

# Instructions

FOR THE



## MODIFICATION KIT

### MODEL SBM - 102-1

## INTRODUCTION

This modification Kit applies to the following Heath Transceivers:

1. All Models HW-100, SB-100, SB-101 and SB-101W.
2. Any Model SB-102 that has a number lower than 5446 as the last four digits of the Series Number (on the blue and white label).

The plate tank circuit of V6, the second transmitter mixer, is used in the receive mode as the plate circuit of V10, RF Amplifier. Due to tube Miller effects, additional capacity is required when receiving to permit the driver preselector to peak at the same dial setting in both transmit and receive modes. This modification uses automatic diode switching to add the required compensating capacity.

## PARTS LIST

PART No	QUAN-TITY	DESCRIPTION
1-26	1	100 kΩ 1/2-watt resistor (brown-black-yellow)
1-35	1	1 MΩ 1/2-watt resistor (brown-black-green)
21-33	1	3.3 pF disc capacitor
66-56	1	1N4149 diode (cathode end marked with a band)
344-50	1	Black hookup wire
391-34	1	Blue and white identification label
431-62	1	3-lug terminal strip
		Instruction sheet
		Solder

Since the 100 K resistor, under certain conditions, is dissipating around 0.9 watts ( $P=E^2/R$ ), I replaced the 1/2 watt resistor that was originally installed in my HW-101 with a 100K, 2 watt resistor. I also replaced the 1N4149, which has a PRV of 75 VDC, with a 400 VDC rectifier diode which appears to work just as well for switching in this circuit.



## MODIFICATION PROCEDURE

- ( ) Remove the cabinet from the transceiver and turn the chassis bottom side up.
- ( ) Remove the coil cover.
- ( ) If you wish, temporarily remove the support rail which holds one end of the switch boards.
- ( ) Refer to Figure 1 and bend a small "foot" on the end of one lead of the 100 k $\Omega$  (brown-black-yellow) resistor.
- ( ) Coat the "foot" with a liberal amount of solder.

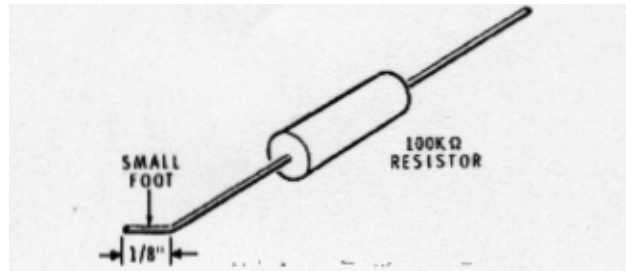


Figure 1

Refer to Figure 2 for the next three steps.

- ( ) Solder the foot on the resistor lead directly to the foil at point 11 on the RF driver circuit board. NOTE: A white-red-red wire (and possibly other components) are already soldered to this foil.

