

General Electric Co.

Model: **226**

Chassis:

Year: **Pre 1951**

Power:

Circuit:

IF:

Tubes:

Bands:

Resources

[Riders Volume 21 - CHANGES 21-1](#)

[Riders Volume 21 - CHANGES 21-2](#)

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Ansley 709

Model 709 is the same as Model 53 which appears on pages 17-12 through 17-5 of *Rider's Manual Volume XVII*.

Automatic A.T.T.P.

The alignment and battery information that appears on page 17-8 of *Rider's Manual Volume XVII* under the heading of Models 660, 662, 666, Series C is labeled incorrectly. This page should be labeled Model A.T.T.P. The schematic for Model A.T.T.P. appears on page 16-1 of *Rider's Manual Volume XVI*.

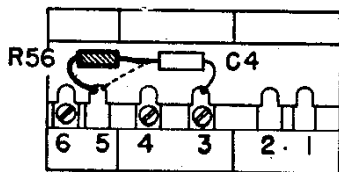
Automatic C-65

This model is the same as Model C-60X which appears on page 16-1 of *Rider's Manual Volume XVI*.

Bendix 95B3, 95M3, 95M9

The switch and its components for the long-playing record player have heretofore been mounted on the back cover. To avoid future difficulty in removing the back cover, this switch and its components are now mounted on a bracket attached to the rear of the cabinet. The bracket is mounted on the top rear cabinet rail and is placed so that the switch, in Models 95B3 and 95M3, extends through the ventilation louver in the upper left corner of the back cover. The strip between the louvers in Model 95M9 covers the switch and it is necessary to remove the strip between the louvers from the back cover.

The terminals of the gang capacitor are numbered from the front to the rear of the chassis as is indicated in the accompanying diagram. In the figure showing trimmer location, the capacitor designated in the r-f sub-chassis as C8, is C4. Resistor R56 has been added to the circuit to avoid any possibility of regeneration occurring, and this resistor is soldered from terminal 5 of the gang capacitor directly to capacitor C4. The other lead of capacitor C4 remains connected to terminal 3 of the gang capacitor as indicated in the diagram. On the schematic diagram, resistor R56 should be inserted in the a-m external lead between terminal board J6 and capacitor C4. Add R56, Comp., 1,000 ohms, 1/4 w, Part No. RC22A102M to the replacement parts list.



Terminals of gang capacitor used in Bendix 95B3, 95M3, 95M9.

An additional filter capacitor C65 has been added to the a-v-c circuit. The 470- μ f capacitor goes from terminal 10 of switch S1C to chassis ground. Add capacitor C65, Mica, 470 μ f, 500 v, Part No. CM5A38 to the replacement parts list.

The figure showing the f-m antenna should show 26" as the dimension for the lower half of the f-m antenna, instead of 6". The dipole should measure 26" on both sides of the center leads.

Farnsworth P-8

This a-m-f-m radio chassis used in Models 1002-F, 1003-M, and 1004-B, is identical to the P-7 chassis which appears on pages 19-19 through 19-33 of *Rider's Manual Volume XIX*, with the exception of the phono-input circuit. The differences are listed below:

1. The P-7 chassis employed a separate phono preamplifier stage; the P-8 does not.
2. Since the P-8 does not employ a pre-amp, the preamp power cable and plug and the 3.3-ohm resistor, ref. no. 14, are not included in this chassis.
3. The record changer, Capehart "333", used with the P-8 chassis employs a crystal pickup. Therefore, a 680,000-ohm, 1/2-watt resistor is connected from the phono-input lead to chassis ground. Following is a list of parts which apply to the Models 1002-F, 1003-M, and 1004-B. These parts are different from those shown for the P-7 chassis.

Part No.	Description
650189A-G1	Loop antenna assembly
59534	On-off volume and tuning knobs
59535	Band switch knob
59537	Treble tone knob
31472	Glass escutcheon.

