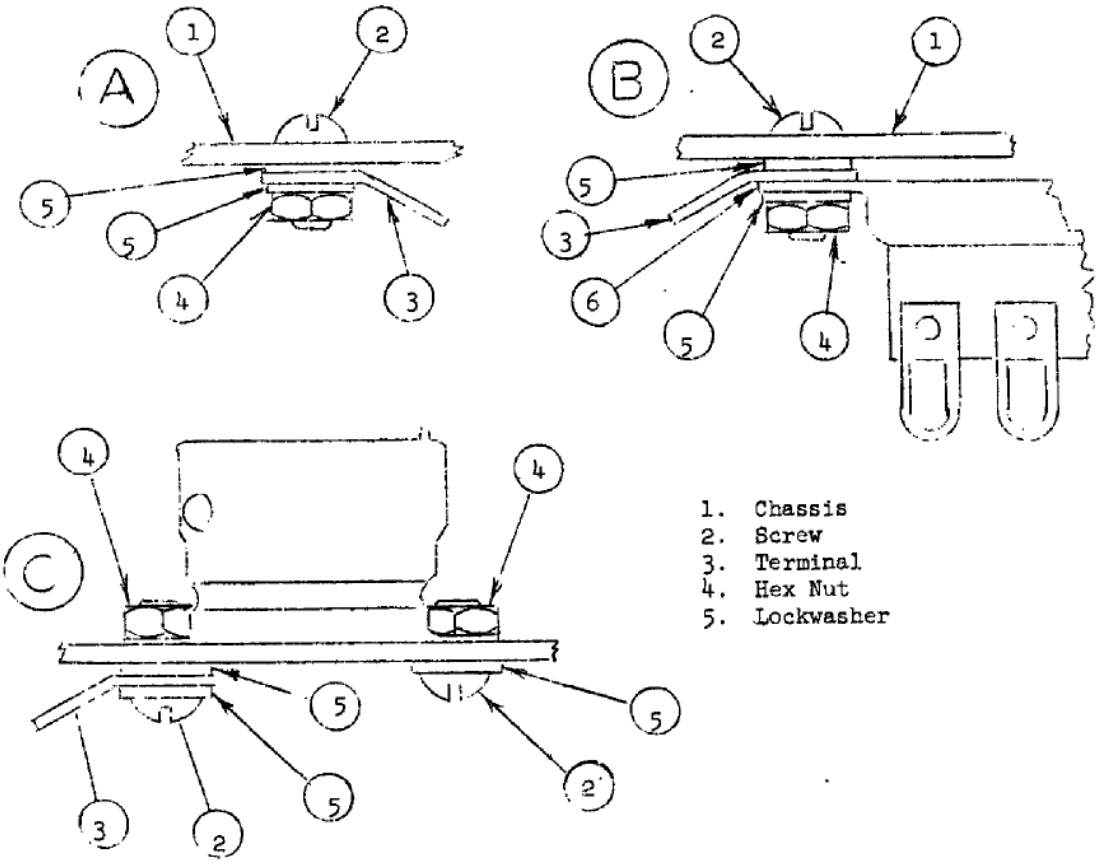
SPECIAL NOTICE

There are numerous points throughout the Viking II where grounds are made directly to the chassis by means of solder terminals. In almost every case, contact resistance between the chassis and solder terminal is very low and results in an excellent ground connection. Occasionally however, a high resistance chassis ground occurs because of oxidation of the aluminum. (The chassis has been etched and given additional treatment to preserve its appearance while being handled during assembly of the kit.)

An extra shakeproof washer, installed between each solder terminal and the chassis, will insure 100% effective grounds. Sketch A below illustrates how a typical ground connection should be made. Sketch B shows the recommended method of making ground connections at the ends of terminal strips. Sketch C shows assembly detail of ground connections at miniature tube sockets X1, X2, X5, X6 and X11.



1. Chassis
2. Screw
3. Terminal
4. Hex Nut
5. Lockwasher

Additional shakeproof washers are contained in the envelope stapled to this sheet.

VIKING II TRANSMITTER KIT
Assembly Details

1. In order to be able to work on the transmitter in an inverted position without damaging the parts mounted above the chassis, four legs roughly 3/5" x 1 1/4" x 11 1/2" should be made of scrap wood. Four 7/32" diameter holes are provided in each end of the chassis for the 1" 10-32 machine screws and nuts supplied for bolting the legs to the chassis. Mount legs so that the chassis is 1/2" off the bench top when right side up.

2. Mount all the tube sockets, and the crystal selector socket in the positions shown on Figure 1, according to the following directions. (Figure 1 may be found in the Instruction Manual).

   a. Mount socket X5, 7 pin minature with shield base, using 3/16" 4-40 machine screws, shakeproof washers and nuts. The nuts must be on top of the chassis with the shakeproof washers and screwheads underneath. (This avoids the danger of short circuits to socket terminals.) A #6 teardrop solder terminal should be fastened under the mounting screw nearest the outside edge of the chassis. Pin 5 (plate) should be toward the front of the chassis. X5 is the 6AQ5 buffer/doubler socket.

   b. Mount miniature socket X6 for the 6AU6 oscillator in the same manner with pin 5 (plate) toward the front of the chassis and a #6 solder terminal under the mounting screw nearest the outside edge of the chassis.

   c. Mount miniature socket X1 for the 6AU6 audio amplifier in the same way with pin 1 (control grid) toward the front of the chassis and a #6 solder terminal under the screw head nearest the edge of the chassis.

   d. Mount X2 for the 6AU6 audio driver in the same way as X1.

   e. Mount miniature socket X11 for the 6AL5 bias rectifier with pin 2 (plate) toward the rear of the chassis and a #6 solder terminal under the screw near pin 3.

   f. Mount socket X4, 5 pin ceramic wafer for one of the 807 modulators, under the chassis with pin 4 (cathode) toward the front of the chassis. Use 1/2" 6-32 screws, shakeproof washers and nuts. Fasten a #6 solder terminal under the nut nearest pin 5 using a shakeproof washer under the screwhead as well as under the nut.

   g. Mount socket X3 in the same manner with pin 2 toward the front of the chassis and a #6 solder terminal under the nut nearest pin 5.

   h. Mount X28, 7 pin miniature socket atop the chassis using 3/16" 4-40 screws, nuts and shakeproof washers with the nuts on top of the chassis. This socket is located next to X3 with pin 2 toward the nearest end of the chassis.

   i. Mount sockets X8 and X9, octal ceramic wafers for the 5R4GY rectifiers, under the chassis with pin 7 toward the rear of the chassis in each case. Use 1/2" 6-32 screws, shakeproof washers and nuts.

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2. j. Locate the 6146 socket assembly CH3, consisting of two octal ceramic wafer sockets X7 and X17, riveted to mounting plate. Mount this assembly under the chassis with the key slots toward the chassis center. Use 1/2" long x 3/8" O.D. spacers, 7/8" 6-32 screws, shakeproof washers and nuts. Use shakeproof washers under the screwheads atop the chassis as well as under the nuts.

k. Mount socket X10, octal wafer for the 5V4G low voltage rectifier, with pin 7 toward the rear of the chassis. Mount with 1/2" 6-32 screws, shakeproof washers and nuts. Bend pin #8 to the vertical position so that it will not short out when the cabinet is installed.

l. Before mounting the crystal selector socket X15, connect the two center rows of terminals all together. Remove the insulation from a 10" piece of W2 wire, straighten and form it into a "U" shape so it will fit into all the terminals of the two center rows of terminals. The center of the "U" should join the two inside terminals of crystal positions 5 and 6. Solder at all 10 of these terminals being sure that none of the terminals are pulled out of position making it difficult to insert crystals later. Use but little solder, do not let it flow down into the socket contacts. Mount the crystal socket X15 atop the chassis with positions 5 and 6 toward the front of the chassis. Use only two 1/2" 6-32 screws, shakeproof washers and nuts in the two rear holes of the socket. Adjust the socket position so that the front socket and chassis holes are lined up, then tighten the two rear screws.

m. Mount R30, 1 megohm potentiometer with the slotted shaft, beneath the chassis near X28 with the shaft extending thru the chassis. Use a 3/8"-32 nut and turn R30 so its terminals are toward X1. (R30 and R6 may be identical or R30 may be 15/16" diameter whereas R6 is 1 1/8" diameter.)

3. a. Mount terminal board X23, (3 terminals), by means of 1/4" 4-40 screws, shakeproof washers and nuts on the inside rear edge of the chassis near socket X10. Install a #6 solder terminal under the mounting washer nearest the underside of the chassis.

b. Mount terminal board X18 (5 terminals) parallel to the front of the chassis beside the sockets for the 807 modulators (X3, X4) using 1/4" 4-40 screws, shakeproof washers and nuts. Install a #6 solder terminal under the mounting washer nearest the center of the chassis.

c. Mount terminal board X19 (also 5 terminals) at right angles to the front of the chassis between and slightly to the rear of sockets (X1,X2) for speech amplifier. Install a #6 solder terminal under the nut nearest the rear of the chassis.

d. Mount terminal board X20 (6 terminals) at right angles to the front of the chassis between the 6146 sockets (X7, X17) and the 6AU6 oscillator socket (X6) with a #6 solder terminal under each nut.

e. Mount terminal board X21 (6 terminals) at right angles to the front of the chassis to the left of the 6146 sockets (X7, X17) with a #6 solder terminal under the nut nearest the front of the chassis.

f. Mount terminal board X22 (6 terminals) the same way at right angles to the front of the chassis opposite pin 1 of the 5R4GY socket X9 with a #6 solder

3. f. terminal under the rear nut.

g. Mount terminal board X24, (3 terminals) vertically, inside the chassis. Install a #6 terminal under the bottom nut.

h. Mount terminal board X25 (3 terminals) parallel with the front of the chassis and to the rear of the 6146 sockets. Use a #6 solder terminal under each nut and a #6 solder terminal atop the chassis under the screw-head nearest the center of the chassis. Turn the strip so that the terminals are as far as possible from the rear 6146 socket.

i. Inside the chassis, on the end and near the 807 socket X4, mount terminal board X26 (3 terminals) vertically.

4. Make all the grounds to the chassis as follows, using #20 tinned wire except where noted otherwise. The black #20 wire (W2) should have the insulation stripped off for the very short leads.

a. Ground the center shield and pin 4 of the 6AQ5 socket (X5) to the solder terminal under the socket mounting screw. Defer soldering until all small parts in this section are mounted.

b. Ground the center shield and pins 2 and 3 of the 6AU6 oscillator socket (X6) to the solder terminal under the mounting screw. The lead to pin 2 should go thru the lower hole in the terminal. Solder at the ground terminal and at pin 2 (being sure not to fill the top hole with solder).

c. Ground pins 2, 4 and the center shield of the audio amplifier socket X1 to the solder terminal under the mounting screw and solder all except pin 4 and the chassis ground lug.

d. Do the same at audio driver socket X2 but do not solder at pins 2 or 4.

e. Ground pin 4 and the center shield of the bias rectifier socket X11 to the solder terminal under the mounting screw. Solder at all points.

f. Connect pin 1 of 5V4G socket X10 to the ground solder terminal of X23, solder at both points.

g. Ground pin 5 of the 807 socket X4 and pin 5 of the 807 socket X3 to the #6 solder terminal under their respective mounting nuts. Solder at all points except pin 5 of X3.

h. Connect the fourth terminal from the rear of terminal board X22 to the solder terminal under rear mounting nut. Solder at the solder terminal only.

i. Using W2 hookup wire, connect sockets X8 and X9 in parallel as follows:
Pin 6 of X8 to pin 6 of X9 and solder at X8 only.
Pin 4 of X8 to pin 4 of X9 and solder at X9 only.
Pin 2 of X8 to pin 2 of X9 and solder at X9 only.
Pin 8 of X8 to pin 8 of X9 and solder at X8 only.

5. a. Solder a 2" length of #24 bare wire to the outside terminal of position 6 of the crystal socket X15. Solder a second piece of #24 bare wire 2" in

5. a. length to the outside terminal of position 5. Leave the ends of these unconnected for the moment.