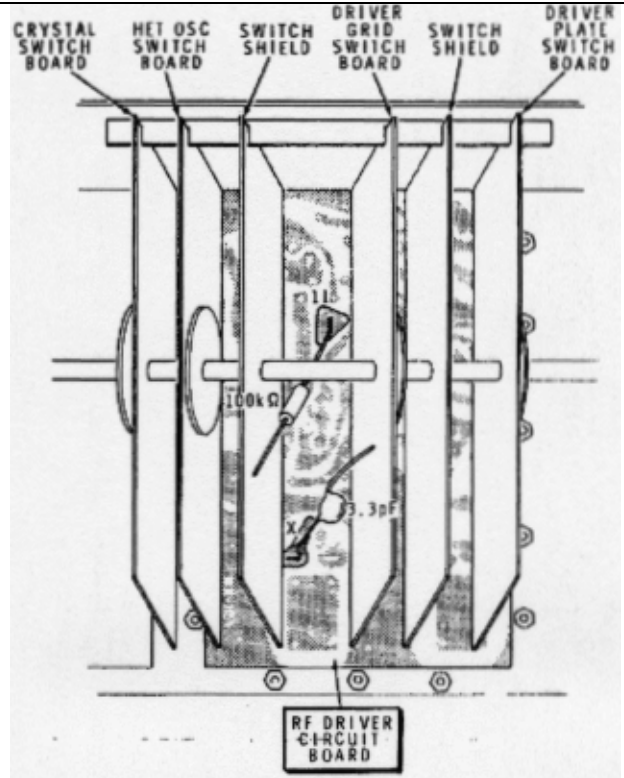


Figure 2

- ( ) Cut the leads of the 3.3 pF disc capacitor to 5/8".
- ( ) Bend a 1/8" foot on the end of one lead of the disc capacitor and solder this foot directly to the foil on the RF driver circuit board at point X as shown. Make sure the solder does not short circuit the foil to the switch shield.

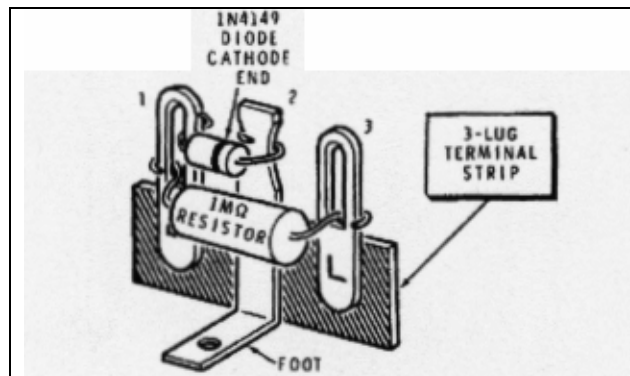


Figure 3

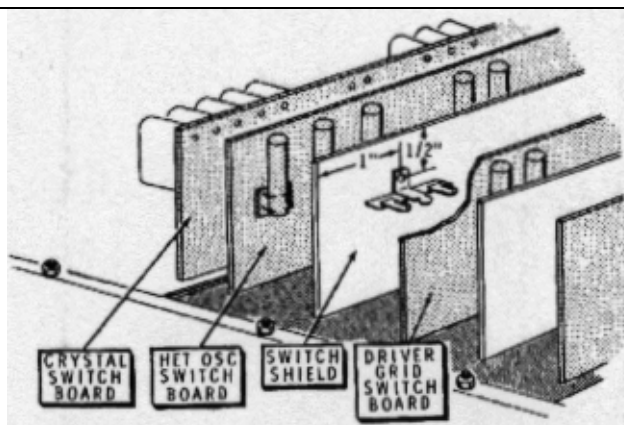
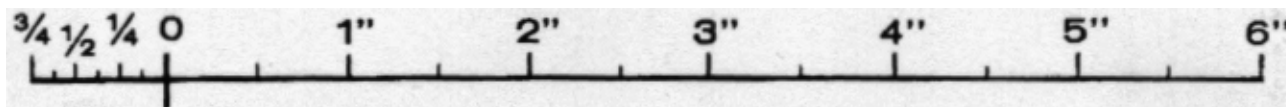


Figure 4

Refer to Figure 3 for the next two steps.

- ( ) Connect the cathode (banded) end of the 1N4149 diode to lug 2 of the 3-lug terminal strip (S-1). Connect the other lead to lug 1 of the terminal strip (NS).
  - ( ) Connect the 1 MΩ (brown-black-green) resistor from lug 1 (NS) to lug 3 (NS) of the terminal strip.
  - ( ) Coat the terminal strip foot with solder.
- ( ) Refer to Figure 4 and solder the 3-lug terminal strip directly to the rear side (driver grid switch board side) of the front switch shield. Follow the dimensions given. Melt some solder on the switch shield at the point to which the terminal strip will be mounted. Then remelt the solder and hold the terminal strip foot snugly against the switch shield until the solder cools.
  - ( ) Connect the free lead of the 3.3 pF disc capacitor to lug 1 of the terminal strip (NS).





