

TEST REPORT



Reg. no. 19

DELTA

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Light & Acoustic

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**Measurements of radio frequency interference from
Masquerade II x82 105 / SafePipe x83 106
Performed for i-data International A/S**

**Project no.: K221300-1
Date: 2000-09-21**

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The requirements to the accredited testing laboratories are laid down in the Danish Agency for Development of Trade and Industry Statutory Order No. 258 of 11 April 1994 on accreditation of laboratories to perform technical testing etc.

The standards DS/EN 45001 „General criteria for the operation of testing laboratories“ and DS/EN 45002 „General criteria for the assessment of testing laboratories“ are integrated parts of the statutory order.

In order to obtain accreditation to perform technical testing it is, among other things, required:

- that the testing laboratory and its personnel are free from any commercial, financial and other pressures which might influence their technical judgement.
- that the testing laboratory operates a quality system which is documented.
- that the testing laboratory is furnished with items of

- equipment required for correct performance of the tests and measurements which the laboratory is accredited to perform.
- that the testing laboratory has sufficient personnel, having the necessary education, training, technical knowledge and experience for their assigned functions.
- that the testing laboratory has procedures for traceable calibration of equipment used for accredited testing.
- that accredited testing is performed after fully documented methods.
- that the testing laboratory has records which contain sufficient information to permit repetition of the test.
- that the testing laboratory is assessed and surveyed by DANAK on a regular basis.
- that the accredited laboratory shall take out an insurance which will cover liability in connection with accredited testing

Test reports carrying the logo of DANAK are used to report accredited testing and the logo shows that the testing has been performed in accordance with the rules of accreditation.



Title Measurements of radio frequency interference from
Masquarade II x82 105 / SafePipe x83 106

Test objects Masquarade II x82 105 / SafePipe x83 106

Report no. DANAK-195214

Project no. K221300-1

Date of test 2000-09-13

Client i-data International A/S
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Contact person Mr. Kim Boll Jensen

Manufacturer i-data International A/S

Specifications EN 55022:1998 (CISPR 22:1997)
FCC part 15 Subpart B class B demonstrated by compliance with EN 55022.

Results The emission from the test object was below the limit of the above specifications.

Test personnel Henrik Egeberg Nielsen

Date 2000-09-21

Project manager



Per Hansen,
Facility Manager, EMC
DELTA

Responsible



Jørgen Duvald Christensen,
Department Manager, EMC
DELTA

The client has received this report in electronic form. DELTA keeps a paper copy of the report.

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electromagnetic field (FCC, class B / EN 55022, class B)
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Annex 6 Test record sheets and photos regarding conducted emission at
telecommunication ports (EN 55022 class B) (6 pages)

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1. **Summary of test results**

The results of the emission tests can be summarised as follows:

Emission tests	EN 55022:1998 (CISPR 22:1997)	FCC part 15 Subpart B class B demonstrated by compliance with EN 55022
Conducted emission, AC mains	Passed	Passed
Radiated electromagnetic field	Passed	Passed
Conducted emission, telecommunication ports	Passed	N / A

Abbreviations : Passed : The emission was below the limit.
 Not done : No test was performed.
 N/A : Not applicable.
 Not relevant : The test was not relevant for the test object.

The test results relate only to the specimen tested.

2. **Test specimen**

Category : Network equipment

Manufacturer : i-data International A/S

Model/Type : Masquarade II / SafePipe

Part no. : x82 105 / x83 106

Serial no. : -

Supply voltage : 115 VAC and 230 VAC

Operational mode : The PC (3.1.2) was running a test programme, which activated all functions and simulated full communication on all ports.

Comments : According to the manufacturer the tested product, Masquarade II x82 105, also covers functions and modules available in SafePipe x83 106. As the two products are identical, except that SafePipe x83 106 is not equipped with harddisc or ISDN port, the tests cover the worst case of EMC configuration, and therefore both products are covered by this report.

