MODIFICATION KIT
Model HWM-32-1

for the

20-METER TRANSCEIVER
MODEL HW-32

The purpose of this Modification Kit is to improve the neutralization of your 20-Meter Transceiver and to provide additional stability. The modification consists of a number of component changes on the circuit board, and the addition of a shield. Be careful when making these changes that you do not damage the circuit board or wire harness.

PARTS LIST

PART No.	PARTS Per Kit	DESCRIPTION
RESISTORS (1/2 Watt)		
1-1	1	47 Ω (yellow-violet-black)
1-9	1	1000 Ω (brown-black-red)
1-20	1	10 KΩ (brown-black-orange)
1-22	1	22 KΩ (red-red-orange)
1-25	1	47 KΩ (yellow-violet-orange)
CAPACITORS		
21-3	2	10 μμf disc
21-31	2	.02 μfd disc
27-47	2	.1 μfd resin (may be color coded, brown-black-yellow)
HARDWARE		
250-212	2	2-56 x 3/16" sheet metal screw
250-213	8	4-40 x 5/16" screw
252-15	8	4-40 nut

PART No.	PARTS Per Kit	DESCRIPTION
HARDWARE (cont'd.)		
254-9	8	#4 lockwasher
250-56	2	6-32 x 1/4" screw
250-170	4	#6 x 1/4" sheet metal screw
252-3	2	6-32 nut
254-1	2	#6 lockwasher
259-1	1	#6 solder lug
GENERAL		
57-27	1	Silicon diode
204-M182	1	L bracket
206-77	1	Tube shield
206-M312	1	Amplifier shield
340-3	1	Heavy bare wire
597-366	1	Instruction sheet

STEP-BY-STEP ASSEMBLY

CIRCUIT BOARD PARTS CHANGES

Refer to Pictorial 1 for the following steps.

NOTE: The same circuit board sectioning used in the original assembly of the kit will be used in these instructions to make it easier to locate the proper parts.

(✓) Remove the cabinet from your HW-32 Transceiver.

NOTE: The solder can be removed from a circuit board connection as follows:

First, heat the connection. Then draw the solder away with a wiping motion of the soldering iron. For best results, keep the excess solder cleaned off the soldering iron tip.

SECTION 3A

(✓) Replace the 100 KΩ (brown-black-yellow) resistor with a 47 KΩ (yellow-violet-orange) resistor.

