

# CHASSIS

## PARTS LIST

Unpack the remainder of the kit and check each part against the following list. The key numbers correspond to the numbers on the "Chassis Parts Pictorial" (Illustration Booklet, Pages 18 and 19). Return any part that is packed in an individual envelope, with the part number on it, back to the envelope after you identify it until that part is called for in a step. Do not throw away any packing material until all of the parts are accounted for.

To order a replacement part, always include the PART NUMBER. Use the Parts Order Form furnished with this kit. If a Parts Order Form is not available, refer to "Replacement Parts" inside the rear cover of this Manual. For prices, refer to the separate "Heath Parts Price List."

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
---------	----------------	------	-------------	-------------------

### ELECTRONIC COMPONENTS

NOTE: The following resistors are rated at 1/4-watt and have a tolerance of 5%. A 5% tolerance is indicated by a fourth color band of gold.

A1	6-470-12	1	47 $\Omega$ (yel-viol-blk) resistor	R4
A1	6-102-12	1	1000 $\Omega$ (brn-blk-red) resistor	R5
A2	10-1212	1	1000 (1 k) $\Omega$ control	R2
A2	10-1211	1	10 k $\Omega$ control	R1
A3	19-756	1	10 k $\Omega$ control with switch	R3/SW2
A4	21-761	2	.01 $\mu$ F (103) glass ceramic capacitor	C3, C4
A5	26-168	1	7-17 pF variable capacitor	C1
A6	60-26	1	Slide switch	SW3
A7	63-1410	1	Rotary switch	SW1
A8	407-765	1	Meter	M1

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
---------	----------------	------	-------------	-------------------

### HARDWARE

NOTE: Hardware packets are marked to show the size of the hardware they contain (HDW #2 & #3, or HDW #4, etc.). You may have to open more than one packet to locate all of the hardware of any one (#6, for example) size.

#### #2 & #3 Hardware

B1	250-467	2	2-56 $\times$ 3/16" screw
B2	250-1172	1	2-56 $\times$ 1/4" screw
B3	252-51	4	2-56 nut
B4	254-7	1	#3 lockwasher

#### #4 Hardware

C1	250-156	2	4-40 $\times$ 1/8" setscrew
C2	250-1412	4	4-40 $\times$ 3/8" screw
C3	250-1448	4	4-40 $\times$ 3/8" flat head screw
C4	252-2	12	4-40 nut
C5	254-9	12	#4 lockwasher

253-40

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
---------	----------------	------	-------------	-------------------

**#6 Hardware**

D1	250-208	3	6-32 × 1/8" screw	
D2	250-1282	7	6-32 × 1/8" setscrew	
D3	250-1307	14	#6 × 1/4" sheet metal screw	
D4	250-1325	9	6-32 × 1/4" screw	
D5	250-1432	4	#6 × 3/8" sheet metal screw	
D6	250-1425	13	6-32 × 1/2" screw	
D7	250-168	2	6-32 × 1-3/8" screw	
D8	252-3	47	6-32 nut	
D9	252-66	1	6-32 wingnut	
D10	253-21	2	#6 flat washer	
D11	254-1	44	#6 lockwasher	
D12	259-1	6	#6 solder lug	

**Other Hardware**

E1	250-15	1	8-32 × 1/8" setscrew	
E2	252-7	10	Control nut	
E3	253-10	5	Control flat washer	
E4	254-4	2	Thick control lockwasher	
E5	254-5	2	Thin control lockwasher	
E6	255-1	5	1/8" spacer	
E7	259-10	2	Control solder lug	

**CONNECTORS**

F1	432-72	2	Male connector pin	
F2	432-73	2	Female connector pin	
F3	432-120	2	PCB connector	
F4	432-196	1	2-pin socket shell	
F5	432-866	6	Spring connector (includes one extra)	
F6	432-907	1	2-pin plug shell	
F7	432-970	1	5-pin socket shell	

KEY No.	HEATH Part No.	QTY.	DESCRIPTION	CIRCUIT Comp. No.
---------	----------------	------	-------------	-------------------

**Connectors (Cont'd)**

F8	434-42	2	Phono socket	J3, J5
F9	436-4	1	Phone jack	J2
F10	436-5	1	Coaxial jack	J4

**SHEET METAL PARTS**

G1	90-566-3	2	Cabinet shell	
G2	200-1441	1	Main chassis	
G3	200-1442	1	Subchassis	
G4	203-2162-1	1	Rear panel	
G5	203-2163-1	1	Front panel	
G6	204-2692	1	Drive bracket	
G7	206-1481	1	BFO shield	
G8	206-1472	1	VFO shield	

**MISCELLANEOUS**

H1	75-61	4	Chassis nut	
H2	100-1839	1	Vernier drive assembly	
H3	260-16	1	Alligator clip	
H4	261-28	2	Thin foot	
H5	261-44	2	Thick foot	
H6	354-5	3	Cable tie	
H7	446-602-2	1	Dial window	
H8	455-15	1	Collar	
H9	456-50	1	VFO shaft	
H10	462-1130	4	Small knob	
H11	462-1137	1	Large knob	
H12	464-78-1	1	Tuning dial	
H13	490-5	1	Nut starter	
H14	490-109	1	Alignment tool (short)	
H15	490-218	1	Alignment tool (long)	

5 Screw for  
Tuning Cap Back

250-  
480  
New Screw

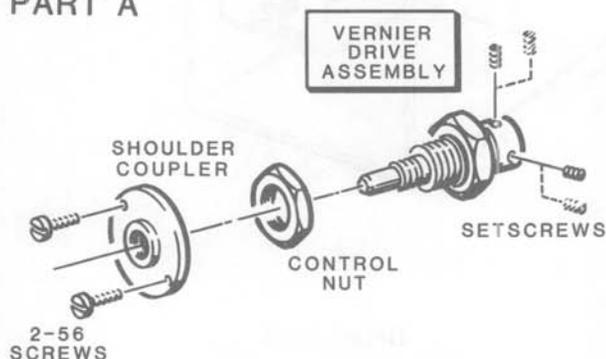
Drive Bracket  
204-2909  
Grommet  
73-53

## STEP-BY-STEP ASSEMBLY

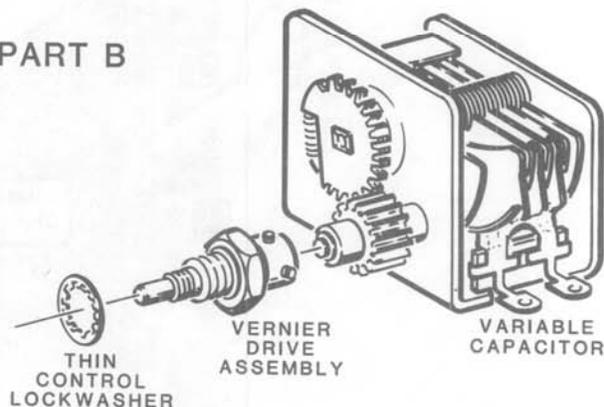
Refer to Pictorial 3-1 (Illustration Booklet, Page 19) for the following steps.

- ( ) Refer to Detail 3-1A Part A and disassemble the vernier drive assembly as shown. Discard the two setscrews, control nut, and two 2-56 screws (if they were supplied with the drive assembly). Save the large shoulder coupler that is threaded onto the drive assembly.
- ( ) Refer again to Detail 3-1A Part A and start two 4-40 × 1/8" setscrews into the vernier drive assembly as shown.
- ( ) C1: Use the following procedure to mount the vernier drive assembly and the 7-17 pF variable capacitor to the drive bracket:
  1. Refer to Detail 3-1A Part B and push the drive assembly onto the shaft of the variable capacitor. Do not tighten the setscrews yet. Then slide a **thin** control lockwasher onto the bushing of the drive assembly.
  2. Set the capacitor/drive assembly into the drive bracket so the lockwasher is inside the chassis as shown in the Pictorial. Push the drive assembly down toward the bottom of the slot in the chassis. Then use a control nut to secure the drive assembly to the chassis. Only tighten this nut finger tight at this time.
  3. Loosely mount the capacitor to the VFO chassis with three 6-32 × 1/8" screws. Tighten these screws finger tight. Then tighten the two setscrews in the drive assembly.
  4. Start a 6-32 × 1/8" setscrew into the VFO shaft. Then push the shaft onto the shaft of the drive assembly and tighten the setscrew.
  5. Rotate the shaft of the drive assembly to make sure it turns smoothly. Then alternately tighten (in small amounts) the three screws that secure the capacitor to the chassis. Keep checking the operation of the assembly to make sure it still operates smoothly until you have the three screws tight.
  6. Tighten the vernier drive control nut.
  7. Temporarily remove the VFO shaft and set it aside.
  8. Reinstall the shoulder coupler onto the vernier drive assembly. Be sure the shoulder on the washer is away from the VFO chassis as shown in the Pictorial. Also be sure to tighten the coupler securely.
  9. Set the VFO assembly aside temporarily.