3. General test conditions

3.1 Test set-up

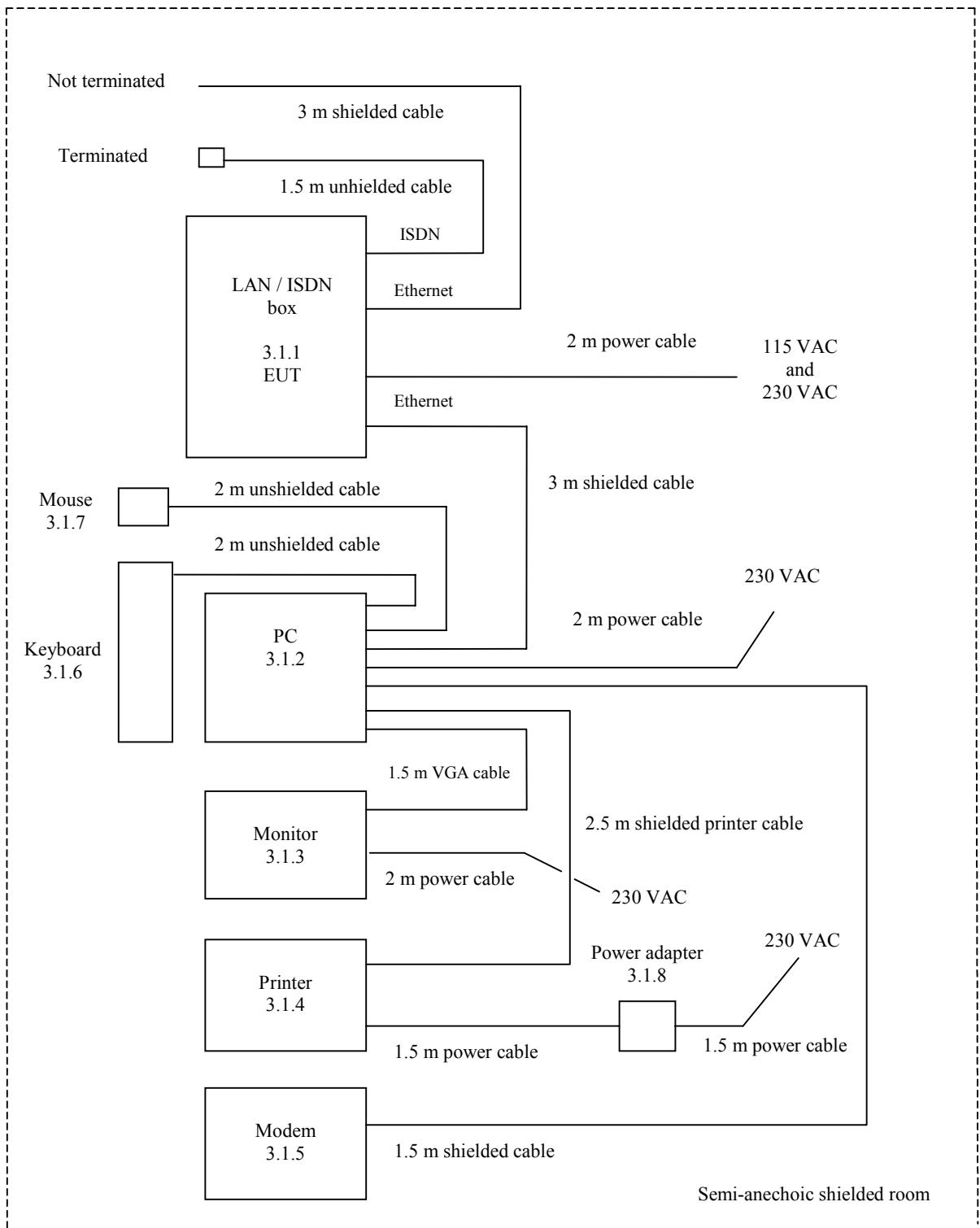


FIG. 1 Test set-up including test object and peripheral equipment

The complete system used during the tests consisted of the following units:

3.1.1 *LAN / ISDN box*

EUT

Manufacturer	:	i-data International A/S
Model/type	:	Masquarade II / SafePipe
Part no.	:	X82 105 / X83 106
Serial no.	:	2000218004 (MAC 00036E1F2398)
FCC ID	:	-

3.1.2 *PC*

Manufacturer	:	DELL
Model/type	:	Dimension L 566 cx
Part no.	:	MCM
Serial no.	:	LPQAN 36472415
FCC ID	:	Tested to comply with FCC Standards

3.1.3 *Monitor*

Manufacturer	:	Hewlett Packard
Model/type	:	D2818A / Ultra VGA 1280
Part no.	:	-
Serial no.	:	KR60833294
FCC ID	:	A3LCMG737

3.1.4 *Printer*

Manufacturer	:	Hewlett Packard
Model/type	:	DeskJet 895 Cxi
Part no.	:	C6410A
Serial no.	:	SG89A2W2HT
FCC ID	:	Tested to comply with FCC Standards

3.1.5 Modem

Manufacturer	:	USB
Model/type	:	56K Fax / Modem
Part no.	:	-
Serial no.	:	US09000001
FCC ID	:	MQ4USM560

3.1.6 Keyboard

Manufacturer	:	DELL
Model/type	:	SK-8000
Part no.	:	-
Serial no.	:	DP/N 025YME
FCC ID	:	Tested to comply with FCC Standards

3.1.7 Mouse

Manufacturer	:	Logitech
Model/type	:	M-S48a
Part no.	:	-
Serial no.	:	LZC01961100
FCC ID	:	JNZ201213

3.1.8 Power Adapter

Manufacturer	:	Hewlett Packard
Model/type	:	C6409-60014
Part no.	:	ADP-20HB Rev.A
Serial no.	:	T5838041928
FCC ID	:	-

4. Tests and results

4.1 Conducted emission, AC mains (EN 55022, class B)

	Requirements
Specification	EN 50081-1:1992
Test method	EN 55022:1998 (CISPR 22:1997)
Frequency range	0.15 - 30 MHz
Limit: (quasi-peak)	0.15-0.50 MHz: 66-56 dB μ V (decreasing lin. with the logarithm of freq.) 0.50-5 MHz: 56 dB μ V 5-30 MHz: 60 dB μ V
Limit: (average)	0.15-0.50 MHz: 56-46 dB μ V (decreasing lin. with the logarithm of freq.) 0.50-5 MHz: 46 dB μ V 5-30 MHz: 50 dB μ V
Test record sheets and photos	<i>Annex 2</i>

Results:

The emission was within the specified limits.