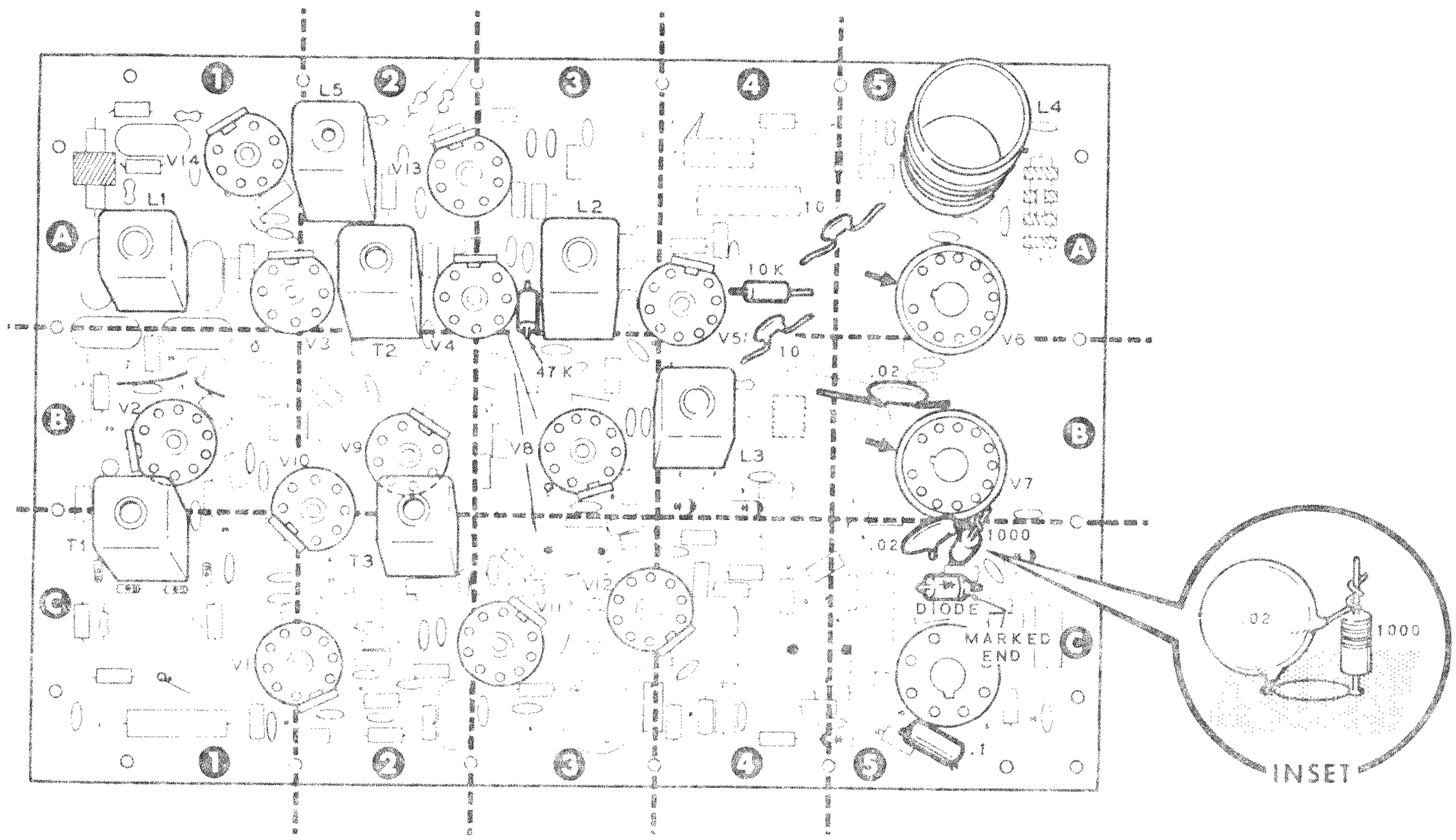
SECTION 4A

( ) Replace the 22 KΩ (red-red-orange) resistor with a 10 KΩ (brown-black-orange) resistor.

( ) Replace the 22 $\mu\mu$f mica capacitor with a 10 $\mu\mu$f disc capacitor.

SECTION 5A

( ) Replace the 22 $\mu\mu$f mica capacitor with a 10 $\mu\mu$f disc capacitor.



PICTORIAL 1

SECTION 5B

( ) Replace the .005 μfd disc capacitor with a .02 μfd disc capacitor.

SECTION 5C

( ) Remove one lead of the .02 μfd disc capacitor from the circuit board and install a 1000 Ω (brown-black-red) resistor in series. See the inset drawing on Pictorial 1.

( ) Replace the 100 KΩ (brown-black-yellow) resistor with a silicon diode. Position the marked end (a color band, color dot, or color end) as shown.

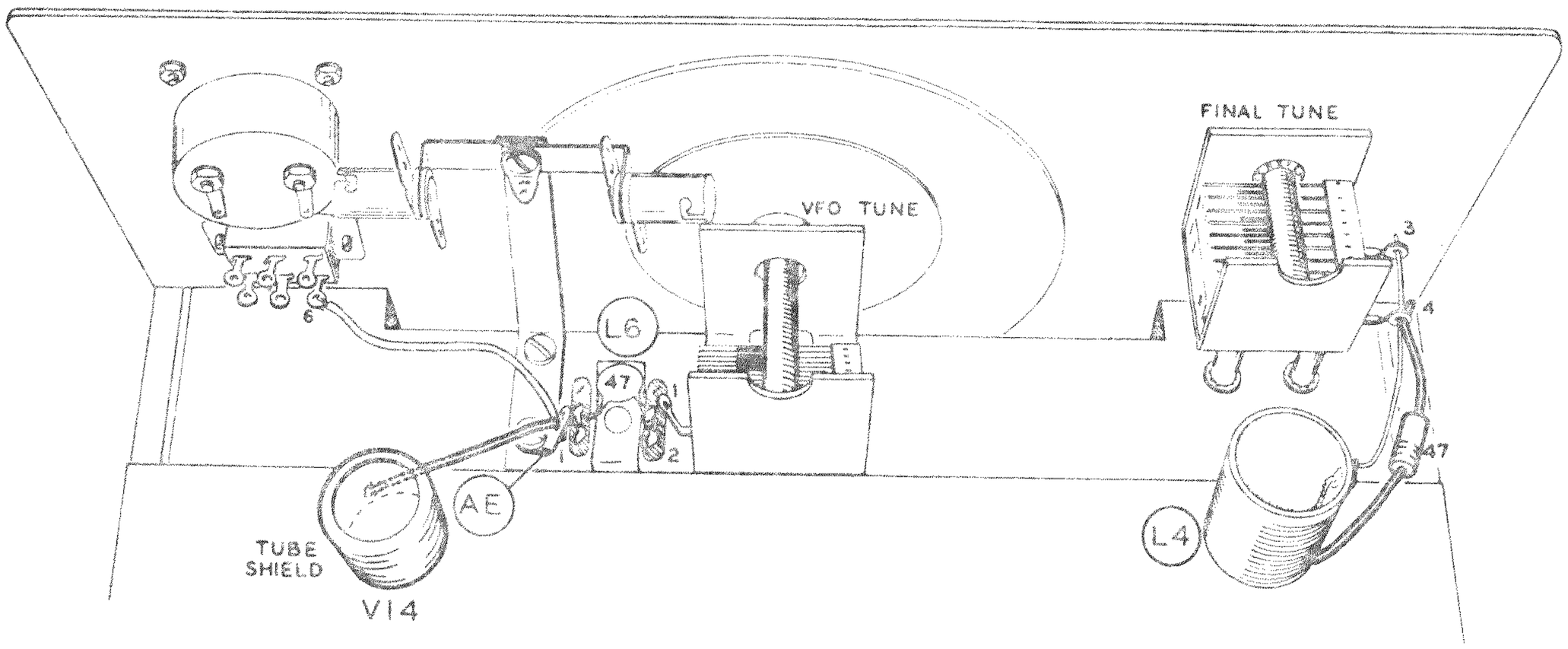
( ) Replace the .02 μfd disc capacitor with a .1 μfd resin capacitor.

