

## **QC test procedure for Monster #168007-00 FM Transmitter**

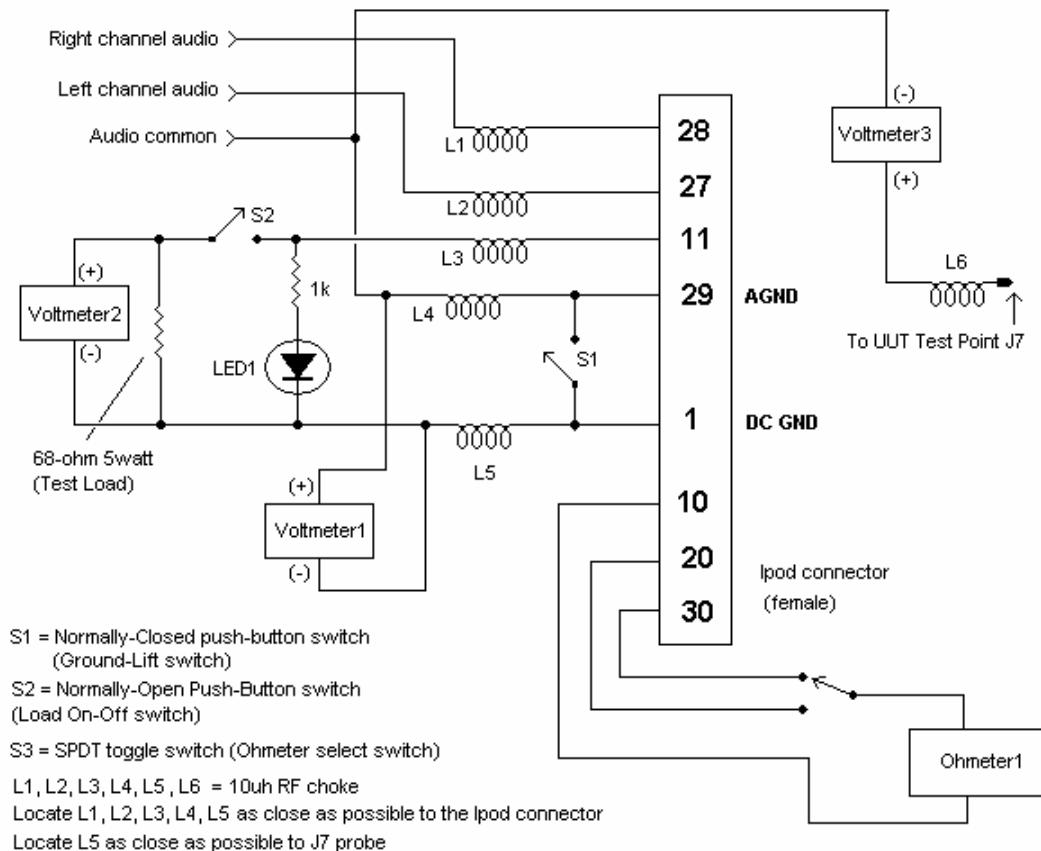
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Rev-1, July 5, 2004

UUT shall be fully assembled PCB with wires soldered to it. The CPU (U1) has already been pre-programmed. UUT has not yet been installed inside its plastic case.

### **Equipment needed:**

- 1) Voltmeter (3ea)
- 2) CRO (1ea)
- 3) Audio signal generator (1ea)
- 4) 12vdc power supply (1ea)
- 5) EWC FM Tester Receiver (1ea)
- 6) Ipod connector test interface adapter (1ea).



**Fig.1. Schematic of Ipod connector test interface adapter.**

## Test setup:

- 1) Connect CRO ch-1 input to left audio output of EWC test receiver.
- 2) Connect CRO ch-2 input to right audio output of EWC test receiver.

