

General Electric Co.

	Model: 250	Chassis:	Year: Pre 1951			
	Power:	Circuit:	IF:			
	Tubes:					
	Bands:					
Resources						
Riders Volume 19 - CHANGES 19-2						
Riders Volume 17 - CHANGES 17-3						
Riders Volume 21 - CHANGES 21-3						
Riders Volume 20 - CHANGES 20-5						
Riders Volume 15 - GE 15-32						
Riders Volume 15 - GE 15-33						
Riders Volume 15 - GE 15-34						
Riders Volume 15 - GE 15-35						
Riders Volume 15 - GE 15-36						

GE 41, 42, 43

These models appear on pages 17-1, 2 through 17-15 of *Rider's Volume XVII*. The following changes should be made. Add Cat. No. REF-003, line fuse F201, 3AG, 5 amp., 250 volts, to the parts list and add this to the schematic diagram of the Special Power Unit on page 17-3. The fuse should be placed in series with the power transformer primary and the power cord. Besides the addition of a fuse, the safety will be further increased by placing a sheet of asbestos underneath the power unit to cover the ventilation slots. Thus, even in the case of overload, the hot tar of the over-heated transformer is prevented from dropping on the floor.

Add Cat. No. RSV-001, Switch—power ON-OFF switch to the parts list. Replacement is readily made by merely bending the mounting tabs.

To adjust for minimum hum level, turn the volume control until the audio output is zero and vary resistor R201 (which is parallel to the filaments and center-tapped to the chassis, forming an effective hum balancing circuit).

General Electric 41, 42, 43, 44, 45

These models appear on pages 17-1, 2 through 17-15 of *Rider's Volume XVII*. A sliding type switch has been added in series with R67 (8200 ohms) connecting the resistor to the phonograph pickup input jack, J3. This switch is on the receiver chassis back apron with its respective label indicating High Fidelity and Normal, the open and closed positions, respectively.

In the replacement parts list under Cat. No. RSS-003, add the item: High Fidelity-Normal switch.

General Electric 50

This model will be found on pages 15-1 through 15-4 of *Rider's Volume XV*. This change covers a correction to the original parts list in the model 50 where Cat. No. RHS-001 was changed to RMX-006 for a tuning assembly and spacer.

A further correction is necessary in the item description since only the tuning shaft and drive pulley (assembled) is supplied under RMX-006. The spacer is the tuning shaft bearing, and is catalogued as a separate item under RHJ-001. The original parts listing of the drive pulley under this number has been deleted.

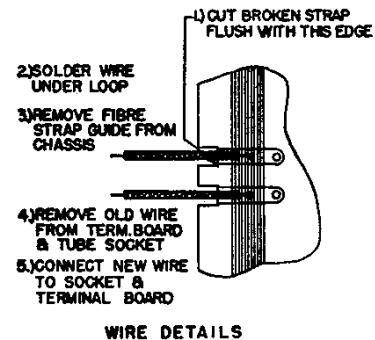
GE 140

This model appears on pages 17-21 through 17-23 of *Rider's Volume XVII*. The following changes should be made in the parts list: From Cat. No. RAD-027 remove the statement "(with loop connecting strips only)." Change Cat. No. RCC-075 to read RCC-080. Delete Cat. Nos. RDK-098, RHC-008, and RMX-103. Add the following parts:

RDK-106 Knob—door catch knob
RCE-002 Strap—loop contact strap
RHE-002 Eyelets—spacer eyelets for escutcheon screws RHS-016
RHE-003 Eyelet—used for loop contact strap
RHR-002 Rivets—door hinge rivets (power cord access)
RHS-015 Screw—self tapping (used for cabinet door cover)
RHS-016 Screw—Phillips, flat-head, mounts bottom of escutcheon

The following procedure is recommended for repairing broken antenna loop connecting straps.

The broken straps should be cut back flush with the inside edge of the notch on the loop. The flexible wire is then used to make connections from the loop to the inside of the receiver. Consult the accompanying diagrams for loop connecting details and wire specifications. Carefully lift the section of the loop to allow connecting the specified pieces of wire and solder

**2 REQUIRED PER SET**

Above, the loop connecting details of the General Electric Model 140. The wire details for the antenna loop connections are shown in the lower figure.

wires to remainder of loose straps. Remove the fibre strap guide which originally insulated the loop straps within the cabinet. Remove original wire leads and pieces of loop strap connected inside the cabinet to the chassis terminal strip and pin 6 of the 1R5 oscillator-converter tube socket. Solder the new leads from the antenna loop directly to the terminal board and tube socket. Make certain that the inside of the loop is connected to pin 6 of the 1R5 tube socket. The following procedure is recommended to replace a speaker in this model.

- 1—Unsolder leads on speaker, using small tip iron.
- 2—Unsolder 90- μ F capacitor (C14) at terminal strip.
- 3—Without unsoldering, remove dual 40- μ F capacitor (C20) from mounting clip.
- 4—Using long screwdriver (8 inches or longer) loosen screws holding speaker to chassis.
- 5—Remove nuts holding speaker to front panel.
- 6—Lift up left end of resistor mounting plate and then lift out speaker.

If the antenna straps which interconnect the antenna in the receiver cover with the radio chassis circuit break, the following replacement procedure is recommended:

- 1—Bend up insulating material covering set end of antenna strips by inserting the tip of a long-nose pliers and twisting gently so as not to tear material.
- 2—Unsolder wires from loop strips in receiver.
- 3—Remove screws holding door cover.
- 4—Lift loop at point midway between hinges to expose strip rivets and unsolder loop from loop strips.

5—Remove rivet or rivets as needed, taking care not to damage loop or loop back.

6—Replace broken straps by new members, Cat. No. RCE-002, and rivet it in place with eyelets, Cat. No. RHE-003.

In order to replace the rectifier disc assembly, SR, proceed as follows:

- 1—Remove two mounting screws from the power switch, S1 (door switch).
- 2—Dress power switch away from mounting plate, providing more access to underside of top chassis deck.
- 3—Unsolder leads to rectifier disc assembly.
- 4—Push aside components underneath rectifier assembly mounting screw until screw can be loosened.

