TEST REPORT

DTXPRO-1.2KU

DTXPRO-1.2KU TRANSMITTER TECHNICAL REPORT

The following information is provided to support the technical performance of the PTI DTXPRO-1.2KU transmitter. The information is supplied for broadcast TV service according to applicable portions of FCC Rule Part 74.

The information in this report is provided in support of verification that the transmitter meets the appropriate requirements. Measurements were recorded of spectrum and other appropriate data to demonstrate compliance.

1. Power Output Measurements
2. Frequency stability tests versus AC input voltage and temperature
3. Harmonic and spurious measurements to demonstrate the transmitter meets the DTV stringent emission mask and FCC Rule 74.794
4. Measurement of cabinet radiation for spurs and harmonics as specified in FCC Rule 2.1053 and Rule 2.1057

Measurements for these parameters were conducted at power output level of both 1200 watts and 800 watts.

The test equipment used for the measurements on the following pages is listed in this exhibit.

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RF Power Output Measurements

The equipment was configured as below shown in Figure 1. The loss through the directional coupler was calibrated at the channel center frequency of 539 MHz. Average power was read on the Agilent E4418B Power Meter.

Setup for Output Power and Spurs and Harmonics Measurements

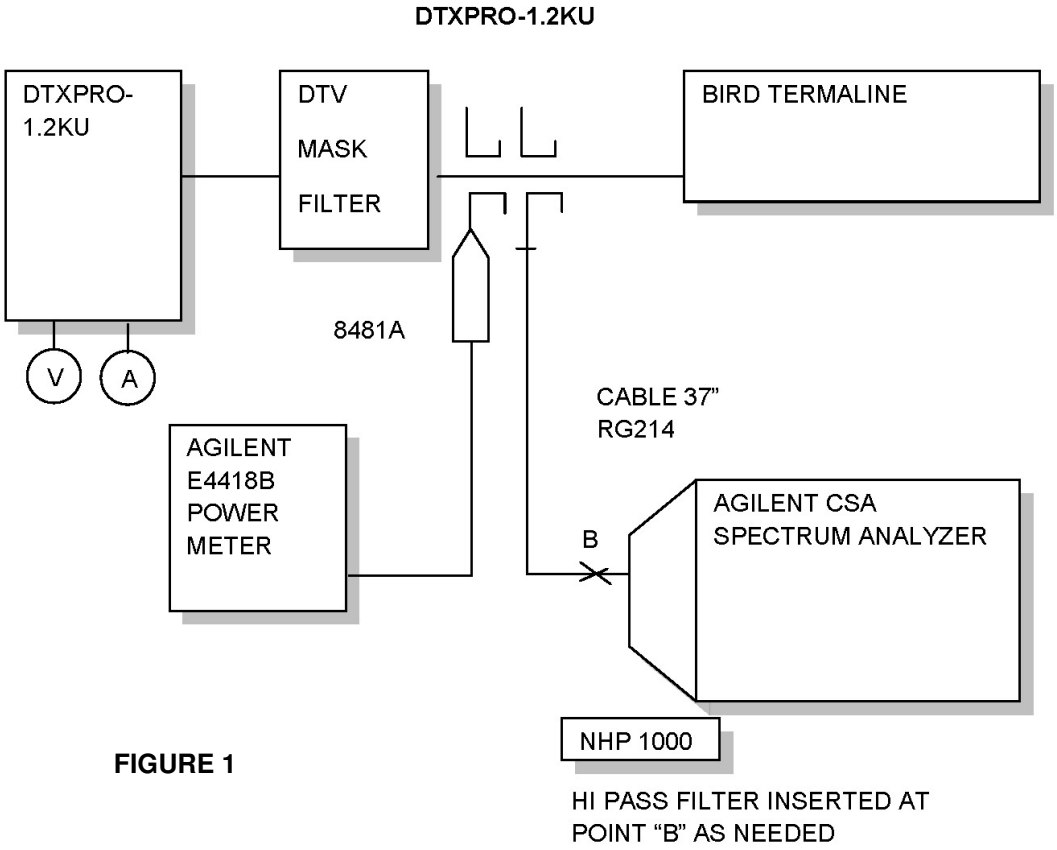
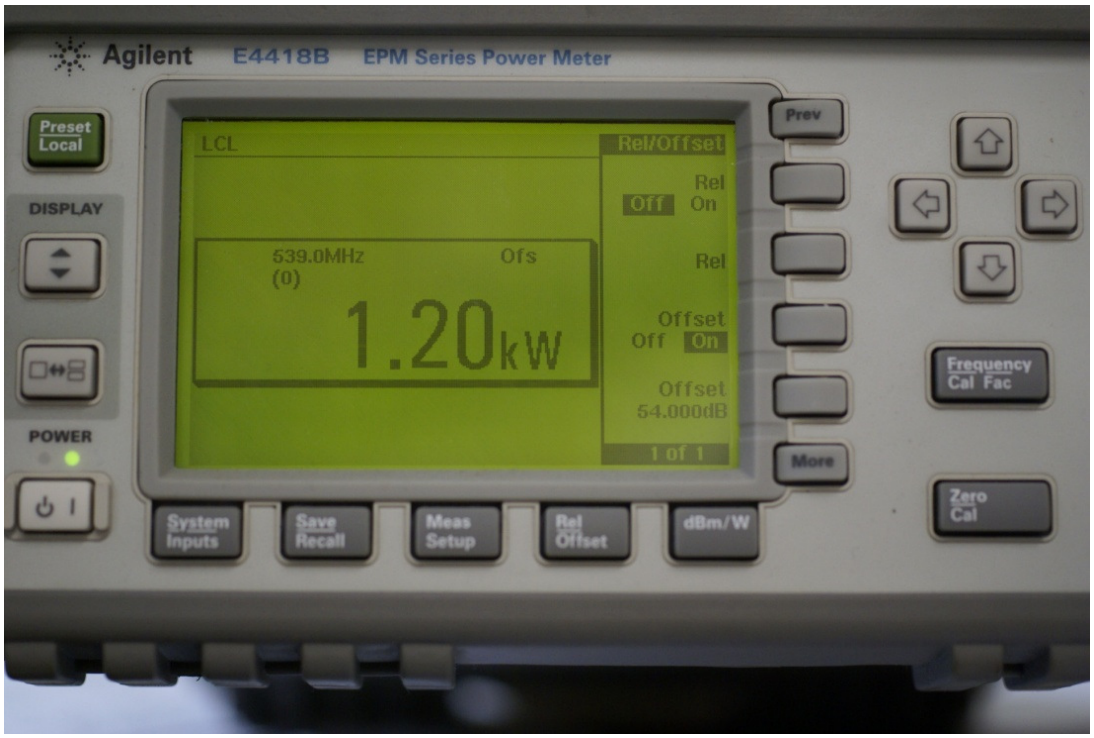


