

ASSEMBLY INSTRUCTIONS  
VIKING VALIANT I CONVERSION KIT  
PART NO. 250-47

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ASSEMBLY INSTRUCTIONS  
VIKING VALIANT I CONVERSION KIT  
PART NO. 250-47

A. INTRODUCTION

This manual contains the step-by-step assembly procedure which should be followed in installing the Viking Valiant I Conversion Kit.

The satisfaction and value derived from any equipment is largely determined by the care and skill with which it is built. Do not attempt to rush through the construction but follow each step of the assembly details carefully and completely before proceeding to the next step. Read carefully and understand fully each step before proceeding with the required action. A small bracketed space is provided before each step of instructions for a check mark after the completion of the step - thus providing a day to day record of what has been assembled. A few moments of extra time and care connecting the leads or mounting the components will be well rewarded in the performance of the unit.

The kit has been packaged for the convenience of the builder by placing the small parts in identifying containers. Before any assembly is started, the kit parts should be checked against the parts list in this instruction manual. The illustrations furnished with this assembly manual will also be useful in further identifying the component parts. Do not remove the hardware from the envelopes until they can be placed in small boxes or containers, along with the envelope, for convenience during assembly of the unit.

If possible a clear table or work bench should be used with the hardware and small components, in their containers, on one side within easy reach of the assembler. Provide a large space on the table for maneuvering the chassis when assembly begins. A nominal list of tools for assembling the kit should include a good clean soldering iron, a 1/8" wide blade screwdriver, a 1/4" wide blade screwdriver, a sharp knife, long nose pliers, diagonal cutters, a 5/16" and a 1/4" Spintite type wrench, a ruler, and a soldering aid probe tool. Four drills of 5/32, 7/32, 25/64, 1/2 inch diameter and 7/8 inch diameter socket punch are required. Use good rosin core solder only and keep the soldering iron hot and clean to assure good solder connections. Be especially careful for cold solder joints which can become very troublesome. A little time spent in "setting up shop" for assembly of the unit will be well worth while in added ease and enjoyment of the assembly.

The following terminology and symbols are used to identify components and assembly operations in the assembly instructions.

<u>Component Letter</u>	<u>Description</u>
BKT	Bracket
CH	Chassis, panels, shield, mounting board assembly
C	Capacitor
F	Fuse
FH	Fuse holder
H	Harness
HW	Hardware
J	Coax connector, power plug, jack
P	Plug
R	Resistor
SW	Switch
TS	Terminal strip
W	Cable, tubing, wire
XV	Socket, tube

<u>Symbol</u>	<u>Description</u>
(S)	Solder the wire to its terminal
(NS)	Do not solder the wire to its terminal
A, B, C etc.	Harness lead break-out points

## B. GENERAL DESCRIPTION

The Viking Valiant I Conversion Kit, part number 250-47, is designed to make the Valiant I more compatible for SSB operation with the Viking SSB Adapter, part number 240-305-2. The Conversion Kit installation will not change the adjustment or operation of the Valiant I.

The kit contains the necessary components and step by step instructions to accomplish the following in the Valiant I.

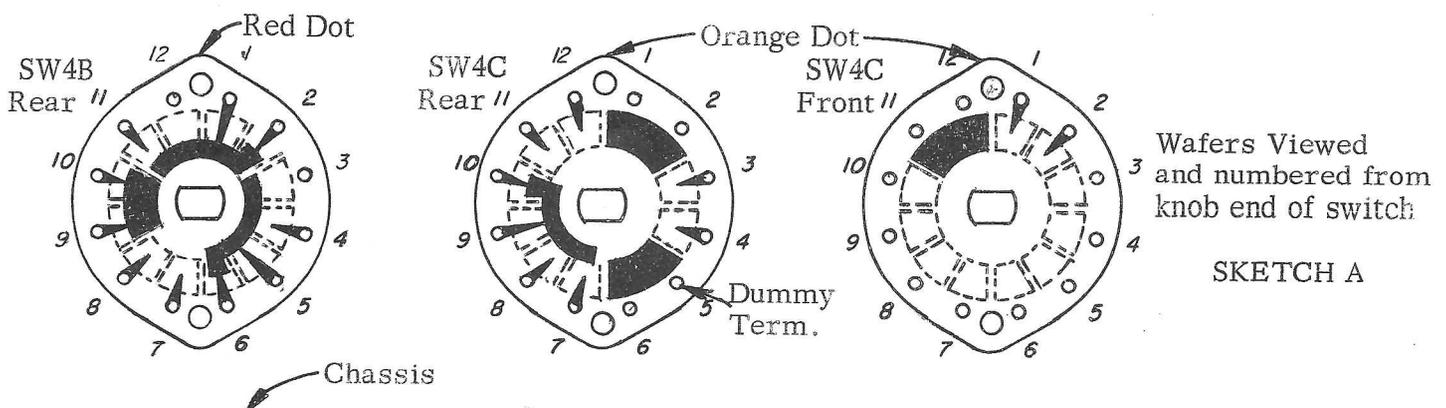
1. Provide a coaxial termination of the VFO output.
2. Complete suppression of VFO leakage through the buffer stage.
3. Improvement of "zeroing" in SSB operation.
4. Provision for switching the Valiant final bias from operate to blocking bias using the SSB Adapter relay.
5. Provision for keying the VFO using the SSB Adapter relay.
6. Protection from loss of bias on the Valiant final tubes if plug P10 is left out or when switching the Valiant from SSB to either the AM or CW mode.

