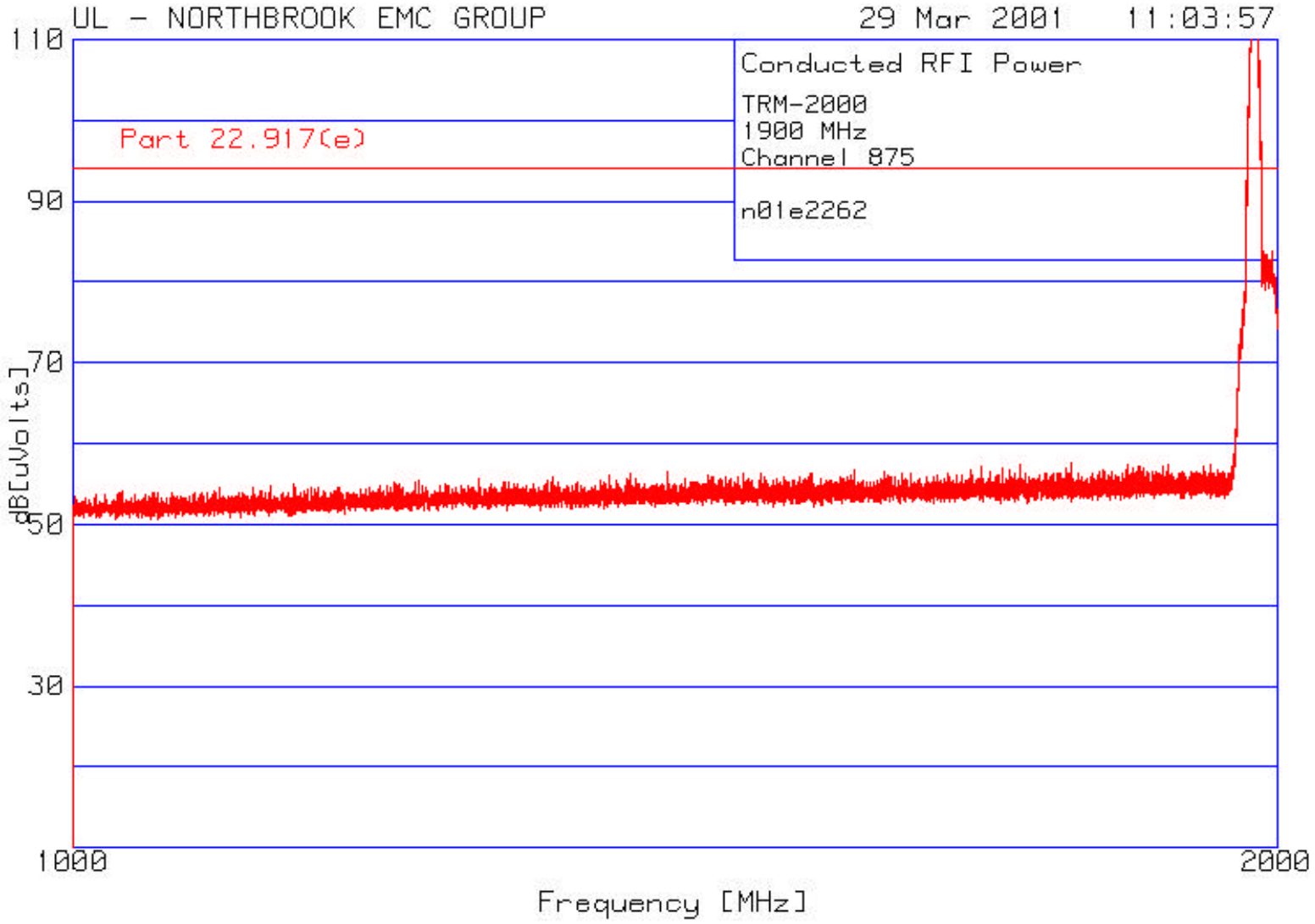
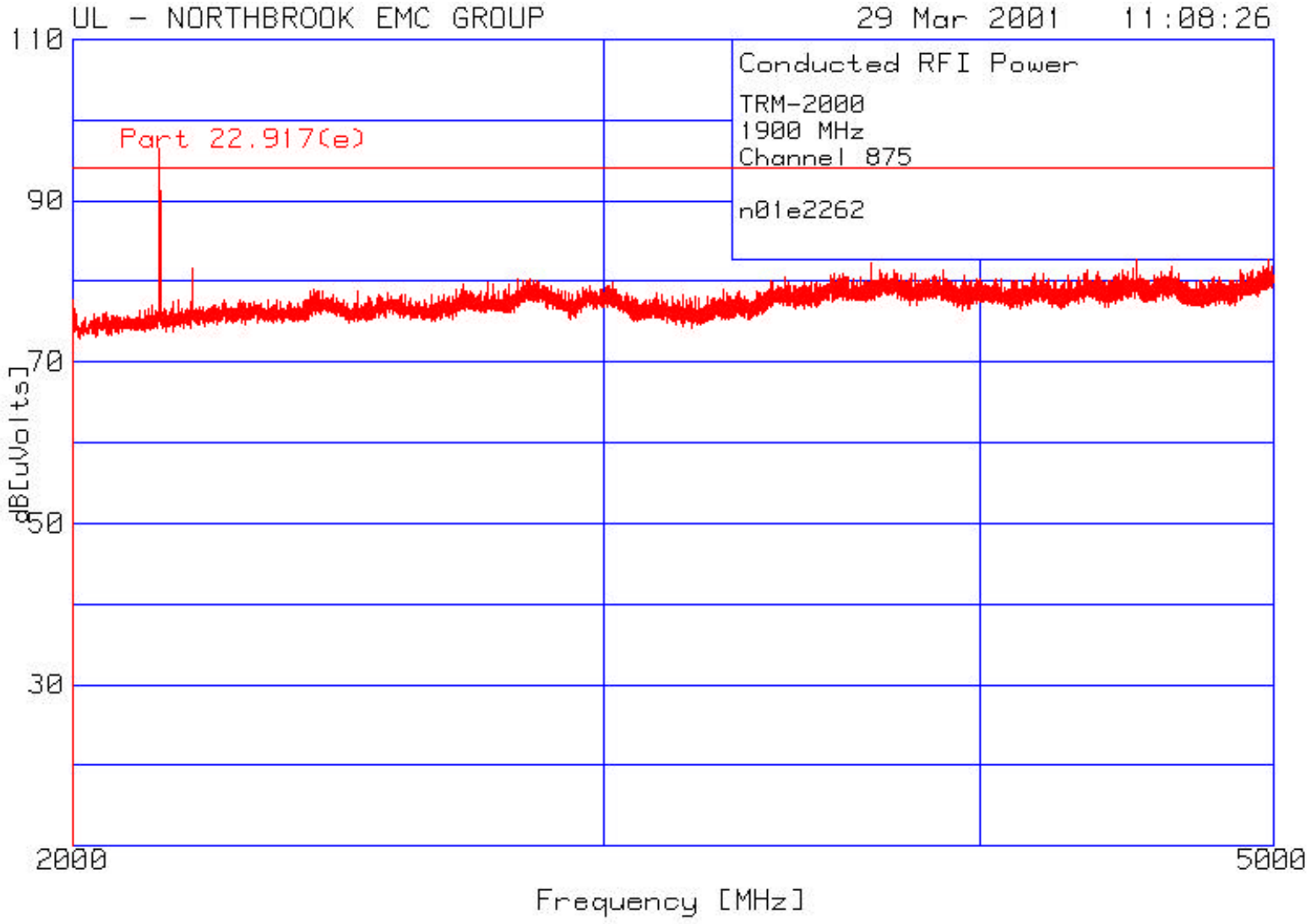
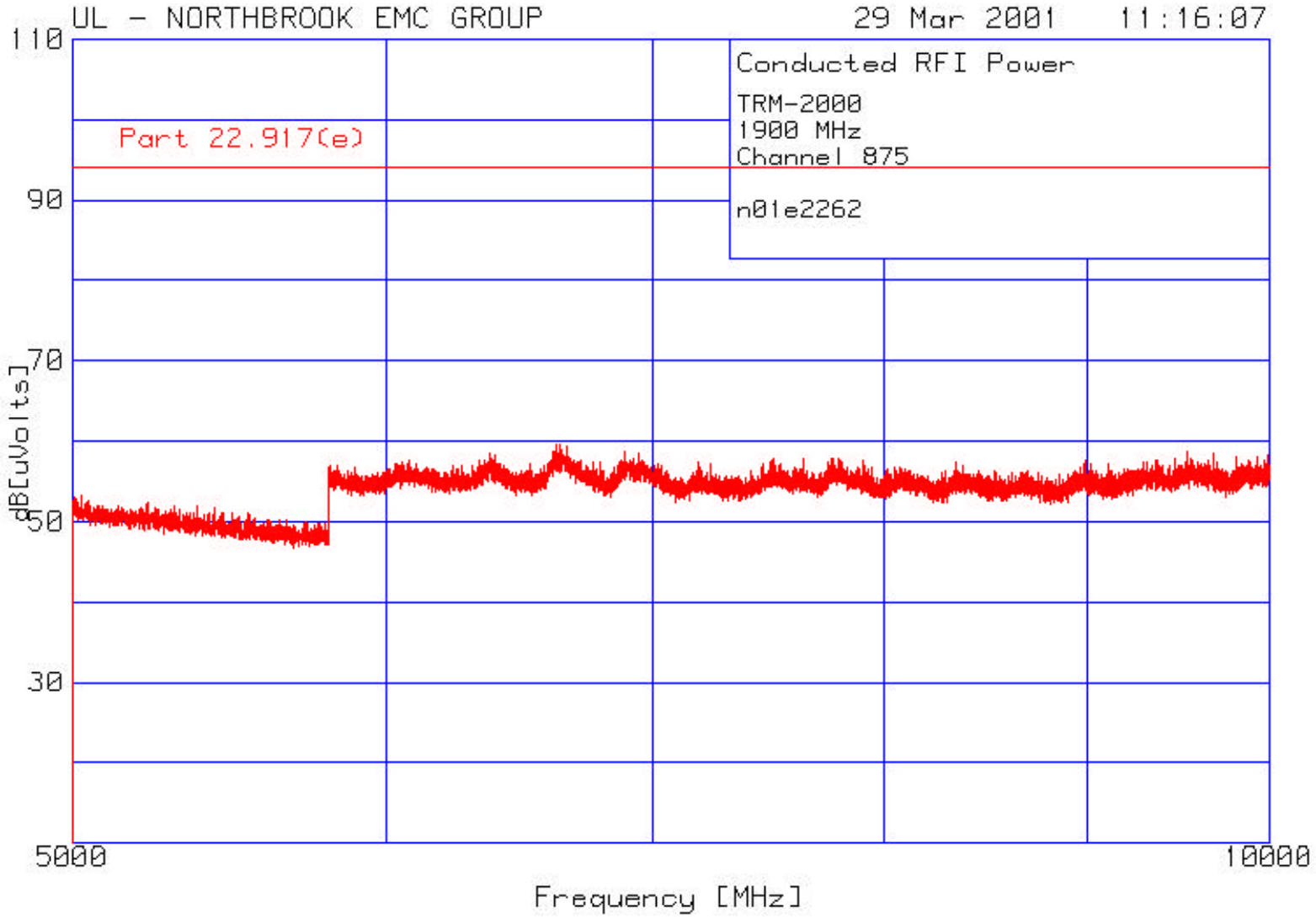
Spurious Emissions at Antenna Terminals
Channel 0875
1 to 2 GHz



