General Electric Co.

Model: G105	Chassis:	Year: Pre October 1938
Power:	Circuit:	IF:
Tubes:		
Bands:		

Resources
Riders Volume 9 - GE 9-32
Riders Volume 9 - GE 9-33, 34
Riders Volume 9 - GE 9-35, 36
Riders Volume 9 - GE 9-37
Riders Volume 9 - GE 9-38
Riders Volume 9 - GE 9-39

MODELS G-105,G-106
Specifications
Tuner Data

GENERAL ELECTRIC CO.

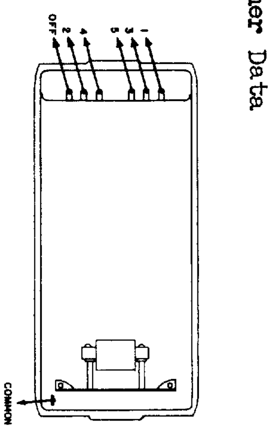


Fig. 12. Pre-timer Wiring Diagram

Physical Specifications

Model	G-105	G-106
Height	42 inches	43 inches
Width	28¼ inches	29½ inches
Depth	15⅝ inches	17⅛ inches
Weight Packed	100 lbs	130 lbs

Manual Tuning Drive Ratio . . 50:1

Tuning Frequency Range

Band "B"	540–1575 kc
Band "C"	1575–5700 kc
Band "D"	5700–18,000 kc

Intermediate Frequency. 455 kc

Electrical Power Output

Undistorted	11.0 watts
Maximum	13.0 watts

Tone Control . . . . 5 Position

Loud-speaker—Electrodynamic

Outside Cone Diameter	12-inch
Voice Coil Impedance	3.5 ohms at 400 cycles
Field Coil Resistance	460 ohms (cold)

Tubes

R.F. Amplifier	GE-6K7
Converter and Oscillator	GE-6A8G
I.F. Amplifier	GE-6K7
Detector and A.V.C.	GE-6H6
Audio Driver	GE-6F5
Audio Inverter	GE-6J5G
Audio Power Amplifier	(2) GE-6V6G
Tuning Indicator	GE-6U5
Rectifier	GE-5U4G
Dial Lamp	(2) MAZDA No. 44

TOUCH-TUNING

The General Electric "Touch-Tuning" system consists of three essential units: the keyboard assembly of fourteen keys, used for touch-tuning control; the motor and drive mechanism; and the split contact segment with its adjustable station buttons, allowing a set up of thirteen different stations to be tuned automatically.

Thirteen keys are used for the selection of pre-set stations while the No. 14 key is used to turn power "Off." Pressing-in any key will lock the key in a semi-depressed position and release any other that may be in the circuit, thus the selection of any station by a station key will release the "Off" key, turning the set power on.

The tuning motor is operated as a 23-volt split-phase induction motor using capacitor C-51 as the phase shifting device. On the Model G-105, the 23 volts is supplied directly from the receiver power transformer while on the Model G-106 the voltage is obtained from a separate transformer which operates the motor only and is always connected to the power line. In this receiver the "Off" key resembles a station key in its operation and is set up when the receiver is assembled at the factory. A special button is assembled on the fan tail assembly, at the rear of the gang condenser, for the "Off" position. This button is white to distinguish it from the regular station buttons and the contact point is narrower so that no bounce back is allowed on the "Off" position.

Fig. 6 shows a simplified schematic of the control circuit and the following cycle of operation may be traced very easily. When a key is depressed, it completes the 23-volt circuit through the button making contact with the contact segment (CT) and energizes one winding of the motor. The other winding on the motor is energized through the condenser C-51. The direction of rotation of the motor is dependent upon whichever half of the contact segment (CT) that the station button first energizes. When voltage is applied to the motor, the rotor is pulled further into motor field, and engages its rubber cone hub (I) with the dial drive wheel (D), (see Fig. 9) which in turn rotates the gang condenser and contact segment (CT). This operation continues until the insulated segment (1) breaks the station button circuit to the contact segment and removes voltage from the motor. The inertia in the tuning system drives the insulated segment past the station button and makes contact with the other half of the contact segment. This energizes the other winding of the motor and causes the motor to reverse. The brake on the dial drive wheel does not allow the tuning system to store up enough inertia to go past this insulated strip on the reversal of the motor and thus allows the station button to come to rest on the narrow insulated segment, thus stopping the tuning operation to this pre-set position.

The motor scan switch S-7 is incorporated to allow finger-tip control of the motor drive. Normally, the switch contacts are open and control of the motor is had by closing either of the two sides of the switch dependent upon the direction of travel desired.

On 25-cycle receivers, two motor capacitors (RC-597) are used to obtain the necessary phase shift. The brake pad tension should be re-adjusted when operating a 25-cycle receiver on a 60-cycle circuit.

Silent Tuning

During period of motor operation, either for automatic station selection or for scanning, silent tuning is incorporated. This is accomplished by a circuit which gives both instantaneous cut-off of the audio amplifier and time delay in restoring the response. By reference to the schematic Fig. 5, it will be observed that one half of the 6H6 diode is used to rectify the 23 volts A.C. available from the motor and the resulting D.C. voltage is used to bias the audio amplifier tube to cut-off. Note that the charging time of the bias circuit is only determined by the diode resistance which is very small. The time required for the audio amplifier (6F5) to return to normal bias however, is determined by the product of R-26 and C-56 and is therefore controllable.

Drive Wheel Brake Adjustment

A friction brake has been incorporated on the drive wheel circumference (D) to accomplish accurate stopping of the motor driven tuning system. When the button passes into the insulated segment it will easily over-ride the insulated segment on the contactor drum, since this segment is very narrow. If this condition continues an oscillatory motion or "hunting" is set up and the motor will not come to rest as long as the station key is pressed. The brake, located at the left side of dial scale, should be adjusted on normal line voltage so that the motor only has to make one or two reversals.

This adjustment should be made under an average operating line voltage and allowance made for changes in voltage over the 24-hour period.

Lubrication

For smooth and noiseless operation of the tuning system, it is absolutely necessary to keep it well lubricated.

Contactor Drum—use thin film of petroleum jelly
Dial Pointer Guide Rods—use thin film of petroleum jelly
Motor Bearings—these are oil-less type and do not require lubrication

Dial Mechanism

A sketch showing the threading of the dial mechanism controls is shown in Fig. 9.

The manual drive involves two extra parts in addition to the motor drive; these are, the manual rubber drive cone (J) and its shaft (C), see Fig. 9. If the idler drive wheel (D) on which the manual drive cone engages is set up too high, the manual drive cone is liable to wedge underneath the idler drive wheel, thus not allowing the motor drive cone to engage when using Touch-Tuning. If this occurs by only a normal pressure on manual control, then the idler drive wheel must be moved down and the motor drive cone adjusted accordingly. The bracket which mounts the large idler drive wheel has slots and mounting screws so that idler drive wheel can be moved either up or down.

The 25-cycle receivers as they leave the factory have a larger rubber manual drive cone than the 60-cycle receivers. The cone for the 60-cycle receiver may be substituted for replacement provided the idler drive wheel is lowered slightly.

REMOTE CONTROL

The GM-8 Remote Control is merely another station keyboard assembly that is wired in parallel with the regular station keys. In addition, a remotely controlled motor is used to either raise or lower the volume at the receiver. By referring to Fig. 11, the details of the operation of this device may be readily understood. Leads No. 2 to No. 7 are the automatic tuning button control leads that parallel any six of the regular receiver station keys. Lead No. 1 supplies 23 volts to the remote keyboard assembly while leads No. 8 and No. 9 are the phase-reversing leads to the volume control motor.

