

Figure 2-17. Control Unit ARC Type C-53, Location and Function of Operating Controls

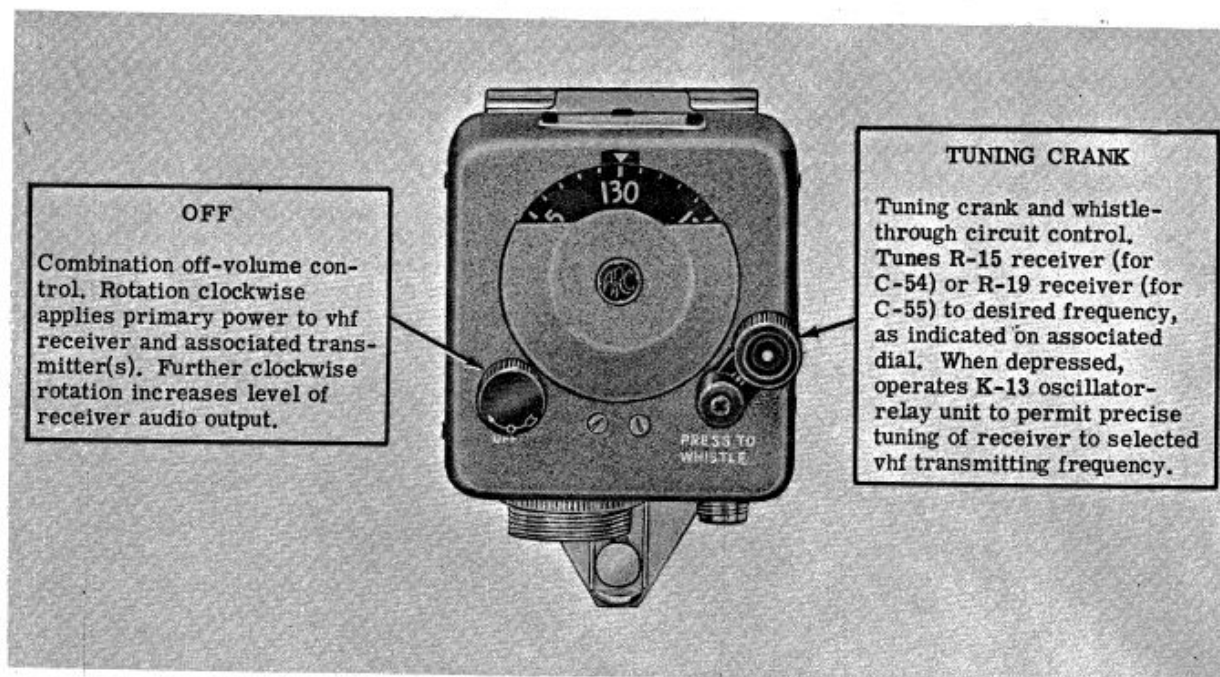


Figure 2-18. Control Units ARC Type C-54 and C-55, Location and Function of Operating Controls

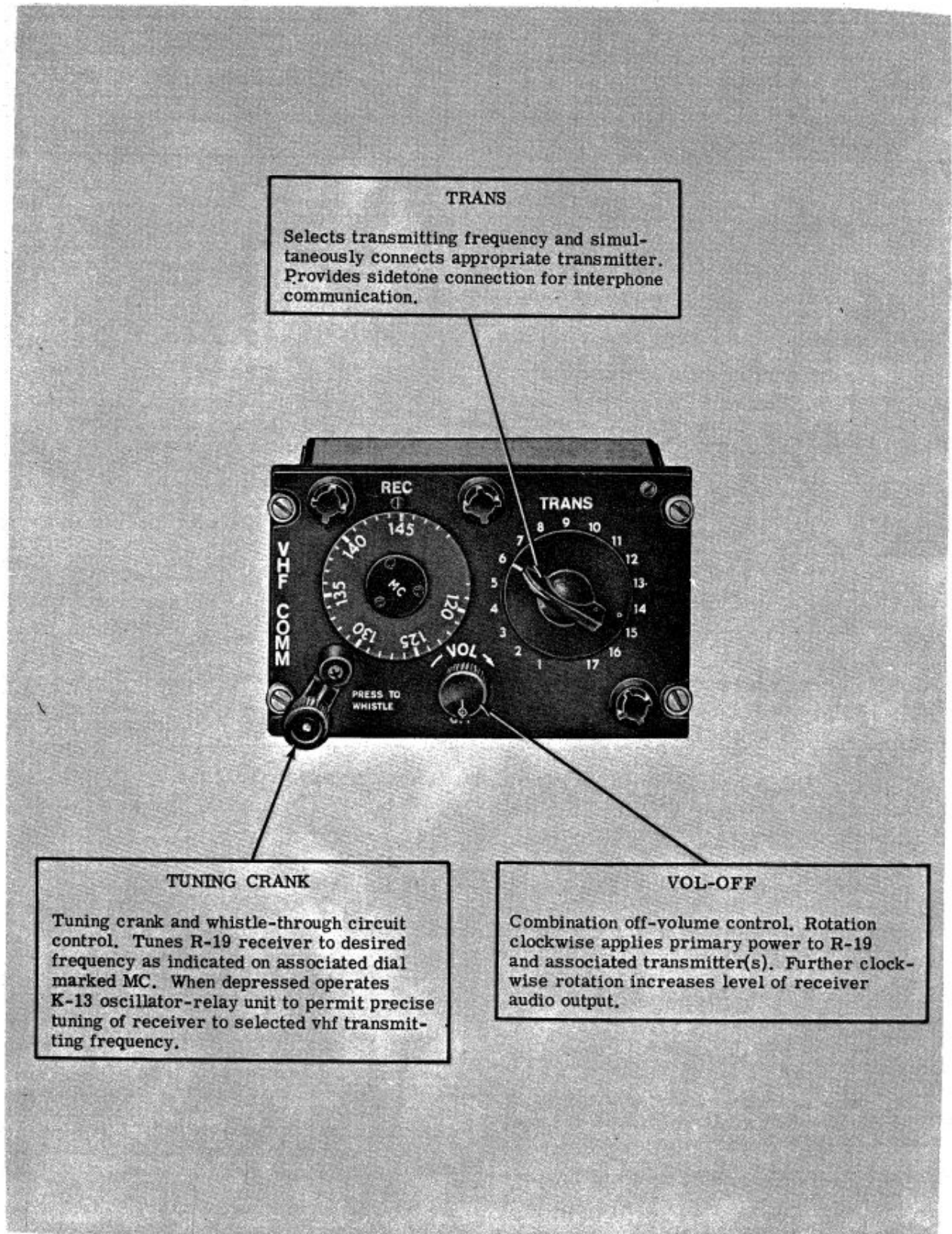


Figure 2-19. Control Unit ARC Type C-56, Location and Function of Operating Controls

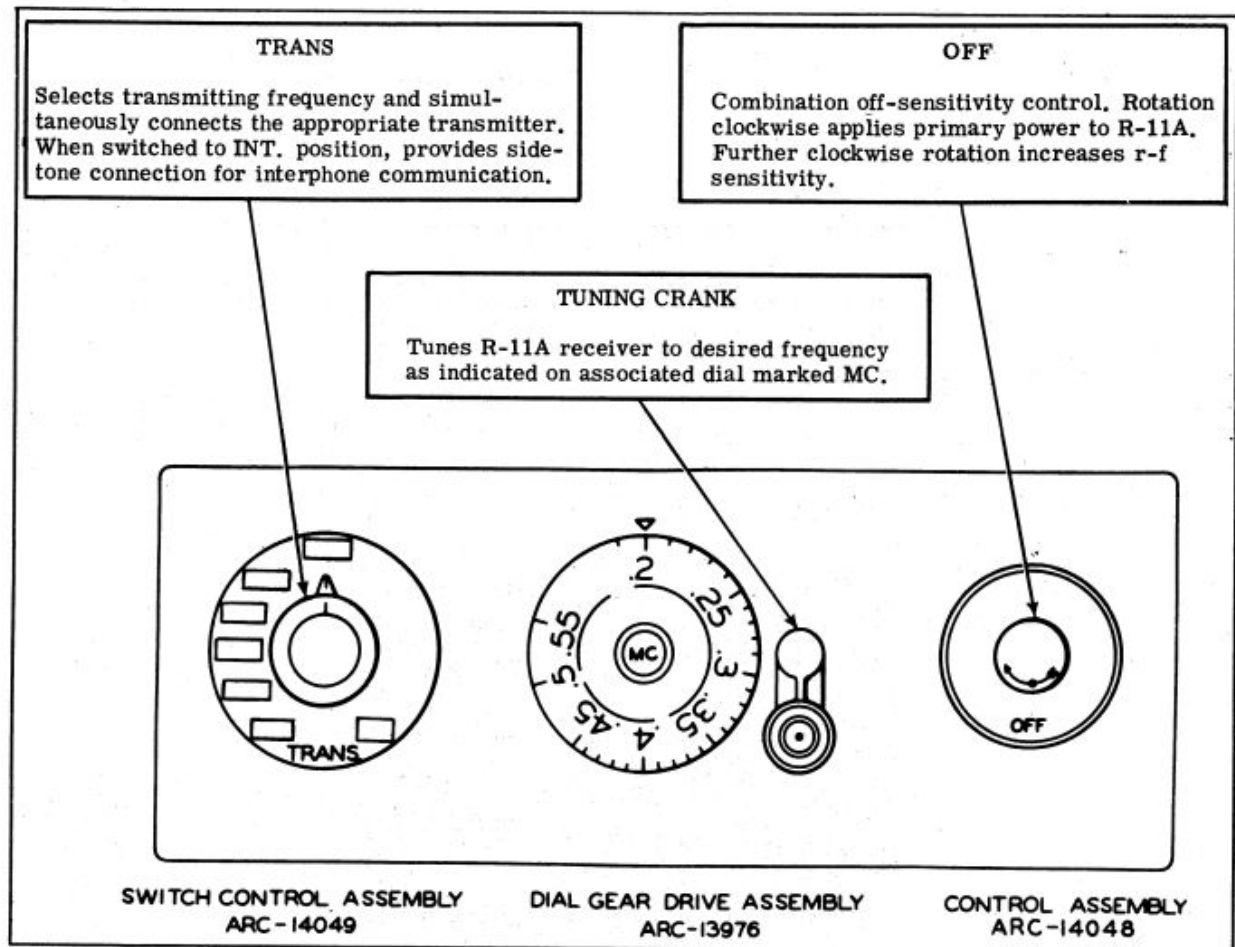


Figure 2-20. Radio Set ARC Type 12, Model H-13B Helicopter Installation, Location and Function of Operating Controls

2-14. OPERATION, PREFLIGHT.

2-15. R-10A OR R-11A RECEIVER. For a preflight operational check of either the R-10A or R-11A, proceed as follows:

- a. Switch on airplane's electrical system.
- b. Apply power to receiver by turning applicable SENS-OFF control fully clockwise. Allow equipment to warm up for two to three minutes.
- c. Set ANT. -LOOP switch of receiver's control assembly to ANT.
- d. Rotate appropriate tuning crank and check operation of receiver over the entire frequency range. Adjust the sensitivity, as required, with the SENS-OFF control.
- e. Tune the receiver to a selected station. Set the ANT. -LOOP switch to LOOP. Check that any other ANT. -LOOP switch present is set to the ANT. position, since optimum results are achieved when only one receiver at a time is operated on LOOP.
- f. Alternately rotate the loop antenna by means of the LOOP tuning crank, and adjust the sensitivity by means of the SENS-OFF control for the sharpest minimum signal. Note the LOOP dial reading. Rotate the loop antenna 180 degrees, and check that the same relative value of signal is received at that point.
- g. Turn SENS-OFF control fully counterclockwise (power off).
- h. Switch off airplane's electrical system unless required for other purposes.

2-16. R-15 OR R-19 RECEIVER. For a preflight operational check of either the R-15 or R-19, proceed as follows:

- a. Switch on airplane's electrical system.
- b. Apply power to the receiver by turning the applicable SENS-OFF (or VOL-OFF) control fully clockwise. Allow the equipment to warm up for two to three minutes.
- c. Set the LO-HI switch (if provided) of the receiver's control assembly to LO.
- d. Rotate the appropriate tuning crank and check operation of receiver over the entire frequency range. Adjust the audio level as required, with either the SENS-OFF control or the VOL-OFF control, whichever is installed.
- e. If "whistle-through" tuning is provided, push in tuning crank, and tune receiver to any transmitting frequency, until maximum whistle is heard. Compare receiver frequency dial reading to transmitting frequency. (Any one of the transmitting frequencies may be used to check "whistle-through" tuning.)
- f. Switch the LO-HI switch (if provided) to HI and check the operation of the receiver on a relatively weak signal. Adjust the audio level as required.
- g. Switch off airplane's electrical system, unless required for other purposes.

2-17. R-20 RECEIVER. No practical preflight operational check of the R-20 can be made, but the signal lamp should be checked for operation by pushing the test switch, which is part of the lamp socket. If the lamp lights, it may be assumed that low voltage is present and, if the Type 12 receiver from which high voltage is obtained has been checked out, it may be assumed that high voltage is also being supplied to the R-20.