CHASSIS WIRING CHANGES

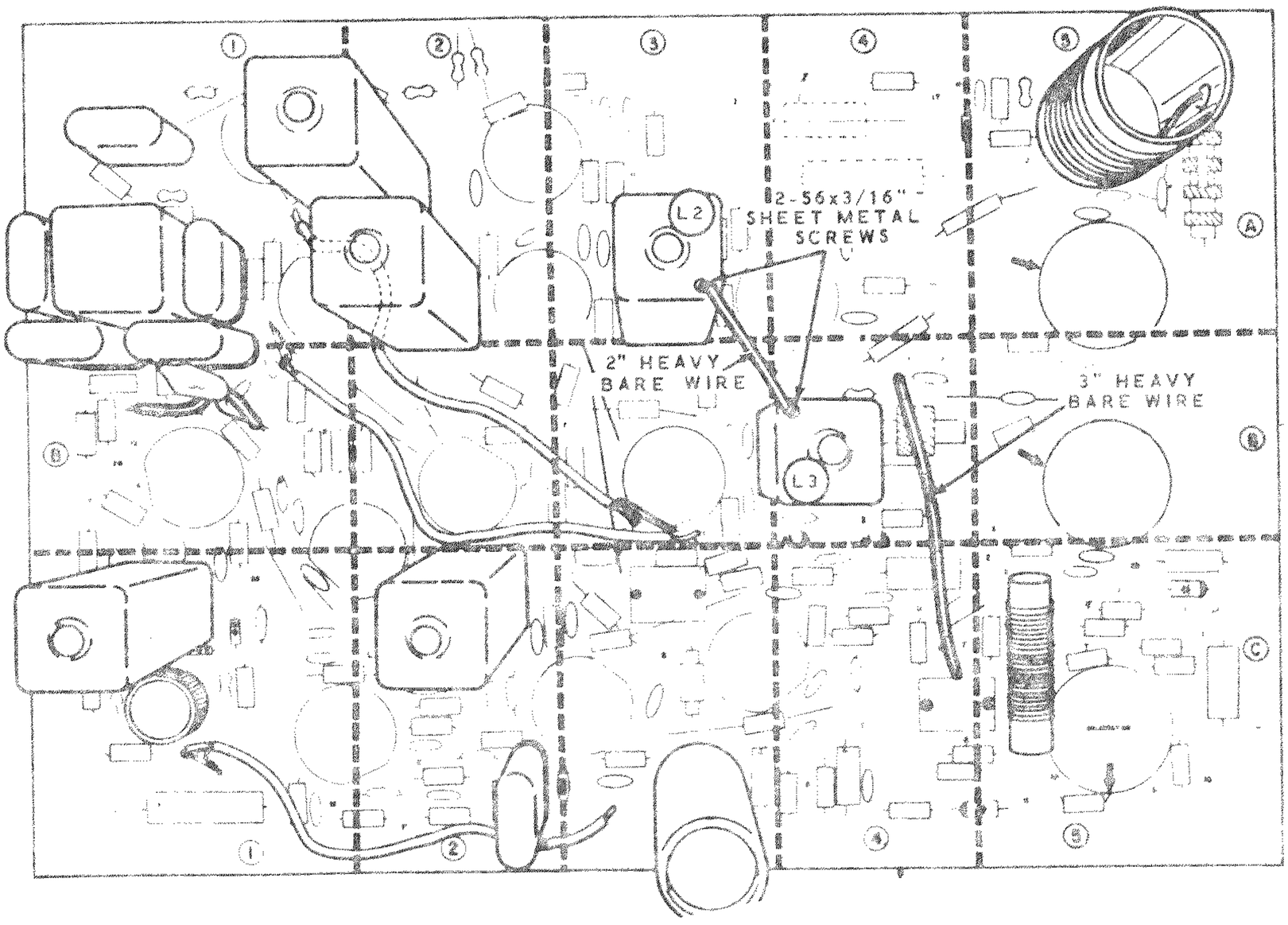
Refer to Pictorial 2 for the following steps.

