Frequency Stability Test
FCC Type Acceptance
47 CFR Ch.1 Part 2.995

REV A
04/24/2000

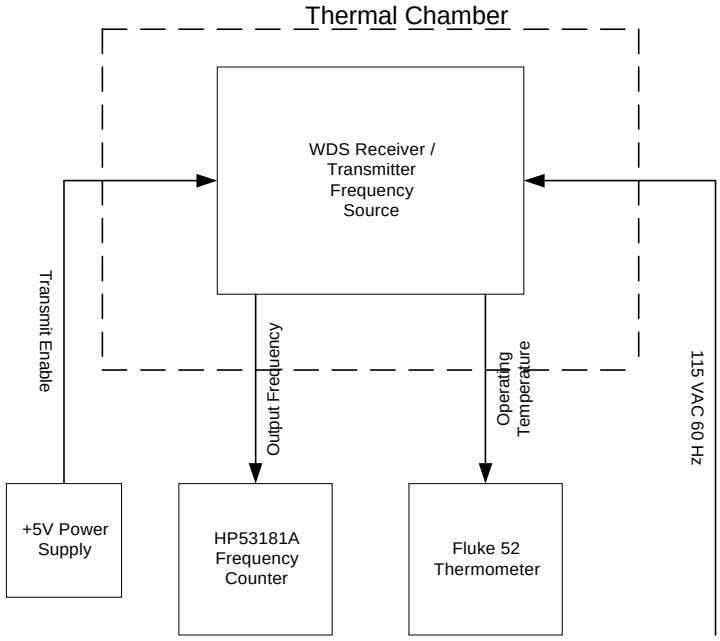
Initial Test Date – January 20, 2000

Purpose
The objective of this test is to demonstrate transmitter frequency source stability over a range of ambient operating temperatures as specified in the Federal Communications Commission 47 FCR Ch. 1 Part 2.995 .

Approach
Frequency measurements shall be taken from the transmitter frequency source that is operating in temperature controlled thermal chamber. Frequency and temperature measurement devices and primary power shall reside outside the thermal chamber. Sufficient time shall be provided between each ambient temperature test so that thermal stabilization is achieved.