Farnsworth P-10

This a-m-f-m radio chassis used in Model 100-M, is identical to the P-10 chassis which appears on pages 19-19 through 19-33 of *Rider's Manual Volume XIX*, with the exception of the phono-input circuit.

In Model 1001-M, the P-10 chassis employs a 680,000-ohm resistor, from phono-input to chassis ground, instead of a 100,000-ohm resistor, ref. no. 15.

Following is a list of parts which apply to Model 1001-M. These parts are different from those shown in the Manual for the P-10 chassis.

Part No.	Description
650183A-G1	Speaker, 10" PM, output trans. assy.
750114B-1	Glass escutcheon
650189A-G1	Loop antenna assy.
650186A-4	On-off volume knob
650186A-2	Tuning knob
650186A-1	Band switch knob
650186A-3	Tone control knob.

Farnsworth P73

This model appears on pages RCD, CH. 18-1 through 18-9 of *Rider's Manual Volume XVIII*. The following part should be added to the parts list:
71245 Removal needle only, osmium tipped (P73).

Farnsworth Service Hints

The following service suggestions are offered in the event that the P70 series changers occasionally drop two or more records at one time. If this situation exists with new records, in which the center hole is not worn, the cause may be one of the following:

1. Misadjustment of the amount of tension on the compression spring (part no. 58789). This adjustment is on the underside of the compression lever assembly (part no. 15195) and consists of the adjustment nut (part no. 37344) and the lock-nut and washer (part nos. 2015-002 and 2121-003). Adjustment of this nut controls the amount of downward pressure exerted on the upper spindle assembly (part no. 13674) by the compression lever, which in

turn controls the degree of expansion of the rubber sleeve (part no. 62152). Reference is made to paragraph "D", page RCD, CH. 19-8 of *Rider's Manual Volume XIX*, of the P71 record changer material for proper adjustment of the compression lever. If the rubber sleeve does not expand sufficiently to hold the remaining records on the spindle, one or more of these records will drop along with the record that is to be played. If this sleeve does not expand to the required value, the adjustment nut (37344) should be adjusted while the rubber is compressed to provide the correct expansion. After the adjustment is set, the lock nut should be tightened, and a small amount of Glyptol applied to secure the adjustment.

2. Incorrect position of the outer spindle (part no. 55334). The outer spindle is fastened to the main frame by a special hex-head bolt (part no. 37334) located on the underside of the main frame. The proper position of the outer spindle is given in relation to the inner spindle (part no. 11379) when the changer is in playing position and with no records on the spindle. Under these conditions the top of the outer spindle should be 1/16" below the point of bend of the metal springs on the inner spindle which form the spindle shelf. If the outer spindle is too high, the spindle shelf will recede into the outer spindle before the rubber sleeve is fully compressed, leaving the records without support.

3. If neither of the two previously mentioned suggestions corrects the situation, it is further suggested that the compression lever assembly (part no. 15195) be inspected to determine if the metal roller on this assembly has a diameter of 1/4" or 5/16". If it is the smaller diameter, replace it with one employing the 5/16" roller. The replacement of this compression lever will require a readjustment of the compression spring (part no. 58789) tension.

General Electric 64, 65, 66, 67, 123, 124, 125, 135, 136, 226

These models are found in *Rider's Manual Volume XX*. Models 64 and 65 appear on pages 20-3 through 20-8; 66 and 67 appear on pages 20-9 through 20-12; 123, 124 and 125 appear on pages 20-13 through 20-15; 135 and 136 appear on pages 20-16 through 20-18; and Model 226 appears on pages 20-27 through 20-29.

Power-supply filter resistor URF-053, 1,500 ohms, 2 watt, carbon in earlier receivers has been changed in later production to URF-049, 1,000 ohms, 2 watt, carbon. Some of the early Model 135 and 136 receivers will be found to have a 2,200-ohm resistor. URF-049, 1,000 ohms, 2 watts, is recommended for service replacement of the filter resistor and will result in improved tube performance.

