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Scope
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TEST REPORT

N° 81818-571636B

FCC REGISTRASTION NUMBER 888863
INDUSTRY CANADA NUMBER 6231A

ISSUED TO : NORTEL NETWORKS
Parc d'activités de Magny-Châteaufort
78928 YVELINES Cedex 09

SUBJECT : **ELECTROMAGNETIC COMPATIBILITY TESTS ACCORDING TO THE PUBLICATIONS 47 CFR PART 15 CLASS B of 2006 , ICES003 CLASS B of 2004, 47 CFR PART 24 of 2004 and RSS133 of 2005**

Apparatus under test :

- Product : BASE STATION
- Trade mark : NORTEL
- manufacturer : NORTEL NETWORKS
- type : GSM 6000 OUTDOOR BTS (AC version)
- configuration Equipped with 2 RM2 PCS1900 50/30
- Serial number : -

Test date : June 2008

Composition of document : 12 pages + 2 related documents

Fontenay-aux-Roses, July 10th, 2008

The technical manager,
Eric ROUSSEL

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES
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RCS Nanterre B 408 363 174
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1 – GENERAL

1.1 - Manufacturer identification

Manufacturer	:	NORTEL NETWORKS
Address	:	Parc d'activités de Magny-Châteaufort 78928 YVELINES Cedex 09

2 - TESTING PROGRAM

Tests have been carried out according to the following specifications:

- Measurement of continuous conducted disturbances in the frequency range 0.15 MHz to 30 MHz - publication 47CFR Part. 15 subpart B (§ 107) class B of 2000 and standard CISPR 22 (§9) class B of 2003
- Measurement of radiated disturbances in the frequency range 30 MHz to 18 GHz - publication 47CFR Part. 15 subpart B (§ 109) ,class B of 2006
- Measurement of radiated disturbances in the frequency range 30 MHz to 1 GHz - standard CISPR 22 (§10) class B of 2003
- Measurement of radiated disturbances in the frequency range 30 MHz to 20 GHz – 47CFR Part. 24 subpart E (§ 24.238) and RSS133 (§ 6.5)

The ICES003 standard use CISPR 22 standard method and limit

3 - EQUIPMENT CHARACTERISTICS

3.1 - Label identification

No number plate statement.
(see hardware and software descriptions of the related document provided by NORTEL , reference : PE/BTS/DJD/020820 issue 03.01/EN).

3.2 - Equipment configuration

The configuration of the equipment under test is described on the related documents reference LCIE 81818-571635-TP-18-FCC and NORTEL - PE/BTS/DJD/020820 issue 01.03/EN.

The position of apparatus under test is given in the photograph in annex.

During the measurements, the apparatus was operating in transmitter mode and the output transmitters were connected to 50 Ohms loads.
All transmitters were at maximum power with the following configuration:

RM2 1900 (50W)

	Channel 1	Channel 2	Channel 3
RM0	512(1930.2 MHz)	661(1961.6 MHz)	810(1989.8 MHz)
RM1	512(1930.2 MHz)	661(1961.6 MHz)	810(1989.8 MHz)

The frame of the BTS was grounded.

4 - OPERATING CONDITIONS

The apparatus was placed in an open field site located rue Théo Bonhomme at ECUELLES (Seine-et-Marne) was powered with a A.C. source delivering 120/240VAC, Split phase US, 60Hz or 230v-60Hz three phases

. Climatic conditions: ambient temperature : 21 °C
relative humidity : 57 %
atmospheric pressure : - hPa

5 - TESTING RESULTS

5.1 DISTURBANCES MEASUREMENT- CISPR22 , 47CFR Part. 15

Apparatus class : B

TEST	TEST SPECIFICATION	RESULTS			
		P	F	NA	Rem
Limits for conducted disturbances at mains ports	Frequency range : 0.15MHz to 30 MHz Diagram No 1	[X]	[ ]	[ ]	[ ]
Limits for radiated disturbances	Frequency range : 30 MHz to 18000 MHz Antennas :				
	- bilog (30 MHz to 1000 MHz)	[X]	[ ]	[ ]	[ ]
	- Horn (1 GHz to 18 GHz)	[X]	[ ]	[ ]	[1]
	Diagram No 2				

P : pass - F : Fail - NA : not applicable - Rem : remark

Remark N° 1 : Between 2 GHz to 18 GHz , the measured levels are below the limit level (15dB margin)

5.2 DISTURBANCES MEASUREMENT - 47CFR Part. 24 subpart E (§ 24.238) and RSS133 (§ 6.5)

5.2.1-Test procedure

Radiated emission measurement procedures shall be performed as outlined in ANSI/TIA-603-C-2004 measurement standard.

The measurements have been carried out in two steps : the identification of the frequencies and the measurement of the radiated field.

5.2.2- The identification of the frequencies (pre scan)

The apparatus was placed inside a shielded room.
The measurement antenna is placed near the apparatus and connected to a spectrum analyzer.
The observation of the radioelectric spectrum is allowed to identify the spurious frequencies to the equipment under test.

5.2.3 -Measurement of the radiated field.