### **Test procedure:**

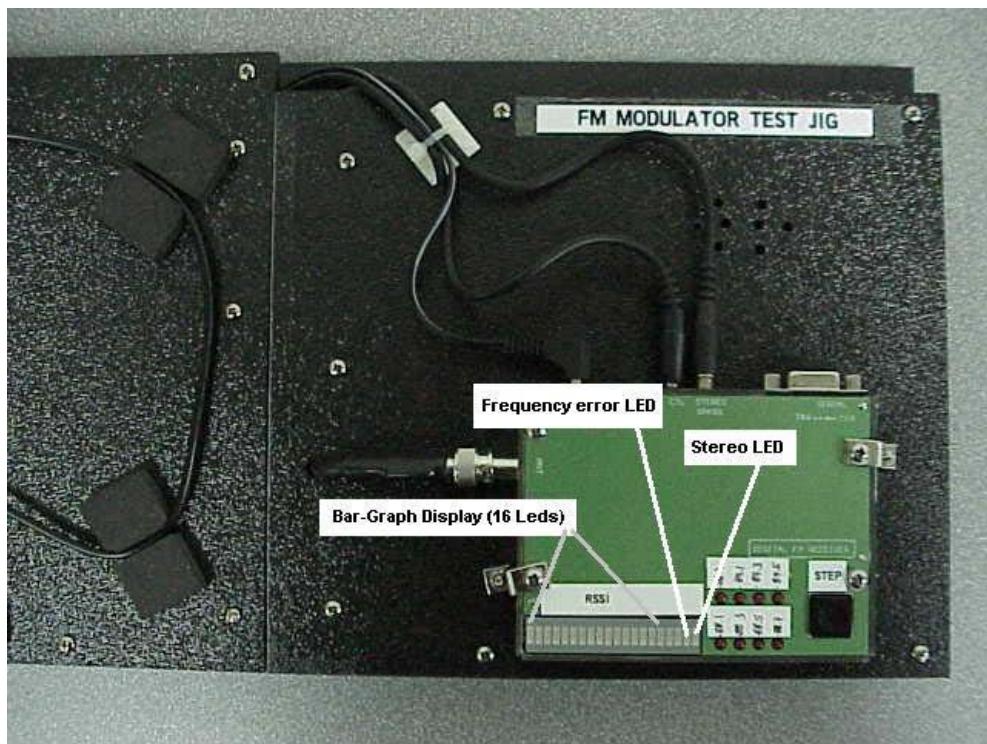
(Please see Fig. 1 above for test adapter designations used here)

**Step 1:** Connect UUT to test adapter (Fig. 1). Connect 12v power source to UUT. When 12v power source is applied to UUT, check that the frequency display of the UUT shall light up and displays 88.1Mhz. Also check that LED of SW1 goes ON. Measure 12v current draw of UUT. Expected reading is about 55ma @ 12vdc.

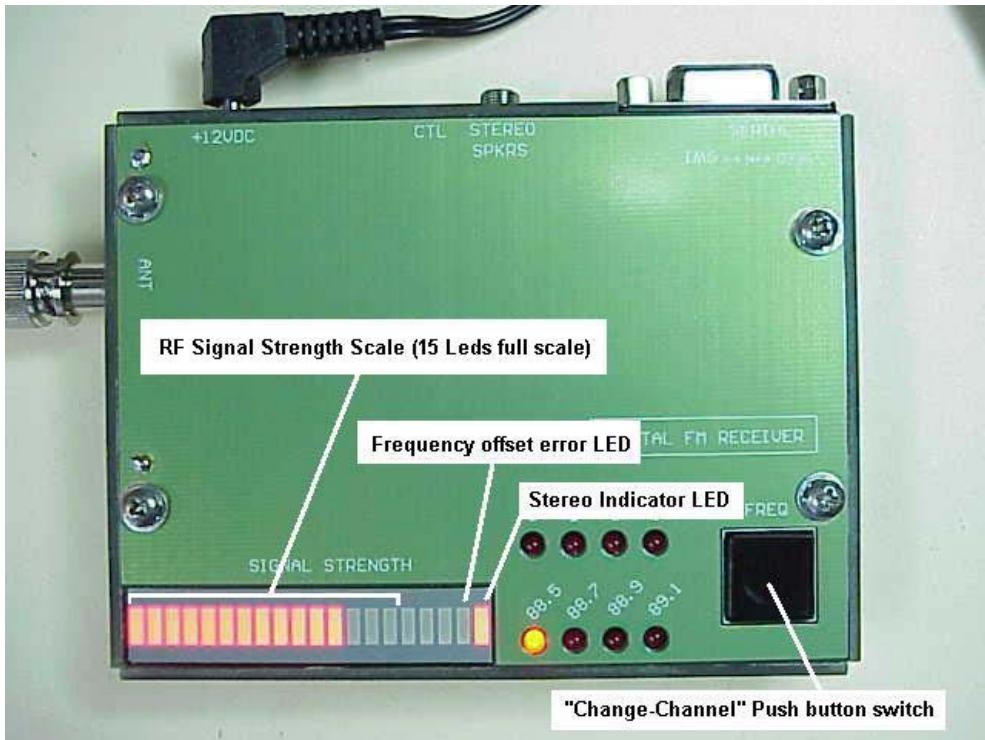
**Step 2:** Connect Voltmeter3 to uut test point J7 via 10uh RF choke. Please ensure that the 10uh RF choke is located as close as possible to the uut J7. Observe voltage displayed by Voltmeter3. **UUT is GOOD if voltage is {1.0v - 3.3v}. FAIL if voltage is outside this range.**

**Step 3:** Preset EWC FM test receiver to 88.1Mhz. Check the following:

- S-meter reading on FM test receiver should be between 9 and 13 bars as shown in picture of FM Test receiver in Fig. 3.
- Frequency Error LED should not be flashing
- Stereo LED should be ON.



