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

Measurements were made per method 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. The transmitter's suppressed carrier emission is produced by mixing of a modulated intermediate frequency with a higher, digitally synthesized injection frequency with a resolution of 12.5 kHz. Both of these frequencies are derived from a temperature compensated crystal oscillator (Y300 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.

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, the absolute accuracy of the transmitter is inherently better than 1.9 PPM. This is accomplished by programming U601 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 until the battery voltage drops below 3.2 volts. Any voltage below 3.2 volts is outside the specified operating range of the transmitter and linearity is degraded. For this reason, the radio shuts down (while in transmit mode) when the voltage drops below 3.2 volts.

Note:

Frequency stability is independent of modulation scheme (Quad –QPSK, Quad-16QAM, Quad-64QAM). The data shown in following tables was taken with the radio set to transmit a Quad-16QAM signal at 810.6625 MHz while locked to a R2660C service monitor.

Temperature [degC]	Frequency Error [Hz]	Frequency Error [ppm]
-25	113	0.139
-20	144	0.178
-15	105	0.130
-10	142	0.175
-5	-139	-0.171
0	-12	-0.015
5	-48	-0.059
10	-22	-0.027
15	24	0.030
20	-29	-0.036
25	-65	-0.080
30	-4	-0.005
35	119	0.147
40	-85	-0.105
45	11	0.014
50	108	0.133
55	146	0.180
60	-18	-0.022

Table 6-4: Transmitter Frequency Stability Data - Frequency vs. Temperature

Supply Voltage (Volt)	Frequency Error [Hz]	Frequency Error [ppm]
3.2	-11	-0.014
3.3	-27	-0.033
3.4	39	0.048
3.5	83	0.102
3.6	75	0.093
3.7	16	0.020
3.8	-96	-0.118
3.9	95	0.117
4	87	0.107

