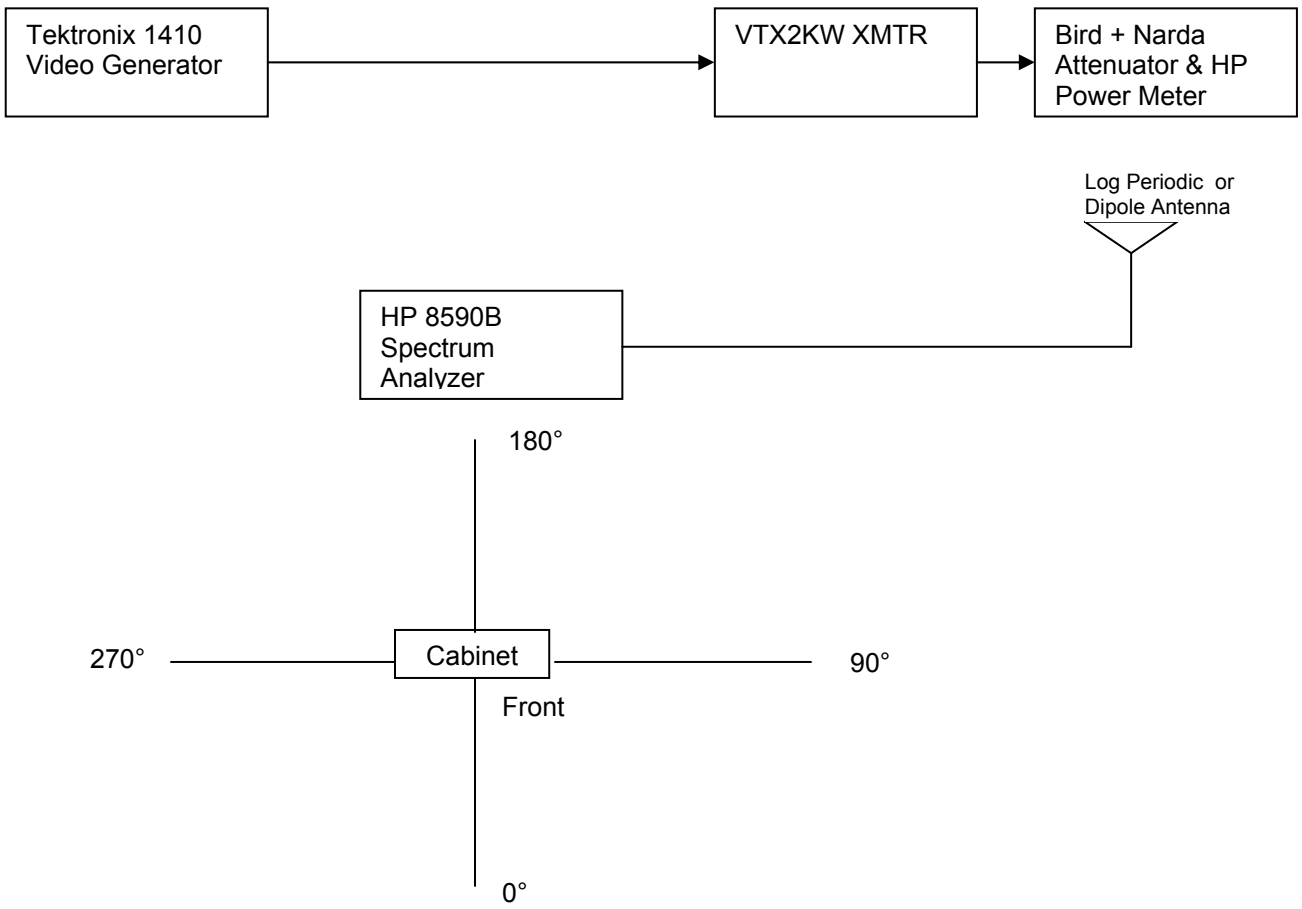
CABINET RADIATION

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 one view of the physical set-up of the test equipment and equipment under test. The transmitter was operated at 2.0 kW peak sync power with a 10 dB visual/aural ratio with the video input signal being a Modulated Stairstep signal. 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 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 photos. For frequencies below 1.05 GHz, an Amplifier Research log periodic antenna was used. For frequencies above 1.05 GHz, a set of dipoles for the measurement frequencies was used.

