STRUCTION MANUAL

for the

W R L

"Globe Linear Amplifier"

MODEL LA-1

Manufactured by WRL ELECTRONICS, INC.

Council Bluffs, Iowa

MANUFACTURERS OF

World Famous Globe Transmitters

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A STATEMENT OF POLICY CONCERNING THE SERVICE OF KITS

In the event the kit does not operate properly after assembly, please write us giving full details. Include the model, serial number, date of purchase and the name of the dealer from whom the kit was purchased. We may be able to determine any wiring error, or faulty component, from the details you give us in your letter.

Your wired kit may be returned to the factory for service or inspection at any time. Our usual service charges will apply. Transportation charges, both ways, should be prepaid by you. Parts within the warranty will be replaced without charge, however, a charge will be made for any component damaged by a wiring error, or carelessness on the part of the constructor.

Kits wired with acid core solder, or solder paste, or flux are not eligible for repair or service and shall be returned unrepaired or serviced, at your expense, immediately. All warranties are null and void on any kit on which acid core, or solder paste or flux, has been used.

ELECTRICAL SPECIFICATIONS

POWER INPUT: 300 watts DC, 420 watts P.E.P., SSB or DSB CIASS B Linear. 200 watts AM CLASS B. 300 watts CW CLASS C.

OUTPUT: Coaxial into 30-150 ohm antenna, 80 through 10 meters. Link coupled (52 ohms) through coaxial connector on 6 meters.

DRIVE REQUIREMENTS: 7 to 15 watts peak from low impedance (52 ohms) source.

BAND COVERAGE: 80 through 6 meters with generous overlap between the 80 through 10 meter bands.

TUBE COMPLEMENT

Quantity	Tube	Function
4	EL38	Grounded grid R.F. amplifiers
1	5R4GY	High voltage rectifier

POWER REQUIREMENTS: 115 volts A.C. 50/60 cycles (Power Consumption 60 watts standby, 350 watts at 210 watts input, 100 watts with B+ on, no excitation applied).

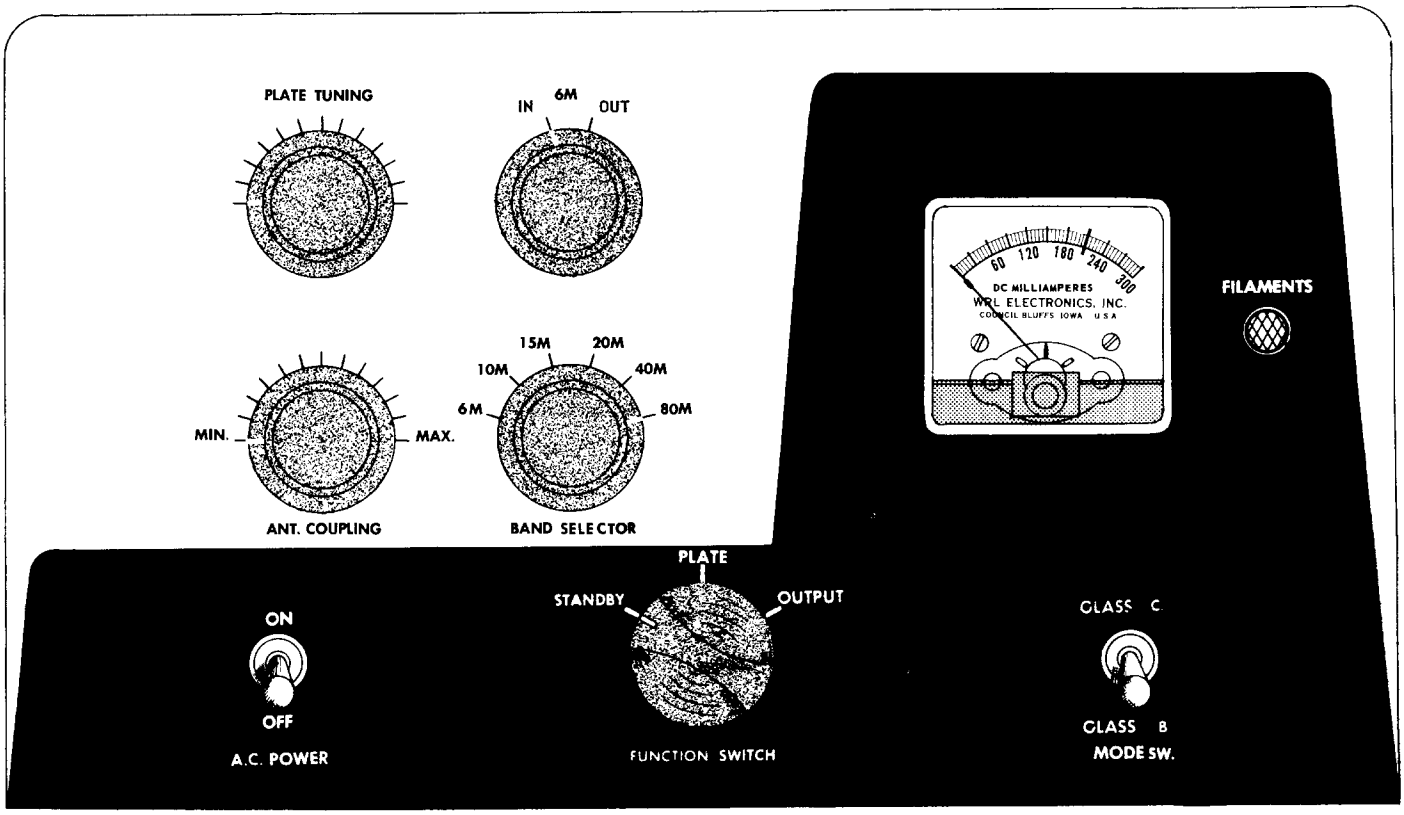


Figure 1. Front Panel View

SECTION I

GENERAL DESCRIPTION

1-1. GENERAL.

1-2. The WRL Globe Linear Amplifier Model LA-1, is manufactured by WRL Electronics, Inc. of Council Bluffs, Iowa. The amplifier is a grounded grid type and may be operated either class B linear or class C. DC plate input power for class B linear AM operation is 200 watts; for class B linear SSB or DSB operation 300 watts, 420 watts P.E.P., for class C CW operation 300 watts. An external low impedance driving source of 7 to 15 watts output power is required for proper operation of the linear amplifier.

1-3. DESCRIPTION.

1-4. The Model LA-1 WRL Globe Linear Amplifier is housed in a perforated steel metal cabinet. Overall dimensions of the unit are 9''x 14''x8-3/8'' and the net weight is approximately 26 pounds. The cabinet is of advanced design in keeping with modern styling, and provides complete ventilation and heat dissipation for the unit. Full TVI precautions have been taken into consideration in the design of the cabinet and by adequate bypassing, filtering and shielding within the amplifier. Tube complement is shown on page i.

1-5. THEORY OF OPERATION.

1-6. Four EL-38 high gain tubes are employed as parallel triode connected grounded grid R.F. amplifiers. Very stable operation is assured by this method as the amplifier is degenerative and self-oscillation cannot occur. The R.F. driving voltage is capacity coupled into the low impedance cathode circuit of the amplifier and is amplified by the tubes. The R.F. voltage appearing at the plates of the tubes is then capacity coupled to the pi network output tank circuit. The plate circuit of the amplifier tubes is shunt fed so no DC voltage appears in the tuned circuits.

A regulated bias voltage is applied to the final tube grids for obtaining maximum linearity for class B operation. Class C operation is obtained by increasing the bias to the final grids. Class C operation improves the efficiency and output of the final amplifier tubes but does sacrifice linearity to some extent; for this reason we recommend class C operation be employed only for CW operation. Convenient selection of class B or class C operation is made by a switch on the front panel of the unit. The bias voltage for class B linear operation is regulated by heavy bleeding and the use of reverse connected selenium rectifiers. The back resistance of the rectifiers varies with applied drive and bias in such a manner that the grid bias on the amplifiers is held to a very close tolerance. The fixed bias voltage for the R.F. amplifier is obtained by rectifying the 6.3VAC filament voltage with a selenium rectifier.

The output circuit on the 80 through 10 meter bands is a conventional pi network and is tuned in the normal manner. The plate tuning condenser is switched out of the circuit for 6 meter operation and is replaced by the fixed output capacity of the final tubes. The only tuning done on 6 meters is matching to the link coupled antenna load with the ANTENNA COUPLING control. The degree of loading is adjusted with the variable link in the 6 meter coil.

The output indicator works as follows: a portion of the R.F. output voltage is rectified, and filtered, then applied to the panel meter. The rectified output voltage then is an indication of energy transfer from the amplifier plate tank circuit to the antenna, therefore, tuning the plate circuit for maximum output current indication on the meter automatically puts the maximum amount of R.F. energy into the antenna. The high B+ voltage supply utilizes a 5R4GY tube connected as a choke input, full wave rectifier and supplies 1000 V DC @ 300 ma.

SECTION II

OPERATING PROCEDURES

2-1. GENERAL

2-2. The following paragraphs describe the various controls of the WRL Globe Linear Amplifier Model LA-1. Tune-up and operating procedures are outlined following the description of controls. It is recommended that this section be studied thoroughly before any attempt is made to place the amplifier in operation.

2-3. DESCRIPTION OF CONTROLS.

2-4. A.C. POWER. This switch applies A.C. power to the power transformer when in the ON position. This is the master power switch.

2-5. FUNCTION SWITCH. Serves three functions. Breaks the high voltage B-lead, connects the panel meter into the cathode circuit of the final tubes, connects the panel meter to the output voltage indicating circuit. NOTE: DO NOT ROTATE THIS SWITCH WITH EXCITATION APPLIED TO THE AMPLIFIER.

2-6. MODE SWITCH. Alters the bias voltage on the final amplifier tubes for either class B or class C operation.

2-7. PLATE TUNING. Tunes final plate circuit to desired frequency of operation on 80 through 10 meter bands.

2-8. ANT. COUPLING. Matches the final plate circuit to the antenna impedance.

2-9. BAND SELECTOR. Selects required amount of inductance for tuning the amplifier plate circuit to resonance.

2-10. 6M IN-OUT. Switches the amplifier plate circuit and the antenna loading condenser from the pi network coil to the 6 meter coil.

2-11. R.F. IND. Switches the output indicating circuit from 6 meter to 80-10 meter output. Located on rear apron of the chassis.

2-12. EXTERNAL CONNECTIONS.

WARNING

Before making any external connections to the amplifier remove the A.C. power cord plug from the A.C. source receptacle. Also place the A.C. POWER switch in the OFF position. Make certain the R.F. driving source is OFF. The first external connection should be a good ground to the GROUND connection on the rear of the amplifier. See paragraph 2-16.

2-13. 6M. Coaxial receptacle located on rear apron of chassis. Connect 6 meter antenna to this receptacle.

2-14. 80-10M. Coaxial receptacle located on rear apron of chassis. Connect 80 through 10 meter antennas to this receptacle.

2-15. R.F. INPUT. Input jack for insertion of R.F. from the external exciter to the amplifier. Located on rear apron of chassis.

2-16. GROUND. Terminal for attaching ground wire to the linear amplifier. NOTE: Most satisfactory grounding method is to run ground wire from the exciter to the linear amplifier. to ground. See Figure 2.

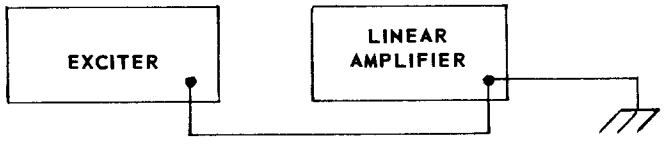


Figure 2. Proper Grounding Method

TABLE I. TYPICAL DIAL SETTINGS FOR 52 OHM RESISTIVE LOAD, FINAL PLATE CURRENT 210 MA., ALL BANDS.

Freq. KC	Final Plate	Ant. Coupling	6 M In-Out Position	Output Meter Current CLASS B-AM
3850			OUT	54 MA
7200			OUT	44 MA
14,250			OUT	42 MA
21,360			OUT	48 MA
28,900			OUT	30 MA
52,000	NOT USED		IN	36 MA

2-17. TUNE-UP PROCEDURE.

2-18. The following paragraphs describe in detail the various tune-up procedures for the WRL Globe Linear Amplifier Model IA-1. Prior to the initial tune-up the following preliminary precautions and procedures should be observed.

WARNING

Operation of this equipment involves the use of high voltages which are dangerous to life. Observe all safety precautions! Do not attempt to make adjustments inside the equipment or change any tubes with the power on. Disconnect (UNPLUG) the power cord before touching any high voltage points or the antenna terminals. Do not do any work on the inside of the amplifier without first unplugging the power cord. It is adviseable to short the B+ to ground using a screwdriver with a highly insulated handle as a shorting stick, before touching any exposed wiring or high voltage points in the equipment.

(1) Remove the amplifier from the cabinet by removing the panel mounting screws and the two self-tapping screws on the rear of the cabinet. Be careful not to mar the panel during this operation. The unit will slide out of the cabinet upon removal of the screws. Inspect the unit for any possible hidden damage and make certain all tubes are in their respective sockets and seated properly.

(2) Replace the amplifier into the cabinet and install the panel mounting screws. Be careful not to mar the panel when replacing the screws, also install the two self-tapping screws on the rear of the cabinet.

(3) Attach a good electrical ground to the chassis grounding connection (located on rear apron of chassis). See paragraph 2-16 and Figure 2.

(4) Connect the antenna feedline to the appropriate coaxial receptacle depending on band of operation desired. The use of a coaxial feedline naturally indicates the use of a coaxial connector such as the type 83-1SP. If a twin-lead type feedline is used, simply insert one conductor of the feedline into the center hole of the appropriate coaxial receptacle (a banana plug serves well as a connector for this purpose) and connect the other conductor of the feedline to the grounding connection on the chassis (same place the external ground wire is attached). NOTE: Use an antenna tuner, or balun with any twin lead feedline system, rather than connecting twin lead directly to the pi-net, as above.

SECTION II

OPERATING PROCEDURES

2-19. TUNE-UP PROCEDURE, CLASS B AM 80-10 METER OPERATION.

(1) Place the A.C. POWER switch to the OFF position.

(2) Place the FUNCTION switch to the STAND-BY position.

(3) Place the R.F. IND. switch (rear apron of chassis) to the 80-10M position.

(4) Place the 6M IN-OUT switch to the OUT position.

(5) Place the BAND SELECTOR switch to desired band of operation, 80-10 meters.

(6) Place the MODE switch to the CLASS B position.

(7) Connect the R.F. Exciter (through a length of RG-59/U cable) to the R.F. INPUT receptacle on the rear apron of the Amplifier chassis.

(8) Connect a short, heavy external grounding wire to the GROUND terminal. See paragraph 2-16 and Figure 2.

(9) Connect the antenna feedline to the coaxial receptacle labeled 80-10M.

(10) Set the ANT. COUPLING control knob to the "9 o'clock" or extreme counter-clockwise position.

(11) Set the PLATE TUNING control knob to the "9 o'clock" or extreme counter-clockwise position.

(12) Insert the A.C. power cord plug into a 115V A.C. source receptacle.

(13) Set the R.F. Exciter Antenna Loading, or Coupling, control to the minimum loading position. If the R.F. Exciter has a link coupled output circuit, set the "link" to minimum coupling.

(14) Turn on and tune up the R.F. Exciter to the desired band of operation, then place to the stand-by position.

(15) Place the Amplifier A.C. POWER switch to the ON position. Allow at least a one minute warm-up period.

CAUTION

Do not rotate the FUNCTION switch with the Exciter supplying excitation to the Linear Amplifier. The Exciter should be placed to the stand-by position before the FUNCTION switch is re-set.

(16) Place the Amplifier FUNCTION switch to the PLATE position. Turn on the R.F. excitation. The Amplifier meter should immediately indicate from 25 to 300 MA depending upon the amount of drive obtained from the R.F. Exciter. NOTE: SHOULD THE LINEAR AMPLIFIER PLATE CURRENT EXCEED 300 MA TURN OFF THE R.F. EXCITER IMMEDIATELY. If link coupling is employed in the R.F. Exciter output circuit, move the link further away from the plate coil to which it is coupled. If the R.F. Exciter employs a pi network which has previously been set to minimum loading, "swamping" is necessary. Swamping may be accomplished by parallel connecting several 100 ohm-2 watt resistors connected from the R.F. Exciter output to ground; thus limiting the Amplifier plate current to the recommended value. Inability to drive the Amplifier to 210 MA (FUNCTION switch at PLATE position) with the R.F. Exciter Antenna Loading, or Coupling, control set to MAXIMUM; or the link tightly coupled indicates an Exciter with inadequate driving power. Operation of the Amplifier below 210 MA current is feasible, however, a sacrifice in R.F. output must be expected.

(17) Place the FUNCTION switch to the OUTPUT position.

(18) Advance the PLATE TUNING control in a clock-wise direction until the meter indicates maximum current output.

(19) Slowly advance the ANT. COUPLING control in a clock-wise direction (an additional increase in R.F. output current should be noted) until the meter again indicates maximum R.F. output current.

(20) Repeat steps 18 and 19 until no more increase in R.F. output current can be obtained. Then advance the ANT. COUPLING control another one-half dial division in a clock-wise direction to assure a slightly overloaded pi network.

