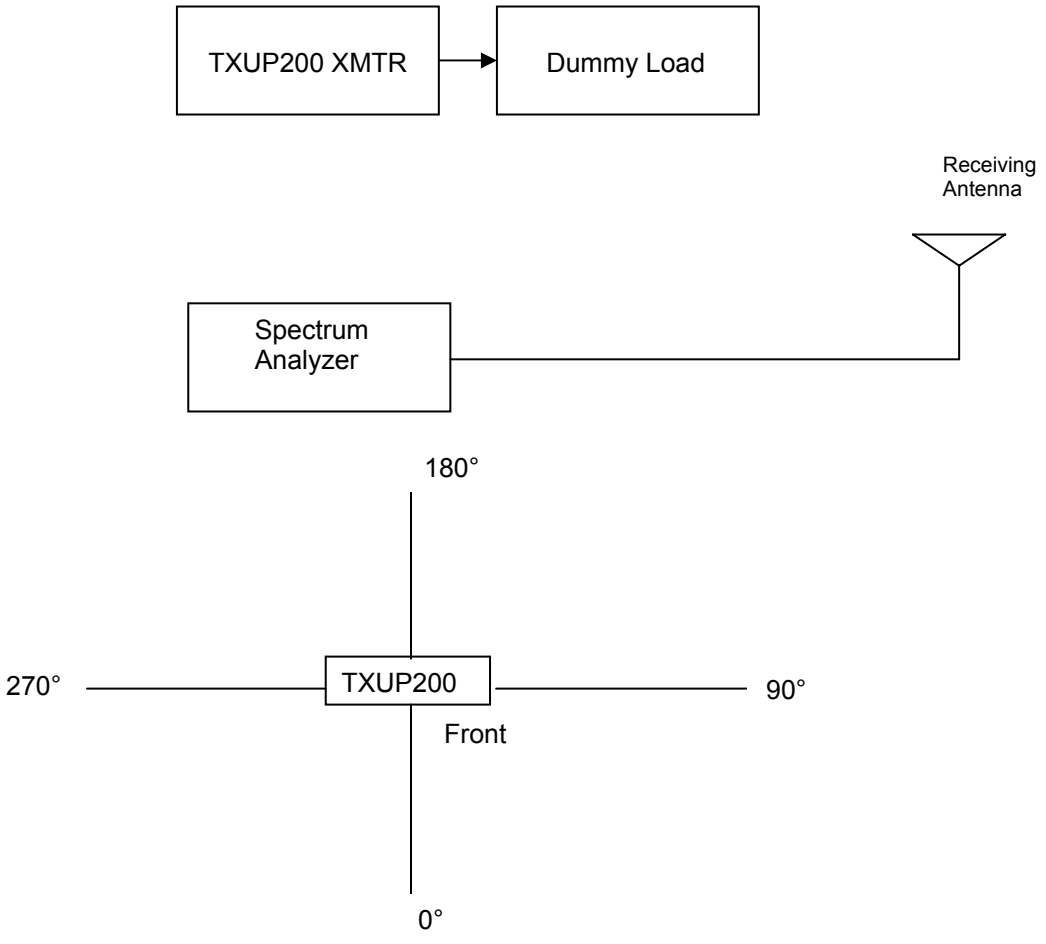
CABINET RADIATION

The transmitter and test equipment were configured as shown below including the angles of measurement with respect to the transmitter cabinet. The transmitter was operated at 250 watts peak sync power with a 10 dB visual/aural ratio with the video input signal being a Color Bars signal. In this case the fundamental frequency was set to 801 MHz because there was interference on 567 MHz. The free space path 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 with 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 photos.

TEST EQUIPMENT CONFIGURATION



As indicated in the spreadsheet data, the worst case calculation was 64.7 dB at the tenth harmonic. Where measured values were above the noise floor, the worst case level was 74.7 dB. The photograph shown below indicates the physical test configuration and the test condition where the 74.7 dB measurement was recorded. The main limitation is the noise floor of the spectrum analyzer. The measurement tables for the all views of the transmitter at each frequency are shown following the picture. The results indicate that all radiated harmonics meet the FCC requirement of 60 dB as outlined in FCC rule 2.1053 and 2.1057.

CABINET RADIATION DATA

TXUP200 250 W CABINET RADIATION SPREADSHEET
250 W Front View
250 W = 54 dBm
Corrected level must be less than -6 dBm
Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	735.25	-42	0.8	7.3	49	0.5	-6 dBm	N/A	
2nd	1470.5	-74	1.2	6.9	55	-24.7	-6 dBm	-78.7	
3rd	2205.75	-86	1.5	6.5	58.6	-32.4	-6 dBm	-86.4	
4th	2941	-86	2.1	6.2	61.1	-29	-6 dBm	-83	
5th	3676.25	-86	2.3	6.8	63	-27.5	-6 dBm	-81.5	
6th	4411.5	-86	2.6	7.3	64.6	-26.1	-6 dBm	-80.1	
7th	5146.75	-86	3.2	7.6	65.9	-24.5	-6 dBm	-78.5	
8th	5882	-86	3.7	6	67.1	-21.2	-6 dBm	-75.2	
9th	6617.25	-80	4.2	5.6	68.1	-13.3	-6 dBm	-67.3	Noise Floor changes
10th	7352.5	-80	4.9	4.6	69	-10.7	-6 dBm	-64.7	Noise Floor changes

NOTES:

Antenna	AH SYSTEMS SAS-510-7 S/N 118	CAL 1-11-06
Spectrum Analyzer	HP 8593E S/N No #	
Cable	RG213, 12 foot length	
Load	BIRD 8932-115 S/N 1399	
Video Source	Tektronix 1910 S/N B010833 (color bars)	

Aural Carrier =-10 dB
Spectrum analyzer RBW 100 kHz VBW 10kHz
Exciter is VEGA

Note: The spectrum analyzer noise floor increased 6 dB for data at the 9^{th} and 10^{th} harmonics. This is why these measured values are higher than the measured values at the previous harmonics.

