6.5 Frequency Stability -- Pursuant 47 CFR 2.1055a(1) & 2.1055(d)2

Frequency stability measurements were made as described in paragraph 7.4. Because of the transmitter's dependence on the stability of the base station oscillator, it is not possible to provide stability data for this transmitter as is commonly supplied for certification per 47 CFR 2.1055 for a radio with a locally stabilized oscillator.

The following information is provided to clarify how the transmitter attains the necessary accuracy of 2.5 PPM or better for 800MHz band operation and 1.5 PPM or better for 900MHz band operation. The transmitter's suppressed carrier emission is produced by impressing the baseband information signal directly onto a digitally synthesized injection frequency with a channel resolution of 12.5 kHz. The synthesized frequency is derived from a temperature compensated crystal oscillator (Y601 in Figure 4-1). Transmission frequency accuracy is enhanced by the radio receiver circuitry, which causes the radio operating frequency to become locked to within 0.4 PPM of the base station once it has acquired the primary control channel. Thus the temperature and voltage frequency stability of the transmitter is within 0.4 PPM accuracy of the higher stability base station oscillator.

The AFC routine and frequency locking mechanism are implemented using both hardware and software. The hardware and software combined provide an automatic frequency control function which locks the receiver to within 0.4 PPM of the control channel oscillator. Since the base station stability is FCC regulated to be 1.5 PPM or better for the 800MHz band and 0.1 PPM or better for the 900MHz band, the absolute accuracy of the transmitter is inherently better than 1.9 PPM in the 800MHz band and 0.5 PPM in the 900MHz band. This is accomplished by programming fine synthesizer adjustments to U600 while the radio is in operation.

Transmitter frequency stability is guaranteed over all specified environmental operating conditions (battery voltage, temperature, humidity, etc.) because of the nature of the base station frequency locking mechanism. The frequency stability of the transmitter is maintained from a fully charged battery voltage of 4.2V to a low battery voltage of 3.55V, below which the radio products shuts down in order to prevent transmitter malfunction.

NOTE 1: Frequency stability is independent of modulation scheme (Quad–QPSK, Quad-16QAM, Quad-64QAM) or TDM interleaving. The data shown in following tables was taken with the radio set to transmit a Quad-16QAM signal at 820.9875 and 899.48125 MHz while locked to a Motorola R2660C service monitor. Measured frequency error points over all extreme temperature and voltage conditions are substantially smaller than the allowable error.

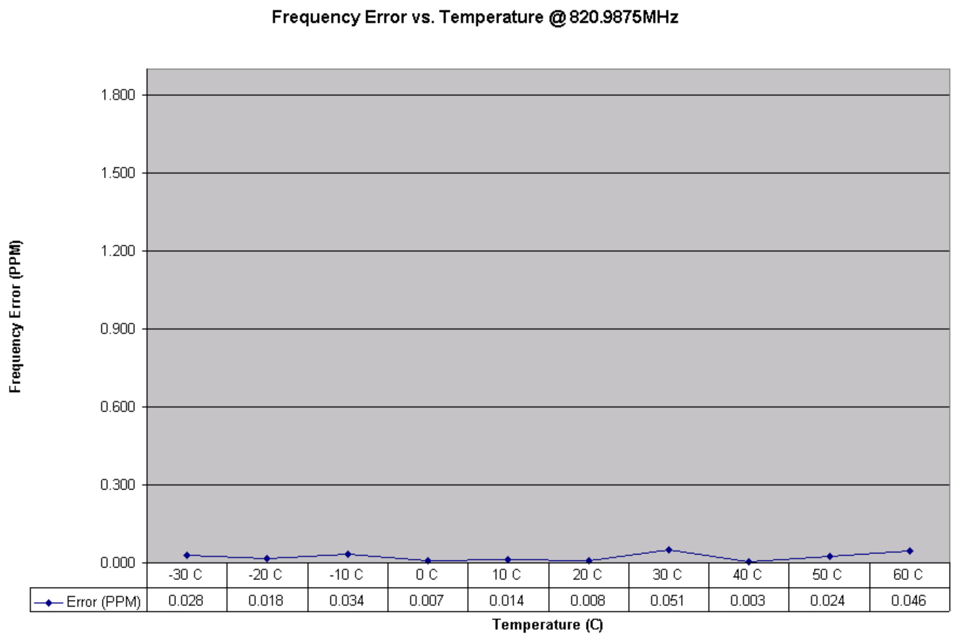

Figure 6-31: Transmitter Frequency Stability (800 MHz band) – Frequency Error vs. Temperature

