NAVSHIPS 93316 *(Non-Registered)*

TECHNICAL MANUAL

for

RADIO RECEIVING SET AN/URR-44

DERO RESEARCH AND DEVELOPMENT CORP.
HUNTINGTON, NEW YORK

DEPARTMENT OF THE NAVY
BUREAU OF SHIPS

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IN REPLY REFER ..

Code 695E-100

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

Subj: Technical Manual for Radio Receiving Set AN/URR-44, NAVSHIPS 93316.

1. This is the Technical Manual for the subject equipment and is in effect upon receipt.

2. When superseded by a later edition, this publication shall be destroyed.

3. Extracts from this publication may be made to facilitate the preparation of other Department of Defense publications.

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R.K. JAMES
Chief of Bureau

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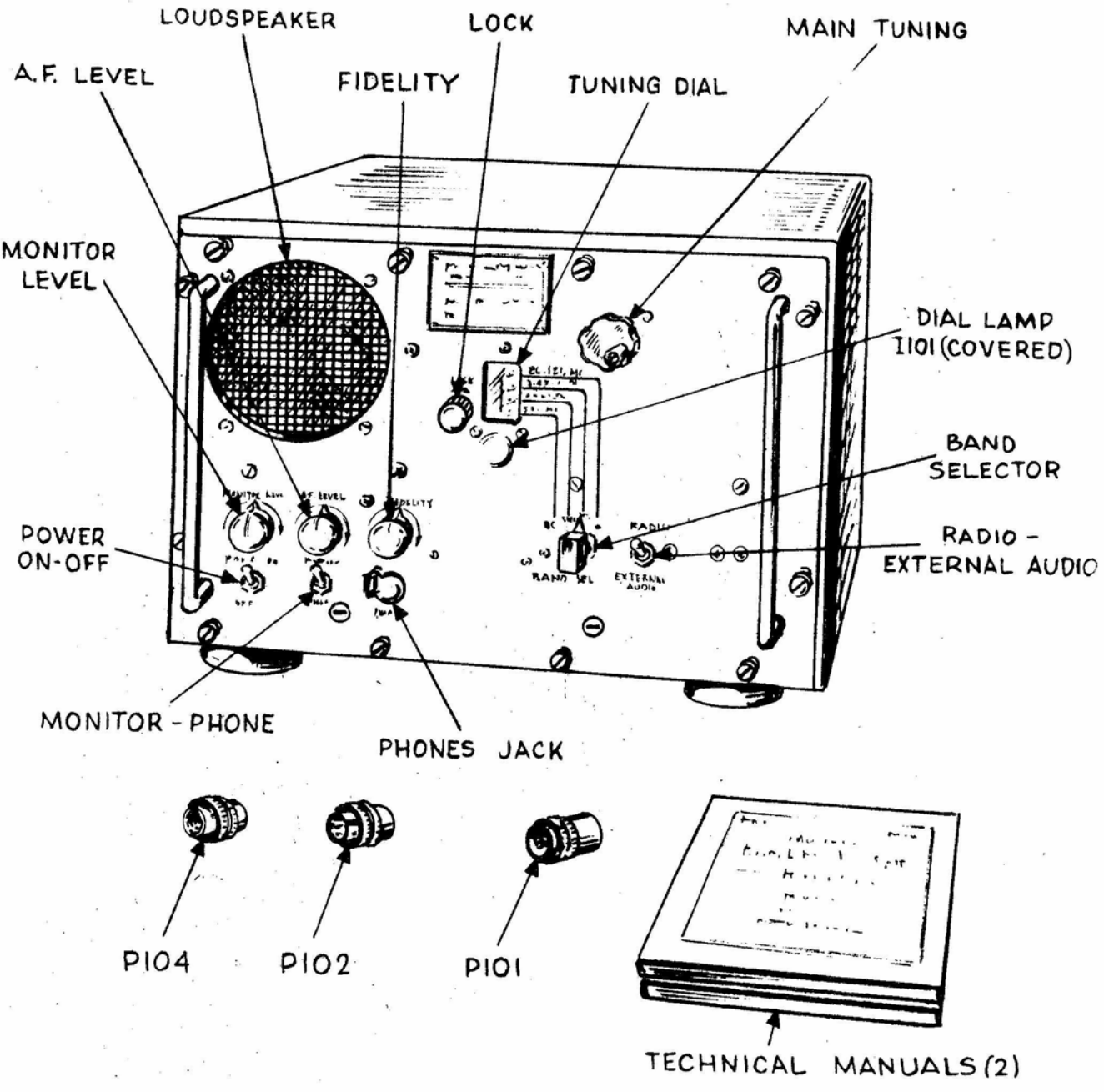


Figure 1-1. Radio Receiving Set AN/URR-44

SECTION 1

GENERAL INFORMATION

1-1. SCOPE OF MANUAL.

This manual describes Radio Receiving Set AN/URR-44, and includes installation, operation, and maintenance procedures.

1-2. DESCRIPTION OF RADIO RECEIVING SET AN/URR-44.

Radio Receiving Set AN/URR-44 (figure 1-1) consists of Radio Receiver R-892/-URR-44, three connector plugs for external cables, and two instruction books.

The AN/URR-44 is a superheterodyne type radio receiving set designed for use aboard all types of U.S. Naval surface vessels, and at Naval shore radio stations. The receiver is designed for voice modulated signal reception on standard broadcast and shortwave bands within the frequency range of 0.54 megacycles to 18.6 megacycles.

a. ELECTRICAL. - Radio Receiver R-892/URR-44 is an 11-tube superheterodyne type receiver, with a frequency coverage of 0.54 MC to 18.6 MC in four bands as follows:

BAND	FREQUENCY RANGE (MC)
BC	0.54 to 1.6
SW1	1.6 to 3.45
SW2	3.45 to 8.6
SW3	8.6 to 18.6

The receiver is designed to operate from external power sources of 105/115/125 volts, 50/60 cycles A.C. The signal circuits of the receiver consist of: one R.F. amplifier stage; an H.F. oscillator stage; a mixer stage; two I.F. amplifier stages; a crystal diode second detector stage; two resistance-coupled A.F. stages; a phase splitter, and a push-pull audio output amplifier providing faithful reproduction of the received signals. A separate tube provides amplified automatic gain control voltage. A self-contained power supply delivers all voltages required for operation of the receiver when connected to the proper power source.

The audio circuits of the receiver permit the use of a pair of standard 600-ohm headphones or the built-in monitor loudspeaker, plus from 1 to 10 external loudspeakers having individual amplifiers. Audio output at the built-in loudspeaker is at least 100 milliwatts, with at least 0.2 to 2.5 watts available at the terminals of audio output connector J104, depending on the lead impedance.

Provision is made for connecting a high-impedance type record player pickup or similar apparatus to the audio circuits of the receiver.

b. MECHANICAL. - The receiver is housed in an enclosed cabinet suitable for mounting on a table or bench. Shock mounts on the bottom of the cabinet contribute to mechanical stability of the equipment. The chassis is fastened to the front panel, which forms the sixth side of the cabinet. The panel and chassis assembly is secured to the cabinet by 12 knurled thumb-screws along the edges of the panel, thus allowing easy removal of the assembly from the cabinet for inspection and servicing. All operating controls are mounted on the front panel, while the

rear of the chassis mounts the power receptacle, antenna input connector, audio output connector, external audio input terminal board, and fuses.

Harmonic radiation from the high-frequency oscillator circuit is minimized through the use of extensive shielding and filtering within the receiver. The R.F. amplifier tube, V101, is completely enclosed by a removable shield cover; the antenna circuit, R.F. transformers, and R.F. switching are enclosed by another shield. A third compartment shields the R.F. transformers and associated switches for the mixer and H.F. oscillator circuits. Two separate 455-KC wave traps in the R.F. section prevent any spurious 455-KC signals in the antenna input circuit from reaching the mixer tube.

1-3. QUICK REFERENCE DATA.

a. FREQUENCY RANGE. - 0.54 MC to 18.6 MC.

(1) TUNING BANDS AND RANGE OF EACH BAND.

(a) BC. - 0.54 to 1.6 MC.

(b) SW1. - 1.6 to 3.45 MC.

(c) SW2. - 3.45 to 8.6 MC.

(d) SW3. - 8.6 to 18.6 MC.

(2) NUMBER OF PRE-SET FREQUENCIES. - None.

b. TYPE OF FREQUENCY CONTROL. - Manually tuned, self-excited oscillator.

c. INTERMEDIATE FREQUENCY. - 455 KC ± 10%.

d. TYPE OF RECEIVER. - Superheterodyne (A.M.).

e. TYPE OF RECEPTION. - A3--Telephone; double sideband, full carrier.

f. AUDIO OUTPUT.

(1) MONITOR SPEAKER. - 100 MW, minimum.

(2) 600-OHM LINE. - 200 MW, minimum.

(3) 60-OHM LINE. - 2.5 W, minimum

(4) HEADPHONE. - 100 MW, minimum.

g. IMPEDANCE

(1) ANTENNA INPUT. - 70 ohms, unbalanced.

(2) AUDIO OUTPUT.

(a) LINE OUTPUT. - 600 to 60 ohms.

(b) PHONES JACK. - 600 ohms.

(3) EXTERNAL AUDIO INPUT. - High impedance.

h. RECOMMENDED ANTENNA. - Open-wire type, approximately 50 ft long, 70 ohms impedance.

i. POWER SUPPLY CHARACTERISTICS.

(1) TYPE. - Self-contained, full-wave rectifier.

(2) INPUT.

(a) A.C. VOLTAGE. - 105/115/125 V.

(b) FREQUENCY. - 50/60 CPS

(c) PHASE. - Single.

(3) CURRENT DRAIN. - 0.73 A.

(4) POWER CONSUMPTION. - 80 W.

1-4. EQUIPMENT LISTS.

a. EQUIPMENT SUPPLIED. - See table 1-1.

b. EQUIPMENT REQUIRED BUT NOT SUPPLIED. - See table 1-2.

c. SHIPPING DATA. - See table 1-3.

TABLE 1-1. EQUIPMENT SUPPLIED

Quant. Per Equip.	Nomenclature		*Overall Dimensions			*Volume	*Weight
	Name	Designation	Height	Width	Depth		
1	Radio Receiver	R-892/URR-44	12-3/8	18	17-3/8	2.24	62
2	Technical Manual	NAVSHIPS	11	8-1/2	1/2	--	--
1	Connector, Antenna	UG-21D/U					
1	Connector, A.C. Input	AN3106B-14S-7S					
1	Connector, Audio	AN3106B-14S-2S					

* Unless otherwise noted, dimensions are in inches, volume in cubic feet, and weight in pounds.

TABLE 1-2. EQUIPMENT REQUIRED BUT NOT SUPPLIED

Quant. Per Equip.	Nomenclature		Required Use	Required Characteristics
	Name	Designation		
1	Antenna		Signal pickup	50 to 100 ft long, fed with 70-ohm coaxial cable
As required	Antenna transmission line		Antenna to receiver connection	Coaxial cable, 70-ohms impedance
As required	Power cable	MCOS-2	A.C. power input cable	2 wires, No. 18 AWG or larger
As required	Audio output cable	TTHFWA-1 1/2	Audio output connection from receiver to external apparatus	Shielded, 2-conductor cable
1	Headphones with cord and plug		Listening	600-ohm impedance

TABLE 1-3. SHIPPING DATA

Nomenclature		*Overall Dimensions			*Volume	*Weight
Name	Designation	Height	Width	Depth		
Radio Receiving Set	AN/UER-44	18 3/4	22	21 3/4	5.2	98

* Unless otherwise noted, dimensions are in inches, volume in cubic feet, and weight in pounds; equipment crated and ready for shipment.

SECTION 2

INSTALLATION

2-1. UNPACKING.

a. The complete equipment, consisting of Radio Receiver R-892/URR-44, three connectors, one set of equipment spare parts, and two technical manuals, is packed in a fibreboard carton for domestic shipment. The equipment is protected from humidity by a moisture-proof barrier carton, with an 18-month supply of silica gel inside. The barrier carton should not be opened until the equipment is to be installed, since the silica gel rapidly becomes saturated and loses its protective qualities when exposed to humid atmosphere.

b. Thoroughly inspect the receiver inside and outside for signs of damage. To reach the interior of the receiver, loosen the 12 knurled thumb-screws along the edges of the front panel, and withdraw the chassis-panel assembly as far as possible. Release the locks on each side of the chassis, by pressing down on the two lever-type catches. Lift the assembly and bring it forward, out of the cabinet.

2-2. POWER REQUIREMENTS.

The equipment is designed to operate from external power sources of 105/115/125 volts, 50/60 cps, single phase.

2-3. INSTALLATION LAYOUT.

a. SITE. - Radio Receiving Set AN/URR-44 is designed for permanent installation on an operating table or bench. To install the equipment permanently, drill four 3/8-inch diameter holes (located 14-1/2 inches apart at the long dimension, and 11-3/4 inches apart at the short dimension), to accommodate the 3/8-inch bolts holding the shock mounts.

b. POSITIONING OF RECEIVER. - When determining the location of the receiver, make sure that a minimum of three feet on all sides of the receiver is provided. This clearance insures easy access to the connections and fuses, which are mounted on the rear of the cabinet. The receiver should be located in a room, or section of a room, where the temperature will be about constant, and away from any direct heat or cold. Extensive electrical shielding precludes the possibility of interaction between the receiver and any other equipment which may be in the room.

2-4. INSTALLATION REQUIREMENTS.

a. ANTENNA. - The antenna input circuit of the receiver is designed with a characteristic impedance of 70 ohms. This allows a single-wire antenna to be properly coupled to the receiver by means of an unbalanced transmission line. Best results will be experienced when the single-wire antenna is fed with coaxial cable of approximately 72 ohms nominal impedance (such as RG-11/U, or similar). The antenna should be of optimum length (between 50 to 100 feet), placed in the open as much as possible, and spaced at least six feet from any parallel stay, mast, or stack. A static drain resistor of approximately 500,000 ohms resistance

should be permanently installed between the antenna and ground, at any convenient point. Connection between the antenna transmission line and the receiver is made through the use of two mating connectors. ANT. connector J101 is similar to a type UG-58A/U connector, and is mounted on the rear of the chassis. Antenna plug P101 is a type UG-21D/U connector, which is packed with the receiver. P101 is permanently affixed to the antenna transmission line when installation is performed.

b. INTERCONNECTIONS. - Detailed instructions are given herein for connection of power, external amplifiers, and/or an external record player.

(1) POWER CONNECTION. - In order to connect power to the receiver, the A.C. power cable must be fabricated. Select a suitable length of two-conductor power cable (such as Navy type MCOS-2), and terminate one end in a plug which will permit connection to the A.C. supply lines used in the installation. A.C. plug P102, a type AN3106-14S-7S connector, is then attached to the other end of the power cable. Connect one conductor to pin A of P102 and the other conductor to pin C. Completely remove the chassis from the cabinet as described in paragraph 2-1b, and locate primary switch panel S106 underneath the chassis (figure 5-3). Determine the supply voltage of the installation, and connect the movable link on S106 to the position corresponding to the available supply voltage. Loosen the two screws which secure the link and loosen the screw corresponding to the correct voltage position. Each terminal on S106 is marked to indicate the voltage with which it is to be used, either 105, 115 or 125 volts A.C. Slide the link along the direction of its slot, until the link is free to pivot on its retaining screw. Slide the forked end of the link under the screw corresponding to the correct voltage setting, and tighten all screws securely. Replace the chassis into the cabinet. The A.C. line cord may now be connected between the A.C. supply and the receiver A.C. power connector, J102.

(2) EXTERNAL AMPLIFIER CONNECTIONS. - The R-892/URR-44 receiver is fitted with an audio output receptacle, J104, which is mounted on the rear of the chassis. J104 is a type AN3102-14S-2P connector, which is used to connect external apparatus to the receiver audio circuits. One to ten external loudspeaker-amplifiers may be operated simultaneously from the audio output circuit of the receiver. The input circuits of the external amplifiers should be connected in parallel with each other. P104, which mates with AUDIO jack J104, must be attached to the connecting cable (such as Navy type TTHF-WA-1 1/2 shielded two-conductor cable). With external amplifiers connected to the receiver in this manner, their input power level may be controlled by the A.F. LEVEL. MONITOR LEVEL is used to control the amount of audio at the loudspeaker or PHONES jack, J103.

(3) EXTERNAL AUDIO INPUT CONNECTION. - The R-892/URR-44 receiver is equipped to audibly reproduce the output of a high-impedance type record player, or similar device, through the receiver audio circuits. EXT. INP. connector TB119 is a screw-type terminal board mounted on the rear of the chassis, to accept the single-wire shielded cable from the external audio device. To connect a record player to the receiver, first loosen the two screws, marked PHONO and GND, on TB119. Wrap the center conductor of the shielded lead from the record player around the PHONO screw and the shield around the screw marked GND. Tighten the two screws. This completes the installation. See paragraph 3-3b for the method of operating the receiver when connected in this manner.

2-5. INSPECTION AND ADJUSTMENTS.

There are no initial adjustments required before the R-892/URR-44 receiver is placed in normal operation. To insure that it has been properly installed and

is in correct operating condition, a listening test should be made. This test should be made of all four frequency bands. All controls should be operated to insure that they perform their intended functions properly. Refer to Section 3 for a discussion of the various front-panel mounted controls and the operating instructions. No further tests or adjustments are necessary prior to operation.

SECTION 3

OPERATOR'S SECTION

3-1. INTRODUCTION.

The R-892/URR-44 is a superheterodyne-type radio receiver designed for use aboard all types of U.S. Naval surface vessels, and at Naval shore radio stations. The equipment is capable of receiving voice transmissions over a frequency range of 0.54 MC to 18.6 MC. This section is intended to provide the operator with sufficient information for efficient operation of the equipment.

3-2. DESCRIPTION OF CONTROLS.

All controls necessary for normal operation of the receiver are front-panel mounted, and arranged in logical positions for most efficient operation. The following subparagraphs are presented to familiarize the operator with the function of each operational control and device. Figure 1-1 locates and identifies all front-panel mounted controls of the receiver.

a. MAIN TUNING. - This control is used, in conjunction with the BAND SELECTOR (subpar. h below), to tune the receiver to any specific frequency between 0.54 MC and 18.6 MC. The tuning dial is calibrated directly in megacycles, and frequencies may be read from the dial with an accuracy of ± 1%. A hairline indicator is centrally located over the calibrated dial. Clockwise (CW) rotation of the main tuning control corresponds to an increase in frequency. The tuning control varies the three sections of capacitor C109, in the tuned circuits of the R.F. amplifier, the H.F. oscillator, and the mixer.

b. LOCK. - The LOCK control is a friction-type device, which functions to lock or unlock the main tuning drive mechanism. The mechanism is locked when the control is turned fully CW.

c. POWER ON-OFF. - This toggle switch connects and disconnects both sides of the A.C. power line, to turn the receiver on or off.

d. MONITOR-PHONE. - This toggle switch connects an audio circuit of the receiver to either the PHONES jack or the built-in loudspeaker, without affecting the main audio output line. With this switch in the MONITOR position, the speaker is connected into the circuit and the headphones are switched out. The PHONE position disconnects the loudspeaker, and connects the PHONES jack.

e. A.F. LEVEL. - This control is used to adjust the audio output volume of the receiver, from a minimum at the extreme counterclockwise (CCW) position to a maximum at the extreme CW position.

f. MONITOR LEVEL. - This control adjusts the audio power level delivered to the monitor loudspeaker or to the PHONES jack, without affecting the audio level at the line output connector.

g. FIDELITY. - This control determines the frequency response characteristics of the audio amplifier stages, within certain limits. Maximum CW position of this

control provides maximum H.F. or treble response, while CCW rotation gives normal flat frequency response.

h. BAND SELECTOR. - This is a four-position switch which selects the desired frequency band at which the receiver is to be operated. The four positions of the switch are marked on the front panel of the receiver: BC, SW1, SW2, and SW3. The BC position indicates that the receiver is set for operation on the broadcast band, while the remaining three positions indicate the three short-wave bands on which the receiver may be operated. Depending upon its position, the BAND SELECTOR switch selects the proper tuned circuits of the antenna input section, the R.F. amplifier, the H.F. oscillator, and the mixer stages for the particular band of operation of the receiver.

i. RADIO-EXTERNAL AUDIO. - This is a double-pole double-throw switch, which is used to select the desired manner of operation of the receiver audio circuits. When operating in the EXTERNAL AUDIO position, the switch removes B+ from the second I.F. amplifier, disconnects the detector output signal from the audio input stage, and connects the PHONO input at TB119 to the audio amplifier stage. With the switch in the RADIO position, the equipment operates as a normal receiver.

j. PHONES JACK. - The PHONES jack is a Navy type 49025A telephone jack, which is used to connect a pair of headphones to the audio output circuit of the receiver. The jack accommodates a JAN type PJ-055B head-telephone plug. The MONITOR-PHONE switch must be in the PHONE position for headphone reception of the desired signal.

