MODEL H-7M

Seven-Tube, Push-Button, Superheterodyne Automobile Receiver

Electrical Specifications

TUBE COMPLEMENT

(1) Type-6K7 ..... R-F Amplifier
(2) Type-6A8 ..... First Detector—Oscillator
(3) Type-6SK7 ..... I-F Amplifier
(4) Type-6R7 ..... Second Det., A-F Amp., and A.V.C.
(5) Type-6V6-G ..... Power Output
(6) Type-6V6-G ..... Power Output
(7) Type-0Z4-G ..... Rectifier

Tuning Range ..... 550 to 1,550 kc

INTERMEDIATE FREQUENCY ..... 260 kc

POWER OUTPUT RATINGS

Maximum ..... 8 watts
Undistorted ..... 6 watts

LOUDSPEAKER

Type ..... 8 inch Electrodynamic
Voice-Coil Impedance ..... 3 ohms at 400 cycles

POWER SUPPLY RATING

Supply Voltage ..... 6.3 volts
Current Drain ..... 8.7 amperes
Fuse Protection ..... 15 ampere

PILOT LAMP ..... 6-8 volts, 0.2 ampere

Mechanical Specifications

RECEIVER CASE DIMENSIONS ..... Height, 2½ inches; Width, 5⅞ inches; Depth, 9¼ inches

SPEAKER CASE DIMENSIONS ..... Diameter, 9½ inches; Depth, 5 inches

OPERATING CONTROLS ..... (Left)—(Plastic Knob) Power-Volume; (Wing Knob) Tone; (Center)—Five Station Keys; (Right)—Manual Tuning; Ratio 7½ - 1.

