WRL MODEL 65A GLOBE SCOUT
BANDSWITCHING TRANSMITTER

SPECIFICATIONS

FINAL POWER INPUT: 65 watts CW, 50 watts phone

OUTPUT: Coaxial into 52 to 1000 ohm antenna

OSCILLATOR: Crystal or VFO

BAND COVERAGE: 160 meters through 10 meters with generous overlap between bands

POWER REQUIREMENTS: 115 VAC. 50/60 cycles (160 Watts CW, 210 Watts phone)

TUBE COMPLEMENT

5U4G Rectifier
6146 RF Power Amplifier
6V6 Crystal Oscillator
6L6G Modulator
6C5 Driver
6SJ7 Speech Amplifier

GENERAL DESCRIPTION

The WRL 65A Globe Scout has been designed to provide the Amateur, Novice or Experienced, with a complete mobile or fixed station transmitter. Primarily designed for fixed station operation, the transmitter may be used very effectively as a mobile transmitter by the installation of a suitable dynamotor or vibrator supply to provide the necessary B plus voltages. The Pi-network in the final stage will load into any random length antenna or into a mobile whip antenna. Complete bandswitching eliminates inconvenient plug-in coils. Band changing entails only the changing of a crystal (crystal socket located on front panel) or the switching of a VFO.

Precautions have been taken to provide a TVI and BCI proof transmitter; a completely shielded cabinet is employed along with adequate bypassing of all external leads. The Pi-network provides a high degree of harmonic attenuation when properly tuned, eliminating the necessity of a low-pass filter in most cases.

CIRCUIT FUNCTIONS

OSCILLATOR. The oscillator circuit was primarily designed for crystal operation, although any VFO with an output of 10-50 Volts RF will work equally as well. The stage employs controlled regeneration allowing the use of standard 160 to 40 meter crystals and provides more than enough harmonic output to drive the final to full input. Bandswitching is incorporated in this stage and the cathode keying has proved to be crisp and clear on all bands. On straight-thru operation, the excitation to the final stage may be in excess of requirements, in this instance, the oscillator tuning control must be detuned slightly to reduce the amount of drive to the proper level. The oscillator stage is capacity-coupled to the final amplifier.

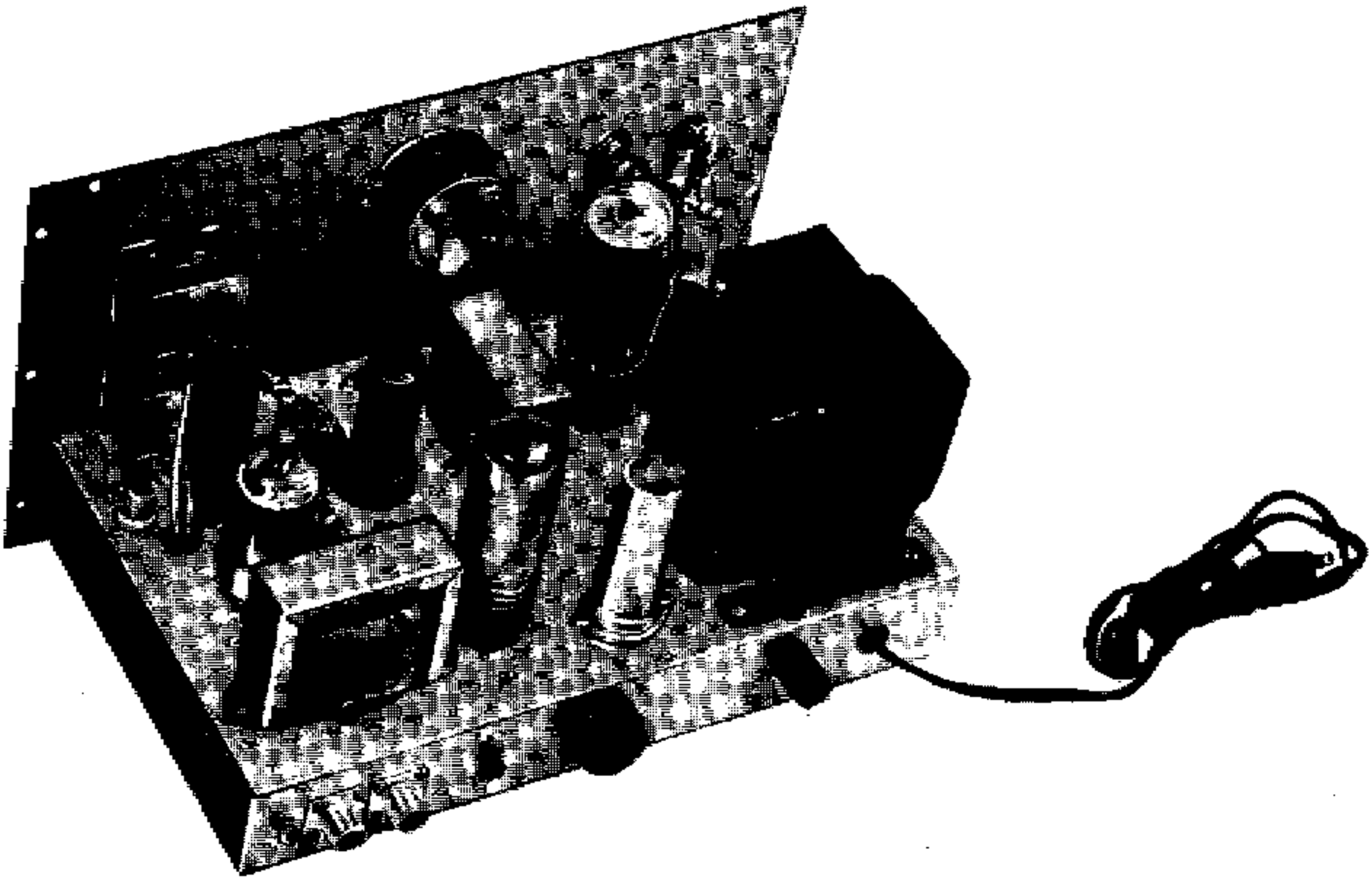
RF POWER AMPLIFIER. This stage employs a 6146 tube operated as a Class C Amplifier. Two types of bias are applied to this stage; one is cathode, or self bias, and the other is excitation bias. The cathode of this stage is keyed as well as that of the oscillator. The final operates straight-thru on all bands except 10 meters where doubling is employed. Due to high efficiency, doubling in this stage does not affect the output to any appreciable extent. Design of the plate circuit in the final stage utilizes bandswitching plus a Pi-network. The pi-network allows matching into various antenna impedances.

SPEECH AND MODULATOR. The speech amplifier circuit is of conventional design, utilizing a 6SJ7 tube. The amplified speech signal is fed into a conventional 6C5 driver stage through the volume control. Latest components such as printed circuit couplates are utilized, these refinements increase efficiency and ease of wiring. Capacity coupling is utilized between the driver stage and a modified Heising type modulator circuit. Modification of the original Heising circuit consists of heavily modulating the screen of the 6146, as well as the plate, so that it contributes materially to the carrier output. Metering of either the final grid or final plate circuits is provided with a dual scale meter for constant monitoring of circuit operation.

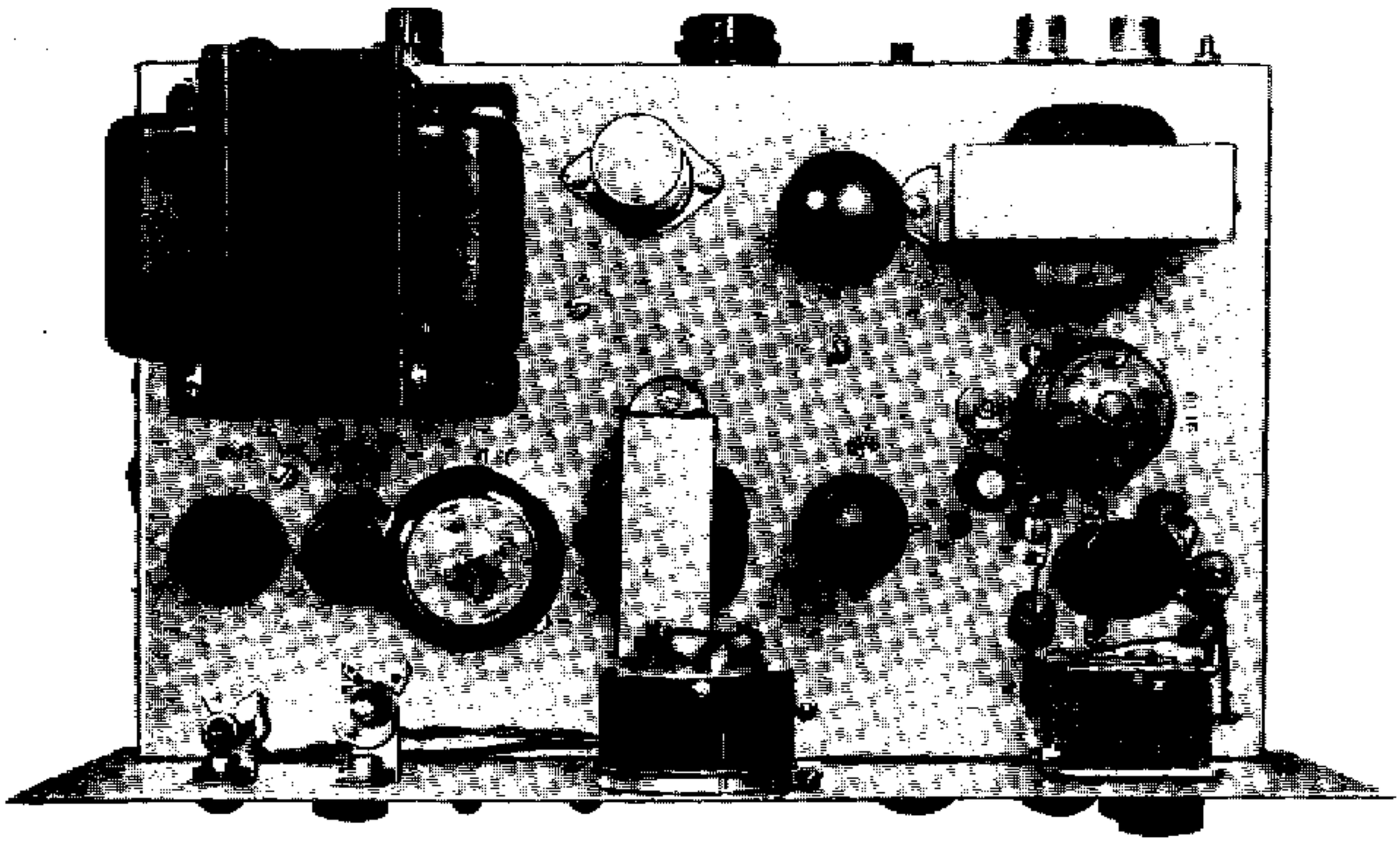
POWER SUPPLY. The power supply utilizes a 5U4G tube as the rectifier. The voltage and current supplied are 500 VDC @ 200 Ma., which is adequate to power the complete transmitter. An auxiliary socket mounted on the rear of the transmitter provides for external power such as would be required in a mobile installation. Power requirements for mobile operation are 6 VDC @ 4 amps and 500 VDC @ 200 Ma.