( ) Connect a 47 Ω (yellow-violet-black) resistor from lug 4 of the Final Tune capacitor (solder) to the bottom eyelet of coil L4 (solder).

( ) Solder one end of a 2-1/2" heavy bare wire to the lower edge of a tube shield and place the shield over tube V14. Connect the other end of this wire to solder lug AE (solder).



PICTORIAL 2



PICTORIAL 3

CIRCUIT BOARD WIRING CHANGES

Refer to Pictorial 3 for the following steps.

( ) Connect one end of a 3" heavy bare wire to the indicated hole in section 4B. The other end will be connected later.

( ) Punch a small hole in the top corner of the metal shields over coil L2 and coil L3. Use an icepick or an awl and be very careful not to damage the coils or the circuit board.

( ) Screw a 2-56 x 3/16" sheet metal screw into each of the two holes punched in the above step.

( ) Solder the ends of a 2" heavy bare wire to the heads of the 2-56 x 3/16" sheet metal screws in L2 and L3.

Refer to Pictorial 4 for the following steps.

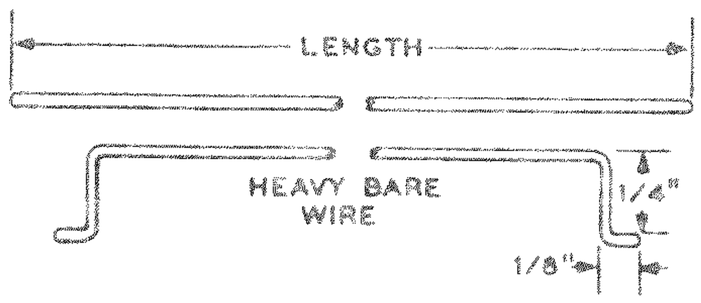
( ) Unsolder and remove the shielded cable that is connected between terminal K in section 2C and lug 1 of the Mic connector. Also remove the cable shield from the solder lug.

( ) Solder one lead of a 22 KΩ (red-red-orange) resistor to terminal K in section 2C. Connect and solder the other lead of this resistor to lug 1 of the Mic connector.

( ) Cut both leads of a .02 μfd disc capacitor to 1/2". Solder these capacitor leads to the circuit board foils as shown in section 1A.

( ) Solder one lead of a .1 μfd resin capacitor to the foil at terminal 10 in section 5C (S-1). Connect the other lead of this capacitor to lug 1 of the Rcvr socket (solder).

NOTE: When heavy bare wire is called for in the next three steps, cut the wire to the length given in the step and prepare the ends as shown in Detail 4A. Solder the ends of the wires directly to the circuit board foil.