(21) Place the FUNCTION switch to the PLATE position and modulate the R.F. Exciter. A slight upward swing of plate current indicates proper operation and operation may be continued. Should the plate current swing downward over 10 MA the R.F. Exciter is downward modulating or the Linear Amplifier plate circuit needs more loading. The Amplifier plate circuit may be loaded more heavily by advancing the ANT. COUPLING control another one-half dial division in a clock-wise direction.

2-20. TUNE-UP PROCEDURE. CLASS B AM 6 METER OPERATION.

(1) Place the A.C.POWER switch to the OFF position.

(2) Place the FUNCTION switch to the STAND-BY position.

(3) Place the R.F. IND. switch (rear apron of chassis) to the 6M position.

(4) Place the 6M IN-OUT switch to the IN position.

(5) Place the BAND SELECTOR switch to the 6M position.

(6) Place the MODE switch to the CLASS B position.

(7) Connect the R.F. Exciter (through a length of RG-59/U cable) to the R.F. INPUT receptacle on the rear apron of the Amplifier chassis.

(8) Connect the antenna feedline to the coaxial receptacle labeled 6M.

(9) Set the ANT. COUPLING control to the "9 o'clock" or extreme counter-clockwise position.

(10) Perform steps 12 through 17 as outlined in paragraph 2-19.

(11) Slowly advance the ANT. COUPLING control in a clockwise direction until the meter pointer indicates maximum output current. The PLATE TUNING control has been switched out of the circuit on the 6 meter band so no adjustment of this control is necessary.

(12) Perform step 21 of paragraph 2-19.

2-21. TUNE-UP PROCEDURE. CLASS B SSB OR DSB 80-10 METER OPERATION.

(1) Perform the tune-up prodedure through step 12 as outlined in paragraph 2-19.

(2) Turn on the SSB or DSB exciter and feed a steady audio tone into it to provide a steady output signal for driving purposes.

(3) Place the amplifier FUNCTION switch to the PLATE position and note the meter reading. A reading of less than 300 MA requires an adjustment of the exciter output until a 300 MA reading is obtained on the amplifier meter. Should the amplifier plate current exceed 300 MA, swamp the exciter output as outlined in step 16, paragraph 2-19.

(4) Tune the amplifier final plate circuit as outlined in steps 17 through 20, paragraph 2-19.

(5) Place FUNCTION switch to the PLATE position.

(6) Remove the audio tone modulation from the SSB or DSB exciter. Modulate the exciter with a microphone in the normal manner. The plate current indication on the amplifier meter will show an average current swing of approximately 200 MA and will occasionally peak to 300 MA with normal speech variations.

2-22. TUNE-UP PROCEDURE. CLASS B SSB OR DSB 6 METER OPERATION.

(1) This procedure is the same as outlined in paragraph 2-20 except that proper amplifier load current is 300 MA rather than 210 MA.

2-23. TUNE-UP PROCEDURE. CLASS C CW OPERATION.

(1) Perform steps 1 through 15 as outlined in paragraph 2-19. Place the MODE switch to the CLASS C position instead of the CLASS B position as specified in step 6, paragraph 2-19.

(2) Place the FUNCTION switch to the PLATE position.

(3) Turn the Exciter on and adjust the Exciter loading so the amplifier draws 300 MA plate current.

(4) Perform steps 17 through 20 as outlined in paragraph 2-19.

(5) Connect a key to the Exciter for CW operation.

2-24. OPERATING HINTS.

2-25. The dial settings given in Table I are typical for the frequencies and resistive load indicated. A deviation of more than 10% from the readings given indicates the antenna is presenting a reactive load to the linear amplifier, which will in turn cause improper tuning. When advancing the ANT. COUPLING control from the minimum position to obtain loading, the final PLATE TUNING control should NOT have to be returned more than one-half dial division from its orginal setting of no load resonance point. Should excessive returning of the PLATE TUNING control be necessary to obtain resonance after advancing the ANT. COUPLING control clockwise, excessive antenna reactance is indicated and must be corrected immediately. Operating the unit with excessive antenna reactance present will cause R.F. heating of coils, condenser flash-over and possible damage to the band selector switch.

SECTION II

OPERATING PROCEDURES

A class B linear amplifier, unlike standard class C amplifiers, must be slightly overloaded to retain maximum linearity. A slight underloading of the final amplifier will cause downward modulation when operating class B AM and may be seen, when monitoring final plate current, as a downward deflection of the meter pointer. Normal linear operation, as seen on the plate meter, will show as a very slight upward swing of the pointer with modulation applied. For SSB linear tune-up it is adviseable to feed a steady R.F. signal into the amplifier, then tune the final in the same manner as for class B AM.

2-26. In some cases the antenna may overload the final to such an extent that a resonance dip or output indication, cannot be obtained. A condition of this nature indicates a very low or complex antenna impedance which must be corrected rather than covered up. An SWR bridge in series with the antenna feedline is an indispensable aid in determining antenna conditions and proper tune-up. We strongly advise the use of an SWR bridge in all cases. An antenna tuner used intelligently aids materially in correcting various conditions and will permit near normal operation of the amplifier. Antenna recommendations for use with the amplifier are a 1/2 wave doublet or dipole (52 ohms), a 52 ohm beam or a 300 ohm folded dipole in conjunction with a matching device to present a 52 ohm load to the amplifier.

2-27. Recommended external driving units for AM, CW or SSB operation with the Linear Amplifier.

Globe Scout 680A, 680 and 66.
Gonset Communicator-6 Meters.
Central Electronics 20A.
Heathkit DX35, DX20, AT-1.
Knight 50 Watt transmitter.
Johnson Adventurer, Navigator.
Harvey Wells Bandmaster
Tecraft TR-20/50

Should TVI be encountered when operating SSB with the 20A Exciter, install a 150 mmfd ceramic condenser from the 20A Antenna post to ground. This will provide a better match between units while bypassing undesired harmonics.

SECTION III

PARTS MOUNTING PROCEDURE

3-1. GENERAL.

3-2. Following is the parts mounting procedure for kit assembly. It is recommended that this procedure be followed as outlined for ease and accuracy in assembly. Prior to assembly, the large pictorial diagrams included with this manual, may be laid out in a convenient manner for ready identification of the various components and mounting holes. Check off each step as it is completed. A complete parts list is given in Section VIII.

☐ 1. Unpack the amplifier kit. Open the various parts containers and check their contents against the parts list.

☐ 2. Lay the punched chassis before you as per Figure 3.

☐ 3. Install a mica filled octal socket in the chassis hole marked SO-1. The socket should be mounted on the inside of the chassis. Position the socket key way as shown in Figure 3. Use two each 6-32x5/16" screw, #6 lockwashers and 6-32x1/4" hex nuts. Tighten securely.

☐ 4. Install octal sockets SO-2, SO-3, SO-4 and SO-5 in the the manner as described for socket SO-1.

☐ 5. Insert the 3/8" rubber grommets GR-1, GR-2, GR-3, GR-4 and GR-5 in their respective holes as per Figure 3.

☐ 6. Remove the large nut and lockwasher from the fuse retainer post FP-1. Insert the post into its hole, position the lugs as per Figure 3. Slip the large lockwasher over the post and add the large hex nut. Tighten securely without using undue pressure as the post will crack if tightened excessively. Refer to Figure 4 on page 8.

☐ 7. Install the DPDT slide switch SW-6 from inside the chassis. Use two each 4-40x3/8" screws and 4-40x3/16" hex nuts. Tighten securely. Refer to Figure 3.

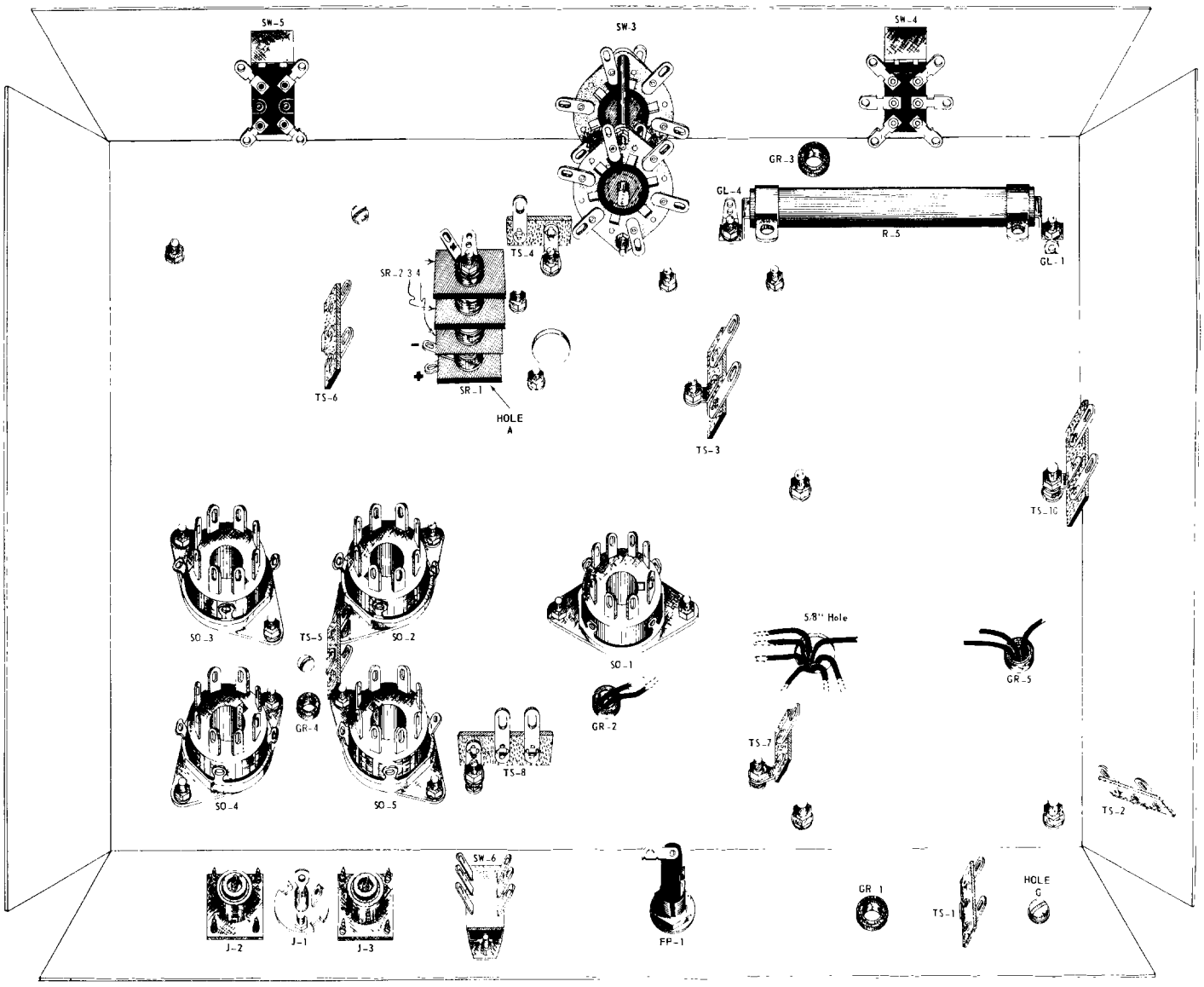


Figure 3. Bottom View, Parts Mounting.

SECTION III

PARTS MOUNTING PROCEDURE

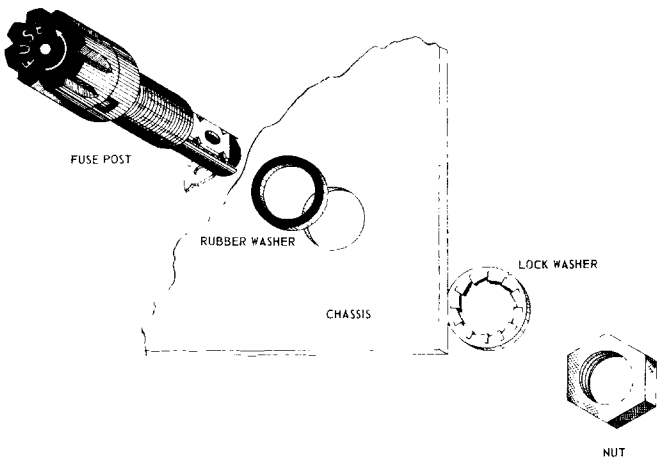


Figure 4. Mounting Detail, Fuse post FP-1.

☐ 8. Install the coaxial receptacle J-2 as follows:

(a) Insert the threaded shank of the receptacle through its respective hole from inside the chassis. Position as per Figure 3. Align the four mounting holes.

(b) Insert the four #6x1/4" self-tapping screws through the screw holes one at a time.

(c) Tighten each screw so that as their threads "bite in", the receptacle is drawn up snug against the chassis.

☐ 9. Install the R.F. input jack J-1 from inside the chassis. Position as per Figure 3. Use two each 6-32x5/16" screws and 6-32x1/4" hex nuts. Tighten securely.

☐ 10. Install the coaxial receptacle J-3 as outlined in step 8.

☐ 11. Insert a 8-32x1/2" screw into the chassis hole labeled "G" from inside the chassis. Slip a #8 lockwasher over the screw from the outside of the chassis. Add a 8-32x5/16" nut and tighten securely. Add another 8-32x 5-16" hex nut. Tighten finger tight only.

☐ 12. Install the 2-lug tie strip TS-1. Position as per Figure 3. Use a 6-32x 5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 13. Install the 2-lug tie strip TS-2. Position as per Figure 3. Use a 6-32x 5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 14. Install the 2-lug tie strip TS-3. Position as per Figure 3. Use a 6-32x 5/16" screw, a #6 lockwasher and 6-32x 1/4" hex nut. Tighten securely.

☐ 15. Install the 1-lug tie strip TS-4. Position as per Figure 3. Use a 6-32x5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 16. Install the 2-lug tie strip TS-5. Position as per Figure 3. Use a 6-32x 5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 17. Insert the metal end brackets into the ends of the 50K ohm, 50 watt resistor R-5. Insert a 6-32x5/16" screw into each of the respective mounting holes from the outside of the chassis. Add #6 solder lugs GL-1 and GL-4 from the inside of the chassis. Mount resistor R-5 in position as per Figure 3. Add a #6 lockwasher and a 6/32x 1/4" hex nut to each of the screws. Position solder lugs GL-1 and GL-4 as per Figure 3. Tighten the hex nuts securely.

☐ 18. Select the three selenium rectifiers SR-2, SR-3 and SR-4 . Place the three rectifiers on the 6-32x1-1/4" screw with the positive (+) lugs towards the screw head. Lay the rectifiers on the table with their lugs pointing up. The screw inserted through the center hole of the rectifiers will hold them in an upright position.

☐ 19. Connect a length of #20 bus wire from the positive (+) lug of SR-2 (nearest the screw head) to the negative (-) lug of SR-3. Solder both connections.

☐ 20. Connect a length of #20 bus wire from the positive (+) lug of SR-3 to the negative (-) lug of SR-4. Solder both connections.

☐ 21. Remove the screw from the rectifiers and insert it into chassis hole "A"

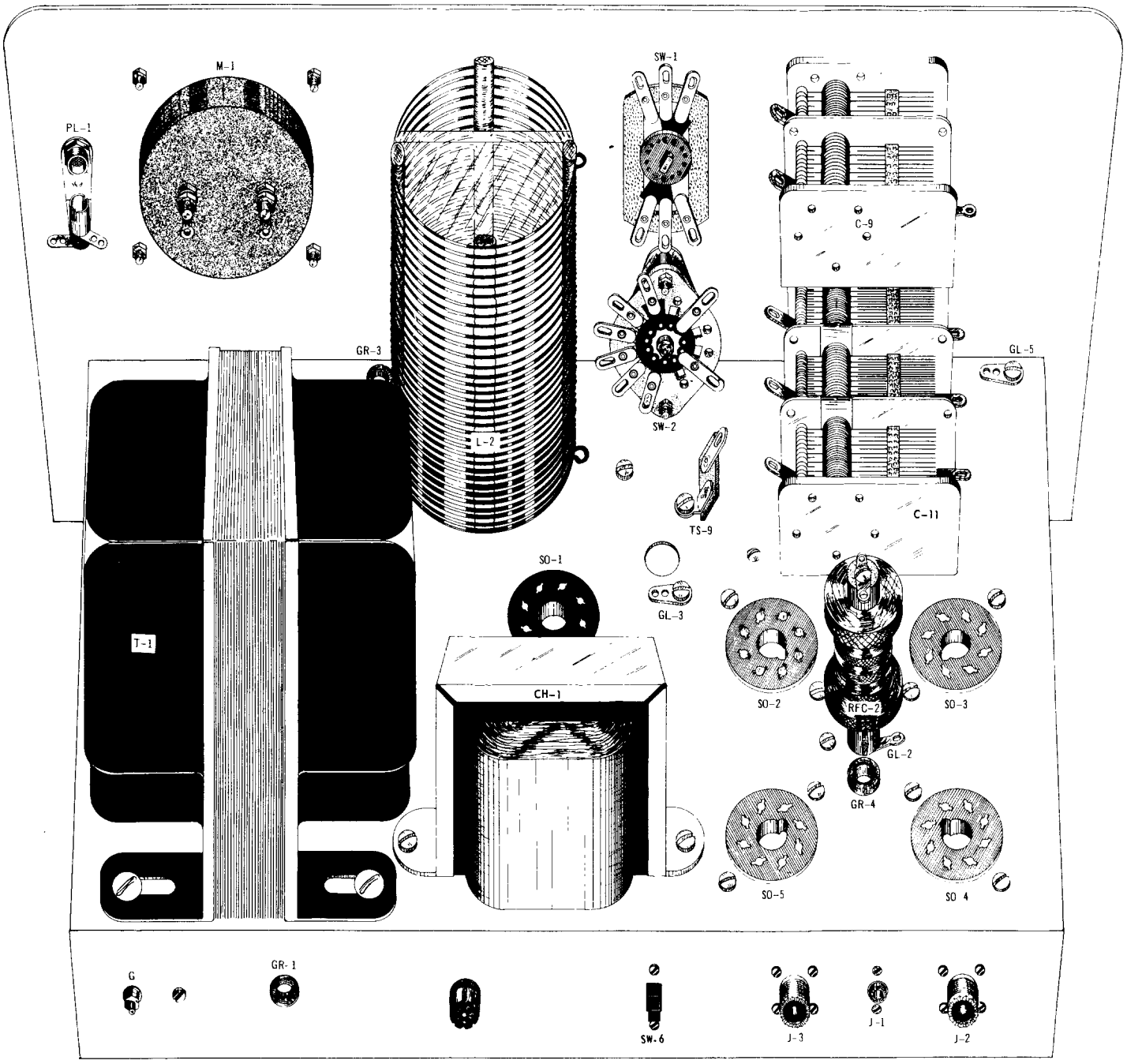


Figure 5. Top View, Parts Mounting.

from the top side of the chassis. Mount selenium rectifier SR-1 on this screw from the under side of the chassis. The positive (+) lug of the rectifier should be towards socket SO-2 as per Figure 3. Add the three connected rectifiers SR-4, SR-3 and SR-2 to the screw. SR-4 should bear against SR-1. The plus (+) sign on the positive lug of SR-2 should be visible after the rectifiers are mounted.

