



Accreditation  
N° 1-0312



# TEST REPORT

N° 60053453-554610A

FCC REGISTRATION NUMBER 93402

**ISSUED TO** : ALCATEL CIT  
Site de Châteaufort  
78775 Magny Les Hameaux Cedex  
France

**SUBJECT** : **ELECTROMAGNETIC COMPATIBILITY TESTS ACCORDING TO THE PUBLICATIONS 47 CFR PART 15 CLASS B of 2006 AND 47 CFR PART 22 of 2004**

Apparatus under test :

- Product : BASE TRANSCEIVER STATION
- Trade mark : ALCATEL-LUCENT
- manufacturer : ALCATEL-LUCENT
- type : UMTS Outdoor 2 IBTS
- Serial number : -

Test date : January 2007

Composition of document : 17 pages + 2 related documents

Fontenay-aux-Roses, March 15<sup>th</sup>, 2007

The technical manager,

**Eric ROUSSEL**



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## **1 - GENERAL**

### **1.1 - Manufacturer identification**

Manufacturer : ALCATEL CIT  
Address : Site de Châteaufort  
78775 Magny Les Hameaux Cedex  
France

## **2 - TESTING PROGRAM**

Test 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 C ( § 15.107) class B of 2006
- Measurement of radiated disturbances in the frequency range 30 MHz to 18 GHz - publication 47CFR Part. 15 subpart C ( § 15.109) ,class B of 2006
- Measurement of radiated disturbances in the frequency range 30 MHz to 20 GHz- publication 47CFR Part. 22 Subpart H ( §22.917) of 2004

## **3 - EQUIPMENT CHARACTERISTICS**

### **3.1 - Label identification**

No number plate statement.

(see hardware and software descriptions of the related document provided by ALCATEL-LUCENT , reference : UMT/BTS/DJD/021529 issue 11.01/EN).

### **3.2 - Equipment configuration**

The configuration of the equipment under test is described on the related documents reference 60053074-554101-TP-Uo2-FCC\_VersionB and ALCATEL-LUCENT - UMT/BTS/DJD/021529 issue 11.01/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 45W

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 120/240 VAC, Split phase US, 60Hz. or a A.C. source delivering 230-50Hz (three phase).

. Climatic conditions: ambient temperature : 23 °C  
relative humidity : 45%  
atmospheric pressure : - hPa

#### 5 - TESTING RESULTS

##### 5.1 - DISTURBANCES MEASUREMENT- 47CFR Part. 15

Apparatus class : B

TEST	TEST SPECIFICATION	RESULTS			
		P	F	NA	Rem
<u>Limits for conducted disturbances at mains ports</u>	Frequency range : 0.15MHz to 30 MHz				
	Diagrams No 1 and 2(120/240VAC- 60Hz)	[X]	[ ]	[ ]	[ ]
	Diagrams No 3 and 4(240V- 50Hz three phase)	[X]	[ ]	[ ]	[1]
<u>Limits for radiated disturbances</u>					
	Frequency range : 30 MHz to 18000 MHz				
	Antennas :				
	- bilog (30 MHz to 1000 MHz)	[X]	[ ]	[ ]	[ ]
	- Horn (1 GHz to 18 GHz)	[X]	[ ]	[ ]	[2]
	Diagram No 5, and table 1				

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

#### Remark

N° 1 : test for information

N° 2 : no frequency between 2 GHz to 18 GHz



## **5.2 – RADIATED DISTURBANCES MEASUREMENT- 47CFR Part. 22**

### **5.2.1-Test procedure**

Radiated emission measurement procedures shall be performed as outlined in Section 8 of the ANSI C63.4 measurement standard.

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

#### **5.2.1.1- 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.

#### **5.2.1.2 -Measurement of the radiated field.**

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

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

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.



**5.2.2 Limits for radiated emissions from FCC Part 22.**

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 C63.4

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 :

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

Where,

$$E(V/m) = \frac{1}{10} * \sqrt{30 * 45 * 1.64}$$

E = Field Strength in Volts/meter,

R = Measurement distance in meters,

P<sub>t</sub> = Transmitter Rated Power in Watts (45 Watts),

G = Gain of ideal Dipole (linear)

Therefore :

$$E = 4,7 \text{ V/m} = 133.4 \text{ dB}\mu\text{V/m}$$

The spurious emissions must be attenuated by at least 43 + 10\*Log(45) = 59.5 dB.