3-3. SEQUENCE OF OPERATION.

This paragraph contains step-by-step instructions for proper operation of the receiver. The operating controls are identified in figure 1-1. Careful adherence to the procedures given will enable the receiver to be operated in the most efficient manner.

a. PHONE RECEPTION.

(1) After the receiver is properly installed (as described in Section 2), the receiver may be placed in operation in the following manner:

Step 1. Place the POWER ON-OFF switch in the POWER ON position.

Step 2. Place the MONITOR-PHONE switch in the MONITOR position.

Step 3. Place the RADIO-EXTERNAL AUDIO switch in the RADIO position.

Step 4. Set the BAND SELECTOR switch to the desired frequency range.

Step 5. Set the MONITOR LEVEL control at mid-range.

Step 6. Adjust the A.F. LEVEL control to produce a small amount of receiver background noise in the monitor loudspeaker.

Step 7. Loosen the locking lever by turning the LOCK dial fully CCW.

Step 8. Tune in the desired signal by turning the tuning control till the hairline indicator is in line with the approximate frequency setting of the station to be received. Slowly rotate the tuning control back and forth until a point is found where the received signal is strongest.

Step 9. After the signal has been properly tuned in, tighten the LOCK dial (fully CW).

Step 10. Set the FIDELITY control to the position giving the desired audio response. The receiver is now adjusted for proper reception.

(2) The settings and adjustments given in (1) above are for the reception of signals of average strength. Variation from the average may require modification of certain control settings; the A.F. LEVEL may be adjusted to produce the desired audio level to the outgoing audio lines; reception of weak signals may be improved by setting the FIDELITY control to the maximum CCW position. If the receiver is driving external audio equipment, the volume of the monitor loudspeaker or headphones may be varied, without affecting the external equipment, by adjusting the MONITOR LEVEL control.

b. EXTERNAL AUDIO INPUT OPERATION. - For operation of a high-impedance type of record player, or other types of audio devices, through the receiver's audio circuits, proceed with the following steps:

Step 1. Connect the audio input device to TB119, at the rear of the receiver.

Step 2. Place the POWER ON-OFF switch in the POWER ON position.

Step 3. Place the RADIO-EXTERNAL AUDIO switch in the EXTERNAL AUDIO position.

Step 4. Activate the audio input device.

Step 5. Adjust the A.F. LEVEL control for the desired audio level to the outgoing audio lines, and the MONITOR LEVEL control for the desired volume at the loudspeaker or headphone.

Step 6. Adjust the FIDELITY control for the desired frequency response.

NOTE

The only controls which have an effect on the receiver performance during this mode of reception are the A.F. LEVEL, FIDELITY, and MONITOR LEVEL controls, and the POWER ON-OFF switch.

3-4. OPERATOR'S MAINTENANCE.

a. ROUTINE CHECKS. - The following routine checks of normal operation of the R-892/URR-44 receiver may be made by the operating personnel. The tests are to be made with the receiver operating under normal conditions. Careful routine check of the equipment very often prevents failure under conditions when maintenance personnel are not available. The following chart assumes that the POWER ON-OFF switch is in the POWER ON position.

TABLE 3-1. ROUTINE CHECK CHART

WHAT TO CHECK	HOW TO CHECK	PRECAUTIONS
Dial lamp	Observe that the lamp is lighted.	If lamp does not light, check fuses and power.
Receiver operation	Make listening test for normal operation by tuning the receiver through each frequency band.	Note the operation of all controls.
External connections and cables	Inspect the firmness of all connections to the receiver. Check that cables have not been damaged.	Loose connections or damaged cables may result in faulty operation.

b. EMERGENCY MAINTENANCE. - The maintenance procedures given in the following paragraphs are intended for the guidance and use of the operating personnel in correcting or restoring the operation of the equipment, at times when a technician may not be available.

NOTE

Operators shall not perform any of the following emergency maintenance procedures without proper authorization.

(1) WITHDRAWAL AND REPLACEMENT OF RECEIVER. - If the receiver is inoperative, it should be withdrawn from the cabinet to determine if there is some obvious fault that can be corrected easily. To withdraw the receiver from the cabinet, proceed as follows:

Step 1. Remove all connections at the rear of the receiver.

Step 2. Loosen the 12 captive thumb-screws around the outer edge of the front panel.

Step 3. Grasp the handles located on the front panel, and pull the chassis forward as far as the release mechanism will permit. At this point the slide release mechanism on both sides of the chassis will drop into slotted grooves, thus locking the chassis in place and preventing forward or backward movement of the chassis.

Step 4. To remove the chassis from the cabinet, depress the slide release on each side of the chassis and pull the chassis forward (figure 3-1).

CAUTION

When servicing the R-892/URR-44 receiver, do not place the chassis on its back with its full weight resting on the receptacles. This practice may cause damage to the receptacles.

Step 5. To replace the receiver chassis into the cabinet, depress the slide release levers and push the chassis into the cabinet until the positioning pins fall into place. Tighten the captive screws around the outer edges of the front panel and replace all connections at the rear of the receiver.

(2) FUSE REPLACEMENT. - If the receiver is inoperative and there is no evidence of trouble at the power source, check the receiver fuses F101 and F102. Fuses F101 and F102 are two-ampere fuses and are mounted with two spares, F103 and F104, at the rear of the receiver (figure 5-1). Probable cause of fuse failure is a short-circuit in the primary of the power transformers, the filament circuit, or the B+ circuit.

CAUTION

Never replace a fuse with one of higher rating unless continued operation of the equipment is more important than probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause has been corrected.

(3) ELECTRON TUBE REPLACEMENT. - All electron tubes employed in the R-892/URR-44 receiver are located and identified in figure 5-2. If a particular tube is defective, as observed visually by the absence of heater or filament glow, the tube may be replaced by another of the same type of proven quality. The A.C. plug may be connected at this time to energize the receiver so that the tubes may be visually inspected.

(a) To remove the rectifier tube V113, it will be necessary to first loosen the clamp about the base of the tube. To loosen the clamp, locate the slotted hole in the lever arm of the clamp and insert a small screwdriver into the hole. Rotate the screwdriver in a counterclockwise direction and the clamp will release, permitting the tube to be removed from its socket by a straight upward pull. To fasten the clamp after replacing the rectifier tube, push the lever arm of the clamp towards the tube, taking care not to damage the tube or other nearby components.

(b) R.F. Amplifier V101 is enclosed in a metal shield which is secured by four captive screws. To remove the shield, remove the four screws around the bottom edge of the shield, with a screwdriver. Lift the shield upward and the R.F. amplifier tube will be seen mounted on a small bracket. To remove the tube press down on the small metal tube shield and, rotating the shield in a counterclockwise direction, release the shield from the tube base and remove the shield. The tube may now be removed by carefully pulling the glass envelope straight out, using caution to prevent bending the tube pins. The tube may be replaced by reversing the above procedure.

(c) The remaining tubes used in the receiver are all visible and accessible when the chassis is removed from the cabinet and may be removed in the same manner as the R.F. amplifier tube described above. H.F. oscillator tube V102, in addition

te having a metal shield, also has a spring clamp permanently mounted in the socket te insure mechanical stability.

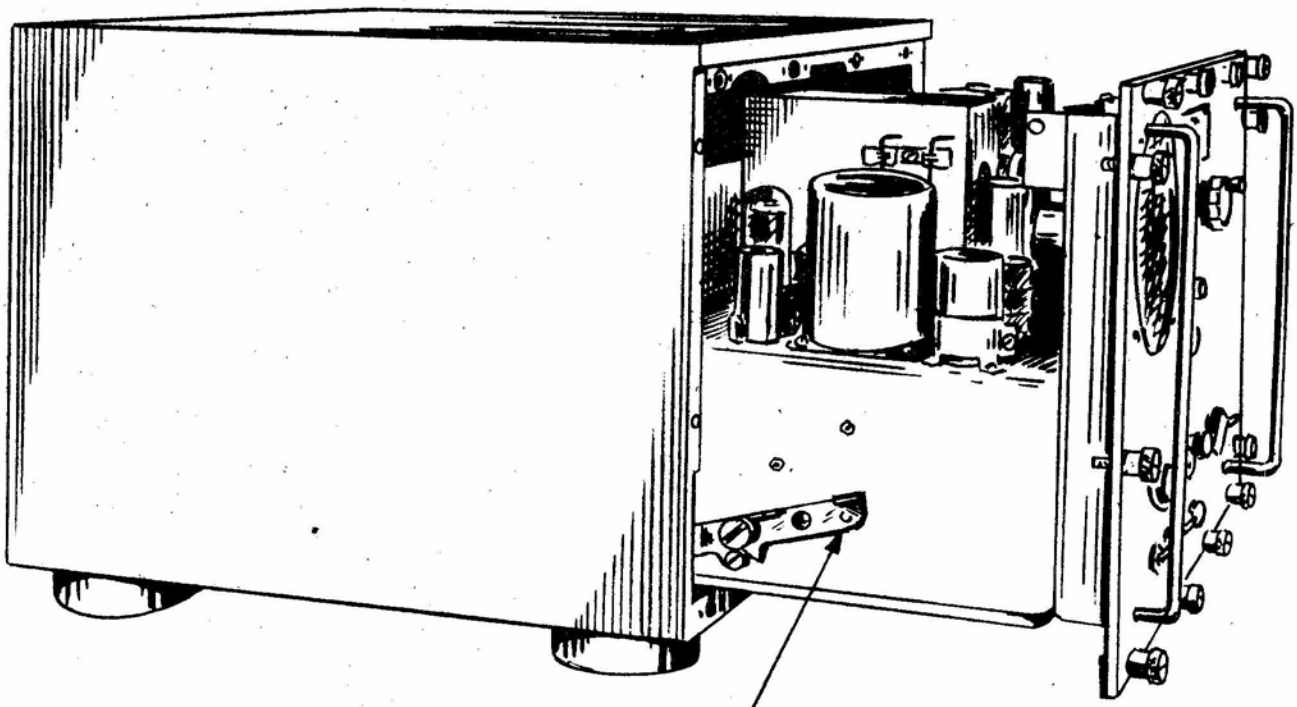


Figure 3-1. Operation of Receiver Release and Slide Mechanism

SECTION 4

PRINCIPLES OF OPERATION

4-1. GENERAL.

The R-892/URR-44 is an 11-tube superheterodyne-type receiver designed to receive voice transmissions on the standard broadcast and international short-wave broadcast bands, within the specified frequency range.

4-2. RECEIVER CIRCUITS.

The receiver employs one R.F. amplifier stage, an H.F. oscillator stage, a mixer stage, two I.F. amplifier stages operating at 455 KC (± 10%), a crystal diode type second detector, two A.F. amplifier stages, a phase splitter, a push-pull audio output stage, and an A.G.C. amplifier. The self-contained power supply consists of a full-wave rectifier and a pi-type LC filter.

4-3. DETAILED CIRCUIT ANALYSIS.

The following subparagraphs describe in detail the operation of the various stages of the R-892/URR-44 receiver. In general, the discussion follows the schematic diagram, figure 6-5. To facilitate circuit description and to present theory in the most easily understandable form, the BAND SELECTOR switch is set at BC (0.54 to 1.6 MC), and all symbol numbers and descriptions, unless otherwise noted, will refer to components associated with this band. Since the circuits on all bands are basically identical, the description will be equally applicable to bands SW1, SW2, and SW3, unless otherwise noted.

a. TUNING. - Simultaneous tuning of the R.F. amplifier, H.F. oscillator, and mixer stages is accomplished by the front-panel mounted tuning control, which drives a three-section ganged tuning capacitor, C109. Frequencies are indicated on the main tuning dial, which is calibrated in megacycles.

b. ANTENNA INPUT CIRCUIT AND R.F. AMPLIFIER V101.

(1) The incoming signal from the antenna enters the receiver circuits through the ANT. input connector J101. Each of the four bands has its own tuned circuit preceding R.F. amplifier V101. Switch section S101A of the BAND SELECTOR switch connects the input signal to the tuned circuit of the desired band. This switch has three main functions:

(a) To connect the input signal to the transformer primary of the tuned circuit of the desired band.

(b) To short out the primaries of the unused tuned circuits.

(c) For BC and SW1 bands only; to connect the 455-kc wave trap, Z105, in parallel with the signal input circuits.

(2) The secondary of the selected tuned circuit is connected to grid 1 of R.F. amplifier V101 by switch section S101B. This switch has five main functions:

(a) To connect the proper transformer secondary to the grid of R.F. amplifier V101.

(b) To ground the secondaries of the unused input transformers.

(c) To connect section C109A of the main tuning capacitor into the tuned circuit secondary of the desired band.

(d) To disconnect the small stator of main tuning capacitor C109A from the tuned circuit on the SW3 band only.

(e) To connect capacitor C107 into the secondary of the tuned circuits on the SW1, SW2, and SW3 bands, when the BAND SELECTOR switch is in these positions.

(3) The input signal is routed by switch S101A to the primary of transformer T103. From the secondary of T103, the signal passes through switch S101B and the parallel resonant-tuned circuit, composed of the secondary of T103, trimmer capacitor C103, and a section of the main tuning capacitor, C109A. The signal is then injected into the signal grid of R.F. amplifier V101 through coupling capacitor C108. The signal is amplified by V101 and appears across mixer transformer T107. V101 is a type 5749 pentode used in a conventional R.F. amplifier circuit, with a plate lead consisting of the parallel combination of resistor R159 and mixer transformer T107. Section S101E of the BAND SELECTOR switch varies the resistance of the R.F. amplifier cathode circuit for each band. In the BC position, this switch connects R163 into the cathode in series with R102; in the SW1 position, R167; and in the SW2 position, R168. In the SW3 position, no additional resistor is connected into the cathode circuit, the bias being set by R102 only. Varying the cathode bias resistor in this manner enables the stage to provide minimum gain to maintain the maximum sensitivity and at the same time, reduce cross modulation to minimum. B+ is applied to V101 through R112, the mixer transformer of each band, and switch section S101D. C134A and C135A are B+ decoupling capacitors.

(4) On the BC and SW1 bands only, a 455-KC wave trap, Z105, is connected in parallel with the signal input circuits. Z105 consists of capacitor C101 in series with variable inductor L101, to form a series-resonant circuit which offers a low-impedance path to ground for any 455-KC signals present in the input signal. A second 455-KC wave trap is included in the plate circuit of V101, in series with the primary of T107. This consists of capacitor C174 in parallel with variable inductor L107, and forms a parallel-resonant circuit tuned to 455 kilocycles. This constitutes a high impedance path for any 455-KC signals.

e. H.F. OSCILLATOR V102.

(1) High-frequency oscillator V102 is a type 6CW4 triode in a conventional Hartley oscillator circuit, with the plate of the oscillator tube at R.F. ground potential. Switch section S101C selects the oscillator tuned circuit for the band in use and, at the same time, shorts out the unused tuned circuits. This switch also connects section C109B of the main tuning capacitor into the selected oscillator tuned circuit. In the SW3 position, only the large stator of C109B is connected into the oscillator tuned circuit of that band; the small stator is shorted to ground.

(2) The oscillator tuned circuit is composed of oscillator coil T111, variable trimmer capacitor C112, padder capacitor C117 in parallel with variable padder capacitor C116, and section C109B of the main tuning capacitor. C109B determines the frequency of the oscillator as the receiver is tuned to signals during normal operation. Variable inductor T111, variable trimmer capacitor C112, and variable padder capacitor C116 are adjusted for proper tracking of the oscillator with the R.F. amplifier and mixer tuned circuits. Capacitor C125 is the feedback coupling capacitor to the grid of V102, and C126A is the bypass capacitor, which maintains the plate of V102 at R.F. ground potential. Regulated B+ voltage is fed to the oscillator plate through R107. C126B is the B+ decoupling capacitor.

d. MIXER V103.

(1) Mixer tube V103 is a type 6BA7 pentagrid converter. Incoming signal voltages, after amplification by R.F. amplifier V101, are impressed across the primary of the mixer transformer, as selected by switch section S101D. This switch has six main functions:

(a) To connect the output of R.F. amplifier V101 to the primary of the mixer transformer of the band in use.

(b) To connect the secondary of the selected mixer transformer to the signal grid (pin 7) of the mixer, through coupling capacitor C133.

(c) To short out the unused mixer transformers.

(d) To connect section C109C of the main tuning capacitor to the selected mixer tuned circuit.

(e) In the SW3 position of the BAND SELECTOR switch: to connect only the larger stator of C109C to the tuned circuit, and to disconnect the smaller stator.

(f) To connect B+ voltage to the plate of R-F amplifier V101.

(2) The signal generated by H.F. oscillator V102 is 455 KC higher in frequency than the incoming signal. This signal passes through coupling capacitor C124 to the injection grid (pin 2) of V103. The mixing of the oscillator signal with the incoming signal (applied at pin 7) produces a signal similar to the original incoming signal but at a frequency of 455 KC, which is impressed across I.F. transformer Z101. Resistor R108 is the grid leak resistor for the oscillator injection grid of V103. C134A is the screen bypass capacitor. Plate voltage is obtained through resistor R113 and the primary of Z101. Screen voltage is tapped from the B+ line between R170 and R176, and supplied to the screen grids through resistor R111. A.G.C. voltage is applied to the signal grid of V103 through isolating resistors R109 and R110.

e. I.F. AMPLIFIERS V104 AND V105. The I.F. amplifier stages are similar, and a discussion of one will hold true for the other. Type 5749/6BA6W pentodes are used. The I.F. amplifiers operate at a frequency of 455 KC ±10%. First and second I.F. transformers, Z101 and Z102, and detector input transformer Z103, are each made up of a primary and secondary winding, tuned to a frequency of 455 KC. A fixed capacitor is connected in parallel with each winding. Tuning is accomplished by adjusting the iron cores of the transformers. In addition, each I.F. transformer has a tertiary winding connected in series with the secondary of the transformer, to provide increased coupling between primary and secondary, and increase the effective

bandwidth of the individual transformer. A.G.C. voltage is applied to the control grid of V104 only, through isolating resistor R114, and the secondary of transformer Z101.

f. SECOND DETECTOR CR101. - Detector input transformer Z103 and diode CR101 comprise a conventional crystal diode second detector stage. Transformer Z103 is tuned to the 455-KC I.F. by capacitor C144 in parallel with the primary winding, and C171 in parallel with the secondary winding; the resonant frequency of the two circuits is controlled by adjustable iron cores. Signals appearing at the secondary of detector input transformer Z103 are rectified by the action of detector CR101. The cathode element of this rectifier is connected directly to ground. Capacitor C145 and resistor R173 comprise a filter for the rectified positive signals. The 455-KC I.F. portion of the signal is filtered out by capacitor C145, and audio signals, with a negative reference level in respect to ground, are developed across resistor R173. The audio signals pass through switch S107, coupling capacitors C155 and C156, and A.F. LEVEL control R141, to the grid of first A.F. amplifier V109A.

g. AUTOMATIC GAIN CONTROL V108.

(1) The A.G.C. amplifier, a type 6C4WA triode, rectifies signals taken from the secondary of detector input transformer Z103, and applies a corresponding D.C. negative voltage to the grids of R.F. amplifier V101, mixer V103, and first I.F. amplifier V104. This biasing voltage controls the amplification of these three stages in inverse proportion to the strength of the signal being received. A.G.C. amplifier V108 converts the signal to a large negative voltage, and applies this negative voltage to the A.G.C. bus. The control grids of the three stages are connected to the A.G.C. bus, so that the A.G.C. voltage is actually grid-biasing voltage, which varies with the strength of the received signal. This controls the amplification of the stages by the correct amount, to provide essentially constant audio output with varying signal strength.