When the remote control is attached to a receiver, then the semi-depressed positions of the receiver push-button keys may or may not indicate which station is tuned in. This will then depend upon whether the receiver was last operated from the remote control or from the station keys of the receiver itself. For this reason, the key assembly of the remote control has not been equipped with a latch bar. All keys of the remote control key assembly are wired in series to avoid possibility of two keys completing the circuit to the motor at the same time.

The remote volume control motor uses a phase-shifting resistor in place of a condenser as used on the tuning motor when operating from a 50- or 60-cycle power supply. When operation is desired from 25 cycles replace the 30-ohm, 10-watt resistor across the volume control motor terminals with a 60 microfarad motor capacitor (RC-597).

The mechanical installation of the volume control motor is shown in Fig. 10. For full installation instructions refer to service notes RCMS-8.

Remote Control Notes

1. If key assembly on remote control unit is too high in the case, it is possible that one or all of the keys may be slightly depressed at all times so as to cause faulty operation of the system. To remedy, lower the complete assembly by loosening the two setscrews on the inside of the case and then lower assembly—tighten setscrews.

2. The tension of the friction clutch on the remote control motor is adjusted at the factory and should not require resetting. If it is set too tight, the volume control may be damaged when "VOL. DEC." key is held in a depressed position after the volume control is turned to the minimum position. If this slip clutch is too loose the control will fail to turn.

AUTOMATIC STATION PRE-TIMER G-106

The Pre-timer is quite similar to the remote control in operation in that it works in parallel with the regular station keys; turning "On" and "Off" power and tuning stations. The operation, however, instead of being controlled manually, is controlled by a synchronous motor. This allows a parallel circuit to be made with a selected station key by a pre-set timing contact.

The 96 timing contacts project through slots in the clock panel and are supported by two metal plates at the rear. A molded carriage is propelled from left to right during the 12 hours of the AM period and from right to left during the PM period, by means of a lead screw having right and left-handed threads, which is rotated continuously by the clock motor. Projections on the timing contacts engage sliders on the carriage corresponding to the stations to which the contacts are set. When the contact is made the pre-timer energizes the corresponding station button on the fantail (in back of the gang condenser) and thus drives the tuning motor to the desired station. In order to differentiate between AM and PM operations, a limit switch is provided that is operated by the carriage at the end of its travel. This switch causes the AM sliders to be energized during the AM period, and the PM sliders during the PM period.

As the contact carriage moves very slowly, the accuracy with which it makes and breaks the control circuits is not sufficient. In order to obtain accurate timing, the contacts on the carriage are arranged so as to engage the sliders several minutes before and to disengage several minutes after the quarter hour and a cam-operated switch is provided in series with the common return lead. This switch closes the control circuit exactly on the quarter hour, and opens it after ample time has elapsed for the completion of the tuning operation, in this case, about ten seconds.

The clock motor is of the self-starting synchronous type with enclosed gearing running in a bath of oil. It operates on the 110-volt power supply.

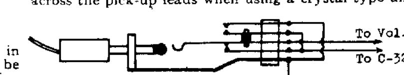
The circuit controlling the receiver is shown on the lower left-hand portion of Fig. 5. The wiring diagram to the clock panel is shown in Fig. 12.

Phonograph Connections

Fig. 13 shows a simple sketch for connecting a crystal or high impedance magnetic pick-up into the G-105 or G-106 circuit for the reproduction of phonograph recording. This method uses a two-circuit jack and is connected into the receiver by opening the circuit between C-32 and the volume control (R-19) and connecting the jack terminals as shown. A telephone plug is attached to the pick-up leads; and for phonograph operation, it is merely necessary to insert it into the jack. The jack may be mounted on the rear chassis deck and all connecting leads should be properly shielded to prevent pick-up.

When the pick-up is connected as suggested, the regular radio volume and tone controls work for both radio and phonograph reproduction.

NOTE.—In most cases a suitable loading circuit composed of a resistor or resistor and capacitor network should be used across the pick-up leads when using a crystal type unit.



Phonograph Connections Fig. 13.

GENERAL ELECTRIC CO.