FIGURE 1

The loss of the directional coupler was determined to be 54 dB.

Measurement Of Nominal Transmitter Power

The transmitter was energized in the test configuration above and the power was read on the Agilent E4418B Power Meter. The indicated reading is shown below.



Calculation of Output Power: An offset of 54dB, equal to the directional coupler loss, entered into the E4418B allows direct display of output power in watts average power. Measured transmitter final voltage is 50VDC and final current is 90amps.

Low Power Operation

The transmitter was energized in the test configuration above and the power was read on the Agilent E4418B power meter. The indicated reading is shown next.

Calculation of Output Power: An offset of 54dB, equal to the directional coupler loss, entered into the E4418B allows direct display of output power in watts average power. Measured transmitter final voltage is 50VDC and final current is 60amps.

Emission Mask Compliance

To determine emission mask compliance the test equipment configuration shown on Figure 1 and Figure 2 was used. The transmitter was tested for compliance with the stringent emission mask classification. The first part of the tests measured the adjacent channel emission and the second part of the tests measured the harmonic and spurious energy.

The transmitter was energized at 1200 watts on Channel 25 (center frequency of 539 MHz) as calculated by the insertion loss of the directional coupler and a reference was established on the spectrum analyzer (using the channel power measurement mode). The bandstop filter frequency response was determined using a network analyzer. The insertion loss at the center of each of the twelve 500 kHz segments either side of the main channel was tabulated. The bandstop filter response is shown on the next page as Plot 1.

