

MODEL F-107

Ten-Tube, Three-Band, A-C Superheterodyne Receiver

Electrical Specifications

FREQUENCY RANGES

"Broadcast" (A).....	530-1,720 kc	R-F ALIGNMENT FREQUENCIES	"Short Wave" (C).....	20,000 kc (osc., det., ant.)
"Medium Wave" (B).....	2,100-6,800 kc		"Medium Wave" (B).....	6,000 kc (osc.)
"Short Wave" (C).....	6,800-22,000 kc		"Broadcast" (A).....	600 kc (osc.), 1,500 kc (osc.)
Intermediate Frequency				460 kc

RADIOTRON COMPLEMENT

(1) Type-6K7.....	R-F Amplifier	(6) Type-6N7.....	Phase Inverter A-F Amplifier
(2) Type-6J7.....	Heterodyne Oscillator	(7) Type-6F6.....	Power Output
(3) Type-6L7.....	First Detector	(8) Type-6F6.....	Power Output
(4) Type-6K7.....	Intermediate Amplifier	(9) Type-6G5.....	Tuning Tube
(5) Type-6H6.....	Second Detector and A.V.C.	(10) Type-5T4.....	Full-Wave Rectifier
Pilot Lamps (4).....			Mazda No. 46, 6.3 volts, 0.25 amp.

POWER SUPPLY RATINGS

Rating A.....	105-125 volts, 50-60 cycles, 135 watts
Rating B.....	105-125 volts, 25-60 cycles, 135 watts

POWER OUTPUT

Undistorted.....	10 watts
Maximum.....	12.5 watts

LOUDSPEAKER

Type	Electrodynamic
Impedance (v.c.).....	2.2 ohms at 400 cycles

Mechanical Specifications

Height	42 $\frac{3}{8}$ inches
Width	26 inches
Depth	14 $\frac{1}{4}$ inches
Weight (net)	57 pounds
Weight (shipping)	74 pounds
Chassis Base Dimensions.....	14 $\frac{7}{8}$ inches x 9 $\frac{3}{4}$ inches x 3 $\frac{1}{4}$ inches
Over-all Chassis Height.....	9 $\frac{3}{4}$ inches
Operating Controls.....	(1) Power Switch—Tone; (2) Tuning (large inner knob), Range Selector (small outer knob, left to right "A," "B," "C"); (3) Volume
Tuning Drive Ratio.....	20 to 1

General Description

This receiver employs a ten-tube, three-band, "Sentry Box" superheterodyne circuit, the arrangement of which is shown by the Schematic Circuit Diagram. Features of design include an r-f amplifier stage, "cumulative-wound" antenna and r-f transformers for high signal-to-noise ratio; magnetite-core, i-f transformers and low-frequency oscillator tracking; automatic volume control; phonograph

terminal board; "Tuning Eye" tuning tube; plunger-type, air-dielectric trimming capacitors; aural-compensated, audio-volume control; high frequency tone control; audio phase-inverter voltage amplifier; push-pull, power-output stage; improved dust-proof electrodynamic loudspeaker; and a new index dial with short-wave stations listed by name and illuminated band and tone indicators.

Service Data

The various diagrams of this booklet contain such information as will be needed to isolate causes for defective operation if such develops. The ratings of the resistors, capacitors, coils, etc., are indicated adjacent to the symbols signifying these parts on the diagrams. Identification titles such as R1, L1, C1, etc., provide reference between the illustrations and Replacement Parts List. The coils, transformer windings, and reactors are rated in terms of d-c resistance to permit continuity checks.

Loudspeaker.—Centering of the loudspeaker is made in the usual manner with three narrow paper feelers after first removing the front dust cover. This may be removed by softening its cement with a light application of acetone, using care not to allow the acetone to flow into the air gap. The dust cover should be cemented back in place with ambroid upon completion of adjustment.

Phonograph Attachment.—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. Model R-93, Record Player should be connected as follows: Remove link between terminals 1 and 2 on terminal board. Connect green wire in Radio-Record switch cable to terminal 1, yellow to terminal 2, and shield extension to terminal 3. Tape unused red and blue leads separately. Connect a 2-conductor twisted cable between the Record Player binding posts and the screw terminals on Radio-Record switch. If additional volume is desired, connect a G.E. Stock No. 9632 transformer between the two-conductor twisted cable and the screw-terminals

on Radio-Record switch as follows: yellow and brown transformer leads and one side of twisted cable to ground screw-terminal on switch; black transformer lead to other side of twisted cable; and blue transformer lead to other screw-terminal on switch.