MODEL G-105
Schematic, Dial Data

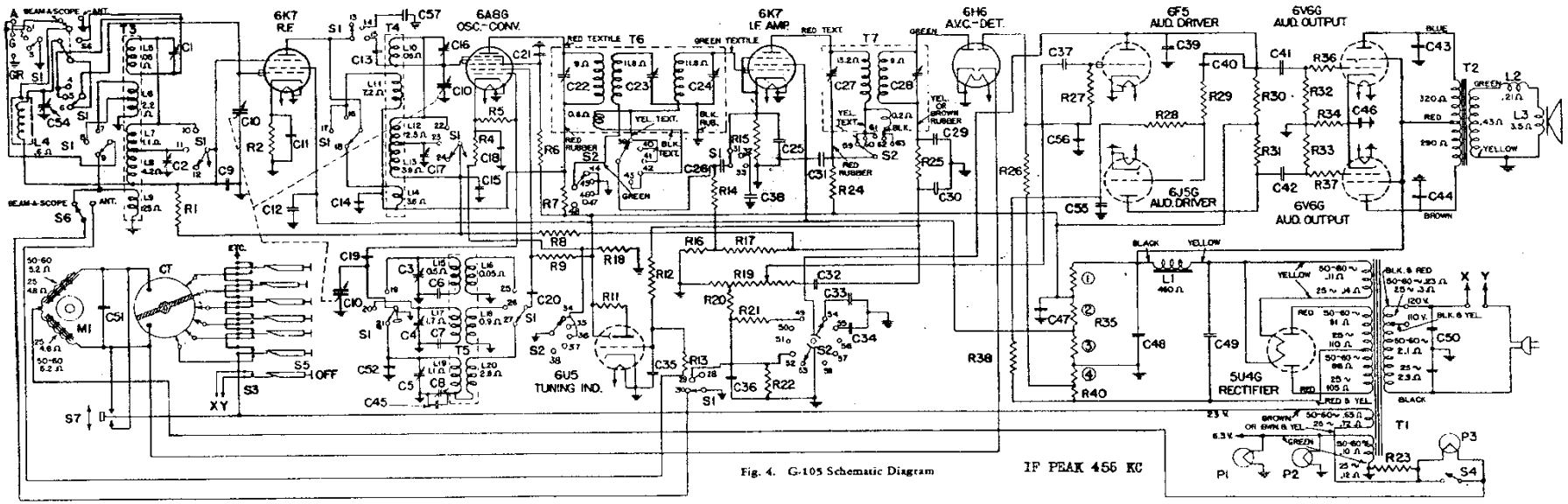


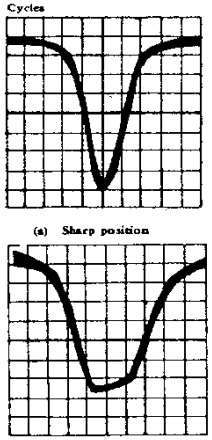
Fig. 4. G-105 Schematic Diagram

SYMBOL	DESCRIPTION
R-1	220,000 Ohm Carbon Resistor
R-2	330 Ohm Carbon Resistor
R-4	330 Ohm Carbon Resistor
R-5	47,000 Ohm Carbon Resistor
R-6	39,000 Ohm Carbon Resistor
R-7	1,000 Ohm Carbon Resistor
R-8	1.8 Megohm Carbon Resistor
R-9	22,000 Ohm Carbon Resistor
R-11	1 Megohm Carbon Resistor
R-12	2.2 Megohm Carbon Resistor
R-13	2.7 Megohm Carbon Resistor
R-14	2.2 Megohm Carbon Resistor
R-15	330 Ohm Carbon Resistor
R-16	56,000 Ohm Carbon Resistor
R-17	220,000 Ohm Carbon Resistor
R-18	330 Ohm Carbon Resistor
R-19	2 Megohm, 1 Megohm Tap. Vol. Control
R-20	68,000 Ohm Carbon Resistor
R-21	68,000 Ohm Carbon Resistor
R-22	1.2 Megohm Carbon Resistor
R-23	1,000 Ohm Carbon Resistor
R-24	1,000 Ohm Carbon Resistor
R-25	47,000 Ohm Carbon Resistor
R-26	470,000 Ohm Carbon Resistor
R-27	1.5 Megohm Carbon Resistor
R-28	82,000 Ohm Carbon Resistor
R-29	1.2 Megohm Carbon Resistor
R-30	68,000 Ohm Carbon Resistor
R-31	68,000 Ohm Carbon Resistor
R-32	220,000 Ohm Carbon Resistor
R-33	220,000 Ohm Carbon Resistor
R-34	230 Ohm Resistor (W.W.)
R-35	4 Sections Voltage Divider
1	1600 Ohms
2	9000 Ohms
3	9000 Ohms
4	11 Ohms
R-36	1,000 Ohm Carbon Resistor
R-37	1,000 Ohm Carbon Resistor

SYMBOL	DESCRIPTION
R-38	470,000 Ohm Carbon Resistor
R-40	20 Ohm W.W. Resistor
C-1	5-40 MMF. "D" Ant. Trimmer
C-2	5-40 MMF. "B" Ant. Trimmer
C-3	2-20 MMF. "D" Osc. Trimmer
C-4	2-20 MMF. "C" Osc. Trimmer
C-5	7-23 MMF. "B" Osc. Trimmer
C-6	3200 MMF. Mica Capacitor
C-7	2100 MMF. Mica Capacitor
C-8	160-375 MMF. "B" Padder
C-9	.05 MFD. Paper Capacitor
C-10	10-450 MMF. Tuning Capacitor
C-11	.05 MFD. Paper Capacitor
C-12	.05 MFD. Paper Capacitor
C-13	18 MMF. Mica Capacitor
C-14	.1 MFD. Paper Capacitor
C-15	.05 MFD. Paper Capacitor
C-16	2-20 MMF. "D" R.F. Trimmer
C-17	3-30 MMF. "B" R.F. Trimmer
C-18	.05 MFD. Paper Capacitor
C-19	50 MMF. Silver Plated Capacitor
C-20	4,700 MMF. Mica Capacitor
C-21	.05 MFD. Paper Capacitor
C-22	100-230 MMF. 1st I.F. Pri. Trimmer
C-23	50-135 MMF. 1st I.F. Sec. Trimmer
C-24	50-135 MMF. 1st I.F. Tert. Trimmer
C-25	.05 MFD. Paper Capacitor
C-26	.05 MFD. Paper Capacitor
C-27	50-135 MMF. 2nd I.F. Pri. Trimmer
C-28	100-230 MMF. 2nd I.F. Sec. Trimmer
C-29	150 MMF. Mica Capacitor
C-30	150 MMF. Mica Capacitor
C-31	.05 MFD. Paper Capacitor
C-32	.02 MFD. Paper Capacitor
C-33	.0055 MFD. Paper Capacitor
C-34	.002 MFD. Paper Capacitor
C-35	.05 MFD. Paper Capacitor
C-36	.0055 MFD. Paper Capacitor
C-37	.02 MFD. Paper Capacitor

SYMBOL	DESCRIPTION
C-38	.01 MFD. Paper Capacitor
C-39	270 MMF. Mica Capacitor
C-40	.02 MFD. Paper Capacitor
C-41	.05 MFD. Paper Capacitor
C-42	.05 MFD. Paper Capacitor
C-43	.003 MFD. Paper Capacitor
C-44	.003 MFD. Paper Capacitor
C-45	175 MMF. Compensating Capacitor
C-46	25 MFD. 25 V. W.V. Dry Electro.
C-47	10 MFD. 400 V. W.V. Dry Electro.
C-48	30 MFD. 450 V. W.V. Wet Electro.
C-49	30 MFD. 450 V. W.V. Wet Electro.
C-50	.01-.01 MFD. 250 V A.C Line Capacitor
C-51	60 MFD. 40 V A.C Dry Electro.
C-52	20 MMF. Compensating Capacitor
C-54	2-20 MMF. Trimmer Capacitor
C-55	.25 MFD. Paper Capacitor
C-56	.25 MFD. Paper Capacitor
C-57	82 MMF. Mica Capacitor
T-1	Power Transformer, 50-60 cycles—25 cycles
T-2	Output Transformer
T-3	Ant. Transformer
T-4	R.F. Transformer
T-5	Osc. Transformer
T-6	1st I.F. Transformer
T-7	2nd I.F. Transformer
L-1	Field Coil 460 Ohms cold
L-2	Hum Buck Coil
L-3	Voice Coil, 3.5 Ohms
L-4	Beam-a-Scope
CT	Contactor Assembly
P-1	Pilot Lamp 6.3 V.—.25 Amp.
P-2	Pilot Lamp 6.3 V.—.25 Amp.
P-3	Tuning Lamp 25 V.—.2 Amp.
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Supply Switch

SYMBOL	DESCRIPTION
S-4	Tuning Lamp Switch
S-5	Station Selector Switch
S-6	Beam-a-Scope—Ant. Switch
S-7	Motor Scan Switch
M	Tuning Motor 23 V. 50-60 Cycles,—25 Cycles



(a) Sharp position

(b) Expanded position

Fig. 2. I.F. curves taken on G-E oscilloscope OFM-1

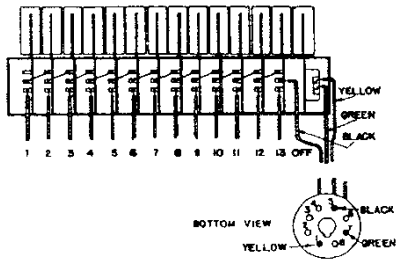


Fig. 7. Keyboard Wiring Diagram—G105

Stopping Accuracy

The exact location at which the dial pointer will come to rest may be made more accurate by slightly lowering the insulated segment (X) on the contactor wheel as shown in Fig. 8. Merely loosen the two screws (Y) and lower the yoke, (Z).

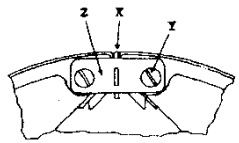


Fig. 8

The proper adjustment is made at the factory and should not require alteration provided the contactor drum is kept well lubricated.