6. a. Mount bracket BKT4 for the 160 meter auxiliary switch SW6 atop the chassis in the position shown on Figure 1. The mounting holes are approximately 4 1/2" from the front of the chassis slightly to the right of the center. These holes are behind the pair of half-inch holes (spaced 2" apart) provided to permit the drive cable to pass thru the chassis. The horizontal edge through which the screws pass should be toward the chassis rear. Use 1/4" 6-32 binding head screws, shakeproof washers and nuts.

b. Mount bracket BKT5 in exactly the same manner under the chassis in the pair of mounting holes in front of the 1/2" cable clearance holes. See Figure 2. The horizontal edge should be to the rear.

c. Mount the 5" shaft and bearing assembly D15 in bracket BKT5 with the shaft extending thru the front edge of the chassis as shown in Figure 2. Secure in place with two 3/8-32 nuts, the second nut locking the first. Obtain additional nuts from the hardware envelope.

d. Mount pulley D4 on the rear end of D15, the hub toward the front of the chassis and the rim of D4 centered over the 1/2" chassis holes.

e. Mount the 160 meter auxiliary switch SW6 (marked CRL 11207 on switch face) on the bracket BKT4 with the shaft toward the front of the chassis and the indexing ball toward the left edge of the chassis. The SW6 assembly screws should be on a line perpendicular to the top of the chassis. Use the 3/8-32 nut and shakeproof washer furnished with the switch.

f. Install the drive pulley D3 on the shaft of SW6 with the hub side toward the front of the chassis. The opening in the rim should be downward (toward the chassis), with SW6 turned to its counter-clockwise position looking at the end of the shaft. The pulley should be centered over the half inch holes provided for passing the drive cable thru the chassis.

g. Cut a 34" length of dial cord D7 (two lengths of the chassis). Slip one of the dial cord tension springs D9 on the cord, tie it in the center of the cord with an overhand knot.

h. Hook the tension spring D9 on either of the ears of D3. Check SW6 to be sure it is still in the counter-clockwise position.

i. Fasten a knob on the shaft D15 so that in the process of stringing the dial cable you can keep the pulley D4 from turning.

j. Pass one end of the cable D7 thru the break in the rim of the pulley D3, around D3 in a counter-clockwise direction looking from the front of the chassis, and thru the corresponding 1/2" hole in the chassis.

k. While holding the end of the dial cable under the chassis, turn the knob on the shaft D15 so that the break in the rim of the pulley D4 is nearest the chassis. Holding the knob with the left hand, string the cable around the pulley D4, thru the break in the rim and under the nearest ear on the pulley. Hold the pulley and dial cord with the right hand. Using a screwdriver, push the ear of D4 so that it grips the dial cord. Tension need not

6. k. be kept since the critical dimensions are now set and if the cable falls off the pulleys, it can be readily re-strung. Tie an overhand knot in the clamped end of the cable, slide the knot down to where the cable is clamped and draw the knot tight.

l. Twist the knob on shaft D-15 in a counter-clockwise direction so that the dial cord is now under tension. String the thus far unused end of the dial cord around the pulley D3 in a clockwise direction, thru the corresponding 1/2" hole in the chassis, around pulley D4 in a clockwise direction. Increase the tension in the cord so that it is good and tight! Now holding D4 and the cable in the right hand, clamp down the other ear of D4 over the cable. Tie an overhand knot in the end of the cord and slide it down tight against the ear and draw tight. Check the cable to make sure that there is no backlash in the switch operation and that the cable does not cross on the pulleys causing them to bind. Trim off excess length of cable, leaving about 1/2".

7. a. Mount bracket BKT8 atop the chassis, just to the right of the socket X5 by means of a 3/8" 10-32 screw, shakeproof washer and nut. Install a flat #10 solder terminal under nut. The outside of the bend in the bracket should be toward the front of the chassis. This is the bracket holding switch SW4 in Figure 4.

b. Locate the exciter bandswitch SW4 (marked CRL 11217 on switch face). Looking at the rear deck of the switch from the rear and with the blank section of the switch to the left, call the topmost terminal #1, the next one 2 and so on around the switch deck in a clockwise direction, the last one being terminal #7. Connect a jumper of W2 wire between terminals 1 and 7 of the rear deck of SW4. Do not solder.

c. Also on the rear deck of SW4, connect R21 (4700 ohms 1 watt) between terminals 1 and 4. Jumper terminal 4 to terminal 3. Connect R22 (22 ohm 1/2 watt resistor) between terminals 4 and 5, solder terminal 5. Both resistors should be close to the switch deck and they should not extend past the ceramic wafer.

d. Consider now the front deck of SW4. Looking at it from the shaft end call the terminals #1 thru #7 in a clockwise direction. (With the blank section to the left, #1 is the top terminal.) Connect a jumper of W2 wire between terminals 1 and 7 of the front deck. Do not solder.

e. Install R36, 10,000 ohm 2 watt resistor behind the front deck of SW4. Trim the resistor leads to length, connect one lead to terminal #1, the other lead to terminal #4. The resistor body should be close to the switch contacts but not touching and interfering with switch rotation.

f. On a line at right angles to the front of the chassis just to the right on BKT8, you will find two holes approximately 5/32" diameter. Install a small grommet in each of these holes.

g. Mount SW4 in bracket BKT8 using the 3/8"-32 nut and shakeproof washer.

h. Looking from the front of the chassis, the switch should be turned so the terminals of the front deck are toward the right end of the chassis and the switch assembly screws on a line perpendicular to the top of the chassis.

7. i. Thru the rearmost grommet under SW4, pass one lead of R20 (100 ohm 1 watt) from the underside of the chassis and connect to terminal #7 (bottom terminal) of the rear deck of SW4. Leave the resistor lead full length.

j. Thru the same grommet, pass one lead of C19 (.005 mfd. ceramic capacitor), also thru terminal 7. Draw C19 down to within 1/4" of the underside of the chassis, trim the lead and solder terminal 7.

k. Thru the grommet under terminal 7 of the front deck of SW4 pass one lead of L20 (4.7 microhenry choke similar in appearance to a 2 watt resistor - color coding is yellow-violet) from the underside of the chassis and connect it to terminal 7 of the front deck of SW4.

l. Make up C23 by paralleling two .005 ceramic capacitors, twisting the leads together. Pass one of the leads of C23 thru the front grommet under SW4 from underneath the chassis and connect to terminal #7, drawing C23 down to within 1/4" of the chassis. Trim the lead from C23 to length and solder terminal 7.

8. a. Mount the oscillator coil L4, terminals toward the front atop the chassis by means of shakeproof washers and 6-32 nuts, behind and slightly to the left of SW4 looking from the front of the chassis. Install a #6 solder terminal under the nut nearest the center of the chassis. (Coil may be identified by 5 spacewound turns at the bottom.)

b. Wire all the taps of L4 with #24 tinned, bare wire, keeping all the leads as short as possible without applying strain at the taps. Straightening the wire by drawing it thru the fingers several times will improve the appearance of this work. Connect the tap nearest the bottom of L4 (not the end terminal) to terminal 2 of the rear deck of SW4, solder at both points.

c. Connect the first tap (approximately 50 turns from the top of L4) to terminal 6 of the rear deck of SW4 and solder at both points.

d. Connect the next lower tap of L4 to terminal 4 of the rear deck of SW4 and solder.

e. Solder terminal 3 of the rear deck of SW4.

f. Between the top terminal of L4 and terminal 1 of the rear deck of SW4, connect with #24 tinned wire and solder at both points.

g. Solder a 2" length of #24 tinned wire to the bottom terminal of L4.

9. a. Mount bracket BKT9 atop the chassis, to the right of SW4 and next to the 1/2" hole near the front edge of the chassis. Mount the bracket flush with the edge of the chassis, the outside of the bend in the bracket to the front. Use a 3/8" 10-32 screw, shakeproof washer and nut. Install a large grommet in the hole to the left of BKT9.

b. Mount the drive control R25 (25,000 ohm 4 watt potentiometer) in BKT9, the shaft toward the front and the terminals toward the left edge of the chassis.

c. Mount the high frequency buffer coil behind R25, parallel to the front of the chassis and its tap toward the rear as per Figure 4. The #14 lead of

9. c. L5B passes thru the hole in the chassis. Shape the straps mentioned in the following steps for easy connection to the front deck of SW4 terminals 5 and 6, before securing L5B. Use 3/8" 6-32 screws and shakeproof washers furnished on L5B's insulators and at the same time, mount the bracket BKT6 under the chassis, the outside of the bend in the bracket toward the front of the chassis. This bracket is for the buffer tuning condenser C22.

d. Connect the left hand strap on L5B to terminal 5 of the front deck of SW4. Do not solder.

e. Connect the mid-tap on L5B to terminal 6 of the front deck of SW4 and solder.

f. Solder 3 inch lengths of #24 tinned bare wire to the bottom terminal of L5A and to the tap next to the bottom terminal.

g. Mount the buffer/doubler coil L5A just to the right of (looking from the front of the chassis) the rear deck of SW4 and directly in front of the 6146 sockets (X7, X17). The coil has all its taps and terminals in a line. The terminals will be to the left and slightly toward the front of the chassis. Use shakeproof washers and 6-32 nuts.

h. Pass the lead from the bottom terminal of L5A thru terminal 5 of the front deck of SW4 and solder.

i. Pass the lead from the tap next to the bottom terminal of L5A thru terminal 4 of SW4 and solder.

j. Connect the next higher coil tap of L5A to terminal 3 of SW4 and solder.

k. Connect the next higher coil tap of L5A to terminal 2 of SW4 and solder.

l. Connect the top terminal of coil L5A to terminal 1 of SW4 and solder. Each of the coil taps and terminals and each of the 7 terminals of SW4 should now be connected and soldered.

10. a. Using 1/4" 6-32 binding head screws, shakeproof washers and nuts, fasten shield S4B to shield S4A. In order to see the positions of these shields slip the smaller of the shields between the decks of SW4. The slot in the small shield will clear the switch. Place the larger of the shields atop the chassis, the edge having the punched holes down. The shield will fit between the 6146 tubes and the oscillator coil L4; also between the buffer coil L5A and the 6146 sockets. The front edge of the shield will be beside the potentiometer R25. After screwing the shields together install 6-32 spade bolts in each of the holes at the bottom of the shield assembly. Be careful not to use the silver plated spade lug in this step. Use 1/4" 6-32 binding head screws passing first thru the spade bolts, then thru the shield; shakeproof washers and nuts. The spade bolts must be either on the sides of the shield facing the front of the chassis or the right end of the chassis looking from the front. The spade bolts will then fit correctly in the chassis holes without the necessity for distorting the shield. It may be necessary to adjust the spade bolts so that they are perfectly aligned before they will drop right in the holes.

b. Secure the shield with shakeproof washers and 6-32 nuts, installing a #6 solder terminal under the chassis, under the nut at the front edge of the

10. b. chassis which will be used as a ground for the pilot light. Atop the chassis, under the nut used to secure the spade bolt (to the shield) which will be at the left edge of the chassis, install a #6 solder terminal turned toward the right. This terminal will be used later as a ground terminal for the rotor of the oscillator tuning capacitor, C18.

c. Locate the oscillator tuning condenser C18 (75L15 JOHNSON), the small variable with a short shaft. Solder 1" length of #14 bus wire to the rotor contact at an angle of 45 degrees from the stator center line down and to the left looking from the shaft end.

d. Install C18 in the hole in the shield near SW4, the shaft extending thru the hole from the rear. Form the bus installed in operation b and pass it thru the hole in the ground terminal installed in operation a. Use two 3/8-32 nuts to secure C18, the second nut to serve as a lock nut. Solder at the ground terminal.

e. Connect the bottom lead of the oscillator coil L4 to the closest stator terminal of C18.

f. Install a small grommet in the hole beside the oscillator socket X6.

g. Strip all but 1" of the insulation off a 3" piece of W2 wire and pass one end down thru the grommet just installed thru terminal 5 of X6. Connect the other end of the wire to the stator terminal of C18 and solder at C18 only.

11. a. Mount the final inductor L9 atop the chassis directly over the six ventilation holes near the front edge. The front of the inductor is the end where the pitch (spacing between turns) is least, and should be toward the front of the chassis. Use 3/8" 8-32 screws, shakeproof washers and nuts. Before proceeding, remove a mounting bracket from one end of the high voltage divider R13 (20,000 ohm 50 watt resistor), mount the bracket and a #10 solder terminal under the forward mounting nut, of the final inductor L9 (under the chassis). Orient the bracket to support R13 later, as shown in Figure 10.

b. Connect a piece of #14 tinned wire between the solder terminal on the front end frame of L9 and the 8-32 screw terminal on the same end of the inductor. Form an eye on the #14 wire and tighten between the nuts of L9's 8-32 terminal. Solder at the solder terminal.

c. Mount the flexible coupler D16 on the front drive shaft of L9. Turn L9 so that the roller contact is against the front stop.

d. Fasten the short end of the pinion and shaft assembly in the flexible coupler D16.

e. Slide BKT1 over the shaft and mount it directly in front of the final inductor L9 using 3/8" 8-32 screws, shakeproof washers and nuts. From this point thru operation 12 h leave screws just finger tight.

f. Mount BKT2 behind the final tuning inductor L9, with the outside of the bend in the bracket toward the right edge of the chassis, looking from the front. Refer to Figure 6. Use 3/8" 10-32 screws, shakeproof washers and nuts.