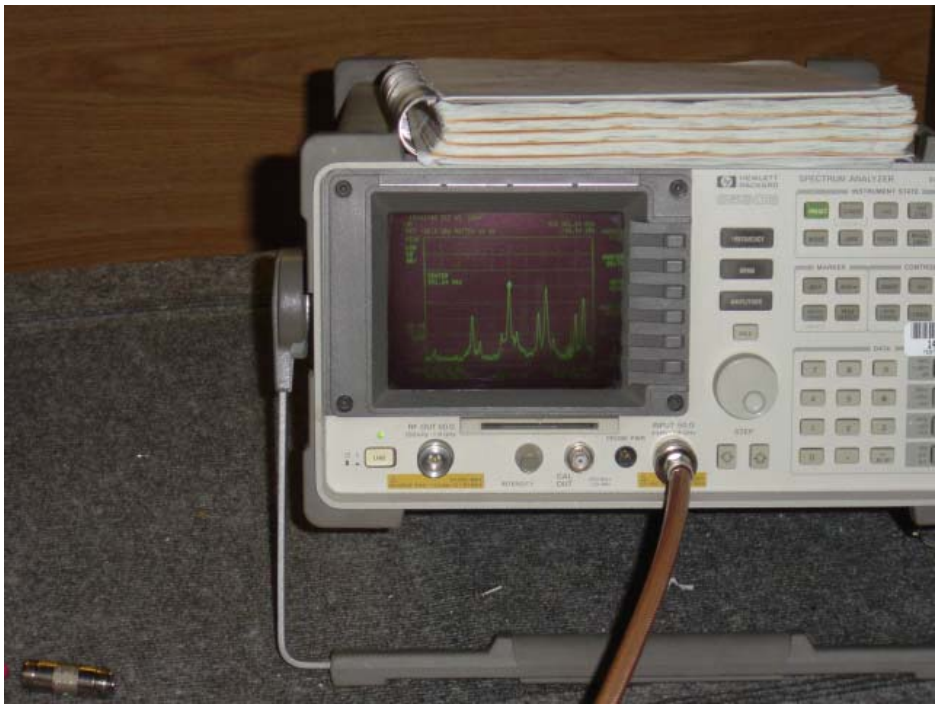
TEST EQUIPMENT CONFIGURATION



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 is shown in the foreground and the VTX2KW is shown in the background. The transmitter was rotated 90 degrees for each of the measurement orientations.

As indicated in the spreadsheet data on the following page, the worst case measurement was 62 dB at the second harmonic. (This photo on the next page shows this particular measurement). The measurement tables for the all views of the transmitter at each frequency are shown below. 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

CABINET RADIATION SPREADSHEET
VTX-2KW Front View
2 kW = 63 dBm
Corrected level must be less than 3 dBm
Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB
Xmit freq.	175.25	-35	6.5	36.6	-4.9	3 dBm	67.9
2nd	350.5	-35	6.5	42.6	1.1	3 dBm	61.9
3rd	525.75	-45	6.5	46.1	-5.4	3 dBm	68.4
4th	701	-65	6.5	48.6	-22.9	3 dBm	85.9
5th	876.25	-60	6.5	50.6	-15.9	3 dBm	78.9
6th	1051.5	-65	6.5	52.2	-19.3	3 dBm	82.3
7th	1226.75	-80	0	53.5	-26.5	3 dBm	89.5
8th	1402	-80	0	54.7	-25.3	3 dBm	88.3
9th	1577.25	-80	0	55.7	-24.3	3 dBm	87.3
10th	1752.5	-75	0	56.6	-18.4	3 dBm	81.4

CABINET RADIATION SPREADSHEET

VTX-2KW Left Side View

2 kW = 63 dBm

Corrected level must be less than 3 dBm

Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB
Xmit freq.	175.25	-30	6.5	36.6	0.1	3 dBm	62.9
2nd	350.5	-38	6.5	42.6	-1.9	3 dBm	64.9
3rd	525.75	-42	6.5	46.1	-2.4	3 dBm	65.4
4th	701	-70	6.5	48.6	-27.9	3 dBm	90.9
5th	876.25	-55	6.5	50.6	-10.9	3 dBm	73.9
6th	1051.5	-70	6.5	52.2	-24.3	3 dBm	87.3
7th	1226.75	-80	0	53.5	-26.5	3 dBm	89.5
8th	1402	-80	0	54.7	-25.3	3 dBm	88.3
9th	1577.25	-80	0	55.7	-24.3	3 dBm	87.3
10th	1752.5	-80	10	56.6	-33.4	3 dBm	96.4

