FCC ID: O2SNURIT3010R

Exhibit 2

Engineering Report
b)Radiated Spurious Emissions (2.1053)

Assessment of Compliance

for

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

Point of Sale Device

Nurit 3010 with a Research In Motion

R902-M-2-0 radio transmitter and Fixed Larsen Antenna

Lipman USA, Inc.

December 2000

LPMB-NURIT3010-POS-3648

51 Spectrum Way Nepean ON K2R 1E6
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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: **O2SNURIT3010R**

Equipment: **Point of Sale Device**

Model: **Nurit 3010 with a Research in Motion R902-M-2-0 Mobitex radio transmitter**

Client: **Lipman USA, Inc.**
50 Gordon Drive
Syosset, NY 11791
U.S.A.

Project #: LPMB-NURIT3010 POS-3648

Prepared By: **APREL Laboratories,**
Regulatory Compliance Division

Approved by: _____ Date: Jan 23, 2001
Jay Sarkar Technical Director, Standards & Certification

Submitted by: _____ Date: Jan 23, 2001
Jay Sarkar Technical Director, Standards & Certification

Released by: _____ Date: Jan 23/01
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FCC ID: **O2SNURIT3010R**
Applicant: Lipman USA, Inc.
Equipment: Point of Sale Device
Model: Nurit 3010 (fixed Larsen antenna) with a Research in Motion R902-M-2-0 Mobitex radio transmitter
Standard: FCC Rules and Regulations Part 2.1053 and 90

ENGINEERING SUMMARY

This report contains the results of Field Strength of Spurious Radiation measurement performed on a LIPMAN Point of Sale Device operating with a built-in Research in Motion Mobitex radio transmitter. The measurements were carried out in accordance with the FCC Rules and Regulations Part 2.1053 and 90. The product was evaluated for spurious when it was set at the maximum power level. The unit uses a fixed Larsen antenna.

(The results presented in this report relate only to the sample tested.)

Summary of the Results

Test Description	Page No.	Test Set-up Figure No.	Results Summary
Field Strength of Spurious Radiation Ref. Paragraph 2.1053 and 90	8	1	**Passed**

INTRODUCTION

General

This report describes the results of the Field Strength of Spurious Radiation measurement conducted on a Lipman USA Point of Sale Device model Nurit 3010 operating with a built-in Research in Motion MOBITEX radio transmitter. Nurit 3010 uses a fixed Larsen antenna. .

Test Facility

The tests were performed for Lipman USA, 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 (90).

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: 24 °C ± 2
- Relative Humidity: 30 - 50 %
- Air Pressure: 101 kPa ± 3

FCC SUBMISSION INFORMATION

FCC ID:	**O2SNURIT3010R**
Equipment:	Point of Sale Device
Model:	Nurit 3010 (fixed Larsen antenna) with a Research in Motion R902-M-2-0 Mobitex radio transmitter
For:	Certification
Applicant:	**Lipman USA, Inc.** 50 Gordon Drive Syosset, NY 11791 U.S.A.
Manufacturer:	**Lipman USA, Inc.** 50 Gordon Drive Syosset, NY 11791 U.S.A.
Evaluated by:	**APREL Laboratories** 51 Spectrum Way Nepean, Ontario Canada K2R 1E6

TEST RESULTS

FOR

Field Strength of Spurious Radiation
Of
Point of Sale Device
Nurit 3010 ARDIS

Lipman USA, Inc.

Test: **Field Strength of Spurious Radiation**

Ref: FCC Parts 2.1046 and 90

Criteria: Emission **:**

The permitted maximum level of spurious emission is 50 + 10 log (P) dB below the unmodulated carrier power of the transmitter (P).

Set-up: See Figure 1.a

Conditions: Voltage Supply: 7.4/8.4 DC Battery

Equipment: See Appendix A.

Procedure: 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 Registration No.:90416).

The **Point of Sales Terminal** was configured to operate at maximum power with appropriate modulation. Special software was employed in order that the transmitter (900 MHz Radio) was processing data in a normal manner.

Prior to final measurement in the OATS, preliminary radiated spurious emissions were scanned in a shielded enclosure at a distance of 1 m using biconical, log-periodic and horn antennas 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.

All field strength measurements were made with a spectrum analyser and the appropriate calibrated antenna for the frequency range from 9 kHz up to 10^{th} harmonics of the transmit frequency (see equipment list for the calibrated antenna used). **The Power of the carrier frequency was also measured in the OATS.**