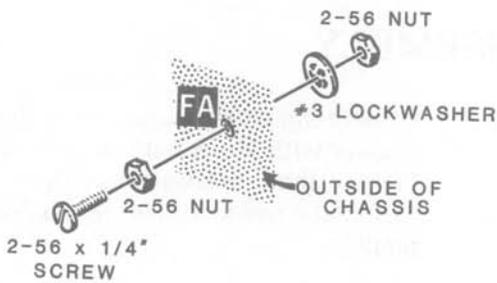
### PART A



### PART B



Detail 3-1A



Detail 3-2A

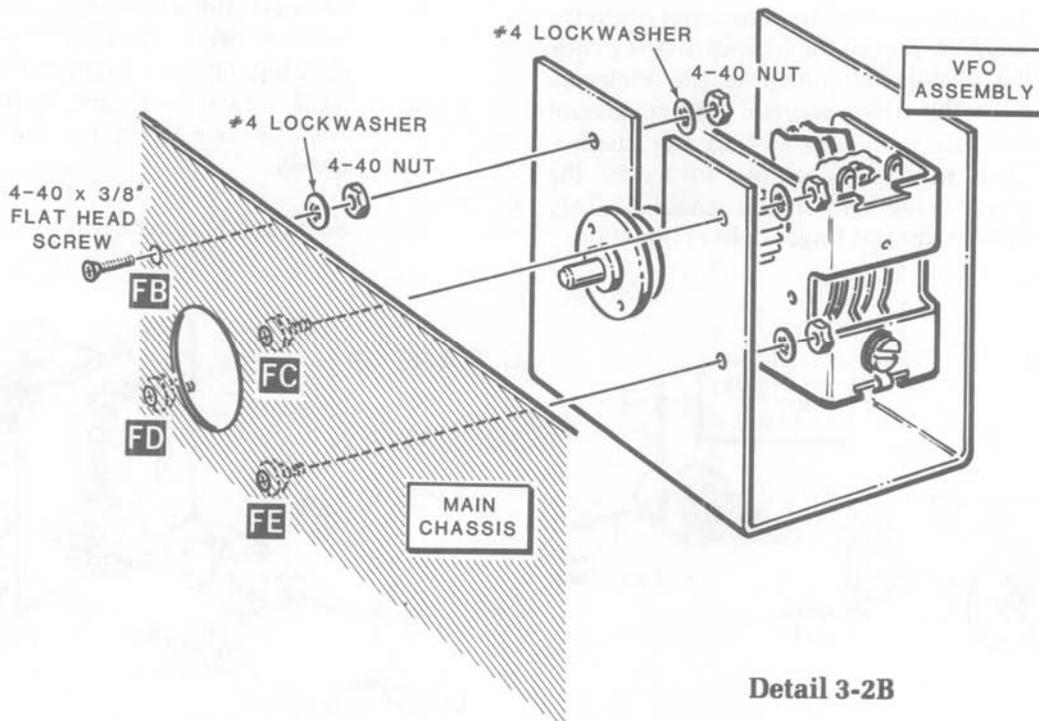
Refer to Pictorial 3-2 (Illustration Booklet, Page 20) for the following steps.

- ( ) Position the main chassis as shown in the Pictorial.
- ( ) Refer to the inset drawing on the Pictorial and press chassis nuts into both of the square holes in either side of the main chassis.
- ( ) Similarly, press chassis nuts into both of the square holes in the other side of the main chassis.

- ( ) Refer to Detail 3-2A and turn a 2-56 nut all the way onto a 2-56  $\times$  1/4" screw. Then use a #3 lockwasher and another 2-56 nut to mount the screw onto the front of the main chassis at FA. NOTE: This screw will be used as a dial stop when the dial is installed.

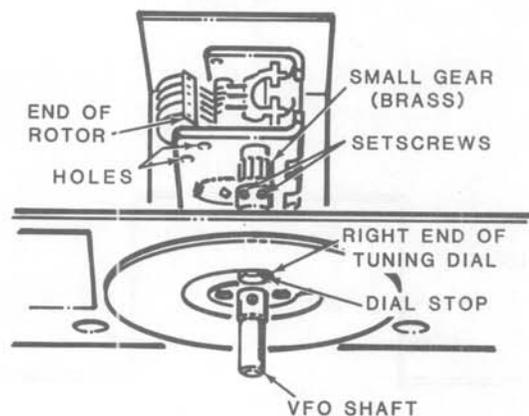
NOTE: Use the nut starter to hold and start 4-40 and 6-32 nuts on screws.

- ( ) Refer to Detail 3-2B and mount a 4-40  $\times$  3/8" flat head screw onto the front of the main chassis at FB. Use a #4 lockwasher and a 4-40 nut. Only tighten the nut finger tight at this time.
- ( ) Similarly, mount 4-40  $\times$  3/8" flat head screws on the front of the main chassis at FC, FD, and FE.
- ( ) Refer to Detail 3-2B and position the VFO assembly (assembled earlier) onto the four screws at FB, FC, FD, and FE. Hold the assembly in place while you tighten the four screws. Then use four #4 lockwashers and four 4-40 nuts to secure the VFO assembly in place.

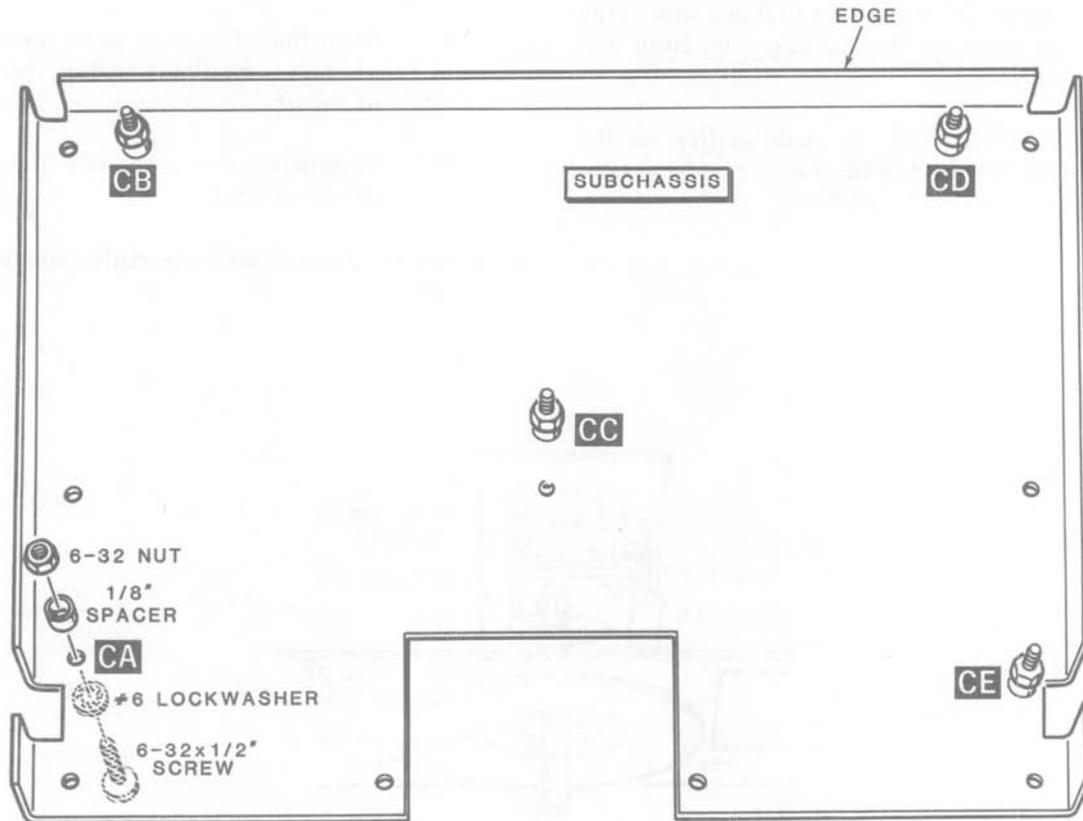


Detail 3-2B

- ( ) Use the following procedure to mount the tuning dial onto the vernier drive assembly:
1. Turn a 2-56 nut all the way onto each of the two 2-56  $\times$  3/16" screws.
  2. Use the prepared screws to mount the tuning dial to the shoulder coupler on the vernier drive assembly as shown. Be sure to position the tuning dial so the dial stop is inside the circular slot as shown. NOTE: The actual position of the lettering on the dial may vary from that shown.
- ( ) Push the VFO shaft (set aside earlier) all the way onto the shaft of the vernier drive assembly. Then tighten the setscrew.
- ( ) Refer to Detail 3-2C and use the following procedure to set the dial stop:
1. Loosen the two setscrews in the vernier drive bushing.
  2. Use your fingers to rotate the smaller gear (brass) on the variable capacitor until the indicated end of the rotor is between the indicated holes in the frame of the capacitor.
  3. Turn the VFO shaft until the right end of the tuning dial is against the dial stop as shown.
  4. Tighten the two setscrews in the vernier drive bushing.
- ( ) Set the main chassis assembly aside temporarily.



