

Exhibit 2/B

MIST Freedom II-C

Wireless Point of Sale Device

FCC ID: O3JF2NRM6832C1

Spurious Measurement Report

(With Test Setup Photographs)



Assessment of Compliance

for

**Measurement of Field Strength of Spurious Radiation in
Accordance with the FCC Rules & Regulations Part 2.1053**

MIST Freedom II-C Wireless Point of Sale Terminal

MIST Inc.



JUNE 2000

MISB-FREEDOM II NOVATEL CDPD-3441

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Engineering Report

Subject: Measurement of: Field Strength of Spurious Radiation in
Accordance with the FCC Rules & Regulations Part 2.1053

FCC ID: O3JF2NRM6832C1

Equipment: Wireless Point of Sale Terminal

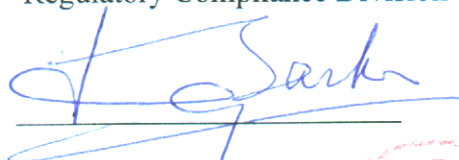
Model: MIST Freedom II-C

Client: MIST Inc
703 Evans Avenue, Suite 500
Toronto, Ontario, M9C 5E9
Canada
Tel: (416) 621-1911, Fax: (416) 621-8875

Project #: MISB – FREEDOM II NOVATEL CDPD - 3441

Prepared By: APREL Laboratories,
Regulatory Compliance Division

Approved by:



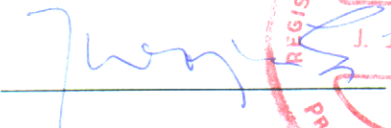
Date:

June 22, 2000

Jay Sarkar

Technical Director, Standards & Certification

Released by:



Date:

June 22/2000

Dr. Jack J. Wojcik, P.Eng.



FCC ID: O3JF2NRM6832C1
Applicant: MIST Inc.
Equipment: Wireless Point of Sale Terminal
Model: MIST Freedom II-C
Standard: FCC Rules and Regulations Part 2.1053

ENGINEERING SUMMARY

This report contains the results of Field Strength of Spurious radiation measurement performed on a MIST Freedom II-C Wireless Point of Sale Terminal operating with a Novatel Expedito (NRM-6832) modem. The measurements were carried out in accordance with the FCC Rules and Regulations Part 2.1053. The product was evaluated for Spurious Emissions when it was set at the maximum power level.

Summary of the Results

Test Description	Page No.	Test Set-up Figure No.	Results Summary
Field Strength of Spurious Radiation Ref. Paragraph 2.1053	8	1	Passed

INTRODUCTION

General

This report describes the results of the Field Strength of Spurious Radiation measurement conducted on a MIST Wireless Point of Sale Terminal, model MIST Freedom II-C operating with a built-in Novatel Expedito (NRM-6832) modem.

Test Facility

The tests were performed for MIST Inc. by APREL Laboratories at APREL's EMI facility located in Nepean, Ontario, Canada. The laboratory operates an (3m and 10m) Open Area Test Site (OATS). The measurement facility is calibrated in accordance with ANSI C63.4-1992.

A description of the measurement facility in accordance with the radiated and AC line conducted test site criteria per ANSI C63.4-1992 is on file with the Federal Communications Commission and is in compliance with the requirements of Section 2.948 of the Commissions rules and regulations. **APREL's registration number is 90416**

APREL is accredited by Standard Council of Canada, under PALCAN program (ISO Guide 25). APREL is also accredited by Industry Canada (formerly DOC) and recognised by the Federal Communications Commissions (FCC).

Standard

The evaluation and analysis were conducted in accordance with FCC Rules and Regulations Parts 2.1053 and the appropriate limits.

Test Equipment

The test equipment used during the evaluation is listed in Appendix A with calibration due dates.

Environmental Conditions

Measurements were conducted in open area test site.

