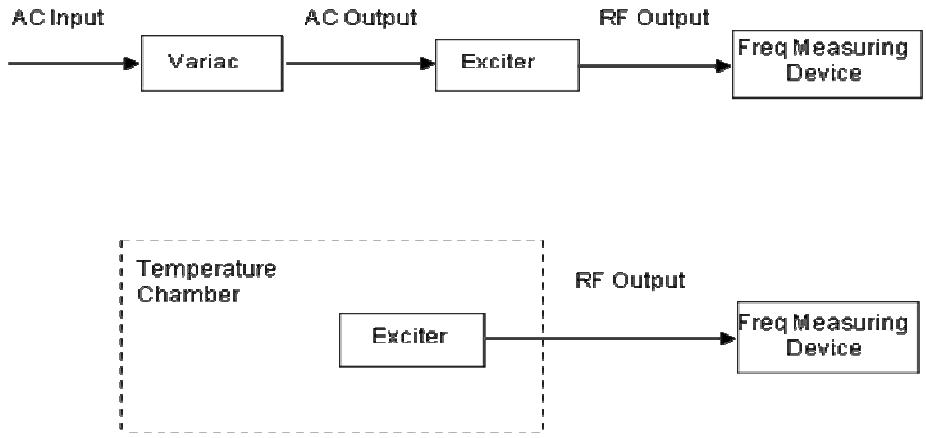
Frequency Stability Measurements

Equipment Model: DTXPRO-1.2KU

Frequency stability versus temperature and line voltage was measured in a controlled environment. For these tests, the exciter RF output was fed to a calibrated Rohde & Schwarz test set that has better than a 1 ppm accuracy. The test equipment configuration is shown below:



The variac was adjusted for nominal voltage and the frequency was recorded. Then the variac was adjusted to 85% and 115% of the nominal voltage and the frequency was recorded at each voltage level. The results are tabulated below:

Line Voltage (Volts)	Pilot Frequency (MHz)
103 (85%)	536.309471
121 (Nominal)	536.309482
139(115%)	536.309475

For the temperature stability measurements, the exciter was placed inside a Cincinnati Sub-Zero temperature chamber -- Model Z-32-2-2H/WC equipped with a CSZ Dimension II temperature controller. The exciter was energized and the pilot frequency was measured on the Rohde and Schwarz test set. The temperature was then raised to +40°C, allowed to stabilize for 15 minutes and then cycled to each colder temperature where it was allowed to stabilize for 10 minutes before recording the measured frequency and moving on to the next lower temperature.