General Electric 210, 211, 212

These models appear on pages 18-21 through 18-25 of *Rider's Volume XVIII*. Change the third column (Signal Input Point) of the alignment charts on page 18-23 to read: 12BE6 grid (pin 7 of V2). See note 7.

The parts list on page 18-25 should be changed as follows: Change catalogue number UOP-557 to UOP-558 for Speaker 5 $\frac{1}{4}$ -inch PM. Add the reference symbol R32 to Cat. No. URD-141—Resistor—6.8 meg., $\frac{1}{2}$ w., carbon.

The following changes have been made in the schematic diagram on page 18-21. Where capacitor C38 is shown terminating at ground on this schematic, later model receivers have this ground connection removed and the capacitor is terminated at the junction of the antenna input and capacitor C14. Capacitor C36 should be added and connected from the junction point of R29, pilot lamp II, and pin 4 of V7 to ground. Resistor R32, which has been added to replacement parts list above, is connected from the junction of R8 and C4 (AVC filter) to the cathode, pin 2, of output tube V6.

This resistor, R32, has been added to increase the converter stage gain when operating in the A-M position because of a change in performance characteristics relative to grid cut-off of the 12BE6 tube.

General Electric 230 Kaiser-Frazer

This model appears on pages 18-26 through 18-28 of *Rider's Volume XVIII*. The change involves a substitution of catalog numbers in the replacement parts list as follows:

Cat. No. URE-035 and URF-055 are catalogued for carbon-type resistors. These numbers are to be replaced for numbers specifying wirewound resistors, RRW-037 becoming the Cat. No. for R13 and RRW-036 the number for R18.

General Electric 502

This model appears on pages 17-4 through 17-8 and pages 17-39, 40 through 17-47 of *Rider's Volume XVII*. The changes involve a schematic correction and a correction in the value of a component in the replacement parts list.

The schematic diagram which shows an open circuit in the screen grids of the 6V6 tubes, V10 and V11, should be corrected to show the screen grids connected to the 260-volt B-plus line.

In the listing of Cat. No. RCW-1028, the capacitor value was mistakenly given as 22- μ F. The capacitors listed are actually 100- μ F and RCW-1028 should be changed to read 100- μ F.

Farnsworth Models

The parts shortage has resulted in the substitution of various types of tuning capacitors without change in part numbers stamped on them. In ordering replacement tuning capacitors for ET-060, 061, 063, 064, 065, 066, 069; EK-263, 264, and 265 the following suggestions should be observed:

Gang Capacitor with 21 plate oscillator section requires the removal of trimmer from r-f section of gang if the loop antenna has a r-f trimmer located on it. This capacitor used B.C. oscillator coil #38483 and, if an S.W. oscillator coil is used requires S.W. oscillator coil #38549. Both of these coils have a white dot to indicate finish lug.

A #26239 gang capacitor with 19 plate oscillator section (identified by red dot on rear) may require the removal of r-f trimmer as explained above. This capacitor requires B.C. oscillator coil #38706 and S.W. oscillator coil (if used) #38709. These oscillator coils are marked with a yellow dot at the finish lug.

The following is an alignment hint for the Farnsworth models with respect to the use of the antenna:

The antenna should be held in a vertical position, $\frac{1}{8}$ inch from the back side of the radio chassis in order to maintain the maximum output of the antenna after being installed in the cabinet. Therefore, we suggest some type of a jig to be made out of scrap material found around the service department to hold said antenna in the proper position while the serviceman is realigning the radio out of the cabinet. This suggestion is very helpful in getting the best operation out of the radio and, in addition, saving expense and time.

GALVIN DIAL CORD SLIPPAGE

Dial slippage encountered in 1946 home sets using slide rule type dials can easily be remedied by restringing using two dial cords.

Formerly, a single cord and tension spring was used for both driving the tuning capacitor and moving the pointer. It is recommended that two cords and tension springs be used; one for driving the tuning capacitor and one for moving the pointer.

Before removing the old cord, make a sketch showing the old cord layout. This will assist greatly in restringing.

First install the drive cord between the tuning shaft and tuning capacitor pulley. It is to be routed in exactly the same manner as the old cord was, except run it only between the tuning shaft and tuning capacitor pulley. Be sure to wind 3 turns around the tuning shaft. The old tension

spring is used to provide tension on the cord by hooking in exactly as before. Use the cord originally on the set for this purpose, except cut it down to the required length.

Install the pointer cord supplied by routing it in the same fashion as before except that it does not go to the tuning shaft. Simply run it to the tuning capacitor pulley and apply light tension to it with the attached tension coil spring. There are several holes in the tuning capacitor pulley through which the tension spring may be hooked and/or adjusted.

To calibrate pointer, simply turn the tuning capacitor to the fully meshed position and set pointer to "V" notch or calibration mark provided.

Use a drop of household cement to fix pointer to cord. A drop of cement on all knots will secure them.

Gamble-Skogmo 43-7601, 43-7601A, 43-7601B

These models, shown on pages 16-1 to 16-5 of *Rider's Volume XVI*, use the General Instrument Record Changer model 205, which can be found on pages RCD.CH. 15-5 to 15-8 of *Rider's Volume XV*.

General Electric 250

To reduce the hum in this model, which is found on pages 15-32 to 15-36 of *Rider's Volume XV*, it is suggested that the following change be made.

Resistor R16 (2200 ohms) should be removed from the negative battery terminal lug, lengthen pigtails, insulate with a spaghetti covering, and solder to the ground lug of the terminal board located at socket saddle of the 1LH4 tube.

An appreciable increase in duration of operation from a fully charged battery in this model can be effected in the following manner, realizing, however, that some degree of performance is sacrificed in regard to sensitivity and power output. Replace power-supply filter resistor, R17 (1500 ohms) with one of 4700 ohms, 1 watt, carbon. This change should be made only when the customer demands a longer duration of operation to one battery charge.

Hallicrafters S-38

In the event that an a-c hum develops in this receiver, the schematic of which appears on page 15-59 of *Rider's Volume XV*, it has been found that the 35Z5GT is the cause of the trouble, even though the tube passes a normal test. Also, other tubes in this set have been known to cause hum. Try replacement tubes.

Another cause is a high resistance ground between the chassis and the case.