WEIGHT ..... Net, 20 pounds; Shipping, 22 pounds

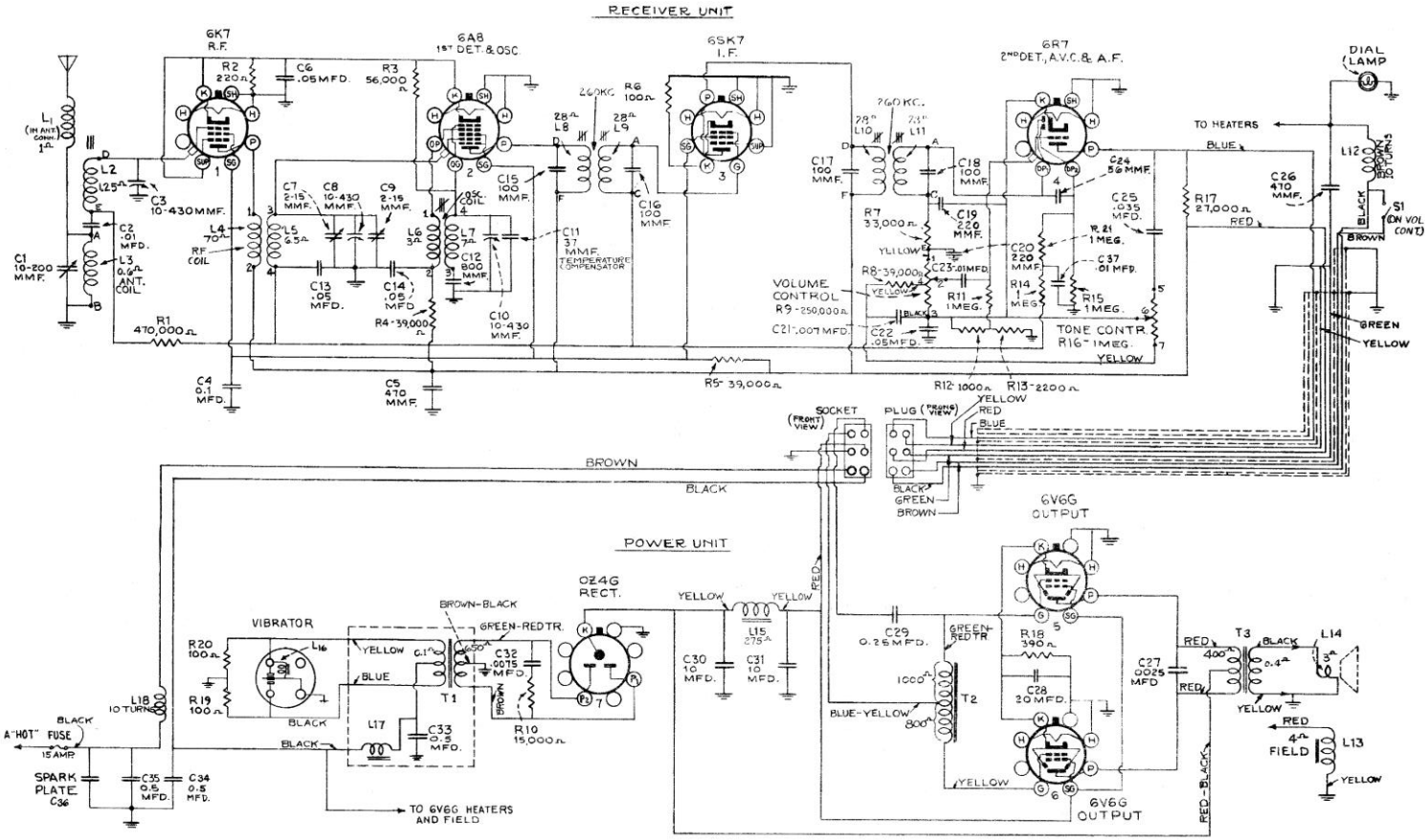

Fig. 1—Schematic Circuit Diagram

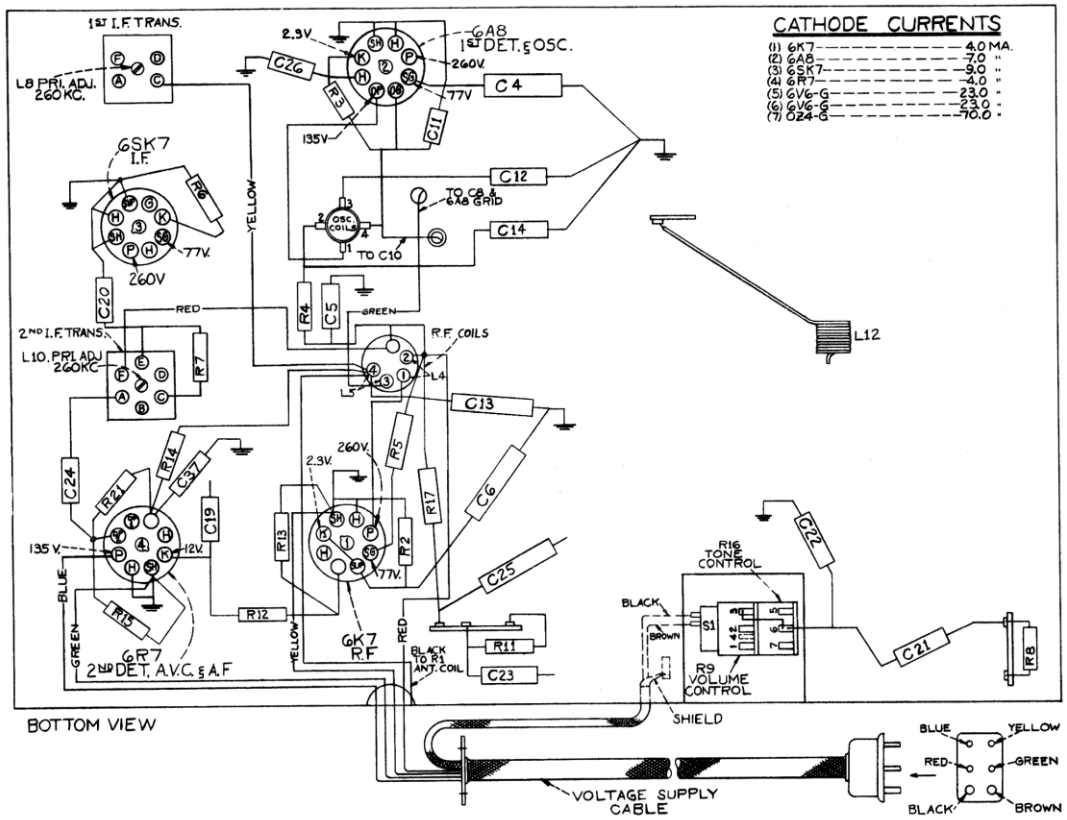

Fig. 2—Receiver Unit Parts and Socket Voltages

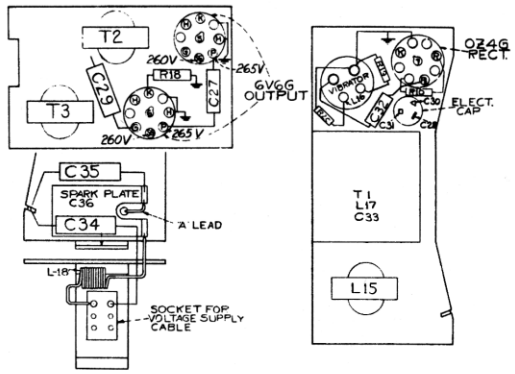

Fig. 3—Power Unit Parts and Socket Voltages

General Description

The CGE Model H7-M is a seven-tube, deluxe superheterodyne automobile receiver consisting of two units, (1) the control unit containing the tuning mechanism, R.F. and I.F. circuits; (2) the speaker unit containing the audio and power supply units, together with the loudspeaker. The output of the First Audio tube in the control unit is fed through a shielded cable to the speaker unit.

Features of design include: Mechanical key tuning for five stations; an R.F. amplifier stage; delayed automatic volume control circuit; magnetite core antenna and I.F. transformers; ignition suppression filters in the antenna and power supply circuits; push-pull beam power output stage; true tone fidelity; continuously variable tone control; eight-inch loudspeaker and a full vision, edge-lighted glass dial.

Alignment Procedure

Test Oscillator.—For all alignment operations, connect the low side of the test oscillator to the receiver chassis, and keep the output signal as low as possible to avoid a-v-c action.

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are as follows: Vertical "H1" to terminal "C" on 2nd I-F transformer; vertical "0" to chassis.

Output Meter. — Connect the output meter across the speaker voice-coil and turn the receiver volume control to maximum (fully clockwise) and tone control to middle of range.

Dial Calibration.—Rotate the gang condenser to its full-mesh (maximum-capacity) position and then adjust dial scale so that the pointer is aligned to the last calibration mark at the low-frequency end of the scale.

Steps	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output
1	6SK7 I-F grid (No. 4 pin) in series with .01 mfd.	260 kc	No Signal 550-750 kc	L10 and L11 (2nd I-F Trans.)
2	6A8 Det. grid cap in series with .01 mfd.	260 kc		L8 and L9 (1st I-F Trans.)