Measurements have been carried out in an open field site with the following antennas :

- Bilog antenna : 30 MHz to 1000 MHz
- Horn type : EMCO 3115 : 1 GHz to 18 GHz
- Horn type : AH SYSTEMS SAS-572 : 18 GHz to 20 GHz

Antennas were placed at 10 m from the equipment under test and connected successively to a spectrum analyzer equipped with a radiofrequency preselector, a preamplifier and a quasi peak-adaptor.

Antennas height was adjusted between 1m and 4 m in order to obtain the maximal electric field value

Antennas under test was placed on a turntable in order to present the side giving the highest level disturbance.

5.2.4 Limits for radiated emissions from FCC Part 24 and RSS133.

Frequency range	Minimum requirement (e.r.p.)/Reference Bandwidth
30 MHz≤ f <20 GHz	The spurious emissions must be attenuated by at least 43 + 10 Log(P) P = Transmitter rated Power in Watts

Measurements were made according to the procedures outline in ANSI/TIA-603-C-2004
The emissions were investigated up to the tenth harmonic of the fundamental emission (20 GHz).
The measured level of the emissions was recorded and compared to the limit.
The reference level for spurious radiation was taken with reference to an ideal dipole antenna excited by the rated output power according to the following relationship :

$$E(V/m) = \frac{1}{R(m)} * \sqrt{30 * Pt}$$

Where,

E = Field Strength in Volts/meter,
R = Measurement distance in meters,
P_t = Transmitter Rated Power in Watts (50 Watts),

Therefore :

$$E(V/m) = \frac{1}{10} * \sqrt{30 * 50}$$

E = 3.87 V/m = 131.76 dBµV/m

The power of any emissions outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10*Log(P)

Therefore, the spurious emissions must be attenuated by at least 43 + 10*Log(50) = 59.99 dB.

Consequently, the field strength limit at 10 meters must be lower than
E = 131.76dBµV/m – 59.99 dB = 71.77 dBµV/m

Limit Level = 71.77dBµV/m

5.2.5 Spectrum Analyzer setting:

Receiver Setting	Pre-Scan (to identify spurious emissions from EUT)	Final Measurements
Detector Type	Peak	Quasi-Peak (CISPR) for 30 MHz - 1GHz Peak for 1 GHz – 20 GHz
Mode	Max Hold	Not Applicable
Bandwidth	100 kHz or 1 MHz (for > 1GHz)	120 kHz Quasi-Peak 100 kHz or 1 MHz (for > 1GHz)
Amplitude Range	60 dB	20 dB
Measurement Time	Not Applicable	> 1 s
Observation Time	Not Applicable	> 15 s
Step size	Continuous sweep	Not Applicable
Sweep Time	Coupled	Not Applicable
Measuring Distance	3 m for 30 MHz – 1 GHz 1 m for 1 GHz – 20 GHz	10m for 30 MHz – 1 GHz 10m for 1 GHz – 20 GHz

5.2.6- Testing results

TEST	TEST SPECIFICATION	RESULTS			
		P	F	NA	Rem
Limits for radiated disturbances	Frequency range : 30 MHz to 20000 MHz				
	Antenna :				
	- bilog (30 MHz to 1000 MHz)	☒	☐	☐	[1]
	- Horn (1 GHz to 18 GHz)	☒	☐	☐	[1]
	- Horn (18 GHz to 20 GHz)	☒	☐	☐	[1]
	Diagram No 3				

P : pass - F : Fail - NA : not applicable - Rem : remark

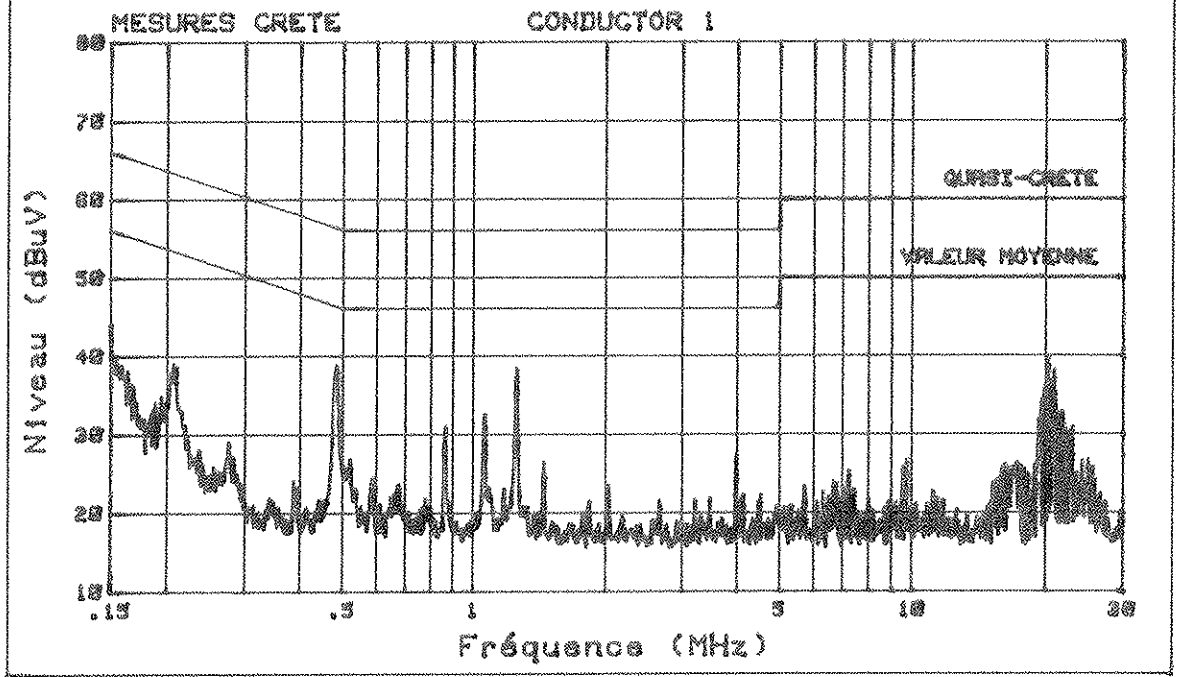
Remark N° 1 : During the Pre-Scan at 1 meter, no spurious frequencies has been detected in the frequency range 2GHz to 20 GHz.The measured levels are below the limit level (30dB margin)
Same result for 47CFR Part. 24 subpart E (§ 24.238) of 2004 and RSS133 (§ 6.5) of 2005.

