

MODELS G-5B & G-5CB

Five-Tube, Three-Band, Battery-Operated, Superheterodyne Receivers

Electrical Specifications

FREQUENCY RANGES		R-F ALIGNMENT FREQUENCIES	
"Standard Broadcast" (A)	530—1,720 kc	"Short Wave" (C)	20,000 kc (osc.)
"Medium Wave" (B)	2,100—6,800 kc	"Medium Wave" (B)	6,100 kc (osc., ant.)
"Short Wave" (C)	6,800—22,000 kc	"Standard Broadcast" (A)	600 kc (osc.), 1,500 kc (osc.)
Intermediate Frequency	460 kc		
RADIOTRON COMPLEMENT		(3) Type 1F7G	Second Det., A-F Amp., and A.V.C.
(1) Type 1C7G	First Detector—Oscillator	(4) Type 1H4G	Audio Driver
(2) Type 1D5GP	Intermediate Amplifier	(5) Type 1J6G	Push-Pull Power Output
BATTERIES REQUIRED			
"A" one plug-in, 2 ½-volt Air Cell, or one 2-volt storage battery; "B," three 45-volt, heavy-duty, plug-in type B batteries;			
"C," two 4 ½-volt plug-in type "C" batteries.			
CURRENT CONSUMPTION			
"A" at 2 volts	0.54 ampere		
"B" at 135 volts	17 milliamperes		
Fuse Rating	½ ampere		
POWER OUTPUT		LOUDSPEAKER	
Undistorted	1.2 watts	Type	Permanent-Magnet Dynamic
Maximum	2.2 watts	Voice Coil Impedance	2.2 ohms at 400 cycles

Mechanical Specifications

	MODEL G5CB	MODEL G5B
Height	39 1/8 inches	21 3/8 inches
Width	24 3/4 inches	17 1/4 inches
Depth	12 1/8 inches	11 3/8 inches
Weight (net)	50 pounds	28 pounds
Weight (shipping)	62 pounds	33 pounds
Chassis Base Dimensions	12 inches x 7 inches x 2 1/2 inches	
Over-all Height of Chassis	8 3/4 inches	
Operating Controls	(1) Volume; (2) Tuning (large inner knob) Range Selector (small outer knob); (3) Power Switch—Tone	
Tuning Drive Ratio	20 to 1	

General Description

Each of these receivers employs a similar chassis, the superheterodyne circuit arrangement of which is shown by figure 2. Model G5CB is a console model employing an 8-inch, permanent-magnet dynamic loudspeaker while Model G5B is a table model employing an 8-inch, permanent-magnet dynamic loud-

speaker. Features of design include magnetite-core i-f transformers and low-frequency "A"-oscillator tracking; automatic volume control; resistance-coupled, first-audio stage and transformer-coupled, audio-driver stage to a push-pull, Class-B, audio-output stage; phonograph terminal board; continuous

high-frequency tone control; super-sensitive, eight inch permanent-magnet dynamic loudspeaker with dust screen; low current drain; and a large, easy-to-read dial.

These receivers may be easily converted to 6-volt operation by employing a GE Model "M-100" Power-unit which, with a 6-volt storage battery, replaces

the "A" and "B" batteries listed under "Batteries required."

The three tuning ranges cover the "Standard broadcast" band and the important short-wave bands at 49, 31, 25, 19, 16, and 13 meters along with channels assigned for police, aviation, and amateur communication.

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.

Phonograph Attachment—A terminal board is provided for connecting a phonograph into the audio amplifying circuit. The 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.