2-18. T-11A, T-11B, T-13 OR T-13A TRANSMITTER. For a preflight operational check of the T-11A, T-11B, T-13, or T-13A transmitter, proceed as follows:

- a. Switch on airplane's electrical system.
- b. Apply power to the transmitter by switching on the SENS-OFF (or VOL-OFF) control of the receiver (usually the vhf receiver), which is interconnected to the transmitter.
- c. Apply power to the receiver whose range includes the frequency upon which a reply will be requested. (Disregard this step if the receiver involved is the same as that of step b., since power is already applied.)
- d. Allow all equipment to warm up for two to three minutes.
- e. Tune the selected receiver to the frequency on which a reply is expected.

f. Set the control unit's TRANS switch to desired transmitting frequency.

g. To check transmitter operation, close microphone switch and call selected station; speak directly into microphone and state frequency upon which reply is awaited. To receive, release microphone switch as soon as transmission is completed.

h. If interphone circuit is included, set TRANS switch to interphone position, close microphone switch, speak into microphone, and check interphone transmission and headset (or loudspeaker) reception.

i. If an FM transmitter, such as Type SCR-619 (not part of Type 12) is installed, set the TRANS switch to FM position. Check out the FM transmitter by operating it as outlined in the applicable handbook.

j. Turn receivers' SENS-OFF (or VOL-OFF) controls fully counterclockwise (power off).

k. Switch off airplane's electrical system, unless required for other purposes.

2-19. TV-10 TRANSVERTER. For a preflight operational check of the TV-10, switch the control unit's TRANS switch to a uhf position, and check the transmission and reception on a uhf frequency in the same manner described for vhf operation in paragraphs 2-16 and 2-18.

2-20. DUAL-CONTROL INSTALLATION. Preflight operation of a dual-control installation is the same as for a single-control installation. Since all mechanical and electrical controls are provided in duplicate, each operator should check his system individually. In addition, each operator should check for proper transfer of control when the respective PUSH FOR CONTROL switch is operated, and the master station should check for override control.

2-21. OPERATION, AIRBORNE.

Note

It is assumed in the airborne operating procedures which follow that all necessary electrical controls which are not part of the Type 12 are in their proper position for the furnishing of primary power.

2-22. R-10A OR R-11A RECEIVER OPERATION WITH FIXED-WIRE ANTENNA. Airborne operation of either the R-10A or R-11A using the fixed-wire antenna is the same. If desired, both the R-10A and R-11A may be operated simultaneously with the wire antenna. Proceed as follows:

a. Apply power to receiver by turning applicable SENS-OFF control fully clockwise. Allow equipment to warm up.

b. Set ANT.-LOOP switch of receiver's control assembly to ANT.

c. Rotate appropriate tuning crank to tune receiver to desired station frequency.

d. Reduce sensitivity with SENS-OFF control until the audio output drops sharply and substantially. (Refer to paragraph 2-4.)

e. Check station identification.

2-23. R-10A OR R-11A RECEIVER OPERATION WITH LOOP ANTENNA. Airborne operation of either the R-10A or R-11A using the loop antenna is the same. However, only one receiver should be operated at a time for best loop antenna reception. Proceed as follows:

a. Follow the same procedure, as outlined in paragraph 2-22, for fixed wire reception.

b. Set ANT. -LOOP switch to LOOP position. Check that any other operating receiver's ANT. -LOOP switch is set to ANT.

c. Rotate the loop antenna by means of the LOOP control and adjust the receiver sensitivity for the sharpest minimum signal. Alternately readjust the loop position and sensitivity control until this sharply defined null is obtained.

d. Read the bearing on the LOOP control dial. This is the station bearing from the heading of the airplane.

CAUTION

Two such nulls, 180 degrees apart, will be present. This ambiguity must be resolved by the operator's knowing the general position of the airplane with respect to the station. If unknown, use either Method 1, described in paragraph 2-24, or Method 2, described in paragraph 2-25, to eliminate this ambiguity.

2-24. DETERMINATION OF STATION BEARING, METHOD 1. A simple procedure to determine the position of the airplane with respect to a station, when using a loop antenna (refer to paragraph 2-23), is as follows:

a. Reduce the volume of the received signal to the point where it is just audible.

b. Fly directly toward (or away from) the station.

c. If the signal strength increases, the airplane is headed toward the station. If the signal fades out permanently, the airplane is headed away from the station.

2-25. DETERMINATION OF STATION BEARING, METHOD 2. An alternative method to that described in paragraph 2-24 for determining a station bearing requires an accurate determination of the null, and a simultaneous reading of the airplane's gyro compass. Proceed as follows:

a. Set the LOOP control to 0 degree.

b. Head the airplane into a null signal and note the gyro compass reading G_1 .

c. Fly for approximately five minutes at the G_1 reading plus 90 degrees.

d. Head the airplane into the null signal, turning back toward the G_1 heading, and note the gyro compass reading G_2 .

e. If G_2 is less than G_1 , the heading G_1 is toward the station. If G_2 is greater than G_1 , the heading G_1 is away from the station.

2-26. R-15 OR R-19 OPERATION. Airborne operation of the R-15 or R-19 receiver is the same. If the installation includes a K-13 oscillator-relay unit for "whistle-through" tuning, precise tuning of the receiver to a transmitting frequency is possible. Proceed as follows:

a. Apply power to the receiver by turning the applicable SENS-OFF (or VOL-OFF) control fully clockwise. Allow the equipment to warm up.

b. Set the LO-HI switch (if provided) of the receiver's control assembly to LO.

Note

Ordinarily the LO position will provide a strong enough signal. If the signal cannot be increased to the desired level, using the sensitivity control, use the HI position.

c. Rotate the appropriate tuning crank and tune in the desired station; reduce the volume by means of the SENS-OFF (or VOL-OFF) control so that the signal strength decreases as the station is tuned in.

d. If "whistle-through" tuning is available, the receiver may be tuned precisely to a transmitting frequency by setting the TRANS switch to the frequency desired and then pressing the receiver tuning crank while tuning for maximum whistle.

e. When the station is tuned in accurately, adjust the audio level by means of the SENS-OFF (or VOL-OFF) control.

2-27. R-20 OPERATION. The R-20 is prepared for operation when the receiver to which it is connected for primary and high voltage is switched on.

2-28. T-11A, T-11B, T-13, OR T-13A OPERATION. To operate any of the vhf transmitters proceed as follows:

a. Apply power to the transmitter by rotating the SENS-OFF (or VOL-OFF) control of the receiver (usually the vhf receiver) connected to the transmitter being operated.

b. If a reply is expected on another receiver's frequency, apply power to that receiver, and tune the receiver to the reply frequency.

c. Allow equipment to warm up.

d. Set control unit's TRANS switch to desired transmitting crystal frequency or, if interphone is desired, to interphone position. If operation of FM equipment (if installed) is desired, set the TRANS switch to FM.

e. Close microphone switch and speak directly into microphone.

f. To receive, release microphone switch as soon as transmission is completed.

2-29. TV-10 OPERATION. The TV-10 is used for the reception and transmission of uhf signals. (Refer to paragraphs 1-38 through 1-41.) To receive or transmit, proceed as follows:

a. Apply power by rotating the associated receiver's VOL-OFF control. Allow equipment to warm up.

b. Set the control unit's TRANS switch to the desired uhf transmitting frequency.

c. To transmit, close the microphone switch and speak directly into the microphone.

d. To receive, release microphone switch as soon as transmission is completed.

e. To receive, tune the associated receiver to the desired receiving frequency. If the frequency is the same as one of the transmitting frequencies, use the "whistle-through" facility for precise tuning.

2-30. OPERATION OF DUAL-CONTROL SYSTEM. For airborne operation of a dual-control installation, once the PUSH FOR CONTROL switch is pushed to transfer control, follow the applicable procedure for receiving or transmitting, described in paragraphs 2-22 through 2-29. (Refer to paragraph 2-6.)

2-31. OPERATION, SECURE.

2-32. To secure any one of the receivers or transmitters, turn the appropriate SENS-OFF (or VOL-OFF) control fully counterclockwise until the on-off switch is operated. To secure the complete Type 12 system, either turn all SENS-OFF (or VOL-OFF) switches to their OFF positions, or if a master radio switch is installed, switch it off.

2-33. EMERGENCY TURN-OFF PROCEDURE.

2-34. If a separate master radio control switch, or equivalent, is installed, set this switch in its off position if an emergency shut-down is required.

SECTION III

OPERATING CHECKS AND ADJUSTMENTS

CAUTION

No transmissions will be made on emergency (distress) VHF or UHF Channels except for emergency purposes. For testing, demonstration or drill purposes, radio equipment will be operated into a nonradiating dummy load instead of an Antenna to prevent transmission of false distress signals.

3-1. PREFLIGHT OPERATING CHECKS AND ADJUSTMENTS.

3-2. Table 3-1 outlines the operating checks and adjustments to be made, as applicable, prior to flight.

TABLE 3-1. PREFLIGHT OPERATING CHECKS AND ADJUSTMENTS

What To Check	How To Check or Adjust
Interconnecting cables and mechanical linkage	Visually and manually check that all interconnecting cables and mechanical linkage are securely and properly connected. Connector rings should be hand-tight.
Dynamotors	With airplane's electrical system and control unit's SENS-OFF (or VOL-OFF) controls switched on, feel dynamotors to check that they are operating, that no excessive vibration exists, and that operation is smooth as evidenced by an even hum. Normal operation of receiver is indicative of proper high-voltage output from dynamotor.
Tuning cranks and selector switch	Rotate tuning cranks and selector switch, and check that operation is smooth without binding or slipping at any point.
Loop antenna operation	Rotate LOOP tuning crank and check that loop antenna rotates without binding or slipping. Compare the azimuth position of the loop antenna with the LOOP indicator dial bearing. At a 90-degree indication, the plane of the loop should be exactly fore and aft.
Microphone and headset	Visually check that microphone and headset are available and are connected properly to J-10 jack boxes.
T-13 or T-13A transmitter frequency-extending capacity plate	If the T-13 or T-13A transmitter is to be operated below the normal low end of the frequency range, remove the top snapslide cover and check that capacity plate ARC-15392, for the T-13, or ARC-15900, for the T-13A, is installed and secured properly. (Refer to paragraph 1-35.) Replace cover.

TABLE 3-1. PREFLIGHT OPERATING CHECKS AND ADJUSTMENTS (Cont)

What To Check	How To Check or Adjust
Transmitter crystals	<p>Remove the top snapslide cover of the vhf transmitters, or the dust cover of the TV-10. Compare the output frequency of each crystal, marked on top of the crystal holder, and its socket position, with the corresponding frequency tabs or frequency chart and the TRANS selector switch positions. Replace cover.</p> <p>Note</p> <p>Except for crystals ARC-17142, crystals which are housed in holders not stamped HERMETIC or OK on the two opposite sides of the holder should be tested for frequency accuracy under actual transmitting conditions, or equivalent. If a tolerance of ± 0.02 percent for ARC-10714 crystal units, or ± 0.01 percent for ARC-14958 crystal units, of the nominal frequency stamped on the side of the holder is not realized, replace the crystal. Mark accordingly all crystals which are not faulty and reinstall.</p>
Combined vhf-uhf frequency dial	Where a combined vhf-uhf frequency dial, such as in the C-53 control unit, is installed, check, as the channel selector switch is changed from vhf to uhf or vice versa, that the proper frequency range indications become fully visible.
"Whistle-through" tone	If "whistle-through" tuning is available, push the tuning crank and check that a sufficient whistle level is present. In a combined vhf-uhf installation, check whistle level for both vhf and uhf. If the whistle level requires adjustment, notify cognizant maintenance personnel.

3-3. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS.

3-4. Table 3-2 outlines the checks and adjustments to be made, as applicable, during airborne operation.

TABLE 3-2. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS

What To Check	How To Check or Adjust
Sensitivity setting for R-10A or R-11A receiver	<p>When operating the R-10A or R-11A receiver in a high-signal-strength area, adjust the applicable sensitivity control to a minimum usable setting to avoid course broadening. (Refer to paragraph 2-4.)</p> <p>When the loop antenna is being used for reception by the R-10A or R-11A, set the applicable SENS-OFF control to the minimum usable setting to prevent avc interaction. (Refer to paragraph 2-4.)</p>

TABLE 3-2. AIRBORNE OPERATING CHECKS AND ADJUSTMENTS (Cont)

What To Check	How To Check or Adjust
Sensitivity setting for R-15 or R-19 receiver	When tuning the R-15 or R-19 receiver, set the applicable LO-HI switch (if provided) to LO, and adjust the corresponding SENS-OFF control for maximum tolerable noise before tuning to the desired station. Final tuning should be done with this control backed off so that the signal is weak. As a final adjustment, increase this setting to the desired maximum point. If several headsets are used simultaneously, set the LO-HI switch to HI. If sufficient volume cannot be obtained with the sensitivity control, set the LO-HI switch to HI.
ANT. -LOOP switch	When the loop antenna is in use with either the R-10A or R-11A receiver, check that the corresponding ANT. -LOOP switch of the receiver not being used with the loop antenna is set to ANT.
TRANS switch	Before transmitting, check that the TRANS switch is set to the desired frequency channel position.
Microphone switch	Release microphone switch, as soon as transmission is completed, to receive.
Station calling	Do not call a station until certain that it is not communicating with another station.

SECTION IV
EMERGENCY OPERATION AND REPAIR

4-1. EMERGENCY OPERATION.

4-2. Table 4-1 is a suggested list of procedures to be used for emergency operation of the equipment. It is assumed that the referenced parts or components are

defective and that no replacements are available. Since some of the procedures require access to the interiors of the components, they are not always practicable during flight. For possible interchangeability of components, refer to paragraph 2-2.