6 - CONCLUSION

The apparatus of manufacturer NORTEL and model GSM 6000 Outdoor BTS (AC version and equipped with 2 RM2 PCS1900 50/30) is in compliance with the requirements of the publications 47 CFR PART 15 Subpart B (§107 and § 109 in the frequency range 30 MHz to 18 GHz) class B of 2006, ICES003 class B , 47CFR Part. 24 subpart E § 24.238 (in the frequency range 30 MHz to 20 GHz) of 2004 and RSS133 (§ 6.5) of 2005.

Diagram n° 1

FCC PART 15 CLASSE B	NORTEL BTS RM2 1900 BTS 6000 OUTDOOR



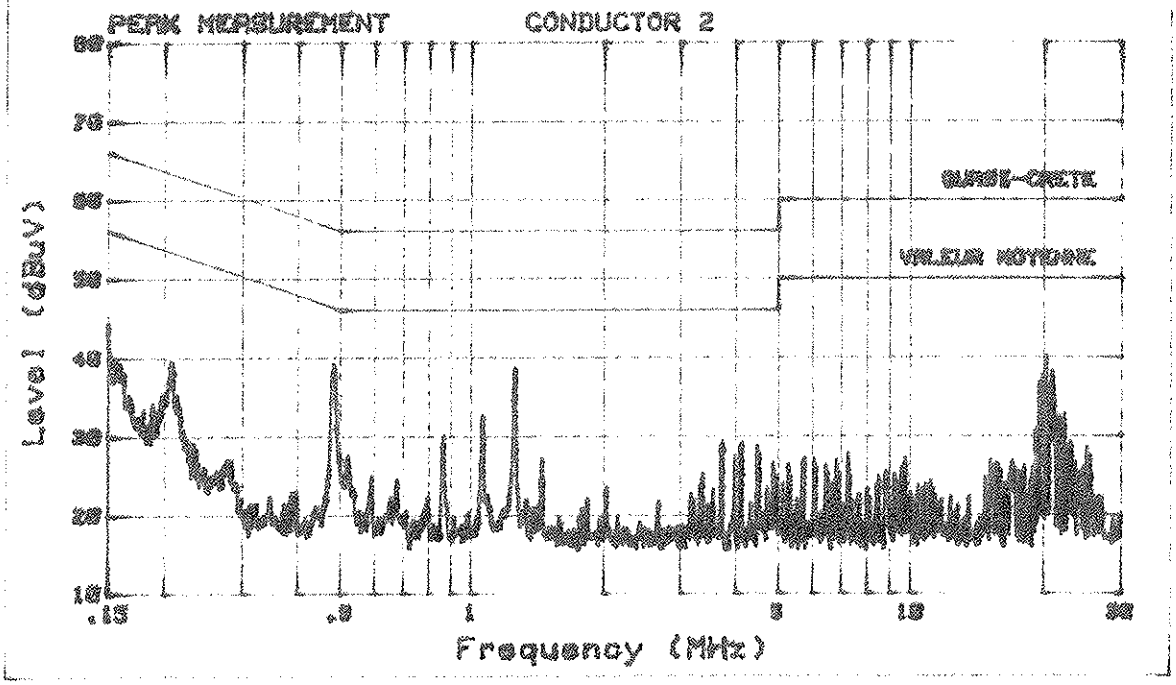


Diagram n° 2

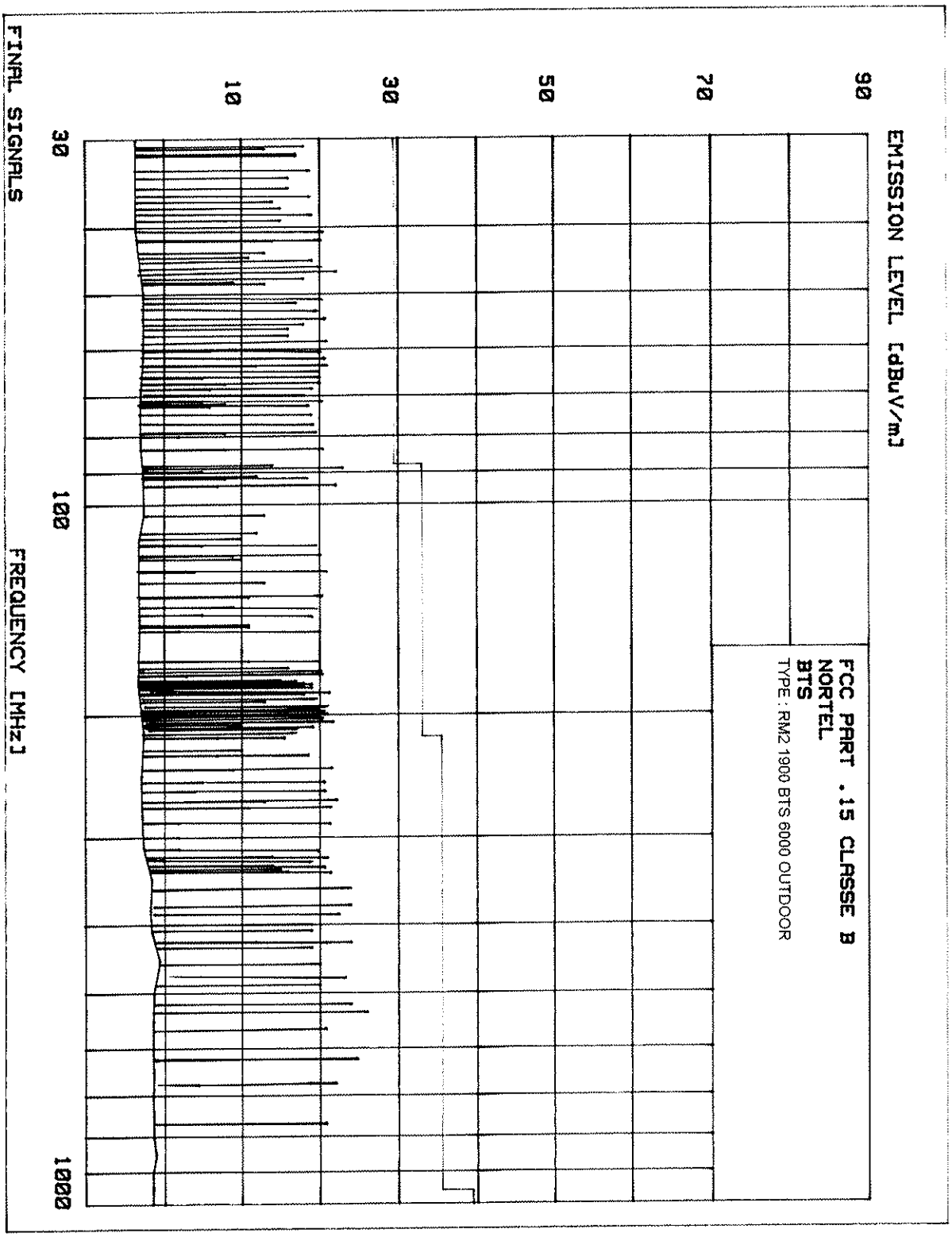

FINAL SIGNALS
EMISSION LEVEL [dBuV/m]
FREQUENCY [MHz]
30
100
1000
10
30
50
70
90
FCC PART .15 CLASSE B
NORTEL
BTS
TYPE : RM2 1900 BTS 6000 OUTDOOR