☐ 22. Place a #6 solder lug over the screw against rectifier SR-2. Add a 6-32x 1/4" hex nut. Tighten finger tight only.

☐ 23. Position rectifiers SR-1, SR-4, SR-3, SR-2 and the solder lug as per Figure 3. Tighten the nut securely.

☐ 24. Mount the filter choke CH-1 on the top of the chassis. Insert the choke leads through grommet GR-2. Use two each 6-32x1/2" screws, #6 lock washers and 6-32x1/4" hex nuts to mount the choke. Tighten securely. Refer to Figures 3 and 5.

☐ 25. Mount the R.F. choke RFC-2 on top of the chassis as follows:

(a) Remove the 8-32 screw from the base of the choke. Discard the bracket supplied with the R.F. choke.

(b) Insert this screw into the proper chassis hole from the under side of the chassis.

(c) Place the #10 grounding lug GL-2 on the top side of the chassis.

(d) Thread the R.F. choke on the screw. Position the choke and grounding lug as per Figure 5.

(e) Tighten the screw securely.

☐ 26. Mount the #6 grounding lug GL-3 on top of the chassis as per Figure 5. Use a 6-32x5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 27. Mount the #6 grounding lug GL-5 on top of the chassis as per Figure 5. Use a 6-32x5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 28. Mount the 1-lug tie strip TS-9 on top of the chassis, position as per Figure 5. Use a 6-32x5/16" screw, a #6 lockwasher and a 6-32x1/4" hex nut. Tighten securely.

☐ 29. Mount the three-gang variable capacitor C-11 on top the chassis. Position as per Figure 5. In this step, only the bottom front mounting screw is installed to hold C-11 in place. Use a 6-32x1/4" screw and a #6 lockwasher. Tighten securely.

☐ 30. Slip a #6 lockwasher over a 6-32x1/4" screw. Insert the screw into the mounting hole of the 2-lug tie strip TS-6. Thread the screw into the bottom rear mounting hole of variable capacitor C-11. Position tie strip TS-6 as per Figure 3. Tighten the screw securely.

☐ 31. Mount the 1-lug tie strip TS-7 on the mounting screw of filter choke CH-1 and position as per Figure 3. Slip a #6 lockwasher over the screw, add a 6-32x1/4" hex nut and tighten securely.

☐ 32. Mount the specially cut 2-lug tie strip TS-8 on the other mounting screw of filter choke CH-1. Position as per Figure 3. Slip a #6 lockwasher over the screw, add a 6-32x1/4" hex nut and tighten securely.

☐ 33. Mount the power transformer T-1 on top of the chassis. Insert the two red leads, the orange lead and the white wire leads into grommet GR-5. Insert the remaining transformer leads into the 5/8" hole. Use four each 10-32x1/2" screws, #10 lock washers and 10-32x 5/16" hex nuts. Check to avoid pinching any transformer leads between the transformer and the chassis before securely tightening the mounting nuts.

☐ 34. Mount the 2-lug tie strip TS-10 (with a 3/16" mounting hole) on the mounting screw of transformer T-1 as per Figure 3. Slip a #10 lockwasher over the screw, add a 10-32x5/16" hex nut, position as per Figure 3 and tighten securely.

☐ 35. Attach the two threaded mounting feet to the coil support of coil L-2 as per Figure 6. Use two 6-32x5/16" screws and tighten securely.

☐ 36. Mount the coil L-2 on top of the chassis. Position as per Figure 5. Use two each 6-32x5/16" screws, #6 lockwashers and 6-32x1/4" hex nuts. Tighten securely.

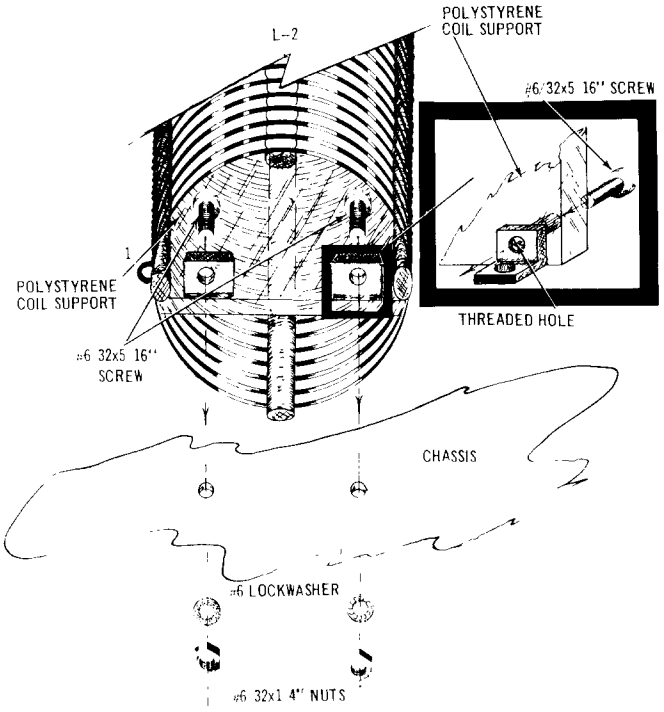


Figure 6. Coil Mounting Detail.

☐ 37. Mount the meter M-1 on the front panel. Use the hardware provided with the meter to secure the meter to the panel. Complete the meter assembly as follows:

(a) Install a #10 flat washer on each meter terminal post.

(b) Add a #10 solder lug to each meter terminal post.

(c) Add another #10 flat washer to each meter terminal post.

(d) Add a #10 hex nut to each meter terminal post.

(e) Position the two solder lugs as per Figure 5 and tighten the #10 hex nuts securely. Refer to Figure 7 for Meter Mounting Detail.

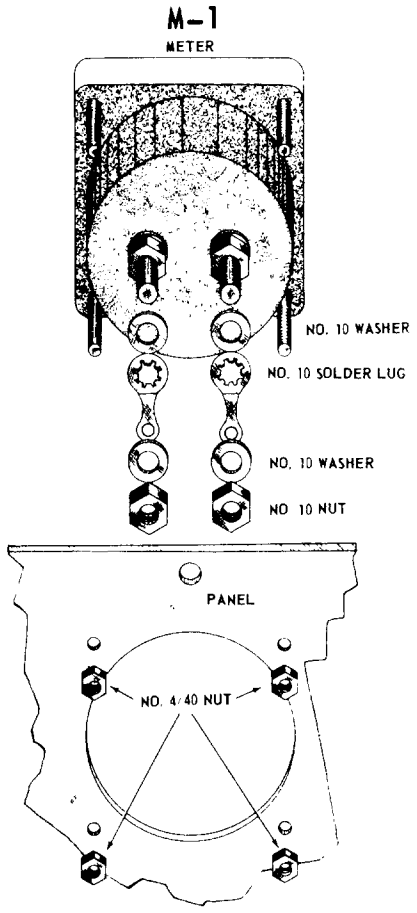


Figure 7. Meter Mounting Detail.

☐ 38. Select the DPDT, rotary type, 6 Meter switch SW-1.

(a) Remove the nut and lockwasher from the switch bushing.

(b) Replace the nut on the bushing and thread it halfway down the bushing.

(c) Add the lockwasher previously removed.

(d) Mount the switch from the rear side of the panel. Use another 3/8" hex nut to secure the switch to the panel.

(e) Position the switch as per Figure 5 and tighten securely.

☐ 39. Select the Single Pole, 6- position, ceramic, rotary type. Band Selector switch SW-2.

(a) Remove the 3/8" hex nut and lockwasher from the threaded bushing of the switch.

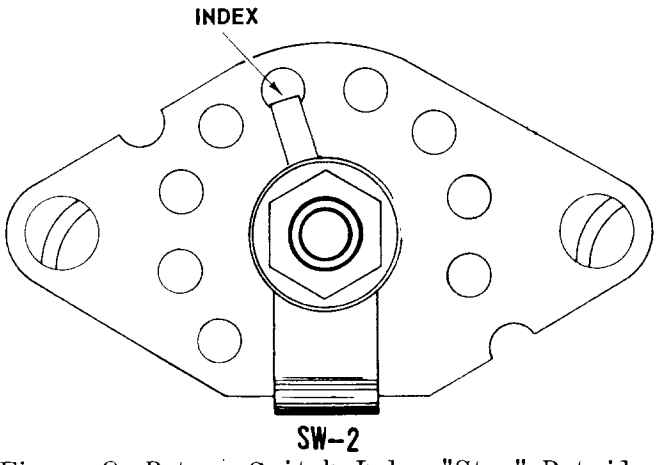


Figure 8. Rotary Switch Index "Stop" Detail.

(b) Place the "stop" into the fifth hole (from either end) of the switch frame.

(c) Slip a 3/8" fibre washer over the threaded bushing, add a 3/8" hex nut. Tighten the nut securely.

(d) Slip the lockwasher previously removed over the threaded bushing.

(e) Mount the switch from the rear side of the panel. Use another 3/8" hex nut to secure the switch to the panel.

(f) Position the switch as per Figure 5 and tighten securely.

☐ 40. Select the pilot light assembly.
☐

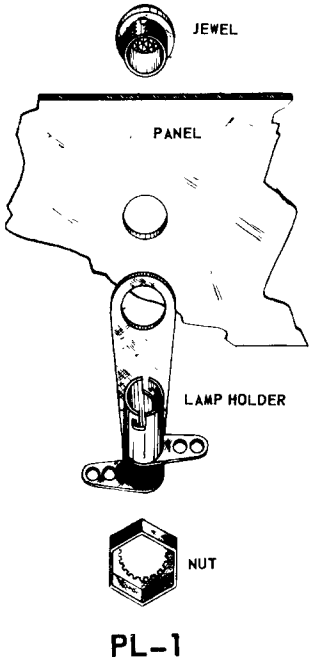


Figure 9. Pilot Light Assembly Mounting Detail.

(a) Remove the hex nut from the threaded shank of the jewel.

(b) Insert the threaded shank of the jewel through the panel from the front of the panel.

(c) Place the socket bracket assembly over the threaded shank of the jewel from the rear of the panel.

(d) Thread the hex nut on the threaded shank of the jewel, position the pilot light assembly as per Figure 5. Tighten securely.

☐ 41. Select the 2-gang variable capacitor
☐ C-9.

(a) Mount a #6 teardrop solder lug at the center, bottom hole of the capacitor frame. Use a 6-32x1/4" screw.

(b) Position the lug so it points to the left side (when viewed from the front) of the capacitor frame. Refer to Figure 10. Tighten securely.

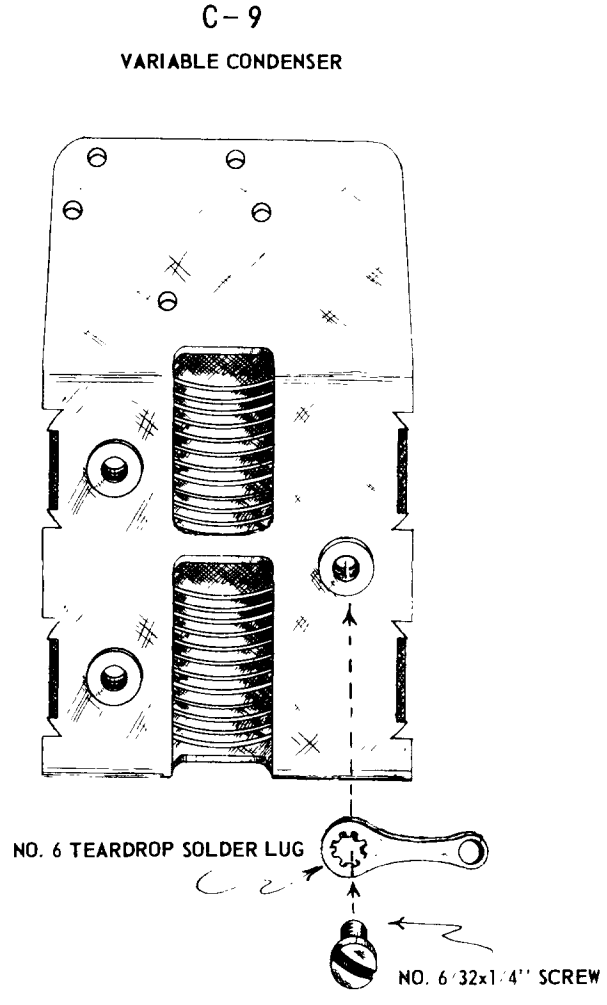


Figure 10. Solder Lug Mounting Detail, C-9.

☐ 42. Mount the variable capacitor C-9 on ☐ the panel with two each 6-32x3/16" screws and #6 lockwashers. Tighten the screws securely. Refer to Figures 5 and 11.

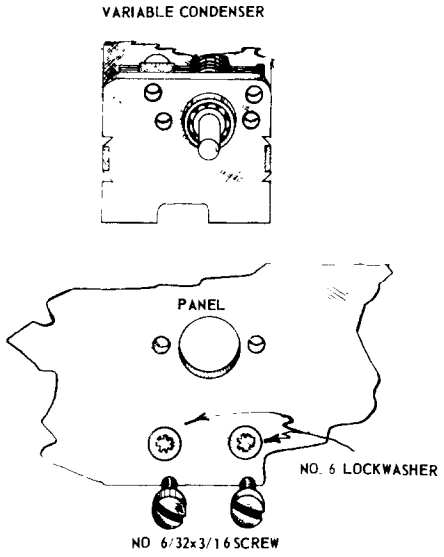


Figure 11. Variable Capacitor C-9, Mounting Detail.

☐ 43. Place the chassis on the table so it ☐ rests on the rear apron of the chassis and transformer T-1, bottom side of the chassis towards you.

☐ 44. Select the DP-3T, rotary type, Func- ☐ tion switch SW-3.

(a) Remove the 3/8" hex nut and lockwasher from the threaded bushing of the switch.

(b) Replace the nut and thread it halfway down the threaded bushing.

(c) Place the amplifier front panel against the front apron of the chassis so the three chassis holes are aligned with the three corresponding panel holes.

(d) Insert the threaded bushing of switch SW-3 through the center hole, from the inside of the chassis.

(e) Add a 3/8" hex nut to the threaded bushing of switch SW-3 from the front panel side. Tighten finger tight only.

☐ 45. Select the DPST, toggle, A.C. Power ☐ switch SW-5.

(a) Run the hex nut on the threaded bushing halfway down the bushing.

(b) Insert the threaded bushing of the switch through the panel hole on the left side (facing the panel) from the inside of the chassis. The keyway slot in the bushing should be towards the bottom of the panel.

(c) Place a flat metal washer over the switch bushing from the front panel side.

(d) Add a ring nut to the switch bushing. Tighten finger tight only. Refer to Figure 12.

☐ 46. Select the DPDT, toggle, Mode switch ☐ SW-4.

(a) Run the hex nut on the threaded bushing halfway down the bushing.

(b) Insert the threaded bushing of the switch through the panel hole on the right side (facing the panel) from inside the chassis.

(c) Place a flat metal washer over the switch bushing from the front panel side.

(d) Add a ring nut to the switch bushing. Tighten finger tight only.

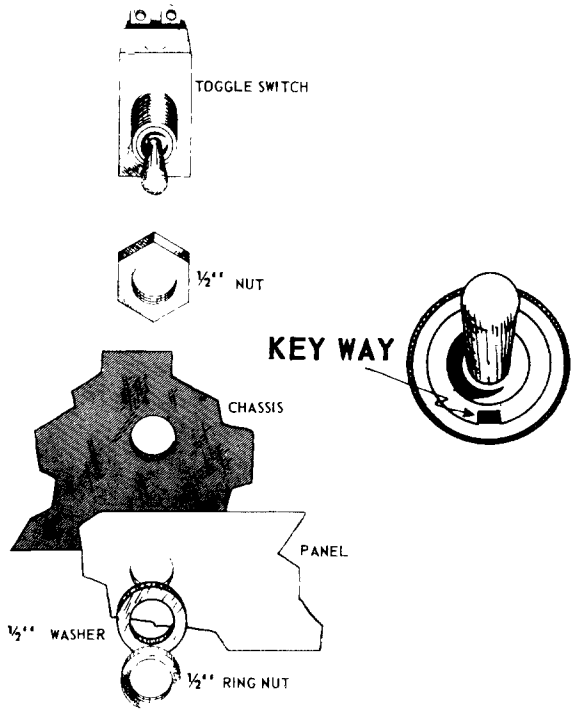


Figure 12. Toggle Switch Mounting Detail.

