# Installation Instructions for Ten-Tec Jupiter AT538K Tuner Kit

The installation of the AT538K is divided into two steps. The first step is to reprogram the on-board logic to add hardware support for the tuner. The second step is the physical installations of the tuner into the Jupiter chassis.

The instructions describe the installation of the tuner into the radio and how to update the radios Programmable Logic to support the new tuner. Jupiter transceivers manufactured after December 2001 will already be factory ready for the optional tuner. If your transceiver was manufactured earlier please contact the Ten-Tec service department for the PLD update files. If a PLD update is not required you may proceed to step 2.

## Step 1: Reprogram the hardware.

The Jupiter contains a PLD (programmable logic device) that provides the DSP system with enhanced I/O capability. This PLD must be reprogrammed to allow the DSP system to communicate with the installed tuner. The Jupiter was designed to perform this kind of self reprogramming. This is a simple process and involves downloading and executing a special firmware package that will make the necessary changes. The initial programming was performed at the factory using special programming equipment.

1a: Remove the top and bottom covers from the Jupiter. You will need to remove the philip screws along the sides and the 1/4" hex screws along the rear of each panel. Exercise care when removing the top panel. The speaker is attached to the top cover with the speaker cable attached to the connector board at the rear panel. Make note of how the speaker is attached to the connector board and gently unplug it from the socket. Set the screws and panels aside form now.

1b: Place the radio on your work surface with the bottom facing up and the front facing you. The large board with surface mount ICs and the ribbon cables to the front panel is the DSP/LOGIC board. Locate the PLD in-circuit programming connector. This will be located to the left and is made of two rows of closely spaced 6 pin headers. To the left of the connector are two white lines imprinted on the PCB. There should be shorting jumpers installed at these locations. Two shorting jumpers are supplied in the AT538K kit that should placed there if they are not already present.

1c: Connect the radio to a 12 volt power supply and a serial cable to your PC. From within Windows, run the Update.exe program from the enclosed disk. Select the COM port to which the radio is attached and download the TT538PL1.RUF file to the Jupiter. When the program has finished downloading the PLD reprogramming will start immediately. Be patient, this process can take a few minutes during which time the screen will blank. During reprogramming the RX LED on the front panel will slowly flash to indicate progress. When the process is completed the display will show 1 horizontal line and the RX LED will stop flashing. DO NOT click OK on the computer until the single horizontal line appears. If the program indicates that it cannot communicate with the PLD you should check for correct installation of the shorting jumpers as indicated in step 1b.

1d. After reprogramming the PLD you must install the new firmware that will support the tuner. Run the Update.exe program again and this time download the JUPITER.RUF file from the disk.

1e. Congratulations, you have completed step 1.

## Step 2: Install the tuner into the Jupiter.

The following pages contain the instructions for installing the tuner into the Jupiter chassis.

2a: The tuner is pre-mounted to a support bracket. The bracket mounts the tuner above the DSP/ LOGIC board. Place the entire assembly in the chassis as shown in figure 1.
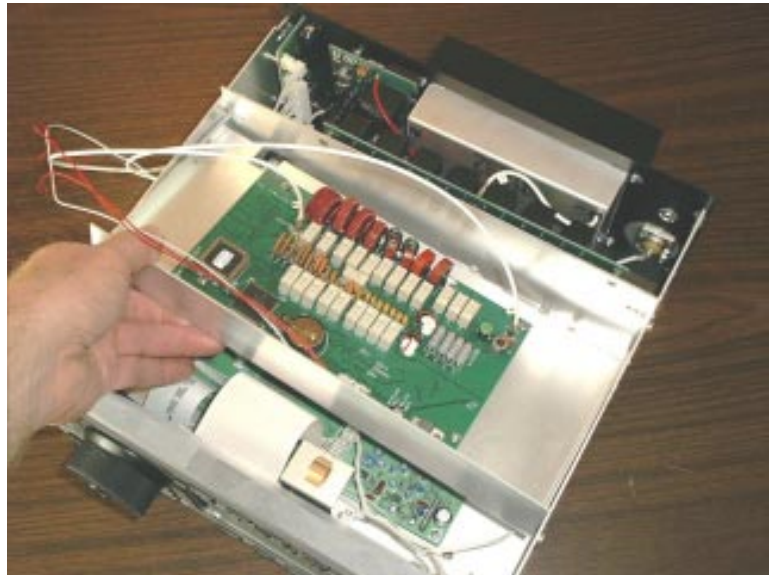


