

0967-980-8010
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NAVSHIPS 92977

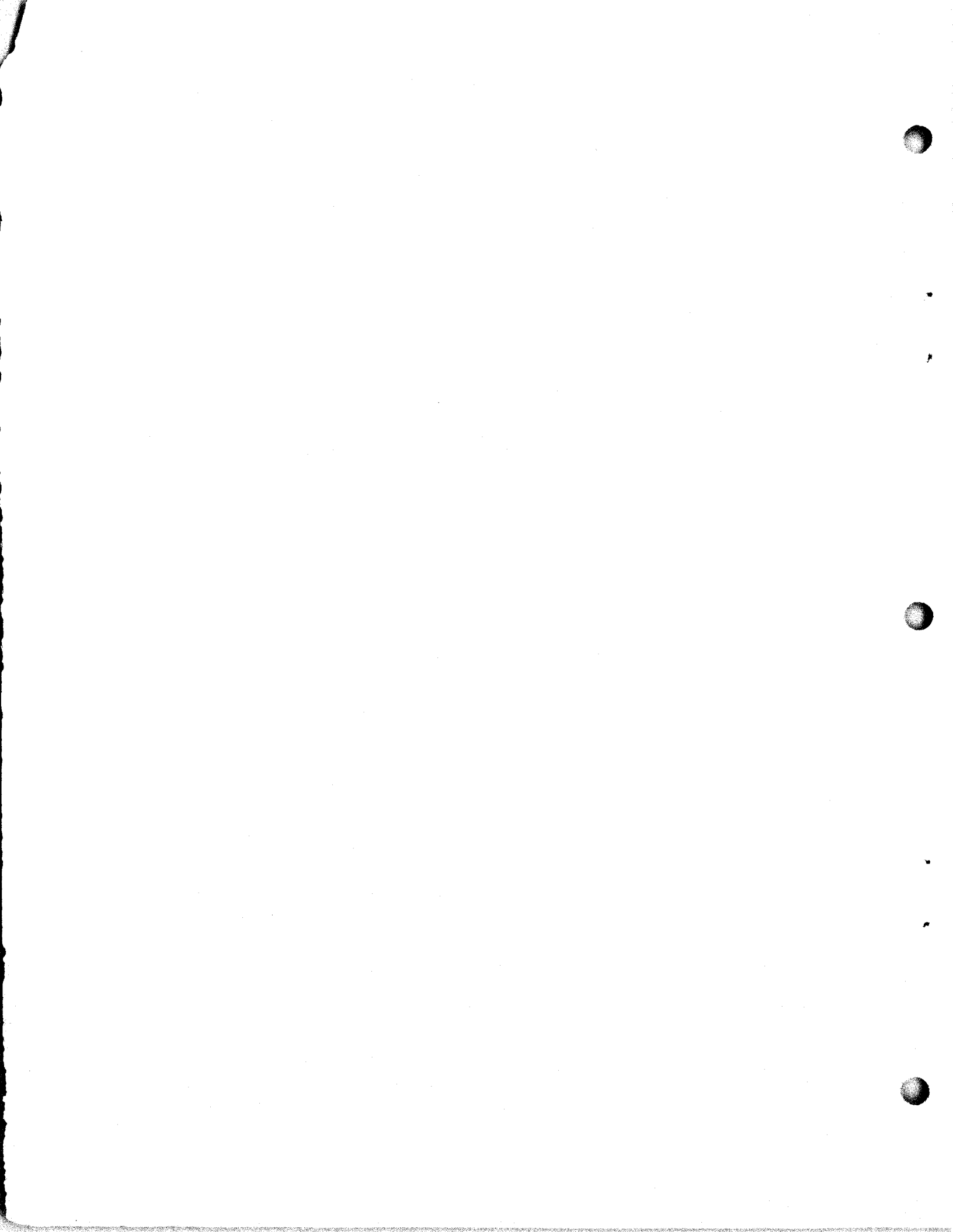
PHOTOFACT* FOLDER
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for

RADIO RECEIVING SET
AN/SRR-13A

HOWARD W. SAMS & CO., INC.
INDIANAPOLIS, INDIANA

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS





DEPARTMENT OF THE NAVY
BUREAU OF SHIPS
WASHINGTON 25, D. C.

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S1/8-1(993)
Ser 993-808

From: Chief, Bureau of Ships
To: All Activities concerned with the Maintenance of the
Subject Equipment

Subj: Photofact Folder for Radio Receiving Set AN/SRR-13A,
NAVSHIPS 92977; request for information

1. The subject publication is the result of an effort on the part of the Bureau of Ships to provide more useful technical instructional material tailored to meet Fleet requirements.

2. To aid in achieving success of this endeavor it will be necessary to receive in the Bureau the user's comments on this form of publication. For this reason, a copy of this letter is being furnished with each book,

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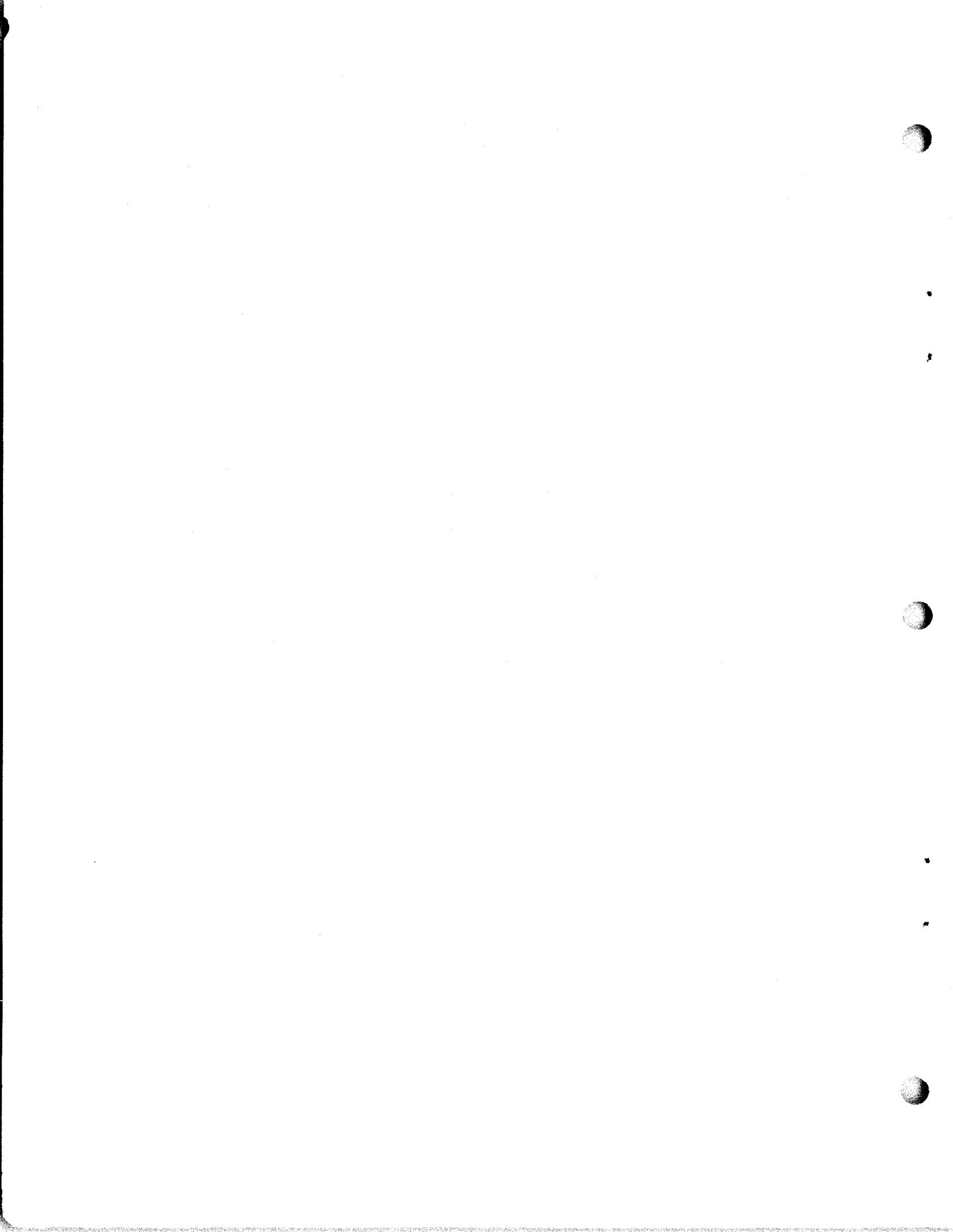
A handwritten signature in dark ink, appearing to read "W. I. Bull".

W. I. BULL

Captain USN

Assistant Chief of Bureau of
Ships for Electronics

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PHOTOFACT* FOLDER
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for

RADIO RECEIVING SET

AN/SRR-13A

HOWARD W. SAMS & CO., INC.
INDIANAPOLIS, INDIANA

Contract: Nobsr-71630

Approval Date: 1 April 1957

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BUREAU OF SHIPS
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From: Chief, Bureau of Ships
To: All Activities concerned with the Installation,
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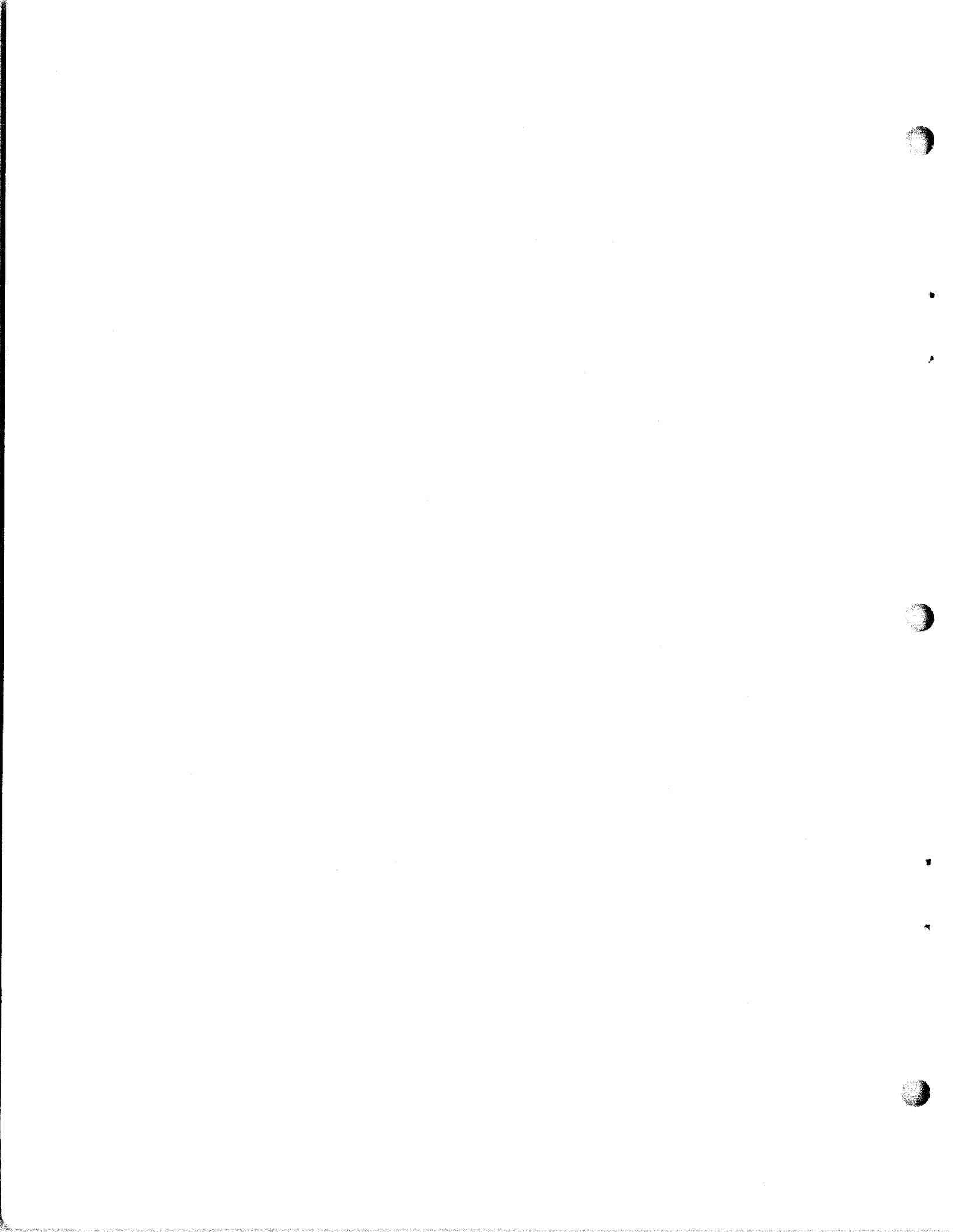
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NAVSHIPS 92977

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A. G. MUMMA
Chief of Bureau

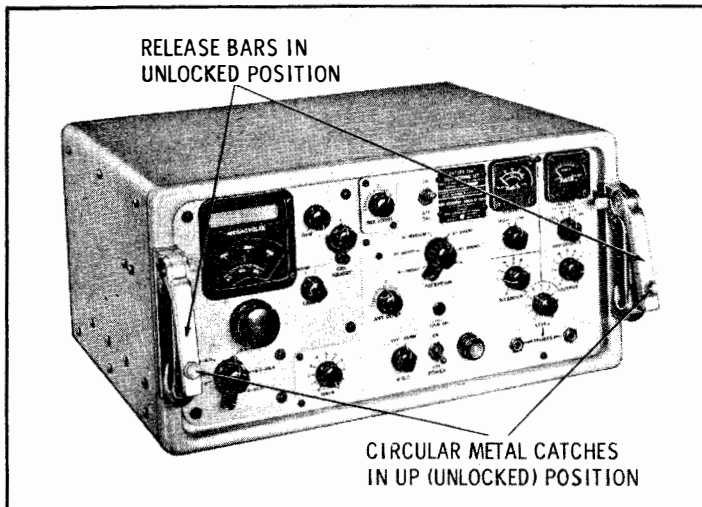
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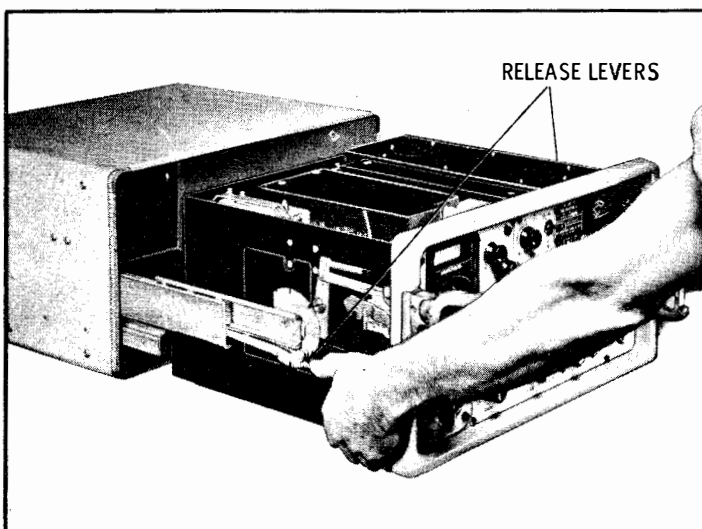
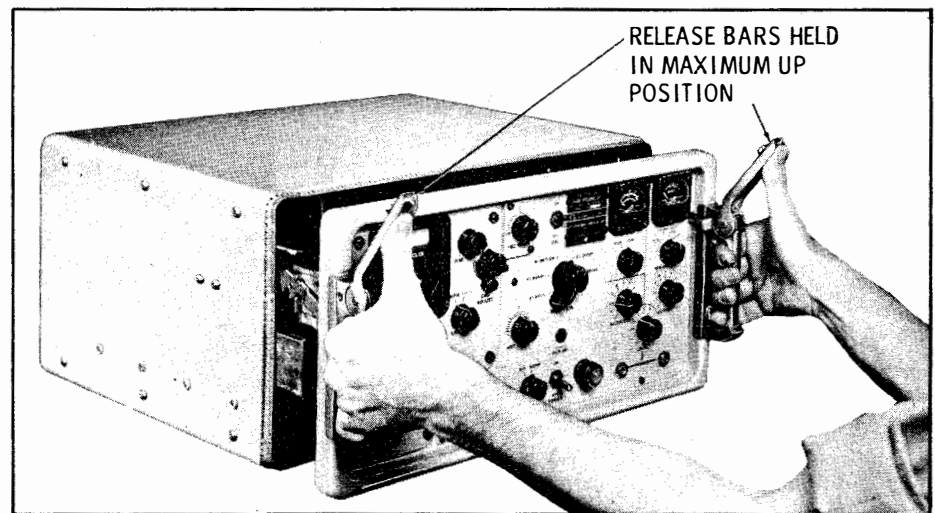
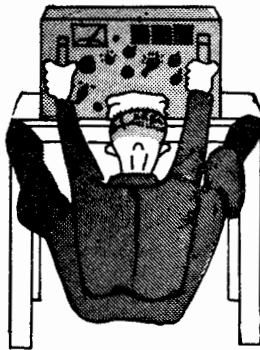
SECTION 1

REMOVAL AND REPLACEMENT OF MAJOR CHASSIS



REMOVING CHASSIS FROM CABINET

1. Cabinet must be mounted or supported when removing chassis.
2. Lift circular metal catches.
3. Raise release bars. Grasp handles and with thumbs push release bars up as far as they will go. This releases chassis front panel from cabinet.
4. Slide chassis out until stops engage.
5. Support chassis by grasping at bottom edge, depress release levers and pull chassis off of slide assembly.

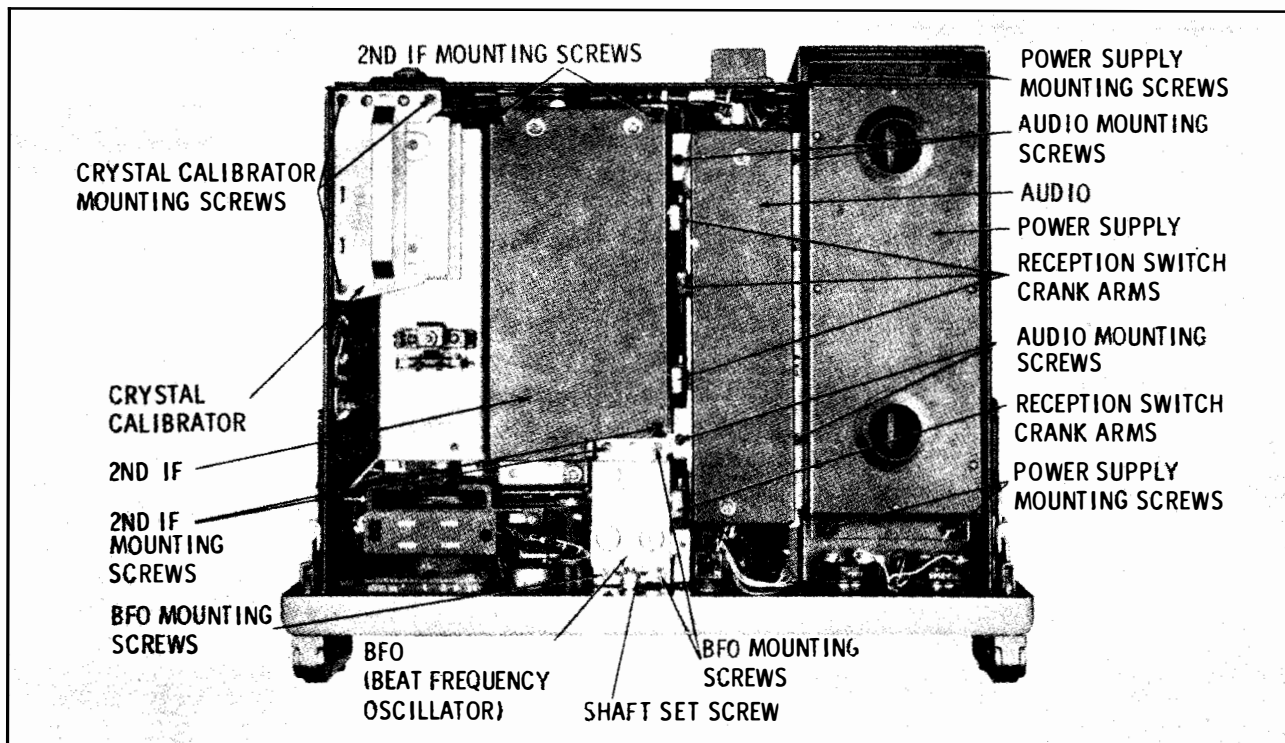


REPLACING CHASSIS IN CABINET

1. Extend the two tracks on cabinet to their full length.
2. Lift the chassis in position so that rails on sides of chassis engage the tracks.
3. Push the chassis on the slide assembly until the locking mechanism clicks into place.
4. Depress the two release levers on the sides of the chassis and push chassis into cabinet.
5. Push the release bars back in position. This secures the chassis in the cabinet. Make sure the round metal catches are down.

SECTION 2

REMOVAL AND REPLACEMENT OF MAJOR ASSEMBLIES



CHASSIS-TOP VIEW

REMOVING MAJOR ASSEMBLIES (TOP CHASSIS)

The mounting screws are of the captive type with a Phillips head. Use proper size Phillips-head screwdriver (Tip size No. 1) to prevent damage to the screw heads.

Grasp assembly to be removed at both ends and ease out evenly to prevent damage to connectors.

Tuning Dial Assembly

Refer to NAVSHIPS 91875 (A) for removal and replacement of Tuning Dial Assembly.

Power Supply

1. Release the four Power Supply assembly mounting screws.
2. Ease Power Supply assembly out of its socket.

Audio

1. Set RECEPTION control to A1 MEDIUM position.
2. Release the four Audio assembly mounting screws.
3. Ease Audio assembly out of its socket.

2nd IF

1. Set RECEPTION control to A1 MEDIUM position.

2. Release the four 2ND IF assembly mounting screws.
3. Ease 2ND IF assembly out of its socket.

BFO

1. Set RECEPTION control to A1 MEDIUM position.
2. Release the four BFO assembly mounting screws.
3. Loosen shaft set screw. Pull out on BFO FREQUENCY VERNIER Knob to separate shaft from extension shaft.
4. Ease BFO assembly out of its socket.

Crystal Calibrator

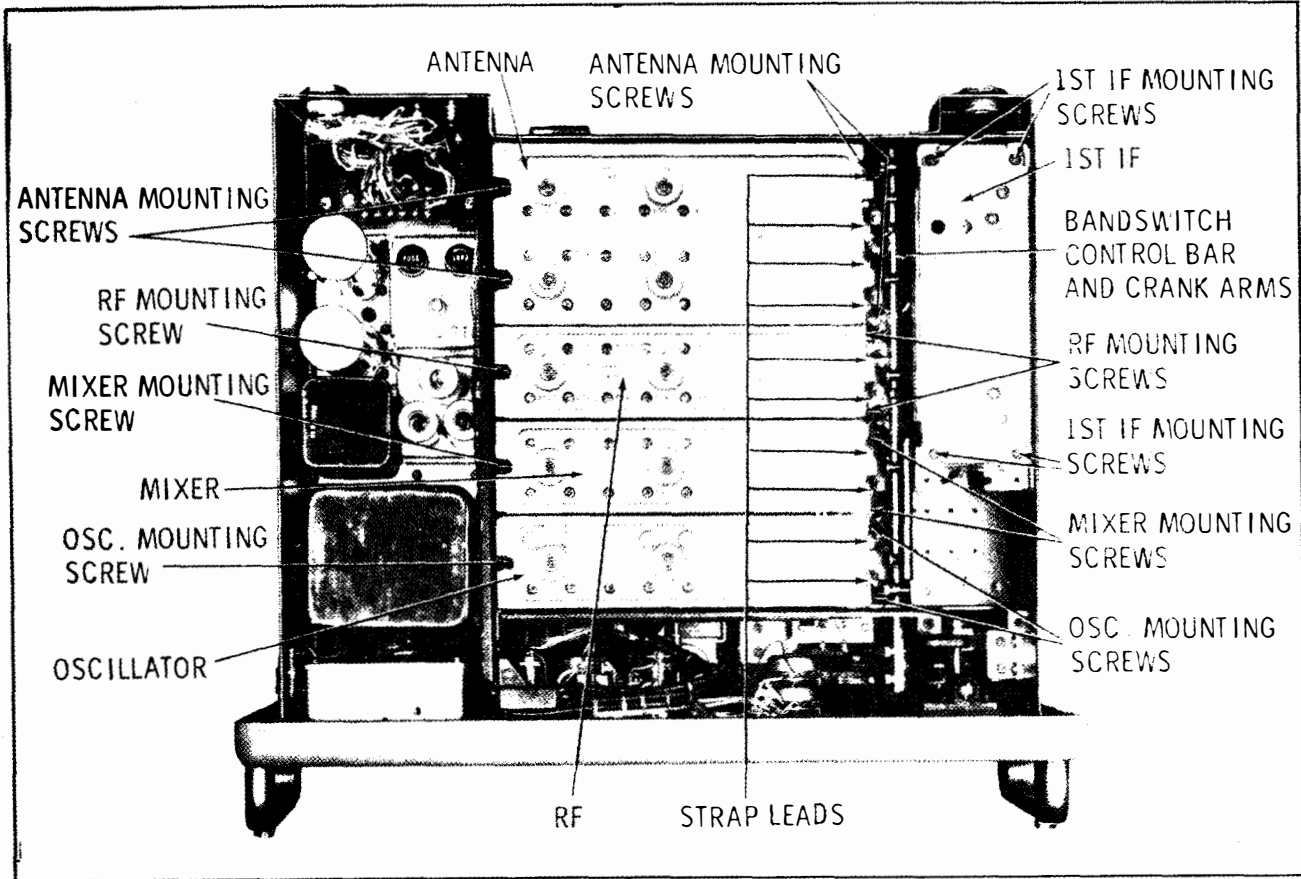
1. Release the three Crystal Calibrator assembly mounting screws.
2. Ease Crystal Calibrator assembly out of its socket.

REPLACING MAJOR ASSEMBLIES (TOP CHASSIS)

When replacing the assembly, orient it to its position in the chassis. Use the connector on the assembly and corresponding socket on the chassis as guides.

Set the RECEPTION control to A1 MEDIUM position when replacing Audio, 2nd IF, and BFO assemblies. Be sure the crank arms on the assembly are set properly to engage the RECEPTION control bar.

Tighten the assembly mounting screws.



CHASSIS-BOTTOM VIEW

REMOVING MAJOR ASSEMBLIES (BOTTOM CHASSIS)

The mounting screws are of the captive type with a Phillips head. Use proper size Phillips-head screwdriver (Tip size No. 1) to prevent damage to the screw heads.

Grasp assembly to be removed at both ends and ease out evenly to prevent damage to connectors.

1st IF

1. Set the band switch in 24.0 – 32.0 MC position.
2. Release the four 1st IF assembly mounting screws.
3. Ease the 1st IF assembly out of its socket.

Oscillator

1. Set the band switch in 24.0 – 32.0 MC position.
2. Disconnect the two tuning capacitor strap leads.
3. Remove the cover from the Mixer assembly. Remove the screw holding link O603.
4. Release the three Oscillator assembly mounting screws.
5. Ease Oscillator assembly out of its socket.

Mixer

1. Set the band switch in 24.0 – 32.0 MC position.
2. Disconnect the two tuning capacitor strap leads.
3. Remove the cover from the Oscillator assembly. Remove the screw holding link O603.

4. Release the three Mixer assembly mounting screws.
5. Ease Mixer assembly out of its socket.

Rf

1. Set the band switch in 24.0 to 32.0 MC position.
2. Disconnect the two tuning capacitor strap leads.
3. Release the three RF assembly mounting screws.
4. Ease RF assembly out of its socket.

Antenna

1. Set the band switch in 24.0 – 32.0 MC position.
2. Disconnect the four tuning capacitor strap leads.
3. Release the four Antenna assembly mounting screws.
4. Ease Antenna assembly out of its socket.

REPLACING MAJOR ASSEMBLIES (BOTTOM CHASSIS)

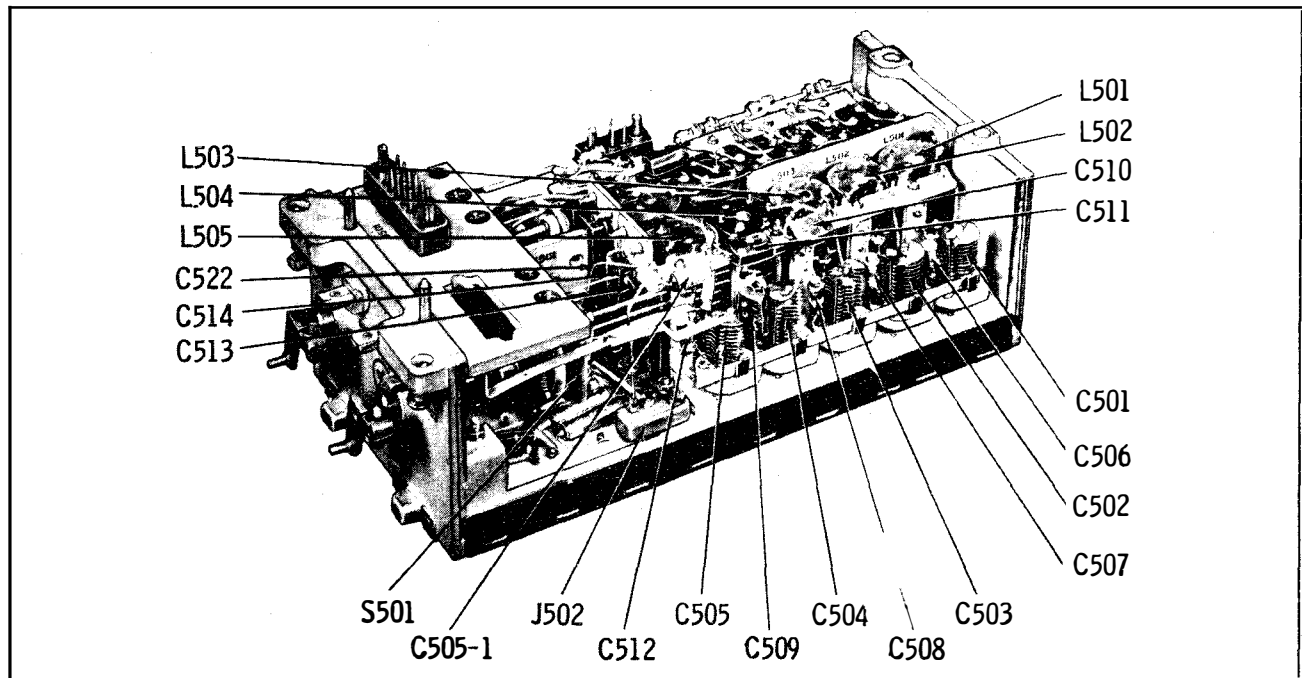
When replacing the Assembly, orient it to its position in the chassis. Use the connector on the assembly and corresponding socket on the chassis as guides.

Set the band switch in 24.0 – 32.0 MC position. Be sure the crank arms on the assembly are set properly to engage the band switch control bar.

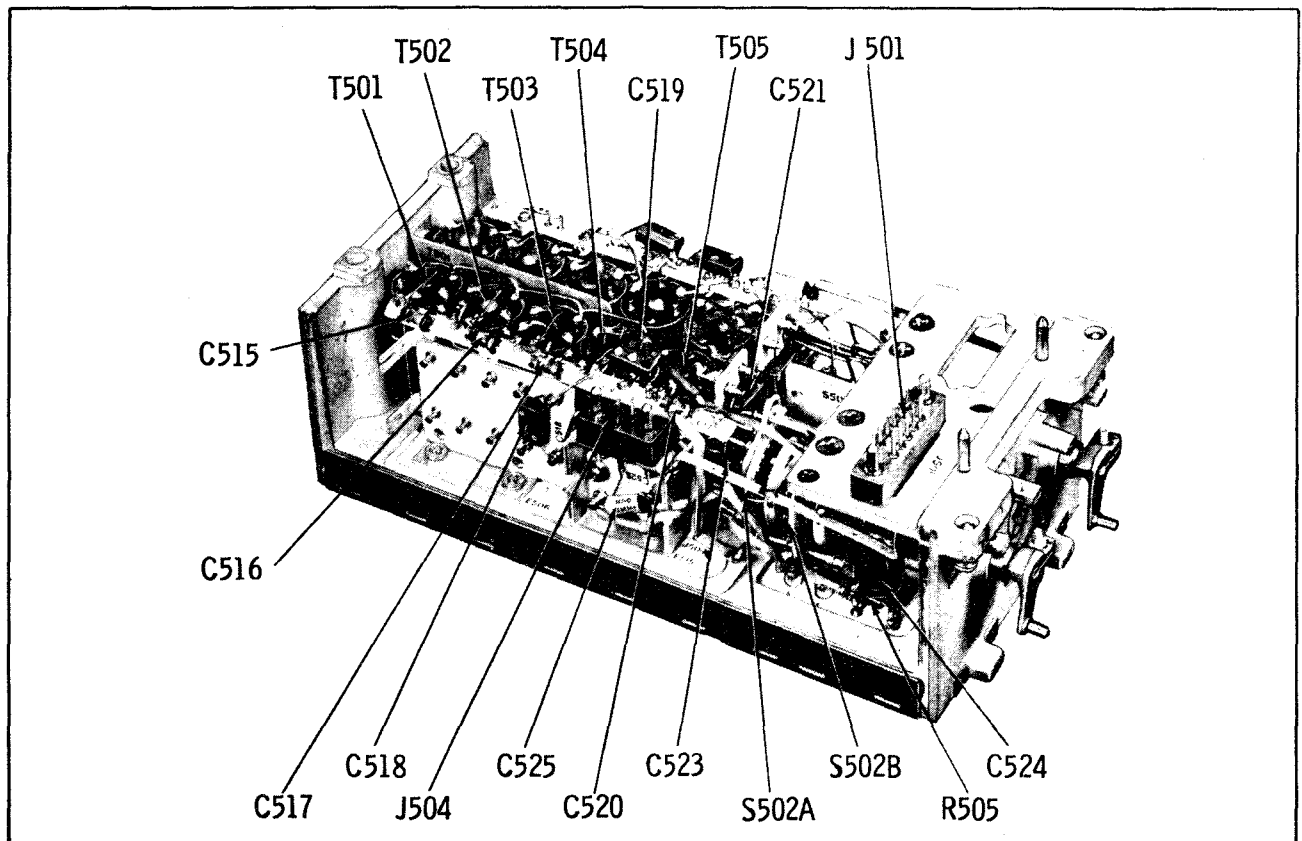
Tighten the assembly mounting screws. Follow the removal procedure for each assembly in reverse order.