PARTS MOUNTING PROCEDURE

☐ 47. Adjust the front panel so each end is 1/2" below the bottom of the chassis. Use a ruler to determine the correct distance.

☐ 48. Position the A.C. Power switch SW-5 and the Mode switch SW-4 as per Figure 3 and tighten the ring nuts securely.

☐ 49. Position the Function switch as per Figure 3. Tighten the 3/8"nut securely.

☐ 50. Rotate the shaft of the Plate Tuning condenser C-9 to the extreme left, or counter-clockwise position. Place a round knob on the shaft with the indicator line pointing to "9 o'clock". Tighten the knob set screw.

☐ 51. Rotate the shaft of the 6 Meter In-Out switch to the extreme left, or counter-clockwise position. Place a round knob on the shaft with the indicator line pointing to the "In" position. Tighten the knob set screw.

☐ 52. Rotate the shaft of the Band Selector switch to the extreme left or counter-clockwise position. Place a round knob on the shaft with the indicator line pointing to the "6M" position. Tighten the knob set screw.

☐ 53. Rotate the shaft of the Antenna Coupling capacitor to the extreme left or counter-clockwise position. Place a round knob on the shaft with the indicator line pointing to "9 o'clock". Tighten the knob set screw.

☐ 54. Rotate the shaft of the Function switch to the extreme left or counter-clockwise position. Place a bar knob on the shaft with the indicator line pointing to the "Standby" position. Tighten the knob set screw.

☐ 55. Insert the #47 pilot bulb PL-1 into the pilot light assembly socket.

☐ 56. Insert the 5 ampere fuse FS-1 into the fuse retainer post assembly FP-1.

3-3. The mounting of the parts has now been completed. The amplifier is now ready for wiring. Proceed to Section IV.

HOW TO MAKE A GOOD SOLDER JOINT

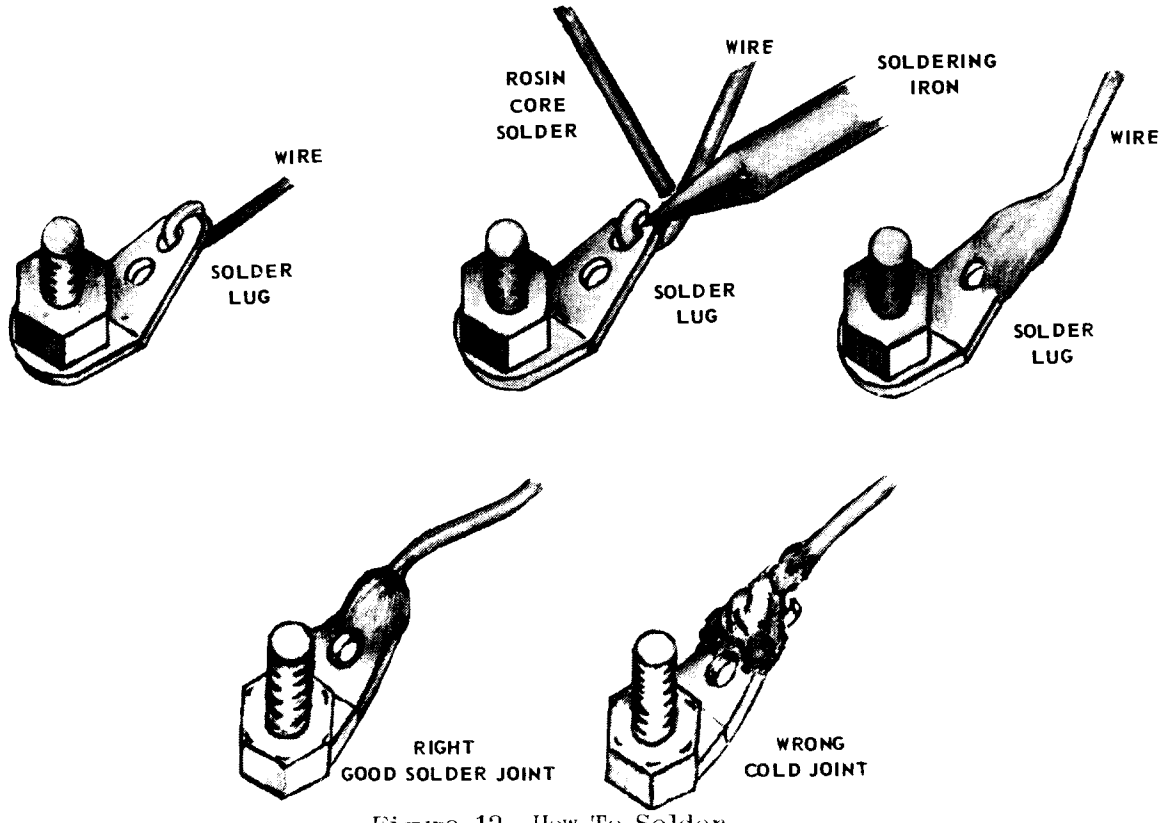


Figure 13. How To Solder.

SECTION IV
WIRING INSTRUCTIONS

4-1. GENERAL.

4-2. Wiring instructions are given in complete step-by-step detail. Read each step through before beginning it. Position components and route leads as shown in the pictorial diagrams. Check off each step as it is completed. (NS) means do not solder yet; (S) means solder now. These symbols are used because in many cases more than one wire will connect to a given point, and the connection should not be soldered until all the wires are connected to it. Refer to the pictorial diagrams to determine the routing of all wires and placement of components. Refer to Figure 27 for easy indentification of various components. Take your time and work carefully; you will be rewarded with a professional looking job and an efficient, proper operating unit.

CAUTION

Use only Rosin Core Solder. Do not use Acid Core Solder. Do not use Soldering Paste or Flux. If the solder on hand is not marked "Rosin Core" or "Radio" Solder, play safe and obtain a new roll. All Warranties are null and void on any unit on which acid core solder has been used.

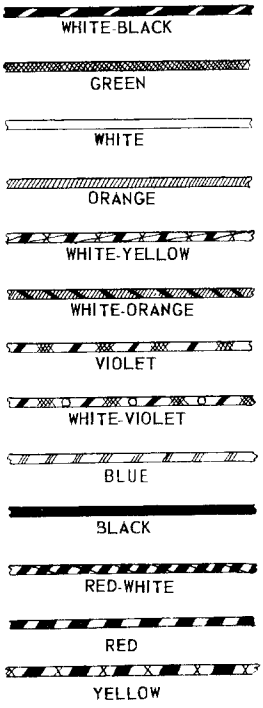


Figure 14. Wire Color Code.

4-3. STEP-BY-STEP WIRING INSTRUCTIONS.

☐☐ 1. Trim, strip and connect one of the black leads of choke CH-1 (emerging from grommet GR-2) to pin 2 of socket SO-1. (NS)

☐☐ 2. Trim, strip and connect the other black lead of CH-1 to lug 1 of tie strip TS-3. (NS)

☐☐ 3. Select one of the green leads of transformer T-1 coming through the 5/8" chassis hole. Trim, strip and connect this lead to the grounding lug hole of tie strip TS-7. (S)

☐☐ 4. Trim, strip and connect one of the black leads of T-1 to lug 1 of tie strip TS-7. (NS)

☐☐ 5. Trim and tape-up the green/yellow lead of T-1 as this lead is not used. NOTE: Some transformers supplied may not have this lead

☐☐ 6. Gather the two red leads and the remaining black lead of T-1. Slip a 2-1/8" length of yellow sleeving over these leads as per Figure 15.

☐☐ 7. Gather both yellow leads, the remaining green lead and the two red leads mentioned in step 6 (all are leads of transformer T-1). Slip a 1-1/2" length of yellow sleeving over these leads as per Figure 15.

☐☐ 8. Trim, strip and connect one of the yellow leads of T-1 to pin 2 of socket SO-1. (S)

☐☐ 9. Trim, strip and connect the other yellow lead of T-1 to pin 8 of SO-1. (S).

☐☐ 10. Connect one red lead of T-1 to pin 6 of SO-1. (S)

☐☐ 11. Trim, strip and connect the other red lead of T-1 to pin 4 of SO-1. (S)

☐☐ 12. Trim, strip and connect the remaining green lead of T-1 to pin 2 of socket SO-5. (NS)

☐ 13. Trim, strip and connect the red/yellow

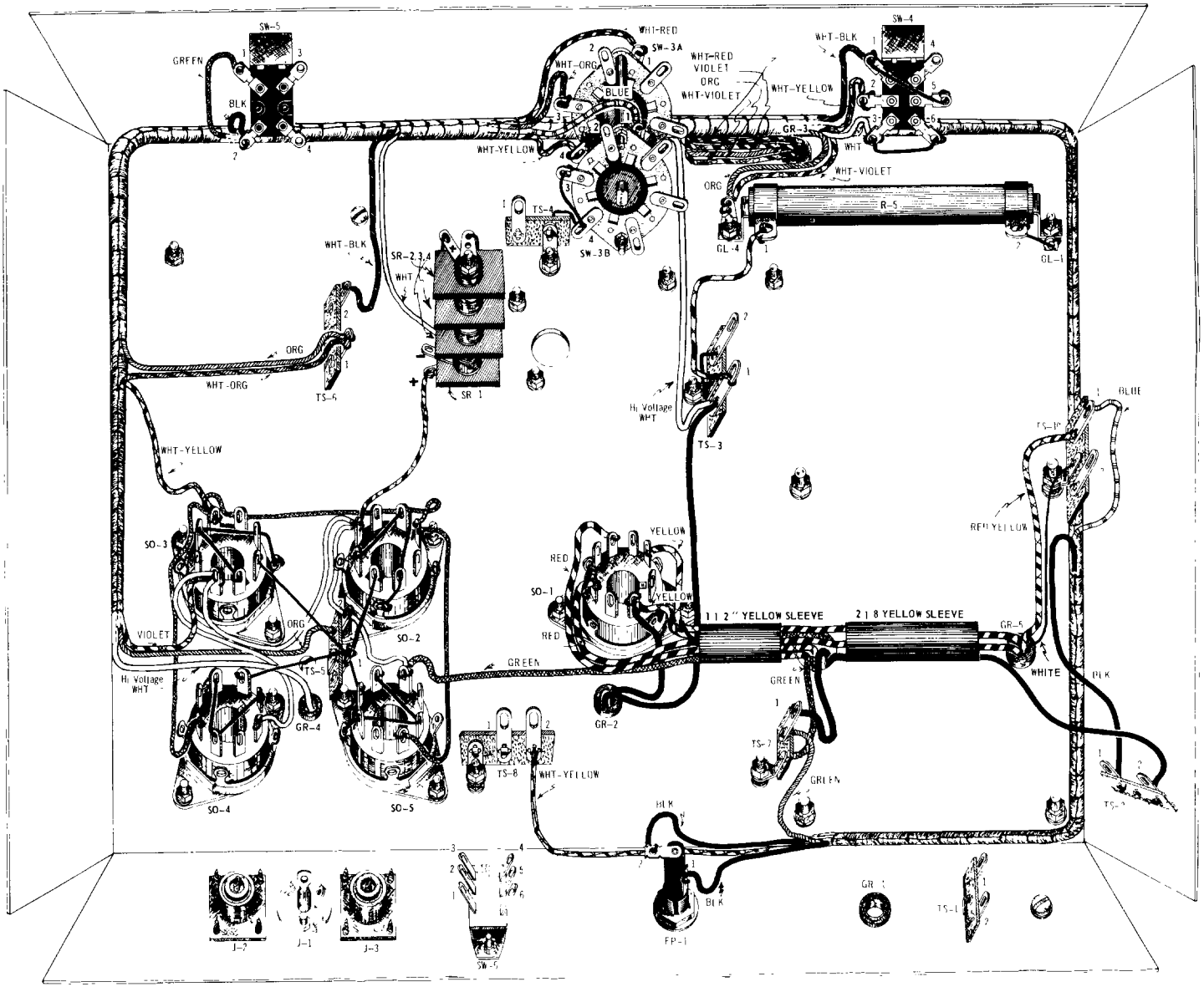


Figure 15. Wiring Steps 1 Through 67.

lead of T-1 to lug 1 of tie strip TS-10. (NS)

NOTE: One black lead of transformer T-1 remains to be connected. This will be done after the wiring harness has been layed in.

☐ 14. Select the wiring harness. Lay it flat on the table and straighten out all leads. Refer to Figure 16 to identify the various branches.

☐ 15. Lay the harness in the chassis with the long continuous side along the front apron of the chassis. Install the harness in place as per Figure 15. Guide branches G, H and I under switch SW-3. Carefully slide branches E and F under switch SW-3. At the same time guide branches G, H and I around the chassis under tie strips TS-1 and TS-2.

☐ 16. After the harness is in place, insert all but the heavy white lead of branch E through grommet GR-3.

☐ 17. Trim, strip and connect the white/yellow lead of branch I to lug 2 of tie strip TS-8. (NS)

☐ 18. Trim, strip and connect one of the black leads of branch H to lug 1 of the fuse retainer post FP-1. (S)

☐ 19. Trim, strip and connect the other black lead of branch H to lug 2 of FP-1. (S)

☐ 20. Trim, strip and connect the green lead of branch H to lug 1 of tie strip TS-7. (S-all connections to this terminal).

☐ 21. Trim, strip and connect the remaining black lead of transformer T-1 to lug 2 of tie strip TS-2. (NS)

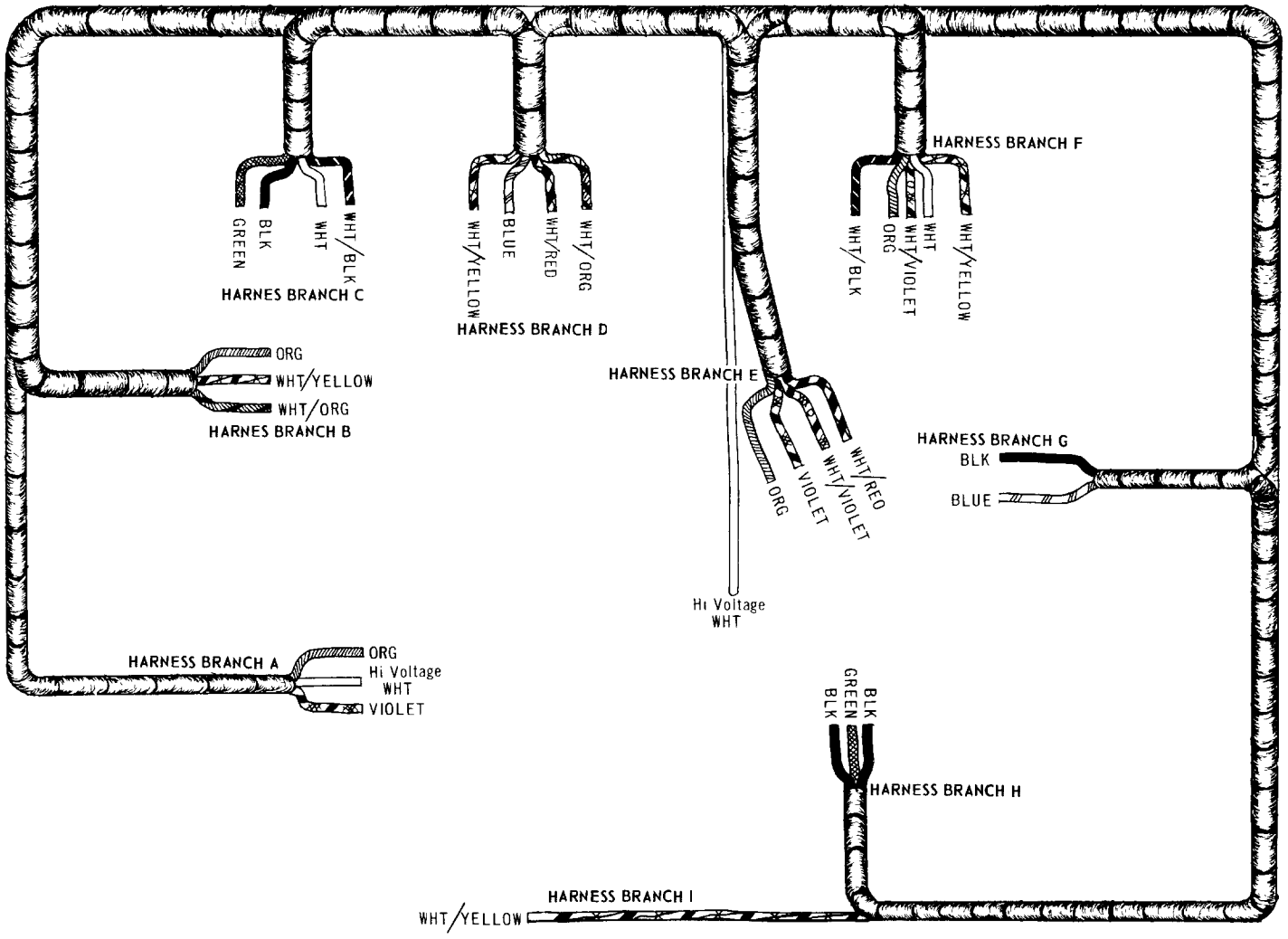


Figure 16. Wiring Harness Layout.