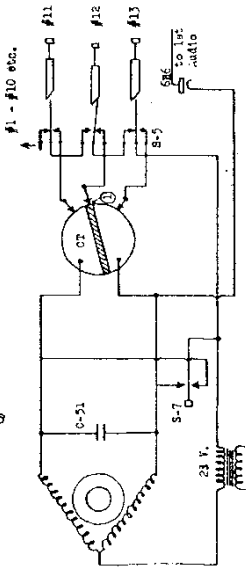
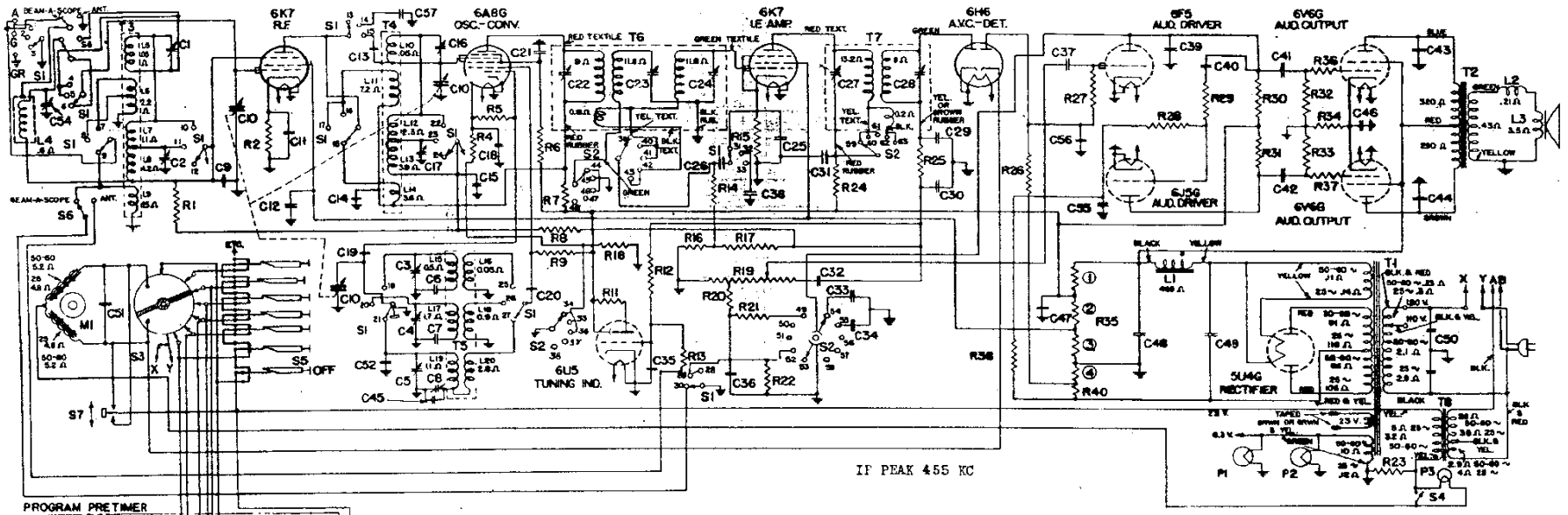
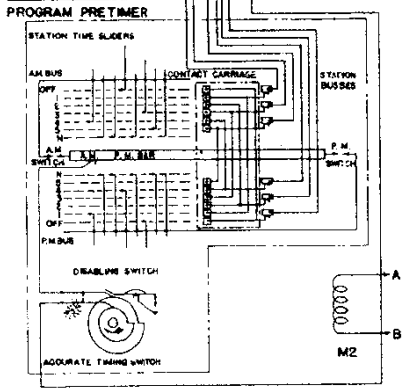


Fig. 6. Schematic of Touch-Tuning System

MODEL G-106
Schematic

GENERAL ELECTRIC CO.





SYMBOL	DESCRIPTION
R-1	Resistor Carbon 220,000 Ohms
R-2	Resistor Carbon 330 Ohms
R-4	Resistor Carbon 330 Ohms
R-5	Resistor Carbon 47,000 Ohms
R-6	Resistor Carbon 39,000 Ohms
R-7	Resistor Carbon 1,000 Ohms
R-8	Resistor Carbon 1.5 Megohms
R-9	Resistor Carbon 22,000 Ohms
R-11	Resistor Carbon 1 Megohm
R-12	Resistor Carbon 2.2 Megohms
R-13	Resistor Carbon 2.7 Megohms
R-14	Resistor Carbon 2.2 Megohms
R-15	Resistor Carbon 330 Ohms
R-16	Resistor Carbon 36,000 Ohms
R-17	Resistor Carbon 220,000 Ohms
R-18	Resistor Carbon 330 Ohms
R-19	Volume Control 2 Megohms
R-20	Resistor Carbon 68,000 Ohms
R-21	Resistor Carbon 68,000 Ohms
R-22	Resistor Carbon 1.2 Megohms
R-23	Resistor Carbon 1,000 Ohms
R-24	Resistor Carbon 1,000 Ohms
R-25	Resistor Carbon 47,000 Ohms
R-26	Resistor Carbon 470,000 Ohms
R-27	Resistor Carbon 1.5 Megohm
R-28	Resistor Carbon 82,000 Ohms
R-29	Resistor Carbon 1.2 Megohms
R-30	Resistor Carbon 68,000 Ohms
R-31	Resistor Carbon 68,000 Ohms
R-32	Resistor Carbon 220,000 Ohms
R-33	Resistor Carbon 220,000 Ohms
R-34	Resistor W.W. 330 Ohms
R-35	4 Sections Voltage Divider
1	1600 Ohms
2	9000 Ohms
3	9000 Ohms
4	11 Ohms

SYMBOL	DESCRIPTION
R-36	Resistor Carbon 1,000 Ohms
R-37	Resistor Carbon 1,000 Ohms
R-38	Resistor Carbon 470,000 Ohms
R-40	Resistor W.W. 20 Ohms
C-1	Capacitor Trimmer 5-40 MMF. "D" Ant.
C-2	Capacitor Trimmer 5-40 MMF. "B" Ant.
C-3	Capacitor Trimmer 3-20 MMF. "D" Osc.
C-4	Capacitor Trimmer 3-70 MMF. "C" Osc.
C-5	Capacitor Trimmer 7-23 MMF. "B" Osc.
C-6	Capacitor Mica 3200 MMF.
C-7	Capacitor Mica 2100 MMF.
C-8	Capacitor Padder 160-375 MMF. "B"
C-9	Capacitor Paper .05 MFD.
C-10	Capacitor Tuning 10-450 MMF.
C-11	Capacitor Paper .05 MFD.
C-12	Capacitor Paper .05 MFD.
C-13	Capacitor Mica 18 MMF.
C-14	Capacitor Paper .1 MFD.
C-15	Capacitor Paper .05 MFD.
C-16	Capacitor Trimmer 2-20 MMF. "D" R.F.
C-17	Capacitor Trimmer 3-30 MMF. "B" R.F.
C-18	Capacitor Paper .05 MFD.
C-19	Capacitor Silver Plated 50 MMF.
C-20	Capacitor Mica 4700 MMF.
C-21	Capacitor Paper .05 MFD.
C-22	Capacitor Trimmer 100-230 MMF. 1st I.F. Pri.
C-23	Capacitor Trimmer 50-135 MMF. 1st I.F. Sec.
C-24	Capacitor Trimmer 50-135 MMF. 1st I.F. Test.