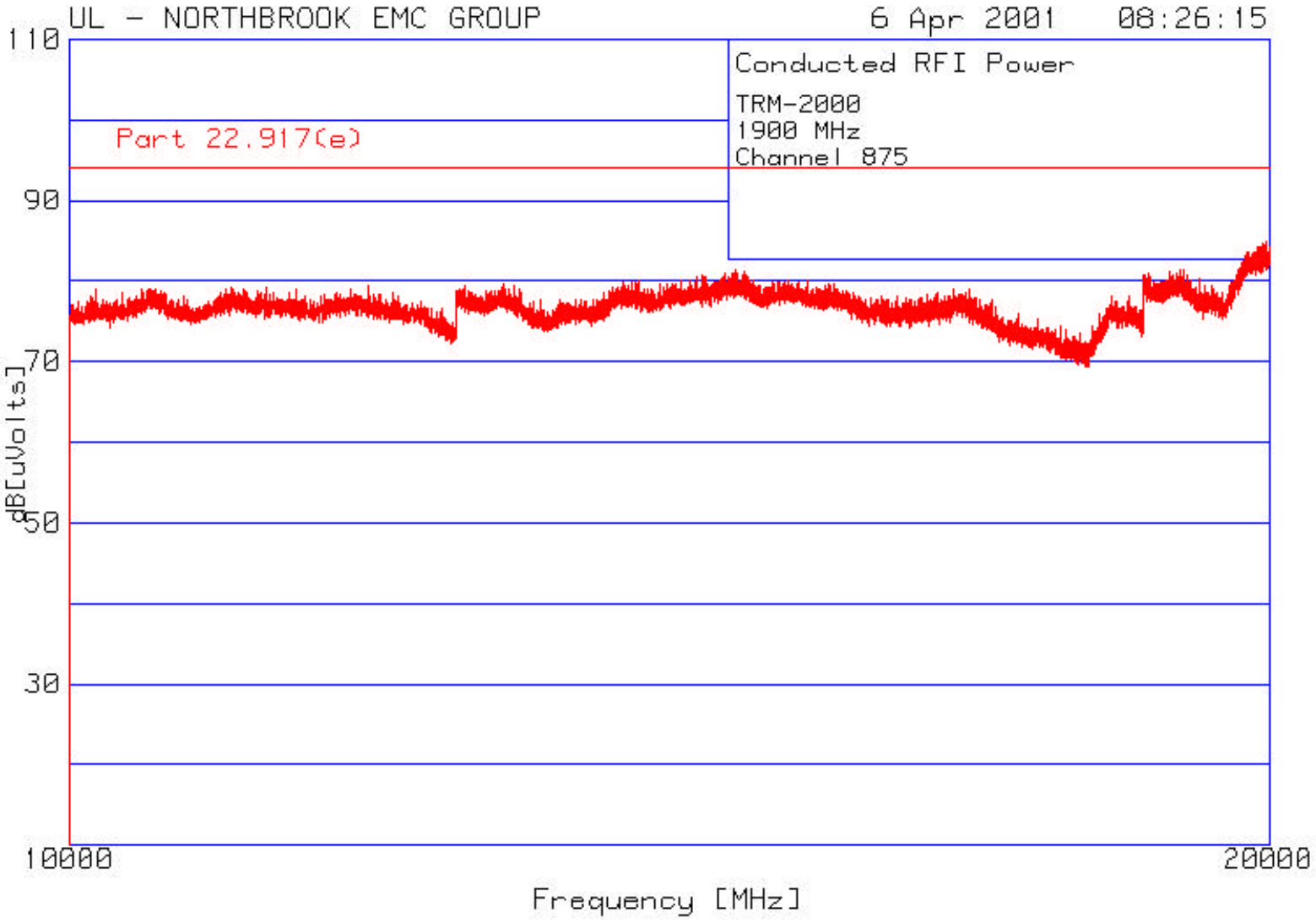
Spurious Emissions at Antenna Terminals
Channel 0875
2 to 5 GHz



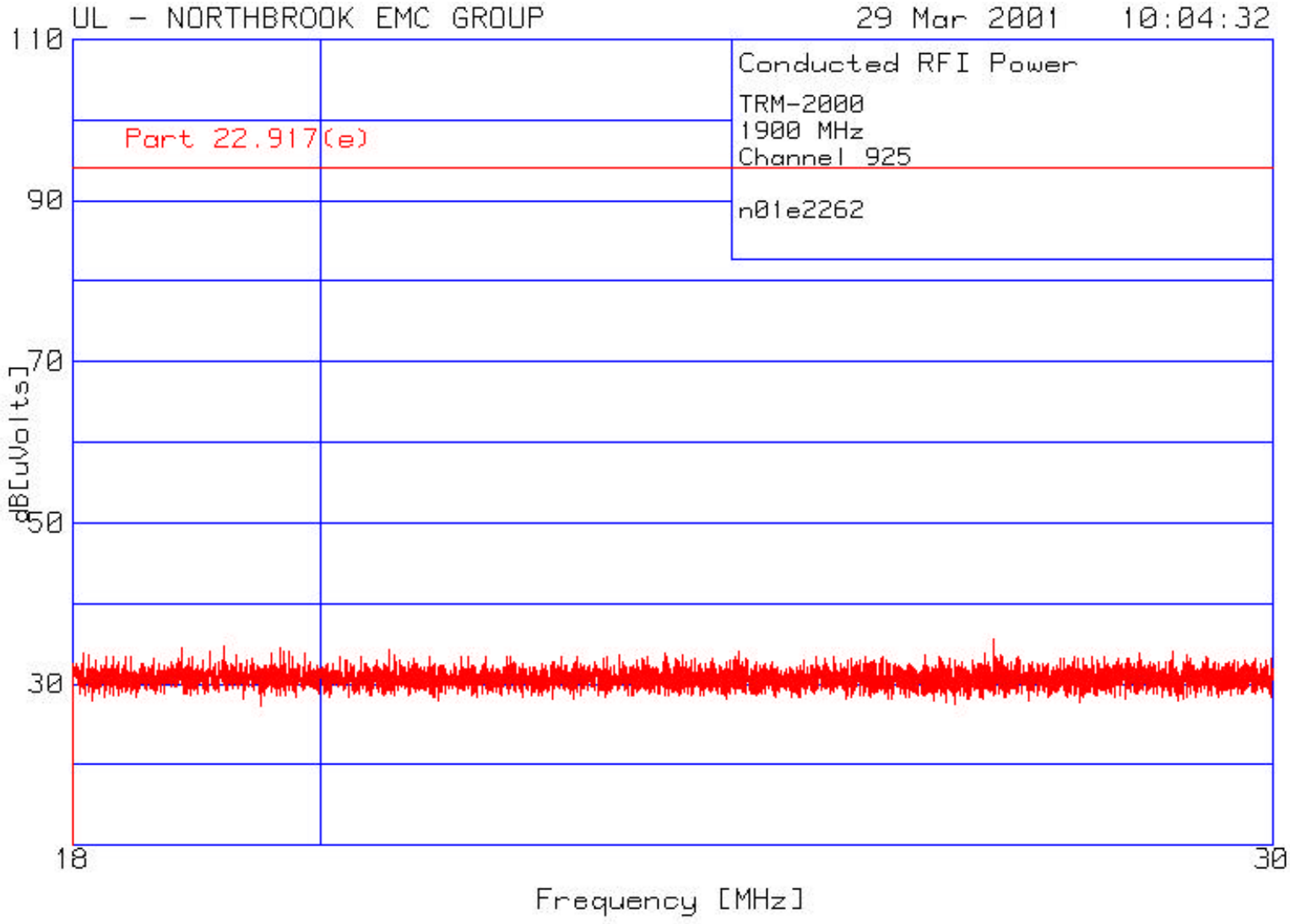
Spurious Emissions at Antenna Terminals
Channel 0875
5 to 10 GHz



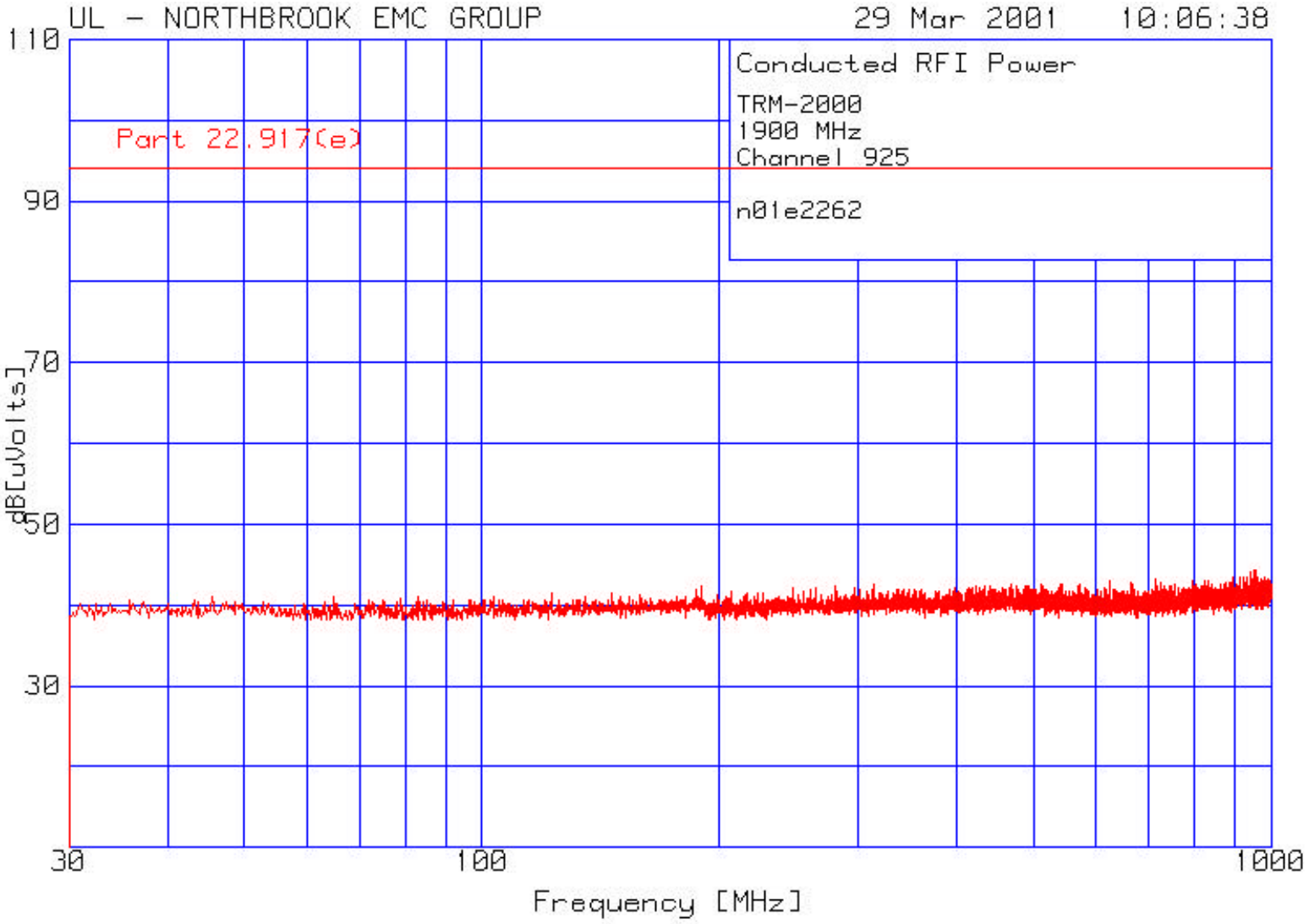
Spurious Emissions at Antenna Terminals
Channel 0875
10 to 20 GHz