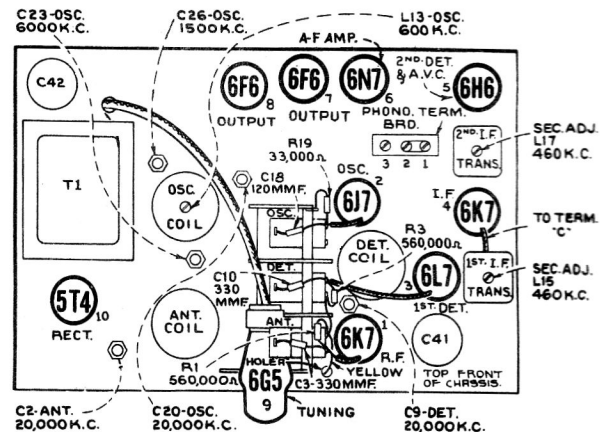


Figure 1—Radiotron, Coil, and Trimmer Locations

Alignment Procedure

Calibrate the tuning dial by adjusting main dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position; then adjust the small (vernier) pointer to "O." These are friction adjustments.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 2.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 4. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to

the receiver "G" (ground) terminal for all alignment operations. Regulate the output of the test oscillator so that minimum signal is applied to the receiver to obtain an observable output indication. This will avoid a-v-c action.

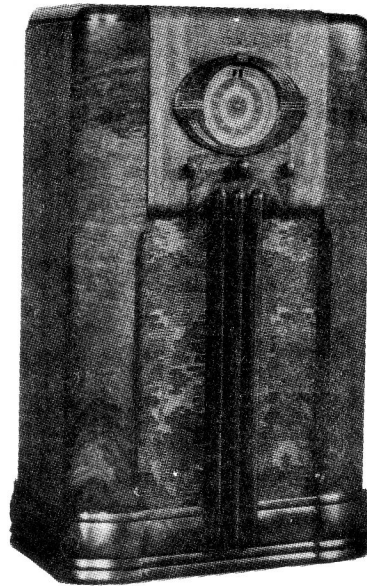
The term "Dummy antenna" means the device which must be connected between the "high" test-oscillator output and the point of connection to the receiver in order to obtain ideal alignment. "No signal, 550-750 kc" means that the receiver should be tuned to a point between 550 and 750 kc where no signal or interference is received from a station or local (heterodyne) oscillator.

Order of Alignment	Test Oscillator			Range Selector	Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting					
1	6K7 I-F Grid Cap	.001 Mfd.	460 kc	"A" Left	No Signal 550-750 kc	2nd I-F Trans.	L16 and L17	Max. (peak)
2	6L7 Det. Grid Cap	.001 Mfd.	460 kc	"A"	No Signal 550-750 kc	1st I-F Trans.	L14 and L15	Max. (peak)
3	Ant. Term.	300 Ohms	20,000 kc	"C" Right	20,000 kc	"C" Osc.	C20	Max. (peak) *
4	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Det.	C9	Max. (peak) †
5	Ant. Term.	300 Ohms	20,000 kc	"C"	20,000 kc	"C" Ant.	C2	Max. (peak) ‡
6	Ant. Term.	300 Ohms	6,000 kc	"B" Center	6,000 kc	"B" Osc.	C23	Max. (peak) *
7	Ant. Term.	200 Mmfd.	600 kc	"A" Left	600 kc	"A" L-F Osc.	L13	Max. (peak)
8	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)
9	Ant. Term.	200 Mmfd.	600 kc	"A"	600 kc	"A" L-F Osc.	L13	Max. (peak)
10	Ant. Term.	200 Mmfd.	1,500 kc	"A"	1,500 kc	"A" H-F Osc.	C26	Max. (peak)

* Use minimum capacity peak if two peaks can be obtained.

† Use maximum capacity peak if two peaks can be obtained.

