

## **BENCH TESTING the Icom/SGC Tuner Interface**

If you have the test equipment available, there are a few simple bench tests that you can run on the completed interface in order ensure that most of it is working correctly. A number of common wiring defects can cause the oscillator in the PIC not to function therefore we check the oscillator signal with an oscilloscope to get a good indication that the PIC is functioning.

### **Basic Resistance Checks**

With the PIC not installed in the socket and no DC power applied, check the following resistances with a multimeter. The negative lead should go to one of the ground pads around the edge of the board. The positive lead will go to the specified pin.

U2, Pin-1	> 3K
U2, Pin-6	> 9K
U2, Pin-8	> 9K
U2, Pin-9	> 10K
U2, Pin-10	> 10K
U2, Pin-12	> 10K

Next we apply 12VDC power to the tuner port because it has the screw terminal block and is easier to attach wires to. Connect the power supply to the tuner terminal block as follows:

+12VDC: Pin-3  
Ground: Pin-4

***I recommend a ½-Amp fuse in the +12VDC line just in case you accidentally short something. The fuse will protect the wires and PC board runs.***

### **Basic Voltage Checks**

With the PIC not installed in the socket make the following voltage measurements with a DC multimeter. The negative lead should go to one of the ground pads around the edge of the board. The positive lead will go to the specified pin.

U2, Pin-1	> +4.5VDC
U2, Pin-6	< +0.1VDC
U2, Pin-8	< +0.1VDC
U2, Pin-9	> +4.5VDC
U2, Pin-10	< +0.1VDC
U2, Pin-12	< +0.1VDC

### **Fault LED Check**

With power applied, the LED should be lighted. Grounding Tuner Port (J2), Pin-1 (the TUNED line) will cause the LED to extinguish.

### **Oscillator Check**

Remove the power. Insert the PIC into the socket. Reapply power.

Check for the oscillator signal with the scope at U2, Pin-3. When the oscillator is running there should be approximately a 4.5V p-p sine-wave signal present.

When power is first applied, the oscillator signal will appear for about one second, and then fade away as the PIC goes to sleep.

Grounding the Radio Port (J1), Pin-2 (Start line) will cause the oscillator to turn back on and stay on as long as the pin remains grounded. Once the oscillator starts, the ground can be removed from Pin-2 and the oscillator will continue to operate until the 30 second time-out causes the PIC to go back to sleep. This is the line that the radio pulls to ground to signal the interface to begin tuning.

Momentarily grounding the Tuner Port (J2), Pin-1 will cancel the 30 second time out and cause the oscillator to stop in short order. With this pin ungrounded, the LED will be lighted. When the pin is grounded, the LED will not be lighted. This is the line that the tuner pulls to ground when it has found a match.

Monitoring Radio Port (J1), Pin-1 with a voltmeter will display +12VDC when the oscillator is not running and near 0VDC shortly before the oscillator stops and the PIC goes to sleep. This is the line that keys the radio during tuning operations.