This usually develops through the rubber mounting grommets or through the switch mounting rivets. Occasionally it may be a defective 25- μ f capacitor (C36), which should be replaced if defective. It is possible that C36 is not of the correct value. Check this point.

If this set loses sensitivity after being in use for approximately a half hour, replace the 12SA7GT/G tube, as an investigation has revealed that this condition is due to a certain percentage of Hytron tubes of this type, of a particular production run marked 1/6, 2/6, 1A6, or 2A6. The replacement should have any other marking than those listed previously.

Hallicrafters S-40

In the event that band 4 (15.7 to 43 mc) fails to operate at all times, but reception on other bands is normal, trouble is indicated in the oscillator circuit of this band, which in most cases can be traced to a weak 6SA7 oscillator tube or low line voltage. In those few cases where trouble persists, even though all voltages are normal and the tube has been replaced, this trouble can be remedied by replacement of the oscillator coil T9 and capacitor C18, as follows:

Replace T9 oscillator coil, part #51B791 containing 7 primary turns, with part #51B791B, having 10 primary turns. Change capacitor C8 (100 μ uf) to part #CC25UK680K, 68 μ uf. Connect the cathode lead from terminal 6 of the 6SA7 (V2) to T9 direct to the secondary winding where it leaves the coil form rather than to terminal lug "A" on the top of the coil form. (See sketch of coil form on page 15-67, 68 in *Rider's Volume XV*.) Replacement coils are furnished without the iron cores, as they are interchangeable. If new cores are needed, due to loss or breakage, they can be ordered under part #77A068.

If the receiver cannot be placed in "break-in" operation, apply the following remedy: Notice on the schematic of the receiver on page 15-67, 68 in *Rider's Volume XV* that the grid of V6 the output 6F6G tube is connected to the power switch S7, so that when the switch is in the "send" position the grid of this tube is grounded. Many operators wish to leave this switch in the "send" position and connect from terminal 5 on the plug PL2, through the transmitter relay to ground. In order to do this, the lead between S7 and V6 should be removed. On later production runs, this lead has been eliminated. See notes on "Power Requirements" and "Preparation for Use" on page 15-71 of *Rider's Volume XV*.

GE 210, 211, 212

These models appear in *Rider's Volume XVIII*, pages 18-21 through 18-25. In the schematic diagram C12 is shown as 22 μ uf. This should be corrected to read 20 μ uf. C12 is listed correctly in the replacement parts list as Cat. No. RCW-3016, 20 μ uf.

The following items should be added to the replacement parts list:

R11-021—Insulator — Textolite (to insulate the volume control from chassis)

R11-022—Insulator — Textolite (to insulate the band switch from chassis) In the tube and trimmer location shown on page 18-25, the secondary tuning slug of T6 is available through the top of the can, while the primary tuning slug of T6 is available through the holes in the bottom of the can.

General Electric 219, 220, 221

These models appear on pages 15-28 through 15-31 of *Rider's Volume XV*. In the parts list, catalog number RLL-003 should be identified as a replacement loop assembly only for Models 219 and 220. Catalog number RLL-025 should be added as the loop assembly for Model 221.

General Electric 250, 260

Model 250 appears on pages 15-32 through 15-36 of *Rider's Volume XV*. Model 260 appears on pages 16-6 through 16-12 of *Rider's Volume XVI*. The following should be added to the parts list for both models: Hinge pin for cover, catalog number RMP-011.

General Electric 321A

This model is the same as Model 321 Late, appearing on pages 15-46 and 15-52 of *Rider's Volume XV*.

General Electric 356, 357, 358

These models appear on pages 18-40 through 18-44 of *Rider's Volume XVIII*. The following changes should be made in the parts list. Under UCC-025, remove symbols C43, C65, C70. Add to UCC-026 symbols C43, C65, C70.

General Electric 376, 377, 378

Models 356, 357, and 358 appear on pages 18-40 through 18-44 of *Rider's Volume XVIII*. Models 376, 377, and 378 appear on pages 19-36 through 19-41 of *Rider's Volume XIX*. When an old type construction 6BE6 (date coded 8/17 or before) is replaced with a new type construction 6BE6 (dated 8/22 or later) it is necessary that the f-m oscillator choke coil L8 be a 13 1/2-turn coil (catalogue number RLF-012) instead of the 17-turn coil that was used in early production models.

General Electric 376, 377, 378

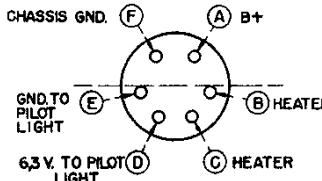
These models appear on pages 19-36 through 19-41 of *Rider's Volume XIX*. The f-m choke, L8, in the cathode circuit of the 6BE6 oscillator converter tube, V2, was listed under catalog number RLF-007. Due to a production change, this choke now becomes RLF-012.

Delete URD-633, R12, Resistor—220 ohms, 1/2 w., carbon. Add URD-637, R12, Resistor—330 ohms, 1/2 w., carbon. Add RCW-3009, C37, Capacitor—20.5 μ uf. $\pm 5\%$, ceramic. Delete UCW-2011, C37, Capacitor—20 μ uf, ceramic. Add symbol number P4 to RJP-003. Delete P3 and P4 (Plug—preamplifier power plug) from RJP-004. Add RJP-005, P3, Plug—preamplifier power plug.

General Electric 417, 417A

Model 417 appears on pages 16-16 through 16-19, and pages 16-21 through 16-24 of *Rider's Volume XVI*. Model 417A appears on pages 17-27, 28 through 17-32 of *Rider's Volume XVII*. These changes are in reference to the wiring of Phono Preamp Plug RJP-005.

Since some of the plugs supplied are inconsistent with specifications regarding the identification notch often referred to in wiring guides, this notch must be disregarded for identification purposes to avoid confusion. While in some receiver productions the position of this key notch will differ from others, nevertheless, all receiver productions are wired the same in respect to the polarized system of prong arrangement.



Phone Preamp Plug RJP-005 in the GE 417, 417A should be wired as shown.

When replacing the plug RJP-005, it is only necessary to follow the simple wiring rule as used in all receiver production where the cluster of four prongs is first located within one-half the area of the plug base as determined by the imaginary center line. Next, locate the two remaining prongs as viewed from the prong end of the plug and begin the wiring in a clockwise direction as indicated by the letter designations in the accompanying diagram. The letters A, B, C, etc., in the diagram, are keys to wiring points, as referred to in the various published receiver circuit diagrams.