Late production receivers incorporate an i-f tube change from the 12SK7 tube of early receivers to a miniature type 12BA6. The tube-pin connections are not the same as those for the 12SK7 tube. This should be considered when reading the diagrams of early production receivers. A tube socket for the 12BA6 tube has been added to the Replacement Parts List and catalogued RJS-141.

For Models 64, 65, 66, 67, 123, 124, and 125, a 47-ohm, 1/2-watt, carbon resistor, part number URD-017, is used in series with the 12BA6 tube cathode to B— to improve circuit stability.

General Electric 50

This model appears on pages 15-1 through 15-4 of *Rider's Manual Volume XV*. The following items should be added to the parts list:

Symbol	Part No.	Description
R4	RRC-013	1.0-megohm volume control
	RJS-060	Tube socket, miniature tube socket for 35W4 rectifier
	RJX-010	Assembly, tube socket and mounting plate assembly for 35W4 rectifier.
	RHH-004	Snapfastener, for mounting cabinet-back.

General Electric 106

This model appears on pages 15-9 through 15-10 of *Rider's Manual Volume XV*. Part no. RJX-005 should be changed to read RJX-007. Delete part no. ROP-006. Add part no. UOX-001, cone, replacement speaker cone.

General Electric 115, 115W

These models appear on page 18-15 of *Rider's Manual Volume XVIII*. The following changes have been made in the parts list.

Delete catalogue numbers and parts RDK-121 and RDK-122.

Add the following:

RAG-019	Grille, for Model 115 and 115W
RDK-150	Knob and bezel, brown, for Model 115
RDK-151	Knob and bezel, white, for Model 115W.

General Electric 118, 119

These models appear on pages 19-8 through 19-10 of *Rider's Manual Volume XIX*. The following changes should be made in the parts list. RLC-001 should be changed to RLC-061, T4, coil, oscillator coil. RAV-054 should be RAV-054.

Add:

RAV-056	Cabinet, Model 119 (oak)
RDK-037	Knob, plain, fawn colored
RDK-040	Knob, with arrow, fawn colored
RHH-004	Snapfastener, holds cabinet back to cabinet on Model 118

General Electric 123, 124

These models appear on pages 20-13 through 20-15 of *Rider's Manual Volume XX*. The following changes should be noted in the replacement parts list. Item RDS-083 is a metal dial scale, tan color, with red and white figures. Later production receivers use the same type scale except for color. The later scale, cat. no. RDS-091, is gold in color, with brown and white figures.

The following catalogue numbers have been changed: URD-127 should read URD-137, R5, Resistor, 4.7 megohms, 1/2 W, carbon; RAU-037 should read RAU-307, Cabinet, Model 124 plastic cabinet (ivory).

General Electric 303

This model appears on pages 15-37 through 15-39 of *Rider's Manual Volume XV*. The symbol for RSW-019, switch, tone control switch, should read S4. Stock no. RMX-013 should be changed to read stock no. RMX-079.

General Electric 125

This model is identical mechanically and electrically to the late production Model 123 and 124 receivers, which appear on pages 20-13 through 20-15 of *Rider's Manual Volume XX*. Model 125 is identified by its maroon color plastic cabinet. The cabinet replacement is listed as: RAU-321, Cabinet, plastic, for Model 125.

General Electric 123, 124, 125, 135, 136, 226

Models 123, 124, and 125 appear on pages 20-13 through 20-15 of *Rider's Manual Volume XX*. Models 135 and 136 appear on pages 20-16 through 20-18 of the same Volume. Model 226 appears on pages 20-27 through 20-29 of the same Volume.

The grid resistor, URD-113, 470,000 ohms, 1/2 watt, carbon, has been changed in later production receivers to URD-121, 1 megohm. This change improved the audio gain.