- Temperature: 20 °C ± 2
- Relative Humidity: 30 - 50 %
- Air Pressure: 101 kPa ± 3

FCC SUBMISSION INFORMATION

FCC ID: O3JF2NRM6832C1

Equipment: Wireless Point of Sale Terminal

Model: MIST Freedom II-C

For: Certification

Applicant: MIST Inc.
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Tel: (416) 621-1911, Fax: (416) 621-8875

Manufacturer: MIST Inc.
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Lachine, Montreal, H8T 3C5
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Tel: (514) 639-6511, Fax: (514) 639-8875

Evaluated by: APREL Laboratories
51 Spectrum Way
Nepean, Ontario
Canada K2R 1E6

MANUFACTURER'S DATA

Equipment Type:	Wireless Point of Sale Terminal
Model:	MIST Inc.
Reference:	FCC Rules and Regulations Parts 2 and Part 22 (H)
Manufacturer:	MIST Inc.
Power Source:	7.2 VDC Battery
Development Stage of Unit:	Production

GENERAL SPECIFICATIONS

1. Frequency Range: 824 to 849 MHz (Transmitter)
2. Rated Transmitted
Output Power: 0.347 W
3. Frequency Tolerance: ± 2.5 PPM
4. Type of Modulation: GMSK
5. Emission Designators(See 47 CFR § 2.201 and §2.202): 28K8FXW
6. Antenna Impedance: 50 Ohms

TEST RESULTS

FOR

**Field Strength of Spurious Radiation
Of
Wireless Point of Sale Terminal
MIST Freedom II-C with a Novatel
Expedite (NRM) modem**

MIST Inc.

Test: Field Strength of Spurious Radiation

Ref.: FCC Part 22 subpart H, Paragraph 22.917(e) and Part 2.1053

Criteria: On any frequency twice or more than twice the fundamental frequency of the mobile, the mean power of spurious emissions shall be attenuated below the power of the unmodulated carrier by at least $43 + 10 \log (P)$ dB.

This was calculated to be 84.6 dB μ V/m at 3 meters.

Set-up: See Figure No. 7.

Method of Measurement:

The final measurements were taken at APREL Laboratory's open area test site (OATS) measurement facility. This open area test site is calibrated to ANSI C63.4 document and a description of the measurement facility is on file with the Federal Communications Commission and is in compliance with the requirements of Section 2.948 of the Commissions rules and regulations. (FCC File No.: 90416).

The mobile was configured to operate at maximum power with appropriate modulation. The mobile was keyed on three different channels in the frequency range 824 MHz to 849 MHz.

Prior to final measurements in the OATS, preliminary radiated spurious emissions were scanned in a shielded enclosure at a distance of 1 m using a broadband Discone antenna and horn antenna in order to determine the characteristic frequencies of the field strength of spurious emissions. Based on this information, measurements were performed in the OATS at these characteristic frequencies using calibrated antennas.

Prior to measurement of the Spurious and harmonic signals, field strength of the carrier frequency was measured in the OATS for reference purposes. All field strength measurements were made with spectrum analyzer and the appropriate calibrated antenna for the frequency range of 9 kHz up to 10th harmonics of the transmit frequency (See equipment list for the calibrated antenna used).

The equipment under test was placed on a turntable positioned 3 meters away from the calibrated receiving antenna, which in turn was connected to the spectrum analyzer. For

each identified frequency, the received signal was maximised by the positioning of the turntable and the height of the antenna. The process was repeated for both horizontal and vertical polarization.

Information submitted includes the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from half-wave dipole antenna.

Measurements given in the spurious emissions test result tables contain: analyzer reading, correction factor, and final reading. The final field strength level are derived from the analyzer measurement and the correction factor (antenna factor and cable loss) as shown in the following example:

Sample Calculation

A. Spectrum analyzer reading (Direct measurement)

At 1648.080 MHz a spurious level of 6.6 dBμV @ 3 meters is measured.
 (See Table 1, 2nd harmonic)

B. Correction factor (antenna factor and cable loss)

Cable loss: 2.0 dB

Antenna factor: 31.2 dB

Total Correction Factor: 2.0 + 31.2 = 33.2 dB/m

C. Final Reading (Field Strength of spurious emission)

$C = A + B$

$C = 6.6 \text{ dB}\mu\text{V} + 33.2 \text{ dB}$

$C = 33.8 \text{ dB}\mu\text{V/m @ 3 meters}$

D. The criteria level.

The field intensity which would be produced by the transmitter carrier operating into a half-wave dipole antenna (gain of 1.64), at a distance of 3 m was calculated using the following formula:

$$\text{Field Strength of carrier (dB}\mu\text{V/m)} = 10\log_{10}\left(\frac{P_t G}{4\pi r^2}\right) + 146 \text{ dB}$$