(2) The plate of A.G.C. amplifier V108 is connected to ground through plate lead resistor R131, while the cathode is connected to the B- lead through R174. Note that the only connection within the receiver between chassis ground and B- is through the voltage divider network consisting of resistors R174 and R175. Therefore, the total cathode current of all tubes used in the receiver passes through these two resistors. During normal operation, this current produces a negative voltage of approximately 60 V at the cathode of V108, while the B- lead is approximately 70 V more negative than chassis ground. The value of resistor R174 has been chosen so that the proper grid voltage to bias V108 beyond cutoff is developed across R174, and passes through grid leak resistor R134 to the grid of V108. With no signal or a very weak signal being received, V108 does not conduct; the only biasing voltage on the control grid of each tube in the receiver is that developed due to the action of the individual cathode-biasing resistors associated with each stage.

(3) Assume now that a strong signal is picked up by the receiver, and passes through each stage until it appears at the secondary of detector input transformer Z103. In addition to being detected by CR101, it also passes to the control grid of A.G.C. amplifier V108 through coupling capacitor C148. During the negative half-cycle, it merely drives the grid of V108 more negative and no A.G.C. action takes place. During the positive half-cycle, however, the grid of V108 is driven positive and V108 begins to conduct by an amount proportional to the amplitude of the incoming signal. The resultant voltage drop across the plate lead resistor R131 appears as a more-negative voltage which is passed to the A.G.C. bus through

isolating resistor R130. The RC circuit composed of R131 and C147 smooths out this pulsating D.C. voltages to a steady D.C. voltage suitable for application to the various grids. The values of resistors R174 and R175 determine the correct delay voltage for the stage, so that proper delay in A.G.C. action is obtained.

h. AUDIO AMPLIFIER V109.

(1) Radio Receiver R-892/URR-44 utilizes two stages of audio amplification prier to the actual audio power amplifier and the phase splitter stage which feeds it. Each section of the type 5670 dual-triode is used as a stage of audio amplification for the signal after it leaves the second detector circuit. Basically the stages consist of two resistance-coupled triode amplifiers, with FIDELITY control R140 included as part of the coupling network between the first and second stages.

(2) Rectified audio signals are coupled from the second detector circuit through coupling capacitors C155 and C156 to one side of A.F. LEVEL control R141, and are impressed upon the grid of first audio amplifier V109 through the moveable contact arm of R141. Rotation of the A.F. LEVEL control enables the operater to regulate the amplitude of the signal applied to the audio circuits, and therefore control the audio volume at the loudspeaker. The signals are then amplified by V109A, and coupled from the plate of V109A to the grid of the second audio amplifier V109B through coupling capacitors C158 and C159.

(3) The FIDELITY control network consists of R140, R145, R146 and C154. Voltage from first audio amplifier V109A is reduced by the voltage dropping action of R145 and R146. Since these are resistors, the voltage-dropping action affects the high and low tones to the same degree as when the FIDELITY control, R140, is in its position of maximum resistance. This essentially takes C154 out of the circuit. Thus, a flat A.F. voltage characteristic is produced at the grid of V109B, and is equal to about 1/10th the amplitude of the signal coming from the plate of V109A. When the FIDELITY control is turned to zero resistance, R145 is shunted by capacitor C154. Since the impedance of the capacitor at high frequencies is lower, proportionally, than at low frequencies, the high frequencies will be bypassed around R145 to the grid of V109B, providing more voltage at V109B at high than at low frequencies. Hence, a treble boost effect will result. After passing through the coupling network, the signal is impressed upon the grid of second audio amplifier V109B, where it is amplified and coupled to the grid of phase splitter V110 through coupling capacitors C162 and C163.

(4) R142 is the plate lead resistor for V109A and resistor R147 is the cathode biasing resister bypassed by capacitor C160. Resistor R145 is part of the coupling network between V109A and V109B, while resistor R146 is the grid resistor for V109B. Resistor R144 is the plate load resistor for V109B and resister R149 is the cathode biasing resistor. Degenerative feedback is provided to V109B; its cathode is connected to the plate of audio output amplifier V112 through resister R154.

i. PHASE SPLITTER V110.

(1) In order to provide push-pull audio output from the receiver, the audio signal must be separated into two signals which are identical in shape and amplitude but opposite in phase. This is the function of phase splitter V110, a type 6CL4WA triode. Signals amplified by second audio amplifier V109B are coupled to the grid of phase splitter V110 through coupling capacitors C162 and C163.

(2) The action of plate lead resistor R153 produces a signal at the plate which is 180 degrees out of phase with the input signal on the grid, while at the cathode, signals are obtained which are in phase with the signal on the grid. R152 can be considered part of the plate lead resistance, with R153 comprising another part. Since these resistors are of equal value and in series with the tube, any voltage change across one, due to the variation of plate current through the tube, will be approximately equal in amplitude to the voltage change across the other. Therefore, two signals of equal amplitude and opposite phase are obtained; one at the plate of V110, the other at the junction of lead resistor R152 and cathode biasing resistor R151. The signal from the plate is coupled to the control grid of audio output amplifier V111 through coupling capacitors C164 and C165, while the signal from the cathode circuit is coupled to the control grid of audio output amplifier V112 through coupling capacitor C175. R150 is the grid leak resistor for V110.

j. AUDIO OUTPUT AMPLIFIERS V111 and V112.

(1) Undistorted audio power output of at least 2.5 W at 60 ohms, or 0.2 W at 600 ohms, is provided through the use of two type 5686 pentodes, V111 and V112, connected in a conventional push-pull amplifier circuit. The audio signal from the plate of phase splitter V110 is coupled through capacitors C164 and C165, and is impressed upon the control grid of V111. Simultaneously, a signal which is identical in shape and equal in amplitude, but of opposite phase, is coupled from the cathode circuit of V110 through coupling capacitor C175 to the control grid of V112. Since the signals on the grids of V111 and V112 are 180 degrees out of phase, when one grid goes in a negative direction, the other goes in a positive direction; therefore, one tube will conduct less than the other. As the signal swings in the opposite direction the reverse happens, the first tube draws more plate current while the other draws less.

(2) Transformer T102 is the audio output transformer. It has a single center-tapped primary winding and two secondary windings; one secondary drives either the internal monitoring loudspeaker or the headphones inserted in PHONES jack J103; the other secondary provides external output through connector J104 (mounted on the rear of the chassis). Audio power of at least 2.5 W at 60 ohms, or 0.2 W at 600 ohms, is available at terminals A and C of audio connector J104, to drive up to ten external amplifiers when properly connected. Audio power of at least 0.1 W is supplied to either PHONES jack J103, or to the primary of transformer T115 to drive loudspeaker LS101, as determined by the position of MONITOR-PHONE switch S104. MONITOR LEVEL control R166 adjusts the audio power level delivered to the PHONES jack or to the monitor loudspeaker, without affecting the power level available at J104.

k. POWER SUPPLY CIRCUIT. - The power supply used in the receiver has been designed to furnish filament voltage of 6.3 V A.C. at 4 A, and B+ voltage of 225 V D.C. at 110 MA, when connected to the proper A.C. power source. Power transformer T101 has three taps on the primary, permitting operation of the equipment from power sources of 105, 115, or 125 V A.C., depending on the position of the movable link, which is placed in the correct position when the equipment is installed. V113 is a type 5Y3W-GTA rectifier tube, connected in a full-wave rectifier circuit, with the two ends of the high-voltage secondary winding of power transformer T101 connected to the plates of the tube. B+ voltage is taken from one of the cathode leads, while B- voltage is taken from the center-tap of the high-voltage secondary. The B-/lead is not connected directly to the chassis; the circuit from chassis ground to B- is completely through resistors R174 and R175 of the A.G.C. amplifier circuit (subpar. g(2) above). Current flowing through these resistors produces a voltage drop across them, so that the chassis is maintained at a positive potential

of approximately 70 V with respect to B-. The filter circuit is of the capacitive-input pi-section type, consisting of capacitors C166A, C166B, and choke L106. Capacitor C167 is connected between chassis ground and B- to provide additional filtering.

SECTION 5

TROUBLE-SHOOTING

5-1. GENERAL.

This section presents instructions necessary to aid maintenance personnel in localizing trouble and determining the probable cause of a malfunctioning R-892/URR-44 receiver.

5-2. TEST EQUIPMENT AND SPECIAL TOOLS REQUIRED.

The following chart lists the test equipment and special tools required for trouble shooting.

TABLE 5-1. TEST EQUIPMENT AND SPECIAL TOOLS REQUIRED

ITEM	DESIGNATION	OTHER SPECIFICATIONS
Audio Oscillator	Navy Model LAJ, or equivalent	Frequency range: 1KC
Capacitor 0.01 mfd. 400 V.		
Dummy Antenna, Non-Inductive		Its impedance added to signal generator's internal impedance should not exceed 70 ohms.
Dummy Lead, 600-ohm 1/2-W	Standard Navy Stock No. N16-R-49822-431, or equivalent.	620-ohm carbon resistor, 1/2-W
Screwdriver, medium-size	Standard Navy Stock No. 041-S-1101, or equivalent	
Signal Generator, R.F.	R.F. Signal Generator Set AN/URM-25, or equivalent.	Frequency range 450 KC to 20 MC.
VTVM	Multimeter ME-25/U, or equivalent.	

5-3. THEORY OF LOCALIZATION.

In the event of trouble with the equipment, the manner in which the receiver operates or fails to operate is often an unmistakable indication of the cause of the trouble. For example, abnormal operation of a control will in most cases indicate

the specific stage at fault. If the receiver is inoperative and the dial lamp does not light, then the trouble is probably in the power supply or the A.C. connection to the receiver. The systematic location and repair of faults can be summarized as follows:

a. Determine the stage at fault by using the trouble-shooting procedures given in the following paragraphs, or your own knowledge of the operation of the receiver.

b. Examine the stage in detail to determine what particular component or adjustment is at fault.

c. Replace or repair the defective component and/or adjust correctly, using the procedures described in Section 6.

d. Make a thorough check of receiver performance before placing the equipment back into regular service.

5-4. OVERALL TROUBLE-SHOOTING.

The location of trouble in the receiver can be accomplished by making the series of checks described in this paragraph. Tubes should be checked in a mutual-conductance tube tester such as Tube Tester TV-3/U series or equivalent. In the absence of a tube tester, a tube may also be checked by replacing it with one known to be good. Specific stages and their associated components can be checked by taking voltage and resistance measurements and comparing the observed readings with the normal values given in Table 5-4. When making these checks, however, it must be borne in mind that certain faults may not cause voltage or resistance measurements to change by a measurable amount. For instance, a short-circuit occurring in a low-resistance inductor may not appear in point-to-point resistance measurements and, if the short should occur in an R.F. coil, false indication of the necessity for realignment may result. Bypass or filter capacitors which develop poor internal connections, or which become open-circuited, will cause poor sensitivity and/or stability. An open capacitor can be located by temporarily connecting a good capacitor of the same rating in parallel with the component under suspicion. Refer to the overall trouble-shooting chart, Table 5-2, for determining functional troubles.

TABLE 5-2. OVERALL TROUBLE-SHOOTING CHART

STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
1.	Set POWER ON-OFF switch to POWER ON.	Dial lamp I101 lights.	If lamp does not light, check fuses F101 and F102. Check A.C. receptacle J102, power switch S105, primary switch S106, and power transformer T101.
2.	Turn LOCK dial fully CW. Crank the tuning knob, tuning the receiver throughout its entire range. Repeat this procedure for each band. Observe the performance of each separate band.	Average reception.	If signal reception is weak, or dead throughout one band, check all coils relating to the specific band. Check the R.F. alignment on that specific band. See paragraph 6-5 for alignment procedures. If there is background noise, but no signal is received, check oscillator tube V102 and the oscillator circuit components. If there is low audio output, check FIDELITY control R140, A.F. LEVEL control R141, and the audio circuit stages. If there is high hum level, check filter capacitors C166 and C167. Check the audio circuit stages for open or shorted bypass capacitor. If signal reception throughout the entire receiver frequency range is weak, check tubes V101 through V105, and check the circuit components of R.F. and I.F. stages. Check the R.F. and I.F. alignment. Refer to paragraph 6-5 for alignment procedures.

TABLE 5-2. OVERALL TROUBLE-SHOOTING CHART (Cont)

STEP	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
			If there is distortion or noisy reception, check for intermittent components, defective tubes, loose antenna input connections, dirty or worn switch contacts, poor soldering, and loose ground connections. If oscillation occurs, check for defective tube, open bypass capacitor, power supply filter capacitors defective (C166 and C167), defective cathode resistors R115 and R121. If unintelligible signals are received, check A.G.C. amplifier V108, and the audio circuit stages.

5-5. TROUBLE-SHOOTING CHART.

The following checks are to be conducted with the receiver chassis removed from the cabinet. Before withdrawing the chassis, remove all external connections from the rear of the receiver. (See paragraph 3-4b(1) for directions on removing the chassis.) After the chassis is positioned on the test bench, connect the A.C. power cable to connector J102 at the rear of the chassis.

CAUTION

When servicing the receiver, do not place the chassis on its back with the full weight resting on the receptacles. This may cause damage to the receptacles.

The checks must be made in the order shown, since the test of any specific section is based on the fact that the previous sections have been tested and found to be operating correctly. The checks should also be performed following any adjustments or repairs to the receiver, before returning the equipment to operational duty.

In trouble-shooting chart, Table 5-3, all tests are made with one lead of the test equipment connected to chassis ground, and the other lead to the test point indicated. The following test point identification symbols are used, both in Table 5-3 and on the overall schematic diagram, Figure 6-6: a star-encircled Arabic numeral represents a major test point, and an encircled capital letter, a secondary test point. The locations of all components are identified in Figures 5-1, 5-2, and 5-3. Refer to Figure 6-6 for point-to-point wiring.

a. A.F. STAGES. - To check the A.F. stages of the receiver, make the following preliminary adjustments, then refer to step 1 of Table 5-3.

Step 1. Connect the 600-ohm Dummy Lead across terminals A and C of J104, or across terminals 6 and 8 of transformer T102.

Step 2. Set POWER ON-OFF switch to POWER ON.

Step 3. Set A.F. LEVEL control to its maximum CW position

Step 4. Turn FIDELITY control to its maximum CCW position.

Step 5. Set the RADIO-EXTERNAL AUDIO switch to EXTERNAL AUDIO.

NOTE

The settings of the remaining front panel controls will not influence the results of the A.F. tests.

b. I.F. STAGES. - To check the I.F. stages of the receiver, make the following preliminary adjustments, then refer to step 2 of Table 5-3.

Step 1. Remove V102 and V108 from their sockets. (This disables the H.F. oscillator and A.G.C. of the receiver.)

Step 2. Set POWER ON-OFF switch to POWER ON.

Step 3. Set BAND SELECTOR switch to BC.

Step 4. Turn A.F. LEVEL control to its maximum CW position.

Step 5. Turn FIDELITY control to its maximum CCW position

c. R.F. STAGES. - The R.F. stages of the receiver consist of R.F. amplifier V101, H.F. oscillator V102, and mixer V103. Be sure that the signal generator used in this check is accurately calibrated. Make the preliminary adjustment given in b above. Do not remove V108 from its socket. Proceed with step 3 of Table 5-3.

d. A.G.C. TEST. - To test the A.G.C. section of the receiver, make the following preliminary adjustments, then proceed with step 4 of Table 5-3.

(a) Set the BAND SELECTOR to BC.

(b) Turn the A.F. LEVEL control to its maximum CW position.

5-6. VOLTAGE AND RESISTANCE CHART.

Table 5-4 offers voltage and resistance readings, taken at the receiver tube socket pins.* These readings are made under the following conditions:

a. All readings are made with no signal input.

b. Line voltage input is 120-V A.C.

c. All readings are D.C. except as noted.

d. Resistance readings are made with all tubes removed from their sockets, and with power off.

e. All resistance readings are in ohms (K equals 1000 ohms).

5-7. OVERALL PERFORMANCE TEST.

The overall performance capabilities of the receiver may be checked by performing a listening test. By tuning in known stations, the accuracy of the dial calibration and the general receiver sensitivity can be checked. The frequency dial is calibrated to an error variation of ±1%.

* The upper lines of the chart are voltage readings; the lower lines are resistance readings.

TABLE 5-3. FUNCTIONAL SECTION TROUBLE-SHOOTING CHART

STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
A.F. STAGES				
1	①	Connect audio oscillator to TB119. Set the RADIO-EXTERNAL AUDIO switch to EXTERNAL AUDIO.		
	Ⓐ	Set the VTVM to 1-V A.C. range, connect to TB119.		
		Tune audio oscillator to 1000 CPS at 0.5 V.	0.5-V indication on VTVM.	
	②	Disconnect VTVM, and set to 2.5-V A.C. range, connect A.C. lead to 600-ohm dummy load (across A and C).	1.9-V A.C. indication on VTVM.	If indication is normal, proceed with step 2. If abnormal: Substitute new 5670 for V109. Substitute new 5686 for V111 and V112. Replace CR101. Deenergize equipment, and test components of the A.F. stages. Replace defective parts. See table 5-4 for tube socket voltages and resistances. Remove test equipment.
I.F. STAGES				
2		Remove V108 and V102 from socket.		

TABLE 5-3. FUNCTIONAL SECTION TROUBLE-SHOOTING CHART (Cont)

STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
	(2)	Connect VTVM across 600-ohm dummy load. Set to 2.5-V A.C. range.		
	(B)	Connect signal generator to J107, through 0.1-mfd, 500-V capacitor.		
		Tune signal generator to 455 KC, 30% modulation at 1KC, with an output of 15 microvolts.	1.9-V A.C. minimum indication on VTVM.	If indication is normal proceed with step 3. If abnormal;
				Substitute new 5749/6BA6W for V104 or V105.
				Reinsert V102 into socket.
				Reinsert V106 into socket.
R.F. STAGES				
3	(C)	Connect signal generator to dummy antenna, connect dummy antenna to J101.		
		Set receiver tuning dial at some frequency near 1.6 MC.		
	(2)	Connect the VTVM to 600-ohm dummy lead. Set to 2.5 V A.C.		
		Tune signal generator near receiver frequency setting, modulated 30% at 1KC, until signal is picked up by receiver. Tune for maximum output.	Receiver setting should correspond to the signal generator frequency, within ±1%.	If indication is normal, see below. If abnormal realign the BC band. See Section 6 for R.F. alignment procedures.

TABLE 5-3. FUNCTIONAL SECTION TROUBLE-SHOOTING CHART (Cont)

STEP	TEST POINT	PRELIMINARY ACTION	NORMAL INDICATION	NEXT STEP
		Repeat the above procedure for SW1, SW2, and SW3 bands, changing the frequency as necessary for each band.	Same as above.	If indication is abnormal, realign the specific band. See Section 6.
	AGC TEST			
2		Connect signal generator to dummy antenna, connect dummy antenna to J101, and ground generator to chassis.		
3		Connect VTVM to J105, set to 10-V D.C. range.		
		Tune signal generator to 1 MC, 30% modulated at 1KC, 1000 microvolt output.		
		Tune receiver to same frequency as signal generator.	VTVM reading at J105 approx. -6.3VDC	Replace V108.
4		Disconnect VTVM from J105 and connect to J106. Set to 30-V D.C. range.	VTVM reading at J106 approx. -15.5 VDC	Check R174 and R175.