Magnavox AMP-101C

This model is the same as Model AMP-101A on pages 17-1 and 17-2 of *Rider's Volume XVII*, except for the following changes in parts values.

Ref.

No.	Description	Part. No.
2-1	Capacitor, paper, 0.1 μ f 600 v.	250152G33
2-2	Capacitor, paper, 0.1 μ f 600 v.	250152G33
8	Resistor, composition, 15,000 ohms, $\pm 10\%$, 1/2 w.	230084G76
9	Resistor, composition, 100,000 ohms, 10%, 1/2 w.	230084G86

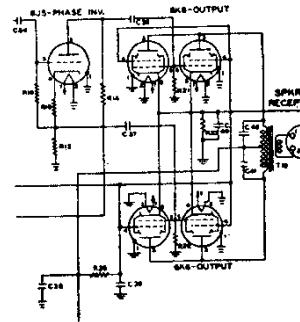
Magnavox AMP 111D, AMP 111E

These models are the same as Model AMP 111, appearing in *Rider's Volume XVIII*, pages 18-4 through 18-7, except for the following parts value changes:

Ref. No.	Description	Part. No.
9	Capacitor, paper, 0.03 μ f, 400 V	250152G25
22	Resistor, composition, 22,000 ohms, $\pm 10\%$, 1/2 W	230084G78

Hoffman C501 and C511, Chassis 108

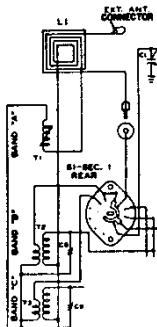
These models are the same as Model A501, Ch. 108S, appearing on pages 15-6 through 15-10 of *Rider's Manual Volume XV*, except that four 6K6 beam-power tubes are used in push-pull parallel in the output stage instead of the two push-pull 6V6's. The change is indicated in the accompanying diagrams. The alignment is still the same as given on page 15-9.



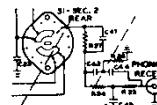
6K6 tubes for Hoffman C501 and C511.

The parts list should be changed to read as follows:

Symbol	Description	Hoffman Number
C47, C23, C24, C25	100 μ uf, $\pm 20\%$, mica	4000
C28, C32	0.005 μ uf, 600 volt, tubular paper	4102
C29, C30	10 μ uf, 450 volt, tubular electrolytic	4203
C31, C33, C34	0.01 μ uf, 400 volt, tubular paper	4112
C41, C46	0.001 μ uf, 600 volt, tubular paper	4104
C43, C42, C44	0.01 μ uf, 600 volt, tubular 330 μ uf, $\pm 10\%$, mica or ceramic	4103
C45	650 μ uf, $\pm 10\%$, mica or ceramic	4011
L1	Loop antenna	55210
LS	12" speaker, electrodynamic	9044
R2, R17	22,000 ohms, $\pm 20\%$, 1/2 w	4501
R3, R27	2.2 megohm, $\pm 20\%$, 1/2 w	4502
R4	10,000 ohms, $\pm 10\%$, 2 w	4503
R11	4,700 ohms, $\pm 20\%$, 1/2 w	4543
R12, R18	47,000 ohms, $\pm 20\%$, 1/2 w	4504
R23	500 ohm, $\pm 20\%$, 3 w	4550
R28	1,500 ohms, $\pm 5\%$, 6 1/2 w	4701
R13, R14, R24	47,000 ohms, $\pm 5\%$, 1/2 w	4537
R25	22,000 ohms, $\pm 5\%$, 1/2 w	4538
R26	22,000 ohms, $\pm 5\%$, 1/2 w	5108
T10	Output transformer	5108



Antenna connection changes for Hoffman C501 and C511.



Circuit changes for Hoffman C501 and C511.

Ketay RP570T

This model appears in the *Miscellaneous section*, page 15-8 of *Rider's Manual Volume XV*. This model is listed in the Indexes as RP507T. It should read RP570T.

GENERAL ELECTRIC CO.

MODEL 250 ----- Battery Filler Cap.

It is important that the battery filler cap be sufficiently tight so that the washer is compressed, otherwise battery acid will leak out and damage the radio. Make sure the washer is replaced when the cap is removed and that possible thread burrs do not prevent the cap from being tightened completely. Use a screwdriver to tighten the cap.

A quantity of Model 250 radios was shipped with the oscillator adjustment plug not locked after alignment. This causes the low frequency calibration to be considerably in error and reduces sensitivity at this end of the band.

Realign the oscillator adjustment (adjacent to 1st IF transformer), L4, then tighten down the lock nut.

Failure of the vibrator unit REU-001 may be treated in the following manner:

1. The vibrator should be removed from the receiver and a resistance check made with an ohmmeter across terminals C and R.
2. If the resistance checks approximately six ohms and the vibrator will not start, it should be replaced with a new one.
3. If the resistance checks an infinite or high value, the vibrator should be opened up by unsoldering the base from the can. A resistance check should then be made across the terminals of the operating coil, and across the 220 ohm resistor. The operating coil should check approximately six ohms. If the coil is open, the vibrator must be replaced with a new one. If the resistor is open, the resistor should be replaced.
4. If the resistance across terminals C and R checks approximately 220 ohms, the starting contacts that short out the 220 ohm resistor do not make contact. This condition may be corrected by opening the vibrator and turning the small adjustment screw on the resistor side of the vibrator very slowly in the clockwise direction until the resistance across terminals C and R reads approximately six ohms. Care should be taken to see that this adjustment screw is not turned beyond the point where contact is made, and the 220 ohm resistor is shorted out.