Pt is transmitter power, 0.347 Watts (ERP)

G is gain, 1.64

r is distance, 3 meters

Field Strength of carrier (dBμV/m) =

$$10 \log_{10} \left(\frac{(0.347 \text{ W})(1.64)}{4\pi(3 \text{ m})^2} \right) + 146 \text{ dB}$$

Field Strength of carrier = 123.0 dBμV/m

D = Field Strength of carrier - (43 + (10 log P))

D = 123.0 dBμV/m - (43 + (10 log 0.347))

D = 84.6 dBμV/m @ 3 meters

Criteria (reference) level at 3 meters from 0.347 Watts into half-wave dipole antenna is 84.6 dBμV/m

E = Margin (spurious emission below the reference level)

E = D - C

E = 84.6 dBμV/m - 39.8 dBμV/m

E = 44.8 dB

The above calculation is shown for AMPS

Results: **PASSED.** See Tables 1 and 2.

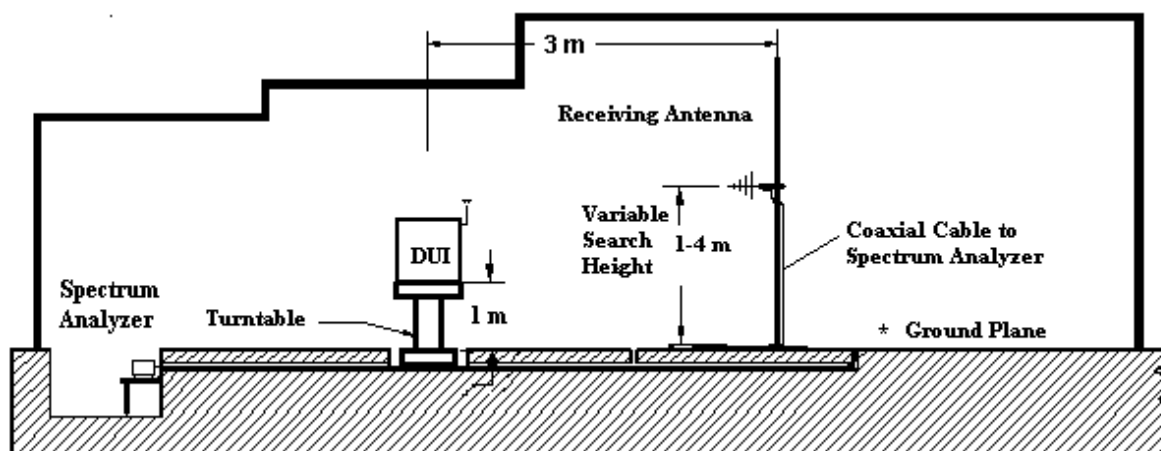


Figure 1.a Test set up for the Field Strength of Spurious Radiation Measurement in OATS
(Not to scale)



Fig. 1.b APREL's OATS (Open Area Test Site)

Table 1
Field Strength of Spurious Radiation
Transmitter Frequency Range: 820 – 850 MHz
Antenna Polarization: Vertical
Resolution Bandwidth:
10 kHz (below 1 GHz)
100 kHz (above 1 GHz)

Channel No.	Frequency (MHz)	Measured Level (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Criteria Level (dBμV/m)	Margin (dB)
		"A"	"B"	"C"	"D"	"E"
991	1648.080 (2 nd harmonic)	6.6	33.2	39.8	84.6	44.8
383	1672.980 (2 nd harmonic)	7.9	33.4	41.3	84.6	43.3
799	1697.940 (2 nd harmonic)	7.1	33.6	40.7	84.6	43.9

Test Performed by: K. C. L. PownerDate: June 22, 2020

Table 2

Field Strength of Spurious Radiation
Transmitter Frequency Range: 820 - 850 MHz
Antenna Polarization: Horizontal
Resolution Bandwidth:
10 kHz (below 1 GHz)
100 kHz (above 1 GHz)

Channel No.	Frequency (MHz)	Measured Level (dBμV)	Correction Factor (dB/m)	Field Strength (dBμV/m)	Criteria Level (dBμV/m)	Margin (dB)
		"A"	"B"	"C"	"D"	"E"
991	1648.080 (2 nd harmonic)	7.4	33.2	40.6	84.6	44.0
383	1672.980 (2 nd harmonic)	9.6	33.4	43.0	84.6	41.6
799	1697.940 (2 nd harmonic)	8.3	33.6	41.9	84.6	42.7