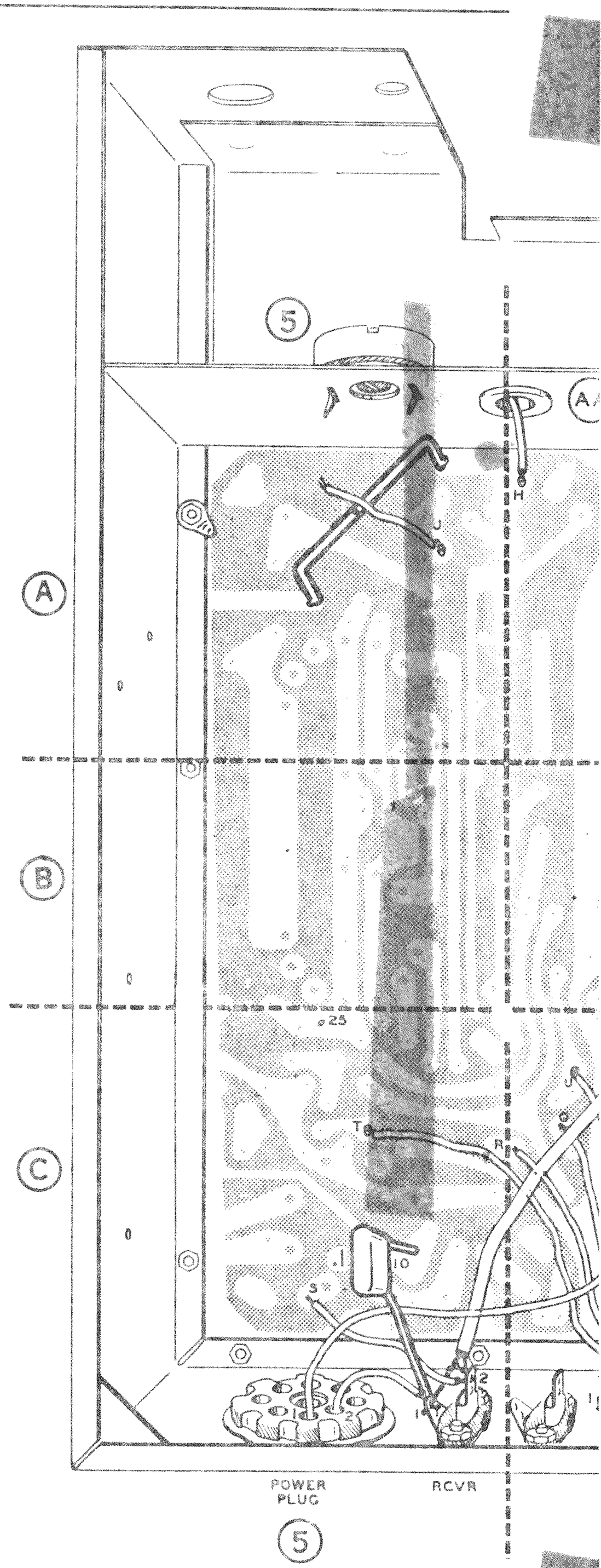


Detail 4A

( ) Prepare a 2-1/2" heavy bare wire. Solder the ends of this wire to the foils as shown in section 5A.

( ) Prepare a 1-3/4" heavy bare wire. Solder the ends of this wire to the foils as shown in section 3B.

( ) Prepare a 1-1/4" heavy bare wire. Solder the ends of this wire to the foils as shown in section 2A.




4
3
2
1
AA
AB
A
B
C
.02
D
E
F
YEL
GRN
22K
1MEG
.005
AD
EXT RELAY
SPKR
FINAL BIAS
TUNE LEVEL
MIC GAIN
MIC

PICTORIAL 4

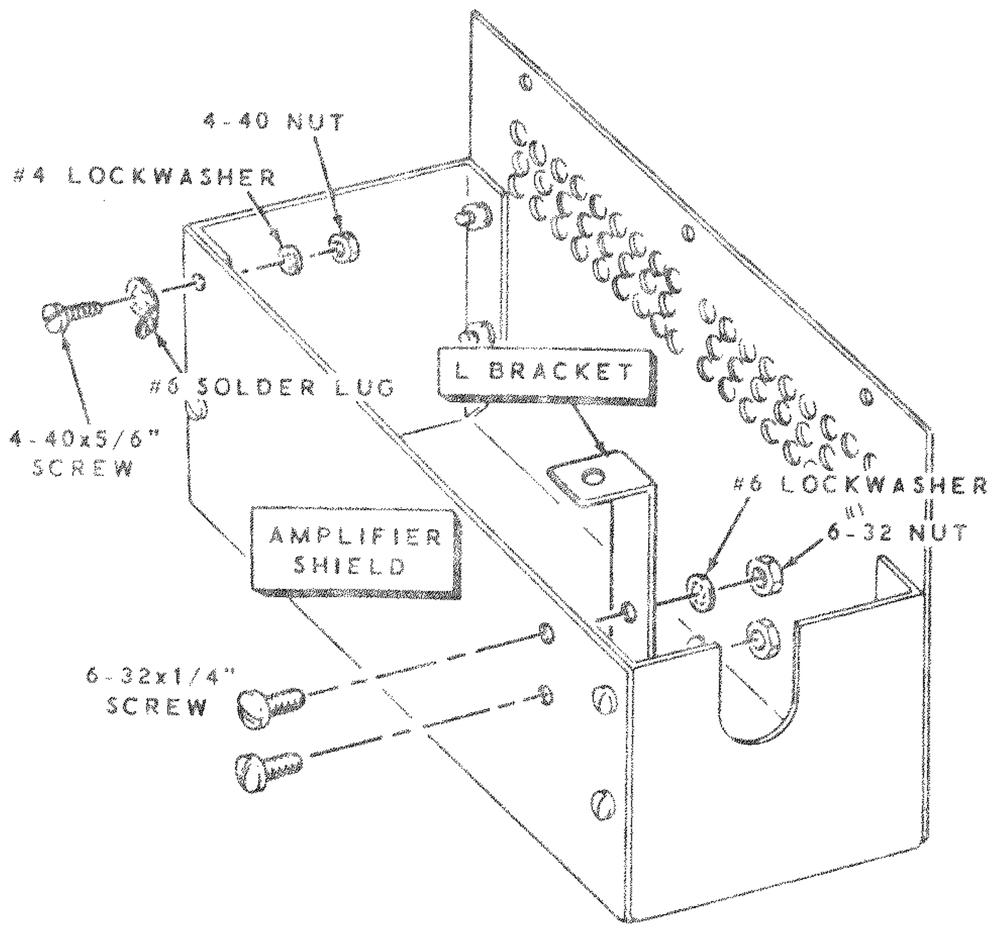
AMPLIFIER SHIELD

Refer to Pictorial 5 for the following steps.