SECTION 3

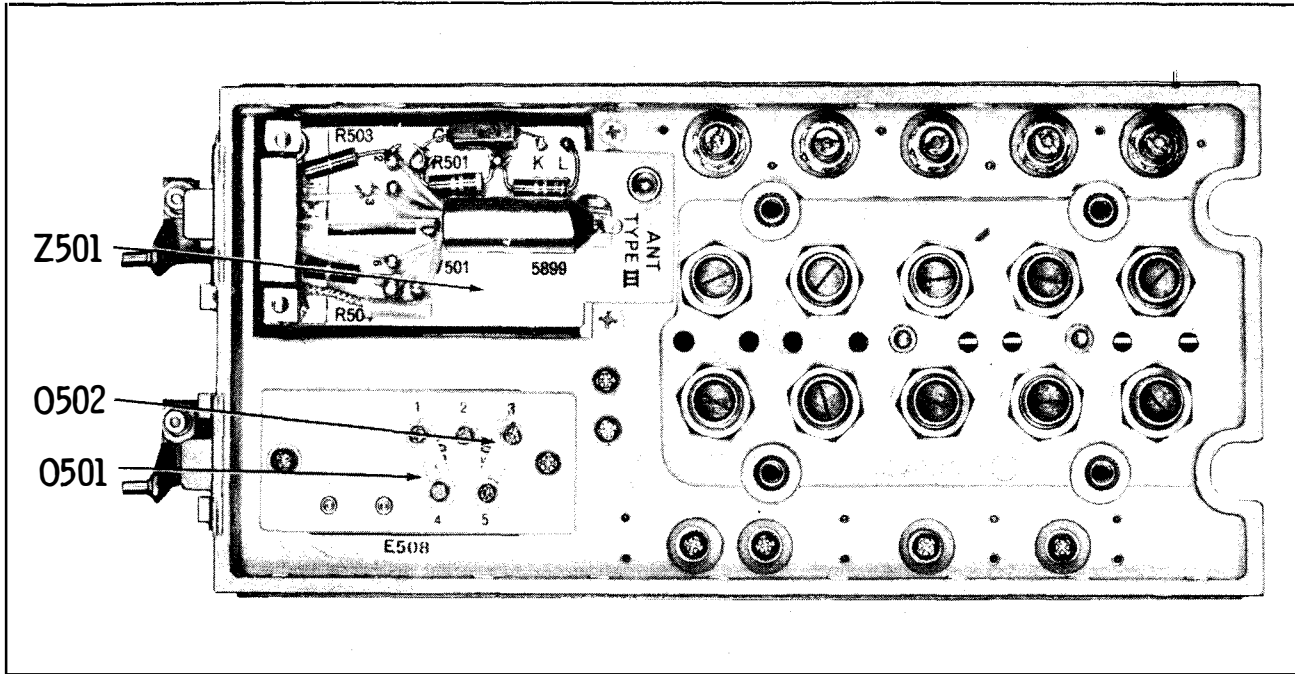
PARTS LOCATION ON MAIN CHASSIS AND MAJOR ASSEMBLIES



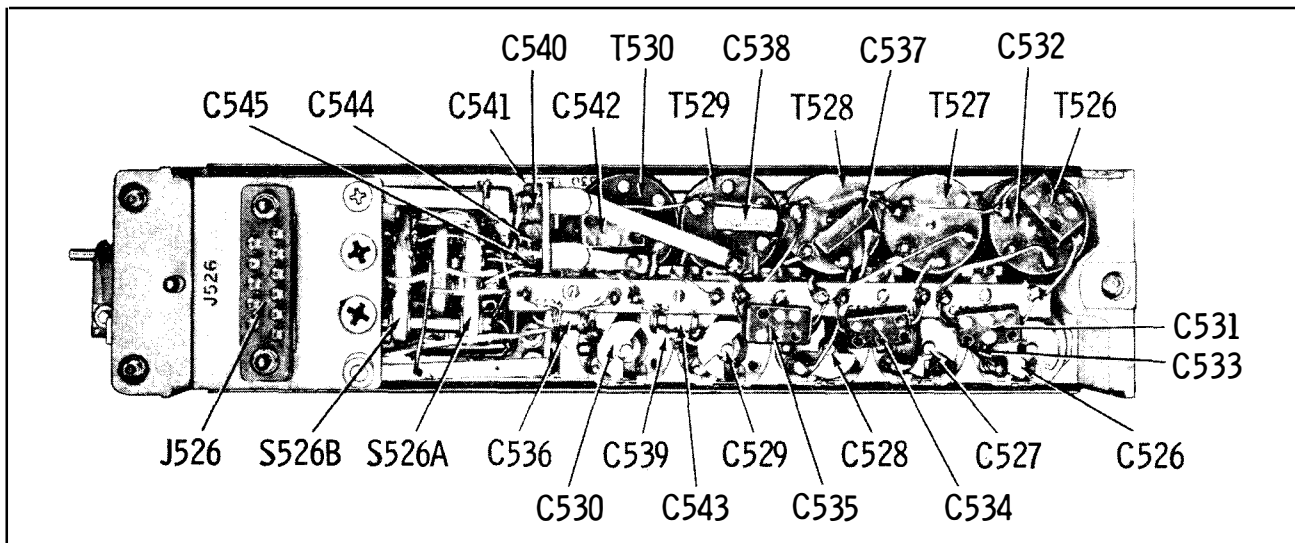
ANTENNA ASSEMBLY-BOTTOM VIEW



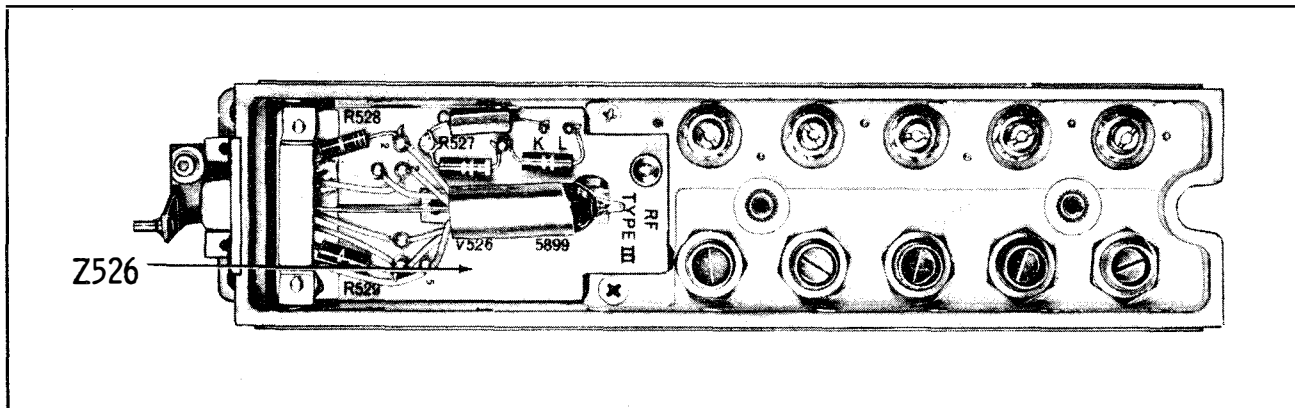
ANTENNA ASSEMBLY-BOTTOM VIEW



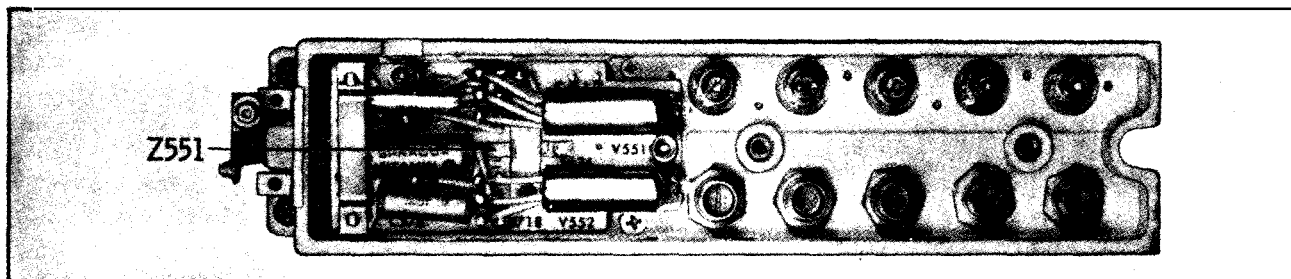
ANTENNA ASSEMBLY-TOP VIEW



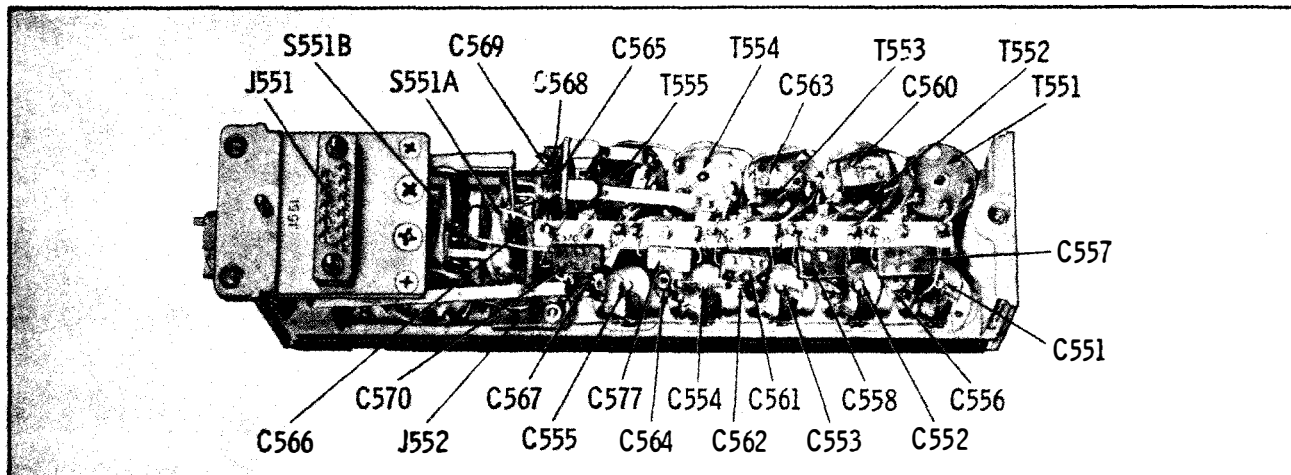
RF ASSEMBLY-BOTTOM VIEW



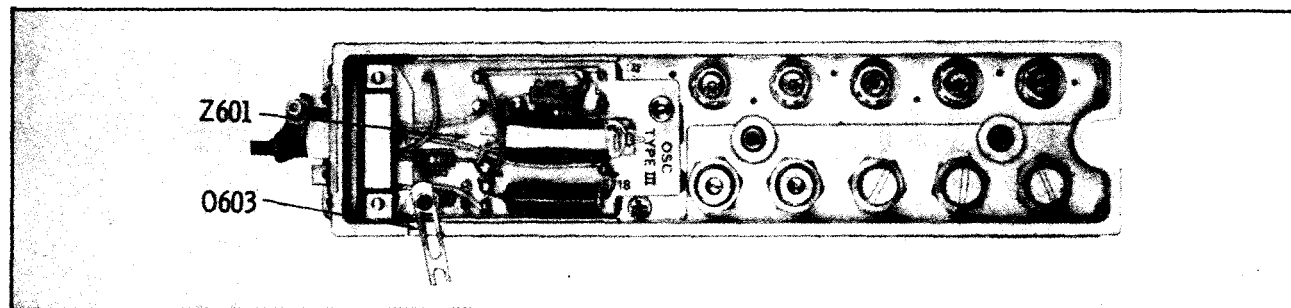
RF ASSEMBLY-TOP VIEW



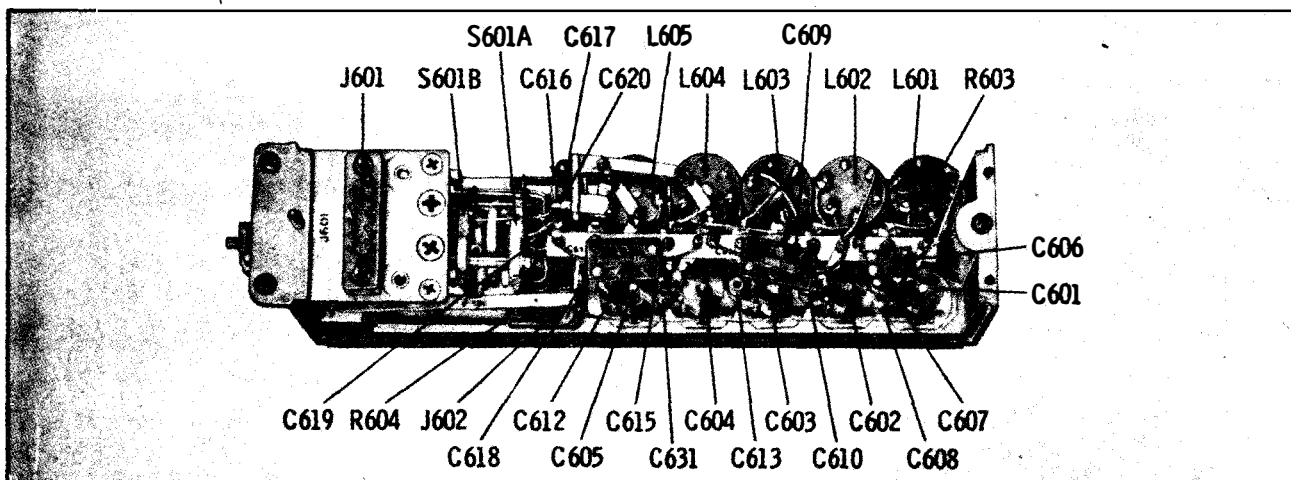
MIXER ASSEMBLY-TOP VIEW



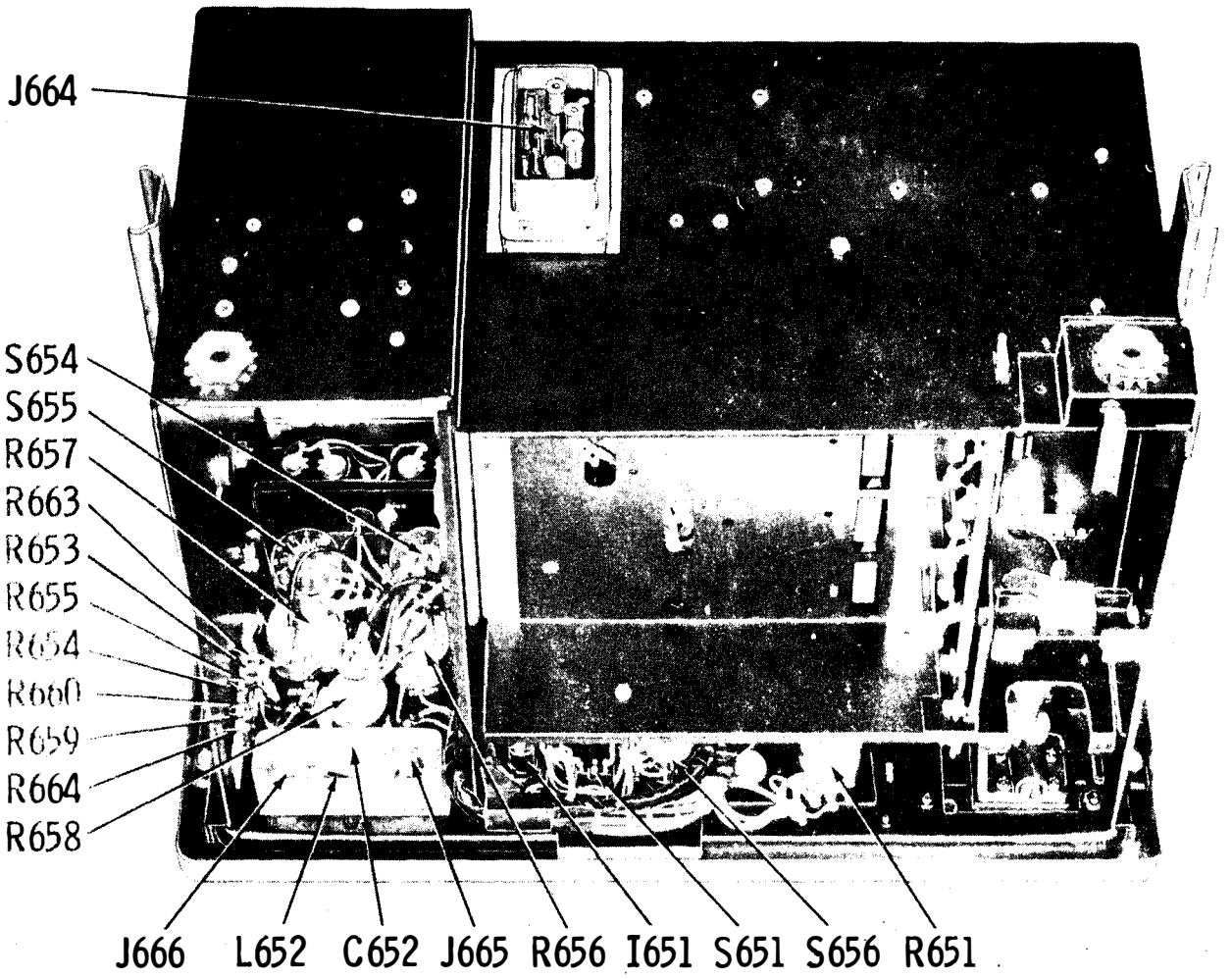
MIXER ASSEMBLY-BOTTOM VIEW



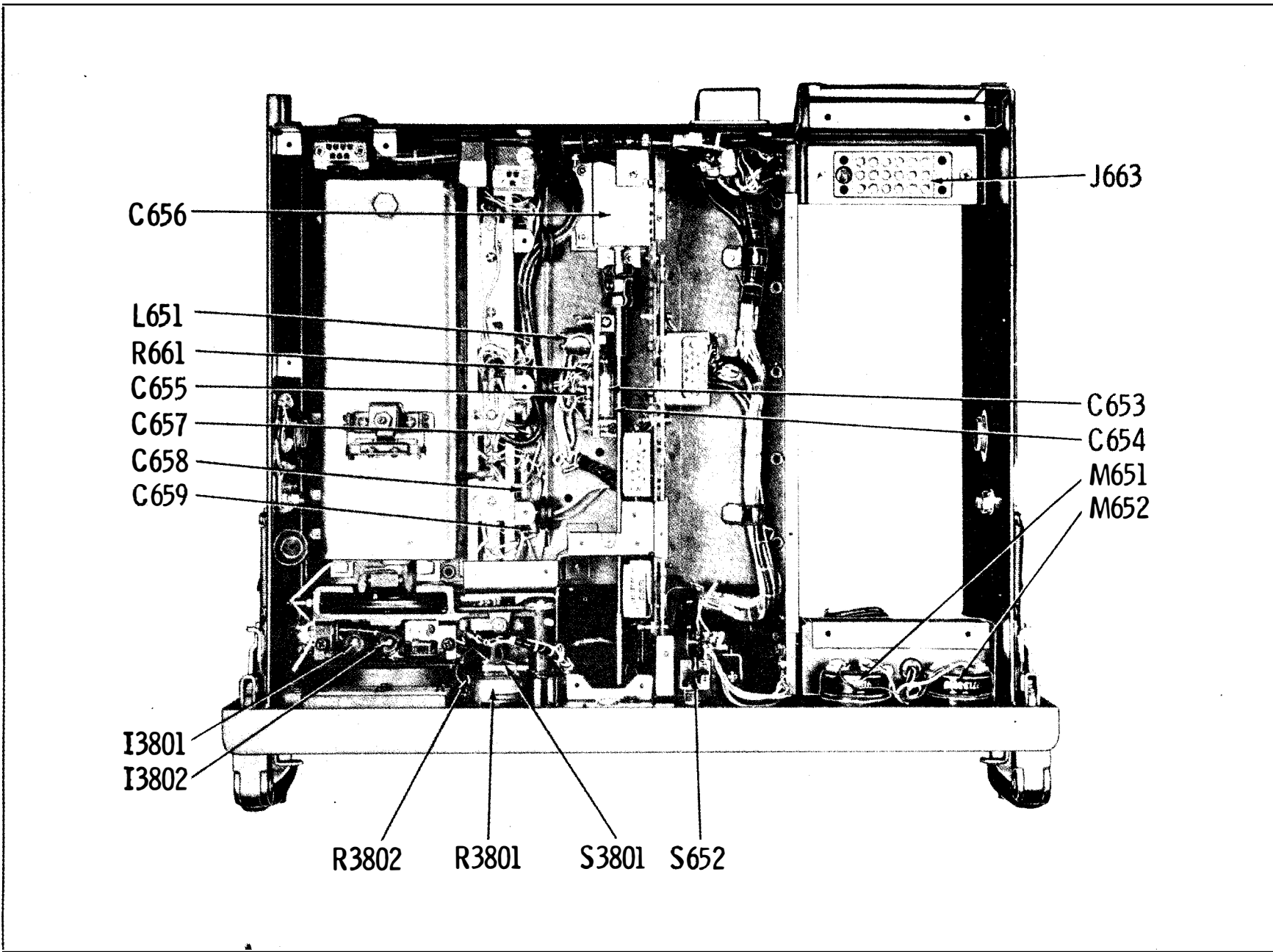
OSCILLATOR ASSEMBLY-TOP VIEW



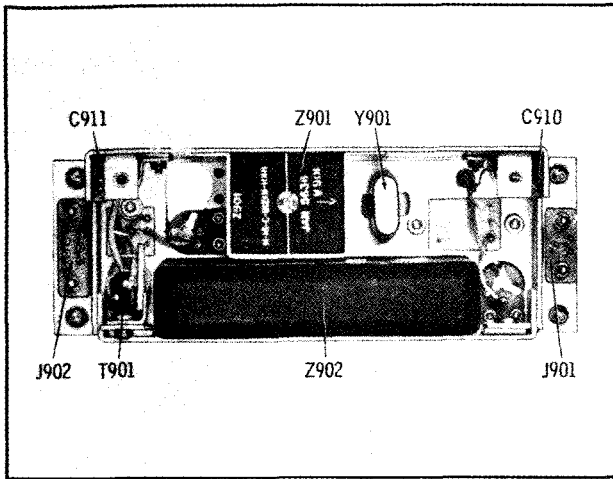
OSCILLATOR ASSEMBLY-BOTTOM VIEW



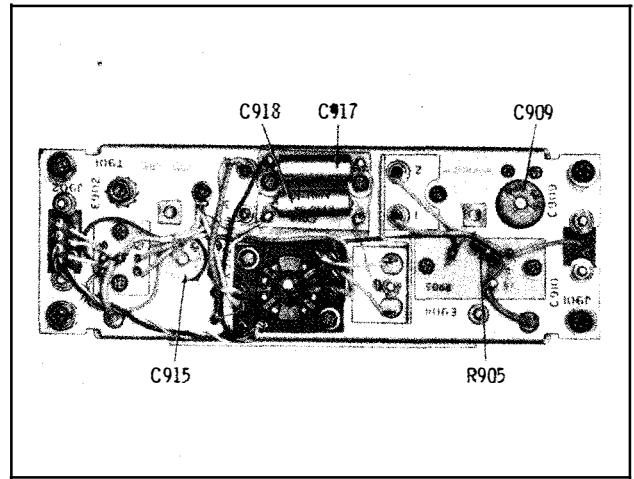
CHASSIS-BOTTOM VIEW (MAJOR ASSEMBLIES REMOVED)



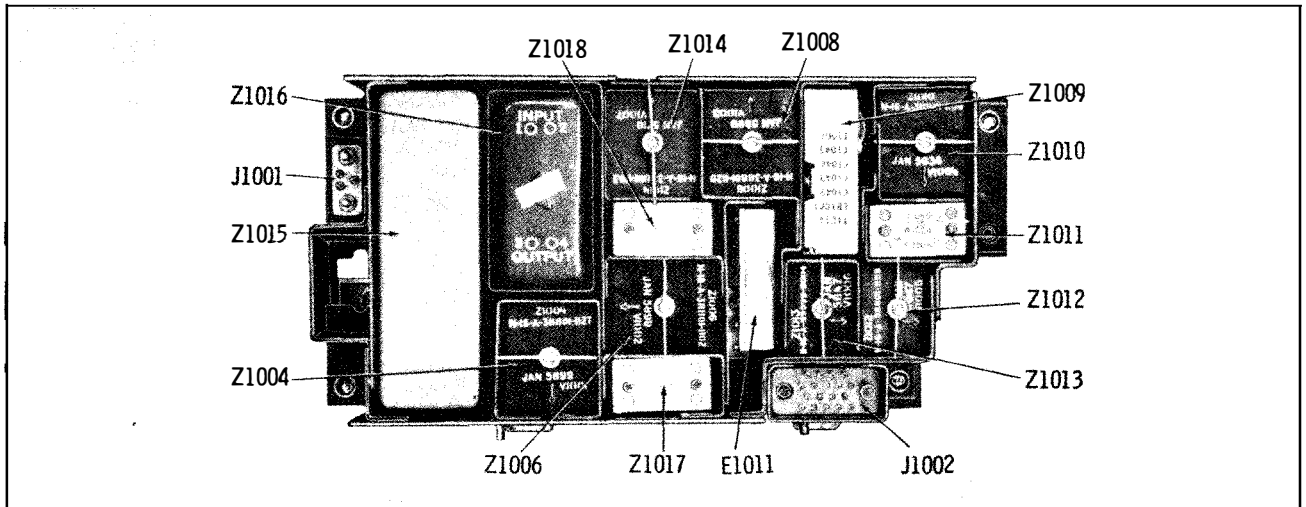
CHASSIS-TOP VIEW (MAJOR ASSEMBLIES REMOVED)



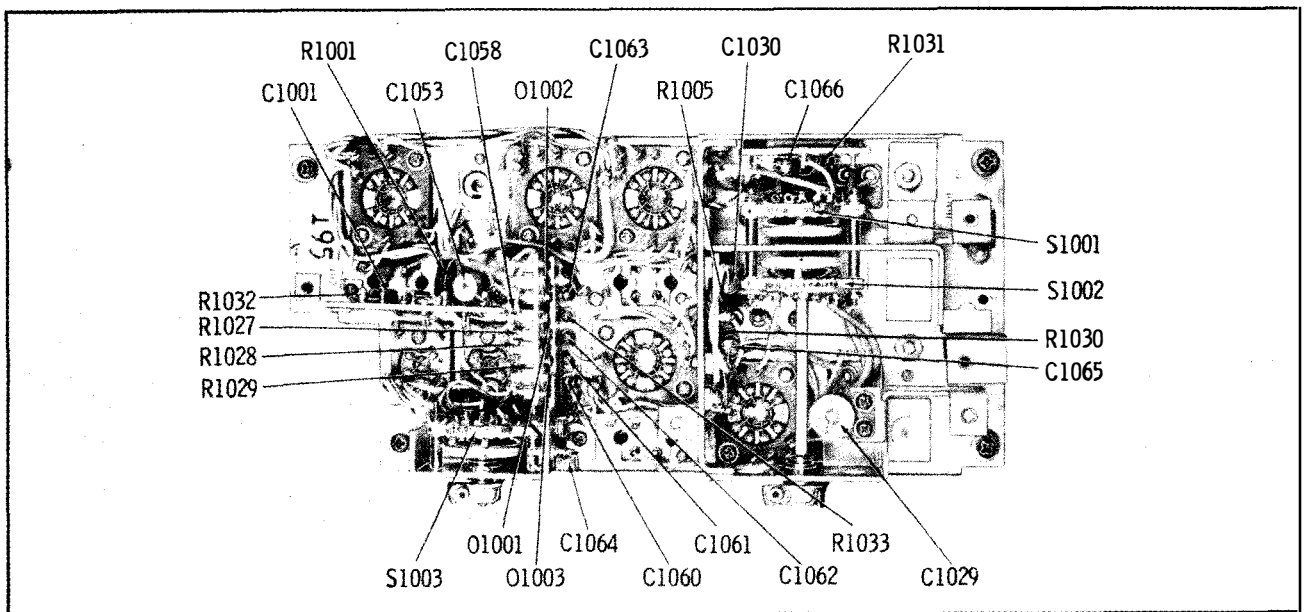
1ST IF ASSEMBLY-TOP VIEW



1ST IF ASSEMBLY-BOTTOM VIEW

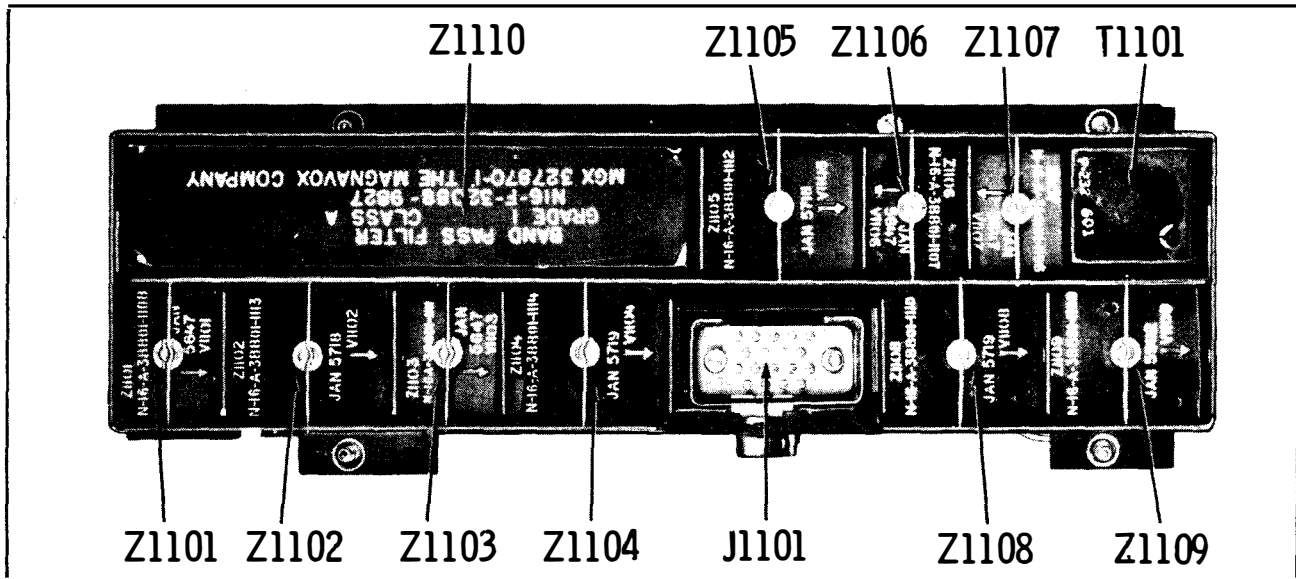


2ND IF ASSEMBLY - TOP VIEW

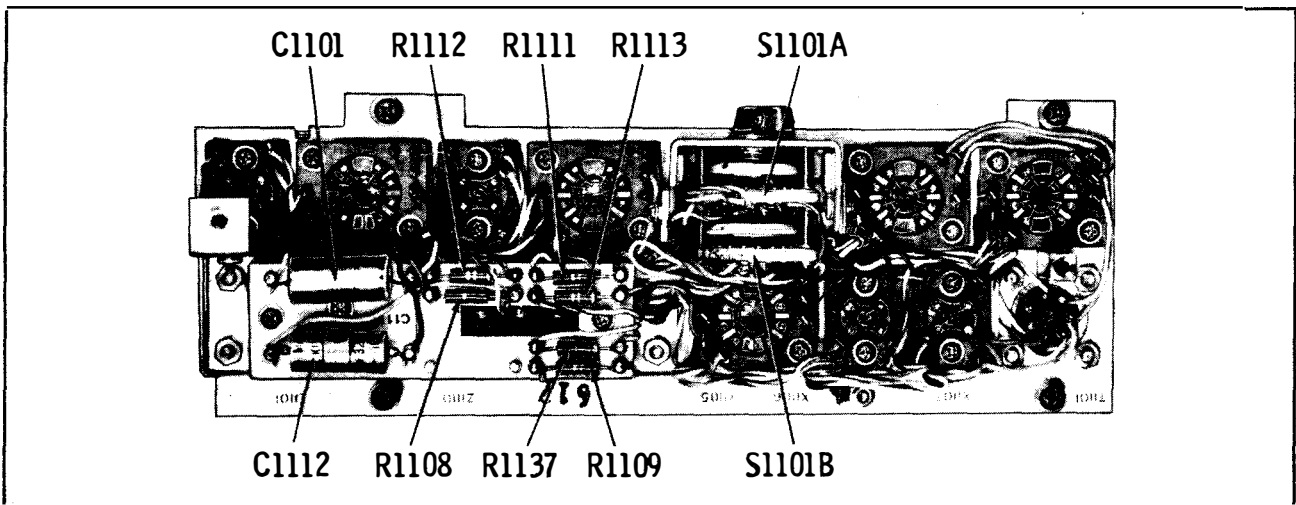


2ND IF ASSEMBLY-BOTTOM VIEW

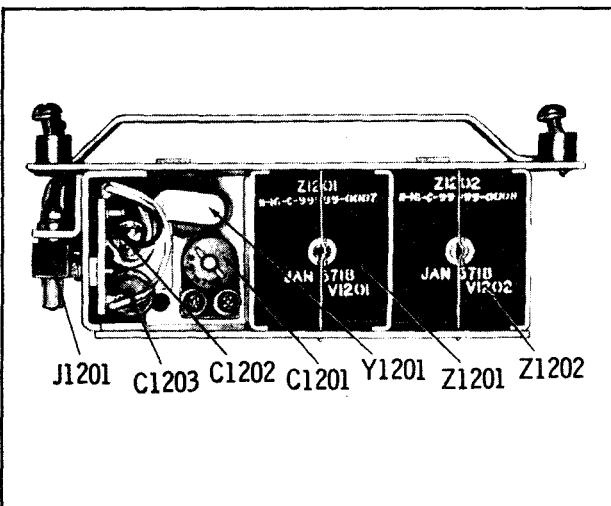
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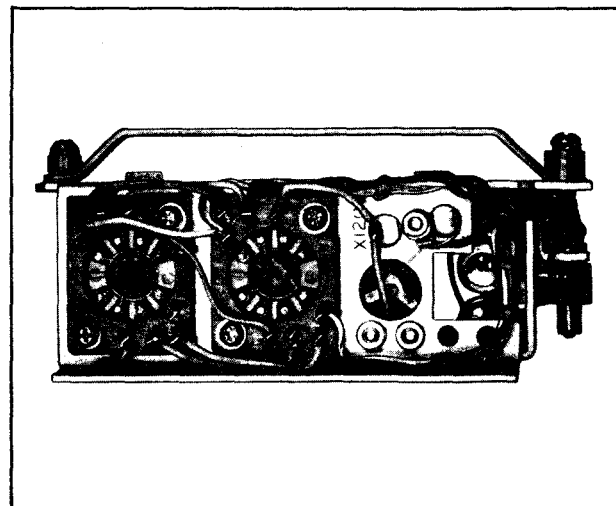
AUDIO ASSEMBLY-TOP VIEW