Detail 3-2C



PICTORIAL 3-3

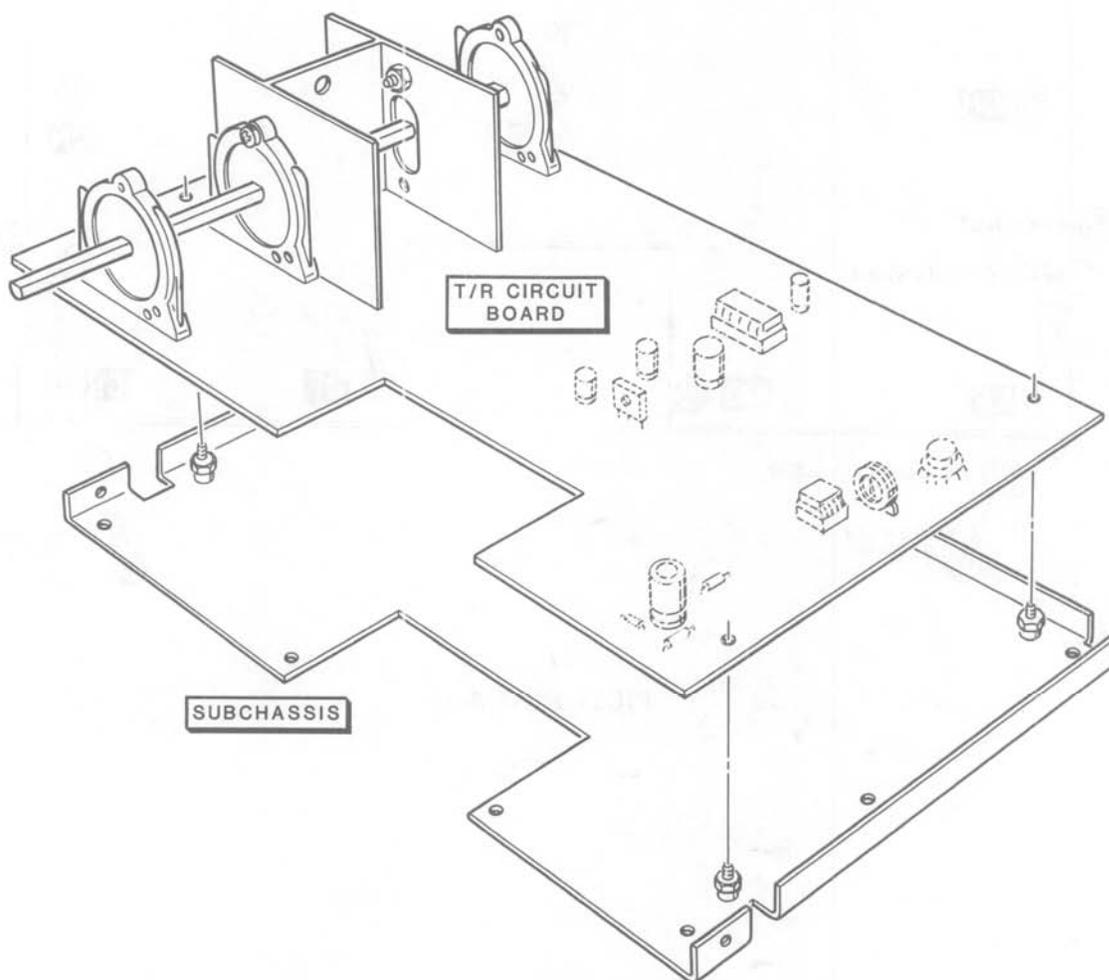
# Heathkit®

Refer to Pictorial 3-3 for the following steps.

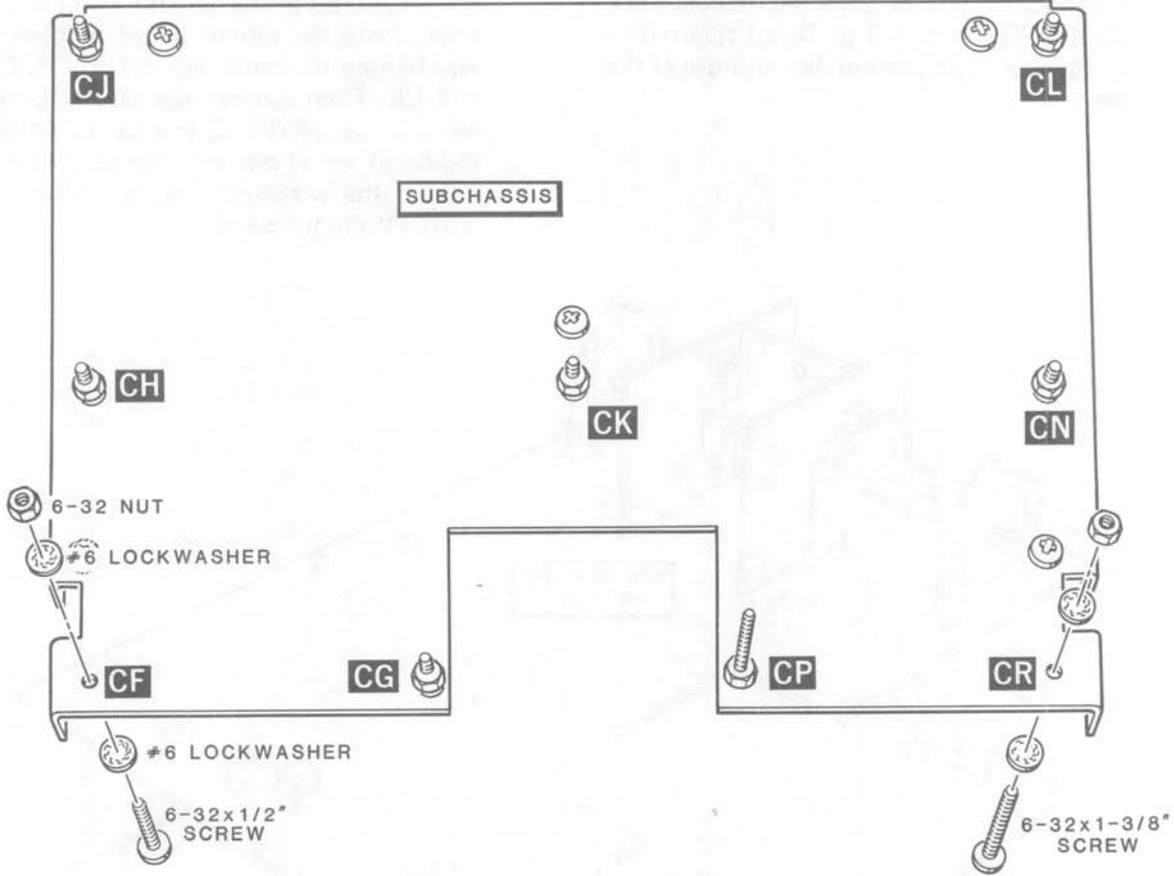
- ( ) Position the subchassis as shown in the Pictorial (note that the edge on the subchassis faces upward).

NOTE: Only the screw size is called out in the following steps. When a step calls for "6-32 × 1/2" hardware," for example, it means you should use a 6-32 × 1/2" screw, one or more #6 lockwashers, and a 6-32 nut. The Pictorial or Detail referred to in the step shows the proper number and use of the lockwashers.

- ( ) Use 6-32 × 1/2" hardware to mount a 1/8" spacer to the subchassis at CA as shown. Only tighten the hardware finger tight at this time.
- ( ) Similarly, mount 1/8" spacers to the subchassis at CB, CC, CD, and CE. Tighten the hardware finger tight.
- ( ) Refer to Detail 3-3A and temporarily position the T/R circuit board onto the subchassis hardware. Hold the circuit board in place while you tighten the hardware at CA, CB, CC, CD, and CE. Then remove the circuit board and set it aside. NOTE: If you could not tighten the hardware at one or more of the locations, tighten the corresponding nut after you remove the circuit board.



Detail 3-3A

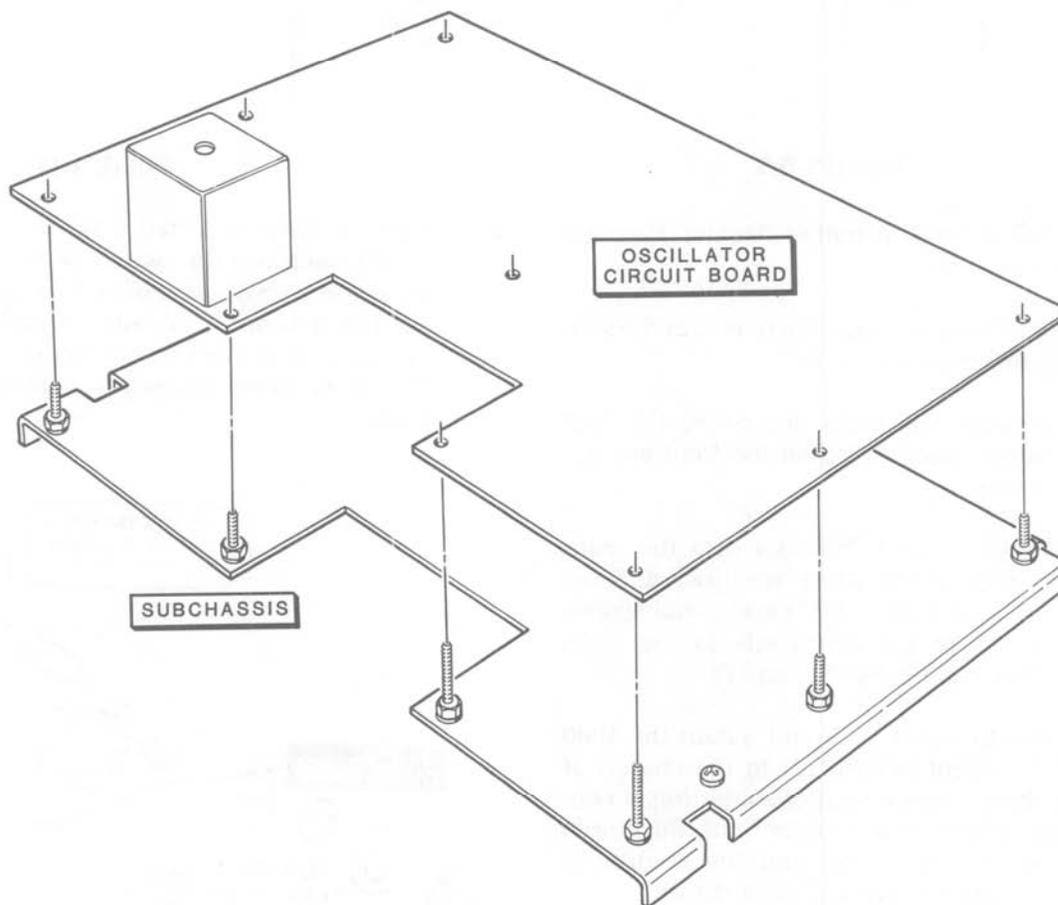


PICTORIAL 3-4

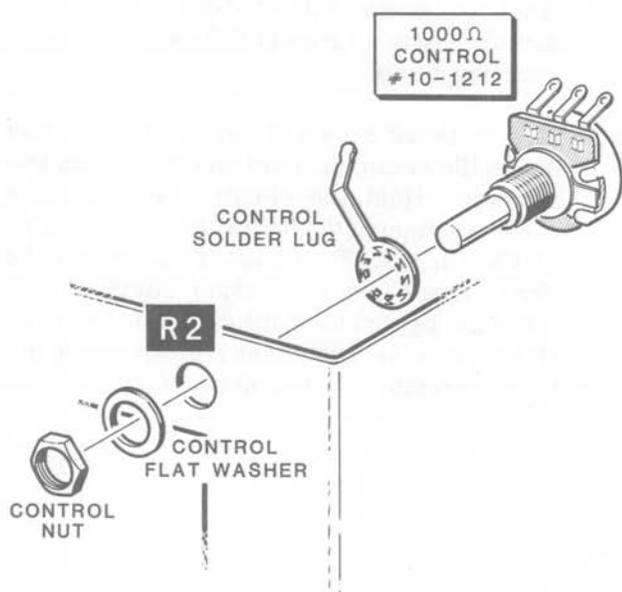
# Heathkit®

Refer to Pictorial 3-4 for the following steps.