## C. ASSEMBLY INSTRUCTIONS

Completely disconnect the Valiant I and remove it from its cabinet. Remove the 866 tubes and place the Valiant on its top with appropriate wooden blocks under each of the two transformers so the chassis is level with the work bench surface. The rear apron of the chassis should be nearest to the operator.

1. ( ) Remove the open type fuse holder, FH1, and the ground terminal screw from the rear apron of the chassis.
2. ( ) Refer to FIG. 2 for the location of all holes to be drilled in the rear apron of the chassis.
  - a. ( ) Drill a 25/64" (.390") diameter hole next to J5.
  - b. ( ) Punch a 7/8" (.875") diameter hole and drill two 5/32" (.156") diameter holes next to J6.
  - c. ( ) Drill or cut a 1/2" (.500") diameter hole next to the 7/8" hole punched in step b. above.
  - d. ( ) Drill a 7/32" (.219") diameter hole adjacent to J8.
3. ( ) Mount the new fuse extractor post, FH1 (part no. 22.739-2), in the 1/2" (.500") diameter hole as follows from the outside of the cabinet: fuse post, rubber washer, chassis and nut. Tighten the nut carefully so as not to break or crack the fuse holder. Insert the old fuse in the holder.

4. ( ) Mount the 5 pin jack, J9 (part no. 22.1585-1), in the 7/8" (.875) diameter hole as follows: (Refer to FIG. 1 for orientation of the jack and solder lugs). Insert one 6-32 x 1/4" binding head screws (11.114-1/4) at each mounting hole, chassis, J9 mounting flange, teardrop soldering lug (22.1016-1), 6-32 hex, nut (12.02-1). Tighten both screws securely.
5. ( ) Reinstall the ground terminal screw in the 7/32" (.219") diameter hole between J6 and J8 (see FIG. 2) as follows: From inside the chassis, 8-32 x 1/2" screw, #8 lockwasher, chassis, #8 lockwasher, 8-32 hex. nut. Securely tighten the screw and then add one 8-32 hex. nut.
- 6a. ( ) Connect terminal 3 of J9 to the adjacent ground lug with a short length of #20 tinned wire (71.271-22). Solder terminal 3 only.
- 6b. ( ) Cut the leads of the four .01 mf. 500 WV disc ceramic capacitors (22.1097-1) each to a length of 1/2" and connect one each between terminals 1, 2, 4 and 5 on J9 (NS) and the nearest solder lugs (S).
- 6c. ( ) Cut the leads of the 150K ohm 1/2 watt resistor (22.5101-10) to 5/8" length and connect between terminals 1 and 5 of J9 (NS).
7. ( ) Remove the end of the gray wire from terminal 4 of TS13 (see FIG. 1) the other end of which connects to the center terminal of R62 (R.F. bias control). Use an ohmmeter to determine which of the two gray wires connects to R62. Connect this end of the wire to terminal 3 of TS13 (NS). Leave the other gray wire on terminal 4 of TS13 (NS).
8. ( ) Locate the MODE SWITCH, SW4, and turn its knob to the counterclockwise position or CW position. The three wafers, going from the panel to the rear of the chassis, are identified as follows: Front - SW4A, middle - SW4B and end - SW4C.
9. ( ) Disconnect the SSB input cable, the R.F. choke, the two parallel 100 ohm 2 watt resistor, the 50 mmf. mica capacitor and the lead on terminal 9 from switch wafer SW4C.
10. ( ) Disconnect from switch wafer SW4B the yellow wire, the violet wire, the red wire, the black wire to ground, the gray wire and the black jumper wire (from terminal 8 of SW4A).
11. ( ) Remove the two nuts that hold the wafers on switch SW4 and remove wafer SW4C, the two long spacers and wafer SW4B. Retain the spacers, phenolic washers and nuts for later use.
12. ( ) Observe that the two new wafers supplied in the kit are color coded. Wafer SW4B (22.1295-12) has a red dot and wafer SW4C (22.1295-11) has an orange dot as shown in the following Sketch A.