Figure 1 - Placement of tuner in chassis above Logic/DSP board

2b: The two red power cables, which plugs into the 13.8v connector J1 on the tuner PCB,  and the coax cables are routed through the grommet located near the left corner. There is a notch in the mounting bracket to prevent cables from becoming pinched when the bracket is attached to the radio's chassis. The cable with the two pin connector attached should pass through the notch and pass under the mounting bracket.
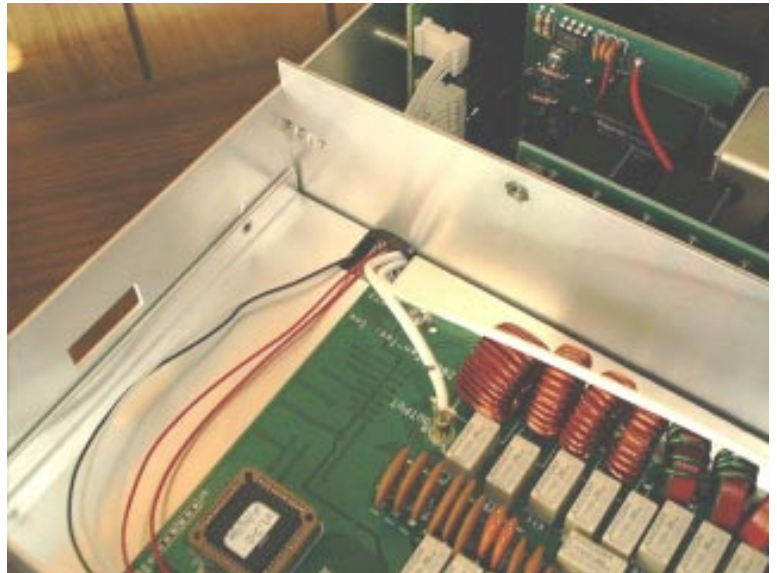


Figure 2 - Routing supply, control and signal cables.

2c: The two pin connector, with the black and white wires,  should be plugged into socket #8 on the LOGIC/DSP board.  This is the open two pin socket located near the front left. The connector should be plugged in the same was as other cables on that connector block.

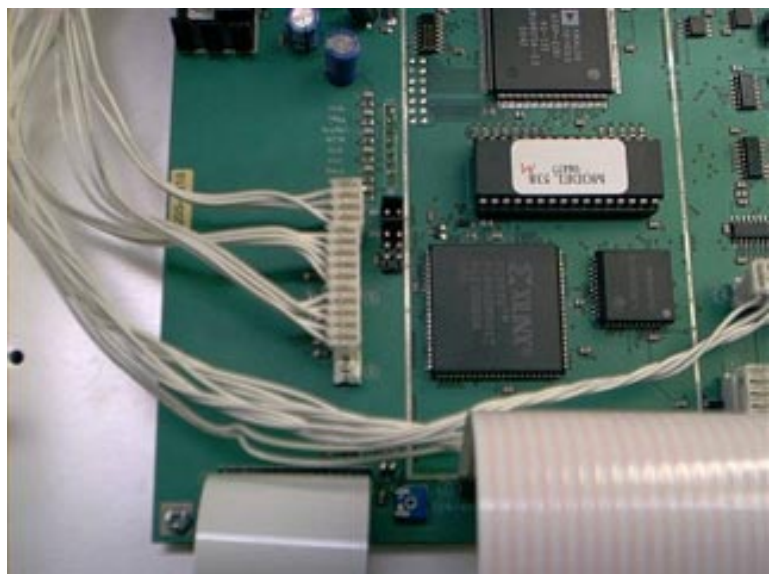The other end connects to START & DONE on J1 of the tuner board.



Figure 3 - 2 pin connector on DSP/LOGIC board for tuner control.

2d: Carefully position the tuner mounting bracket to align the mounting holes with existing holes in the side panels of the radio. See figure 4. Be sure that no wire are pinched between the mounting bracket and rear bulkhead. Attach the tuner bracket to the radio chassis using the 4 screws provided. Once installed, the power and coax cables should pass freely through the bulkhead grommet.
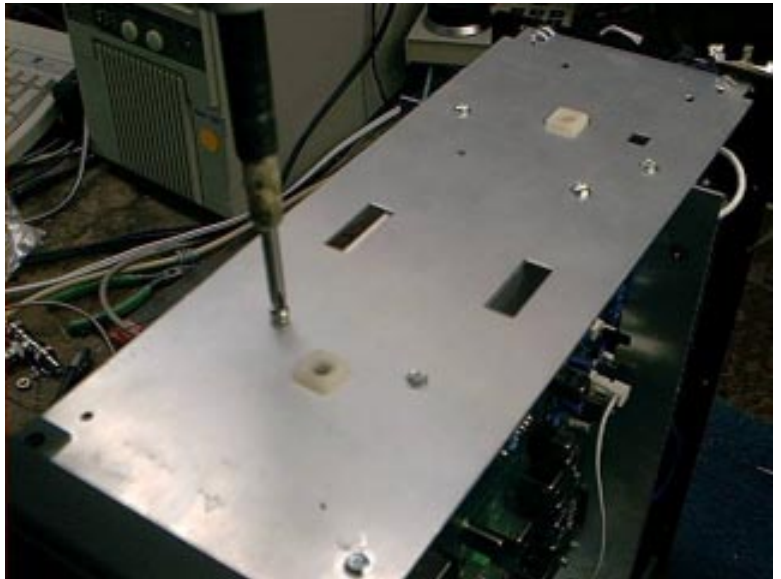