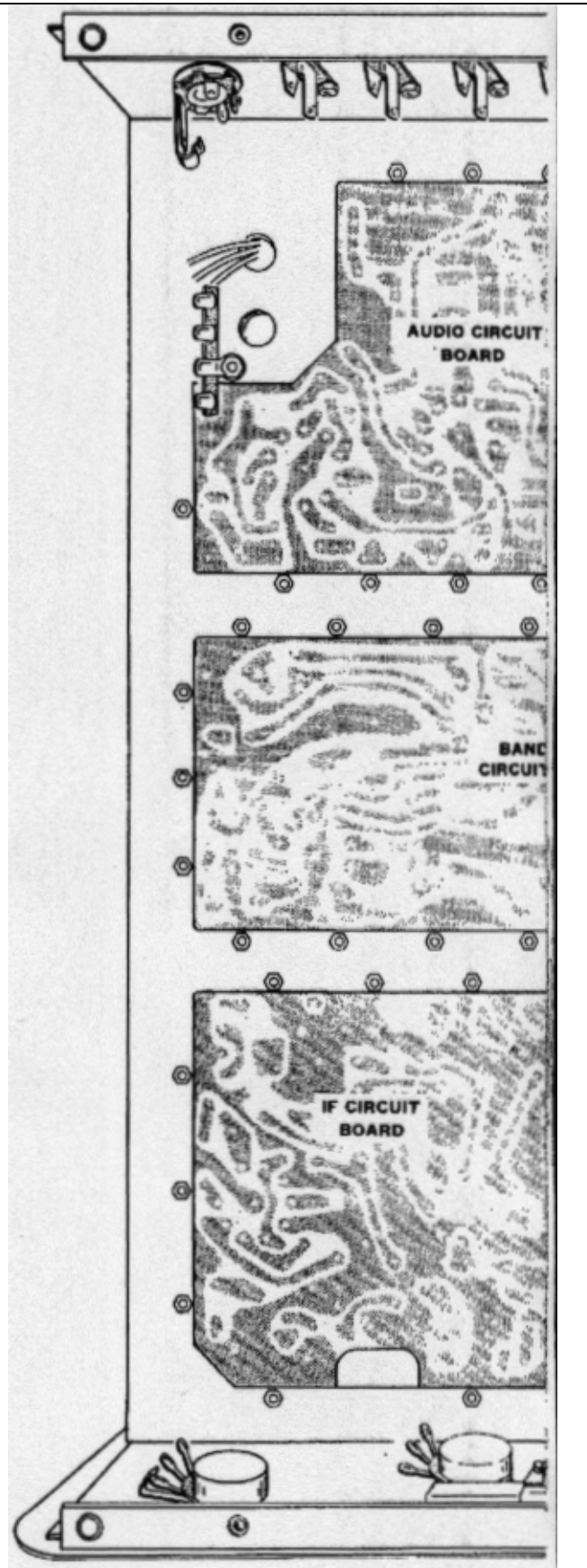
- ( ) Connect the free end of the 100 k $\Omega$  resistor to lug 1 of the terminal strip (S-4). Make sure the capacitor and resistor leads do not touch any other wires or components.
- ( ) Prepare a 16" black hookup wire by removing 1/4" of insulation from each end of the wire.
- ( ) Connect one end of the black hookup wire to lug 3 of the terminal strip (S2).

NOTE: Two sets of steps follow. Use only those steps applying to your transceiver.

**MODELS WITH "SB-" PREFIX:**

- ( ) Refer to Figure 5 and route the black hookup wire over the bandswitch shaft, as shown, down through grommet CD, and back along the wiring harness to lug 1 of the Bias Adjust control. Position the wire against the switch shield.
- ( ) Melt the solder on lug 1 of the Bias Adjust control and push the bare end of the black hookup wire through the opening in the lug. After the solder has cooled, tug on the wire to make sure it is securely connected.

Proceed to the "Final Assembly."