TABLE 4-1. EMERGENCY OPERATION PROCEDURES

Trouble	Remedy
DYNAMOTOR FAILURE	Replace with dynamotor from unused or least necessary receiver.
R-11A RECEIVER INOPERATIVE	If R-11A is not operating properly, and the R-10A is available, it is possible to utilize commercial broadcast signals in the vicinity of the destination for navigation information by using the R-10A and the loop antenna.
ELECTRON TUBE FAILURE	Replace with corresponding type from component not in use, or least required.
FUSE FAILURE	If receiver fuse has failed and other receivers installed contain fuses, replace with fuse from receiver not in use or from one not required to complete mission. Active fuses for installations including a J-12 or J-13 junction box are contained therein. If fuses are installed on front panels of receivers of such installations, they are inactive and therefore may be used to replace a defective fuse in the junction box. If no fuses are available, and component use is imperative, short fuseholder out of circuit.
CONTROL UNIT FAILURE	Since no facilities for local operation are available, disconnect the nondefective control unit from the receiver not in use, or least required, and substitute for defective component; disregard substitute control unit dial indications. If a C-16 is substituted for a C-17 (or correspondingly a B'CAST control assembly for a RANGE control assembly), set the ANT. -LOOP switch in LOOP position for emergency operation, since the ANT. position will result in no audio output.
FAILURE OF RECEIVER POWERING TRANSMITTER	Disconnect transmitter from defective receiver and connect to nondefective receiver to restore transmission.
LOOP ANTENNA CONTROL UNIT FAILURE	Use fixed-wire antenna for reception.
BATTERY NOT RECHARGING	To conserve battery, turn off all components except one actually in use.
SEVERE OUTSIDE INTERFERENCE	Use vhf or uhf components: R-15, R-19, TV-10, T-11A, T-11B, T-13, T-13A; or use loop antenna, if available, with R-10A or R-11A. Turn all others off.

TABLE 4-1. EMERGENCY OPERATION PROCEDURES (Cont)

Trouble	Remedy
POOR RECEPTION WITH FIXED-WIRE ANTENNA	Use loop antenna.
TRANSMITTER FAILURE	Use other vhf transmitter, if installed. If due to "power supply" receiver failure, reconnect transmitter to operating receiver. If uhf facilities are available, transmit on uhf frequency.

4-3. EMERGENCY REPAIR.

4-4. GENERAL. Improper functioning of components or circuit failure may be due to minor faults which may be repaired by the operator. These may include loose cable connections between units or to the primary power source, electron tube failure, blown fuses, or burned-out lamps. Replacement procedures for such items are described in the following paragraphs. Figures 4-1 through 4-10 show the location and type of electron tubes and crystal units. Electrical schematic diagrams of the components (figures 4-11 through 4-47) are included for reference.

4-5. REPLACEMENT OF CRYSTALS. The T-11A, T-11B, T-13, and T-13A transmitters may each contain from one to five crystals. The TV-10 transverter may contain up to eight crystals. Figures 4-6 through 4-10 show the location of these parts. To replace a crystal, proceed as follows:

- Shut down all power to transmitter.
- Slide back the snapslide fasteners which secure the top cover of the vhf transmitter, and remove the cover. For the TV-10, remove the dust cover.
- Remove the defective crystal from its socket and insert the new crystal.
- Replace cover and secure.

4-6. REPLACEMENT OF ELECTRON TUBES. All electron tubes are easily accessible from the top of the component. Figures 4-1 through 4-10 are electron tube location diagrams. To replace an electron tube, proceed as follows:

- Shut down all power to component.
- Slide back the snapslides which secure the component's top cover and remove the cover.
- Pull out the defective tube and insert the new tube.
- Replace cover and secure.

4-7. REPLACEMENT OF LAMPS. All edge-lighted plastic panel AN, console control units, and those control units used for dual-control installations, contain panel lamps. For 28-volt operation, the edge-lighted control units use midjet flange-base AN3140-327 lamps, installed on the front panel in MS25010-2 red-filter light assemblies, for edge-lighting the panel. The C-44, C-47, and C-50 control units, used in

dual-control installations, use the same type of lamp installed in a mechanical dimmer-type light assembly for indicating when control of the system has been transferred. For 14-volt operation, type 330 lamps are used. To replace any of these lamps, proceed as follows:

- Unscrew the lamp housing, and remove together with the rubber grommet (if present) and the lamp.
- With the thin edge of a knife blade (or the fingernails of the thumb and forefinger) inserted between the flange base of the lamp and the threaded bushing, withdraw the defective lamp.
- Insert a new lamp, seating the flange of the base firmly against the threaded bushing.
- Replace the lamp housing assembly, and screw in finger-tight.

4-8. REPLACEMENT OF FUSES. Some receivers contain a 20-ampere type 3AG cartridge fuse, installed in an extractor-type fuseholder located on the receiver front panel. If such fuses are installed, and replacement is required, proceed as follows:

- Shut down power to component.
- Rotate fuseholder cap a quarter-turn counter-clockwise and remove the cap together with the fuse.
- Remove the defective fuse.
- Insert a new fuse of the proper rating in the cap, and replace the cap in the fuseholder body. Secure with a quarter-turn clockwise.

4-9. The J-12, J-13, and J-15 junction boxes each contain three type 3AG, 20-ampere cartridge fuses, installed in fuse-clip holders. To replace, shut down power, pull defective fuse out of clips, and insert a new one. The J-13A and J-15A junction boxes do not contain fuses.

4-10. LOCATION DIAGRAMS OF ELECTRON TUBES AND CRYSTALS.

4-11. Figures 4-1 through 4-10 locate and identify the electron tubes and crystals used in the components of Radio Set ARC Type 12.

4-12. SCHEMATIC DIAGRAMS.

4-13. Schematic diagrams of the electrical components of Radio Set ARC Type 12 are shown in figures 4-11 through 4-46.