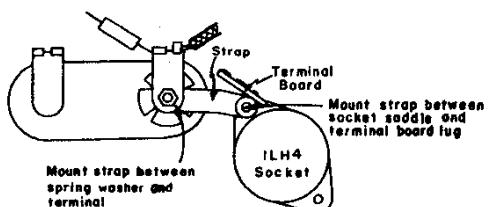
A few radios were shipped that did not have the IF transformers peaked for maximum sensitivity. For sets with low sensitivity, realign the IF amplifier

When hum is experienced, the following checks should be made in the order of their listing:

1. Check the battery electrolyte level. It should be maintained at the recommended level.
2. A battery which is nearly discharged caused an excessive hum level.
3. A dirty or loose negative battery terminal contact causes excessive hum. Remove the battery and clean the terminals. Also, clean the negative prong located in the battery compartment, with fine emery; spread the battery spring contacts; and install a rubber insert, V61J551, up through the center of the split spring contacts. Early production radios did not have the rubber insert so that the normal handling causes these spring contacts to be compressed resulting in a high resistance connection. For those receivers not equipped, write your requirements to the Technical Service Section in Bridgeport and they will be forwarded immediately. When re-installing the battery, spread a thin layer of petroleum jelly on the contacts.

4. Where the previous checks do not remedy the trouble, check the spring washer on the opposite end of the negative prong for a good chassis bond. This requires that the front part of receiver case be removed and then install a bonding strap as shown in the illustration. The factory is now installing an auxiliary copper strap made of 3/8" x .010" soft copper strip, fastened between the spring washer and the 1LH4 socket saddle hole as shown in the illustration. Drill out the rivet at the socket saddle and install a bolt and nut to hold it and the socket and terminal board.

In a few remote cases it has been found that the storage battery (25-2) terminals have loosened internally where they are swaged to the plate holder of the battery. This causes low voltage when under load and results in a "dead" or intermittent set. To remedy replace the battery.



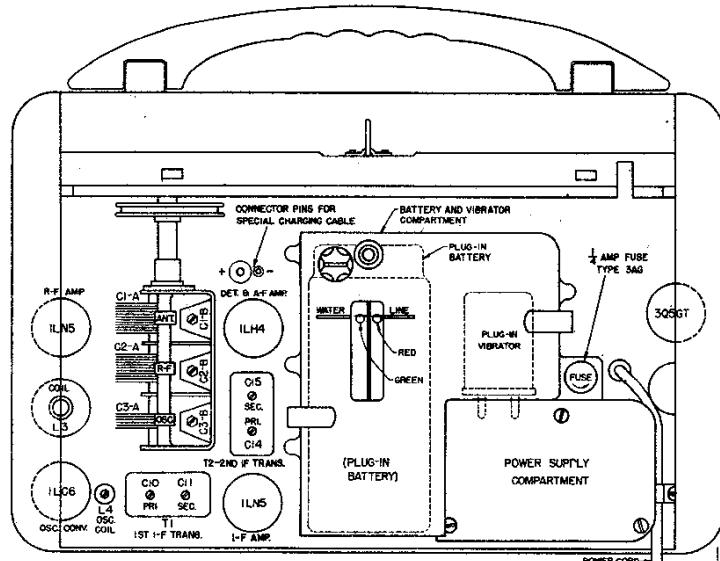


Fig. 3. Tube and Trimmer Location

ELECTRICAL CIRCUIT ALIGNMENT

1. EQUIPMENT REQUIRED.

1. Signal generator with audio tone modulation.
2. A-c output meter, 1 or $1\frac{1}{2}$ volts full scale, 1000 ohms - volt.
3. Insulated screwdriver.

2. ALIGNMENT PROCEDURE.

1. *General.*—The alignment procedure is given in table form for convenience. Reference is made to Fig. 3 for the trimmer locations. The low side of the signal generator should be connected to the chassis of the receiver for i-f alignment; the high side should be connected as indicated in the Alignment Chart. A meter or some other suitable indicating device must be connected to the output of the receiver. Two methods for connecting an output meter are given in later paragraphs.

When aligning the receiver, the Volume Control on the receiver should be turned to its maximum position (clockwise), and the Tone Control should be turned to the position of maximum treble (extreme counterclockwise). The output signal of the signal generator should be kept as low as possible at all times; the reading of a meter connected across the voice coil leads of the receiver should be kept below $\frac{1}{2}$ volt by changing the signal generator output. If the signal level is too high, the AVC becomes effective and alignment errors may result.

The following paragraphs give greater details regarding the connection of the output meter and the signal generator to the receiver during alignment.

2. *Connecting the Output Meter.*—In aligning the receiver, some means for indicating differences in the output voltage will be required. Either of the following methods is satisfactory. The first requires more disassembly of the receiver case than the second, but the second requires additional test equipment.

Method 1.—A satisfactory method for indicating differences in output is to connect a rectifier-type a-c meter of 1 or $1\frac{1}{2}$ volts full scale deflection across the speaker voice coil terminals. To gain access to the speaker, remove the front panel from the radio as previously described. A short green lead will be found connected to one terminal of the speaker. This may be pushed through one of the holes in the chassis so that it will be accessible from the back of the radio. The front panel is reinstalled in place so that the stray capacities in the set will be the same as when the set is operating normally. Connect the meter between this lead and ground. A convenient ground connection is to remove the tone control knob and use a clip lead to the shaft.

Method 2.—The following is an alternate method which eliminates the necessity of removing the front panel of the set, but which requires additional test equipment. Make an indicating device by connecting a 4- to 6-inch diameter magnetic speaker or the high-impedance leads from the

ELECTRICAL RATING:

Charging from A-c Line:

Voltage.....	105-125 volts, a-c only
Frequency.....	50/60 cps
Wattage.....	10 watts

Fuse:

G-E No. 2548, $\frac{1}{4}$ -ampere rating.

OPERATING FREQUENCIES:

Broadcast Band.....	540-1600 kc
I-F Amplifier.....	455 kc

POWER OUTPUT:

Undistorted.....	248 milliwatts
Maximum.....	365 milliwatts

LOUDSPEAKER:

Type.....	Alnico PM
Outside Cone Diameter.....	.5 $\frac{1}{4}$ inches
Voice Coil Impedance (400 cps).....	3.2 ohms

ALIGNMENT CHART

Turn Tone Control CCW (Treble)

Turn Volume Control CW (Maximum)

Step	Connect Signal Generator to	Signal Generator Setting	Dial Setting	Adjust
1	Stator of C2-A in series with 0.05 mf.	455 kc	Reference Point Below 550 kc (Gang Closed)	2nd i-f (T-2) Trimmers for Max.
2	Stator of C2-A in series with 0.05 mf.	455 kc	Reference Point Below 550 kc (Gang Closed)	1st i-f (T-1) Trimmers for Max.
3	† Inductively Coupled	580 kc	580 kc	*L3 and L4 for Maximum.
4	† Inductively Coupled	1500 kc	1500 kc	**C3-B, C2-B, and C1-B for maximum in sequence given.