TABLE 5-4. VOLTAGE AND RESISTANCE CHART

TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V101	-0.22 1.1 meg	0 0	6.6 AC 0	0 0	190 7.5K	148 28K	7.4 1.2K		
V102	120 ∞	0 ∞	0 0	6.6 AC 1	120 6K	-28 50K	0 1		
V103	88 11K	-3.2 22K	0 0	0 0	6.6 AC 1	0 0	0.49 1.8 meg	0 0	195 8K
V104	-0.2 1.3 meg	0 0	0 0	6.8 AC 1	190 8K	84 54	1.4 145		
V105	0 3.3	0 0	0 0	6.6 AC 0.05	190 77K	105 55K	3.1 450		
V108	-0.6 220K	0 ∞	6.6 AC 1	0 0	-0.6 ∞	-92 420K	-70 1K		
V109	0 0	2.5 500	0 22K	108 55K	0 0	70 140K	0 470	1.4 1.5K	6.6 AC 0
V110	110 ∞	0 ∞	6.6 AC 0	0 0	110 55K	-25.5 500K	-18.5 50K		
V111	-80 ∞	-95 470K	-80 ∞	6.6 AC 0	0 0	190 7K	185 7K	-80 1.6K	190 ∞
V112	-80 ∞	-95 470K	-80 ∞	6.6 AC 0	0 0	190 7K	185 7K	-80 1.6K	190 ∞
V113	0 ∞	230 7.5K	0 ∞	-100 1.4K	0 ∞	-100 1.4K	0 ∞	230 7.5K	

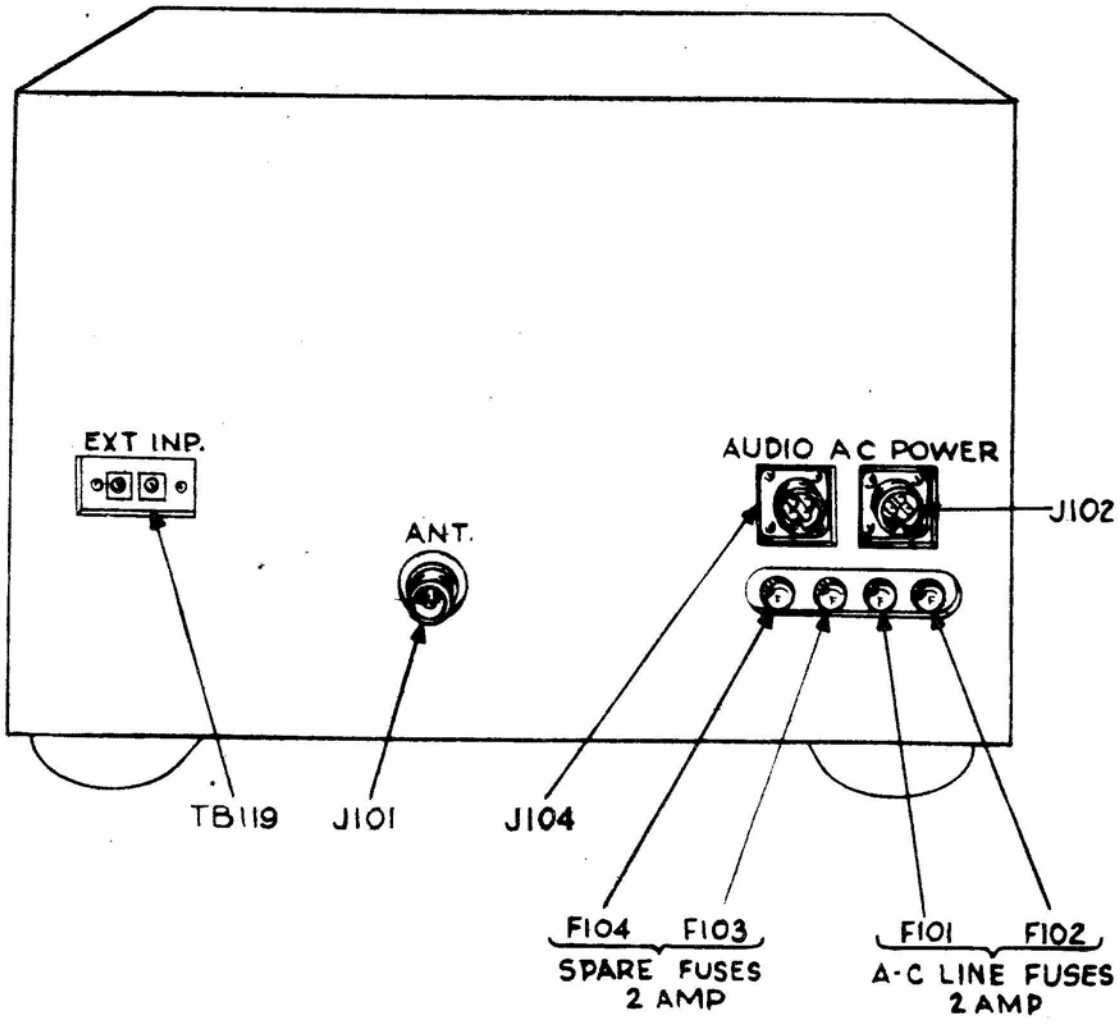


Figure 5-1. Receiver Rear View, Parts Location Diagram

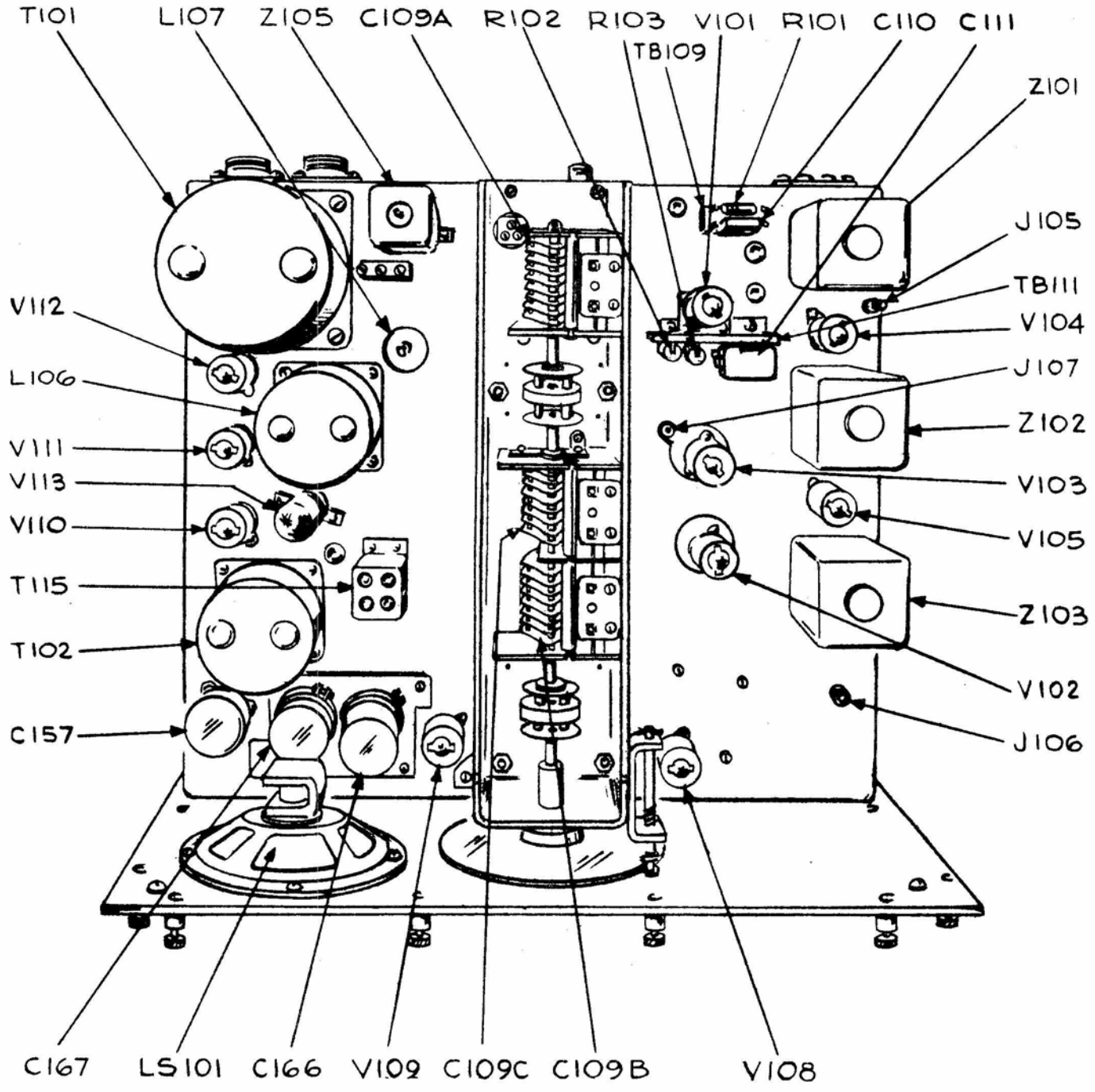


Figure 5-2. Receiver Chassis Top View, Parts Location Diagram

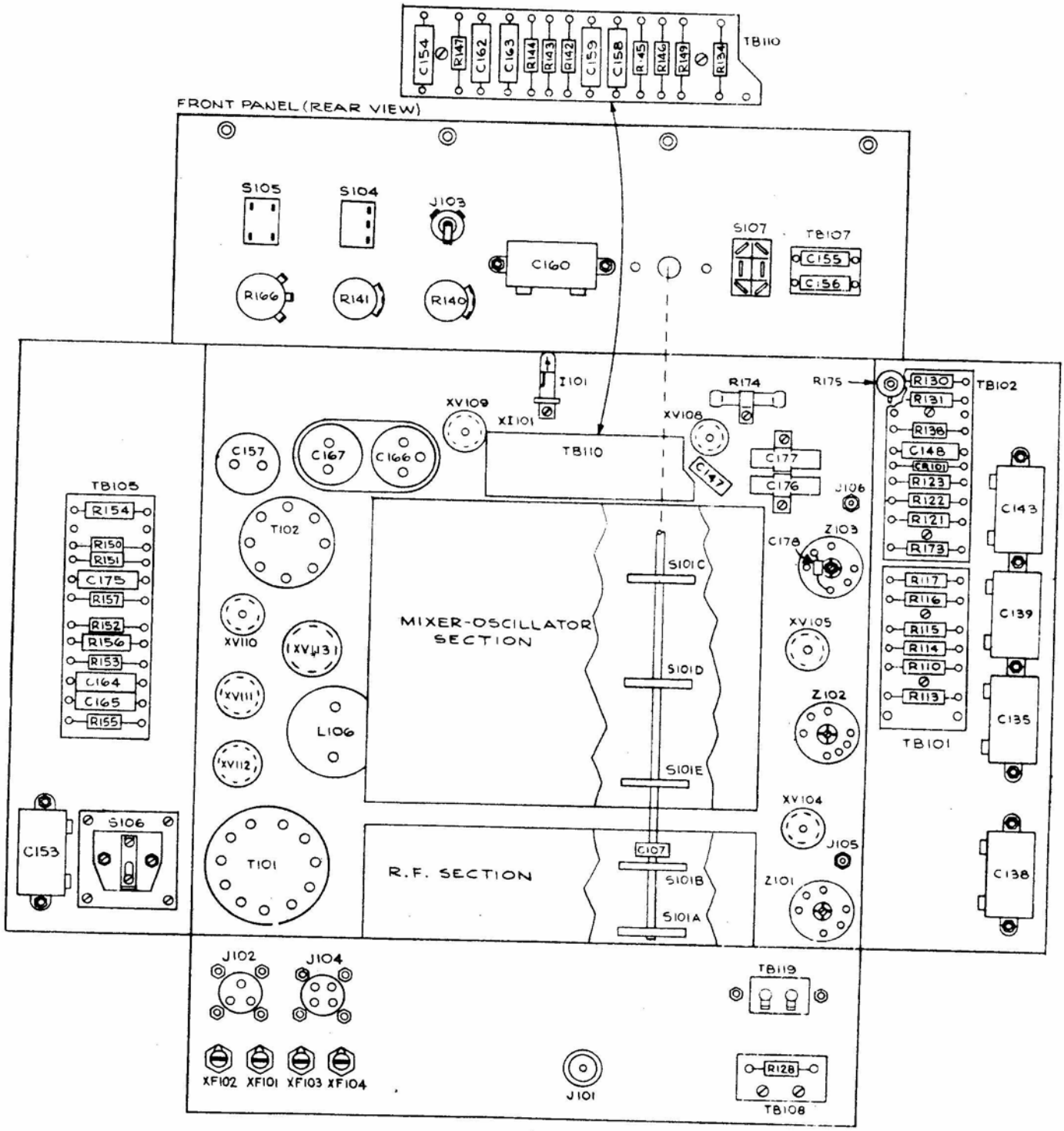


Figure 5-3. Receiver Chassis Bottom View, Parts Location Diagram, Part 1

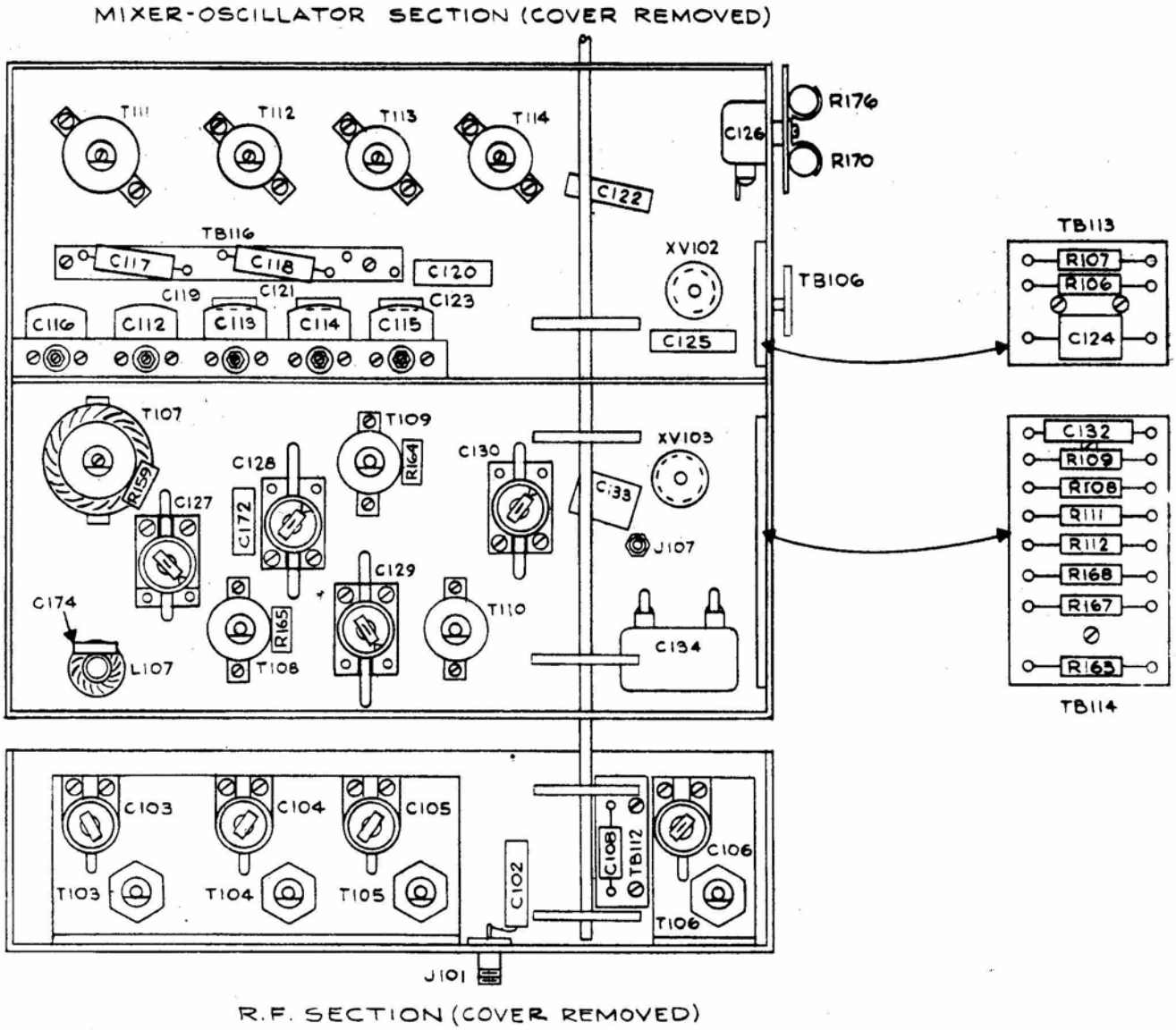


Figure 5-3. Receiver Chassis Bottom View, Parts Location Diagram, Part 2

SECTION 6

REPAIR

6-1. FAILURE REPORT.

"Report each failure of the equipment, whether caused by a defective part, wear, improper operation, or an external cause. Use ELECTRONIC FAILURE REPORT form DD787. Each pad of the forms includes full instructions for filling out the forms and forwarding them to the Bureau of Ships. However, the importance of providing complete information cannot be emphasized too much. Be sure that you include the model designation and serial number of the equipment (from the equipment identification plate), the type number and serial number of the major unit (from the major unit identification plate), and the type number and reference designation of the particular defective part (from the technical manual). Describe the cause of the failure completely, continuing on the back of the form if necessary. Do not substitute brevity for clarity. And remember--there are two sides to the failure report--

"YOUR SIDE"

"Every FAILURE REPORT is a boost for you:

1. It shows that you are doing your job.
2. It helps make your job easier.
3. It insures available replacements.
4. It gives you a chance to pass your knowledge to every man on the team.

"BUREAU SIDE"

"The Bureau of Ships uses the information to:

1. Evaluate present equipment
2. Improve future equipment.
3. Order replacements for stock.
4. Prepare field changes.
5. Publish maintenance data.

Always keep a supply of failure report forms on board. You can get them from the nearest District Publications and Printing Office."

6-2. GENERAL.

This section presents all instructions necessary for complete repair of an R-892/URR-44 receiver. Trouble-shooting procedures for the receivers are described in Section 5. Refer to Section 5 when the source of the trouble is not known. After the cause is located, refer to the following paragraphs of the section for detailed instructions on electrical alignment procedures and adjustments. Also, a paragraph is included for guidance when making mechanical repairs or adjustments.

6-3. PREVENTIVE MAINTENANCE.

Preventive maintenance is a systematic series of operations performed at regular intervals on equipment to eliminate major breakdowns and unwanted interruptions in service, and to keep equipment operating at top efficiency. Table 6-1 lists the necessary periodic checks to be performed on the equipment, showing what to check, when and how to check, and precautions to be observed. The routine maintenance test schedule should be modified if the equipment is being used under adverse conditions; the monthly checks should be performed weekly and the quarterly checks

performed every one or two months, depending upon conditions.

TABLE 6-1. ROUTINE MAINTENANCE CHECK CHART

WHAT TO CHECK	HOW TO CHECK	PRECAUTIONS
	EACH WATCH	
Receiver operation	Make listening test for normal operation, by tuning the receiver through each frequency band.	Note the operation of all controls.
	MONTHLY	
Antenna, and all connections to the receiver	Inspect for corrosion, damage, or loose connections.	Tighten all connections.
	QUARTERLY	
General inspection	Withdraw receiver from cabinet. a. Make a careful visual inspection of the interior, to detect symptoms of wear or over-heating. b. Check for noisy or faulty components and/or connections.	 Replace affected components. Tap components and connections with a piece of insulating material, while receiver is adjusted for normal operation with an audible output.

6-4. TEST EQUIPMENT AND SPECIAL TOOLS REQUIRED FOR TUNING.

The following chart lists the test equipment and special tools required for tuning and adjustment of the receiver.

TABLE 6-2. TEST EQUIPMENT AND SPECIAL TOOLS REQUIRED FOR TUNING.

ITEM	DESIGNATION	SPECIFICATIONS
Alignment tool	Standard Navy Stock No. N16-R-49822, or equivalent	
Bristo wrenches (2)		No. 6 and No. 8, 1 each.
Capaciter, 0.01 mfd., 600-V		
Dummy Antenna, Non-Inductive		Its impedance added to signal generater's internal impedance should not exceed 70 ohms
Dummy Lead, 600-ohm, 1/2 W	Standard Navy Stock No. N16-R-49822-431, or equivalent	620-ohm carbon resistor, 1/2 W
Screwdriver, medium-size	Standard Navy Stock No. G41-S-1101, or equivalent	
Signal Generater, R.F.	R.F. Signal Generator Set AN/URM-25, or equivalent	Frequency range: 450 KC to 20 MC
VTVM	Multimeter ME-25/U, or equivalent.	

6-5. TUNING ADJUSTMENT.