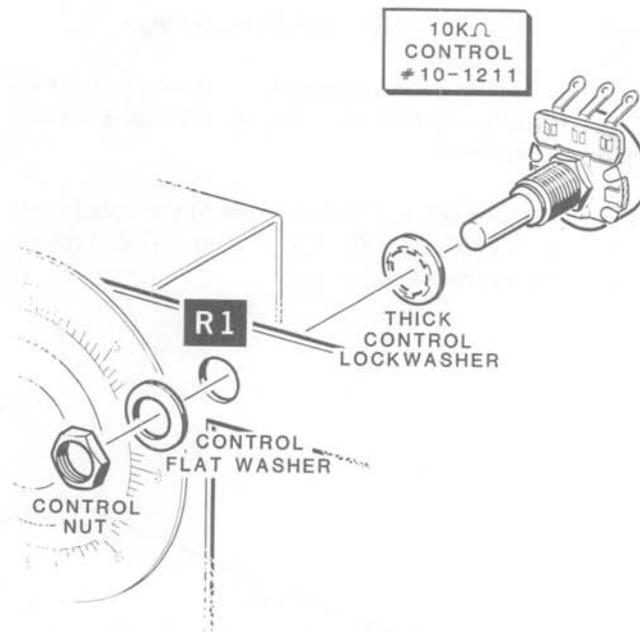
- ( ) Reposition the subchassis as shown in the Pictorial (note that the edge on the chassis faces downward).
- ( ) Mount 6-32  $\times$  1/2" hardware to the subchassis at CF, CG, CH, CJ, CK, CL, and CN. Tighten the hardware finger tight.
- ( ) Similarly, mount 6-32  $\times$  1-3/8" hardware to the subchassis at CP and CR. Tighten the hardware finger tight.
- ( ) Refer to Detail 3-4A and temporarily position the oscillator circuit board onto the subchassis hardware. Hold the circuit board in place while you tighten the hardware at CF, CG, CH, CJ, CK, CL, CN, CP, and CR. Then remove the circuit board and set it aside. NOTE: If you could not tighten the hardware at one or more of the locations, tighten the corresponding nut after you remove the circuit board.



Detail 3-4A



Detail 3-5A



Detail 3-5B

Refer to Pictorial 3-5 (Illustration Booklet, Page 21) for the following steps.

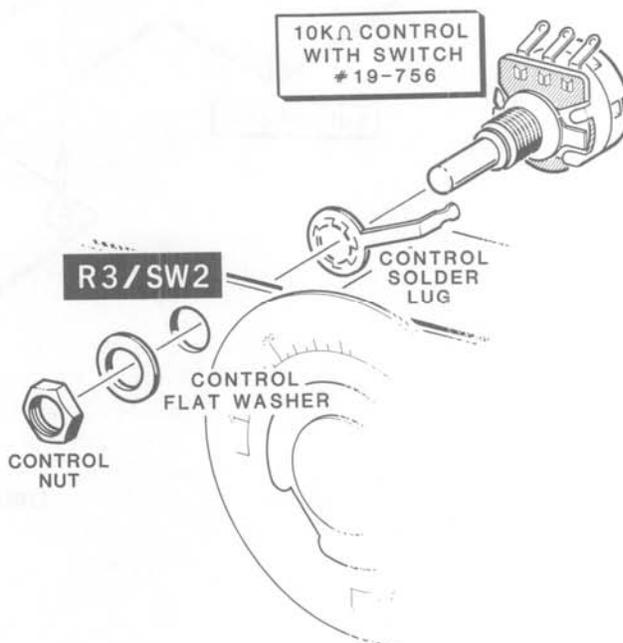
( ) Use the following procedure to mount the subchassis to the main chassis:

1. Position the main chassis so the four larger round holes on the front are upward.
2. Position the subchassis into the main chassis so the edges are upward. Then use four 6-32 × 1/4" sheet metal screws to secure the subchassis to the main chassis at FF, FG, FH, and FJ.

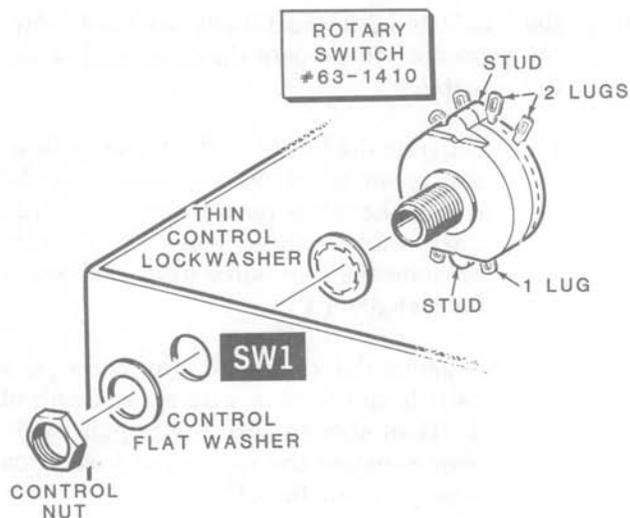
( ) R2: Refer to Detail 3-5A and mount the 1000 (1 k) Ω control (#10-1212) to the chassis at R2 as shown. Use a control solder lug, a control flat washer, and a control nut. Be sure to position the solder lug and the control as shown before you tighten the hardware.

( ) R1: Refer to Detail 3-5B and mount the 10 kΩ control (#10-1211) to the chassis at R1 as shown. Use a **thick** control lockwasher, a control flat washer, and a control nut. Be sure to position the control as shown before you tighten the hardware.

( ) R3/SW2: Refer to Detail 3-5C and mount the 10 kΩ control with switch (#19-756) to the chassis at R3/SW2 as shown. Use a control solder lug, a control flat washer, and a control nut. Be sure to position the solder lug and the control as shown before you tighten the hardware.



Detail 3-5C



Detail 3-5D

- ( ) SW1: Refer to Detail 3-5D and mount the rotary switch (#63-1410) to the chassis at SW1 as shown. Use a **thin** control lockwasher, a control flat washer, and a control nut. Be sure to position the switch as shown before you tighten the hardware (note the positions of the lugs). Also make sure the switch studs are perpendicular to the subchassis.

- ( ) Set the chassis assembly aside temporarily.

Refer to Pictorial 3-6 (Illustration Booklet, Page 22) for the following steps.

- ( ) Position the T/R circuit board as shown in the Pictorial.

## NOTES:

- In the following steps you will be directed to prepare wires and cables and connect one end to the circuit board. The other ends of these wires and cables will be connected later.
- When a step directs you to prepare a stranded wire, first cut the wire to the indicated length and remove 1/4" of insulation from each end.

Tightly twist together the wire strands at each end. Then melt a small amount of solder on these ends to hold the strands together.

- ( ) Prepare a 7" large red stranded wire. Then connect and solder one end of the wire to circuit board hole 12V/IN. Cut off any excess wire end.
- ( ) Prepare the following shielded cables. They are listed in the order in which you will use them. NOTE: To prepare these cables, use the same procedure that you used when you prepared shielded cables for the T/R circuit board.

3-1/2"	13"
14"	19-1/2"
14"	6"
16-1/2"	8"

Connect and solder one end of the shielded cables to the circuit board as follows:

- ( ) 3-1/2" cable: Inner lead to hole ANT, shield wires to nearby hole GND.
- ( ) 14" cable: Inner lead to hole NARROW/OUT, shield wires to nearby hole GND.
- ( ) 14" cable: Inner lead to hole WIDE/OUT, shield wires to nearby hole GND.
- ( ) 16-1/2" cable: Inner lead to hole BFO/IN, shield wires to nearby hole GND.
- ( ) 13" cable: Inner lead to hole TX/IN, shield wires to nearby hole GND.
- ( ) 19-1/2" cable: Inner lead to hole INJ/IN, shield wires to nearby hole GND.
- ( ) 6" cable: Inner lead to hole AUDIO/IN, shield wires to nearby hole GND.
- ( ) 8" cable: Inner lead to hole AUDIO/OUT, shield wires to nearby hole GND.



NOTE: In the following steps you will be directed to label some of the shielded cables coming from the T/R circuit board. You can use masking tape or something similar that you can easily write on. This will make it easier for you to identify these cables later. When you connect the free ends of these cables, you can remove the tape, if you desire.

- ( ) Label the cable coming from Narrow/Out "NARROW/OUT."
- ( ) Label the cable coming from Wide/Out "WIDE/OUT."
- ( ) Label the cable coming from TX/In "TX/OUT."
- ( ) Label the cable coming from INJ/In "INJ/OUT."
- ( ) Label the cable coming from BFO/In "BFO/OUT."
- ( ) Set the T/R circuit board aside temporarily.
- ( ) Cut a 24" length of 8-wire cable Then refer to Detail 3-6A Part A (Illustration Booklet, Page 23) and use the following procedure to prepare one end of the cable:

1. Separate the brown and red wires (as a pair) from the rest of the wires for a length of 9". Then shorten these wires by 8". Now separate the brown and red wires from each other for a length of 1". Save the cut-off 2-wire cable for use later.
2. Separate the orange, yellow, green, and blue wires from the rest of the wires and each other for a length of 2".
3. Separate the violet and gray wires from the other wires and each other for a length of 7-1/4". Then shorten these wires by 6-1/2". Save the cut-off wires for use later.
4. Remove 1/4" of insulation from each wire at this end of the cable and prepare the ends.