3†	* Ant. connector in series with 60 mmfd.	600 kc	600 kc	L7 (osc.)
4†	* Ant. connector in series with 60 mmfd.	1,400 kc	1,400 kc signal	C7 (det.) C1 (ant.)
5†	* Ant. connector in series with 60 mmfd.	600 kc	600 kc (rock)	L7 (osc.)
6†	* Ant. connector in series with 60 mmfd.	1,400 kc	1,400 kc signal	C7 (det.) C1 (ant.)**

***Note 1.**—This 60 mmfd. capacitor must be inserted at the antenna connector of the receiver. The lead from the test oscillator to the 60 mmfd. capacitor may be shielded if desired, but no shielding should be used between capacitor and antenna connector.

†**Note 2.**—These adjustments should be made with unit enclosed in its shielded case, through holes provided for adjustment purposes.

****Note 3.**—Final adjustment of C1 must be made after the receiver has been installed and the antenna connected. See "Antenna Circuit."

Antenna Circuit

It is very important that these instructions be followed when installing the H7-M receiver.

The antenna circuit is designed to work with an antenna having a total capacity including the shielded lead-in not to exceed 150 mmf. If an antenna having a larger capacity is to be used, it will be necessary to add a capacitor in series with the lead from the antenna filter L-1 to the antenna coil terminal ("A"). Where a "Double Under the Running Board" type of antenna is to be used having a capacity of approximately 200 mmf., the capacitor added should be approximately 500 mmf. The insulated running board type having an approximate capacity of 550 mmf. will require a capacitor of approximately 150 mmf. Cars using an insulated steel top of approximately 3,500 mmf. will require a series capacitor of 150 mmf.

After installation and with antenna connected, tune in a weak station near 1,400 kc and adjust compensator trimmer C-1 for maximum signal output. This trimmer is accessible by removing plug button near antenna jack on top of receiver. If a maximum (peak) signal output cannot be obtained in the range of the antenna trimmer, the effective capacity should be checked and compensated for by varying series capacity as described above.