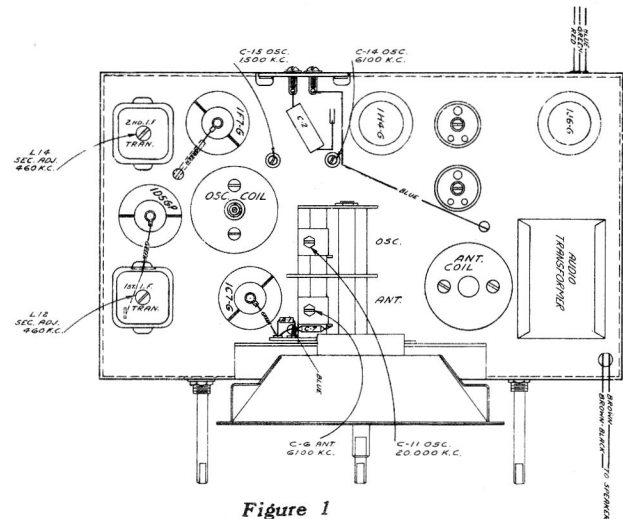


Figure 1

Alignment Procedure

Calibrate the tuning dial by adjusting the dial pointer to the low-frequency (end) calibration mark on dial with the gang tuning-condenser plates in full-mesh position. This is a friction adjustment.

Perform alignment in proper order, tabulated below, starting with No. 1 and following all operations across, then No. 2, etc. Adjustment locations are shown on figures 1 and 4.

Cathode-ray alignment is highly preferable; the connections to the chassis are shown on figure 3. If an output indicator is used, connect it across the loudspeaker voice-coil and advance the receiver volume control to full-volume position.

Connect the "low" output terminal of the test oscillator to the receiver "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			Receiver Dial Setting	Circuit to Adjust	Adjustment Symbols	Adjust to Obtain
	Connection to Receiver	Dummy Antenna	Frequency Setting				
1	1D5G-P Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	2nd I-F Trans.	L13 & L14	Symmetrical Curve
2	1C7G Det. Grid Cap	.001 Mfd.	460 kc	No Signal 550-750 kc	1st I-F Trans.	L11 & L12	Symmetrical Curve
3	Ant. Term.	300 Ohms	20,000 kc	20,000 kc	"C" Osc.	C11	Max. (peak)*†
4	Ant. Term.	300 Ohms	6,100 kc	6,100 kc	"B" Osc.	C14	Max. (peak)*
5	Ant. Term.	300 Ohms	6,100 kc	6,100 kc	"B" Ant.	C6	Max. (peak)
6	Ant. Term.	200 Mmfd.	600 kc	600 kc	"A" L-F Osc.	L10	Max. (peak)
7	Ant. Term.	200 Mmfd.	1,500 kc	1,500 kc	"A" H-F Osc.	C15	Max. (peak)
8	Ant. Term.	200 Mmfd.	600 kc	Rock thru 600 kc	"A" L-F Osc.	L10	Max. (peak)
9	Ant. Term.	200 Mmfd.	1,500 kc	Rock thru 1,500 kc	"A" H-F Osc.	C15	Max. (peak)