When the transmitter is purchased in kit form, we suggest you check all parts against the parts list before any assembly is begun. In the event of any shortage, please notify us immediately. Some resistance and capacity values supplied, may vary somewhat from those specified in the parts list, however, all parts supplied will be within reasonable limits and will work satisfactorily. During assembly and wiring of the kit, refer to the pictorial and schematic diagrams as you progress. Check each item and all wiring against these diagrams as assurance that all parts are mounted correctly and that wiring is correct. These checks can save you grief in burned out components and improper operation. Read the instructions carefully, check each step as you complete it. Take your time in assembly and wiring, it pays with proper operation and many enjoyable QSO's.

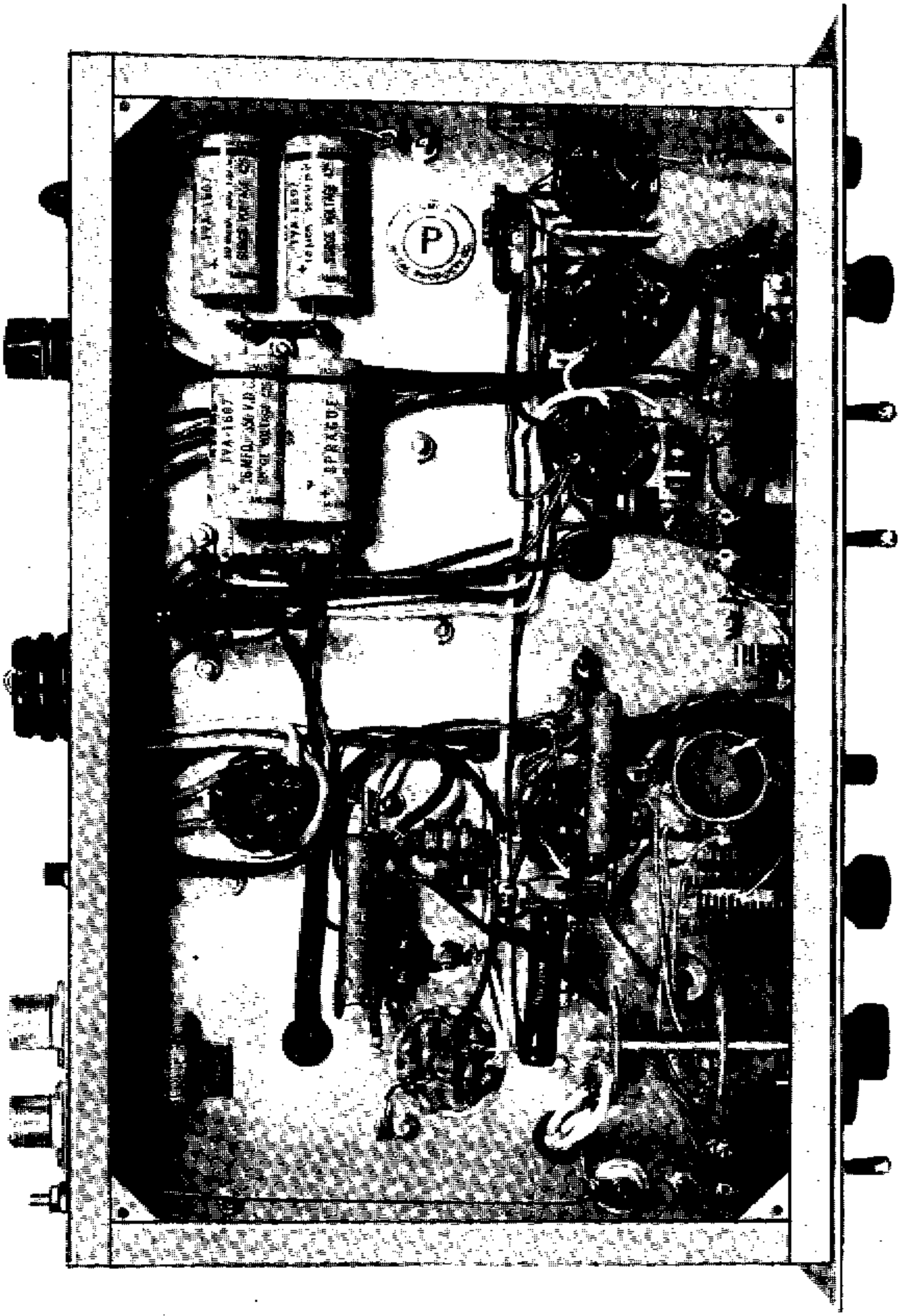
As a last word, do not hesitate to drop us a line, should your kit not function properly upon completion (or your wired unit upon receipt.)



Top And Rear View Of Chassis



Top View Of Chassis



Bottom View Of Chassis

CHASSIS ASSEMBLY

☑ 1. Install an octal bakelite socket in hole SO-1 with its key-way facing to the rear of the chassis.

☐ 2. Install an octal bakelite socket in hole SO-2 with its key-way facing to the rear of the chassis.

☑ 3. Install an octal bakelite socket in hole SO-3 with its key-way facing to the front of the chassis.

☑ 4. Install an octal bakelite socket in hole SO-4 with its key-way facing to the rear of the chassis.

☑ 5. Install the octal mica filled socket in hole SO-5 with its key-way facing the right side of the chassis.

☑ 6. Install an octal bakelite socket in hole SO-6 with its key-way facing to the front of the chassis.

☐ 7. Install an octal bakelite socket in hole SO-7 with its key-way facing the left side of the chassis.

☑ 8. Insert the three 3/8" grommets in holes GR2, 3, 4.

☑ 9. Insert the two ½" grommets in holes GR1, 5.

☐ 10. Install the coax connectors C01, 2 using 4/40x3/8" bolts, ¼" nuts and the lockwashers.

☐ 11. Install SW5 (SPST) slide switch in the slot next to CO-2 as shown in pictorial 1.

☐ 12. Install the Fuse retainer post FS-1 as follows: Remove the 7/16" nut and internal lock washer. Leave the rubber washer next to the cap. Put the post into hole FS-1, position the lugs as shown in pictorial 1, slip on the internal lock washer and follow that with the 7/16" nut. The assembly may now be tightened using caution not to break the bakelite housing.

☑ 13. Install a 1" porcelain feed thru insulator in hole I-1 with the shortest end to the under side of the chassis.

☐ 14. Attach a #6 solder lug to each end of this insulator and position as shown in pictorials 1 & 2 (Both to front of chassis).

☐ 15. Install a 1" porcelain feed thru insulator in hole I-2 with the shortest end also to the under side of the chassis.

☐ 16. Attach a #6 solder lug to each end of this insulator. Position top lug to face front of chassis and bottom lug to face the rear of the chassis.

☐ 17. Using #6x5/16" screws and ¼" nuts, attach #6 solder lugs to the following grounding points, GL1, 3, 4, 8. Position these lugs as shown in pictorials 1 & 2.

☑ 18. Mount the 3 slot filter condenser plate in hole FC-1 on top of the chassis using #6x5/16" screws, ¼" nuts, and lock washers. Leave the nut on the left side of this plate loose.

☑ 19. Install 3 lug tiestrip TS-5 with #6x5/16" hardware using the loose screw of FC-1 and the screw hole directly in front of it. Position TS-5 as shown in pictorial 1.

☑ 20. Install 5 lug tiestrip TS-2 with #6x5/16" screw, nut and lock washers. Position as shown in pictorial 1.

☑ 21. Install 2 lug tiestrip TS-3 with a #6x5/16" screw, nut and lock washer. Position as shown in pictorial 1.

☑ 22. Install 2 lug tiestrip TS-4 with #6x5/16" hardware. Position as shown in pictorial 1.

☑ 23. Install 2 lug tiestrip TS-1 with #6x5/16" hardware. Position as shown in pictorial 1.

☑ 24. Install 2 lug tiestrip TS-6 with #6x5/16" hardware. Position as shown in pictorial 1.

☑ 24. Install 1 lug tiestrip TS-7 and with it solder lug GL5. Use #6x5/16" hardware and position as shown in pictorial 1.

☑ 26. Mount #546x2 choke CH2 using #6x5/16" screws, nuts and lock washers. Attach a #6 solder lug GL2 to the bolt nearest the front of the chassis. Position GL-2 as shown in pictorial 1. Run the choke leads down thru hole GR-3.