I.F. and R.F. alignment comprise the only tuning and adjustment procedures for the receiver. All electrical adjustments have been carefully made at the factory before shipment, and are of a sufficiently permanent nature so that realignment should not be necessary for a considerable period of time under normal operating conditions. However, realignment may become necessary after replacement of a tube associated with a tuned circuit, or replacement of the tuned circuit itself. Before attempting alignment, the need should first be definitely established by conducting the performance tests described in Table 5-2. All alignment adjustments are shown in figures 6-1 and 6-2. Typical audio response and A.G.C. characteristic curves are shown in figures 6-3 and 6-4, respectively.

a. I.F. ALIGNMENT. - I.F. transformers Z101 and Z102, and detector input transformer Z103, each contain two adjustable powdered iron cores to adjust their respective resonant frequencies. The slugs associated with the primaries are accessible through a hole in the bottom of the chassis, while those of the secondaries are accessible through a hole in the top of each I.F. shield. To align the I.F. section, proceed as follows:

Step 1. Remove all external connections from the rear of the receiver. Remove the receiver chassis from the cabinet. Reconnect the A.C. power cable to the receiver.

Step 2. Remove H.F. oscillator tube V102 and A.G.C. tube V108. These circuits must be disabled to tune the I.F. circuits.

Step 3. Connect the R.F. output lead from the signal generator, to J107, through a 0.01-uf 400-V capacitor.

Step 4. Connect the 600-ohm dummy lead to terminals A and C of AUDIO connector J104, or to terminals 6 and 8 of transformer T102. Connect the VTVM across the dummy lead.

Step 5. Set the POWER ON-OFF switch to POWER ON.

Step 6. Set the BAND SELECTOR switch to BC.

Step 7. Set the MONITOR-PHONE switch to MONITOR.

Step 8. Rotate the A.F. LEVEL control to maximum CW, and the FIDELITY control to maximum CCW.

Step 9. Turn on the signal generator. Carefully adjust the frequency to 455 KC, modulated 30% at 1 KC. Increase the output of the generator until the VTVM at the output indicates about two volts.

Step 10. Insert the blade of the alignment tool into the access hole in transformer Z103, and turn the slug until a peak in the VTVM reading is obtained. If two peaks appear, the correct peak is the one obtained when the slug is farthest out of the coil. Make this adjustment for both the secondary (top) and primary (bottom) slugs.

Step 11. Repeat this procedure for transformers Z102 and Z101, in that order, tuning each slug separately for maximum deflection of the VTVM. Reduce the output of the signal generator, as necessary, to keep the VTVM reading at approximately 1 volt.

Step 12. Repeat the adjustments in steps 10 and 11, to insure accuracy.

b. WAVE TRAP ADJUSTMENT. - The two wave traps are adjusted by varying the inductance of coils L101 and L107. To adjust the wave traps, proceed as follows:

Step 1. Place the front panel controls in the same positions as in the I.F. alignment procedure above.

Step 2. Connect the signal generator through the dummy antenna, to ANT. connector J101.

Step 3. Connect the 600-ohm dummy lead across terminals A and C of AUDIO connector J104.

Step 4. Connect the VTVM across the 600-ohm dummy lead.

Step 5. Tune the signal generator to 455 KC, modulated 30% at 1 KC.

Step 6. Tune the receiver to 540 KC.

Step 7. Increase the signal input until the modulation is heard, and an indication is obtained on the VTVM.

Step 8. Adjust slugs of L101 and L107 for minimum output.

c. R.F. ALIGNMENT.

(1) R.F. alignment means adjustment of the tuned circuits of the R.F. amplifier, mixer, and H.F. oscillator stages, to insure accurate tracking of these stages with each other as the receiver is tuned over its frequency range. R.F. input transformers T103 through T106, mixer transformers T107 through T110, and oscillator coils T111 through T114 each contain an adjustable powdered iron core for varying the amount of inductance in each tuned circuit. The amount of capacitance in each tuned circuit is varied by means of adjustable trimmer capacitors, connected in parallel with the secondary of each transformer, while different sections of main tuning capacitor C109 provide tuning over the entire range of the receiver. For alignment of these circuits, proceed as follows:

Step 1. Remove all external connections from the rear of the chassis and remove the receiver chassis from the cabinet.

Step 2. Remove the chassis bottom cover plate, by releasing the ten captive screws around the outer edge of the plate. All R.F. alignment adjustments are now accessible through the access holes in the mixer-oscillator and R.F. coil compartment cover plates.

Step 3. Remove tube V108. This procedure disables the automatic gain control circuit of the receiver, and is necessary for accurate R.F. alignment.

Step 4. Connect the A.C. power cable to the receiver.

Step 5. Connect the VTVM across a 600-ohm dummy lead at terminals A and C of AUDIO connector J104, or at terminals 6 and 8 of transformer T102. Set the VTVM to one of the higher ranges, to eliminate the possibility of any damage occurring to it.

Step 6. Connect the signal generator R.F. output lead through the dummy antenna, to ANT. connector J101. Turn the signal generator on, and adjust for a signal modulated 30% at 1 KC. Set the tuning dial of the signal generator to any frequency in the BC band.

Step 7. Set the POWER ON-OFF switch to POWER ON.

Step 8. Set the BAND SELECTOR switch to BC.

Step 9. Place the FIDELITY control to maximum CCW.

Step 10. Rotate the A.F. LEVEL control to maximum CW.

Step 11. Tune the receiver to pick up the signal from the generator.

Step 12. Adjust the VRVM to one of the lower ranges, until the pointer is approximately at half-scale deflection. Alignment of the receiver may now be

accomplished by following the Alignment Chart, Table 6-3, which gives step-by-step procedure for R.F. alignment.

(2) A few precautions must be taken, however, to insure that alignment will be carried out properly. Be sure that the receiver is tuned to exactly the same frequency as the signal generator. The H.F. oscillator must be set to operate at a frequency which is above the frequency of the R.F. amplifier, and not below. This can be checked by tuning in the image of the test signal, which must appear 910 KC lower in frequency on the receiver dial than the signal from the signal generator. This image will be considerable weaker than the fundamental; it may be necessary to increase the input signal to identify the image signal. If the image does not appear at the proper point on the receiver dial, the oscillator is incorrectly adjusted; the capacity of the oscillator trimmer capacitor must be varied until the image and fundamental signals appear at the proper points on the dial. The following is the general procedure to use in the alignment of the R.F. amplifier, the H.F. oscillator, and the mixer stages:

Step 1. Set the signal generator to the H.F. alignment point of the desired band (step 1 of table 6-3).

Step 2. Set the receiver dial to the corresponding H.F. alignment point of the desired band.

Step 3. Adjust the corresponding trimmer capacitors of the H.F. oscillator, R.F. amplifier, and mixer, as directed in table 6-3, for maximum indication on the VTVM.

Step 4. Set the signal generator to the low-frequency alignment point of the desired band.

Step 5. Adjust the slugs on the corresponding transformers and coils, for maximum indication on the VTVM.

Step 6. After alignment is completed, operate the receiver to determine whether the alignment has successfully restored receiver performance.

TABLE 6-3. R.F. ALIGNMENT CHART

STEP	RANGE	ADJUST SIGNAL SOURCE AND RECEIVER TO (MC)	ADJUST TO RECEIVE TEST SIGNAL	ADJUST FOR MAXIMUM OUTPUT
1	BC	1.6	Trimmer capacitor C112	Trimmer capacitors C103, C127
2	BC	0.54	Inductor T111	Inductors T103, T107
3	BC	1.6	Trimmer capacitor C112	Trimmer capacitors C103, C127
4	BC	1.0	Padder capacitor C116	
Repeat the above order until calibration is correct.				

TABLE 6-3. R.F. ALIGNMENT CHART (Cont)

STEP	RANGE	ADJUST SIGNAL SOURCE AND RECEIVER TO (MC)	ADJUST TO RECEIVE TEST SIGNAL	ADJUST FOR MAXIMUM OUTPUT
1	SW1	3.4	Trimmer capaciter C113	Trimmer capaciters C104, C128
2	SW1	1.6	Inducter T112	Inducters T104, T108
3	SW1	3.4	C113	C104, C128
Repeat the above order until calibration is correct.				
1	SW2	8.5	Trimmer capaciter C114	Trimmer capaciters C105, C129
2	SW2	3.5	Inducter T113	Inducters T105, T109
3	SW2	8.5	C114	C105, C130
Repeat the above order until calibration is correct.				
1	SW3	18.0	Trimmer capaciter C115	Trimmer capaciters C106, C130
2	SW3	9.0	Inducter T114	Trimmer capaciters T106, T110
3	SW3	18.0	C115	C106, C130
Repeat the above order until calibration is correct.				

6-6. REMOVAL, ADJUSTMENT, REPAIR AND REASSEMBLY OF PARTS.

The following subparagraphs describe the procedures used to remove, adjust, repair, and reassemble the components of the receiver. Test equipment and special tools required are listed in table 6-2.

To remove the chassis from the cabinet, refer to the instructions in paragraph 3-4b(1), and figure 3-1.

a. REMOVAL OF CONTROL KNOBS, DIAL KNOBS, AND COUPLINGS. - All control knobs, except the BAND SELECTOR switch and tuning dial, are fastened to their respective shafts by two No. 8-32 Brists set screws, located 90 degrees apart around the circumference of each knob. To remove a knob loosen each set screw. The knobs can then be lifted from the shaft. The BAND SELECTOR switch and the tuning dial knobs can be removed with a small standard screwdriver. All couplings are fastened to

their respective shafts by four No. 6-32 set screws, located two on each side of the coupling. To remove the coupling, use the Phillips-head or Bristo screwdriver, as required, and loosen until the coupling will rotate on the shaft. To completely remove the coupling, it will be necessary to loosen all mechanical connections to one of the shafts, and slide the shafts away from the coupling until there is enough space between the two shafts to allow the coupling to be removed.

b. REMOVAL OF THE CHASSIS BOTTOM COVER PLATE. To remove the chassis bottom cover plate, loosen the 10 captive screws around the outer edges of the plate. Lift off the plate.

c. REMOVAL OF COVERS FROM COIL COMPARTMENTS.

(1) MIXER-OSCILLATOR COIL COMPARTMENT COVER. - To remove the cover from the mixer-oscillator coil compartment, loosen the 12 slotted-head captive screws around the outer edges and in the center of the cover, and lift off the cover.

(2) R.F. COIL COMPARTMENT COVER. To remove the cover from the R.F. coil compartment, loosen the four slotted-head captive screws on top of the cover and the three which are inside the compartment. Three large holes for access to these screws are drilled in the top of the compartment, along one side.

(3) REMOVAL OF MIXER-OSCILLATOR COIL COMPARTMENT SIDE PLATE. - The mixer-oscillator coil compartment is enclosed on three sides by a single plate, which may be removed to gain access to compartments during repair of the receiver. To remove this side plate, first loosen the eight slotted-head screws on the flange which runs around the bottom inside edge of the plate next to the chassis. Using the off-set Phillips-head screwdriver, remove the six screws on the side of the compartment that hold this plate. Carefully lift out the entire side plate, using extreme caution to prevent damage to nearby components.