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

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

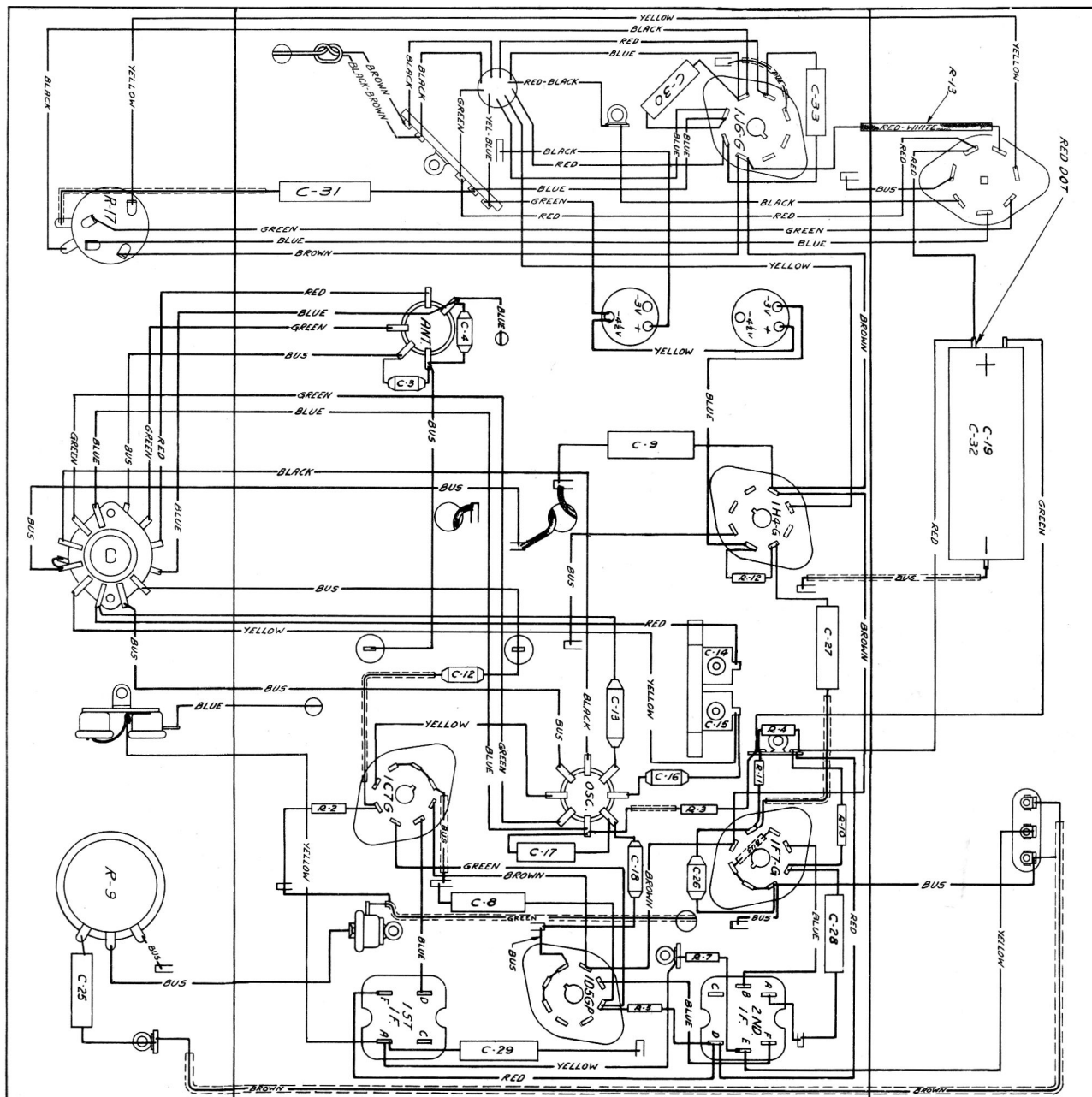
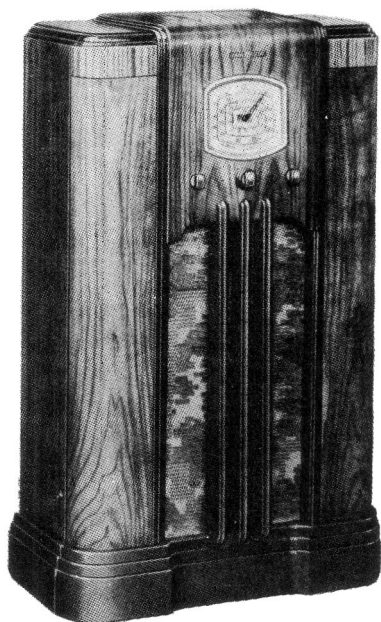
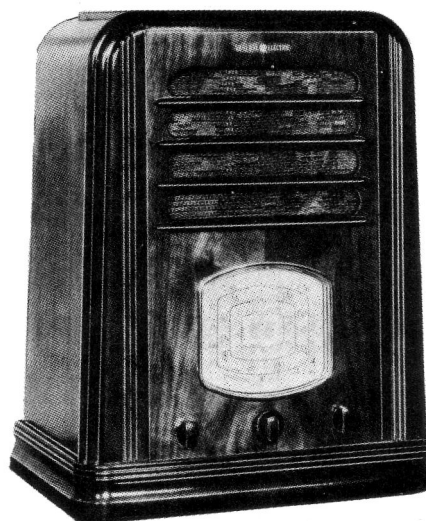


Figure 3—Chassis Wiring Diagram



MODEL G5CB



MODEL G5B

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.