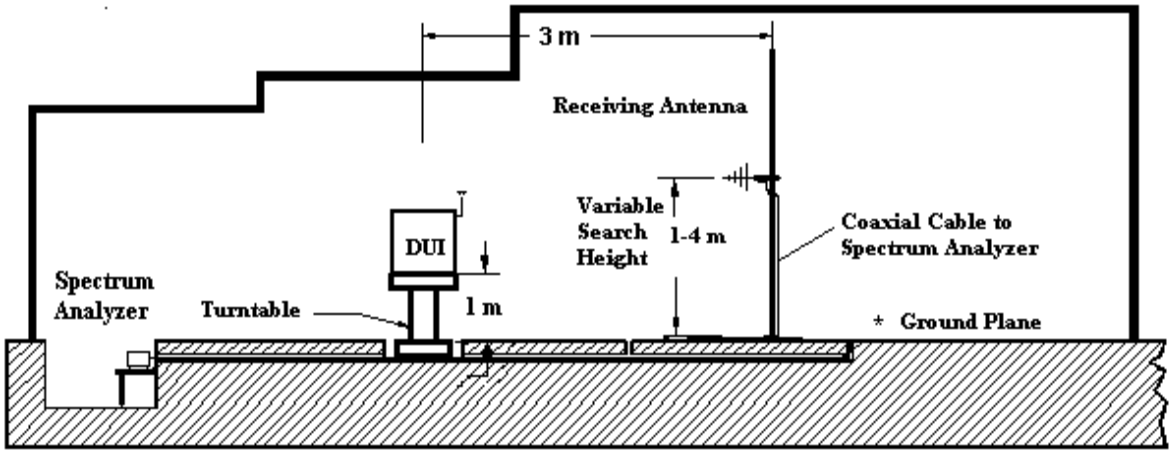

Figure 1.a Test set up for the Field Strength of Spurious Radiation Measurement in OATS (Not to scale)

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

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 maximized by the positioning of the turntable and the height of the antenna. The process was repeated for both horizontal and vertical polarisation.

Information submitted includes the relative radiated power of each spurious emissions with reference to the calculated 78.3dBµV/m limit per FCC Part 90, 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

At 1798.00 MHz (second harmonic) a spurious level of 38.7 dBµV @ 3 meters is measured.

B. Correction factor (antenna factor and cable loss)

Cable loss: 0.5 dB
Antenna Factor: 30.5 dB
Total Correction Factor: 0.5 + 30.5 = 30.0 dB/m

C. Final reading (Field Strength of spurious emission):

C = A + B
C = 38.7 dBµV + 31.0 dB
C = 69.7 dBµV/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:

Field Strength of unmodulated carrier (dBμV/m) = $10 \log_{10} (PtG/4\pi r^2) + 146$ dB

Pt is transmitter carrier power, unmodulated
G is gain, 1.64
R is distance, 3 meters

Criteria (reference) level at 3 meters from 2.344 Watt (ERP) into half-wave dipole antenna is 78.3 dBμV/m.

E = Margin (spurious emission below the reference level)

E = D – C
E = 78.3 dBμV/m –69.7 dBμV/m
E =8.6 dBμV/m

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

Table 1
Field Strength of Spurious Radiation
Transmitter Frequency: 899.00 MHz
Antenna Polarization: Vertical
Resolution Bandwidth:
10 kHz (below 1 GHz)
100 kHz (above 1 GHz)

Frequency (MHz)	Measured Level (dBμV) "A"	Correction Factor (dB/m) "B"	Field Strength (dBμV/m) "C"	Criteria Level (dBμV/m) "D"	Margin (dB) "E"
899.00 Carrier	103.5	29.3	132.8	-	-
1798.00 2nd harmonic	38.7	31.0	69.7	78.3	8.6
2697.00 3rd harmonic	33.0	38.9	71.9	78.3	6.4
3596.00 4th harmonic	12.4	45.3	57.7	78.3	20.6
4495.00 5th harmonic	2.8 noise floor	47.3	50.1	78.3	28.3

Test performed by: Kristen Fowler Date: Dec, 2000

Table 2

Field Strength of Spurious Radiation

Transmitter Frequency: 899.00 MHz

Antenna Polarization: Horizontal

Resolution Bandwidth:

10 kHz (below 1 GHz)

100 kHz (above 1 GHz)

Frequency (MHz)	Measured Level (dBμV) "A"	Correction Factor (dB/m) "B"	Field Strength (dBμV/m) "C"	Criteria Level (dBμV/m) "D"	Margin (dB) "E"
899.00 Carrier	86.0	29.3	115.3	-	-
1798.00 2nd harmonic	6.3	31.0	37.3	78.3	41.0
2697.00 3rd harmonic	2.8 noise floor	38.9	41.7	78.3	36.6
3596.00 4th harmonic	2.9 noise floor	45.3	48.2	78.3	30.1
4495.00 5th harmonic	2.6 noise floor	47.3	49.9	78.3	28.5

Test performed by: Kr. Cehn Rossa Date: Dec, 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, 2001
Biconical Antenna	20 MHz - 200 MHz	Eaton	94455-1	100890	July 21, 2001
Log - Periodic Antenna	200 MHz -1.0 GHz	Eaton	ALP-1	100761	July 21, 2001
Horn Antenna	1 – 18 GHz	APREL Inc.	AA – 118	100553	March 12, 2001
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
Notch Filter	DC - 6 GHz	APREL Inc.	NFLT-835	301470	CBT
Attenuator	20 dB	APREL Inc.	4779-20	301370	May 18, 2001
Amplifier (LNA)	30-1000 MHz	APREL Inc.	APRLNA-001	301415	June 20,2001

APPENDIX B

PHOTOGRAPHS

Lipman USA
Point of Sale Device
Nurit 3010 ARDIS

Spurious Measurements in OATS