( ) Attach the L bracket to the amplifier shield. Use 6-32 x 1/4" hardware as shown.

( ) Install a #6 solder lug as shown. Use a 4-40 x 5/16" screw, a #4 lockwasher, and a 4-40 nut.

( ) Fasten all four corners of the shield with the remaining 4-40 x 5/16" hardware.



PICTORIAL 5

Refer to Pictorial 6 for the following steps.

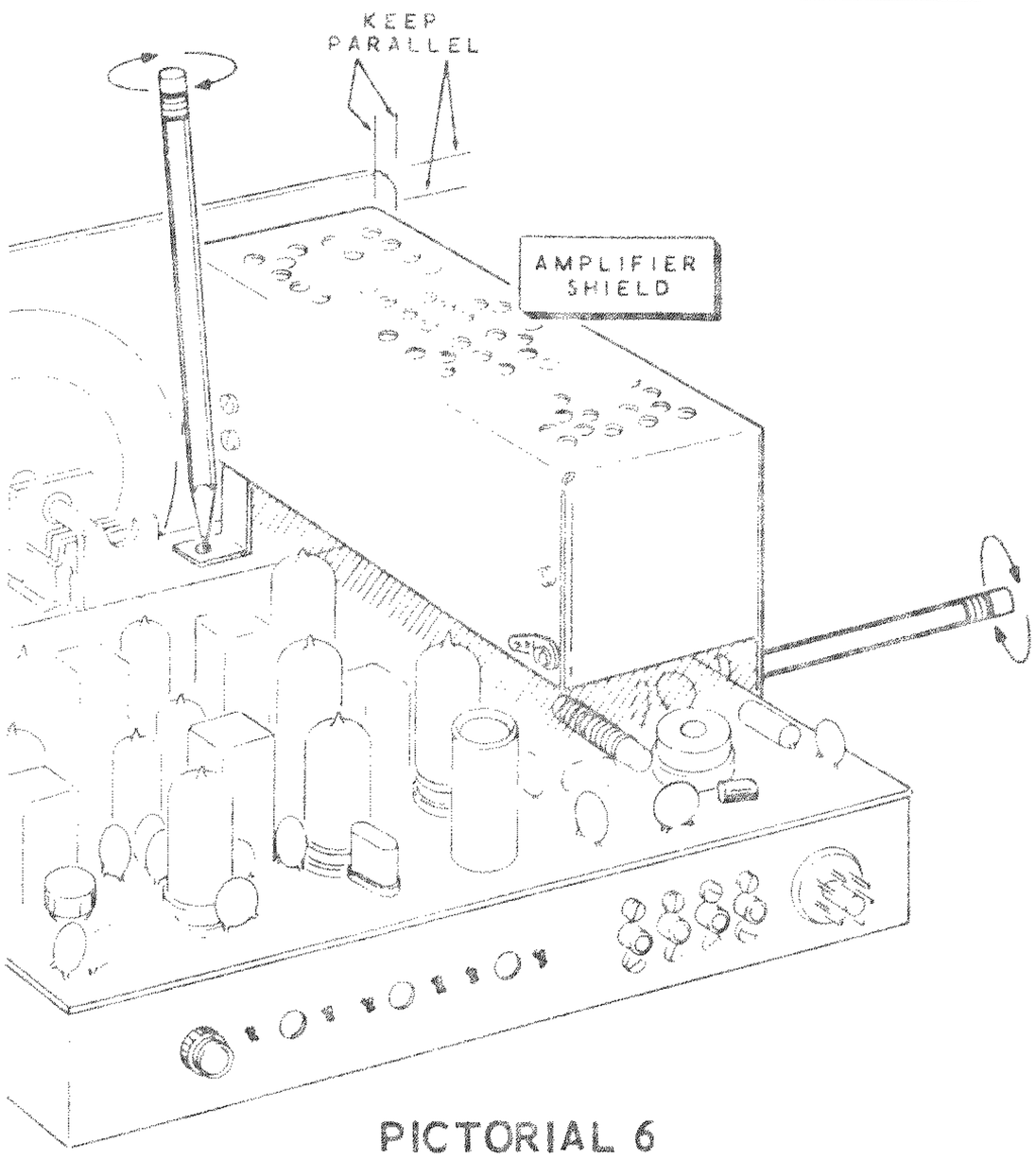
( ) Turn the Final Tune knob on the front panel of the Transceiver so the plates of the capacitor are fully closed. Be careful not to damage the capacitor as you perform the next step.

( ) Position the shield on the chassis so the front of the shield fits into the space between the final tune capacitor and the front panel.

( ) With the shield parallel to the top and side edges of the front panel, mark the mounting holes on the top and side of the chassis.