Radiotron Voltages; Measured with all batteries at Normal Voltage

Radiotron	Plate	Screen Grid	Grid	Filament
Conv. 1C7G	135v	60	—3.0	2.0v
Osc.	120v			
1D5GP I.F.	135v	60v		2.0v
Det. 1F7G				2.0v
Audio	40v	30v	—1.0v	
1H4G Driver	135v		—7.5v	2.0v
1J6G Output	135v/135v		—4.5v	2.0v

Bias Cells—Three bias cells are used only for the purpose of supplying bias potential to the 1C7G first-detector—oscillator tube. These cells should never be measured with an ordinary voltmeter or other device which draws any current. A simple check on these cells may be made by connecting a milliammeter in the plate circuit of the 1C7G tube and noting the plate current reading. Then carefully remove

the cells and substitute a battery potential of 2.7 volts in their place and note the new reading on the milliammeter. If the first reading obtained (with bias cells) is more than 40% from the latter reading (with 2.7-volt battery), the bias cells should be replaced. This 40% difference is equivalent to a change of approximately 25% battery voltage.

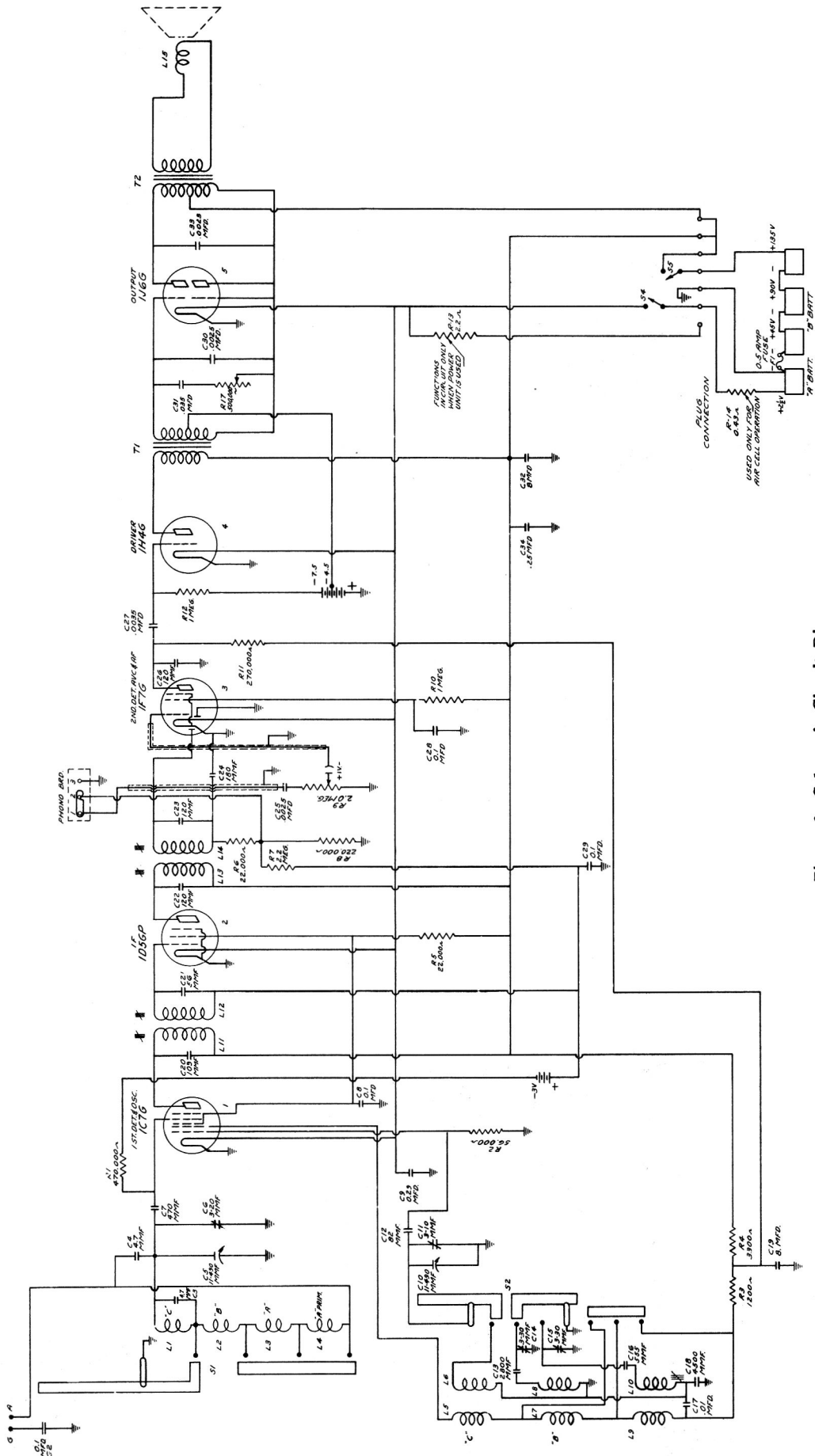


Figure 2—Schematic Circuit Diagram

Operation With "M-100" Powerunit.