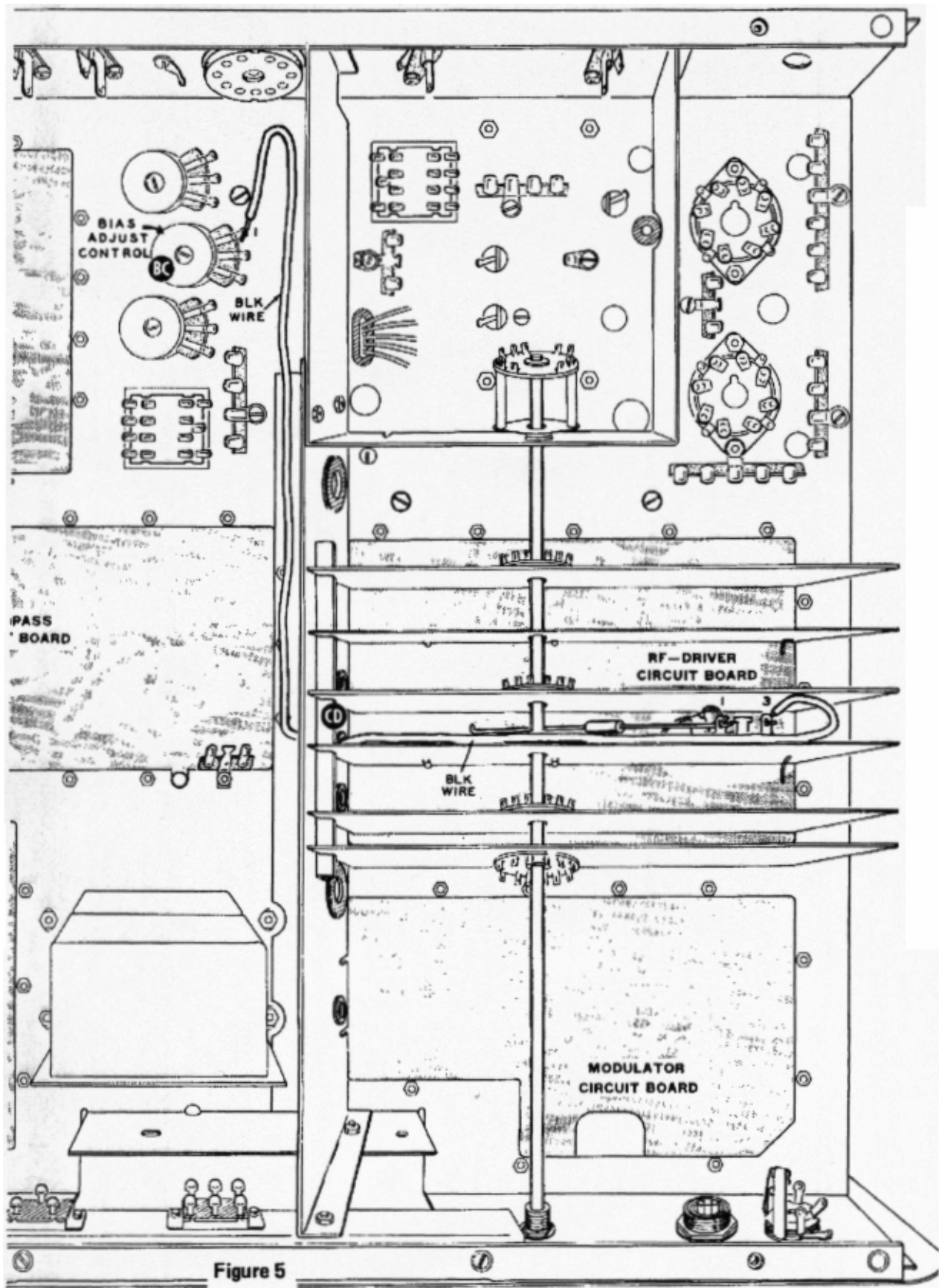


Figure 5

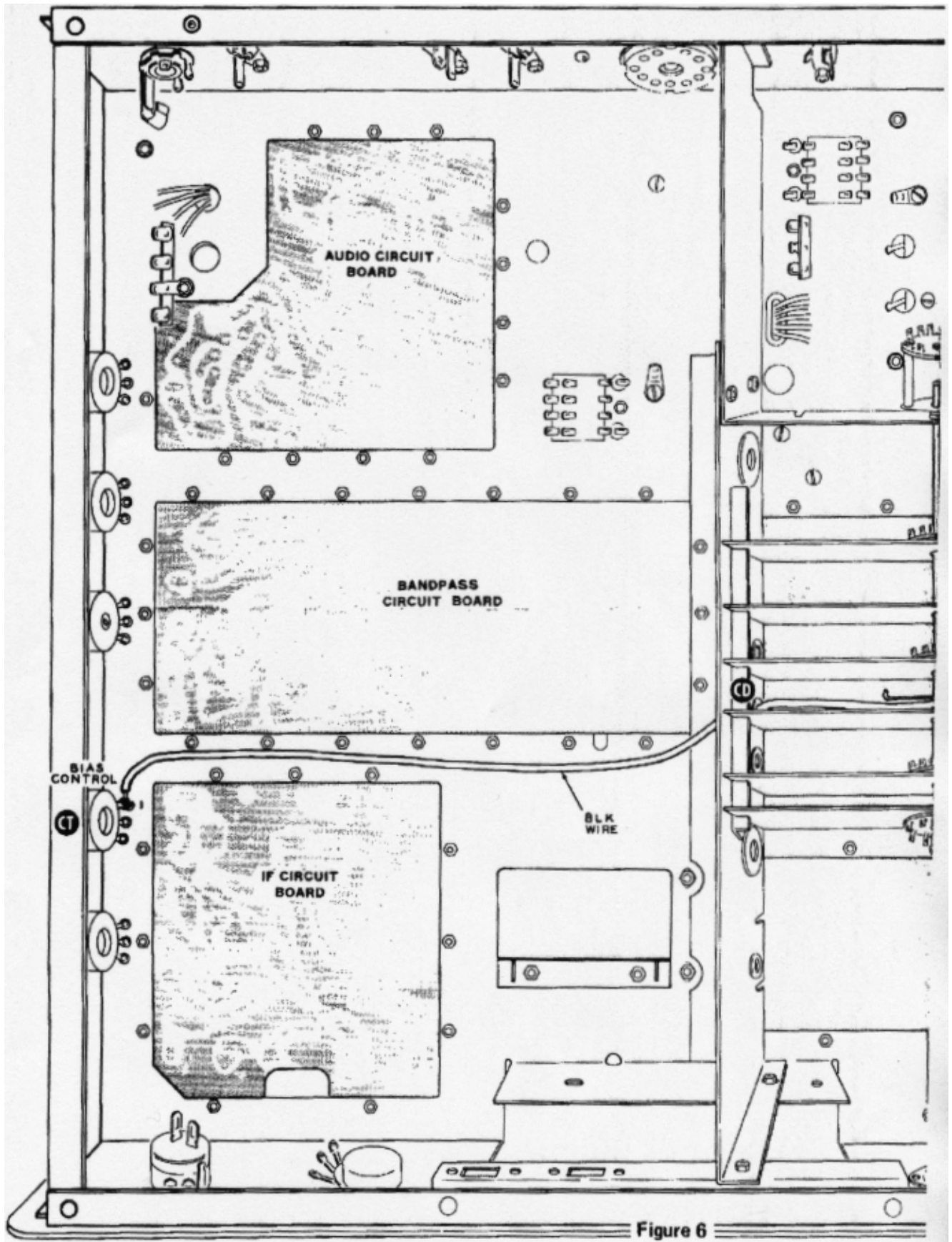
