trimmer (Part of C6)
C10	170-0008	Variable - 4 Gang (AM Oscillator Section)
C11	163-0470	470 Mmfd. - 500 V. - Mica
C12		Trimmer (Part of C10)
C13	166-0010P	10 Mmfd. - 500 V. - Ceramic
C14	163-0047	47 Mmfd. - 500 V. - Mica
C15	165-0006A	6 Mmfd. - 500 V. - Ceramic
C16	165-0006A	6 Mmfd. - 500 V. - Ceramic
C17	166-4700D	.0047 Mfd. - 500 V. - Ceramic
C18	163-0470	470 Mmfd. - 500 V. - Mica
C19	168-0002D	.01 Mfd. - 500 V. - Ceramic
C20	166-0470N	470 Mmfd. - 500 V. - Ceramic
C21	168-0002D	.01 Mfd. - 500 V. - Ceramic
C22	168-0002D	.01 Mfd. - 500 V. - Ceramic
C23	163-3900	.0039 Mfd. - 500 V. - Mica
C24	163-0100	100 Mmfd. - 500 V. - Mica (Part of T4)
C25	163-0100	100 Mmfd. - 500 V. - Mica (Part of T4)
C26	166-0270N	270 Mmfd. - 500 V. - Ceramic
C27	168-0002D	.01 Mfd. - 500 V. - Ceramic
C28	163-0047	47 Mmfd. - 500 V. - Mica
C29	166-4700D	.0047 Mfd. - 500 V. - Ceramic
C30	168-0002D	.01 Mfd. - 500 V. - Ceramic (Chassis 1-603-2 only)
C31	166-4700D	.0047 Mfd. - 500 V. - Ceramic
C32	166-4700D	.0047 Mfd. - 500 V. - Ceramic
C33	163-0100	100 Mmfd. - 500 V. - Mica
C34	168-0002D	.01 Mfd. - 500 V. - Ceramic
C35	160-06218	.0018 Mfd. - 600 V. - Paper - Molded
C36	166-2000P	.002 Mfd. - 500 V. - Ceramic
C37	166-3300P	.0033 Mfd. - 500 V. - Ceramic

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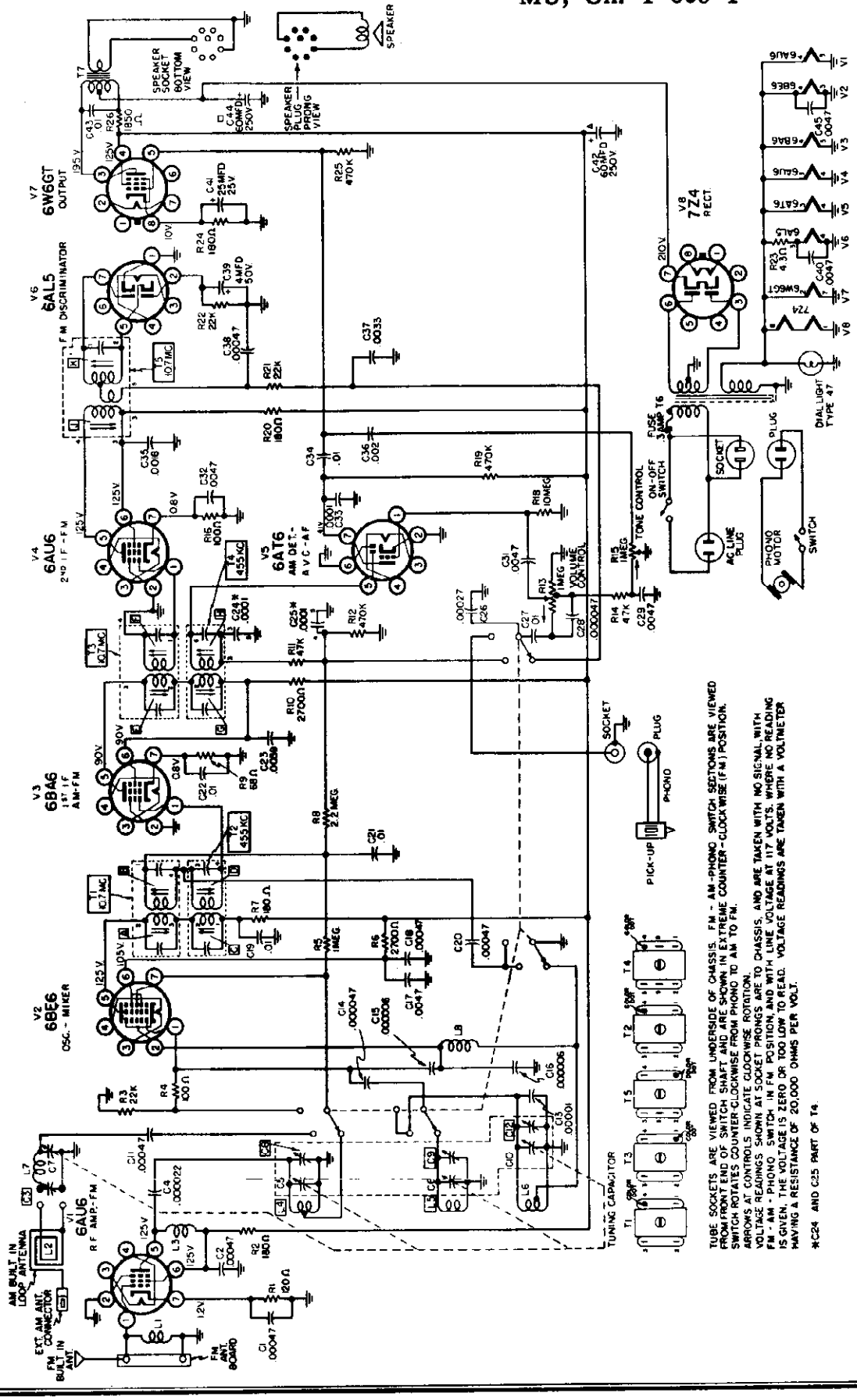
CHASSIS 1-603-1, 1-603-2

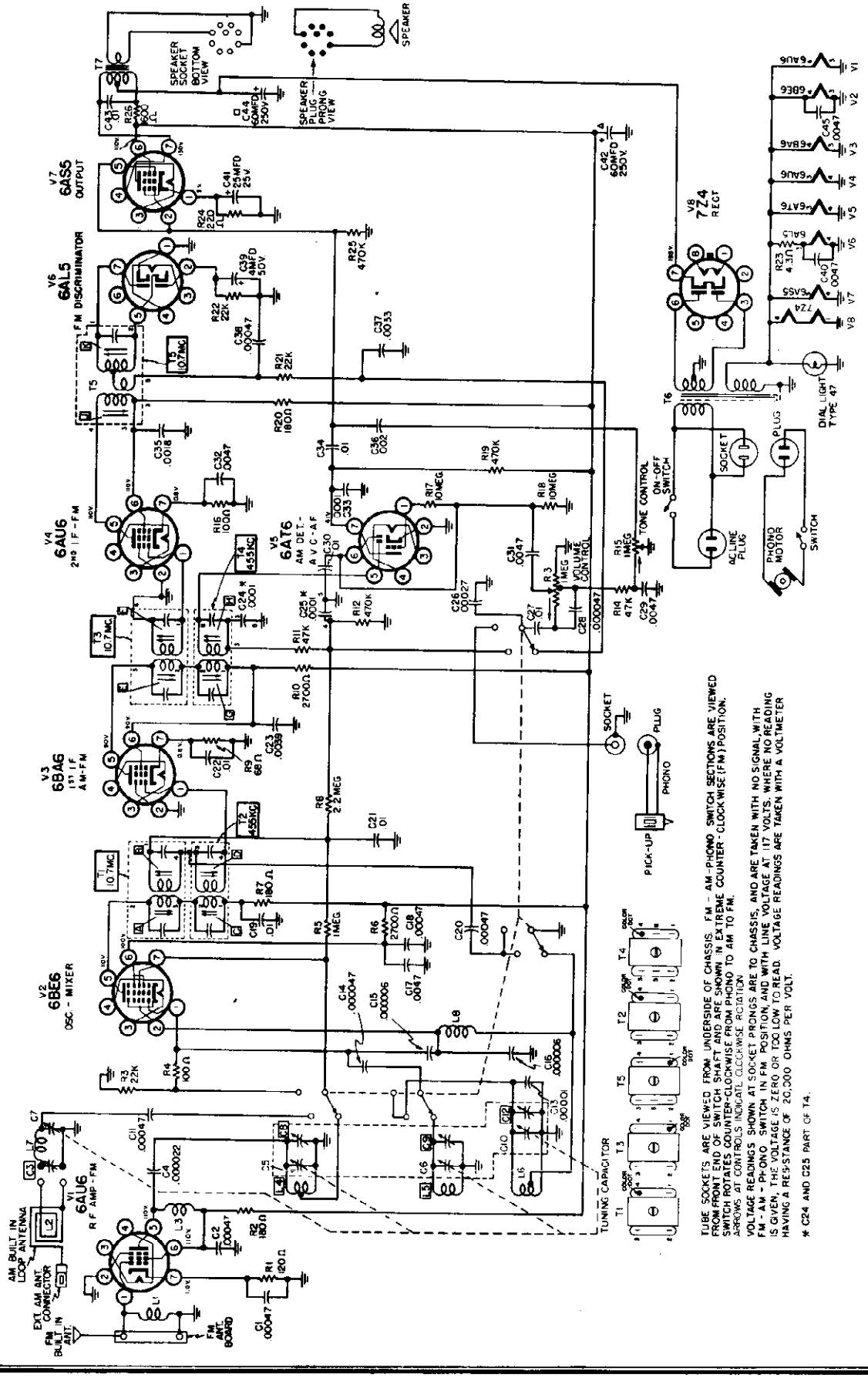
SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
		CAPACITORS (CONT'D)
C38	166-0470N	470 Mmfd. - 500 V. - Ceramic
C39	161-1008	4 Mfd. - 50 V. - Electrolytic
C40	168-0002D	.01 Mfd. - 500 V. - Ceramic
C41	161-3011	25 Mfd. - 25 V. - Electrolytic
C42	161-3011	60 Mfd. - 250 V. - Electrolytic △
C43	160-0411	.01 Mfd. - 400 V. - Paper - Molded
C44	161-3011	60 Mfd. - 250 V. - Electrolytic □
C45	166-4700D	.0047 Mfd. - 500 V. - Ceramic
		CHOKES, COILS, AND TRANSFORMERS
L1	111-0012	FM Antenna Coil
L2	582-0012	AM Loop Antenna
L3	146-0014	FM RF Plate Choke
L4	112-0009	FM RF Plate Coil Assembly
L5	113-0021	FM Oscillator Coil
L6	113-0011	AM Oscillator Coil
L7	146-0014	AM Antenna Choke
L8	146-0013	Oscillator/Mixer Cathode Choke
T1	121-0017	1st IF Transformer (FM)
T2	121-0018	1st IF Transformer (AM)
T3	122-0017	2nd IF Transformer (FM)
T4	122-0019	2nd IF Transformer (AM)
T5	128-0007	FM Discriminator Transformer
T6	141-0017	117 V. 60 Cycle Power Transformer (Chassis 1-603-1 only)
T6	141-0036	117 V. 60 Cycle Power Transformer (Chassis 1-602-2 only)
T7	143-0018	Audio Output Transformer
		MISCELLANEOUS CHASSIS PARTS
	726-0003	Background - Dial
	416-0011	Board - Antenna (FM)
	497-0005	Bushing and Retainer - Line Cord
	497-0013	Bushing - Rubber
	487-0013	Button - Snap
	487-0004	Clip - IF Transformer Can Mounting
	554-0019	Clip - Tuning Shaft Retaining
	417-0006	Connector Pin - Antenna Lead
	722-0020	Dial - Station
	497-0012	Grommet - Rubber
	792-0007	Pointer - Dial
	494-0007	Pulley - Dial Drive
	493-0016	Shaft - Tuning
	482-0007	Shield - Miniature Tube
	411-0007	Socket - Dial Light
	417-0002	Socket - 1 Prong - Phono Input
	417-0009	Socket - 2 Prong - Phono Motor
	412-0015	Socket - 7 Prong Miniature
	412-0020	Socket - 7 Prong Miniature - Mica filled
	412-0003	Socket - 8 Prong Octal
	412-0001	Socket - 8 Prong Lock-in
	419-0003	Socket - 8 Prong - Speaker
	496-0023	Spring - Drive String Tension
		MISCELLANEOUS ELECTRICAL PARTS
	157-0017	Control-Dual-Tone, Volume and On/Off
R13		Control-Volume
R15		Control-Tone
	195-0008	Cord and Receptacle Assembly
	195-0002	Cord - Line
	611-0047	Lamp - #47
	573-0004	Switch - FM/AM/PHONO
		RESISTORS
R1	181-0121	120 Ohm - 1/2 W.
R2	181-0181	180 Ohm - 1/2 W.
R3	181-0223	22,000 Ohm - 1/2 W.
R4	181-0101	100 Ohm - 1/2 W.
R5	181-0105	1 Megohm - 1/2 W.
R6	181-0270	2,700 Ohm - 1/2 W.
R7	181-0181	180 Ohm - 1/2 W.
R8	181-0225	2.2 Megohm - 1/2 W.
R9	181-0680	68 Ohm - 1/2 W.
R10	181-0272	2,700 Ohm - 1/2 W.
R11	181-0473	47,000 Ohm - 1/2 W.
R12	181-0474	470,000 Ohm - 1/2 W.
R13		Listed under "Miscellaneous Electrical Parts"
R14	181-0473	47,000 Ohm - 1/2 W.
R15		Listed under "Miscellaneous Electrical Parts"
R16	181-0101	100 Ohm - 1/2 W.
R17	181-0106	10 Megohm - 1/2 W. (Chassis 1-603-2 only)
R18	181-0106	10 Megohm - 1/2 W.
R19	181-0474	470,000 Ohm - 1/2 W.
R20	181-0181	180 Ohm - 1/2 W.
R21	181-0223	22,000 Ohm - 1/2 W.
R22	181-0223	22,000 Ohm - 1/2 W.
R23	189-0007	4.3 Ohm - 1/2 W. - W.W.
R24	182-0181	180 Ohm - 1 W. (Chassis 1-603-1 only)
R24	182-0221	220 Ohm - 1 W. (Chassis 1-603-2 only)
R25	181-0474	470,000 Ohm - 1/2 W.
R26	187-0009	1,850 Ohm - 5 W. - W.W. (Chassis 1-603-1 only)
R26	187-0015	1,600 Ohm - 5 W. - W.W. (Chassis 1-603-2 only)