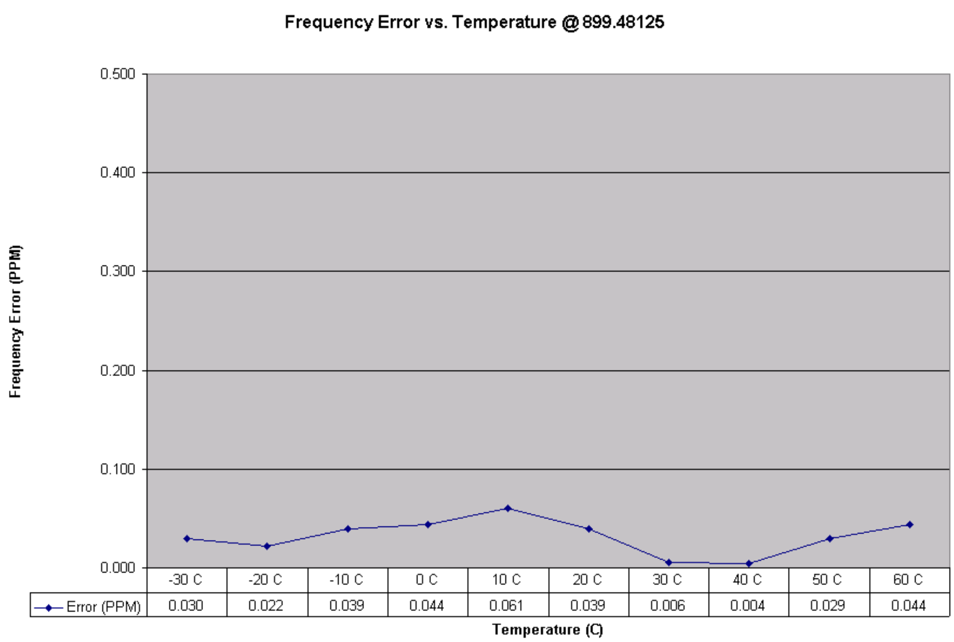

Figure 6-32: Transmitter Frequency Stability (900 MHz band) – Frequency Error vs. Temperature

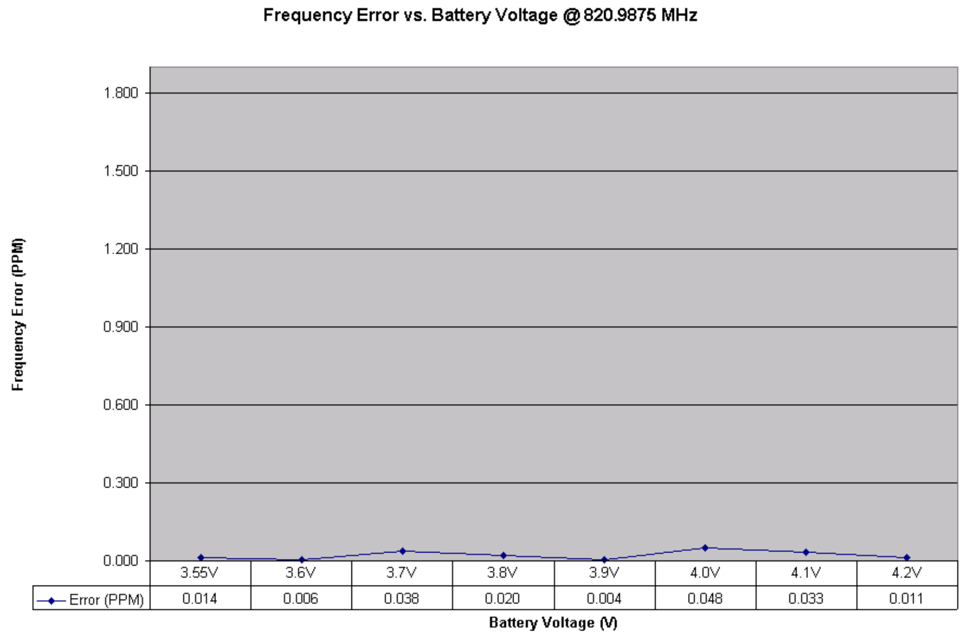

Figure 6-33: Transmitter Frequency Stability (800 MHz band) - Frequency Error vs. Voltage