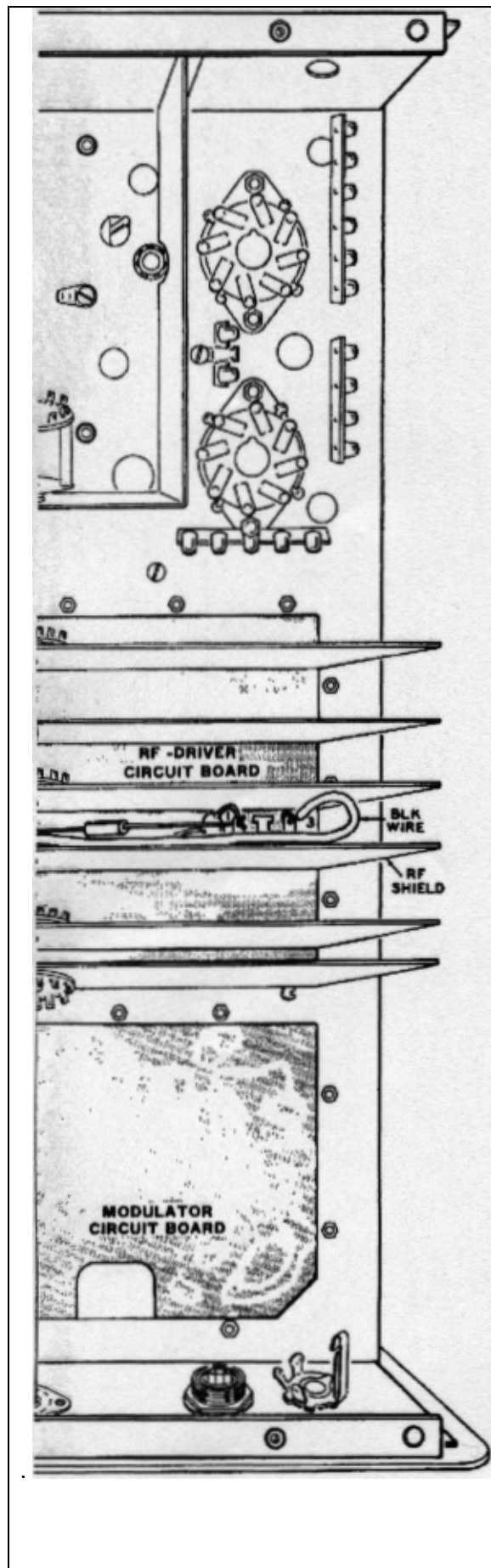
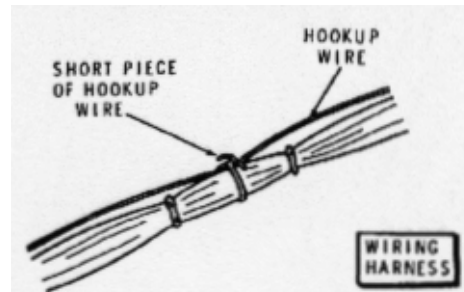