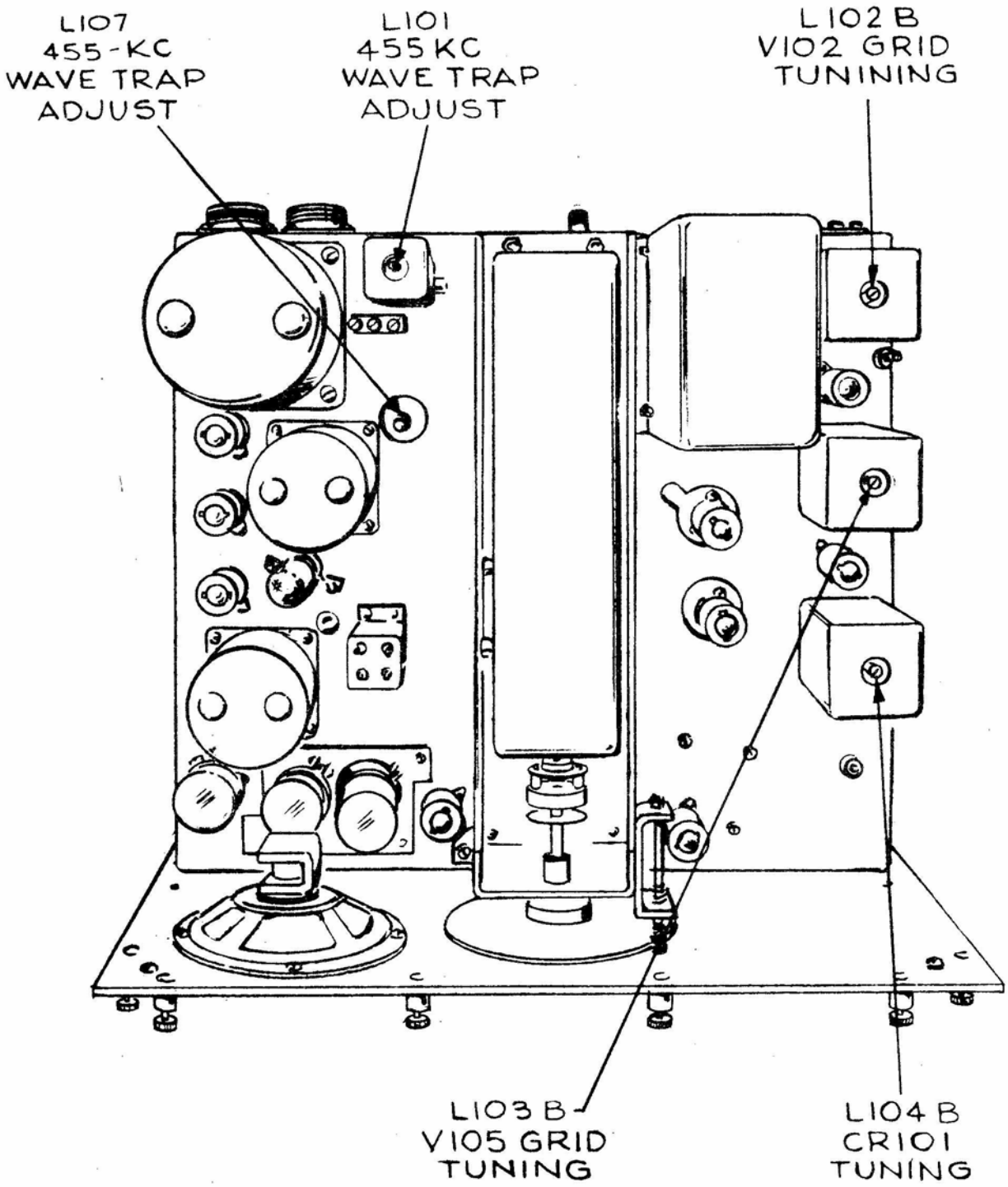


Figure 6-1. Alignment Adjustment Locations, Receiver Chassis Top View

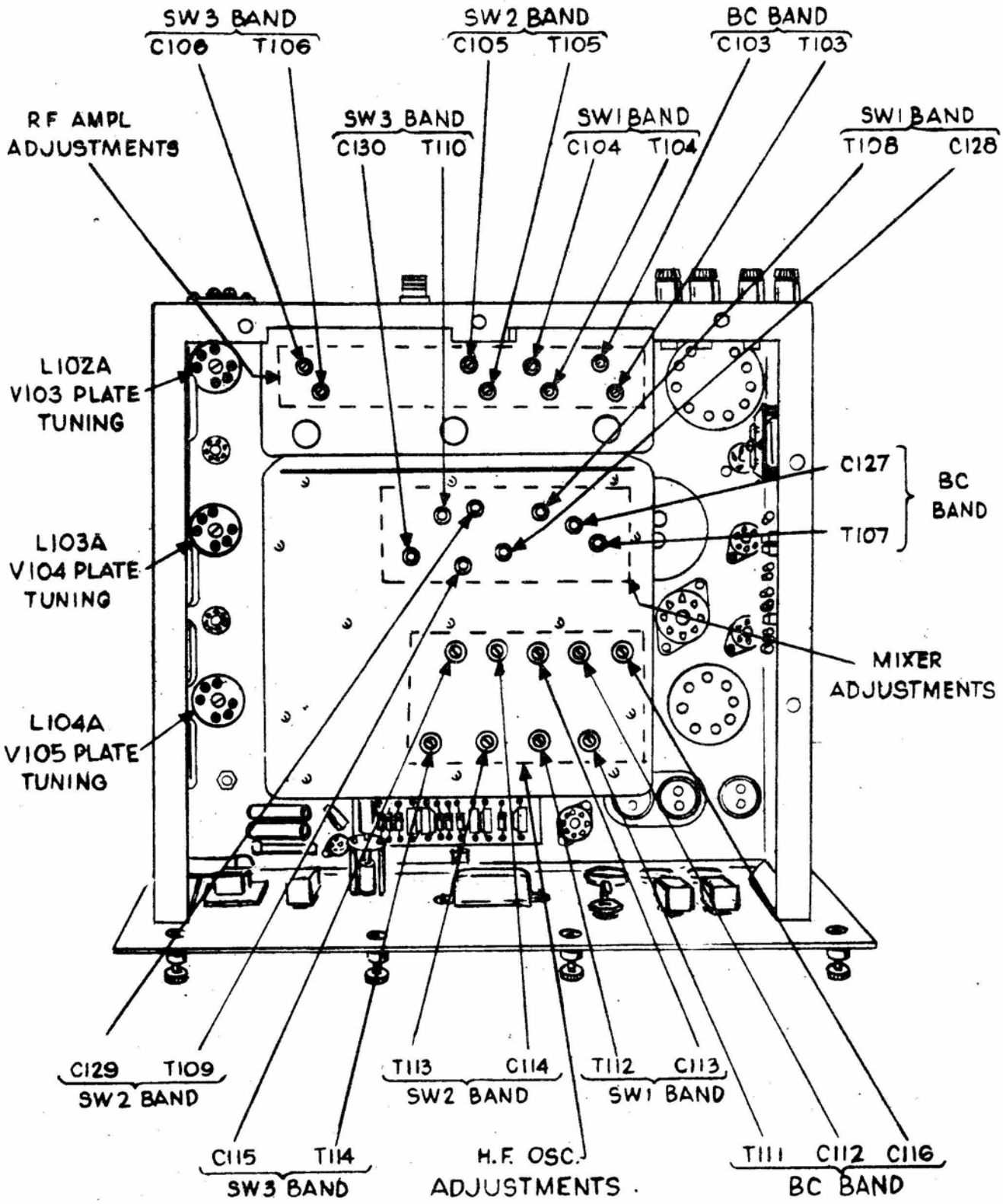


Figure 6-2. Alignment Adjustment Locations, Receiver Chassis Bottom View

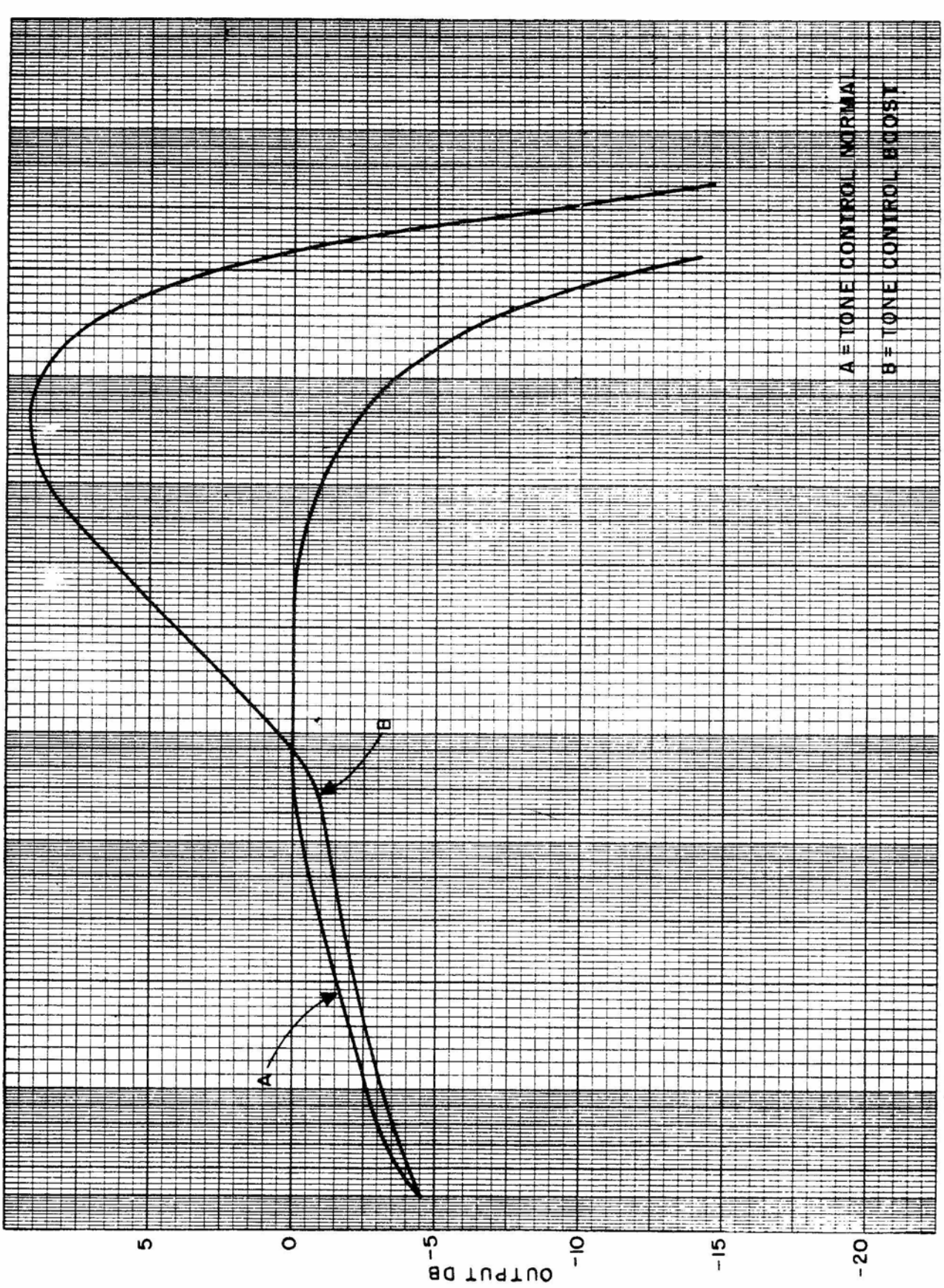


Figure 6-3. Audio Response Curves

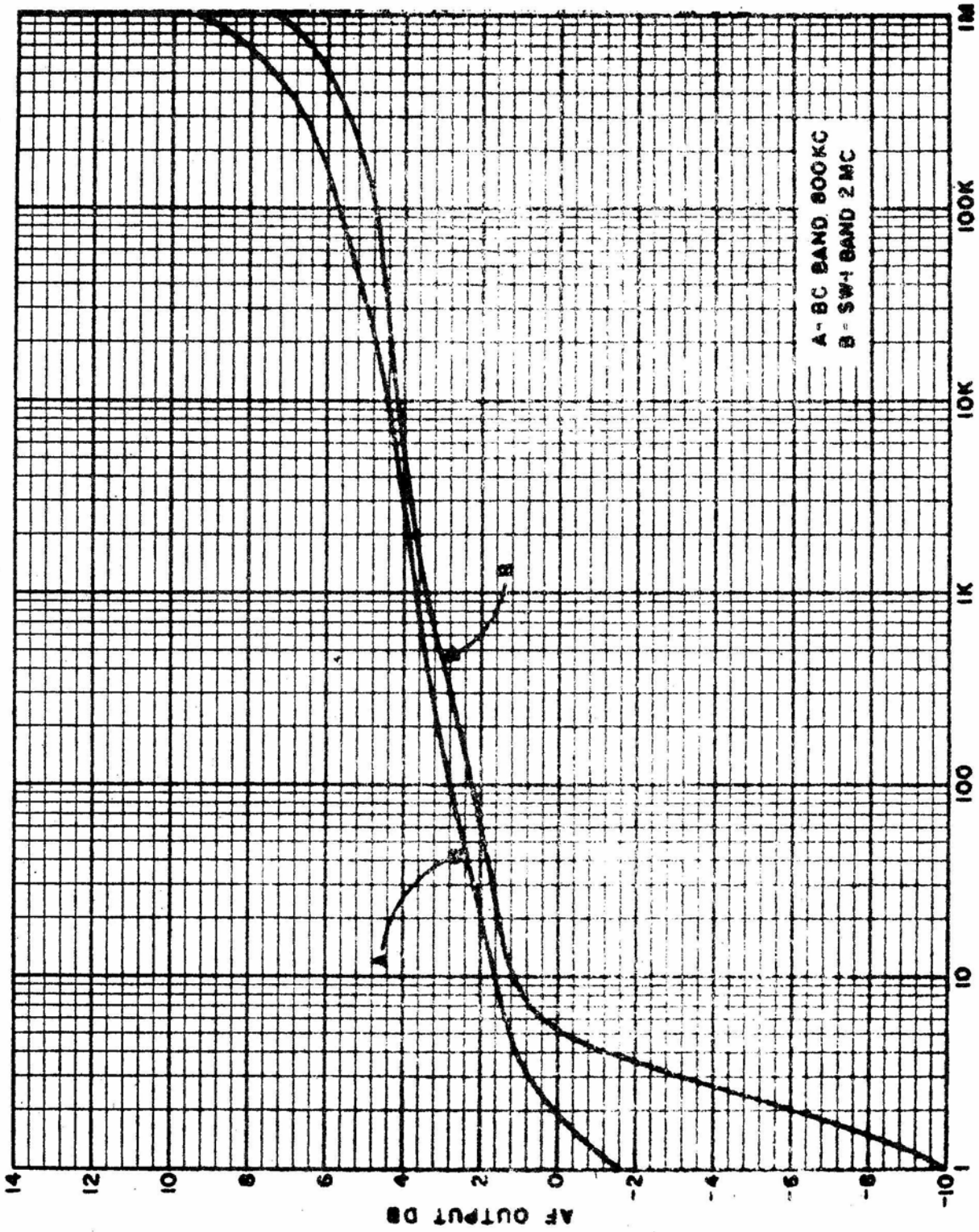
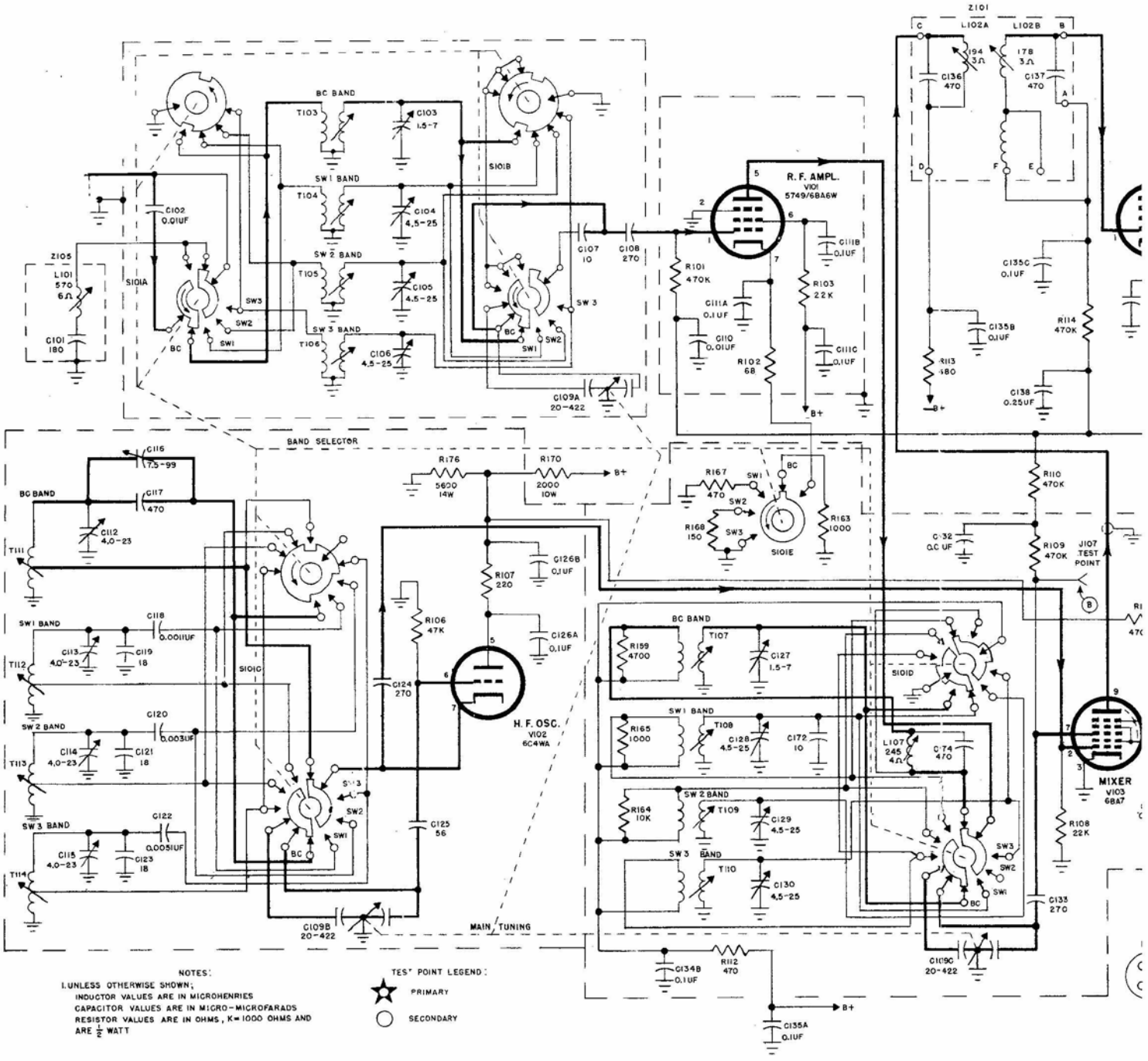
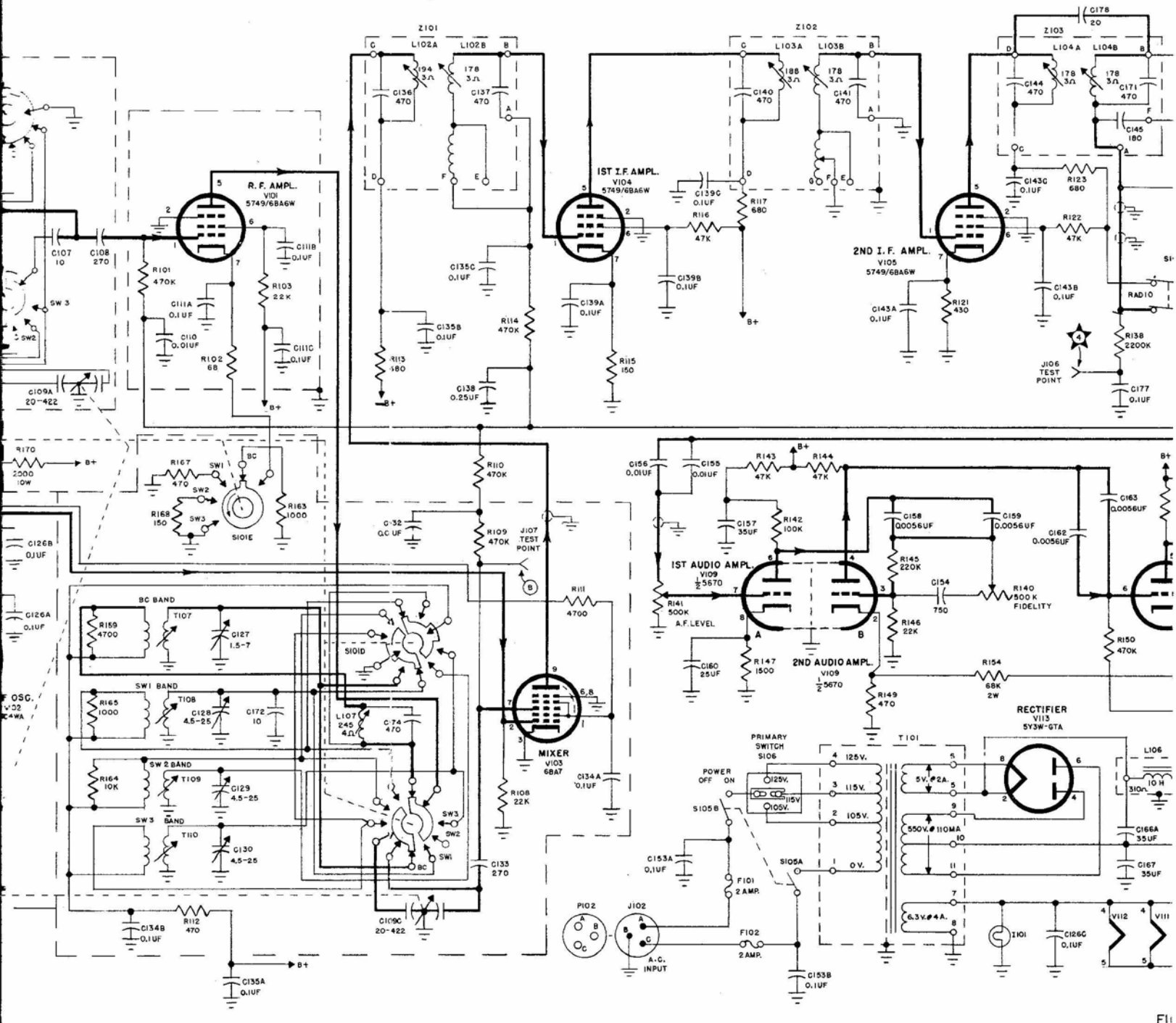


Figure 6-4. A.G.C. Characteristic Curves



NOTES:
1. UNLESS OTHERWISE SHOWN;
INDUCTOR VALUES ARE IN MICROHENRIES
CAPACITOR VALUES ARE IN MICRO-MICROFARADS
RESISTOR VALUES ARE IN OHMS, K=1000 OHMS AND ARE ½ WATT

TEST POINT LEGEND:
PRIMARY
SECONDARY


Z101
L102A
L102B
Z102
L103A
L103B
Z103
L104A
L104B
R.F. AMPL.
V101
5749/6BA6W
IST I.F. AMPL.
V104
5749/6BA6W
2ND I.F. AMPL.
V105
5749/6BA6W
IST AUDIO AMPL.
V109
1/2 5670
2ND AUDIO AMPL.
V109
1/2 5670
MIXER
V103
6BA7
RECTIFIER
V113
5Y3W-GTA
T101
PRIMARY
SWITCH
S106
POWER
OFF ON
S105B
S105A
F101
2 AMP.
F102
2 AMP.
A.C.
INPUT
P102
J102
J106
TEST
POINT
J107
TEST
POINT
RADIO
BC BAND
SW1 BAND
SW2 BAND
SW3 BAND
S101D
S101E
A.F. LEVEL
FIDELITY
B+