Figure 4 - Attaching the tuner unit to the chassis.

2e: Solder both red power wires to the Jupiter's D.C. Input board as shown in figure 5. With care you can heat the existing Low-Pass Board power connection and push the tuner's power cable into the hole. Check the connection closely to ensure that it is well soldered.
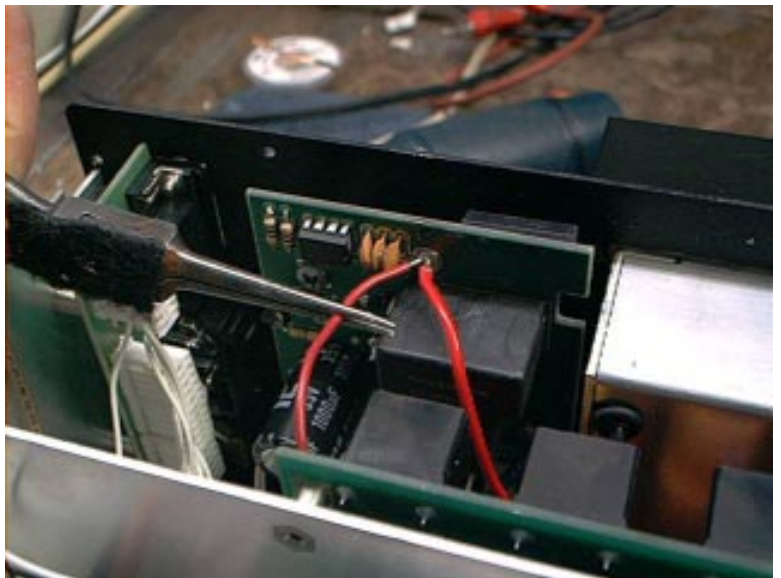


Figure 5 - Attaching the 12v supply to the tuner unit

2f: Remove the 4 screws holding the Low-Pass board to the rear bulkhead. See Figure 6. This will allow the board to move freely without the need to remove it from the chassis. Make note of how the coax cable from the SO-239 connector attaches to the Low-Pass board. Note that the coax's center conductor passes through a small toroid transformer.

Disconnect the coax between the Low-Pass board and the rear panel SO-239. This will no longer be used in the radio and may be discarded.
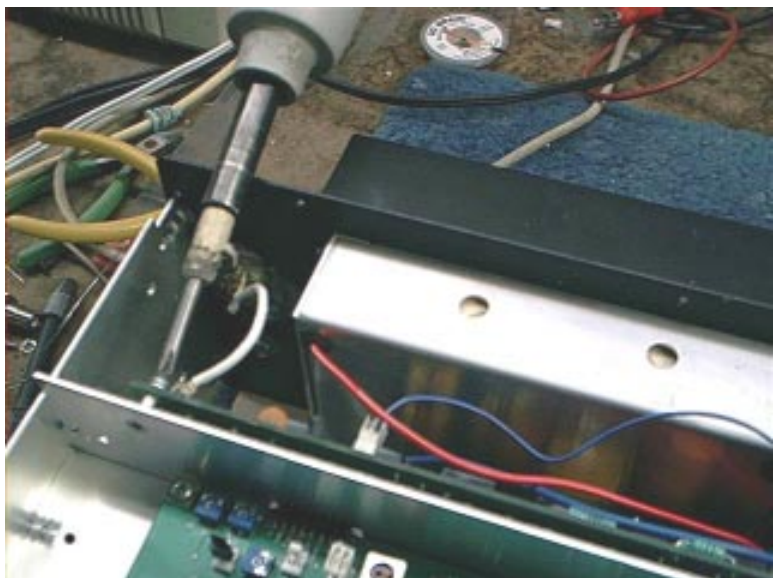


Figure 6 - Remove screws holding the Low-Pass filter to the bulkhead.