SYMBOL	DESCRIPTION
C-25	Capacitor Paper .05 MFD.
C-26	Capacitor Paper .05 MFD.
C-27	Capacitor Trimmer 50-135 MMF. 2nd I.F. Pri.
C-28	Capacitor Trimmer 100-230 MMF. 2nd I.F. Sec.
C-29	Capacitor Mica 150 MMF.
C-30	Capacitor Mica 150 MMF.
C-31	Capacitor Paper .05 MFD.
C-32	Capacitor Paper .01 MFD.
C-33	Capacitor Paper .0055 MFD.
C-34	Capacitor Paper .002 MFD.
C-35	Capacitor Paper .05 MFD.
C-36	Capacitor Paper .0055 MFD.
C-37	Capacitor Paper .01 MFD.
C-38	Capacitor Paper .01 MFD.
C-39	Capacitor Mica 270 MMF.
C-40	Capacitor Paper .01 MFD.
C-41	Capacitor Paper .05 MFD.
C-42	Capacitor Paper .05 MFD.
C-43	Capacitor Paper .003 MFD.
C-44	Capacitor Paper .003 MFD.
C-45	Capacitor Compensating 175 MMF.
C-46	Capacitor Dry Electro. 25 MFD. 75 V. W.V.
C-47	Capacitor Dry Electro 10 MFD. 400 V.W.V.
C-48	Capacitor Wet Electro 30 MFD. 450 V.W.V.
C-49	Capacitor Wet Electro. 30 MFD. 450 V.W.V.
C-50	Capacitor Line .01-.01 MFD. 250 V. A.C.
C-51	Capacitor Dry Electro-60 MFD. 40 V.A.C. (Use Quam, 2 on 25 cycle receivers)
C-52	Capacitor Compensating 10 MMF.
C-54	Capacitor Trimmer 1-10 MMF.
C-55	Capacitor Paper .25 MFD.
C-56	Capacitor Paper .25 MFD.

SYMBOL	DESCRIPTION
C-57	Capacitor Mica 82 MMF.
T-8	23 volt Transformer 50-60 cycles—25 cycles
T-1	Power Transformer 50-60 cycles—25 cycles
T-2	Output Transformer
T-3	Ant. Transformer B.C.D.
T-4	R.F. Transformer B.C.D.
T-5	Osc. Transformer B.C.D.
T-6	1st I.F. Transformer
T-7	2nd I.F. Transformer
L-1	Field Coil 400 Ohms Cold
L-2	Hum Buck Coil
L-3	Voice Coil 3.5 Ohms
L-4	Beam-a-Scope
CT	Contactor Assembly
P-1	Pilot Lamp 6.3 V.—.25 Amp.
P-2	Pilot Lamp 6.3 V.—.25 Amp.
P-3	Tuning Lamp 25 V.—.2 Amp.
S-1	Band Change Switch
S-2	Tone Control Switch
S-3	Power Supply Switch
S-4	Tuning Lamp Switch
S-5	Station Selector Switch
S-6	Beam-a-Scope—Ant. Switch
S-7	Motor Bone Switch
M-1	Tuning Motor 23 V. 50-60 cycles—25 cycles
M-2	Pretimer Motor—60 cycles, 50 cycles, 25 cycles

Fig. 5. G-106 Schematic Diagram

GENERAL ELECTRIC CO.

MODELS G-105,G-106
Chassis Wiring,Socket
Trimmers,Dial Mechanism
Volume Control Motor

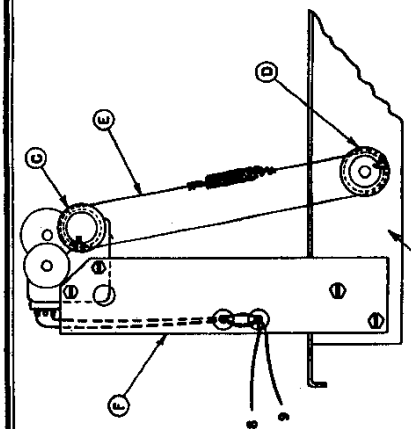


Fig. 10. Volume Control Motor Mounting

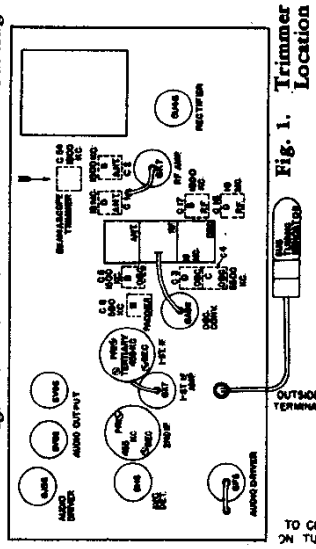


Fig. 1. Trimmer Location

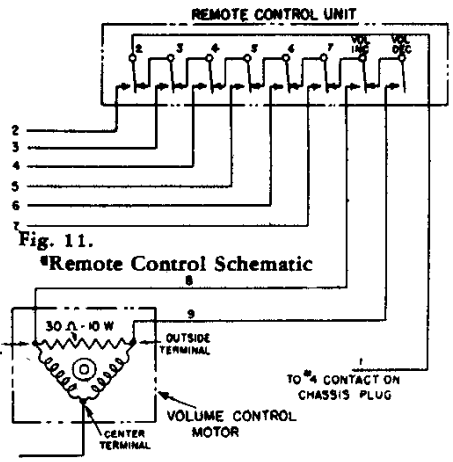


Fig. 11. *Remote Control Schematic

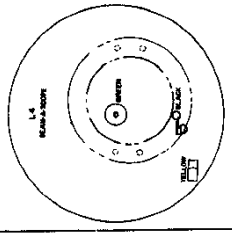


Fig. 3. Chassis Parts Layout

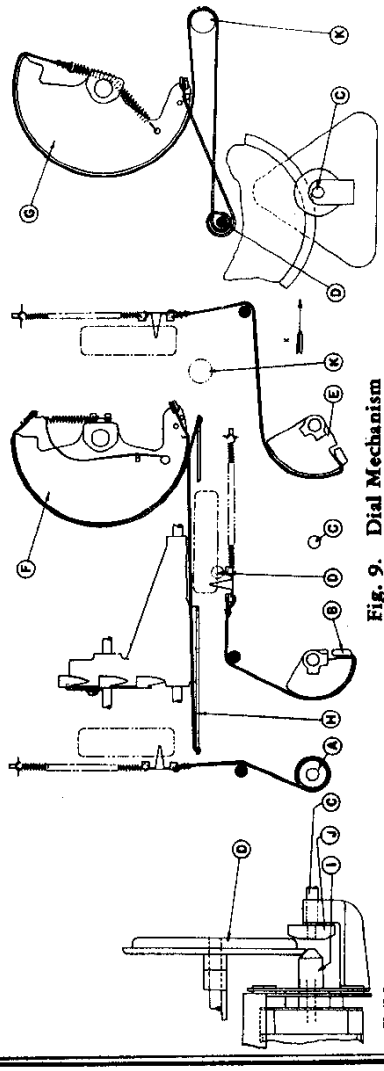


Fig. 9. Dial Mechanism

GENERAL ELECTRIC CO.

KEYBOARD TOUCH-TUNING

THREE-BAND SUPERHETERODYNE RECEIVERS

SERVICE DATA

MODELS G-105 AND G-106

Electrical Specifications

Model G-105:

Rating "A"...105-115 (115-125)* volts, 50-60 cycles, 155 watts
Rating "C"...105-115 (115-125)* volts, 25-60 cycles, 160 watts

Model G-106:

Rating "A"...105-115 (115-125)* volts, 60 cycles, 155 watts
Rating "B"...105-115 (115-125)* volts, 50 cycles, 155 watts
Rating "C"...105-115 (115-125)* volts, 25 cycles, 160 watts

* The receivers as shipped from the factory have the power cord connected to the 115-125-volt tap of the transformer (black and red lead). If the normal voltage of the power supply is always below 110 volts, the connection of the power cord should be removed from this lead and soldered to the 105-115-volt tap (black and yellow lead). After changing the connection, tape the soldered joint as well as the exposed end of the unused lead. This change requires removal of the chassis from the cabinet.