MODELS 25-M, M-1, 75-B, B-1, M
M-1, 178B, BU, M, MU, 373B, BU,
MU, Ch. 1-603-1

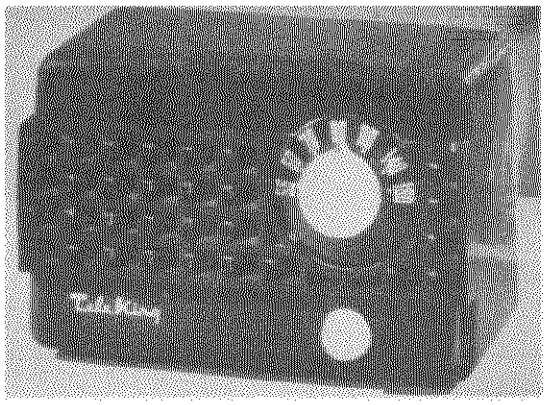


SCHEMATIC DIAGRAM FOR 1-603-1 CHASSIS

MODELS 388B, BU, M,
MU, Ch. 1-603-2



SCHEMATIC DIAGRAM FOR 1-603-2 CHASSIS

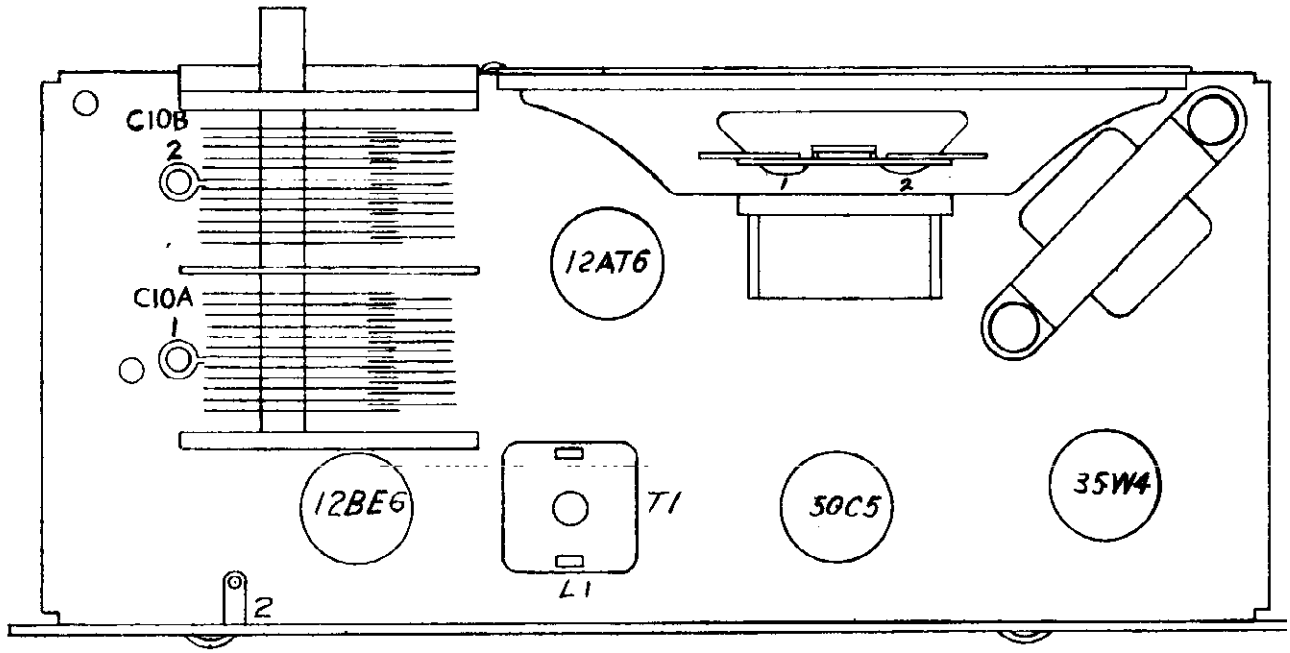


LINE VOLTAGE: 120 VOLTS AC								FULL VOLUME CONTROL – NO SIGNAL
TUBE	PINS							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	
35W4	—	—	85 AC	120 AC	120 AC	—	130 V	
50C5	0	–9.8 V	26 AC	76 AC	—	110 V	120 V	"4 Tube Radio"
12BE6	–10 V	0 V	26 AC	13 AC	105 V	105 V	–.8 V	
12AT6	–1 V	0 V	0 AC	13 AC	–.8 V	–.7 V	58 V	

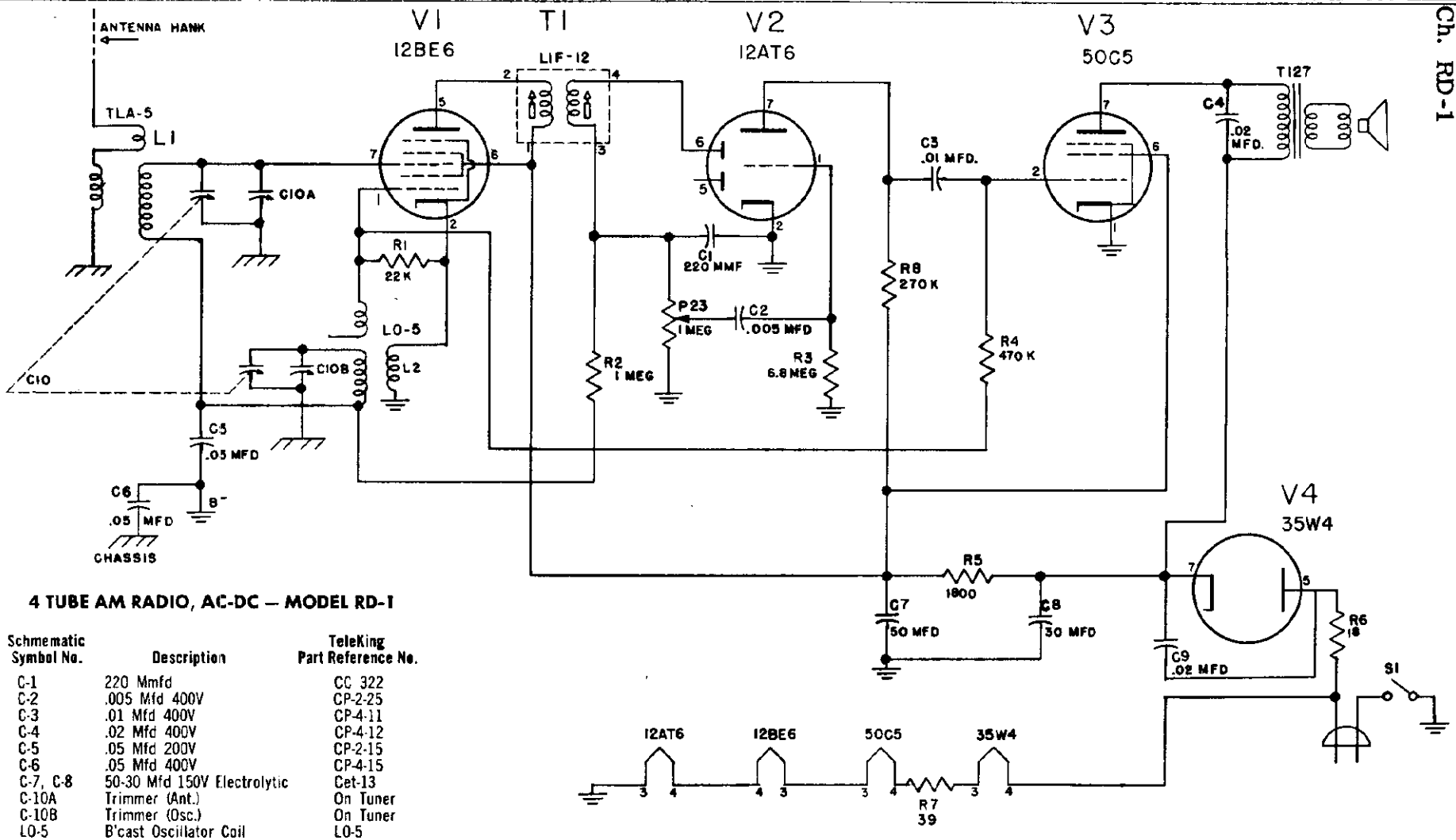
Voltage readings made with V.T.VM from pins designated to B–.