SECTION IV

WIRING INSTRUCTIONS

☐ 22. Connect the white lead (electrostatic shield lead) of T-1 to the center grounding hole of tie strip TS-10. (S)

☐ 23. Trim, strip and connect the black lead of harness branch G to lug 1 of tie strip TS-2. (NS)

☐ 24. Trim, strip and connect the blue lead of branch G to lug 1 of tie strip TS-10. (S-all connections to this terminal).

☐ 25. Trim, strip and connect the white lead of branch F to lug 3 of switch SW-4. (NS)

☐ 26. Trim, strip and connect the white/yellow lead of branch F to lug 2 of SW-4. (S)

☐ 27. Trim, strip and connect the white/black lead of branch F to lug 1 of SW-4. (NS)

☐ 28. Trim, strip and connect the orange lead of branch F to grounding lug GL-4. (NS)

☐ 29. Trim, strip and connect the white/violet lead of branch F to GL-4. (S)

☐ 30. Trim, strip and connect the heavy white lead of branch E to lug 1 of tie strip TS-3. (NS)

☐ 31. Trim, strip and connect the white/red lead of branch D to lug 1, front wafer (SW-3A), of switch SW-3. (S)

☐ 32. Trim, strip and connect the white/orange lead of branch D to lug 3, front wafer (SW-3A), of SW-3. (S)

☐ 33. Trim, strip and connect the white/yellow lead of branch D to lug 4, front wafer (SW-3A), of SW-3. (S)

☐ 34. Trim, strip and connect the blue lead of branch D to lug 1, rear wafer (SW-3B), of SW-3. (NS)

☐ 35. Trim, strip and connect the white lead of branch C to the positive (+) lug of selenium rectifier SR-4. (NS)

☐ 36. Trim, strip and connect the white/black lead of branch C to lug 2 of tie strip TS-6. (NS)

☐ 37. Trim, strip and connect the heavy green lead of branch C to lug 1 of switch SW-5. (S)

☐ 38. Trim, strip and connect the black lead of branch C to lug 2 of SW-5. (S)

☐ 39. Trim, strip and connect the orange lead of branch B to lug 1 of tie strip TS-6. (NS)

☐ 40. Trim, strip and connect the white/orange lead of branch B to lug 1 of TS-6. (NS)

☐ 41. Trim, strip and connect the white/yellow lead of branch B to pin 5 of socket SO-3. (NS)

☐ 42. Trim, strip and connect the violet lead of branch A to pin 2 of SO-3. (NS)

☐ 43. Trim, strip and connect the orange lead of branch A to lug 2 of tie stripTS-5. (NS)

☐ 44. Route the heavy white lead of branch A to the right between sockets SO-3 and SO-4 and up through grommet GR-4. Trim, strip and connect the lead to the bottom lug of R.F. choke RFC-2. Refer to Figures 15 and 19.

☐ 45. Locate the white/violet and violet leads on the top side of the chassis. The leads emerge from grommet GR-3. (Harness branch E). See Figure 19.

(a) Twist the two leads together.

(b) Strip the insulation from the ends of the leads.

(c) Connect the white/violet lead to one terminal of pilot light assembly PL-1. (S)

(d) Connect the violet lead to the other terminal of pilot light assembly PL-1. (S)

☐ 46. Trim, strip and connect the white/red lead of branch E to the lug on the positive (+) terminal post of the meter M-1. (S) See Figure 19.

☐ 47. Trim, strip and connect the orange lead of branch E to the lug on the negative (-) terminal post of the meter. (S) See Figure 19.

☐ 48. Connect a length of #20 bus wire from lug 2 of resistor R-5 to grounding lug GL-1. (S)

☐ 49. Connect a length of #20 bus wire from lug 1 of switch SW-4 to lug 5 of SW-4. (S)

☐ 50. Connect a length of #20 bus wire from lug 3 of SW-4 to lug 6 of SW-4. (S)

☐ 51. Connect a length of #20 bus wire from lug 2 of tie strip TS-3 to the center grounding hole of TS-3. (S-at grounding hole only) See Figure 15.

☐ 52. Connect a length of #20 bus wire from the grounding hole of tie strip TS-4 to lug 4, rear wafer of switch SW-3 (SW-3B) and on to lug 3, rear wafer of SW-3. (S-at lugs 3 and 4 of SW-3 only). See Figure 15.

☐ 53. Connect a length of #20 bus wire from the negative lug of selenium rectifier SR-2 to the grounding lug just above it. (S) See Figure 15.

☐ 54. Thread a length of #20 bus wire through pins 1, 4 and 7 of socket SO-2 and on to the grounding lug just below pin 7. (S)

☐ 55. Thread a length of #20 bus wire through pins 1, 4, and 7 of socket SO-3 and on to the grounding lug just below pin 7. (S)

☐ 56. Thread a length of #20 bus wire through pins 1, 4 and 7 of socket SO-4 and on to the grounding lug just below pin 7. (S)

☐ 57. Thread a length of #20 bus wire through pins 1, 4 and 7 of socket SO-5 and on to the grounding lug just below pin 7. (S)

☐ 58. Connect a two inch length of #20, solid insulated wire from lug 1 of resistor R-5 to lug 1 of tie strip TS-3. (S-at lug 1 of R-5 only)

☐ 59. Connect a length of #20 bus wire from pin 8 of socket SO-2 to lug 1 of tie strip TS-5, wrap the wire once around lug 1 of TS-5, and carry the wire over to pin 8 of socket SO-5. (S-at pins 8 of SO-2 and SO-5 only)

☐ 60. Connect a length of #20 bus wire from pin 8 of socket SO-4 to lug 1 of TS-5, wrap the wire once around lug 1 of TS-5, and carry the wire over to pin 8 of socket SO-3. (S-at pins 8 of SO-3 and SO-4 only)

☐ 61. Connect a length of green #20 hook-up wire from pin 5 of socket SO-5 to pin 5 of socket SO-2. (NS)

☐ 62. Connect a length of green #20 hook-up wire from pin 5 of SO-2 to pin 5 of socket SO-3. (NS)

☐ 63. Connect a length of green #20 hook-up wire from pin 5 of SO-3 to pin 5 of socket SO-4. (NS)

☐ 64. Connect a length of #16 white hook-up wire from pin 2 of socket SO-5 to pin 2 of socket SO-2. (S-at pin 2 of SO-5 only)

☐ 65. Connect a length of #16 white hook-up wire from pin 2 of SO-2 to pin 2 of socket SO-3. (NS)

☐ 66. Connect a length of #16 white hook-up wire from pin 2 of SO-3 to pin 2 of socket SO-4. (S)

☐ 67. Connect a length of #20,solid, insulated wire from pin 2 of socket SO-2 to the positive (+) lug of selenium rectifier SR-1. (S)

NOTE: Refer to Figure 17 for the following steps.

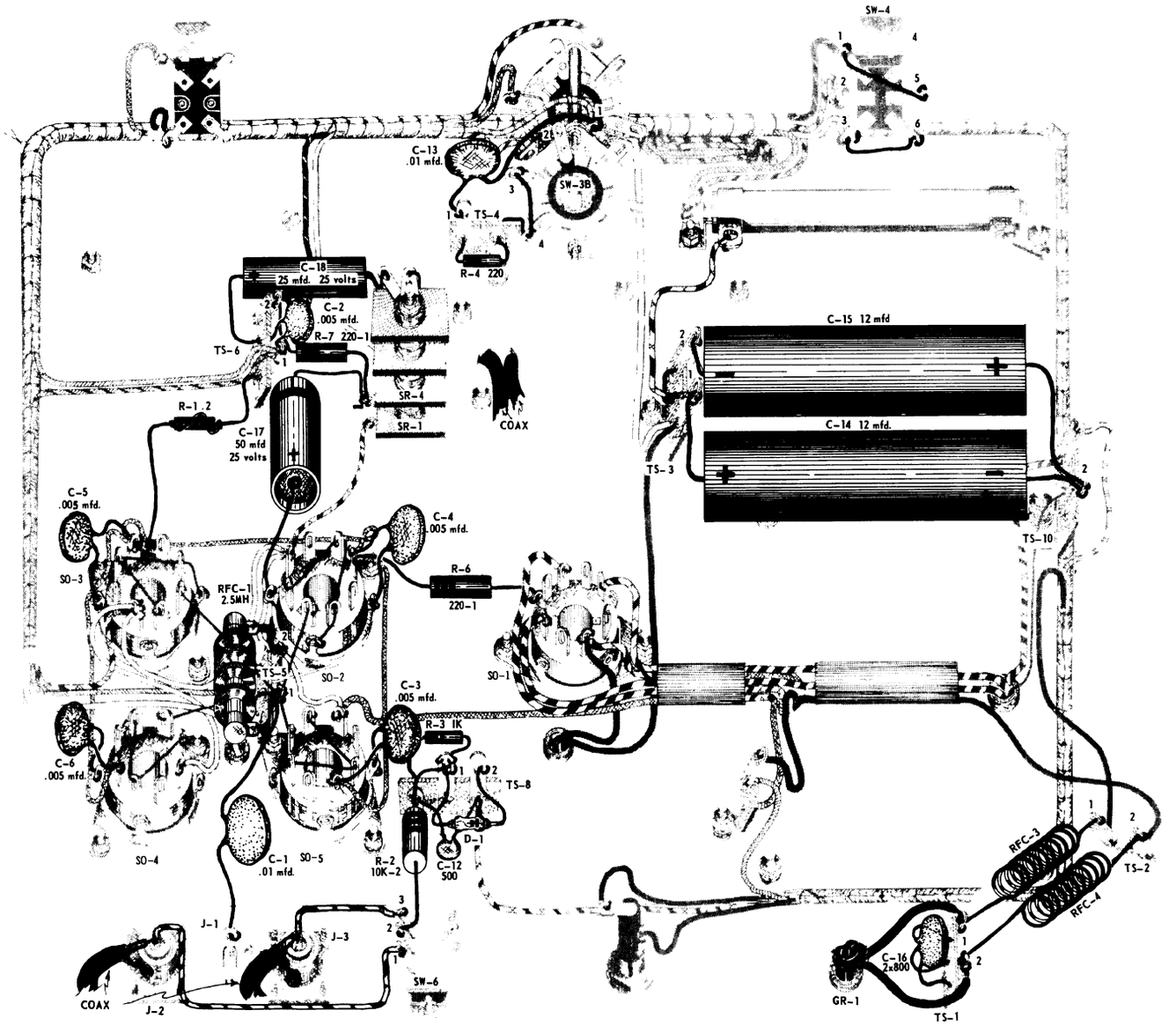


Figure 17. Wiring Steps 68 Through 100.

☐ 68. Connect the negative (-) end of the 12 mfd-700V capacitor C-15 to lug 2 of tie strip TS-3, (S all connections at this terminal)

☐ 69. Connect the positive (+) end of C-15 to lug 2 of tie strip TS-10. (NS)

☐ 70. Connect the negative (-) end of the 12mfd-700V capacitor C-14 to lug 2 of TS-10. (S)

☐ 71. Connect the positive (+) end of C-14 to lug 1 of tie strip TS-3. (S-all connections at this terminal).

☐ 72. Trim the three leads of the 2x800 mmfd disc ceramic capacitor C-16 to one-half inch in length.

(a) Connect the center lead of C-16 to the center grounding hole of tie strip TS-1. (S)

(b) Connect one of the end leads of C-16 to lug 1 of TS-1. (NS)

(c) Connect the remaining lead of C-16 to lug 2 of TS-1. (NS)

☐ 73. Select the two A.C. line chokes RFC-3 and RFC-4. These are the two 14 turn coils wound with #16 bus wire. Pull these coils apart carefully so that none of the turns touch each other.

☐ 74. Connect one end of RFC-3 to lug 1 of tie strip TS-2. (S-all connections at this terminal).

☐ 75. Connect the other end of RFC-3 to lug 1 of tie strip TS-1. (NS)

☐ 76. Connect one end of RFC-4 to lug 2 of tie strip TS-2. (S)

☐ 77. Connect the other end of RFC-4 to lug 2 of tie strip TS-1. (NS)

☐ 78. Connect a length of #20, solid, insulated wire from lug 3 of switch SW-6 to the center lug of coaxial receptacle J-3. (S-at lug 3 of SW-6 only)

☐ 79. Connect a length of #20, solid, insulated wire from lug 1 of SW-6 to the center lug of coaxial receptacle J-2. (S-at lug 1 of SW-6 only)

☐ 80. Connect the .005 mfd., disc, ceramic capacitor C-3 from pin 5 of socket SO-5 to the socket grounding lug below pin 4. (S)

☐ 81. Connect the .005 mfd., disc, ceramic capacitor C-4 from pin 5 of socket SO-2 to the socket grounding lug below pin 6. (S-at grounding lug only)

☐ 82. Connect the .005 mfd., disc, ceramic capacitor C-5 from pin 5 of socket SO-3 at the socket grounding lug below pin 4. (S)

☐ 83. Connect the .005 mfd., disc, ceramic capacitor C-6 from pin 5 of socket SO-4 to the socket grounding lug below pin 6. (S)

☐ 84. Connect the 10,000 ohm, 2 watt resistor R-2 (Brown-Black-Orange) from lug 2 of switch SW-6 to lug 1 of tie strip TS-8 (S-at lug 2 of SW-6 only)

☐ 85. Connect the IN48 diode rectifier between lugs 1 and 2 of TS-8. Make certain the diode is connected with the symbols as shown in Figure 17. (NS)

☐ 86. Connect the 1000 ohm, 1/2 watt resistor R-3 (Brown-Black-Red) from lug 1 of TS-8 to the grounding lug of TS-8. (NS)

☐ 87. Connect the 500 mmfd., disc. ceramic capacitor C-12 from lug 2 of TS-8 to the grounding lug of TS-8. (S)

☐ 88. Solder all connections on lugs 1 and 2 of TS-8. IMPORTANT NOTE: When doing so, hold the pigtail leads of diode D-1 with long nose pliers so the diode will not become damaged by excessive heat. Refer to Figure 18.

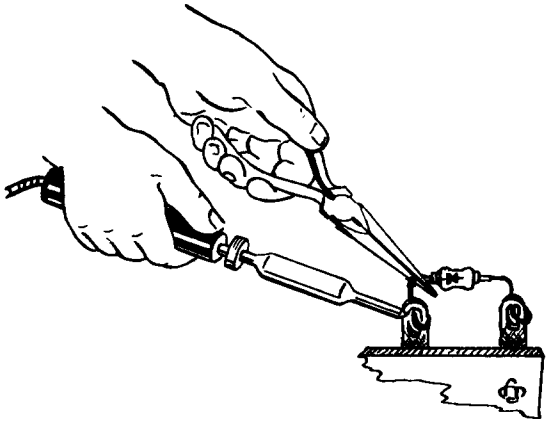


Figure 18. Proper Method of Soldering Diode Leads.

☐ 89. Connect the .01 mfd., disc, ceramic capacitor C-1 from the center lug of input jack J-1 to lug 1 of tie strip TS-5. (S-at J-1 only)

☐ 90. Connect choke RFC-1 between lugs 1 and 2 of TS-5. (S-all connections at these terminals).

☐ 91. Connect the 220 ohm, 1 watt resistor R-7 (Red-Red-Brown) from lug 2 of tie strip TS-6 to the negative lug of selenium rectifier SR-1. (S-at lug 2 of TS-6 only).

☐ 92. Connect the negative (-) end of the 50 mfd-25V capacitor C-17 to the negative lug of SR-1. (S)

☐ 93. Connect the positive (+) end of C-17 to the grounding lug of socket SO-2 just below pin 2. (S)

☐ 94. Connect the negative (-) end of the 25 mfd-25V capacitor C-18 to the positive lug of selenium rectifier SR-4. (S)

☐ 95. Connect the positive (+) end of C-18 to the center grounding hole of tie lug strip TS-6. (NS)

☐ 96. Connect the .005 mfd, disc, ceramic capacitor C-2 from lug 1 of TS-6 to the center grounding hole of TS-6. (S-at the grounding hole only).

☐ 97. Connect the special meter shunt resistor R-1 from lug 1 of TS-6 to the grounding lug below pin 6 of socket SO-3. (S-all connections at both terminals).

☐ 98. Connect the 220 ohm, 1/2 watt resistor R-4 (Red-Red-Brown) from lug 1 of tie strip TS-4 to the grounding hole of TS-4. (S-at grounding hole only).

☐ 99. Connect the .01 mfd., disc, ceramic capacitor C-13 from lug 1 of TS-4 to lug 1, rear wafer, of switch SW-3 (SW-3B). (S-all connections).

☐100. Connect the 220 ohm, 1 watt resistor R-6 (Red-Red-Brown) from pin 5 of socket SO-2 to the socket grounding lug below pin 6 of socket SO-1. (S)

☐101. Turn the chassis over so it appears as in Figure 19. Connect the .01 mfd., disc, ceramic capacitor C-8 from grounding lug GL-2 to the bottom lug of R.F. choke RFC-2. (S)

☐102. Connect the 200 mmfd. mica capacitor C-10 from lug 1 of switch SW-2 to the grounding hole of tie lug TS-9. (S-at lug 1 of SW-2 only).