Diagram n° 3

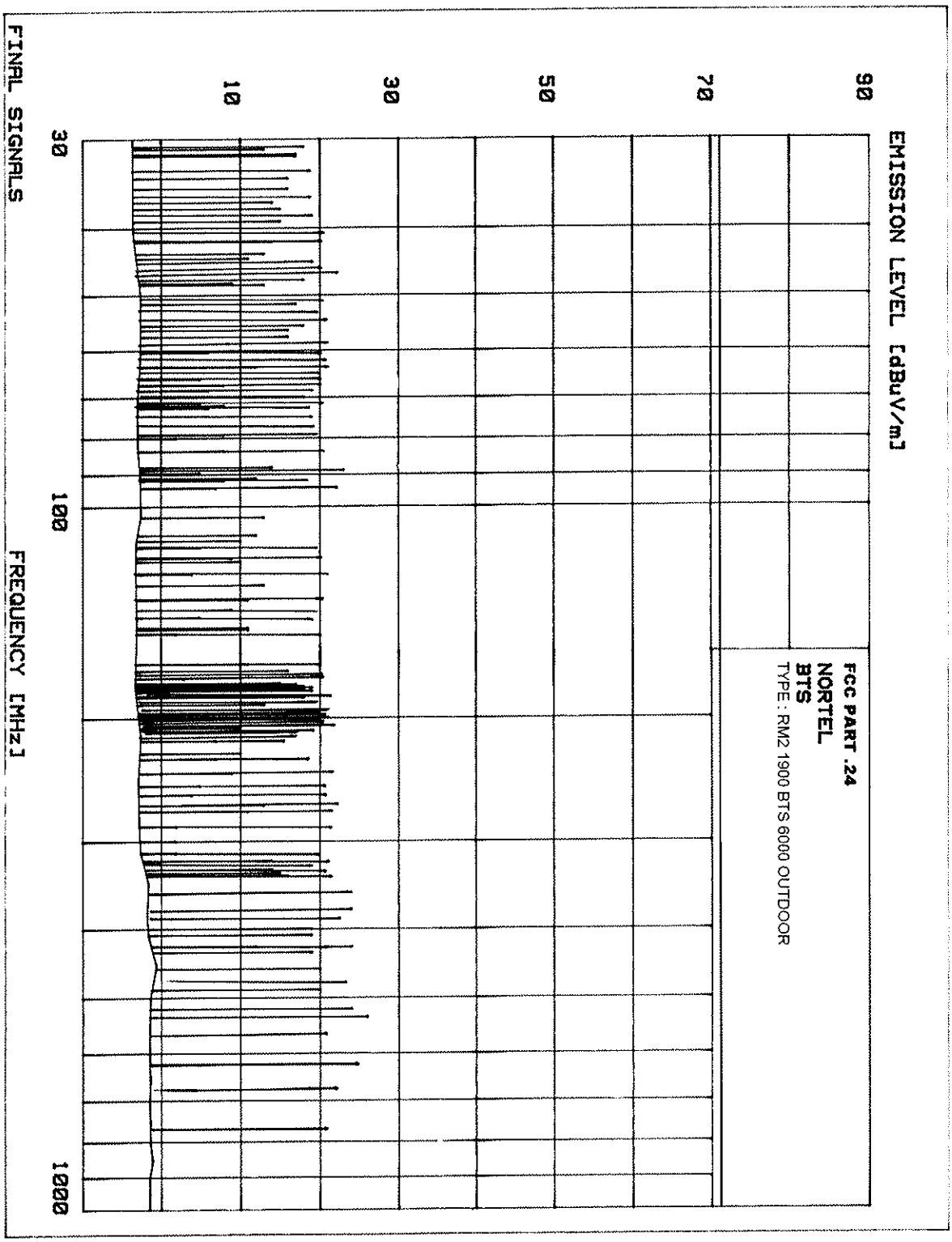

FINAL SIGNALS
EMISSION LEVEL [dBuV/m]
FREQUENCY [MHz]
30
100
1000
10
30
50
70
90
FCC PART 24
NORTEL
BTS
TYPE : RM2 1900 BTS 6000 OUTDOOR

Photo N° 1

EQUIPMENT LIST

Test	Apparatus	Trade Mark	Type	Registration number
	Open area test site			
X	Spectrum analyseur	HEWLETT PACKARD	8566B	A4060004
X	Preselector	HEWLETT PACKARD	85685A	A4069001
X	Quas-Peak adaptator	HEWLETT PACKARD	85650A	B2163019
X	Preamplifier	HEWLETT PACKARD	8449B	A4069002
	Signal Generator	HEWLETT PACKARD	8657A	A5442003
	Signal Generator	HEWLETT PACKARD	E4433B	A5488014
	Signal Generator	ROHDE & SCHWARZ	SMP02	B2163019
	Mire	PHILIPS	PM 5518-TX	A5240009
	RLTE	SECRET	ENS 1039	C2324001
	Coupler	NARDA	3020A	C5364002
	Coupler	SALIES	3060-20	C5364001
X	V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322001
	V ISLN	ROHDE & SCHWARZ	ESH3-Z6	C2322020
X	Bilog antenna	CHASE	CBL 6112A	C2040040
	Bilog antenna	AH SYSTEM	SAS-2001251	C2040025
	Dipole large bande /	ROHDE & SCHWARZ	HUF-Z1	C2040011
	Logperiodic antenna	ROHDE & SCHWARZ	HL 023 A2	C2040001
	Logperiodic antenna	E\D	AN112	C2040029
x	Horn antenna	AH SYSTEMS	SAS-572	
X	Horn antenna	EMCO	.3115	C2042016

UNCERTAINTIES CHART

Kind of measurement	*Wide uncertainty laboratory* (k=2) ±x(dB)	*CISPR uncertainty limit* ±y(dB)
Measurement of conducted disturbances in voltage on the AC power port on the Fontenay-aux-Roses site.	3.56	3.6
Measurement of conducted disturbances in voltage on the AC power port on the Ecuelles site.	3.50	3.6