☑ 27. Install condenser FC-1 in its mounting plate by inserting the 3 ears on the condenser into the 3 slots in the mounting plate. With a pair of pliers, twist each ear $\frac{1}{4}$ turn while keeping the condenser firmly pressed to the mounting plate.

☑ 28. Mount transformer PT-1 as shown in pictorial 2. Insert all transformer leads thru the hole marked PT-1 on pictorial 1. Use #8x$\frac{1}{2}$" screws, nuts and lock washers. Leave the two screws on the left side of PT-1 loose and just snug the other two.

☑ 29. Attach a #10 solder lug to each of the two screws left loose in the previous step. Position these lugs as shown on pictorial 1 then tighten all transformer screws securely.

☑ 30. Mount #1300-008 choke CH1 with #6x5/16" screws, nuts and lock washers. Run the choke leads through hole GR-2.

☑ 31. Mount the 2$\frac{1}{2}$" threaded bakelite insulator I-3 on hole I-3 and on top of the chassis. Use a #6x5/16" screw and lock washer.

☑ 32. On top of insulator I-3, attach the double #6 solder lug with a #6x5/16" screw. Position this lug as shown in pictorial 2.

☑ 33. Mount the output coil L-3 on top of the chassis, on the two remaining holes near I-2. Use #6x5/16" screws & lock washers inserted up through the two mounting holes and into the threaded mounting feet of L-3. Position the lugs of L-3 as shown in pictorial 2.

☐ 34. Mount oscillator coil L-2 underneath the chassis, facing the lugs as shown in pictorial 1. Use #6x5/16" screws, nuts and lock washers. Insert the two screws in the mounting feet of L-2 up thru the 2 chassis holes then attach lock washers and nuts on top of the chassis.

Set aside the chassis temporarily and prepare the panel for mounting to the chassis by proceeding with the following steps.

PANEL ASSEMBLY

☑ 1. Prepare tuning condensers TC1 & 2 as follows: locate the tapped hole on the bottom of the condenser which is furthest away from the rotor shaft. Install a #6 teardrop lug, using a #6x¼" screw, positioning the lug so it faces and hangs out from the rear frame approximately 3/16". Tighten the screws securely now as they are inaccessible later.

☑ 2. Insert the condensers in holes TC1 & 2. Use #6x¼" screws and lockwashers in the left mounting hole of each condenser and #6x ¼" screws with 3 lockwashers each (as spacers) in the right mounting holes. The extra lockwashers in the right mounting holes insures that the mounting bolts will not accidentally short to the stator plate support of the 2 condensers.

☑ 3. Mount the pilot light assemblies PL1 and PL2 in their respective holes and position as shown in pictorial 2.

☑ 4. Install the Xtal socket in hole X-1 using the 4/40x½" round head screw and the 4/40x3/16" nut. Insert the screw thru the Xtal socket hole, then thru the panel holes with the 3/16" nut behind the panel. Tighten the screw carefully as too much pressure may crack the Xtal socket.

☑ 5. Install the 2" meter in hole M1 as follows: Loosen the #6 nut on the mounting ring as far as it will go. Loosen the 3 # 4/40 bolts on the edges of the ring so that only ¼" remains in the ring. Insert the meter in hole M1. Slip the mounting ring over the meter so that the 3 #4/40 bolt heads face the rear edge of the meter. Hold the ring and front edge of meter against the panel snugly then tighten the #6 bolt and nut so that the ring is securely clamped to the meter case. Align the meter face so that it is straight, then while holding the meter to the panel tighten the 3 #4/40 screws with a small screwdriver until they make firm contact with the rear of the panel and hold the meter securely in place.

☑ 6. The panel may now be attached to the chassis as follows: Lay the chassis on its rear apron so that the front edge is up. Transformer PT-1 will brace the chassis. Align the panel holes (lower edge) with the chassis holes. Insert key jack in hole K-1 with the smooth faced washer and the 3/8" nut on the front of the panel. Do not tighten any panel controls until all are in and positioned. Install the mic. jack in hole J-1 assembling so that the smooth face washer is on the front of the panel and the grounding lug, lockwasher and 7/16" nut are behind the chassis apron.

☑ 7. Install the osc. condenser 75J12 in hole TC3 from behind and positioned as shown in pictorial 1. Secure to panel with #6x 5/16" screws. Caution advised here when tightening as the porcelain frame of TC-3 will crack and chip with excessive pressure.

☑ 8. Install the volume control w/switch in hole VC-1. First remove the 7/16" nut, slip the two 3/8" fiber washers over the threads, insert the control in hole VC-1 from behind then screw the 7/16" nut on snugly.

☑ 9. Remove the knurl nut from the DPST SW-1. Insert this switch in hole SW-1 from behind then install the knurl nut on the front panel side. Position this switch so that its guide slot faces the bottom of the panel.

☑ 10. Remove the knurl nut from the DPDT SW-2. Insert this switch in hole SW-2 from behind the panel then install the knurl nut on the front panel side. Position this switch so its guide slot faces the bottom of the panel.

☑ 11. Remove the knurl nut from the DPDT SW-3. Insert this switch into hole SW-3 from behind the panel then install the knurl nut on the front panel side. Position this switch so its guide slot faces the bottom of the panel.

☑ 12. Remove one 7/16" nut from wafer SW-4. Insert this switch in hole SW-4 and position as shown in pictorial 1. Install the 7/16" nut on front panel side.

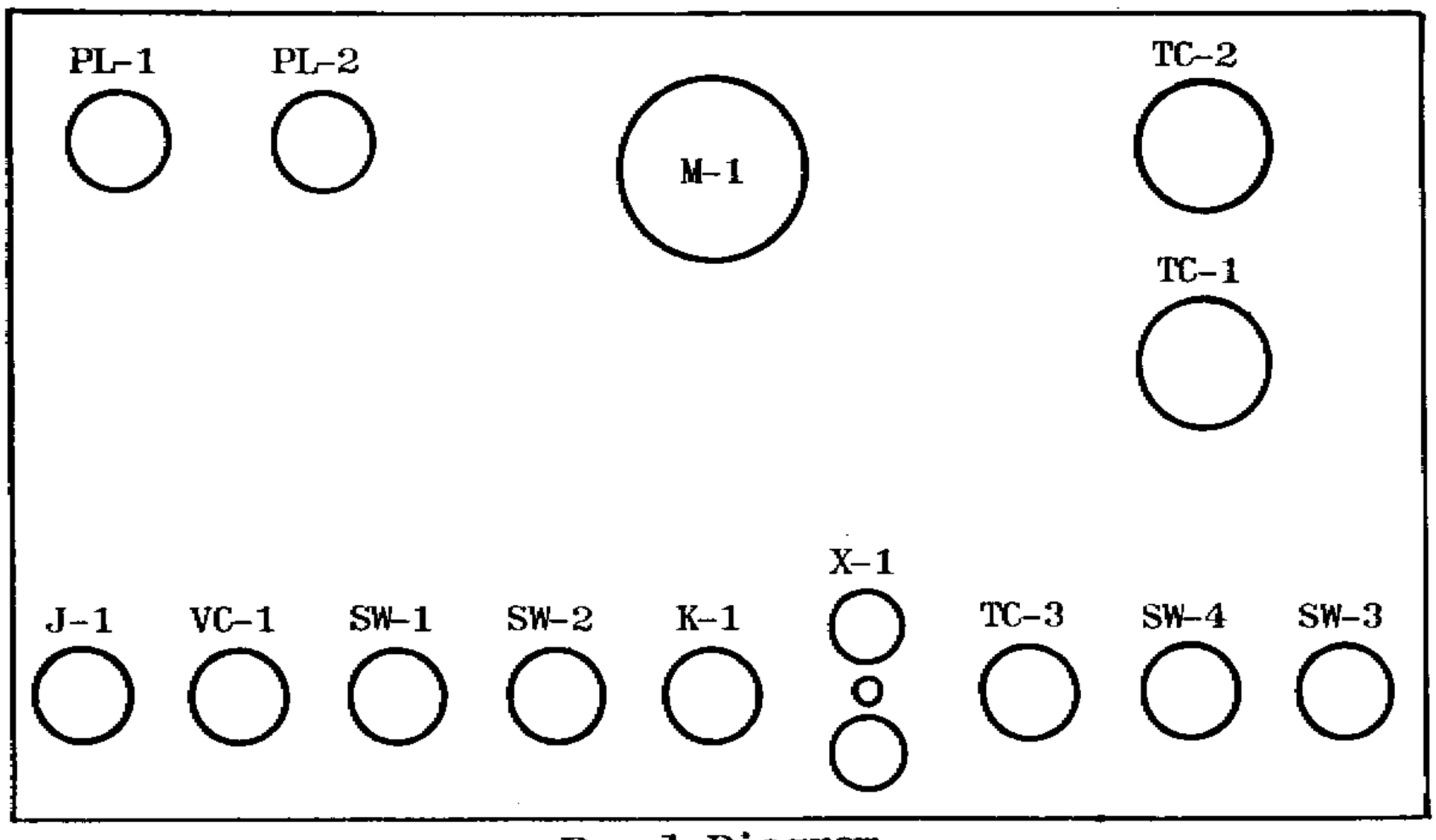
☑ 13. Before tightening any controls make certain there is ½" clearance from the bottom of the chassis to the bottom of the panel. Now all the front panel controls may be tightened securely making certain their positioning is as shown in pictorial 1.

☑ 14. Install the pointer knobs on the following controls: Fil/Gain, Band Switch so that the arrow indicates the proper positions.

☑ 15. Rotate tuning condensers TC1, 2, 3 so that their plates are fully meshed. Install knobs on these condenser shafts so that the arrows point towards the left side of the panel.