11. g. Mount bracket BKT3 between brackets BKT1 and BKT2 using 5/16" 10-32 screws and shakeproof washers at the front and 3/8" 10-32 screws, shakeproof washers and nuts at the rear. Loosen the top bearing in BKT1 but do not remove. Tighten the screws securing BKT1, 2 and 3.

h. Take the loose gear from BKT1 and hold it behind the top bearing in BKT1 with the hub toward the chassis rear, set screws up and with the gear teeth in mesh with the small gear near the center of BKT1. Pass the shaft of variable condenser C29 (large 350 mmf. capacitor with long shaft marked 154-2-3) thru the hub of the gear and the bearing in BKT1. Permit C29 to rest on the final inductor L9.

i. Fasten the mounting feet provided in the hardware envelope (23.08-2) on the 400 mmfd. capacitor C30 (marked 154-34-3) using the screws provided and #6 shakeproof washers.

j. Pass a 1/2" 6-32 screw thru the rear bracket of C30, thru the rear mounting hole in BKT3 and the rear bracket of C29. Secure with a shakeproof washer and nut.

k. Secure the front bracket of C30 to BKT3 using a 1/4" binding head screw with <u>two</u> shakeproof washers under the head. BKT3 is tapped.

l. Secure the front bracket of C29 to BKT3 using half inch 6-32 screw, shakeproof washer and nut.

m. With the roller of the inductor L9 at the front stop and with C29 fully meshed, adjust the position of the gear on the shaft of C29 so that the groove in the gear's hub clears the gear below. Tighten set screws.

n. Tighten the top bearing BKT1. Attach a knob temporarily to the final tuning shaft and check to see whether or not the tuning assembly turns freely. Look down past the shaft of C29 and check to see if the tuning shaft is exactly parallel with it. If not, loosen the mounting screws of BKT1 and adjust it so the two shafts are parallel. (This will aid in installing the panel later.) A drop of oil on the bearings of BKT1 will aid in making the tuning smooth. <u>Do not lubricate the roller or trolley of L9</u>.

12. a. Mount bracket BKT10 beneath the shaft of C30 using a 3/8" 10-32 screw, shakeproof washer and nut, the outside of the bend in the bracket toward the front of the chassis. Mount the coupling switch SW5 (marked SW5 on switch face) in bracket BKT10, the shaft toward the front of the chassis and the switch turned so that the blank portion is toward the bottom and the two rotor contacts are on a line of 45 degrees to the top of the chassis. Use a 3/8"-32 nut and shakeproof washer.

b. Fasten a #6 solder terminal under the nut of the bottom front stator terminal of the output tuning condenser C30 and pointing toward the chassis. Between this terminal and the two rotor lugs (left hand) of SW5, connect a piece of #14 wire and solder.

c. Locate C36 and C37 each 300 mmf. (1200 VDC test) mica capacitors with stamped terminals. Lay these two capacitors together, terminals touching and with mounting holes together. Using the lower right hand end frame screw of C30 (looking from the front) mount C36 and C37 together, with their

12. c. regular mounting holes to the right, by means of the capacitors' solder terminals. At the same time, install a #6 solder terminal pointing up under the screwhead.

d. Under the screw in the front mounting bracket for C30 (nearest the shaft) install a #6 solder terminal pointing toward the chassis. Bend this terminal and the terminal in the previous operation so they project to the front.

e. Form a "U" shaped piece of #14 wire with sharp corner bends to fit the terminals just installed. The sides of the "U" should be approximately 1 1/2".

f. Locate capacitor C38, 150 mmf. mica. Refer to Figure 10 b. Turn the capacitor so that the mounting holes are to the left and the face of the capacitor adjacent to the solder terminals toward you. Twist the top terminal of the capacitor about 45 degrees and with the capacitor facing the same direction, slip the bent terminal over the #14 wire. Slide the ends of the "U" shaped wire into the terminals on C30 and adjust its position so that the flat side is parallel to the chassis and the end of C38 is flush with the ends of C37 and C36. Solder the #6 terminals but not the terminal of C38.

The steps g., h., and i. can be accomplished with #16 bare copper wire if available, if not, then with parallel conductors of #20 wire furnished with the kit.

g. Using a straight lead, cut to fit, connect the bottom terminal of C38 to the extreme right hand terminal of SW5 looking from the front of the chassis. Solder at both points.

h. Bend the bottom terminals of C36 and C37 so there is no danger that they short together. Connect the bottom terminal of C37 (front condenser) to the terminal next to the right hand terminal of SW5, solder at both points.

i. Connect the bottom terminal of C36 (rear condenser) to the next adjacent terminal of SW5 and solder.

j. Install C35, .0003 mfd. 450 V molded mica (tan in color) in front of C38 against the edge of C37 and the end flush with the end of C38. Connect the top lead to the #14 wire and the bottom lead to the next adjacent terminal of SW5, solder at SW5 only.

k. Install C34 (identical to C35) next to C35, connect the bottom lead to the next adjacent terminal of SW5 and solder at SW5 only.

l. Install C33 (identical to C34 and C35) next to C34, connect to SW5 and solder. Solder all condenser leads and the terminal of C38 on the #14 wire.

3. a. Mount bracket BKT12 atop the chassis, outside of the bend flush with the front edge of the chassis, next to the switch SW5 (output coupling switch) using a 3/8" 10-32 screw, shakeproof washer and nut.

b. On the long end of the 1 5/8" shaft and bearing assembly D14, slip pulley D5, hub side toward the bearing.

c. Slip D14 into the hole in BKT12 from the rear and secure with the 3/8"-32 mounting nut on the assembly.

13. d. Adjust the position of the pulley D5 on the shaft of D14 so that it clears the shield base of the socket X2 by 1/4". (The hub of the pulley will be almost exactly flush with the end of the shaft.)

e. Slip pulley D6 on the front shaft of the output coupling capacitor C30, the hub to the rear. Adjust the position of the pulley so that it lines up with pulley D5, the opening in the rim toward pulley D5, and with C30 at full capacity.

f. With the pulley D5 turned so that the opening in its rim is toward C30, run a 3/4" 8-32 screw thru the hole (stamped in the pulley) nearest the rim and just to the left of bracket BKT12. Pass the screw thru the pulley from the rear to front. Secure with a shakeproof washer and nut. This is the stop for the drive assembly.

g. Readjust the position of D5 on the shaft D14 so that the end of the screw installed in 13 f. is exactly flush with the front edge of bracket BKT12.

h. Now, making use of the stop just provided, install the drive cable in a similar manner as the drive cable for the 160 meter switch SW6 described in part 7 j. thru l. The tension spring should be fastened to pulley D5 on shaft assembly D14. It will not matter if C30 is allowed to turn during the assembly of the cable. The pulley on C30 should be loosened after the cable has been strung and re-tightened after adjusting C30 to maximum capacity with the drive pulley at the counter-clockwise stop. Do not be afraid to tighten the cable and make sure it can be rotated to the limits of the stops without jumping off the pulleys.

14. a. Looking at the rear of C29 and C30, (refer to Figure 6-7) remove the mounting bracket screw nearest the shaft of C30 and the end frame screw at the bottom and to the left of the shaft of C29. These screws are then used to attach the jumper strap BKT15 (16.1088) used to bond C29 and C30.

b. Remove the mounting screw of the 6146 sub panel nearest the rear end of the final tuning inductor L9. Attach the tank grounding strap BKT14 (16.1089) to C29 using two 1/4" 6-32 binding head screws and shakeproof washers. Attach the other end to the chassis replacing the 7/8" 6-32 screws and spacer. It will be necessary to twist the bottom of the strap about 1/4" turn to the right. The strap must be positioned so as not to interfere with the stator connection of C29. Fasten two #6 solder terminals under the nut <u>below</u> the chassis for grounding the 6146 cathodes later.

15. a. Looking at the 160 meter switch SW6 from the rear of the chassis, call the first terminal to the right of the top nut (used in assembling the switch) terminal #1. Call the others in order in a clockwise direction #2, 3, etc. around to the one just to the left of #1 which will be #12.

b. Fasten a flat #10 solder terminal under the 8-32 screw terminal on the rear of the final inductor L9 and connect a piece of #14 wire between this terminal and terminals 2 and 3 on the 160 meter switch SW6 and solder.

c. Connect a #6 terminal on the bottom rear stator terminal of the coupling capacitor C30. Solder a piece of #14 wire between this terminal and terminals 11 and 12 of the 160 meter switch SW6.

15. d. Connect a jumper consisting of double leads of bare #20 (W2 wire) between terminals 5-6 of the 160 meter switch SW6. Connect another jumper between terminals 8-9. Solder only at terminals 6 and 8.

e. Straighten the leads of the 160 meter auxiliary inductor L10. Set it in position behind SW6 as shown in Figure 7. Measure the lead length necessary to connect the top lead to terminal 5 of SW6 and the bottom lead to terminal 9 of SW6.

f. Strip insulation from the leads of L10, connect to terminals 5 and 9 of SW6 and solder.

g. Secure L10 with #6 shakeproof washers and nuts installing a #6 solder terminal under the rear stud of L10.
Note: Terminals 1, 4, 7, and 10 of SW6 should be blank.

16. a. Mount the residual high frequency coil L8 on the bottom rear stator terminal of the tuning condenser C29 as shown in Figure 7, by means of its attached solder terminal using a #6 shakeproof washer and nut. Place the shakeproof washer between the nut on C29 and the terminal of L8 rather than between L8s terminal and the nut used to secure it. Thus the mounting nut can be tightened without turning the terminal of L8 and distorting the coil. Solder the plain wire end of L8 to the solder terminal on the rear of the final tuning inductor L9. Make certain the turns of L8 are not shorted by the lead coming from the front turn.

b. A silver plated spade lug is used for mounting the plate coupling capacitor C31 (2000 mmf. 1.5 KVDC capacitor). Place a 6-32 nut and shakeproof washer on the spade lug, turn the capacitor on to it, (2 turns only) tighten the locknut. Mount this assembly on the same terminal of C29 used to mount L8, secure with a shakeproof washer and nut. Keep capacitor C31 spaced 1/8" from the ground strap.

c. Mount the RF choke L7 behind the 6146 tube sockets using a 3/8" 8-32 screw and shakeproof washer. The empty solder terminal atop L7 should be turned toward the front of the chassis.

d. Install a small grommet in the hole to the right of L7.

e. By means of a 1/4" 6-32 screw and shakeproof washer, fasten three #6 solder terminals to the coupling capacitor C31. (See Figure 6-7)

f. Connect and solder a straight piece of #14 wire between one of the solder terminals on C31 and the top terminal of the RF choke L7.

g. Solder one end of parasitic suppressors L11 and L12(composed of 9 turns of #16 wire, wound over a 1 watt 820 ohm carbon resistor - see Figure 6-7) to the remaining two solder terminals on C31.

h. Solder a 6146 plate cap connector to each of the other ends of L11 and L12.

i. Connect a 4.7 microhenry choke L21 between the two bottom taps of RF choke L7. Connect C46 (.01 mfd. ceramic disc capacitor) between the bottom tap and solder terminal on the chassis near L7. Connect C32 (.01 mfd. ceramic disc capacitor) between the other lower tap of L7 and the solder terminal.

16. i. on the chassis. Keep all leads as short as possible, solder at all points. Position the capacitors so they are clear of the chassis.

17. a. At the front, right end of the chassis mount bracket BKT11, the outside of the bend in the bracket flush with the front of the chassis. Use a 3/8" 10-32 screw shakeproof washer and nut.

b. In the large hole just to the left of BKT11, install a large rubber grommet.

18. a. Invert the chassis and with the front toward you, lay the wiring harness in position. (The diagram of the wiring harness located at the rear of the operating manual will aid in identification of leads and in properly orienting the harness.)

At one extreme end of the harness you will find a bundle of 6 leads three of them green, two red and one brown. These are the VFO power leads and should be in the rear, right hand corner of the chassis (looking from the bottom).

Diagonally opposite, in the front, left hand corner of the chassis (looking from the bottom) you will find a bundle of 10 leads, one blue, one brown, one grey, one black, one orange, one white, one yellow, one violet, one red and one green. Run all except the red and green leads thru the grommet. These are the meter leads.