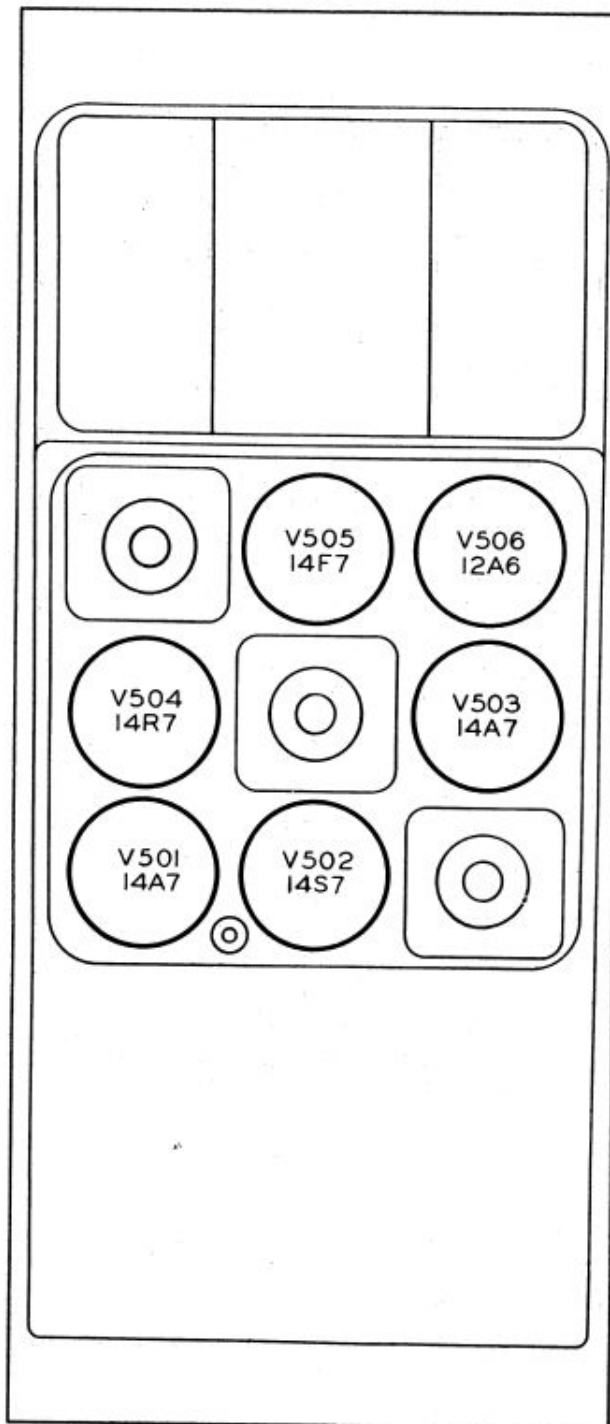


Figure 4-1. Radio Receiver ARC Type R-10A,
Electron Tube Location Diagram

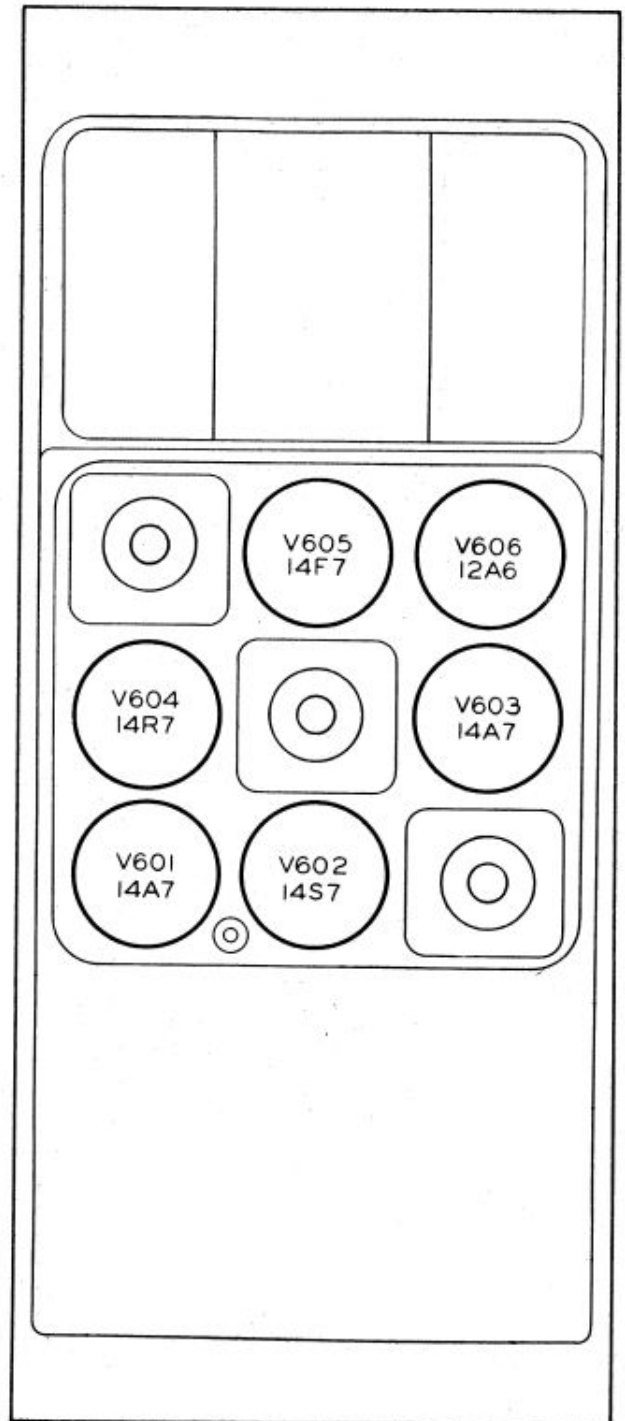


Figure 4-2. Radio Receiver ARC Type R-11A,
Electron Tube Location Diagram

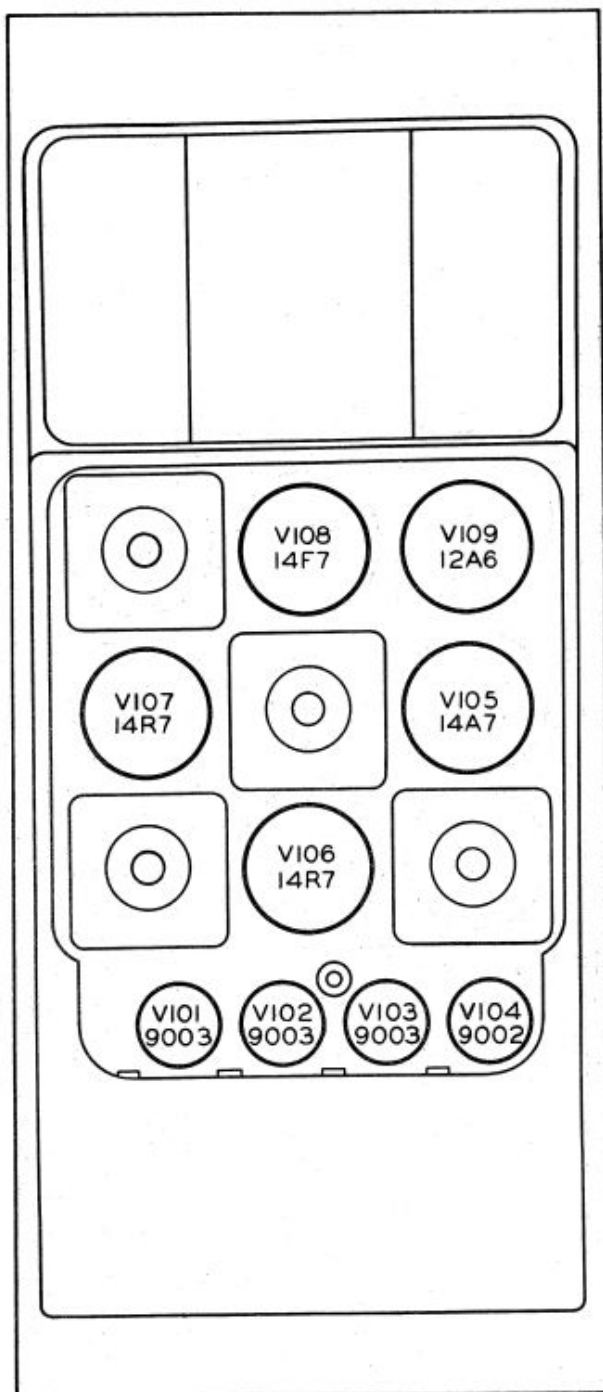


Figure 4-3. Radio Receiver ARC Type R-15,
Electron Tube Location Diagram

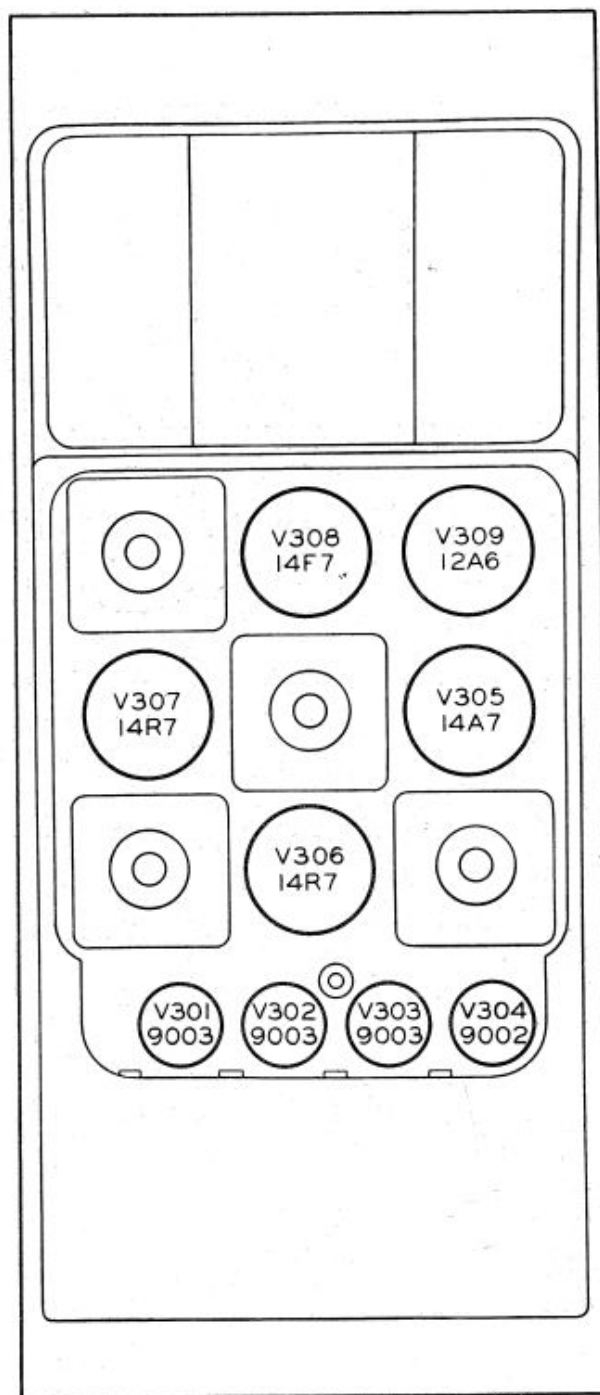


Figure 4-4. Radio Receiver ARC Type R-19,
Electron Tube Location Diagram

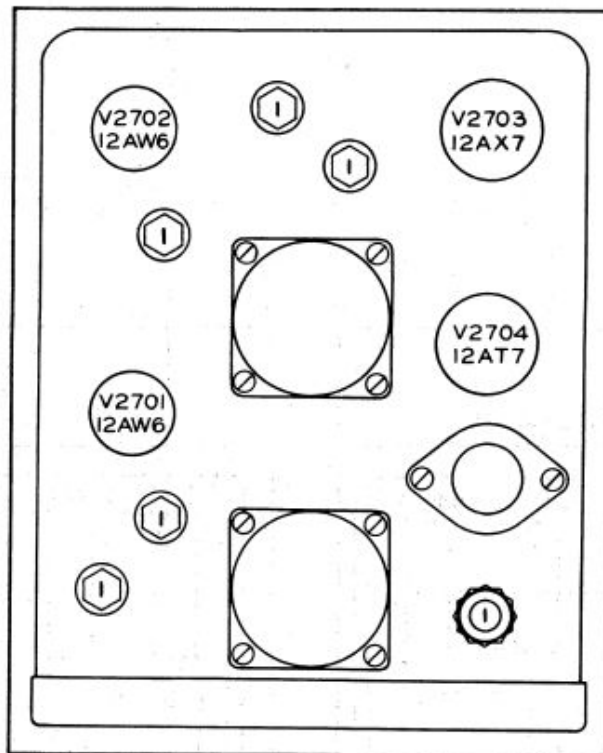


Figure 4-5. Radio Receiver ARC Type R-20,
Electron Tube Location Diagram

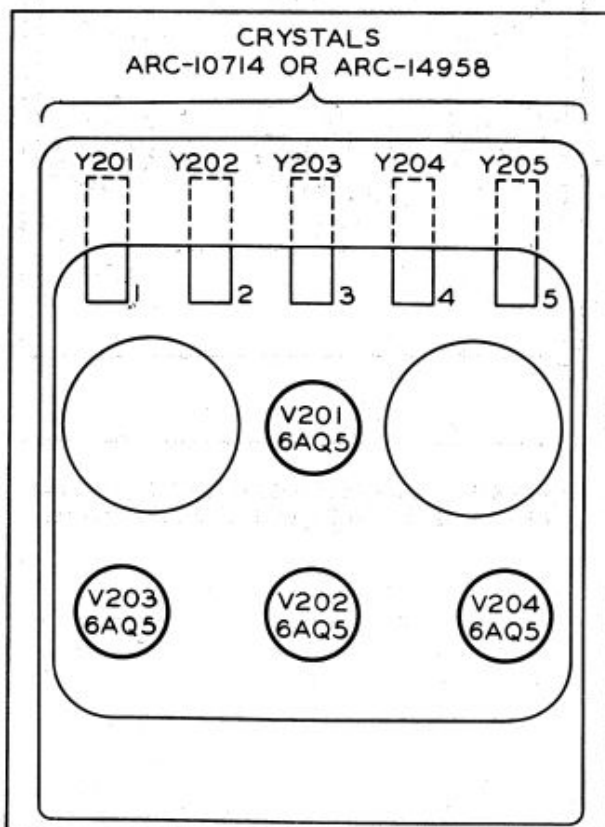


Figure 4-6. Radio Transmitter ARC Type T-11A,
Electron Tube and Crystal Location Diagram

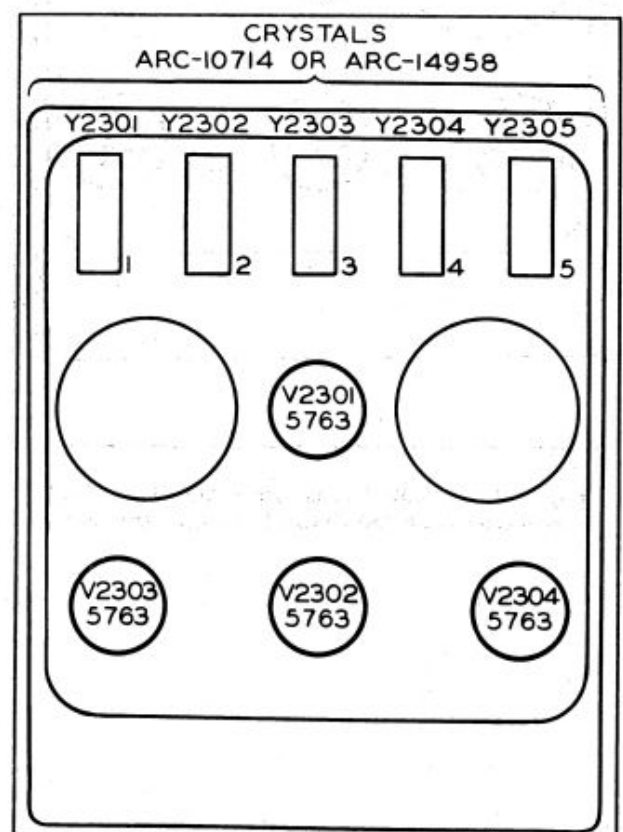


Figure 4-7. Radio Transmitter ARC Type T-11B,
Electron Tube and Crystal Location Diagram

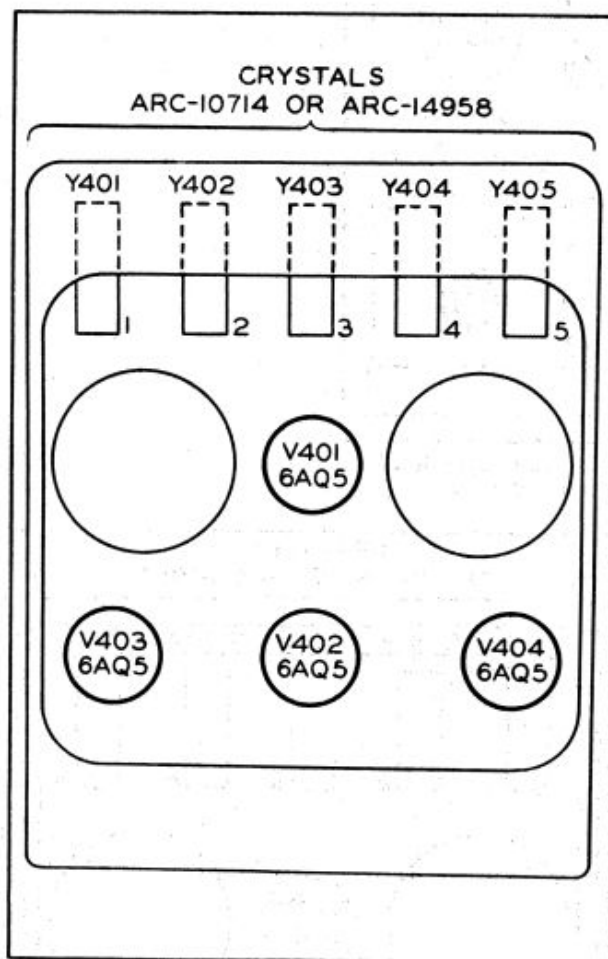


Figure 4-8. Radio Transmitter ARC Type T-13,
Electron Tube and Crystal Location Diagram

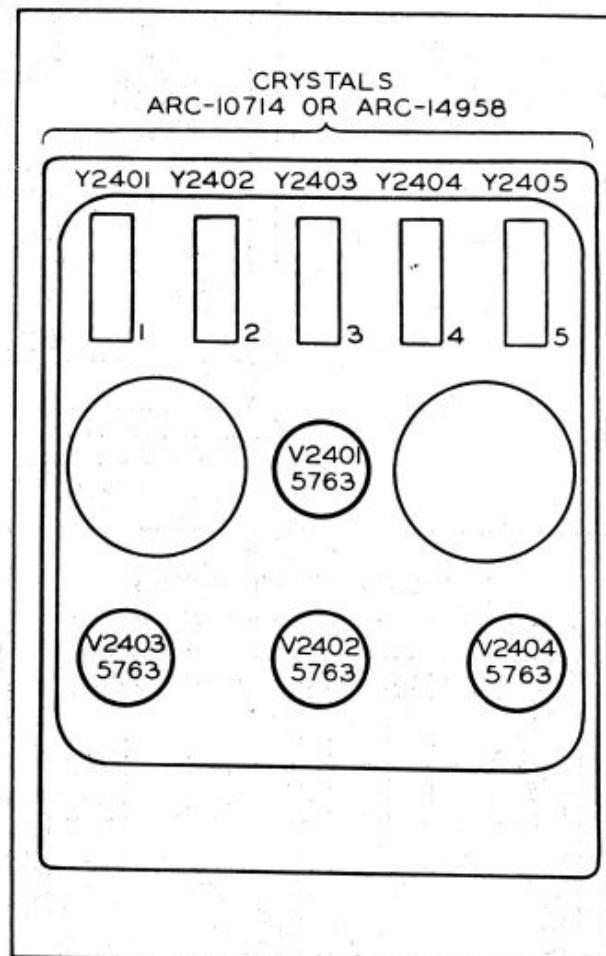


Figure 4-9. Radio Transmitter ARC Type T-13A,
Electron Tube and Crystal Location Diagram