☑ 16. Install 2-#10 solder lugs and 2-#10 washers to the meter posts, position lugs to face the chassis then secure with 2-#10 nuts.

☐ 17. This completes the assembly portion of the transmitter. The wiring procedure now follows.



Panel Diagram

POWER SUPPLY WIRING

(S) means solder (NS) means do not solder. Socket pins are identified by counting clockwise from the guide slots and indicate pins #1 through #8 in order, the socket pins facing you. In designating color codes, only the necessary colors for identification will be given. Trim all component leads to appropriate length for neat and direct connections.

☑ 1. Select the 2 heavy yellow leads of PT-1 which come thru hole PT-1. Dress along the rear edge of the chassis to socket SO-6 and connect to pins #2 and #8 of SO-6. (S at pin #2 only.)

☑ 2. Select the 2 red leads of PT-1, dress these also along the rear edge of the chassis and connect to pins #4 and #6 of SO-6. (S)

☑ 3. Select the 2 heavy green leads of PT-1. Connect one of these to the grounding hole of TS-5 nearest the front of the chassis. (S)

☑ 4. Connect the other green lead to pin #7 of SO-7. (S) Dress this lead along with the yellow and red leads.

☑ 5. Route the red/yellow lead towards the front of the chassis to SW-1 and connect it to lug B of SW-1. (NS)

☑ 6. Connect one of the remaining two black leads to lug A of FS-1. (NS)

☑ 7. Dress the other black lead towards the front of the chassis and connect it to lug 4 of VC-1. (NS)

☑ 8. Connect a $2\frac{3}{4}$" piece of #20 bare wire from lug A of SW-1 to ground lug GL3. (NS)

☑ 9. Connect the 1 meg (Brown-Black-Green) $\frac{1}{2}$W resistor from lug A to to lug B of SW-1. (S)

☑ 10. Thread a $2\frac{3}{4}$" piece of #20 bare wire from pin #1 thru pin #2 of SO-7 then to the nearest twisted ear of FC-1 (S) at FC1 and pin 2 only.)

☑ 11. Connect either lead of CH1 which comes thru GR2 to pin #8 of SO-6. (S)

☑ 12. Connect the other lead of CH1 to lug #1 of TS-5. (NS)

☑ 13. Connect a 4" piece of red wire from pin #3 of SO-7 to lug #1 of TS-5. (S) at pin 3 only.

☑ 14. Insert the tinned ends of the AC line cord into hole GR4 then separate the two leads to a length of 9". Tie a double knot at this point.

☑ 15. Connect one line cord lead to lug B of FS-1. (S)

☑ 16. Connect the other line cord lead to lug #5 of VC-1 (S). Dress along the chassis with the black and the red/yellow leads.

☑ 17. Connect a 1" piece of #20 bare wire from lug #1 to lug #2 of TS-5. (NS)

☐ 18. Connect a 5" red lead from lug #3 of TS-5 to pin #4 of SO-3. (NS)

☑ 19. Connect either lead of CH2 which comes thru hole GR-3 to lug #2 of TS-5. (S)

☑ 20. Connect the other lead of CH2 to pin #3 of SO-3. (NS)

☐ 21. Connect a 9½" white lead, #16 wire, from pin #6 of SO-7 to pin #7 of SO-5. (S) at SO-5 only. Dress this lead up the middle of the chassis under the yellow leads of PT-1 then over to SO-5.

☑ 22. Connect a 9" white lead, #16 wire, from pin #7 of SO-5 to pin #7 of SO-3. (NS)

☑ 23. Connect the 50,000 ohm 10 watt resistor from pin #1 of SO-7 to to lug #1 of TS-5 (S) at SO-7 only.

☑ 24. Connect a 2" piece of #16 bare wire thru pins #6 & 7 of the octal plug PL-7 (S). Insert plug into SO-7.

☑ 25. Connect a 3" black lead from lug D of SW-1 to lug #4 of VC-1. (S)

☑ 26. Connect a 6½" blue lead from pin #5 of SO-7 to lug A of FS-1 (S) at FS-1 only.

☑ 27. Connect a 14" blue lead from pin #4 of SO-7 to lug C of SW-1 (S) at SW-1 only. Dress lead up middle of chassis.

☑ 28. Twist together two-12" red and black leads. Connect the red lead to lug #3 of SW-3. (S)

☐ 29. Connect the black lead of this same end to lug #6 of SW-3. (S) Dress these leads along the front edge of the chassis to GR5, then up thru GR5 to meter M1.

☑ 30. Twist together two 17" blue leads. Connect one end of each lead to pins #4 and 5 of SO-7 (S). Dress these leads up the middle of the chassis to hole GR5, up thru GR5 then along chassis front edge to PL2.

☑ 31. Connect the two blue leads to the solder lugs of PL2. (S)

☑ 32. Connect a 1" piece of #20 bare wire from a twisted ear of FC-1 to the rear mounting lug hole of TS-5. (S)

☐ 33. Twist together two 14" green leads, connect one lead to lug GL-5. (S)

☐ 34. Connect the other green lead of this same end to pin #7 of SO-4. (NS)

☑ 35. Route these green leads up the middle of the chassis, thru hole GR5 then over to connect to the lugs of PL-1. (S)

☑ 36. Connect the twisted black and red leads to the #10 lugs on the meter posts. Black to minus, Red to plus. (S)

☐ 37. Connect a 4" white lead from pin #7 of SO-5 to pin #7 of SO-4 (S)

☐ 38. Connect a 16 mf 350V condenser, plus side to lug #3 of TS-5 minus side to lug #2 of TS-6 (S) at TS-5 only.

☐ 39. Connect another 16 mf 350V condenser, plus side to lug #2 of TS-6, minus side to ground lug GL-7. (S)

☐ 40. Connect another 16 mf 350V condenser, plus side to lug #1 of TS-5 minus to lug #1 of TS-6. (NS)

☐ 41. Connect another 16 mf 350V condenser, plus side to lug #1 of TS-6, minus to ground at GL-6. (S)

This completes the power supply wiring and the following checks may be run to determine if the supply is operating correctly.

☐ 42. Insert the 5U4G tube in socket SO-6.

☐ 43. Insert the two pilot light bulbs in PL-1 andPL-2.

☐ 44. Insert the 3 amp fuse in FS-1.

☐ 45. Plug the line cord into any 115 VAC 60 cycle supply.

☐ 46. Rotate the Fil/Gain knob until an audible click is hear. PL-1 should be lit now.

☐ 47. Connect a 1000 VDC Voltmeter plus side to lug #1 of TS-5, minus side to ground.

☐ 48. Turn on the Transmit Switch. The meter should indicate plus 650 volts at this point and PL-2 should be lit.

☐ 49. Turn off Transmit Switch, set meter to read 250 V. AC.

☐ 50. Connect meter to pins #4 and 5 of SO-7.

☐ 51. Turn on Transmit Switch, meter should indicate 115 VAC at this point.

☐ 52. If the above conditions can't be met it is suggested that the wiring be re-checked carefully for any mistakes or poorly soldered connections. If all is normal up to this point, the Modulator section should be wired next.

MODULATOR WIRING

☑ 1. Thread a 2" piece of #20 bare wire thru pins #1 and 2 of SO-1. then to grounding hole of TS-3. (S) at pin #2 only.

☑ 2. Thread a 2" piece of #20 bare wire thru pins #1 and 2 of SO-2 then to the grounding hole of TS-3. (S) at pin #2 only.

☑ 3. Thread a 1½" piece of #20 bare wire thru pins #1 and 2 of SO-3 then to ground at GL-3. (S) at pins #1 and 2.

☑ 4. Connect a 2" white lead from pin #7 of SO-3 to pin #7 of SO-2. (S) at SO-3 only.

☑ 5. Connect a 3" white lead from pin #7 of SO-2 to pin #7 of SO-1. (S)

☑ 6. Connect a 1¾" #20 bare wire from the grounding leaf of J-1 to lug #1 of VC-1 (S) at J-1 only.

☑ 7. Prepare a 4" piece of shielded wire by peeling the shield braid back ½" at each end. Then strip the insulation back ¼" at each end. Connect the center wire of one end to lug #2 of VC-1 and the braid from this same end to lug #1 of VC-1. (S)

☑ 8. Connect the center wire at the other end of this lead to pin #5 of SO-2 (S). Cut off the braid pigtail at this end.

☑ 9. Connect a 2200 ohm ½W. resistor (Red-Red-Red) from pin #3 to pin #1 of SO-1. When inserting the pigtail of this resistor thru pin #3, carry it on thru to pin #5 so that #3 & 5 are connected together. (S) at pin #5 only.

☑ 10. Connect a 25 mf 25 V condenser plus side to pin #3 of SO-1, minus side to pin #1 of SO-1. (S) at pin #3 only.

☑ 11. Slip a 1¼" piece of #16 insulation over one lead of a 47,000 ohm ½W. resistor (Yellow-Violet-Orange). Insert this end into the center hole of J-1 from behind the panel so that it protrudes 1/8" past the face of J-1. (S)

☑ 12. Connect the other end of this resistor to pin #4 of SO-1. (NS)

☑ 13. Connect a 2.2 meg ½W. resistor (Red-Red-Green) from pin #4 to pin #1 of SO-1. Bridge the resistor over the center hole of the socket. (S)

☑ 14. Connect a 22K.-½W. resistor (Red-Red-Orange) from lug #1 to lug #2 of TS-3. (NS)

☑ 15. Connect a 9" yellow lead from lug #1 of TS-3 to any condenser lug at FC-1. (S) at FC-1. Dress this lead along center of chassis then down the middle to FC-1.

☐ 16. Prepare couplate PC91. Twist together leads #1 & 2 then cut to 1-3/8". Cut lead #3 to 1-5/8". Cut leads #4 & 5 to 1-1/8". Cut lead #6 to 2¼". Slip #16 insulation over leads #3, 4, 5 and 6 leaving 3/16" of the pigtail exposed for wiring.