Following the main harness along the front of the chassis you will find, near the right, three leads tied off together, one each black, white and red. Run these leads thru the grommet under the drive control R25.

At the points where the harness is in close proximity to terminal boards the cables should lie as follows: to the rear of X18 to the right (looking from the bottom of the chassis) of X22, between X10 and X11, to the right of X20 and to the right of X21.

Leads in the harness will prove to be slightly long and must be trimmed to fit. The plastic covering of the wire may be readily stripped using a good wire stripper, diagonal cutters or a knife. An iron applied directly to the insulation will cause it to melt but the iron can be left on joints long enough for the solder to flow without affecting the insulation. Leads can be identified by their color and proximity to connecting terminals and it is not necessary to constantly refer to the wiring harness drawing in the course of connecting it.

In the following operations, trim leads to the correct length, strip the insulation from the ends, wrap securely on the proper terminal but DO NOT SOLDER UNTIL SPECIFICALLY INSTRUCTED TO DO SO. Refer to Figure 2.

b. Solder lead 20B green to pin 3 of X1.

c. Connect lead 9A (red) to the center terminal of X19.

d. Solder leads 19B and 20A (green) to pin 3 of X2.

e. Solder lead 4B (black) to the ground terminal adjacent to pin 4 of X2.

18. f. Solder lead 46B (yellow-blue) to pin 2 of X4. (Run the lead between the socket and the chassis end.) Don't fill both holes in the terminal.

g. Solder lead 15B (green) to pin 1 of X4.

h. Solder leads 40B (the longest violet lead) to pin 4 of X4.

i. Solder leads 39B and 40A (both violet) to pin 4 of X3.

j. Solder leads 14B, 15A both green and a jumper of W2 wire (1") to pin 1 of S3. Solder the other end of the jumper to pin 3 of X28.

k. Connect a jumper of W2 wire (may be bare) between pin 5 of X3 and pin 4 of X28, solder at both points.

l. Solder leads 45B and 46A (both yellow-blue) to pin 2 of X3.

m. Connect lead 43B (violet) to the center terminal of terminal board X18.

n. Connect leads 48B and 49A (both green-white) to the fourth terminal from the end of the chassis on terminal board X18.

o. Connect lead 22B (black) to the center terminal of X26, the three terminal strip on the end of the chassis.

p. Connect leads 8B and 39A (violet) to the terminal of terminal board X22 nearest the center of the chassis.

q. Connect leads 7B and 38A (yellow) to the fifth terminal from the rear of the chassis on terminal board X22.

r. Connect leads 32B and 52A (both gray-red) to the second terminal from the rear of terminal board X22.

s. Connect leads 27B and 28A (both black-brown) to the rear terminal of terminal board X22.

t. Connect lead 42A (violet) to pin 1 of the front 5R4 socket X9.

u. Connect lead 12B (red) to pin 3 of the 5V4G socket X10.

v. Solder lead 24B (green) to pin 3 of the 6AL5 socket X11.

w. Connect lead 21A (white) to pin 6 of the 6AL5 socket X11. (Use the hole in the terminal nearest the chassis.)

x. Connect lead 29A (white) to the terminal of terminal board X23 nearest the underside of the chassis.

y. Connect lead 27A (black-brown) to the center terminal of X23.

z. Connect lead 31B (blue-orange) to the terminal of X23 nearest the edge of the chassis.

a_a Connect lead 47B (gray) to the terminal of terminal strip X25 nearest the

18. a_a crystal socket X15.
Note: Lead 52B (gray-red) is left unconnected at this time.

19. a. Connect leads 13B, 16A, and 24A (green) to the terminal of X24 nearest the underside of the chassis.

b. Connect lead 50B (brown) to the center terminal of X24.

c. Connect leads 10B and 12A (both red) to the terminal of terminal board X24 farthest from the underside of the chassis.

d. Connect leads 16B and 17A (green) to pin 4 of X6.

e. Connect leads 17B and 18A (green) to pin 3 of X5.

f. Connect lead 3B (gray) to pin 2 of X5.

g. Connect lead 25B (white) to pin 6 of X5.

h. Connect lead 23B (black-brown) to the second terminal from the front of the chassis on terminal board X20.

i. Connect leads 9B, 10A and 11A (red) to the 3rd and 4th terminals from the front of the chassis on terminal board X20. Jumper these terminals together with the excess of one of the leads.

j. Connect leads 34A and 50A (brown) to the fifth terminal from the front of the chassis on terminal board X20.

k. Connect lead 1B (blue) to pin 7 of the 6AU6 oscillator socket X6.

20. a. Connect leads 6B and 21B (white) to the fourth terminal from the front of the chassis on terminal board X21.

b. Connect lead 54 (blue) to the rear terminal of X21.

c. Connect lead 22A (black) to the third terminal from the front of terminal board X21.

d. Connect lead 23A (black-brown) to the second terminal from the front of X21.

e. Connect lead 5B (orange) to the terminal of X21 nearest the front of the chassis.

f. Solder lead 37B (black), which comes out of the harness very close to the front mounting nut of L9, to the terminal under this nut.

21. a. Screw the 120 volt indicator lamp S6 into the high voltage indicator socket X13A. Mount the socket behind the front edge of the chassis, bracket to the left with the filament of the lamp centered over the hole (the one, of a pair, nearest the underside of the chassis). The bracket is directly under the shaft for the 160 meter switch. Use a 1/4" 6-32 binding head screw, shakeproof washer and nut. Solder lead 33B (gray-red) to one of X13's terminals, solder lead 28B (black-brown) to the other terminal. Polarity need not be observed.

21 b. Screw the 6 volt, #40 lamp in the low voltage indicator socket X14A. Mount the socket behind the front edge of the chassis, bracket to the right, the lamp centered over the hole (the one of a pair nearest the underside of the chassis) beneath the drive control R25. Use a 1/4" 6-32 binding head screw, shakeproof washer and nut. Connect a bare piece of #20 wire between the terminal of X14A nearest the top of the chassis and the solder terminal under the shield mounting nut next to the front of the chassis. Solder at both points being careful not to touch any of the harness leads with the iron. Solder leads 18B and 19A (green) to the other terminal of X14A.

c. Mount the keying jack J2 (using a 3/8" -32 hex nut) in the front edge of the chassis directly under the bandswitch SW4 with the solder terminals of J2 to the left. Strip 1 1/2" of insulation off the black lead 26B, run it thru the heavy ground lug of J2 to the terminal of J2 nearest the front of the chassis. (If 26B is a little short, draw the required length out of the harness.)

d. Between the only empty terminal left on J2 and the terminal of terminal board X20 nearest the front of the chassis, connect L19, 4.7 microhenry choke.

e. Between the two rear terminals of J2, connect C43, .005 mfd. ceramic disc capacitor, using the shortest possible leads. Solder all three terminals of J2.

f. Connect lead 36B (blue) to the terminal of X20 nearest the front of the chassis and solder.

g. Mount the low voltage switch SW1 (SPST) in the front edge of the chassis in the hole nearest the bottom edge of the chassis and just above the indicator light in X14A. Use the pair of hex nuts to adjust the switch shank so that about 1/4" to 5/16" protrudes thru the front of the chassis. Solder lead 29B (white) to one of the switch terminals, 30A (blue-orange) to the other. Turn the switch now so that the terminals are toward the underside of the chassis. (Put the knurled nut back on the switch to avoid losing it.)

h. Mount the high voltage switch SW2 (DPST toggle) above the 120 volt indicator light X13A using the pair of hex nuts and adjusting the length of shank protruding thru the front of the chassis to the same as that of SW1. The body of the switch should be perpendicular to the chassis, the bushing keyway toward the bottom edge of the chassis.

i. Solder leads 30B and 31A (both blue-orange) to the terminal to the left and nearest the underside of the chassis. On the same side of SW2, to the terminal farthest from the underside of the chassis solder leads 32A and 33A (both gray-red).

j. On the right side of SW2 solder lead 37A (black) to the terminal nearest the underside of the chassis. Solder lead 35B (orange) to the other terminal of SW2. (Put the knurled nut back to the switch.)

22. a. Locate the phone/CW switch SW3, 4 pole double throw ceramic wafer switch (marked 22.886 on switch face). Note that the switch is symmetrical. Looking at the switch from the rear call the first contact in a clockwise direction from either of the switch wafer mounting nuts, terminal #1. The

22. a. next terminal will be #2 and so on around the switch in a clockwise direction from the rear, the last terminal being numbered 12.

b. Connect R28 (20,000 ohms 20 watts) between terminals 8 and 11 (See figure 10). Since the leads will be used to support R28, they should be heavy, preferably #14 wire with the ends flattened so they will pass thru the switch terminals. Keep the leads short and R28 snug against SW3. Solder at the resistor terminals only.

c. Mount the phone/CW switch in the center of the front of the chassis using a 3/8" -32 nut only. Turn the switch so that R28 is toward the underside of the chassis and parallel to it. The resistor must be clear of the chassis.

d. Solder leads 51B (red), 47A (gray) and the lead of R28 to terminal 8 of SW3.

e. Solder lead 45A (yellow-blue) to terminal 5.

f. Solder lead 41B (gray-red) to terminal 4.

g. Solder lead 48A (green-white) and the lead of R28 to terminal 11.

h. Solder lead 44B (violet) to terminal 12.

i. Solder lead 35A (orange) to terminal 1.

j. Solder leads 2B and 34B (both brown) to terminal 2.

k. Solder lead 36A (blue) to terminal 3.

Terminals 6, 7, 9 and 10 will be left blank.

23. a. Locate the voltage divider resistor R13 (20,000 ohm wirewound). When the resistor was shipped from the factory, the shape of the slider tap may have been deliberately distorted so that it does not make contact with the resistance element. If so, the tap must be taken off the resistor, reshaped and put back on the resistor between 1 3/4 and 2 inches from the rear terminal of R13. Do not attempt to move the tap without first loosening it.

b. Mount R13 perpendicular to the front of the chassis as shown in Figure 10. One of the resistor mounting feet was earlier mounted under the nut for the final inductor L9. Place the open end of R13 over the bracket "V" and mount the other foot with a 1/4" 6-32 binding head screw, shakeproof washer and nut. Also, fasten a #6 solder terminal under the mounting nut.

c. Solder leads 42B, 43A and 44A (violet) to the terminal on the end of R13 nearest the rear of the chassis.

d. Solder leads 41A and 55 (both gray-red) to the slider of R13.

e. Solder leads 38B and 53 (both yellow) to the front terminal of R13.

f. Solder lead 51 (red) to pin #5 of X28. Connect short jumper from pin #5 to pin #6 of X28.

g. Pass lead 49B (green-white) thru the grommet in the chassis beside the PA plate choke L7.

23. h. Connect lead 55 (gray-red) to the center shield (used as an insulated terminal) of X28. Do not solder.

i. Solder lead 53 (yellow) to pin 2 of X28.

j. Solder lead 54 (blue) to the left terminal of R30 (looking at the potentiometer from the rear) with the terminals pointing away from you.

k. Solder a short jumper of W2 wire between the center terminal of R30 and pin 7 of X28.

l. Connect R29, 470,000 to 500,000 ohm 1/2 watt resistor between the center shield of X28 and the right terminal of R30 (looking at the potentiometer from the rear). Solder at X28 only.

m. Solder the "ground" or "outside foil" end of C56, .1 mfd 400 volt tubular capacitor to pin 5 of socket X3. Solder the other end of C56 to the terminal of R30 to which R29 was connected in the previous operation.

24. a. Turn the chassis right side up, the left end toward you (end opposite from crystal socket). Locate the meter switch SW7 (marked 11206 on switch face). Mount it in bracket BKT11 located on the front right corner of the chassis, using a 3/8" -32 nut only. The nuts used to assemble the switch should lie on a line perpendicular to the top of the chassis. The switch is symmetrical and may be turned with either nut up. Looking at SW7 from the rear, call the first terminal to the right of the top screw, terminal 1, the next in a clockwise direction 2 and so on around the switch, the last one being #12.

b. Solder the brown lead to terminal 6.

c. Strip 1 1/2" of insulation off the black lead, pass it thru terminal 5, slip a piece of spaghetti over the exposed lead and solder to terminal 9. Solder at terminal 5 also.

d. Solder the orange lead to terminal 4.

e. Strip 3/4" of insulation off the yellow lead, pass it thru terminal 3, solder at terminal 2. Solder also at 3.

f. Solder the violet lead to terminal 8.

g. Solder the white lead to terminal 10.

h. Solder the gray lead to terminal 11.

i. Solder the blue lead to terminal 12.