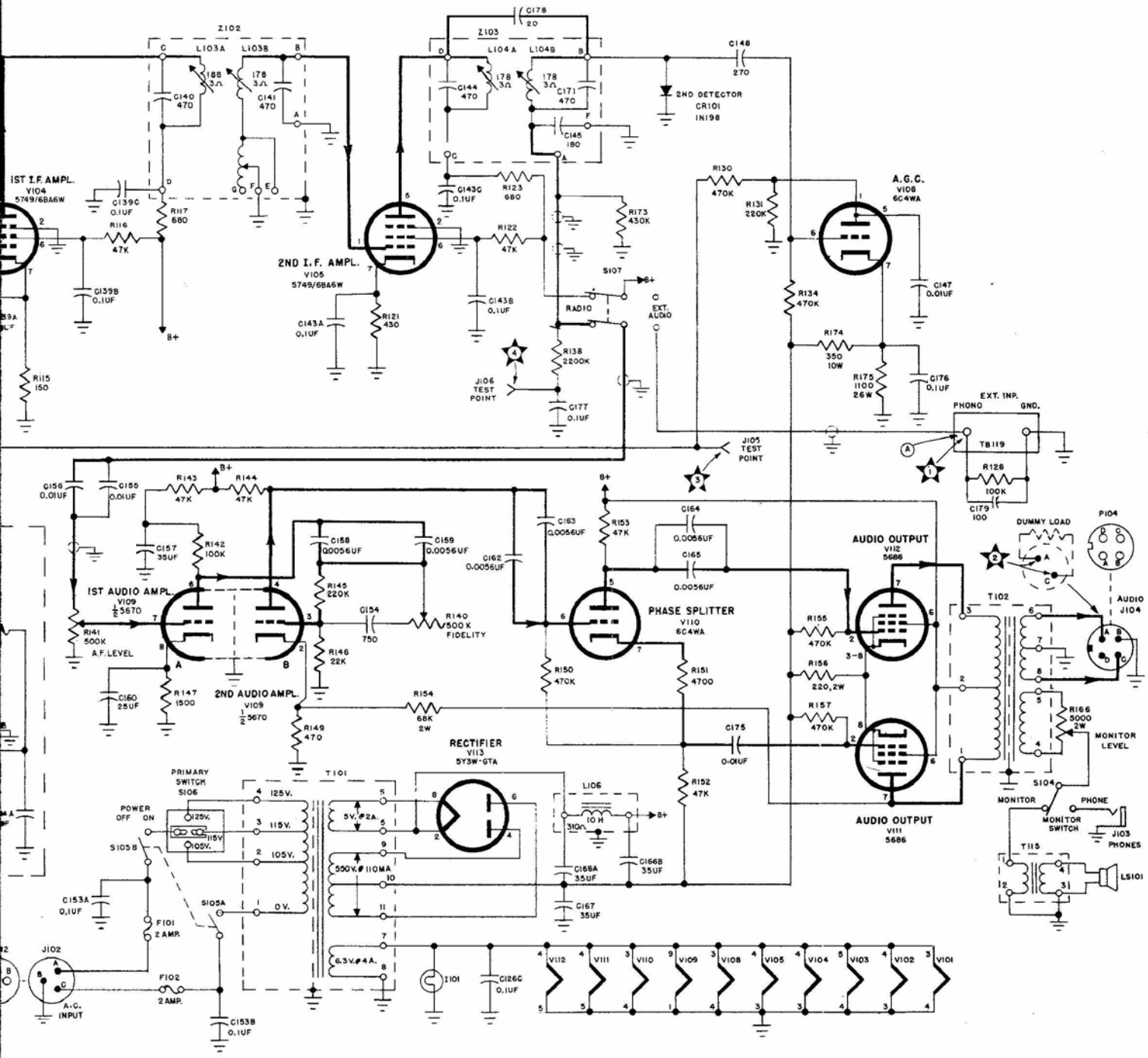
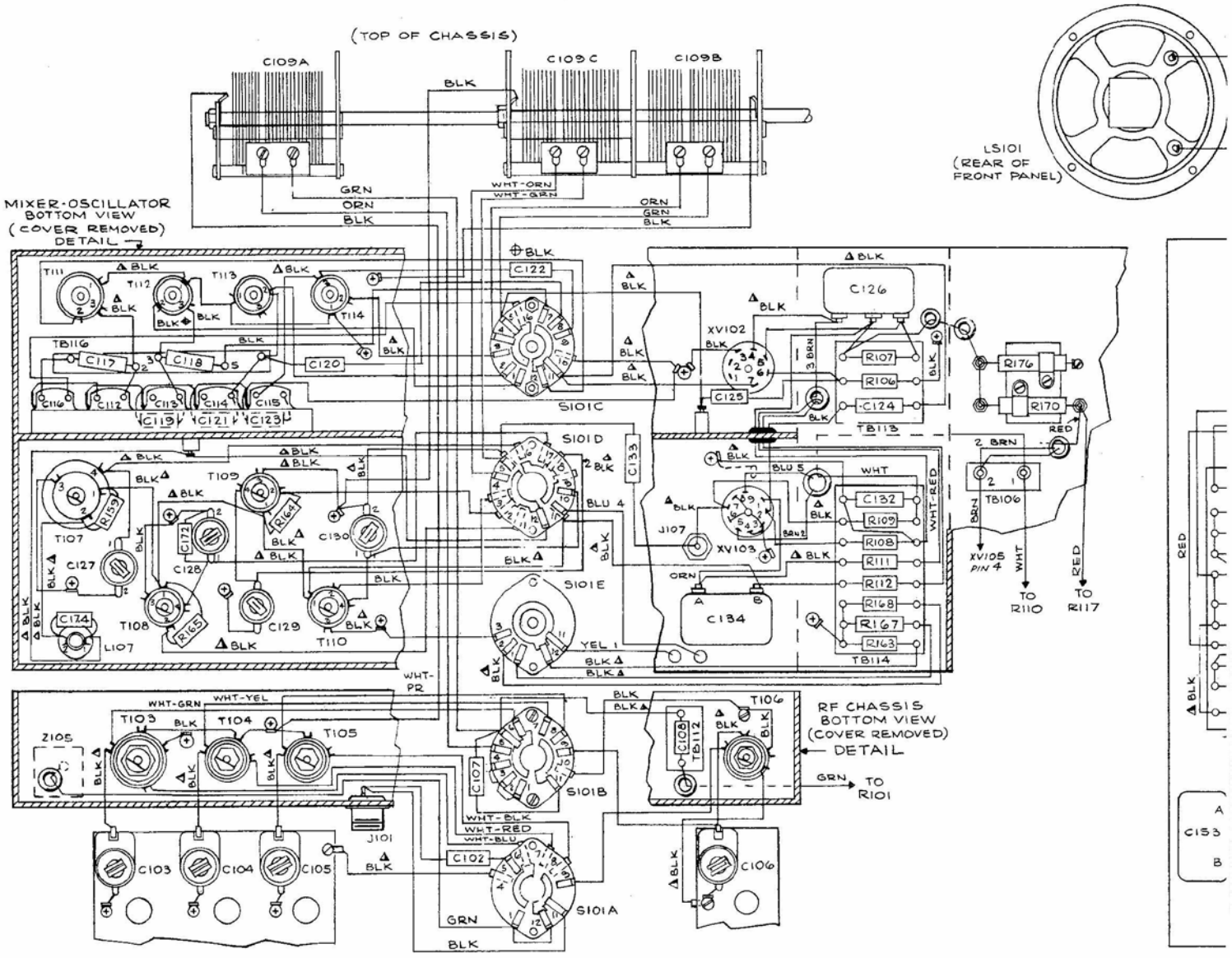
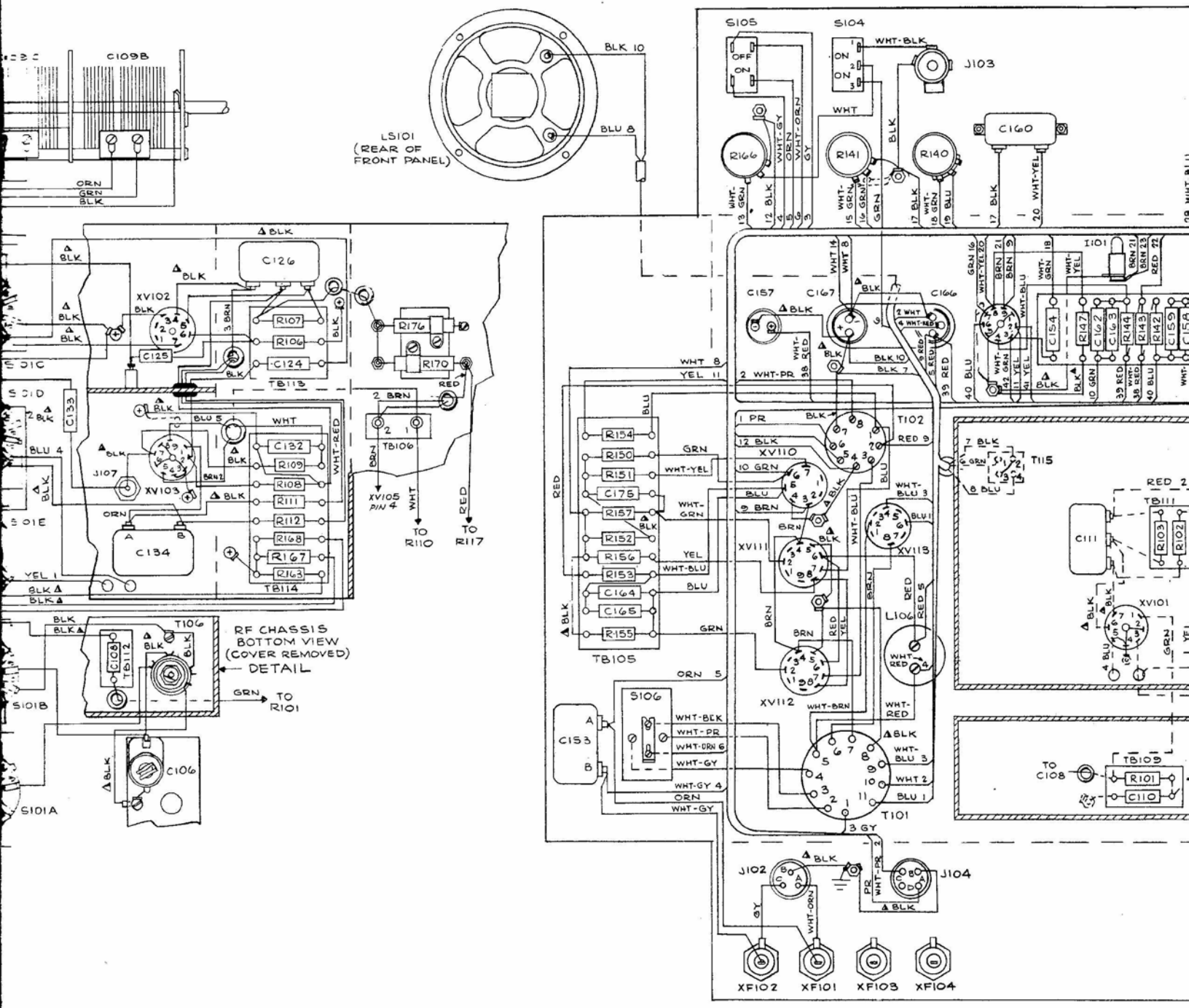


FIGURE 6-5. RADIO RECEIVER R-892/URR-44, SCHEMATIC DIAGRAM



COLOR CODE	
BLK - BLACK	ORN - ORANGE
BLU - BLUE	PR - PURPLE
BRN - BROWN	RED - RED
GRN - GREEN	WHT - WHITE
GY - GRAY	YEL - YELLOW


LS101
(REAR OF
FRONT PANEL)
BLK 10
BLU 8
S105
S104
J103
C160
R166
R141
R140
C126
XV102
R107
R106
C124
C125
TB113
R176
R170
2 BRN
TB106
XV105
PIN 4
TO
R110
TO
R117
C133
C132
R109
R108
R111
R112
R168
R167
R163
TB114
XV103
J107
C134
T106
C108
TB112
RF CHASSIS
BOTTOM VIEW
(COVER REMOVED)
DETAIL
GRN TO
R101
S101B
S101A
C106
C157
C167
C166
I101
C154
R147
C162
C163
R144
R143
R142
C159
TB105
R154
R150
R151
C178
R157
R152
R156
R153
C164
C165
R155
XV110
XV111
XV112
XV113
T102
T101
T115
L106
S106
C153
J102
J104
XF102
XF101
XF103
XF104
TB111
R103
R102
C111
XV101
TB109
R101
C110
TO
C108

FI

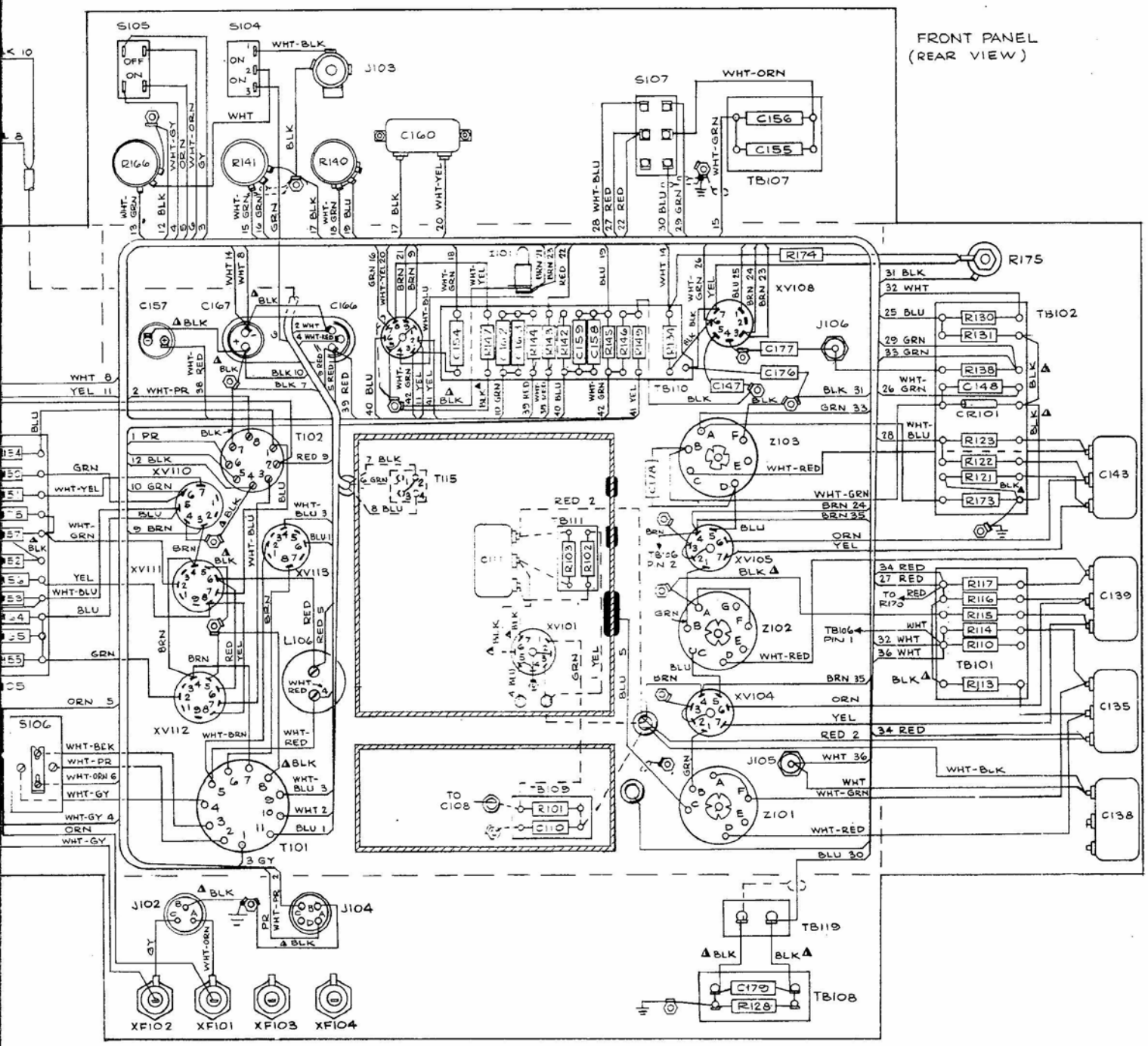


FIGURE 6-6. RADIO RECEIVER R-892/URR-44, WIRING DIAGRAM

SECTION 7

PARTS LIST

7-1. INTRODUCTION.

This section covers the listing and description of maintenance parts of the equipment. Reference designations have been assigned to identify all maintenance parts. They are used for marking the equipment, and are included on drawings, diagrams and the parts list. This equipment consists of one major unit.

7-2. MAINTENANCE PARTS LIST.

Table 7-1 lists all maintenance parts of this equipment. Column 1 lists the reference designations of the various parts, and they are given in alphabetical and numerical order. Column 2 refers to explanatory notes. Column 3 gives the name and describes the various parts. Complete information is given for all key parts (parts differing from any part previously listed in this table) and sub-key parts (parts identical with a key part, but appearing for the first time). The name and the description are omitted for other parts. However, reference is made to the key part or sub-key part for the data. Column 4 indicates how the part is used and gives its functional location in the equipment.

7-3. STOCK NUMBER CROSS REFERENCE.

Table 7-2 lists by stock numbers all key parts that have been assigned stock numbers. If the stock numbers of a part used in the equipment is known, this table can be used to locate the description of the part in table 7-1.

TABLE 7-1. MAINTENANCE PARTS LIST

Ref. Desig.	Notes	Name and Description	Locating Function
100-199		RADIO RECEIVER R-892/URR-44: for voice modulated signal reception (see Section 1 for performance data); operating power requirements 105 to 125 Vac, 50/60 cycles, single phase; overall dim. 12-3/8 in. high, 18 in. wide, 17-3/8 in. deep; HRCo. part/dwg. BM547	
C101		CAPACITOR, FIXED, MICA DIELECTRIC: 180 mmf ±5%, 500 Vdcw, MIL-C-5A type No. CM20E181J modified; HRCo. part/dwg. D-925-25	Antenna wave trap tuning, p/o Z105
C102		CAPACITOR, FIXED, MICA DIELECTRIC: 10,000 mmf ±10%, 300 Vdcw, MIL-C-5A type No. CM35B103K	Antenna series
C103		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 1.5 to 7.0 mmf, 500 Vdcw, MIL-C-81A type No. CV11A070; w/terminals modified by HRCo. dwg. A-490-203-1	Tuning, T103
C104		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 4.5 to 25.0 mmf, 500 Vdcw, MIL-C-81A type No. CV11A250; w/terminals modified by HRCo. dwg. A-490-203-1	Tuning, T104
C105		Same as C104	Tuning, T105
C106		Same as C104	Tuning, T106
C107		CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10 mmf ±.25 mmf, 500 Vdcw, MIL-C-20B type No. CC21CH100C	Trimmer, T104, T105, T106
C108		CAPACITOR, FIXED, MICA DIELECTRIC: 270 mmf ±5%, 500 Vdcw, MIL-C-5A type No. CM20D271J	Grid input coupling, V101

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C109		CAPACITOR, VARIABLE, AIR DIELECTRIC: plate meshing type; c/o 2 sections C109A & C109B-C. C109A contains 1 section and C109B-C contains 2 sections	Tuning control
C109A		p/o C109, single section; 20 to 422 mmf, 1000V AC peak, RRCo. part/dwg. Q-780	RF tuning
C109B-C		p/o C109, 2 sections; each section 20 to 422 mmf, 1000V AC peak, RRCo. part/dwg. Q-781	Osc-mixer tuning, V102 and V103
C110		Same as C102	Grid return bypass, V101
C111		CAPACITOR, FIXED, PAPER DIELECTRIC: 3 sections, MIL-C-25A type No. CP53B5EF104V	
C111A		p/o C111, 0.1 mf +20-10%, 600 Vdcw	Cathode bypass, V101
C111B		p/o C111, 0.1 mf +20-10%, 600 Vdcw	Screen bypass, V101
C111C		p/o C111, 0.1 mf +20-10%, 600 Vdcw	Screen B+ bypass V101
C112		CAPACITOR, VARIABLE, AIR DIELECTRIC: 4 to 23 mmf, 600V AC rms, plate meshing type, JAN-C-92 type No. CT1B025	Parallel trimmer, T111
C113		Same as C112	Parallel trimmer, T112
C114		Same as C112	Parallel trimmer, T113
C115		Same as C112	Parallel trimmer, T114

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C116		CAPACITOR, VARIABLE, AIR DIELECTRIC: 7.5 to 99.0 mmf, 600V AC rms, plate meshing type, JAN-C-92 type No. CT1B100	Series padder, T111
C117		CAPACITOR, FIXED, MICA DIELECTRIC: 470 mmf ±2%, 500 Vdcw, MIL-C-5A type No. CM20B471G	Series padder, T111
C118		CAPACITOR, FIXED, MICA DIELECTRIC: 1,100 mmf ±2%, 500 Vdcw, MIL-C-5A type No. CM30B112G	Series padder T112
C119		CAPACITOR, FIXED, CERAMIC DIELECTRIC: 10 mmf ±5%, 500 Vdcw, MIL-C-20B type No. CC21U100J	Fixed trimmer, T112
C120		CAPACITOR, FIXED, MICA DIELECTRIC: 3,000 mmf ±2%, 500 Vdcw, MIL-C-5A type No. CM30B302G	Series padder, T113
C121		Same as C119	Fixed trimmer, T113
C122		CAPACITOR, FIXED, MICA DIELECTRIC: 5,100 mmf ±2%, 500 Vdcw, MIL-C-5A type No. CM35B512G	Series padder, T114
C123		Same as C119	Fixed trimmer, T114
C124		Same as C108	Output coupling, V102
C125		CAPACITOR, FIXED, MICA DIELECTRIC: 56 mmf ±10%, 500 Vdcw, MIL-C-5A type No. CM25E560K	Grid input coupling, V102

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C126		Same as C111	
C126A		p/o C126	Plate bypass, V102
C126B		p/o C126	Decoupling, V102
C126C		p/o C126	Heater bypass, V102
C127		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 1.5 to 7.0 mmf, 500 Vdcw, MIL-C-81A type No. CV11A070; w/terminals modified by RRCo. dwg. A-490-203-2	Parallel trimmer, T107
C128		CAPACITOR, VARIABLE, CERAMIC DIELECTRIC: 4.5 to 25.0 mmf, 500 Vdcw, MIL-C-81A type No. CV11A250; w/terminals modified by RRCo. dwg. A-490-203-2	Parallel trimmer, T108
C129		Same as C128	Parallel trimmer, T109
C130		Same as C128	Parallel trimmer, T110
C131		Not used	
C132		Same as C102	Grid return bypass, V103
C133		Same as C108	Grid input coupling, V103
C134		CAPACITOR, FIXED, PAPER DIELECTRIC: 2 sections, MIL-C-25A type No. CP53B6EF104V	
C134A		p/o C134, 0.1 mf +20-10%, 600 Vdcw	Screen bypass, V103
C134B		p/o C134, 0.1 mf +20-10%, 600 Vdcw	Plate return bypass, V101

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C135		Same as C111	
C135A		p/o C135	Plate return isolating bypass, V101
C135B		p/o C135	Plate return bypass, V103
C135C		p/o C135	Grid return bypass, V104
C136		CAPACITOR, FIXED, MICA DIELECTRIC: 470 mmf ±2%, 500 Vdcw, MIL-C-5A type No. CM20E471G modified; RRCo. part/dwg. D-925-21	Fixed tuning, L102A, p/o Z101
C137		Same as C136	Fixed tuning, L102B, p/o Z101
C138		CAPACITOR, FIXED, PAPER DIELECTRIC: 0.25 mf ±10%, 600 Vdcw, MIL-C-25A type No. CP53B2EF254K	A.G.C. bus bypass
C139		Same as C111	
C139A		p/o C139	Cathode bypass, V104
C139B		p/o C139	Screen bypass, V104
C139C		p/o C139	Plate return bypass, V104
C140		Same as C136	Fixed tuning, L103A, p/o Z102
C141		Same as C136	Fixed tuning, L103B, p/o Z102
C142		Not used	

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C143		Same as C111	
C143A		p/o C143	Cathode bypass, V105
C143B		p/o C143	Screen bypass, V105
C143C		p/o C143	Plate return bypass, V105
C144		Same as C136	Fixed tuning, L104A, p/o Z103
C145		Same as C101	Plate return bypass, V106A, p/o Z103
C146		Not used	
C147		Same as C102	Plate bypass, V108
C148		Same as C108	Grid coupling, V108
C149		Not used	
C150		Not used	
C151		Not used	
C151		Not used	
C152		Not used	
C153		Same as C134	
C153A		p/o C153	AC power line bypass
C153B		p/o C153	AC power line bypass
C154		CAPACITOR, FIXED, MICA DIELECTRIC: 700 mmf ±500 Vdcw, MIL-C-5A type No. CM30D751J	Fidelity control capacitor