ALIGNMENT CHART

STEPS	ALIGN	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL SETTING	CONNECT GENERATOR TO	ADJUST	OUTPUT METER ACROSS VOICE COIL
1	I.F.	.05	455 KC	High Freq. End	Pin 7—12BE6 Converter Grid	T-1 Double Slug	Peak for Max.
2	Osc.	.05	1650 KC	High Freq. End	Pin 7—12BE6 Converter Grid	C10B Osc. Tuner Trim	Peak for Max.
3	Hank Ant.	100 mmf.	1500 KC	1500 KC	Ant. Lead	C10A R.F. Tuner Trim	Peak for Max.
4	Repeat Steps 2 and 3						



TOP VIEW



4 TUBE AM RADIO, AC-DC — MODEL RD-1

Schmematic Symbol No.	Description	TeleKing Part Reference No.
C-1	220 Mmfd	CC 322
C-2	.005 Mfd 400V	CP-2-25
C-3	.01 Mfd 400V	CP-4-11
C-4	.02 Mfd 400V	CP-4-12
C-5	.05 Mfd 200V	CP-2-15
C-6	.05 Mfd 400V	CP-4-15
C-7, C-8	50-30 Mfd 150V Electrolytic	Cet-13
C-10A	Trimmer (Ant.)	On Tuner
C-10B	Trimmer (Osc.)	On Tuner
LO-5	B'cast Oscillator Coil	LO-5
P-23	Volume Control and Switch 1 Meg ¼W	P-23
R-1	22K ohms ½W	RC-223-2
R-2	1 Megohm ½W	RC-105-2
R-3	6.8 Megohms ½W	RC-685-1
R-4	470K ohms ½W	RC-474-1
R-5	1800 ohms 1W	RC-182-4
R-6	18 ohms ½W	RC-180-2
R-7	39 ohms 1W	RC-390-5
R-8	270K ohms ½W	RC-274-1
TLA-5	B'cast Antenna Coil	TLA-5

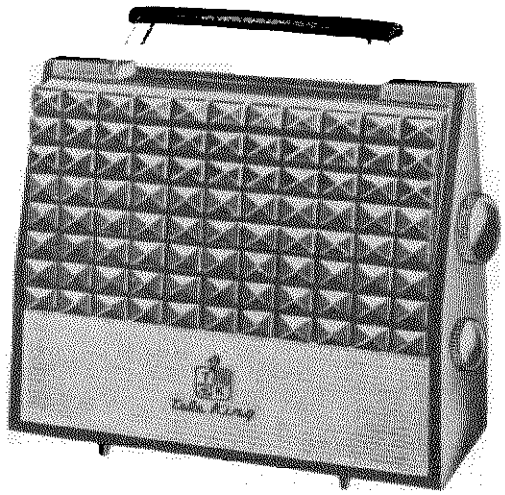
Misc. Parts

CV-4	2 Gang Variable Condenser	CV-4
LIF-12	IF Trans. 455 KC	LIF-12
PMS-7	4" Round PM Speaker	PMS-7
T-127	Audio Output Trans.	T-127

SCHEMATIC DIAGRAM

INTERMEDIATE FREQUENCY 455 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

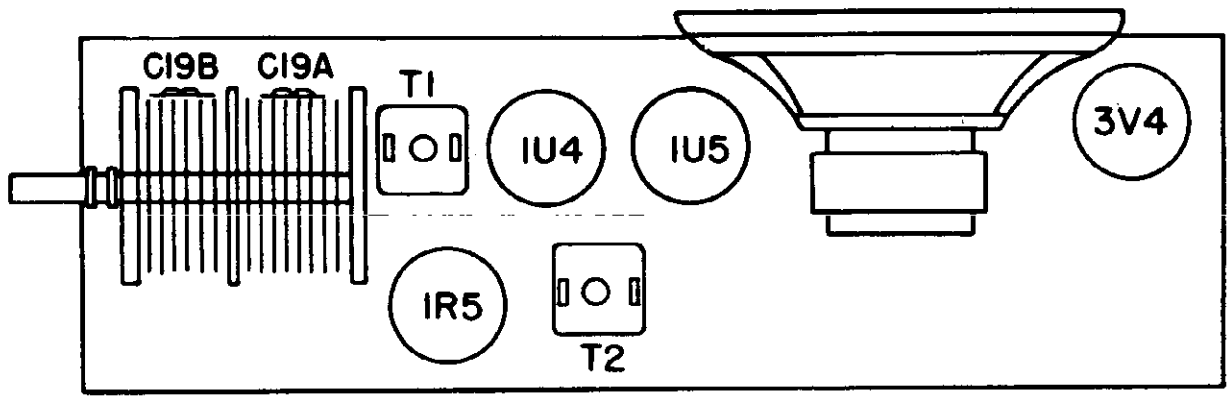


LINE VOLTAGE: 117 VOLTS AC						FULL VOLUME CONTROL — NO SIGNAL		
TUBE	Pin #1	Pin #2	Pin #3	Pin #4	Pin #5	Pin #6	Pin #7	
1R5	1.25 V	98 V	48 V	—10 V	1.25 V	—.4 V	2.5 V	
1U5	0 V	25 V	26 V	— .4 V	0 V	—.2 V	1.25 V	PORTABLE RADIO
1U4	2.5 V	98 V	97 V	0 V	2.5 V	1.3 V	3.75 V	
3V4	3.75 V	93 V	97 V	0 V	5.1 V	0 V	6.3 V	

Voltage readings made with V.T. VM from pins designated to B—.
B+ at input filter — 125V DC.
B+ at output filter — 98V DC.

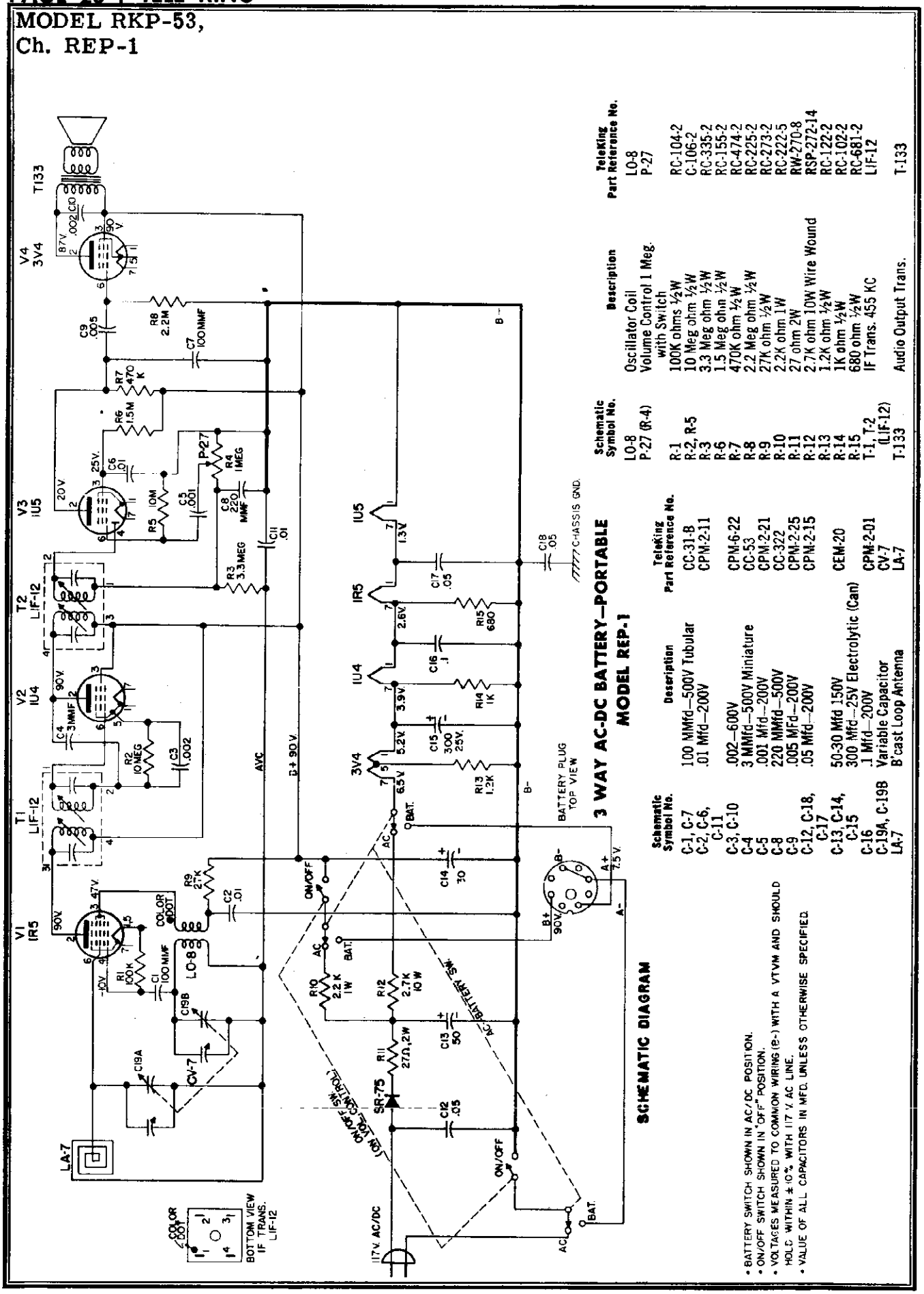
ALIGNMENT CHART

STEPS	ALIGN	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL SETTING	CONNECT GENERATOR TO	ADJUST	OUTPUT METER ACROSS VOICE COIL
1	2nd I.F.	.05	455 KC	High Freq. End	Pin 6—1R5 Converter Grid	T-2 Double Slug	Peak for Max.
2	1st I.F.	.05	455 KC	High Freq. End	Pin 6—1R5 Converter Grid	T-1 Double Slug	Peak for Max.
3	Osc.	.05	1650 KC	High Freq. End	Pin 6—1R5 Converter Grid	C19B Osc. Tuner Trim	Peak for Max.
4	Loop Ant.	Radiate into Loop Ant.	1500 KC	1500 KC	Several Turns Around Loop	C19A Loop Tuner Trim	Peak for Max.
5	Repeat Steps 3 and 4						



TOP VIEW

MODEL RKP-53,
Ch. REP-1



3 WAY AC-DC BATTERY—PORTABLE
MODEL REP-1

SCHEMATIC DIAGRAM

Schematic Symbol No.	Description	TeleKing Part Reference No.
C-1, C-7	100 MMfd—500V Tubular	CC-31-B
C-2, C-6, C-11	.01 Mfd—200V	CPM-2-11
C-3, C-10	.002—600V	CPM-6-22
C-4	3 MMfd—500V Miniature	CC-53
C-5	.001 Mfd—200V	CPM-2-21
C-8	220 MMfd—500V	CC-322
C-9	.005 Mfd—200V	CPM-2-25
C-12, C-18, C-17	.05 Mfd—200V	CPM-2-15
C-13, C-14, C-15	50-30 Mfd 150V 300 Mfd—25V Electrolytic (Can) .1 Mfd—200V	CEM-20 CPM-2-01
C-16	Variable Capacitor	CV-7
C-19A, C-19B	B'cast Loop Antenna	LA-7