Measurement of conducted disturbances in voltage on the DC power port on the Fontenay-aux-Roses site.	3.56	3.6
Measurement of conducted disturbances in voltage on the DC power port on the Ecuelles site.	3.56	3.6
Measurement of conducted disturbances in voltage on the telecommunication port.	3.28	*Under consideration*
Measurement of conducted disturbances in current	2.90	*Under consideration*
Measurement of radiated electric field from 30 to 200 MHz in horizontal position on the Fontenay-aux-Roses site	4.58	5.2
Measurement of radiated electric field from 30 to 200 MHz in vertical position on the Fontenay-aux-Roses site	4.82	5.2
Measurement of radiated electric field from 200 to 1000 MHz on the Fontenay-aux-Roses site	4.92	5.2
Measurement of radiated electric field from 1 to 18 GHz on the Fontenay-aux-Roses site	6.54	*Under consideration*
Measurement of radiated electric field from 30 to 1000 MHz on the Ecuelles site	4.72	5.2
Measurement of radiated electric field from 1 to 6 GHz on the Ecuelles site	5.60	*Under consideration*
Measurement of radiated electric field from 6 to 18 GHz on the Ecuelles site	5.83	*Under consideration*
Measurement of disturbance power	3.37	4.5
Immunity to conducted disturbances, induced by radio electric field	2.36	/
Immunity to conducted disturbances, induced by radio electric field, method oh the injection clamp	2.76	/
Immunity to radiated radio electric field from 80 MHz to 2.6 GHz	2.64	/

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limits values.