ADJACENT CHANNEL MEASUREMENTS

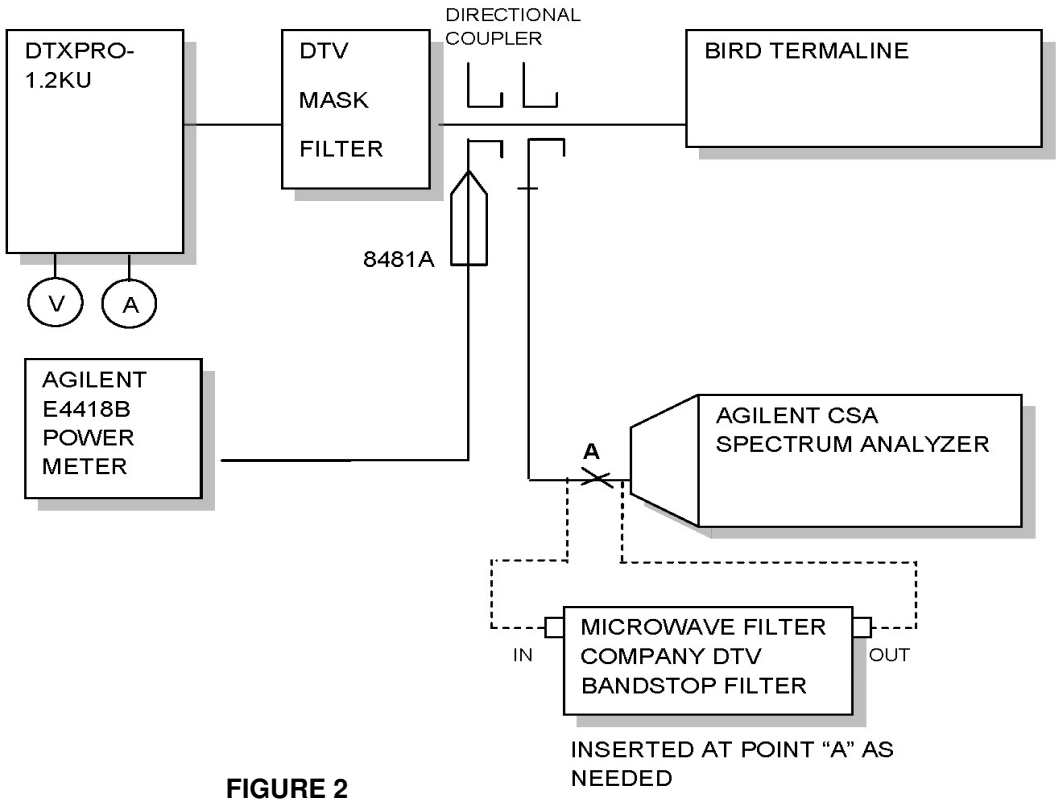