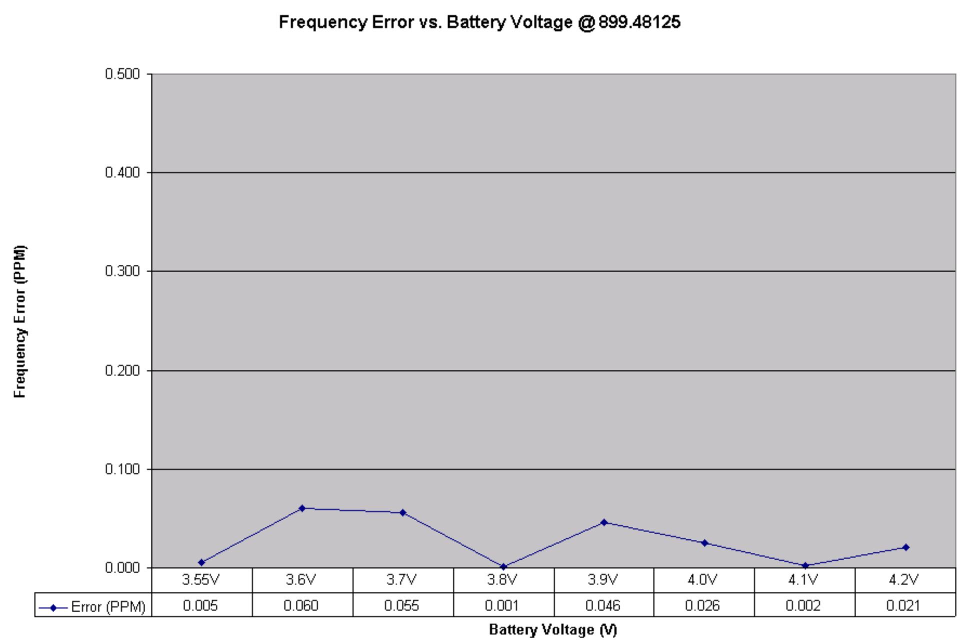

Figure 6-34: Transmitter Frequency Stability (900 MHz band)- Frequency Error vs. Voltage

6.6 Power Line Conducted Spurious Voltage -- Pursuant 47 CFR 15.207

Conducted voltage limits:

-Per 47 CFR 15.207

This radio product can transmit while resting in a battery charger that is connected to the AC power line. Figures 6-35 and 6-36 demonstrate compliance with the cited limit. Each figure contains two measurement traces in addition to the two applicable limit lines (black traces), the higher being applicable to measurements utilizing a quasi-peak detector and the lower being applicable to measurements utilizing an average detector. The upper data trace (light blue) portrays the amplitude of the voltage measured during sweeping with a peak detector while the lower trace (light green) represents the amplitude of the voltage measured using an average detector. These detectors facilitated the measurement process. Measurements with a quasi-peak detector lie between these bounds.

For the phase line, six local voltage maxima in Figure 6-35 were re-measured with the quasi-peak and average detector. The quasi-peak detector readings, the average detector readings and the relevant limits are tabulated in the Table 6-3. Note that the readings with either type of detector are lower than the respective limits, thus indicating full compliance.

For the neutral line, six local voltage maxima in Figure 6-36 were re-measured with the quasi-peak and average detector. . The quasi-peak detector readings, the average detector readings and the relevant limits are tabulated in the Table 6-4. Note that the readings with either type of detector are lower than the respective limits, thus indicating full compliance.