General Electric 135, 136, 226

Models 135 and 136 appear on pages 20-16 through 20-18 of *Rider's Manual Volume XX*. Model 226 appears on pages 20-27 through 20-29 of the same Volume.

Late production receivers use a new type output transformer having a tapped primary. The tapped section to the B+ lead is connected in series with the power-supply filter resistor at the input filter capacitor. B+ ripple current through this winding is out of phase with ripple current to the receiver tubes, thus producing bucking voltage and reducing hum. The transformer leads are connected as follows: yellow to input filter capacitor, red to filter resistor, blue to plate of input tube, and secondary leads to speaker voice coil.

The new transformer, catalogue number RTO-078, will be carried in replacement stock in place of the original early production items RTO-063 and RTO-075 for the Models 135, 136, and 226, respectively.

General Electric 141, 143

Instability on the high end of the broadcast band might be caused by an oscillator coil whose coupling winding has changed its coupling capacitance. This defect can be corrected by replacing the coupling winding with a capacitor C15 of the value 56 μ mf, catalogue number UCG-022. This capacitor connects the "high" side of the tuning capacitor C2 with the oscillator grid, pin 4, of the tube V1, 1R5.

Late production receivers always use capacitor C15 in conjunction with a new type of oscillator coil, RLC-101. This item replaces coil formerly catalogued RLC-089.

The hinge used in these receivers can easily be removed and replaced in the plastic cabinet or cover by the application of heat. To remove the hinge from the back cover or cabinet proper, heat the hinge at the half to be removed from the cabinet with a soldering iron. The hinge may then be pulled out of the groove of the plastic hinge recess. Since the cabinet plastic softens at a relatively low temperature, it will be unnecessary to apply the heat very long. To replace the hinge into the new unit, first start the hinge into the slotted recess in the plastic, then heat the hinge with the soldering iron and gently push the hinge into place.

General Electric 124, 135, 136

Model 124 appears on pages 20-13 through 20-15 of *Rider's Manual Volume XX*; Models 135 and 136 appear on pages 20-16 through 20-18 of the same Volume.

Where speakers have broken loose from cabinet mountings, or damage occurs when servicing receiver, the speaker can be re-mounted using screws in place of the original clips where the mounting bosses are broken. It is suggested that all four bosses be re-worked to use screws for mounting, since the operation of removing the speaker may result in the breaking of additional bosses. The repair procedure is outlined as follows:

1. Cut off speaker mounting bosses and file flat to the level of the speaker baffle ring.
2. Drill hole 5/16-inch deep in each boss with #42 or 3/32-inch diameter drill.
3. Mount speaker with self-tapping screws #4 x 1/4 inch long, Shakeproof Type 25, catalogue number RHS-044.

General Electric 233 Kaiser-Frazer

This model appears on pages 18-29 through 18-36 of *Rider's Manual Volume XVIII*. Noise in the form of rattle can be attributed to mechanical insecurity of parts, loose fittings, and screw fastenings, etc. Some of these are:

1. Loose tone control knobs and loose tone and volume control shafts may rattle against the cast grille. The keyway in the tone control shaft may be spread slightly to provide a tighter fit to the control knob.
2. If the shaft assembly seems loose or tends to rattle within the grille mounting hole, a 3/4-inch length of #1 spaghetti (fabric or cambric tubing) may be slipped over the shaft assembly and into the bushing. This will displace the loose fitting and cushion against rattle.
3. Vibration of the screen which is set behind the case instrument panel grille causes a buzz sound when loose. The screen may be shimmed at its four corners to stabilize its mounting.