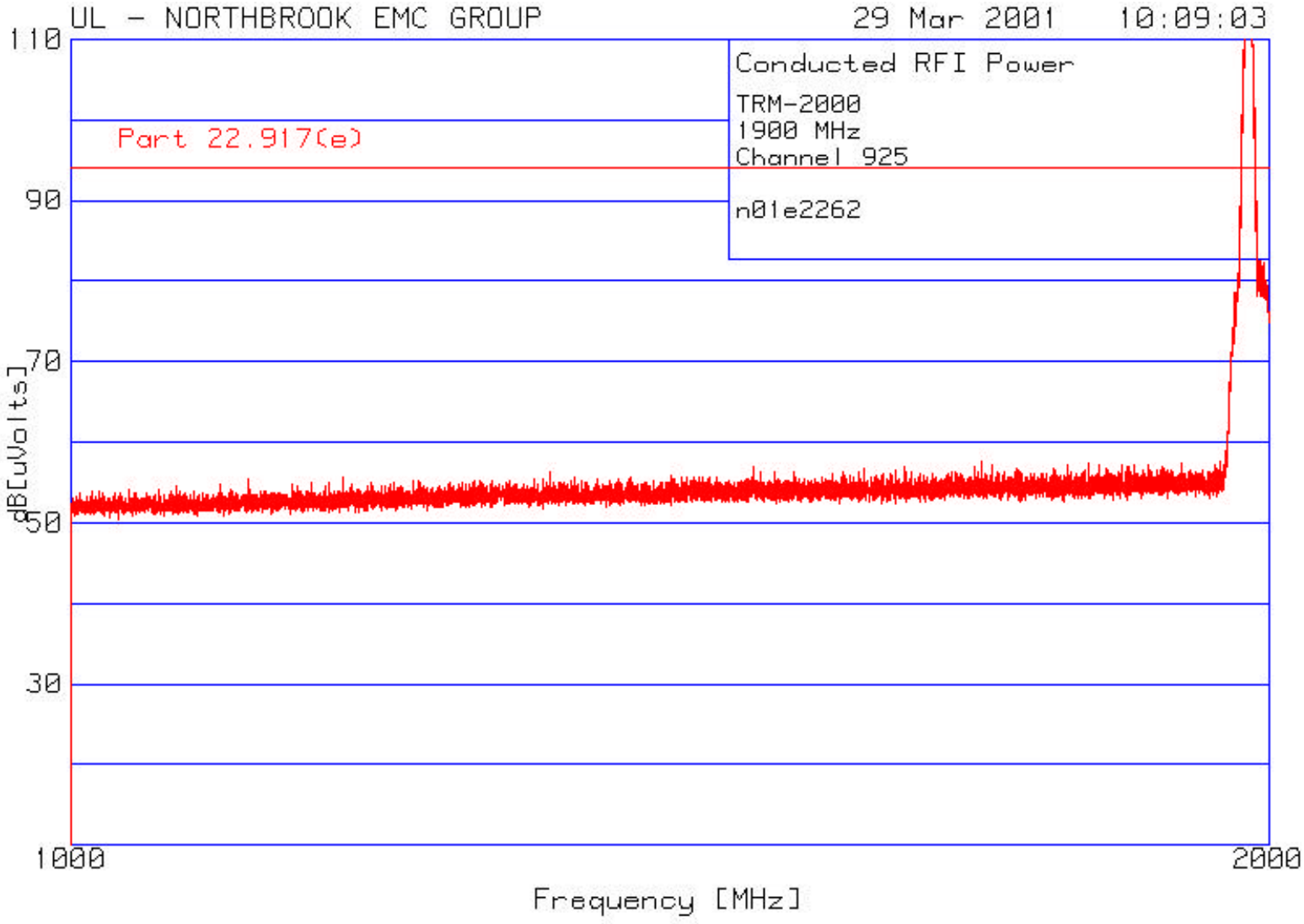
Spurious Emissions at Antenna Terminals
Channel 0925
18 to 30 MHz



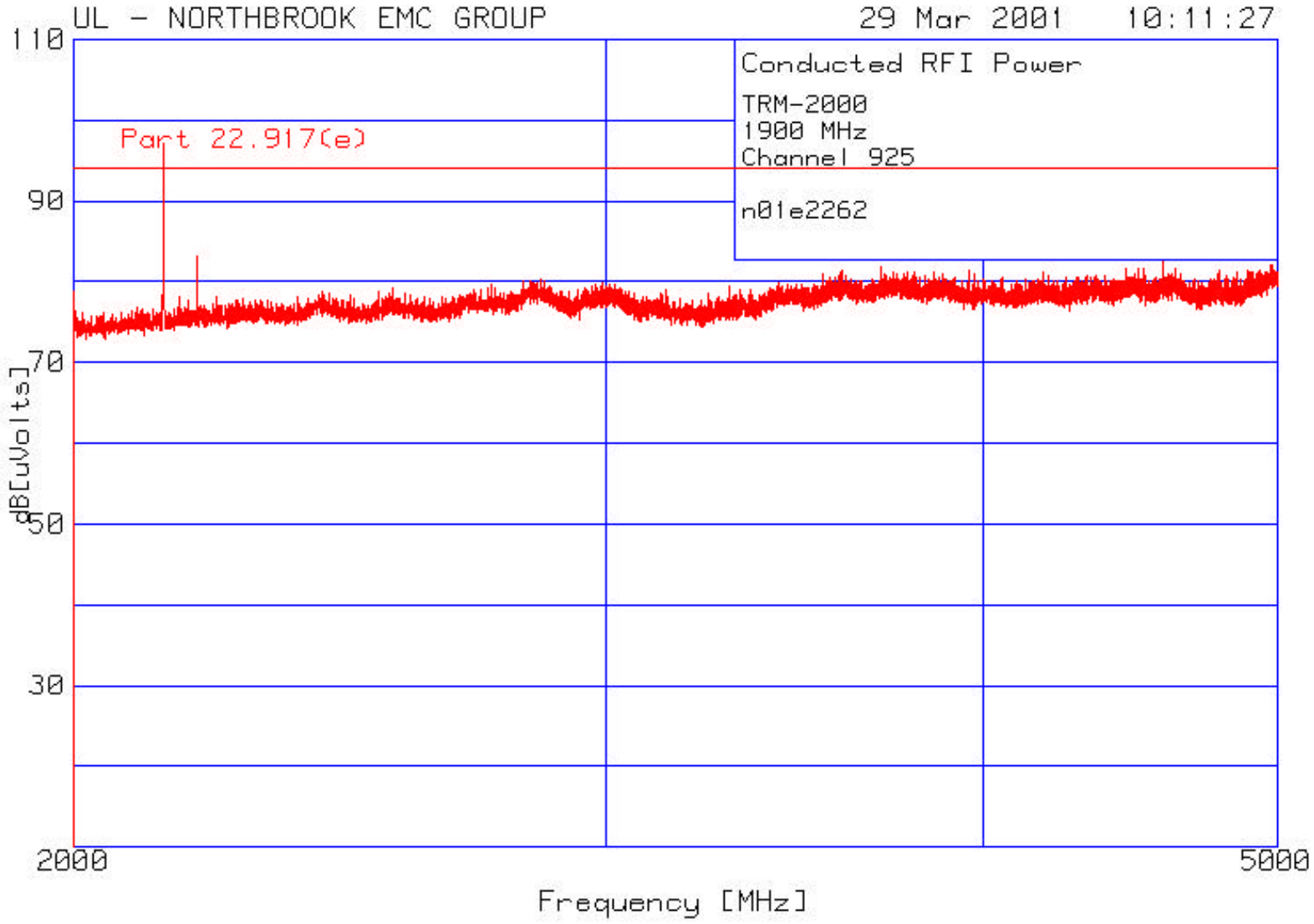
Spurious Emissions at Antenna Terminals
Channel 0925
30 MHz to 1 GHz



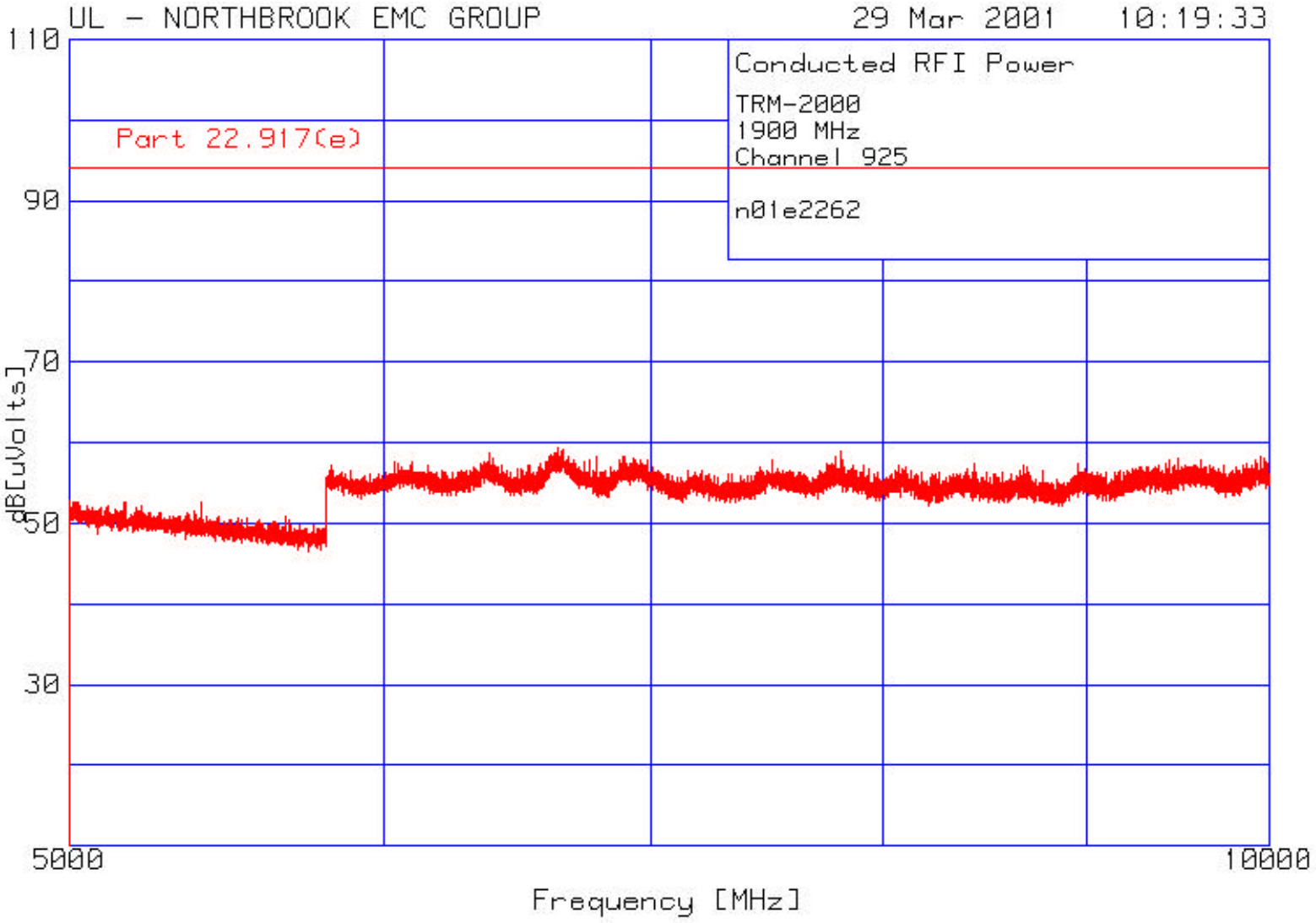
Spurious Emissions at Antenna Terminals
Channel 0925
1 to 2 GHz