AUDIO ASSEMBLY-BOTTOM VIEW

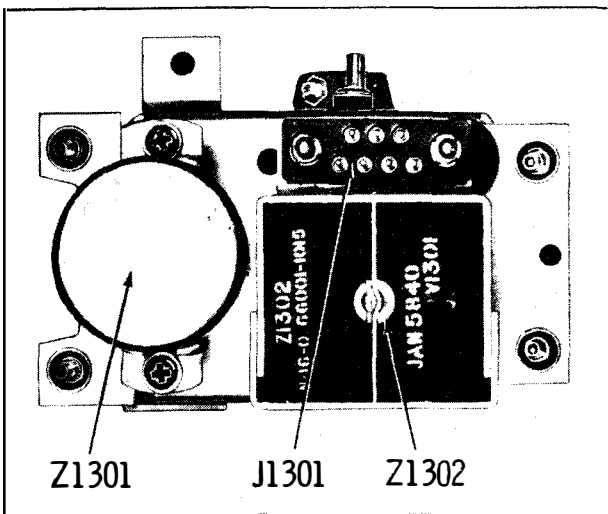


XTAL CALIBRATOR ASSEMBLY-TOP VIEW

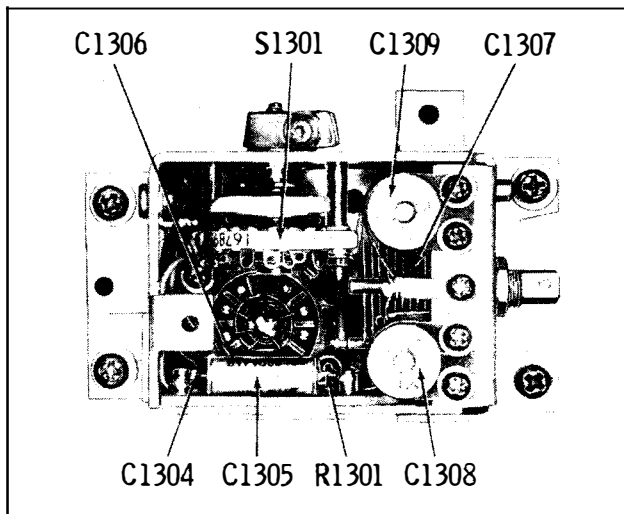


XTAL. CALIBRATOR ASSEMBLY-BOTTOM VIEW

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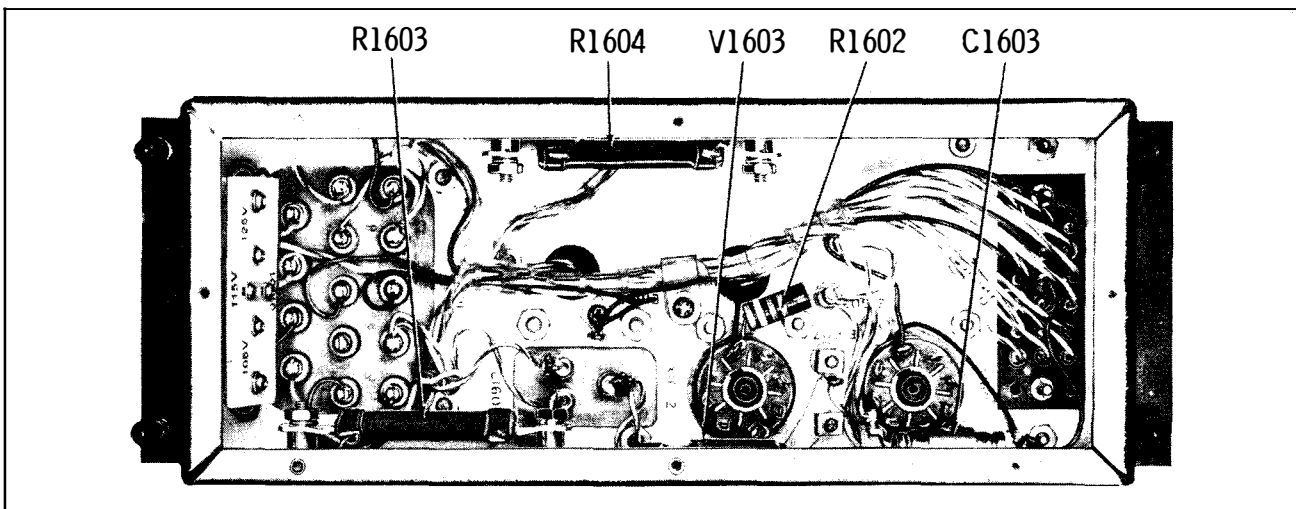


BFO ASSEMBLY-TOP VIEW

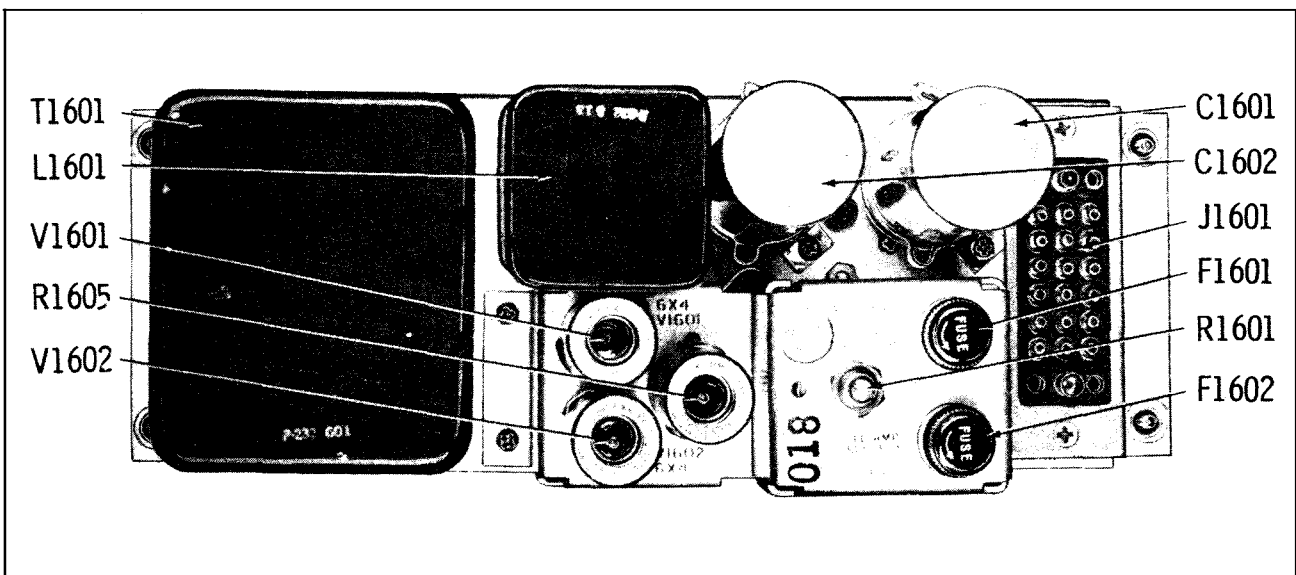


BFO ASSEMBLY-BOTTOM VIEW

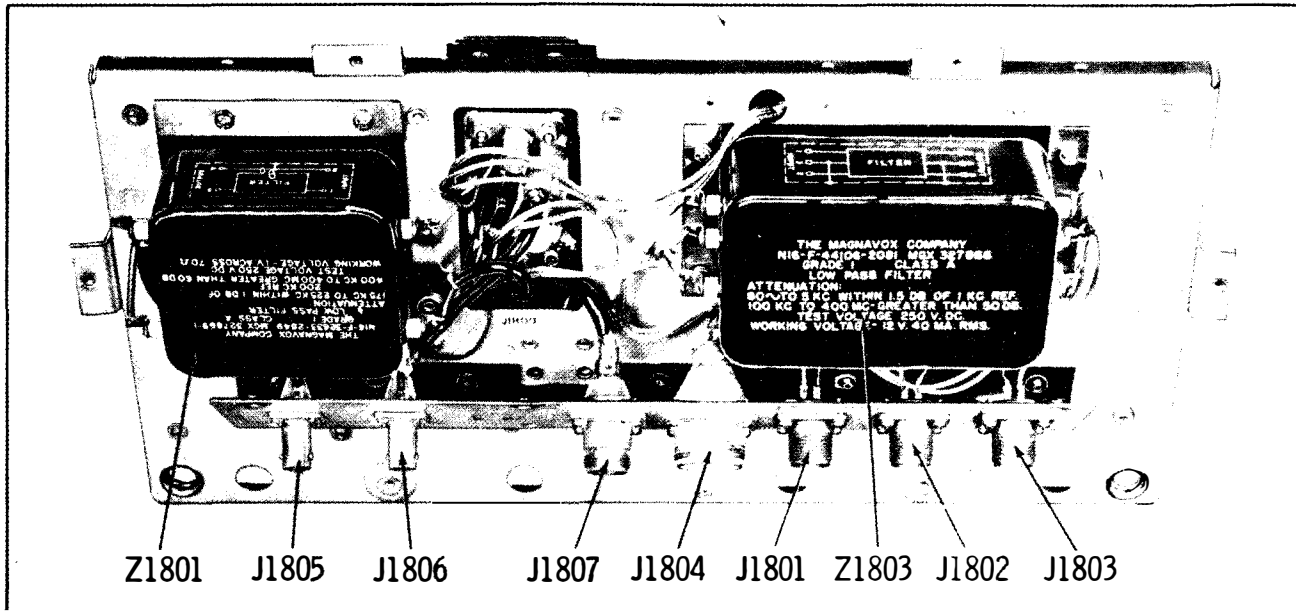
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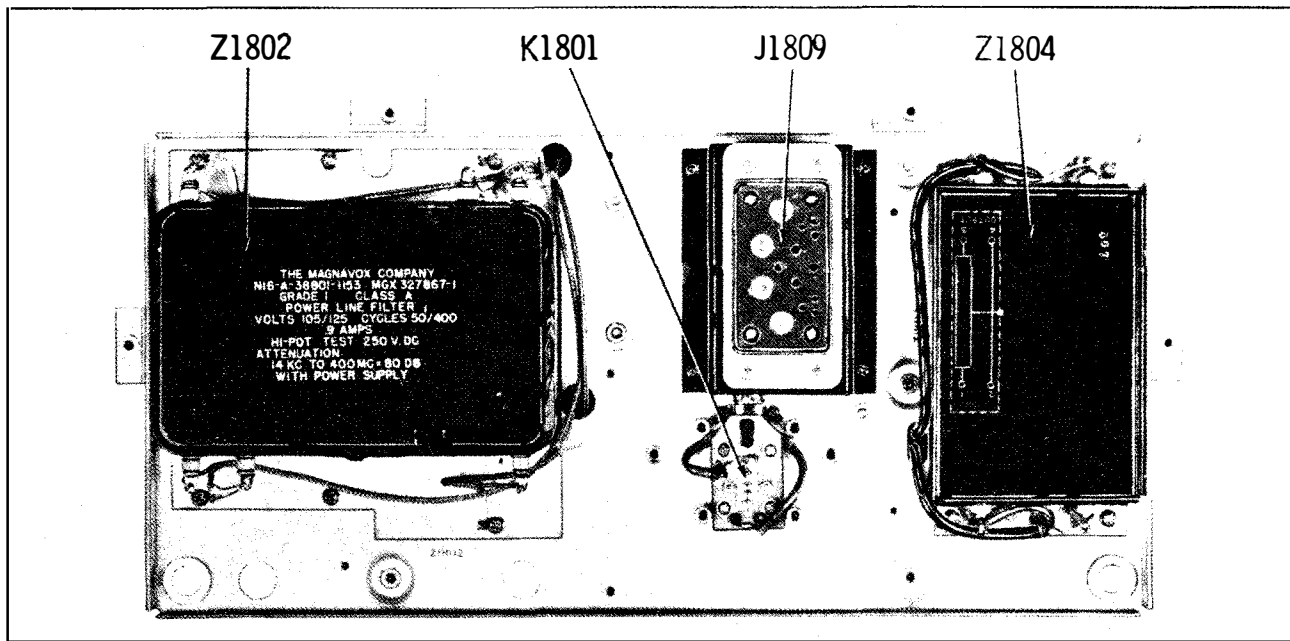
POWER SUPPLY ASSEMBLY-BOTTOM VIEW



POWER SUPPLY ASSEMBLY-TOP VIEW



FILTER ASSEMBLY-REAR VIEW

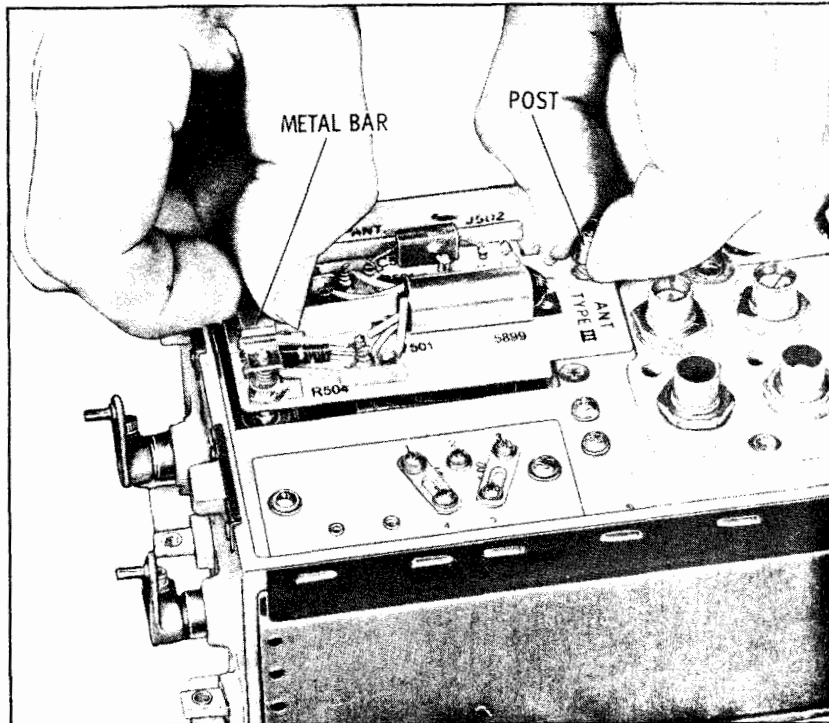


FILTER ASSEMBLY-FRONT VIEW

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SECTION 4

REMOVAL AND REPLACEMENT OF MINOR ASSEMBLIES



REMOVING PLUG-IN BOARDS

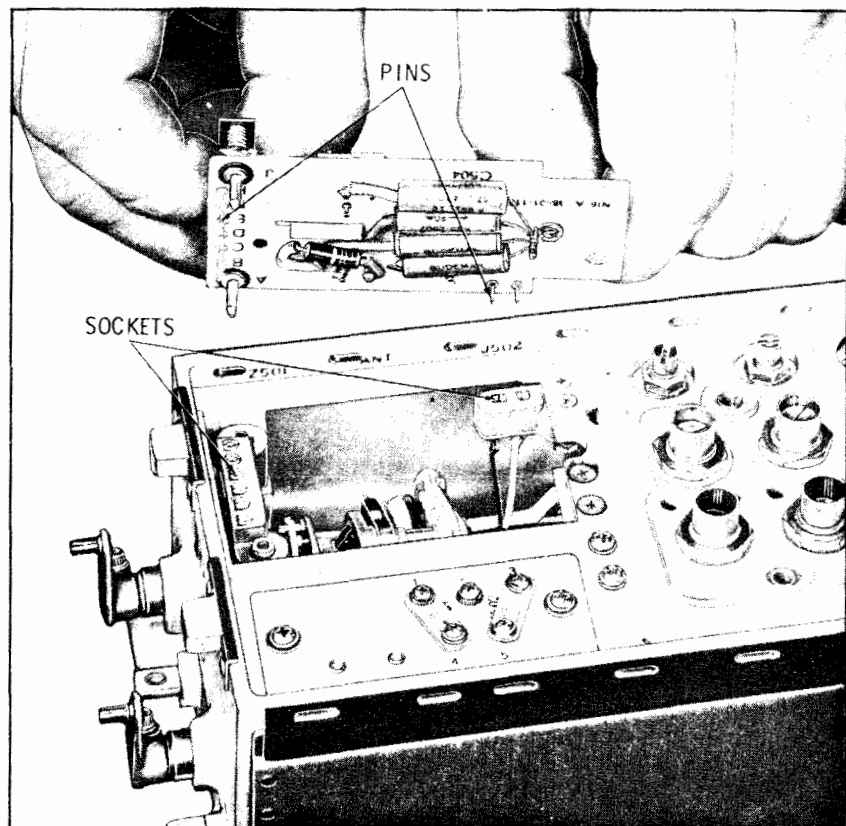
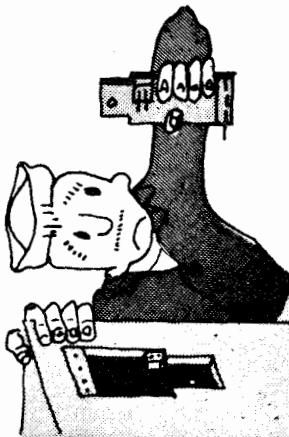
The covers must be removed from the Antenna, RF, Mixer and Oscillator assemblies before the plug-in boards can be removed.

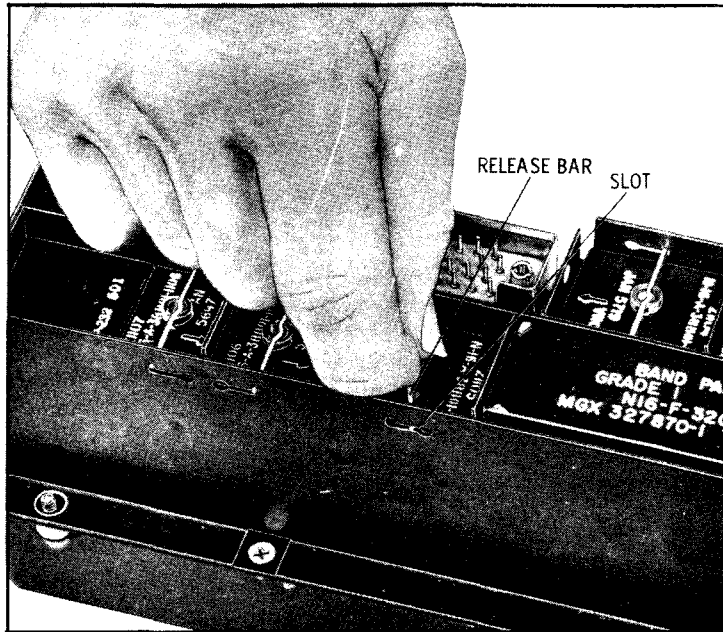
1. Pull the plug-in board from its position by gripping the metal bar and post at the ends of the board.



REPLACING PLUG-IN BOARDS

1. Orient the plug-in board so the pins fit over the sockets in the major assembly and push the board in place.

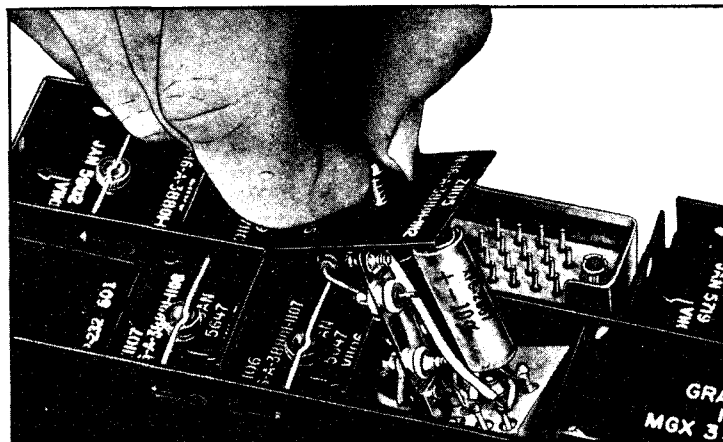
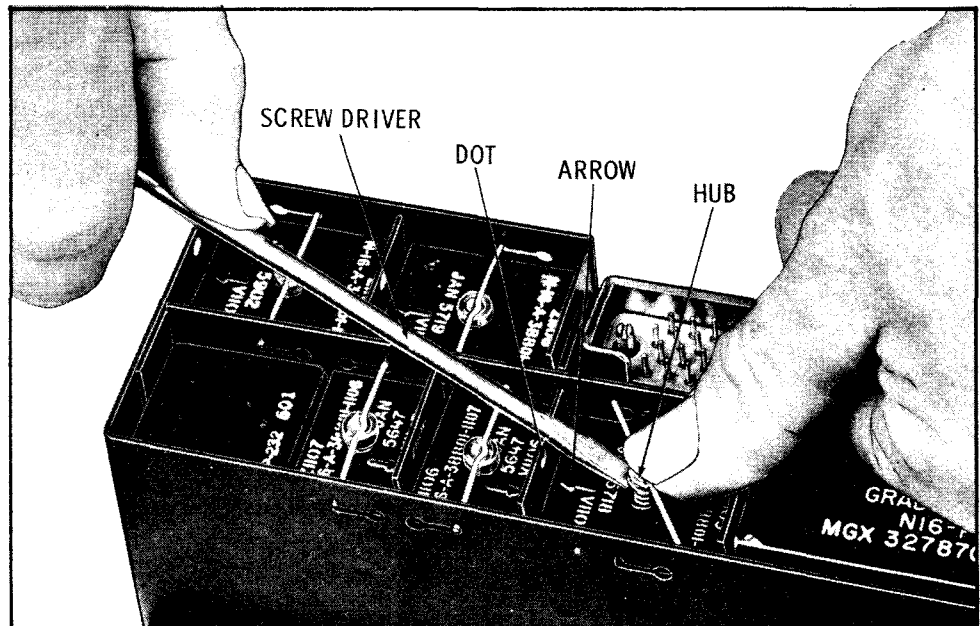
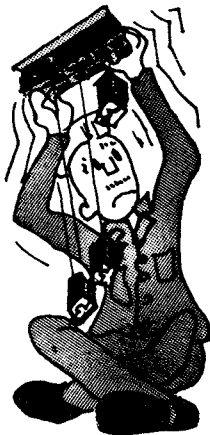




REMOVING PLUG-IN UNITS

The major assemblies (BFO, Crystal Calibrator, 1st IF, 2nd IF and Audio) must be removed from the chassis before the plug-in units can be removed.

1. Depress and then turn the release bar a quarter turn.
2. Place the tip of a screwdriver blade under the hub of the release bar. Place thumb on opposite side of hub to equalize side pressure. Pry up gently to pull the plug-in unit from the socket in the major assembly.
3. Grasp the release bar and remove the plug-in unit from the compartment.

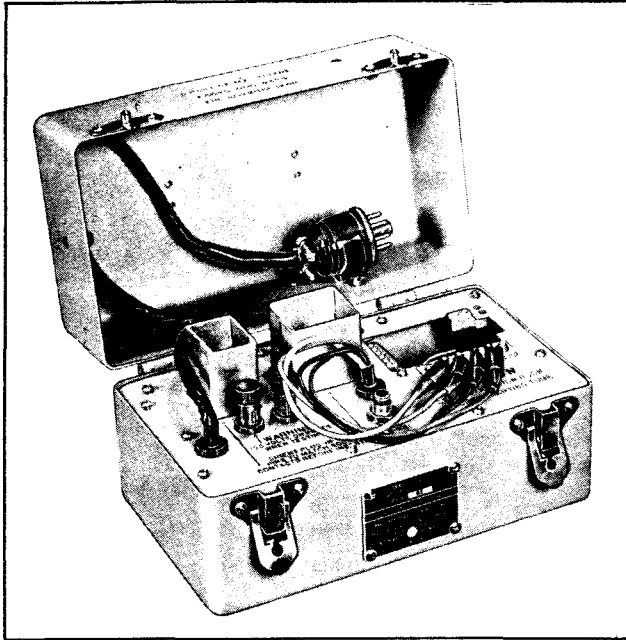


REPLACING PLUG-IN UNIT

1. Orient the plug-in unit so the arrow on top of the unit points toward the dot on the side wall of the compartment in the major assembly.
2. Push the unit in place.
3. Depress the release bar and turn it a quarter turn so the ends of the bar fit into the slotted holes in the walls of the compartment.

SECTION 5

APPLICATION OF MX-2012/U TEST ADAPTER

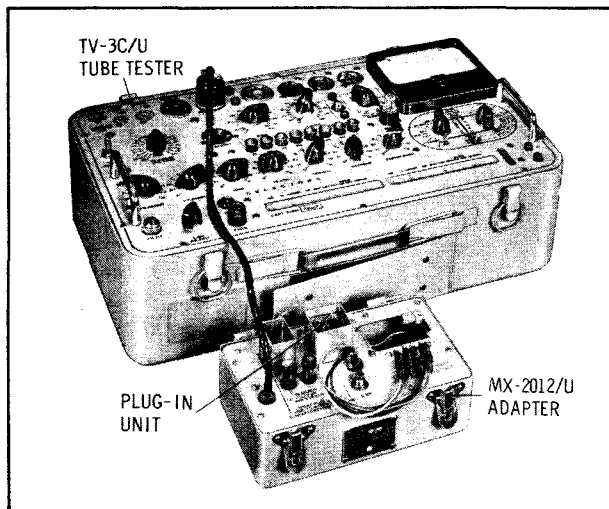
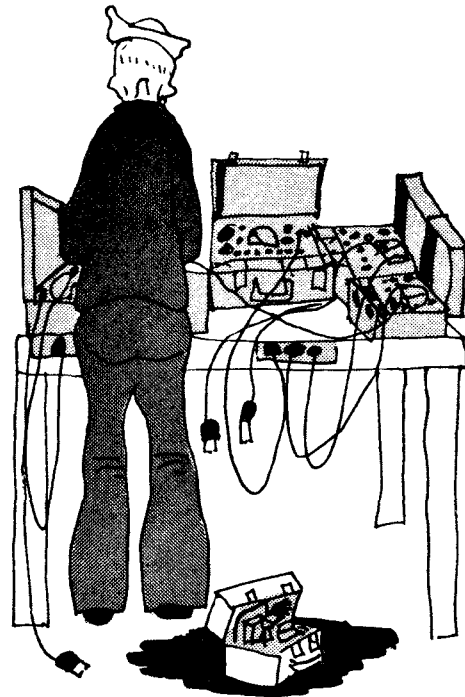


TEST ADAPTER MX-2012/U

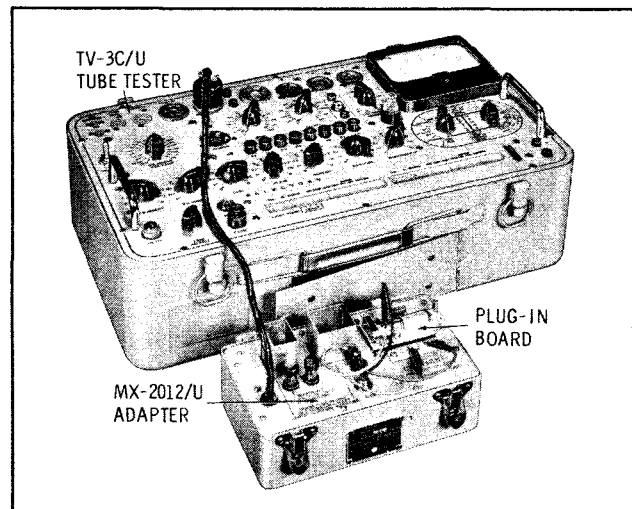
MX-2012/U TEST ADAPTER

The MX-2012/U Test Adapter is a unit designed to be used in conjunction with tube testers of the TV-3/U Series for testing subminiature tubes mounted on the subassemblies in this receiver without removing the tube from the subassembly.

To use this equipment, follow the instructions and use the Tube Test Chart shown in Section 4 of NAVSHIPS 92743, Instruction Book for Test Adapter MX-2012/U. Consult tube tester instruction book for correct tube tester operating procedure.