Suggestions for improving circuit and pick-up noise are as follows:

1. The former condition can be improved by antenna selection and careful peaking of the antenna trimmer to increase sensitivity and reduce noise. For metropolitan areas, a 62-inch antenna is quite adequate, while in outlying country areas the antenna length of 93 inches is recommended. Adjustment of the antenna trimmer is important and should not be overlooked. Every receiver installation should be adjusted for normal operation after the receiver has been operating approximately 15 minutes to reach normal operating temperatures, and with antenna fully extended. Tune in one of the weakest stations at approximately 1,200 kc, or near the higher-frequency end of the dial scale. Adjust trimmer for minimum noise level and maximum clarity on station used for test.
2. Noise pick-up may come from various sources, chiefly from ignition circuits of the car. The recommended noise suppressor and noise filter capacitor units should be checked. To eliminate wheel static insert about 1/2 ounce of powdered graphite through the valve of all four tire tubes. This will provide a ground leakage path to dampen static radiation.

SPECIFICATIONS

CABINET	Material..... Plastic (brown)
	Height..... 8 $\frac{5}{8}$ in.
	Width..... 13 $\frac{1}{8}$ in.
	Depth..... 8 in.
ELECTRICAL RATING	Voltage..... 105-125
	Frequency..... 50-60 cycles or DC
	Wattage..... 26 at 117 volts input
OPERATING FREQUENCIES	Standard Broadcast..... 540-1600 kc
	I-F Amplifier..... 455 kc
POWER OUTPUT	Undistorted..... 1 watt
	Maximum..... 1.75 watts
LOUDSPEAKER	Type..... Alnico V PM
	Outside Cone Diameter..... 5 $\frac{1}{4}$ inches
	Voice Coil Impedance at 400 Cycles..... 3.2 ohms
TUBE COMPLEMENT	(V1) R-F Amplifier..... 12SK7
	(V2) Oscillator-Converter..... 12SA7
	(V3) I-F Amplifier..... 12SK7
	(V4) Detector-Audio..... 12SQ7
	(V5) Rectifier..... 35Z5
	(V6) Audio Power Amplifier..... 35L6
	(I1) Pilot Lamp..... G-E Mazda No. 47

GENERAL INFORMATION

The Model 226 is a five-tube (plus rectifier tube) table model a-c or d-c superheterodyne Standard AM Broadcast receiver. It is equipped with an efficient built-in antenna loop which is connected to an R-F amplifier stage providing increased gain. This receiver employs automatic volume control, beam power output and an oversize permanent magnet loudspeaker.

ELECTRICAL CIRCUIT ALIGNMENT

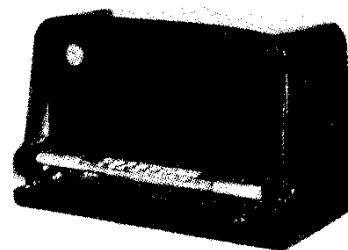
EQUIPMENT REQUIRED

1. Test oscillator, tone amplitude-modulated.
2. A-C output meter, 1 $\frac{1}{2}$ volts full scale.
3. .05 mfd., paper capacitor.
4. Insulated screwdriver.
5. Coupling loop for test oscillator (see text).
6. Isolation power transformer.

ALIGNMENT PROCEDURE

The alignment steps are given in the table form of the Alignment Chart. Adjustment trimmers are shown in the illustration of Fig. 3.

1. The chassis is removed from the cabinet with the antenna loop and back attached and the speaker leads reconnected.
2. An isolation transformer should be used for the receiver power source when aligning or servicing AC-DC receivers, to prevent short circuiting of equipment and shock hazard.
3. The output meter is connected across the terminals of the loudspeaker voice coil.
4. The receiver volume control should be turned to maximum and test oscillator signal output attenuated during alignment to develop not more than 1 $\frac{1}{4}$ volts output meter reading at the loudspeaker.
5. For i-f alignment, the high side of the signal generator output cable should be connected through a .05 mfd. paper capacitor to the points indicated in the Alignment Chart. The low side of the output cable is connected to the receiver chassis.
6. To align the oscillator and r-f trimmers, the signal generator output is inductively coupled to the radio loop, L1, by connecting a four-turn, six-inch diameter loop of bell wire across its output terminals and then locating the loop about one foot from the radio loop antenna. To prevent possible errors in comparative peak readings, the position of signal generator loop with respect to the radio loop antenna should not be changed during measurement.