Therefore the field strength limit at 10 meters is :

$$E = 133.4 \text{ dB}\mu\text{V/m} - 59.5 \text{ dB} = 73.9 \text{ dB}\mu\text{V/m}$$

Limit Level = 73.9 dBμV/m



### 5.2.3 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 1GHz - 20GHz
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	> 1s
Observation Time	Not Applicable	> 15s
Step size	Continuous sweep	Not Applicable
Sweep Time	Coupled	Not Applicable
Measuring Distance	3m for 30 MHz - 1GHz 1m for 1GHz - 20GHz	10m for 30 MHz - 1GHz 10m for 1GHz - 20GHz

### 5.2.4- Testing results

TEST	TEST SPECIFICATION	RESULTS			
		P	F	NA	Rem
<u>Limits for radiated disturbances</u>	Frequency range : 30 MHz to 20000 MHz				
	Antenna :				
	- bilog (30 MHz to 1000 MHz)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[1]
	- Horn (1 GHz to 18 GHz)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[1]
	- Horn (18 GHz to 20 GHz)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[1]
	Diagram No 6				

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.

## 6 - CONCLUSION

The apparatus of manufacturer ALCATEL LUCENT and model UMTS outdoor2 iBTS is in compliance with the requirements of the publications 47 CFR PART 15 Subpart C (§15.107 and §15.109 in the frequency range 30 MHz to 18 GHz) class B and 47CFR Part. 22 subpart H ( §22.917 in the frequency range 30 MHz to 20 GHz) of 2004



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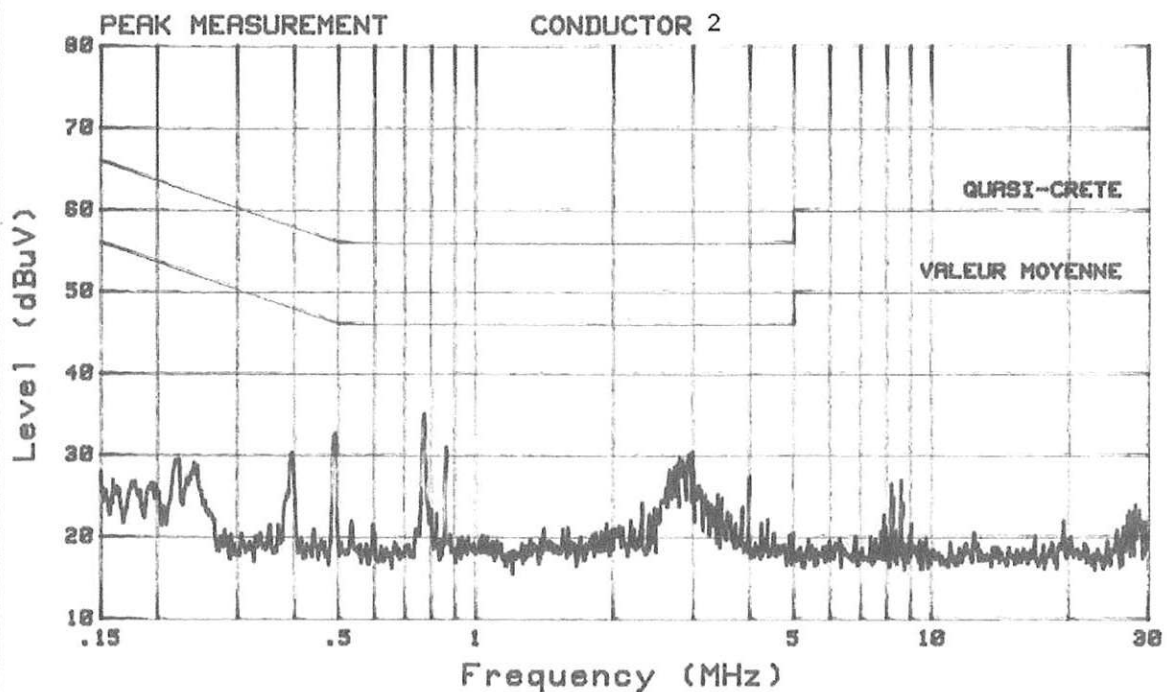
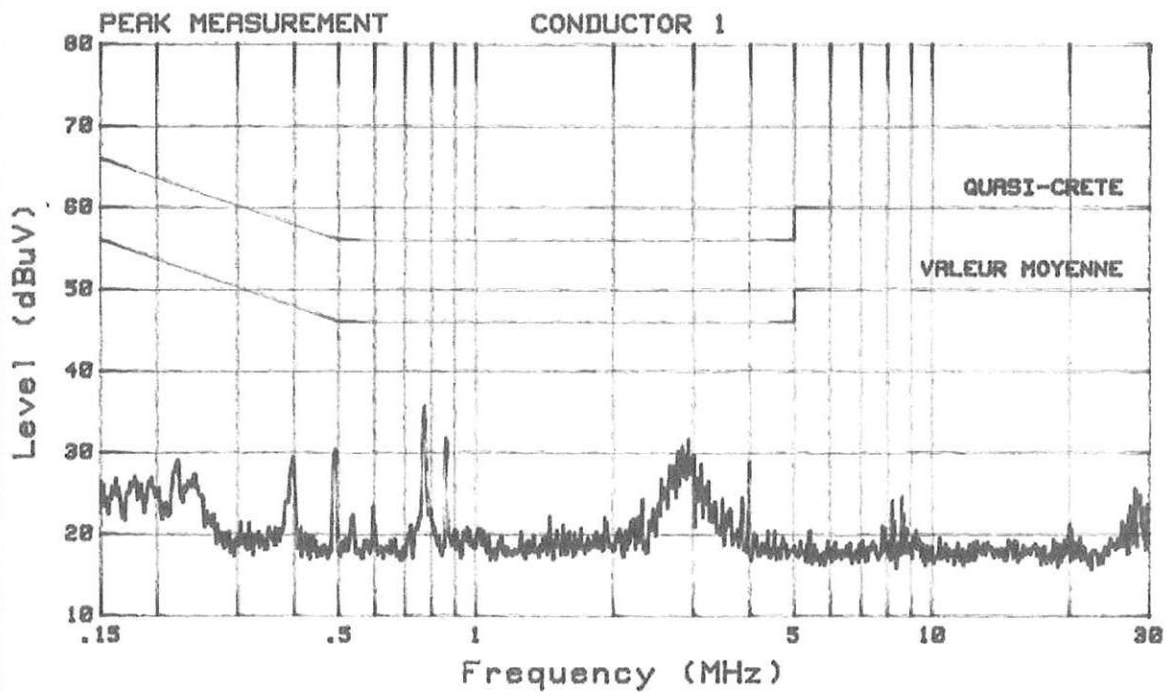
Diagram n°1