‡ After this adjustment, check for image signal by shifting receiver dial to 19,080 kc.



Model F107

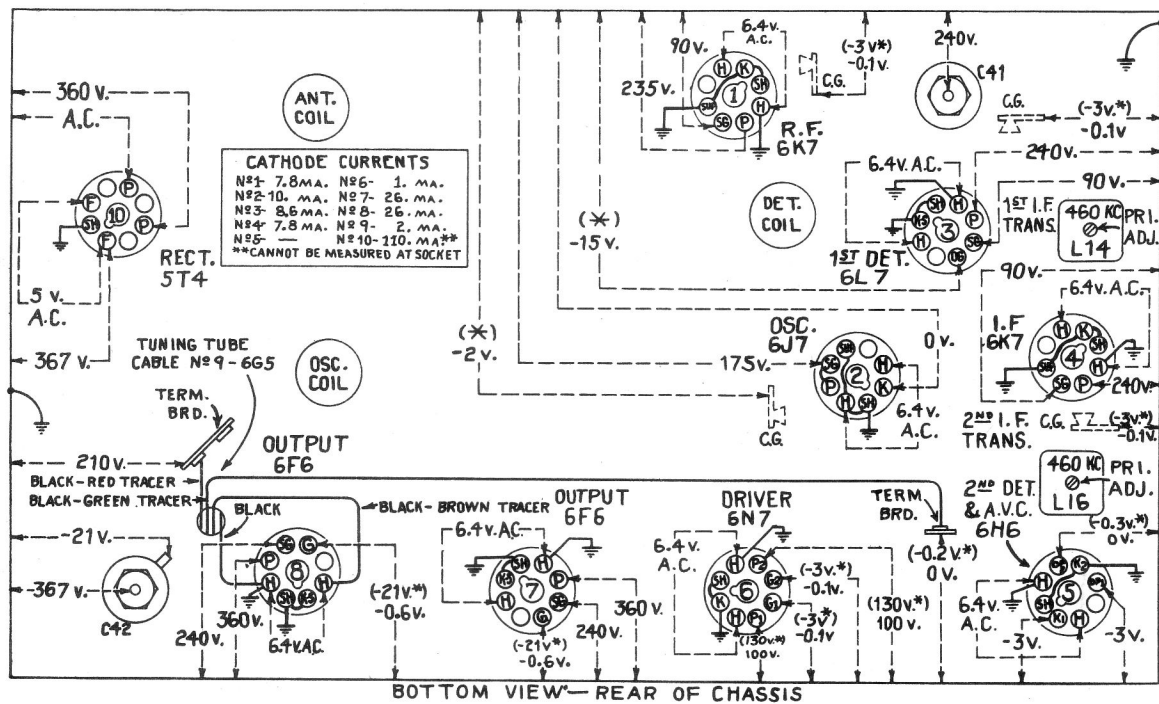


Figure 2—Radiotron Socket Voltages, Coil, and Trimmer Locations

Measured at 115 volts, 60-cycle supply—Tuned to approximately 1,000 kc ("Standard Broadcast")—
No signal being received—Volume control minimum

Note: Two voltage values are shown for some readings. The value shown in parentheses with asterisk (*) indicates operating conditions without voltmeter loading. The other value (generally lower) is the actual measured voltage and differs from the value shown in parentheses because of the additional loading of the voltmeter through the high series circuit resistance.

Voltage values as specified should hold within $\pm 20\%$ when the receiver is normally operative at its rated line voltage. To duplicate the conditions under which the voltages were measured requires a 1,000-ohm-per-volt d-c meter, having ranges of 10, 50, 250, and 500 volts. Use the nearest range above the specified measured voltage. A-c voltages were measured with a corresponding a-c meter.