Test Configuration

Figure 1 - Thermal Chamber Test Setup



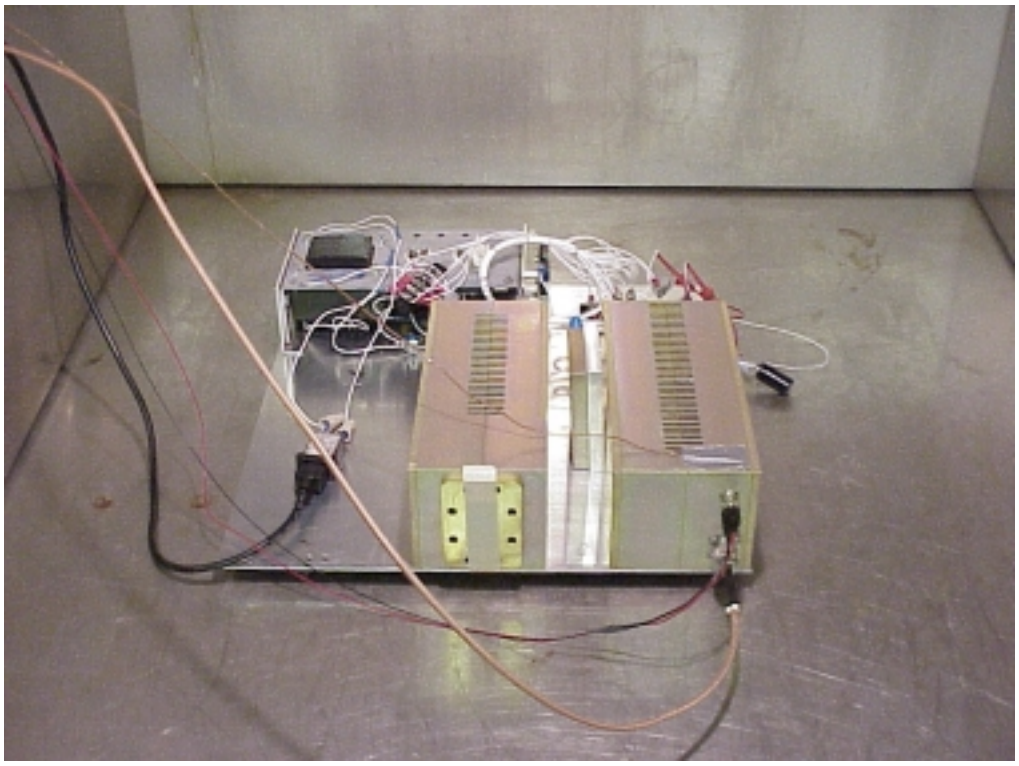


Figure 2 – WDS Receiver/Transmitter Frequency Source Connections

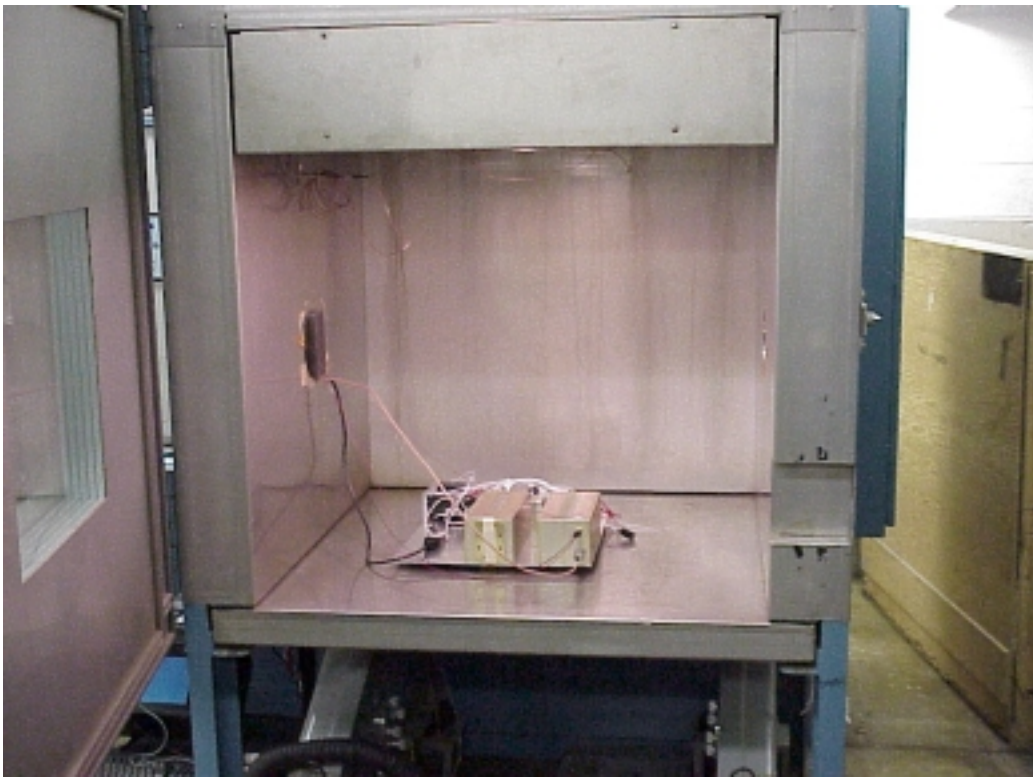


Figure 3 – Thermal Chamber (inside)

Figure 4 – Thermal Chamber (outside)

Figure 5 – Measurement Equipment

Test Equipment

Transmitter Frequency Source – WDS Receiver
Frequency Counter – HP 53181A
Thermometer – Fluke 52
AC Power Source – Standard 115 VAC - 60 Hz Power (from wall outlet)

Frequency Stability vs Ambient Temperature Test

Frequency stability measurements shall be recorded as “average frequency” taken using the HP 53181A. This device has a mode that measures the statistical: mean, standard deviation, high and low of a frequency source over a period of time.