Schematic Symbol No.	Description	TeleKing Part Reference No.
LO-8	Oscillator Coil	LO-8
P-27 (R-4)	Volume Control 1 Meg. with Switch	P-27
R-1	100K ohms ½W	RC-104-2
R-2, R-5	10 Meg ohm ½W	C-106-2
R-3	3.3 Meg ohm ½W	RC-335-2
R-6	1.5 Meg ohm ½W	RC-155-2
R-7	470K ohm ½W	RC-474-2
R-8	2.2 Meg ohm ½W	RC-225-2
R-9	27K ohm ½W	RC-273-2
R-10	2.2K ohm 1W	RC-222-5
R-11	27 ohm 2W	RW-270-8
R-12	2.7K ohm 10W Wire Wound	RSP-272-14
R-13	1.2K ohm ½W	RC-122-2
R-14	1K ohm ½W	RC-102-2
R-15	680 ohm ½W	RC-681-2
T-1, T-2 (LIF-12)	IF Trans. 455 KC	LIF-12
T-133	Audio Output Trans.	T-133

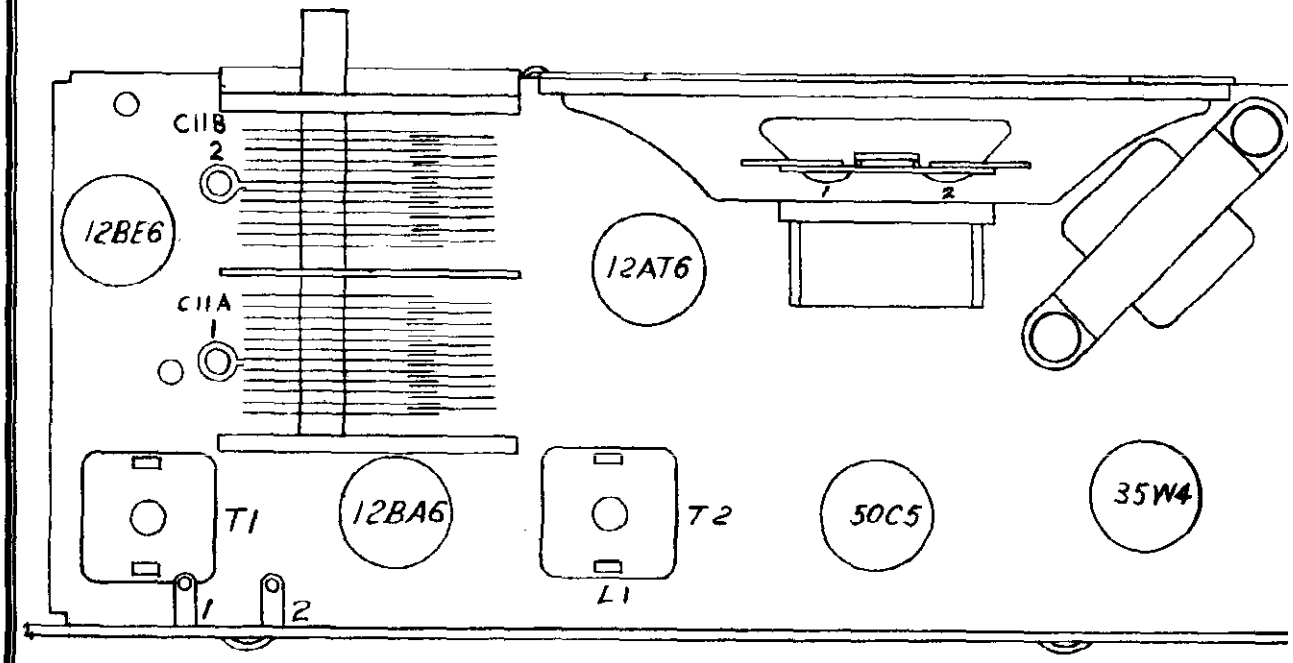
- BATTERY SWITCH SHOWN IN AC/DC POSITION.
- ON/OFF SWITCH SHOWN IN "OFF" POSITION.
- VOLTAGES MEASURED TO COMMON WIRING (B-) WITH A VTVM AND SHOULD HOLD WITHIN ± 10% WITH 117 V. AC LINE.
- VALUE OF ALL CAPACITORS IN MFD. UNLESS OTHERWISE SPECIFIED.

LINE VOLTAGE: 120 VOLTS AC					FULL VOLUME CONTROL — NO SIGNAL			
TUBE	PINS							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	
35W4	—	—	88 AC	120 AC	120 AC	—	125 V	
50C5	6.4 V	0 V	36 AC	88 AC	0 V	98 V	115 V	
12BE6	—7.4 V	0 V	24 AC	36 AC	98 V	98 V	—.8 V	"5 Tube Radio"
12BA6	—1 V	0 V	24 AC	12 AC	96 V	98 V	1.3 V	
12AT6	—1 V	0 V	0 AC	12 AC	—1.2 V	—.9 V	52 V	

Voltage readings made with V.T.VM from pins designated to B—.

ALIGNMENT CHART

STEPS	ALIGN	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL SETTING	CONNECT GENERATOR TO	ADJUST	OUTPUT METER ACROSS VOICE C
1	2nd I.F.	.05	455 KC	High Freq. End	Pin 7—12BE6 Converter Grid	T-2 Double Slug	Peak for Max
2	1st I.F.	.05	455 KC	High Freq. End	Pin 7—12BE6 Converter Grid	T-1 Double Slug	Peak for Max
3	Osc.	.05	1650 KC	High Freq. End	Pin 7—12BE6 Converter Grid	C11B Osc. Tuner Trim	Peak for Max
4	Loop Ant.	Radiate into Loop Ant.	1500 KC	1500 KC	Several Turns Around Loop	C11A Loop Tuner Trim	Peak for Max
5	Repeat Steps 3 and 4						



TOP VIEW

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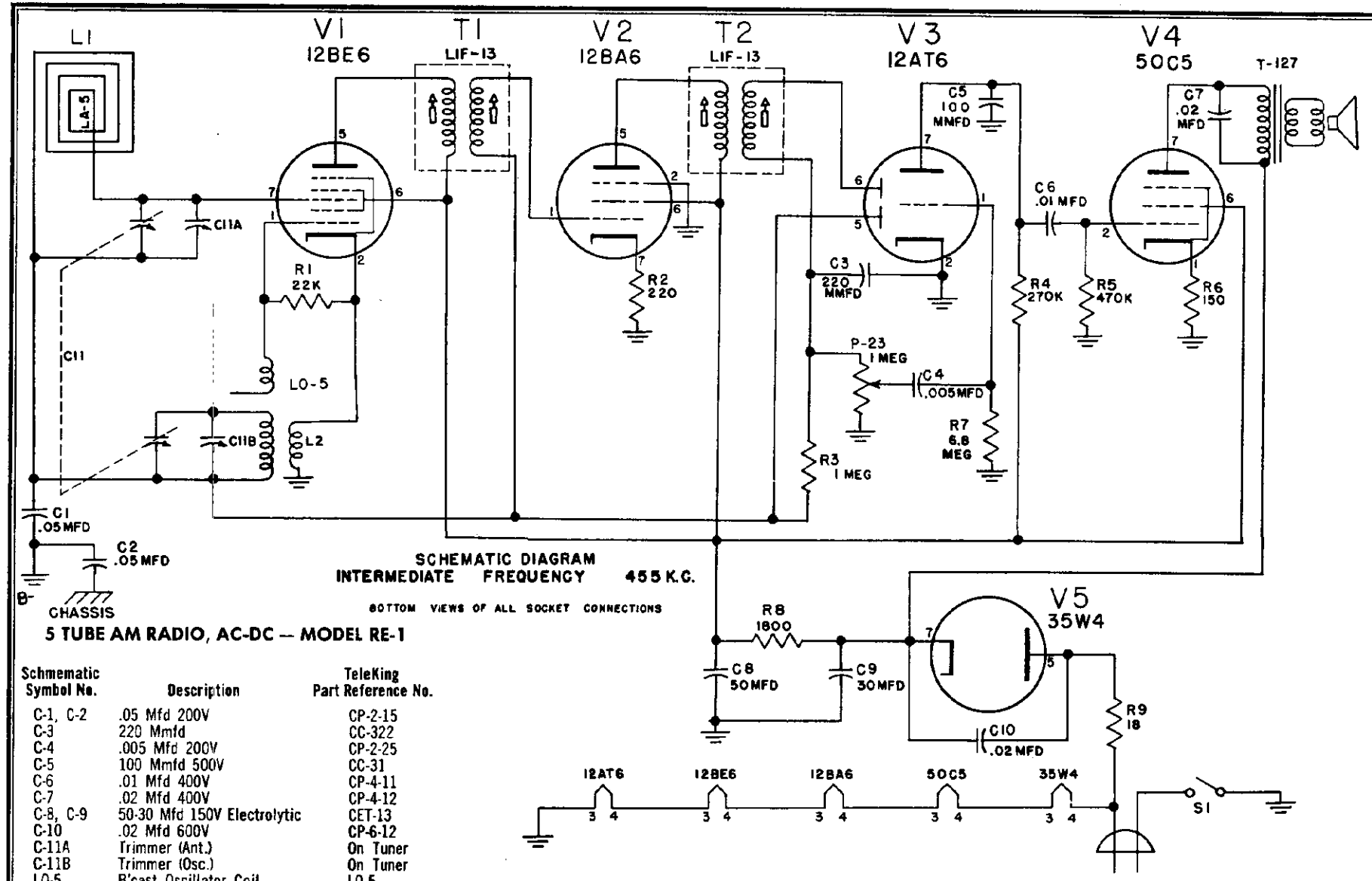


SCHEMATIC DIAGRAM
INTERMEDIATE FREQUENCY 455 K.C.