25. a. Connect lead 49B (green-white) to the bottom tap on the choke I7. Solder being careful not to dislodge the other components.

26. a. Wire the drive control R25 as follows: solder the red lead to the lug nearest the chassis.

b. Solder the white lead to the center lug.

26. c. Solder the black lead to the top lug.

NOTE: THE .005 MFD. CERAMIC DISC CAPACITORS IN THE FOLLOWING OPERATIONS SHOULD BE CONNECTED WITH THE SHORTEST POSSIBLE LEADS. ONCE AGAIN, DO NOT SOLDER TERMINALS UNTIL INSTRUCTED.

27. a. Connect C27, .005 mfd. between pin 2 and the ground terminal adjacent to pin 4 of X5.

b. Solder SH5, 2.2 ohms 1/2 watt between pin 2 of the buffer socket X5 and the ground terminal adjacent to pin 4.

c. Solder C26, .005 mfd. between pins 3 and 4 of X5.

d. Solder C21, .005 mfd. between pin 6 and the center shield of the buffer socket X5.

e. Connect R23, 47K ohms 1/2 watt between the second terminal from the front on X20 and pin 1 of the buffer socket X5.

f. Solder C20, .00005 mfd. silver mica capacitor (ruby red) between pin 5 of X6 running the other lead thru pin 1 of X5 to pin 7 of X5. Solder at all three points.

g. Connect R18, 100K ohms 1/2 watt between pins 1 and 3 of X6.

h. Solder a 4" piece of W2 wire to pin 1 of X6. Leave the remaining end unconnected for the time being.

i. Solder C16, .005 mfd. between pins 4 and 3 of X6.

j. Connect C15, .005 mfd. between terminal 7 and the center shield of the oscillator socket X6. Solder at center shield only.

k. Solder SH3, 5.1 ohm 1/2 watt resistor between pin 7 of X6 and the fifth terminal from the front of X20.

l. Connect R19, 68K ohm to pin 6 of the oscillator socket X6 and to the fourth terminal from the front of the chassis on X20.

m. Connect R20, 100 ohms 1 watt, extending through the grommet, to the fourth terminal from the front of the chassis on X20.

n. Solder L20, 4.7 microhenry choke from terminal 7 of the front deck of SW4(B) to the third terminal from the front on terminal board X20.

o. Solder C17, .005 mfd. between the fourth terminal from the front on X20 and the ground terminal at the rear of X20.

p. Beside the right side of the terminal board X20, solder C24, .005 mfd. between the second terminal from the front on terminal board X20 and the ground terminal under the front mounting nut of X20.

28. a. Solder C19, .005 mfd. connected to #7 of SW4A to the ground terminal under the mounting nut of the oscillator coil L4.

28. b. Connect C23, parallel .005 mfd. to the #10 ground terminal under the nut used to mount the bracket for SW4. Keep the leads very short.

29. a. Mount the buffer tuning capacitor C22, 75 mmf. with the long shaft, in the bracket under the inductor L5B, using two 3/8-32 nuts, the second nut serving as a locknut. The bottom of the stator is parallel to the underside of the chassis.

b. Solder two parallel conductors of #20 (W2) wire between the rotor of C22 and the ground terminal under the mounting nut for the bracket of SW4.

c. Connect the #14 lead of the auxiliary inductor L5B which comes from the top of the chassis, to the right hand stator terminal of C22. Make sure the #14 lead is centered in the hole and does not touch the chassis.

d. Between this same stator terminal and pin 5 of the buffer socket X5, solder a piece of W2 wire keeping it as short as possible while remaining clear of all components near it.

e. Check to be certain that all connections in the oscillator/buffer section are soldered, except pin #6 of X6.

30. a. Pass a #14 wire thru pins 4 and 8 of each 6146 socket (X7 and X17) and solder to the closest respective solder terminal installed earlier.

b. Connect pins 1, 6, 7, and 8 of each 6146 socket with #14 wire. Connect pin 6 of X17 to pin 1 of X7. (This can best be done by slightly deforming the socket terminals and forming the wire so that it will pass thru the holes in each of the terminals.) Solder at all points.

c. Using #20 wire (W2) connect pin 2 of X17 to pin 2 of X7 and solder at X7 only.

d. Solder a piece of #14 wire between pin 3 of X17 and pin 3 of X7. Then solder C28, .001 ceramic disc capacitor between pin 6 of X17 and the mid-point of the #14 wire connecting pins #3 of the two 6146 sockets.

e. Solder a piece of #14 wire between pin 5 of X17 and pin 5 of X7 making certain it clears all the other pins.

f. Between the mid-point of the wire just installed and the rear terminal of X21 connect RF choke L6, soldering the choke at the mid-point of the wire and using a #14 wire lead to connect to X21 and to support the choke. Do not solder at X21 as yet but solder at the end of L6.

g. Make up C25 by twisting the leads of the two 25 mmf. silver (ruby red in color) mica capacitors tightly together.

h. Solder C25 between the mid-point of the wire (installed in operation E), and the empty stator terminal of C22. Because of limited space it may be easier to connect C25 to the #14 wire lead from L5B.

i. Connect leads 13A and 14A (green) of the wiring harness to the terminal of terminal board X25 nearest the center of the chassis.

30. j. Between pin 3 of the socket X17 and the terminal of X25 nearest the crystal socket connect R35, 56 ohm 1 watt resistor. Solder at pin 3.

k. Between the terminal of X25 nearest the crystal socket and the ground terminal, solder C45, 0.001 mfd. ceramic disc capacitor.

l. Connect L23, open wound VHF choke between terminal 2 of X17 and the terminal of the terminal board X25 nearest the center of the chassis.

m. Connect C44, .005 mfd. ceramic disc capacitor between the terminal of X25 to which L23 was just connected and the ground terminal. Do not solder.

n. Solder C40, .005 mfd. between pins 2 and 1 of socket X17.

31. a. Place R24, 1800 ohm resistor on the chassis snug against the left side of terminal board X21 and connect between the end terminals of X21. Solder at the end terminal of X21 nearest the center of the chassis.

b. Connect shunt SH4, 5.1 ohms 1/2 watt between the front terminal of X21 and the fifth terminal from the front of the chassis on X21. SH4 should be on the same side of X21 as R24. Use the excess length of SH4 lead to jumper terminal 5 to terminal 4 of X21. Do not solder.

c. On the same side of X21, connect R17, 2700 ohms 1 watt, between the third and fifth terminals from the front of the chassis on X21. Do not solder.

d. On the other side of X21, connect R15, 1500 ohms, 1 watt between the second terminal from the front of the chassis and the ground soldering terminal under the front mounting nut of X21. Do not solder.

e. Also on the right side of X21, between the second and third terminals from the front of the chassis, solder R16, 820 ohms 1 watt.

f. Between the terminal of X21 nearest the front of the chassis and the ground terminal under the front mounting nut solder C39, .005 mfd.

g. Solder the fourth and fifth terminals from the front of the chassis on X21.

32. a. Mount the modulation transformer T4 (SNC P1992) atop the chassis between the meter switch SW7 and the 807 sockets X3 and X4, as shown in Figure 9, with 3/8" 8-32 screws, shakeproof washers and nuts. Use shakeproof washers under the screwheads as well as the nuts.

b. Snug against the right side of terminal board X19 connect C4, .1 mfd paper tubular capacitor, between the terminal of X19 nearest the front of the chassis and the rearmost terminal of X19. The ends of the paper tubular capacitors which are marked with black bands are connected to the outside foil. These are the ends which should be connected to ground or the low potential point.

Use the excess length of the rear lead to connect also to the ground terminal at the rear of X19. Push the capacitor back so there is no possibility of the front lead touching the ground lug adjacent to pin 4 of X2.

c. Next to C4, lying flat on the chassis, connect C54, 10 mfd. 25 volt

32. c. electrolytic capacitor, the positive terminal to pin 7 of socket X2, the negative terminal to the ground terminal under the mounting nut of X18. Solder the ground terminal.

d. On the left side of the terminal board, flat against the chassis and snug against X19, connect C1, 10 mfd. electrolytic capacitor between pin 7 of socket 1 and the terminal under the rear mounting nut of terminal board X19. Connect the positive end of the capacitor to pin 7, the negative end to ground.

e. Next to C1, connect C3, a .02 mfd. 400 volt capacitor between pin 6 of X1 and the rear terminal of terminal board X19, the foil end toward the rear of X19. Solder the rear terminal of X19 and ground terminal behind it.

f. Connect R2, 1800 ohms 1/2 watt between pins 4 and 7 of X1. The resistor is insulated so pull the leads thru the terminals and let the resistor lie against the bottom of the socket. Solder at both points.

g. Connect R31, 470 ohms 1/2 watt resistor between pins 4 and 7 of socket X2. Solder at both points. (This may appear as 510 ohms in the schematic diagram).

h. Connect R32, 1 megohm 1/2 watt resistor between pin 6 of X1 and the front terminal on terminal board X19. Here too, the leads can be kept very short. Solder at pin 6 of socket X1 only.

i. Bend one of the leads of R3, 470K ohms 1/2 watt resistor at right angles to the resistor body. Cut this same lead to 5/8" length and put a sharp bend in the lead 1/8" from the end. Connect this end to pin 5 of X1, connect the other end to the terminal of X19 nearest the front of the chassis.

j. Trim one of the leads of C2, .003 mfd. paper tubular capacitor to 1 1/8" length, put a sharp bend in the lead 1/8" from the end and connect to pin 5 of X1. Solder this terminal being careful to keep the iron away from C1. The other end of C2 will be left unconnected for the time being.

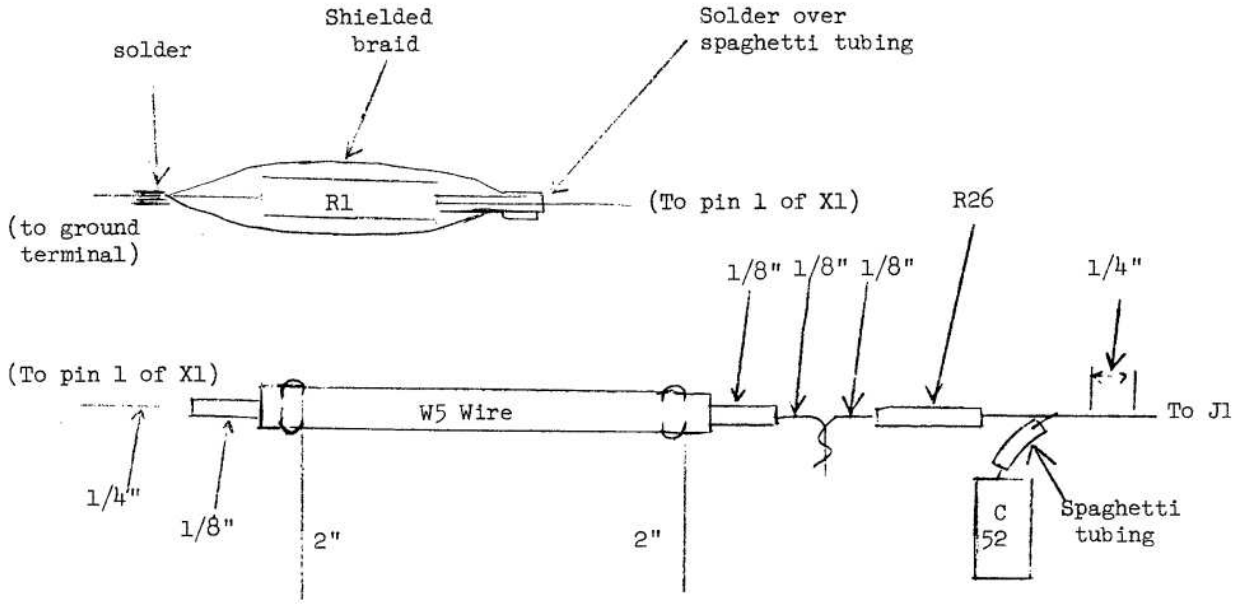
k. Connect R5, 22K ohms between the terminal of X19 nearest the front of the chassis and the center terminal to which the red harness lead was earlier connected. Solder the front terminals only.

l. Connect R37, 22,000 ohm 1/2 watt resistor between pins 5 and 6 of X2. Solder at pin 6 only.