NORTEL

GSM 6000 outdoor BTS 1900MHz hardware delivery notice

Document number:	PE/BTS/DJD/020820
Document issue:	03.01 / EN
Document status:	Standard
Date:	13/JUN/2008

External document

Printed in France

NORTEL CONFIDENTIAL

PUBLICATION HISTORY

13/JUN/2008

Issue 03.01 / EN, Standard
Delivery of the AC version of the GSM1900 Outdoor BTS 6000 for RM2 1900 introduction

13/OCT/2006

Issue 02.01 / EN, Standard
Delivery of the DC version of the GSM1900 Outdoor BTS 6000 – N°445082

11/OCT/2006

Issue 01.01 / EN, Standard
Delivery of the AC version of the GSM1900 Outdoor BTS 6000 – N°434143

AVLM Recipient: LCIE	Date of delivery: 13/JUNE/2008
Product: GSM 6000 Outdoor BTS	
Article delivered: AC version of GSM 6000 Outdoor BTS	Article code: NTQ610FA 01
Section transmitting: 8Z60	Designer name: Chenet Stéphane
Cabinet Serial Number: NNTMGVC10024	

Documents related to the Hardware Design Specifications

- PE/BTS/DD/016672 V01.05/EN BTS 6000 Product Specification

Documents dealing with specifications:

Issues fixed on the cabinet:

Missing Equipment:

Software compatibility:

Modules software version :

- Load BTS : /
  - ICM/ABM : CDI120795
  - RM : CDI121233

PI software tools :

- WINTMI: v03d306
- TIL COAM: v16a304
- TIL Alarm: v16a301
- WINTOOL: v05a2_e16.0

The delivery includes :

ARTICLE	PEC code	Release	Serial number	Comment
CAB: PRECA	NTQ610FA	01	NNTMGVC10024	
UCPS CCU UMTS/GSM	NTUM44AF	01	ATSNZH117028	
DDU	NTN066AA	D1	ATSNZH122771	
ADU	NTQ666CA	D1	ATSNZH121759	
CRICO	NTQ620CA	01	NNTMGVC30024	
CECU	NTQ675JG	01	NNTMGVC20024	
CECU Control Board	NTQ629AA	01	NNTMLA07G23D	
RICAM	NTN024AA	0D2	FANTASTIX	MIR 2.5 IP ICM0 : 47.164.182.180
RM2 1900 50/30	NTN050PP	D1	NNTM7880Y9QV	
RM2 1900 50/30	NTN050PP	D1	NNTM7880Y9QY	
DDM 1900 W/VSWR W/ HYBRIDS	NTN063AA	04	FICT03000PEX	
DDM 1900 W/VSWR W/HYBRIDS	NTN063AA	03	FICT03000N94	
DDM 1900 W/VSWR W/ HYBRIDS	NTN063AA	D1	FICT020000JH	
CALPRO2	NTQ675CA	D1	NNTMGT004MHZ	
CUSERICO	NTQ650AA	D1	NNTMGT004L67	
Battery SAFT	NTQ675AA	01	07445L000015	
CPRIPRO2	NTQ675SA	02	NNTM7880WTAV	
RECTIFIER, 1400 W	NTN070BF	01	ATSNZH085318	
RECTIFIER, 1400 W	NTN070BF	01	ATSNZH085344	

Additional delivery:

ARTICLE	PEC code	Release	Serial number	Comment
Isolator box for CECU debug	N/A	N/A	N/A	
External alarm cable				
ABIS external cable				

Tests performed:

- MIC BER in T1
- Inventory test.
- DDM Alarms & Inventory interface.
- Dale & Dali.
- TX sequence with factory test bench on each RM2 1900 MHz
- RX sequence with factory test bench on each RM2 1900 MHz

Functional limits:

- **Hardware Limitations :**

  None

- **Software Limitations :**

  None

Documents related to the Hardware Test Specifications

Reference of the test specifications documents:

- PE/BTS/DJD/018118 V01.01/EN Hardware integration test specification for BTS 6000

Documents related to the Hardware Test Report

Reference of the test reports documents:

- PE/BTS/DJD/023736 V01.01/EN Hardware integration tests report for GSM1900 RM2 introduction

END OF DOCUMENT

EMC Test plan for the introduction of GSM RM2 1900MHz (FCC)

Reference:	**81818-571635-TP-18-FCC**
Revision:	**A**
Status:	**Approved**
Date:	**06/May/2008**

Customer:	**NORTEL**
Product:	**GSM 18000 & 6000 & 9000 BTS**

Author:	**V. GODET** P.O. J. PALARD
Verified by:	**D. PRADON** 07/05/2008

LABORATOIRE CENTRAL
DES INDUSTRIES ELECTRIQUES
RELATED DOCUMENT N° 2
to test report N° 81818-571635
25 pages

PUBLICATION HISTORY

VERSION	DATE	AUTHOR	MODIFICATION
A	06-May-08	V. GODET	Creation of document

CONTENTS

1. INTRODUCTION

This document presents the FCC EMC tests plan for the introduction of RM2 1900MHz as described in the document referenced [R1] on GSM BTS products.