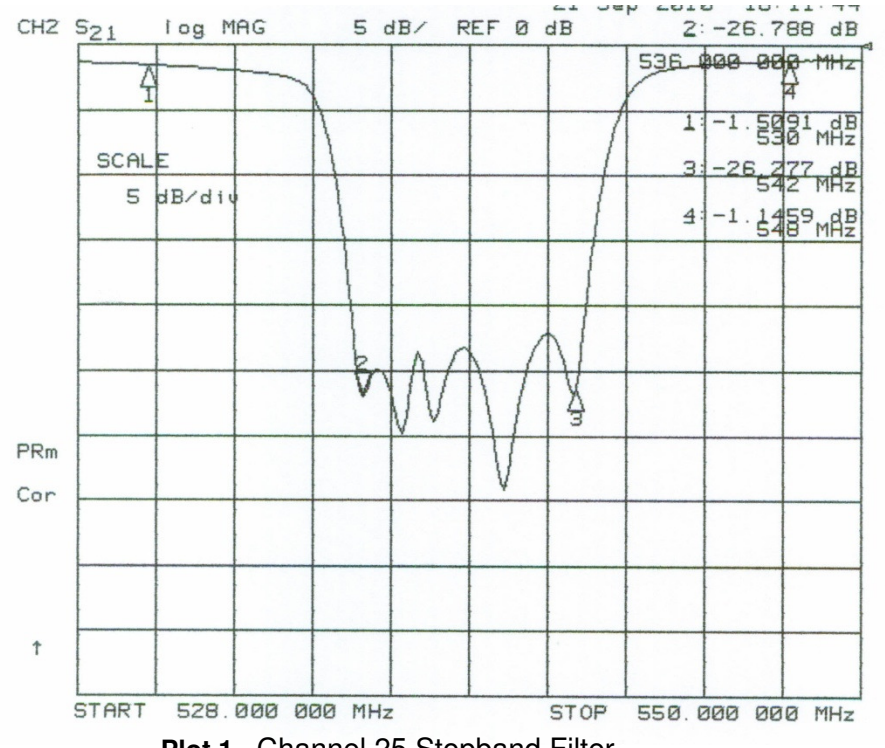
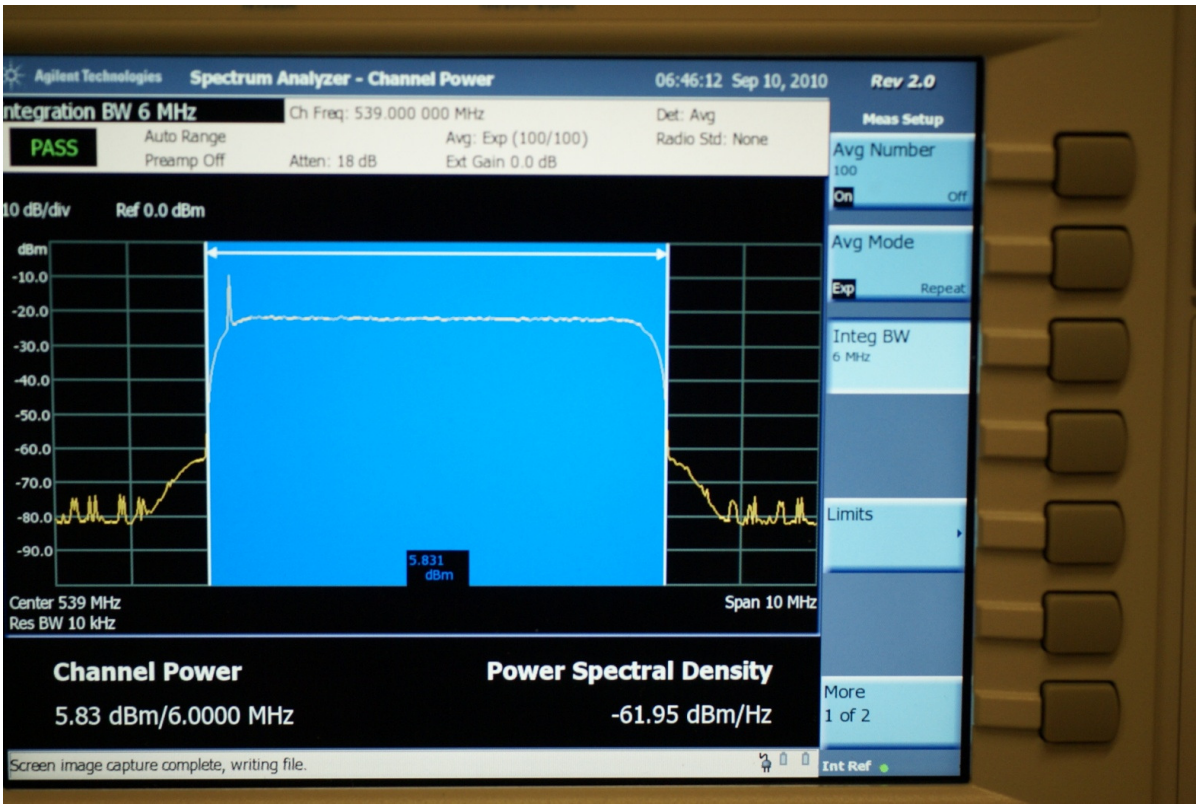