13. ( ) Make the following jumper connections on the new SW4B wafer.
  - a. ( ) Terminal 9 to terminal 11 using a 1 1/4" length of orange covered wire (NS).
  - b. ( ) Terminal 6 to terminal 8 using a 1 1/4" length of black covered wire (NS).
  - c. ( ) Terminal 2 to terminal 4 using a 1 1/4" length of violet covered wire (NS).
  
14. ( ) Make the following jumper connections on the new SW4C wafer.
  - a. ( ) Terminal 10 to terminal 11 using a 1" length of #20 tinned wire (NS).
  - b. ( ) Terminal 1 (front view) to terminal 7 (rear view) using a 2 1/2" length of black plastic covered wire (solder at terminal 1 only).
  
15. ( ) Orient the rotors of the new wafers SW4B and SW4C so the shaft-slot-flats are toward the two mounting holes. When in this position, the long contact 9 is connected to contact 10 on SW4C and the contact 1 is connected to contact 2 on SW4B. See Sketch A.
  
- 16a. ( ) Install the new SW4B with the red dot side of the wafer away from the chassis and phenolic washers on both sides of the wafer. See Sketch A.
  
- 16b. ( ) Replace the two long spacers, two phenolic washers, the new SW4C wafer (with orange dot away from the chassis as shown in Sketch A), two phenolic washers, two split lockwashers and two 4-40 nuts. Carefully tighten the nuts.
  
17. ( ) Reconnect the following wires to SW4B, the middle wafer.
  - a. ( ) Reconnect the yellow wire to terminal 1 (S).
  - b. ( ) Reconnect the violet wire to terminal 4. Solder terminals 2 and 4.
  - c. ( ) Reconnect the red wire to terminal 5 (S).
  - d. ( ) Reconnect the black wire (from ground) to terminal 6. Solder terminals 6 and 8.
  - e. ( ) Reconnect the gray wire and the black jumper (from terminal 8 of SW4A) to terminal 7 (S).
  - f. ( ) Solder terminal 9.
  
18. ( ) Reconnect the following wires and parts to SW4C, the end wafer.
  - a. ( ) Reconnect the two parallel 100 ohm resistors to terminal 12 (NS).
  - b. ( ) Reconnect C29 (50 mmf. mica capacitor) and L14 (2.4 mh R.F. choke) to terminal 10. Solder both terminals 10 and 11.
  - c. ( ) Reconnect the lead from terminal 8 of socket XV4 to terminal 9 (S).
  - d. ( ) Connect a 1 1/4" #20 tinned wire lead to terminal 7 (S) and to the closest ground lug on XV-11 (S).
  - e. ( ) Replace the C101 (100 mmf. capacitor) with the .005 mf. disc capacitor (22.827) and connect it between terminal 12 (S) and the dummy terminal 5 (NS).