For North America, applicable standard for EMC Base stations are the FCC part 15/ICES 003 Class B, and the FCC Part 24/RS133.

The following table gives some information of the EUT:

Product Name	GSM 18000 & 6000 & 9000 BTS
Manufacturer	NORTEL
Serial Number	-
Alimentation of the EUT	AC & DC

BTS 18000 Covered configurations:

Indoor and Outdoor: Full 1900MHz S111 to S666.

Indoor and Outdoor: Dual band S111_S111 to S333_S333

Standard single band RF configurations:

- Up to S666 configuration with a single cabinet configuration
- Support of extension cabinets (up to 3 cabinets with 3 S666/666/666) for IFM + ICM config.
- Support of extension cabinets (up to 2 cabinets with 2 S666/333) for RICAM config.

Standard dual band RF configurations:

- Up to S333_333 configuration with a single cabinet configuration
- Support of extension cabinets (up to 3 cabinets with 3 S333_333/333_333/333_333) for IFM + ICM config
- Support of extension cabinets (up to 2 cabinets with 2 S333_333/333) for RICAM config

➢ Synchronization options:

- GPS synchronization
- Synchronization from S8000/S12000

➢ Modules covered:

- 1900 MHz RM and RM2 30w GMSK/ 30w EGPRS
- 1900 MHz RM2 50w GMSK/ 30w EGPRS
- 850 MHz HPRM 60w GMSK/ 45w EGPRS
- All GSM850 and PCS1900 coupling devices configurations with mixed source including:

– DDM_H2, DDM_D and mixed configuration with and without VSWR

  – TX filter_H2, TX filter and mixed configuration with and without VSWR

- Simplex ICM and duplex ICM configurations
- ABM
- RICAM configuration
- T1 (100 Ohms) PCM interface with and without secondary protection
- E1 (75/120 Ohm modes) PCM interface with and without secondary protection
- Rectifiers: 1,4KW, including mixed configurations between all rectifiers.
- Rectifiers: 1,6KW (for BTS 18000 Outdoor NG only)
- UCPS UMTS/GSM CCU
- NgUCPS GSM CCU (for BTS 18000 Outdoor NG only)

- Internal batteries (SBS60, SBS40, SBS15) HAWKER
- Internal batteries (SBS60, SBS40, SBS15) HAWKER, NARADA (for BTS 18000 Outdoor NG only)

➢ Energy:

– AC power for outdoor cabinet only; 3 configurations are available:
  - 240/400VAC, Three phases, WYE connected, Four wires plus protective earth, 208-240V -10%/+10%
  - 230VAC, single phase, Two wires plus protective earth, 208-240V -10%/+10%
  - 120/240VAC, Split phase US, Three wires plus protective earth, 208-240V -10%/+10%
  - 120/240VAC, Split phase Europe, Three wires plus protective earth, 208-240V -10%/+10%

– 48V DC power for Indoor cabinet only:-40.5Vdc to -57Vdc

➢ Options for Outdoor cabinet:
- Alarm protection module (ALPRO2 box & S8000/S12000 ALPRO)
- Primary protection module (PRIPRO2)
- AC Plugs: Europe, German, UK
- UserICO V2
- Balun
- Kit DC outdoor
- Kit Heater

➢ Options for Indoor cabinet:
- Alarm protection module (S8000/S12000 ALPRO)
- Balun

The following modules or options are not covered:
- SPM
- Modules or OEM to be included in "user rack"
- Power box, external DC distribution
- Battery Cabinet
- Kit Light for outdoor cabinet

Covered Configurations for BTS 6000:

The following configurations will be covered:

➢ Standard single band RF configurations:
- Up to S33 configuration with a single cabinet configuration
- Support of extension cabinets (up to 3 cabinets with 3 S666)

➢ Modules covered:
- 1900 MHz RM and RM2 30w GMSK/ 30w EGPRS
- 1900 MHz RM2 50w GMSK/ 30w EGPRS
- 850 MHz HPRM 60w GMSK/ 45w EGPRS
- All GSM850 and PCS1900 coupling devices configurations with mixed source including:
  – DDM_H2, DDM_D and mixed configuration with and without VSWR
  – TX filter_H2, TX filter and mixed configuration with and without VSWR

- Simplex ICM and duplex ICM configurations
- ABM
- IFM1
- RICAM & ICAM
- Both E1 (75/120 Ohm modes) and T1 (100 Ohm) PCM interfaces
- RMPSU Artesyn
- RM2PSU Artesyn
- Rectifiers: 1.4 kW Artesyn.
- UCPS UMTS/GSM CCU

➢ Energy:
- AC power; 2 configurations available for outdoor and Indoor cabinet:
  - 230VAC, single phase, Two wires plus protective earth, 200-240V -10%/+10%
  - 120/240VAC, Split phase Europe, Three wires plus protective earth, 200-240V -10%/+10%
- DC power; 1 configuration available for Outdoor cabinet only:
  - - 48 V