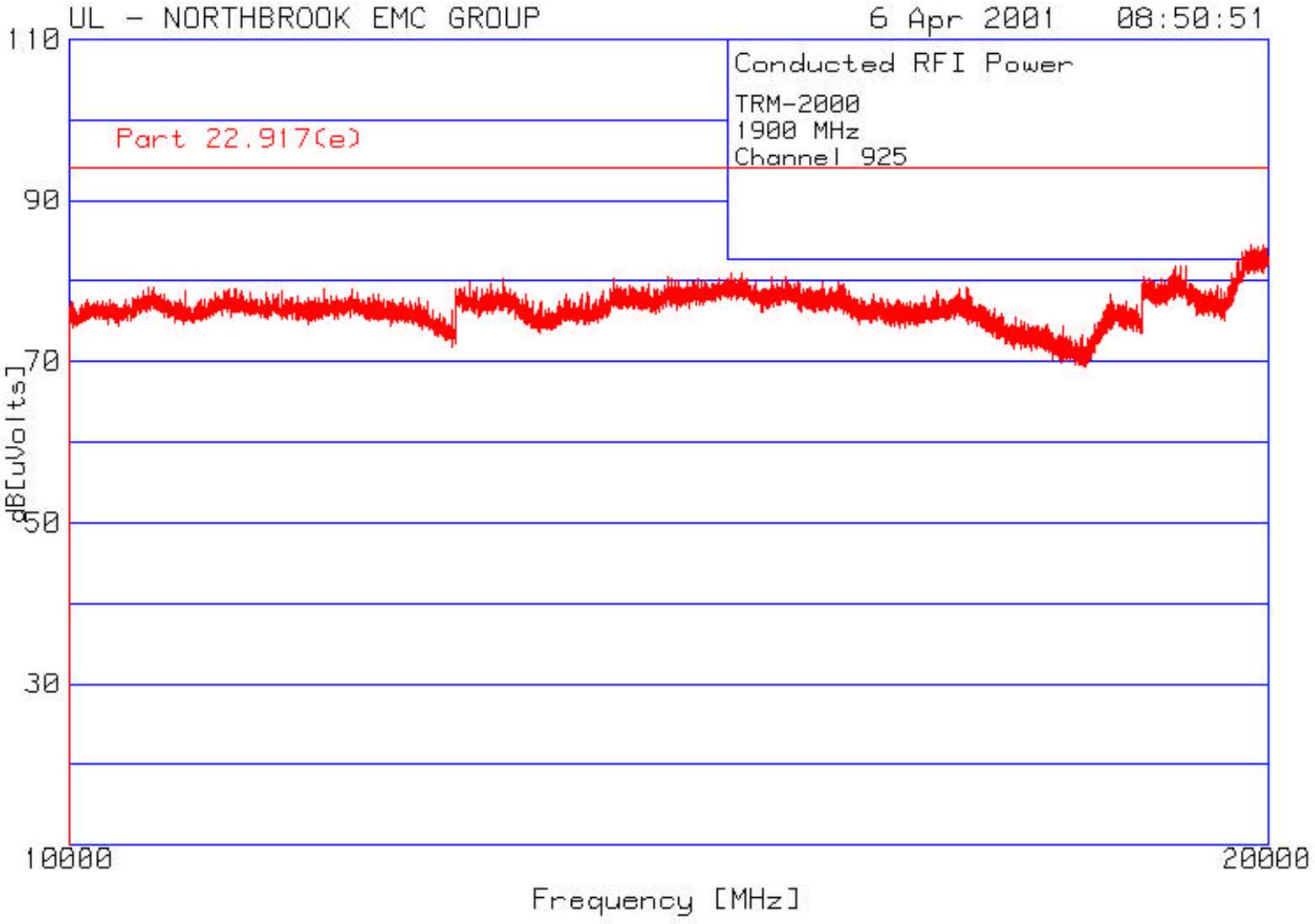
Spurious Emissions at Antenna Terminals
Channel 0925
2 to 5 GHz



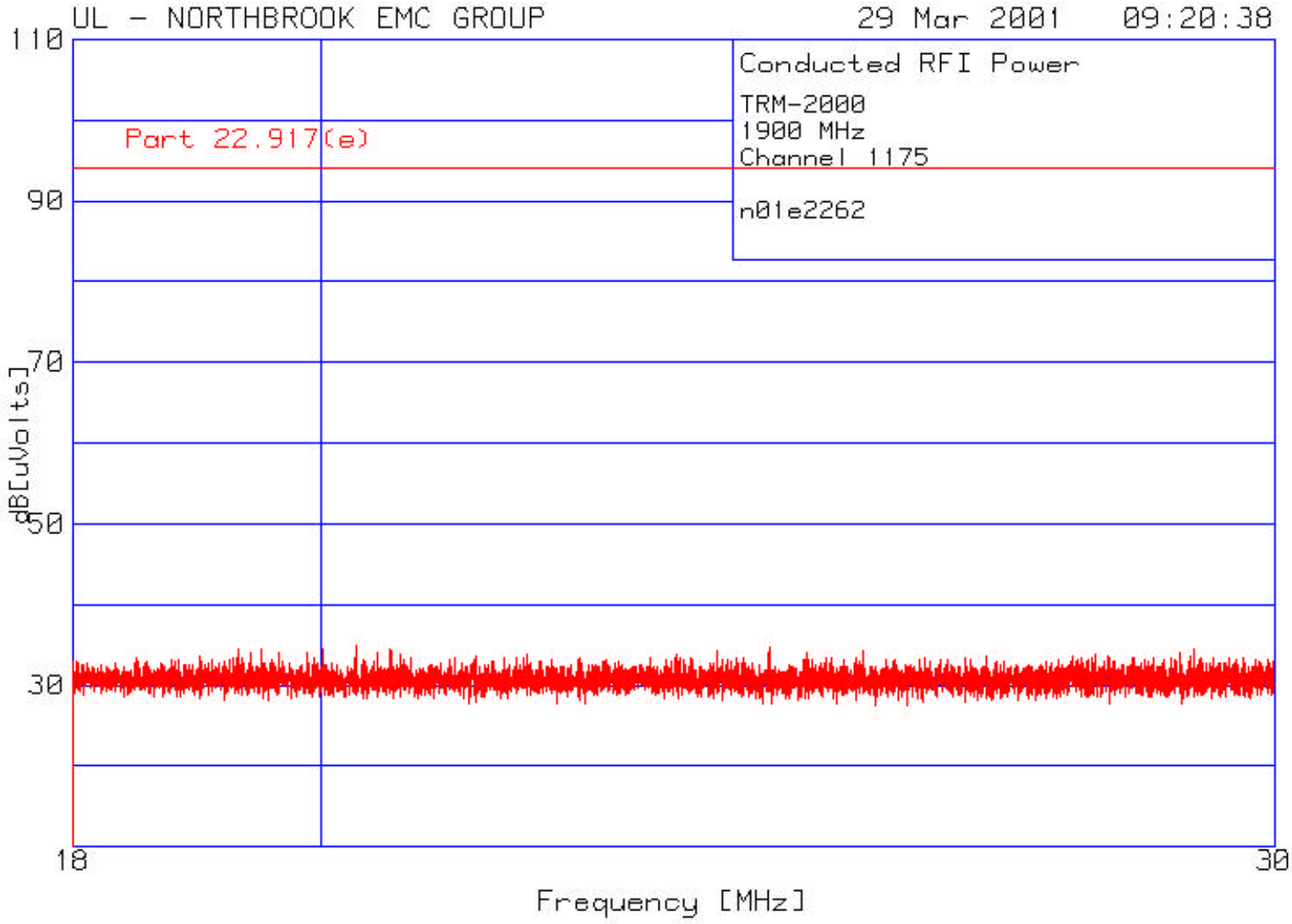
Spurious Emissions at Antenna Terminals
Channel 0925
5 to 10 GHz



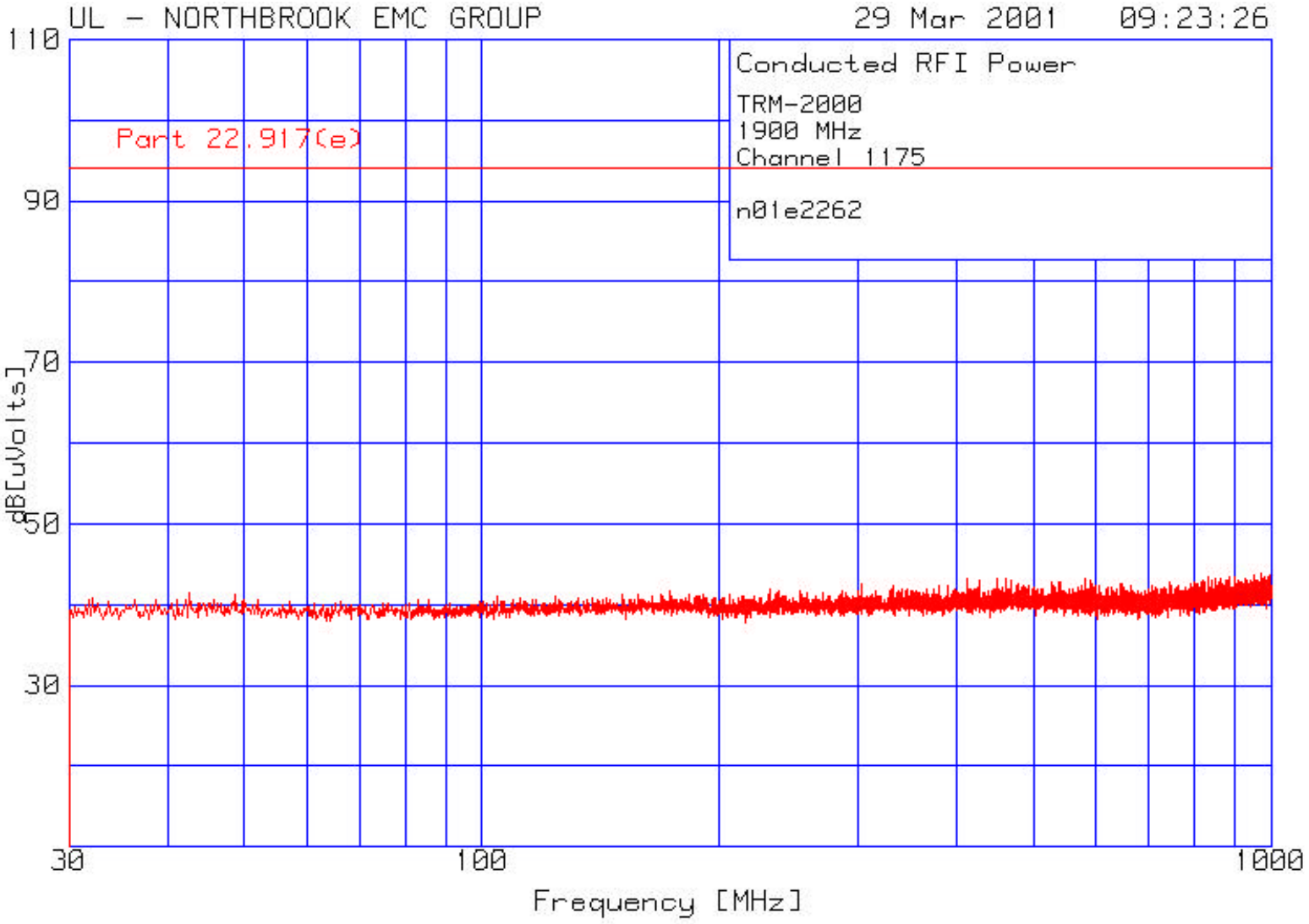
Spurious Emissions at Antenna Terminals
Channel 0925
10 to 20 GHz