☐ 17. Position this couplate so that it lays on edge between SO-1 and SO-2 and is about 5/8" off the chassis.

☐ 18. Connect lead #3 of PC91 to lug #1 of TS-3. (NS)

☐ 19. Connect lead #5 of PC91 to pin #8 of SO-1. (S)

☐ 20. Connect lead #4 of PC91 to pin #6 of SO-1. (S)

☐ 21. Connect lead #6 of PC91 to lug #3 of VC-1. (S)

☒ 22. Connect the twisted leads #1 and #2 to the center grounding hole of TS-3. (S)

☒ 23. Connect a 1500-½W. resistor (Brown-Green-Red) from pin #8 to pin #1 of SO-2. (NS)

☒ 24. Connect a 7¾" black lead from pin #8 of SO-2 to a condenser leaf at FC-1. (S) Dress this lead along with the yellow lead.

☒ 25. Prepare couplate PC-81. Cut lead #1 to 5/8". Cut lead #2 to 1-3/8". Cut lead #3 to 2¼". Cut lead #4 to ¾". Slip #16 insulation over leads #1, 2 & 3 leaving 3/16" of the pigtail exposed for soldering.

☒ 26. Position PC-81 so it lays edgewise at the lower edge of and between SO-1 and SO-2. Keep 5/8" off the chassis.

☒ 27. Connect lead #4 of PC-81 to pin #1 of SO-2. (S)

☒ 28. Connect lead #3 of PC-81 to pin #5 of SO-3. (S)

☒ 29. Connect lead #2 of PC-81 to pin #3 of SO-2. (S)

☒ 30. Connect lead #1 of PC-81 to lug #1 of TS-3. (S)

☒ 31. Connect a 390-2W. resistor (Orange-White-Brown) from pin #8 of SO-3 to ground at GL3 (S) at GL3 only.

☒ 32. Connect an 8½" yellow lead from pin #8 of SO-3 to the remaining lug of FC-1. (S) Route along with yellow and blue leads.

☒ 33. Connect a 4-3/8" red lead from pin #4 of SO-3 to lug #2 of TS-3 (S) at TS-3 only.

☒ 34. Connect a 6½" red lead from lug #2 of TS-5 to pin #6 of SW-2 (S) at SW-2 only. Dress up the middle of the chassis.

☒ 35. Connect a 3½" yellow lead from lug #4 of SW-2 to lug #3 of K1. (S) at SW-2 only. Dress lead along front edge of chassis.

☒ 36. Connect a 3" Red lead from lug #1 of SW-2 to pin #3 of SO-3. (S) at SW-2 only.

☒ 37. Connect a 2" #20 bare wire from lug #3 of SW-2 to GL-2 (S) at SW-2 only.

☒ 38. Connect a 22K-2W. resistor (Red-Red-Orange) from pin #4 of SO-3 to lug #5 of SW-2. (S) Bridge this resistor over SO-3.

This completes the modulator wiring. A careful double check is recommended at this point.

OSCILLATOR WIRING

☑ 1. Thread a 2" #20 bare wire thru pins #1 and 2 of SO-4 to ground at GL-5. (NS)

☑ 2. Thread a 4" piece of #20 bare wire from GL2, through lugs #1 and 2 of K1, to pin #1 of socket X1. (S) at K1 and GL2.

☑ 3. With a 2" #20 bare wire connect pin #1 of X1 to the rotor leaf of condenser TC3. (S) Caution advised when soldering at X1 that coil L2 doesn't get burned or nicked.

☑ 4. Connect a 3¼" green lead from pin #5 of SO-4 to pin #2 of X1. (S) at X1 only and caution again advised here.

☑ 5. Connect a 47K-½W. resistor (Yellow-Violet-Orange) from pin #5 to pin #1 of SO-4. (NS)

☑ 6. Connect a 25 mmf condenser (Red-Green-Black) from pin #5 to pin #8 of SO-4 (S) at pin 5 only and don't use excessive heat as the condenser might change value.

☑ 7. Connect a .005 mf disc condenser from pin #4 to pin #2 of SO-4 (S) at pin #2 only.

☑ 8. Connect a 47K-½W. resistor (Yellow-Violet-Orange) from pin #4 to pin #6 of SO-4. (S) at pin 4 only. Position this resistor around the outside edge of the socket and it must clear pin #5.

☑ 9. Connect a 120½W. resistor (Brown-Red-Brown) from pin #6 of SO-4 to lug #1 of TS-4. (NS)

☑ 10. Connect a 2-1/8" piece of #20 bare wire from pin #3 of SO-4 to the left stator lug of TC-3 (S) at TC-3 only. Keep this lead clear of all surrounding components.

☑ 11. Connect one small R.F. choke 2.5MH-50MA from pin #8 of SO-4 to lug #1 of TS-2. (NS)

☑ 12. Connect a 120 mmf condenser. (Brown-Red-Brown) from pin #8 of SO-4 to pin #1 of SO-4 (S) at pin #1 only.

☑ 13. Connect a .005 mf disc condenser from lug #1 of TS-2 to the the ground hole of TS-2 nearest lug #1. (S) at ground only.

☑ 14. Connect a 7" green lead from lug #1 of TS-2 to lug #3 of K1. (S) at K1 only.

☑ 15. Connect a .005 mf disc condenser from lug #1 of TS-4 to the center grounding hole of TS-4. (S) at ground only and position this condenser edgewise between TS-4 and SO-4.

☑ 16. Connect a 2½" red lead from lug #1 of TS-4 to lug #1 on the front wafer of SW-4 (S) at SW-4 only.

☑ 17. Connect a 2½" blue lead from the bottom lug of L-2 to lug #1 of TS-4. (S)

☑ 18. Connect a 6000-10W. resistor from pin #6 of SO-4 to lug #1 of TS-7. (S) at pin #6 only.

☑ 19. Connect the ½" coil L-1 from the right stator lug of TC-3 to pin #7 front wafer of SW-4. (S) at TC-3 only and position coil so it lays in a vertical plane between TC-3 and SW-4. Insert a ¾" piece of #16 insulation over the lead which goes to SW-4.

☑ 20. Connect a 4" red lead from lug #1 of L-2 to lug #3 front wafer of SW-4. (S)

☑ 21. Connect a 4" red lead from lug #2 of L-2 to lug #4 front wafer of SW-4. (S)

☑ 22. Connect a 4" red lead from lug #3 of L-2 to lugs #5, 6 and 7 front wafer of SW-4. (S)

☑ 23. Connect a 5½" red lead from lug #1 of TS-7 to lug #2 of TS-2. (S) at TS-7 only.

This completes the oscillator circuit wiring. At this point check for shorting leads, burned coil and clean soldered connections at SW-4.

FINAL WIRING

☒ 1. Thread a 2" piece of #16 bare wire thru pins #2 and #8 of SO-5 then to ground at GL-4. (S) at pin #2 and GL-4 only.

☒ 2. Connect a small 2.5MH-50MA RFC from pin #5 of SO-5 to lug #3 of TS-2. Position this choke between I-1 and TS-2. (NS)

☒ 3. Connect a 56½W. resistor (Green-Blue-Black) from pin #3 of SO-5 to lug #5 of TS-2. (S) at pin #3 only.

☒ 4. Connect a 22K-½W. resistor (Red-Red-Orange) from lug #3 to #4 of TS-2. (S) at lug #3 only.

☒ 5. Connect a 120½W. resistor (Brown-Red-Brown) from lug #4 of TS-2 to the grounding hole nearest lug #5. (NS)

☒ 6. Connect a .005 mf disc condenser from the bottom lug on I-1 to lug #5 of TS-2. (NS) Bridge this condenser over the RF choke.

☒ 7. Connect a 33 mmf condenser (Orange-Orange-Black) from pin #3 of SO-4 to pin #5 of SO-5. (S) Insert #16 insulation over each pigtail of this condenser.

☒ 8. Connect a 5" red lead from lug #2 of TS-2 to lug #2 of TS-5. (S) at TS-5 only.

☒ 9. Remove the inner wire from a 1" piece of shielded cable, discard the wire and twist the ends of the braid so they can be inserted into the holes of pins #4 and #6 of SO-5. Keep the braid at least 3/16" away from pin #5. (S) at pin 4 only.

☒ 10. Connect a .005 mf disc condenser from lug #5 of TS-2 to the grounding hole next to it. (S) at ground hole only.

☒ 11. Connect a .005 mf disc condenser from the center of the 1" shield braid on pins #4 and 6 of SO-5 to pin #8 of SO-5. (S)

☒ 12. Connect a 12,500-10W. resistor from lug #2 to lug #5 of TS-2. (S)

☒ 13. Connect the meter shunt, which is made up of special resistance wire wound on a 56 ohm 1W. resistor, from lug #1 of TS-2 to lug #2 of TS-4. (NS)

☒ 14. Connect a 14" blue lead from lug #5 of SW-3 to lug #4 of TS-2. (S) Dress this lead along the front edge of the chassis, then down the middle to TS-2.

☒ 15. Connect a 1" piece of #20 bare wire from lug #4 of SW-3 to GL-1. (S)

☒ 16. Twist together a black and red lead 6-5/8" long. Connect the red of one end to lug #2 of SW-3. (S)

☒ 17. Connect the black lead of this same lead end to lug #1 of SW-3. (S)

☐ 18. Route this twisted pair under SW-4 to TS-4. Unwind the two leads back to TS-4 and connect the red lead to lug #2 of TS-4. (NS)

☐ 19. Route the remaining black lead to TS-2 and connect it to lug #1 of TS-2. (S)

☒ 20. Connect a 2" piece of #16 bare wire from the bottom lug of I-2 to lug #1 rear wafer of SW-4. (S) at SW-4 only.