BOTTOM VIEWS OF ALL SOCKET CONNECTIONS

5 TUBE AM RADIO, AC-DC — MODEL RE-1

Schmematic Symbol No.	Description	TeleKing Part Reference No.
C-1, C-2	.05 Mfd 200V	CP-2-15
C-3	220 Mmfd	CC-322
C-4	.005 Mfd 200V	CP-2-25
C-5	100 Mmfd 500V	CC-31
C-6	.01 Mfd 400V	CP-4-11
C-7	.02 Mfd 400V	CP-4-12
C-8, C-9	50-30 Mfd 150V Electrolytic	CET-13
C-10	.02 Mfd 600V	CP-6-12
C-11A	Trimmer (Ant.)	On Tuner
C-11B	Trimmer (Osc.)	On Tuner
LO-5	B'cast Oscillator Coil	LO-5
P-23	Volume Control w. Switch 1 Megohm ¼W	P-23
R-1	22K ohms ½W	RC-223-2
R-2	220 ohms ½W	RC-221-2
R-3	1 Megohm ½W	RC-105-1
R-4	270K ohms ½W	RC-274-1
R-5	470K ohms ½W	RC-474-1
R-6	150 ohms ½W	RC-151-2
R-7	6.8 Megohms ½W	RC-685-1
R-8	1800 ohms 1W	RC-182-4
R-9	18 ohms ½W	RC-180-2

Misc. Parts

CV-4	2 Gang Variable Condenser	CV-4
LIF-13 (2)	IF Trans—455KC	LIF-13
PMS-7	4" Round PM Speaker	PMS-7
LA-5	B'cast Antenna Loop	LA-5
T-127	Audio Output Trans.	T-127

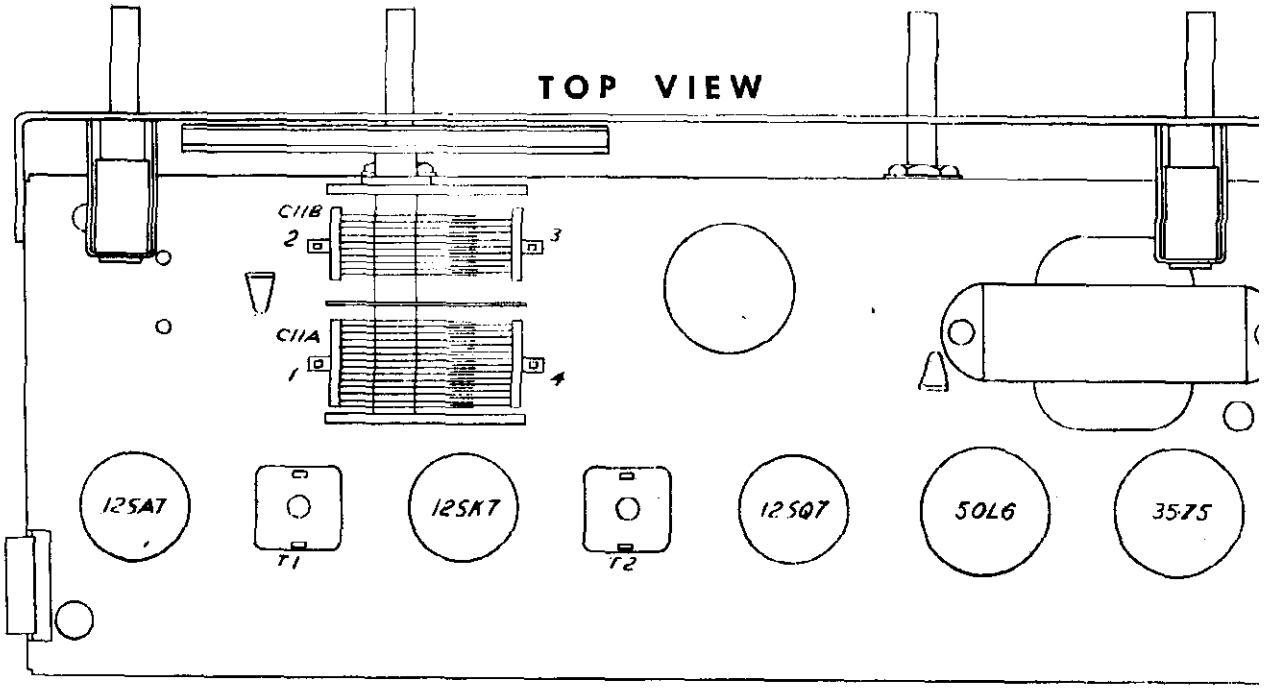
LINE VOLTAGE: 117 VOLTS AC — FULL VOLUME CONTROL — NO SIGNAL

TUBE COMPLEMENT	PINS							
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
35Z5	—	117 AC	—	—	—	117 AC	90 AC	120 V
50L6	—	90 AC	110 V	95 V	0 V	—	38 AC	7 V
12SQ7	—	—.8 V	0 V	—.7 V	—.7 V	52 V	12.5 AC	0 AC
12SK7	—	38 AC	0 V	—.8 V	0 V	96 V	25 AC	96 V
12SA7	—	25 AC	96 V	96 V	—.7 V	0 V	12.5 AC	—.8 V

Voltage readings made with V.T.VM from pins designated to B—

ALIGNMENT CHART

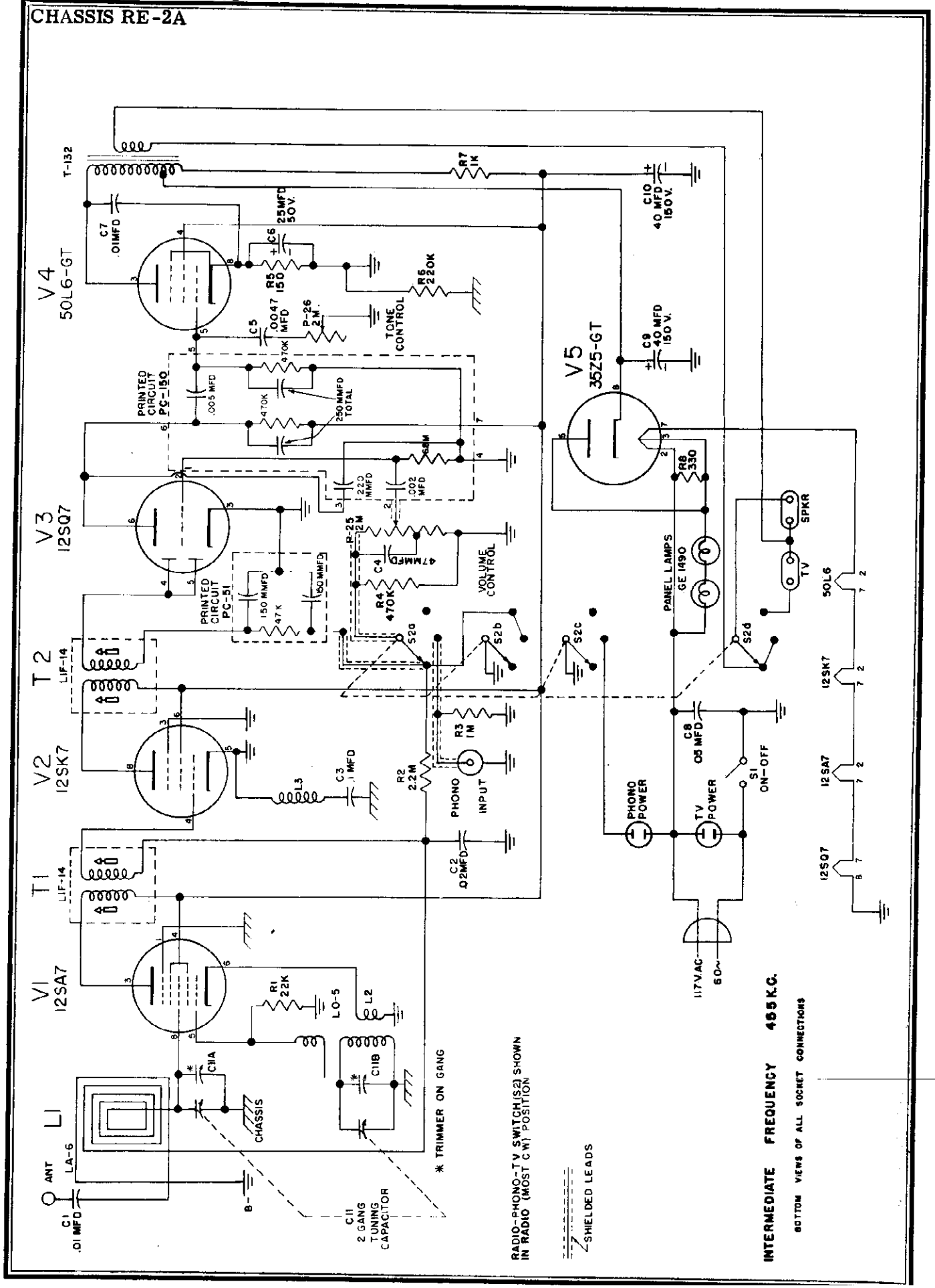
STEPS	ALIGN	DUMMY ANTENNA	GENERATOR FREQUENCY	DIAL SETTING	CONNECT GENERATOR TO	ADJUST	OUTPUT METER ACROSS VOICE C
1	2nd I.F.	.05	455 KC	High Freq. End	Pin 8—12SA7 Converter Grid	T-2 Double Slug	Peak for Max
2	1st I.F.	.05	455 KC	High Freq. End	Pin 8—12SA7 Converter Grid	T-1 Double Slug	Peak for Max
3	Osc.	.05	1650 KC	High Freq. End	Pin 8—12SA7 Converter Grid	C11B Osc. Tuner Trim	Peak for Max
4	Loop Ant.	Radiate into Loop Ant.	1500 KC	1500 KC	Several Turns Around Loop	C11A Loop Tuner Trim	Peak for Max
5	Repeat Steps 3 and 4						



5 TUBE AM RADIO MODEL RE-2A USED IN COMBINATIONS

Schematic Symbol No.	Description	TeleKing Part Reference No.
C-1, C-7	.01 Mfd 400V	CP-4-11
C-2	.02 Mfd 400V	CP-4-12
C-3	.1 Mfd 600V	CP-6-01
C-4	47 Mfd 500V	CM-447
C-5	.0047 Mfd 500V	CEF-17
C-6	25 Mfd 50V Electrolytic	CP-4-427
C-8	.05 Mfd 600V	CP-6-15
C-9, C-10	40 40 Mfd 150V Electrolytic	CEM-19
C-11	2-Gang Variable Cond. w. Drum	CV-5
C-11a, C-11b	Trimmer Condenser on Gang	C-11a, C-11b
L-1	B'cast Loop Antenna	LA-6
L-2	B'cast Oscillator Coil	LO-5
PC-51	Printed Circuit	CRP-6
PC-150	Printed Circuit	CRP-5
PL-3	Pilot Lamp GE 1490	PL-3
P-25	Volume Control 2 Megohms	P-25
P-26	Tone Control w. Switch 2 Megohms	P-26
R-1	22K ohms ½W	RC-223-2
R-2	2.2 Megohms ½W	RC-225-2
R-3	1 Megohm ½W	RC-105-2
R-4	470K ohms ½W	RC-474-2
R-5	150 ohms ½W	RC-151-1
R-6	220K ohms ½W	RC-224-2
R-7	1000 ohms 2W	RC-102-7
R-8	330 ohms 1W	RC-331-4
T-1, T-2	I.F. Transformer	LIF-14
T-132	Audio Output Transformer	T-132

CHASSIS RE-2A



ALIGNMENT AND SERVICE DATA

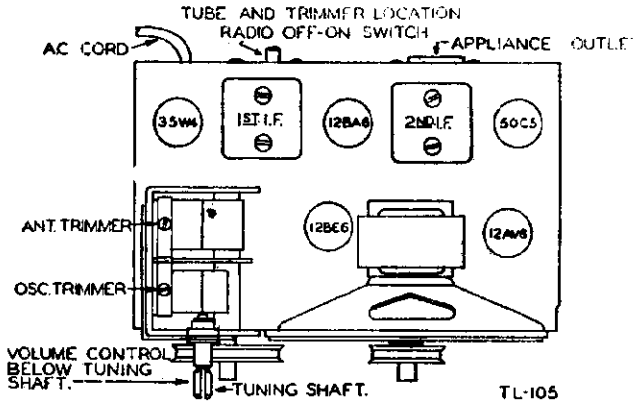
Remove chassis from cabinet for alignment.