☐103. Connect a length of #16 bus wire from tap 1 of coil L-2 to lug 8 of SW-2. (S-at lug 8 of SW-2 only) NOTE: When connecting leads to the coil taps, form a hook on the lead, then clamp the hook securely around the coil tap. Refer to Figure 20.

☐104. Connect a length of #16 bus wire to lug 1 of switch SW-1. (NS) Thread it through lug 1 of variable capacitor C-9 and carry the wire over to lug 2 of C-9. Make certain the jumper from lug 1 to lug 2 of C-9 does not touch the capacitor frame center shield. (S-at lugs 1 and 2 of C-9 only).

☐105. Connect a length of #16 bus wire from lug 2 of switch SW-2 to tap 2 of coil L-2. (S)

☐106. Connect a length of #16 bus wire from lug 3 of SW-2 to tap 3 of L-2. (S)

☐107. Connect a length of #16 bus wire from lug 4 of SW-2 to tap 4 of L-2. (S)

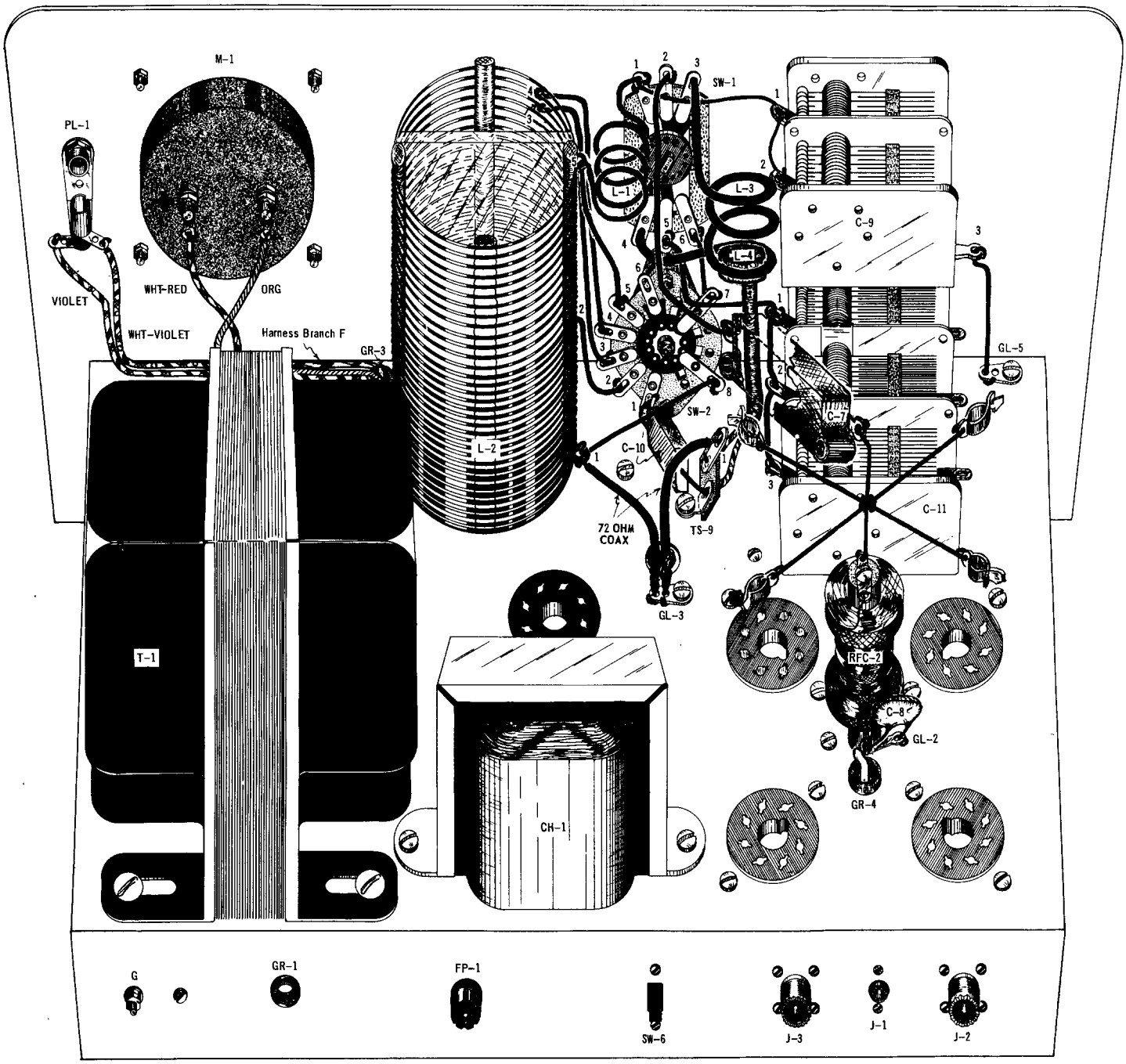


Figure 19. Wiring Steps 101 Through 133.

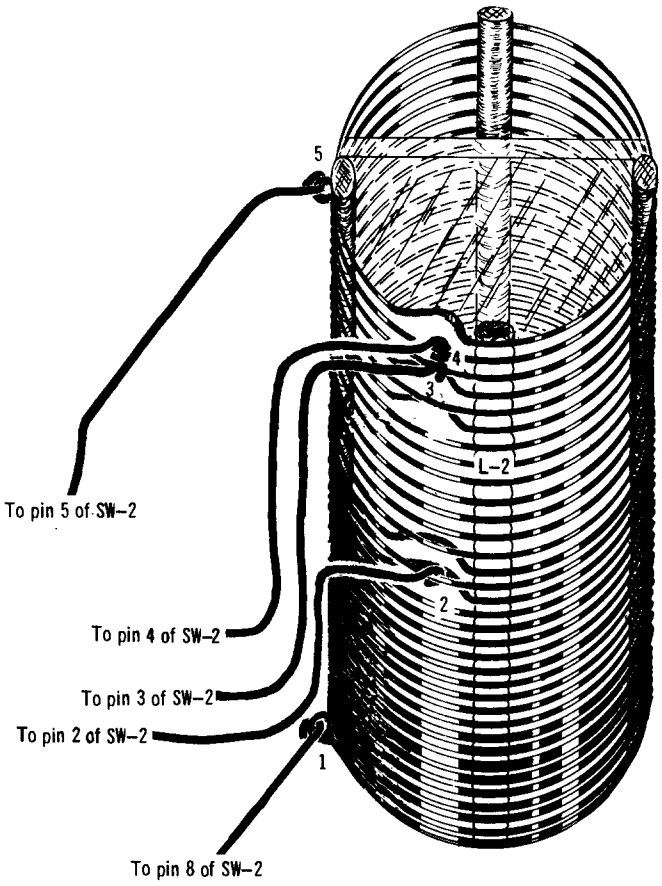


Figure 20. Coil Tap Detail.

☐108. Connect a length of #16 bus wire from ☐ lug 5 of SW-2 to tap 5 of L-2. (S-at lug 5 of SW-2 only).

☐109. Connect a length of #16 bus wire from ☐ lug 7 of SW-2 to lug 6 of switch SW-1. (S)

☐110. Attach a length of #16 bus wire to lug ☐ 3 of the 3-gang variable capacitor C-11. Thread the free end of the wire through lug 2 of C-11 and carry over and connect to lug 1 of C-11. (S-at all three points).

☐111. Connect a length of #16 bus wire from ☐ lug 5 of switch SW-1 to the bus wire which connects to lug 1 of C-11. Form a hook then clamp securely. (S)

☐112. Select the 6 meter coil L-3. The coil ☐ is made of 1/8" copper tubing. Connect the coil between lugs 3 and 4 of switch SW-1. (S)

☐113. Insert the 3 turn, 6 meter, link coil ☐ L-4 into the bottom turn of L-3. Connect one lead of the link coil to the grounding hole of tie strip TS-9. (S)

☐114. Connect the other lead of the link ☐ coil to lug 1 of TS-9. (NS)

☐115. Connect a length of #16 bus wire from ☐ lug 3 of the 2-gang variable capacitor C-9 to grounding lug GL-5. (S)

☐116. Connect the 3-1/2 turn, air wound, 10 ☐ meter coil L-1 from lug 1 of switch SW-1 to tap 5 of coil L-2. (S)

☐117. Cut two pieces of #16 bus wire to 3-1/4" ☐ in length. Attach and solder a 1/4" plate cap to both ends of each of the wires. Lay aside temporarily.

☐118. Prepare and install the two lengths of ☐ RG-59/U coaxial cable as follows:

(a) Cut one piece to 9" in length and the other to 11" in length.

(b) Strip 1-1/2" of outer rubber insulation from one end of each piece of cable. Be careful not to cut through the braided shield beneath the outer insulation.

(c) Strip 3/4" of outer rubber insulation from the other end of the two pieces of cable.

(d) Separate the braided shield wires on the stripped ends of the two lengths of coaxial cable. Twist together the separated wires at each end to form a single lead and tin each one with solder.

(e) Strip 1/4" polyethylene insulation from the center conductor at each end of the two pieces of cable. Be careful not to nick the center conductor during this operation.

(f) Insert the two cable ends stripped 1-1/2" through the large chassis hole, near grounding lug GL-3, from the underside of the chassis.

☐119. Connect the twisted braided shield ☐ wires of both pieces of cable to GL-3. (S)

☐120. Connect the center conductor of the ☐ 11" length of cable to tap 1 of coil L-2. (S)

☐121. Connect the center conductor of the ☐ 9" length to lug 1 of tie strip TS-9. (S-all connections at this terminal).

☐122. Connect the braided shield on the ☐ loose end of the 11" length to the shell of coaxial receptacle J-2. (S)

☐123. Connect the center conductor of the ☐ 11" length to the center lug of J-2. (S)

☐124. Connect the braided shield on the loose ☐ end of the 9" length to the shell of coaxial receptacle J-3. (S)

☐125. Connect the center conductor of the ☐ 9" length to the center lug of J-3. (S)

☐126. Insert an EL38 tube in each socket ☐ SO-2, SO-3, SO-4 and SO-5.

☐127. Place the plate caps, previously pre- ☐ pared, on the tubes so the plate leads cross over in the center as per Figure 19.

☐128. Connect one end of a 5-1/4" length of ☐ #16 bus wire to the solder lug on top of R.F. choke RFC-2. (S) Bring the wire straight up and wrap once around the crossover of the plate leads. (S) See step 129 regarding excess lead length.

☐129. Connect one lug of the .0005 mfd.-2500V, ☐ mica capacitor C-7 to the loose end of the 5-1/4" wire referred to in step 128. (S)

☐130. Connect a short length of #16 bus wire ☐ from lug 2 of switch SW-1 to the other lug of C-7. (S)

☐131. Insert the tinned ends of the A.C. ☐ line cord through grommet GR-1. Tie a knot in the cord (on the inside of the chassis) 2" from the tinned ends. Refer to Figure 17.

☐132. Connect one tinned lead of the A.C. ☐ line cord to lug 1 of tie strip TS-1. (S-all connections at this terminal).

☐133. Connect the other tinned lead of the ☐ A.C. line cord to lug 2 of TS-1. (S-all connections at this terminal).

☐134. Insert the 5R4GY tube into socket ☐ SO-1.

4-4. The wiring of the amplifier is now completed. Double check the wiring to make certain all connections are correct and have been soldered. Also inspect each connection for cold solder joints. Certain preliminary tests should be made before the assembled kit is placed into actual operation. The purpose of these tests is to determine that all circuits and components are functioning properly before placing the unit into actual on-the-air operation. Proceed as follows:

WARNING

Operation of this equipment involves the use of high voltages which are dangerous to life. Observe all safety precautions! Do not attempt to make any adjustments inside the equipment or change tubes when the A.C. power is on. Disconnect-UNPLUG-the A.C. power cord before touching any high voltage components.

4-5. Place the A.C. POWER switch to the OFF position and the FUNCTION switch to the STAND-BY position.

4-6. Insert the A.C. power plug into a 115V A.C. source receptacle.

4-7. Place the A.C. POWER switch to the ON position. Allow a two minute warm-up period before proceeding to the next step.

4-8. Use a test meter to check the various voltages throughout the amplifier. Voltages should closely correspond to those given in the voltage chart Table III, Section VI, paragraph 6-4.

4-9. If the voltages are normal, turn the unit off and place it into the cabinet. Use eight #6x1/4" self-tapping screws to fasten the panel and chassis rear apron to the cabinet. The unit may now be placed into operation as outlined in Section II.

4-10. Improper voltage readings, in most cases, would indicate a wiring error or faulty component. Recheck all wiring and test for any defective component.

SECTION V

ANTENNA CONSIDERATIONS

5-1. GENERAL.

5-2. The WRL Globe Linear Amplifier pi network final tank circuit is capable of matching a nominal range of non-reactive antenna impedances under normal conditions. As the reactive component in the antenna and feedline increases, the possible matching range is reduced in as much as the pi network must compensate with an opposite reactive component. This reduces the matching capability for higher impedances. In some cases, where the reactive component is higher than the resistive component, the matching range may be reduced to as little as 50 to 90 ohms. Optimum results will be obtained by correctly measuring the impedance at the transmitter end of the feedline and correcting any large antenna reactance rather than try to tune it out with the pi network.

5-3. One of the most commonly encountered troubles is a feedline that acts as a transformer. Such a feedline may present a complex load to the transmitter very different from the impedance at the feed point of the antenna. As an example; using a 52 ohm feedline having an SWR of only 1.5:1, due to mismatch at the antenna, the impedance at the transmitter end of the feedline may be anywhere from approximately 32 to 77 ohms resistive and 21 ohms reactive. At an SWR of only 3:1 the resistance may vary from 17 to 156 ohms and the reactance to 70 ohms. The PI-NET may normally have the capability of matching this resistive range, but due to compensation for such a large reactance, the PI-NET may no longer be able to match the resistive load. A resistive antenna having an impedance the same as the characteristic impedance of the feedline should give no difficulty, as the line is flat, and changing the length of the feedline will not change the feed point impedance. Where the antenna does not have an impedance the same as the feedline, or where the antenna is reactive (off resonance) the feedline should preferably be cut to exact EVEN multiples of 1/2 wave, taking into account velocity factor of the type feedline used. In such case the impedance at the end of the feedline will be the same as to the antenna feed point. A feedline cut to 1/8 or 1/4 wave can present a very complex impedance at the end of the feedline. Such a feedline, while measuring a relatively low SWR, may be virtually impossible to load in many cases.

5-4. Beams usually have a very low impedance, often as low as 15 ohms for a close spaced 3 element array. By using a folded dipole driven element, "T" match or other means to increase the feed point impedance, the feed point impedance is increased to a high enough value to use common type feedlines. Even so, it takes a very little reactance to present a complex impedance below 50 ohms, and out of range for the PI-NET to match. In any type antenna it is best to try and make the impedance presented to the antenna about 70 ohms where a bit more reactance can be tuned out and still maintain a match.

5-5. The most reliable way to adjust any antenna is by the use of a good SWR bridge. Most bridges cover the range of 52-72 ohms. The bridge should be excited by a low power signal on the operating frequency (power to be determined by the manufacturers specifications on the particular instrument), and the antenna adjusted for the lowest possible SWR. (1:1 not usually obtainable). A SWR of 1.5:1 is good. If the bridge used is for coax, a balancing device should be used (or the readings most likely will be in error) when measuring a balanced type antenna feedline. The antenna section of A.R.R.L. Handbook gives many suggestions for antennas, or similar publications can be refered to.

5-6. Keep in mind the fact that many antenna diagrams refer only to free space, or theoretical dimensions and impedances which will seldom hold true in practical application. Also an antenna which may be a certain impedance at one location may be considerably different at another location, even when the same height above ground, and this can be due to no more than different soil conductivity. Therefore, specified dimensions may have to be corrected for each particular location and the only sure way that an antenna impedance can be determined is to measure it properly.

5-7. ANTENNA CONSIDERATIONS.

5-8. For general all around use, lowest cost, ease of maintenance and good performance, the

doublet antenna is recommended. A chart of antennas for each band, and the formula for computing the length of an antenna for a specific frequency is given in Table II.

5-9. When an antenna is made to the correct length for a specific operating frequency, the length of the feedline is not critical. In practice this is practically impossible so the feedline should be kept as near to even multiples of one-half wave as possible. Thus any mis-match at the antenna end will not be exaggerated at the transmitter end. A 72 or 52 ohm (preferable 72 ohm) feedline should be used on a doublet antenna. The junction of the feedline and antenna center should be kept as close as possible as even a small amount of fanning of the feedline may cause a mis-match. See Figure 21.

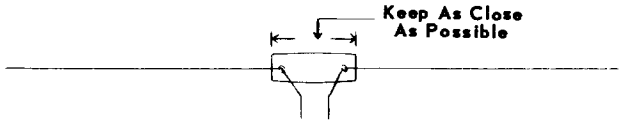


Figure 21.

Should the antenna be less than one-half wave above ground the lengths given in Table III may not hold true. In this case it may be necessary to adjust the length of the antenna and/or feedline for the best match.

TABLE II. ANTENNA CHART

Band	1/2 Wave Doublet-72 Ohms
10 Meters	15'-9" to 16'-6"
15 Meters	21'-11" to 22'-3"
20 Meters	32'-10" to 33'-3"
40 Meters	64'-3" to 66'-3"
80 Meters	118'-0" to 133'-0"

Formulas: For half-wave doublet in feet

$$\frac{468}{\text{Specific Freq. (MC.)}}$$

SECTION VI

MALFUNCTIONS AND PROBABLE CAUSE-VOLTAGE CHART

6-1. GENERAL.