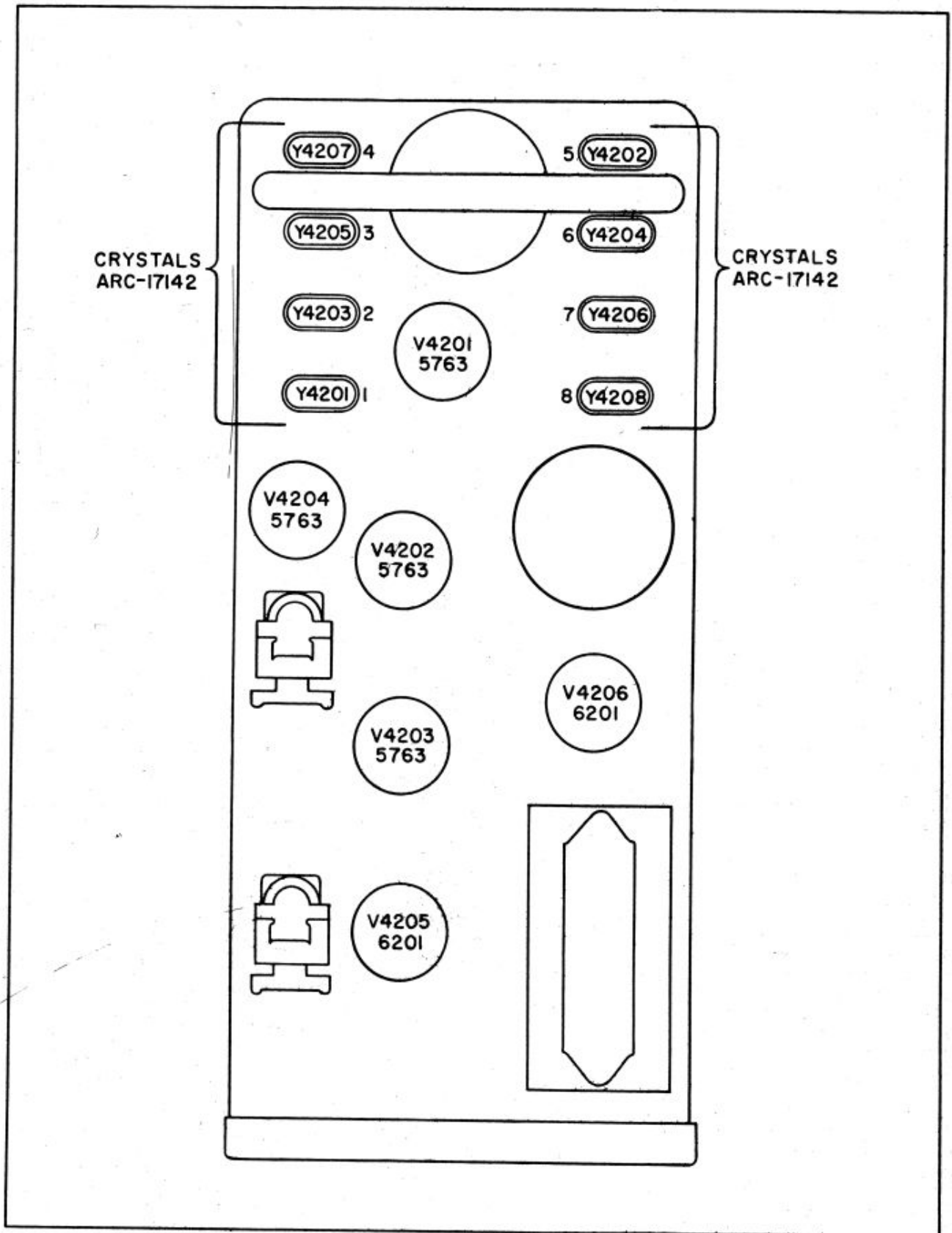
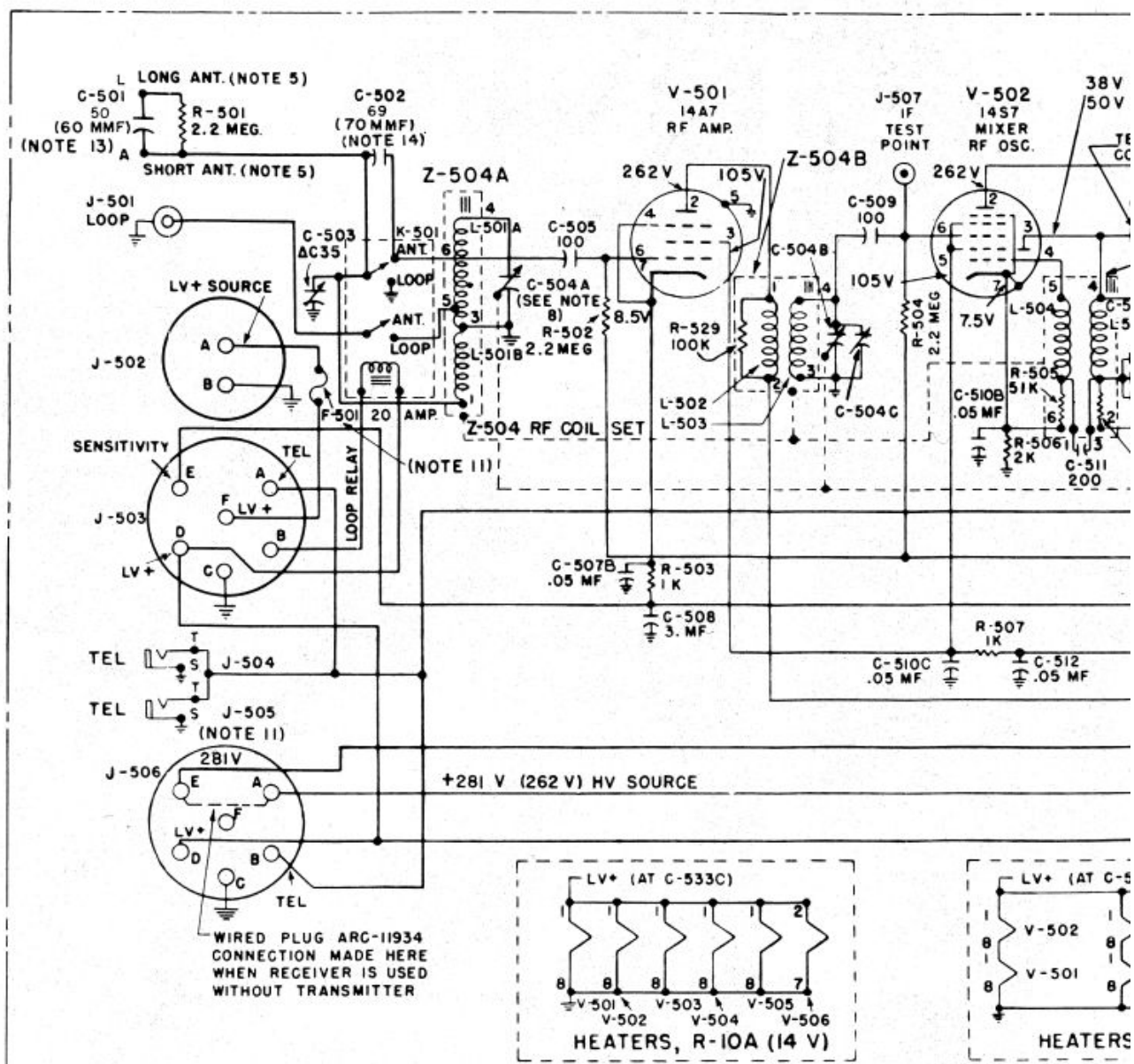


Figure 4-10. UHF Transverter ARC Type TV-10, Electron Tube and Crystal Location

NOTES:

1. CONNECTIONS ARE SHOWN TO WIRED SIDE OF CONNECTORS.
2. CAPACITOR VALUES ARE IN MICROMICROFARADS UNLESS FOLLOWED BY "MF" - MICROFARAD.
3. RESISTOR VALUES ARE IN OHMS UNLESS FOLLOWED BY MULTIPLIER:
K = 1,000; MEG = 1,000,000.
4. INDUCTOR VALUES ARE IN MICROHENRIES UNLESS FOLLOWED BY
"MH" - MILLIHENRY (1,000 MICROHENRIES) OR "H" - HENRY.
5. A "SHORT" ANTENNA IS DEFINED AS ONE HAVING AN EFFECTIVE CAPACITANCE OF 21-50 MMF AND A "LONG" ONE AS 50 MMF OR GREATER. BEGINNING WITH SERIAL NO. 365 OF R-10A(14V) AND SERIAL NO. 75 OF R-10A (28V) "A" ANTENNA TERMINAL POST CONNECTION WAS DELETED AND "L" ANTENNA TERMINAL POST WAS MARKED "A".
6. D-C VOLTAGE VALUES SHOWN ARE APPROXIMATE AND ARE BASED ON THE FOLLOWING CONDITIONS:
 - A. LV+ AT TERMINAL "2" OF J-508 SET AT 13.5 VOLTS ON R-10A (14V) OR 27 VOLTS ON R-10A (28V) BY ADJUSTMENT OF LV+ SOURCE.
 - B. AF CATHODE LINE, TERMINAL "B" OF J-502, AND SENSITIVITY LINE, TERMINAL "E" OF J-503 GROUNDED; NO SIGNAL INPUT.
 - C. 20,000 OHMS-PER-VOLT OR 1,000 OHMS-PER-VOLT VOLTMETER USED, UNLESS OTHERWISE INDICATED.
 - D. ALL VOLTAGES ARE MEASURED USING A D-10A DYNAMOTOR AS THE HIGH VOLTAGE SUPPLY. WHEN A D-10 DYNAMOTOR IS USED, VALUES WILL BE APPROXIMATELY 10% LESS. VALUES IN PARENTHESIS ARE THOSE OBTAINED WHEN DYNAMOTOR ALSO SUPPLIES POWER TO A TRANSMITTER CONNECTED TO J-506; NO RECEIVER DRAIN.
 - E. NEGATIVE TERMINAL OF VOLTMETER GROUNDED TO CHASSIS.
7. THE I. F. IS 239 KC. ALL THE I-F TRIMMER CAPACITORS HAVE A ΔC OF 17 MMF.
8. EACH TUNING SECTION OF C-504 HAS A ΔC OF 346 MMF. EACH TRIMMER HAS A ΔC OF 16 MMF.
9. SYMBOL NO. C-506 NOT USED.
10. REFER TO PARAGRAPH 1-43.
11. DELETED BEGINNING WITH SERIAL NO. 365 OF R-10A (14V) AND SERIAL NO. 75 OF R-10A (28V).
12. ADDED BEGINNING WITH SERIAL NO. 365 OF R-10A (14V) AND SERIAL NO. 75 OF R-10A (28V).
13. VALUE SHOWN IN PARENTHESIS USED BEGINNING WITH SERIAL NO. 365 OF R-10A (14V) AND SERIAL NO. 75 OF R-10A (28V).
14. VALUE SHOWN IN PARENTHESIS USED BEGINNING WITH SERIAL NO. 437 OF R-10A (14V) AND SERIAL NO. 210 OF R-10A (28V).