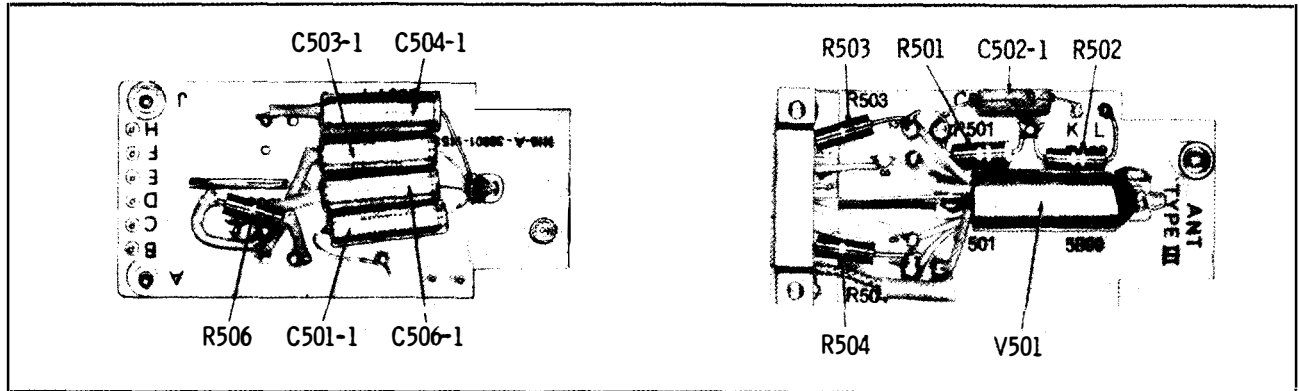
SET-UP FOR TESTING TUBES IN PLUG-IN UNITS



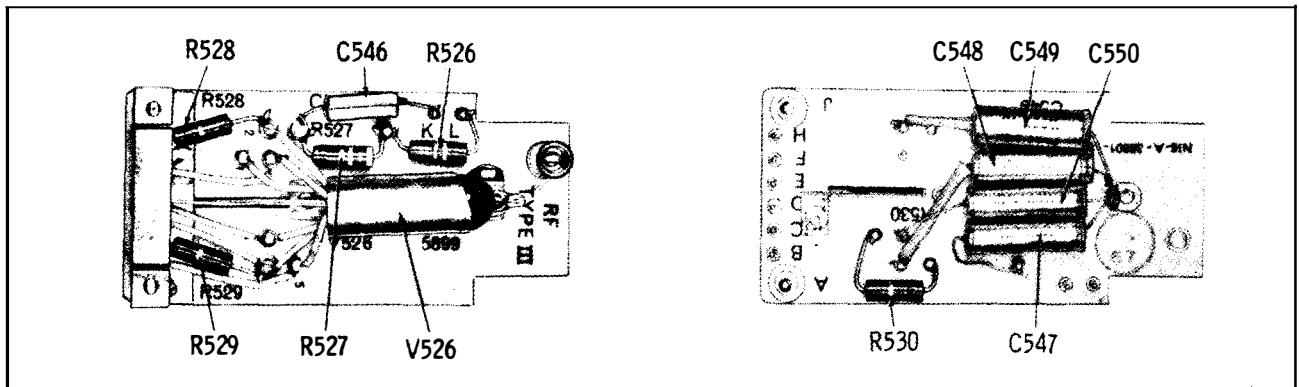
SET-UP FOR TESTING TUBES IN PLUG-IN BOARDS

SECTION 6

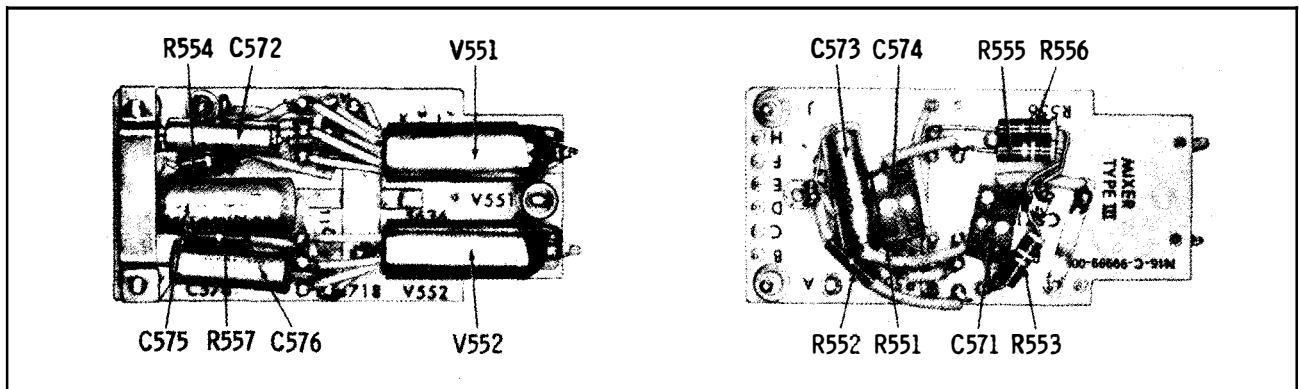
PARTS LOCATION ON MINOR ASSEMBLIES



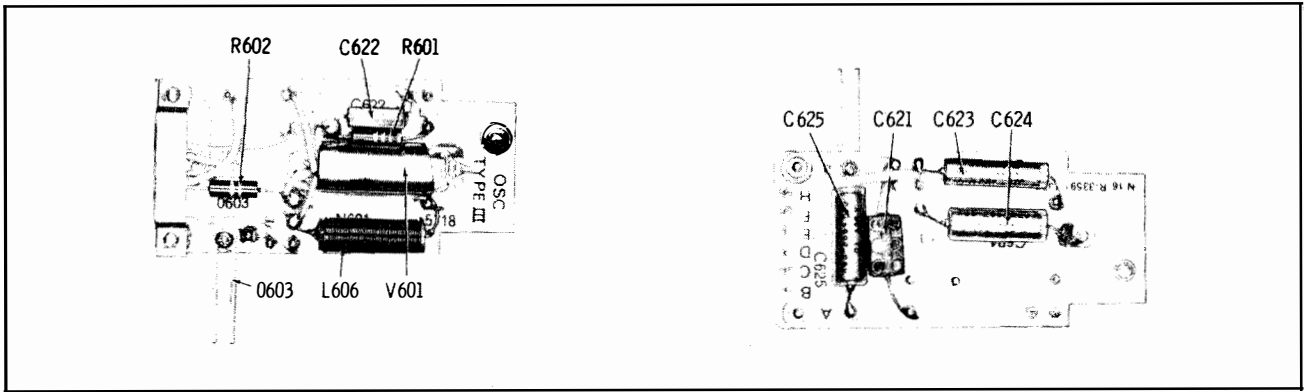
1ST RF AMP., Z501 - ANTENNA ASSEMBLY



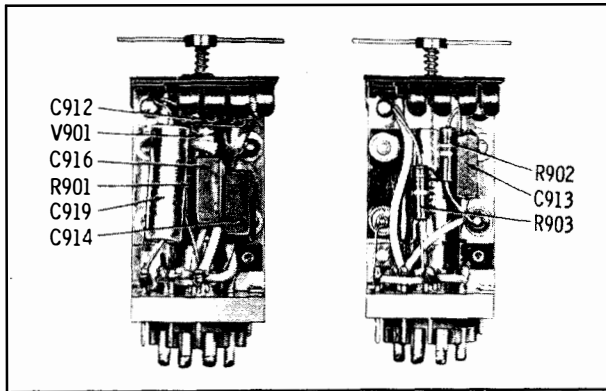
2ND RF AMP., Z526 - RF ASSEMBLY



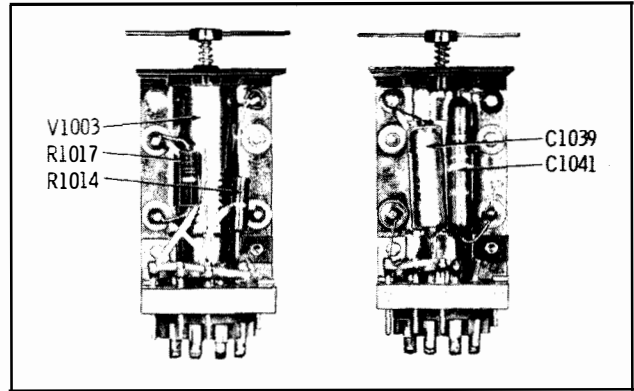
MIXER & CATHODE FOLLOWER, Z551 - MIXER ASSEMBLY



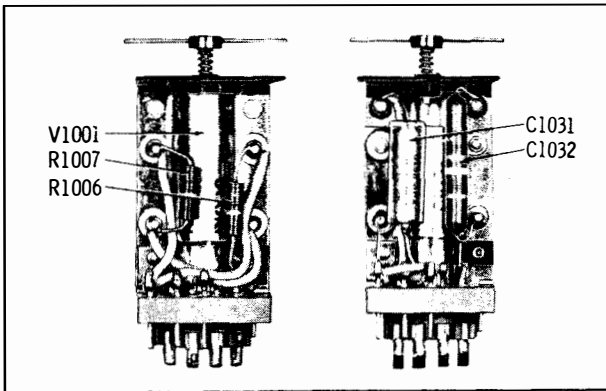
OSCILLATOR, Z601 – OSCILLATOR ASSEMBLY



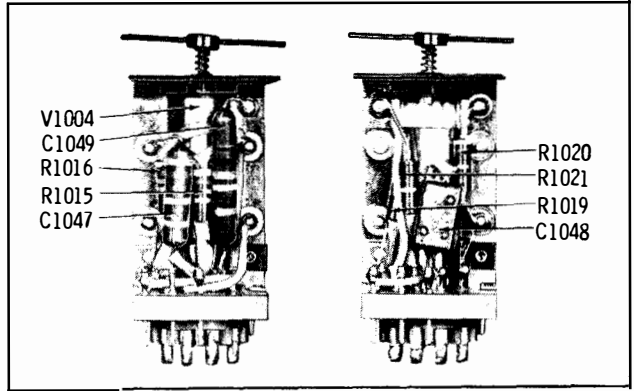
CONVERTER, Z901 – 1ST IF ASSEMBLY



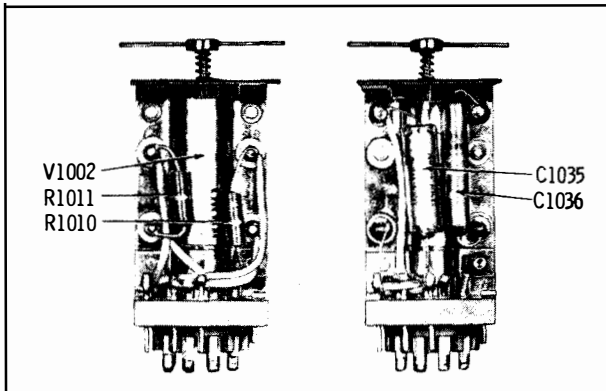
3RD AMPLIFIER, Z1008 - 2ND IF ASSEMBLY



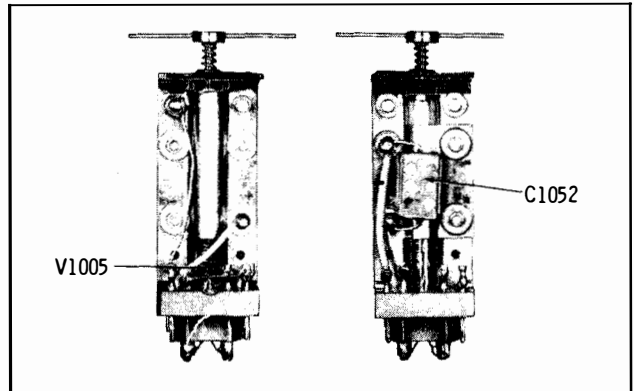
1ST AMPLIFIER, Z1004 - 2ND IF ASSEMBLY



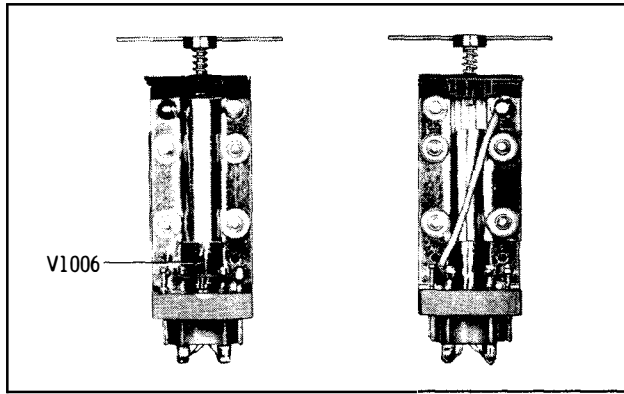
BFO MIXER, Z1010 - 2ND IF ASSEMBLY



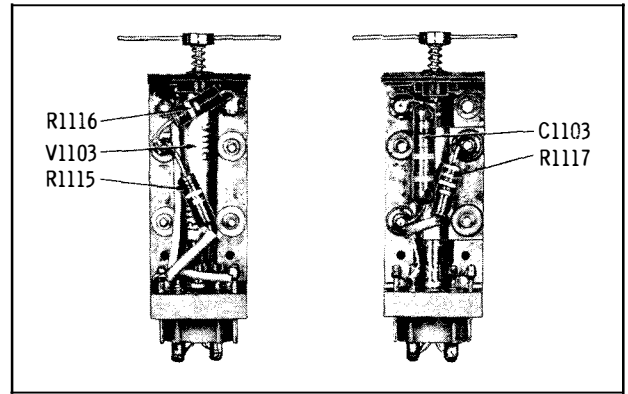
2ND AMPLIFIER, Z1006 - 2ND IF ASSEMBLY



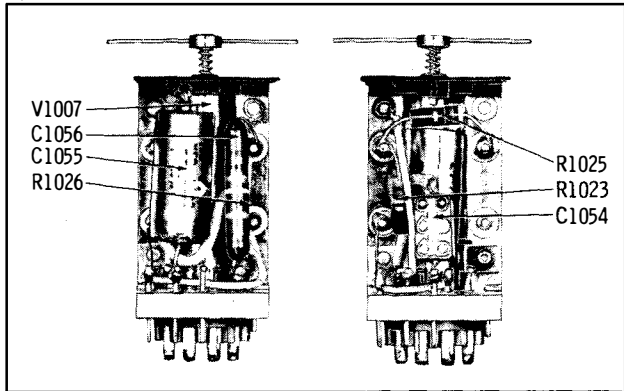
DETECTOR, Z1012 - 2ND IF ASSEMBLY



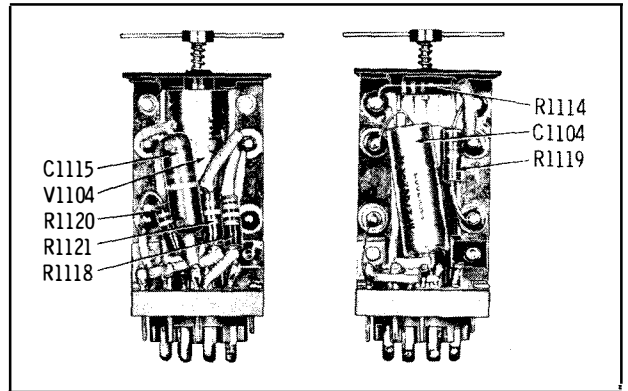
AGC DELAY DIODE, Z1013 - 2ND IF ASSEMBLY



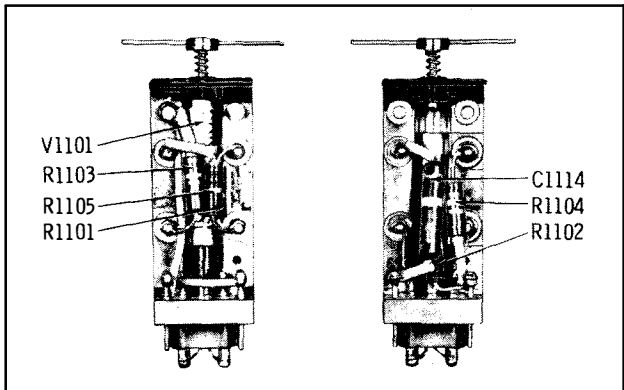
SILENCER DIODE, Z1103 - AUDIO ASSEMBLY



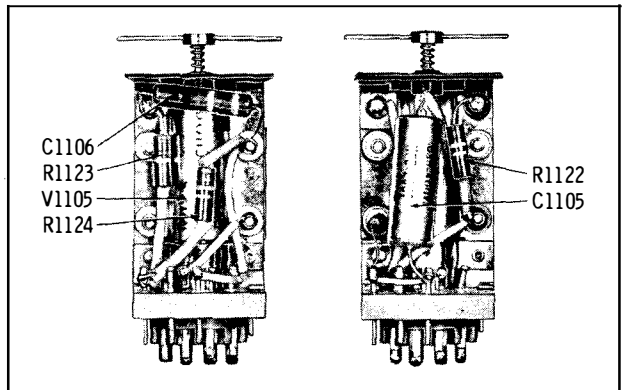
CATHODE FOLLOWER, Z1014 - 2ND IF ASSEMBLY



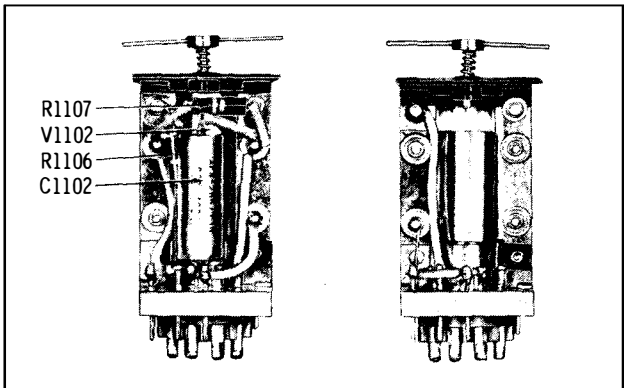
SILENCER CONT. AMP., Z1104 - AUDIO ASSEMBLY



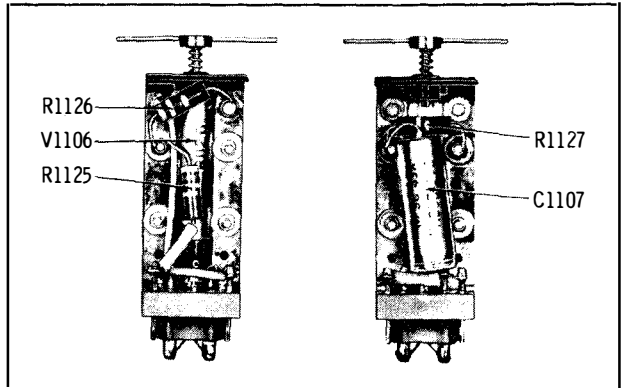
NOISE LIMITER DIODE, Z1101 - AUDIO ASSEMBLY



2ND AUDIO AMPLIFIER, Z1105 - AUDIO ASSEMBLY

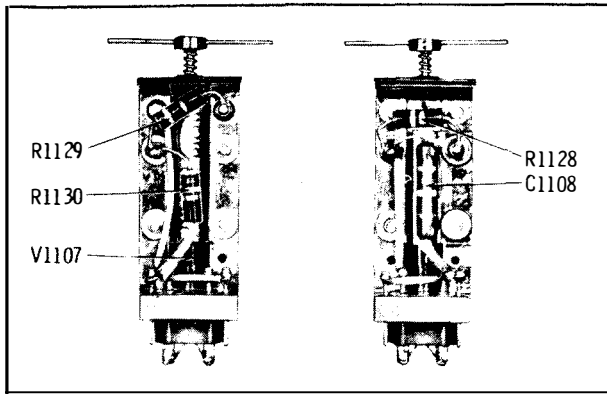


1ST AUDIO AMPLIFIER, Z1102 - AUDIO ASSEMBLY

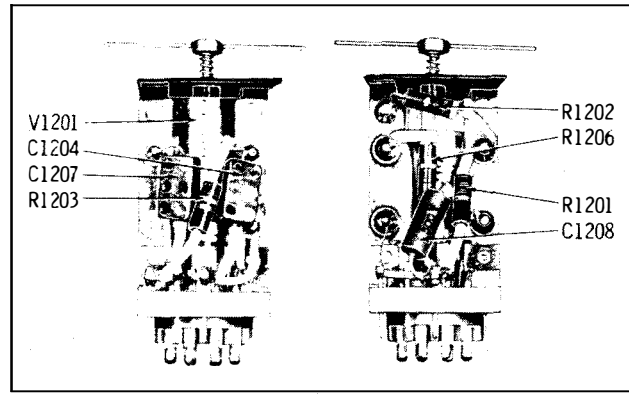


LIMITER DIODE, Z1106 - AUDIO ASSEMBLY

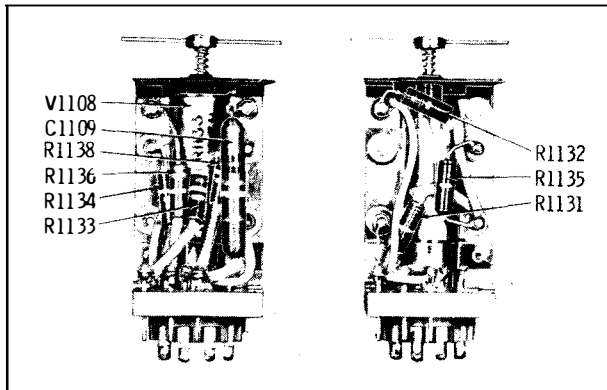
26



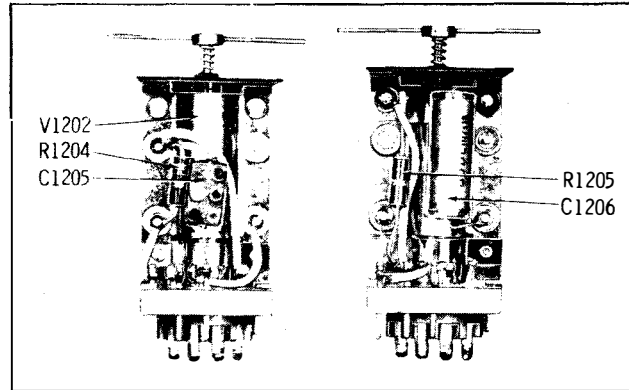
LIMITER DIODE, Z1107 - AUDIO ASSEMBLY



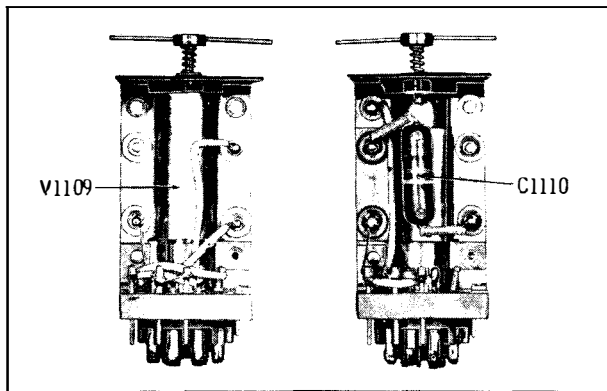
MULTIVIBRATOR, Z1201 - XTAL. CAL. ASSEMBLY



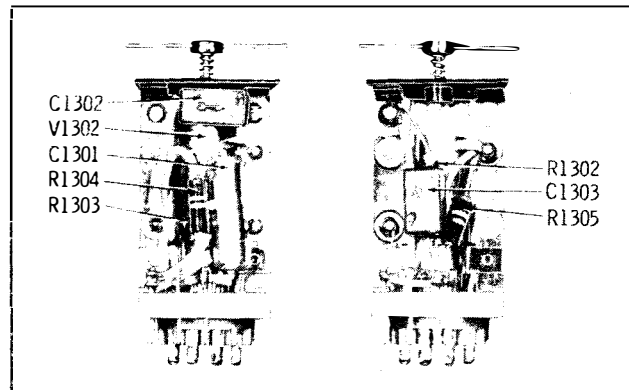
3RD AUDIO AMPLIFIER, Z1108 - AUDIO ASSEMBLY



MULTIVIBRATOR, Z1202 - XTAL. CAL. ASSEMBLY



AUDIO OUTPUT, Z1109 - AUDIO ASSEMBLY



BFO, Z1302 - BFO ASSEMBLY

SECTION 7

PREPARING CHASSIS FOR SERVICING

PREPARING CHASSIS FOR SERVICING

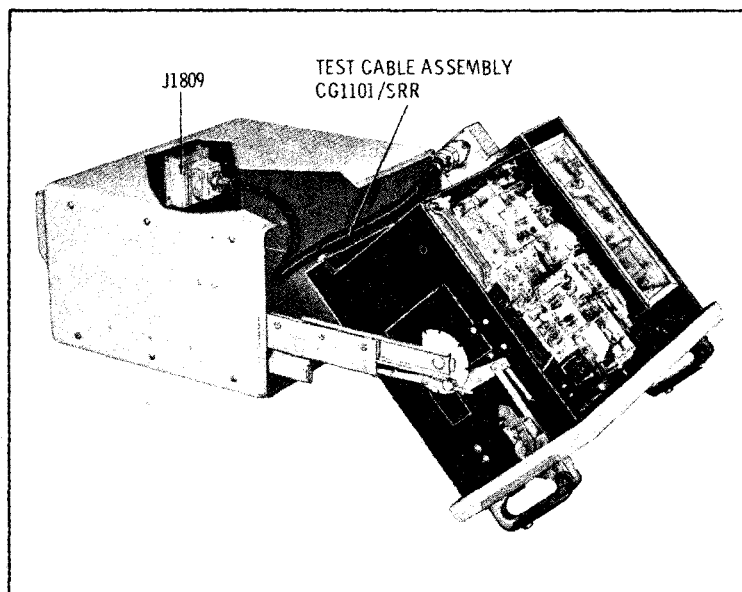
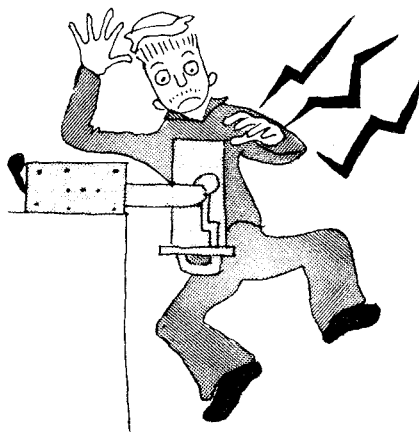
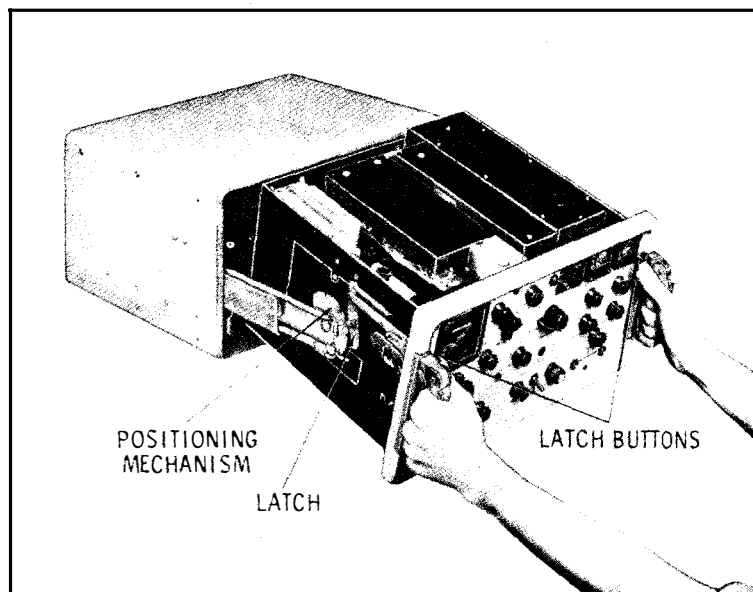
1. Cabinet must be mounted or supported when withdrawing chassis.
2. Lift circular metal catches on handles.
3. Raise release bars. Grasp handles, and with thumbs, push release bars up as far as they will go. This releases chassis front panel from cabinet.
4. Slide chassis out until stops engage.
5. Depress latch buttons with thumbs, and tilt chassis up or down until the positioning mechanism engages

in the desired 45° or 90° position. Select position most appropriate for the servicing to be performed.

CAUTION

Before performing Step 6, make certain no power is being applied to the receiver.

5. Connect the proper end of Test Cable Assembly, CG-1101/SRR to receptacle J1809 on inside rear of cabinet. Connect the other end of the test cable to receptacle J664 on back of receiver chassis.

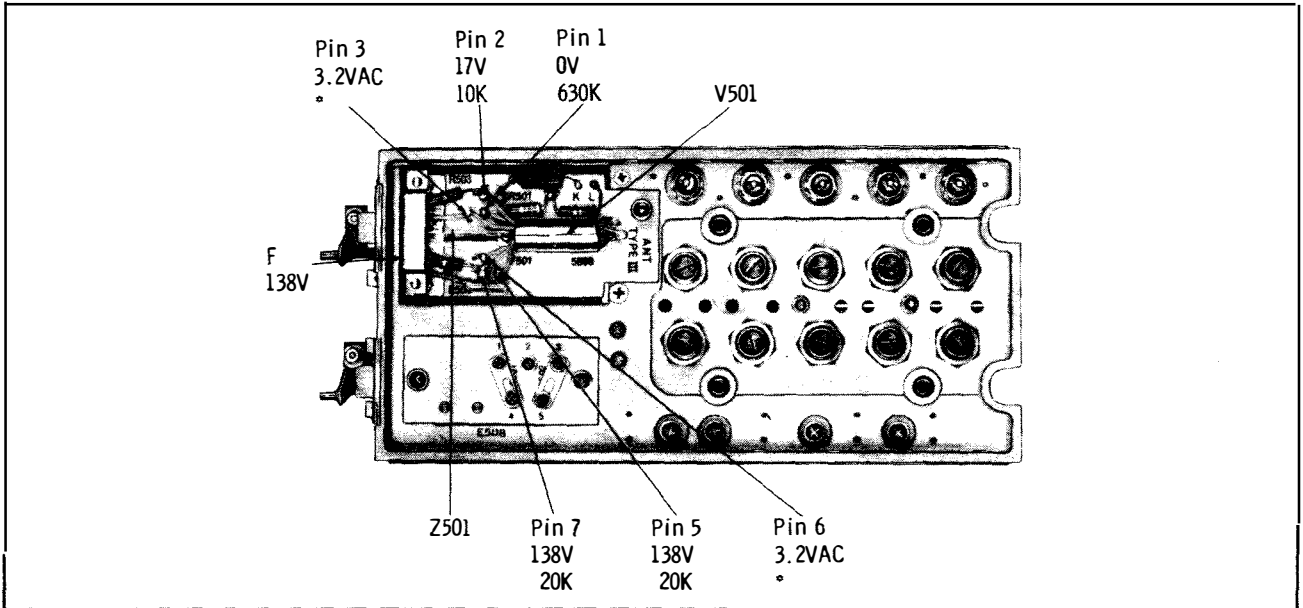


SECTION 8

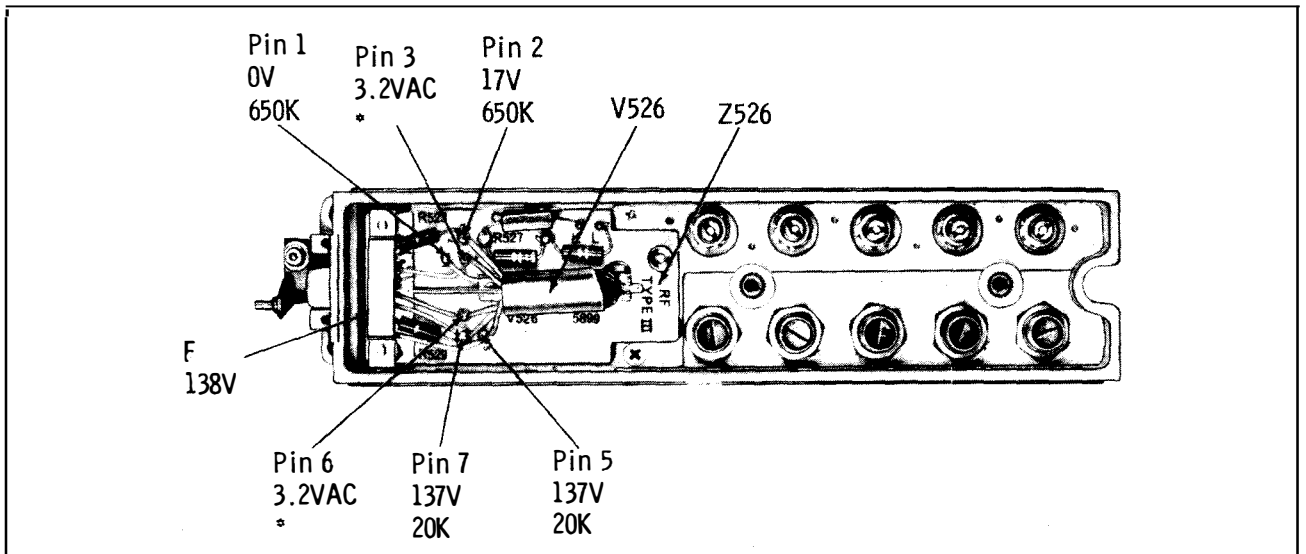
VOLTAGE AND RESISTANCE MEASUREMENTS

All measurements taken with units mounted in place on chassis. Covers removed.

