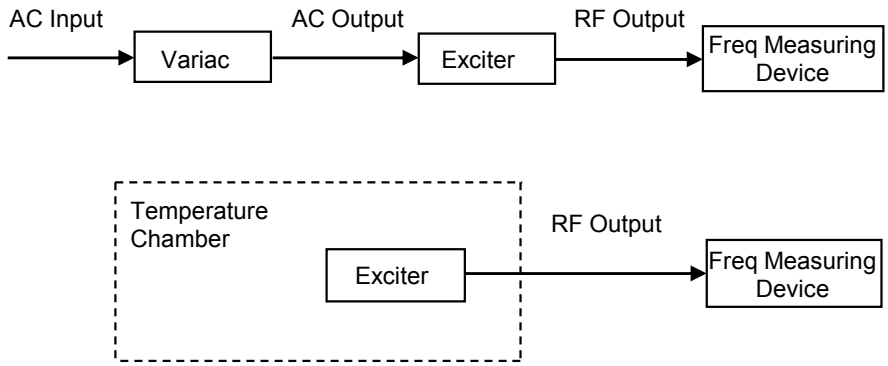
FREQUENCY STABILITY

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 frequency measuring device that has better than a 1ppm 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

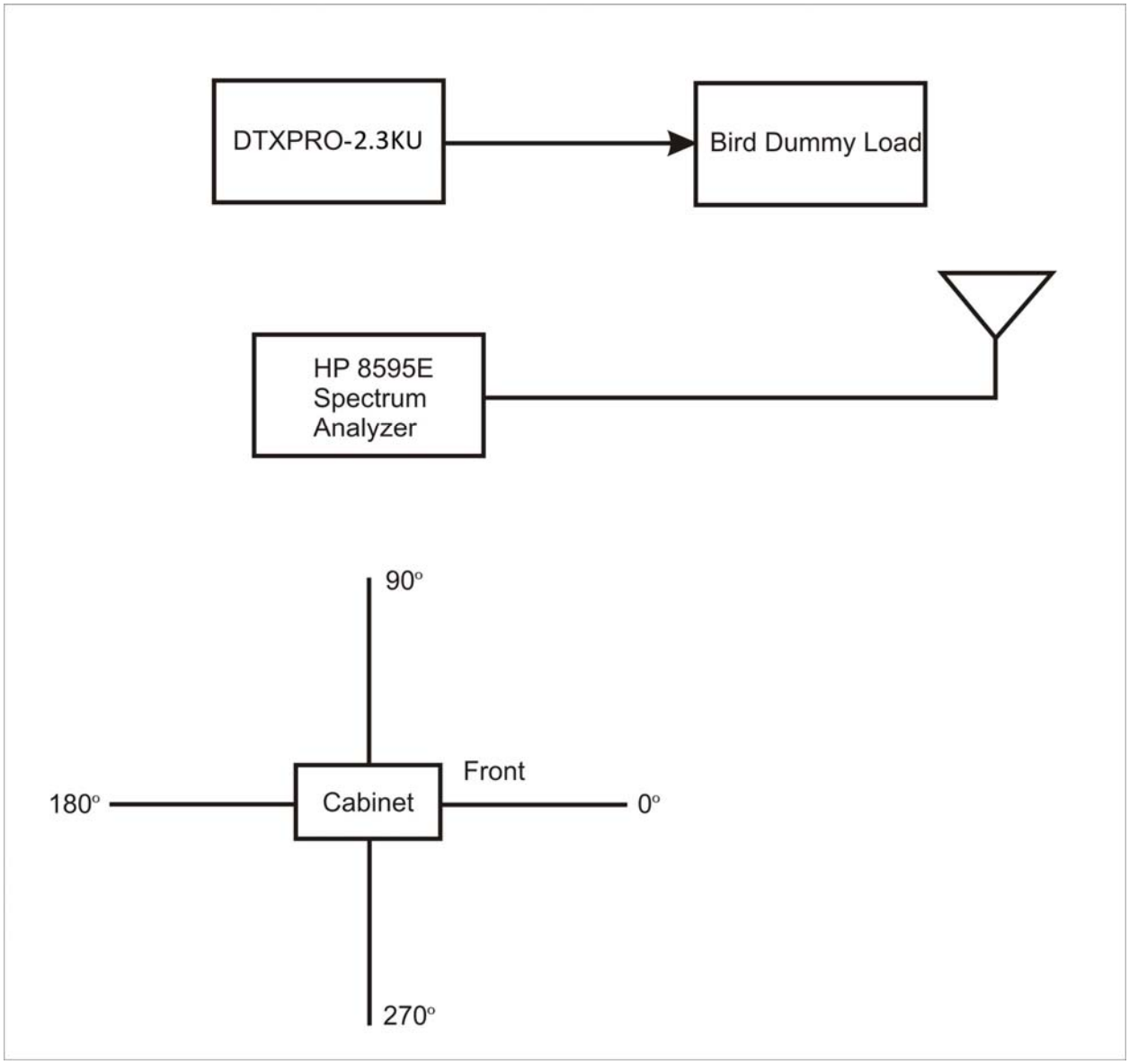
For the temperature stability measurements the exciter was placed inside a Cincinnati Sub-Zero temperature chamber Model Z-32-2-2-H/WC equipped with a CSZ Dimension II temperature controller. The exciter was energized and the pilot frequency was measured on the Rhode and Schwarz test set. The temperature was then raised to +40 ºC, 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 2,300 W 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 -85 dB 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-2.3KU 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 -59.4 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.

