

## 741-159 TEST PROCEDURE – HAR Transmitter

Ref: BOM 711159

Serial Number of Unit: \_\_\_\_\_

Date of Test: \_\_\_\_\_

Test performed by: \_\_\_\_\_

This procedure describes the final assembly and testing procedures required for the Highway Advisory Radio (HAR) Transmitter. The HAR was tested by an outside test laboratory to FCC 47 CFR 2.1046, RF output power; 1047, Modulation characteristics; 1049, Occupied bandwidth; 1051, Spurious emissions at antenna terminals; 1053, Field strength of spurious radiation and 1055 Frequency stability. The following tests are to insure continued compliance.

**Test Equipment & Set-up:**

Unit testing requires setting up the following test equipment:

- a. Oscilloscope
- b. Audio Signal Generator
- c. Spectrum analyzer
- d. HP 8901 Modulation Analyzer

**1. Set-up**

- 1.1. Connect the Device Under Test (DUT) to a 24VDC Power Supply with a current limit of 2 Amps.
- 1.2. Connect an Audio Signal Generator to the RCA phono jack input of the DUT.
- 1.3. Set the frequency of the Generator to 2500Hz and 15 dBm out across 600 Ohms.

**2. RF Amplifier Test****1. RF Output Power (FCC 90.242 b iii)**

- 1.1. Turn the Audio Generator OFF
- 1.2. Connect a 50 Ohm RF load with a 60 dB (58.39 actual) attenuator to the output BNC of the DUT. Connect the -60 dB port of the attenuator to the HP 8901. Push the "RF Power" button on the front of the 8901.
- 1.3. Using the power potentiometer set the power level to just below 10 Watts. This is -23.98 dBm on the 8901 or 60 V peak to peak measured on the oscilloscope.

Test OK \_\_\_\_\_

**2. Frequency (FCC 90.242 b 2)**

Push the "Freq" button on the 8901 and adjust the trim cap beside the crystal to within 5 Hz of the frequency for this transmitter. (FCC specification is 100 Hz, adjust as close as possible to exact)

Actual Frequency: \_\_\_\_\_ Test OK \_\_\_\_\_

**2.1. Modulation Level**

Push the "AM" button on the 8901. Adjust the modulation level to 75%.

Test OK\_\_\_\_\_

2.2. Measure harmonics. (FCC 90.210 b)

Set the spectrum analyzer to the center frequency and 20 kHz/div and then tune to the frequencies below.

Confirm that harmonics (2X, 3X output frequency, etc) and spurious at the carrier +/- 200kHz are at least 54 dB below the carrier.

Test OK\_\_\_\_\_

2.3. Measure occupied bandwidth. (FCC 90.210 b)

Set the spectrum analyzer to the center frequency and 2 kHz/div.

Confirm that the close in spurious, - 3 kHz to - 6 kHz and + 3 kHz to + 6 kHz are greater than 25 dB below the carrier, when modulated with a 2500 Hz tone.

Confirm that the close in spurious, - 6 kHz to - 10 kHz and + 6 kHz to + 10 kHz, are greater than 35 dB below the carrier, when modulated with a 2500 Hz tone.

( If this test is unsuccessful, the modulation level can be adjusted downwards to compensate. )

Test OK\_\_\_\_\_

At the conclusion of the test, record the current drawn by the DUT with no modulation: \_\_\_\_\_ Amp.