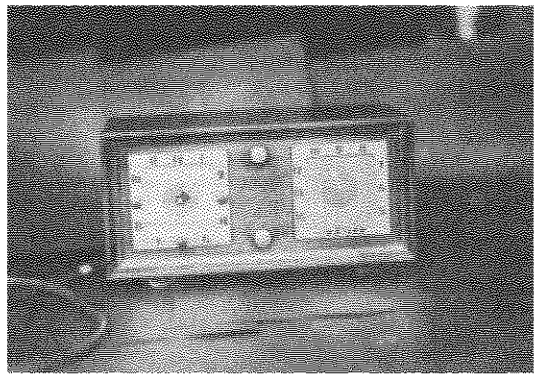
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD condenser. The ground lead from the generator must be connected to the metal frame of the gang condenser. Turn the gang condenser to complete minimum capacity. Adjust the generator to 455KC and adjust the trimmers of the 1st and 2nd I.F. transformers until a maximum reading is noted on the output meter.

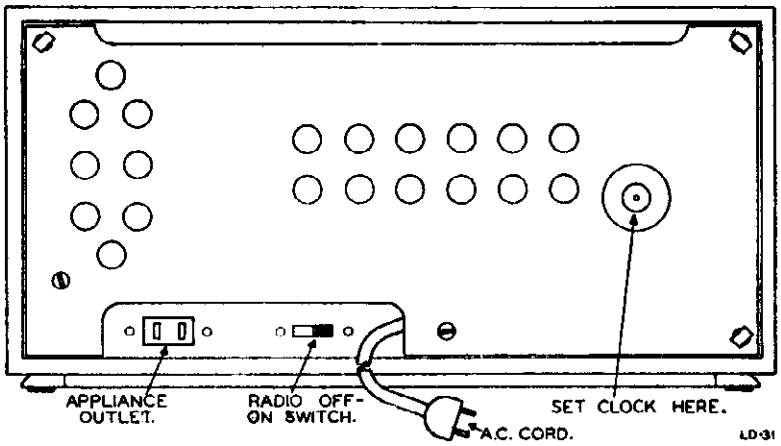
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. The OSC. trimmer is located on the front of the chassis between the volume and tuning controls. Adjust this trimmer until the 1650 KC signal is tuned in.

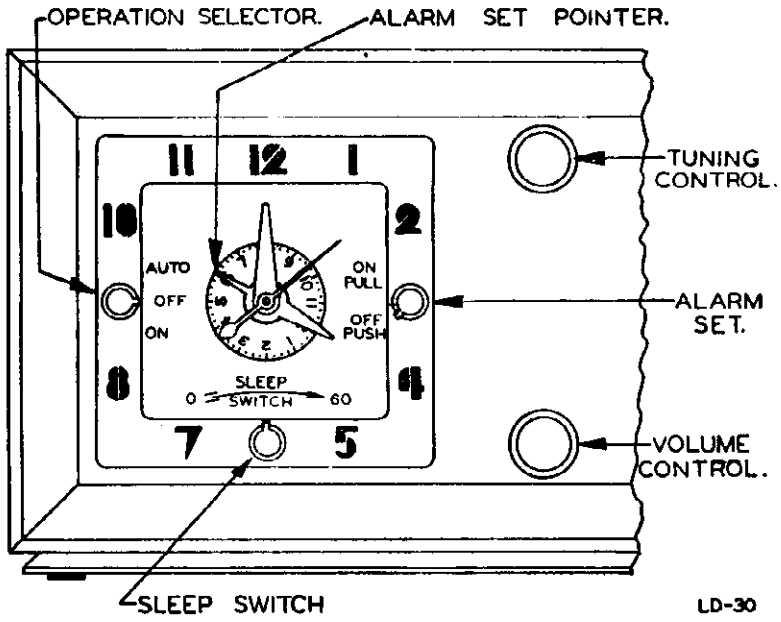
THIRD STEP: Remove the hot lead of the generator from the ANT section of the gang condenser. Adjust the Signal Generator to 1400 KC. Rotate the tuning control until this signal is tuned in. The ANT trimmer is located on the back of the loop antenna. Adjust this trimmer until a maximum reading is noted on the output meter. No further adjustment should be necessary, unless the set has been damaged, as the coils and condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



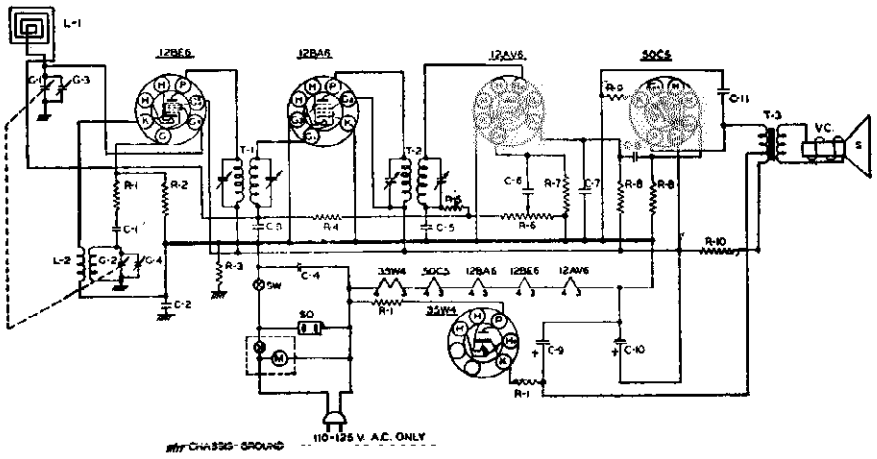


MODEL 5170





MODEL-5170 SD-109



PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
IR-17	R-1	33Ω RESISTOR 1/2W. 20%	MC-4	C-1	50MMFD. MICA CONDENSER.		S	4" P.M. SPEAKER
IR-9	R-2	22M Ω RESISTOR 1/2W. 20%	PC-8	C-2	.1MFD. CONDENSER 400 V.	SPK-19	V.C.	VOICE COIL
IR-20	R-3	220M Ω RESISTOR 1/2W. 20%	PC-2	C-3	.05MFD. CONDENSER 200 V.		T-3	OUTPUT TRANSFORMER
IR-23	R-4	3.3MEG. RESISTOR 1/2W. 20%	PC-5	C-4	.05MFD. CONDENSER 400 V.	LL-28	L-1	LOOP ANT
IR-10	R-5	.47M Ω RESISTOR 1/2W. 20%		C-5	220MMFD.	LO-14	L-2	OSC. COIL
VC-37	R-6	1 MEG. VOLUME CONTROL	MC-8	C-6	.002MFD.	CK-1	M	ELECTRIC CLOCK
IR-13	R-7	2.2MEG. RESISTOR 1/2W. 20%		C-7	220MMFD.	SO-37	SO	APPLIANCE SOCKET
IR-11	R-8	470M Ω RESISTOR 1/2W. 20%		C-8	.005MFD.	SW-9	SW	SPST. RADIO ON-OFF SWITCH
IR-14	R-9	150Ω RESISTOR 1/2W. 20%	EC-24	C-9	50 MFD. ELECTROLYTIC 150 W.D.C.			
IR-42	R-10	1000Ω RESISTOR 1 W. 10%		C-10	50 MFD.			
			PC-10	C-11	.005MFD. CONDENSER 400 V.			
L1-6	T-1	INPUT I.F. TRANSFORMER	GC-58	G-1	TUNING CONDENSER			
L1-7	T-2	OUTPUT I.F. TRANSFORMER		G-2				

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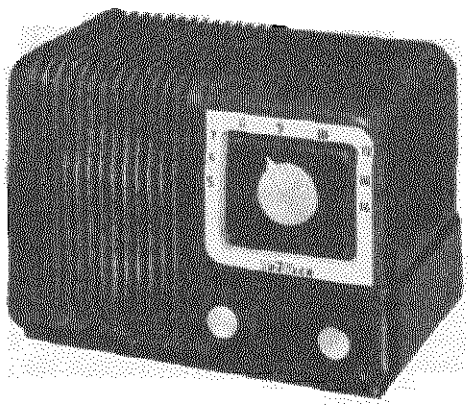


Operating Instructions

POWER SOURCES: This receiver may be operated on alternating current (AC) of 110 to 125 volts at 60 cycles or on direct current (DC) of 110 to 125 volts. When used on DC, if the tubes light up but set does not play, reverse the cord plug in the power outlet.

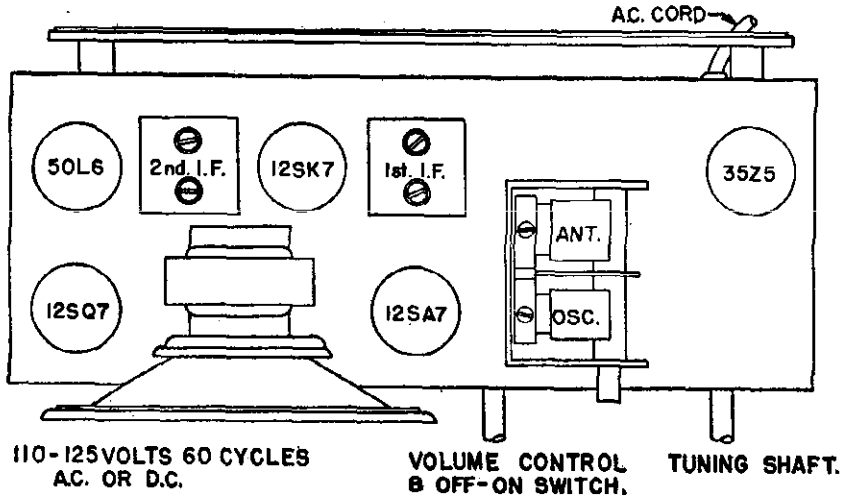
CAUTION: Always predetermine voltage of power source. Never try to plug this receiver into a 220 volt line, as this will cause serious damage.

INSTALLATION: Unwind the power cord and plug into a convenient outlet. This receiver is equipped with a sensitive loop antenna and under ordinary conditions no external antenna would be required.

Due to the directional qualities of the loop antenna the reception of some stations may be improved by placing the receiver in different positions.

CONTROLS: Two knobs control the operation of this receiver. The left hand knob is used to turn set off and on. It is also used to control volume. Rotate knob to your right in a clockwise direction and a click will be heard. This turns receiver on. Allow about 30 seconds for tubes to heat up, then continue to rotate knob to your right to increase volume. The right hand knob is the station selector. Rotate this knob to right or left to locate your station. By mentally adding a zero to the numbers on the dial, the result will be read directly in kilocycles. To turn set off, turn left hand knob to your left in a counterclockwise direction as far as it will go and a click will be heard. The power switch will then be turned off.

MODEL-5171
TUBE AND TRIMMER LOCATION



MODEL 5171

ALIGNMENT AND SERVICE DATA

Remove chassis from cabinet for alignment.