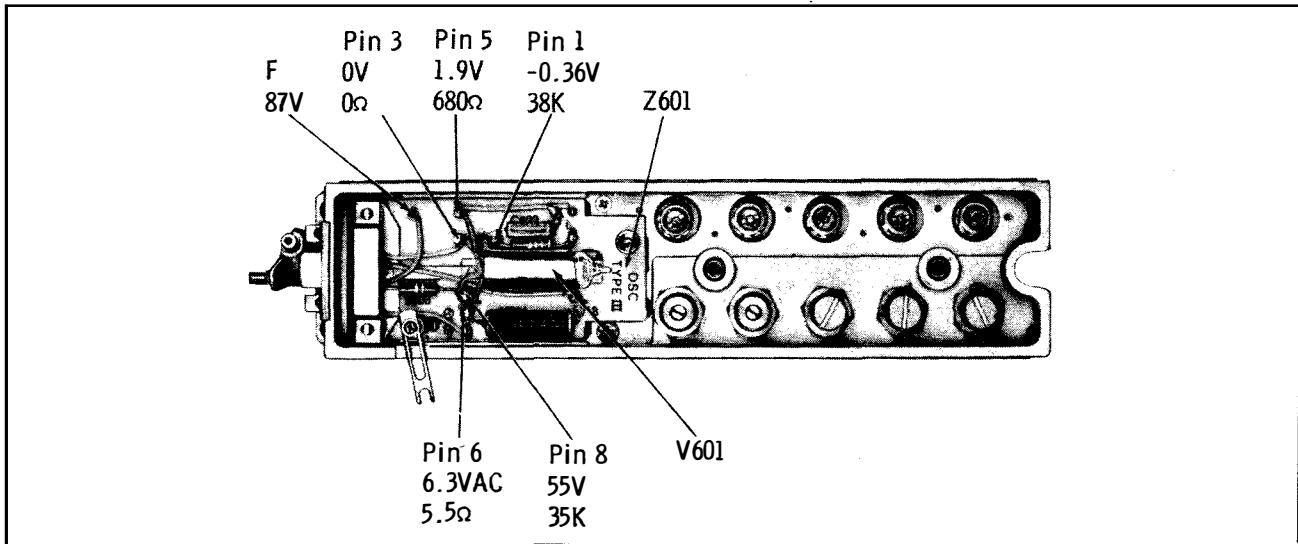
- | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|-----------------|-------------|---|------|-----------|---|----------|------|---|----------|-----|---|------|----------|---|----------|-----|---|---|
| <ol style="list-style-type: none"> 1. Voltage and resistance measurements taken with multimeter, AN/USM-34 Series. 2. Measured values are from socket pin to chassis ground. 3. Line voltage maintained at 117 VAC for voltage readings. 4. Nominal tolerance on component values makes possible a variation of $\pm 15\%$ in voltage and resistance readings. 5. Socket pins with no readings shown indicate no connection. Voltage - 0V; resistance - 1NF. 6. Asterisk (*) indicates resistance less than 1Ω. | <ol style="list-style-type: none"> 7. Preset the following controls as indicated: <table border="0" style="margin-left: 20px;"> <tr> <td>Band Selector</td> <td>—</td> <td>Band I (2-4 MC)</td> </tr> <tr> <td>Tuning Dial</td> <td>—</td> <td>2 MC</td> </tr> <tr> <td>RECEPTION</td> <td>—</td> <td>A1 BROAD</td> </tr> <tr> <td>GAIN</td> <td>—</td> <td>Full CCW</td> </tr> <tr> <td>AGC</td> <td>—</td> <td>NORM</td> </tr> <tr> <td>SILENCER</td> <td>—</td> <td>Full CCW</td> </tr> <tr> <td>CAL</td> <td>—</td> <td>ON for measurements on V1201 and V1202. OFF for all other measurements.</td> </tr> </table> | Band Selector | — | Band I (2-4 MC) | Tuning Dial | — | 2 MC | RECEPTION | — | A1 BROAD | GAIN | — | Full CCW | AGC | — | NORM | SILENCER | — | Full CCW | CAL | — | ON for measurements on V1201 and V1202. OFF for all other measurements. |
| Band Selector | — | Band I (2-4 MC) | | | | | | | | | | | | | | | | | | | | |
| Tuning Dial | — | 2 MC | | | | | | | | | | | | | | | | | | | | |
| RECEPTION | — | A1 BROAD | | | | | | | | | | | | | | | | | | | | |
| GAIN | — | Full CCW | | | | | | | | | | | | | | | | | | | | |
| AGC | — | NORM | | | | | | | | | | | | | | | | | | | | |
| SILENCER | — | Full CCW | | | | | | | | | | | | | | | | | | | | |
| CAL | — | ON for measurements on V1201 and V1202. OFF for all other measurements. | | | | | | | | | | | | | | | | | | | | |



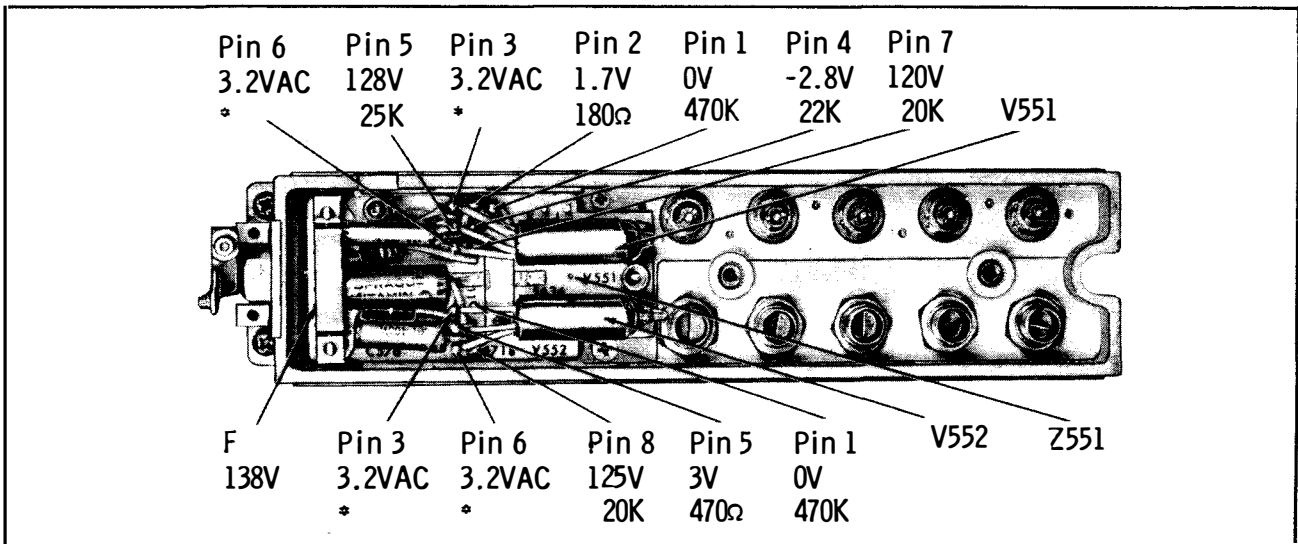
ANTENNA ASSEMBLY



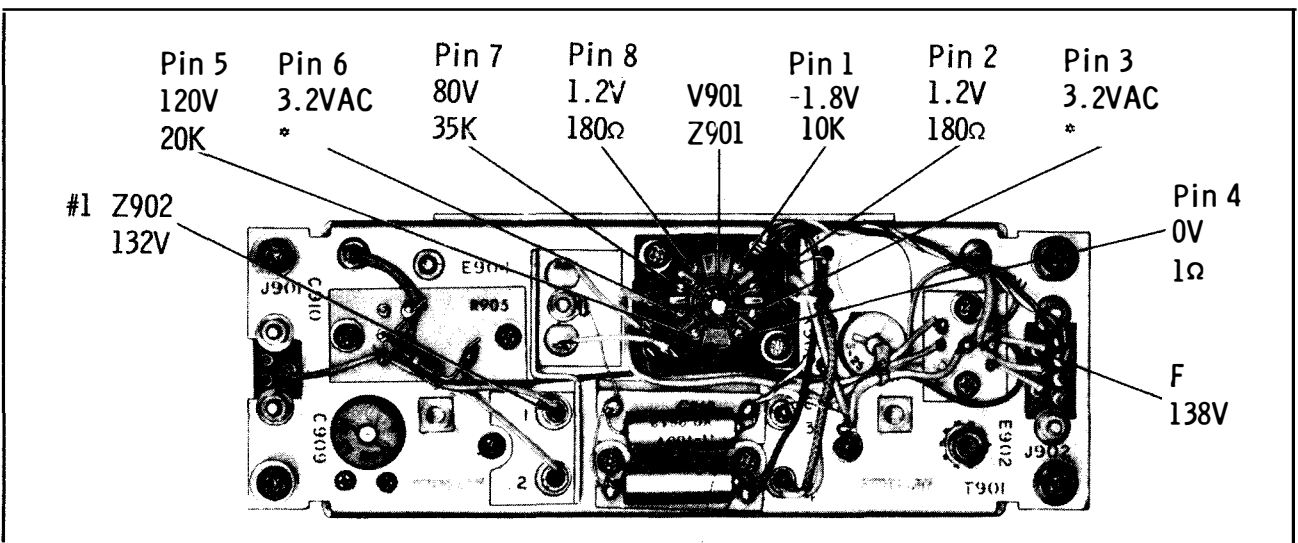
RF ASSEMBLY



OSCILLATOR ASSEMBLY



MIXER ASSEMBLY

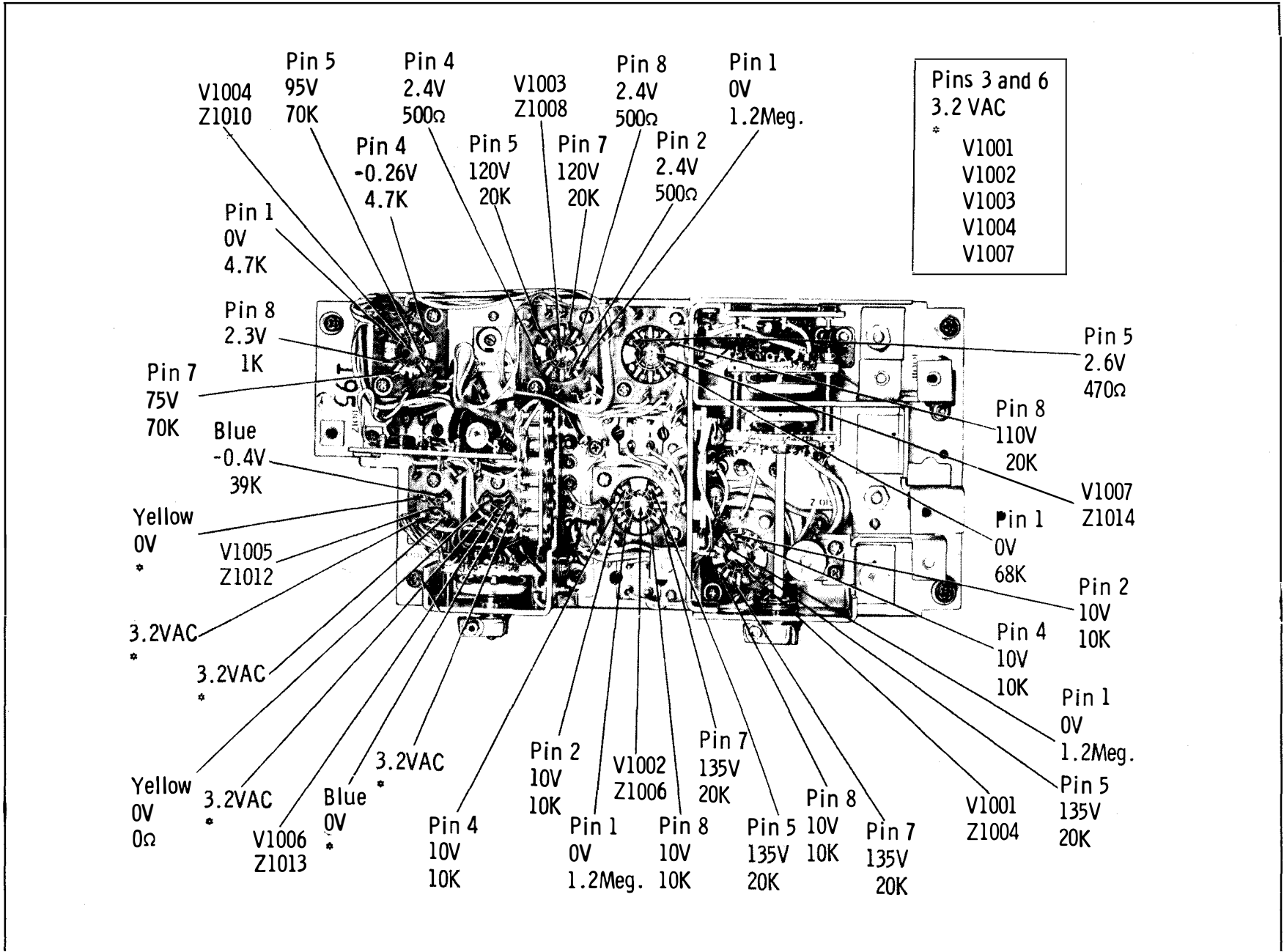


1ST IF ASSEMBLY

30

ORIGINAL

2ND IF ASSEMBLY



Pins 3 and 6
3.2 VAC
*
V1001
V1002
V1003
V1004
V1007

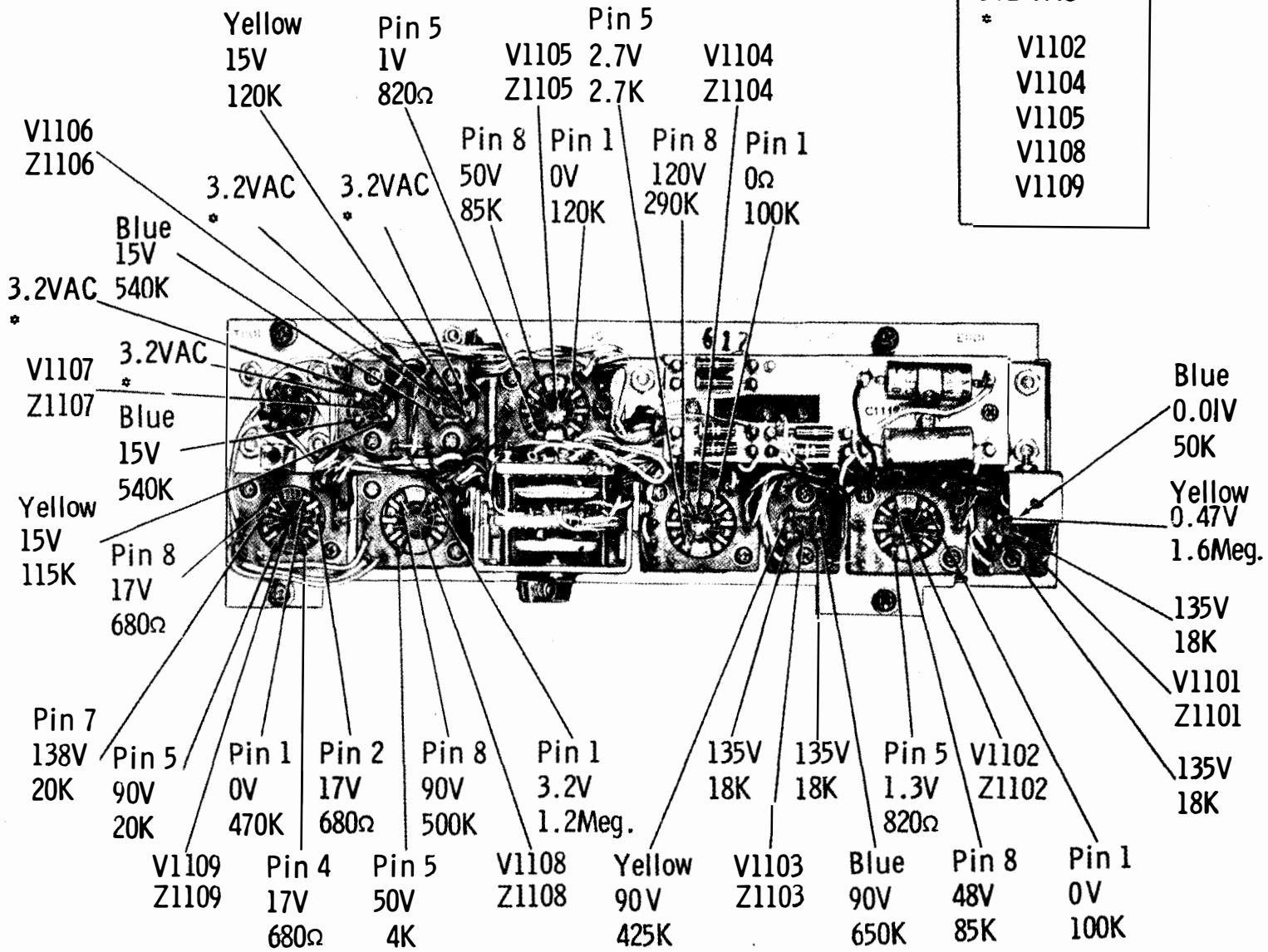
AN/SRR-13A

NAVSHIPS 92977

Section 8

Pins 3 and 6
3.2 VAC
*
V1102
V1104
V1105
V1108
V1109

AUDIO ASSEMBLY



ORIGINAL

SECTION 9

TROUBLE CHART

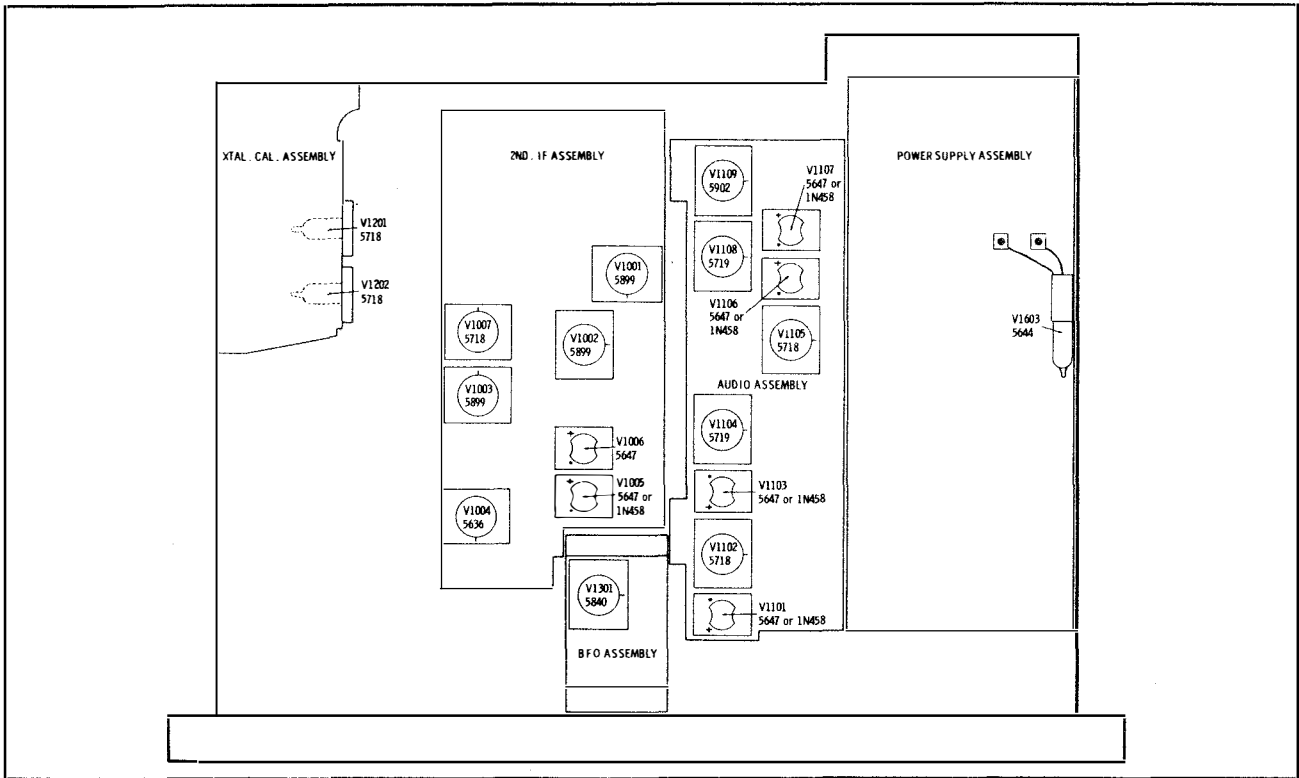
Symptom	Probable Cause	Localizing Procedure and-or Suggested Remedy
<p>Receiver dead. Dial light not glowing. Pilot light not glowing. No signal indication in phones, OUTPUT meter, or TUNING meter. Fuses F1601, and F1602 OK.</p> <p style="text-align: center;">NOTE Make certain AC power is available at distribution panel.</p>	<ol style="list-style-type: none"> 1. Power cable defective. 2. Line filter assembly Z1802 defective. 3. POWER switch S651 open. 4. Power transformer T1601 primary or secondary open. 	<ol style="list-style-type: none"> 1. Check for presence of line voltage between terminals B and C of power cable plug. If no voltage, check continuity of cable with ohmmeter, and replace if defective. 2. After power cable has been eliminated, remove receiver from cabinet and check for presence of line voltage between terminals 8 and 10 of J1809 on inside rear of cabinet. If no voltage, replace filter, or, for emergency operation, jumper terminal 1 to terminal 4, and terminal 3 to terminal 6 of filter assembly Z1802. See pg. 3-9. 3. If line voltage is present between terminals R and T of J663, (See pg. 3-5) but not between terminals N and P of J663, replace POWER switch, or, for emergency operation, jumper terminal 1 to terminal 2, and terminal 3 to terminal 4 of POWER switch S651. See pg. 3-4. 4. If line voltage is present between terminals N and P of J663, check, with voltage and resistance measurements, the power transformer primary (terminals 1, 2, 3, 4, and 6) or secondary (terminals 10 to 14). Replace if defective. See pg. 8-5.
<p>Receiver dead. Dial light not glowing. Pilot light not glowing. No signal indication in phones, OUTPUT meter, or TUNING meter. Fuses F1601 or F1602 open and burn out when replaced.</p> <p style="text-align: center;">NOTE Do not jumper fuses in an attempt to keep receiver operating while trying to locate trouble. Serious damage to a major component may result.</p>	<ol style="list-style-type: none"> 1. Shorted component in power supply assembly. 2. POWER switch S651 shorted. 3. Power transformer T1601 windings shorted internally or to ground. 4. Minor assembly short across T1601 filament winding. 	<ol style="list-style-type: none"> 1. Check rectifier tubes V1601 and V1602, (See pg. 3-8) and replace if defective. Check for shorts in the power transformer T1601 secondary (terminals 5 and 7) and in the B+ filter networks. See pg. 8-5. 2. Remove leads from POWER switch S651 and check for shorts with ohmmeter. If shorted replace. See pg. 3-4. 3. After the components in Steps 1 and 2 have been eliminated, check power transformer T1601 by removing all secondary connections and observing if transformer overheats and/or burns out fuses. If this is the case, replace transformer. See pg. 3-8 and 8-5. 4. After the components in Steps 1, 2, and 3 have been eliminated, use the MX-2012/U Test Adapter and check all minor assemblies for possible shorts. See pg. 5-1.

Symptom	Probable Cause	Localizing Procedure and-or Suggested Remedy
Receiver dead. Dial light glowing. Pilot light not glowing. No signal indication in phones, OUTPUT meter, or TUNING meter.	1. Defective component in power supply assembly.	1. Check the DC voltage between terminal D of J663 and ground, and terminal C of J663 and ground. If no voltage, check V1601, V1602, the filter networks, and power transformer T1601. If voltage is normal (in which case the pilot light may be glowing) check all interconnecting lines and connectors for faulty connection. See pg. 8-5.
No signal indication in phones or OUTPUT meter on any band or any position of RECEPTION control. Normal signal indication on TUNING meter.	1. Receiver inoperative between input of V1108 Driver Amplifier, and T1101 output transformer circuits.	1. Check output transformer T1101 and associated secondary circuits. Use the MX-2012/U Test Adapter and check minor assemblies Z1109, and Z1108. Check with voltage and resistance measurements, all interconnecting lines and connectors involving the above assemblies. See pg. 5-1, and 8-4.
Signals audible but weak and/or distorted on all bands and all positions of RECEPTION control. Normal signal indication on TUNING meter.	1. Receiver inoperative between input of V1102 1st Audio Amplifier, and output of V1108 Driver Amplifier.	1. Use the MX-2012/U Test Adapter and check minor assemblies Z1108, Z1107, Z1106, Z1105, Z1103, and Z1102. Check with voltage and resistance measurements, all interconnecting lines, connectors, and switches involving the above assemblies. See pg. 5-1, and 8-4.
Signals weak and/or distorted on A3 positions of RECEPTION control only. Normal reception on A1, and FSK positions. Normal signal indication on TUNING meter.	1. Diode Detector V1005, or Noise Peak Limiter V1101 inoperative.	1. Use the MX-2012/U Test Adapter and check minor assemblies Z1101 and Z1012. Check with voltage and resistance measurements, all interconnecting lines, connectors, and switches involving the above assemblies. See pg. 5-1, 8-4 and 8-3.
Reception abnormal on A1 and FSK positions of RECEPTION control only. C W signals audible as rushing noises only, not as distinct tones. Normal reception on A3 positions. Normal signal indication on TUNING meter.	1. BFO V1301, or BFO Mixer V1004 inoperative.	1. Use the MX-2012/U Test Adapter and check minor assemblies Z1010 and Z1302. Check with voltage and resistance measurements, BFO coil assembly Z1301, and all interconnecting lines, connectors, and switches involving the above assemblies. See pg. 5-1, 8-3, and 8-5.
No signal indication on TUNING meter or OUTPUT meter. Slight rushing noise audible on A3 positions of RECEPTION control. Weak C W signals may be audible on A1 and FSK positions.	1. Receiver inoperative in 2nd IF assembly.	1. Use the MX-2012/U Test Adapter and check minor assemblies Z1008, Z1006, and Z1004. Check with voltage and resistance measurements, IF transformer assemblies Z1011, Z1018, Z1017, and all interconnecting lines, connectors, and switches involving the above assemblies. See pg. 5-1 and 8-3.
No signal reception on any band or any position of RECEPTION control. Loud rushing noise audible only. TUNING meter not active.	1. Crystal Y901 defective.	1. Replace crystal. See pg. 3-6.

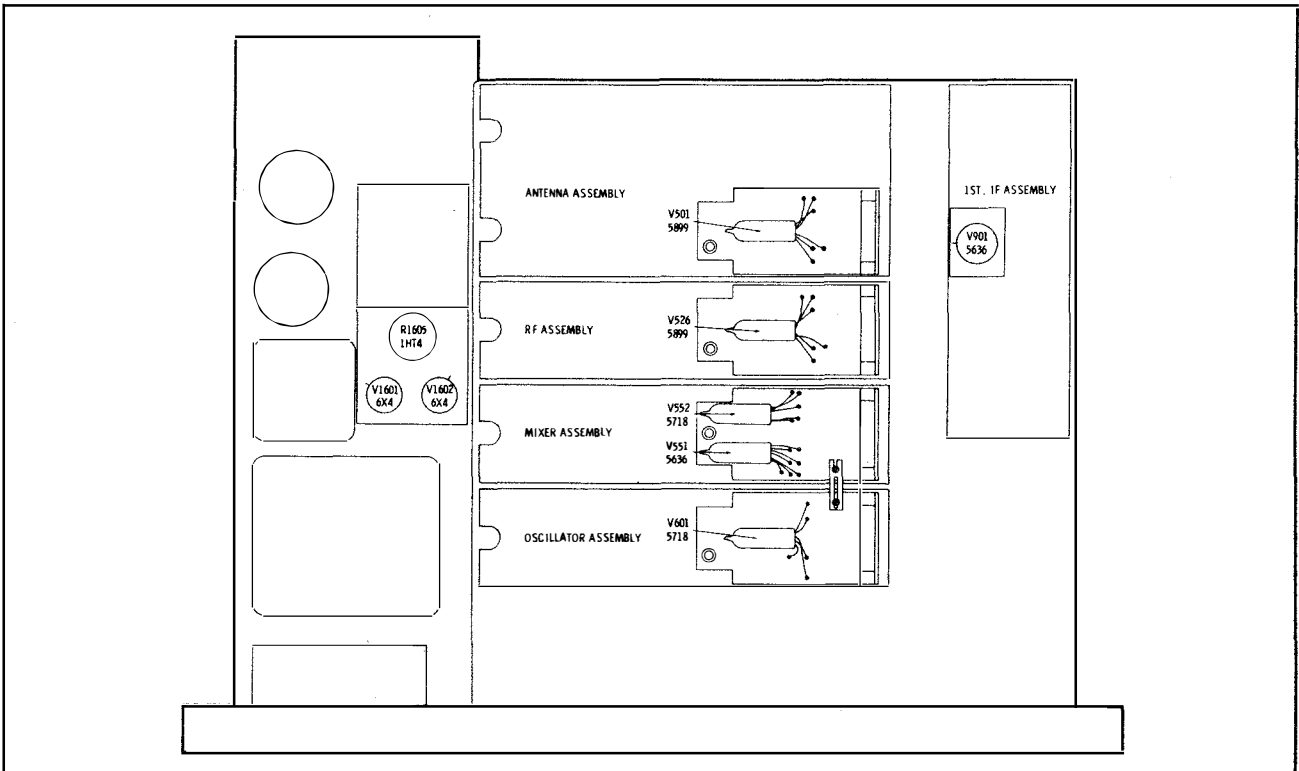
Symptom	Probable Cause	Localizing Procedure and/or Suggested Remedy
	<ol style="list-style-type: none"> 2. Converter V901, Oscillator, V601, or Mixer V551 inoperative. 3. Regulator tube R1605 open. 	<ol style="list-style-type: none"> 2. Use the MX-2012/U Test Adapter and check minor assemblies Z901, Z601, and Z551. Check with voltage and resistance measurements all interconnecting lines, connectors and switches involving the above assemblies. See pg. 5-1 and 8-2. 3. Check regulator tube R1605 with ohmmeter and replace if defective. See pg. 3-8.
No signal reception (rushing noise only) on one or a few bands. Normal reception on other bands.	<ol style="list-style-type: none"> 1. Defective component involving Converter V901, Oscillator V601, or Mixer V551 on band or bands not functioning. 	<ol style="list-style-type: none"> 1. Check with voltage and resistance measurements all components (particularly tuned circuits) interconnecting lines, connectors, and switches associated with minor assemblies Z901, Z601, and Z551 on bands not functioning. See pg. 8-2.
Signals weak; noise level high on all bands and all positions of RECEPTION control. TUNING meter only slightly active.	<ol style="list-style-type: none"> 1. RF Amplifiers V501 or V526 weak or inoperative. 	<ol style="list-style-type: none"> 1. Use the MX-2012/U Test Adapter and check minor assemblies Z526 and Z501. Check with voltage and resistance measurements, all interconnecting lines, connectors, and switches involving the above assemblies. See pg. 5-1 and 8-1.
Signals weak; noise level high on one or a few bands. Normal reception on other bands.	<ol style="list-style-type: none"> 1. Defective component involving RF Amplifiers V501 or V526 on band or bands functioning abnormally. 2. Misalignment. 	<ol style="list-style-type: none"> 1. Check with voltage and resistance measurements all components (particularly tuned circuits) interconnecting lines, connectors, and switches associated with minor assemblies Z501 or Z526 on bands functioning abnormally. See pg. 8-1. 2. If procedure 1. above checks normal, perform RF SECTION ALIGNMENT. (Long periods of idleness or first 100 hours operation will sometimes cause change in tube interelectrode capacitances. Realignment will usually restore original performance in these cases.)
Reception normal. SILENCER control does not function on A3 positions of RECEPTION control.	<ol style="list-style-type: none"> 1. DC Amplifier V1104 inoperative. 	<ol style="list-style-type: none"> 1. Use the MX-2012/U Test Adapter and check minor assembly Z1104. Check with voltage and resistance measurements all interconnecting lines, connectors, and switches involving the above assembly. See pg. 5-1 and 8-4.
Reception normal. TUNING meter not functioning.	<ol style="list-style-type: none"> 1. Defective meter M651. 2. TUNING meter rectifier assembly Z1009 inoperative. 	<ol style="list-style-type: none"> 1. Replace meter M651. See pg. 3-5. 2. Check with voltage and resistance measurements TUNING meter rectifier assembly Z1009 and all interconnecting lines, connectors and switches, involving the above assembly. See pg. 3-6 and 8-3.
Reception normal. Crystal calibrator does not function when attempting to align tuning dial.	<ol style="list-style-type: none"> 1. Crystal Y1201 defective. 2. Crystal Calibrator stages V1201 or V1202 inoperative. 	<ol style="list-style-type: none"> 1. Replace crystal. See pg. 3-7. 2. Use the MX-2012/U Test Adapter and check minor assemblies Z1201 and Z1202. Check with voltage and resistance measurements all interconnecting lines, connectors, and switches involving the above assemblies. See pg. 5-1 and 8-5.