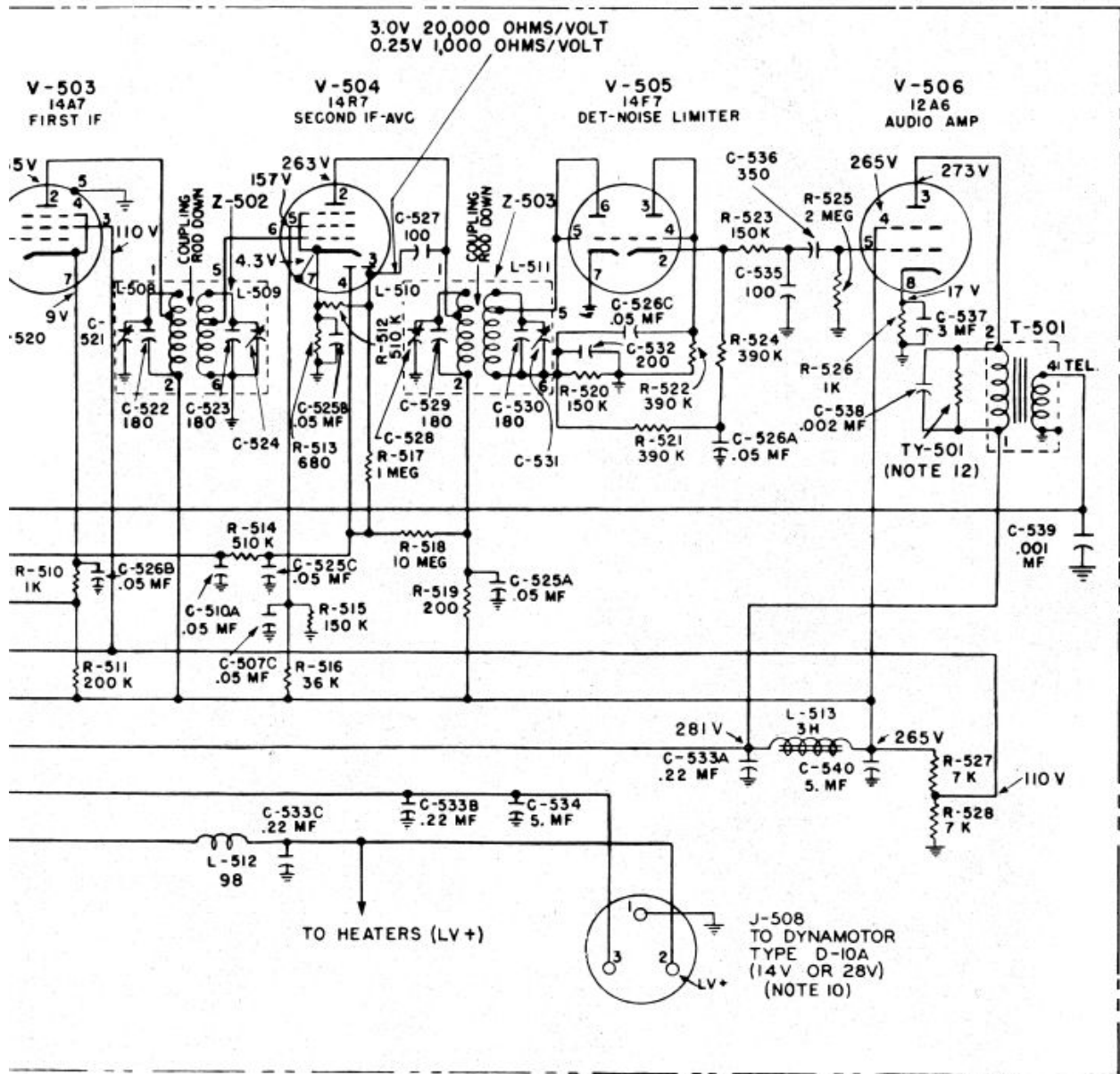


Figure 4-11. Radio Receiver ARC Type R-10A, Schematic Diagram

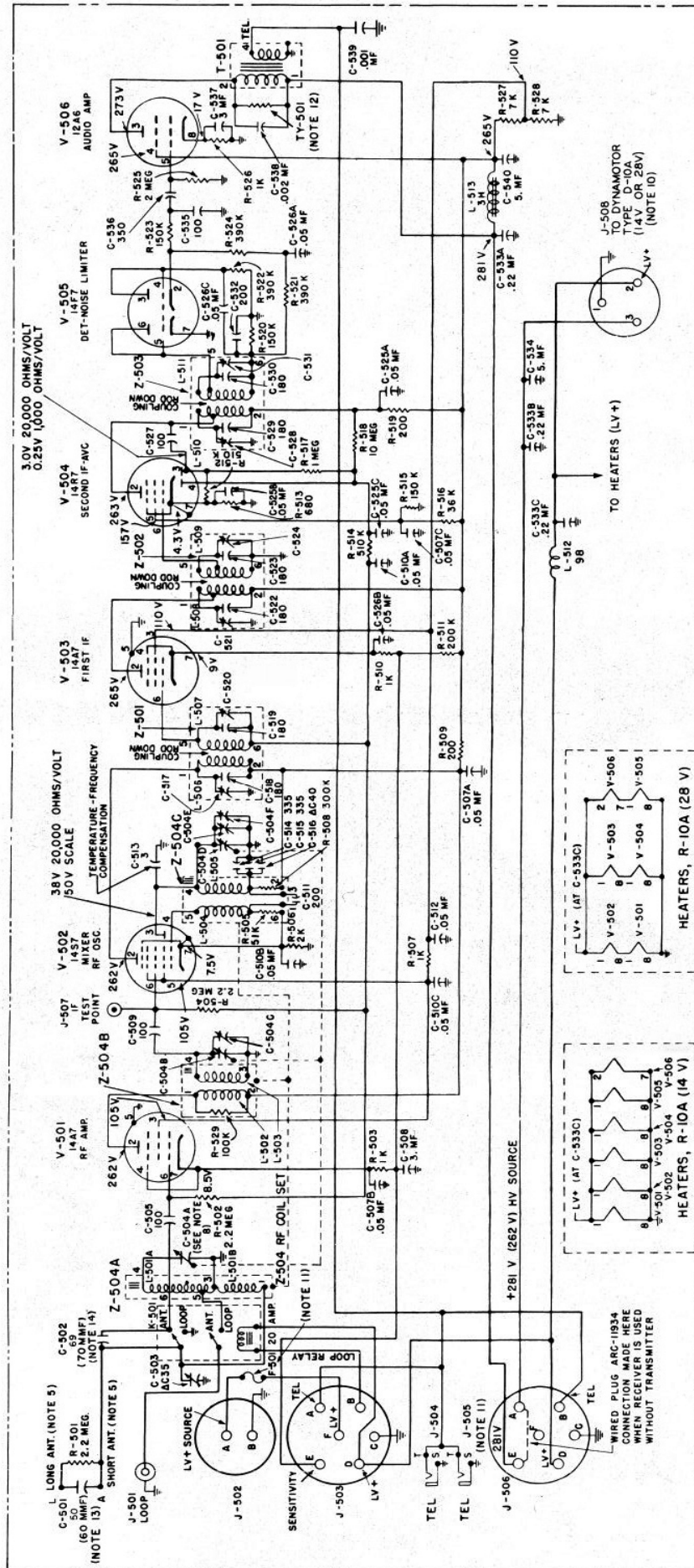
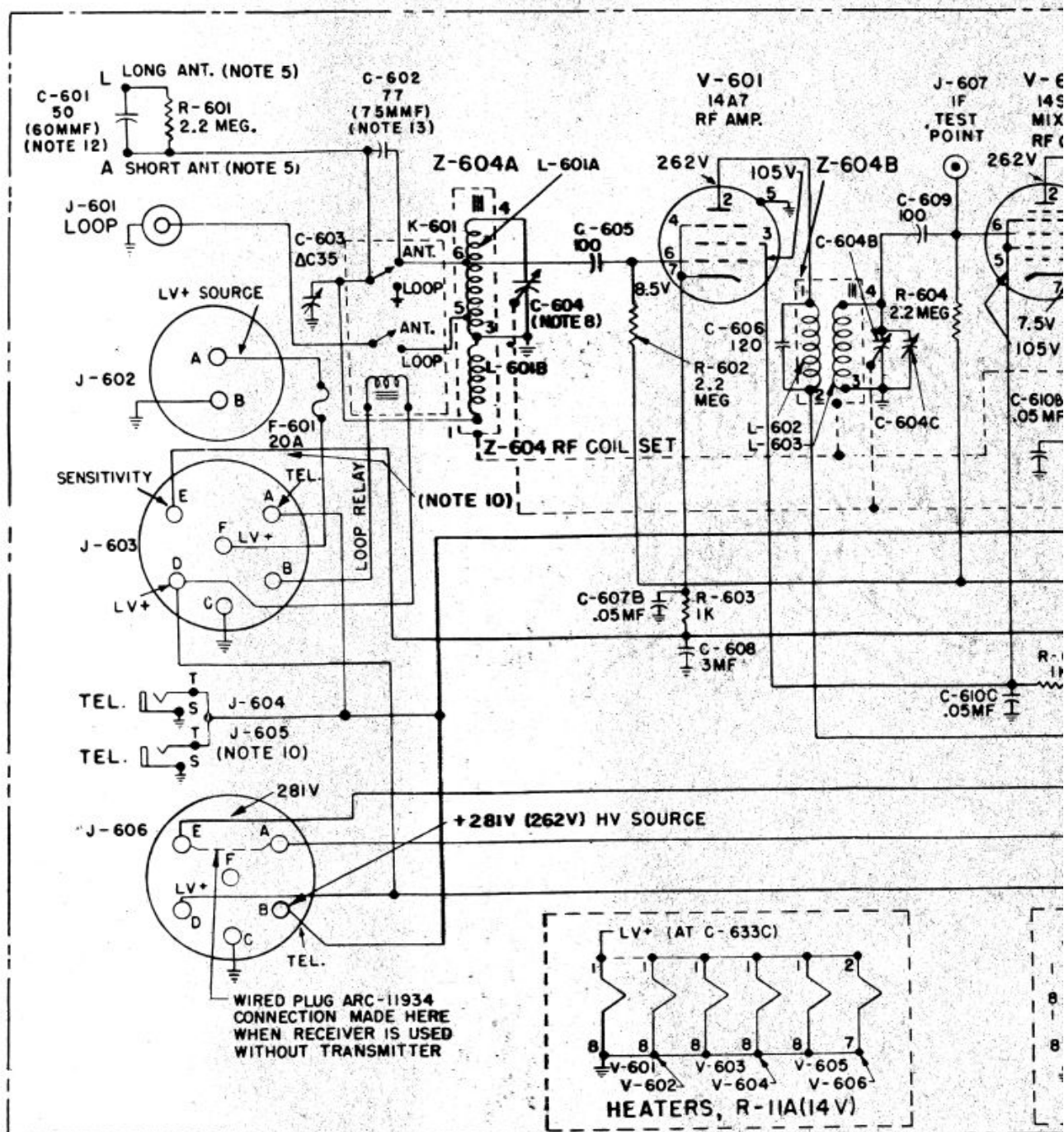


Figure 4-11. Radio Receiver ARC Type R-10A, Schematic Diagram

NOTES:

1. CONNECTIONS ARE SHOWN TO WIRED SIDE OF CONNECTORS.
2. CAPACITOR VALUES ARE IN MICROMICROFARADS UNLESS FOLLOWED BY "MF" - MICROFARAD.
3. RESISTOR VALUES ARE IN OHMS UNLESS FOLLOWED BY MULTIPLIER:
K = 1,000; MEG = 1,000,000.
4. INDUCTOR VALUES ARE IN MICROHENRIES UNLESS FOLLOWED BY "MH" - MILLIHENRY (1,000 MICROHENRIES) OR "H" - HENRY.
5. A "SHORT" ANTENNA IS DEFINED AS ONE HAVING AN EFFECTIVE CAPACITANCE OF 21-50 MMF AND A LONG ONE AS 50 MMF OR GREATER. BEGINNING WITH SERIAL NO. 530 OF R-11A (14V) AND SERIAL NO. 405 OF R-11A (28V) "A" ANTENNA TERMINAL POST CONNECTION WAS DELETED AND "L" ANTENNA TERMINAL POST WAS MARKED "A".
6. D-C VOLTAGE VALUES SHOWN ARE APPROXIMATE AND ARE BASED ON THE FOLLOWING CONDITIONS:
 - A. LV+ AT TERMINAL "2" OF J-608 SET AT 13.5 VOLTS ON R-11A (14V) OR 27 VOLTS ON R-11A (28V) BY ADJUSTMENT OF LV+ SOURCE.
 - B. SENSITIVITY LINE, TERMINAL "E" OF J-603 GROUNDED; NO SIGNAL INPUT.
 - C. 20,000 OHMS-PER-VOLT OR 1,000 OHMS-PER-VOLT VOLTMETER USED, UNLESS OTHERWISE INDICATED.
 - D. ALL VOLTAGES ARE MEASURED USING A D-10A DYNAMOTOR AS THE HIGH VOLTAGE SUPPLY. WHEN A D-10 DYNAMOTOR IS USED, VALUES WILL BE APPROXIMATELY 10 PERCENT LESS. VALUES IN PARENTHESIS ARE THOSE OBTAINED WHEN DYNAMOTOR ALSO SUPPLIES POWER TO A TRANSMITTER CONNECTED TO J-606; NO RECEIVER DRAIN.
 - E. NEGATIVE TERMINAL OF VOLTMETER GROUNDED TO CHASSIS.
7. THE I. F. IS 85 KC. ALL THE I-F TRIMMER CAPACITORS HAVE A ΔC OF 17 MMF.
8. EACH TUNING SECTION OF C-604 HAS A ΔC OF 346 MMF. EACH TRIMMER HAS A ΔC OF 16 MMF.
9. REFER TO PARAGRAPH 1-43.
10. DELETED BEGINNING WITH SERIAL NO. 530 OF R-11A (14V) AND SERIAL NO. 1405 OF R-11A (28V).
11. ADDED BEGINNING WITH SERIAL NO. 530 OF R-11A (14V) AND SERIAL NO. 1405 OF R-11A (28V).
12. VALUE SHOWN IN PARENTHESIS USED BEGINNING WITH SERIAL NO. 530 OF R-11A (14V) AND SERIAL NO. 1405 OF R-11A (28V).
13. VALUE SHOWN IN PARENTHESIS USED BEGINNING WITH SERIAL NO. 560 OF R-11A (14V) AND SERIAL NO. 6794 OF R-11A (28V).