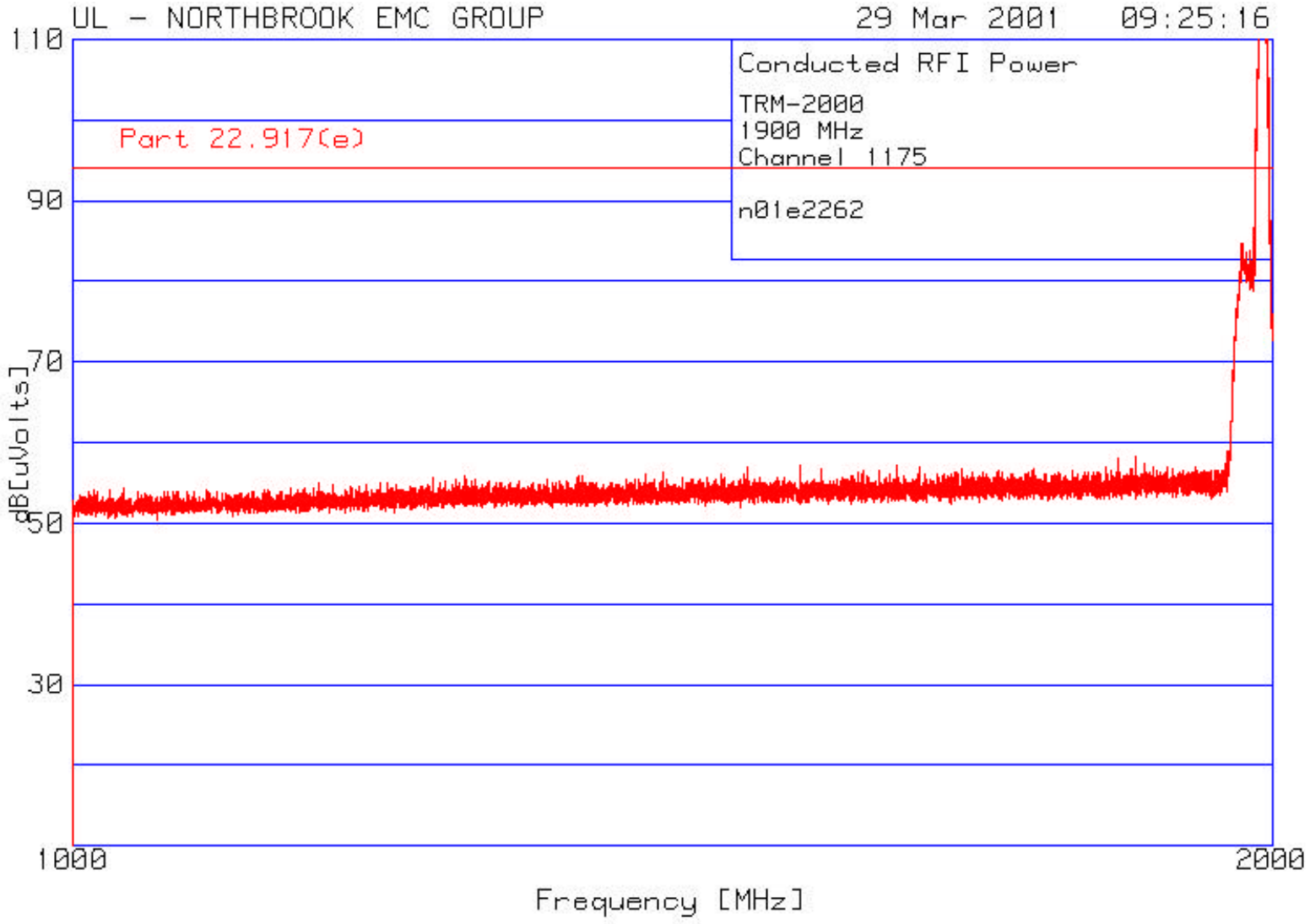
Spurious Emissions at Antenna Terminals
Channel 1175
18 to 30 MHz



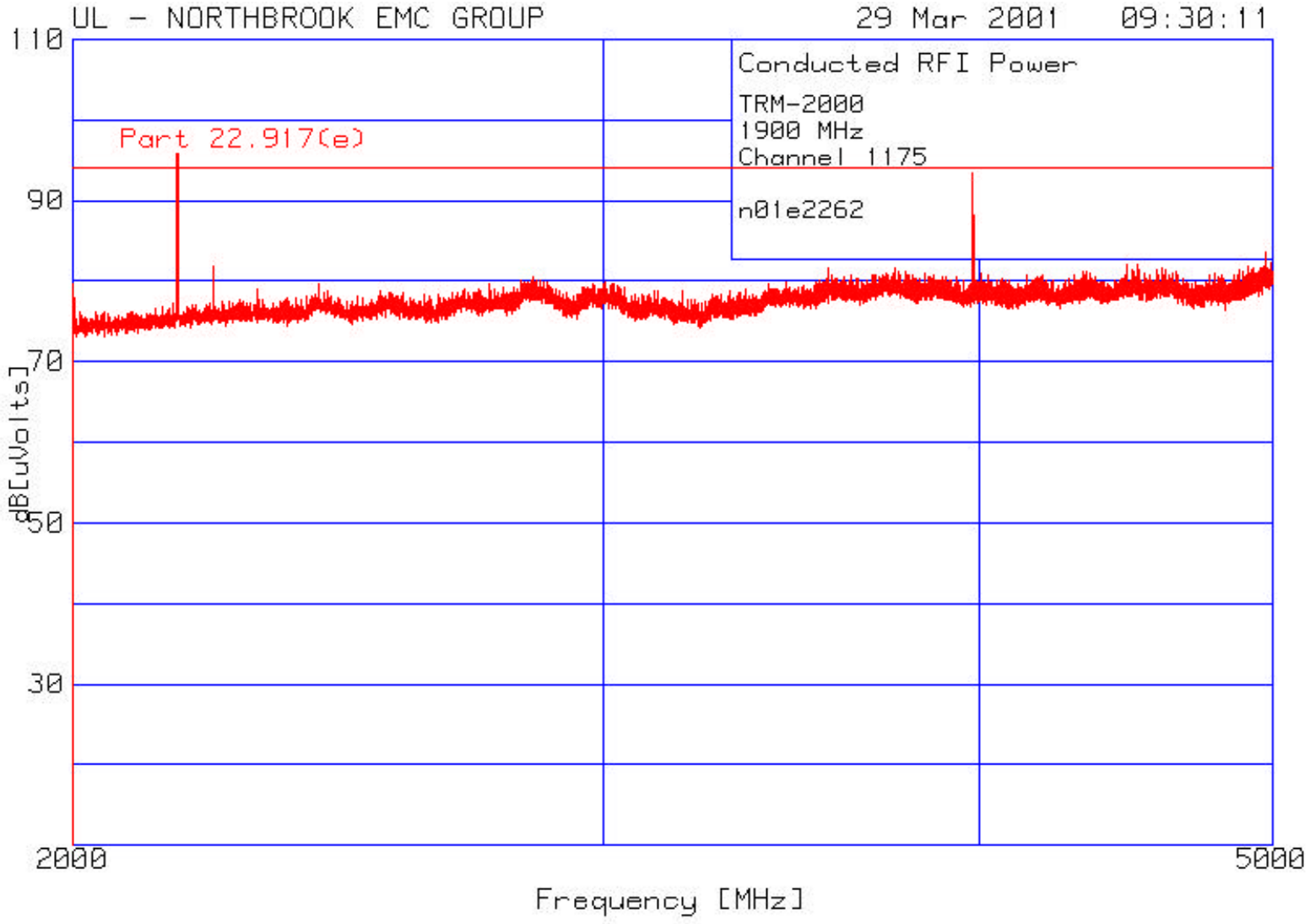
Spurious Emissions at Antenna Terminals
Channel 1175
30 MHz to 1 GHz



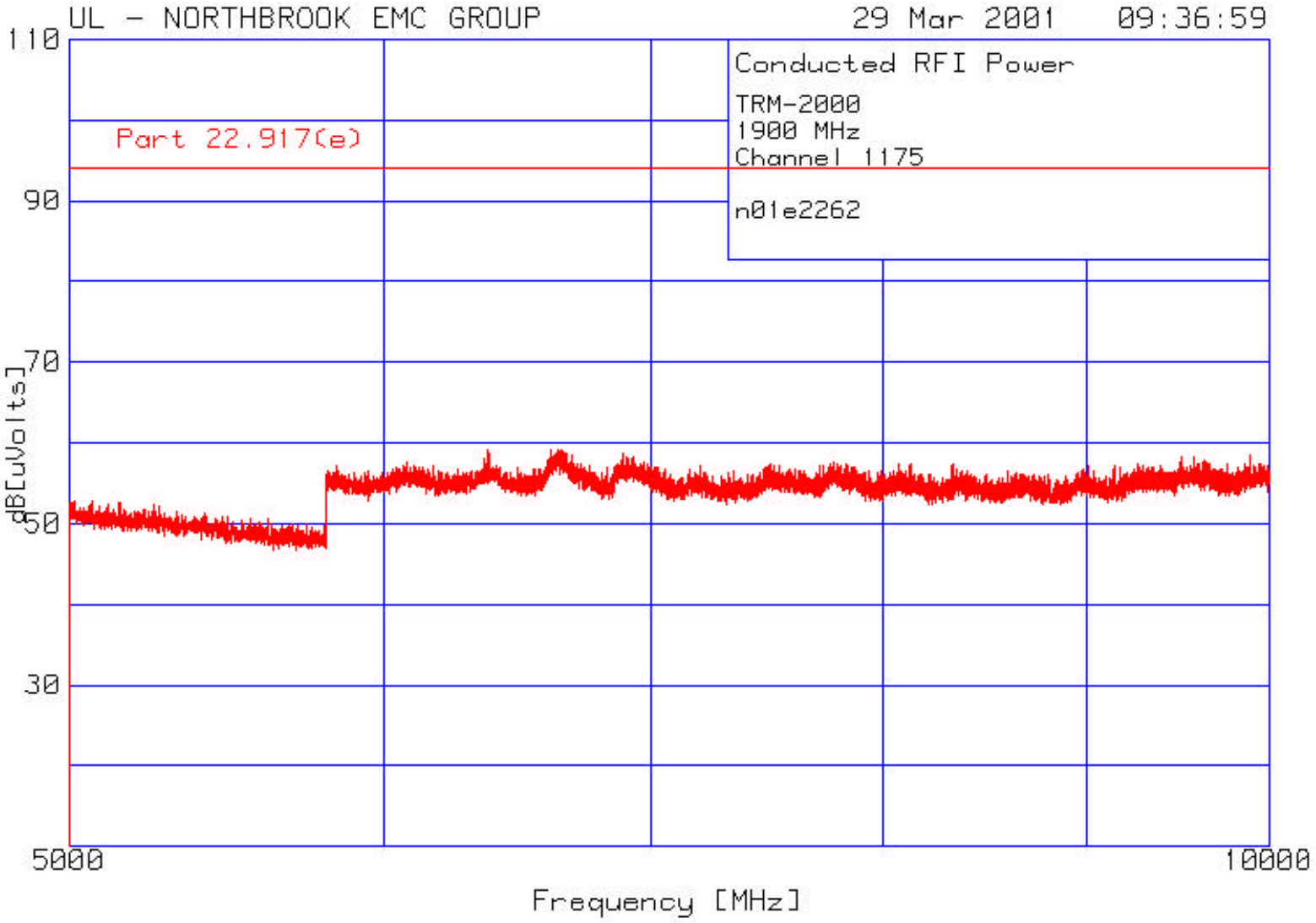
Spurious Emissions at Antenna Terminals
Channel 1175
1 to 2 GHz



Spurious Emissions at Antenna Terminals
Channel 1175
2 to 5 GHz



Spurious Emissions at Antenna Terminals
Channel 1175
5 to 10 GHz



4.4 RADIATED EMISSIONS

Test Lab: MPB Technologies Inc. Airdrie Test Personnel: Erin Hails Test Date: 28 March & 6 April 2001	Product: TRM-2000 [1900 MHz]