SECTION 10

TUBE PLACEMENT CHART



TOP VIEW



BOTTOM VIEW

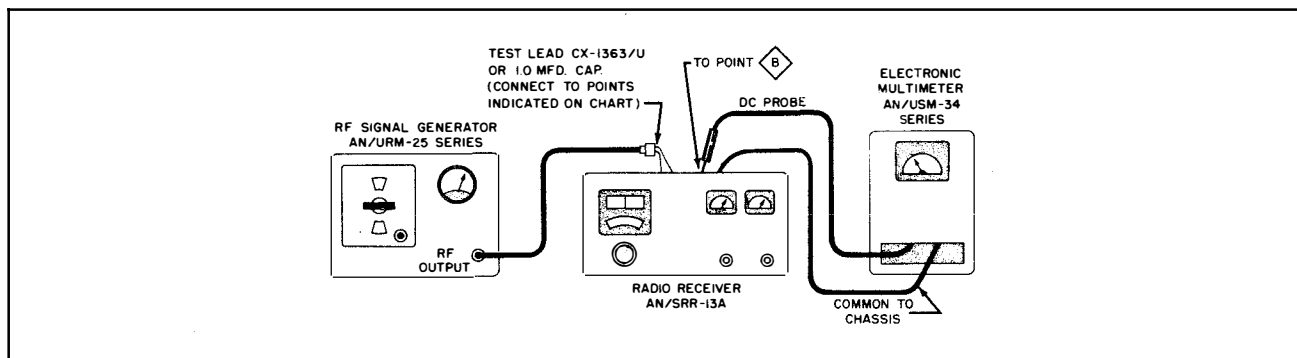
SECTION 11

ALIGNMENT INSTRUCTIONS

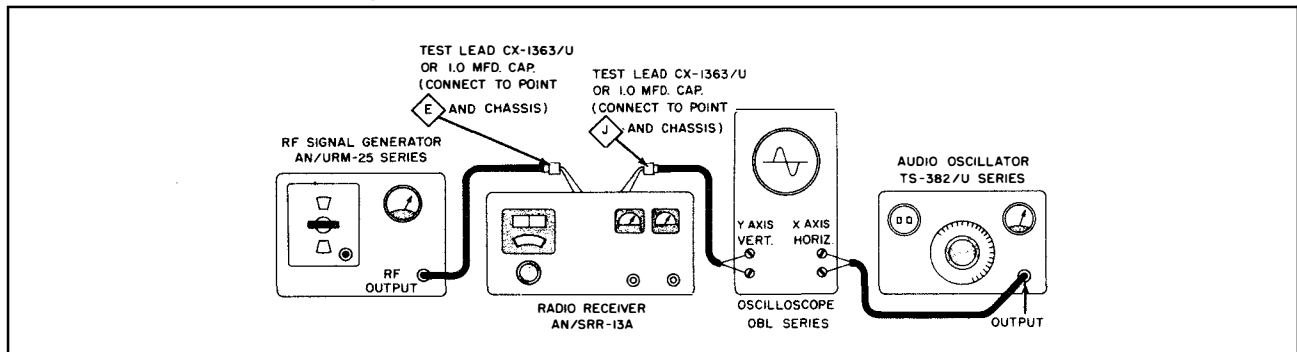
SENSITIVITY CHECK

A quick check of receiver sensitivity may be performed as follows:

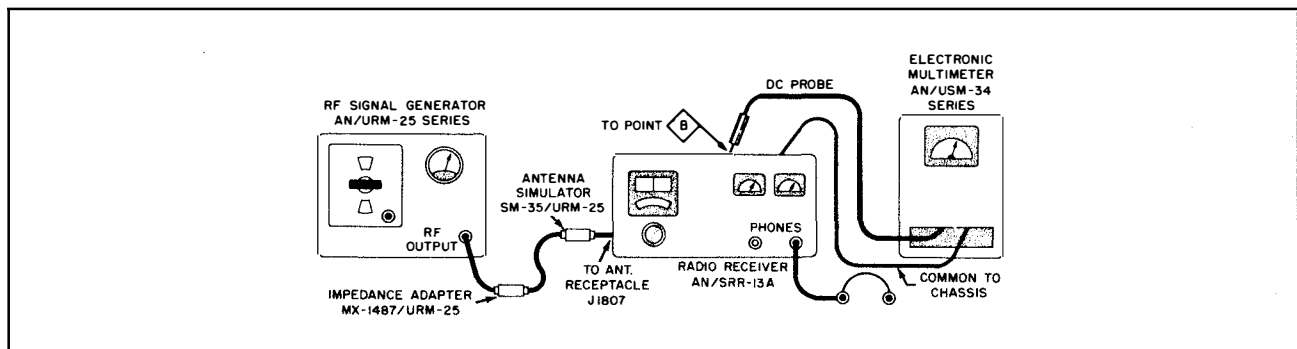
1. Set Band Selector to Band III (8.0-16.0MC).
2. Set tuning dial to 12.0 MC.
3. Set RECEPTION control to A3 BROAD.
4. Set AGC switch to OFF position.
5. Turn GAIN control fully clockwise.
6. Turn SILENCER control fully counterclockwise.
7. Connect jumper across terminals of ANT receptacle J1807.
8. With the ADD DECIBELS switch in the -10db position, adjust the GAIN control until the needle on the OUTPUT meter reads 0.
9. Remove jumper from ANT receptacle.
10. Connect an RF signal generator (AN/URM-25 series) through an impedance adapter and antenna simulator to ANT receptacle.
11. With the ADD DECIBELS switch in the 0 position, adjust the signal generator output at 12.0 MC until the needle on the OUTPUT meter reads 0.
12. The reading on the signal generator meter should be approximately 10 microvolts. Any reading that exceeds this figure (by a factor of more than 2) would normally indicate poor receiver sensitivity, and (after all possibilities of component failure have been eliminated) a need for receiver alignment.



TEST EQUIPMENT CONNECTIONS FOR IF SECTION ALIGNMENT



TEST EQUIPMENT CONNECTIONS FOR B.F.O. ALIGNMENT



TEST EQUIPMENT CONNECTIONS FOR RF SECTION ALIGNMENT

Failure of some components may give the same indications as a misaligned receiver. Attempt alignment only when possibility of component failure has been eliminated and need for alignment has been established. When complete receiver alignment is to be performed, follow the instructions step by step as outlined below.

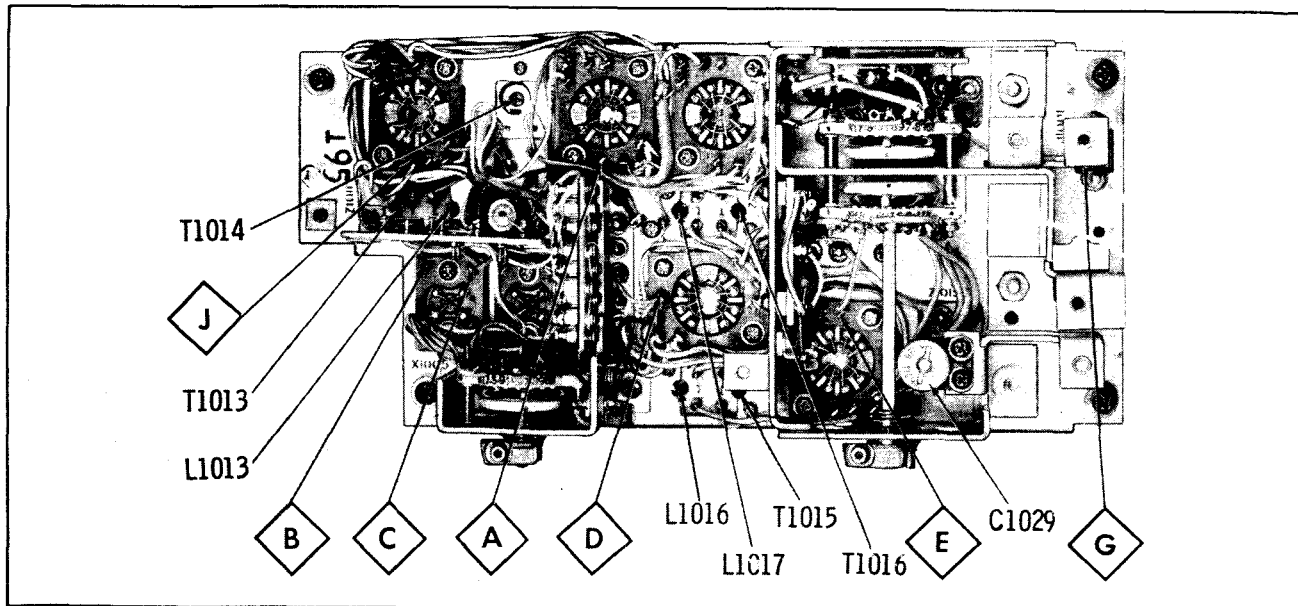
LIST OF TEST EQUIPMENT FOR ALIGNMENT (IMPORTANT)

- | | | |
|---|---|---|
| 1. An Electronic Multimeter (AN/USM-34 Series). | 4. An Audio Oscillator (TS-382/U Series). | 7. 1 Capacitor (39MMF approx.) |
| 2. An RF Signal Generator Set (AN/URM-25 Series). | 5. 2 Capacitors (1.0MFD approx.) | 8. 1 Jumper Lead (6 inches of #22 wire approx.) |
| 3. An Oscilloscope (OBL Series or equal). | 6. 1 Capacitor (680MMF approx.) | |

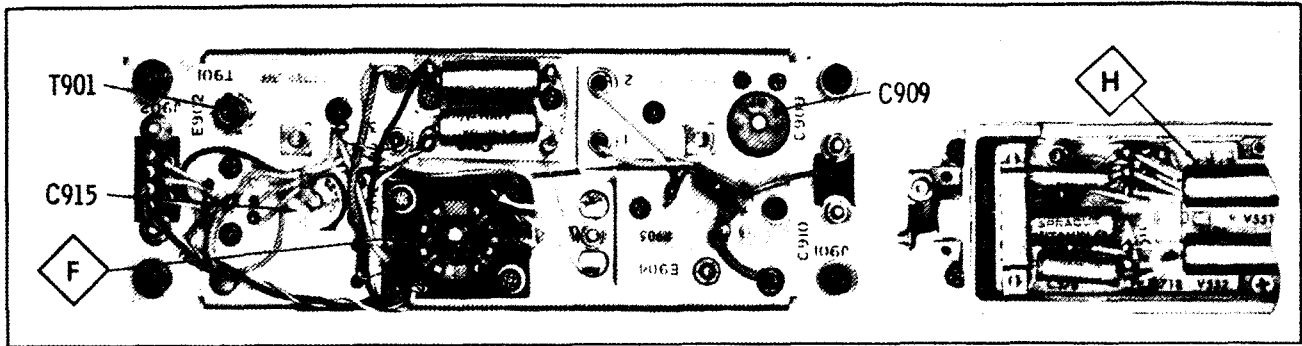
IF SECTION ALIGNMENT

Pre-Set GAIN control fully clockwise.
 Pre-Set OUTPUT, LEVEL and SILENCER controls fully counterclockwise. Turn CAL. and AGC switches to OFF position.
 Connect a 680MMF Shunting capacitor to Point \diamond and chassis.
 Allow a 15 minute warm up period for the receiver and test equipment.
 At all times throughout the procedure for this section, the signal generator level should be adjusted for a reading within the 0 to 10 volt range of the VTVM.

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	CONNECT. VTVM	SECTION	ADJUST	REMARKS
1.	High side through 1.0MFD capacitor to point \diamond . Low side to chassis.	200KC (Unmod.)	AI MEDIUM	III (8.0-16.0MC)	DC Probe to point \diamond . Common to chassis.	2nd IF	L1013	Adjust for maximum deflection.
2.	"	"	"	"	"	"	T1013	Remove the 680MMF shunting capacitor from point \diamond . Adjust for maximum deflection.
3.	High side through 1.0MFD capacitor to point \diamond . Low side to chassis.	"	"	"	"	"	L1017	Connect the 680MMF shunting capacitor to point \diamond and chassis. Adjust for maximum deflection.
4.	"	"	"	"	"	"	T1016	Remove the 680MMF shunting capacitor from point \diamond . Adjust for maximum deflection.
5.	High side through 1.0MFD capacitor to point \diamond . Low side to chassis.	"	"	"	"	"	L1016	Connect the 680MMF shunting capacitor to point \diamond and chassis. Adjust for maximum deflection.
6.	"	"	"	"	"	"	T1015	Remove the 680MMF shunting capacitor from point \diamond . Adjust for maximum deflection.
7.	"	"	"	"	Not Used	Tuning Indicator Rectifier	T1014	Adjust for maximum deflection on TUNING meter on receiver front panel with TUNING switch in LOW position. (Reduce signal generator output if necessary to keep meter needle on scale).



ALIGNMENT POINTS - 2ND IF ASSEMBLY



ALIGNMENT POINTS - 1ST IF AND MIXER ASSEMBLIES
IF SECTION ALIGNMENT (CONT.)

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	CONNECT VTVM	SECTION	ADJUST	REMARKS
8.	High side through 1.0MFD capacitor to point Ⓞ. Low side to chassis.	200KC (Unmod.)	A1 MEDIUM	III (8.0-16.0MC)	DC Probe to point Ⓞ. Common to chassis.	2nd. IF	T901	Connect a jumper lead from point Ⓞ to point Ⓞ. Adjust for maximum deflection.
9.	"	"	A3 BROAD	IV (16.0-24.0MC)	"	"	C1029	Adjust for maximum deflection.
10.	High side through 1.0MFD capacitor to point Ⓞ. Low side to chassis.	1600KC (Unmod.)	"	"	"	1st. IF	C909, C915	"

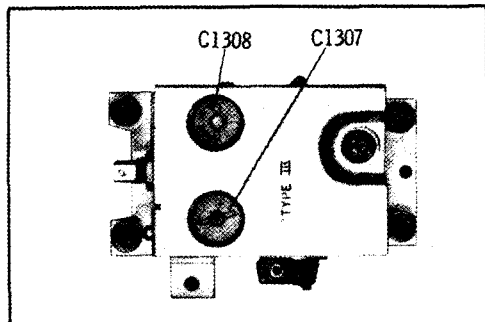
BFO ALIGNMENT

Turn the **FREQ. VERNIER** on receiver to zero position. Set oscilloscope controls as follows:
 1. **COARSE FREQUENCY** to 15-50 position.
 2. Vertical (Y AXIS) **INPUT SWITCH** to AMP. position.
 3. Horizontal (X AXIS) **INPUT SWITCH** to TIME-BASE position.

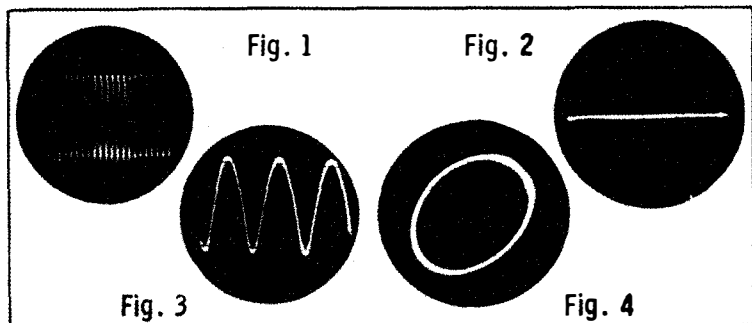
STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	CONNECT SCOPE	SECTION	ADJUST	REMARKS
11.	High side through 1.0 MFD capacitor to point Ⓞ. Low side to chassis.	200KC (Unmod.)	A1 BROAD	Any	Vertical (Y AXIS) Input Terminal to point Ⓞ. GND. Terminal to chassis.	BFO	C1307	Adjust for zero beat on scope. See Figures 1, 2, and 3. Figure 1 shows high frequency pattern obtained when adjustment is far from zero beat. Figure 2 shows lower frequency pattern obtained when adjustment is closer to zero beat. Figure 3 shows straight line pattern obtained when adjustment is at zero beat.

Apply a 2550 cycle signal from an Audio Oscillator to the Horizontal (X AXIS) Input Terminals of the Oscilloscope. Set Oscilloscope controls as follows:
 1. **COARSE FREQUENCY** to OFF position.
 2. Vertical (Y AXIS) **INPUT SWITCH** to AMP. position.
 3. Horizontal (X AXIS) **INPUT SWITCH** to AMP. position.

12.	High side through 1.0 MFD capacitor to point Ⓞ. Low side to chassis.	200KC (Unmod.)	FSK	Any	Vertical (Y AXIS) Input Terminal to point Ⓞ. GND. Terminal to chassis.	BFO	C1308	Adjust for circular pattern on scope similar to Figure 4.
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ALIGNMENT POINTS - BFO ASSEMBLY

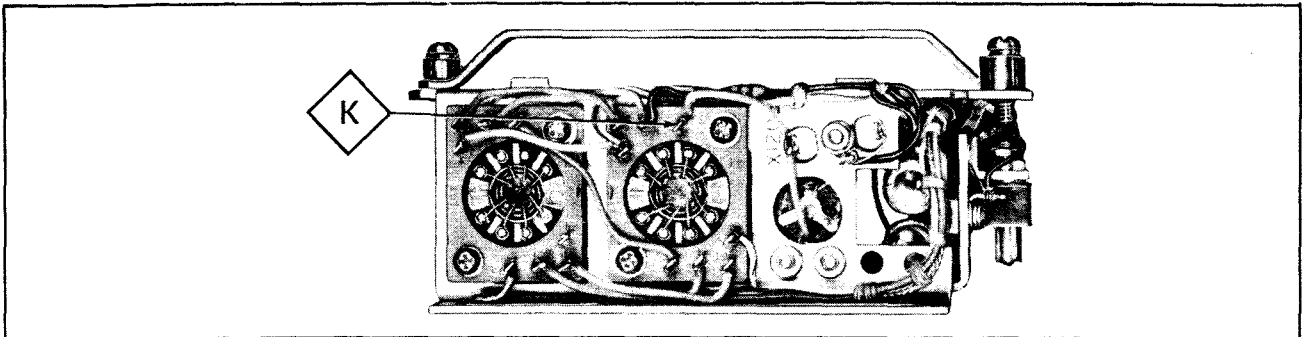


BFO ALIGNMENT WAVEFORMS

CRYSTAL CALIBRATOR OSCILLATOR ALIGNMENT

Crystal calibrator oscillator adjustment, C1201 is factory preset and normally will not require adjustment. Step 13 may therefore be omitted if a frequency meter is not readily available.

- | | | |
|---------------------|--|---|
| <p>STEP
13.</p> | <p>1. Set RECEPTION control to A1 MEDIUM.
2. Turn CAL switch to ON.
3. Set frequency meter to 200KC.</p> | <p>4. Connect frequency meter to point 
5. Adjust C1201 for zero beat in headphones.</p> |
|---------------------|--|---|



ALIGNMENT POINTS - XTAL CALIBRATOR ASSEMBLY

RF SECTION ALIGNMENT

Adjust the level of signal input to the receiver from the signal generator before each step as follows: First turn the ADD DECIBEL switch to the -10 db position. Then adjust the GAIN control in the receiver and the output control of the generator for a reading of -10 db in the OUTPUT meter. (With the ADD DECIBEL switch in the -10 db position, a reading of -10 db is indicated when the needle reads 0.)

When aligning the inductances of the oscillator stages on bands I, II, and III, first unscrew and remove the metal caps; then adjust the oscillator slug by using the special alignment tool which clips behind the front apron of the chassis. Use the short outer section of the tool to hold the plastic slug support, then adjust the slug for zero beat with the long inner section of the tool. (See Figure 5.) DO NOT ADJUST THE PLASTIC SUPPORT AS THIS WAS FACTORY PRESET FOR PROPER TEMPERATURE COEFFICIENT.

Whenever the use of headphones is called for in these instructions, the OUTPUT and LEVEL controls should be adjusted as follows: First set the LEVEL control to full clockwise position, then advance the OUTPUT control clockwise until a strong but not distorted tone is heard. Thereafter use the LEVEL control to adjust the loudness of the tone to a suitable level.

Before starting the oscillator adjustments on each band, preset the CAL ADJUST knob to center position and lock it. Also the BFO must be adjusted to exactly 200KC by using either of the following two procedures:

(A) TO ZERO BEAT BFO WITH CRYSTAL CALIBRATOR OSCILLATOR.

Set the RECEPTION switch to A1 BROAD, and connect a jumper wire between terminals 2 and 3 of the CAL switch, S652. Turn the CAL switch to ON. Tune the receiver away from a calibration frequency and adjust the FREQ. VERNIER for zero beat in the headphones. Remove the jumper wire, turn the CAL switch to OFF, and proceed with the oscillator alignment. If the FREQ. VERNIER should accidentally be moved during oscillator alignment, repeat the above procedure before continuing.

(B) TO ZERO BEAT BFO WITH SIGNAL GENERATOR.

Set the RECEPTION switch to A1 BROAD, and turn the CAL switch to ON. Tune the receiver away from a calibration frequency. Apply the output of the signal generator through an impedance adapter and an antenna simulator to the ANT receptacle at the back of the receiver. Set the signal generator to 200KC, apply a sufficiently high level of signal to obtain a beat note in the headphones and carefully adjust the generator frequency for zero beat.

Turn the CAL switch to OFF. Adjust the FREQ. VERNIER to produce zero beat in the headphones, and proceed with the oscillator alignment. If the FREQ. VERNIER should accidentally be moved during oscillator alignment, repeat the above procedure before continuing.

BAND I ALIGNMENT

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	PROJECTION DIAL SETTING	CONNECT VTVM	SECTION	ADJUST	REMARKS
14.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807).	4.0MC (Unmod.)	A1 BROAD	I (2.0-4.0MC)	4.0MC	Not Used	OSC.	C601	Adjust for zero beat in headphones.
15.	"	2.0MC (Unmod.)	"	"	2.0MC	"	"	L601	Adjust for zero beat in headphones. Repeat steps 14 and 15 until no further adjustment is necessary.

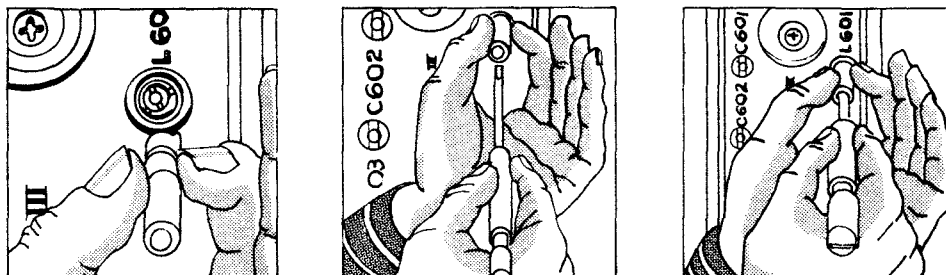


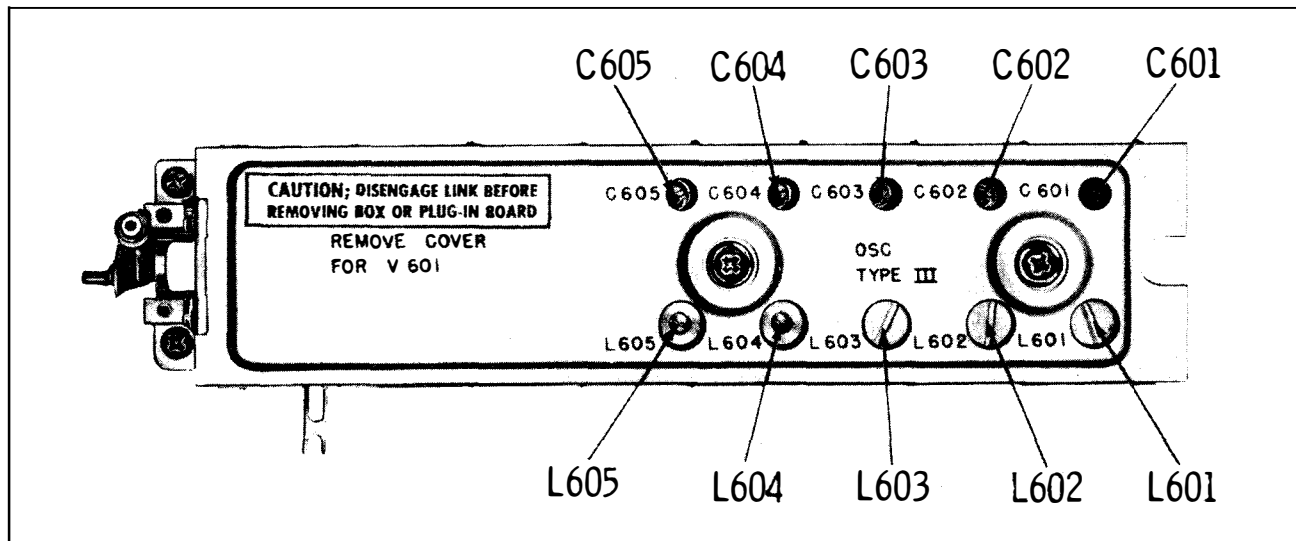
FIG. 5

CALIBRATION CORRECTION ADJUSTMENTS

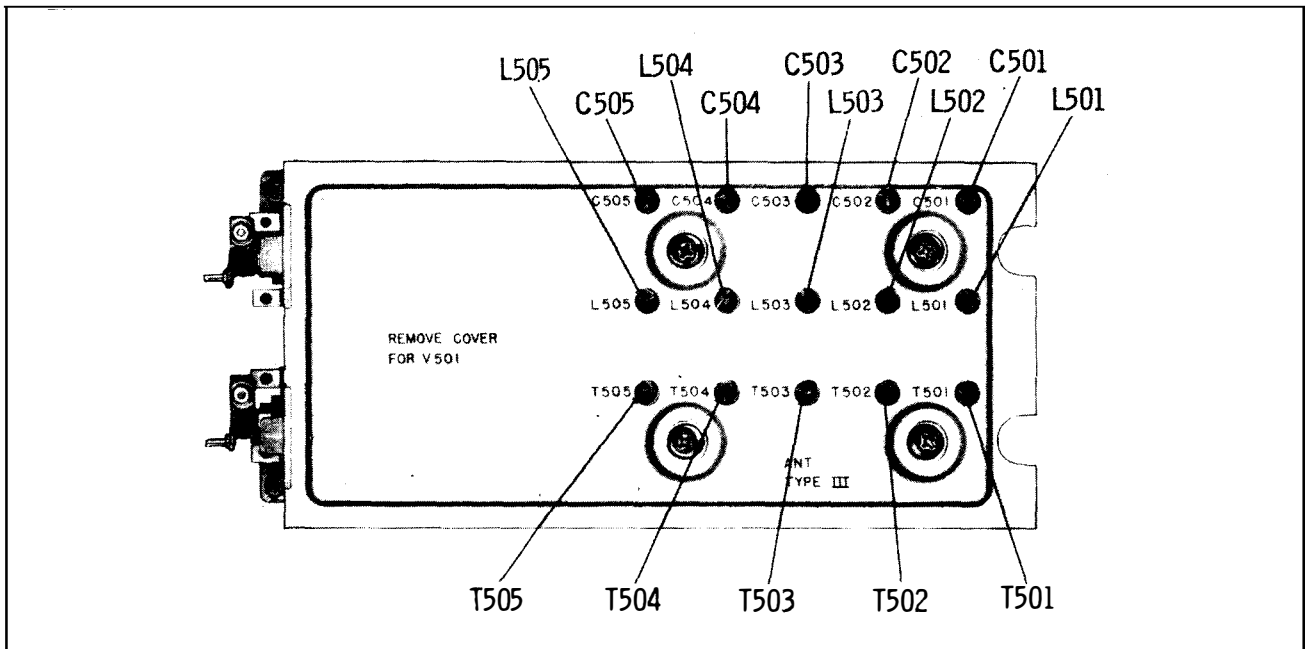
<p>STEP 16.</p>	<p>After the oscillator adjustments have been made and checked, disconnect the signal generator, turn the CAL switch to ON, and check each calibration check point to make sure that the CAL ADJUST knob is capable of causing the calibrator frequency markings to coincide with the point of zero beat. If such is not the case, perform the following correction adjustments.</p> <ol style="list-style-type: none"> 1. Set the CAL ADJUST knob to its center position. 2. Check all of the calibration points on the band, and the number of divisions on the linear scale by which the zero beat note is displaced from the point where the calibration marker appears. Attach a negative prefix to this number if the zero beat note occurs at a dial position which is lower than the dial marker, and a positive prefix if the zero beat note occurs at a dial position which is higher than the dial marker. 3. Record the positive and negative extremes of the number obtained in Step 2. 4. Compute the average of the two readings. This is equal to one-half the algebraic sum of these readings. 	<ol style="list-style-type: none"> 5. Set the tuning dial to the calibration marker at the low end of the band and note the linear scale reading. 6. Turn the tuning dial knob until the linear scale's position is displaced by the number of divisions computed in Step 4. (Take into account the proper sign.) 7. Set the CAL ADJUST knob so that the calibration marker at the low end of the band coincides with the linear scale reading obtained in Step 6. Lock the CAL ADJUST knob. 8. Realign the oscillator with the CAL ADJUST knob set to the position determined in Step 7, then recheck the calibration points as described in the first paragraph. 9. If the calibration check points can still not be brought to coincidence by use of the CAL ADJUST knob, then align the tuning dial as described in paragraph 11, Section 7 of NAVSHIPS 91875 (A), Instruction book for Radio Receiving Sets AN/SRR-11, AN/SRR-12, AN/SRR-13, and repeat the oscillator alignment and calibration correction adjustments.
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RF SECTION ALIGNMENT (CON'T.)

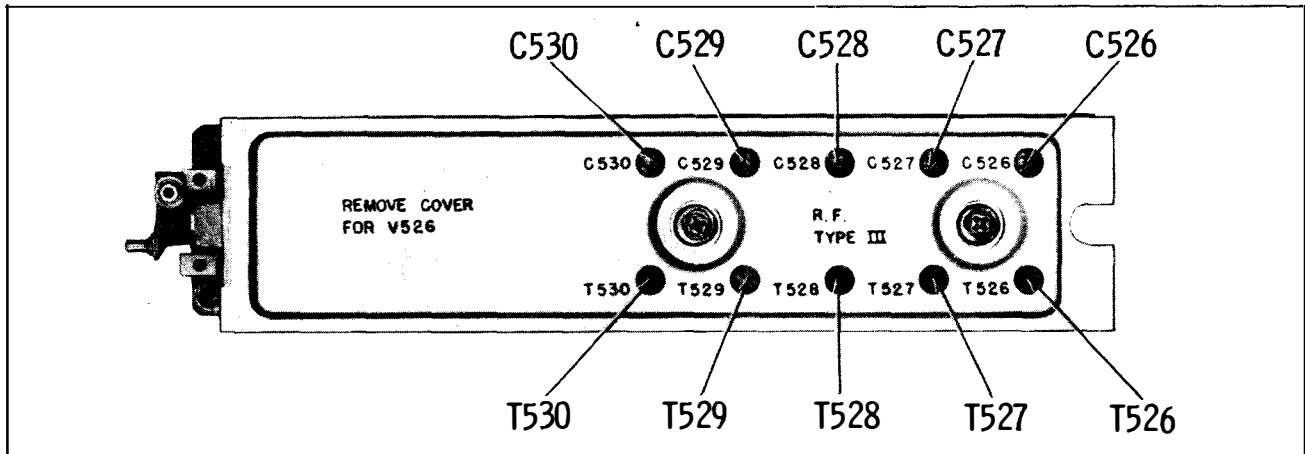
STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	PROJECTION DIAL SETTING	CONNECT VTVM	SECTION	ADJUST	REMARKS
17.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807)	3.88MC (Mod.)	A3 BROAD	I (2.0-4.0MC)	Tune to 3.88MC	DC Probe to Point (B). Common to chassis. (See Remarks)	ANT.	C501, ANT. COMP.	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
18.	"	"	"	"	"	"	RF	C526	"
19.	"	"	"	"	"	"	MIXER	C551	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 17 through 19 until no further adjustment is necessary.
20.	"	2.1MC (Mod.)	"	"	Tune to 2.1MC	"	ANT.	L501, T501	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
21.	"	"	"	"	"	"	RF	T526	"
22.	"	"	"	"	"	"	MIXER	T551	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 20 through 22, until no further adjustment is necessary.



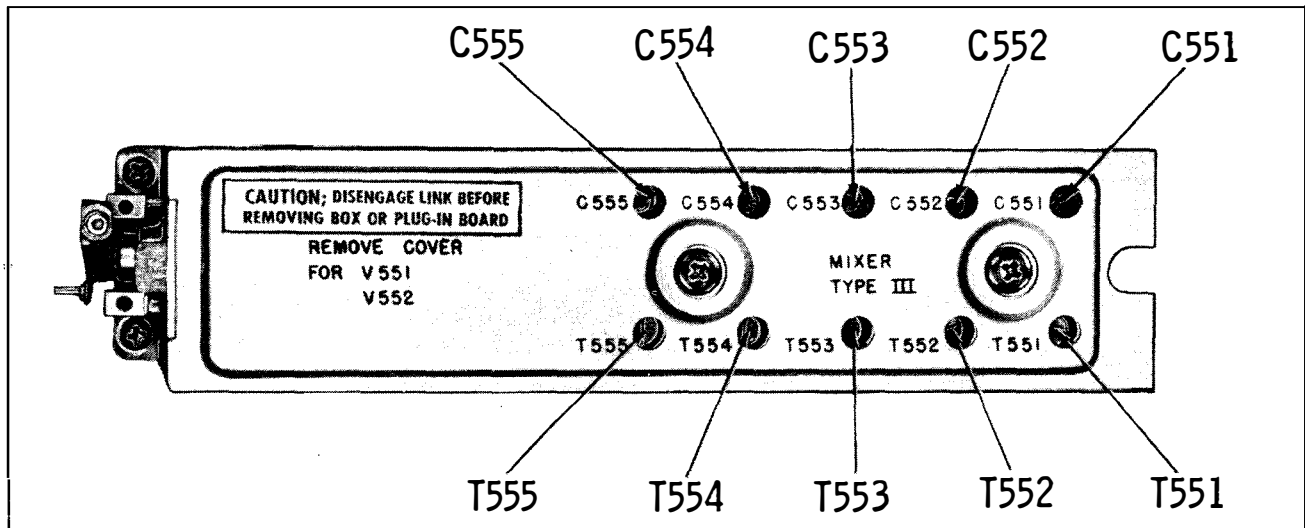
ALIGNMENT POINTS - OSCILLATOR ASSEMBLY



ALIGNMENT POINTS - ANTENNA ASSEMBLY



ALIGNMENT POINTS - RF ASSEMBLY



ALIGNMENT POINTS - MIXER ASSEMBLY

BAND II ALIGNMENT

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	PROJECTION DIAL SETTING	CONNECT VTVM	SECTION	ADJUST	REMARKS
23.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807)	8.0MC (Unmod.)	A1 BROAD	II (4.0-8.0MC)	8.0MC	Not Used	OSC.	C602	Adjust for zero beat in headphones.
24.	"	4.0MC (Unmod.)	"	"	4.0MC	"	"	L602	Adjust for zero beat in headphones. Repeat steps 23 and 24 until no further adjustment is necessary.
25.	Perform Calibration Correction Adjustments As In Step 16.								
26.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807)	7.76MC (Mod.)	A3 BROAD	II (4.0-8.0MC)	Tune to 7.76MC	DC Probe to Point $\text{\textcircled{B}}$. Common to chassis. (See Remarks)	ANT.	C502 ANT. COMP.	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
27.	"	"	"	"	"	"	RF	C527	"
28.	"	"	"	"	"	"	MIXER	C552	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 26 through 28 until no further adjustment is necessary.
29.	"	4.28MC (Mod.)	"	"	Tune to 4.28MC	"	ANT.	L502, T502	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
30.	"	"	"	"	"	"	RF	T527	"
31.	"	"	"	"	"	"	MIXER	T552	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 29 through 31 until no further adjustment is necessary.