**Fig.2 - Test jig for testing FM transmitter. FM Test receiver shown.**



**Fig 3 - FM Test receiver showing typical S-meter reading from good uut.**

**Step 4:** Press M3 of UUT so that frequency display indicates 107.9 Mhz. Check that LED of SW3 goes ON.

**Step 5:** Observe voltage measured by Voltmeter3. Wait for voltage reading to stabilize. Observe Voltmeter3 reading only. **UUT is GOOD if voltage is within {1.5v - 3.5v}.** **FAIL if voltage is outside this range.**

**Step 5:** Preset EWC FM test receiver to 107.9Mhz. Check the following:

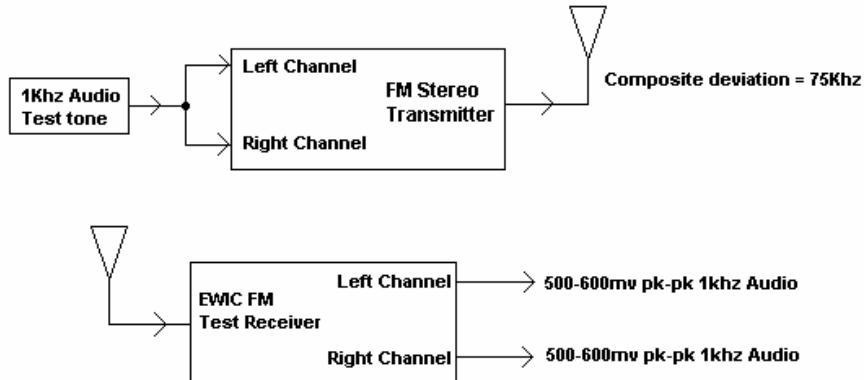
- S-meter reading on FM test receiver should be between 9 and 13 bars as shown in picture of FM Test receiver in Fig. 3.
- Frequency Error LED should not be flashing
- Stereo LED should be ON.

**Step 6:** Connect 1khz triangular waveform audio to Left audio channel input of UUT. Observe waveform displayed by CRO for Left channel output of FM Test receiver:

Check that there is no audio on Right channel.

Check that triangular waveform is not clipped or distorted.

Check that peak-peak audio level is within 500 - 600mv pk-pk +/- 10%. Fail if audio level is outside of this range.



**Fig 4 - Showing Audio test setup.**

**Step 7:** Disconnect 1khz triangular waveform audio connection from left audio channel input of UUT. Connect 1khz triangular waveform audio to Right audio channel input of UUT. Observe waveform displayed by CRO for Right channel output of FM Test receiver. Check that there is no audio on Left channel. Check that level is the same as level observed from Left channel in the last step. Check that triangular waveform is not clipped or distorted.

**Step 8:** Press the momentary push-button switch S2 (Load On-OFF) of the Ipod connector test adapter. Observe Voltmeter2 reading. Acceptable reading is no less than about 1.0v less than 12v power supply voltage (11.0v).

**Step 9:** Press the momentary push button switch S1 (Ground-Lift switch) of the Ipod connector test adapter. Check that voltmeter1 reads between {0.5v - 0.75v}. UUT is bad if voltage is outside of this acceptable range.

**Step 10:** Measure resistance of Ipod UUT connector:

Pin 30 to pin 10 = 1.0 Meg Ohm 1%

Pin 20 to pin 10 = 1.0 Meg Ohm 1%

Refer to Ohmeter1 of test adapter (Fig 1).

**Step 11:** Check function of SW1, SW2, SW3. Check that all three switches work correctly and check that all segments in frequency display are working as you increment and decrement frequency.

#### **Final QC Check:**

For assembled UUT in plastic case:

- 1) Connect to +12v supply
- 2) Check that frequency readout comes ON normally.
- 3) Observe current draw from 12v power supply. Check that LED of uut CLA Plug is ON.
- 4) Connect UUT to Apple Ipod MP3 player
- 5) Activate Apple Ipod to play music. Set UUT to 88.1 Mhz.

- 6) Listen for music with an FM radio tuned to 88.1 Mhz. Observe quality of music: check for clean audio on both Left and Right channels operating in stereo. Check that FM radio "STEREO" indicator is ON.
- 7) Tune FM radio to 98.1 Mhz. Preset UUT to 107.9 Mhz. Observe how long it takes for UUT to stabilize at 107.9 Mhz. Observe quality of music.
- 8) Check mechanical operation of push-button switches. Check that all LED's of push buttons work. Check for dead segments in frequency readout.