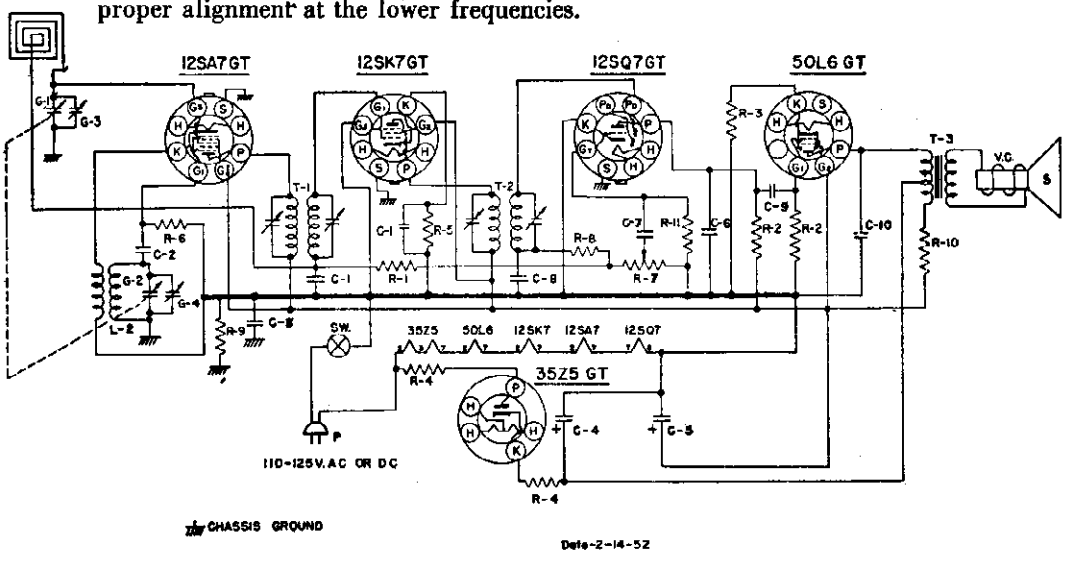
A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser through the .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the trimmers of the first and second I. F. transformers until a maximum reading is noted on the output meter.

SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser. Loosely couple the generator to the receiver loop by using a complete turn of wire. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer until a maximum signal is noted on the output meter. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



PART NO.		DESCRIPTION	PART NO.		DESCRIPTION	PART NO.		DESCRIPTION
1R-23	R-1	3.3 MEG. RESISTOR 1/2W 20%		G-3	ANT. TRIMMER CONDENSER.	LL-28	L-1	LOOP ANT.
1R-11	R-2	470M RESISTOR 1/2W 20%		G-4	OSC. TRIMMER CONDENSER	LO-13	L-2	OSC. COIL.
1R-14	R-3	150 RESISTOR 1/2 W 20%	PC-2	C-1	.05 MFD. CONDENSER 200 V.	LI-6	T-1	INPUT I.F. TRANSFORMER
1R-17	R-4	33 RESISTOR 1/2 W 20%	MC-4	C-2	50 MMFD. MICA CONDENSER.	LI-7	T-2	OUTPUT I.F. TRANSFORMER
1R-21	R-5	330 RESISTOR 1/2W 20%	PC-9	C-3	.1 MFD. CONDENSER 400 V.		T-3	SPK. OUTPUT TRANSFORMER
1R-9	R-6	22M RESISTOR 1/2W 20%	EC-24	C-4	50MFD. ELECTROLYTIC 150 V.	SPK-19	V.C.	VOICE COIL
VC-35	R-7	1 MEG. VOLUME CONTROL.		C-5	50MFD.		S	P.M. SPEAKER
1R-10	R-8	47M RESISTOR 1/2 W 20%		C-6	220MMFD.	CO-1	P	LINE CORD.
1R-20	R-9	220M RESISTOR 1/2 W 20%		C-7	.002MFD.	SW	SW	AC. SWITCH ON VOLUME CONTROL
1R-42	R-10	1000 RESISTOR 1W 20%	MC-8	C-8	220MMFD. HERLEC			
1R-13	R-11	2.2 MEG. RESISTOR 1/2 20%		C-9	.005MFD.			
GC-58	G-1, G-2	GANG CONDENSER.	PC-10	C-10	.005MFD. CONDENSER 400V.			

FREQUENCY RANGE: 535 KC. TO 1630 KC.

OPERATING INSTRUCTIONS

POWER SOURCES: This receiver operates from its own enclosed batteries and requires no external power source.

CONTROLS: Two controls are provided for the operation of this receiver and are located on the left and right ends of the front panel of the cabinet.

VOLUME CONTROL AND "OFF-ON SWITCH": The right hand knob is the volume control and is also used to turn the receiver "OFF" or "ON". Rotate this knob upward and a click will be heard, which indicates that the receiver is "ON". Turn this knob further upward to increase volume, or downward to decrease volume.

STATION SELECTOR: The left hand knob is the station selector or tuning control. Rotate this knob upward or downward to select your desired station. By mentally adding zeroes to the figures on the dial the result will be read directly in kilocycles i.e., 14 plus 00 equals 1400 KC, or 65 plus 0 equals 650 KC.

Rotate the tuning knob until the proper station has been selected, then adjust the volume control to the desired level.

ANTENNA: This receiver is equipped with a sensitive Ferramic Rod antenna and requires no external antenna wire. However, due to the directional qualities of the antenna, some stations may appear to be weak in reception. This condition may be remedied by rotating, or changing the position, of the receiver.

CAUTION: When you have finished listening to the receiver, turn the volume control all the way downward until a click is heard and the word "OFF" appears in the window opening of the cabinet. This will indicate that the switch is turned off. If the switch is left on for long periods of time the batteries will be used up and the receiver will not play. Remember that conservative use of the receiver will give many hours of enjoyment and economical operation.

BATTERY SERVICING

(See Fig. No. 1)

To replace the batteries in this receiver:

Remove the back by pressing downward along the top of the back in the vicinity of the metal handle loops, and at the same time, pull backward on the cabinet back, to disengage the locking catches along the inside edge of the back.

To replace the "A" batteries, lift the old batteries straight up. When inserting fresh batteries, make sure that the metal cap on the top of the batteries face outward toward the ends of the cabinet. (See Fig. No. 1) Place the metal cap against the end connectors, then push the batteries straight down into place.

To replace the "B" battery, disconnect the snap fastener connector. Replace with a fresh battery and snap the connector into place. Replace the battery in the cabinet as shown in Fig. No. 1, making sure that the connector end faces the speaker.

After the batteries have been installed, replace the back, making sure that the catches on the bottom edge of the back fit into the slots along the bottom edge of the cabinet and then swing the back up as if it were on a hinge until it begins to enter the cabinet at the top. Then push downward along the top edge of the back, at the same time pressing it inward, to reingage the top catches.

CAUTION: If the batteries in the receiver wear out from use and the receiver refuses to operate, make sure that the volume control is turned all the way downward, in "OFF" position, until the batteries can be replaced. If the switch is left in the "ON" position. this will cause the battery cells to burst and they will leak into the receiver which may ruin the component parts.

BATTERY LIFE AND REPLACEMENT

The specified batteries are especially designed for this receiver and will yield balanced life under normal conditions of service.

To insure maximum service—all batteries should be replaced at the same time.

Types required: 2-1½ Volt "A" 1-67½ Volt "B".

Manufacturers Types and Numbers

SIZE "G"-"A" BATTERY

EVEREADY	NO. 964
BURGESS	NO. 21R
RCA	NO. VS236
RAY-O-VAC	NO. 8R

67½ VOLT "B" BATTERY

EVEREADY	NO. 477
BURGESS	NO. P45
RCA	NO. VS216
RAY-O-VAC	NO. 946

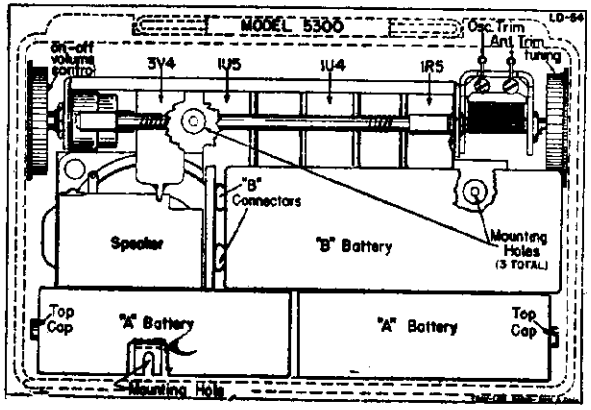


Fig. 1

MODEL 5300

ALIGNMENT AND SERVICE DATA

Refer to Fig. No. 1 for location of mounting screws, and remove the chassis from the cabinet for alignment. A signal generator is required having the following frequencies: 455 KC, 1400 KC, and 1630 KC. An output meter should be connected across the speaker.

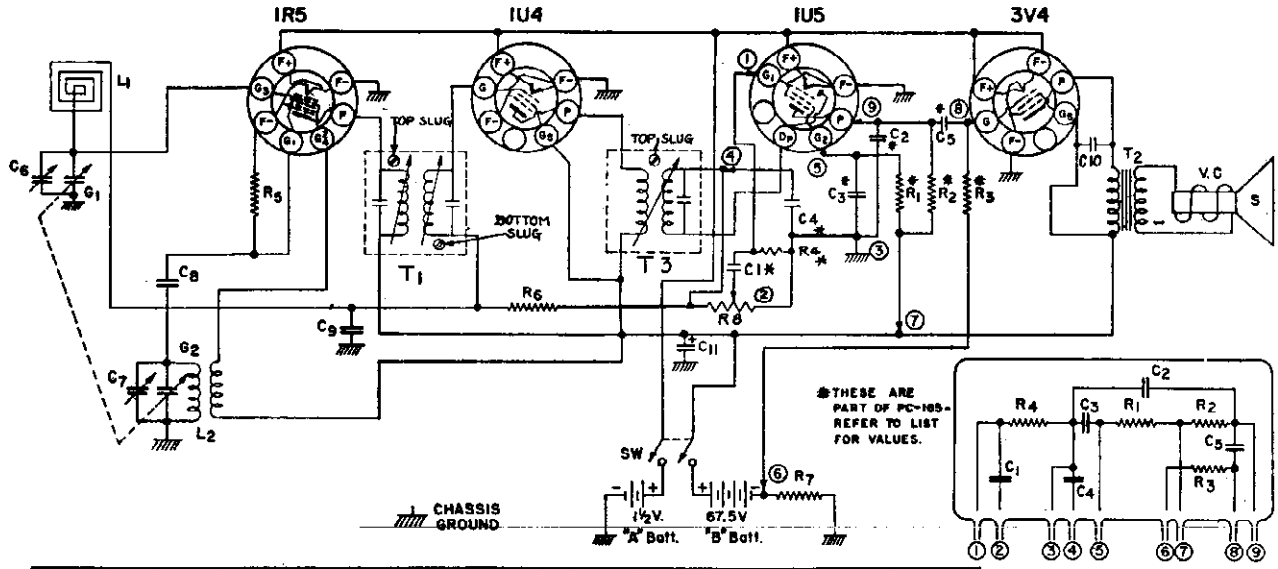
FIRST STEP: Connect the hot lead from the generator to the ANT. section of the gang condenser, through a .1 MFD. condenser. The ground lead from the generator may be connected to any spot on the metal chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans. The IF adjustments are made in the top and in the bottom of the can nearest to the gang condenser. The remaining IF can, farthest from the gang condenser, is adjusted only from the top. Adjust the cores until a maximum reading is noted on the output meter.

The volume control of the receiver should be turned to maximum during the IF and all subsequent alignment and the generator output as low as possible to prevent the AVC from working and giving false readings.

SECOND STEP: With the leads from the generator still connected as in IF alignment, adjust the generator to 1630 KC. Make sure that the gang condenser is turned to complete minimum capacity. Adjust the generator to 1630 KC. and adjust the oscillator trimmer of the receiver until the signal is tuned in. Next, turn the gang condenser to complete maximum capacity. Adjust the generator to 535 KC., then adjust the iron core in the end of the oscillator coil until the signal is tuned in. It may be well to recheck the 1630 KC. setting to make sure that the adjustment of the iron core has not shifted the frequency.