- f. ( ) Reconnect the SSB input coaxial cable inner conductor to the dummy terminal 5 (S).
19. ( ) Install the cable harness supplied with the kit so breakout "A" (see FIG. 3) is positioned between J9 and the line filter terminal strip TS17 (see FIG. 1). Lay the harness along the main cable with breakout at switch wafer SW4C.
20. ( ) Make the following connections with the wires from the harness breakout "A".
  - a. ( ) Connect the gray wire to terminal 1 of J9 (S).
  - b. ( ) Connect the orange wire to terminal 2 of J9 (S).
  - c. ( ) Connect the yellow wire to terminal 4 of J9 (S).
  - d. ( ) Connect the white wire to terminal 5 of J9 (S).
21. ( ) Make the following connections with the wires from the harness breakout "B".
  - a. ( ) Connect the two orange wires to terminal 3 of terminal strip TS13 (S).
  - b. ( ) Connect the two gray wires to terminal 4 of terminal strip TS13 (S).
22. ( ) Make the following connections with the wires from the harness breakout "C".
  - a. ( ) Connect the white wire to terminal 4 of SW4C (S).
  - b. ( ) Connect the black wire to terminal 3 of SW4C (S).
  - c. ( ) Connect the white-blue-orange wire to terminal 2 of SW4C (S).
23. ( ) Make the following connections with the wires from the harness breakout "D".
  - a. ( ) Connect the white wire to terminal 3 on potentiometer R39 (S). See FIG. 1 for location of R39.
  - b. ( ) Connect the yellow wire to terminal 7 of socket XV-11 (S). See FIG. 1 for location of socket XV-11.
24. ( ) Make the following connections with the wires from the harness breakout "E".
  - a. ( ) Route all 5 uncabled wire ends under SW4B.
  - b. ( ) Connect the gray wire to terminal 11 of SW4B (S).
  - c. ( ) Connect the orange wire to terminal 10 of SW4B (S).
  - d. ( ) Connect the white wire to terminal 4 of J7 (S) located on the front of the chassis (see FIG. 1).
  - e. ( ) Connect the black wire to terminal 1 of socket XV3 (S).
  - f. ( ) Connect the white-blue-orange wire to terminal 3 of socket XV3 (NS).
25. ( ) Remove the VFO shield mounting nut located near terminal 8 of TS6 (see FIG. 1). Mount the two lug terminal strip, TS52 (22.837), with this hardware and position the strip at right angle to TS6. Place shakeproof washer between chassis and mounting foot.

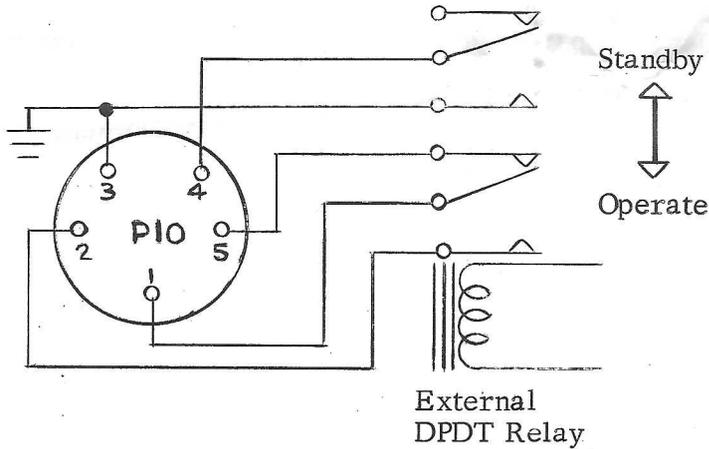
26. ( ) Cut the leads of the 15 mmf. durmica capacitor, C113 (22.4029-10), to a length of 1/2" and connect one end to terminal 8 of TS6 (S).
27. ( ) Connect the other end of the 15 mmf. capacitor to ungrounded terminal 2 of TS52 (NS).
28. ( ) Prepare the 15 3/4" length of RG-62/U coaxial cable as shown in FIG. 4.
29. ( ) Carefully insert the cable through the small hole in the coax. retainer cap (13.1051). In the same manner, pass the cable through the coax. shield adapter (13.1050). Push both parts back against the outside polyethelene jacket of the coax. so the inner conductor is exposed.
30. ( ) Pass the phono jack, J10 (22.1868), through the 25/64" (.390") diameter hole near J5 from the outside of the chassis. Make a small hook at the end of the inner conductor of the RG-62/U coax. cable and solder it to the center terminal of J10, the phono jack.
31. ( ) Secure J10 to the chassis by turning the coax. shield adapter on to it and tighten securely.
32. ( ) Using a sharp pointed tool, pull the shield out of the adapter and "comb" it around the small end of the coax. shield adapter as shown in FIG. 4. Tighten the retainer cap to the shield adapter just enough to secure the coax. shield wires. Over tightening the retainer cap will cut the coax. shield wires. Position the coax. cable along the SSB input coax. cable and tie it to the main cable.
33. ( ) Connect the other end of the RG-62/U cable inner conductor to terminal 2 of TS52 (S). Connect the shield to the ground lug on socket XV3 (S).
34. ( ) Remove the 68K ohm 1 watt resistor, R8, which is connected to terminal 6 of socket XV11 and terminal 3 of socket XV3.
35. ( ) Connect the 150K ohm 2 watt resistor (22.7101-10) and the 120K ohm 2 watt resistor (22.7099-10) in parallel. Solder both wire junctions. Connect one end of the two parallel resistors to terminal 6 of socket XV11 (S) and connect the other end to terminal 3 of socket XV3 (S).
36. ( ) Cut one lead of C112, .01 mf. 1500 WV disc ceramic capacitor (22.826-1) to a length of 1/2" and the other lead to a length of 1 9/16". Connect the end of the shorter lead to terminal 1 (bottom) of L5 which is located between XV3, XV11 and TS6 (S). Slide a 1 3/8" length of plastic tubing over the longer lead and connect it to terminal 8 of SW4C (S).
37. ( ) Set the Valiant on its bottom, replace the 866 tubes and place the unit in its cabinet. This completes the installation of the Conversion Kit except for the installation of P10 (22.1731) which is described in the following section.