—These receivers may readily be operated from a GE "100" Powerunit, in which case, a six-volt storage battery replaces the "A" and "B" batteries listed under "Batteries required." When using the "100", one cell (2 volts) of the storage battery supplies filament voltage to the tubes, while the other two cells (4 volts) supplies power for the "100". When installing, the seven prong "100" receptacle plugs into the seven prong plug on the rear apron of the receiver chassis and the four battery leads clip on terminals of the storage battery as follows: Red to + 6 V.; Blue to + 4 V.; Yellow to + 4 V.; and brown (fused lead) to —V. The two four-volt leads (Blue and Yellow) should make separate connections to the same battery strap to avoid vibrator buzz which might otherwise

result if these two leads are joined together or touch each other. Observe extreme care that proper connections are made to the battery, as wrong connection will burn out the tubes.

The following changes under "Electrical specifications become effective when employing the "100"; "A" battery current drain at 6 volts, 1.65 amperes. Fuse rating, 3 amperes. Undistorted output, 1.3 watts. Maximum output, 1.8 watts. Under "Service data," the following voltages apply to the Type 1J6G power-output tube. Either plate to chassis, 180 volts. Either grid to chassis, —4½ volts. Plate current (either plate), 1.6 ma.

When servicing, the "100" chassis should be insulated from the receiver chassis to avoid vibrator buzz.