THIRD STEP: Remove the generator leads from the gang condenser and the chassis. Loosely couple the generator to the antenna by laying the hot generator lead near the antenna rod. Set the generator at 1400 KC. and tune in the 1400 KC. signal on the receiver. Adjust the ANT. trimmer until a maximum signal is noted on the output meter.

No further adjustment should be necessary as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.



PART NO.	SYMBOL	DESCRIPTION	PART NO.	SYMBOL	DESCRIPTION
	C_6	ANTENNA TRIMMER ON GANG.	LL-30	L_1	LOOP ANTENNA.
	C_7	OSC. TRIMMER ON GANG.	LO-18	L_2	OSC. COIL.
CC-5	C_8	100 mmf. CERAMIC CONDENSER.	LI-10	T_1	I.F. TRANSFORMER INPUT.
CC-3	C_9	.005 mfd. CERAMIC CONDENSER.		SW	D.P.S.T. SWITCH (Part of Vol. control)
CC-20	C_{10}	.0015 mfd. CERAMIC CONDENSER.		T_2	SPEAKER TRANSFORMER.
EC-11	C_{11}	10 mfd. 70 V. ELECTROLYTIC COND.	SPK-21	VC	VOICE COIL.
IR-20	R_5	220 K. ±20% ½ Watt. RESISTOR.		S	P.M. SPEAKER
IR-23	R_6	3.3 meg. ±20% ½ Watt. RESISTOR.	LI-11	T_3	I.F. TRANSFORMER OUTPUT
IR-39	R_7	620 Ω ±10% ½ Watt. RESISTOR.	TU-40		RADIO TUBES IR5, IU4, IU5, 3V4
VC-40	R_8	1 meg. VOLUME CONTROL.			
GC-12	G_1 G_2	GANG CONDENSER			

PC-165 WIRING DIAGRAM

R_1 = 4.7 Meg.
R_2 = 1.0 Meg.
R_3 = 3.3 Meg.
R_4 = 10 Meg.

C_1 = 2000 mmf.
C_2 = 150 mmf.
C_3 = .01 mfd.
C_4 = 150 mmf.
C_5 = 5000 mmf.

TUNING RANGE – 540 KC to 1650 KC

POWER SOURCES: This receiver is designed for operation on either an external power source or on the enclosed batteries.

AC OR DC OPERATION: This receiver may be operated on 50 to 60 cycle, 110 to 125 volt AC current or 110 to 125 DC current.

CAUTION: Never plug this receiver into a 220 volt line as this will seriously damage the component parts which have been designed for 110 to 125 volt operation only.

To operate on AC or DC open the small door at the right in the back of the cabinet. Pull out the power cord and plug into a convenient outlet of the proper voltage and current. Follow instructions under "Controls."

To operate on the enclosed batteries, follow instructions under "Controls."

ANTENNA: This receiver is equipped with a sensitive loop antenna and requires no external antenna wire. However, due to the directional qualities of the loop some stations may appear to be weak in reception. This condition may be remedied by rotating or changing the position of the receiver.

CONTROLS: This receiver has three control knobs which are located on the front panel of the cabinet.

STATION SELECTOR KNOB: The center knob is the station selector. Rotate this knob to the right or left to select your desired station. The dial scale is calibrated in kilocycles. By mentally adding a zero to the numbers on the scale, the result will be read directly in (KC) kilocycles. (i.e., 60 plus 0 equals 600 KC or 140 plus 0 equals 1400 KC).

POWER SELECTOR SWITCH: The right hand knob is the power selector. It has three positions which are indicated on the front panel. The extreme left hand position is the "OFF" position. The small dot on this knob must point to "OFF" when the receiver is not in use. The center position is "AC-DC" and is used when it is desired to operate the receiver from a power line source. The extreme right hand position is "BATT" and is used when it is desired to operate on the enclosed batteries.

AC OPERATION: When an AC power source is used, set the power selector knob to "AC-DC" after the power cord has been plugged into a convenient outlet. The receiver is now ready for operation.

DC OPERATION: If the receiver does not operate after a few seconds, reverse the power cord plug in the outlet and it will operate properly.

BATTERY OPERATION: The power cord is not used for battery operation and may be hanked and put back in the cabinet. Set the power control knob to "BATT" and the receiver is ready for operation on the enclosed batteries.

CAUTION: When the receiver is not in use, the power selector knob must be turned to "OFF." If the knob is allowed to remain in "BATT" position, the batteries will be in use constantly. The volume control does not control the batteries and they are still in operation even though the volume control is turned all the way off.

VOLUME CONTROL: The left hand knob is the volume control. After the power selector knob has been properly set and the receiver is in operation, rotate the volume control knob to the right to increase volume or to the left to decrease volume.

BATTERY SUPPLIERS

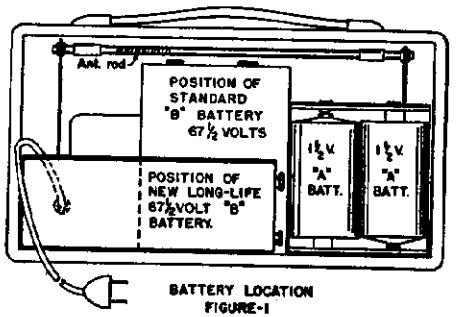
The batteries for this receiver may be purchased from any reliable dealer.

For proper operation this receiver requires two "A" batteries and one "B" battery.

The "A" batteries are size "D" flashlight cells and are made by all battery manufacturers.

The "B" battery is a 67½ volt battery, either standard size or the new long life series as made by the following manufacturers.

	Standard Type	Long Life Type
Eveready	67½ vlt. #467	#477
Burgess	67½ vlt. #XX45	#P45
RCA	67½ vlt. #VS016	#VS216
Ray-O-Vac	67½ vlt. #4367	#946



BATTERY LOCATION
FIGURE-1

BATTERY SERVICING

(See Fig. No. 1)

To replace the batteries in this receiver.

Remove the back.

To the right, looking into the rear of the cabinet is the "A" or flashlight battery container. To the left is the "B" or 67½ volt battery.

To replace the "A" batteries, pull the old batteries out of the container. Replace with fresh batteries, making sure the batteries are inserted according to the diagram on the inside of the container.

To replace the "B" battery, disconnect the snap fastener connectors. Replace with a fresh battery and snap the connectors into place. Replace the battery in the cabinet as shown in Fig. No. 1, making sure that the connector end faces the top of the cabinet.

After the batteries have been installed, replace the back, making sure that the two washers in the bottom of the back fit into the slot near the bottom edge of the cabinet.

ALIGNMENT AND SERVICE DATA

(See Fig. No. 2 For Trimmer Location)

Remove chassis from cabinet for alignment.

A Signal Generator is required having the following frequencies: 455 KC, 1400 KC, 1650 KC. An output meter should be connected across the speaker.

The volume control of the receiver should be turned to maximum during the I. F. and all subsequent alignment and the generator output as low as possible to prevent the A. V. C. from working and giving false readings.

FIRST STEP: Connect the hot lead from the generator to the ANT. Section of the gang condenser through a .1 MFD. condenser. The ground lead from the generator must be connected to "B" minus under the chassis. Turn the gang condenser to complete minimum capacity. Set the generator to 455 KC. Adjust the movable iron cores in the IF cans. These IF adjustments are made in the top and in the bottom of the can under the chassis. Adjust the cores until a maximum reading is noted on the output meter.

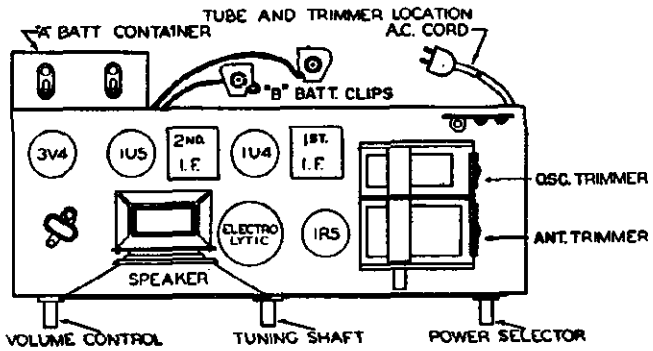
SECOND STEP: With the leads from the generator still connected in the same manner, adjust the Signal Generator to 1650 KC. Adjust the OSC. trimmer until the 1650 KC signal is tuned in. The gang condenser must be at complete minimum capacity for this adjustment.

THIRD STEP: Remove the generator leads from the gang condenser and replace the chassis in the cabinet. Loosely couple the generator to the receiver loop by making a complete turn of wire over the outside of the cabinet. With the receiver and generator set at 1400 KC, increase the generator output. Adjust the ANT. trimmer through the hole which is provided in the end of the cabinet until a maximum signal is noted on the output meter. The ANT. trimmer hole in the side of the cabinet is covered by a small plug button. Replace this button after adjustment has been made. No further adjustment should be made as the coils and gang condenser in this receiver have been specially handled at the factory to insure proper alignment at the lower frequencies.

PART NO.		DESCRIPTION
RC-20	R-1	220 M~ RESISTOR 1/2W 20 %
RC-17	R-2	82M~ RESISTOR 1/2W 20 %
RC-17	R-3	33~ RESISTOR 1/2W 20 %
		82M~ RESISTOR 1/2W 10 %
VC-10		1MEG. VOLUME CONTROL
		270~ RESISTOR 1/2W 10 %
		620~ RESISTOR 1/2W 5 %
		10MEG.
		3.3MEG.
		1MEG.
		2.2MEG.
		3600
		470~
		47~
MC-3	C-1	100 MMFD. MICA CONDENSER
PC-6	C-2	.01MFD. CONDENSER 400 W.V.
PC-6	C-3	.1 MFD. CONDENSER 400 W.V.
PC-5	C-4	.05 MFD. CONDENSER 400 W.V.
EC-6	C-5	70 MFD. 10 W.V. ELECTROLYTIC

PART NO.		DESCRIPTION
PC-3	C-6	.1 MFD. CONDENSER 200 W.V.
PC-6	C-7	.005 MFD. CONDENSER 600 W.V.
EC-14	C-8	40 MFD.
	C-9	40 MFD. 150 W.V. ELECTROLYTIC
	C-10	20 MFD.
MC-7	C-11	.1 50 MMFD.
	C-12	.002 MFD.
	C-13	.005 MFD.
	C-14	100 MFD.
	C-15	200 MFD.
PC-2	C-16	.05 MFD. CONDENSER 200 W.V.
SR-2	SR	SELENIUM RECTIFIER
CC-1		LINE CORD
SW-8	SW-1	3 POLE 3 POSITION SWITCH
	4 BATT	2 "D" SIZE FLASHLITE CELLS 3 VOLTS
	6 BATT	1-67½ VOLT BATTERY

PART NO.		DESCRIPTION
LT-5	T-1	INPUT IF TRANSFORMER
LT-5	T-2	OUTPUT IF TRANSFORMER
SPK-5	T-3	SPEAKER OUTPUT TRANSFORMER
	V.C.	VOICE COIL
	S	3½ P.M. SPEAKER
	C-4	OSC. TRIMMER
TU-39	—	IR5-1U4-1U5-3V4
GC-19 or GC-14	GANG CONDENSER	
LL-69 or LL-81	ANT. ROD	LL-82 FOR GC-12 LL-81 FOR GC-14
LO-17 or LO-19	OSC. COIL	LO-17 FOR GC-12 LO-19 FOR GC-14



MODEL-5301
FIGURE-2

TL-114