GENERAL INFORMATION

The Models G-105 and G-106 are three band A-C operated receivers employing ten General Electric Pre-tested tubes in a superheterodyne circuit as described above. These receivers are equipped with a simplified Touch Tuning system allowing motor-tuning of thirteen stations; and the new and exclusive self-contained antenna system, "Beam-a-Scope." Other features of design include; electric finger-tip dial drive control, R.F. Amplifier, five position hi-fidelity tone control, special I.F. transformers and push-pull output.

The Model G-106 not only has all the above features, but it also incorporates an ingenious automatic program preselector which permits the automatic tuning of favorite programs at 15-minute intervals throughout a 24-hour period.

BEAM-A-SCOPE

The "Beam-a-Scope" is essentially a tuned coil antenna wound on an impregnated frame and shielded by a Faraday screen against electrostatic disturbances. This construction discriminates in favor of the desired signal as against a local man-made noise source in three ways. First, since any noise source is composed of two components—electrostatic and magnetic fields—the "Beam-a-Scope" may be revolved so that a null point is found where no voltage is produced from these two components in the direction where the noise originates. Due to the fact that this null point is very sharp, it is very unusual that any desired station will be in a direct line with the rejected noise signal and thereby have its signal strength reduced appreciably. In the second place, the "Beam-a-Scope" eliminates the external return path to ground present in the case of an unshielded antenna. This reduces or eliminates local man-made noise sources in much the same way as a shielded antenna lead-in does in an ordinary antenna installation. In the third place, the "Beam-a-Scope" discriminates against the electrostatic component of an incoming wave in comparison with the magnetic component, because of the Faraday shield. Since the electrostatic component of a local noise source is a great deal larger than the magnetic component, this rejection property brings about an enormous increase in signal-to-noise ratio.

The above operation is only available on the broadcast band and in this position the Beam-a-Scope is also the first tuned grid circuit. On the "C" and "D" bands, the Beam-a-Scope is connected to operate as a capacity type antenna.

Switch (S-6) located at the rear of the chassis is the Beam-a-Scope-antenna transfer switch to allow operation on all bands with either the Beam-a-Scope or an outside antenna. This switch also reduces the sensitivity of the 6U5 tuning indicator tube in the "B" band only.

Loud-speaker

To center the voice coil, remove dust cover by softening with acetone. Loosen the two spider clamping screws and place three 1 in. by ¼ in. by 0.010 in. paper or celluloid strips equally spaced around pole piece for clearance; then tighten clamping screws. Remove centering strips and cement the dust cap back in place with Glyptal cement.

Coil System

The "B," "C" and "D" band antenna coils are wound on a single coil form T-3 as shown in Fig. 4 and 5. T-4 and T-5 are the R.F. and oscillator transformers respectively for the "B," "C" and "D" bands. All switch points are numbered in Fig. 4 and 5 to facilitate in locating these switch points on the pictorial wiring diagram, Fig. 3.

The following table gives the coils in use for the various positions of the wave change switch.

Coil	Band "B"	Band "C"	Band "D"
Antenna Primary Beam-a-Scope	....	Lower portion of L-6	L-6
Regular Antenna	L-9	Lower portion of L-6	L-6
Wave change switch point	Gnd to (3) Ant to (9)	Gnd to (2) Ant to (8)	Gnd to (1) Ant to (7)
Antenna Secondary Beam-a-Scope	L-4 (Beam-a-Scope)	L-5 + L-7	L-5
Regular antenna	L-5+L-7+L-8	L-5+L-7	L-5
Wave change switch point	C-9 to (12) 6K7 grid to (6)	C-9 to (11) & (12) 6K7 grid to (5)	C-9 to (10) and (11) 6K7 grid to (4)
R.F. Primary	L-14	L-11	L-11
Wave change switch point	6K7 plate to (13) and (18)	6K7 plate to (14) and (17)	6K7 plate to (15) and (16)
R.F. Secondary	L-10+L12+L13	L-10 + L-12	L-10
Wave change switch point	C-15 to (24)	C-15 to (23) and (24)	C-15 to (22) and (23)
Oscillator Primary	L-19	L-17	L-15
Wave change switch point	Osc. grid to (21)	Osc. grid to (20) Gnd to (21)	Osc. grid to (19) Gnd to (20)
Oscillator Secondary	L-20	L-18	L-16
Wave change switch point	C-20 to (27)	C-20 to (26)	C-20 to (25)

In the "C" and "D" bands, the band switch removes bass compensation by grounding capacitor C-36, increases the I.F. sensitivity and also increases the sensitivity of the tuning indicator tube.

NOTE.—When replacing capacitors C-45 and C-52, it is absolutely necessary to replace with the specified parts as these are special negative temperature coefficient capacitors that compensate for oscillator drift with temperature.

ALIGNMENT PROCEDURE

Alignment Procedure

Use a "dummy" antenna in making all alignments. The grid lead should not be removed from the tube to which the input signal is applied when aligning the I.F. amplifier.

I.F. Alignment with Oscilloscope*

Band Switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B	455 K.C. and 30 K.C. Sweep	Normal	I.F. 6K7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity—vertical input to ground and junction at R-25, R-12, and R-17. Adjust trimmers in order mentioned for a single curve of maximum amplitude. The resulting curve on the "normal" position is shown in Fig. 2A. The expanded curve taken with tone control at "Treble I" is shown in Fig. 2B.
2. Band B	455 K.C. and 30 K.C. Sweep	Treble I	Converter 6A8 Grid	1st I.F. Sec. 1st I.F. Pri.	
3. Band B	455 K.C. and 30 K.C. Sweep	Normal	Converter 6A8 Grid	1st I.F. Tertiary	
4. Band B	455 K.C. and 30 K.C. Sweep	Normal	Converter 6A8 Grid	All I.F. Trimmers	

I.F. Alignment with Output Meter*

Band Switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B	455 K.C. modulated	Normal	I.F. 6K7 Grid	2nd I.F. Sec. 2nd I.F. Pri.	Condenser gang at minimum capacity-output meter connected across voice coil-volume control at maximum-input as low as practical. Adjust all trimmers in order listed for maximum output. Note:—Do not attempt alignment in the expanded position.
2. Band B	455 K.C. modulated	Normal	Converter 6A8 Grid	1st I.F. Sec. 1st I.F. Pri. 1st I.F. Tertiary	
3. Band B	455 K.C. modulated	Normal	Converter 6A8 Grid	All I.F. Trimmers	

R.F. Alignment**

Band Switch Setting	Input Frequency	Tone Control Position	Point of Input	Trimmer	Comments
1. Band B					Mechanically adjust dial pointer to first line at left-hand end of dial scale with condenser gang fully meshed.
2. Band B	1500 K.C. modulated	Bass	Antenna Post	Osc. (C-5) R.F. (C-17) Ant. (C-2)	Connect output meter across voice coil-antenna switch turned to counter-clockwise position. Adjust trimmers in order listed for maximum output.
3. Band B	580 K.C. modulated	Bass	Antenna Post	Osc. Padder (C-8)	Adjust padder for maximum output in vicinity of 580 K.C. while rocking gang condenser.
4. Band B	1500 K.C. modulated				
5. Band C	5500 K.C. modulated	Bass	Antenna Post	Osc. (C-4)	Adjust trimmer for greatest output with dial pointer at 5500 K.C.
6. Band D	18.0 M.C. modulated	Bass	Antenna Post	Osc. (C-3) R.F. (C-16) Ant. (C-1)	Peak C16 and C1 while rocking gang condenser. The image of any signal on the D band should be 910 K.C. below input signal. Example: 15 M.C. image 14.09 M.C.
7. Band B	1500 K.C. modulated	Bass	Antenna Post	Beam-a-scope (C-54)	Turn antenna switch to clockwise position, align Beam-a-scope trimmer for maximum output.