33. a. Slip 3/8" of small spaghetti over one of the leads of R1, 1 meg ohm 1/2 watt. Locate the shielded wire W5, cut off 1" of both the wire and braid. Discard the inside conductor of the 1" piece just cut off. Over the end of R1 slide the 1" piece of shielding, this will be used to shield the resistor. (See the sketch on the next page.)

b. Form the braid snug over the spaghetti and draw the other end down tight over the resistor lead. Carefully tin the end of the braid over the spaghetti being careful not to melt the insulation, solder the other end of the braid to the resistor lead. This serves to shield the resistor R1.

c. Take the remaining piece of W5 shielded wire, slide the shield braid back



33. c. and trim off the insulation of the center conductor back 1/4". Hold the end of the braid back 1/8" from the end of the insulation of the center conductor, draw the braid thru the fingers tightening the braid over the center conductor. Wrap a 2" piece of stripped W2 (#20) wire around the end of the braid and solder. Twist the strands of the center conductor together and tin with solder. (See sketch on this page.)

d. At the other end of the shielded wire lead prepared in step c, you will find that the shield braid is longer than the center conductor. Cut the braid off flush with the end of the center conductor.

e. Slide the shield braid back, cut off 1/4" of the insulation of the center conductor and tin the stranded wires with solder.

f. Adjust the position of the shield braid so that it is back about 1/8" from the bare center conductor. Wrap one end of a 2" piece of stripped W2 (#20) wire around the braid and solder. This is to serve as another ground lead.

g. Connect the insulated lead of resistor R1 to pin 1 of socket X1. Connect the other end of R1 to the ground terminal adjacent to pin 4 of X1.

h. Solder the center conductor of the previously prepared shielded lead assembly to pin 1 of socket X1. Solder the ground lead of the assembly to the ground terminal adjacent to pin 4 of X1.

34. a. Mount the audio gain control R6 (1 meg. volume control) under the meter switch. Mount with a 3/8"-32 nut and turn the terminals toward SW3.

b. Using a short length of W2 wire but not taut, connect the terminal of R6 nearest the underside of the chassis to pin 2 of X2. Solder at both points.

c. Using a similar length of W2 wire, connect the center terminal of R6 to pin 1 of X2 and solder at both points.

d. Connect C2, .003 mfd. previously connected to pin 5 of X1 to the remaining terminal of R6 and solder.

e. Prepare the still free end of the shielded wire W5 (as shown on sketch) connected to pin 1 of X1 as follows: trim the tinned center conductor to 1/8". Cut one lead of R26, 22K ohms 1/2 watt, to 1/8" length. Solder this lead to the center conductor of the shielded wire. Slip the 1" length of large spaghetti over the resistor and the soldered connection to the center conductor of W5. Slip a 1" piece of small spaghetti over one of the leads of C52, 300 mmf. mica capacitor. With the spaghetti tight against the body of the condenser, hold the condenser so that the end of the insulation is flush with the end of the insulation of the resistor and twist the wires together. Solder the leads together and trim off all but 1/4" of the tinned leads. This will serve in a later operation to connect the center terminal of the microphone connector.

35. The modulation transformer has dual secondary windings, normally series connected by instructions a, b, and c following. If the Viking II modulator is to be used for driving a larger stage, suggestions for wiring can be found in the operating instruction manual.

a. Cut both the green/yellow and red wire of T4 to length and connect to the center terminal of X18. Solder all the leads on this terminal.

b. Trim the yellow wire of T4 to length and connect to the fourth terminal from the end of the chassis on X18. Solder all the leads on this terminal.

c. Cut to length both the red/yellow and green wires of T4 and solder to the end terminal of X18 nearest the center of the chassis.

d. Trim the blue transformer lead to length, strip off 3/8" of insulation, tin with solder and connect but do not solder to the second terminal from the chassis end on terminal board X18.

e. Trim the brown transformer lead to length, strip off 3/8" of insulation, tin with solder and connect but do not solder to the terminal of X18 nearest the end of the chassis. Save the excess lengths of the blue and brown leads.

f. Connect C55, .01 mfd. 1500 volt ceramic disc capacitor between the terminal of X18 nearest the end of the chassis and the second terminal from the end. Do not solder.

g. Install a large grommet in the hole between the 807 sockets X3 and X4. Connect the excess length of the brown lead (trimmed off in 37 e.) to the terminal of X18 nearest the end of the chassis. Solder. Run the brown

35. g. lead thru the grommet just installed.

h. Connect the excess length of the blue lead (trimmed off in 37 d.) to the second terminal of X18 from the end of the chassis and solder. Run the blue lead thru the grommet installed in 37 g. Be sure that C55 is not in contact with the chassis.

i. Trim the brown and blue leads (now above the chassis) to exactly the same length, strip off 3/8" of insulation and tin with solder. Slip a 1" length G17 (.133 ID black spaghetti tubing) over each of the leads. Trim one lead of R33 and one lead of R34 (both 22 ohms 1/2 watt) to 3/8" length. Form a hook in these leads. Solder one resistor (the lead with the hook) to the blue transformer lead, solder the other resistor to the brown lead. Solder an 807 plate cap (TC2 and TC3) to each of the remaining resistor leads keeping the leads as short as possible. When cool, slide the tubing on the leads over resistors and soldered connections.

36. a. Mount the audio driver transformer T3 (SNC P1503) underneath the chassis on the left end above terminal board X18, (See Figure 10) with the red and the blue leads up, the yellow, green and black leads nearest the under side of the chassis. Use 1/4" 6-32 binding head screws, shakeproof washers and nuts.

b. Connect the yellow lead to the terminal of terminal board X26 nearest the underside of the chassis.

c. Connect R10, 100 ohms 1/2 watt, between this terminal and pin 3 of socket X3.

d. Connect the green lead of T3 to the terminal of X26 nearest the bottom edge of the chassis.

e. Connect R11, 100 ohms 1/2 watt, between this terminal and pin 3 of the socket X4.

f. Connect C7, .001 mfd. paper tubular capacitor between the end terminals of X26. Solder at these end terminals and at pin 3 of sockets X3 and X4.

g. After cutting to length, solder the black lead of T3 to the center terminal of X26.

h. Run the red lead of T3 around the transformer and solder to the center terminal of X19.

i. Run the blue lead of T3 around the transformer, trim to length and solder to pin 5 of X2.

37. a. Mount the high voltage transformer T1 (SNC P1781) atop the chassis in the corner between the 807 sockets and the 5R4 sockets X8 and X9, using 3/8" 8-32 screws, shakeproof washers and nuts. Use washers under the heads of the screws as well as the nuts. (See Figure 9)

b. Trim one of the red leads to length and solder to pin 4 of the 5R4 socket X8.

c. Trim the other red lead to length and solder to pin 6 of the 5R4 socket X9.

37. d. Trim the black leads of T1 to length and connect one lead to each of the two rearmost terminals of terminal board X22. Solder all leads of these two terminals.

e. Trim the red/yellow lead of T1 to length, strip insulation and tin with solder, connect to the second terminal from the front of the chassis on X22 but do not solder.

38. a. Before mounting the choke L1 (SNC P1783) between the 5R4 sockets X8 and X9 and the 5V4G socket X10, note that there is a small hole in the chassis inside the square formed by the mounting holes of the choke. Insert from the top of the chassis, a 1/4" 6-32 screw, into this hole and secure with a 6-32 nut.

b. Mount the choke L1 atop the chassis using 3/8" 8-32 screws using shakeproof washers under both screwheads and nuts. (See Figure 9).

c. Trim to length, tin with solder and connect one of the leads of the choke L1 to pin 8 of X9. Do not solder.

d. Trim the other lead to length, tin with solder and connect it to pin 1 of X9. Do not solder.

39. a. Mount the filter choke L3 (SNC P1784) under the chassis to the rear of the crystal selector board, the choke parallel to the rear edge of the chassis and the leads emerging fron the side of the choke facing the front of the chassis. Secure only the end of the choke nearest the right end of the chassis using a 1/4" 6-32 binding head screw, shakeproof washer and nut. Transformer T2 will mount directly above and the other end of L3 will be secured by one of the mounting screws of T2. Knot the leads of L3 together so as to be able to identify them later and not inadvertently get them mixed up with the primary leads of the low voltage transformer T2.

b. Before mounting the low voltage transformer atop the chassis in the corner behind the crystal board, note that the red/yellow lead of T2 will come thru the large hole in the corner of the chassis and connect to the ground terminal under the mounting nut of terminal board X24. Since this will be a short lead and difficult to handle once the transformer is mounted, check the lead length required, trim to length, strip insulation from the end and tin with solder first.

c. Mount the low voltage transformer T2 atop the chassis using shakeproof washers under the heads and nuts for the 3/8" 8-32 screws. Secure the free end of choke L3 at the same time. The bundle of wires containing the red leads should project thru the 5/8" hole nearest the corner of the chassis.

Note: In connecting the leads of T2, leave a little slack so that when the leads are cabled to the wiring harness, they will not be drawn excessively tight.

d. Solder one of the yellow leads of T2 to pin 2 of the 5R4 socket X8.

e. Solder the other yellow lead of T2 to pin 8 of the 5R4 socket X9.

f. Starting now near the point where the leads emerge from the high voltage

39. f. transformer T1 lace all transformer leads together and to the wiring harness where they follow the same course across the rear of the chassis. Use the waxed cord furnished with the kit and lace up to the point opposite the 6-32 nut under the filter choke L1.

g. Lay the green leads from transformer T2 atop the yellow leads and just to the right of the point where the lacing was discontinued, put a right angle bend in the green leads toward the front of the chassis. Now tie the lacing off at this point using the last ties to secure the green leads at the bend.

h. Trim to length and connect one of the green transformer leads to the terminal of terminal board X25 nearest the center of the chassis (the terminal to which the open wound VFH choke is connected) and solder.

i. Trim to length and solder the other green transformer lead to the ground terminal under the mounting nut of X25 nearest the center of the chassis.

j. Trim to length, tin with solder and connect one of the brown leads of T2 to pin 8 of the 5V4G socket X10. Do not solder. Make sure this pin is in the vertical position to avoid shorting when the cabinet is installed.

k. Connect the other brown lead of T2 to pin 2 of X10 and solder.

l. Solder one of the blue leads of T2 to pin 1 of the bias rectifier socket X11. Make this lead about 2" too long and double it back against itself for about an inch. This will insure that when later lacing of leads is done, it will be possible to keep from straining the tube socket terminal.

m. Solder the other blue lead of T2 to pin 5 of socket X11.

n. Solder one of the red leads of T2 to pin 4 of the 5V4G socket X10.

o. Solder the other red lead of T2 to pin 6 of the 5V4G socket X10.

p. Route the black leads to terminal board X23 so that they follow the cable as far as socket X10. Solder one to the terminal of X23 to which the blue and orange lead was previously connected.

q. Connect the other black lead of T2 to the terminal of X23 to which the black/brown lead was previously connected. Do not solder.

r. Solder the red/yellow lead of T2 to the ground terminal under the mounting nut of terminal strip X24.

s. Route one of the leads of the filter choke L3 (SNC P1784) in the bundle of transformer leads to pin 6 of socket X11. Tin the end of the lead and connect to pin 6 but do not solder.

t. Route the other lead of L3 in the same manner and connect to pin 7 of socket X11. Do not solder.

u. Connect a short jumper of W2 wire between pins 2 and 7 of X11. Solder at pin 2 only.

39. v. Starting at the right end of the chassis, lace up all the transformer leads (they can be laced to the wiring harness at the same time) back to the point where the lacing was earlier tied off. Finish lacing at the point where the green leads branch off.

40. a. Choke L2 (SNC P-501) is to be mounted on the inside rear edge of the chassis directly under choke L1. One lead connects to pin 8 of the 5V4G socket X10. The other lead connects to pin 3 of X10. Before mounting L2, cut the leads to the proper length and tin the ends. Mount L2 using one 3/8" 8-32 screw, shakeproof washers and nuts. The screw nearest the socket X8 should be a 3/4" 8-32 extending thru the chassis from the inside. This screw will serve as the transmitter ground terminal. Use shakeproof washers under the screw heads as well as the nuts. Connect the leads but do not solder.

41. a. Mount the bias supply filter capacitor C12-13 (dual 15 mfd. 150 volt) parallel to the rear edge of the chassis next to resistor R13. See Figure 10. The negative (black and blue leads) should be to the right toward the 6AL5 socket X11.

b. Solder the positive leads (red, green) to the ground terminal under the rear mounting nut of the final tuning inductor L9.

c. Solder the blue lead to pin 7 of X11.

d. Solder the black lead to pin 6 of X11.