☒ 21. Connect a 450-10W. resistor from lug #2 of TS-4 to pin #6 of SO-5 (S). Keep this resistor clear of SW-4.

☒ 22. Condenser C10 has been omitted from the circuit.

☒ 23. Connect a 6½" green lead from the bottom lug of I-1 to pin #3 of SO-3. (S)

☒ 24. Connect a 5¾" piece of #16 bare wire from the bottom lug on I-2 to the center post of connector CO-1. (S) at I-2 only. Make certain this lead is clear of all surrounding objects.

☒ 25. Note that there is a slit at each end of the polystyrene support of coil L-4. Press these slits over the two lugs of TS-1 and down as far as they will go. Be careful not to damage L-4 by binding or shorting any turns. With a pair of long nose pliers, give each lug of TS-1 a very slight twist so that L-4 won't slide off when the chassis is right side up.

☒ 26. Connect one end of L-4 to connector CO-1. (S)

☒ 27. Connect the other end of L-4 to connector CO-2. (S)

☒ 28. Connect the large RF choke 2.5MH-200MA from the top lug on I-1 to one end of the double lug on insulator I-3. (S) at I-1 only.

☒ 29. The suppressor choke consists of 9 turns of wire space wound on a 56-1W. resistor. Trim each pigtail end so that ½" of lead remains.

☒ 30. Connect one end of this suppressor to the 3/8" plate cap. (S) ¼" of lead should remain between the cap and the suppressor to allow for bending.

☐ 31. Connect the other end of this suppressor to the double lug on I-3 also leaving ¼" of lead here to allow for bending. (S)

☒ 32. Connect the tubular .001 mf ceramic condenser from the double lug on I-3 to the side lug of TC-1 nearest the meter (S). Slip a length of #16 insulation over each pigtail of this condenser.

☒ 33. Slip a 2¼" piece of #16 insulation over a 2¾" piece of #16 bare wire. Connect this lead from the top lug of I-2 to the outside edge lug of TC-2. (S) at TC-2 only.

☒ 34. Thread a 4" piece of #20 bare wire thru each bottom teardrop lugs of TC-1 and TC-2 then over to GL-8. (S)

☐ 35. Slip a 3½" piece of #16 insulation over a 4" piece of #16 bare wire, connect this lead from the top lug LT-1 of coil L-3 to the outside edge lug of TC-1. (S)

☐ 36. Route all the following coil leads from the coil L-3 down thru hole GR-1. Use the high voltage wire (#18 white with heavy insulation) for these RF leads. Be careful of damaging L-3 when soldering to it.

☐ 37. Connect a 6" piece of high voltage wire from tap LT-2 of L-3 to pin #6 rear wafer of SW-4. (S)

☐ 38. Connect a 5" piece of high voltage wire from tap LT-3 of L-3 to pin #5 and pin #4 rear wafer of SW-4. (S)

☐ 39. Connect a 3½" piece of high voltage wire from tap LT-4 of L-3 to pin #3 rear wafer of SW-4. (S)

☐ 40. Connect a 3" piece of high voltage wire from tap LT-5 of L-3 to pin #2 rear wafer of SW-4. (S)

☐ 41. Connect a 1" piece of #16 bare wire from the top lug of I-2 to tap LT-6 of L-3. (S)

☐ 42. Connect the 6" piece of twin lead rubber covered wire from the two lugs of SW-5, route this pair up middle of chassis past TS-2. Connect one lead to lug #1 of TS-2 (S) and connect the other lead to pin #8 of SO-4.

This completes the transmitter wiring. A careful re-checking of all soldered joints, coils and wiring is recommended before operation of the transmitter is attempted.

TUNE UP PROCEDURE FOR WRL 65A

☐ 1. Make certain all tubes are in their respective sockets and seated properly.

☐ 2. Attach a good electrical ground (#12 wire) to the chassis grounding bolt and connect it to a water pipe or a ground rod.

☐ 3. Attach the antenna to the proper coax connector.

☐ 4. Turn all switches to the OFF position.

☐ 5. Insert the xtal desired in the xtal socket. Refer to the xtal chart.

CRYSTAL FREQUENCY	BAND OF OPERATION
1800-2000 KC	160 Meters
3500-4000 KC	80-75 Meters
7000-7300 KC	40 Meters
7000-7200 KC	20 Meters
7000-7200 KC	15 Meters
6740-6807 KC	11 Meters
7000-7425 KC	10 Meters

☐ 6. Set the band switch to the band of operation desired.

☐ 7. Set the phone CW switch to the CW position.

☐ 8. Set the F Grid/Plate meter switch to F Grid position.

☐ 9. Insert a key in the key jack, close the key contacts.

☐ 10. Set the 3 tuning condensers TC-1, 2, and 3 to maximum capacity which is with all arrows pointing to the left side of the panel, as you face the panel.

☐ 11. Insert the line cord into a 115 VAC receptacle.

☐ 12. Turn on the filament switch by rotating the Fil/Gain control clockwise until an audible click is heard. Allow 2 minutes for tubes to heat.

☐ 13. Turn on the plate switch to the transmit position.

☐ 14. Tune the oscillator tuning control TC-3 for maximum grid current as indicated on the meter, but keep it below 3 Ma. by detuning TC3 if necessary. Open the key.

☐ 15. Set the meter switch to F.-Plate position, close the key and tune the Final Plate tuning control TC-1 for a minimum reading on the meter. This minimum reading will vary on different bands. The antenna must be attached to the coax connector for this step.

☐ 16. Now carefully turn the Ant. load tuning condenser TC-2 in a clockwise direction toward the Max. position until the plate current rises to 130 MA.

☐ 17. Re-tune the Final Plate tuning condenser for minimum dip on the meter.

☐ 18. Repeat Steps 16 and 17 until the plate current minimum dip is 130 MA.

☐ 19. Set the meter switch to F. Grid position and peak up the oscillator tuning control so that from 2 to 3 MA. is indicated on the meter. Do not exceed 3 MA. grid current on the final as this will shorten tube life and may cause excessive harmonic radiation.

☐ 20. You may now proceed to operate CW. If phone operation is desired, complete the following steps.

☐ 21. Turn off the plate switch to Standby position.

☐ 22. Set the Phone/CW switch to phone position.

☐ 23. Connèct a high impedance crystal or dynamic microphone to the Mic. input jack.

☐ 24. Set the gain control approximately $\frac{3}{4}$ of full rotation clockwise.

☐ 25. Turn on the plate switch to Transmit position.

☐ 26. Reduce the final plate to 115 MA. load as described in steps #16 and 17.

☐ 27. With normal speech in the microphone, adjust the gain control so that the final plate current does not vary by much more than 5% either side of 115 MA.

OPERATING SUGGESTIONS AND LOADING HINTS

A good electrical ground connection to the chassis of the transmitter is essential for efficient operation and proper loading of the final stage. An antenna length of between 60 and 80 feet, at least 15 feet clear of the ground, has been found to be almost ideal for all band operation. A folded dipole type antenna for any band, will match into the Pi section well, needing no extra matching section. The coax connector labled "doublet" is to be used with 160 and 80 M doublet antennas or with lower than 52 ohm impedance antennas on other bands.

Tune up procedure for the Pi section is simple, but care must be excercised so that you do not inadvertently tune to a harmonic of the fundamental signal. The proper tuning point on the final tank is indicated by a sharp, clean and low dip in plate current with the plate tuning condenser approximately half meshed. When attempting to load with the ant. load control, do not operate with the loading condenser at minimum capacity as this indicates excessive reactance and will lead to excessive harmonic radiation. The loading condenser should load gradually, but firmly from minimum capacity, and should show full load at half of its full capacity. Antenna trimming or lengthening is the obvious remedy for any faulty loading conditions.

REMOTE SOCKET. This is socket SO-7 located on the rear apron of the chassis. It will provide 115 VAC for external relay operation at pins #4 and 5 when the transmit switch is turned on. It can also provide B+ at pin #3 and filament voltage at pin #7.

There are several precautions to be observed when tuning up the transmitter so that proper operation is insured. When tuning the oscillator on the 20 M or 15 M bands, two resonance points will be found. One point of resonance is double the 40 M Xtal frequency and the other is triple the 40 M Xtal frequency. The doubling resonance point is approximately $\frac{3}{4}$ full capacity, or when the indicator arrow is toward the left side of its scale. The tripling resonance point is at approximately $\frac{1}{4}$ of full capacity, or when the arrow is toward the right side of its scale. When operating on the 20 or 10 M band tune the oscillator to the doubling resonance point. When operating on the 15 M band tune the oscillator to the tripling resonance point. When tuning the final plate control on the 160 M band two resonance points will be observed. One will be toward max. cap. or when the arrow is toward the left side of its scale. This is the 160 M resonance point. The other resonance point is close to min. cap. of the tuning condenser. the arrow towards the right side of its scale. On the 15 M band there are also two resonance points. One resonance point is at 20 M and will be found at approximately $\frac{3}{4}$ of full capacity. The other and correct resonance point is at approximately $\frac{1}{4}$ of full capacity or with the arrow facing toward the right side of its scale. Summing up, the tuning condenser settings for each band are as follows with the fractions indicating the approximate quantity of full capacity.

BAND	ARROW	OSC. TUNING	ARROW	FINAL PLATE TUNING
10	Left	3/4	Right	1/4
15	Right	1/4	Right	1/4
20	Left	3/4	Up	1/2
40	Left	3/4	Up	1/2
80	Up	1/2	Up	1/2
160	Up	1/2	Left	3/4

A long wire antenna is not recommended when operating in a TV fringe signal area. A doublet or folded dipole, half wave antenna at the operating frequency will give much better results. The long wire, or end fed antenna, may be used only if it is approximately $\frac{1}{4}$ wave long at the operating frequency. The main objective is to reduce the standing wave ratio on the feed line to a minimum, this will automatically reduce harmonic radiation and TVI. This point cannot be over-emphasized as it is very important in the suppression of TVI and BCI and, at the same time, permits a much better signal radiation from the antenna. A little extra time spent on a properly tuned antenna system will more than repay the operator in better QSO's and less radiated interference.