FIGURE 2



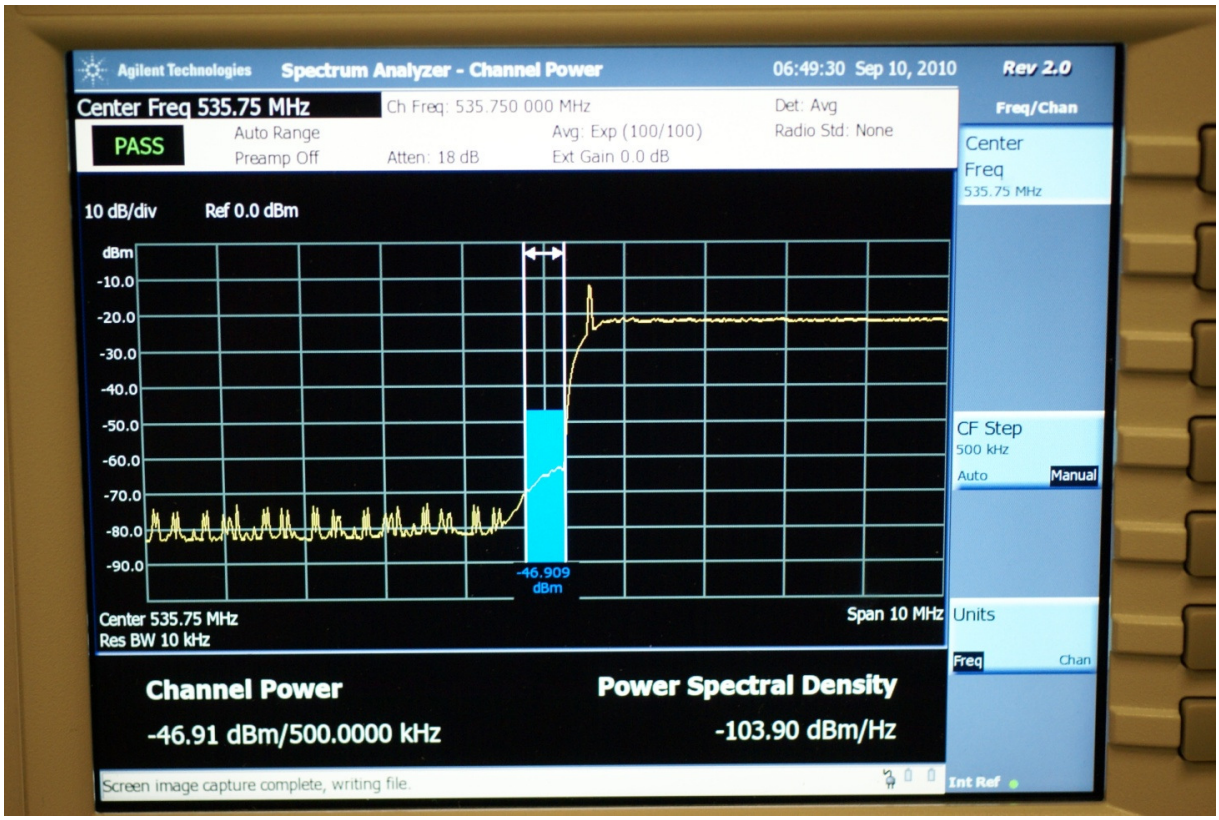
Plot 1 - Channel 25 Stopband Filter



Screenshot 1

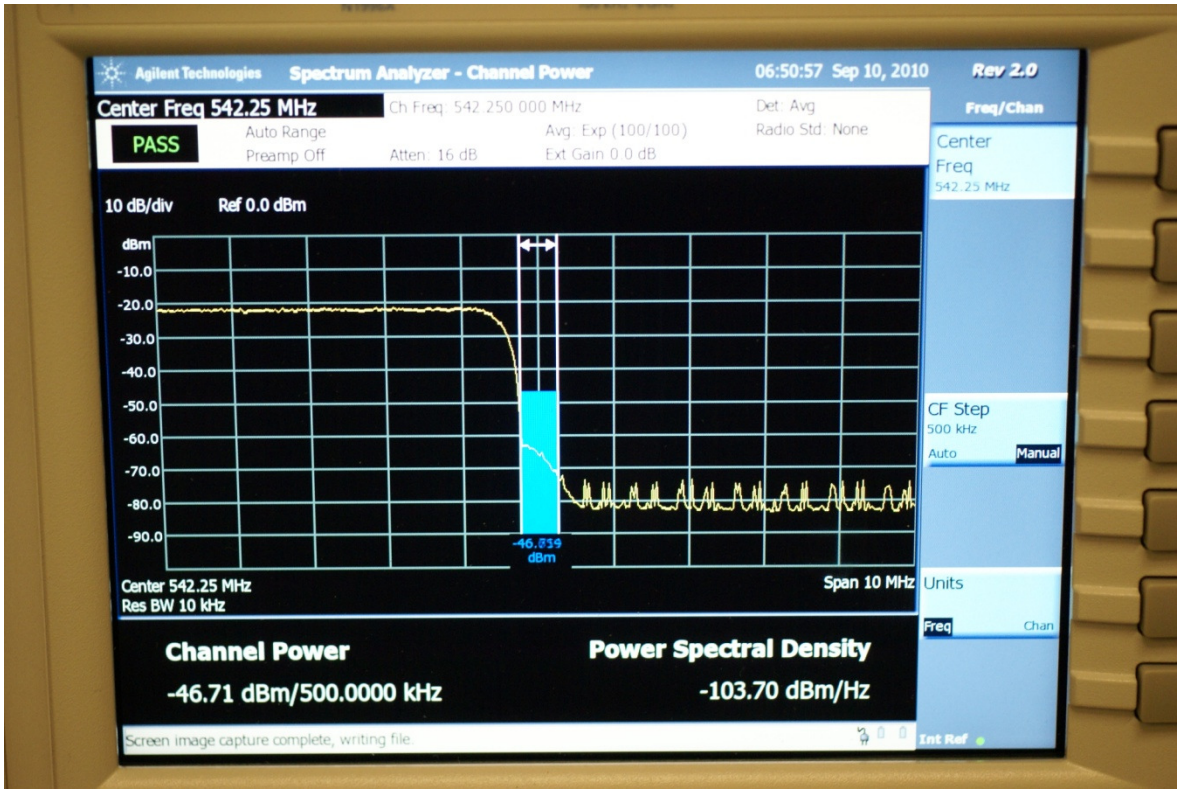
The filter was inserted in the path between the coupler and the spectrum analyzer and amount of change indicated in the channel power was 26 dB so this is the value of attenuation used for further optimization of the input level later in the measurements.