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C155		Same as C102	Grid coupling, V109A
C156		Same as C102	Grid coupling, V109A
C157		CAPACITOR, FIXED, ELECTROLYTIC: 35 mf, 400 Vdcw, MIL-C-62A type No. CE31C350Q	Plate return isolating, V109A
C158		CAPACITOR, FIXED, MICA DIELECTRIC: 5,600 mmf ±10%, 500 Vdcw, MIL-C-5A type No. CM35B562K	Grid coupling, V109B
C159		Same as C158	Grid coupling, V109B
C160		CAPACITOR, FIXED, ELECTROLYTIC: 25 mf, 25 Vdcw, MIL-C-62A type No. CE63C250F	
C161		Not used	
C162		Same as C158	Grid coupling, V110
C163		Same as C158	Grid coupling, V110
C164		Same as C158	Grid coupling, V111
C165		Same as C158	Grid coupling, V111
C166		CAPACITOR, FIXED, ELECTROLYTIC: 2 sections, MIL-C-62A type No. CE32C350Q	
C166A		p/o C166, 35 mf, 400 Vdcw	Power supply B+ filter
C166B		p/o C166, 35 mf, 400 Vdcw	Power supply B+ filter
C167		Same as C157	B- to ground filter
C168		Not used	
C169		Not used	

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
C170		Not used	
C171		Same as C136	Fixed tuning, L104B, p/o Z103
C172		Same as C107	Parallel trimmer, T108
C173		Not used	
C174		CAPACITOR, FIXED, MICA DIELECTRIC: 470 mmf ±5%, 500 Vdcw, MIL-C-5A type No. CM20D471J	Fixed tuning, L107, p/o L107
C175		Same as C102	Grid coupling, V112
C176		CAPACITOR, FIXED, PAPER DIELECTRIC: .1 mfd ±10%, 400 Vdcw, MIL-C-25A type No. CP05A1EE104K	Cathode bypass, V108
C177		Same as C176	Test point audio bypass, J106
C178		CAPACITOR, FIXED, CERAMIC DIELECTRIC: 2.0 mmf ±.25 mmf, 500 Vdcw, MIL-C-20B type No. CC20UK020C	Coupling, Z103
C179		CAPACITOR, FIXED, MICA DIELECTRIC: 100 mmf ±5%, 300 Vdcw, MIL-C-5A type No. CM15C101J	Audio bypass
CR101		SEMICONDUCTOR DEVICE, DIODE: germanium, MIL-E-1C type No. 1N198	2nd detector
E101		SHIELD, ELECTRON TUBE: JAN-S-28A type No. TS102U02	u/w V101
E102		Same as E101	u/w V102
E103		SHIELD, ELECTRON TUBE: JAN-S-28A type No. TS103U03	u/w V103

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
E104		Same as E101	u/w V104
E105		Same as E101	u/w V105
E106		Not used	
E107		Not used	
E108		Same as E101	u/w V108
E109		SHIELD, ELECTRON TUBE: JAN-S-28A type No. TS103U01	u/w V109
E110		Same as E101	u/w V110
E111		SHIELD, ELECTRON TUBE: JAN-S-28A type No. TS103U02	u/w V111
E112		Same as E111	u/w V112
E113		Not used	
F101		FUSE, INSTRUMENT: Cartridge type, 2 amps @ 250 volts, MIL-F-15160C type No. F02G2R00A in accordance with dwg. MS90078-11	AC power line
F102		Same as F101	AC power line
F103		Same as F101	Spare
F104		Same as F101	Spare
I101		LAMP, INCANDESCENT: 6-8V, T-3-1/4 bulb, clear, type No. TB-11 in accordance with dwg. MS15571-1	Dial lamp
I102		Not used	
J101		CONNECTOR, RECEPTACLE: 1 round female contact, MIL-C-71A type No. UG-58A/u modified; RRCo. part/dwg. T-089	Antenna input

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
J102		CONNECTOR, RECEPTACLE: 3 round male contacts, MIL-C-5015C type No. AN3102A-14S-7P	AC input
J103		JACK, TELEPHONE: RRCo. part/dwg. H-464-1	Phone jack
J104		CONNECTOR, RECEPTACLE: 4 round male contacts, MIL-C-5015C type No. AN 3102A-14S-2P	Audio output
J105		JACK, TIP: RRCo. part/dwg. S-174-2	Test point, A.G.C. bus voltage
J106		Same as J105	Test point, CR101 DC output alignment
J107		Same as J105	Test point, mixer input alignment
L101		COIL, R.F.: RRCo. part/dwg. SA:9080	Antenna wave trap inductor , p/o Z105
L102		TRANSFORMER, IF.: includes L102A, L102B and tertiary winding, RRCo. part/dwg. SA:9079	
L102A		p/o L102	Primary, Z101
L102B		p/o L102	Secondary, Z101
L103		TRANSFORMER, IF.: includes L103A, L103B and tertiary winding, RRCo. part/dwg. SA:9080	Inductor, 2nd IF., p/o Z102
L103A		p/o L103	Primary, Z102
L103B		p/o L103	Secondary, Z102

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
L104		TRANSFORMER, IF.: includes L104A and L104B, HRCo. part/dwg. SA:9077	Inductor, detector, p/o Z103
L104A		p/o L104	Primary, Z103
L104B		p/o L104	Secondary, Z103
L105		Not used	
L106		REACTOR, FILTER CHOKE: 10 hy @ 125 ma DC, 310 ohms DC max, HRCo. part/dwg. A-3001-34	Power supply
L107		COIL, RF: includes C174, HRCo. part/dwg. SA:9210	455 KC rejection in mixer circuit
LS101		LOUDSPEAKER, MAGNETIC: PM, Voice coil impedance 3.2 ohms ±10% @ 400 cps, HRCo. part/dwg. P-847-1	Loudspeaker
P101		CONNECTOR, PLUG, ELECTRICAL: 1 round male contact, MIL-C-71A type No. UG-21D/U	Antenna input
P102		CONNECTOR, PLUG: 3 round female contacts, MIL-C-5015C type No. AN3106B-14S-7S	AC input
P103		Not used	
P104		CONNECTOR, PLUG: 4 round female contacts, MIL-C-5015C type No. AN3106B-14S-2S	Audio output
R101		RESISTOR, FIXED, COMPOSITION: 470K ±10%, 1/2 W, MIL-R-11B type No. RC20GF474K	Grid load, V101
R102		RESISTOR, FIXED, COMPOSITION: 68 ohms ±10%, 1/2 W, MIL-R-11B type No. RC20GF680K	Cathode bias, V101

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
R103		RESISTOR, FIXED, COMPOSITION: 22K ±10%, 1/2 W, MIL-R-11B type No. RC20GF223K	Screen dropping, V101
R104		Not used	
R105		Not used	
R106		RESISTOR, FIXED, COMPOSITION: 47K ±10%, 1/2 W, MIL-R-11B type No. RC20GF473K	Grid bias, V102
R107		RESISTOR, FIXED, COMPOSITION: 220 ohms ±10%, 1/2 W, MIL-R-11B type No. RC20GF221K	Plate load, V102
R108		Same as R103	No. 1 grid bias, V103
R109		Same as R101	No. 2 grid load, V103
R110		Same as R101	No. 2 grid load, V103
R111		RESISTOR, FIXED, COMPOSITION: 4.7K ±10%, 1/2 W, MIL-R-11B type No. RC20GF472K	Screen dropping, V103
R112		RESISTOR, FIXED, COMPOSITION: 470 ohms ±10%, 1/2 W, MIL-R-11B type No. RC20GF471K	Plate B+ filter, V101
R113		RESISTOR, FIXED, COMPOSITION: 680 ohms ±10%, 1/2 W, MIL-R-11B type No. RC20GF681K	Plate B+ filter, V103
R114		Same as R101	A.G.C. filter to grid of V104
R115		RESISTOR, FIXED, COMPOSITION: 150 ohms, ±10%, 1/2 W, MIL-R-11B type No. RC20GF151K	Cathode bias, V104

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
R116		Same as R106	Screen dropping, V104
R117		Same as R113	Plate B+ filter, V104
R118		Not used	
R119		Not used	
R120		Not used	
R121		RESISTOR, FIXED, COMPOSITION: 430 ohms ±5%, 1/2 W, MIL-R-11B type No. RC20GF431J	Cathode bias, V105
R122		Same as R106	Screen dropping, V105
R123		Same as R113	Plate B+ filter, V105
R124		Not used	
R125		Not used	
R126		Not used	
R127		Not used	
R128		RESISTOR, FIXED, COMPOSITION: 100K ±10%, 1/2 W, MIL-R-11B type No. RC20GF104K	Ext. audio input load
R129		Same as R101	Plate dropping, V108
R131		RESISTOR, FIXED, COMPOSITION: 220K ±10%, 1/2 W, MIL-R-11B type No. RC20GF224K	Plate load, V108
R132		Not used	
R133		Not used	
R134		Same as R101	Grid leak, V108

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
R135		Not used	
R136		Not used	
R137		Not used	
R138		RESISTOR, FIXED, COMPOSITION: 2.2 megs ±10%, 1/2 W, MIL-R-11B type No. RC20GF225K	Audio filter, J106
R139		Not used	
R140		RESISTOR, VARIABLE, COMPOSITION: 500K ±20%, 1 W, (order with 1 Shakeproof Lock Washer - #1220-02 and one Nut - 3/8-32 NEF-2B), MIL-R-94B type No. RV2NAXSD504B	Fidelity control
R141		Same as R140	A.F. level control
R142		Same as R128	Plate load, V109A
R143		Same as R106	Plate dropping, V109A
R144		Same as R106	Plate load, V109B
R145		Same as R131	Grid bias, V109B, p/o tone control
R146		Same as R103	Grid bias, V109
R147		RESISTOR, FIXED, COMPOSITION: 1.5K, ±10%, 1/2 W, MIL-R-11B type No. RC20GF152K	Cathode bias, V109A
R148		Not used	
R149		Same as R112	Cathode bias, V109B
R150		Same as R101	Grid leak, V110
R151		Same as R111	Cathode bias, V110

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
R152		RESISTOR, FIXED, COMPOSITION: 47K ±5%, 1/2 W, MIL-R-11B type No. RC20GF473J	Plate load (split phase), V110
R153		Same as R152	Plate load (split phase), V110
R154		RESISTOR, FIXED, COMPOSITION: 68K ±5%, 2 W, MIL-R-11B type No. RC42GF683J	Feed-back V112 to V109B
R155		RESISTOR, FIXED, COMPOSITION: 470K ±5%, 1/2 W, MIL-R-11B type No. RC20GF474J	Grid load, V111
R156		RESISTOR, FIXED, COMPOSITION: 220 ohms ±10%, 2 W, MIL-R-11B type No. RC42GF221K	Cathode bias, V111 and V112
R157		Same as R155	Grid load, V111
R158		Not used	
R159		RESISTOR, FIXED, COMPOSITION: 4.7K ±5%, 1/2 W, MIL-R-11B type No. RC20GF472J	Primary load, p/o T107
R160		Not used	
R161		Not used	
R162		Not used	
R163		RESISTOR, FIXED, COMPOSITION: 1K ±10%, 1/2 W, MIL-R-11B type No. RC20GF102J	Cathode bias, V101
R164		RESISTOR, FIXED, COMPOSITION: 10K ±5%, 1/2 W, MIL-R-11B type No. RC20GF103J	Primary load, T109, p/o T109
R165		Same as R163	Primary load, T108, p/o T108

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
R166		RESISTOR, VARIABLE, WIREWOUND: 5K ±10%, 2 W (order with one Shakeproof Lock Washer - #1220-02 and one Nut - 3/8-22 NEF-2), JAN-R-19 type No. RA20A2ED502CK	Monitor level control
R167		Same as R112	Cathode bias, V101
R168		Same as R115	Cathode bias, V101
R169		Not used	
R170		RESISTOR, FIXED, WIREWOUND: 2K ±5%, 10 W, MIL-R-26C type No. RW56G202	Plate dropping, V102
R171		Not used	
R172		Not used	
R173		RESISTOR, FIXED, COMPOSITION: 430K ±5%, 1/2 W, MIL-R-11B type No. RC20GF434J	Output bias, CR101
R174		RESISTOR, FIXED, WIREWOUND: 350 ohms, ±5%, 10 W, MIL-R-26C type No. RW56G351	Biasing network, p/o V108
R175		RESISTOR, FIXED, WIREWOUND: 1.1K ±5%, 26 W, MIL-R-26C type No. RW33V112	Biasing network, p/o V108(in cathode)
R176		RESISTOR, FIXED, WIREWOUND: 5.6K ±5%, 14 W, MIL-R-26C type No. RW56V562	p/o voltage divider network for V102 plate supply

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
S101		SWITCH ASSEMBLY, ROTARY: Consists of S101A, S101B, S101C, S101D, and S101E	Band selector
S101A		SWITCH SECTION, ROTARY: 2 pole, 4 position, RRCo. part/dwg. Q-606	Signal input transformer selector, p/o S101
S101B		SWITCH SECTION, ROTARY: 2 pole, 4 position, RRCo. part/dwg. Q-608	Signal input transformer selector, p/o S101
S101C		SWITCH SECTION, ROTARY: 2 pole, 4 position, RRCo. part/dwg. Q-607	H.F. oscillator transformer selector, p/o S101
S101D		SWITCH SECTION, ROTARY: 4 pole, 4 position, RRCo. part/dwg. Q-605	Mixer transformer selector, p/o S101
S101E		SWITCH SECTION, ROTARY: 1 pole, 4 position, RRCo. part/dwg. Q-604	Band selector, p/o S101
S102		Not used	
S103		Not used	
S104		SWITCH, TOGGLE, SPDT: (order with mounting hardware as specified in JAN-S-23 plus Shakeprpof Lock Washer - #1224-02) JAN-S-23 type No. ST12D	Monitor-phone selector
S105		SWITCH, TOGGLE, DPST: (mounting hardware as specified in JAN-S-23 plus Shakeproof Lock Washer - #1224-02) JAN-S-23 type No. ST22K	Power on-off switch
S106		TERMINAL BOARD: primary switch connection board, RRCo. part/dwg. SA:6479	Power transformer primary tap

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
S107		SWITCH, TOGGLE, DPDT: (including two nuts per MS-25082-8, one Lock Washer, Shakeproof - #1224-02 and one Lock Ring per MS-25081-1), MIL-S-3950A type No. MS35059-15	Audio input selector
T101		TRANSFORMER, POWER: Step up and step down, RRCo. part/dwg. A-2945-23	Power
T102		TRANSFORMER, AUDIO FREQUENCY: Plate coupling type, RRCo. part/dwg. A-2968-5	Audio output
T103		TRANSFORMER, RF: 0.54 to 1.6 mc frequency range, RRCo. part/dwg. SA:9100	RF input (BC Band)
T104		TRANSFORMER, RF: 1.6 to 3.45 mc frequency range, RRCo. part/dwg. SA:9098	RF input (SW-1 band)
T105		TRANSFORMER, RF: 3.45 to 8.6 mc frequency range, RRCo. part/dwg. SA:9104	RF input (SW-2 band)
T106		TRANSFORMER, RF: 8.6 to 18.6 mc frequency range, RRCo. part/dwg. SA:9092	RF input (SW-3 band)
T107		TRANSFORMER, RF: 0.54 to 1.6 mc frequency range, includes R159, RRCo. part/dwg. SA:9090	Mixer input (BC band)
T108		TRANSFORMER, RF: 1.6 to 3.45 mc frequency range, includes R165, RRCo. part/dwg. SA:9096	Mixer input (SW-1 band)
T109		TRANSFORMER, RF: 3.45 to 8.6 mc frequency range, RRCo. part/dwg. SA:9102	Mixer input (SW-2 band)

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
T110		TRANSFORMER, RF: 8.6 to 18.6 mc frequency range, RRCo. part/dwg. SA:9108	Mixer input (SW-3 band)
T111		COIL, RF: 96 uh @ 2.5 mc, DC resistance 2.57 ohms, RRCo. part/dwg. SA:9088	H.F. oscillator inductor (BC band)
T112		COIL, RF: 17.8 uh @ 2.5 mc, DC resistance 0.68 ohms, RRCo. part/dwg. SA:9094	H.F. oscillator inductor (SW-1 band)
T113		COIL, RF: 3.8 uh @ 7.9 mc, DC resistance 0.11 ohms, RRCo. part/dwg. SA:9100	H.F. oscillator inductor (SW-2) band)
T114		COIL, RF: 1.07 uh @ 25 mc, DC resistance 0.06 ohms, RRCo. part/dwg. SA:9106	H.F. oscillator inductor (SW-3 band)
T115		TRANSFORMER, AUDIO FREQUENCY: RRCo. part/dwg. A-2968-4	Audio output to loudspeaker
V101		ELECTRON TUBE: MIL-E-1C type No. 5749/6BA6W	RF amplifier
V102		ELECTRON TUBE: MIL-E-1C type No. 6C4WA	H.F. oscillator
V103		ELECTRON TUBE: MIL-E-1C type No. 6BA7	Mixer
V104		Same as V101	1st IF. amplifier
V105		Same as V101	2nd IF. amplifier
V106		Not used	
V107		Not used	
V108		Same as V102	A.G.C. amplifier

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
V109		ELECTRON TUBE: includes V109A and V109B, MIL-E-10 type No. 5670	
V109A		p/o V109	1st audio amplifier
V109B		p/o V109	2nd audio amplifier
V110		Same as V102	Phase splitter
V111		ELECTRON TUBE: MIL-E-10 type No. 5686	Audio output
V112		Same as V111	Audio output
V113		ELECTRON TUBE: MIL-E-10 type No. 5Y3WGTA	Rectifier
V114		Not used	
V115		Not used	
XF101		FUSE HOLDER: includes cap, consists of XF101A, and XF101B, RRCo. part/dwg. H-477-1	For F101
XF101A		p/o XF101 - FUSE HOLDER w/o cap, RRCo. part/dwg. H-477-2	
XF101B		p/o XF101 - CAP, RRCo. part/dwg. H-477-3	
XF102		Same as XF101	For F102
XF102A		p/o XF102	
XF102B		p/o XF102	
XF103		Same as XF101	For F103
XF103A		p/o XF103	
XF103B		p/o XF103	

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
XF104		Same as XF101	For F104
XF104A		p/o XF104	
XF104B		p/o XF104	
XI101		LAMP HOLDER: miniature base lamp, RRCo. part/dwg. T-226	For I101
XI102		Not used	
XV101		SOCKET, ELECTRON TUBE: 7 pin miniature, JAN-S-28A type No. TS102C01	For V101
XV102		Same as XV101	For V102
XV103		SOCKET, ELECTRON TUBE: 9 pin miniature, JAN-S-28A type No. TS103C01	For V103
XV104		Same as XV101	For V104
XV105		Same as XV101	For V105
XV106		Not used	
XV107		Not used	
XV108		Same as XV101	For V108
XV109		Same as XV103	For V109
XV110		Same as XV101	For V110
XV111		Same as XV103	For V111
XV112		Same as XV103	For V112
XV113		SOCKET, ELECTRON TUBE: octal, JAN-S-28A type No. TS102C02	For V113

TABLE 7-1. MAINTENANCE PARTS LIST (Cont)

Ref. Desig.	Notes	Name and Description	Locating Function
XV114		Not used	
XV115		Not used	
Z101		TRANSFORMER, IF.: includes C136, C137, L102A and L102B, RRCo. part/dwg. SA:9168	1st IF.
Z102		TRANSFORMER, IF.: includes C140, C141, L103A and L103B, RRCo. part/dwg. SA:9167	2nd IF.
Z103		TRANSFORMER IF: includes C144, C145, C171, L104A and L104B, RRCo. part/dwg. SA:9169	Input, detector
Z104		Not used	
Z105		WAVE TRAP: includes C101, L101, RRCo. part/dwg. SA:9081	Antenna wave trap

TABLE 7-2. STOCK NUMBER CROSS REFERENCE

Reference Designations	Federal Stock Number	Standard Navy
AN/URR-44	F5820-681-9740	
L106	N5950-645-1271	
L107	N5950-645-2704	
M176	N5950-691-0218	
T101	N5950-647-5199	
T110	N5950-647-9350	
T111	N5950-647-9643	
T112	N5950-648-0834	
T113	N5950-647-9920	
T114	N5950-648-0786	
Z101	N5950-645-2378	
Z102	N5950-645-2379	
Z103	N5950-647-8764	