Test Result, TRM-2000 [1900 MHz]: PASS

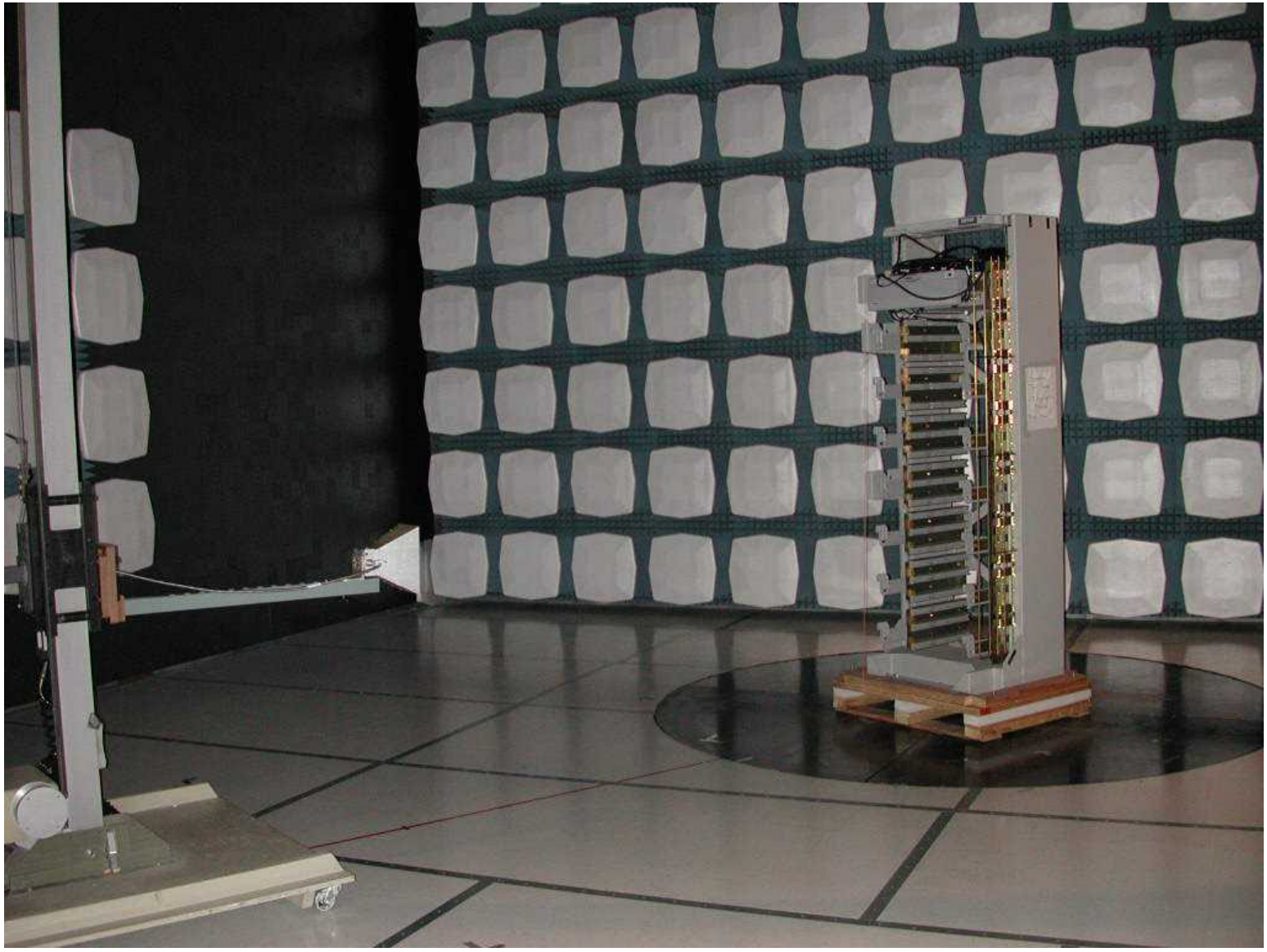
Objectives/Criteria	Specifications
The field strength emissions shall not exceed the limits for the specifications as stated. Emission levels should meet the requirements with a margin of 6dB. Tests should be performed from the lowest internally used/generated frequency to the tenth harmonic of the highest internally used/generated frequency. (NB. f_c denotes carrier frequency)	FCC Part 2.1053 and 2.1057 FCC Part 24.238 Frequency — Emission Level 9 kHz to lower edge of f_c — -13 dBm or 82.2 dBµV/m upper edge of f_c to the tenth harmonic of f_c — -13 dBm or 82.2 dBµV/m

Comments: Note that the sensitivity in the scan from 17 to 20 GHz was less than ideal. However, the emissions were examined more closely in real time with a much smaller resolution bandwidth, bringing the noise floor way down. There were no emissions within -20 dB of the specified limit.

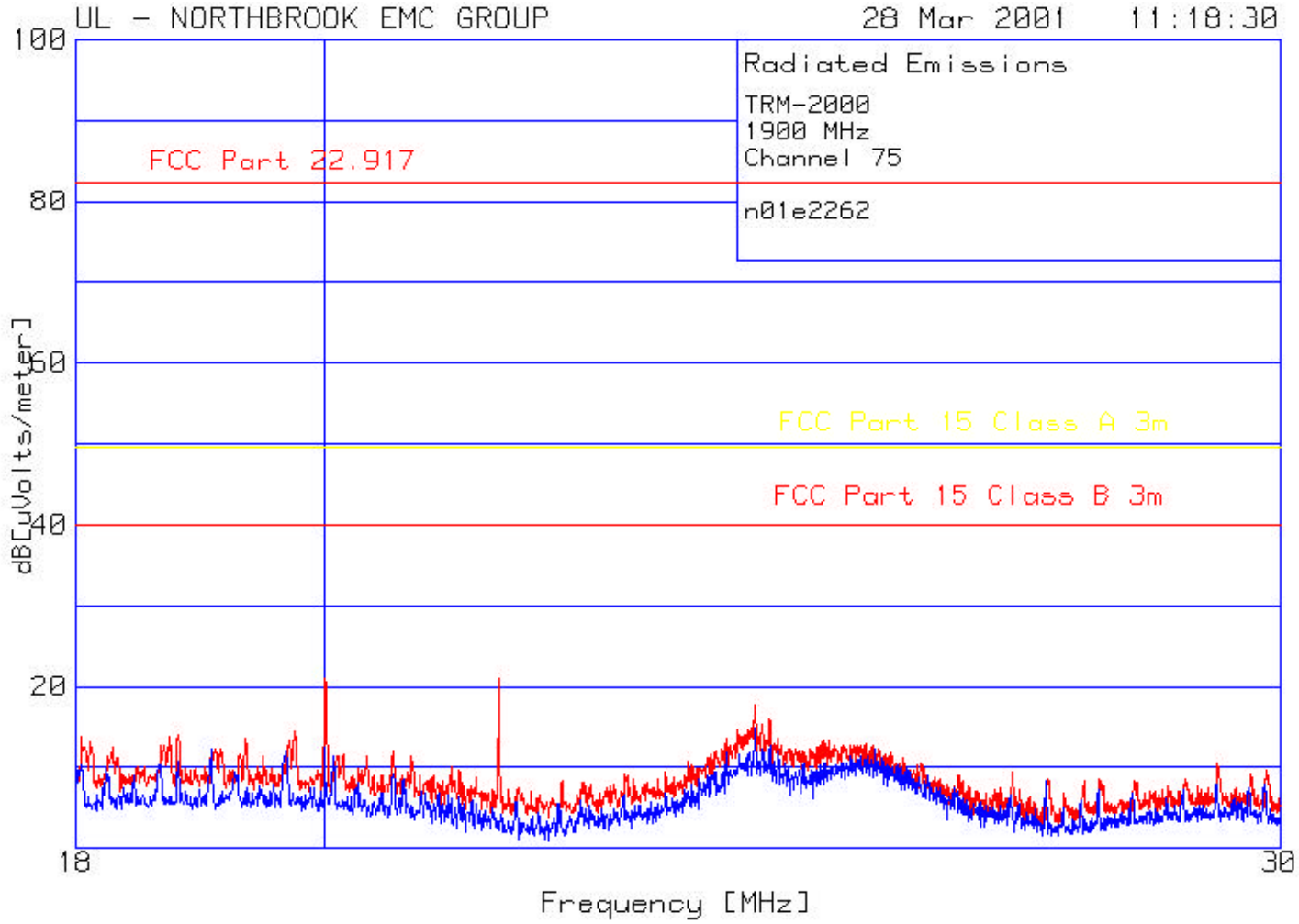
Channel	Frequency [MHz]	Emission Level [dBµV/m]	Delta [dB from limit]

There were no emissions measured to be within -20 dB of the specified limit. Refer to the test data plots for more details. Note that the limit specified in the plots is from Part 22; however, the applicable limit (from Part 24) is identical in value to the one shown in the plots, and so this does not alter the results.