FCC PART 15

CLASSE B

ALCATEL  
BTS

TYPE : UMTS 850 OUTDOOR2 1BTS



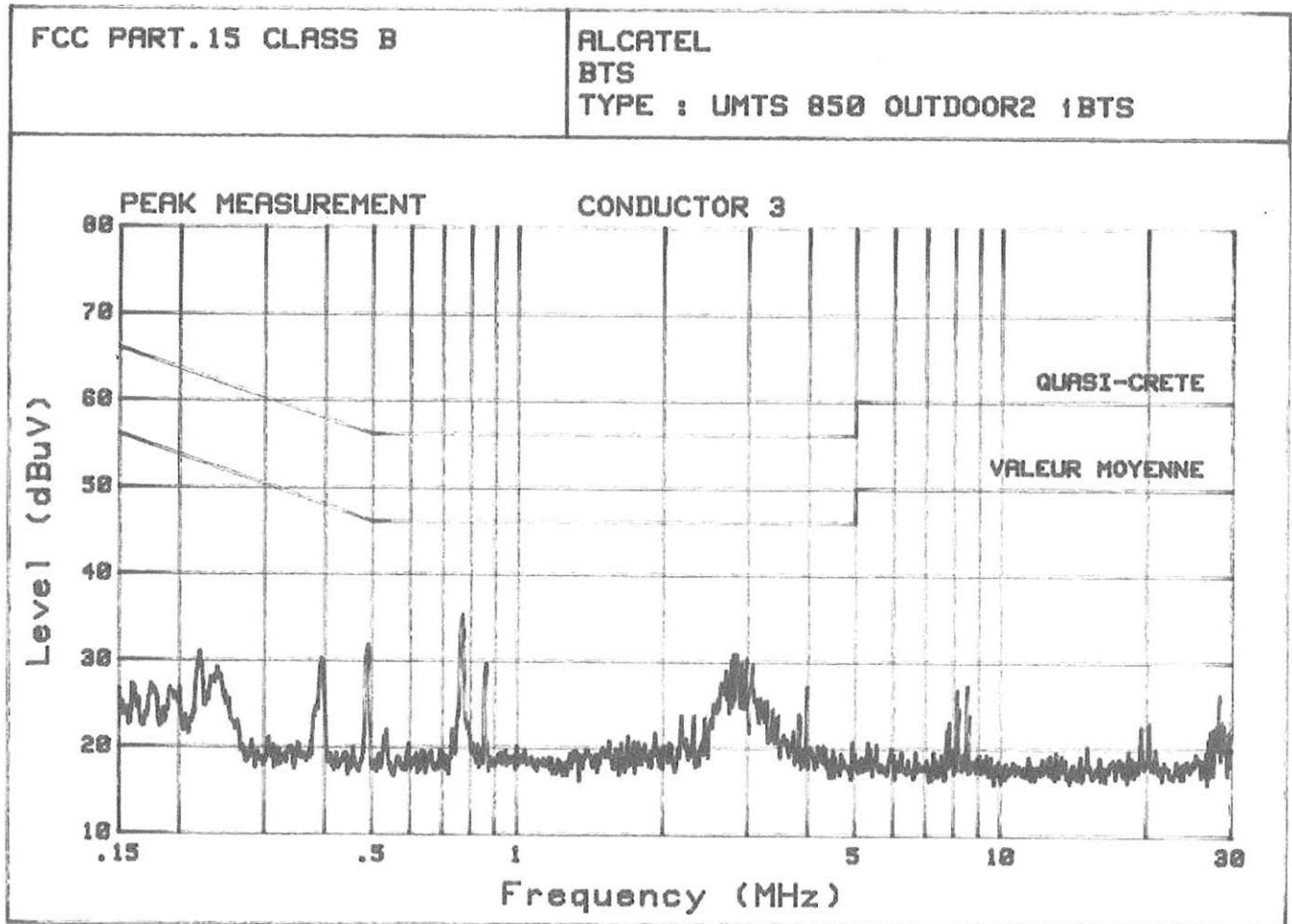


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Diagram n°2