6-2. This section deals with various malfunctions the operator may encounter. The most likely causes for each type of malfunction are given. The operator should be able to ascertain the nature of the malfunction from this chart and thus, easily repair the equipment. A voltage chart is also given as an aid to determining the nature of various malfunctions.

WARNING

Operation of this equipment involves the use of high voltages which are dangerous to life. Observe all safety precautions! Do not attempt to make adjustments inside the equipment, or change tubes with any power on. Disconnect-UNPLUG-the A.C. power cord and short out the filter condensers with a shorting bar with a highly insulated handle before touching any high voltage components.

6-3. MALFUNCTIONS AND PROBABLE CAUSE.

SYMPTOM	PROBABLE CAUSE
1. Amplifier will not operate when A.C. power is applied.	1-1. Defective 5 ampere fuse.
2. Fuse blows when A.C. power is applied.	2-1. Shorted tube or tubes. 2-2. Capacitor C-7 shorted.
3. Lack of plate current.	3-1. Insufficient R.F. drive. 3-2. Defective 5R4GY. 3-3. R.F. choke RFC-1 or RFC-2 open. 3-4. Defective R.F. input cable.
4. Final plate circuit will not tune properly.	4-1. Pi network overloaded excessively. 4-2. Improper exciter tuning. 4-3. Band selector switch in wrong position.
5. Antenna will not load.	5-1. Defective antenna system. 5-2. Excessive antenna reactance. 5-3. Antenna impedance too high or too low. 5-4. Capacitor C-11 shorting.
6. Downward modulation, Class B AM operation.	6-1. Exciter modulating downward. 6-1. Insufficient loading of Globe Linear Amplifier.
7. Output current indicator inoperative.	7-1. Diode D-1 defective. 7-2. Switch SW-6 defective. 7-3. Resistor R-2 defective.
8. Arcing of final plate tuning capacitor.	8-1. Insufficient, or lack of antenna loading.

6-4. TYPICAL VOLTAGE READINGS.

6-5. The voltage readings given in Table III are typical for the conditions as set forth. Some allowance must be made if the test meter used is not a 20,000 ohm per volt meter and for possible line voltage variation.

WARNING

Use extreme caution when taking voltage readings. High voltages, dangerous to life, are involved.

CONDITIONS: A.C. line voltage 115 volts; Test meter 20,000 ohms/volt sensitivity; Band Selector switch in 40 meter position; amplifier plate current 210 MA CIASS B linear AM operation; output current indicator with 52 ohm resistive load, 60 MA; meter connected from specified tube pin to nearest chassis ground except where otherwise noted. IMPORTANT: R.F. voltage present at pin 8 of the EL38 prohibits measurement at this point.

TABLE III. TYPICAL VOLTAGE READINGS.

Tube Type	Tube Function	Tube Pin Number							
		1	2	3	4	5	6	7	8
EL38	R.F. Amplifier	0	6.3VAC		0	-13C* -3.2B**		0	‡
5R4GY	Rectifier		+1100VDC		1100VAC		1100VAC		+1100VDC

* Voltage for CLASS C operation.
**Voltage for CLASS B operation.
‡ EL38 plate voltage measured at the bottom terminal of RFC-2, +1000VDC.

SECTION VII

HELPFUL KIT BUILDING INFORMATION

7-1. GENERAL.

7-2. This section contains information useful in building or testing any radio or electronic equipment. The information included will enable identification of capacitors, resistors, transformer leads, the new schematic symbols, etc.

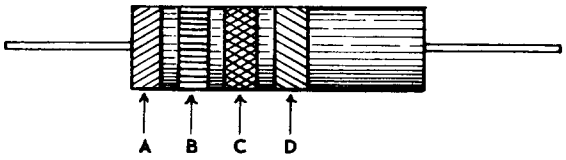
7-3. Standard color codes are used to mark values on such items as resistors and capacitors, and to identify the leads on transformers. The resistor-capacitor color code is given in Table IV.

7-4. Composition resistors are color coded as shown in Figure 22. These bands of color refer to the resistor-capacitor color code, Table IV. If the first band is of double width, it means the resistor is a wire-wound unit. Here is an example: First band, green. Second band, blue. Third band, orange. Fourth band, silver. This would be a 56,000 ohm 10% resistor; the first band, green, means the first figure is a 5; the second band, blue, means the second figure is a 6; the third band, orange, means "multiply by 1000". 56 multiplied by 1000 is 56,000. The fourth band, silver, means the acutal resistance is within 10% of the marked value. If there were no fourth band, it would indicate that the resistor was within 20% of the marked value.

TABLE IV. RESISTOR-CAPACITOR COLOR CODE.

Color	Significant Figure	Decimal Multiplier	Tolerance%	Voltage Rating*
Black	0	1	—	—
Brown	1	10	1*	100
Red	2	100	2*	200
Orange	3	1000	3*	300
Yellow	4	10,000	4*	400
Green	5	100,000	5*	500
Blue	6	1,000,000	6*	600
Violet	7	10,000,000	7*	700
Gray	8	100,000,000	8*	800
White	9	1,000,000,000	9*	900
Gold	—	0.1	5	1000
Silver	—	0.01	10	2000
No color	—	—	20	500

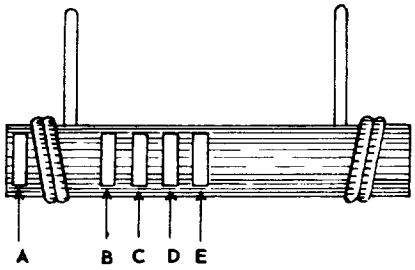
*Capacitors only.



A – FIRST SIGNIFICANT FIGURE OF RESISTANCE IN OHMS.
B – SECOND SIGNIFICANT FIGURE.
C – DECIMAL MULTIPLIER.
D – RESISTANCE TOLERANCE IN PER CENT. IF NO COLOR IS SHOWN, THE TOLERANCE IS ± 20%.

Figure 22. Fixed Composition Resistor Code.

7-5. Ceramic capacitors of the general purpose type use the same color code with regard to significant figures and multipliers as do resistors. See Figure 23. The fifth band indicates tolerance.



A – DIELECTRIC CHARACTERISTIC.
B – FIRST SIGNIFICANT FIGURE.
C – SECOND SIGNIFICANT FIGURE.
D – MULTIPLIER.
E – TOLERANCE.

Figure 23. Tubular Ceramic Capacitor Code.

7-6. Mica capacitors have been marked with many different color codes in the past. Shown here are the three codes most likely to be encountered. Most of the mica capacitors used in WRL kits have the acutal numerical value stamped on the capacitor, making the use of a color code unnecessary in such cases.

7-7. With the increasing use of variable frequency oscillators in amateur transmitters, temperature compensating (TC) capacitors are being used with increasing frequency. The color code for temperature compensating capacitors is the same as for resistors in regards significant figures and multipliers, but differs in the tolerance reading and in the showing of tempreature coefficient. See Figure 25.

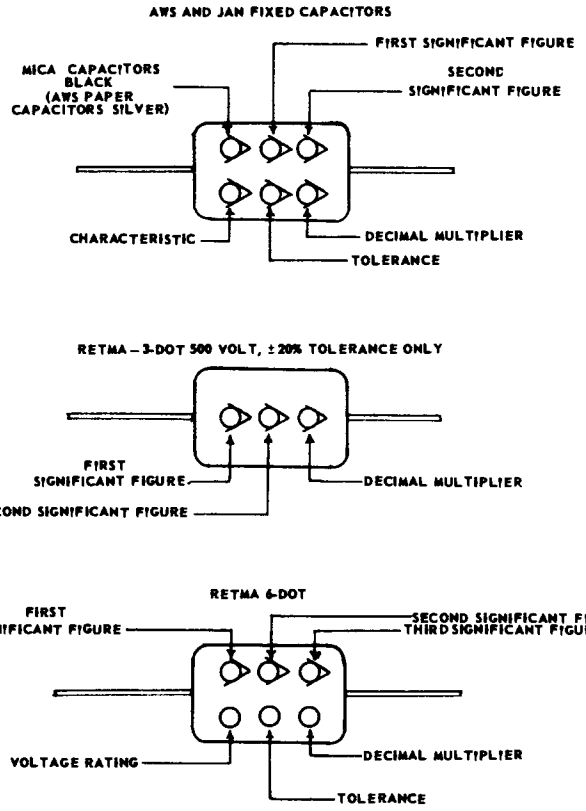
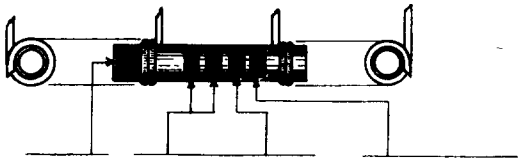


Figure 24. Mica Capacitor Color Code.



	TEMPERATURE COEFFICIENT	CAPACITY SIGNIFICANT FIGURES	CAPACITY MULTIPLIER	TOLERANCE MMF.	TOLERANCE PERCENT
BLACK	ZERO (TCZ)	0	1	±2.0	± 20%
BROWN	.....	1	10	.....	± 1%
RED	N080	2	100	.....	± 2%
ORANGE	N150	3	1,000	.....	±2½%
YELLOW	.....	4	10,000	.....	.....
GREEN	N330(TCA)	5	.....	± .5	± 5%
BLUE	.....	6	.....	.....	GMV
VIOLET	N750 (TCN)	7	.....	.....	.....
GREY	.....	8	.01	±.25	.....
WHITE	....	9	.1	±1.0	± 10%
ORANGE-ORANGE	N1500(TCL)	....	.....	.....	.....

Figure 25. Color Coding For TC Type Ceramic Capacitors.

7-8. The leads of a power transformer are of different colors of wire. The wire color indicates to which winding the lead is connected, as follows:

TABLE V. POWER TRANSFORMER CODING.

Winding	Color Code
Primary Leads	Black
if tapped:	
Common	Black
Tap	Black/Yellow
Finish	Black/Red
High Voltage	Red
Center Tap	Red/Yellow
Rectifier Filament	Yellow
Center Tap	Yellow/Blue
Filament No. 1	Green
Center Tap	Green/Yellow
Filament No. 2	Brown
Center Tap	Brown/Yellow
Filament No. 3	Slate
Center Tap	Slate/Yellow

7-9. In the past, the electronic and electric portions of the industry used different, and sometime mutually confusing, symbols. Recently, a single set of symbols have been adopted. Those most applicable to electronics and radio are shown in Figure 26.

7-10. KIT ASSEMBLY. WRL kits come with all holes prepunched, so that a minimum number of tools will be needed for assembly of the kit. The following are recommended as suitable:

1-small knife for scraping off enamel insulation.

1-small screwdriver.

1-medium screwdriver.

1-long nose pliers.

1-diagonal or side-cutting pliers ("dikes")

1-small-tip soldering iron, at least 100 watts, or .....

1-soldering gun, at least 100 watts.

Rosin core solder, the amount depending on the kit. DO NOT USE ACID CORE SOLDER. USE ONLY ROSIN CORE OR "RADIO" SOLDER.

Additional tools which are helpful, but not absolutely necessary.

1 set-"Spintite" or socket wrenches.

1-6 inch crescent wrench.

1-Wire stripper.

In mounting the components of the kit, follow the instructions closely and consult the pictorial diagrams for positioning. You will find in many cases a glance at the diagram will explain far better than several paragraphs of words. Route wires as shown in the pictures, as wire placement may be important. Be sure that socket keyways are positioned as in the pictures, so that the proper pin numbers will be in the proper location.

7-11. SOLDERING. A poor solder joint may cause faulty operation of the equipment. The importance of a good soldering job cannot be overstated. The secret of a good solder joint is simple: GET THE JOINT ITSELF HOT ENOUGH TO MELT THE SOLDER. It is not sufficient to melt the solder with the soldering iron and let it drip upon the joint; the joint itself must be hot enough to melt solder. Only in this way will the solder flow onto the joint and make a secure bond. Also, make a secure mechanical connection before applying solder, as the solder should be depended on only for an electrical connection and not for mechanical strength, i.e., twist the wire around a terminal so that the twist will hold even before solder is applied. Again, USE ONLY ROSIN CORE OR "RADIO" SOLDER. ACID CORE SOLDER WILL EAT AWAY THE WIRING AND IN TIME CAUSE FAILURE OF THE EQUIPMENT. DO NOT USE SOLDERING PASTE OR FLUX. AS IT WILL TEND TO BREAK DOWN INSULATION. Be sure that the surfaces to be soldered are clean and bright. Scrape any tarnish or enamel insulation off any wires or terminals which are to be soldered. Keep the tip of the soldering iron clean and bright and well-tinned with solder. A piece of steel wool is an excellent item with which to clean a soldering iron tip, even when the iron is on and hot.

SECTION VII

HELPFUL KIT BUILDING INFORMATION

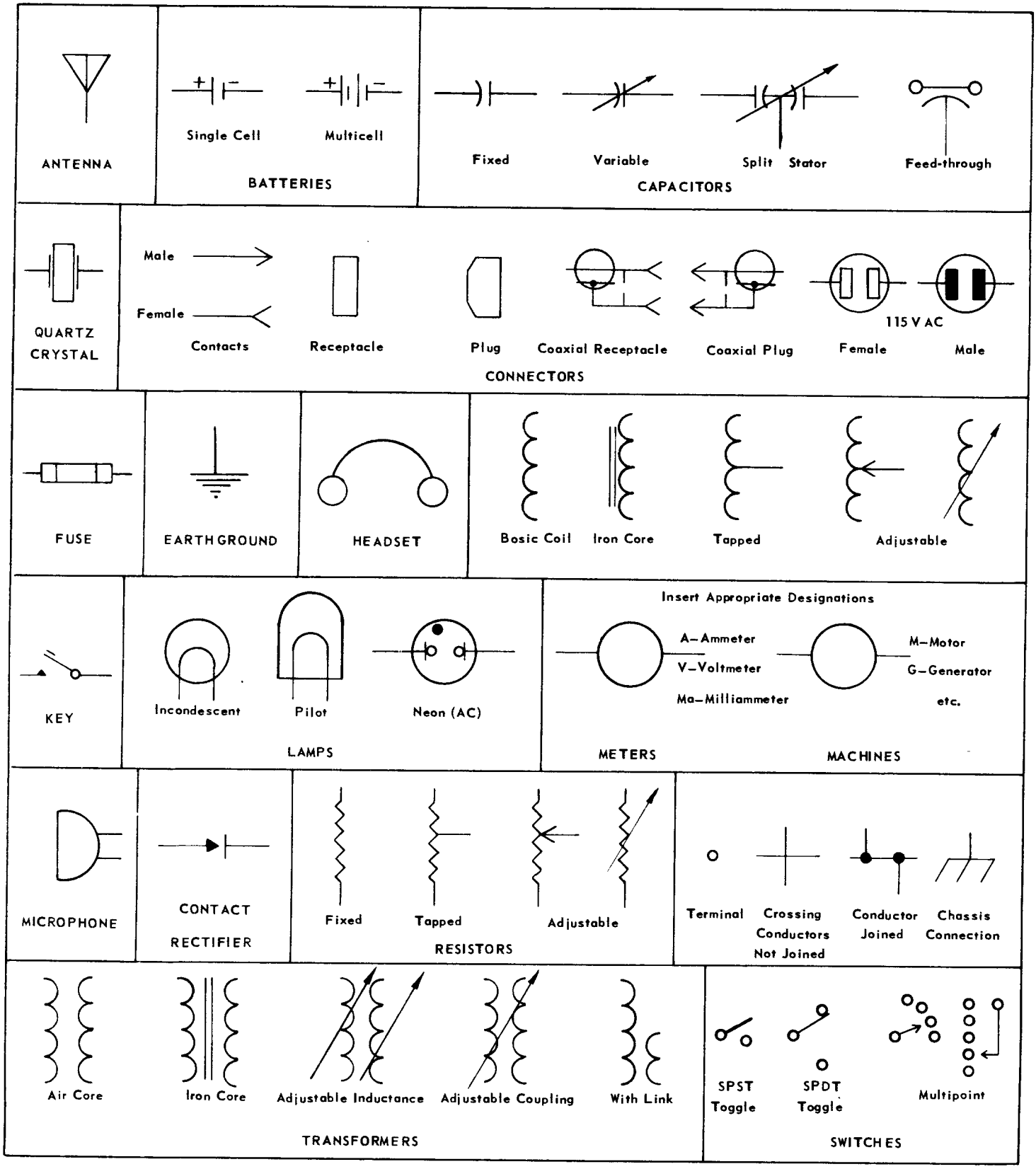
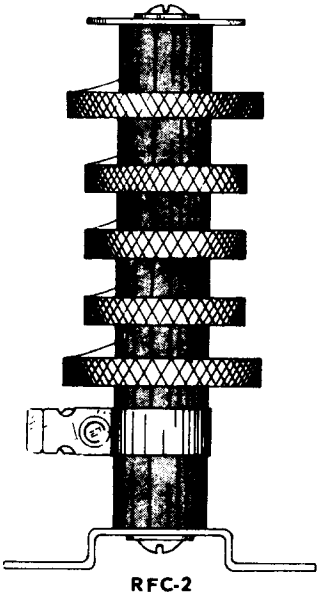


Figure 26. Electronic Symbols.