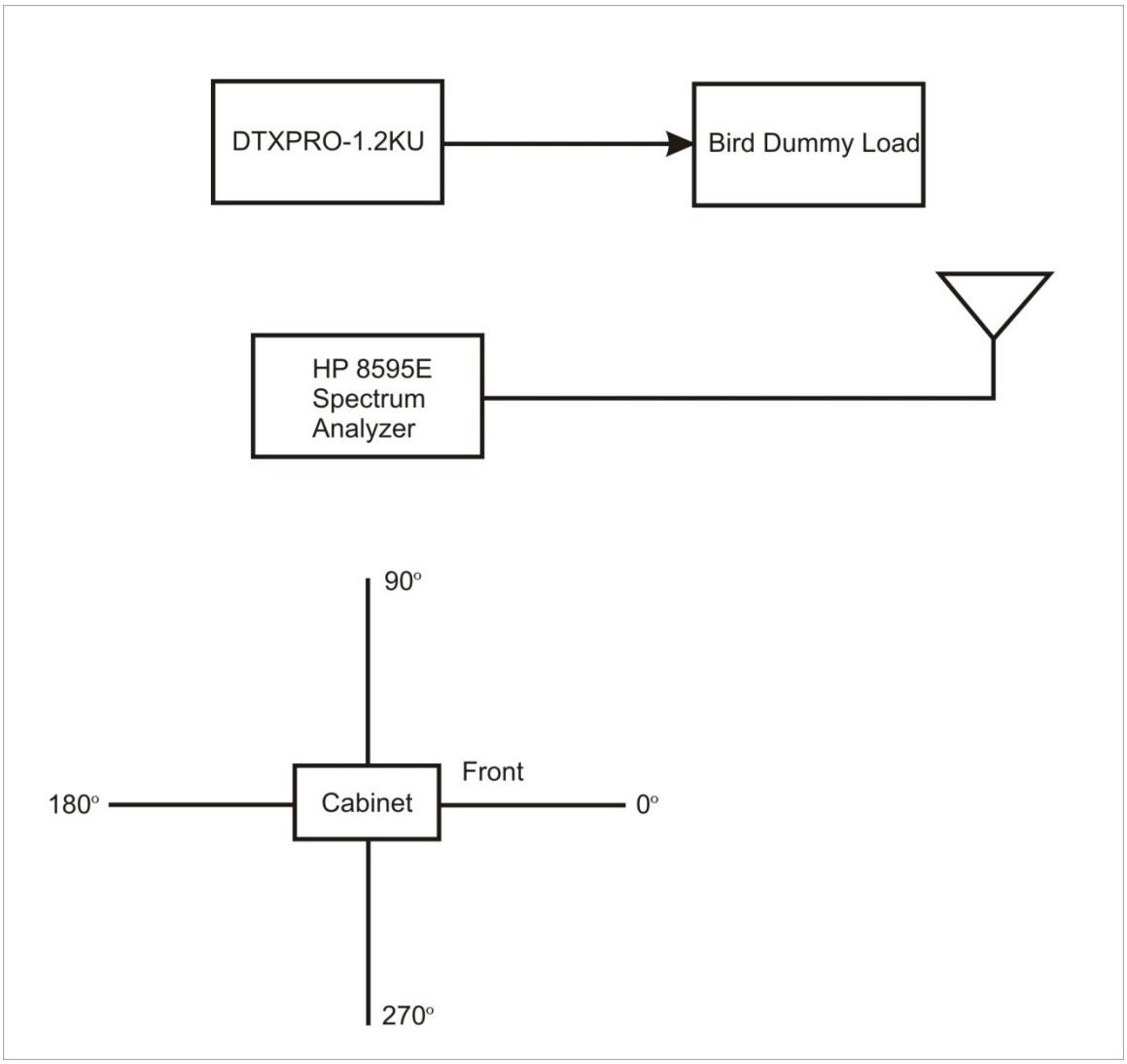
Set Pilot Freq=536.3094406

Temperature °C	Time	Pilot Freq *MHz)	Difference (Hz)
25	11:25	536.309515	74
40	11:46	536.309908	467
30	12:10	536.309688	247
20	12:30	536.309513	72
10	12:50	536.309574	133
0	13:10	536.309755	314

The recorded data indicates that the frequency stability requirements of FCC Rule 2.1055 were met.

CABINET RADIATION

The transmitter and test equipment were configured as shown below including the angles of measurement with respect to the transmitter cabinet. The photo on the subsequent page also shows the physical set-up of the test equipment and equipment under test. The transmitter was operating at 1.2kW average power. The free space path loss, cable loss and antenna gain characteristics were obtained at the fundamental frequency and at each of the harmonics of the visual carrier frequency in order to accurately assess the level of the signal radiated from the cabinet. Radiation from the cabinet was measured at a distance of 30 feet in 4 different physical rotation angles: 0, 90, 180 and 270 degrees (0 degrees being the front of the cabinet). All spectral components above -80 dB referenced to peak sync power radiated from the cabinet were recorded. The values are tabulated in the table on the next page following the photo.



Physical Cabinet Radiation Test Configuration

This photograph shows the actual laboratory environment in which the cabinet radiation tests were conducted. The log periodic antenna, cable and spectrum analyzer are shown in the foreground and the DTXPRO-1.2KU is shown in the background. The transmitter was rotated 90 degrees for each of the measurement orientations.

As calculated from the spreadsheet data on the following page, the worst case measurement was -70.2 dBm at the second harmonic. (The photo above shows this particular measurement). The measurement tables for the remaining views of the transmitter are shown on the following pages.

Cabinet Radiation Test Results

Test Inputs	**Conditions and Parameters**
Test Date	August 29, 2010
Test Engineer	Jim collier
Transmitter Model Number	DTXPRO-1.2KU
Operating Power Output Level	60.8 dBm 1200 watts (Power)
Center Frequency	0.539 gHz Channel 25
Antenna Model Number	ETS 3147 Serial Number 9112-1053
Spectrum Analyzer Model	8596E
Distance to Transmitter	10 meters

(Power levels were measured in 500kHz segments between lower frequency edge and upper frequency edge. Center frequency of highest level in band segment is recorded below)