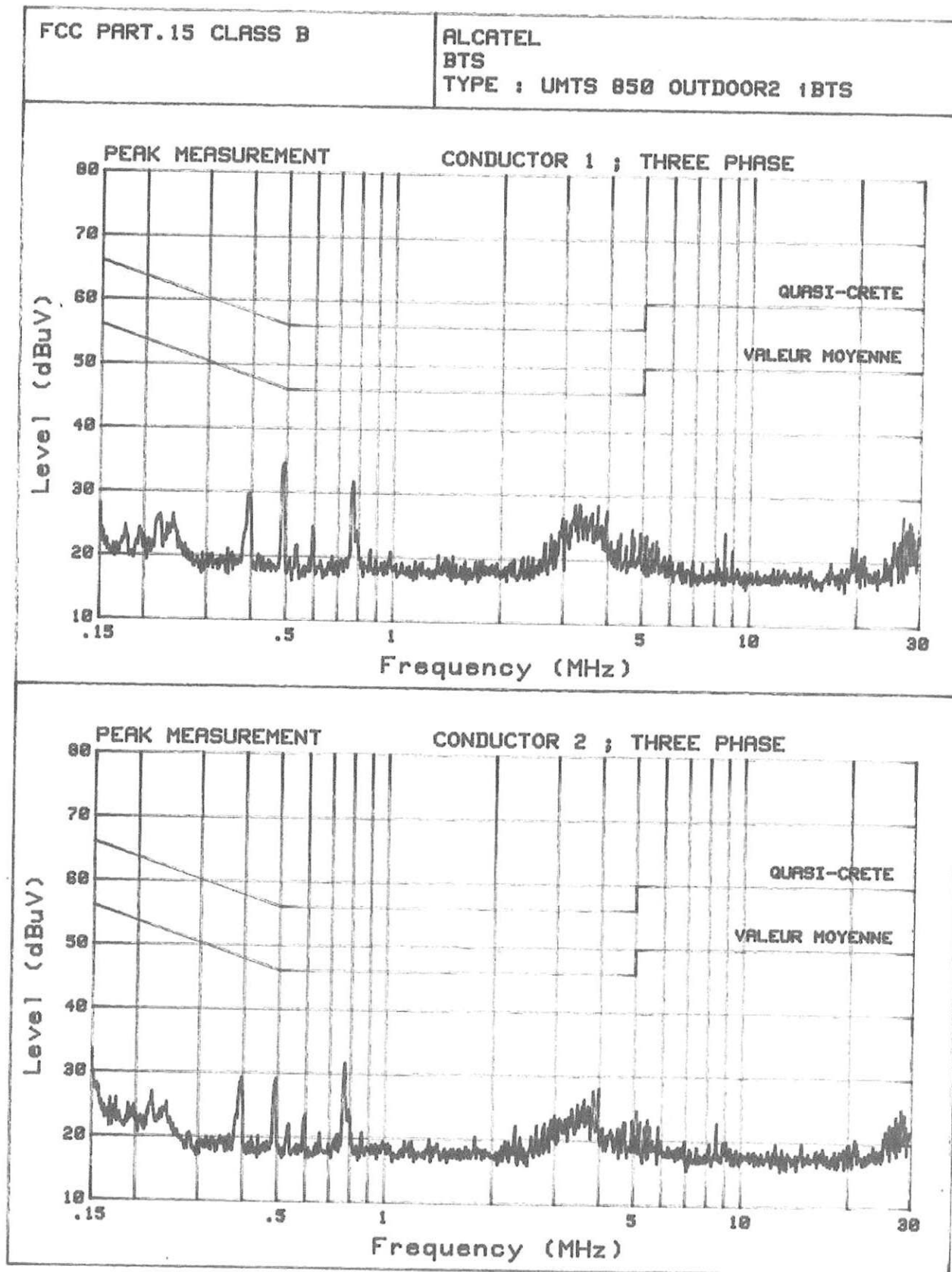


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Diagram n°3



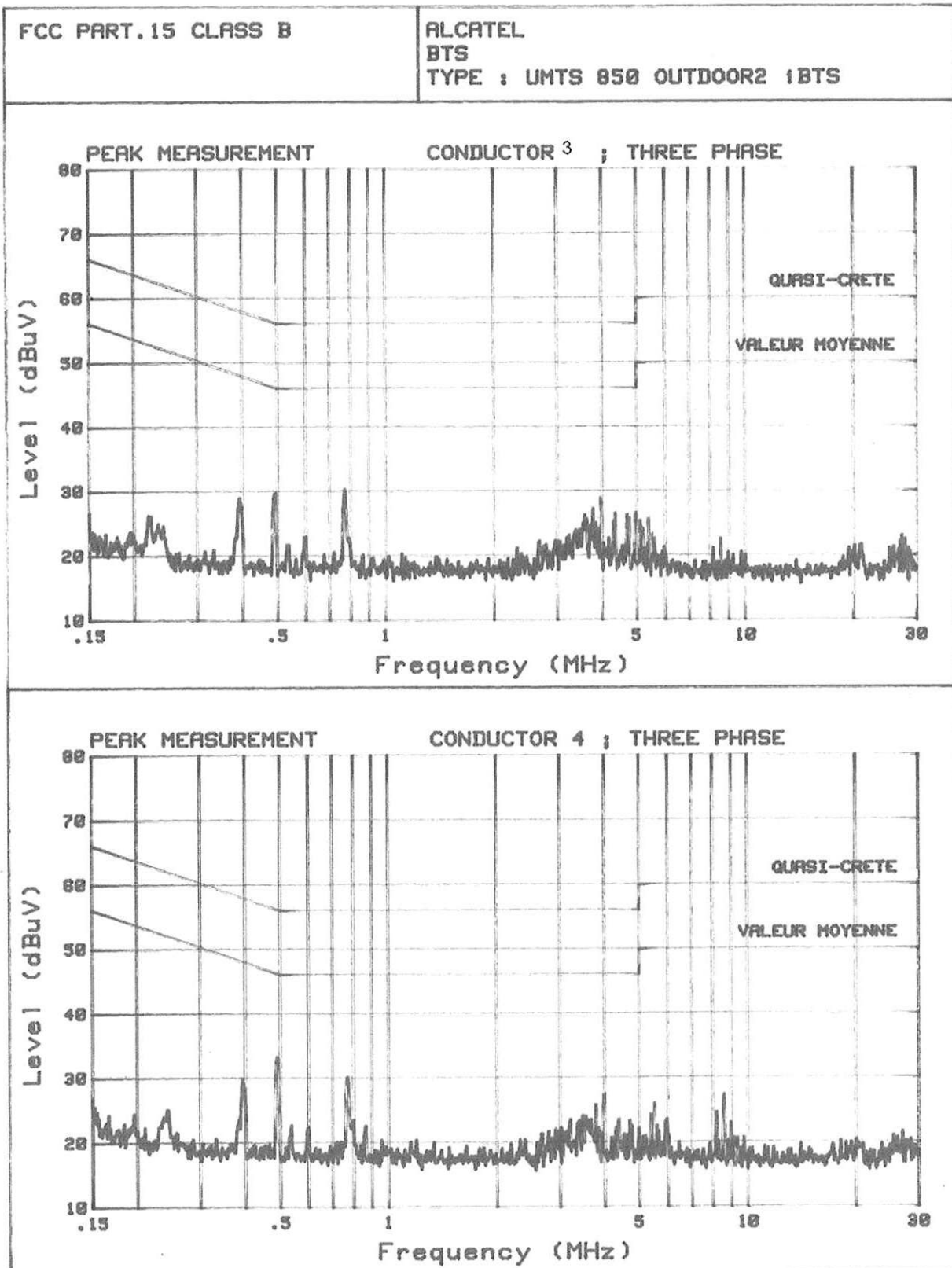