TYPICAL VOLTAGE READINGS

40 meter band, 115 VAC. 60 cycle, line. 20,000 ohm/volt meter. Phone/CW switch on CW position. Meter connected from the points indicated to ground at chassis. Final loaded to 130 Ma. with 3 Ma. grid current.

6V6 OSC.
Pin #1-0
#2-0
#3-300 VDC
#4-160 VDC
#5-0
#6-300 VDC
#7-6.3 VAC
#8-1.6 VDC

6146 FINAL
Pin #1-55 VDC
#2-0
#3-230 VDC
#4-55 VDC
#5-Minus 66 VDC
#6-55 VDC
#7-6.3 VAC
#8-0
PLATE-500 VDC

40 meter band. 115 VAC. 60 cycle line. 20,000 ohm/volt meter. Phone/CW switch on Phone position. Meter connected from the points indicated to chassis ground. Final loaded to 115 Ma. with 3 Ma. grid current.

6V6 OSC.
Pin #1-0
#2-0
#3-260 VDC
#4-160 VDC
#5-0
#6-270 VDC
#7-6.3 VAC
#8-1.6 VDC

6146 FINAL
Pin #1-45 VDC
#2-0
#3-200 VDC
#4-60 VDC
#5-Minus 72 VDC
#6-60 VDC
#7-6.3 VAC
#8-0
PLATE-435 VDC

6L6G MOD.
Pin #1-0
#2-0
#3-430 VDC
#4-320 VDC
#5-0
#6-460 VDC
#7-6.3 VAC
#8-22 VDC

6C5/6J5 SPEECH
Pin #1-0
#2-0
#3-55 VDC
#4-0
#5-0
#6-0
#7-6.3 VAC
#8-1.2 VDC

6SJ7 SPEECH
Pin #1-0
#2-0
#3-.8 VDC
#4-0
#5-.8 VDC
#6-18 VDC
#7-6.3 VAC
#8-50 VDC

5U4G RECT.
Pin #1-0
#2-500 VDC-5 VAC to pin #8
#3-0
#4-600 VAC
#5-0
#6-600 VAC
#7-0
#8-500 VDC-5 VAC to pin #2

PARTS LIST FOR GLOBE SCOUT 65A KIT

RESISTORS

Quantity	Symbol	Description
1	R1	47K ohms ½ W.
1	R2	47K ohms ½ W.
1	R3	120 ohm ½ W.
1	R4	22K ohm ½ W.
1	R5	120 ohm ½ W.
1	R6	450 ohm 10 W.
1	R7	56 ohm ½ W.
1	R8	12,500 ohm 10 W.
1	R9	3 ohm special
1	R10	6000 ohm 10 W.
1	R11	50K ohm 10 W.
1	R12	22K ohm 2 W.
1	R13	22K ohm ½ W.
1	R14	2.2 Meg ½ W.
1	R15	2200 ohm ½ W.
1	R16	1500 ohm ½ W.
1	R17	390 ohm 2 W.
1	R18	47K ohm ½ W.
1	R19	1 Meg ½ W.

CAPACITORS

Quantity	Symbol	Description
1	C1	25 mmf-600 V.
1	C2	120 mmf-600 V.
1	C3	.005 mf. disc. 600 V.
1	C4	.005 mf. disc. 600 V.
1	C5	.005 mf. disc. 600 V.
1	C6	33 mmf 600 V.
1	C7	.005 mf. disc. 600 V.
1	C8	.005 mf. disc. 600 V.
1	C9	.005 mf. disc. 600 V.
1	C11	25 mf. 25 V. Elec.
1	FC-1, C12	10 mf. 500 V. Elec.
1	FC-1, C13	10 mf. 500 V. Elec.
1	C14	.001 mf 1500 V. Cer.
1	C15	16 mf 350 V. Elec.
1	C16	16 mf 350 V. Elec.
1	C17	16 mf 350 V. Elec.
1	C18	16 mf 350 V. Elec.
1	FC-1, C19	10 mf 500 V. Elec.
2	TC1 and TC2	365 mmf variable cond.
1	TC3	75 mmf variable cond.

COILS-CHOKES-TRANSFORMERS

Quantity	Symbol	Description
1	L1	20-15-10 M. oscillator coil
1	L2	40-80-160 M. oscillator coil
1	L3	10-160 M. Final coil
1	L4	L matching coil
1	RFC1	2.5 MH-50MA choke
1	RFC2	2.5 MH-50MA choke
1	RFC3	2.5 MH-200MA choke
1	PS-1	56 ohm parasitic choke
1	CH1	1300-008 Filter choke
1	CH2	546X2 Modulation choke
1	PT1	Power Transformer

SOCKETS-TERMINAL STRIPS-KNOBS

Quantity	Symbol	Description
6		Octal bakelite sockets
1		Octal mica filled sockets
1		Octal plug less cap
5		Indicator knobs
1	TS-2	5 lug tie strip
4	TS-1,3,4,6	2 lug tie strips
1	TS-5	3 lug tie strip
1	TS-7	1 lug tie strip
1	FC-1	Mounting plate
1	J-1	Mic. connector
1	X-1	Xtal socket
2	PL1-PL2	Pilot light sockets
1	K-1	Closed circuit key jack
2	C01 and C02	Coax Connectors

POSTS AND COUPLATES

Quantity	Symbol	Description
1	FS-1	Fuse post
1	PC91	Pentode couplate
1	PC81	Triode couplate

METERS-TUBES

Quantity	Symbol	Description
1	M1	0-150 MA-2" meter
1		6146
1		6V6
1		5U4G
1		6L6G
1		6C5
1		6SJ7
1		#47 pilot light
1		6S6 pilot light
1		3 amp fuse

CONTROLS-SWITCHES

Quantity	Symbol	Description
1	VC-1	500K ohm potentiometer with on-off switch
1	SW1	DPST toggle
2	SW2-SW3	DPDT toggle
1	SW4	2 section band sw.
1	SW5	SPST Xtal-VFO slide sw.

HARDWARE AND MISCELLANEOUS

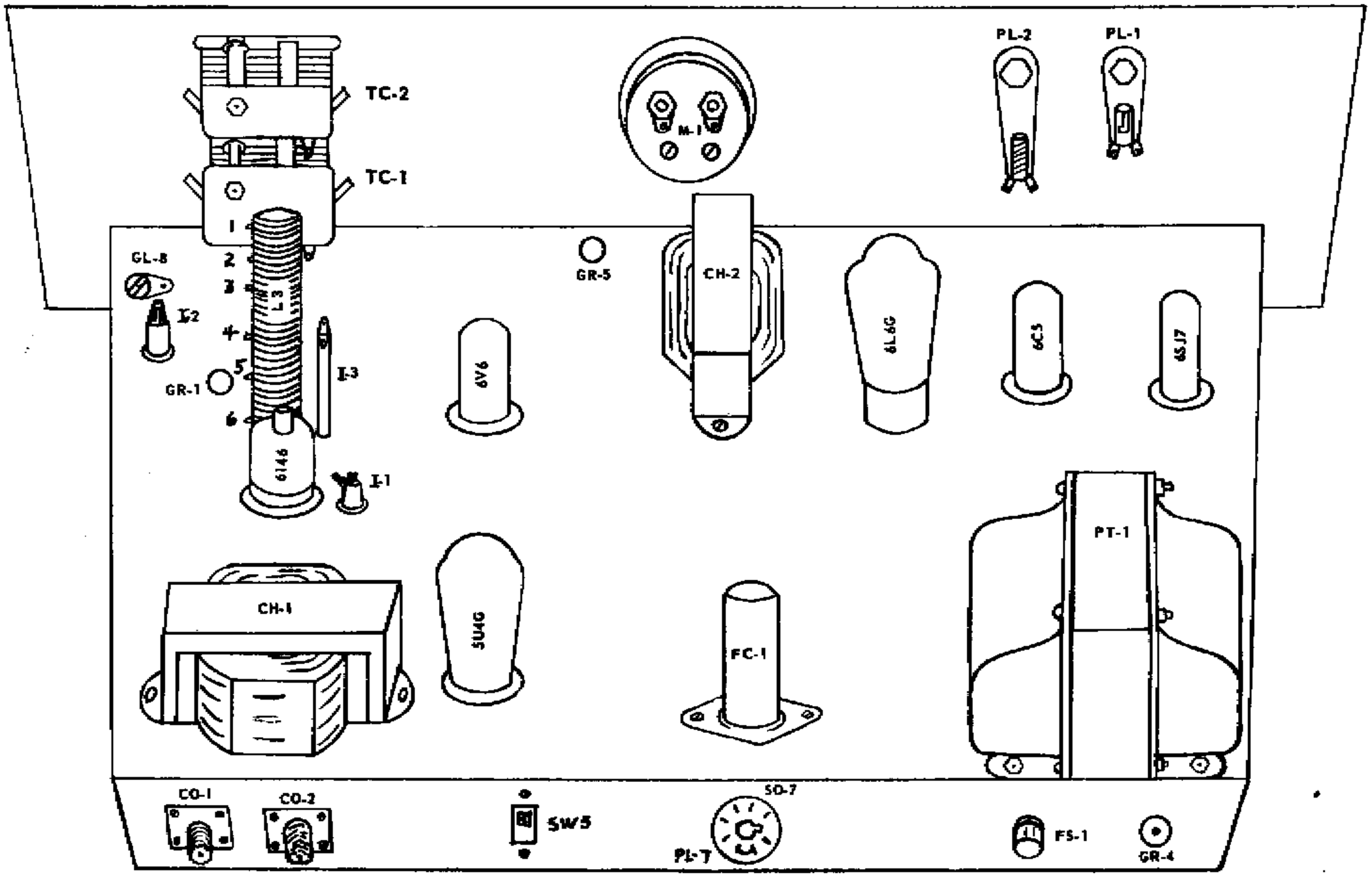
Quantity	Symbol	Description
1		Punched chassis
1		Cabinet
1		Punched front panel
7		Socket retainer rings
3		3/8" rubber grommets
2		½" rubber grommets
2	I-1 and I-2	1" ceramic insulators
1	I-3	2½" threaded bakelite insulator
2		3/8" fiber washers
3		7/16" hex nuts
1		3/8" plate cap
1		AC line cord W/plug
12		#6x¼" self tapping cabinet screws