The next step was to measure the first four 500 kHz sub-bands on each side of the desired channel. For this part of the measurement, the stopband filter was not necessary. The attenuator on the spectrum analyzer was adjusted so that it was not being overloaded. Once the first four sub-bands were measured, the signal was close to the noise floor. Screenshots 2 and 3 show the spectrum on each side of the desired channel as an example of the measurements.



Screenshot 2
Lower sideband spectrum measured using channel power mode
Center frequency = 535.75MHz Sub Band -1

The next step was to install the bandstop filter in the path from the coupler to the spectrum analyzer and reduce the attenuation so that the emissions in the remaining subbands could be measured.



Screenshot 3

Upper sideband spectrum measured using channel power mode.
Center frequency = 542.25 MHz
Sub Band +1

The first step of the procedure optimized the level of the spectrum analyzer dynamic range ensuring the noise floor was below the value assumed if the transmitter spectrum just met the limits of the emission mask. Once that was done, the spectrum analyzer attenuator was not changed and the channel power mode was engaged to measure each of the remaining 500 kHz segments (on both sides of the desired channel) using the center frequency of that segment.

The final step was to make any adjustments necessary for the proximity of the noise floor and to take into account the stopband filter loss in that order and record the values in the table. Then those recorded power levels were subtracted from the total power in the desired channel and values were tabulated to determine if they met the emission mask.

The table with the corrected emission mask measurement values is presented below. The transmitter emissions met the requirements as indicated by comparison with the FCC Stringent Emission Mask.

Lower Adjacent Channel Measurements (**1200 Watts Average**)

Channel 25 Center Frequency 539 MHz

Subband	Center Freq. MHz	6MHz Channel Power dBm ($0Db_{DTV}$)	500 kHz Spectrum Analyzer Noise Channel Power dBm	500 kHz Measured Channel Power dBm	Stop Band Filter Gain	500kHz Channel Power Corrected for Noise Floor	500kHz Channel Power Corrected for Stop Band Filter	Sub Band Power dB_{DTV}	FCC Mask Limit dB_{DTV}
1	535.75	5.8	-63.0	-46.5	-------	**	-------	-52.3	-47.0
2	535.25	5.8	-63.0	-58.8	-------	**	-------	-64.6	-49.9
3	534.75	5.8	-63.0	-62.6	-------	**	-------	-68.4	-55.6
4	534.25	5.8	-63.0	-62.3	-------	**	-------	-68.1	-61.4
STOP BAND FILTER USED BELOW THIS LINE									
5	533.75	5.8	-86.0	-77.1	-2.4	**	-74.4	-80.5	-67.1
6	533.25	5.8	-86.0	-79.9	-2.2	**	-77.7	-83.5	-71.9
7	532.75	5.8	-86.0	-82.4	-2.2	**	-80.2	-86.0	-76.0
8	532.25	5.8	-86.0	-83.1	-2.0	**	-81.1	-86.9	-76.0
9	531.75	5.8	-86.0	-85.2	-1.8	**	-83.4	-89.2	-76.0
10	531.25	5.8	-86.0	-86.3	-1.7	**	-84.6	-90.4	-76.0
11	530.75	5.8	-86.0	-86.4	-1.6	**	-83.0	-88.8	-76.0
12	530.25	5.8	-86.0	-85.5	-1.6	**	-83.9	-89.7	-76.0
A	**B**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**C**

** Noise floor proximity correction was not necessary to meet the mask and was not computed here.

I=F-G

Lower Adjacent Channel Measurements (**800 Watts Average**)