† Use loop on output of signal generator.

* Adjust L3 and L4 alternately several times to obtain peak.

** Make all adjustments of C1B, C2B, and C3B with rear cover closed, through the three ports provided on cover. Remove snap buttons for access.

output transformer of a good p m dynamic speaker to the terminals of a rectifier-type microammeter with a full scale deflection of 100 microamperes or less. For convenience, the meter and speaker may be mounted in a small box in such a way that the meter will be visible when the speaker is placed in front of the speaker on the receiver being aligned.

To use this device, place its speaker in front of and about an inch away from the speaker of the receiver being aligned. The meter will then deflect in proportion to the intensity of the sound produced by the speaker, and therefore may be used as an output meter. The meter must not be moved during alignment.

3. *Connecting the Signal Generator.*—For aligning the i-f transformers, the output of the signal generator should be coupled through a 0.05 mf. capacitor to the grid (pin 6) of the 1LC6 oscillator-converter tube. This may be accomplished easily by connecting the capacitor to the stator of C2-A, the middle section of the tuning gang, as this stator is connected directly to the converter grid. The low side of the signal generator output should be connected to the chassis ground to complete the circuit.

For aligning the oscillator and r-f coils, the r-f signal should be inductively coupled by connecting a three- or four-turn, 6-inch diameter, loop of bell wire across the signal generator output terminals and then locate the loop about one foot from the radio cover, with cover open. To prevent possible errors in peak readings, the position of the loop with respect to the receiver should not be changed during any one set of adjustments.

GENERAL ELECTRIC CO.

1. POWER SUPPLY

All power necessary for the operation of the receiver is supplied by the 2-volt built-in rechargeable battery. Power to the 1.4-volt tube filaments is supplied by the battery through suitable voltage dropping resistors. The high voltage for the screens and plates of the tubes is furnished by a synchronous vibrator used in conjunction with a step-up power transformer and its associated filter circuit. The synchronous vibrator operates directly from the battery voltage.

The receiver power is obtained from the battery at all times in the manner just described, whether the power cord is connected to a power source or not. When the power cord is connected to a receptacle supplying from 105 to 125 volts, 50 or 60 cps, a-c, and the power selector is in either the CHARGE or ON position, the power supplied from the line will be used to charge the battery. The CHARGE position on the three-position power selector switch allows the battery to be charged from the house current when the receiver is not operating. The ON position of the switch permits the radio to be operated at the same time that the battery is being charged. Under this condition, the battery floats in the circuit to keep the voltage at its proper voltage and, with high line voltage, the battery may be charged slowly while the radio is operating.

The battery-charging unit consists of a step-down transformer which converts the house current to approximately 5.8 volts center-tapped at 117 volts line, and a full-wave copper-oxide rectifier circuit which supplies the battery with d-c charging current.

A charging cable is available, which provides a convenient means of charging the radio battery from an automobile or 6-volt storage battery. The cable plug is inserted over the two pins provided, see Fig. 3, and the plug and socket on the other end of the cable are connected to a 6-volt supply. Complete installation instructions are provided with each cable.

2. CHARGER CHARACTERISTICS

Testing the operation of the rectifier unit.—A $\frac{1}{4}$ -ampere fuse is used in series with the primary of the charger transformer. If the battery does not show any signs of becoming charged after a reasonable length of time, check the fuse. If it is necessary to replace the fuse, use a $\frac{1}{4}$ -ampere, Type 3AG fuse.

If one or more of the copper-oxide discs of the rectifier unit are defective, the charger will not operate properly. To test the rectifier unit operation, remove the battery from the unit and reconnect it in series with a d-c ammeter capable of reading at least two amperes. Plug the power cord into a 105-125 volt, 50 or 60 cps, a-c supply, and turn the power selector switch to the CHARGE position. With the a-c line voltage at 117 volts, the average charging current should read about 1.8 amperes at 2.1 volts battery. Care must be exercised in making this test as the charging circuit is of extremely low resistance. *Very heavy* leads must be used, and the use of an ammeter having only 0.05 ohms resistance will introduce considerable error. If the line voltage is greater than 117, or the battery voltage is lower than 2.1 volts, the charging current will be greater. If the current is much less than 1.8 amperes at the rated line voltage of 117 volts, one or more of the copper-oxide discs may be defective.

Testing the individual rectifier discs. Two rectifier assemblies are used in the receiver, each assembly consisting of two rectifier discs held together by an eyelet. A cross section of a rectifier assembly is shown in Fig. 2. The center plate of the assembly is positive and is provided with a soldering tab. A copper-oxide rectifier disc is located on each side of the center plate. The rectifier disc conducts when the positive potential is applied to the copper-oxide surface. The copper oxide is a dark purple coating which has been plated with nickel to afford a good surface contact to the copper oxide. If either or both of the rectifier discs in an assembly become defective, the entire assembly should be replaced.

To check the rectifier assembly, the following tests are recommended. In the conducting direction, the rectifier assembly should pass 0.5 ampere or more when $\frac{1}{2}$ volt is impressed across it. If a d-c ammeter is not available for measuring currents as high as 0.65 ampere, the circuit shown in Fig. 2 can be used for this check. The 2.00-ohm resistance should be fairly accurate. The voltage across the rectifier assembly should read 0.7 volt or less; if this voltage exceeds 0.7 volt, the assembly is defective and should be replaced.

The reverse current flow is as important as the above test and is made as follows: Reverse the battery polarity in the test circuit described for current check, disconnect the voltmeter, and place a milliammeter that will read 10 ma. in series with a lead to one of the battery terminals. A suitable meter fuse should be used in series with the milliammeter to prevent damage to the meter in case the assembly under test

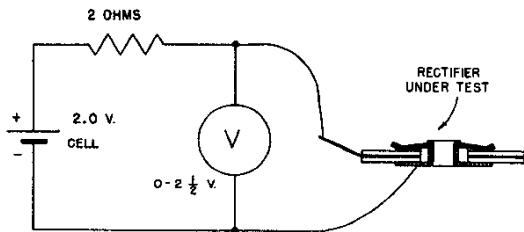


Fig. 2. Rectifier Test Circuit

is shorted. The reverse current should not exceed 10 ma. If the current is considerably above this value, the rectifier assembly should be discarded.