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Diagram n°4



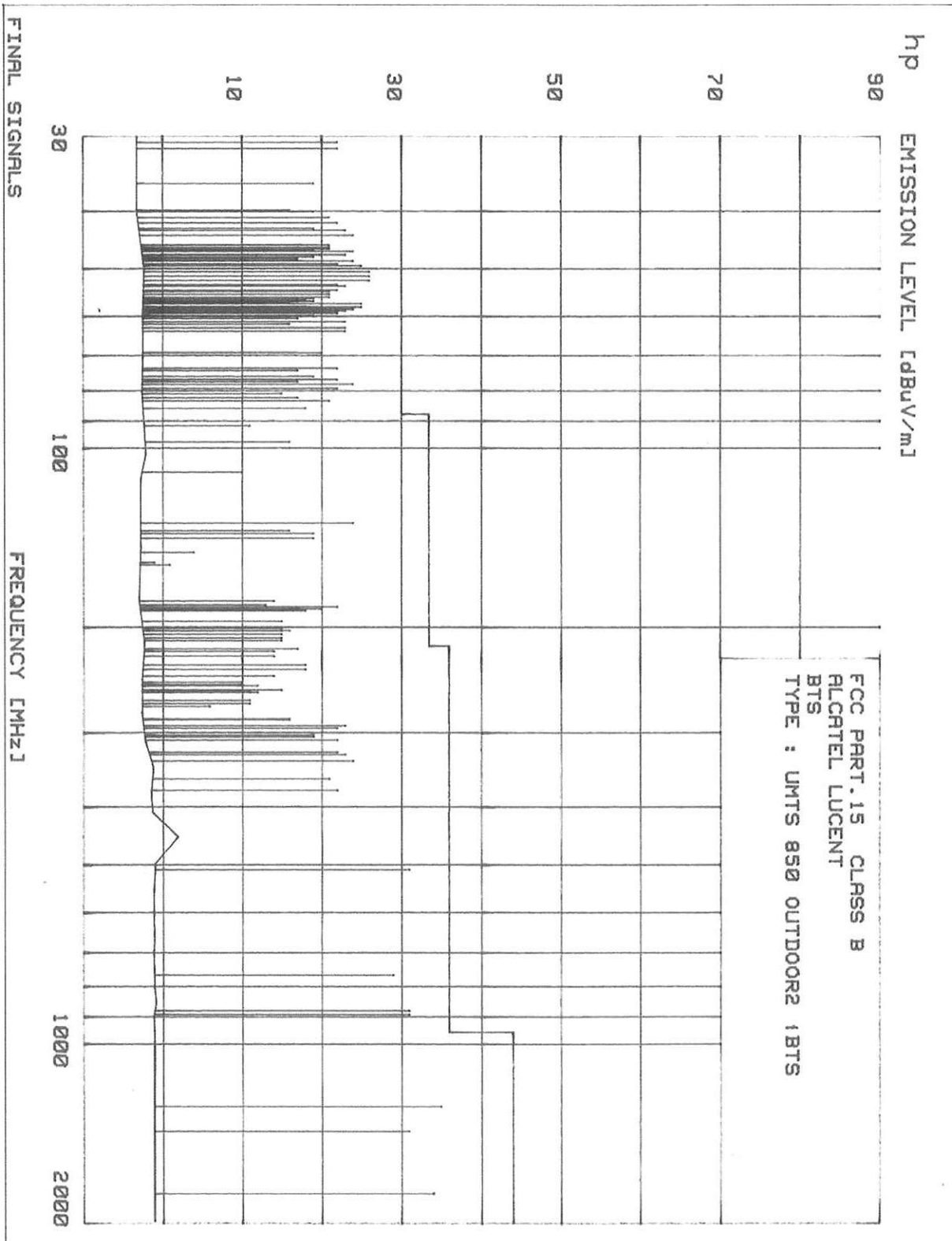


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Diagram n° 5