NOTE: This end of the cable will be referred to as "end A."

( ) Refer to Detail 3-6A Part B and use the following procedure to prepare the other end of the 8-wire cable:

1. Separate the brown, red, orange, yellow, and green wires (as a group) from the rest of the wires for a length of 11-1/2". Then shorten these wires by 3". Now separate the five wires from each other for a length of 1".
2. Separate the violet and gray wires (as a pair) from the blue wire for a length of 8". Then shorten this 2-wire pair by 5". Now separate the two wires from each other for a length of 1".
3. Remove 1/4" of insulation from the end of each wire at this end of the cable and prepare the ends.

NOTE: This end of the cable will be referred to as "end B."

Connect the wires at **end A** of the 8-wire cable to the T/R circuit board as follows. Solder each wire to the foil as you connect it and cut off any excess wire end.

- ( ) Orange wire to hole + R.
- ( ) Blue wire to hole KEY.
- ( ) Green wire to either hole 9V **near the center of the circuit board.**
- ( ) Yellow wire to hole YEL.

NOTE: The other wires at this end of the cable and the wires at end B will be connected later.

( ) Locate the brown-red 2-wire cable you set aside earlier. Separate the wires at one end of this cable for 1" and separate the wires at the other end for 1-1/2". Then prepare the ends.

Connect the wires at the end of the 2-wire cable that has the wires separated for 1-1/2" to the T/R circuit board as follows. Solder each wire to the foil as you connect it and cut off any excess wire end.

- ( ) Brown wire to METER - .



# Heathkit®

- ( ) Red wire to METER +.
- ( ) Cut a 14" length of 8-wire cable. Set this cable aside for use later. Then separate the wires from the remaining length of 8-wire cable. Use these wires whenever a small stranded wire is called for.
- ( ) Prepare the following **small** stranded wires:
  - 10" brown
  - 7" green
  - 9" orange
  - 7" red

Connect one end of the prepared wires to the T/R circuit board as follows. Solder each wire to the foil and cut off any excess wire end as you connect it. The free ends of these wires will be connected later.

- ( ) Brown wire to hole +T.
- ( ) Green wire to the remaining hole labeled 9V near the center of the circuit board.
- ( ) Orange wire to hole 9V (toward the right edge of the circuit board).
- ( ) Red wire to hole 12V.

Refer to Pictorial 3-7 (Illustration Booklet, Page 24) for the following steps.

- ( ) Position the chassis as shown in the Pictorial.
- ( ) Refer to Detail 3-7A (Illustration Booklet, Page 24) and use the following procedure to mount the T/R circuit board to the subchassis:
  1. Place a #6 lockwasher on each of the screws at CA, CB, CC, CD, and CE.
  2. Pull the 7" shaft all the way out of the rotary switches that are mounted on the T/R circuit board.
  3. Position the T/R circuit board onto the screws extending from the subchassis.

Be careful not to pinch any wires between the circuit board and the subchassis.

4. Use five 6-32 nuts to secure the circuit board to the screws.
5. Slide the 7" shaft back into the rotary switches. Make sure the flat on one side of the shaft is positioned as shown in the Pictorial.
6. Turn the 7" shaft three positions clockwise. Then pull the shaft back out of rotary switch SW404.
7. Start an 8-32  $\times$  1/8" setscrew into the collar. Then slide the collar onto the end of the 7" shaft (between rotary switches SW403 and SW404).
8. Slide the shaft back into rotary switch SW404 as far as possible, position the collar against the back of rotary switch SW403, and tighten the setscrew (against the flat on the shaft).
9. Position transformer T401 so it is not touching the lugs of switch SW2.

## NOTES:

1. In the following steps, (NS) means not to solder the connection because you will add other wires later. "S-" with a number, such as (S-2), means to solder the connection. The number following the "S-" tells you how many wires should be at the connection. This helps you check your work for errors as you go.
2. You may wish to turn the chassis over to make the connections in the next two steps.
  - ( ) Connect the free end of the green wire, coming from hole 9V of the T/R circuit board, to switch SW1 lug 12 (NS).
  - ( ) Connect the free end of the orange wire, coming from hole 9V of the T/R circuit board, to switch SW1 lug 12 (S-2).

- ( ) Connect the free end of the large red wire, coming from hole 12V/IN of the T/R circuit board, to switch SW2 lug 2 (NS).
- ( ) Bend the solder lugs at controls R3/SW2 and R2 away from the chassis enough to allow you to route wires between them and the chassis in the following steps.
- ( ) Connect the free end of the red wire, coming from hole 12V of the T/R circuit board, to switch SW2 lug 2 (S-2).
- ( ) Connect the free end of the brown wire, coming from hole +T of the T/R circuit board, to control R2 lug 3 (NS). Route this wire as shown in the Pictorial.
- ( ) Connect a 1" bare wire between control R1 lugs 1 (S-2) and 2 (S-1).
- ( ) Connect a 1" bare wire from control R2 lug 1 (NS) to the nearby solder lug (S-1).
- ( ) Connect one end of the 8" large red wire to switch SW2 lug 1 (S-1). The other end of this wire will be connected later.
- ( ) C3: Cut both leads of a .01  $\mu$ F (103) glass ceramic capacitor to 1/2". Then connect the capacitor between control R2 lugs 1 (NS) and 2 (S-2).
- ( ) C4: Cut both leads of a .01  $\mu$ F (103) glass ceramic capacitor to 5/8". Then connect the capacitor between control R2 lugs 1 (NS) to 3 (NS).

Refer to Pictorial 3-8 (Illustration Booklet, Page 25) for the following steps.

- ( ) Route the 8-wire cable coming from the T/R circuit board around the VFO assembly, along the front of the chassis, and down the corner to the other side of the chassis as shown in the Pictorial.

Connect some of the wires coming from the free end of the 8-wire cable as follows:

- ( ) Violet wire to control R1 lug 1 (NS).
- ( ) Gray wire to control R1 lug 3 (S-1).
- ( ) Red wire to control R2 lug 2 (NS).
- ( ) Brown wire to control R2 lug 3 (NS).
- ( ) Prepare the following wires:

three 1" **small** bare

one 8" **large** red stranded

- ( ) Connect a 1" bare wire from control R3 lug 3 (NS) to the nearby solder lug (S-1).

- ( ) R5: Cut both leads of a 1000  $\Omega$  (brn-blk-red) resistor to 1/2". Then connect the resistor between control R2 lugs 1 (S-4) and 3 (S-4).
- ( ) Route the brown-red 2-wire cable across the circuit board and out through the large rectangular hole in the front of the chassis as shown in the Pictorial. The free ends of these wires will be connected later.

- ( ) Connect the free end of the shielded cable, coming from holes Audio/In and GND on the T/R circuit board, to control R3 as follows:

Inner lead to lug 2 (S-1).

Shield wires to lug 3 (NS).

- ( ) Prepare an 8" shielded cable. Then connect the wires at one end of the cable to control R3 as follows:

Inner lead to lug 1 (S-1).

Shield wire to lug 3 (S-3).

- ( ) Route the free end of the cable coming from control R3 as shown in the Pictorial; it will be connected later.



# Heathkit®

Refer to Pictorial 3-9 (Illustration Booklet, Page 26) for the following steps.

- ( ) Locate the 14" 8-wire cable that you set aside earlier. Then refer to Detail 3-9A (Illustration Booklet, Page 26) and use the following procedure to prepare one end of the cable:

1. Separate the wires for a length of 2-1/2".
2. Shorten each wire to the length shown.
3. Remove 1/4" of insulation from each wire at this end of the cable and prepare the ends.

NOTE: This end of the cable will be referred to as "end A."

- ( ) Refer again to Detail 3-9A and use the following procedure to prepare the other end of the 14" cable:

1. Separate the wires for a length of 2-1/2".
2. Shorten each wire to the length shown.
3. Remove 1/4" of insulation from each wire at this end of the cable and prepare the ends.

NOTE: This end of the cable will be referred to as "end B."

Position the cable as shown in the Pictorial. Then refer to the inset drawing on the Pictorial and connect the wires at end A (the end with the short brown wire) to switch SW1 as follows. NOTE: Some of the following switch lugs are hard to get to. You may find it easier to turn the chassis over to make some connections.

- ( ) Brown wire to lug 1 (S-1).
- ( ) Red wire to lug 2 (S-1).
- ( ) Orange wire to lug 3 (S-1).
- ( ) Yellow wire to lug 4 (S-1).
- ( ) Green wire to lug 5 (S-1).
- ( ) Blue wire to lug 6 (S-1).
- ( ) Violet wire to lug 7 (S-1).
- ( ) Gray wire to lug 8 (S-1).

NOTE: End B of this cable will be connected later.

- ( ) Route the free ends of the cables labeled "Narrow/Out" and "Wide/Out" as shown in the Pictorial so they are between switch SW1 and control R3/SW2.
- ( ) Route the free ends of the cables labeled "TX/Out", "INJ/Out", and "BFO/Out" and the cable coming from control R3 as shown in the Pictorial so they are in the corner of the chassis next to switch SW1.

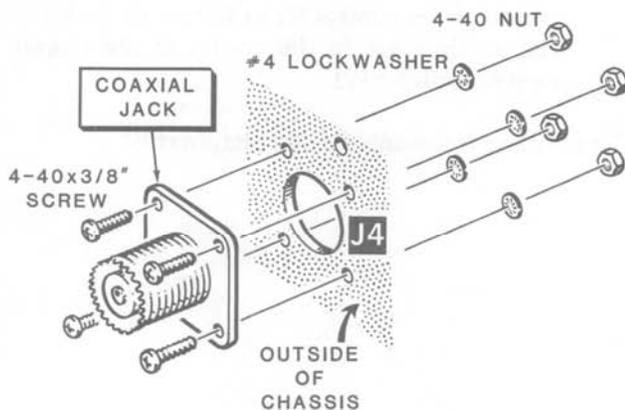
Set the chassis assembly aside temporarily.