* Use "dummy" antenna consisting of .05 mfd. capacitor between signal generator and point of input.
** Use "dummy" antenna consisting of 250 mmf. capacitor in series with 200-ohm resistance between the signal generator and the point of input.

MODELS G-105 AND G-106

Insist on genuine factory-tested parts, which may be purchased from authorized dealers.

Stock No.	Description	List Price
	CHASSIS ASSEMBLY	
*RB-008	BOARD—Terminal Board (2 lugs) (25-cycle set)	$0.10
*RB-023	BOARD—Terminal Board (4 lugs)	.10
*RB-049	BOARD—Antenna-ground terminal board	.10
*RB-062	BOARD—Terminal board (6 terminals)	.10
*RB-066	BOARD—Terminal board (4 lugs)	.10
*RB-070	BOARD—Terminal board (3 lugs)	.10
RB-094	BOARD—Terminal board (7 lugs)	.10
RB-163	BRACKET—Tuning motor transformer bracket (G-106 only)	.80
*RC-011	CAPACITOR—.002 mfd., 600 V. paper (C-34)	.25
RC-020	CAPACITOR—.003 mfd., 1500 V. paper (C-43, -44)	.25
*RC-023	CAPACITOR—.005 mfd., 600 V. paper (C-33, -36)	.25
*RC-039	CAPACITOR—.01 mfd., 600 V. paper (C-38)	.25
*RC-048	CAPACITOR—.02 mfd., 600 V. paper (C-32, -37, -40)	.30
*RC-092	CAPACITOR—.05 mfd., 600 V. paper (C-9, 11, -12, -15, -18, -21, -25, -25, -31, -35, -41, -42)	.30
*RC-104	CAPACITOR—.1 mfd., 600 V. paper (C-14)	.30
*RC-136	CAPACITOR—.25 mfd., 200 V. paper (C-55, -56)	.30
RC-217	CAPACITOR—50 mmf., mica (silver plated) (C-19)	.35
RC-219	CAPACITOR—18 mmf., mica (C-13)	.25
RC-227	CAPACITOR—82 mmf., mica (C-57)	.25
RC-230	CAPACITOR—20 mmf., compensating capacitor (C-52)	.35
*RC-242	CAPACITOR—150 mmf., mica (C-29, -30)	.25
RC-245	CAPACITOR—175 mmf., compensating capacitor (C-45)	.45
RC-263	CAPACITOR—270 mmf., mica (C-39)	.25
*RC-349	CAPACITOR—2100 mmf., mica (C-7)	.30
*RC-353	CAPACITOR—3200 mmf., mica (C-6)	.70
RC-393	CAPACITOR—4700 mmf., mica (silvered) (C-20)	.50
*RC-429	CAPACITOR—30 mfd., 450 V. wet electrolytic (C-48, -49)	1.35
RC-596	CAPACITOR—25 mfd., 25 V.; 10 mfd., 400 V.; dry electrolytic (C-46, -47)	1.10
RC-597	CAPACITOR—60 mfd., 40 V. A-C motor capacitor (C-51)	1.00
RC-678	CAPACITOR—160-375 mmf., "B" padder (C-8)	.30
RC-679	CAPACITOR—2-20 mmf., trimmer (C-54)	.20
RC-680	CAPACITOR—2-20 mmf., 3-30 mmf., double trimmers (C-16, -17)	.35
RC-681	CAPACITOR—7-23 mmf., "B" osc. trimmer (C-5)	.90
RC-682	CAPACITOR—2-20 mmf., double trimmers (osc.) (C-3, -4)	.35
RC-683	CAPACITOR—5-40 mmf., double trimmers (ant.) (C-1, -2)	.35
RC-729	CONDENSER—3 gang tuning condenser (C-10)	5.60
*RC-863	POWER CORD—Power cord	.65
RC-1977	CLAMP—Tuning indicator clamp and thumb screw	.10
RC-8035	Cable—Speaker cable and plug	.50
RC-8040	CABLE—Tuning indicator cable and socket	.45
RC-892	CABLE—Clock connector cord and plug	.50
RG-016	GRID CLIP—Control grid clip (for metal tubes) (Pkg. of 5)	.10
RK-027	KNOB—Tone and band change knobs (Pkg. of 5)	.50
RK-028	KNOB—Control knobs (plain) (Pkg. of 5)	.30
RL-063	COIL—Ant. coil band "B," "C," and "D" (T-3)	1.25
RL-142	COIL—R.F. coil band "B," "C," and "D" (T-4)	1.15
RL-267	COIL—Osc. coil band "B," "C," and "D"	$1.25
RL-500	BEAM-A-SCOPE—Beam-a-scope antenna complete	9.15
*RQ-1247	RESISTOR—330 ohm, ½-W. carbon (R-2, -4, -15, -18) (Pkg. of 5)	.70
*RQ-1259	RESISTOR—1000 ohm, ½-W. carbon (R-7, -24, -36, -37) (Pkg. of 5)	.70
*RQ-1291	RESISTOR—22,000 ohm, ½-W. carbon (R-9) (Pkg. of 5)	.70
*RQ-1299	RESISTOR—47,000 ohm, ½-W. carbon (R-5, -25) (Pkg. of 5)	.70
*RQ-1301	RESISTOR—56,000 ohm, ½-W. carbon (R-16) (Pkg. of 5)	.70
*RQ-1303	RESISTOR—68,000 ohm, ½-W. carbon (R-20, -30, -31) (Pkg. of 5)	.70
RQ-1305	RESISTOR—82,000 ohm, ½-W. carbon (R-28) (Pkg. of 5)	.70
*RQ-1315	RESISTOR—220,000 ohm, ½-W. carbon (R-1, -17, -32, -33) (Pkg. of 5)	.70
*RQ-1323	RESISTOR—470,000 ohm, ½-W. carbon (R-26, -38) (Pkg. of 5)	.70
*RQ-1331	RESISTOR—1.0 megohm, ½-W. carbon (R-11) (Pkg. of 5)	.70
*RQ-1333	RESISTOR—1.2 megohm, ½-W. carbon (R-22, -29) (Pkg. of 5)	.70
*RQ-1335	RESISTOR—1.5 megohm, ½-W. carbon (R-27) (Pkg. of 5)	.70
*RQ-1337	RESISTOR—1.8 megohm, ½-W. carbon (R-8) (Pkg. of 5)	.70
*RQ-1339	RESISTOR—2.2 megohm, ½-W. carbon (R-12, -14) (Pkg. of 5)	.70
RQ-1341	RESISTOR—2.7 megohm, ½-W. carbon (R-13) (Pkg. of 5)	.70
RQ-1459	RESISTOR—1000 ohm, 1-W. carbon (R-23)	.20
RQ-1497	RESISTOR—39,000 ohm, 1-W. carbon (R-6)	.20
RR-740	RESISTOR—Voltage divider resistor (R-35)	.85
RR-1006	RESISTOR—20 ohm, ½-W. carbon W.W. resistor (R-40) (Pkg. of 5)	.70
RR-1007	RESISTOR—230 ohm, 2-W. carbon resistor (R-34)	.20
*RS-174	SHIELD—Grid shield cap (Pkg. of 5)	.25
*RS-200	SOCKET—8 prong octal base socket (Pkg. of 5)	.75
*RS-204	SOCKET—5 prong octal tube socket (Pkg. of 5)	.75
RS-225	SOCKET—Dial light bayonet socket assembly	.10
RS-226	SOCKET—Octal base (on rear deck of chassis)	.15
RS-227	SOCKET—Tube socket (low loss octal base)	.15
RS-228	SOCKET—Station set-up lamp socket	.20
RS-229	SOCKET—Tube socket (6A8G)	.35
RS-508	SPACER—Tuning motor transformer spacer (Pkg. of 4)	.25
RS-396	SWITCH—Tone control switch (S-2)	1.35
RS-397	SWITCH—Station set-up lamp switch (S-4)	.20
RS-398	SWITCH—Motor scan switch (S-7)	.75
RS-399	SWITCH—Antenna loop switch (S-6)	.85
RS-3007	SWITCH—Band change switch (S-1)	3.00
RS-3001	SWITCH—Tuning motor "Off" switch	1.00
RT-104	TRANSFORMER—Power transformer, 105-125 V., 25-60 cycles (T-1)	14.75
RT-105	TRANSFORMER—Power transformer, 105-125 V., 50-60 cycles (T-1)	9.00
RT-106	TRANSFORMER—Tuning motor transformer, 50-60 cycles	3.70
RT-107	TRANSFORMER—Tuning motor transformer, 25 cycles	11.10
RT-263	TRANSFORMER—1st I.F. transformer and shield (T-6)	2.30
RT-264	TRANSFORMER—2nd I.F. transformer and shield (T-7)	1.60
RT-439	TRANSFORMER—Output transformer (T-2)	3.20
RV-042	VOLUME CONTROL—2 megohm volume control (R-19)	$0.75
*RW-101	WASHERS—Felt washers for knobs (Pkg. of 10)	.45
*RX-027	ASSEMBLY—Chassis mounting assembly	.15
RX-049	ASSEMBLY—Condenser mounting assembly	.15