BAND III ALIGNMENT

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	PROJECTION DIAL SETTING	CONNECT VTVM	SECTION	ADJUST	REMARKS
32.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807).	16.0MC (Unmod.)	A1 BROAD	III (8.0-16.0MC)	16.0MC	Not Used	OSC.	C603	Adjust for zero beat in headphones.
33.	"	8.0MC (Unmod.)	"	"	8.0MC	"	"	L603	Adjust for zero beat in headphones. Repeat steps 32 and 33 until no further adjustment is necessary.
34.	Perform Calibration Correction Adjustments As In Step 16.								
35.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807)	15.49MC (Mod.)	A3 BROAD	III (8.0-16.0MC)	Tune to 15.49MC	DC Probe to Point $\text{\textcircled{B}}$. Common to chassis. (See Remarks)	ANT.	C503, ANT. COMP.	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
36.	"	"	"	"	"	"	RF	C528	"
37.	"	"	"	"	"	"	MIXER	C553	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 35 through 37 until no further adjustment is necessary.
38.	"	8.32MC (Mod.)	"	"	Tune to 8.32MC	"	ANT.	L503, T503	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
39.	"	"	"	"	"	"	RF	T528	"
40.	"	"	"	"	"	"	MIXER	T553	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 38 through 40 until no further adjustment is necessary.

BAND IX ALIGNMENT

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	PROJECTION DIAL SETTING	CONNECT VTVM	SECTION	ADJUST	REMARKS
41.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807).	24.0MC (Unmod.)	A1 BROAD	IX (18.0-24.0MC)	24.0MC	Not Used	OSC.	C604	Adjust for zero beat in headphones.
42.	"	16.0MC (Unmod.)	"	"	16.0MC	"	"	L804	Adjust for zero beat in headphones. Repeat steps 41 and 42 until no further adjustment is necessary.
43.	Perform Calibration Correction Adjustments As In Step 16.								
44.	Impedance Adapter and Antenna Simulator to ANT. receptacle (J1807).	23.62MC (Mod.)	A3 BROAD	IX (18.0-24.0MC)	Tune to 23.82MC	DC Probe to Point \odot . Common to chassis. (See Remarks)	ANT.	C504, ANT. COMP.	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
45.	"	"	"	"	"	"	RF	C529	"
46.	"	"	"	"	"	"	MIXER	C554	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 44 through 46 until no further adjustment is necessary.
47.	"	16.32MC (Mod.)	"	"	Tune to 16.32MC	"	ANT.	L504, T504	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
48.	"	"	"	"	"	"	RF	T529	"
49.	"	"	"	"	"	"	MIXER	T554	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 47 through 49 until no further adjustment is necessary.

BAND V ALIGNMENT

STEP	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RECEPTION CONTROL POSITION	BAND SELECTOR POSITION	PROJECTION DIAL SETTING	CONNECT VTVM	SECTION	ADJUST	REMARKS
50.	Impedance Adapter and Antenna Simulator to ANT. Receptacle (J1807)	32.0MC (Unmod.)	A1 BROAD	V (24.0-32.0MC)	32.0MC	Not Used	OSC.	C605	Adjust for zero beat in headphones.
51.	"	24.0MC (Unmod.)	"	"	24.0MC	"	"	L605	Adjust for zero beat in headphones. Repeat steps 50 and 51 until no further adjustment is necessary.
52.	Perform Calibration Correction Adjustments As In Step 16.								
53.	Impedance Adapter and Antenna Simulator to ANT. Receptacle.	31.7MC (Mod.)	A3 BROAD	V (24.0-32.0MC)	Tune to 31.7MC	DC Probe to Point \odot . Common to chassis. (See Remarks)	ANT.	C505, ANT. COMP.	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
54.	"	"	"	"	"	"	RF	C530	"
55.	"	"	"	"	"	"	MIXER	C555	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 53 through 55 until no further adjustment is necessary.
56.	"	24.3MC (Mod.)	"	"	Tune to 24.3MC	"	ANT.	L505, T505	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available.
57.	"	"	"	"	"	"	RF	T530	"
58.	"	"	"	"	"	"	MIXER	T555	Adjust for maximum deflection. OUTPUT meter on receiver may be used if VTVM is not available. Repeat steps 56 through 58, until no further adjustment is necessary.

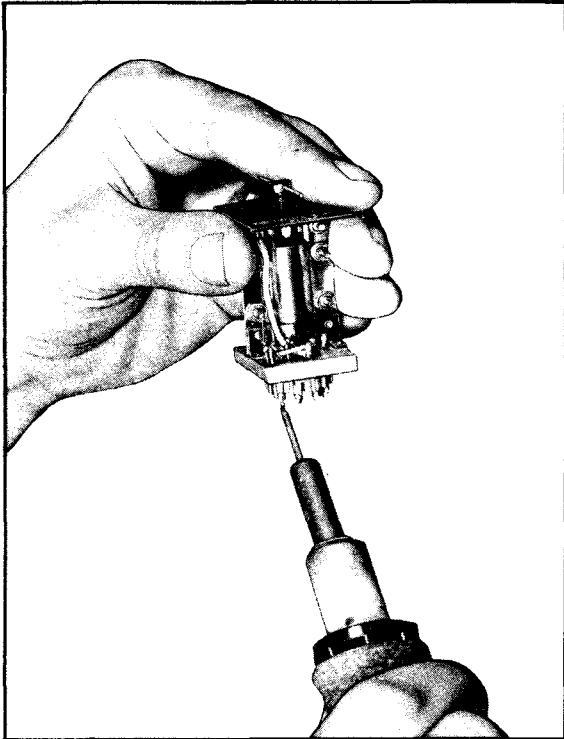
To insure correct frequency of the signal generator output, a frequency meter should be used throughout these instructions. This is especially true for the higher frequency adjustments in the R-F Section Alignment.

SECTION 12

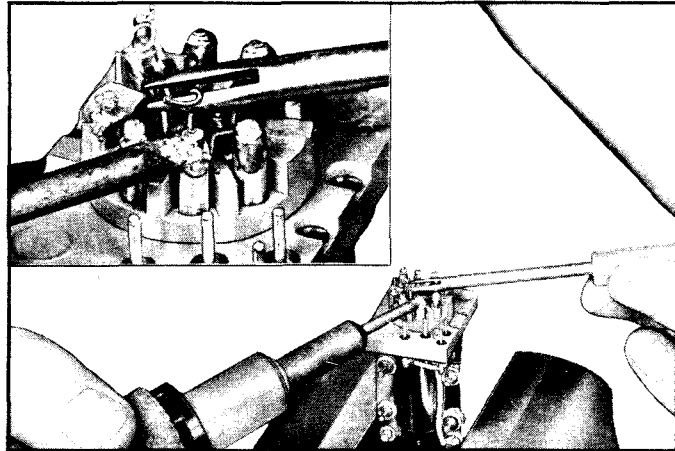
REMOVING AND REPLACING TUBES AND COMPONENTS

REPLACING TUBES IN PLUG-IN-UNITS

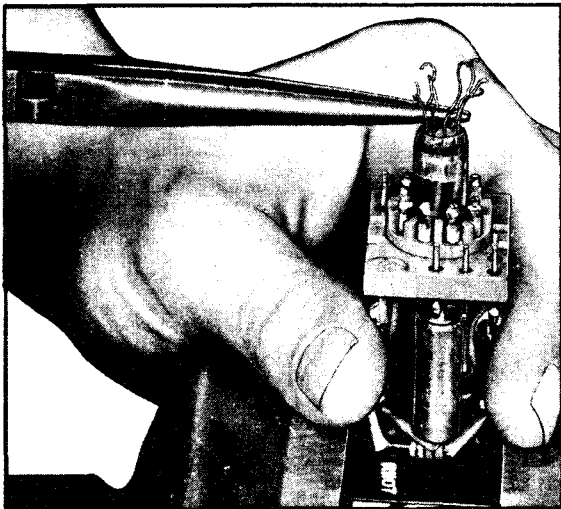
All electron tubes used in Radio Set AN/SRR-13A except those in the power supply, are of the subminiature type, and are soldered into the minor assemblies. Normally the entire minor assembly will be replaced when found defective. However, on occasion it may become necessary to replace the tube in a minor assembly.



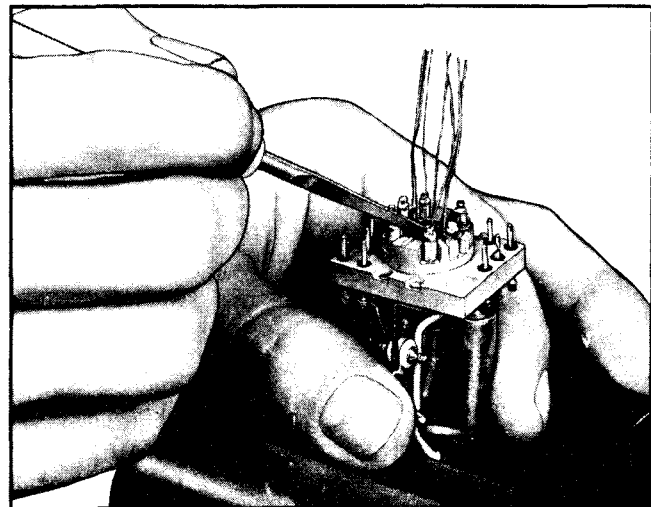
Remove excess solder from socket pins using pencil type soldering iron. Hold minor assembly in position shown. Heat pins and shake minor assembly to remove solder. Do not overheat pins.



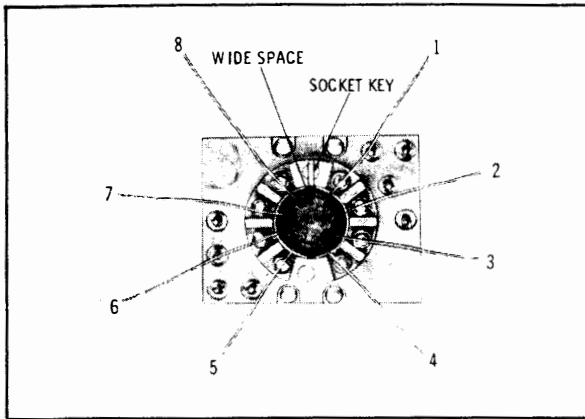
Carefully unwrap tube leads from socket pins. Minor assembly should be secured in some manner, such as gently clamping it in a vise. Use soldering aid or needle nose pliers to unwrap leads while applying heat with pencil type iron.



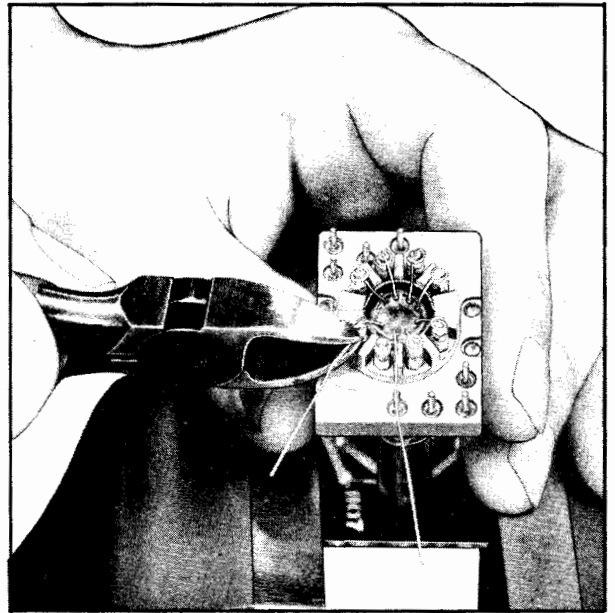
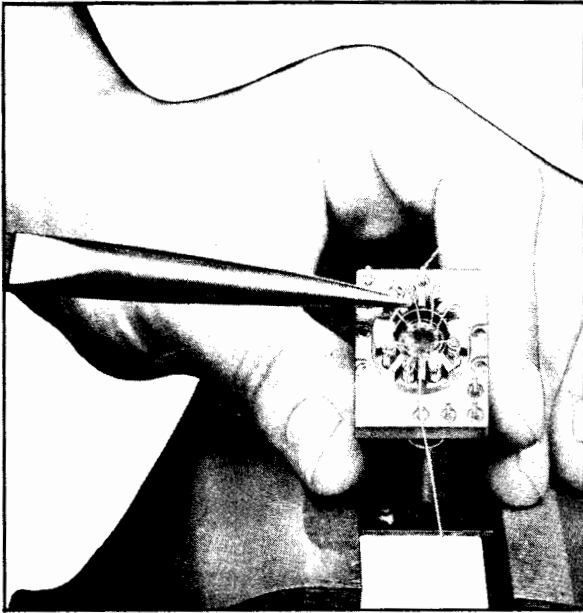
Use needle nose pliers or fingers to grasp the unsoldered tube leads. Gently pull tube out from bottom of socket.



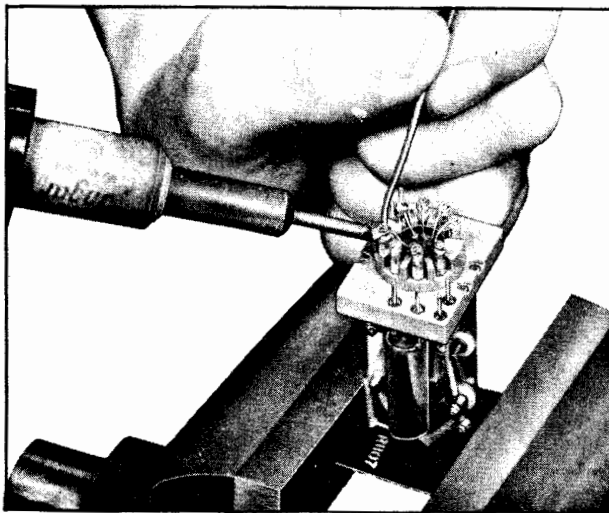
Insert new tube in socket with wide space between tube leads opposite key on socket. Gently force tube down with a suitable tool until tube base is slightly below bottom edge of socket. CAUTION: On minor assembly Z1109, which uses a type 5902 tube, depress the release bar and position the tube so that the clearance between the tube tip and the release bar pin is approximately 1/8 inch.



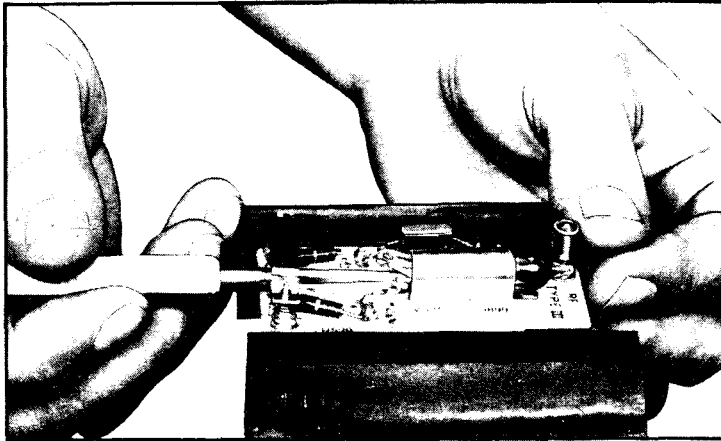
Align leads to socket pins as indicated. On minor assemblies employing type 5647 diode tubes position and connect yellow lead to pin located near yellow dot on socket, and blue lead to pin near blue dot. Connect the remaining two leads to nearest pins.



Seat leads into grooves on socket pins and wrap approximately 1 turn around the pin, then clip off excess with cutting pliers. Grooves should be cleaned of excess solder with a small wire brush or other suitable tool before attaching new leads.

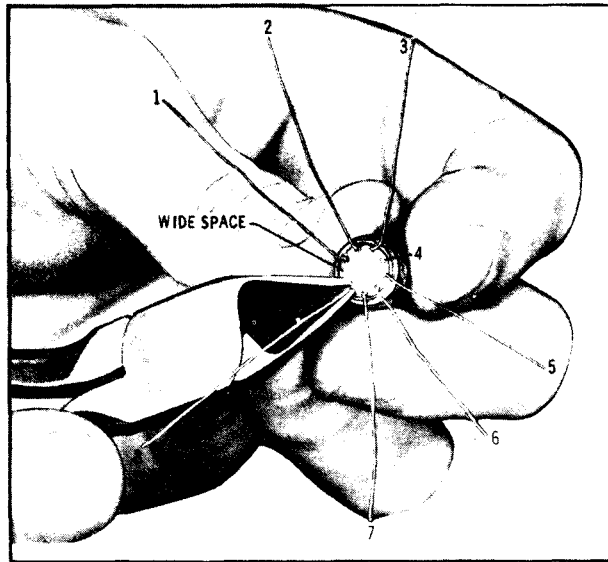


Solder new leads to socket pins using pencil type iron. Apply iron to pin and apply solder to heated pin so that it flows freely through the connection. Avoid excessive use of solder.

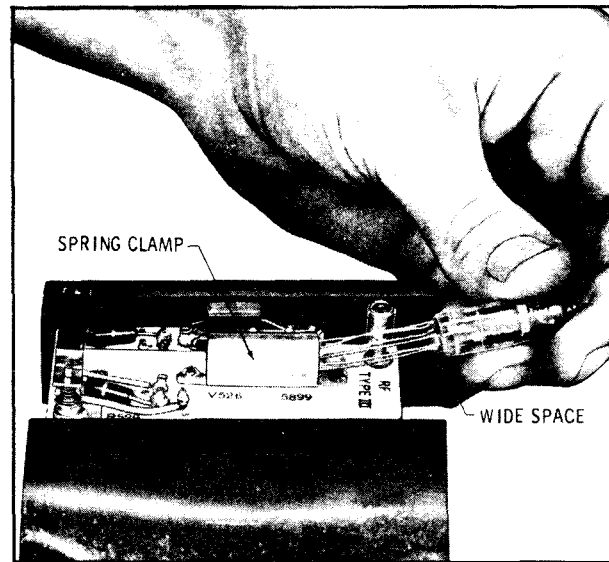


CAUTION: Place strips of rubber or soft plastic inside of vice jaws to protect assembly.

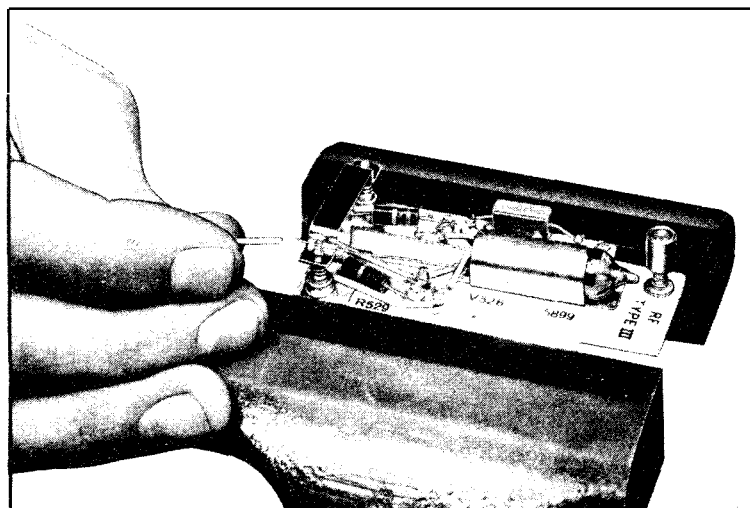
To replace tubes on plug-in boards, remove excess solder and unsolder leads from numbered terminals. Use same procedure as described for plug-in units. Gently force tube out from bottom of spring clamp using a suitable tool until tube can be grasped with fingers and removed.



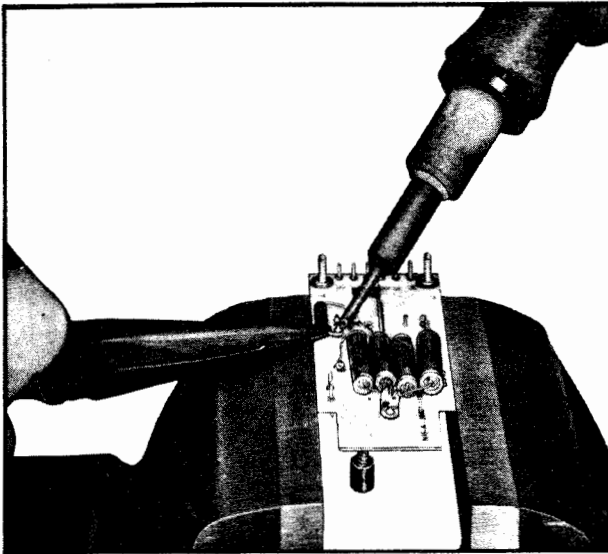
Clip off unused leads close to tube base with cutting pliers before inserting tube in spring clamp. Refer to schematic diagram to determine which leads are not used.



Insert new tube, lead end first, into spring clamp. Position tube base flush with bottom edge of spring clamp. Wide space between tube leads should be adjacent to surface of board.

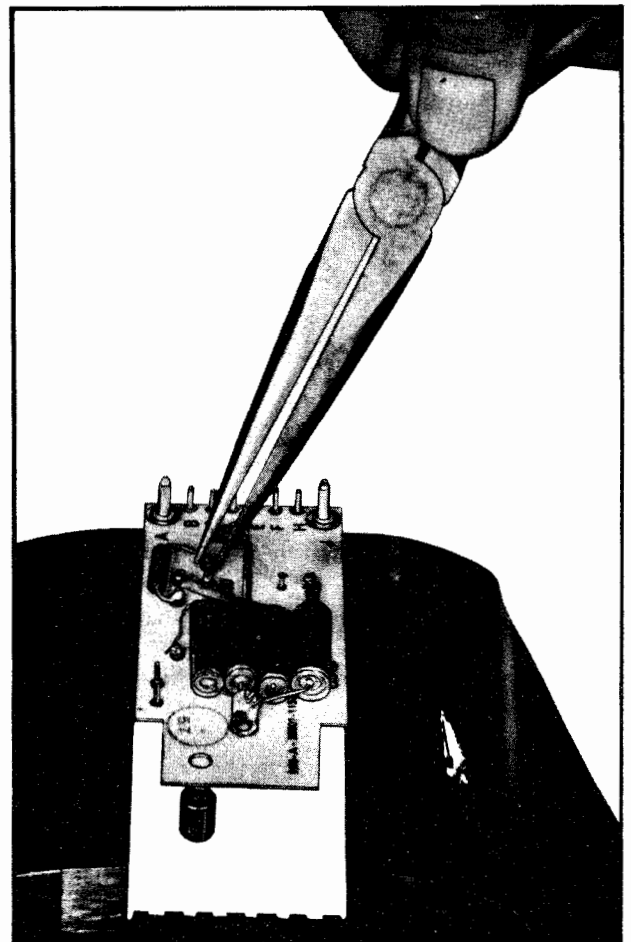
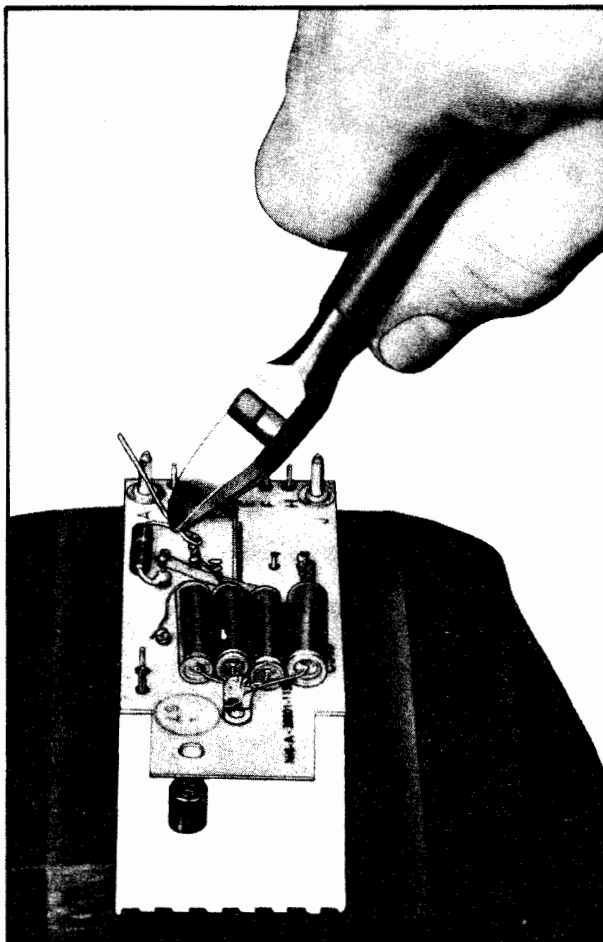


Replace sleeving from old tube leads on new leads. Align leads to the proper numbered terminals. Wrap and solder new leads to terminals.



REMOVING & REPLACING COMPONENTS

Use pencil type soldering iron to apply heat to the terminal. Grasp the lead between the component and the terminal with needle nose pliers to protect the component from damage by heat. This technique should also be used when removing or replacing leads on a terminal to prevent damage to the insulation. The replacement part should be placed in the same position as the original component. Cut the leads to the correct length and make a good mechanical connection before soldering.



SECTION 13

FUNCTIONAL PARTS LIST (Circuit Elements Only)

SYMBOL	FEDERAL STOCK NUMBER	NAME OF PART AND DESCRIPTION	SYMBOL	FEDERAL STOCK NUMBER	NAME OF PART AND DESCRIPTION
C-501	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-573	*N5910-666-6980	Capacitor, Paper: .01 mfd. @ 400V; 20%
C-501-1	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-574	N5910-668-2345	Capacitor, Mica: 47 mmf. @ 500V; 5%
C-502	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-575	*N5910-643-9168	Capacitor, Paper: .047 mfd. @ 100V; 20%
C-502-1	N5910-668-2345	Capacitor, Mica: 47 mmf. @ 500V; 5%	C-576	*N5910-666-6980	Capacitor, Paper: .01 mfd. @ 400V; 20%
C-503	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-577	*N5910-636-2336	Capacitor, Ceramic: 12 mmf. @ 500V; 10%
C-503-1	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-601	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.
C-504	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-602	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.
C-504-1	*N5910-666-6980	Capacitor, Paper: .01 mfd. @ 400V; 20%	C-603	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.
C-505	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-604	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.
C-505-1	*N5910-636-2336	Capacitor, Ceramic: 12 mmf. @ 500V; 10%	C-605	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.
C-506	N5910-112-8420	Capacitor, Ceramic: 3 mmf. p/m 0.25 mmf.; 500V	C-606	N5910-665-0215	Capacitor, Mica: 458 mmf. @ 300V; 1%
C-506-1	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-607	N5910-270-9178	Capacitor, Ceramic: 33 mmf. @ 300V; 2%
C-507	N5910-195-5157	Capacitor, Ceramic: 10 mmf. p/m 0.25 mmf.; 500V	C-608	N5910-666-5830	Capacitor, Ceramic: 7 mmf. p/m 0.25 mmf.; 500V
C-508	N5910-195-5157	Capacitor, Ceramic: 10 mmf. p/m 0.25 mmf.; 500V	C-609	N5910-665-0230	Capacitor, Mica: 820 mmf. @ 500V; 1%
C-509	N5910-666-6187	Capacitor, Mica: 27 mmf. @ 500V; 5%	C-610	N5910-270-9178	Capacitor, Ceramic: 33 mmf. @ 300V; 2%
C-510	N5910-270-3298	Capacitor, Mica: 375 mmf. @ 500V; 1%	C-612	N5910-665-0229	Capacitor, Mica: 1400 mmf. @ 500V; 1%
C-511	N5910-227-0848	Capacitor, Mica: 33 mmf. @ 500V; 2%	C-613	N5910-666-9757	Capacitor, Ceramic: 27 mmf. @ 300V; 2%
C-512	N5910-195-7000	Capacitor, Ceramic: 18 mmf. @ 500V; 2%	C-615	N5910-644-6671	Capacitor, Ceramic: 10 mmf. p/m 0.5 mmf.; 500V
C-513	N5910-227-0848	Capacitor, Mica: 33 mmf. @ 500V; 2%	C-616	N5910-270-9178	Capacitor, Ceramic: 33 mmf. @ 300V; 2%
C-514	N5910-280-8171	Capacitor, Mica: 140 mmf. @ 500V; 1%	C-617	N5910-636-2093	Capacitor, Mica: 288 mmf. @ 500V; 1%
C-815	N5910-195-6580	Capacitor, Ceramic: 15 mmf. @ 500V; 2%	C-618	N5910-636-2309	Capacitor, Ceramic: 22 mmf. @ 500V; 2%
C-516	N5910-195-6580	Capacitor, Ceramic: 15 mmf. @ 500V; 2%	C-619	N5910-270-9178	Capacitor, Ceramic: 33 mmf. @ 300V; 2%
C-517	N5910-195-6580	Capacitor, Ceramic: 15 mmf. @ 500V; 2%	C-620	N5910-636-3773	Capacitor, Mica: 120 mmf. @ 500V; 1%
C-518	N5910-666-6187	Capacitor, Mica: 12 mmf. @ 500V; 5%	C-621	*N5910-101-5606	Capacitor, Mica: 15 mmf. @ 500V; 5%
C-519	N5910-270-3287	Capacitor, Mica: 330 mmf. @ 500V; 1%	C-622	N5910-668-2345	Capacitor, Mica: 47 mmf. @ 500V; 5%
C-520	N5910-644-6668	Capacitor, Ceramic: 22 mmf. @ 500V; 2%	C-623	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%
C-521	N5910-666-6187	Capacitor, Mica: 27 mmf. @ 500V; 5%	C-624	*N5910-666-6980	Capacitor, Paper: .01 mfd. @ 400V; 20%
C-522	N5910-270-4877	Capacitor, Mica: 120 mmf. @ 500V; 1%	C-625	*N5910-666-6980	Capacitor, Paper: .01 mfd. @ 400V; 20%
C-523	N5910-644-6668	Capacitor, Ceramic: 22 mmf. @ 500V; 2%	C-631	N5910-666-9758	Capacitor, Ceramic: 15 mmf. @ 500V; 2%
C-524	N5910-249-5427	Capacitor, Mica: 220 mmf. @ 500V; 5%	C-651A	N5910-666-6010	Capacitor, Variable Tuning: 15-235 mmf.
C-525	*N5910-636-2336	Capacitor, Ceramic: 12 mmf. @ 500V; 10%	Part of C-651: 15-235 mmf.		
C-526	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-651B		Part of C-651: 15-235 mmf.
C-527	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-651C		Part of C-651: 15-235 mmf.
C-528	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-651D		Part of C-651: 15-235 mmf.
C-529	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-651E		Part of C-651: 15-235 mmf.
C-530	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-852	N5910-568-1682	Capacitor, Mica: 2200 mmf. @ 500V; 10%
C-531	N5910-666-5649	Capacitor, Mica: 4 mmf. @ 500V; 10%	C-853	*N5910-644-5821	Capacitor, Paper: .1 mfd. @ 100V; 20%
C-532	N5910-666-6187	Capacitor, Mica: 27 mmf. @ 500V; 5%	C-854	*N5910-666-8810	Capacitor, Paper: .1 mfd. @ 200V; 10%
C-533	N5910-195-7810	Capacitor, Ceramic: 5 mmf. p/m 0.25 mmf.; 500V	C-855	*N5910-866-8835	Capacitor, Paper: .01 mfd. @ 100V; 10%
C-534	N5910-644-5991	Capacitor, Mica: 6 mmf. @ 500V; 5%	C-856	N5910-644-8026	Capacitor, Trimmer: 3.0 to 28 mmf.
C-535	N5910-666-1164	Capacitor, Mica: 68 mmf. @ 500V; 5%	C-857	*N5910-868-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%
C-536	N5910-100-5769	Capacitor, Ceramic: 2 mmf. p/m 0.25 mmf.; 500V	C-858	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%
C-537	N5910-644-5991	Capacitor, Mica: 6 mmf. @ 500V; 5%	C-859	*N5910-668-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%
C-538	N5910-666-6579	Capacitor, Mica: 10 mmf. @ 500V; 5%	C-909	N5910-284-4721	Capacitor, Trimmer: 5 to 25 mmf.
C-539	N5910-195-5157	Capacitor, Ceramic: 10 mmf. p/m 0.25 mmf.; 500V	C-910	*N5910-192-8419	Capacitor, Paper: .1 mfd. @ 400V; 10%
C-540	N5910-270-3306	Capacitor, Mica: 405 mmf. @ 300V; 1%	C-911	*N5910-192-6419	Capacitor, Paper: .1 mfd. @ 400V; 10%
C-541	N5910-227-0848	Capacitor, Mica: 33 mmf. @ 500V; 2%	C-912	N5910-253-9133	Capacitor, Mica: 180 mmf. @ 500V; 5%
C-542	N5910-666-6579	Capacitor, Mica: 10 mmf. @ 500V; 5%	C-913	N5910-284-9444	Capacitor, Mica: 33 mmf. @ 500V; 5%
C-543	N5910-255-0125	Capacitor, Ceramic: 5 mmf. @ 500V; 5%	C-914	N5910-229-1753	Capacitor, Mica: 270 mmf. @ 500V; 5%
C-544	N5910-280-8171	Capacitor, Mica: 140 mmf. @ 500V; 1%	C-915	N5910-284-4721	Capacitor, Trimmer: 5 to 25 mmf.
C-545	N5910-227-0848	Capacitor, Mica: 33 mmf. @ 500V; 2%	C-916	N5910-229-1753	Capacitor, Mica: 270 mmf. @ 500V; 5%
C-546	N5910-668-2345	Capacitor, Mica: 47 mmf. @ 500V; 5%	C-917	*N5910-644-5821	Capacitor, Paper: .1 mfd. @ 100V; 10%
C-547	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-918	*N5910-644-5821	Capacitor, Paper: .1 mfd. @ 100V; 10%
C-548	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-919	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 400V; 10%
C-549	*N5910-666-6980	Capacitor, Paper: .01 mfd. @ 400V; 20%	C-1029	N5910-284-4720	Capacitor, Trimmer: 5 to 25 mmf.
C-550	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-1030	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 200V; 10%
C-551	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-1031	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 100V; 10%
C-552	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-1032	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 300V; 10%
C-553	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-1035	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 100V; 10%
C-554	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-1036	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 300V; 10%
C-555	N5910-284-4455	Capacitor, Trimmer: 2.6 to 19.7 mmf.	C-1039	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 100V; 10%
C-556	N5910-112-8420	Capacitor, Ceramic: 3 mmf. p/m 0.25 mmf.; 500V	C-1040	N5910-195-6580	Capacitor, Ceramic: 15 mmf. @ 500V; 2%
C-557	N5910-666-6187	Capacitor, Mica: 27 mmf. @ 500V; 5%	C-1041	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 300V; 10%
C-558	N5910-644-5991	Capacitor, Mica: 6 mmf. @ 500V; 5%	C-1042	N5910-666-5435	Capacitor, Mica: 2100 mmf. @ 500V; 2%
C-560	N5910-666-1164	Capacitor, Mica: 68 mmf. @ 500V; 5%	C-1043	N5910-644-0580	Capacitor, Ceramic: 280 mmf. @ 500V; 1%
C-561	N5910-644-5991	Capacitor, Mica: 6 mmf. @ 500V; 5%	C-1044	N5910-195-5157	Capacitor, Ceramic: 10 mmf. p/m 0.25 mmf.; 500V
C-562	N5910-112-8420	Capacitor, Ceramic: 3 mmf. p/m 0.25 mmf.; 500V	C-1045	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 100V; 10%
C-563	N5910-666-6608	Capacitor, Mica: 20 mmf. @ 500V; 5%	C-1046	N5910-195-6580	Capacitor, Ceramic: 15 mmf. @ 500V; 2%
C-564	N5910-195-7000	Capacitor, Ceramic: 18 mmf. @ 500V; 2%	C-1047	N5910-266-0867	Capacitor, Paper: .0047 mfd. @ 300V; 10%
C-565	N5910-270-3308	Capacitor, Mica: 420 mmf. @ 300V; 1%	C-1048	*N5910-666-6200	Capacitor, Mica: 22 mmf. @ 500V; 10%
C-566	N5910-227-0848	Capacitor, Mica: 33 mmf. @ 500V; 2%	C-1049	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 300V; 10%
C-567	N5910-195-5157	Capacitor, Ceramic: 10 mmf. p/m 0.25 mmf.; 500V	C-1050	N5910-263-0433	Capacitor, Mica: 510 mmf. @ 300V; 5%
C-568	N5910-270-4884	Capacitor, Mica: 150 mmf. @ 500V; 1%	C-1051	N5910-194-3038	Capacitor, Mica: 390 mmf. @ 500V; 5%
C-569	N5910-227-0848	Capacitor, Mica: 33 mmf. @ 500V; 2%	C-1052	N5910-256-5590	Capacitor, Mica: 470 mmf. @ 300V; 10%
C-570	N5910-667-5825	Capacitor, Mica: 15 mmf. @ 500V; 2%	C-1053	*N5910-666-8810	Capacitor, Paper: .1 mfd. @ 200V; 10%
C-571	N5910-668-2345	Capacitor, Mica: 47 mmf. @ 500V; 5%	C-1054	N5910-666-6579	Capacitor, Mica: 10 mmf. @ 500V; 5%
C-572	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 100V; 20%	C-1055	*N5910-666-8810	Capacitor, Paper: .1 mfd. @ 200V; 10%
			C-1056	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 300V; 10%
			C-1057	N5910-229-1753	Capacitor, Mica: 270 mmf. @ 500V; 5%
			C-1058	N5910-256-5589	Capacitor, Mica: 470 mmf. @ 300V; 5%
			C-1059	N5910-229-1753	Capacitor, Mica: 240 mmf. @ 500V; 5%
			C-1060	*N5910-644-5821	Capacitor, Paper: .1 mfd. @ 100V; 10%
			C-1061	*N5910-644-6211	Capacitor, Paper: .22 mfd. @ 100V; 10%