If a milliammeter is not available, a rough check may be made by measuring the resistance of the assembly in the nonconducting direction on the low-resistance range of an ohmmeter. The resistance should measure at least 300 ohms.

3. DISASSEMBLY OF THE RECEIVER

The following outlines should be of assistance in gaining access to the various compartments of the receiver and in dismantling it for replacement of panels.

To Gain Access to Power Supply Compartment.

1. Open the back cover and unsnap the battery compartment cover. Remove the cover by prying gently with a screwdriver.

2. Remove the three flat-head screws on the power supply compartment cover (see Fig. 3).

3. Pry the lid from the power supply compartment and lift it straight outward. All of the power supply components are attached to the lid and will come out with it as far as the connecting leads will permit. In replacing this cover, be careful not to short circuit the B + lead.

To Gain Access to Underside of Radio Chassis.

1. Open the top cover and remove the four Phillips-head screws from the front edge of the escutcheon.

2. Unscrew the three flat-head screws from the bottom of the case, and remove the single sheet of metal which forms the front and bottom of the case. Disconnect the speaker plugs from the speaker to free the front panel from the chassis.

To Remove the Right End Panel.

1. Open the top cover and pull off the four knobs.

2. Remove the two cover stay-arms by unscrewing the screw which holds each to the cover. This allows the loop to fall to its extreme position. Care should be taken to see that the loop connection springs are not broken while the stay-arms are off.

3. Remove the eight Phillips-head screws which hold the escutcheon in place.

4. Bend the ends of the escutcheon inward slightly to free them from the end panels, and remove the escutcheon and dial assembly.

5. Remove the three speed-nuts which hold the end in place. Two of these are located in the top part of the case; the third one is in the bottom rear.

6. Pull off the end panel.

To Remove the Left End Panel.

1. Remove the escutcheon and dial assembly as outlined in steps one through four in the preceding paragraph.

2. Unscrew the three flat-head screws from the bottom of the case, and remove the single sheet of metal which forms the front and bottom of the case. Disconnect the speaker plugs from the speaker to free the front panel from the chassis.

3. Remove the three speed-nuts which hold the end in place. Two of these are located in the top part of the case; the third is in the bottom front.

To Remove Top and Rear Cover Assembly.

1. Open the back cover and unsolder the two antenna loop leads. To facilitate replacement, mark each of the metal strips with the color code of the wire which was unsoldered from it.

2. Remove the escutcheon and dial assembly as outlined in steps one through four of the preceding paragraph, "To Remove the Right End Panel."

3. Unscrew the three flat-head screws located near the ends of the hinge on the top of the chassis, and remove the entire top and rear cover assembly.

4. Pull out the hinge pin to separate the top and rear covers.

STAGE GAIN AND VOLTAGE CHECKS

Stage gain measurements may be made with a vacuum-tube voltmeter to check circuit performance and to locate stages which are not operating properly. The gain values listed may have a tolerance of 20%.

1. R-F Stage Gains.

R-F Amplifier grid (1LN5, pin 6) to Osc.
Conv. grid (1LC6, pin 6) 25.0 at 1000 kc
Osc. Conv. grid (1LC6, pin 6) to I-F Amp.
grid (1LN5, pin 6) 33 at 1000 kc

2. Audio Gain.

The power output across the speaker voice coil should be approximately 50 milliwatts with a 400 cps signal of 0.07 volts applied across C19 (Volume Control max.)—Tone Control CCW).

3. Oscillator Grid Bias.

The d-c voltage developed across the oscillator grid leak (R2) averages 8.1 volts at 1000 kc.

4. Socket Pin Voltages.

Fig. 4 shows typical tube pin voltages. All readings should be made from the pins to ground unless otherwise indicated.

BATTERY INFORMATION

The receiver uses a 2-volt Willard Radio Battery No. 25-2 or equivalent. It has a 25 ampere-hour capacity and should be cared for in the same manner as any other storage battery.

Charge Indicator

The degree of charge of the battery can be determined by raising the back cover of the radio and referring to the charge ball indicators visible through the hole in the metal battery case.

If the battery is fully charged, two indicator balls will be visible at the surface of the liquid in the battery. When the battery discharges, these ball indicators will sink and disappear in the following order:

1. Green indicator sinks when approximately 20 per cent of battery capacity has been discharged.
2. The red ball sinks when battery is 80 per cent discharged.

On charge, the balls rise or float in the reverse order and the charge is complete and may be stopped when both balls appear in the opening.

To Charge Battery

The battery is charged by merely plugging the receiver power cord in the rated a-c power outlet and turning the

selector switch to CHARGE. Frequent check should be taken of the charge indicator and when both indicator balls are visible, the battery is fully charged. Charging the battery after all indicator balls are visible will not harm the battery except that it will evaporate the water faster. A completely discharged battery will be restored usually within 20 to 30 hours.

When operating the receiver from the a-c house current, the battery floats or is being charged at a slow rate. Thus, if you wish to operate the receiver at the same time that you are charging even a fully discharged battery, plug the power cord in the a-c receptacle and turn the power selector switch to the ON position. Prolonged and repeated operation on this position will assure that the battery is always maintained in a nearly fully charged condition.

Battery Operating Instructions

1. Add distilled or tap water in the filler cap at sufficiently frequent intervals to keep liquid level at indicator mark as viewed through opening in battery case. DO NOT OVERFILL as this impairs nonspill feature.

2. A fully charged battery will operate the radio in the ON position without being connected to a-c outlet for about 20 hours before recharging is required. Whenever possible, it is best not to allow the battery to become discharged to the extent that both indicators disappear.

However, if both indicators have sunk, the battery should be recharged immediately or within 24 hours.

3. A battery will continually discharge at a slow rate even when not in use. For this reason, monthly checks should be made of the charge condition and the battery placed on charge when necessary. This will prevent damage to the battery such as freezing during cold weather.