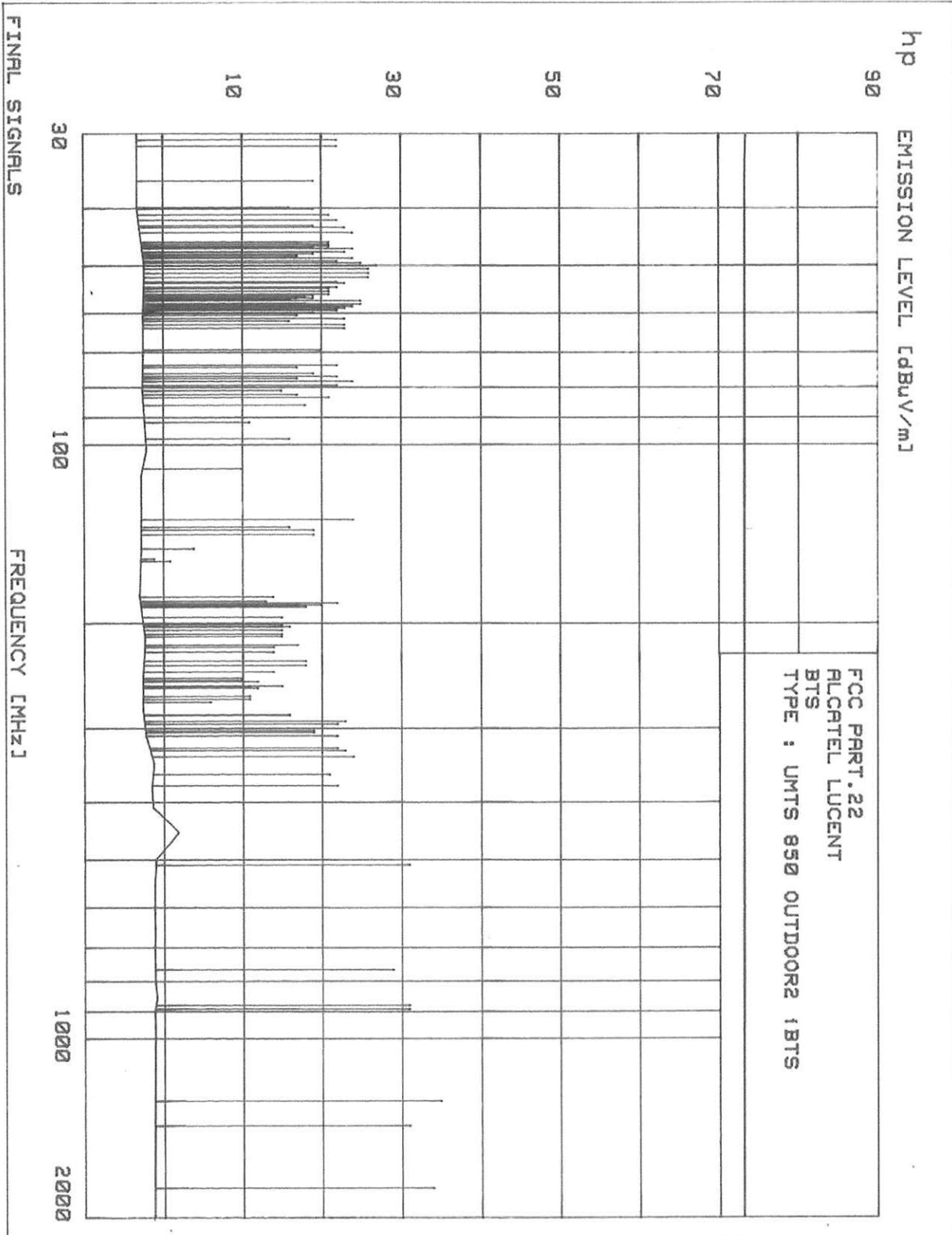


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Diagram n° 6





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Table n°1