42. a. Mount the dual capacitor C10-11 (dual 15 mfd., 450 volts) parallel to the rear edge of the chassis with the black lead toward terminal board X22. (Bend the end of the mounting bracket and mount under the 6-32 nut below L1.)

b. Solder one of the positive capacitor leads to pin 8 of X10.

c. Solder the other positive capacitor lead to pin 3 of X10.

d. Cut to length, tin with solder and connect but do not solder, the negative (black) lead of the capacitor to the fourth terminal from the rear of the chassis on terminal board X22.

43. a. Pass the ends of shunt SH2 between the front terminal and the second terminal from the front of the chassis on terminal board X22. Solder at the front terminal only.

b. Pass the ends of shunt SH1 between the second and third terminals from the front of X22. Solder at the third terminal only.

44. a. Mount C8, .5 mfd paper tubular capacitor, parallel to the rear of the chassis behind 807 sockets X3 and X4 with the ground end toward X22. Solder one to a #6 ground terminal under the rearmost mounting stud of the 160 meter inductor L10.

b. Solder the other lead to pin 2 of the 807 socket X4.

45. a. Mount the high voltage filter capacitor C9, 8 mfd., oil filled on the left end of the chassis beneath the high voltage transformer T1, using the

45. a. mounting brackets furnished in the miscellaneous hardware package. Use 3/4" 8-32 screws, shakeproof washers and nuts with washers under the screw heads as well as the nuts. Mount the capacitor with as much clearance as possible between the capacitor and the components below.

b. Locate a sufficiently long red scrap of wire cut from one of the transformer leads and solder between the closest terminal of C9 and pin 1 of socket X9.

c. Similarly locate a long enough scrap of black wire cut from one of the transformer leads and solder between the remaining terminal of C9 and the second terminal from the front on terminal board X22.

46. a. Mount the fuse post X16 in the 1/2" hole beside the bias rectifier socket X11.

b. If available, use a scrap of one of the black transformer leads and solder between the body terminal of X16 and the terminal of X23 to which the white lead was previously connected. This will be the terminal nearest the underside of the chassis.

47. a. Lay the line filter assembly L13, consisting of three open wound chokes, (see Figure 10. d.) down on the bench with the mounting bracket toward you, the edge of the mounting bracket pointing up. The coils are L13A, L13B and L13C respectively from left to right.

The end of the line filter assembly toward you will now be called the front and the end away from you will be called the rear. The side of the filter exposed will be called the top while the side laying on the table will be called the bottom.

b. Solder a 4" length of W2 wire to the #6 teardrop terminal on the rear, bottom terminal of coil L13A.

c. Solder a 5" length of W2 wire to the #6 teardrop terminal on the rear, bottom terminal of coil L13B.

d. Install a large grommet in the 1/2" hole beside the terminal board X23.

e. Pass the line cord thru this grommet, tie an overhand knot in the cord leaving approximately 1" of the insulated leads extending from the knot. (Measure from the knot to the end of the insulation, do not include the tinned ends of the leads.)

f. Pull as much of the line cord as necessary through the grommet. Solder one of the tinned leads to the #6 teardrop terminal on the front, bottom terminal of L13A and the other lead to the front bottom teardrop on coil L13B.

g. Mount the antenna relay socket J5 on the rear edge of the chassis near the choke L2, using a 3/8" 4-40 screw, shakeproof washer and nut.

h. Solder 3" leads of W2 wire to each of the terminals of J5 to be later connected to the line filter assembly L13.

47. i. Mount the line filter assembly between terminal strip X23 and the choke L2, using 1/4" 4-40 screws, shakeproof washers and nuts. At the same time install three flat #6 solder terminals under these nuts, parallel to the rear edge of the chassis, a single terminal pointing toward X23 under the nut nearest X23 and a pair of terminals, one pointing each direction, under the nut nearest L2.

j. Trim to length and solder the 5" lead from the rear, bottom terminal of L13B to the center terminal of X23.

k. Trim to length and solder the 4" lead from the rear, bottom terminal of L13A to the end terminal of the fuse post X16.

l. Solder the wiring harness lead 52B (gray/red) to the teardrop terminal on the rear, bottom terminal of coil L13C.

m. Connect capacitors C41, C42 and C53, .005 mfd ceramic disc capacitors, each bypassing the front, top terminals of one of the sections of the line filter L13 to ground. Connect one capacitor between the front, top terminal and the ground terminal below each of the individual line filter chokes. Solder at the ground terminals and at the choke nearest X23.

n. Solder one of the leads from the antenna relay power socket J5 to the front, top terminal of coil L13B (center coil).

o. Solder the remaining lead from the antenna relay power socket J5 to the front, top terminal of coil L13C (coil nearest choke L2).

Check to see that all connections in this section are soldered.

48. a. Lay the VFO socket shield in place on the face of the octal ceramic wafer socket X12 and line up the holes in the shield with the holes in the socket. Fasten the shield temporarily in place with 6-32 screws and nuts. Bend the edges of the shield up slightly at the points where the small holes are punched.

b. Now, before mounting the socket and shield on the chassis, connect ceramic disc capacitors as follows: C51, .005 mfd. between pin 3 of the socket and the hole near the lip of the shield; C50, .005 mfd. between pin 8 and the hole in the lip of the shield; C49, .005 mfd. between pin 7 and the hole in the lip of the shield.

c. Using W2 wire connect socket pins 1, 2, 4, 5, and 6 to the lip of the shield. Solder all connections except terminals 3, 7, and 8.

d. Remove the temporary screws in the assembly, mount the corner (with chassis inverted) key slot away from the corner of the chassis. An octal plug or tube base may assist in centering the shield perfectly avoiding the possibility of later accidentally grounding the VFO plug pins. Use 1/2" 6-32 screws, shakeproof washers and nuts.

e. Wind choke L15, 15 turns self supporting W2 wire on a pencil or other form

48. e. approximately 1/4" in diameter. Solder between pin 7 of X12 and the terminal of X24 to which the green leads are connected.

f. Solder L16, 4.7 microhenry choke between pin 8 of the VFO power socket X12 and the terminal of X24 to which the brown lead is connected.

g. Solder L14, 4.7 microhenry between pin 3 of X12 and the terminal of X24, to which the red leads are connected.

49. a. Mount the bracket BKT7 under the chassis by means of 1/2" 6-32 screws, shake-proof washers and nuts thru the front of X15. The outside of the bend in the bracket is toward the front of the chassis.

b. Cover one of the leads of the 50 mmf. (tan) capacitor C14 with spaghetti and solder the end to the terminal of crystal position 6 at the point where it was soldered to the "U" shaped common lead on X15. Solder the remaining lead to pin 6 of the oscillator socket X6.

c. Mount the crystal selector switch SW8 (marked 22.628 on switch face) on the bracket BKT7, the shaft toward the front edge of the chassis. Looking at the switch from the rear, call the rotor terminal #1 and the next terminal in a clockwise direction 2 and so on around the switch, the last terminal being 12. Using a 3/8" -32 nut secure SW8 temporarily with terminals 1 and 7 lying on a line perpendicular to the top of the chassis.

d. Install one of the 3/8" -32 panel bearings D17 in the hole in front of the chassis in line with the shaft of SW8. The threaded portion extends thru the chassis to the front. Secure with a 3/8" -32 nut.

e. Slip one of the split sleeve couplings D19 on the shaft of the crystal selector switch SW8. Loosen the screws in BKT7 slightly.

f. Slip the 1/4" x 5 1/2" shaft extension D11 into the coupling D19, on the crystal selector switch SW8. Adjust the position of BKT7 slightly so that the shaft of SW8 and the shaft D11 line up nicely, then tighten the screws in BKT7 permanently. Remove the coupling D19 and shaft extension D11.

g. Solder the short lead from terminal 6 on the outside edge of the crystal board X15 to terminal 6 on SW8.

h. Solder the short lead from terminal 5 on the outside edge of X15 to terminal 7 of SW8.

i. Connect the 4" piece of W2 wire previously connected to pin 1 of X6 to the rotor terminal 1 on switch SW8.

j. Using #24 wire, connect and solder the outside terminal of crystal position 7 to switch terminal 5.

k. In the same way connect and solder a lead from crystal position 4 to switch terminal 8.

l. Connect crystal position 8 to switch terminal 4.

m. Connect crystal position 3 to switch terminal 9.

49. n. Connect crystal position 9 to switch terminal 3.

o. Connect crystal position 2 to switch terminal 10.

p. Connect crystal position 10 to switch terminal 2.

q. Connect crystal position 1 to switch terminal 11. Terminal 12 on the switch is left unconnected for the time being.

50. a. Prepare the RG-8/U cable F1 and the RG-59/U cable for installation exactly as per the drawings immediately following.

b. Using an additional 6-32 nut and a #8 shakeproof washer, mount a flat #10 solder terminal on the bottom, rear stator terminal of the output coupling capacitor C30. Turn the terminal up, tighten the nut, bend the terminal down so that it lies parallel to the top of the chassis.

c. Looking from the rear of the chassis, remove the bottom, left hand 6-32 screw used to secure the tie rod of the final tuning capacitor C29.

d. Pass the RG-8/U cable assembly thru the hole in the chassis beneath C30, from the top of the chassis. Connect the ground braid of the cable to C29 by means of the screw just removed. Insert the center conductor of the cable thru the #10 terminal just installed and solder.

e. Slide the hood over the shield braid of the cable, so that the rectangular end will fit the output connector, receptacle J3 (83-1R).

f. Solder the center conductor to the center terminal of receptacle J3.

g. Push the threaded portion of J3 thru the chassis from the inside, slide the hood down over the rear of J3 and secure J3 and the hood with four 3/8" 4-40 screws, shakeproof washers and nuts.

h. Solder the tinned braid of the cable to the hood being careful not to leave the iron long and overheat the insulation of the cable.

51. a. In the hole next to the VFO power socket X12, insert the threaded portion of the connector on the RG-59/U cable assembly G2, from inside the chassis. Secure with four 3/8" 4-40 screws, shakeproof washers and nuts.

b. Route the cable assembly to the right, parallel with the transformer cable to the right end of the chassis, toward the front of the chassis between the crystal selector board X15 and the end of the chassis.

c. Insert the #20 lead, soldered to the braid of G2, thru pin 2 of the oscillator socket X6, drawing the lead up as short as possible without straining the socket terminal. Solder the wire in the terminal.

d. Let the cable form a curve and solder to terminal 12, the only remaining empty terminal of the crystal selector switch SW8.

52. a. If possible use scraps of transformer leads for this operation. Solder a black lead to terminal 7 of the meter switch SW7. Solder a red lead to terminal 1 of SW7.

51. g. the bearing should be toward the chassis. Use a shakeproof washer left over from one of the switches, between the mounting nut and the panel. Tighten the bearing only finger tight.

h. Tentatively place the panel over the shafts of the transmitter, shifting shafts as necessary to get them to pass thru the panel holes.

i. Note which, if any, of the panel bearings or switch bushings keep the panel from slipping down over the threads. If necessary, loosen the nuts of the bearings causing the trouble and shift the positions of the components slightly. Push the panel down tight.

j. Fasten the knurled nuts on the switches SW1 and SW2, using fingers only. Secure the panel with 3/8-32 screws on all the bushings extending thru the panel. Be careful not to mar the panel with wrenches.

k. Loosen the dial indicator plate and the final tuning dial and adjust their positions so that the indicator is flush with the dial and clears the dial by about 1/32". Be careful that the nuts do not fall off the indicator plate. A bent piece of #14 wire is probably the best tool to adjust the dial indicator plate position.

l. Mount the microphone connector J1 in the front panel next to the gain control R6, discarding the insulated washers furnished with the connector.

m. Solder the twisted lead of the microphone filter assembly to the center hole in the connector J1. Solder the ground lead to the ground lug behind J1.

n. Tighten the panel bearing for the final tuning shaft making sure it does not bind. Do not tighten it excessively tight and if binding does occur it can be rectified by moving BKT1 slightly by loosening its mounting screws in the chassis.

o. Slip the split sleeve coupling D18 on the shaft of C18. Slide the 1/4" x $2\frac{1}{4}$" shaft extension D13 into the coupling from the front panel. Center the ends of the shafts in the coupling D18 and tighten.

p. Slip the split sleeve coupling D19 on the shaft of the crystal selector switch SW8. Slip the 1/4" x 5 1/2" shaft extension D11 into the coupling, center the ends of the shafts together and secure.

q. Solder the red meter lead to the terminal of the meter filter terminal board X27 nearest the end of the chassis. Solder the black meter lead to terminal of X27 nearest the output coupling capacitor C30.