BATTERY INSTALLATION

The following instructions should be carefully followed in installing a battery:

1. Remove battery from packing carton.
2. If needed, add water to bring liquid level to indicator mark on battery container. *Do not overfill.*
3. Raise back cover on radio, remove battery case cover. The latter is removed by unclipping the two catches. Pry off cover.
4. Unplug battery and replace with new battery.
5. Place battery on charge, if necessary, as described in a previous paragraph, until both indicators are showing in the opening in the case cover.

CAT. NO.	SYMBOL	DESCRIPTION
UNIVERSAL G-E REPLACEMENT PARTS LIST		
UCC-030	C8, 17	CAPACITOR—0.1 mf., 400 v., paper
UCC-039	C13, 21, 23	CAPACITOR—0.005 mf., 600 v., paper
UGC-041	C24	CAPACITOR—0.02 mf., 600 v., paper
UCN-506	C5	CAPACITOR—0.68 mmf., ceramic
UCU-028	C7, 18, 19	CAPACITOR—100 mmf., mica
UCU-040	C4	CAPACITOR—330 mmf., mica
UOP-006	LS1	LOUDSPEAKER—5 1/2-inch PM speaker
URD-049	R7	RESISTOR—1,000 ohms, 1/2 w., carbon
URD-057	R16	RESISTOR—2,200 ohms, 1/2 w., carbon
URD-059	R15	RESISTOR—2,700 ohms, 1/2 w., carbon
URD-067	R6	RESISTOR—5,600 ohms, 1/2 w., carbon
URD-081	R5	RESISTOR—22,000 ohms, 1/2 w., carbon
URD-089	R3, 9	RESISTOR—47,000 ohms, 1/2 w., carbon
URD-105	R2, 12	RESISTOR—220,000 ohms, 1/2 w., carbon
URD-121	R1, 14	RESISTOR—1 meg., 1/2 w., carbon
URD-129	R8	RESISTOR—2.2 meg., 1/2 w., carbon
URD-137	R11	RESISTOR—4.7 meg., 1/2 w., carbon
URD-053	R17	RESISTOR—1,300 ohms, 1 w., carbon

SPECIALIZED G-E REPLACEMENT PARTS

RAC-002		COVER—Battery compartment cover
RAC-003		COVER—Power supply compartment cover
RAC-006		COVER—Case back cover (brown)
RAC-007		COVER—Case back cover (gray)
RAC-010		COVER—Case left end cover (brown)
RAC-011		COVER—Case left end cover (gray)
RAC-012		COVER—Case right end cover (brown)
RAC-013		COVER—Case right end cover (gray)
RAG-002		COVER—Case front end grille (brown)
RAG-003		COVER—Case front end grille (gray)
RAI-001		BRACE—Case cover brace assembly (brown)
RAI-002		BRACE—Case cover brace assembly (gray)
RAX-004		COVER—Case cover assembly (brown)
RAX-005		ASSEMBLY—Case cover stay arm assembly
RAX-006		COVER—Case cover assembly (gray)
RBC-001	B2	CELL—Bias cell
RCC-028	C6, 12, 16, 25, 32	CAPACITOR—0.05 mf., 400 v., paper
RCC-069	C34	CAPACITOR—0.5 mf., 120 v., paper
RCC-070	C29, 30,	CAPACITOR—0.5 mf., 120 v., paper
RCC-073	C31	CAPACITOR—0.003 mf., 1500 v., paper

CAT. NO.	SYMBOL	DESCRIPTION
SPECIALIZED G-E REPLACEMENT PARTS		
RCE-007	C26A, B, C	CAPACITOR—15 mf., 150 v.; 15 mf., 150 v.; 1200 mf., 1.5 v. electrolytic
RCT-008	C1A, B, 2A, B, 3A, B	CONDENSER—Tuning condenser and trimmers
RDC-007		CORD—Drive cord and tension spring
RDE-001		ESCUTCHEON—Dial scale escutcheon
RDK-020		KNOB—Control knob (plain)
RDK-021		KNOB—Control knob (pointer)
RDP-008		POINTER—Dial pointer assembly
RDS-013		SCALE—Dial scale
REF-001	F1	FUSE—1/4-amp. fuse, Type 3AG
REU-001	V1	VIBRATOR—Vibrator unit
REX-001	X1, 2, 3, 4	RECTIFIER—Copper-oxide rectifier assembly
RHF-001		FOOT—Cabinet foot
RHK-001		KNOB—Cover lock knob
RHQ-002		TUBE—Battery vent tube
RHX-003		HARDWARE—Tuning condenser mtg. hardware
RIG-001		GASKET—Dial scale gasket
RJS-019		SOCKET—Vibrator socket
RJS-020		SOCKET—Loctal tube socket
RJS-021		PLATE—Electrolytic capacitor mounting plate
RJS-026		SOCKET—Octal base tube socket
RJW-001		HOLDER—Fuse holder
RLB-002	L3	COIL—R-f coil
RLC-008	L4	COIL—Oscillator coil
RLE-001	L5, 6	CHOKE—Vibrator and R + choke
RLE-002	L7	CHOKE—Filament choke
RLL-008	L1	BEAM-A-SCOPE—Loop antenna assembly (in cover)
RMC-008		CAM—Cover lock mechanism cam
RMC-009		CATCH—Cover lock mechanism catch
RME-010		LEVER—Tuning shaft
RMW-004		PULLEY—Pulley and stud (small pulley)
RMW-009		PULLEY—Pulley and stud (large pulley)
RMX-013		CATCH—Battery case catch
RRC-008	R10	VOLUME CONTROL—0.5 meg., potentiometer
RRG-001	R18	RESISTOR—7.5 ohms, 1/2 w., carbon
RSW-009	S4	SWITCH—Power selector switch
RSW-010	S5	SWITCH—Tone selector switch
RTC-001	T4	TRANSFORMER—Rectifier transformer
RTL-011	T1	TRANSFORMER—1st i-f transformer
RTL-012	T2	TRANSFORMER—2nd i-f transformer
RTQ-007	T3	TRANSFORMER—Output transformer
RTV-001	T5	TRANSFORMER—Vibrator transformer
RWL-005	P3	PLUG—Power cord and plug