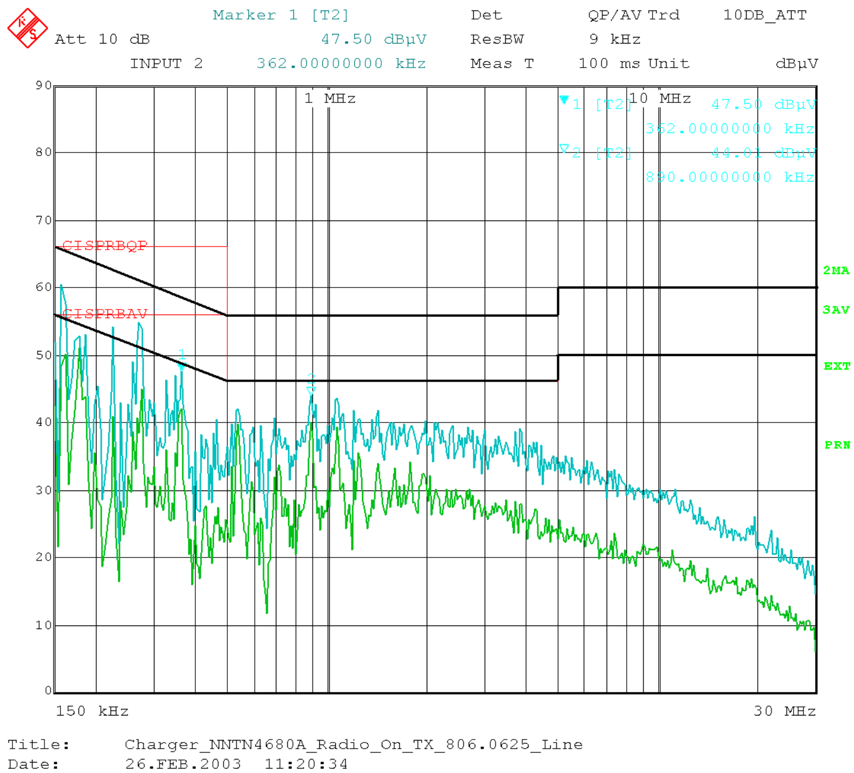

Figure 6-35: Phase Line Voltage with a Peak and Average Detector (Radio in transmit mode at 806.0625 MHz)

Frequency (MHZ)	Quasi-Peak (dBuV)	Average (dBuV)	Quasi-Peak Limit (dBuV)	Average Limit (dBuV)
0.158	49.18	25.63	65.57	55.57
0.186	44.36	32.14	64.21	54.21
0.226	40.14	20.76	62.60	52.60
0.27	45.21	24.2	61.12	51.12
0.362	41.55	32.62	58.68	48.68
0.890	40.35	33.13	56.00	46.00

Table 6-3: Phase Line Voltage Data- Quasi-Peak and Average (Radio in transmit mode at 806.0625 MHz)

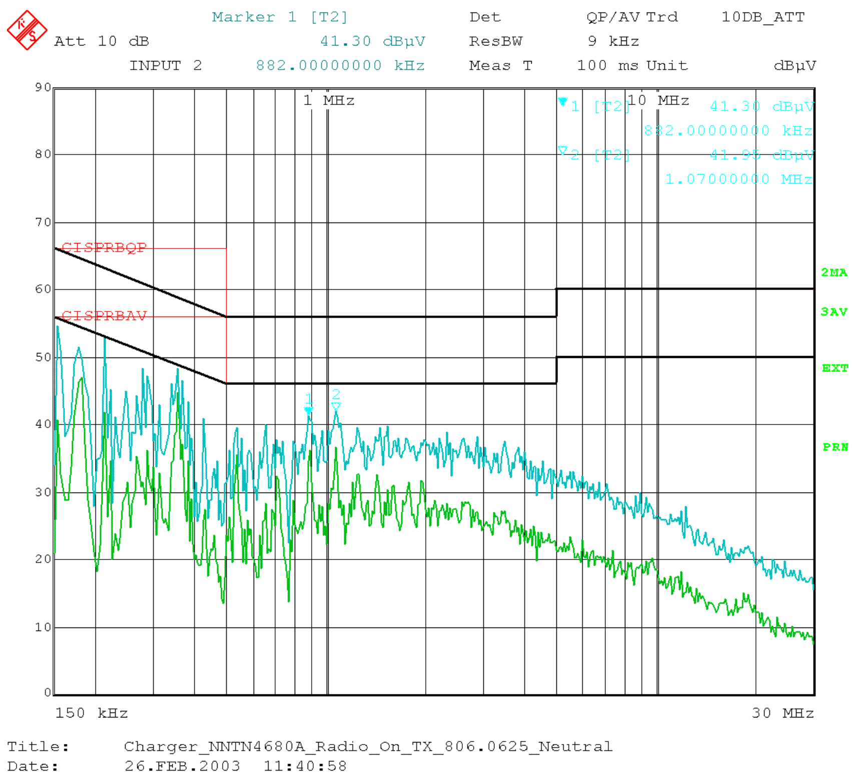

Figure 6-36: Neutral Line Voltage with a Peak and Average detector (Radio in transmit mode at 806.0625 MHz)

Frequency (MHZ)	Quasi-Peak (dBuV)	Average (dBuV)	Quasi-Peak Limit (dBuV)	Average Limit (dBuV)
0.154	43.91	20.37	65.78	55.78
0.178	49.83	40.58	64.58	54.58
0.214	41.49	20.93	63.05	53.05
0.354	44.36	36.42	58.87	48.87
0.882	36.5	27.94	56.00	46.00
1.070	38.17	31.7	56.00	46.00

Table 6-4: Neutral Line Voltage Data-Quasi-Peak and Average (Radio in transmit mode at 806.0625 MHz)