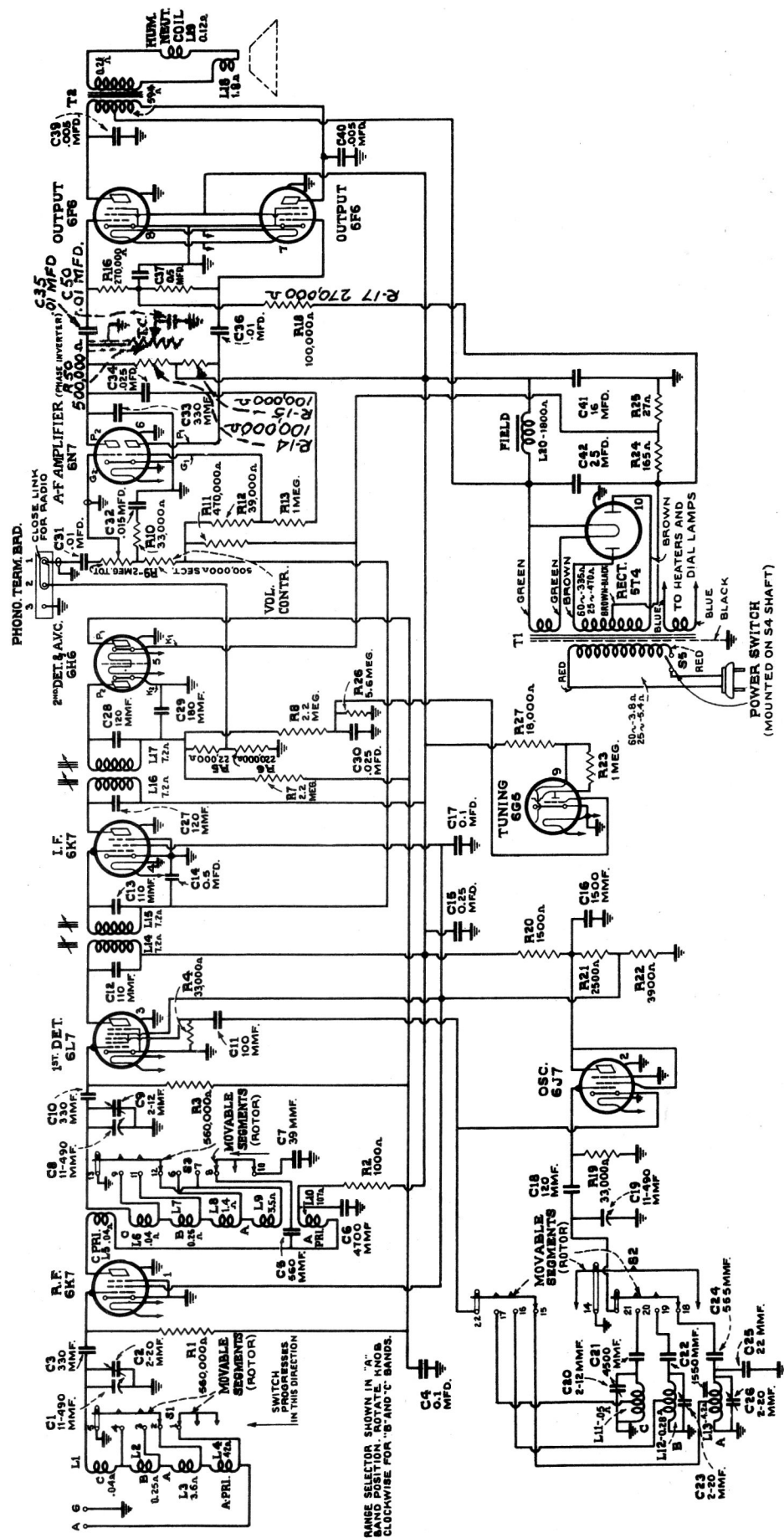


Figure 3—Schematic Circuit Diagram

Precautionary Lead Dress.—(1) Keep leads to a-c switch dressed away from antenna coil and trimmer C2. (2) Keep all filament leads twisted. (3) Keep yellow lead from term. E of 2nd i-f trans. to phono. term. board as short as possible. (4) Keep leads of C21 as short as possible. (5) Dress shielded lead from volume control to phono. term. board against side of chassis and away from 6L7 socket. (6) Yellow lead from 6J7 oscillator cathode to dummy terminal on 6L7 socket must be dressed away from chassis base and from brown filament lead. (7) All molded capacitors should be dressed so that flat side is perpendicular to chassis base. (8) Yellow lead from cathode of 6J7 socket to term. 22 of S2 must be dressed under spaghetti on 6J7 socket jumper