*Indicates Stock Number of replacement part. May differ in some respect from original part and description.

SYMBOL	FEDERAL STOCK NUMBER	NAME OF PART AND DESCRIPTION	SYMBOL	FEDERAL STOCK NUMBER	NAME OF PART AND DESCRIPTION
C-1062	*N5910-644-6211	Capacitor, Paper: .22 mfd. @ 100V; 10%	J-1807	*N5935-149-3483	Connector, Receptacle: one female cont.
C-1063	*N5910-644-3539	Capacitor, Paper: .1 mfd. @ 400V; 10%	J-1809	N5935-257-9724	Connector, Receptacle: 14 female cont.
C-1064	*N5910-666-6200	Capacitor, Mica: 22 mmf. @ 500V; 10%	K-1801	N5945-316-2720	Relay Thermal
C-1065	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 200V; 10%	L-501	N5950-318-3631	Coil, RF: antenna; adj. iron core
C-1066	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 200V; 10%	L-502	N5950-568-1639	Coil, RF: antenna; adj. iron core
C-1067	N5910-229-1753	Capacitor, Mica: 270 mmf. @ 500V; 5%	L-503	N5950-696-8948	Coil, RF: Antenna; adj. iron core
C-1068	N5910-229-1753	Capacitor, Mica: 270 mmf. @ 500V; 5%	L-504	N5950-699-5290	Coil, RF: antenna; adj. iron core
C-1101	*N5910-644-6211	Capacitor, Paper: .22 mfd. @ 100V; 10%	L-505	N5950-699-5289	Coil, RF: antenna; adj. iron core
C-1102	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 400V; 10%	L-601	N5950-645-3809	Coil, RF: osc.; adj. iron core
C-1103	N5910-644-5902	Capacitor, Paper: .001 mfd. @ 400V; 10%	L-602	N5950-645-4973	Coil, RF: osc.; adj. iron core
C-1104	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 400V; 10%	L-603	N5950-696-8946	Coil, RF: osc.; adj. iron core
C-1105	*N5910-644-6248	Capacitor, Paper: .033 mfd. @ 400V; 10%	L-604	N5950-647-9658	Coil, RF: osc.; adj. iron core
C-1106	N5910-644-5902	Capacitor, Paper: .001 mfd. @ 400V; 10%	L-605	N5950-647-9659	Coil, RF: osc.; adj. iron core
C-1107	*N5910-643-9168	Capacitor, Paper: .047 mfd. @ 200V; 10%	L-606	N5950-645-0375	Coil, RF: heater choke; iron core
C-1108	N5910-254-2619	Capacitor, Paper: .0018 mfd. @ 300V; 10%	L-651	N5950-316-9781	Coil, RF: choke; iron core
C-1109	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 300V; 10%	L-652	N5950-645-0374	Coil, RF: headphone filter
C-1110	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 200V; 10%	L-1016	N5950-648-0777	Coil, RF: adj. iron core
C-1112	N5910-281-0107	Capacitor, Paper: .1 mfd. @ 200V; 10%	L-1017	N5950-648-0777	Coil, RF: adj. iron core
C-1114	*N5910-644-6293	Capacitor, Paper: .0022 mfd. @ 300V; 10%	L-1601A	N5950-645-1342	Coil, Filter Choke
C-1115	*N5910-666-6980	Capacitor, Paper: .012 mfd. @ 200V; 10%	L-1601B		Coil, Filter Choke
C-1201	N5910-284-4675	Capacitor, Trimmer: 8 to 50 mmf.	M-651	N6625-643-1446	Meter, Microammeter: DC; 0 to 100 μ A
C-1202	*N5910-644-6211	Capacitor, Paper: .22 mfd. @ 100V; 20%	M-652	N6625-643-3061	Meter, Audio Level: AC; 25-16,000 cyc.
C-1203	*N5910-644-6211	Capacitor, Paper: .22 mfd. @ 100V; 20%	R-501	N5905-279-2515	Resistor: 470K Ω ; 1/2W; 10%
C-1204	N5910-265-5765	Capacitor, Mica: 150 mmf. @ 500V; 5%	R-502	*N5905-192-3981	Resistor: 120K Ω ; 1/2W; 10%
C-1205	N5910-126-9566	Capacitor, Mica: 47 mmf. @ 500V; 20%	R-503	*N5905-279-1894	Resistor: 82 Ω ; 1/2W; 5%
C-1206	*N5910-666-8810	Capacitor, Paper: .1 mfd. @ 200V; 20%	R-504	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
C-1207	N5910-665-0200	Capacitor, Mica: 5 mmf. @ 500V; 20%	R-505	*N5905-192-3971	Resistor: 330 Ω ; 1/2W; 10%
C-1208	*N5910-100-5776	Capacitor, Ceramic: 3 mmf. p/m 0.5 mmf.; 500V	R-506	*N5905-190-8889	Resistor: 100 Ω ; 1/2W; 10%
C-1301	*N5910-666-8835	Capacitor, Paper: .01 mfd. @ 400V; 10%	R-526	*N5905-192-3981	Resistor: 120K Ω ; 1/2W; 10%
C-1302	N5910-194-3038	Capacitor, Mica: 390 mmf. @ 500V; 5%	R-527	N5905-279-2515	Resistor: 470K Ω ; 1/2W; 10%
C-1303	N5910-256-5589	Capacitor, Mica: 470 mmf. @ 300V; 5%	R-528	*N5905-279-3514	Resistor: 180 Ω ; 1/2W; 5%
C-1304	N5910-666-6197	Capacitor, Mica: 22 mmf. @ 500V; 5%	R-529	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
C-1305	*N5910-666-8835	Capacitor, Paper: .01 mfd. 400V; 10%	R-530	*N5905-190-8889	Resistor: 100 Ω ; 1/2W; 10%
C-1306	N5910-256-5589	Capacitor, Mica: 470 mmf. @ 300V; 5%	R-551	*N5905-171-2004	Resistor: 22K Ω ; 1/2W; 5%
C-1307	N5910-284-4720	Capacitor, Trimmer: 5 to 25 mmf.	R-552	*N5905-279-3514	Resistor: 180 Ω ; 1/2W; 5%
C-1308	N5910-284-4720	Capacitor, Trimmer: 5 to 25 mmf.	R-553	N5905-279-2515	Resistor: 470K Ω ; 1/2W; 10%
C-1309	N5910-644-6027	Capacitor, Trimmer: 3.4 to 50.4 mmf.	R-554	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
C-1601	N5910-174-9206	Capacitor, Electrolytic: 120 mfd. @ 350V	R-555	N5905-279-2515	Resistor: 470K Ω ; 1/2W; 10%
C-1602	N5910-174-9206	Capacitor, Electrolytic: 120 mfd. @ 350V	R-556	*N5905-192-3973	Resistor: 470 Ω ; 1/2W; 5%
C-1603	*N5910-192-5203	Capacitor, Paper: .01 mfd. @ 600V; 20%	R-557	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
CR-1001	N5960-194-9408	Germanium Diode: Type 1N69	R-601	*N5905-171-1998	Resistor: 33K Ω ; 1/2W; 10%
F-1601	N5920-284-6733	Fuse, Cartridge: 1 Amp.; 125V; Slo-Blo	R-602	*N5905-279-3502	Resistor: 12K Ω ; 1/2W; 10%
F-1602	N5920-284-6733	Fuse, Cartridge: 1 Amp.; 125V; Slo-Blo	R-603	*N5905-195-6791	Resistor: 680 Ω ; 1/2W; 5%
I-651	G6240-223-9100	Lamp, Neon: Type NE-51	R-604	*N5905-279-3521	Resistor: 15 Ω ; 1/2W; 10%
I-3801	G6240-012-5588	Lamp, Incandescent: Type #55	R-651A	N5905-264-7794	Resistor, Variable: 10K Ω ; 2W; 20%
I-3802	G6240-012-5588	Lamp, Incandescent: Type #55	R-651B		Resistor, Variable: 10K Ω ; 2W; 20%
J-501	N5935-259-4009	Connector, Receptacle: 11 male cont.	R-652	*N5905-107-4898	Resistor, Variable: 500 Ω ; 2W; 20%
J-502	N5935-283-3378	Connector, Receptacle: two female cont.	R-653	*N5905-171-2004	Resistor: 22K Ω ; 1/2W; 5%
J-503	N5935-257-9655	Connector, Receptacle: six female cont.	R-654	*N5905-279-3505	Resistor: 3.9K Ω ; 1/2W; 5%
J-504	N5935-201-3949	Connector, Receptacle: three male cont.	R-655	*N5905-190-8880	Resistor: 1.2K Ω ; 1/2W; 5%
J-526	N5935-259-4009	Connector, Receptacle: 11 male cont.	R-656	N5905-108-1698	Resistor, Variable: 1 meg. 2W; 20%
J-527	N5935-283-3378	Connector, Receptacle: two female cont.	R-657A	N5905-264-7810	Resistor, Variable: 100K Ω ; 2W; 20%
J-528	N5935-257-9655	Connector, Receptacle: six female cont.	R-657B		Resistor, Variable: 100K Ω ; 2W; 20%
J-551	N5935-259-4009	Connector, Receptacle: 11 male cont.	R-658	N5905-248-3310	Resistor, Variable: 50K Ω ; 2W; 20%
J-552	N5935-283-3378	Connector, Receptacle: two female cont.	R-659	*N5905-190-8880	Resistor: 1.2K Ω ; 1/2W; 10%
J-553	N5935-257-9655	Connector, Receptacle: six female cont.	R-660	*N5905-279-3502	Resistor: 12K Ω ; 1/2W; 5%
J-601	N5935-259-4009	Connector, Receptacle: 11 male cont.	R-661	*N5905-195-9482	Resistor: 27K Ω ; 1/2W; 10%
J-602	N5935-283-3378	Connector, Receptacle: two female cont.	R-663	*N5905-195-9451	Resistor: 82K Ω ; 1/2W; 10%
J-603	N5935-257-9655	Connector, Receptacle: six female cont.	R-664	*N5905-279-1761	Resistor: 620 Ω ; 1/2W; 5%
J-651	N5935-283-3377	Connector, Receptacle: three female cont.	R-901	*N5905-185-8510	Resistor: 10K Ω ; 1/2W; 10%
J-652	N5935-283-3424	Connector, Receptacle: 11 female cont.	R-902	*N5905-185-8510	Resistor: 10K Ω ; 1/2W; 10%
J-653	N5935-283-3424	Connector, Receptacle: 11 female cont.	R-903	*N5905-279-3514	Resistor: 180 Ω ; 1/2W; 10%
J-654	N5935-283-3424	Connector, Receptacle: 11 female cont.	R-904	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
J-655	N5935-283-3424	Connector, Receptacle: 11 female cont.	R-905	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
J-656	N5935-283-3377	Connector, Receptacle: three female cont.	R-1001	N5905-316-2591	Resistor, Thermal: 820 Ω
J-657	N5935-283-2901	Connector, Receptacle: seven female cont.	R-1005	*N5905-190-8874	Resistor: 1.2 meg.; 1/2W; 10%
J-658	N5935-283-3377	Connector, Receptacle: three female cont.	R-1006	*N5905-171-2006	Resistor: 270 Ω ; 1/2W; 10%
J-659	N5935-259-3971	Connector, Receptacle: 18 female cont.	R-1007	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
J-660	N5935-259-3971	Connector, Receptacle: 18 female cont.	R-1009	*N5905-192-0649	Resistor: 20K Ω ; 1/2W; 5%
J-661	N5935-283-2901	Connector, Receptacle: seven female cont.	R-1010	*N5905-171-2006	Resistor: 270 Ω ; 1/2W; 10%
J-662	N5935-283-2901	Connector, Receptacle: seven female cont.	R-1011	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
J-663	N5935-259-7110	Connector, Receptacle: 18 female cont.	R-1013	*N5905-192-0649	Resistor: 20K Ω ; 1/2W; 10%
J-664	N5935-295-5009	Connector, Receptacle: 14 male cont.	R-1014	N5905-817-5636	Resistor: 1000 Ω ; 1/2W; 10%
J-665	*N5935-283-1269	Jack, Telephone: two cond. plug	R-1015	*N5905-254-9201	Resistor: 47K Ω ; 1/2W; 10%
J-666	*N5935-283-1269	Jack, Telephone: two cond. plug	R-1016	*N5905-254-9201	Resistor: 47K Ω ; 1/2W; 10%
J-901	N5935-201-3949	Connector, Receptacle: three male cont.	R-1017	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
J-902	N5935-247-9282	Connector, Receptacle: seven male cont.	R-1019	*N5905-279-3504	Resistor: 4.7K Ω ; 1/2W; 10%
J-1001	N5935-201-3949	Connector, Receptacle: three male cont.	R-1020	*N5905-279-3504	Resistor: 4.7 K Ω ; 1/2W; 10%
J-1002	N5935-259-6944	Connector, Receptacle: 18 male cont.	R-1021	N5905-817-5636	Resistor: 1000 Ω ; 1/2W; 10%
J-1101	N5935-259-6944	Connector, Receptacle: 18 male cont.	R-1023	*N5905-249-3661	Resistor: 68K Ω ; 1/2W; 5%
J-1201	N5935-247-9282	Connector, Receptacle: 18 male cont.	R-1025	*N5905-192-3973	Resistor: 470 Ω ; 1/2W; 10%
J-1301	N5935-247-9282	Connector, Receptacle: 18 male cont.	R-1026	*N5905-279-3504	Resistor: 4.7K Ω ; 1/2W; 10%
J-1601	N5935-259-6950	Connector, Receptacle: 18 male cont.	R-1027	*N5905-279-3497	Resistor: 39K Ω ; 1/2W; 10%
J-1801	N5935-283-2916	Connector, Receptacle: two male cont.	R-1028	*N5905-279-2515	Resistor: 470K Ω ; 1/2W; 5%
J-1802	N5935-283-2916	Connector, Receptacle: two male cont.	R-1029	*N5905-279-2510	Resistor: 3.9 meg.; 1/2W; 5%
J-1803	N5935-283-2916	Connector, Receptacle: two male cont.	R-1030	*N5905-190-8874	Resistor: 1.2 meg.; 1/2W; 10%
J-1804	N5935-280-1892	Connector, Receptacle: three male cont.	R-1031	*N5905-190-8874	Resistor: 1.2 meg.; 1/2W; 10%
J-1805	*N5935-636-8293	Connector, Receptacle: one female cont.	R-1032	*N5905-190-8885	Resistor: 2.2 meg.; 1/2W; 10%
J-1806	*N5935-636-8293	Connector, Receptacle: one female cont.	R-1033	*N5905-279-1876	Resistor: 2.2K Ω ; 1/2W; 10%
			R-1101	*N5905-192-0390	Resistor: 1 meg.; 1/2W; 10%

*Indicates Stock Number of replacement part. May differ in some respect from original part and description.

**Alternate Item

SYMBOL	FEDERAL STOCK NUMBER	NAME OF PART AND DESCRIPTION	SYMBOL	FEDERAL STOCK NUMBER	NAME OF PART AND DESCRIPTION
R-1102	*N5905-195-9451	Resistor: 82KΩ; 1/2W; 5%	T-527	N5950-647-9476	RF Transformer: adj. iron core
R-1103	*N5905-192-3981	Resistor: 120KΩ; 1/2W; 5%	T-528	N5950-647-9488	RF Transformer: adj. iron core
R-1104	*N5905-190-8865	Resistor: 270KΩ; 1/2W; 10%	T-529	N5950-647-9491	RF Transformer: adj. iron core
R-1105	*N5905-192-0390	Resistor: 1 meg.; 1/2W; 10%	T-530	N5950-647-9479	RF Transformer: adj. iron core
R-1106	*N5905-171-1999	Resistor: 820Ω; 1/2W; 10%	T-551	N5950-647-9475	RF Transformer: adj. iron core
R-1107	*N5905-249-3661	Resistor: 68KΩ; 1/2W; 10%	T-552	N5950-647-9477	RF Transformer: adj. iron core
R-1108	*N5905-279-1754	Resistor: 1.5 meg.; 1/2W; 5%	T-553	N5950-647-9841	RF Transformer: adj. iron core
R-1109	*N5905-249-3661	Resistor: 68KΩ; 1/2W; 5%	T-554	N5950-647-9838	RF Transformer: adj. iron core
R-1111	*N5905-195-9482	Resistor: 27KΩ; 1/2W; 5%	T-555	N5950-647-9837	RF Transformer: adj. iron core
R-1112	N5905-279-2515	Resistor: 470KΩ; 1/2W; 10%	T-901	N5950-647-7643	IF Transformer: adj. iron core
R-1113	N5905-279-2515	Resistor: 470KΩ; 1/2W; 10%	T-1013	N5950-647-7644	IF Transformer: adj. iron core
R-1114	*N5905-171-1998	Resistor: 33KΩ; 1/2W; 5%	T-1014	N5950-295-7263	RF Coil: adj. iron core
R-1115	*N5905-195-6761	Resistor: 100KΩ; 1/2W; 5%	T-1101	N5950-647-7044	AF Transformer
R-1116	*N5905-195-9483	Resistor: 150KΩ; 1/2W; 5%	T-1601	N5950-647-5408	Power Transformer
R-1117	*N5905-192-0379	Resistor: 330KΩ; 1/2W; 5%	V-501	N5960-256-9989	Tube: 5899
R-1-18	*N5905-192-0379	Resistor: 330KΩ; 1/2W; 5%	V-526	N5960-256-9989	Tube: 5899
R-1119	*N5905-279-1880	Resistor: 2.7KΩ; 1/2W; 5%	V-551	N5960-230-5226	Tube: 5636
R-1120	*N5905-249-9468	Resistor: 130KΩ; 1/2W; 5%	V-552	N5960-228-3793	Tube: 5718
R-1121	*N5905-190-8865	Resistor: 270KΩ; 1/2W; 5%	V-601	N5960-228-3793	Tube: 5718
R-1122	*N5905-192-3981	Resistor: 120KΩ; 1/2W; 10%	V-901	N5960-230-5226	Tube: 5636
R-1123	*N5905-171-1999	Resistor: 820Ω; 1/2W; 10%	V-1001	N5960-256-9989	Tube: 5899
R-1124	*N5905-249-3661	Resistor: 68KΩ; 1/2W; 10%	V-1002	N5960-256-9989	Tube: 5899
R-1125	N5905-279-2515	Resistor: 470KΩ; 1/2W; 10%	V-1003	N5960-256-9989	Tube: 5899
R-1126	*N5905-279-3505	Resistor: 3.9KΩ; 1/2W; 10%	V-1004	N5960-230-5226	Tube: 5636
R-1127	*N5905-195-6761	Resistor: 100KΩ; 1/2W; 10%	V-1005	N6645-695-0204	Tube: 5647
R-1128	*N5905-195-6761	Resistor: 100KΩ; 1/2W; 10%	V-1006	** N6645-695-0204	Crystal Unit: 1N458
R-1129	*N5905-279-3505	Resistor: 3.9KΩ; 1/2W; 10%	V-1007	N5960-228-3793	Tube: 5718
R-1130	N5905-279-2515	Resistor: 470KΩ; 1/2W; 10%	V-1101	N6645-695-0204	Tube: 5647
R-1131	*N5905-190-8874	Resistor: 1.2 meg.; 1/2W; 10%	V-1102	** N5960-228-3793	Crystal Unit: 1N458
R-1132	*N5905-279-1080	Resistor: 2.7KΩ; 1/2W; 5%	V-1103	N6645-695-0204	Tube: 5647
R-1133	N5905-279-2515	Resistor: 470KΩ; 1/2W; 10%	V-1104	** N5960-228-0636	Crystal Unit: 1N458
R-1134	*N5905-195-6761	Resistor: 100KΩ; 1/2W; 5%	V-1105	N5960-228-3793	Tube: 5718
R-1135	*N5905-190-8880	Resistor: 1.2KΩ; 1/2W; 5%	V-1106	N6645-695-0204	Tube: 5647
R-1136	*N5905-192-3971	Resistor: 680Ω; 1/2W; 10%	V-1107	** N6645-695-0204	Crystal Unit: 1N458
R-1137	*N5905-185-8490	Resistor: 4.7 meg.; 1/2W; 5%	V-1108	** N5960-228-0636	Crystal Unit: 1N458
R-1138	N5905-279-2515	Resistor: 470KΩ; 1/2W; 10%	V-1109	N5960-248-3090	Tube: 5719
R-1201	*N5905-190-8885	Resistor: 2.2 meg.; 1/2W; 5%	V-1201	N5960-228-3793	Tube: 5718
R-1202	*N5905-192-3973	Resistor: 470Ω; 1/2W; 5%	V-1202	N5960-228-3793	Tube: 5718
R-1203	*N5905-279-3502	Resistor: 12KΩ; 1/2W; 5%	V-1301	N5960-230-5241	Tube: 5840
R-1204	*N5905-195-6453	Resistor: 5.6KΩ; 1/2W; 5%	V-1601	*N5960-272-9182	Tube: 6X4
R-1205	*N5905-239-0579	Resistor: 8.2KΩ; 1/2W; 5%	V-1602	*N5960-272-9182	Tube: 6X4
R-1206	*N5905-279-3521	Resistor: 15Ω; 1/2W; 10%	V-1603	N5960-262-0184	Tube: 5644
R-1301	N5905-279-1876	Resistor: 2.2KΩ; 1/2W; 10%	Y-901	N5955-129-8795	Crystal Unit, Quartz: 1400kc
R-1302	N5905-817-5636	Resistor: 1000Ω; 1/2W; 10%	Y-201	N5955-132-5777	Crystal Unit, Quartz: 200kc
R-1303	*N5905-195-9482	Resistor: 27KΩ; 1/2W; 10%	Z-501	N5930-308-4593	1st RF Amp. Antenna Assembly
R-1304	*N5905-171-2004	Resistor: 22KΩ; 1/2W; 10%	Z-551	N5820-305-1946	Mixer & Cathode Follower:
R-1305	*N5905-195-6761	Resistor: 100KΩ; 1/2W; 10%	Z-601	N5820-308-4875	Mixer Assembly
R-1601	*N5905-107-4898	Resistor, Variable: 500Ω; 2W; 20%	Z-901	N5820-305-1944	Oscillator: Oscillator Assembly
R-1602	*N5905-249-3642	Resistor: 39KΩ; 2W; 10%	Z-1004	N5820-303-4461	Converter: 1st IF Assembly
R-1603	*N5905-175-7436	Resistor: 4KΩ; 12.5W; 5%	Z-1006	N5820-303-4449	1st Amp.: 2nd IF Assembly
R-1604	*N5905-250-5068	Resistor: 400Ω; 12.5W; 5%	Z-1008	N5820-303-4462	2nd Amp.: 2nd IF Assembly
R-1605	N5905-644-5003	Regulator Tube: 1HT4	Z-1010	N5820-303-4451	3rd Amp.: 2nd IF Assembly
R-3801	*N5905-108-9918	Resistor: 50Ω; 2W; 20%	Z-1012	N5820-308-4592	BFO Mixer: 2nd IF Assembly
R-3802	*N5905-279-2637	Resistor: 47Ω; 1W; 10%	Z-1013	N5820-308-4592	Detector: 2nd IF Assembly
S-501	N5930-699-2041	Switch, Rotary: 3 pole, 6 position, 6 throw, single section	Z-1014	N5820-303-4588	AGC Delay Diode: 2nd IF Assembly
S-502	N5930-568-1016	Switch, Rotary: 6 pole, 6 position, 6 throw; two section(S-502A,S-502B)	Z-1014	N5820-246-6577	Cathode Follower: 2nd IF Assembly
S-526	N5930-568-1015	Switch, Rotary: 6 pole, 6 position, 6 throw; two section (S-526A,S-526B)	Z-1101	N5820-644-4427	Noise Limiter Diode: Audio Assembly
S-551	N5930-309-2795	Switch, Rotary: 6 pole, 6 position, 6 throw; two section(S-551A,S-551B)	Z-1102	N5820-303-4458	1st Audio Amp.: Audio Assembly
S-601	N5950-568-1015	Switch, Rotary: 6 pole, 6 position, 6 throw; two section(S-601A,S-601B)	Z-1103	N5820-303-4457	Silencer Diode: Audio Assembly
S-651	N5930-050-2635	Switch, Toggle: DPST	Z-1104	N5820-303-4459	Silencer Control Amplifier: Audio Assembly
S-652	N5930-050-2630	Switch, Toggle: SPDT	Z-1105	N5820-309-0105	2nd Audio Amp.: Audio Assembly
S-654	N5930-245-7019	Switch, Rotary: SPDT; two position; single section	Z-1106	N5820-303-4453	Limiter Diode: Audio Assembly
S-655	N5930-249-1465	Switch Rotary: single pole, 4 position, 3 throw; single section	Z-1107	N5820-303-4452	Limiter Diode: Audio Assembly
S-656	N5930-296-5584	Switch, Rotary: two section; 2 position, two pole, two throw (S-656A,S-656B)	Z-1108	N5820-303-4456	3rd Audio Amp.: Audio Assembly
S-1001	N5930-548-4078	Switch Section, Rotary: 3 pole, 6 position, 18 contacts; single section	Z-1109	N5820-303-4455	Audio Output: Audio Assembly
S-1002	N5930-548-4078	Switch Section, Rotary: 3 pole, 6 position; 18 contacts; single section	Z-1110	N5915-375-2217	Filter, Band Pass: Controls Response of Audio Unit
S-1003	N5930-548-4078	Switch Section, Rotary: 3 pole, 6 position; 18 contacts; single section	Z-1201	N6625-501-1436	Multivibrator: Crystal Calibrator Assembly
S-1101	N5930-694-1676	Switch, Rotary: 5 pole, 6 position; 36 contacts; two section(S-1101A,S-1101B)	Z-1202	N5820-669-8954	Multivibrator: Crystal Calibrator Assembly
S-1301	N5930-548-4077	Switch Section, Rotary: 2 pole, 9 position 18 contact; single section	Z-1301	N5950-696-8933	Coil, RF: BFO Assembly
S-3801	N5950-296-9342	Switch, Sensitive; SPDT	Z-1302	N5820-644-4447	BFO: BFO Assembly
T-501	N5950-696-8950	Antenna Transformer: adj. iron core	Z-1801	N5915-375-2347	Filter, Low Pass: Filters Output Circuit from 2nd IF
T-502	N5950-696-8952	Antenna Transformer: adj. iron core	Z-1802	N5915-284-5425	Filter, Low Pass: Filters Power Line Circuit
T-503	N5950-696-8947	Antenna Transformer: adj. iron core	Z-1803	N5915-373-0834	Filter, Low Pass: Filters Audio Output Circuit
T-504	N5950-645-6111	Antenna Transformer: adj. iron core	Z-1804	N5915-644-5731	Filter, Band Pass: Filters Output Circuit from 1st IF
T-505	N5950-647-9337	Antenna Transformer: adj. iron core			
T-526	N5950-647-9478	RF Transformer: adj. iron core			

*Indicates Stock Number of replacement part. May differ in some respect from original part and description.

**Alternate Item