Channel 25 - Center Frequency 539 MHz

Subband	Center Freq. MHz	6MHz Channel Power dBm ($0Db_{DTV}$)	500 kHz Spectrum Analyzer Noise Channel Power dBm	500 kHz Measured Channel Power dBm	Stop Band Filter Gain	500kHz Channel Power Corrected for Noise Floor	500kHz Channel Power Corrected for Stop Band Filter	Subband Power dB_{DTV}	FCC Mask Limit dB_{DTV}
1	535.75	4.2	-65.0	-44.1	------	**	------	-48.3	-47.0
2	535.25	4.2	-65.0	-57.1	------	**	------	-61.3	-49.9
3	534.75	4.2	-65.0	-63.1	------	**	------	-67.3	-55.6
4	534.25	4.2	-65.0	-63.1	------	**	------	-67.3	-61.4
STOP BAND FILTER USED BELOW THIS LINE									
5	533.75	4.2	-87.9	-78.5	-2.4	**	-76.1	-80.3	-67.1
6	533.25	4.2	-87.9	-78.3	-2.2	**	-76.1	-80.3	-71.9
7	532.75	4.2	-87.9	-81.7	-2.2	**	-79.5	-83.7	-76.0
8	532.25	4.2	-87.9	-81.9	-2.0	**	-79.9	-84.1	-76.0
9	531.75	4.2	-87.9	-84.8	-1.8	**	-83.0	-87.2	-76.0
10	531.25	4.2	-87.9	-87.7	-1.7	**	-86.0	-90.2	-76.0
11	530.75	4.2	-87.9	-88.1	-1.6	**	-86.5	-92.3	-76.0
12	530.25	4.2	-87.9	-87.6	-1.6	**	-86.0	-90.2	-76.0
A	**B**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**C**

** Noise floor proximity correction was not necessary to meet the mask and was not computed here.

I=F-G

Upper Adjacent Channel Measurements (1200 Watts Average)

Channel 25 (539 MHz)

Subband	Center Freq. MHz	6MHz Channel Power dBm ($0Db_{DTV}$)	500 kHz Spectrum Analyzer Noise Channel Power dBm	500 kHz Measured Channel Power dBm	Stop Band Filter Gain	500kHz Channel Power Corrected for Noise Floor	500kHz Channel Power Corrected for Stop Band Filter	Subband Power dB_{DTV}	FCC Mask Limit dB_{DTV}
1	542.25	5.8	-63.6	-46.3	------	**	------	-52.1	-47.0
2	542.75	5.8	-63.6	-60.0	------	**	------	-65.8	-49.9
3	543.25	5.8	-63.6	-62.8	------	**	------	-68.6	-55.6
4	543.75	5.8	-63.6	-61.9	------	**	------	-67.7	-61.4
STOP BAND FILTER USED BELOW THIS LINE									
5	544.25	5.8	-85.7	-77.0	-2.1	**	-74.9	-80.7	-67.1
6	544.75	5.8	-85.7	-79.6	-1.8	**	-77.8	-83.6	-71.9
7	545.25	5.8	-85.7	-82.2	-1.7	**	-80.5	-86.3	-76.0
8	545.75	5.8	-85.7	-84.2	-1.6	**	-82.6	-88.4	-76.0
9	546.25	5.8	-85.7	-85.2	-1.5	**	-83.7	-89.5	-76.0
10	546.75	5.8	-85.7	-85.7	-1.4	**	-84.3	-91.5	-76.0
11	547.25	5.8	-85.7	-86.5	-1.4	**	-85.1	-92.3	-76.0
12	547.75	5.8	-85.7	-85.7	-1.3	**	-84.4	-90.2	-76.0
A	**B**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**C**