Refer to Pictorial 3-10 (Illustration Booklet, Page 27) for the following steps.

- ( ) Position the rear panel as shown in the Pictorial.
- ( ) Use the following procedure to mount a ground post onto the rear panel:
  1. Scrape or sand any excess paint from around hole RA on the inside of the panel.
  2. Use 6-32 × 1/2" hardware to mount a #6 solder lug to the panel at RA. Position the solder lug as shown in the Pictorial. Then tighten the hardware securely.
  3. Slide two #6 flat washers onto the end of the 6-32 × 1/2" screw. Then use a 6-32 wingnut to secure these washers. Only tighten this nut finger tight.

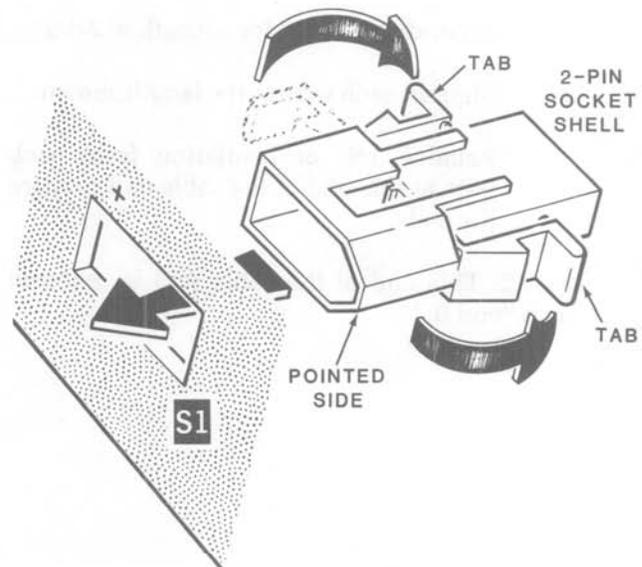
NOTE: Scrape or sand any excess paint from around the mounting holes on the inside of the rear panel when you mount the jacks and socket in the next three steps. This will insure a good ground.

- ( ) J4: Refer to Detail 3-10A and mount the coaxial jack onto the **outside** of the rear panel at J4. Use 4-40 × 3/8" hardware.



Detail 3-10A

- ( ) J3: Mount a phono socket onto the inside of the rear panel at J3. Use 6-32 × 1/4" hardware. Be sure to position the socket as shown.
- ( ) J2: Mount the phone jack onto the inside of the rear panel at J2. Use a **thick** control lockwasher, a control flat washer, and a control nut. Be sure to position the jack as shown before you tighten the hardware.
- ( ) S1: Refer to Detail 3-10B and bend back the tabs on the 2-pin socket shell as shown. Then push the socket shell into rear panel hole S1 until it locks into place. Be sure the pointed side of the socket shell is toward the right as shown.



Detail 3-10B

# Heathkit®

Refer to Pictorial 3-11 (Illustration Booklet, Page 28) for the following steps.

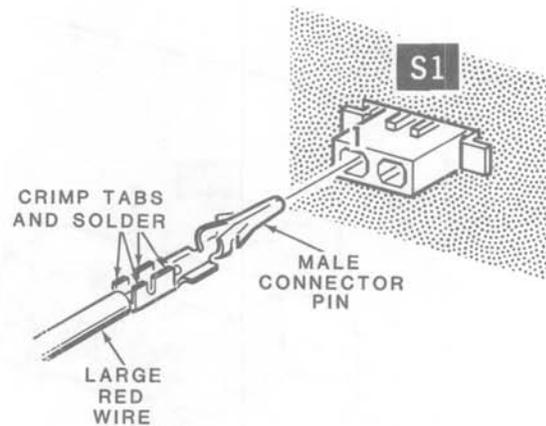
- ( ) Position the rear panel near the chassis assembly as shown. Then use six #6 × 1/4" sheet metal screws to secure the panel to the chassis. Start all six screws before you tighten them. Be careful not to pinch any wires or cables between the panel and the chassis.

Connect the free end of the shielded cable coming from T/R circuit board holes ANT and GND as follows:

- ( ) Inner lead to coaxial jack J4 lug 1 (S-1).
- ( ) Shield wires to solder lug RA (S-1).
- ( ) Refer to Detail 3-11A and install a male connector pin on the free end of the large red wire coming from switch SW2. Then push this connector pin into socket S1 hole 1 until it locks in place.
- ( ) Prepare a 4" large black stranded wire.
- ( ) Install a male connector pin on one end of the prepared wire. Then push this connector pin into socket S1 hole 2 until it locks into place. Connect the free end of this wire to socket J3 lug 2 (NS).
- ( ) R4: Cut both leads of a 47 Ω (yel-viol-blk) resistor to 5/8". Then connect the resistor between jack J2 lugs 1 (NS) and 3 (NS). Position the resistor as shown in the Pictorial. Be sure the leads of this resistor do not touch anything other than the lugs to which they are connected.
- ( ) Prepare a 4" shielded cable. Then connect one end of the cable to socket J3 as follows:

Inner lead to lug 1 (S-1).

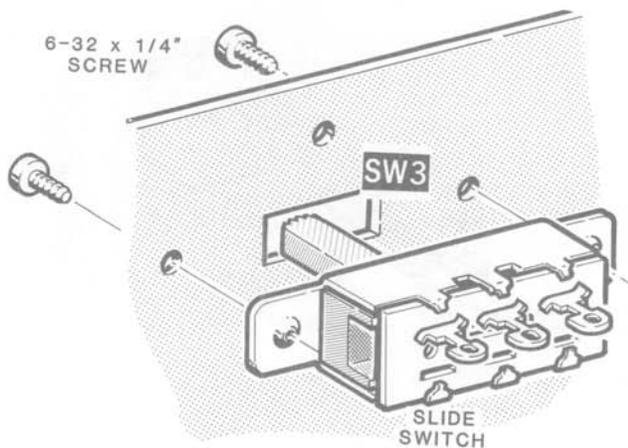
Shield wires to lug 2 (S-2).



**Detail 3-11A**

- ( ) Connect the free end of the 4" shielded cable to jack J2 as follows:
  - Inner lead to lug 2 (S-1).
  - Shield wires to lug 1 (NS).
- ( ) Connect the free end of the shielded cable, coming from T/R circuit board holes Audio/Out and GND to jack J2 as follows:
  - Inner lead to lug 3 (S-2).
  - Shield wires to lug 1 (S-3).
- ( ) Position the wires and cables that are connected to the T/R circuit board and the rear panel as neatly as possible. Then refer to the inset drawing on the Pictorial and install cable ties on some of these wires and cables in the areas shown.
- ( ) Check the shield wires on jack J2. Make sure these wires only touch lug 1.

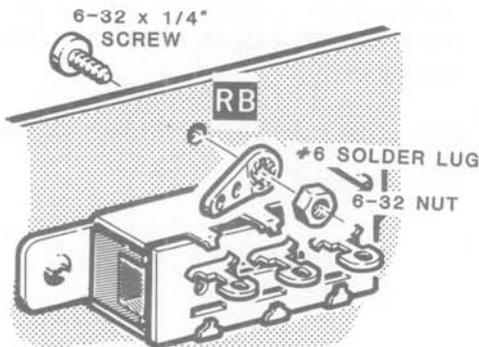




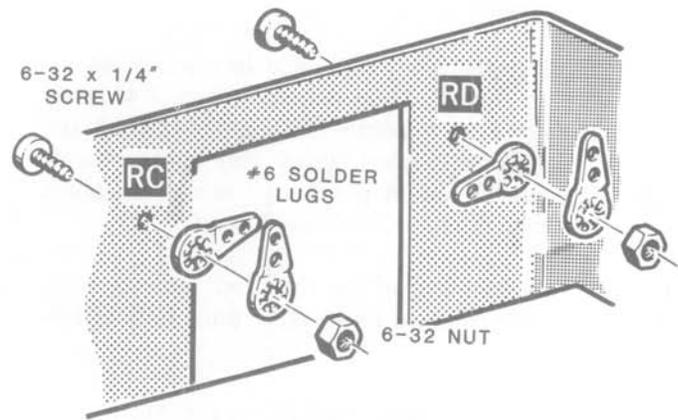
Detail 3-12A

Refer to Pictorial 3-12 (Illustration Booklet, Page 29) for the following steps.

- ( ) Turn the chassis assembly over (T/R circuit board down) and position it as shown in the Pictorial.
- ( ) SW3: Refer to Detail 3-12A and mount the slide switch to the front of the chassis at SW3. Use two 6-32  $\times$  1/4" screws. Be sure to position the switch so the lugs are closest to the top edge of the chassis.
- ( ) Refer to Detail 3-12B and mount a #6 solder lug to the chassis at RB. Use a 6-32  $\times$  1/4" screw and a 6-32 nut. Be sure to position the solder lug as shown in the Pictorial before you tighten the hardware.



Detail 3-12B



Detail 3-12C

- ( ) Refer to the inset drawing on the Pictorial and flatten four #6 solder lugs. Use these solder lugs in the next two steps.
- ( ) Refer to Detail 3-12C and mount two #6 solder lugs to the front of the chassis at RC. Use a 6-32  $\times$  1/4" screw and a 6-32 nut. Be sure to position each solder lug as shown in the Pictorial before you tighten the hardware.
- ( ) Similarly, mount two #6 solder lugs to the front of the chassis at RD. Be sure to position the solder lugs as shown in the Pictorial before you tighten the hardware.
- ( ) Route the cable labeled "INJ/Out" across the front of the chassis so it is between switch SW3 and solder lug RB. The free end of this cable will be connected later.

NOTE: When you connect the cables to switch SW3 and solder lug RB, in the following steps, be careful not to burn the insulation on any nearby cables.