#### D. EXTERNAL RELAY CONNECTION AND PLUG P10.

When the Conversion Kit is installed in the Valiant I, jack J9 provides the necessary termination for switching bias from operating to blocking values and for keying the VFO. When the Valiant I is used with the Viking SSB Adapter, the relay in the Adapter provides the necessary switching functions.

If the Valiant I is operated by itself or used with an SSB exciter that does not have a relay to provide bias switching and VFO keying, P10 must be inserted into J9. A jumper of #20 wire must be soldered to pins 1 and 2 of P10 to provide operating bias on the final amplifier when the mode switch is turned to SSB. Connections on switch SW4B provide operating bias on the final amplifier in the AM and CW modes.

Connections of an external relay to the Valiant I jack, J9, for SSB exciters other than the Viking SSB Adapter are shown below at Sketch B.



- Pin 1 of P10 connects to 6146 grids
- Pin 2 of P10 - operating bias
- Pin 3 of P10 - ground
- Pin 4 of P10 connect to relay if Valiant VFO is used
- Pin 5 of P10 - blocking bias

SKETCH B

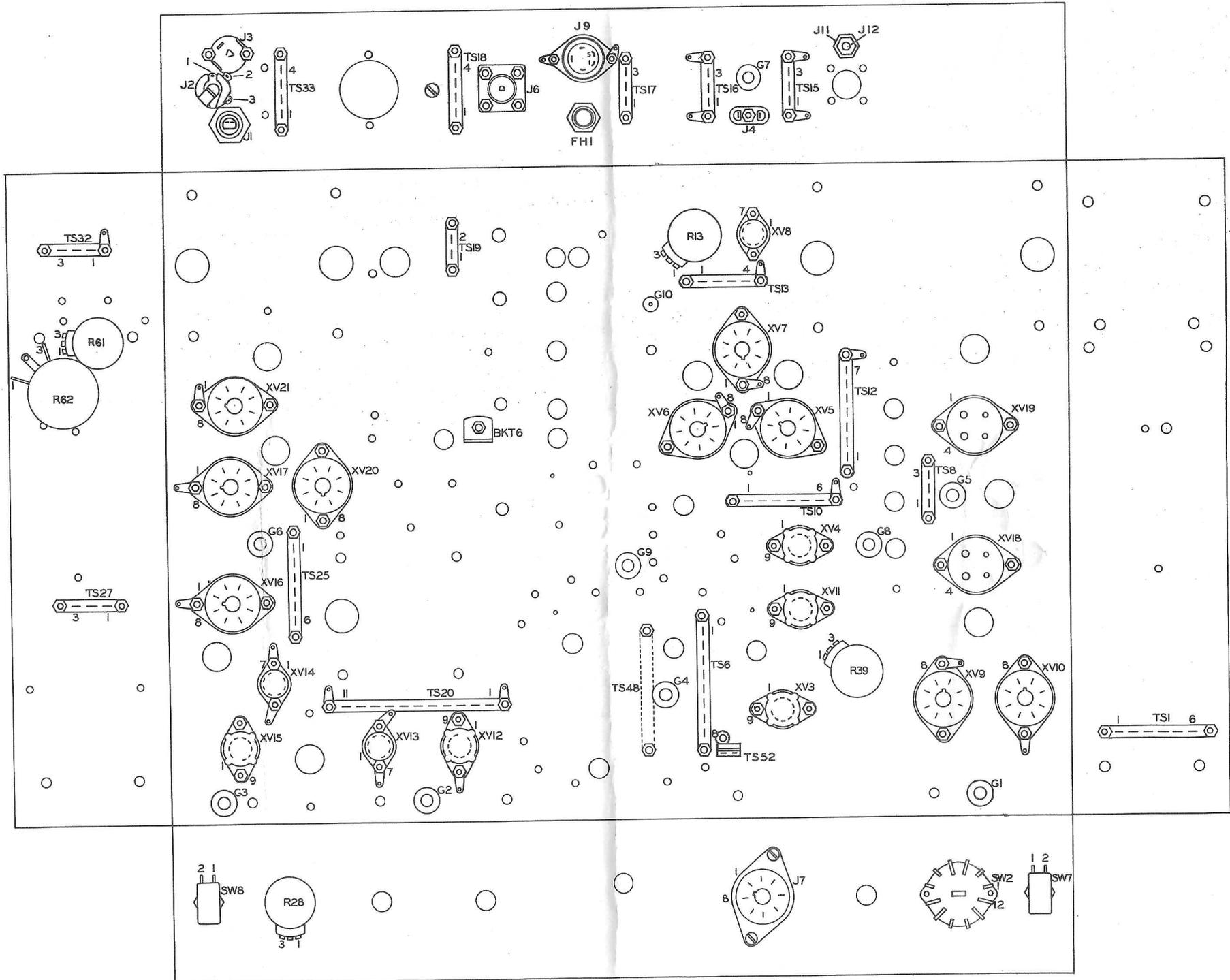
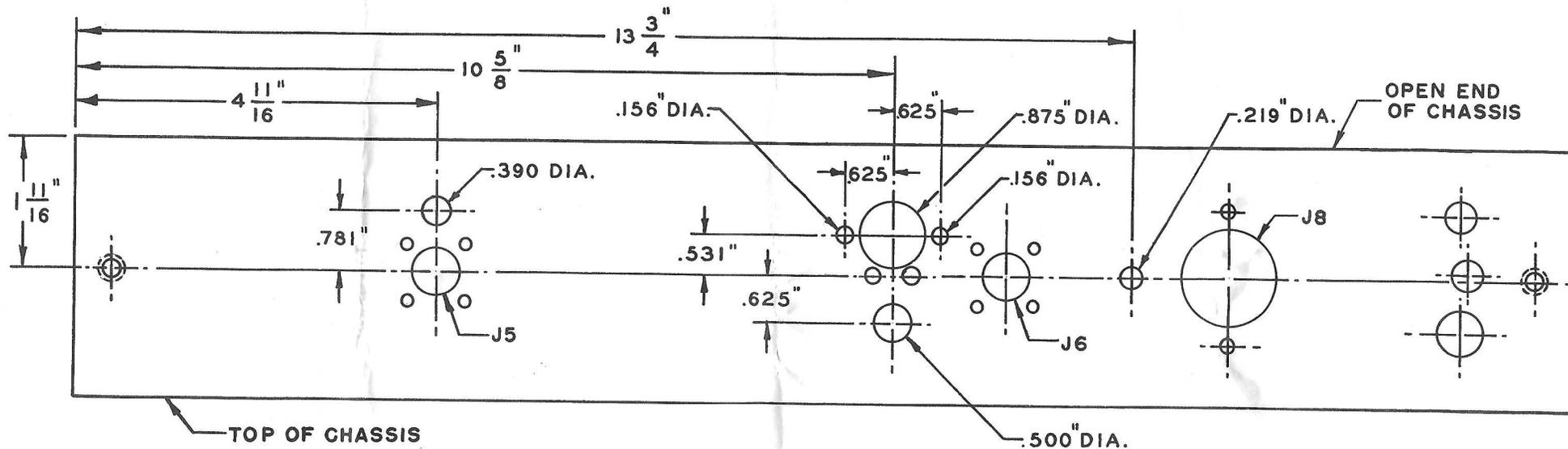