Table 6-5: Transmitter Frequency Stability Data - Frequency vs. Voltage

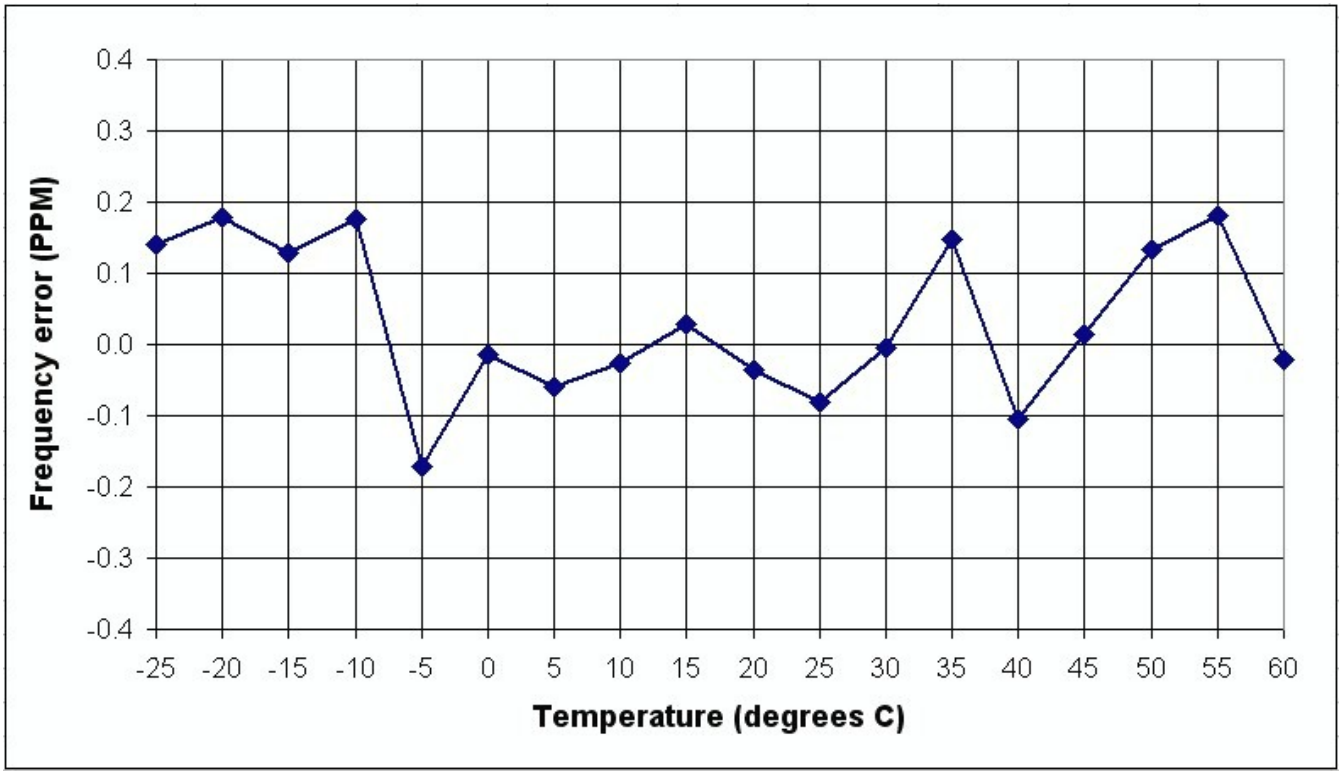

Figure 6-20: Frequency Stability vs. Temperature

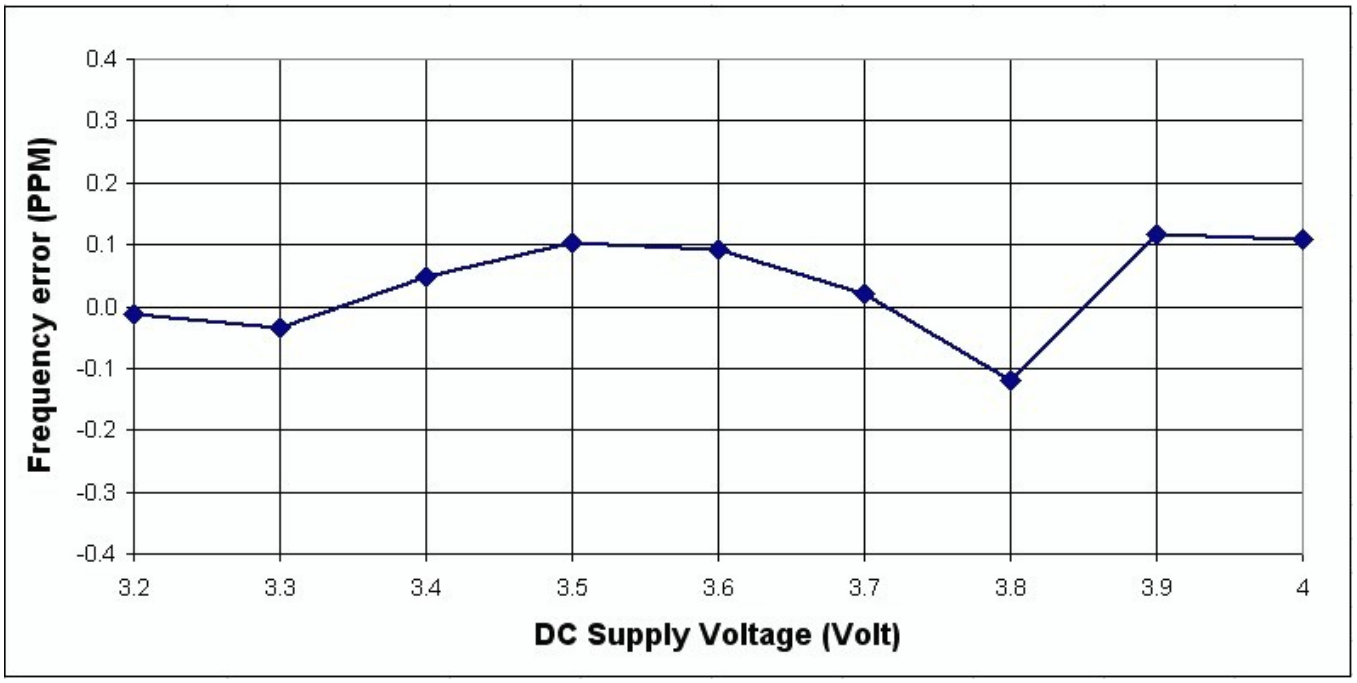

Figure 6-21: Frequency Stability vs. Voltage