Measurement at transmitters frequencies for indicative level

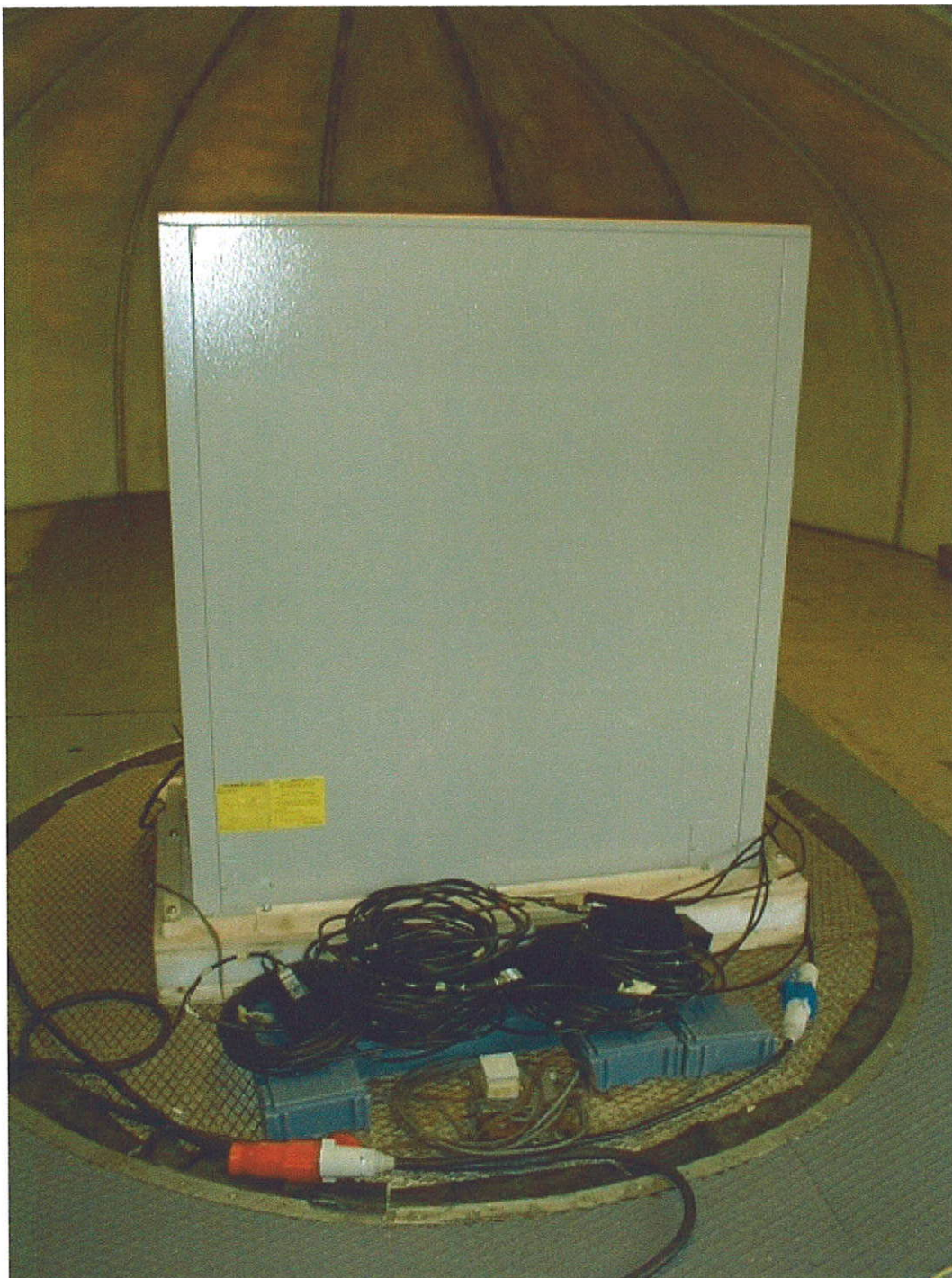
Frequency (MHz)	Level (dB $\mu$ V/m)
881.8	66
887.2	64