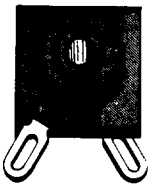


RFC-2

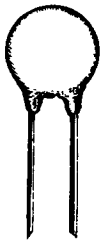
METER SHUNT, R-1

2 WATT RESISITOR

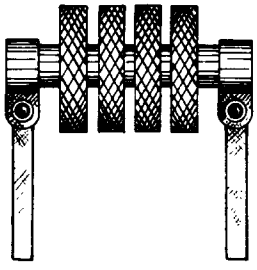
1/2 WATT RESISTOR

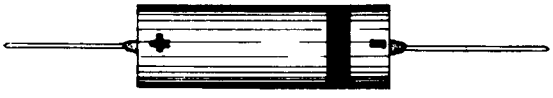


SELENIUM RECTIFIER



DISC CAPACITOR

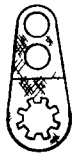




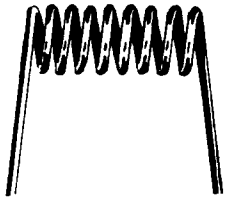
ELECTROLYTIC CAPACITOR

MICA CAPACITOR
C-10

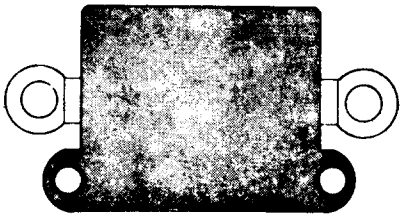
NO.6 GROUND LUG



NO. 4 GROUND LUG



A.C.LINE CHOKE



2500 V MICA CAPACITOR

NO.10 GROUND LUG

FIG. 27 PARTS IDENTIFICATION

SECTION VIII

PARTS LIST

Quan.	Description	Circuit Designation	WRL Part No.
1	Capacitor, .01Mfd-1Kv., ceramic disc	C-1	1101-024
1	Capacitor, .005Mfd-600 Volt, ceramic disc	C-2	1101-003
1	Capacitor, .005Mfd-600 Volt, ceramic disc	C-3	1101-003
1	Capacitor, .005Mfd-600 Volt, ceramic disc	C-4	1101-003
1	Capacitor, .005Mfd-600 Volt, ceramic disc	C-5	1101-003
1	Capacitor, .005Mfd-600 Volt, ceramic disc	C-6	1101-003
1	Capacitor, 500Mmfd-2500 Volt, Mica	C-7	1102-005
1	Capacitor, .01Mfd-1Kv., ceramic disc	C-8	1101-024
1	Capacitor, 2-gang variable, 70 Mmfd per section	C-9	1105-017
1	Capacitor, 200Mmfd, Mica	C-10	1102-001
1	Capacitor, 3-gang variable, 365 Mmfd per section	C-11	1105-021
1	Capacitor, 500Mmfd-600 Volt, ceramic disc	C-12	1101-005
1	Capacitor, .01 Mfd-1 Kv., ceramic disc	C-13	1101-024
1	Capacitor, 12 Mfd-700 V., electrolytic	C-14	1106-007
1	Capacitor, 12 Mfd-700 Volt, electrolytic	C-15	1106-007
1	Capacitor, 2x.0008 Mfd-1600 Volt, ceramic disc	C-16	1104-002
1	Capacitor, 50Mfd-25 Volt, electrolytic	C-17	1106-005
1	Capacitor, 25Mfd-25 Volt, electrolytic	C-18	1106-003
1	Choke, filter	CH-1	1300-008

Quan.	Description	Circuit Designation	WRL Part No.
1	Diode rectifier IN-48	D-1	3700-002
1	Fuse, 5 ampere, type 3AG	FS-1	1500-007
1	Receptacle, pin plug	J-1	2000-002
1	Receptacle, co-axial	J-2	2000-004
1	Receptacle, co-axial	J-3	2000-004
1	Coil, 10 meter final plate	L-1	1400-045
1	Coil, 80-20 meter final plate	L-2	1400-044
1	Coil, 6 meter final plate	L-3	1400-046
1	Coil, 6 meter link	L-4	1400-047
1	Meter, 0-300 MA.	M-1	2500-011
1	Pilot bulb # 47	PL-1	3800-002
1	Resistor, special meter shunt	R-1	1010-004
1	Resistor, 10 K ohms, 2 watt	R-2	1002-009
1	Resistor, 1000 ohms, 1/2 watt	R-3	1000-014
1	Resistor, 220 ohms, 1/2 watt	R-4	1000-012
1	Resistor, 50 K ohms, 50 watt	R-5	1006-002
1	Resistor, 220 ohms, 1 watt	R-6	1001-004
1	Resistor, 220 ohms, 1 watt	R-7	1001-004
1	Choke, R.F., 2.5 MH-200 MA.	RFC-1	1301-002
1	Choke, R.F., 1MH-600 MA.	RFC-2	1301-007
1	Choke, A.C. line	RFC-3	1301-011
1	Choke, A.C. line	RFC-4	1301-011

Quan.	Description	Circuit Designation	WRL Part No.
1	Rectifier, Selenium, 65MA.-25V.	SR-1	3700-003
1	Rectifier, Selenium, 65MA.-25V.	SR-2	3700-003
1	Rectifier, Selenium, 65MA.-25V.	SR-3	3700-003
1	Rectifier, Selenium, 65MA.-25V.	SR-4	3700-003
1	Switch, rotary, DPDT	SW-1	2100-016
1	Switch, rotary, SP-5 pos.	SW-2	2100-004
1	Switch, rotary, DP-3T	SW-3	2100-013
1	Switch, toggle, DPDT	SW-4	2101-001
1	Switch, toggle, DPST	SW-5	2101-002
1	Switch, slide, DPDT	SW-6	2102-002
1	Transformer, power	T-1	1200-004

Quan.	Description	WRL Part No.
2	Bracket, coil mounting	3300-051
2	Bracket, resistor mounting	1901-020
1	Cabinet	1700-015
1	Chassis, punched	1900-004
1	Fuse, Retainer post	1500-006
5	Grommet, 3/8''	3200-001
1	Harness, wire assembly	2703-004
1	Knob, bar	2600-008
4	Knob, round, skirted	2600-009
1	Lug, solder, #6 teardrop	2006-008
4	Lug, solder, #6 bent	2006-004
3	Lug, solder, #10	2006-003
2	Nut, hex, 4-40x3/16''	2901-001
30	Nut, hex, 6-32x1/4''	2901-003
2	Nut, hex, 8-32x5/16''	2901-004
5	Nut, hex, 10-32x5/16''	2901-005
3	Nut, hex, 3/8''	2901-006
2	Nut, ring, switch	2901-008

Quan.	Description	WRL Part No.
1	Panel	1800-006
1	Pilot light assembly	2400-001
4	Plate cap, 1/4''	2005-004
1	Power cord, A.C. with plug	2700-042
4	Rubber mounting feet	3300-010
3	Screw, 6-32x1/4''	2900-003
2	Screw, 4-40x3/8''	2900-001
4	Screw, 6-32x3/16''	2900-018
31	Screw, 6-32x5/16''	2900-004
2	Screw, 6-32x1/2''	2900-005
1	Screw, 6-32x1-3/4''	2900-025
1	Screw, 8-32x1/2''	2900-008
4	Screw, 10-32x1/2''	2900-024
16	Screw, self-tapping #6x1/4''	2900-017
4	Screw, self-tapping #6x3/8''	2900-013
4	Socket, octal	1600-023
1	Socket, octal, mica filled	1600-024
3-5/8''	Sleeving, yellow	2800-006
3	Tie strip, 1-lug	2002-006
6	Tie strip, 2-lug	2002-002
1	Tie strip, special 2-lug	2002-003M
4	Tube, EL38	
1	Tube, 5R4GY	
1	Washer, fibre, 3/8''	3100-004
2	Washer, flat steel, 3/4''	3101-008
27	Washer, lock, #6	3101-002
1	Washer, lock, #8	3101-003
4	Washer, lock, #10	3101-004
45''	Wire, #16 bus	2700-004
26''	Wire, #20 bus	2700-005
20''	Wire, coaxial cable, RG-59/U	2701-001
12''	Wire, hook-up, #16, white	2700-026
10''	Wire, hook-up, #20 solid, yellow	2700-001
14''	Wire, hook-up, #20, stranded, green	2700-011

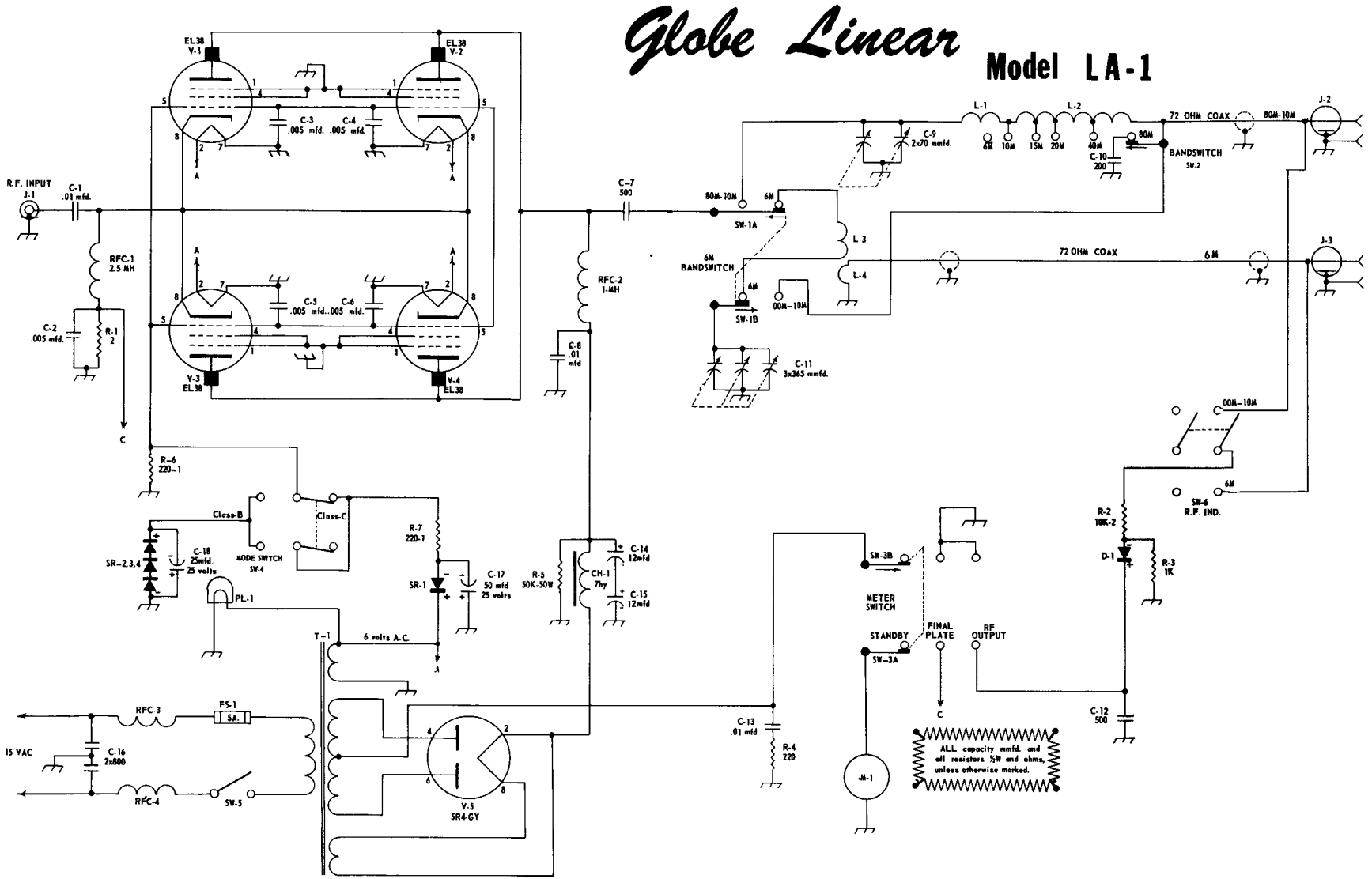


Figure 28. Schematic Drawing Of Model LA-1 Globe Linear Amplifier.

ENGINEERING BULLETIN

November 12, 1958

Subject: Modification of Function Switch in LA-1 Linear Amplifier.

The following changes in LA-1 will eliminate excessive arcing at function switch.

Bottom view of chassis, panel away from you.

1. Remove the blue lead from pin 1 of section B of FUNCTION SWITCH, SW-3.

2. Remove from ground lug GL-4 (ground lug located to left of resistor R-5, 50,000 ohm-50 watt) the orange lead (This is negative lead to the meter).

3. Connect the orange lead just removed to pin 1 of SW-3B. (NS)

4. Remove the meter shunt and its .005 mfd by-pass from tie strip TS-6. This tie strip is located to left of selenium rectifier SR-1.

5. Connect one end of meter shunt to pin 1 of SW-3B (where you put the orange lead on SW-3B). (S)

6. Connect the other end of meter shunt to pin 3 of SW-3A. (S) There is a white with orange wire at this point.

7. The 220 ohm-1/2 watt resistor and .01 disc condenser at tie strip TS-4 located to left and rear of SW-3 can be deleted, but will not alter operation if it is left in.

8. ~~At junction of the blue wire and the red with yellow tracer~~ on tie strip TS-10 (at right of filter condensers), remove the red with yellow tracer wire and connect to ground lug of TS-10. (S)

9. Cut off bare end of blue wire that was removed from pin 1 of section B of FUNCTION SWITCH SW-3, fold back against harness and tape.

10. Above changes to be made on factory wired units, serial number KH or later, Kit serial number LH or later.

GLOBE ELECTRONICS, INC.
Council Bluffs, Iowa

Globe Linear Model LA-1

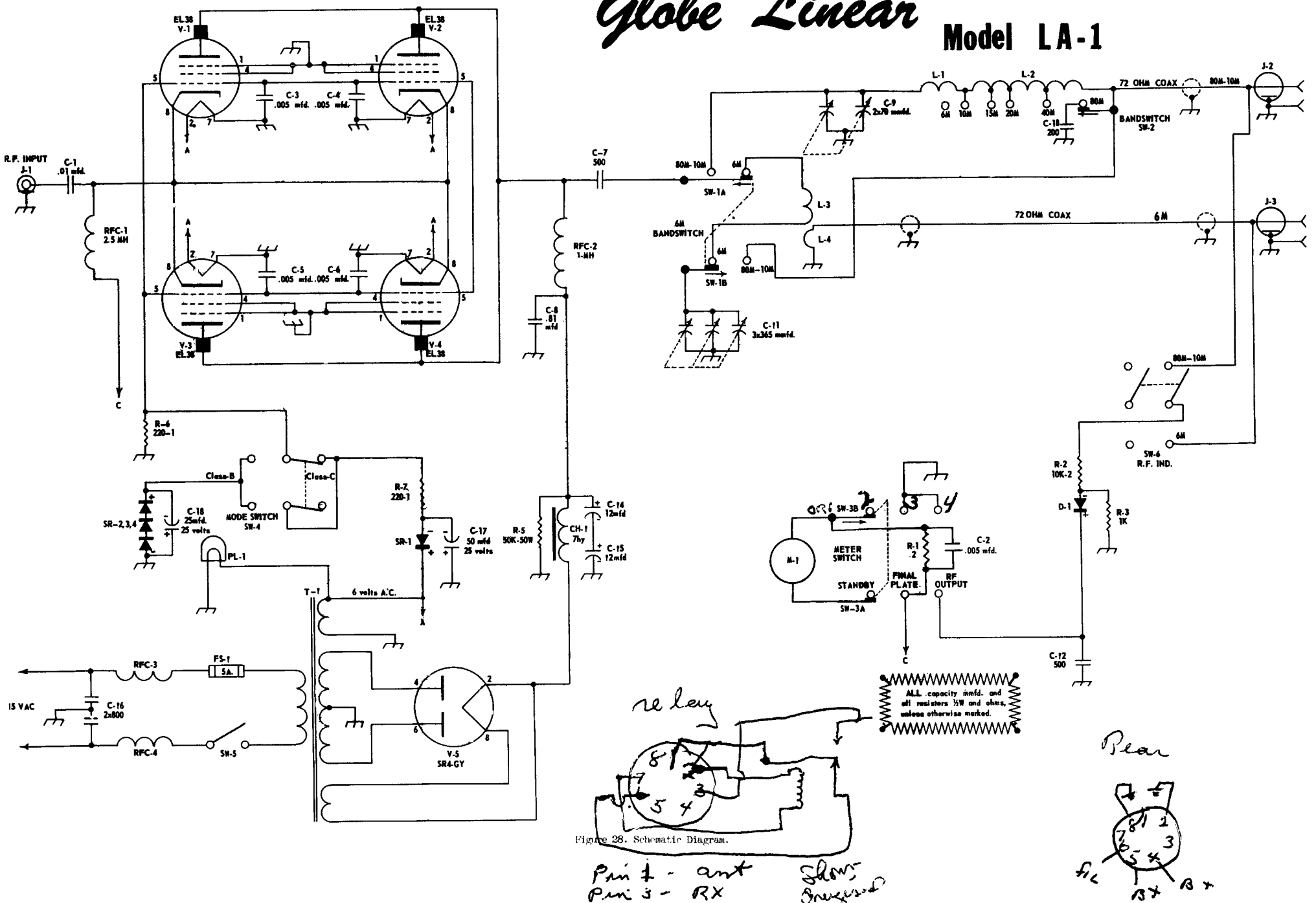


Figure 28. Schematic Diagram.