REPLACEMENT PARTS MODELS G-5B and G-5CB

STOCK No.	DESCRIPTION	STOCK No.	DESCRIPTION
RECEIVER ASSEMBLIES			
14388	Belt-Variable condenser drive belt.....	14404	Plug-7 contact male plug located on rear apron of chassis for battery cable.....
13216	Board-Antenna and ground terminal board	12827	Plug-"B" battery male plug.....
12717	Board-Phonograph Terminal Board.....	11341	Plug-"C" battery male plug.....
14338	Bushing-Variable condenser mounting bushing and screw assembly.....	14340	Pulley-Station selector drive belt pulley and knob shaft.....
S-2102	Cable-Battery cable complete with fuse, fuse holder, one 7 contact female connector and three 2 contact male connectors.....	14406	Resistor-2.2 ohms, flexible type, 3 watts (R13).....
12607	Cap-First I.F. Transformer shield top...	14410	Resistor-0.43 ohms, flexible resistor ½ watt, complete with clip (R14).....
12581	Cap-Second I.F. Transformer shield top...	12267	Resistor-1200 ohms, carbon type, ½ watt (R3).....
30314	Cap-Grid contact cap-Pkg. of 5.....	12312	Resistor-3300 ohms, carbon type, ½ watt (R4).....
S-2100	Cap-Station selector indicator pointer cap.....	13998	Resistor-22,000 ohms, insulated, ½ watt (R5).....
14383	Capacitor-Adjustable dual trimmer.....	14284	Resistor-22,000 ohms, carbon type, 1/10 watt (R6).....
14392	Capacitor-4.7 Mmfd. (C3,C4).....	12286	Resistor-56,000 ohms, carbon type, ½ watt (R2).....
13307	Capacitor-56 Mmfd. (C21).....	11398	Resistor-220,000 ohms, carbon type, 1/10 watt (R8).....
12813	Capacitor-82 Mmfd. (C12).....	11453	Resistor-270,000 ohms, carbon type, 1/10 watt (R11).....
14262	Capacitor-110 Mmfd. (C20).....	11452	Resistor-470,000 ohms, carbon type, 1/10 watt (R1).....
12404	Capacitor-120 Mmfd. (C22,C23).....	12200	Resistor-1 Megohm insulated, ½ watt (R12).....
12724	Capacitor-120 Mmfd. (C26).....	13730	Resistor-1 Megohm, carbon type, ½ watt (R10).....
14712	Capacitor-180 Mmfd. (C24).....	12679	Resistor-2.2 Megohms, insulated ½ watt (R7).....
30433	Capacitor-470 Mmfd. (C7).....	14350	Screw-No.8-32x3/16 square head set screw for gear stock No.30085 and drum stock No.14345 (Pkg. of 10).....
12537	Capacitor-555 Mmfd. (C16).....	14374	Shield-Antenna coil shield.....
30057	Capacitor-2800 Mmfd. (C13).....	12008	Shield-I.F. Transformer shield.....
12897	Capacitor-4500 Mmfd. (C18).....	14375	Shield-Oscillator coil shield.....
3932	Capacitor-.0025 Mfd. (C25,C30,C33).....	12218	Shield-Radiotron shield.....
30303	Capacitor-.0035 Mfd. (C27).....	11196	Socket-Octal radiotron socket.....
14393	Capacitor-.01 Mfd. (C17).....	12007	Spring-Retaining spring for core Stock No.12006 (Pkg. of 10).....
5196	Capacitor-.035 Mfd. (C31).....	12907	Spring-Tension spring for indicator drive gear Stock No.30085-Pkg. of 10).....
4839	Capacitor-0.1 Mfd. (C2,C8,C28,C29)...	14342	Spring-Tension spring for idler stock No.14341 (Pkg. of 10).....
12484	Capacitor-0.25 Mfd. (C9).....	14402	Switch-Range switch (S1,S2).....
14403	Capacitor Pack-Comprising two sections each 8 Mfd. (C19,C32).....	S-2094	Transformer-Audio transformer pack (T1,T2).....
12681	Cell-Bias cell.....	14261	Transformer-First I.F. transformer (L11,L12,C20,C21).....
14372	Coil-Antenna coil and shield (L1,L2,L3,L4).....	14283	Transformer-Second I.F. transformer (L13,L14,C22,C23,C24,R6,R8).....
14373	Coil-Oscillator coil and shield (L5,L6,L7,L8,L9,L10).....	S-1779	Tone control and "On" and "Off" switch.....
14397	Condenser-2 gang variable tuning condenser (C5,C6,C10,C11).....	14400	Volume Control.....
S-2064	Clip-Radiotron shield grounding clip (Pkg. of 10).....	REPRODUCER ASSEMBLIES	
14409	Connector-7 contact connector for battery cable).....	TABLE AND CONSOLE MODELS	
12800	Core-Adjustable core and stud assembly for coil Stock No.14373.....	S-2096	Cone-Reproducer cone and dust cap.....
12006	Core-Adjustable core and stud for I.F. transformers.....	S-2097	Reproducer-Reproducer complete.....
S-2098	Dial-Station selector dial scale.....		
11962	Fastener-Station selector dial scale fastener (Pkg. of 25).....		
14398	Drive-Variable condenser vernier drive pinion gear and shaft.....		
14345	Drum-Variable condenser drive belt drum complete with set screws.....		
3748	Fuse-½ ampere fuse.....		
30085	Gear-Indicator drive gear and hub assembly and pointer stem and gear assembly.....		
S-2101	Escutcheon-Station selector escutcheon and crystal.....		
14405	Holder-Bias cell holder (triple unit)...		
S-1838	Holder-Bias cell holder (single unit)...		
6516	Holder-Fuse holder complete.....		
14341	Idler-Station selector drive belt idler		
S-2099	Indicator-Station selector indicator pointer.....		
11347	Knob-Volume Control, tone control, or range screw knob.....		
12699	Knob-Station Selector Knob.....		