Connect some of the cables coming from the right front corner of the chassis as follows:

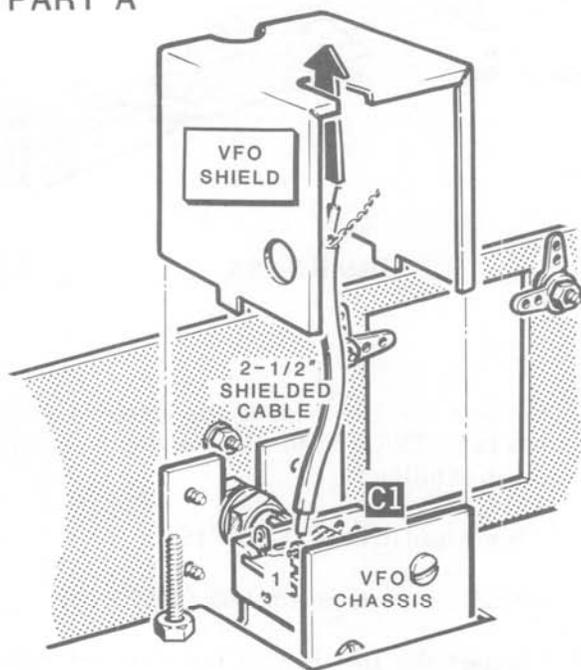
- ( ) Cable labeled "Narrow/Out": Inner lead to switch SW3 lug 3 (S-1); shield wires to solder lug RB (NS).
- ( ) Unlabeled cable: Inner lead to switch SW3 lug 2 (S-1); shield wires to solder lug RB (NS).

# Heathkit®

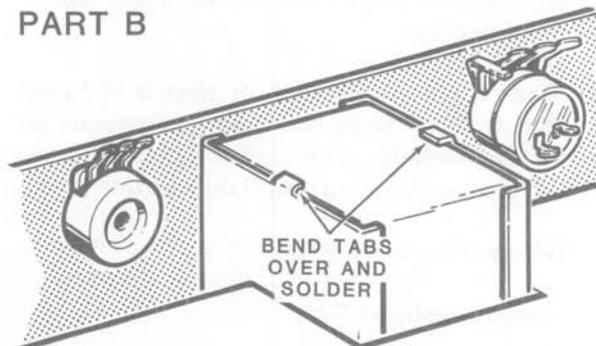
- ( ) Cable labeled "Wide/Out": Inner lead to switch SW3 lug 1 (S-1); shield wires to solder lug RB (S-3).
- ( ) Prepare a 2-1/2" shielded cable. NOTE: Cut off the shield wires at **one end** of this cable.
- ( ) Refer to Detail 3-12D and connect the inner lead at the end of the prepared shielded cable that does not have a shield to variable capacitor C1 lug 1 (S-1). The free end of this cable will be connected later.
- ( ) Refer again to Detail 3-12D and use the following procedure to mount the VFO shield onto the VFO chassis:

1. Refer to Part A of the Detail and slide the VFO shield onto the VFO chassis. Make sure all the edges of the shield are on the outside of the VFO chassis. Also make sure the shielded cable coming from the variable capacitor extends through the indicated slot in the VFO shield.
2. Turn the chassis assembly over so the T/R circuit board is up. Then refer to Part B of the Detail, bend over the two tabs on the VFO shield, and solder them to the VFO chassis.

PART A



PART B



Detail 3-12D

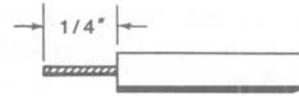


Refer to Pictorial 3-13 (Illustration Booklet, Page 30) for the following steps.

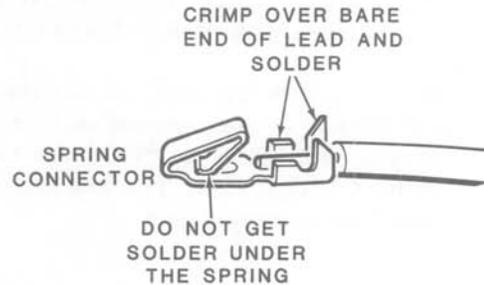
- ( ) Position the chassis assembly as shown in the Pictorial so the T/R circuit board is down, if this has not already been done.
- ( ) Position the oscillator circuit board near the chassis. Then connect the violet wire of the 8-wire cable coming from the front left corner of the chassis to oscillator circuit board hole D (S-1).
- ( ) Connect the gray wire of the 8-wire cable coming from the left front corner of the chassis to oscillator circuit board hole C (S-1).
- ( ) Refer to Detail 3-13A Part A and install a spring connector on the free end of the brown, red, orange, yellow, and green wire of the 8-wire cable coming from the left front corner of the chassis.

Position the 5-pin socket shell as shown in Detail 3-13A Part B. Then push the spring connectors on the wires into the holes of the socket shell as follows. Be sure to push on each wire until it locks into place.

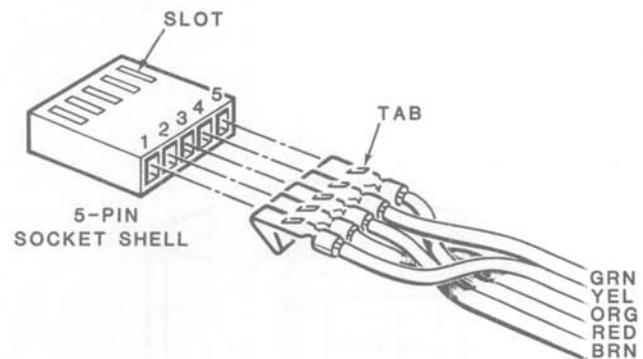
- ( ) Yellow wire into hole 1.
- ( ) Orange wire into hole 2.
- ( ) Brown wire into hole 3.
- ( ) Green wire into hole 4.
- ( ) Red wire into hole 5.
- ( ) Push the 5-pin socket onto oscillator circuit board plug P101. Be sure the yellow wire is at 12V as shown in the Pictorial.
- ( ) Connect the free end of the shielded cable labeled "INJ/Out" to the oscillator circuit board as follows:
  - Inner lead to hole INJ/OUT (S-1).
  - Shield wires to nearby hole GND (S-1).



### PART A



### PART B



### Detail 3-13A

- ( ) Connect the free end of the shielded cable labeled "TX/Out" to the oscillator circuit board as follows:
  - Inner lead to hole TX/OUT (S-1).
  - Shield wires to nearby hole GND (S-1).
- ( ) Connect the free end of the shielded cable labeled "BFO/Out" to the oscillator circuit board as follows:
  - Inner lead to hole BFO/OUT (S-1).
  - Shield wires to nearby hole GND (S-1).

# Heathkit®

Connect the wires at the free end of the 8-wire cable coming from the right front corner of the chassis to the oscillator circuit board as follows:

- ( ) Gray wire to hole 10 (S-1).
- ( ) Violet wire to hole 12 (S-1).
- ( ) Blue wire to hole 15 (S-1).
- ( ) Green wire to hole 17 (S-1).
- ( ) Yellow wire to hole 20 (S-1).
- ( ) Orange wire to hole 30 (S-1).
- ( ) Red wire to hole 40 (S-1).
- ( ) Brown wire to hole 80 (S-1).

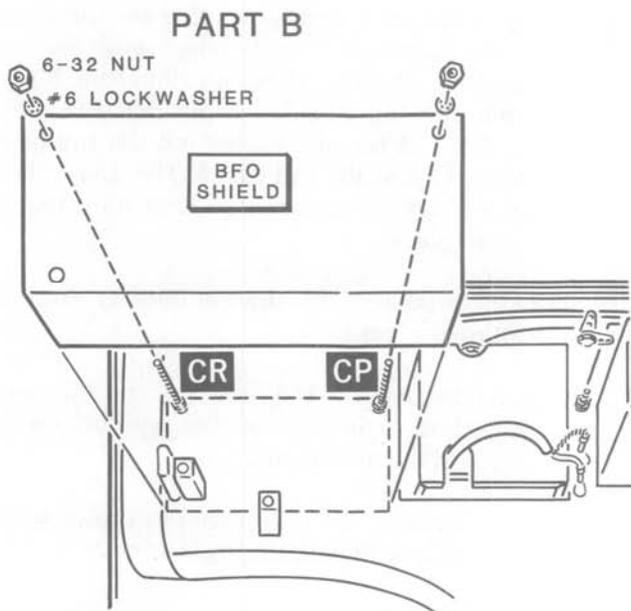
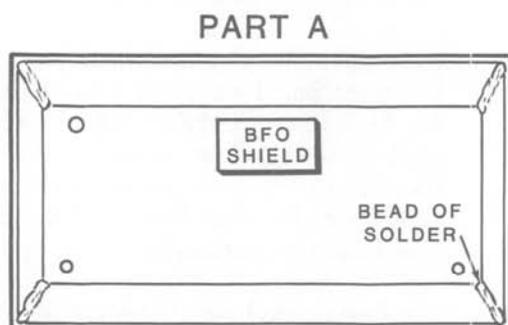
Refer to Pictorial 3-14 (Illustration Booklet, Page 31) for the following steps.

- ( ) Refer to Detail 3-14A (Illustration Booklet, Page 31) and turn an additional 6-32 nut onto each of the nine screws extending from the subchassis (at CF, CG, CH, CJ, CK, CL, CN, CP, and CR). Then place a #6 lockwasher onto each of these screws.