HARDWARE AND MISCELLANEOUS

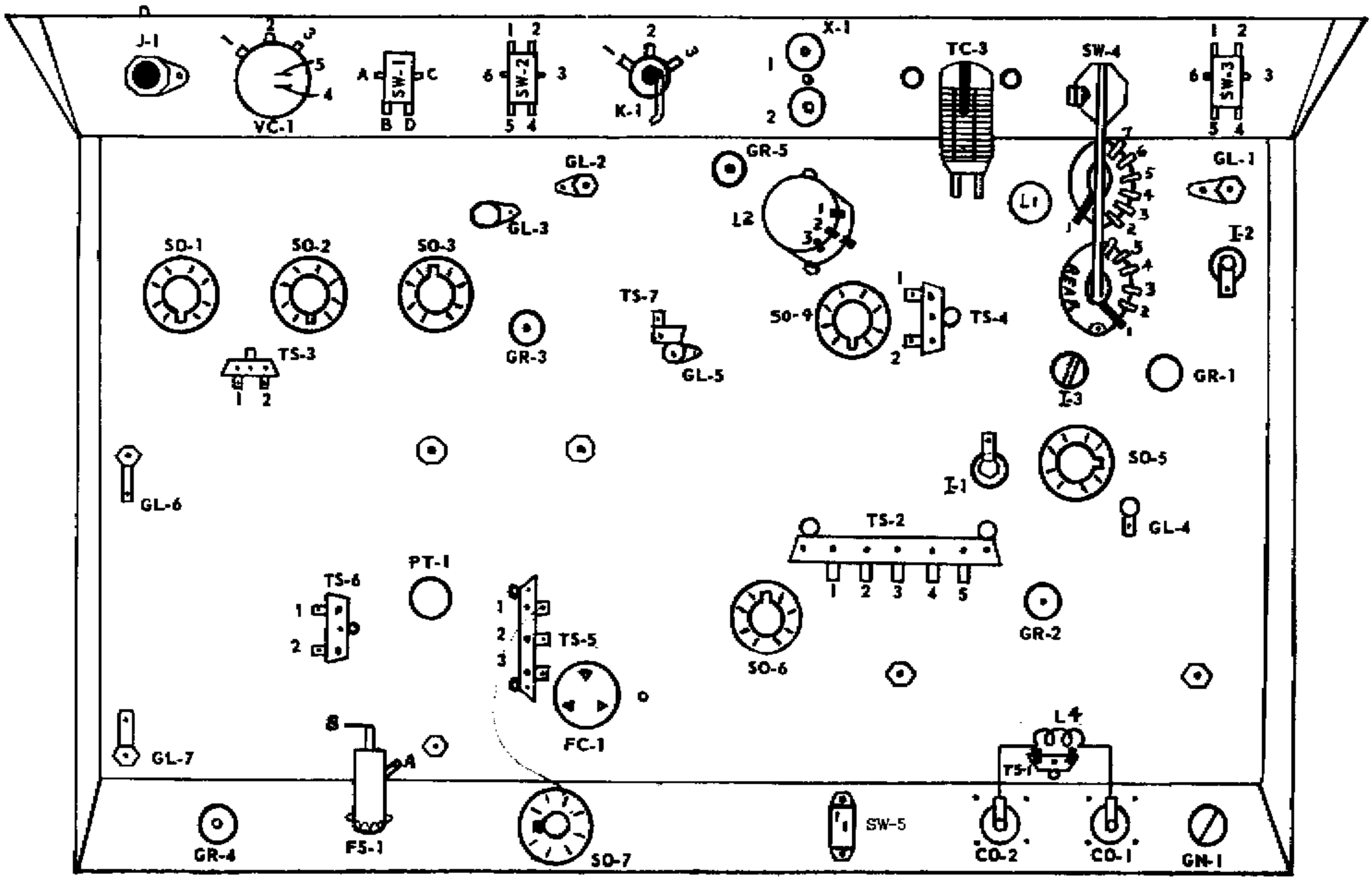
Quantity	Description
10	#6 solder lugs
1	#6 double solder lug
2	#6 teardrop solder lug
4	#10 solder lugs
5	#8x½" B.H. screws
8	#4/40x3/8" B.H. screws
26	#6x5/16" B.H. screws
8	#6x¼" B.H. screws
1	#4/40x½" RH screw
3	#8 internal lock washers
8	#4 internal lock washers
24	#6 internal lock washers
2	#10 flat washers
6	#8x5/16" hex nuts
8	#4x¼" hex nuts
22	#6x¼" hex nuts
2	#10x3/8" hex nuts
1	#4/40x3/16" hex nuts

WIRE

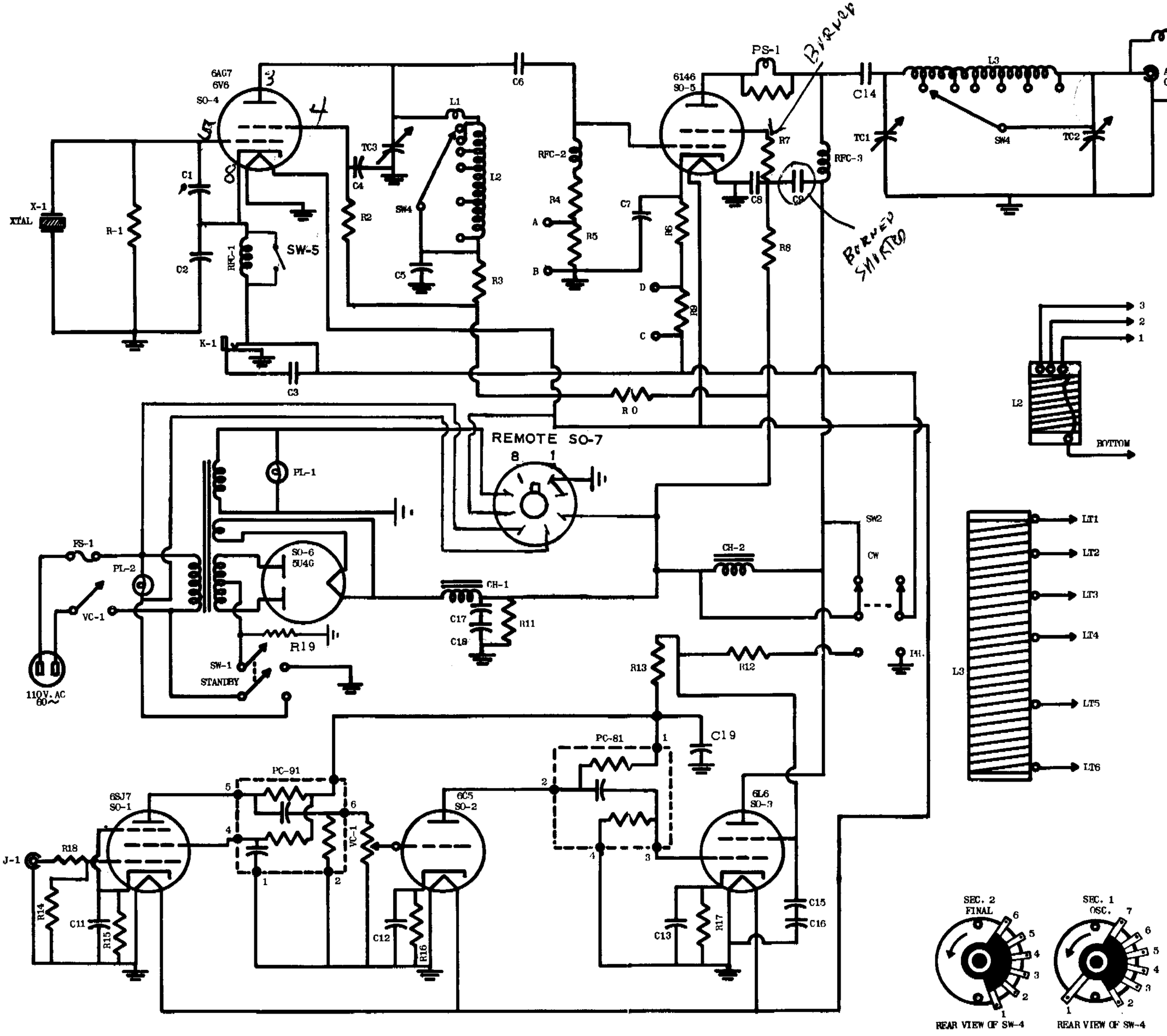
Quantity	Description
40"	#20 bus wire
24"	#16 bus wire
9"	#20 white hook up wire
70"	#20 red hook up wire
30"	#20 black hook up wire
70"	#20 blue hook up wire
44"	#20 green hook up wire
26"	#20 yellow hook up wire
19"	#18 white hi voltage wire
5"	#20 shielded mic cable
25"	#16 insulation
6"	#18 twin lead wire
9½"	#16 white hook up wire



PICTORIAL 2



PICTORIAL 1



Schematic of Globe Scout