Pineapple Technology Inc.

CABINET RADIATION TEST

PUTS** **CONDITIONS & PARAMETERS

E:	**1/6/2011**			
INEER:	**J. Collier**			
TTER MODEL NO	**DTXPRO-2.3KU**	**SO12705-6**		
NG POWER OUTPUT LEVEI	**63.6 dBm**	**2300**	**Power in Watts**	
FREQUENCY	**0.539 gHz**	**25**	**Channel**	
MODEL NUMBEF	**ETS 3147 S/N 9112-1053**			
M ANALYZER MODEI	**8595E**			
E TO TRANSMITTEF	**10 METERS**			

vels were measured in 500kHz segments between lower freq edge and upper frequency edge
quency of highest level in band segment is recorded below.)

FRONT VIEW

Center Frequency GHz	SIGNAL LEVEL dBm	CABLE LOSS dB dB	ANTENNA GAIN dB dB	PATH LOSS dB dB	ADJ LEVEL dBm	MAXIMUM LEVEL dBm	STATUS P=PASS	Lower Frequency Edge	Upper Frequency Edge
1.078	-69.5	0.6	6.5	53.15	-22.2128	3.6	P	1.072	1.084
1.617	-76.5	0.9	6.5	56.67	-25.4161	3.6	P	1.608	1.626
2.156	-78.4	1.2	4.3	59.17	-22.3425	3.6	P	2.144	2.168
2.695	-79.5	1.5	3.0	61.11	-19.9294	3.6	P	2.68	2.71
3.234	-80.5	1.7	4.4	62.69	-20.4709	3.6	P	3.216	3.252
3.773	-80.6	2.0	2.7	64.03	-17.257	3.6	P	3.752	3.794
4.312	-81.4	2.3	-0.2	65.19	-13.7223	3.6	P	4.288	4.336
4.851	-81.9	2.6	0.5	66.22	-13.6244	3.6	P	4.824	4.878
5.39	-81.1	2.8	1.9	67.13	-13.0343	3.6	P	5.36	5.42