Figure 6



## MODEL HW-100:

- ( ) Refer to Figure 6 and route the hookup wire over the switch shaft, through grommet CD, and along the wiring harness to Bias control CT.
- ( ) melt the solder on lug 1 of control CT and push the bare end of the hookup wire through the opening in the lug. After the solder has cooled, tug on the wire to make sure it is securely connected.



## FINAL ASSEMBLY

Figure 7

NOTE: You can secure the hookup wire to the wiring harness with electrical tape or with short pieces of hookup wire as shown in Figure 7.

- ( ) If it was removed, replace the support rail and secure it with the hardware previously removed. Make sure all switch boards and shields fit into the proper slots in the comb on the support rail.
- ( ) Replace the coil cover. Make sure the grounding clips on the under side of the cover fit over the switch shields.
- ( ) Refer to the alignment section of your assembly manual and peak the driver grid and driver plate coils.
- ( ) Replace the transceiver cabinet.
- ( ) Carefully peel away the backing paper from the blue and white identification label. Then press the label onto the rear of the cabinet. Be sure to refer to the numbers on this label in any communications you have with the Heath Company about this kit.
- ( ) Copy the heavy, dark lines from the schematic on Page 8 onto the schematic diagram in your transceiver manual.

This completes the modification.

# CIRCUIT DESCRIPTION

A negative voltage is always applied to the anode of D907 from the Bias Adjust control through resistor R954. When receiving, a higher positive voltage is applied to the anode of D907 from the screen circuit of V11 through resistor R955. As its anode is now positive, the diode conducts and acts as a closed switch to supply a ground to C955. This action places the capacitor in parallel with C421B and adds capacity to the plate tuned circuit.

In the transmit mode, the positive voltage is removed by the opening of contacts 3 and 11 of RL2. The remaining negative voltage prevents D907 from conducting and it consequently acts as an open switch, removing the ground from C955. The capacitance of C955 is therefore removed from the plate circuit of V6.