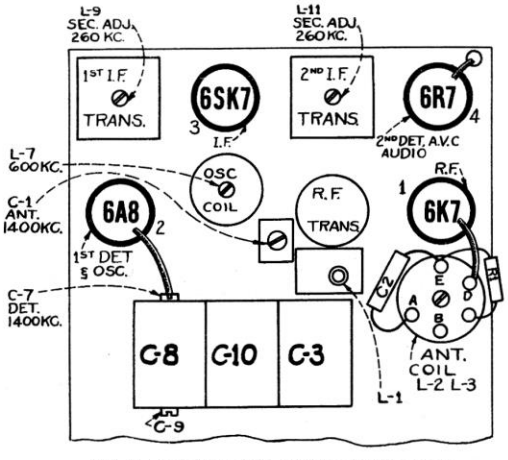

Fig. 4—Receiver Unit, Tubes and Trimmers

Service Data

Antenna Filter.—A filter is included in the antenna circuit. Being completely shielded, it prevents radiating ignition interference within the set. It also reduces the possibility of picking up vibrator interference. As shown in Figure 5, the filter unit is mounted inside a steel shell which in turn is welded to the chassis. The shielded antenna lead-in makes contact with the filter unit within the steel shell and is held in place by a bayonet type connector.

Key Tuning Mechanism.—The Key tuning mechanism used in this receiver is of the mechanical type, wherein the movement of the key actually turns the tuning condenser to any pre-determined setting. The movement is actuated thru a Push-Arm, Cam, Rocker Plate and Sector Gear, which meshes with a Scissors Gear directly fastened to the tuning condenser shaft. The scissors gear prevents backlash between the sector gear and the tuning condenser. Since the sector gear is mounted directly on the rocker plate shaft, the position of the rocker plate will accurately determine the position of the tuning condenser.

The cams which determine the stop points for each key are mounted on the push arms and are locked in place by the locking screws and lock-shoes, which press firmly against the cams when the locking screws are tightened. **Care should be used when locking screws are tightened not to use excessive force as the threads may become damaged or stripped.**

The mechanism should be adjusted so that when using either manual or key tuning, it operates positively and without backlash or bind. The following hints will be found helpful in adjusting the mechanism properly.

1. With the gang condenser in full mesh, the sector gear should have the two end teeth fully meshed in the scissor gear, as shown in the illustration.

2. The position of the sector gear on the rocker-plate shaft should be adjusted so that there is clearance between the rocker-plates and the frame of the push-key mechanism at both extremities of gang rotation. Thus correct adjustment prevents the rotation of the gang being limited by the rocker plates touching the frame.

3. The drive cord should have 6½ turns around the tuning shaft as shown in the illustration. Three degrees of adjustment of the tension on the drive cord may be obtained by use of the three positions for connecting the drive-cord-tension spring to the drive-cord drum on the condenser shaft as shown.

4. The push-arms, rocker-plate shaft, and pulleys should be lubricated with light grease (sparingly). Care should be taken to keep the lubricant off of the drive cord.

Push Key Adjustment

The push keys should be adjusted for five favorite stations after the receiver is installed and operating.

Any standard broadcast stations may be chosen. The preferable arrangement is to adjust for stations in the order of frequency, from low to high. Proceed as follows:—

1. Remove the five keys by pulling straight out.

2. Loosen adjustment screw by rotating one-half turn.

3. Using the tuning control, accurately tune in the first station.

4. With station accurately tuned in, press the first key fully in and then gently release so as not to jar mechanism.

5. Tighten the key screw securely with screwdriver. Do not force with pliers.

6. Proceed in same manner to adjust other four keys.

Loudspeaker

The loudspeaker cone may be centered in the usual manner with three celluloid or paper feelers after gently cutting away the front dust cover. A new cover should be cemented in place upon completion of the adjustment.