and pulled tight away from chassis. The following bus leads should be kept as short as possible and, when necessary, replaced only with wire having same diameter as original: (9) Lead from L11-L12-L13 to ground lance; (10) Lead from term. 13 of S3 to ground lance; (11) Lead from term. 9 of S3 to L6-L7; (12) Lead from L6 to C8; (13) Lead from C9 to C8; (14) Lead from term. 5 of S1 to ground lance; (15) Lead from L1-L2 to term. 4 of S1; (16) Lead from L1 to C1; (17) Lead from term. 21 of S2 to C19. (18) Keep filament leads dressed away from grid prongs of 6N7. (19) Keep blue and green leads from plate prongs of output tubes twisted their entire length.

REPLACEMENT PARTS

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
12038	Band-Rubber band for tuning tube-Pkg. of 10...	14078	Resistor-18,000 ohms,carbon type 1 watt (R27).....
14384	Belt-Variable condenser drive belt-Pkg. of 2..	14284	Resistor-22,000 ohms,carbon type 1/10 watt (R5).....
14517	Board-Antenna and ground terminal board.....	11300	Resistor-33,000 ohms,carbon type 1/10 watt (R19).....
12717	Board-Phonograph terminal board.....	13735	Resistor-33,000 ohms,carbon type 1/2 watt (R4,R10).....
14338	Bushing-Variable condenser mounting bushing assembly.....	11322	Resistor-39,000 ohms,carbon type 1/2 watt(R12)
14394	Cable-Tuning tube cable and socket.....	5145	Resistor-100,000 ohms,carbon type 1/2 watt (R14,R15,R18).....
11350	Cap-Grid contact cap-Pkg. of 5.....	11398	Resistor-220,000 ohms,carbon type,1/10 watt (R6).....
12607	Cap-First I.F. transformer shield top.....	11453	Resistor-270,000 ohms,carbon type,1/10 watt (R16,R17).....
12581	Cap-Second I.F. transformer shield top.....	11172	Resistor-470,000 ohms,carbon type,1/2 watt(R11)
12884	Capacitor-Adjustable trimmer (long) (C2,C23,C26).....	11397	Resistor-560,000 ohms,carbon type,1/10 watt (R1,R3).....
12714	Capacitor-Adjustable trimmer (medium)(C9,C20).	12013	Resistor- 1 megohm,carbon type,1/10 watt (R23).....
14021	Capacitor-22 Mmfd. (C25).....	13730	Resistor- 1 megohm,carbon type,1/2 watt(R13)
13545	Capacitor-22 Mmfd. (C7).....	11626	Resistor- 2.2 megohm,carbon type,1/2 watt (R8,R7).....
12720	Capacitor-100 Mmfd.(C11).....	11668	Resistor- 5.6 megohm,carbon type,1/2 watt(R26)
14262	Capacitor-110 Mmfd.(C12,C13).....	14532	Resistor-Voltage divider,comprising one 1500 ohm,one 2500 ohm,one 3900 ohm,one 27 ohm and one 165 ohm sections (R20,R21,R22,R24,R25).....
12404	Capacitor-120 Mmfd.(C27,C28).....	14350	Screw-No. 8-32x3/16 square head set screw for drum Stock No.14345 gear Stock No. 30085 and hub and arm on band indicator cable-Pkg. of 10.....
12724	Capacitor-120 Mmfd.(C18).....	14374	Shield-Antenna or R.F. coil shield.....
12406	Capacitor-180 Mmfd.(C29).....	12008	Shield-First or Second I.F. transformer shield.....
12952	Capacitor-330 Mmfd.(C3,C10,C33).....	14375	Shield-Oscillator coil shield.....
12727	Capacitor-555 Mmfd.(C24).....	14114	Socket-Dial lamp socket.....
12537	Capacitor-560 Mmfd.(C5).....	11195	Socket-5 contact 5T4 Radiotron socket.....
13762	Capacitor-1500 Mmfd.(C16).....	11196	Socket-8 contact 6F6,6H6,6K7,6L7,6N7,or 6J7 Radiotron socket.....
12729	Capacitor-1550 Mmfd.(C22).....	4982	Spring-Retaining spring for knob Stock No.14359-Pkg. of 10.....
12728	Capacitor-4500 Mmfd.(C21).....	14270	Spring-Retaining spring for knob Stock No.14269.....