Photo N° 1





Photo N° 2





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**LISTE DU MATERIEL / EQUIPMENT LIST**

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



**TABLE DES INCERTITUDES / UNCERTAINTIES CHART**

Type de mesure / Kind of measurement	Incertitude élargie laboratoire / Wide uncertainty laboratory (k=2) $\pm x$ (dB)	Incertitude limite du CISPR / CISPR uncertainty limit $\pm y$ (dB)
Mesure des perturbations conduites en tension sur le réseau d'énergie « alternatif » sur le site de Fontenay-aux-Roses / <i>Measurement of conducted disturbances in voltage on the AC power port on the Fontenay-aux-Roses site.</i>	3.56	3.6
Mesure des perturbations conduites en tension sur le réseau d'énergie « alternatif » sur le site en espace libre d'Ecuelles / <i>Measurement of conducted disturbances in voltage on the AC power port on the Ecuelles site.</i>	3.50	3.6
Mesure des perturbations conduites en tension sur le réseau d'énergie « continu » sur le site de Fontenay-aux-Roses / <i>Measurement of conducted disturbances in voltage on the DC power port on the Fontenay-aux-Roses site.</i>	3.56	3.6
Mesure des perturbations conduites en tension sur le réseau d'énergie « continu » sur le site en espace libre d'Ecuelles. / <i>Measurement of conducted disturbances in voltage on the DC power port on the Ecuelles site.</i>	3.56	3.6
Mesure des perturbations conduites en tension sur le réseau de télécommunication / <i>Measurement of conducted disturbances in voltage on the telecommunication port.</i>	3.28	A l'étude / Under consideration
Mesure des perturbations conduites en courant / <i>Measurement of conducted disturbances in current</i>	2.90	A l'étude / Under consideration
Mesure du champ électrique rayonné de 30 à 200MHz en polarisation horizontale sur le site de Fontenay-Aux-Roses / <i>Measurement of radiated electric field from 30 to 200MHz in horizontal position on the Fontenay-aux-Roses site</i>	4.58	5.2
Mesure du champ électrique rayonné de 30 à 200MHz en polarisation verticale sur le site de Fontenay-Aux-Roses / <i>Measurement of radiated electric field from 30 to 200MHz in vertical position on the Fontenay-aux-Roses site</i>	4.82	5.2
Mesure du champ électrique rayonné de 200 à 1000MHz sur le site de Fontenay-Aux-Roses / <i>Measurement of radiated electric field from 200 to 1000MHz on the Fontenay-aux-Roses site</i>	4.92	5.2
Mesure du champ électrique rayonné de 1 à 18GHz sur le site de Fontenay-Aux-Roses / <i>Measurement of radiated electric field from 1 to 18GHz on the Fontenay-aux-Roses site</i>	6.54	A l'étude / Under consideration
Mesure du champ électrique rayonné de 30 à 1000MHz sur le site en espace libre d'Ecuelles / <i>Measurement of radiated electric field from 30 to 1000MHz on the Ecuelles site</i>	4.72	5.2
Mesure du champ électrique rayonné de 1 à 6GHz sur le site en espace libre d'Ecuelles / <i>Measurement of radiated electric field from 1 to 6GHz on the Ecuelles site</i>	5.60	A l'étude / Under consideration
Mesure du champ électrique rayonné de 6 à 18GHz sur le site en espace libre d'Ecuelles / <i>Measurement of radiated electric field from 6 to 18GHz on the Ecuelles site</i>	5.83	A l'étude / Under consideration
Mesure de la puissance perturbatrice / <i>Measurement of disturbance power</i>	3.37	4.5
Immunité aux perturbations conduites, induites par les champs radioélectriques / <i>Immunity to conducted disturbances, induced by radio electric field</i>	2.36	/
Immunité aux perturbations conduites, induites par les champs radioélectriques, méthode de la pince d'injection / <i>Immunity to conducted disturbances, induced by radio electric field, method oh the injection clamp</i>	2.76	/
Immunité aux champs radioélectriques rayonnés de 80MHz à 2.6GHz / <i>Immunity to radiated radio electric field from 80MHz to 2.6GHz</i>	2.64	/

Les valeurs d'incertitudes calculées du laboratoire étant inférieures aux valeurs d'incertitudes limites établies par le CISPR, la conformité de l'échantillon est établie directement par les niveaux limites applicables. / *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.*