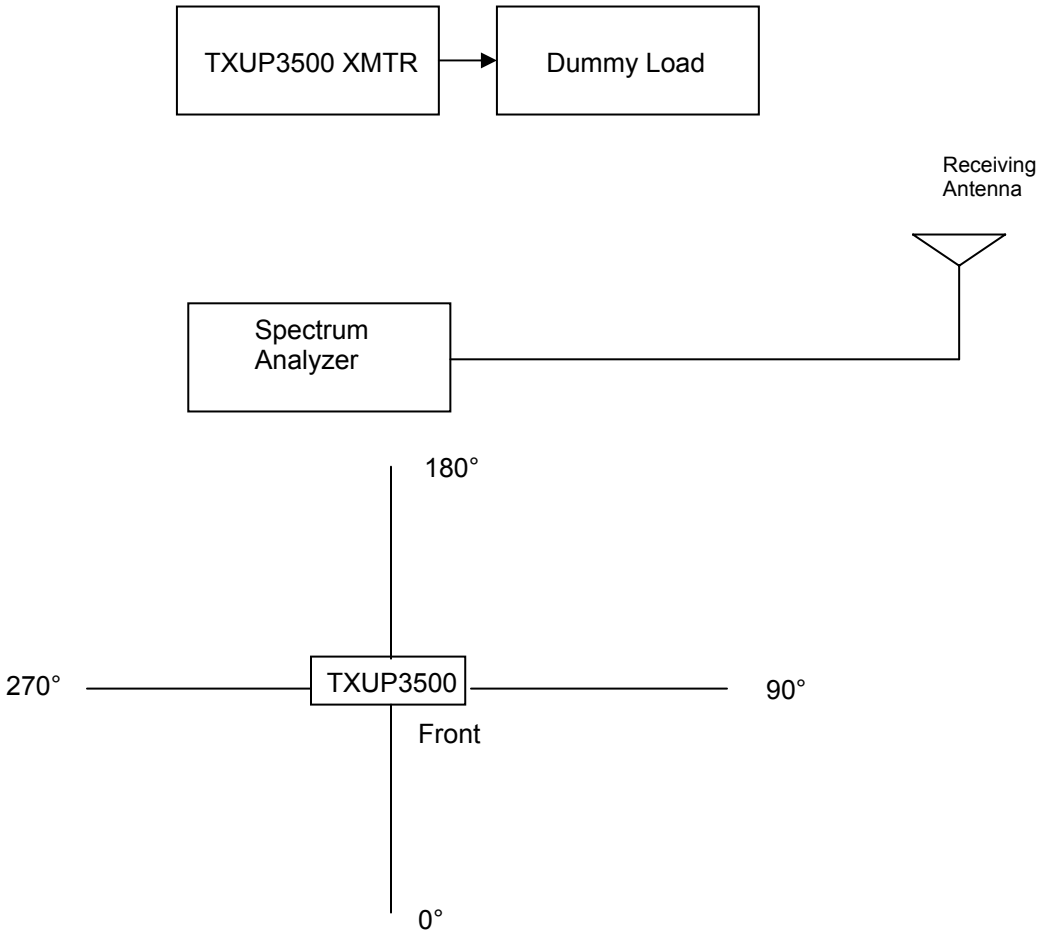
# CABINET RADIATION

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 3500 watts peak sync power with a 10 dB visual/aural ratio with the video input signal being a Modulated Stairstep 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 greater than -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 -75.0 dB at the tenth harmonic. 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
3.5 kW Front View
3.5 kW = 65.4 dBm
Corrected level must be less than 5.4 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. | 801.25 | -42 | 0.9 | 7.3 | 49.8 | 1.4 | 5.4 dBm | 64 | |
| 2nd | 1602.50 | -67 | 1.5 | 6.8 | 55.8 | -16.5 | 5.4 dBm | 81.9 | |
| 3rd | 2403.75 | -77 | 1.8 | 7.3 | 59.3 | -23.2 | 5.4 dBm | 88.6 | |
| 4th | 3205.00 | -84 | 2.2 | 6.1 | 61.9 | -26 | 5.4 dBm | 91.4 | |
| 5th | 4006.25 | -90 | 2.6 | 6.6 | 63.7 | -30.3 | 5.4 dBm | 95.7 | |
| 6th | 4807.50 | -90 | 3.1 | 6.7 | 65.3 | -28.3 | 5.4 dBm | 93.7 | |
| 7th | 5608.75 | -90 | 3.7 | 7.3 | 66.7 | -26.9 | 5.4 dBm | 92.3 | |
| 8th | 6410.00 | -90 | 4.1 | 6.2 | 67.8 | -24.3 | 5.4 dBm | 89.7 | |
| 9th | 7211.25 | -80 | 4.6 | 4.6 | 68.8 | -11.2 | 5.4 dBm | 76.6 | Noise floor changes |
| 10th | 8012.50 | -80 | 5.2 | 4.6 | 69.8 | -9.6 | 5.4 dBm | 75 | 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 | |
| XMTR | TXUP3500 | |
| 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 reduced 10 dB for data at the 9$^{th}$ and 10$^{th}$ harmonics. This is why the figures are higher than the figures at the previous harmonics.