MODEL 226

ALIGNMENT CHART

Step	Connect Test Oscillator to:	Test Osc. Setting	Radio Dial Setting	Adjust Trimmers for Maximum
I-F ALIGNMENT				
1	V3, 12SK7 grid (Pin 4), in series with .05 mfd.	455 KC	C9 and C8 of second i-f transformer, T3
2	V2, 12SA7 grid (Pin 8), in series with .05 mfd.	455 KC	C7 and C6 of first i-f transformer, T2
3	V2, 12SA7 grid (Pin 8), in series with .05 mfd.	455 KC	Recheck adjustment of C9, C8, C7, C6, for maximum
R-F ALIGNMENT				
4	Inductively coupled to radio loop	1620 KC	Minimum capacity C1A, C1B	C3, oscillator trimmer
5	Inductively coupled to radio loop	1500 KC	1500 KC	C2, r-f trimmer

STAGE GAINS AND VOLTAGE CHECKS

Stage gain measurements by vacuum tube voltmeter or similar measuring device may be used to check circuit performance and isolate trouble. The gain values listed may have tolerances of 20 per cent. Readings are taken with low signal input so that AVC is not effective.

1. I-F GAIN

12SA7 Grid to 12SK7 Grid..... 50 @ 455 KC
12SK7 Grid to 12SQ7 Diode Plate..... 50 @ 455 KC

2. AUDIO GAIN

Input of 0.15 volts at 400 cycles across volume control (R6) with control set at maximum will develop approximately $\frac{1}{2}$ watt output across the speaker voice coil terminals.

3. OSCILLATOR GRID BIAS

D-C voltage developed across the oscillator grid leak (R4) averages 8.5 volts at 1000 kc.

4. TUBE SOCKET PIN VOLTAGES

Fig. 5 shows voltages from tube pins to B-. Voltage readings differing greatly from those specified may help localize defective components.