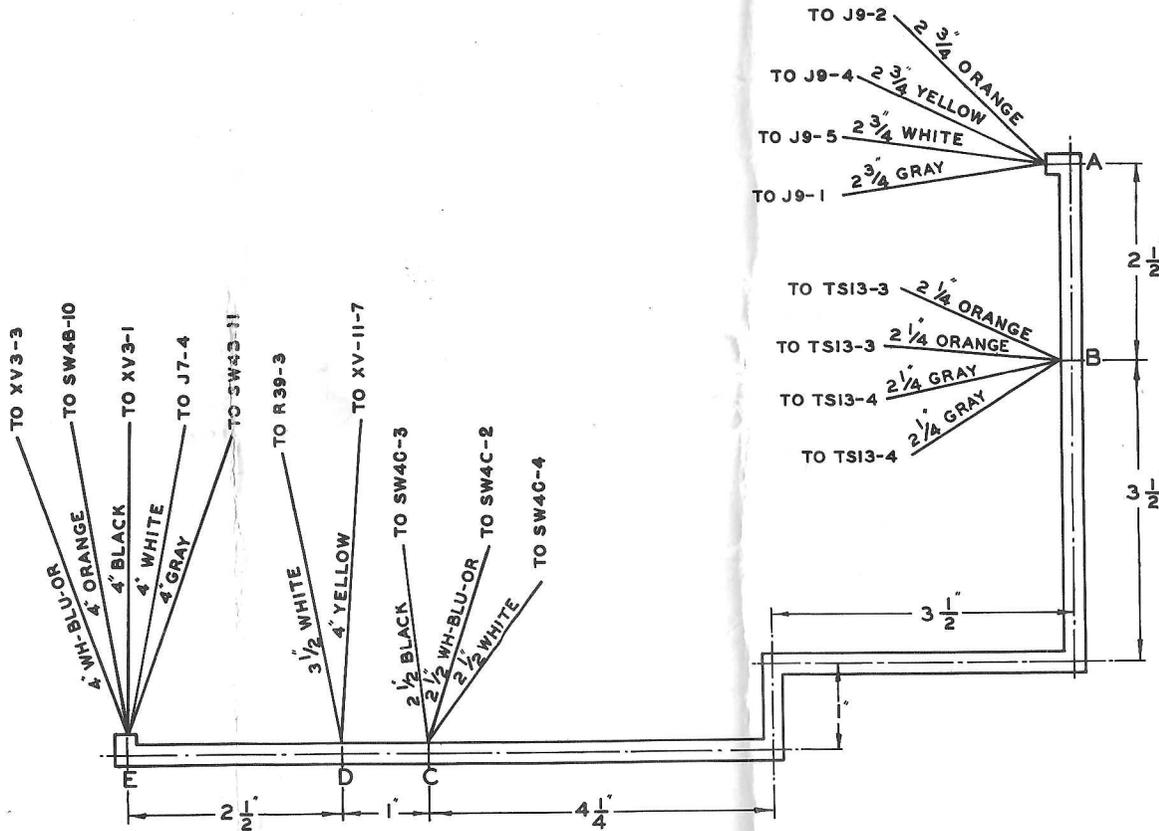
FIGURE I, LAYOUT GUIDE



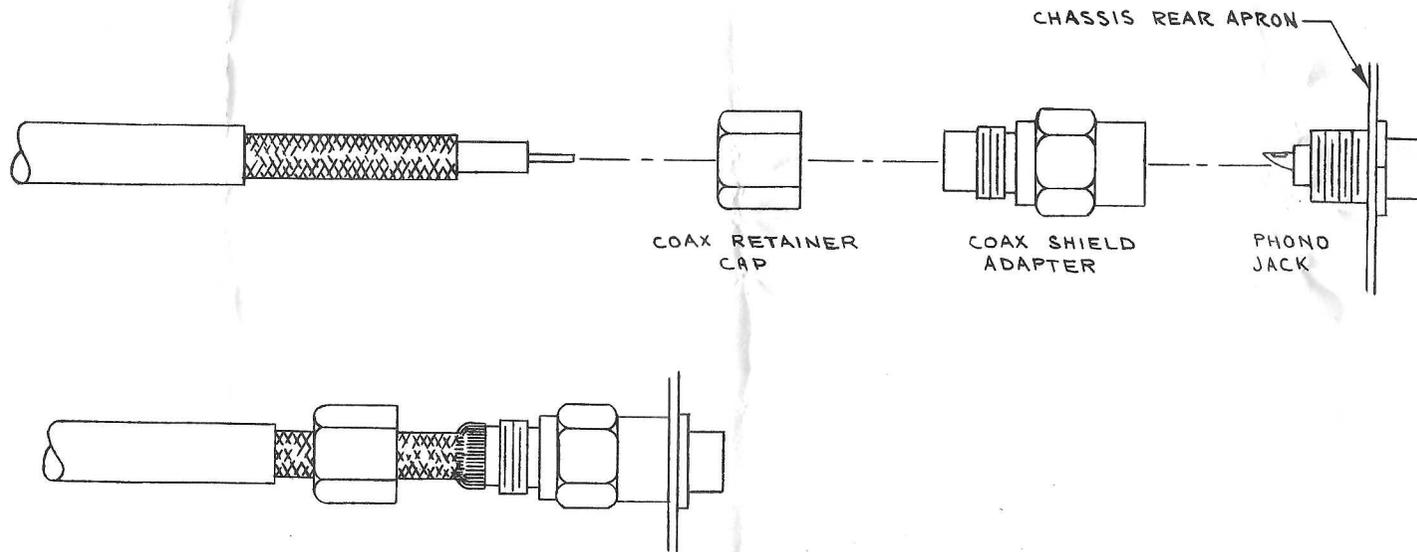
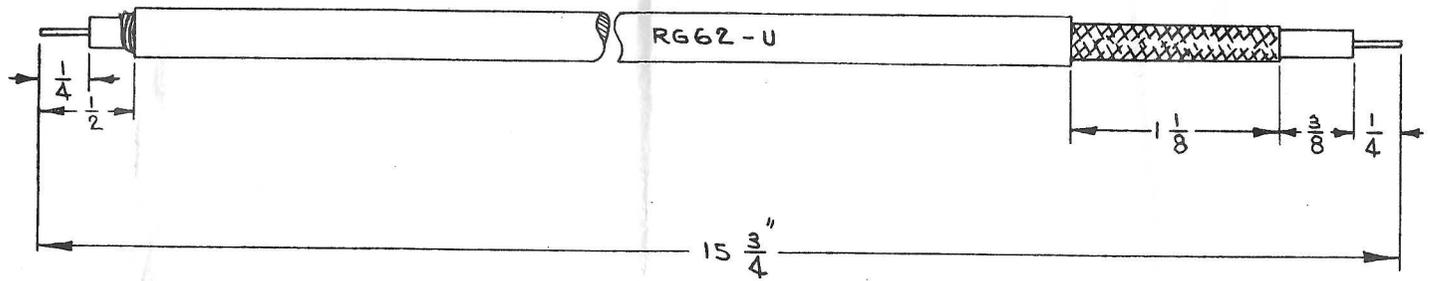
REAR CHASSIS MODIFICATION  
 FIGURE 2

