Emission measurements in the shielded chamber

Instructions for tests

Version 1.2, 6/21/06

1. Schedule a test at the site.

Notify the LWA RFI person serving as an NRAO contact, who will make arrangements with NRAO. Currently this is Ylva Pihlstrom (ylva@unm.edu, 505-2774492). Estimate about 3 hours for a regular emissions/shielding test of a single device.

2. Test performance

To comply with test procedures required for NRAO equipment, the emission test must be performed according to the instructions that follow below (adopted from NRAO procedures). Additional tests may of course be taken if investigating specific emission signals. The test is divided into two several parts, mostly depending on frequency.

2a. Test setup for frequencies above 1 GHz

Receiving antenna: use the broadband discone without extended wires
Antenna positions: 3 (in a diagonal pattern)
Spectrum analyzer settings:

- Start frequency: 1 GHz
- Stop frequency: 20 GHz
- Preamp: On
- Detector: Positive peak
- Trace: Max hold
- Sweep: Continuous
- RBW: 100 Hz
- Reference level: Approximately 70 dB above the expected noise level of -145 dBm. This might have to be adjusted. Ignore the 0 Hz DC offset spike.
- Attenuator: 0 dB nominal. If signals above the reference level are expected or seen, use an attenuator setting that places the signal peak within 10 dB of the reference level.
- Point storage: 1900

2b. Test setup for low frequencies 0 - 1 GHz

Receiving antenna: use the broadband discone with extended wires
Antenna positions: 3 (in a diagonal pattern)
Spectrum analyzer settings:

- Start frequency: 0 GHz
- Stop frequency: 1 GHz
- Preamp: Off
- Detector: Positive peak
- Trace: Max hold
- Sweep: Continuous
- RBW: 100 Hz
- Reference level: Approximately 70 dB above the expected noise level of

-110 dBm. This might have to be adjusted. Ignore 0 Hz DC offset spike.

Attenuator: 0 dB nominal. If signals above the reference level are expected or seen, use an attenuator setting that places the signal peak within 10 dB of the reference level.

Point storage: 500

2c. Test setup for 50-90 MHz

Receiving antenna: use the broadband discone with extended wires
Antenna positions: 3 (in a diagonal pattern)
Spectrum analyzer settings:

Start frequency: 50 MHZ
Stop frequency: 90 MHz
Preamp: Off
Detector: Positive peak
Trace: Max hold
Sweep: Continuous
RBW: 100 Hz
Reference level: Approximately 70 dB above the expected noise level of -110 dBm. This might have to be adjusted. Ignore 0 Hz DC offset spike.
Attenuator: 0 dB nominal. If signals above the reference level are expected or seen, use an attenuator setting that places the signal peak within 10 dB of the reference level.
Point storage: 800

3. General guidelines:

- On the windows machine available at the chamber, use the DAQ program to store data.
- After having positioned the receiving antenna in a new position, start a new scan by pressing Trace/Clear/Max hold on the spectrum analyzer
- When the scan is finished, press the RUN button on the DAQ program screen, which now should be updated. Press save to store the scan data.
- Bring a memory stick to copy data from the VLA computer.

4. Data reduction

Transfer the data files to your computer, and use anonymous ftp to place the raw data files in the LWA RFI depository. Make sure you create a new subdirectory and name it with DEVICE_DATE.

1. Reduce data with Excel spreadsheets already prepared and available at the LWA RFI page. Those spreadsheets include chamber and antenna calibration information.
2. When the data is reduced, fill in a results summary form (self-explanatory).
3. Finally, use anonymous ftp to deposit all Excel spreadsheets and the summary form in the LWA RFI depository. This data will be added to a database containing the results for all devices tested.