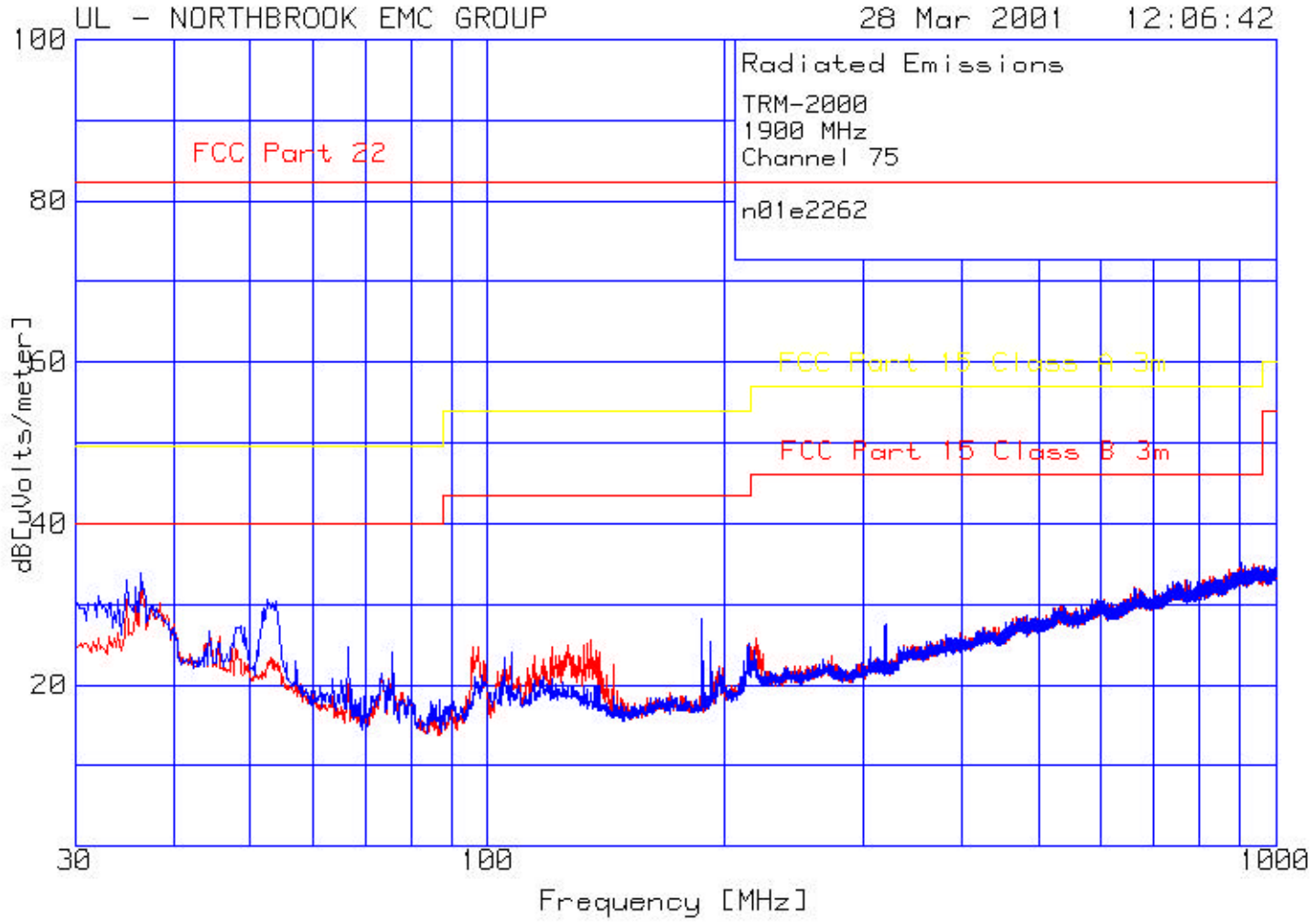
EQUIPMENT TEST SETUP



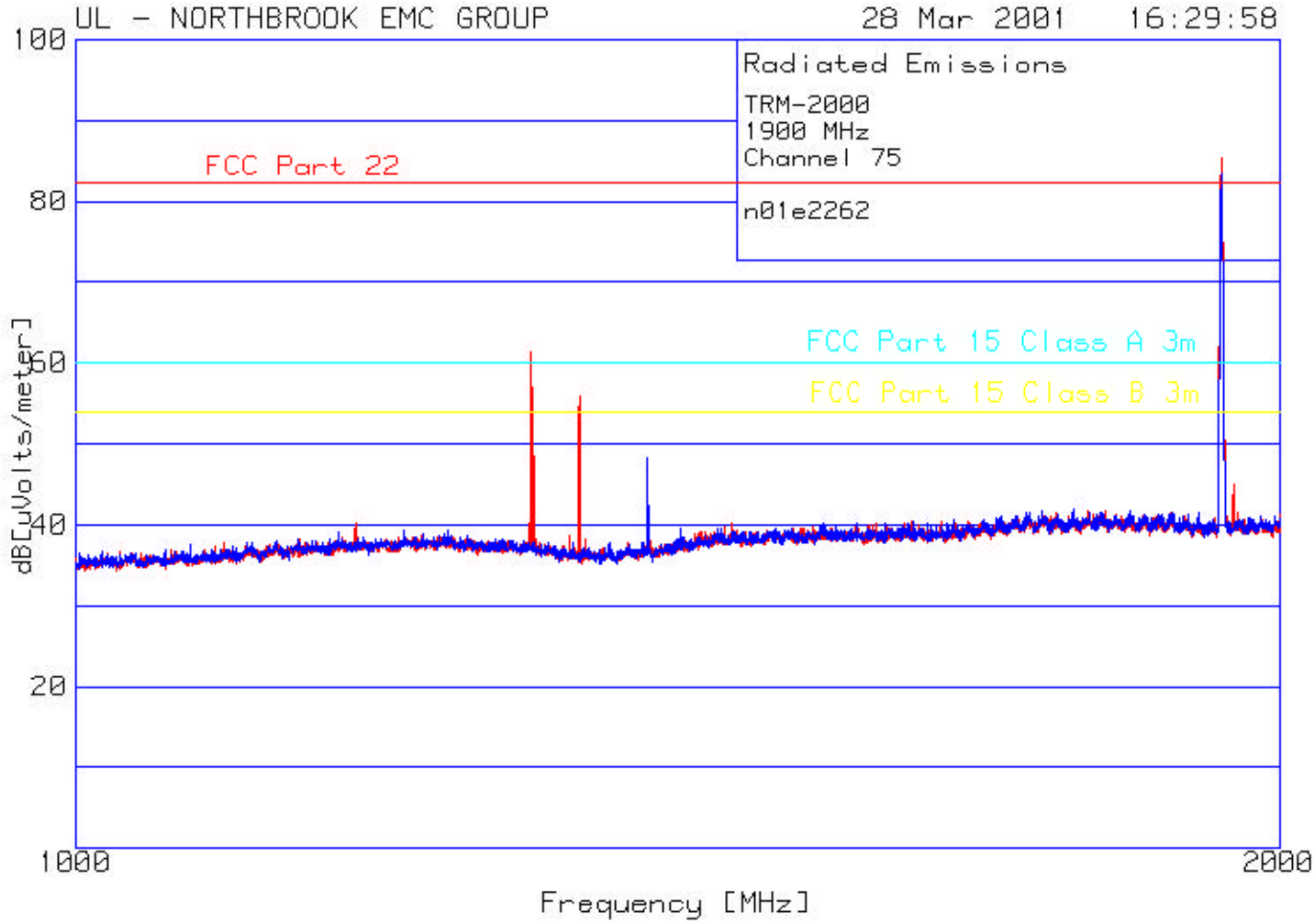
Radiated Emissions
Channel 75
18 to 30 MHz



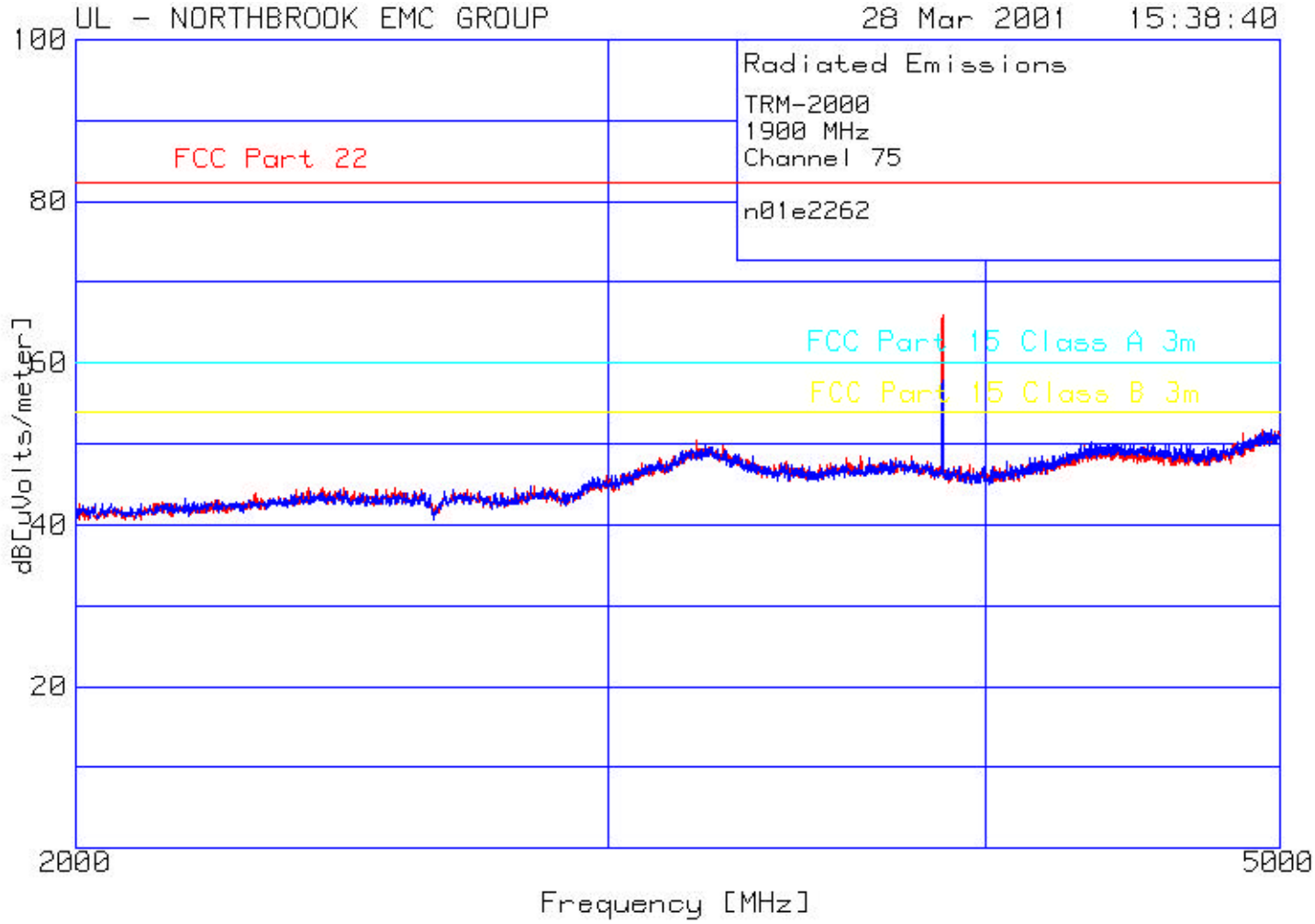
Radiated Emissions
Channel 75
30 to 1000 MHz



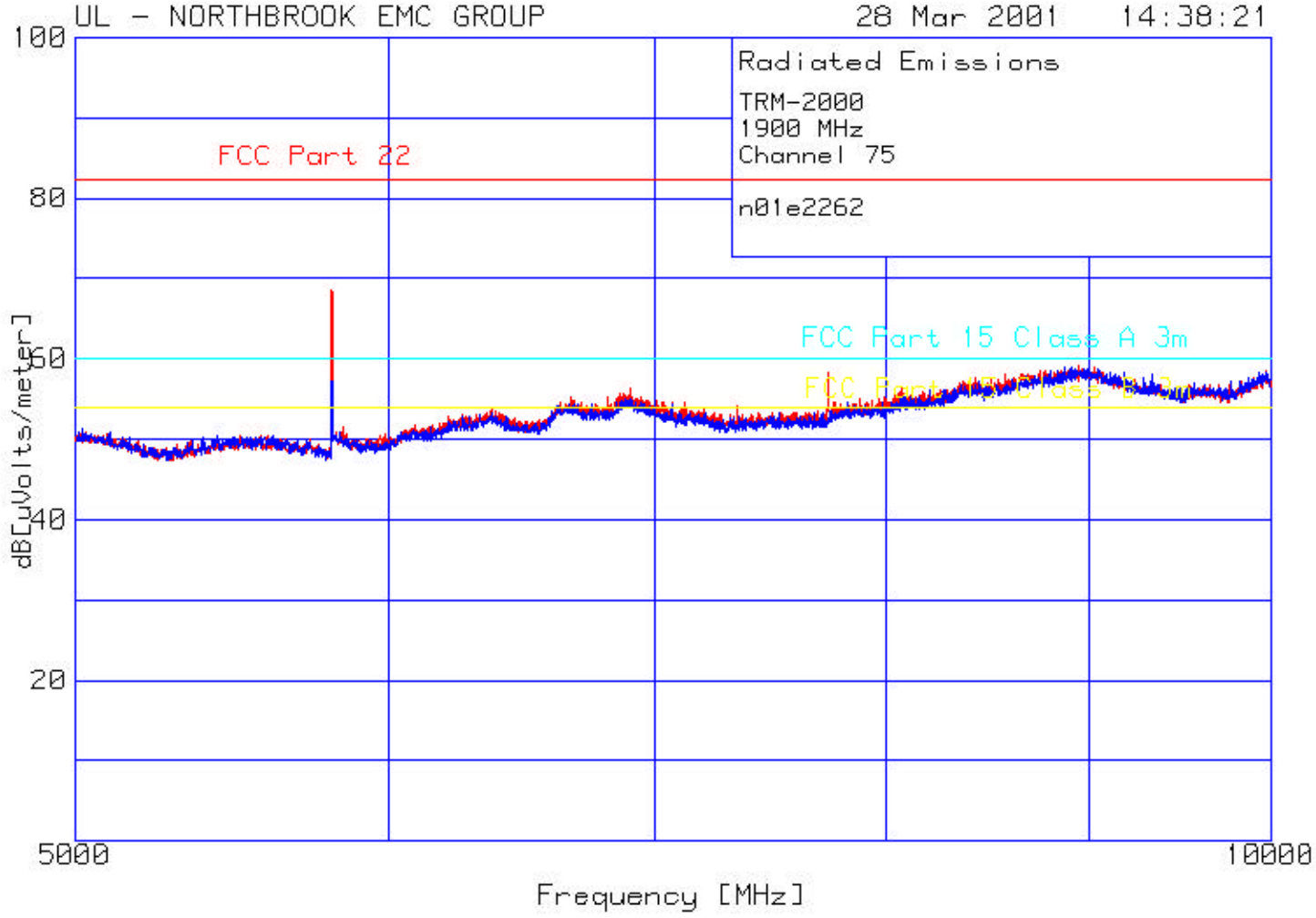
Radiated Emissions
Channel 75
1 to 2 GHz