CABINET RADIATION SPREADSHEET
3.5 kW Left side View
3.5 kW = 65.4 dBm
Corrected level must be less than 5.4 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. | 801.25 | -66 | 0.9 | 7.3 | 49.8 | -22.6 | 5.4 dBm | 88 | |
| 2nd | 1602.50 | -66 | 1.5 | 6.8 | 55.8 | -15.5 | 5.4 dBm | 80.9 | |
| 3rd | 2403.75 | -85 | 1.8 | 7.3 | 59.3 | -31.2 | 5.4 dBm | 96.6 | |
| 4th | 3205.00 | -90 | 2.2 | 6.1 | 61.9 | -32 | 5.4 dBm | 97.4 | |
| 5th | 4006.25 | -90 | 2.6 | 6.6 | 63.7 | -30.3 | 5.4 dBm | 95.7 | |
| 6th | 4807.50 | -90 | 3.1 | 6.7 | 65.3 | -28.3 | 5.4 dBm | 93.7 | |
| 7th | 5608.75 | -90 | 3.7 | 7.3 | 66.7 | -26.9 | 5.4 dBm | 92.3 | |
| 8th | 6410.00 | -90 | 4.1 | 6.2 | 67.8 | -24.3 | 5.4 dBm | 89.7 | |
| 9th | 7211.25 | -80 | 4.6 | 4.6 | 68.8 | -11.2 | 5.4 dBm | 76.6 | Noise floor changes |
| 10th | 8012.50 | -80 | 5.2 | 4.6 | 69.8 | -9.6 | 5.4 dBm | 75 | Noise floor changes |

Note: The spectrum analyzer noise floor reduced 10 dB for data at the $9^{th}$ and $10^{th}$ harmonics.
This is why the figures are higher than the figures at the previous harmonics.

CABINET RADIATION SPREADSHEET
3.5 kW Rightside View
3.5 kW = 65.4 dBm
Corrected level must be less than 5.4 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. | 801.25 | -50 | 0.9 | 7.3 | 49.8 | -6.6 | 5.4 dBm | 72 | |
| 2nd | 1602.50 | -70 | 1.5 | 6.8 | 55.8 | -19.5 | 5.4 dBm | 84.9 | |
| 3rd | 2403.75 | -82 | 1.8 | 7.3 | 59.3 | -28.2 | 5.4 dBm | 93.6 | |
| 4th | 3205.00 | -90 | 2.2 | 6.1 | 61.9 | -32 | 5.4 dBm | 97.4 | |
| 5th | 4006.25 | -90 | 2.6 | 6.6 | 63.7 | -30.3 | 5.4 dBm | 95.7 | |
| 6th | 4807.50 | -90 | 3.1 | 6.7 | 65.3 | -28.3 | 5.4 dBm | 93.7 | |
| 7th | 5608.75 | -90 | 3.7 | 7.3 | 66.7 | -26.9 | 5.4 dBm | 92.3 | |
| 8th | 6410.00 | -90 | 4.1 | 6.2 | 67.8 | -24.3 | 5.4 dBm | 89.7 | |
| 9th | 7211.25 | -80 | 4.6 | 4.6 | 68.8 | -11.2 | 5.4 dBm | 76.6 | Noise floor changes |
| 10th | 8012.50 | -80 | 5.2 | 4.6 | 69.8 | -9.6 | 5.4 dBm | 75 | Noise floor changes |

Note: The spectrum analyzer noise floor changed 10 dB for data at the $9^{th}$ and $10^{th}$ harmonics.
This is why the figures are higher than the figures at the previous harmonics.

CABINET RADIATION SPREADSHEET

3.5 kW Back side View

3.5 kW = 65.4 dBm

Corrected level must be less than 5.4 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. | 801.25 | -45 | 0.9 | 7.3 | 49.8 | -1.6 | 5.4 dBm | 67 | |
| 2nd | 1602.50 | -86 | 1.5 | 6.8 | 55.8 | -35.5 | 5.4 dBm | 100.9 | |
| 3rd | 2403.75 | -90 | 1.8 | 7.3 | 59.3 | -36.2 | 5.4 dBm | 101.6 | |
| 4th | 3205.00 | -90 | 2.2 | 6.1 | 61.9 | -32 | 5.4 dBm | 97.4 | |
| 5th | 4006.25 | -90 | 2.6 | 6.6 | 63.7 | -30.3 | 5.4 dBm | 95.7 | |
| 6th | 4807.50 | -90 | 3.1 | 6.7 | 65.3 | -28.3 | 5.4 dBm | 93.7 | |
| 7th | 5608.75 | -90 | 3.7 | 7.3 | 66.7 | -26.9 | 5.4 dBm | 92.3 | |
| 8th | 6410.00 | -90 | 4.1 | 6.2 | 67.8 | -24.3 | 5.4 dBm | 89.7 | |
| 9th | 7211.25 | -80 | 4.6 | 4.6 | 68.8 | -11.2 | 5.4 dBm | 76.6 | Noise floor changes |
| 10th | 8012.50 | -80 | 5.2 | 4.6 | 69.8 | -9.6 | 5.4 dBm | 75 | Noise floor changes |

Note: The spectrum analyzer noise floor reduced 10 dB for data at the $9^{th}$ and $10^{th}$ harmonics.
This is why the figures are higher than the figures at the previous harmonics.

# VOLTAGES AND CURRENTS TO FINAL AMPLIFIERS

Final amplifier DC voltage and current measurements were made with the transmitter operating at 3500 Watts power output and at 875 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. Voltage and current measurements were made at the transmitter.

Peak Output Power = 3500 Watts
Voltage = 32 volts
Total DC Current = 24X10= 240 amps
Final amplifier DC power input = 32 x 240 = 7680 watts

Peak Output Power = 875 Watts
Voltage = 32 volts
Total DC Current = 84 amps
Final amplifier DC power input = 32 x 84 = 2688 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 | | |