➢ Options for Outdoor and Indoor cabinet:
- Alarm protection module (CALPRO2)
- Primary protection module (CPRIPRO2)
- CUserICO

➢ Options for Outdoor AC cabinet only:
- Internal battery (SAFT)
- AC Heater
- Outdoor enclosure (door and second skin)
- CUCPS for power supply management

➢ Options for Indoor AC cabinet only:
- CUCPS for power supply management
- Indoor enclosure (door and no second skin)
- Internal battery (SAFT)

➢ Stand alone module:
- CECU

The following modules or options are not covered:
- SPM
- Modules to be included in "user rack"

Covered configurations for BTS 9000:

The following GSM BTS9000 configurations shall be covered:

- Standard single band RF configurations:
  - Up to S333 configuration with a single cabinet configuration
  - Support of extension cabinets (up to 3 cabinets with 3 S333/333/333)
- Standard dual band RF configurations:
  - Up to S333_333 configuration with a single cabinet configuration
  - Support of extension cabinets (up to 3 cabinets with 3 S333_333/333_333/333_333)
- Synchronization options:
  - GPS synchronization
  - Synchronization from S8000/S12000
- Modules covered:
  - 1900 MHz RM and RM2 30w GMSK/ 30w EGPRS
  - 1900 MHz RM2 50w GMSK/ 30w EGPRS
  - 850 MHz HPRM 60w GMSK/ 45w EGPRS
  - All GSM850 and PCS1900 coupling devices configurations with mixed source including:
    - DDM_H2, DDM_D and mixed configuration with and without VSWR
    - TX filter_H2, TX filter and mixed configuration with and without VSWR
  - Simplex ICM and duplex ICM configurations
  - E1 (75/120 Ohm modes) PCM interface with and without secondary protection
- Energy:
  - 48V DC power for Indoor cabinet only:-40.5Vdc to -57Vdc
- Options for Indoor cabinet:
  - Alarm protection module (S8000/S12000 ALPRO)
  - Balun

The following modules or options are not covered:

- SPM
- H3D configuration

2. RELATED DOCUMENTS

2.1. APPLICABLE STANDARDS

[A1]	CFR 47 Part 2	Code of Federal Regulations - Part 2 - Frequency Allocations and Radio Treaty Matters. General Rules and Regulations. Date : June 1996.
[A2]	47 CFR Part 15 08/20/02	FCC Rules for Radio Frequency Devices, Title 47 of the Code of Federal Regulations – Radio frequency devices – dated 08/20/02
[A3]	CFR 47 Part 24	Code of Federal Regulations - Part 24 - Personal Communications Services.
[A4]	IC ES 003 (NMB 003)	Industry Canada - Digital apparatus
[A5]	RSS 133	Industry Canada – 2 GHz Personal Communications Services.
[A6]	EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement (1998).
[A7]	EN 301 489-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1 : Common technical requirements.
[A8]	EN 301 489-8	ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 8 : Specific conditions for GSM base stations.
[A9]	EN 301 908-1	Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS) and User Equipment (UE) for IMT-2000 Third – Generation cellular networks; Part 1 : Harmonized EN for IMT-2000, introduction and common requirements covering essential requirements of article 3.2 of the R&TTE Directive.
[A10]	3GPP TS 101 087	Digital cellular telecommunications system (Phase 2 and Phase 2+); Base Station System (BSS) equipment specification; Radio aspects (3GPP TS 11.21)
[A11]	CISPR 22	Limits and methods of measurement of radio disturbance characteristics of information technology equipment (1997)
[A12]	EN 61000-4-2	Electromagnetic Compatibility (EMC) Part 4-2: Testing and measurement techniques – Electrostatic Discharge immunity test (1995)
[A13]	EN 61000-4-3	Electromagnetic Compatibility (EMC) Part 4-3: Testing and measurement techniques – Radiated, radio-frequency electromagnetic field immunity test (1995)
[A14]	EN 61000-4-4	Electromagnetic Compatibility (EMC) Part 4-4: Testing and measurement techniques – Electrical fast transient / burst immunity test (1995)
[A15]	EN 61000-4-5	Electromagnetic Compatibility (EMC) Part 4-5: Testing and measurement techniques – Surge immunity test (1995)
[A16]	EN 61000-4-6	Electromagnetic Compatibility (EMC) Part 4-6: Testing

		and measurement techniques – Immunity to conducted disturbances induced by radio frequency fields (1996)
[A17]	EN 61000-4-11	Electromagnetic Compatibility (EMC) Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity test (1994)
[A18]	EN 61000-3-2	Electromagnetic Compatibility (EMC) Part 3-2: Limit of harmonic current emissions (equipment input current up to and including 16A per phase) (1995)
[A19]	EN 61000-3-3	Electromagnetic Compatibility (EMC) Part 3-3: Limitation of voltage fluctuations and flicker in low-voltage supply systems for equipment with rated current up to 16A. (1995)

2.2. REFERENCE DOCUMENTS

[R1]	PE/BTS/DPL/023431	GSM 18000 & 9000 & 6000 BTS Project Qualification Plan for the RM2 GSM 1900MHz introduction