52. a. Install the knobs and dials as follows:

Control Function	Dial	Control Position	Dial Reading
Crystal switch SW8	10 - 0	Extreme counter clockwise	0
Buffer tuning C22	0 - 100	Plates meshed	0
Phone-CW switch SW3	Single Mark	Extreme counter clockwise	CW
160 meter switch SW6	Single Mark	Extreme counter clockwise	Out
Gain control R6	10 - 0	Extreme counter clockwise	0
Oscillator tuning C18	100 - 0	Plates meshed	0
Bandswitch SW4	160 - 10	Extreme counter clockwise	160
Excitation control	10 - 0	Extreme counter clockwise	0
Final tuning L9, C29	Spinner	C29 meshed, L9 at stop	0
Coupling SW5	7 - 1	Extreme counter clockwise	1
Fine coupling, C30	100 - 0	At clockwise stop	0
Meter switch SW7	Off - Mod	At counter clockwise stop	Off

53. a. This is the stage now where the testing should be done. Read the Instruction Manual warnings and notices on the first three pages, Theory of Operation and Tuning Details before testing. The following instructions are fairly complete in themselves but familiarity with operating procedure is very helpful. The transmitter should not be placed in the cabinet until after testing thoroughly. First look over the wiring carefully for unsoldered connections, accidental grounds and other mechanical difficulties. A half hour spent now may save hours later.

b. Loosen both taps on the voltage divider R13 and adjust the position of the rear tap to approximately 1/3 of the distance from the end nearest the center of the chassis. Adjust the forward tap to a position slightly forward of the center of R13.

c. Install the 5 amp fuse F1 in the fuse holder X16 and with both switches on the front of the panel down (off), plug the line cord into the 115 volt 60 cycle AC line source.

d. Next, with all the tubes out of their sockets, throw the low voltage switch (left hand toggle switch) "on" to determine if line voltage is applied to the primary of T2. This will be evidenced by the green jewel lighting.

e. If no trouble is encountered at this stage, throw the high voltage switch, leaving the low voltage switch "on". The red jewel should light indicating that power is applied to the primary of T1.

f. Turn off the H.V. switch and plug the 5V4G rectifier into socket X10. Check the voltage between ground and the fourth terminal from the front of the chassis on terminal board X20. It should be somewhere around 380 volts positive with respect to ground when the line voltage is 120 volts.

g. Plug the 6AL5 bias rectifier in the socket X11. This should produce a voltage of approximately 80 volts negative with respect to the chassis on the front terminal of terminal board X21. Voltage at the second terminal from the front of the chassis on X21 should be approximately 25 volts. Voltage at the third terminal from the front should be around 40 volts. These readings taken with a 20,000 ohms per volt meter, may be less on a 1,000 ohm per volt meter.

53. h. Set the phone/CW switch on CW. Next, plug the 6AU6 oscillator tube into socket X6 and switch the meter to the "osc" position. Oscillator current without a crystal will be approximately 14 ma to 20 ma. With an active 160, 80 or 40 meter crystal plugged into the crystal socket corresponding to the crystal switch dial, the current should drop markedly to around 7 to 10 ma. The meter reads 25 ma. full scale. Leave the crystal in the circuit. Turn off the low voltage.

i. Next, plug the 6AQ5 buffer into socket X5, set the bandswitch to the setting corresponding with the fundamental frequency of the crystal. Turn on the low voltage. Turn the drive control R25 clockwise about half way. With the meter switch in the "bfr" position, tune the oscillator condenser C18 to the position where the 6AQ5 buffer plate current rises to a peak. This rise in plate current indicates the 6AQ5 is receiving excitation.

j. This step involves application of drive to the 6146 amplifier tubes. Be sure to keep the grid current for the 6146 tubes to 8 ma. or less at all times! Turn off the low voltage, plug the 6146's into sockets X7 and X17, connect the plate caps, turn the low voltage back on. Tune the buffer condenser C22 for peak grid current turning the drive control R25 counter clockwise as necessary to keep grid current below 8 ma. The buffer plate current at this point will depend upon its output frequency. At the fundamental frequency of the crystal it may be quite low whereas, if the transmitter is operating on 10 meters with a 40 meter crystal for example, the buffer current will be higher. In the "bfr" position the meter reads 50 ma. full scale.

k. Turn the drive control to the extreme counter clockwise position removing excitation to the 6146's. Plug the 5R4GY rectifiers into their sockets X8 and X9.

l. Keep the 807 plate caps away from ground. Don't touch them! They have full plate voltage on them. Turn the meter switch to the "plt" position, turn on high voltage switch. The meter will kick up momentarily then drop back to zero or nearly so. The plate voltage, measured at the lug of the voltage divider R13, nearest the center of the chassis will be around 700 to 800 volts depending on the line voltage.

m. Turn the drive control up until the 6146's draw about 100 ma. plate current (read on the "plt" position of the meter switch).

n. Tune the final amplifier to resonance starting with the tuning capacitor C29 fully meshed (dial reading 0). This precludes the possibility of tuning the final amplifier to a harmonic. Resonance is the first point where the current dips sharply. (Note: On 10 meters the amplifier cannot be tuned to resonance unless the coarse coupling switch SW7 is on position 7.)

o. Adjust the amplifier for minimum antenna coupling (C30 fully meshed and with the coarse coupling switch on position 1), attach the antenna and re-tune the amplifier to resonance (minimum plate current). Now load the antenna by turning the coarse coupling switch to position 2, retune C29 for minimum current, turn the coarse coupling switch to position 3, re-tune C29 and so on. A point will be reached where the minumum amplifier plate current is now at a somewhat higher level indicating that the amplifier is at least partially loaded. At this point, bring the grid current up to its normal value of 6 ma. The plate current will now be considerably higher. Continue

53. o. tuning the amplifier as before using SW7 and C30 as a fine coupling control always bringing the amplifier back to resonance with C29 after each adjustment of C30 or SW7. The loaded plate current should not exceed 300 ma., may be somewhat lower before the taps on R13 have their final adjustment. When fully loaded, no matter what the current there should still remain a perceptible difference between the out of resonance plate current and resonant plate current. Do not load beyond the point where a perceptible dip can be obtained.

p. The adjustable tap on R13 nearest the front panel is used to set the screen voltage for the 6146's. Don't try to adjust the tap with the plate voltage on! Also, when moving the tap, loosen it sufficiently so that the resistance wire is not damaged as the tap is moved. By trial and error, adjust the tap so that the screen voltage (pin 3 of X7 and X17) is 195 volts with the amplifier drawing 300 ma. in the CW position. Note: At this point when testing, it is possible to apply excessive excitation unless care is used with the amplifier fully loaded on CW and with 6 ma. grid current, grid current will exceed 8 ma. if the high voltage is switched off. For this reason, when shutting down the transmitter during adjustment, switch off the LV switch first, then the HV switch.

q. Next, turn off both power switches and plug in the 6AU6 amplifier tubes in sockets X1 and X2. Plug the 807's into sockets X3 and X4 and attach plate caps. Turn on the Low voltage switch, watch the grid current!

r. With the audio gain control turned to the "0" position, with the phone/CW switch in the "phone" position and with the amplifier loaded, throw the high voltage on. If a whistle is heard from the modulation transformer, turn the high voltage off, discharge the high voltage supply by shorting the 807 plate caps to ground, reverse the 807 plate caps.

s. Again, with the high voltage off, adjust the tap on R13 nearest the center of the chassis so that the static plate current of the 807 modulators as read on the "mod" position of the meter switch, is between 60 and 80 ma., preferably toward 80 ma.

t. Attach the microphone to the mike input connector and adjust the audio gain control for 100% modulation (approximately 175 ma. "mod" current peak swing.)

u. Before assembling the transmitter in the cabinet, it is a good plan to check it on all bands and become somewhat familiar with its operation.

54. a. Install the Viking II in the cabinet. With the large rectangular cutouts at the bottom, slide the assembly 23.995-1 (back and sides of the cabinet) under the rear edge of the transmitter chassis. The screw holes in the ends of this assembly will line up with the 5 tapped holes at each end of the front panel.

b. Using 5/16" 8-32 binding head screws and #8 shakeproof washers, secure the assembly 23.995-1 to the front panel. Access to the lower screw holes is best obtained by placing the end of the transmitter chassis flush with the edge of the work bench thus permitting you to work from the bottom. If a long screwdriver is used, the blade of which fits the screw slots snugly, then wax or some other material can be used to hold the screws on the driver, greatly simplifying this operation.

54. c. Using 3/8" #8 threadcutting screws and shakeproof washers, secure the back panel of the cabinet to the rear of the transmitter chassis. The end of one screw will be very close to pin #8 of the 5V4G socket X10. Bend the solder tab of this socket contact straight up and be sure there are no stray strands of wire which can accidentally short to the screw. One of the other screws will touch one of the terminals of the 5R4GY socket nearest the rear of the chassis, however, this terminal is blank and no harm will be done.

d. Using a flat washer under the head of each 1/2" 10-32 screw mount the four rubber feet 22.825 on the bottom plate, securing them with #10 shakeproof washers and 10-32 nuts.

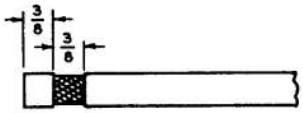
e. Install the bottom plate using 5/16" 8-32 binding head screws and #8 shakeproof washers.

f. With crystals, tubes and tube shields all in place and with plate caps connected on both 6146's and 807's install the top cover 23.993-2. With the folded edge to the rear, slide the lip of the lid between the panel contact springs and the top edge of the panel.. Secure the rear of the top cover with three 1/2" 10-32 thumb screws.

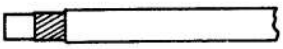
This completes assembly of the Viking II transmitter. Detailed operating instructions and servicing data will be found in the companion book "Operating Instructions, Viking II Transmitter".

ASSEMBLY DETAILS

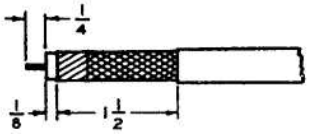
RG-8/U OUTPUT CABLE



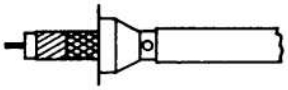
Strip off outer jacket only being coreful not to disturb the copper braid.



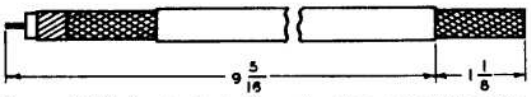
Tin the copper braid with solder, remove oll excess solder. After cooling remove end piece of outer jacket and untinned broid, os shown.



Cut outer jacket insulation and center conductor insulation ond remove per drowing.

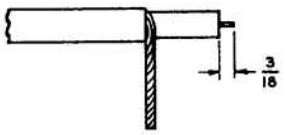


In order to slide hood H1 (Amphenol 83-1H) over the tinned braid it will either be necessary to enlarge the hole in H1 by reoming with the nose of o closed pair of long nosed pliers or corefully filing the tinned braid until it will pass easily thru the hood. After checking to see that H1 now passes over the broid, remove it for the time being.

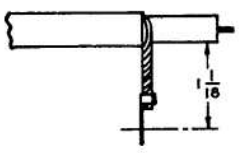


Remove 1⅛" of outer jacket from the other end of the coble.

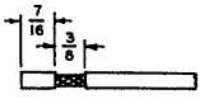
Unbraid the shielding ond prepore the center conductar as shown.



Cut off one of the clomps of one of the heavy No. 10 solder terminals. Clomp the terminal tightly in the exact position shown but do not solder until ofter the cable has been installed.

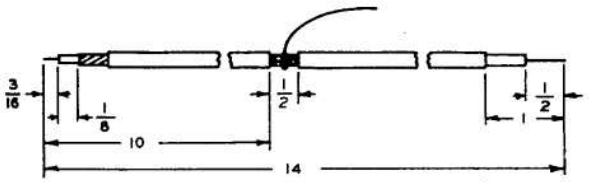


RG-59/U VFO INPUT CABLE



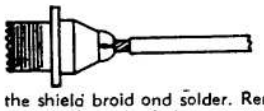
Remove outer jacket os shown.

Tin the copper braid with solder. After cooling, remove end piece of outer jacket and untinned broid as shawn.



Remove ½" of outer jacket 10" from one end os shown ond prepare ather end by removing 1" of outer jacket ond shield braid, strip ½" of insulotion from center conductor. Solder a 3" length of No. 20 wire (stripped W2) to the braid where outer jacket was removed.

Using diogonal cutters cut the metol awoy from the holes in H2 (Amphenol 83-1H) os shown.



Solder the center conductor to the center terminol of one of the 83-1R receptacles. Slide the hood over the RG-59/U coble, bend down to the shield broid ond solder. Remove the iron quickly so os not to melt the polyethylene center conductor.