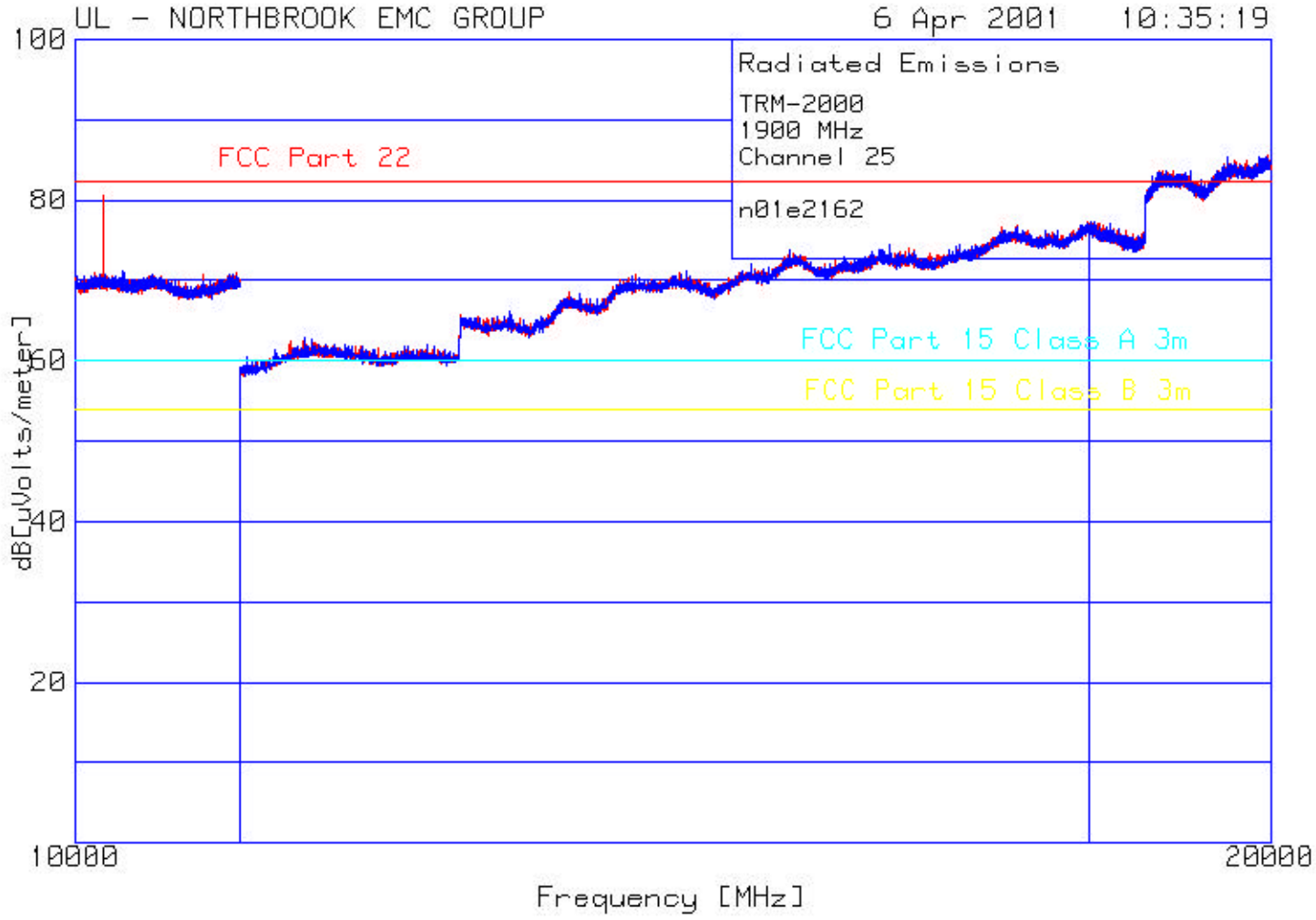
Radiated Emissions
Channel 75
2 to 5 MHz



Radiated Emissions
Channel 75
5 to 10 MHz



Radiated Emissions
Channel 75
10 to 20 MHz



5.0 TEST FACILITY

5.1 LOCATION

The EUT was tested for Electromagnetic Compatibility at the Electronics Test Centre, located in Airdrie, Alberta, Canada.

The RF Anechoic Chamber (RFAC) is identified as Chamber 1, located in the main building complex at the Electronics Test Centre. Its usable working space measures 10.6 m long x 7.3 m wide x 6.5 m high.

This test site is listed with the FCC under Registration Number 99541. Measurements taken at this site are accepted by Industry Canada per file number IC 2046-1.

The floor, walls and ceiling consist of annealed steel panels. The walls and ceiling are covered with ferrite tile, augmented by RF absorbant foam material on the end wall nearest the turntable, and on the adjacent walls and the ceiling. The chamber floor supports a 15 cm high internal floor, constructed of annealed steel panels, that forms the ground plane, and is bonded to the chamber walls.

The 3 m diameter turntable is flush-mounted with the floor. A sub-floor cable-way is provided to route cables between the turntable pit and EUT support equipment. EUT access is gained through an opening in the centre of the turntable.

Test instrumentation and EUT support equipment is located in two shielded vestibules located at the side of the main room. Cables are routed through bulkhead panels between the rooms as required. Power feeds are routed into the main room and vestibules through line filters providing at least 100 dB of attenuation between 10 kHz and 10 GHz.

5.2 GROUNDING PLAN

The EUT was located in a rack supplied by the client. The EUT was grounded according to Nortel Networks specifications.

5.3 POWER

AC power was supplied to the test chamber via an Underwriter's Laboratories ULW100-69, 100 dB, 100 Ampere wall mounted filter. Bonding to ground is via eight-inch lengths of two inch steel conduit.

5.4 TEST CONFIGURATION

5.4.1 RF OUTPUT POWER

Figure 1 illustrates the configuration of the test and measurement equipment used for FCC Part 2.1046.

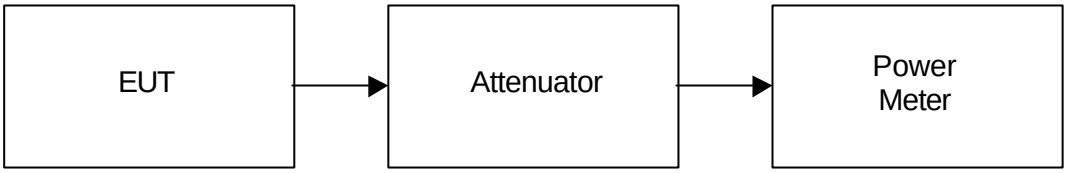


Figure 1 - Measurement Setup for RF Output Power

5.4.2 OCCUPIED BANDWIDTH AND SPURIOUS EMISSIONS AT ANTENNA TERMINALS

Figure 2 illustrates the configuration of the test and measurement equipment used for FCC Part 2.1049, 2.1051 and 2.1057.

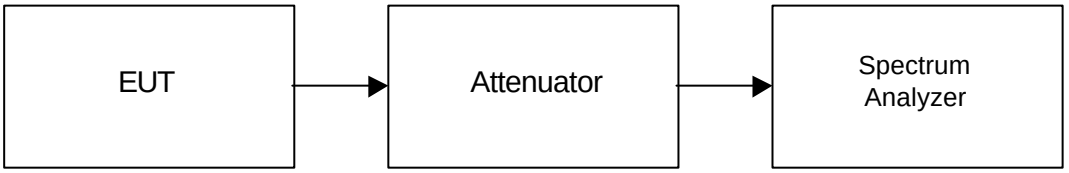


Figure 2 - Measurement Setup for Occupied Bandwidth and Spurious Emissions at Antenna Terminals

6.0 TEST EQUIPMENT

6.1 EQUIPMENT USED

The following equipment was used for this procedure. All measurement devices are calibrated annually, traceable to NIST.

For RF Output Power, one power meter was used. For Occupied Bandwidth and Spurious Emissions at Antenna Terminals, one spectrum analyzer was used.

6.2 CALIBRATION

All measurement instrumentation conforms to ANSI C63.2. Calibration is maintained in accordance with manufacturer recommendations, and ISO Guide 25. Each measurement device is labeled with its ETC asset number and calibration due date.

6.2.1 CALIBRATION ACCURACY

Test equipment used to provide quantitative measurements are calibrated with standards traceable to the National Research Council, National Institute of Standards and Technology, or other national standards. Instrumentation systems for emissions measurements have the following accuracies:

Frequency: ± 1 kHz
Amplitude: ± 2 %

6.2.2 Test Equipment Description

The equipment used in the tests was selected from the following list.

Instrument	Manufacturer	Model No.	Asset No.	Calibration Due
Spectrum Analyzer	Hewlett Packard	8566B	9565	9 March 2001
Spectrum Analyzer	Hewlett Packard	8566B	9168	30 January 2002
Spectrum Analyzer	Hewlett Packard	8595E	20087561	17 November 2001
RF Preselector	Hewlett Packard	85685A	9563	12 March 2001
RF Preselector	Hewlett Packard	85685A	9728	21 September 2001
Quasi-Peak Adapter	Hewlett Packard	85650A	9243	16 June 2001
Line Impedance Stabilization Network	EMCO	3825/2r	9331	2 November 2001
Line Impedance Stabilization Network	EMCO	3825/2r	9259	2 November 2001
Biconilog Antenna	ARA	Lpb-2520/A	4318	14 March 2001
Dual Ridged Guide Antenna	EMCO	3115	9588	6 August 2001
Low Noise Amplifier	MITEQ	JS43-01001800-21-5P	4354	14 February 2002
Power Meter	Hewlett Packard	436A	9061	3 August 2001
Power Meter	Hewlett Packard	E4419A	20085989	6 October 2001
Power Sensor	Hewlett Packard	8482A	9758	3 August 2001
Power Sensor	Agilent	8482A		8 October 2001

Appendix A

TRM-2000 [1900 MHz]

Test Sample Description
(from data provided by Nortel Networks)

Product Application	**Product Category**
Commercial ✓ Military o	Telecommunications ✓ Aerospace o Information Technology o Test & Measurement o Surface Transportation o Other o _____
Product Name	TRM-2000 [1900 MHz]
Part/Model No.	NPGS58CA P1
Serial Number	NNTM 537TG7E9
Power Requirements: (Voltage, AC/DC, Hz, Current)	-48 VDC, 20 Amps
Typical Installation Instructions or Configuration	as per rated specifications
Ground Connection (in addition to power cord)	yes
Internally Generated or Used Frequencies [MHz]	Fixed: 4.9152, 19.6608, 19.968, 31.9488, 39.3216, 63.8976, 78.6432, 148.6848, 153.6 Tunable: 13.771 to 14.659, 1776.4 to 1836.4
Peripheral Support Equipment	laptop, cell site tester, spectrum analyzer, power meter
Description and number of interconnecting Leads & Cables	DC interconnect, RF cables, fibre optic cables, customer alarm cable, T1/E1 cable, GPS cable
Brief Functional Description	CDMA metrocell BTS