RIGHT VIEW

Center Frequency GHz	SIGNAL LEVEL dBm	CABLE LOSS dB dB	ANTENNA GAIN dB dB	PATH LOSS dB dB	ADJ LEVEL dBm	MAXIMUM LEVEL dBm	STATUS	Lower Frequency Edge	Upper Frequency Edge
1.078	-59.4	0.6	6.5	53.15	-12.1128	3.6	P	0.396	0.408
1.617	-74.3	0.9	6.5	56.67	-23.2161	3.6	P	0.594	0.612
2.156	-79.7	1.2	4.3	59.17	-23.6425	3.6	P	0.792	0.816
2.695	-79.4	1.5	3.0	61.11	-19.8294	3.6	P	0.99	1.02
3.234	-80.1	1.7	4.4	62.69	-20.0709	3.6	P	1.188	1.224
3.773	-80.7	2.0	2.7	64.03	-17.357	3.6	P	1.386	1.428
4.312	-81.2	2.3	-0.2	65.19	-13.5223	3.6	P	1.584	1.632
4.851	-81.7	2.6	0.5	66.22	-13.4244	3.6	P	1.782	1.836
5.39	-81.4	2.8	1.9	67.13	-13.3343	3.6	P	1.98	2.04

REAR VIEW

Center Frequency GHz	SIGNAL LEVEL dBm	CABLE LOSS dB dB	ANTENNA GAIN dB dB	PATH LOSS dB dB	ADJ LEVEL dBm	MAXIMUM LEVEL dBm	STATUS	Lower Frequency Edge	Upper Frequency Edge
1.078	-77.4	0.6	6.5	53.15	-30.1128	3.6	P	0.396	0.408
1.617	-74.6	0.9	6.5	56.67	-23.5161	3.6	P	0.594	0.612
2.156	-77.9	1.2	4.3	59.17	-21.8425	3.6	P	0.792	0.816
2.695	-79.7	1.5	3.0	61.11	-20.1294	3.6	P	0.99	1.02
3.234	-80.5	1.7	4.4	62.69	-20.4709	3.6	P	1.188	1.224
3.773	-81.1	2.0	2.7	64.03	-17.757	3.6	P	1.386	1.428
4.312	-81.7	2.3	-0.2	65.19	-14.0223	3.6	P	1.584	1.632
4.851	-81.5	2.6	0.5	66.22	-13.2244	3.6	P	1.782	1.836
5.39	-81.1	2.8	1.9	67.13	-13.0343	3.6	P	1.98	2.04

LEFT VIEW

Center Frequency GHz	SIGNAL LEVEL dBm	CABLE LOSS dB dB	ANTENNA GAIN dB dB	PATH LOSS dB dB	ADJ LEVEL dBm	MAXIMUM LEVEL dBm	STATUS	Lower Frequency Edge	Upper Frequency Edge
1.078	-79.3	0.6	6.5	53.15	-32.0128	3.6	P	0.396	0.408
1.617	-72.6	0.9	6.5	56.67	-21.5161	3.6	P	0.594	0.612
2.156	-79.6	1.2	4.3	59.17	-23.5425	3.6	P	0.792	0.816
2.695	-79.8	1.5	3.0	61.11	-20.2294	3.6	P	0.99	1.02
3.234	-80.6	1.7	4.4	62.69	-20.5709	3.6	P	1.188	1.224
3.773	-80.7	2.0	2.7	64.03	-17.357	3.6	P	1.386	1.428
4.312	-80.7	2.3	-0.2	65.19	-13.0223	3.6	P	1.584	1.632
4.851	-81.1	2.6	0.5	66.22	-12.8244	3.6	P	1.782	1.836
5.39	-81.2	2.8	1.9	67.13	-13.1343	3.6	P	1.98	2.04

Test Equipment List

The following test equipment was used in the various test equipment configurations or to create calibration of equipment at various frequencies. All equipment was known to be in working order.

VENDOR	MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
Agilent	N1996A	CSA Spectrum Analyzer	MY45371110
Com-Tech	DC5KC-1	Directional Coupler UHF 5kw RMS	044863
Mini-Circuits	NHP-1000	High Pass Filter	15542
Microwave Filter Company	R16560-25	DTV Band Stop Filter	D/C 0705-R1009
Agilent	E4418B	EPM Series Power Meter	MY40330293
Agilent	8481A	Power Sensor	1550A03679
Bird	8890-300	2500 Watt Dummy Load	4778
Rohde & Schwarz	EFA-53	TV Test Receiver	100041
ETS	3147	Log Periodic Antenna	9112-1053
Hewlett Packard	8596E	Spectrum Analyzer	3807A01244
Agilent	8753D	Network Analyzer	3410A04800