MODEL 226

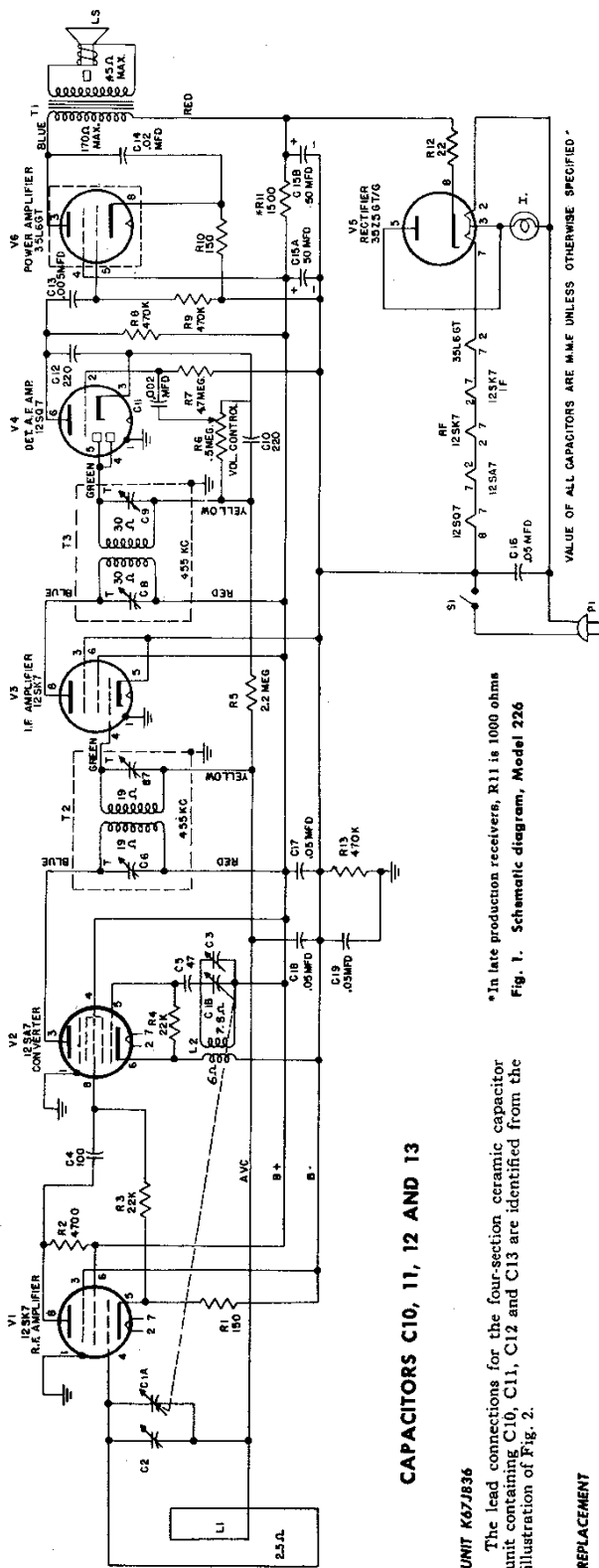


Fig. 1. Schematic diagram, Model 226

CAPACITORS C10, 11, 12 AND 13

UNIT K67J836

The lead connections for the four-section ceramic capacitor unit containing C10, C11, C12 and C13 are identified from the illustration of Fig. 2.

REPLACEMENT

The four-section unit is catalogued RCW-3013 in the parts list for direct replacement. However, any single section may be replaced by one of the single unit capacitors catalogued for the respective capacitor symbol. These items are: UCC-036, C11; UCC-039, C13; and UCU-1036, C10 or C12.

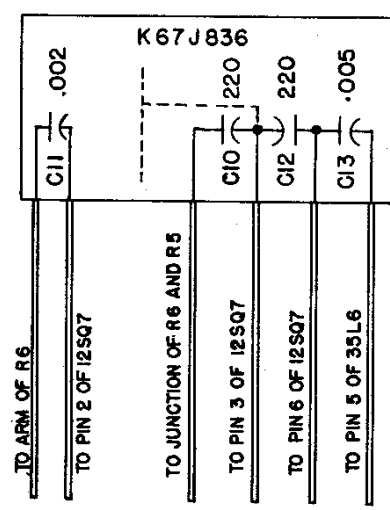


Fig. 2. Capacitor RCW-3013 (K67J836)

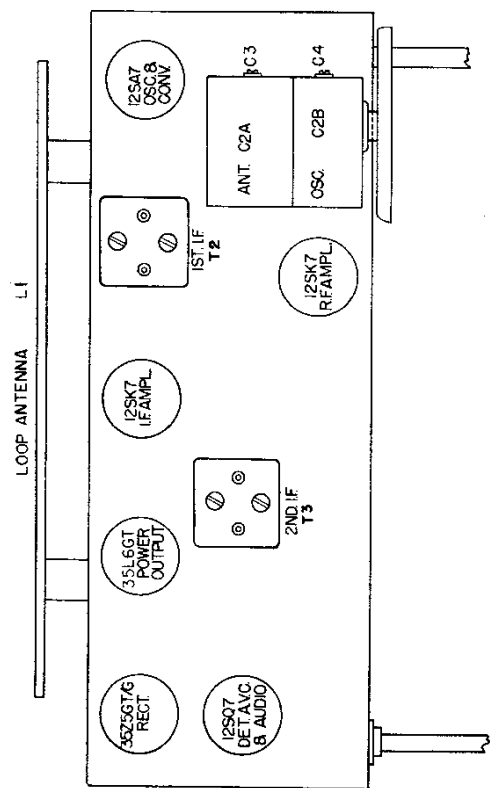


Fig. 3. Tube and Trimmer Location