STOCK NO.	QTY.(INCHES)	DESCRIPTION
71.91 - 103	29 3/4	ORANGE
71.91 - 104	22 3/4	YELLOW
71.91 - 109	32	WHITE
71.91 - 108	29 3/4	GRAY
71.91 - 100	10	BLACK
71.91 - 116	10	WHITE-BLUE-ORANGE

LEAD NO.	BREAKOUT POINTS	LENGTH	COLOR
1	AB	7 1/2	ORANGE
2	AD	22 3/4	YELLOW
3	AD	22	WHITE
4	AB	7 1/2	GRAY
5	BE	22 1/4	GRAY
6	BE	22 1/4	ORANGE
7	CE	10	BLACK
8	CE	10	WHITE-BLUE-ORANGE
9	CE	10	WHITE



CONVERSION KIT HARNESS  
FIGURE 3



VFO OUTPUT COAX. ASSEMBLY  
FIGURE 4

# VIKING VALIANT I CONVERSION KIT

## PARTS LIST

<u>Part No.</u>	<u>Item No.</u>	<u>Qty.</u>	<u>Description</u>
22.1097	C108, 109, 110, 111	4	.01 mf. 500 V. ceramic capacitor
22.826	C112	1	.01 mf. 1500 V. ceramic capacitor
22.4029-10	C113	1	15 mmf. ±10% 500 V. mica capacitor
22.827	C101	1	.005 mf. 600 V. ceramic capacitor
22.739-2	FH1	1	Fuse Extractor post
23.1624	H	1	Harness
11.114-1/4	HW	2	#6-32 x 1/4 bd. hd. screw
22.1016-1	HW	2	#6 lockwasher solder lug
12.02-1	HW	2	#6-32 x 1/4 hex. nut
22.1585	J9	1	5 pin socket jack
22.1868	J10	1	Phono jack
13.1050	J11	1	Coax. shield adapter
13.1051	J12	1	Coax. retainer ring
22.1731	P10	1	Plug, 5 pin
22.7101-10	R6	1	150K ±10% ohm 2 watt resistor
22.7099-10	R8	1	120K ±10% ohm 2 watt resistor
22.5101-10	R22	1	150K ±10% ohm 1/2 watt resistor
22.1295-11	SW	1	Switch wafer
22.1295-12	SW	1	Switch wafer
22.837	TS52	1	2 lug terminal strip
71.0321-810	W20	15 3/4"	RG62/U coax. cable
71.91-103	W	1 1/2"	#20 orange plastic covered copper wire
71.91-100	W	4"	#20 black plastic covered copper wire
71.91-107	W	1 1/2"	#20 violet plastic covered copper wire
71.271-220	W	3"	#20 tinned copper wire
42.240-770	W	1 3/8"	Plastic tubing
42.491-400	W	1 1/2"	#4 waxed cord