12897	Capacitor-4700 Mmfd.(C6).....	12907	Spring-Tension spring for indicator drum gear Stock No.30085.....
4838	Capacitor-.005 Mfd.(C39,C40).....	14342	Spring-Tension spring for idler Stock No.14341-Pkg. of 10.....
13138	Capacitor-.01 Mfd. (C31,C35,C36).....	12007	Spring-Retaining spring for core Stock No.12006 and No.12800-Pkg. of 10.....
14393	Capacitor-.01 Mfd. (C50).....	14515	Switch-Range switch (S1,S2,S3).....
11315	Capacitor-.015 Mfd.(C32).....	S-1794	Tone control and power switch (S5,R50).....
4870	Capacitor-.025 Mfd.(C30,C34).....	14376	Transformer-First I.F. transformer (L14,L15,C12,C13).....
4839	Capacitor-0.1 Mfd. (C4,C17).....	14283	Transformer-Second I.F. transformer (L16,L17,C27,C28,C29,R5,R6).....
12484	Capacitor-0.25 Mfd.(C15).....	11211	Transformer-Power transformer 105-125 volts-50-60 cycle (T1).....
12741	Capacitor-0.5 Mfd. (C14,C37).....	11212	Transformer-Power transformer 105-125 volts,25-60 cycle (T1).....
5212	Capacitor-16 Mfd. (C41).....	14335	Volume Control (R9).....
14531	Capacitor-25 Mfd. (C42).....	14379	Washer-Felt washer for indicator pointer-Pkg. of 10.....
14372	Coil-Antenna coil and shield(L1,L2,L3,L4)....	S-1796	Tone indicator Jewel (Green).....
14516	Coil-Oscillator coil and shield,(L11,L12,L13).	S-1797	Tone indicator Jewel (Brown).....
14414	Coil-R.F.coil and shield (L5,L6,L7,L8,L9,L10).	S-1798	Tone indicator Jewel (Red).....
14513	Condenser-3 gang variable tuning condenser (C1,C8,C19).....	REPRODUCER ASSEMBLIES	
5040	Connector-4-contact female connector for reproducer cable.....	13866	Cap-Dust cap for cone center-Pkg. of 5.....
12006	Core-Adjustable core and stud for transformer Stock No. 14376 and Stock No. 14283.....	11234	Coil-Field coil (L20).....
12800	Core-Adjustable core and stud for coil Stock No. 14516.....	11469	Coil-Hum neutralizing coil (L19).....
S-1792	Dial-Station selector dial scale complete with tuning tube escutcheon.....	12667	Cone-Reproducer cone and dust cap (L18)....
14514	Drive-Variable condenser vernier drive pinion gear and shaft.....	5039	Plug-4 contact male plug for reproducer....
14345	Drum-Variable condenser drive belt drum complete with set screws.....	14535	Reproducer-Reproducer complete.....
S-1795	Escutcheon-Tuning tube escutcheon.....	14534	Transformer-Output transformer (T2).....
S-1789	Escutcheon-Station selector escutcheon and crystal complete.....	14357	Washer-Spring washer to hold field coil-Pkg. of 5.....
11982	Fastener-Dial scale fastener-Pkg. of 25.....		
30085	Gear-Indicator drive gear and hub and pointer stem and gear.....		
14341	Idler-Station selector drive belt idler.....		
S-1790	Indicator-Station selector indicator pointer..		
S-1791	Indicator-Vernier indicator pointer.....		
S-1782	Knob-Station selector knob.....		
S-1783	Knob-Volume control,tone control or range switch knob.....		
5226	Lamp-Dial lamp-Pkg. of 2.....		
14028	Nut-Jamb nut for adjustable trimmer capacitor Stock No.12714 and No.12884-Pkg. of 10.....		
12471	Plate-6J7 Radiotron socket mounting plate and rubber cushions-less socket.....		
14340	Pulley-Station selector drive belt pulley and knob shaft.....		
S-1793	Reflector-Dial reflector and bracket complete with tuning tube bracket and band indicator..		
14720	Resistor-1000 ohms, carbon type 1/2 watt (R2)...		