FRONT VIEW

Harmonic	Center Frequency GHz	Signal Level dBm	Cable Loss dB	Antenna Gain dB	Path Loss Db	Adj Level	Maximum Level	Status P=Pass	Lower Frequency Edge	Upper Frequency Edge
2	1.078	-70.2	0.6	6.5	53.15	-22.9128	0.8	P	1.072	1.084
3	1.617	-76.3	0.9	6.5	56.67	-25.2161	0.8	P	1.608	1.626
4	2.156	-79.6	1.2	4.3	59.17	-23.5425	0.8	P	2.144	2.168
5	2.695	-79.5	1.5	3.0	61.11	-19.9294	0.8	P	2.68	2.71
6	3.234	-80.7	1.7	4.4	62.69	-20.6709	0.8	P	3.216	3.252
7	3.773	-81	2.0	2.7	64.03	-17.657	0.8	P	3.752	3.794
8	4.312	-81.3	2.3	-0.2	65.19	-13.6223	0.8	P	4.288	4.336
9	4.851	-81.6	2.6	0.5	66.22	-3.3244	0.8	P	4.824	4.878
10	5.39	-81	2.8	1.9	67.13	-2.9343	0.8	P	5.36	5.42

LEFT VIEW

Harmonic	Center Frequency GHz	Signal Level dBm	Cable Loss dB	Antenna Gain dB	Path Loss dB	Adj. Level dBm	Maximum Level dBm	Status	Lower Frequency Edge	Upper Frequency Edge
2	1.078	-74.8	0.6	6.5	53.15	-27.5128	0.8	P	1.072	1.084
3	1.617	-79.9	0.9	6.5	56.67	-28.8161	0.8	P	1.608	1.626
4	2.156	-79.5	1.2	4.3	59.17	-23.4425	0.8	P	2.144	2.168
5	2.695	-79.6	1.5	3.0	61.11	-20.0294	0.8	P	2.68	2.71
6	3.234	-80.5	1.7	4.4	62.69	-20.4709	0.8	P	3.216	3.252
7	3.773	-81.1	2.0	2.7	64.03	-17.757	0.8	P	3.752	3.794
8	4.312	-81.7	2.3	-0.2	65.19	-14.0223	0.8	P	4.288	4.336
9	4.851	-82.2	2.6	0.5	66.22	-13.9244	0.8	P	4.824	4.878
10	5.39	-80.7	2.8	1.9	67.13	-12.6343	0.8	P	5.36	5.42

Cabinet Radiation Test Results

RIGHT VIEW

Harmonic	Center Frequency GHz	Signal Level dBm	Cable Loss dB	Antenna Gain dB	Path Loss dB	Adj. Level dBm	Maximum Level dBm	Status	Lower Frequency Edge	Upper Frequency Edge
2	1.078	-75	0.6	6.5	53.15	-27.7128	0.8	P	1.072	1.084
3	1.617	-79.9	0.9	6.5	56.67	-28.8161	0.8	P	1.608	1.626
4	2.156	-79.6	1.2	4.3	59.17	-23.5425	0.8	P	2.144	2.168
5	2.695	-80.3	1.5	3.0	61.11	-20.7294	0.8	P	2.68	2.71
6	3.234	-80.9	1.7	4.4	62.69	-20.8709	0.8	P	3.216	3.252
7	3.773	-81.5	2.0	2.7	64.03	-18.157	0.8	P	3.752	3.794
8	4.312	-81.8	2.3	-0.2	65.19	-14.1223	0.8	P	4.288	4.336
9	4.851	-80.8	2.6	0.5	66.22	-12.5244	0.8	P	4.824	4.878
10	5.39	-80.5	2.8	1.9	67.13	-12.4343	0.8	P	5.36	5.42

REAR VIEW

Harmonic	Center Frequency GHz	Signal Level dBm	Cable Loss dB	Antenna Gain dB	Path Loss dB	Adj. Level dBm	Maximum Level dBm	Status	Lower Frequency Edge	Upper Frequency Edge
2	1.078	-72.5	0.6	6.5	53.15	-25.2128	0.8	P	1.072	1.084
3	1.617	-72.9	0.9	6.5	56.67	-21.8161	0.8	P	1.608	1.626
4	2.156	-79.5	1.2	4.3	59.17	-23.4425	0.8	P	2.144	2.168
5	2.695	-79.9	1.5	3.0	61.11	-20.3294	0.8	P	2.68	2.71
6	3.234	-80.9	1.7	4.4	62.69	-20.8709	0.8	P	3.216	3.252
7	3.773	-80.6	2.0	2.7	64.03	-17.257	0.8	P	3.752	3.794
8	4.312	-81.6	2.3	-0.2	65.19	-13.9223	0.8	P	4.288	4.336
9	4.851	-81.9	2.6	0.5	66.22	-13.6244	0.8	P	4.824	4.878
10	5.39	-80.5	2.8	1.9	67.13	-12.4343	0.8	P	5.36	5.42