CAUTION: In the next step, the shield mounting holes will be drilled in the chassis. Be very careful when drilling these holes that you do not damage the underchassis components or wires. Some type of gauge (a piece of tape, etc.) should be placed approximately 3/16" from the tip of the drill. This will help prevent component damage by showing you when the drill has penetrated far enough through the chassis. Be sure to use a center punch to mark the hole locations to prevent the drill from wandering.

( ) Remove the shield and drill 7/64" diameter holes at the four marked locations.



PICTORIAL 6

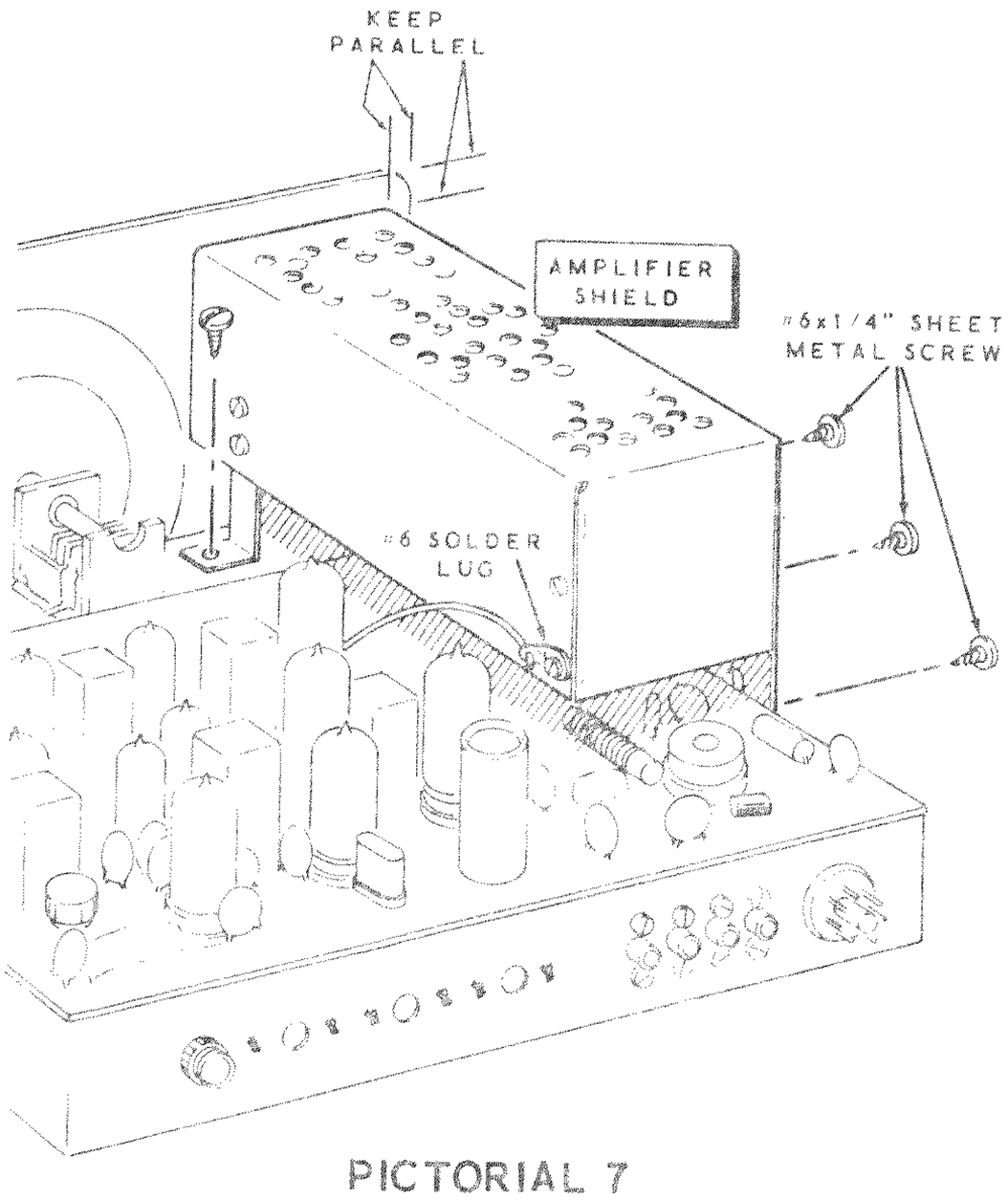
Refer to Pictorial 7 for the following steps.

( ) Install the amplifier shield on the chassis. Use four #6 x 1/4" sheet metal screws.

( ) Check the rotation of the Final Tune knob. If it binds on the front of the panel, loosen the setscrew and slide the knob forward slightly. Then retighten the setscrew.

( ) Locate the heavy bare wire that is connected to the circuit board in section 4B. Bend this wire so it does not touch the 1 mh choke coil that is next to it. Connect the free end of this wire to the solder lug on the shield (S-1).