CABINET RADIATION SPREADSHEET

VTX-2KW Right Side View

2 kW = 63 dBm

Corrected level must be less than 3 dBm

Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB
Xmit freq.	175.25	-35	6.5	36.6	-4.9	3 dBm	67.9
2nd	350.5	-40	6.5	42.6	-3.9	3 dBm	66.9
3rd	525.75	-45	6.5	46.1	-5.4	3 dBm	68.4
4th	701	-70	6.5	48.6	-27.9	3 dBm	90.9
5th	876.25	-62	6.5	50.6	-17.9	3 dBm	80.9
6th	1051.5	-65	6.5	52.2	-19.3	3 dBm	82.3
7th	1226.75	-80	0	53.5	-26.5	3 dBm	89.5
8th	1402	-80	0	54.7	-25.3	3 dBm	88.3
9th	1577.25	-80	0	55.7	-24.3	3 dBm	87.3
10th	1752.5	-80	0	56.6	-23.4	3 dBm	86.4

CABINET RADIATION SPREADSHEET
VTX-2KW Back View
2 kW = 63 dBm
Corrected level must be less than 3 dBm
Distance is 30 feet

Harmonic	Frequency MHz	Measured Level	Antenna Gain	Path Loss	Corrected Level	Required Level	Comparison to transmit level dB
Xmit freq.	175.25	-40	6.5	36.6	-9.9	3 dBm	72.9
2nd	350.5	-45	6.5	42.6	-8.9	3 dBm	71.9
3rd	525.75	-50	6.5	46.1	-10.4	3 dBm	73.4
4th	701	-70	6.5	48.6	-27.9	3 dBm	90.9
5th	876.25	-60	6.5	50.6	-15.9	3 dBm	78.9
6th	1051.5	-70	6.5	52.2	-24.3	3 dBm	87.3
7th	1226.75	-80	0	53.5	-26.5	3 dBm	89.5
8th	1402	-80	0	54.7	-25.3	3 dBm	88.3
9th	1577.25	-80	0	55.7	-24.3	3 dBm	87.3
10th	1752.5	-80	0	56.6	-23.4	3 dBm	86.4

VOLTAGES AND CURRENTS TO FINAL AMPLIFIERS

Final amplifier DC voltage and current measurements were made with the transmitter operating at 2.0 kWatts power output and at 0.5 kWatt output power. 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. Voltage measurements were made using a Fluke 77 meter. Current measurements were made using the transmitter meter with a voltage measurement across a DC shunt. The power supply voltage was measured as 31 volts for each operational point.

Peak Output Power = 2000 Watts
Voltage = 31 volts
Total DC Current = 110amps
Final amplifier DC power input = 31 x 110 = 3410 watts

Peak Output Power = 500 Watts
Voltage = 31 volts
Total DC Current = 60 amps
Final amplifier DC power input = 31 x 60 = 1860 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 supplier of the equipment stipulated the equipment was within the calibration period.

EQUIPMENT MODEL	SERIAL NUMBER
Tektronix 1410 Video generator	B020216
Modulation Sciences MSI320 demodulator	390128364
HP 8590B Spectrum Analyzer	3089A09840
VM-700A Video Analyzer	N/A
K & L VHF notch filter	F918-4
HP 200 CD Audio Generator	0960A86012
Tektronix TSG90 Video signal generator	B022622
Tektronix 1750 Waveform Monitor	B033351
Amplifier Research AT 1000 Log Periodic Antenna	11641
Fluke 77 meter	54810424
Wavetek 8003 Scalar Analyzer	1813961
HP 54601 Oscilloscope	3134A02137
HP-435B Power Meter	2702A17274
Bird 8890-300 30 dB Attenuator	N/A
Narda 20 dB Attenuator	N/A
HP 8901B Modulation Monitor	N/A
HP 53181 Frequency Counter	3736A05957