CABINET RADIATION SPREADSHEET
250 W Left side View
250 W = 54 dBm
Corrected level must be less than -6 dBm
Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	735.25	-44	0.8	7.3	49	-1.5	-6 dBm	N/A	
2nd	1470.5	-70	1.2	6.9	55	-20.7	-6 dBm	-74.7	
3rd	2205.75	-86	1.5	6.5	58.6	-32.4	-6 dBm	-86.4	
4th	2941	-86	2.1	6.2	61.1	-29	-6 dBm	-83	
5th	3676.25	-86	2.3	6.8	63	-27.5	-6 dBm	-81.5	
6th	4411.5	-86	2.6	7.3	64.6	-26.1	-6 dBm	-80.1	
7th	5146.75	-86	3.2	7.6	65.9	-24.5	-6 dBm	-78.5	
8th	5882	-86	3.7	6	67.1	-21.2	-6 dBm	-75.2	
9th	6617.25	-80	4.2	5.6	68.1	-13.3	-6 dBm	-67.3	Noise Floor changes
10th	7352.5	-80	4.9	4.6	69	-10.7	-6 dBm	-64.7	Noise Floor changes

Note: The spectrum analyzer noise floor increased 6 dB for data at the 9th and 10th harmonics. This is why these measured values are higher than the measured values at the previous harmonics.

CABINET RADIATION SPREADSHEET
250 W Right side View
250 W = 54 dBm
Corrected level must be less than -6 dBm
Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	735.25	-51	0.8	7.3	49	-8.5	-6 dBm	N/A	
2nd	1470.5	-72	1.2	6.9	55	-22.7	-6 dBm	-76.7	
3rd	2205.75	-86	1.5	6.5	58.6	-32.4	-6 dBm	-86.4	
4th	2941	-86	2.1	6.2	61.1	-29	-6 dBm	-83	
5th	3676.25	-86	2.3	6.8	63	-27.5	-6 dBm	-81.5	
6th	4411.5	-86	2.6	7.3	64.6	-26.1	-6 dBm	-80.1	
7th	5146.75	-86	3.2	7.6	65.9	-24.5	-6 dBm	-78.5	
8th	5882	-86	3.7	6	67.1	-21.2	-6 dBm	-75.2	
9th	6617.25	-80	4.2	5.6	68.1	-13.3	-6 dBm	-67.3	Noise Floor changes
10th	7352.5	-80	4.9	4.6	69	-10.7	-6 dBm	-64.7	Noise Floor changes

Note: The spectrum analyzer noise floor increased 6 dB for data at the 9th and 10th harmonics. This is why these measured values are higher than the measured values at the previous harmonics.

CABINET RADIATION SPREADSHEET

250 W Back side View

250 W = 54 dBm

Corrected level must be less than -6 dBm

Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Cable Loss	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB	
Xmit freq.	735.25	-41	0.8	7.3	49	1.5	-6 dBm	N/A	
2nd	1470.5	-74	1.2	6.9	55	-24.7	-6 dBm	-78.7	
3rd	2205.75	-86	1.5	6.5	58.6	-32.4	-6 dBm	-86.4	
4th	2941	-86	2.1	6.2	61.1	-29	-6 dBm	-83	
5th	3676.25	-86	2.3	6.8	63	-27.5	-6 dBm	-81.5	
6th	4411.5	-86	2.6	7.3	64.6	-26.1	-6 dBm	-80.1	
7th	5146.75	-86	3.2	7.6	65.9	-24.5	-6 dBm	-78.5	
8th	5882	-86	3.7	6	67.1	-21.2	-6 dBm	-75.2	
9th	6617.25	-80	4.2	5.6	68.1	-13.3	-6 dBm	-67.3	Noise Floor changes
10th	7352.5	-80	4.9	4.6	69	-10.7	-6 dBm	-64.7	Noise Floor changes

Note: The spectrum analyzer noise floor increased 6 dB for data at the 9^{th} and 10^{th} harmonics. This is why these measured values are higher than the measured values at the previous harmonics.

VOLTAGES AND CURRENTS TO FINAL AMPLIFIERS

Final amplifier DC voltage and current measurements were made with the transmitter operating at 250 Watts power output and at 62.5 watts power output. A video input signal of sync and 0 IRE “setup” level was used. The aural carrier was energized and adjusted for the proper 10 dB Visual to Aural power ratio.

Peak Output Power = 250 Watts
Voltage = 32 volts
Total DC Current = 2X 8 = 16 amps
Final amplifier DC power input = 32 x 16 = 512 watts

Peak Output Power = 62.5 Watts
Voltage = 32 volts
Total DC Current = 6 amps
Final amplifier DC power input = 32 x 6 = 192 watts

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 good working order and the equipment was within the calibration period.

Type	Manufacturer	Model	Date of Calibration	Calibration Expired
Spectrum Analyzer	Advantest	R3132	11/11/05	11/11/06
Signal Generator Platform	Tektronix	TG2000	15/05/05	15/05/06
Video Measurement Set	Tektronix	VM700A	09/01/06	09/01/07
TV Test Receiver	Rohde&Schwarz	EFA	15/05/05	15/05/06
Selective Modulation Analyzer	Rohde&Schwarz	FMAS	02/04/05	02/04/06
Wattmeter	BIRD	4391	02/04/05	02/04/06
Attenuator	Elettronika	N/A		
Dummy Load 100W	Elettronika	N/A		