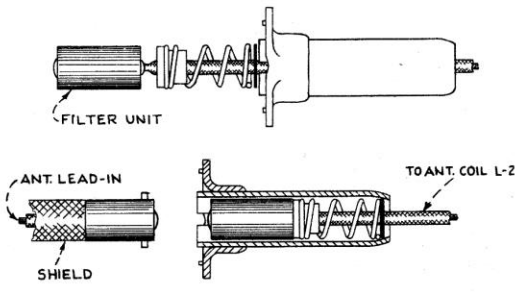

Fig. 5—Antenna Filter

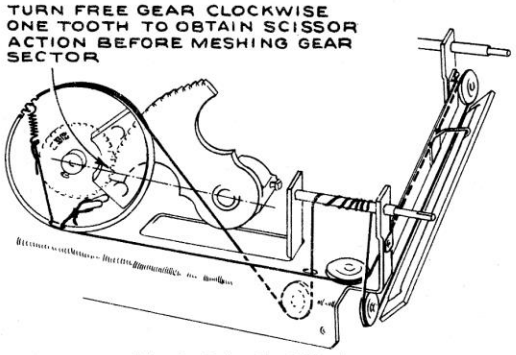

Fig. 6—Drive Cord Hookup

RECEIVER MOUNTING CHART FOR 1939 MODEL CARS.

MAKE OF CAR	RECEIVER POSITION	HEATER POSITION	REMARKS
BUICK	In centre, under instrument Panel.	Right side.	May be installed to left of steering column. Space down to clear map light switch handle.
CHEVROLET or PONTIAC	To right of steering column under instrument panel.	Right Side.	---
CHRYSLER DESOTO DODGE PLYMOUTH	To right of cowl ventilator handle, under instrument panel.	Right side.	---
FORD (Deluxe)	To left of centre, between cowl ventilator handle and panel light rheostat.	Right of centre.	---
FORD (Mercury)	To left of centre, clear of shift lever when in reverse.	Right of centre.	---
FORD (Standard)	To left of centre, under instrument panel between steering column and cowl ventilator handle.	Centre of firewall.	Space down to clear panel light switch handle.
HUDSON 6,8 & 112	In centre, under instrument panel.	Right side.	---
NASH	Right side, under glove box.	In centre.	May be installed to left of steering column. Space down to clear switch handle.
OLDSMOBILE	On right side, under glove compartment.	In centre.	May be installed in centre to right of ventilator handle when heater is not used.
PACKARD	Right of ventilator handle under instrument panel.	In centre or on right side.	On cars not equipped with over-drive, mount receiver between steering column and ventilator handle.
STUDEBAKER	Left of steering column, under instrument panel.	In centre.	Receiver may be mounted in centre of panel, when heater is not used.

Note:—The above chart provides a ready reference to the receiver mounting positions in all the 1939 model cars. The " **H7-M** " model receiver consisting of two units, namely; a tuning unit and a speaker unit, should be mounted in the car, in such a manner, that the tuning unit is placed directly above the speaker unit. This mounting arrangement requires a minimum of space and reduces installation problems.