DIAL SCALE AND AUTOMATIC DRIVE ASSEMBLY

RB-160	BRACKET—Reduction drive wheel bracket	.20
RB-161	BRACKET—Manual and motor drive bracket	.40
RB-162	BRACKET—Tuning condenser mounting bracket (front)	.45
RB-700	BRAKE—Drive wheel friction brake (complete)	.20
RC-8041	CABLE—Dial pointer drive cable (2 cords)	.15
RC-8042	CABLE—Tone or volume control indicator cable (Pkg. of 5)	.40
RC-8043	CABLE—Band indicator cable (Pkg. of 5)	.35
RC-8044	CABLE—Condenser drive cable (Pkg. of 5)	.85
RD-073	DIAL—Dial scale	2.25
RE-031	ESCUTCHEON—Dial scale escutcheon	1.75
RM-112	MOTOR—Tuning motor, 50-60 cycles	4.00
RM-113	MOTOR—Tuning motor, 25 cycles	5.35
*RP-048	DRIVE PULLEY—Condenser drive pulley (G)	.35
*RP-079	PULLEY—Volume control drive pulley assembly (A)	.15
*RP-083	PULLEY—Band change drive cord pulley (E)	.10
*RP-084	PULLEY—Tone control drive pulley (B)	.10
RP-110	POINTER—Band change, tone and volume indicator pointer (Pkg. of 5)	.20
RP-111	POINTER—Dial scale pointer and clamp	.15
RP-300	PULLEY—Rubber cone drive pulley (motor) (I)	.25
RP-301	PULLEY—Drive cord idler pulley (Pkg. of 2)	.10
RP-302	DRIVE PULLEY—Pointer and drive pulley (F)	.35
*RS-427	SPRING—Volume, tone and band indicator tension springs (Pkg. of 5)	.20
RS-446	SPRING—Drive cord tension spring (Pkg. of 5)	.25
RS-911	SHAFT—Drive wheel shaft and collar	.15
RS-912	SHAFT—Manual drive shaft and rubber cone pulley	.20
RW-023	WINDOW—Volume control window	.30
RW-023	WINDOW—Tone control window	.30
RW-024	WINDOW—Band change window	.30
RW-900	WHEEL—Idler drive wheel (D)	.45

AUTOMATIC PROGRAM PRESELECTOR—G-106 ONLY

RC-8079	CARDS—Station letter cards (set)	.35
RC-8080	CARDS—Neutral (card) (Strip of 5)	.05
RE-041	ESCUTCHEON—Clock face escutcheon and window	.65
RW-028	WINDOW—Celluloid station windows (Pkg. of 10)	.05

PUSH-BUTTON MECHANISM

RC-8045	CARDS—Station letter cards (set)	$0.60
RC-8046	CABLE—Power cable and plug to push-button assembly	.50
RC-8047	CABLE—Station selector button cable	.95
RK-203	KEY—Station key (Pkg. of 5)	.30
RS-444	SPRING—Station button springs (Pkg. of 10)	.10
RS-864	SCREWS—Keyboard assembly thumb screws (Pkg. of 10)	.40
RS-3008	SWITCH—Push button "On-Off" switch	.50
RT-906	TAB—"Off" tab for station button (Strip of 10)	.05
RW-025	WINDOW—Celluloid station window (Pkg. of 25)	.15
RX-051	ASSEMBLY—Keyboard touch-tuning assembly switch complete (G-105)	7.40
RX-052	ASSEMBLY—Keyboard touch-tuning assembly switch (complete) (G-106)	7.45

STATION SELECTOR ASSEMBLY (BEHIND TUNING CONDENSER)

RB-701	BAND—Contactor band	.10
RC-1978	CONTACT—Thumb screw contact (complete) (Pkg. of 5)	.45
RC-1979	CONTACT—Stationary contact complete (For "Off" switch) (G-106 only)	.15
RI-108	INSULATOR—Contactor band insulator (Pkg. of 5)	.45
RS-447	SPRING—Contactor band tension spring (Pkg. of 5)	.15
RW-901	WHEEL—Contactor wheel (CT) complete	2.00

SPEAKER ASSEMBLY

RC-936	CONE—12-inch cone and voice coil assembly	1.10
RC-991	CLAMP—Cone spider clamp	.05
RD-301	DUST CAP—Speaker cone dust cap (Pkg. of 5)	.10
RP-109	PLUG—Male speaker plug	.20
RS-075	SPEAKER—12-inch speaker	5.50
*RX-030	ASSEMBLY—Speaker mounting assembly	.10

(Prices subject to change without notice.)

*Used on previous receivers.

SOCKET VOLTAGES

Tube No.	Plate to Ground Volts D-C	Screen Grid to Ground Volts D-C	Cathode to Ground Volts D-C	Cathode Current MA	Heater Volts A-C
6K7 R.F.	215	95	2.6	7.5	6.4
6A8 Conv.	215	85	2.7	9.0	6.4
6A8 Osc.	135	...			
6K7 I.F.	215	95	2.6	7.5	6.4
6H6 Det.	...	...	...	...	6.4
6F5 Audio	150*	...	0	1.0	6.4
6J5G Inverter	85*	...	0	2.0	6.4
6V6G Output	280	290	17.5	40 each	6.4
6U5 Indicator	220	...	...	0.5	6.4
5U4G Rectifier	Plate to Plate 680 RMS		350	120	5.1

6F5 Bias Supply Voltage—1.2 Volts
6J5G Bias Supply Voltage—3.5 Volts

AC Line voltage—120 No signal input—1000 ohms per volt meter—dial pointer at 530 K.C. on broadcast band.
* Measured on 500-volt scale.