Test Performed by: K. Chao P. LumanDate: June 22, 2000

APPENDIX A

List of Test Equipment

List of Equipment

Description	Range	Manufacturer	Model #	APREL Asset #	Cal. Due Date
Spectrum Analyzer	9 kHz - 3 GHz	Anritsu	MS2661C	301330	Dec 10, 2000
Spectrum Analyzer	9 kHz - 30 GHz	Anritsu	MS2667C	301436	Nov 3, 2000
Biconical Antenna	20 MHz - 200 MHz	Eaton	94455-1	100890	July 21, 2000
Log - Periodic Antenna	200 MHz -1.0 GHz	Eaton	ALP-1	100761	July 21, 2000
Horn Antenna	1 – 18 GHz	Aprel	AA – 118	100553	March 12, 2000
Anechoic Shielded Room	10 kHz - 10 GHz	APREL Inc.	–	301329	N/A
OATS	30 MHz – 1 GHz	APREL Inc.	3 m & 10 m	N/A	N/A
Mast with the Controller	1 m – 4 m	EMCO	1051 – 12	100507	N/A
Turntable with the Controller	0° - 360°	EMCO	1060 – 1.241	100506	N/A

APPENDIX B

Photographs



MIST Freedom II-CDPD



MIST Freedom II CDPD

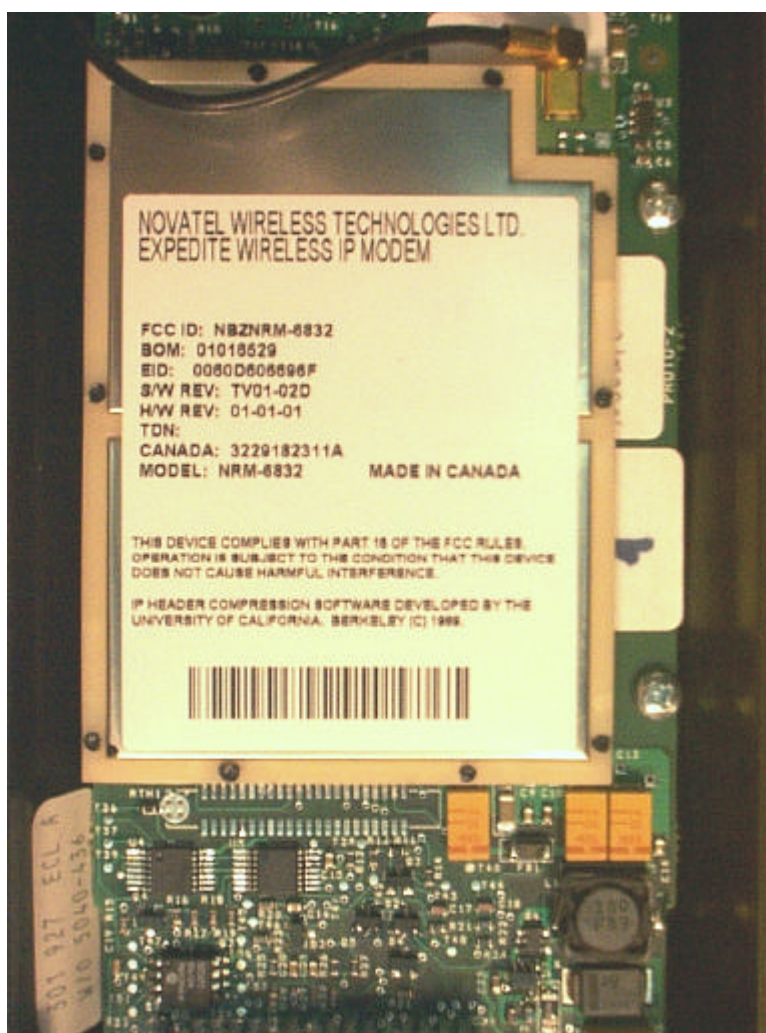


Field Strength of Spurious Radiation measurement in OATS



MIST Freedom II-CDPD, Inside View

MIST Freedom II-CDPD, Inside View - Close Up



MIST Freedom II-CDPD, Novatel CDPD Modem