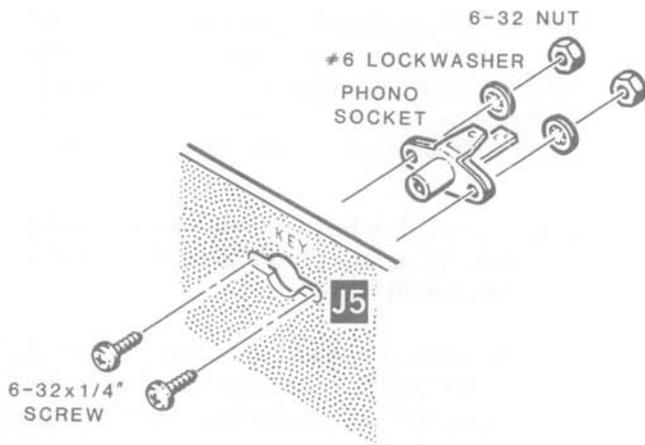
- ( ) Position the oscillator circuit board into the chassis so the nine screws extending from the subchassis pass through the nine corresponding holes in the circuit board. Then use nine 6-32 nuts to secure the circuit board in place.
- ( ) Refer to Detail 3-14B and use the following procedure to mount the BFO shield onto the oscillator circuit board:
  1. Position the shield as shown in Part A of the Detail. Then melt a bead of solder along the each of the four corner seams in the shield.
  2. Slide the BFO shield onto the two long screws at CP and CR as shown in Part B of the Detail. Then use two #6 lockwashers and two 6-32 nuts to secure the shield. Tighten the nuts only until they are snug.
- ( ) Connect the free end of the shielded cable coming from variable capacitor C1 as follows:

Inner lead to PCB pin E (S-1).

Shield wires to nearby wire socket GND (S-1).



**Detail 3-14B**



Detail 3-14C

NOTE: Scrape or sand any excess paint from around the mounting holes on the inside of the rear panel when you mount the socket in the next step.

- ( ) J5: Refer to Detail 3-14C and mount a phono socket onto the rear panel at J5 as shown. Use 6-32 × 1/4" hardware. Be sure to position the socket as shown in the Pictorial.
- ( ) Connect the free end of the blue wire coming from the 8-wire cable (near the left side of the chassis) to phono socket J5 lug 1 (S-1).
- ( ) Route the wires and cables that are connected to the oscillator circuit board and the rear panel as shown. Then position the 8-wire cable and the shielded cable that run along the front of the chassis behind the indicated solder lugs at RC and RD. NOTE: Bend these solder lugs as necessary so they hold the cables in place.

Refer to Pictorial 3-15 (Illustration Booklet, Page 32) for the following steps.

- ( ) Refer to Detail 3-15A and use the following procedure to install the dial window on the inside of the front panel:
  1. Position the front panel as shown so the side with the printing is down.

2. Draw a pencil line across the center of the front panel.
3. Carefully peel the backing paper strips from the dial window. Then position the window so the line on it lines up with the pencil line on the front panel. Also be sure the edge of the window is flush with the edge of the front panel. Then press the window into place.

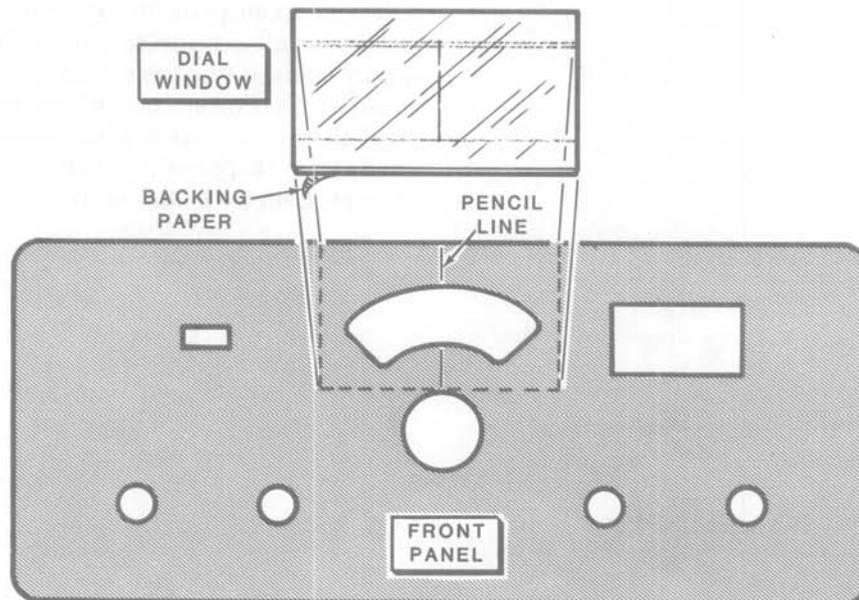
- ( ) Carefully inspect the lugs of the meter for a fine shorting wire that may be wrapped around the lugs. Remove any wire that you find.

M1: Position the meter near the front of the chassis. Then connect the 2-wire cable that extends through the large rectangular hole in the front of the chassis to the meter lugs as follows:

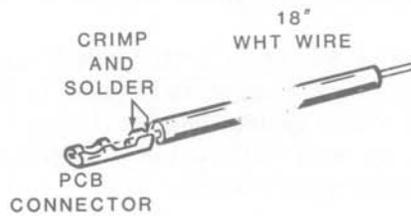
- ( ) Brown wire to the negative (-) or unmarked lug (S-1).
- ( ) Red wire to the positive (+) or dot marked lug (S-1).
- ( ) Use the following procedure to mount the front panel onto the chassis:
  1. Position meter M1 in the rectangular cut-out in the front panel as shown.
  2. Hold the meter in place while you slide the front panel onto the four shafts at R2, R1, R3/SW2, and SW1. Make sure the knob on the slide switch passes through its hole in the front panel. Also make sure the meter lugs clear the T/R circuit board and the subchassis.
  3. Use four control nuts to secure the front panel at R2, R1, R3/SW2, and SW1. Tighten these nuts only until they are snug.

# Heathkit®

- ( ) Start a 6-32 × 1/8" setscrew into each of the four small knobs and two setscrews into the large knob.
- ( ) Turn the shaft of the CW LEVEL control fully counterclockwise. Then install a small knob on the shaft of this control. Be sure the knob pointer lines up with the line on the front panel at the 7-o'clock position before you tighten the setscrew.
- ( ) Turn the shaft of the RIT control to the center of its rotation (detent position). Then install a small knob on the shaft of this control. Be sure the knob pointer lines up with the "0" on the front panel before you tighten the setscrew.
- ( ) Turn the shaft of the AF GAIN control fully counterclockwise until it clicks, if this has not already been done. Then install a small knob
- on the shaft of this control. Be sure the knob pointer lines up with the line at "OFF" on the front panel before you tighten the setscrew.
- ( ) Turn the shaft of the BAND switch fully counterclockwise. Then install a small knob on the shaft of this switch. Be sure the knob pointer lines up with "80" on the front panel before you tighten the setscrew.
- ( ) Install a large knob on the main tuning shaft and tighten both setscrews.
- ( ) Shake out any loose clippings or solder splashes that may be lodged in the wiring. Also carefully check the chassis connections to make sure they are all soldered properly.
- ( ) Set the chassis aside temporarily.



Detail 3-15A

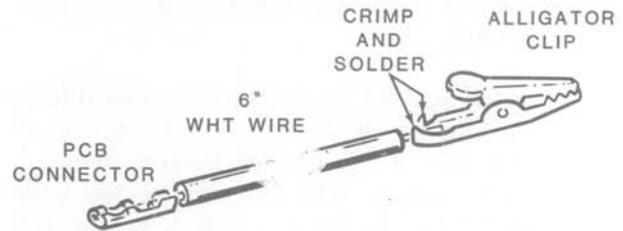


PICTORIAL 3-16

Refer to Pictorial 3-16 for the following steps.

- ( ) Prepare an 18" white solid wire.
- ( ) Solder a PCB connector onto one end of the prepared wire as shown in the Pictorial.

NOTE: This wire will be referred to as the "test lead" during the "Initial Tests."



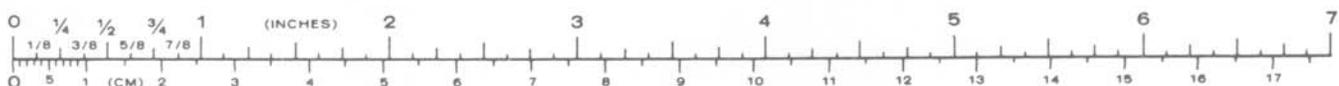
PICTORIAL 3-17

Refer to Pictorial 3-17 for the following steps.

- ( ) Prepare a 6" white solid wire.
- ( ) Solder a PCB connector on one end of the prepared wire.
- ( ) Solder an alligator clip onto the other end of the prepared wire as shown in the Pictorial.

NOTE: This wire will be referred to as the "meter test lead" during the "Initial Tests."

Before you can perform the "Alignment," you may have to install a connector on the ends of your power supply leads, if this has not already been done. Refer ahead to "DC Power" in the "Installation and Operation" section of this Manual (Page 87) and install a connector (supplied) on your power supply leads. Then proceed to "Initial Tests."



## INITIAL TESTS

The following resistance tests will help assure you that there are no wiring errors or other problems that might prevent your unit from operating properly, or even damage components. You will need an ohmmeter to make these tests.

If you do not achieve the indicated results as you perform a test, locate and correct the problem before you proceed to the next test. A possible cause is listed for each test. Refer to the "In Case of Difficulty" section for help in locating more difficult problems.

## RESISTANCE TESTS

The following resistance tests will help determine if there are any wiring errors, solder bridges, or other problems in your Transceiver. Perform all of the tests before you connect your Transceiver to a power source.

Set the front panel controls and switches as follows:

- ( ) CW LEVEL – fully counterclockwise.
- ( ) RIT – center of rotation (detent position).
- ( ) AF GAIN – fully counterclockwise (off).

- ( ) BAND switch – 80.
- ( ) SELECTIVITY – WIDE.
- ( ) Set your ohmmeter to the  $R \times 100$  range and connect its common lead to the Transceiver chassis.

NOTE: If you do not obtain the correct meter readings in the next step, interchange the meter leads and recheck the readings.

- ( ) Touch the ohmmeter test probe to the points indicated in the following chart and observe the reading. Then change the BAND switch position and move the test probe to the next test point, etc.