2g: Locate the coax attached to the tuner's "transmitter" position. This is to be attached to the Low-Pass filter board as indicated in Figure 7. The small toroid is only loosely attached to the board and may be moved around to get a little extra soldering room. As a final step you should make sure the toroid is back in place.
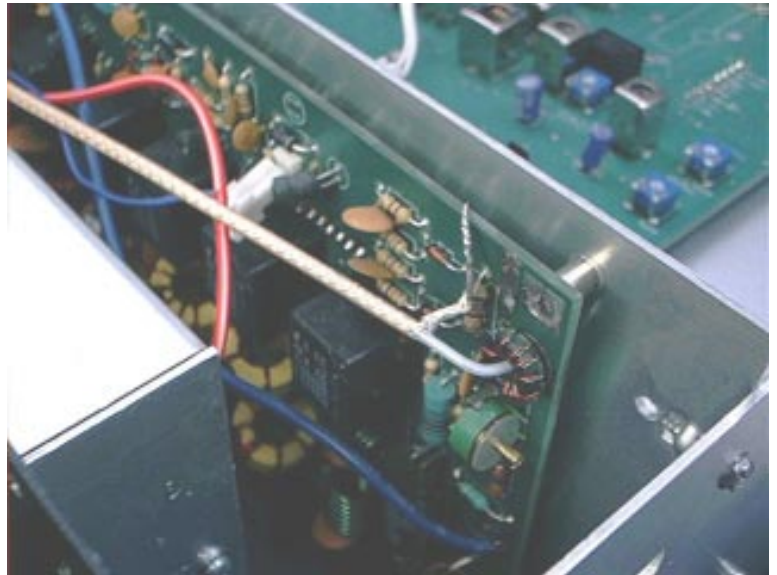
Figure 7- Tuner input coax soldered to the low-pass board output

2h: Locate the coax cable coming from the tuner's "Antenna" connection. This coax is to be attached to the rear panel SO-239 connector as shown in Figure 8.
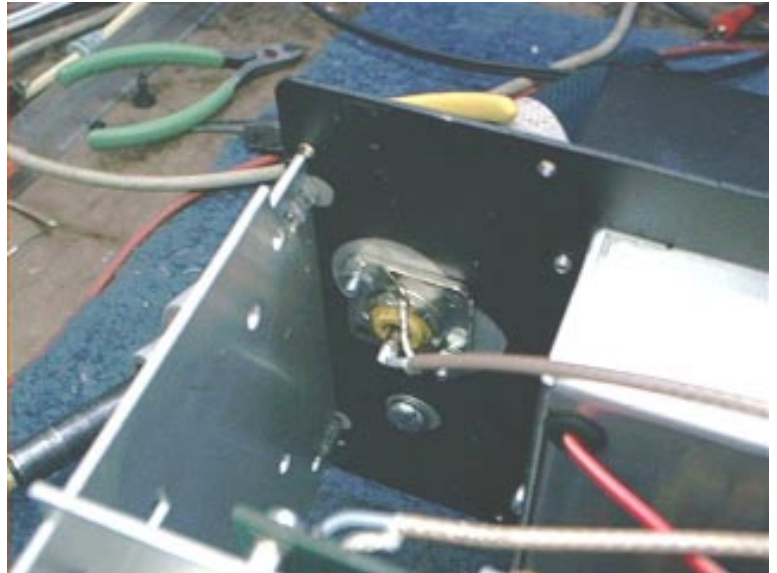
Figure 8 - Tuner output coax soldered to the SO-239 connector.

The final step is to reinstall the covers. However, it wouldn't hurt to test out the radio with the covers removed. Note that you will need to temporarily reattached to the top-cover and speaker or use an external speaker.

NOTE!!
Don't forget to reconnect the speaker wire when reinstalling the top cover. The speaker connects to socket #17 located near the External Speaker jack on the rear panel.

# Operating the Jupiter Transceiver with built-in tuner

The optional internal tuner for the Jupiter is controlled through use of the front panel [TUNE] button. In addition, the tuner may be disabled/enabled via the USER MENU.

## To Activate the Tune

Tune the radio to the desired frequency. Press the [TUNE] button

The radio will key in CW mode at approximately 20 watts output.

When the minimum SWR has been achieved the tuning process will stop.

And the transceiver will return to receive mode.

The Letter 'T' will appear at the far right of the main frequency display indicating        that the tuner is ready.

## To Bypass the Tuner

The [TUNE] Button will toggle between TUNER ON and TUNER OFF.

The tuner is disabled and bypassed when the 'T' is NOT displayed.

## To Disable the Tuner

The Tuner may be disabled by setting AUTO TUNER to OFF in the User Menu.

## To enter TUNE mode without affecting the tuner setting

Press [ALT] then [TUNE ] to place the radio in TUNE mode.