Frequency Stability vs Ambient Temperature
Test Results

Elapsed Time	Ambient Temperatures											
	0° C		10° C		20° C		30° C		40° C		50° C	
	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)
0 Min.	**5,550,008,960**	**0.4**	**5,550,008,389**	**10.4**	**5,550,007,255**	**20.2**	**5,550,007,255**	**29.4**	**5,550,004,526**	**39.7**	**5,550,003,627**	**48.8**
1 Min.	**5,550,009,023**	**0.4**	**5,550,008,402**	**10.4**	**5,550,007,267**	**20.1**	**5,550,007,267**	**29.6**	**5,550,004,627**	**39.7**	**5,550,003,687**	**49.4**
2 Min.	**5,550,009,042**	**0.4**	**5,550,008,426**	**10.4**	**5,550,007,281**	**20.1**	**5,550,007,281**	**29.7**	**5,550,004,690**	**39.9**	**5,550,003,718**	**49.5**
3 Min.	**5,550,009,007**	**0.4**	**5,550,008,380**	**10.4**	**5,550,007,289**	**20.1**	**5,550,007,289**	**29.8**	**5,550,004,736**	**40.0**	**5,550,003,757**	**49.6**
4 Min.	**5,550,008,939**	**0.5**	**5,550,008,392**	**10.4**	**5,550,007,298**	**20.1**	**5,550,007,298**	**29.8**	**5,550,004,794**	**40.0**	**5,550,003,781**	**49.6**
5 Min.	**5,550,008,882**	**0.5**	**5,550,008,373**	**10.4**	**5,550,007,299**	**20.3**	**5,550,007,299**	**29.9**	**5,550,004,801**	**40.0**	**5,550,003,798**	**49.7**
6 Min.	**5,550,008,868**	**0.6**	**5,550,008,349**	**10.5**	**5,550,007,294**	**20.3**	**5,550,007,294**	**30.0**	**5,550,004,849**	**40.1**	**5,550,003,848**	**49.8**
7 Min.	**5,550,008,855**	**0.7**	**5,550,008,316**	**10.5**	**5,550,007,292**	**20.4**	**5,550,007,292**	**30.1**	**5,550,004,880**	**40.0**	**5,550,003,857**	**50.0**
8 Min.	**5,550,008,846**	**0.7**	**5,550,008,316**	**10.5**	**5,550,007,292**	**20.5**	**5,550,007,292**	**30.1**	**5,550,004,908**	**40.2**	**5,550,003,893**	**50.0**
9 Min.	**5,550,008,849**	**0.7**	**5,550,008,293**	**10.5**	**5,550,007,297**	**20.6**	**5,550,007,297**	**30.2**	**5,550,004,942**	**40.2**	**5,550,003,914**	**50.0**
10 Min.	**5,550,008,823**	**0.7**	**5,550,008,276**	**10.5**	**5,550,007,294**	**20.7**	**5,550,007,294**	**30.2**	**5,550,004,946**	**40.2**	**5,550,003,922**	**50.0**

Amendment to Previous
Frequency Stability vs Ambient Temperature
Test Results

Test Date - 4/22/2000

Purpose
The purpose of this test is to provide additional data for the previous frequency stability test (originally performed on 1/20/2000) for the temperature ranges of -10°C, -20°C and -30°C.

Approach
The same approach was used as in the previous frequency stability testing.

Test Configuration
The same test configuration/setup was used as in the previous frequency stability testing.

Test Equipment
The same test equipment was used as in the previous frequency stability testing.

Transmitter Frequency Source
The same device (transmitter frequency source) was used as in the previous frequency stability testing.

Frequency Stability vs Ambient Temperature Test Results

Elapsed Time	Ambient Temperatures					
	-10° C		-20° C		-30° C	
	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)	Average Measured Frequency (Hz)	Meas Temp (°C)
0 Min.	5,550,011,640	-10.4	5,550,012,389	-20.2	5,550,011,463	-30.2
1 Min.	5,550,011,689	-10.4	5,550,011,402	-20.2	5,550,011,228	-30.1
2 Min.	5,550,011,686	-10.4	5,550,012,426	-20.2	5,550,011,273	-30.1
3 Min.	5,550,011,725	-10.4	5,550,012,380	-20.2	5,550,011,284	-30.1
4 Min.	5,550,011,769	-10.3	5,550,012,392	-20.2	5,550,011,289	-30.1
5 Min.	5,550,011,803	-10.3	5,550,012,373	-20.1	5,550,011,279	-30.0
6 Min.	5,550,011,822	-10.2	5,550,012,349	-20.1	5,550,011,301	-30.1
7 Min.	5,550,011,841	-10.1	5,550,012,316	-20.1	5,550,011,310	-30.1
8 Min.	5,550,011,847	-10.1	5,550,012,316	-20.1	5,550,011,296	-30.0
9 Min.	5,550,011,852	-10.1	5,550,012,293	-20.0	5,550,011,294	-30.0
10 Min.	5,550,011,870	-10.1	5,550,012,276	-20.0	5,550,011,315	-30.0