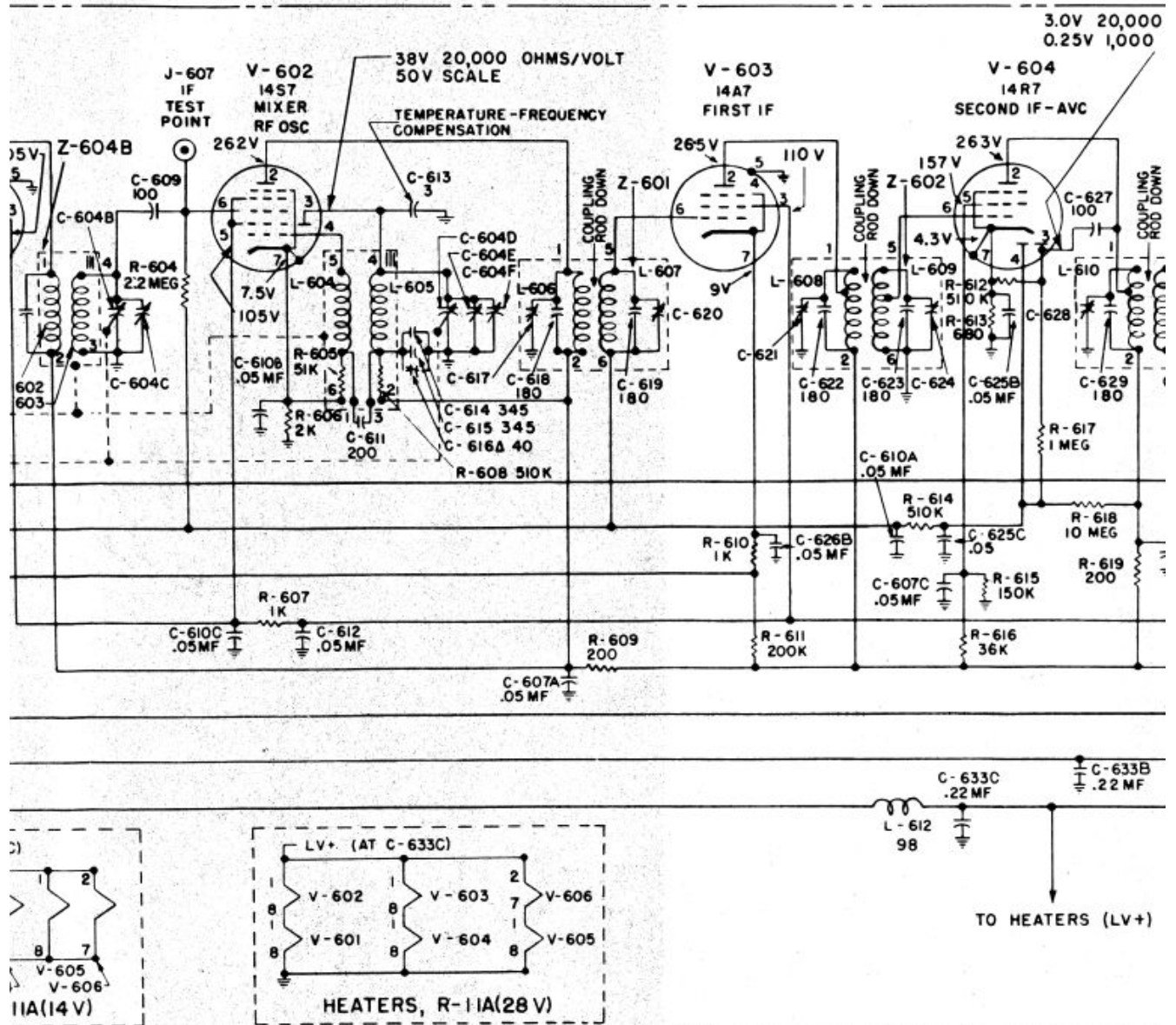


Figure 4-12, Radio R

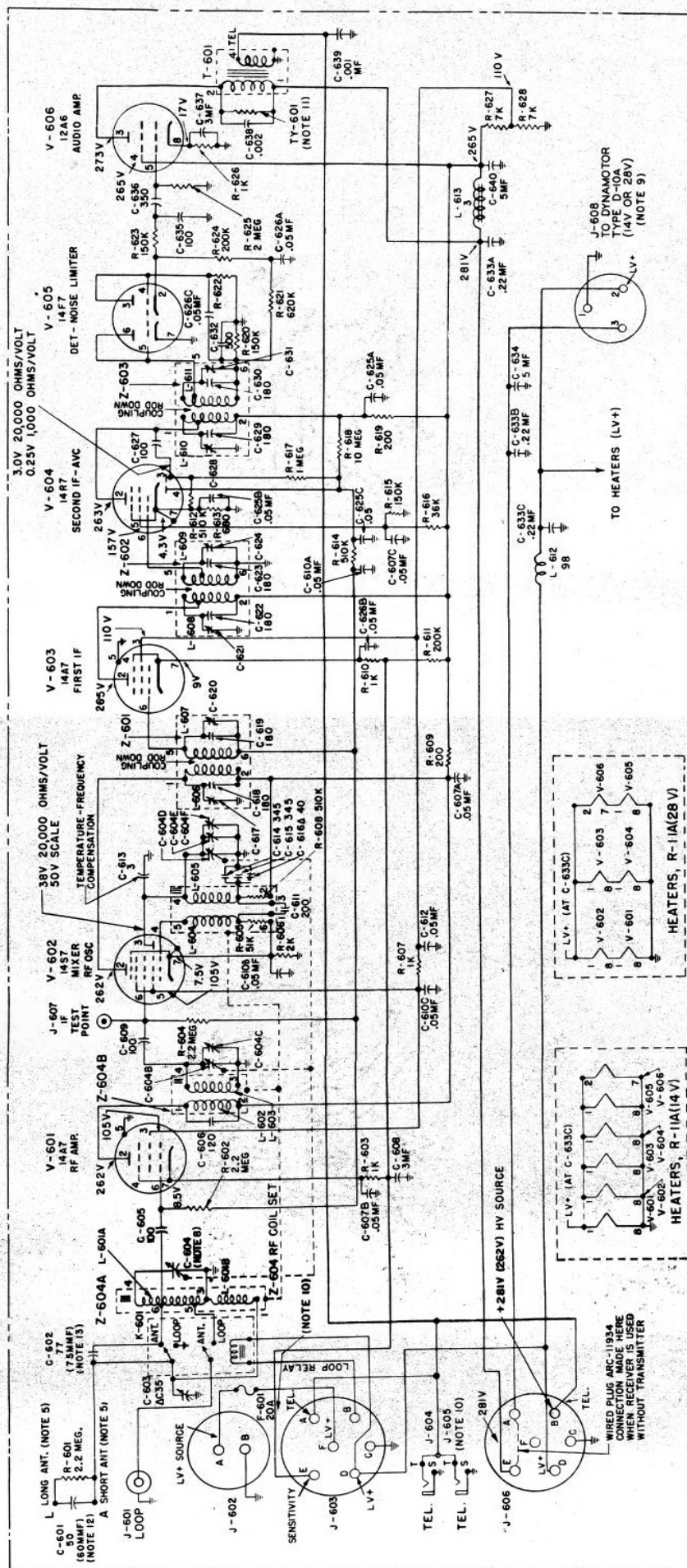
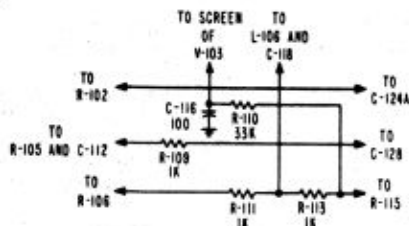


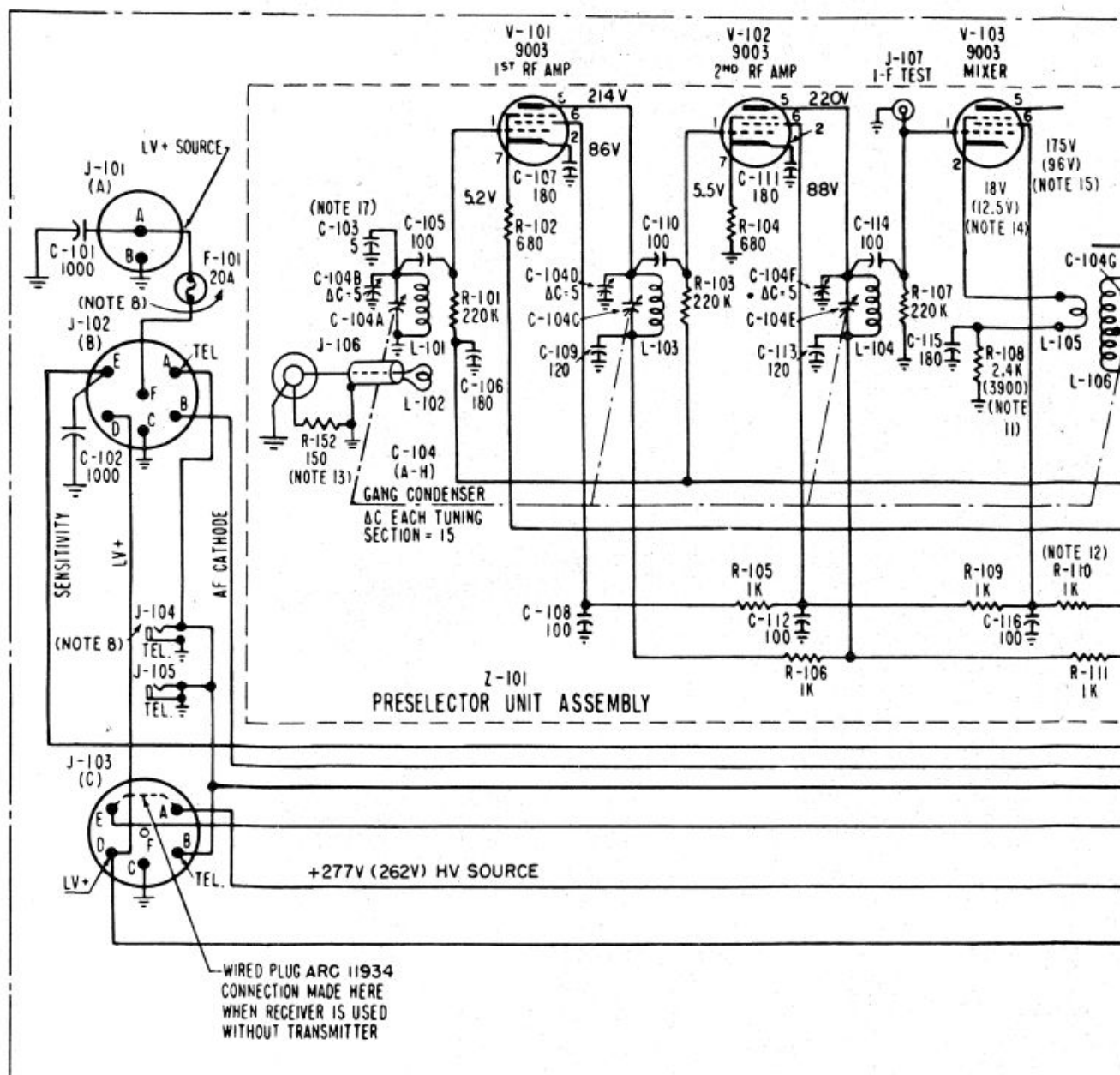
Figure 4-12. Radio Receiver ARC Type R-11A, Schematic Diagram

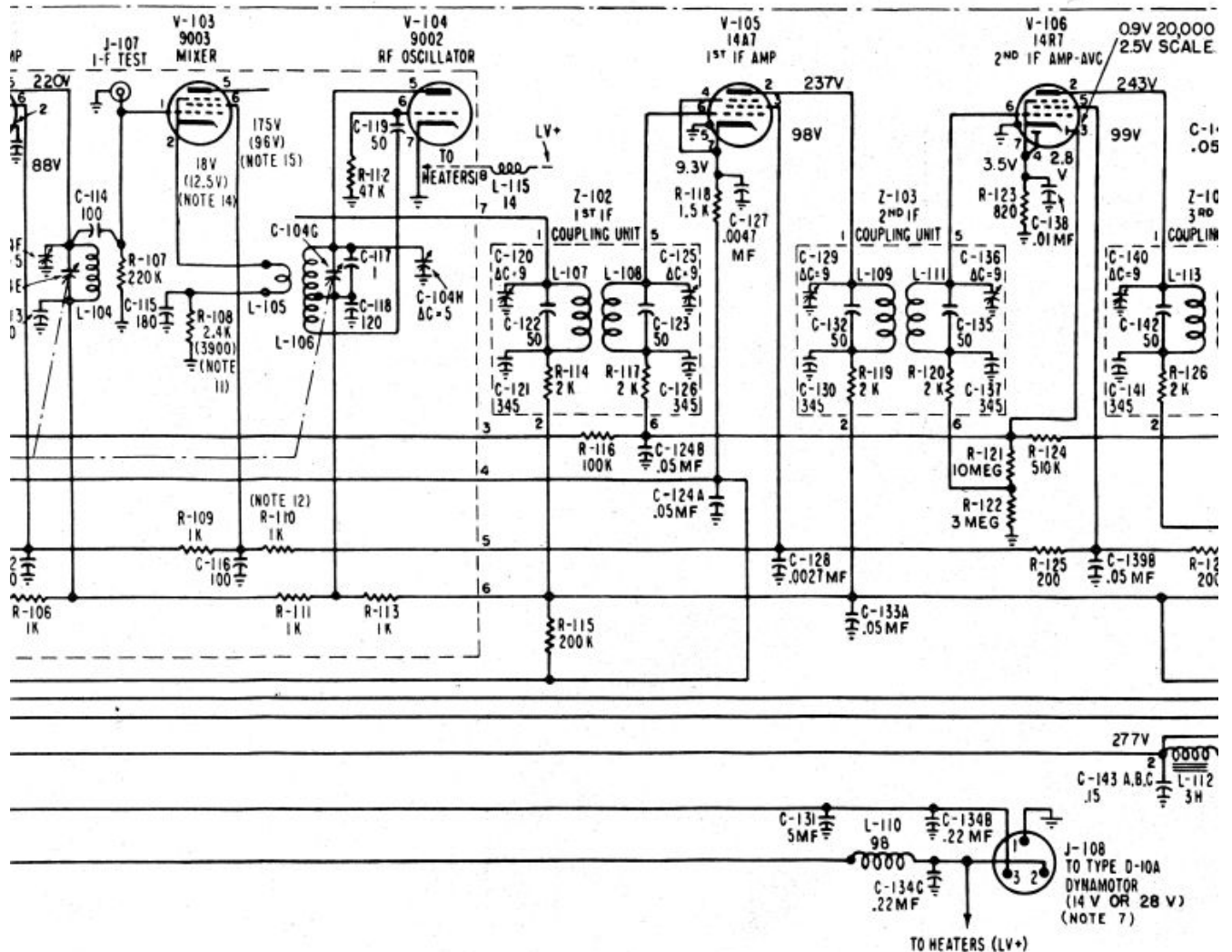
NOTES:

1. CONNECTIONS ARE SHOWN TO WIRED SIDE OF CONNECTORS.
2. CAPACITOR VALUES ARE IN MICROMICROFARADS UNLESS FOLLOWED BY "MF" - MICROFARAD.
3. RESISTOR VALUES ARE IN OHMS UNLESS FOLLOWED BY MULTIPLIER:
K = 1,000; MEG = 1,000,000.
4. INDUCTOR VALUES ARE IN MICROHENRIES UNLESS FOLLOWED BY
"MH" - MILLIHENRY (1,000 MICROHENRIES) OR "H" - HENRY.
5. THE I. F. IS 15 MC. THE R-F OSCILLATOR FREQUENCY IS 15 MC LESS THAN THE R-F SIGNAL FREQUENCY.
6. D-C VOLTAGE VALUES SHOWN ARE APPROXIMATE AND ARE BASED ON THE FOLLOWING CONDITIONS:
 - A. LV+ AT TERMINAL "2" OF J-108 SET AT 13.5 VOLTS ON R-15 (14V) OR 27 VOLTS ON R-15 (28V) BY ADJUSTMENT OF LV+ SOURCE.
 - B. AF CATHODE LINE, TERMINAL "B" OF J-102, AND SENSITIVITY LINE, TERMINAL "E" OF J-102 GROUNDED; NO SIGNAL INPUT.
 - C. 20,000 OHMS-PER-VOLT OR 1,000 OHMS-PER-VOLT VOLTMETER USED, UNLESS OTHERWISE INDICATED.
 - D. ALL VOLTAGES ARE MEASURED USING A D-10A DYNAMOTOR AS THE HIGH VOLTAGE SUPPLY. WHEN A D-10 DYNAMOTOR IS USED, VALUES WILL BE APPROXIMATELY 10 PERCENT LESS. VALUES IN PARENTHESIS ARE THOSE OBTAINED WHEN DYNAMOTOR SUPPLIES 130 MA TO A TRANSMITTER CONNECTED TO J-103; NO RECEIVER DRAIN.
 - E. NEGATIVE TERMINAL OF VOLTMETER GROUNDED TO CHASSIS.
7. REFER TO PARAGRAPH 1-43.
8. DELETED BEGINNING WITH SERIAL NO. 700 OF R-15 (14V) AND SERIAL NO. 1061 OF R-15 (28V).
9. ADDED BEGINNING WITH SERIAL NO. 700 OF R-15 (14V) AND SERIAL NO. 1061 OF R-15 (28V).
10. VALUE SHOWN IN PARENTHESIS USED BEFORE SERIAL NO. 700 OF R-15 (14V) AND SERIAL NO. 1061 OF R-15 (28V).
11. VALUE SHOWN IN PARENTHESIS USED BEFORE SERIAL NO. 1822 OF R-15 (28V).
12. VALUE SHOWN USED BEFORE SERIAL NO. 800 OF R-15 (14V) AND SERIAL NO. 2026 OF R-15 (28V). PRESENT VALUE AND WIRING CONNECTION SHOWN BELOW:



13. ADDED BEGINNING WITH SERIAL NO. 825 OF R-15 (14V) AND SERIAL NO. 2540 OF R-15 (28V).
14. VOLTAGE SHOWN IN PARENTHESIS USED BEFORE SERIAL NO. 1822 OF R-15 (28V).
15. VOLTAGE SHOWN IN PARENTHESIS USED BEFORE SERIAL NO. 800 OF R-15 (14V) AND SERIAL NO. 2026 OF R-15 (28V).
16. ADDED BEGINNING WITH SERIAL NO. 825 OF R-15 (14V) AND SERIAL NO. 2426 OF R-15 (28V).
17. DELETED BEGINNING WITH SERIAL NO. 825 OF R-15 (14V) AND SERIAL NO. 2426 OF R-15 (28V).





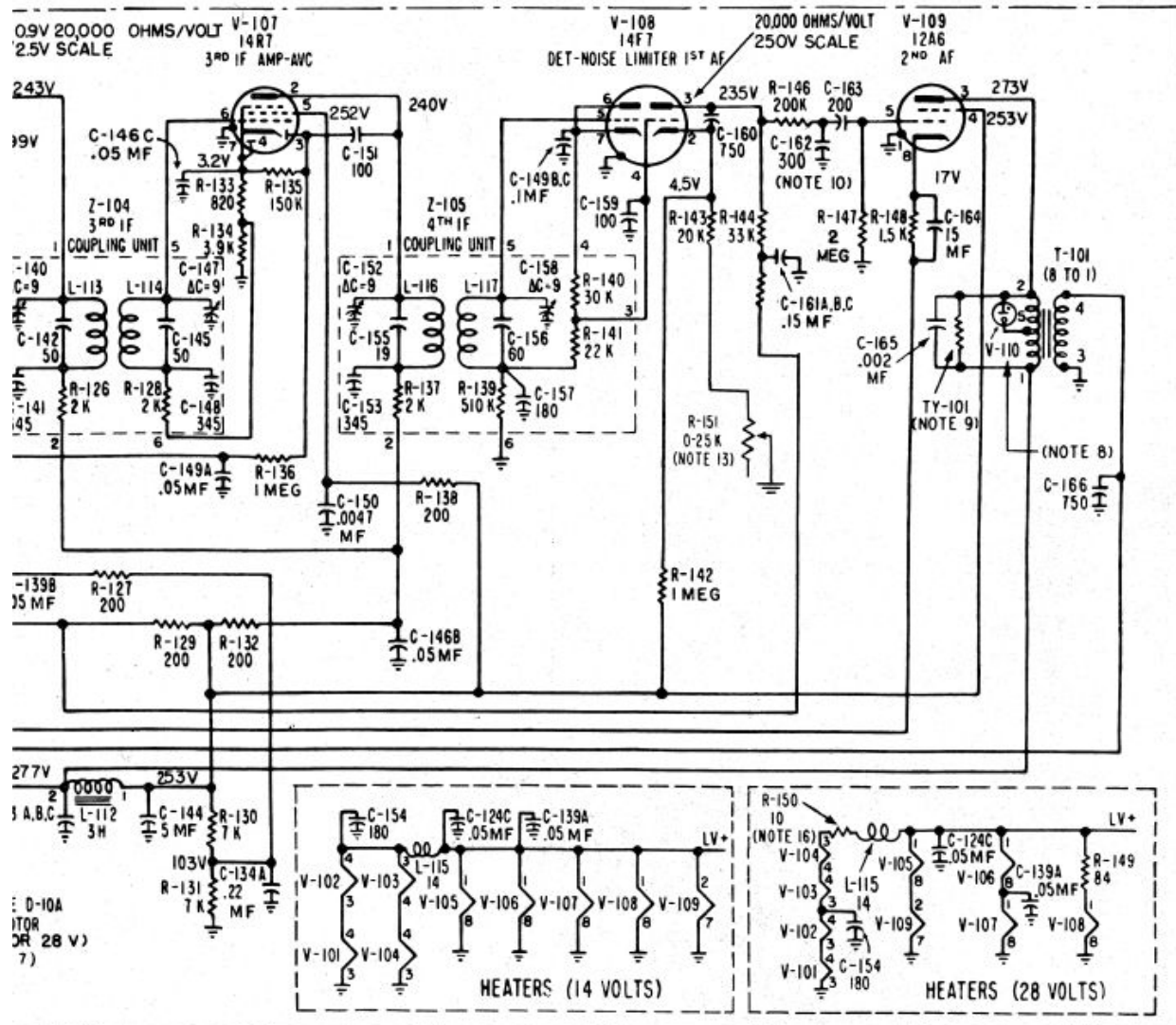
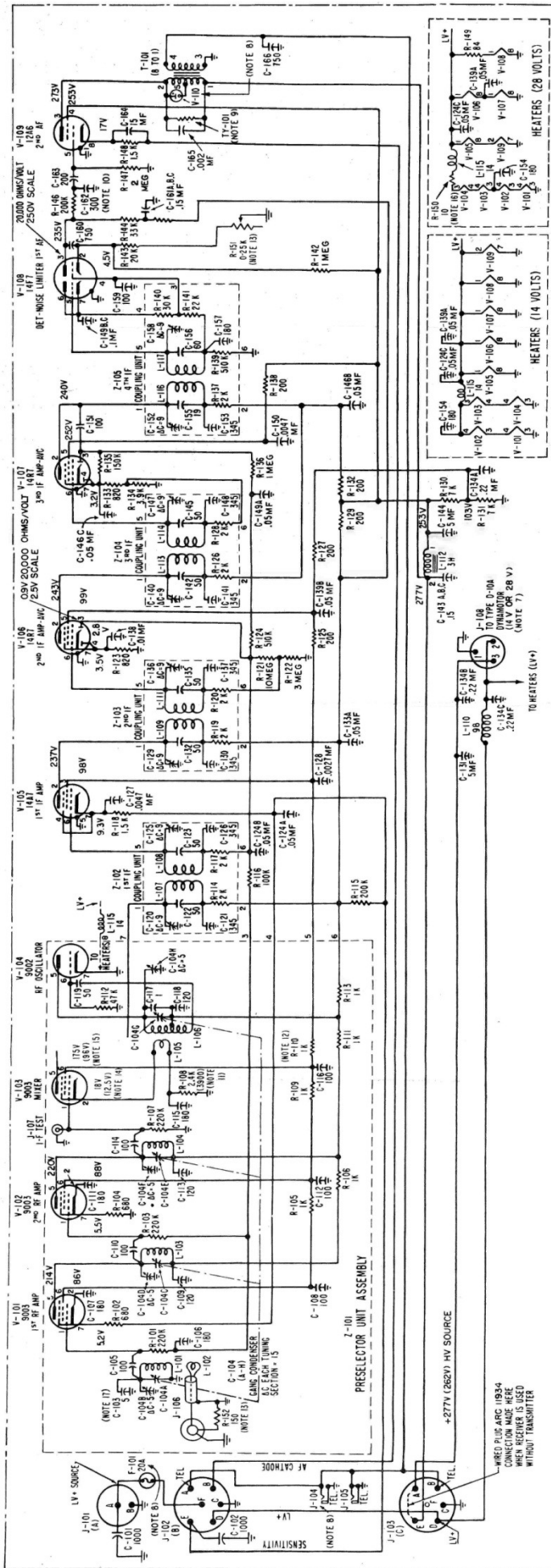


Figure 4-13. Radio Receiver ARC Type R-15, Schematic Diagram



NOTES:

1. CONNECTIONS ARE SHOWN TO WIRED SIDE OF CONNECTORS.
2. CAPACITOR VALUES ARE IN MICROMICROFARADS UNLESS FOLLOWED BY "MF" - MICROFARAD.
3. RESISTOR VALUES ARE IN OHMS UNLESS FOLLOWED BY MULTIPLIER: K = 1,000; M = 1,000,000.
4. INDUCTOR VALUES ARE IN MICROHENRIES UNLESS FOLLOWED BY "MH" - MILLIHENRY (1,000 MICROHENRIES) OR "H" - HENRY.
5. THE I. F. IS 15 MC. THE R-F OSCILLATOR FREQUENCY IS 15 MC LESS THAN THE R-F SIGNAL FREQUENCY.
6. D-C VOLTAGE VALUES SHOWN ARE APPROXIMATE AND ARE BASED ON THE FOLLOWING CONDITIONS:
 - A. LV+ AT TERMINAL "2" OF J-308 SET AT 13.5 VOLTS ON R-19 (14V) OR 27 VOLTS ON R-19 (28V) BY ADJUSTMENT OF LV+ SOURCE.
 - B. AF CATHODE LINE, TERMINAL "B" OF J-302, AND SENSITIVITY LINE, TERMINAL "E" OF J-302 GROUNDED; NO SIGNAL INPUT.
 - C. 20,000 OHMS-PER-VOLT OR 1,000 OHMS-PER-VOLT VOLTMETER USED.
 - D. ALL VOLTAGES ARE MEASURED USING A D-10A DYNAMOTOR AS HIGH VOLTAGE SUPPLY. WHEN A D-10 DYNAMOTOR IS USED, VALUES WILL BE APPROXIMATELY 10 PERCENT LESS. VALUES IN PARENTHESIS ARE THOSE OBTAINED WHEN DYNAMOTOR SUPPLIES POWER TO A TRANSMITTER CONNECTED TO J-303; NO RECEIVER DRAIN.
 - E. NEGATIVE TERMINAL OF VOLTMETER GROUNDED TO CHASSIS.
7. DELETED BEGINNING WITH SERIAL NO. 51 OF R-19 (14V) AND SERIAL NO. 780 OF R-19 (28V).
8. ADDED BEGINNING WITH SERIAL NO. 51 OF R-19 (14V) AND SERIAL NO. 780 OF R-19 (28V).
9. VALUE SHOWN IN PARENTHESIS USED BEFORE SERIAL NO. 51 OF R-19 (14V) AND SERIAL NO. 780 OF R-19 (28V).
10. VALUE SHOWN IN PARENTHESIS USED BEFORE SERIAL NO. 377 OF R-19 (14V) AND SERIAL NO. 7440 OF R-19 (28V).
11. ADDED BEGINNING WITH SERIAL NO. 377 OF R-19 (14V) AND SERIAL NO. 7440 OF R-19 (28V).
12. DELETED BEGINNING WITH SERIAL NO. 377 OF R-19 (14V) AND SERIAL NO. 7440 OF R-19 (28V).
13. ADDED BEGINNING WITH SERIAL NO. 151 OF R-19 (14V) AND SERIAL NO. 7141 OF R-19 (28V).