Replacement Parts — Model H7-M

STOCK No.	DESCRIPTION
	CONTROL UNIT ASSEMBLIES
32979	Capacitor-Adjustable capacitor(C1)...
31728	Capacitor-37 mmfd. (C11).....
12723	Capacitor-56 mmfd. (C24).....
30904	Capacitor-100 mmfd.(C15,C16,C17,C18)
12694	Capacitor-220 mmfd.(C19,C20).....
30433	Capacitor-470 mmfd.(C5,C26).....
33052	Capacitor-800 mmfd.(C12).....
5148	Capacitor-.007 mfd.(C21).....
4937	Capacitor-.01 mfd.(C23).....
14393	Capacitor-.01 mfd.(C2,C37).....
5196	Capacitor-.035 mfd.(C25).....
32787	Capacitor-.05 mfd.(C6,C13,C14,C22).
4839	Capacitor-0.1 mfd.(C4).....
31977	Coil-Antenna filter (L1).....
S-2378	Coil-Antenna coil & core (L2,L3)....
32977	Coil-Oscillator coil less shield (L6,L7).....
S-2379	Coil-R.F. coil-less shield(L4,L5)...
32974	Condenser-3 gang variable tuning condenser complete with scissors gear (C3,C7,C8,C9,C10).....
32978	Control-Volume control,tone control and power switch (R9,R16,S1).....
32634	Cord-Indicator pointer drive cord (34" long).....
S-2384	Dial-Station selector dial scale....
32982	Drum-Dial drive drum.....
32290	Gear-Tuning mechanism gear sector...
32985	Indicator-Station selector indicator pointer.....
11765	Lamp-Dial lamp.....
32981	Pulley-Drive cord bracket and pulley assembly.....
32980	Pulley-Drive cord bracket assembly complete with two pulleys.....
14439	Resistor-100 ohm,1/4 watt (R6).....
14561	Resistor-220 ohms,1/4 watt (R2).....
14720	Resistor-1000 ohms,1/4 watt (R12)...
13716	Resistor-2,200 ohms,1/4 watt (R13)..
S-2036	Resistor-27,000 ohms,1/2 watt(R17)..
12454	Resistor-33,000 ohms,1/4 watt (R7)..
12266	Resistor-39,000 ohms,1/4 watt(R4,R8)
30434	Resistor-39,000 ohms,1 watt (R5)....
12286	Resistor-56,000 ohms,1/4 watt (R3)..
12285	Resistor-470,000 ohms,1/4 watt(R1)..
13730	Resistor-1 megohm,1/4 watt (R11,R14, R15,R21).....
2917	Retainer-Station selector knob shaft retainer (Pkg.of 5).....
13471	Ring-Retaining ring for antenna coil (Pkg.of 5).....
3584	Ring-Retaining ring for R.F. coil (Pkg.of 5).....
31482	Screw-No.8-32 x 1/2 in. set screw for gear Stock #32290 (Pkg.of 5)..
14350	Screw-No.8-32 x 3/16 in. set screw for drum stock #32982 (Pkg.of 10).
12533	Screw-No. 8 x 1/4 in. S.T. case screws (Pkg.of 10).....
32983	Shaft-Station selector knob shaft...
3623	Shield-R.F. coil shield.....
12883	Shield-Oscillator shield.....
S-2338	Socket-Dial lamp socket.....
32299	Socket-Octal base tube socket.....
31615	Spring-Drive cord tension spring (Pkg.of 5).....
30585	Spring-Push arm tension spring (Pkg. of 10).....
32990	Transformer-First I.F. transformer (L8,L9,C15,C16).....
32991	Transformer-Second I.F. transformer (L10,L11,C17,C18).....

STOCK No.	DESCRIPTION
	POWER UNIT ASSEMBLIES
5107	Capacitor-.0025 mfd.(C27).....
30626	Capacitor-.0075 mfd.(C32).....
30965	Capacitor-0.25 mfd.(C29).....
12741	Capacitor-0.5 mfd.(C34,C35)....
32240	Capacitor-Electrolytic capacitor consisting of two 10 mfd. sections and one 20 mfd.section (C28,C30,C31).....
30641	Lead-Ammeter lead (Chassis end) complete with male section of fuse holder.....
32378	Pin-Contact pin for speaker lead (Pkg.of 5).....
33064	Reactor-Filter reactor (L15).....
30540	Resistor-100 ohms,1/2 watt (R19, R20).....
S-2059	Resistor-390 ohms,1 watt (R18)...
12695	Resistor-15,000 ohms,1/4 watt(R10)
33063	Socket-six contact female socket for control unit cable.....
32299	Socket-Radiotron socket.....
13686	Socket-Vibrator socket.....
32243	Transformer-Interstage transformer (T2).....
32241	Transformer-Output transformer(T3)
32986	Transformer-Vibrator transformer (T1,L17,C33).....
13688	Vibrator-Plug-in vibrator (L16)..
	REPRODUCER ASSEMBLIES (84567-501)
33017	Cone-Reproducer cone and voice coil (L14).....
32987	Reproducer-Reproducer complete...
	MISCELLANEOUS ASSEMBLIES
5025	Capacitor-Generator capacitor....
5023	Fuse-15 Ampere fuse (Package of 5).....
4290	Insulator-Fuse holder insulating sleeve (Pkg. of 5).....
S-2347	Key-Station selector key.....
S-2380	Knob-Dummy knob.....
S-2381	Knob-Tone control knob.....
S-2382	Knob-Volume control or tuning knob.....
7766	Lead-Ammeter lead complete with clip and fuse holder.....
S-2149	Marker-Station call letter marker (1 set).....
33389	Mounting-Control unit mounting assembly consisting of straps, screws and washers.....
32998	Mounting-Power unit mounting assembly consisting of bolt, nut and washers.....
32317	Screw-Set screw for Knob Stock #S-2382(Pkg.of 5).....
S-2351	Spring-Retaining spring for key Stock #S-2347 (Pkg.of 5).....
5024	Suppressor-Distributor suppressor
32769	Washer-Felt washer for under control knobs (Pkg.of 10).....
32976	Frame-Dial scale frame and holder