** Noise floor proximity correction was not necessary to meet the mask and was not computed here.

I =F-G

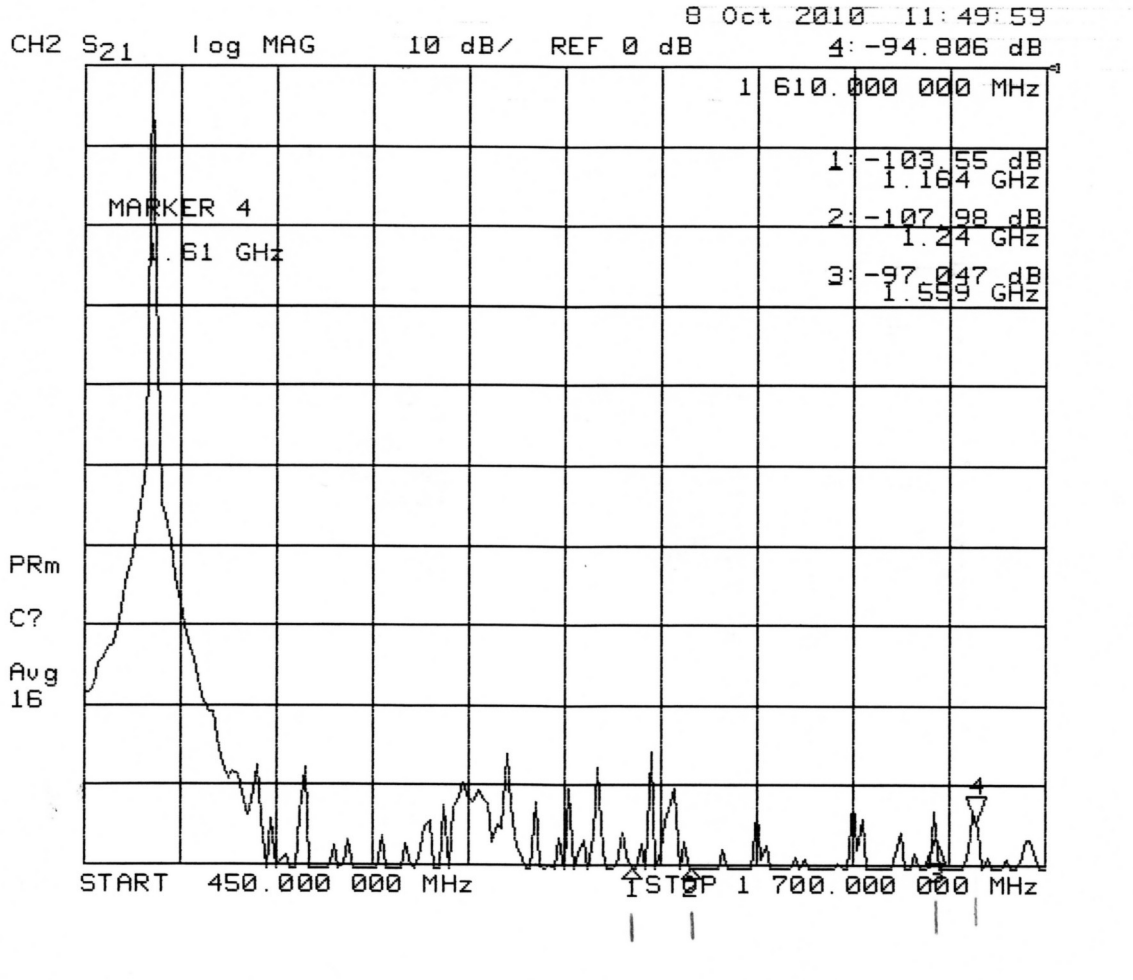
Upper Adjacent Channel Measurements (800 Watts Average)

Channel 25 Center Frequency 539 MHz

Subband	Center Freq. MHz	6MHz Channel Power dBm ($0Db_{DTV}$)	500 kHz Spectrum Analyzer Noise Channel Power dBm	500 kHz Measured Channel Power dBm	Stop Band Filter Gain	500kHz Channel Power Corrected for Noise Floor	500kHz Channel Power Corrected for Stop Band Filter	Sub Band Power dB_{DTV}	FCC Mask Limit dB_{DTV}
1	542.25	4.2	-65.6	-42.9	-----	**	-----	-47.1	-47.0
2	542.75	4.2	-65.6	-56.3	-----	**	-----	-60.5	-49.9
3	543.25	4.2	-65.6	-63.6	-----	**	-----	-67.8	-55.6
4	543.75	4.2	-65.6	-63.6	-----	**	-----	-67.8	-61.4
STOP BAND FILTER USED BELOW THIS LINE									
5	544.25	4.2	-87.8	-74.2	-2.1	**	-72.1	-76.3	-67.1
6	544.75	4.2	-87.8	-77.7	-1.8	**	-75.9	-80.1	-71.9
7	545.25	4.2	-87.8	-81.3	-1.7	**	-79.6	-83.8	-76.0
8	545.75	4.2	-87.8	-84.6	-1.6	**	-83.0	-87.2	-76.0
9	546.25	4.2	-87.8	-86.7	-1.5	**	-85.2	-89.4	-76.0
10	546.75	4.2	-87.8	-86.7	-1.4	**	-85.3	-89.5	-76.0
11	547.25	4.2	-87.8	-87.1	-1.4	**	-85.7	-89.9	-76.0
12	547.75	4.2	-87.8	-87.4	-1.3	**	-86.1	-90.3	-76.0
A	**B**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**C**

** Noise floor proximity correction was not necessary to meet the mask and was not computed here.

I=F-G



The above network analyzer plot of the output filtering for this transmitter demonstrates compliance with emission attenuation requirements for GPS band protection as specified by FCC 74.794.

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 knowing to be in working order.

VENDOR	MODEL NUMBER	DESCRIPTION	SERIAL NUMBER
Agilent	N1996A	CSA Spectrum Analyzer	MY45371110
Comtech	DC5KC-1	Directional Coupler UHF 5kw RMS	044863
Mini-Circuits	NHP-1000	Hi Pass Filter	15542
Microwave Filter Company	R16560-25	DTV Bandstop 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