This completes the changes to your Transceiver. Check to see that all connections are soldered.



PICTORIAL 7

ADJUSTMENTS

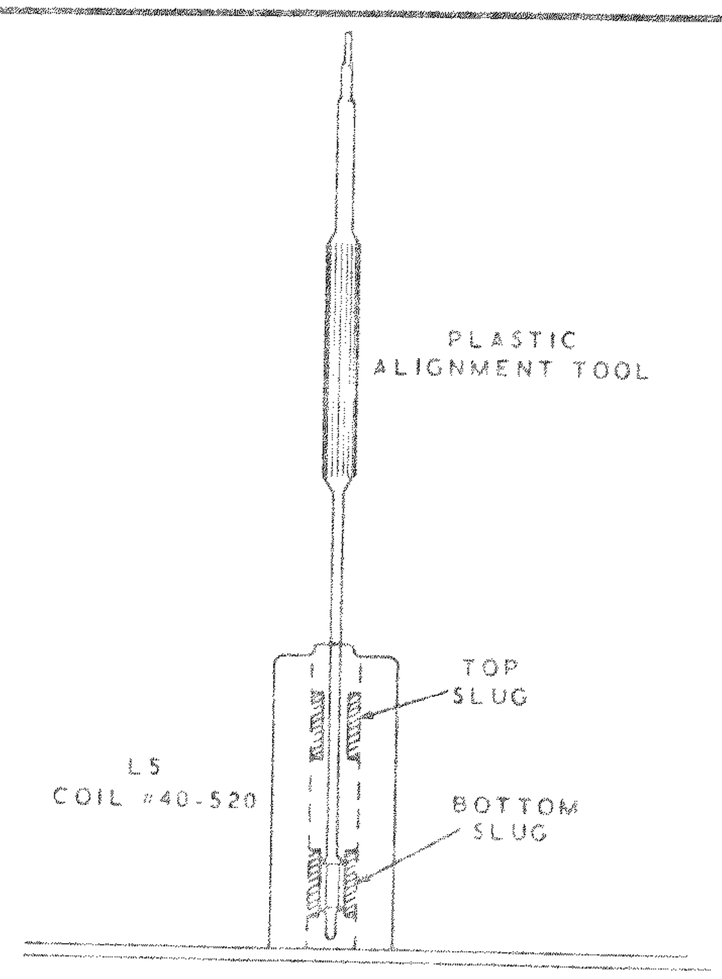
The changes just completed make it necessary to realign the Transceiver. Perform the Alignment instructions given in the Manual, and then continue with the following steps.

( ) Punch a hole in the top center of the metal shield over coil L5 with an awl or an ice pick. Be careful not to damage the coil or the circuit board.

NOTE: In the next step, the bottom slug of L5 will be adjusted. It is very important that the top slug of this coil does not get moved. Refer to Pictorial 8 for the proper use of the plastic alignment tool to make this adjustment.

( ) With the Transceiver in operation and with the Function switch in the Tune position, adjust the bottom slug of coil L5 for maximum output at 14.275 megacycles.

This completes the adjustment of the Transceiver.



PICTORIAL 8

RESISTANCE CHANGES

Please make the following resistance changes in your Manual to reflect the resistance readings that are affected by the modification of your HW-32 Transceiver.

Page 35, in the "Resistance Chart:"

At tube socket V5, pin 2, change the resistance to read, "between 200 KΩ and 2.3 megohm."

Page 51, on Figure 10:

At tube socket V5, pin 2, change the resistance to read, "between 200 KΩ and 2.3 megohm."

At tube socket V5, pin 8, change 50 K to 40 K.

At tube socket V4, pin 1, change the resistance to read, "between 300 KΩ and 2.3 megohm."

At tube socket V4, pin 6, change 150 K to 80 K.

SCHEMATIC CHANGES

NOTE: If you wish to bring the Schematic up to date, please make the following value and parts changes.

COMPONENT	OLD VALUE	NEW VALUE OR PART
C4	.02 μfd	.1 μfd
C63	22 μμf	10 μμf
C64	22 μμf	10 μμf
C73	.005 μfd	.02 μfd
C75	.02 μfd	.02 μfd in series with 1000 Ω
R43	100 KΩ	47 KΩ
R54	22 KΩ	10 KΩ
R78	100 KΩ	Silicon Diode

Add a 47 Ω resistor in parallel with the wire between C65 and C69.

Add a .02 μfd capacitor from lug 3 of V3, in the filament circuit, to ground.

Add a .1 μfd capacitor from wire 10 at RFC60 to ground.

Connect a 22 KΩ resistor from lug 1 of the MIC connector to the junction of C11 and C12.

Cross out the shielded cable that comes from lug 1 of the MIC connector.