Climatic conditions:

22.3°C and 43.5 %RH

Comments:

Supply power was 230 VAC.

4.2 Radiated electromagnetic field (EN 55022, class B)

	Requirements	
Specification	EN 50081-1:1992	
Test method	EN 55022:1998 (CISPR 22:1997)	
Measuring distance	10 m	
Frequency range	30 - 1000 MHz	
Limit: (quasi-peak)	30-230 MHz:	30 dB μ V/m
	230-1000 MHz:	37 dB μ V/m
Test record sheets and photos	<i>Annex 3</i>	

Results:

The emission was within the specified limits.

Climatic conditions:

22.3°C and 43.5 %RH

Comments:

Supply power was 115 VAC.

4.3 **Conducted emission, AC mains (FCC, class B / EN 55022, class B)**

	Requirements
Specification	FCC Rules and Regulations:1997, part 15, subpart B class B, demonstrated by compliance with EN 55022
Test method	CISPR 22:1997
Frequency range	0.15 - 30 MHz
Test set-up	ANSI C63.4:1992
Limit: (quasi-peak)	0.15-0.50 MHz: 66-56 dB μ V (decreasing lin. with the logarithm of freq.) 0.50-5 MHz: 56 dB μ V 5-30 MHz: 60 dB μ V
Limit: (average)	0.15-0.50 MHz: 56-46 dB μ V (decreasing lin. with the logarithm of freq.) 0.50-5 MHz: 46 dB μ V 5-30 MHz: 50 dB μ V
Test record sheets and photos	<i>Annex 4</i>

Results:

The emission was within the specified limits.

Climatic conditions:

22.3°C and 43.5 %RH

Comments:

Supply power was 115 VAC.

4.4 Radiated electromagnetic field (FCC, class B / EN 55022, class B)

	Requirements
Specification	FCC Rules and Regulations:1997, part 15, subpart B, class B, demonstrated by compliance with EN 55022
Test method	CISPR 22:1997
Test set-up	ANSI C63.4:1992
Measuring distance	10 m
Frequency range	30 – 1000 MHz
Limit: (quasi-peak)	30-230 MHz: 30 dB μ V/m 230-1000 MHz: 37 dB μ V/m
Test record sheets and photos	<i>Annex 5</i>

Results:

The emission was within the specified limits.

Climatic conditions:

22.3°C and 43.5 %RH

Comments:

Supply power was 115 VAC.

4.5 **Conducted emission at telecommunication ports (EN 55022, class B)**

	Requirements
Specification	EN 50081-1:1992
Test method	EN 55022:1998 (CISPR 22:1997), class B
Frequency range	0.15 - 30 MHz
Limit: (quasi-peak)	0.15-0.50 MHz: 40 - 30 dB μ A (decreasing lin. with the logarithm of freq.) 0.50-30 MHz: 30 dB μ A
Limit: (average)	0.15-0.50 MHz: 30 - 20 dB μ A (decreasing lin. with the logarithm of freq.) 0.50-30 MHz: 20 dB μ A
Test record sheets and photos	<i>Annex 6</i>

Results:

The emission was within the specified limits.

Climatic conditions:

22.3°C and 43.5 %RH

Comments:

Supply power was 230 VAC.

Test at ISDN port using unshielded cable:

During the measurement of conducted RF disturbance current on the telecommunication ports, the port is connected to an ISN with a CM impedance of 150 ohm and an unbalance according to CISPR 22:1997. The unbalance of the ISN is according to a category 3 UTP cable (50 dB to 25 dB). The measurement is performed twice using an unbalance to each of the two leads in the twisted pairs (upper connector and lower connector of the ISN). Both measurements shall be below the limit in order to pass the requirements of the standard. Test was performed using both 50 dB and 80 dB balance.

Test at Ethernet port using shielded cable:

Test was performed according to CISPR22:1997 configuration C.1.2 (using 150 Ω resistor, ferrite tube and current probe).

Annex 1

List of instruments

(1 page)

List of instruments

EC NO.	INSTRUMENT	MANUFACTURER	TYPE
29797 6111A	BILOG ANTENNA, 30-1000 MHz	CHASE	CBL
29301	ARTIFICIAL MAINS NETWORK	ROHDE & SCHWARZ	ESH2-Z5
29916	AUTOMATIC EMI RECEIVER	ROHDE & SCHWARZ	ESCS-30
29861	EMI-SOFTWARE Ver. 1.6	ROHDE & SCHWARZ	ES-K1
29697	FERRITE TUBE CLAMP	LUTHI	FTC 101
49014	DUAL 2 WIRE ISN FOR SIGN. CABLES	ROHDE & SCHWARZ	ENY 22 1109.9508.0
29995	RF CURRENT PROBE	EMCO	91550-1L

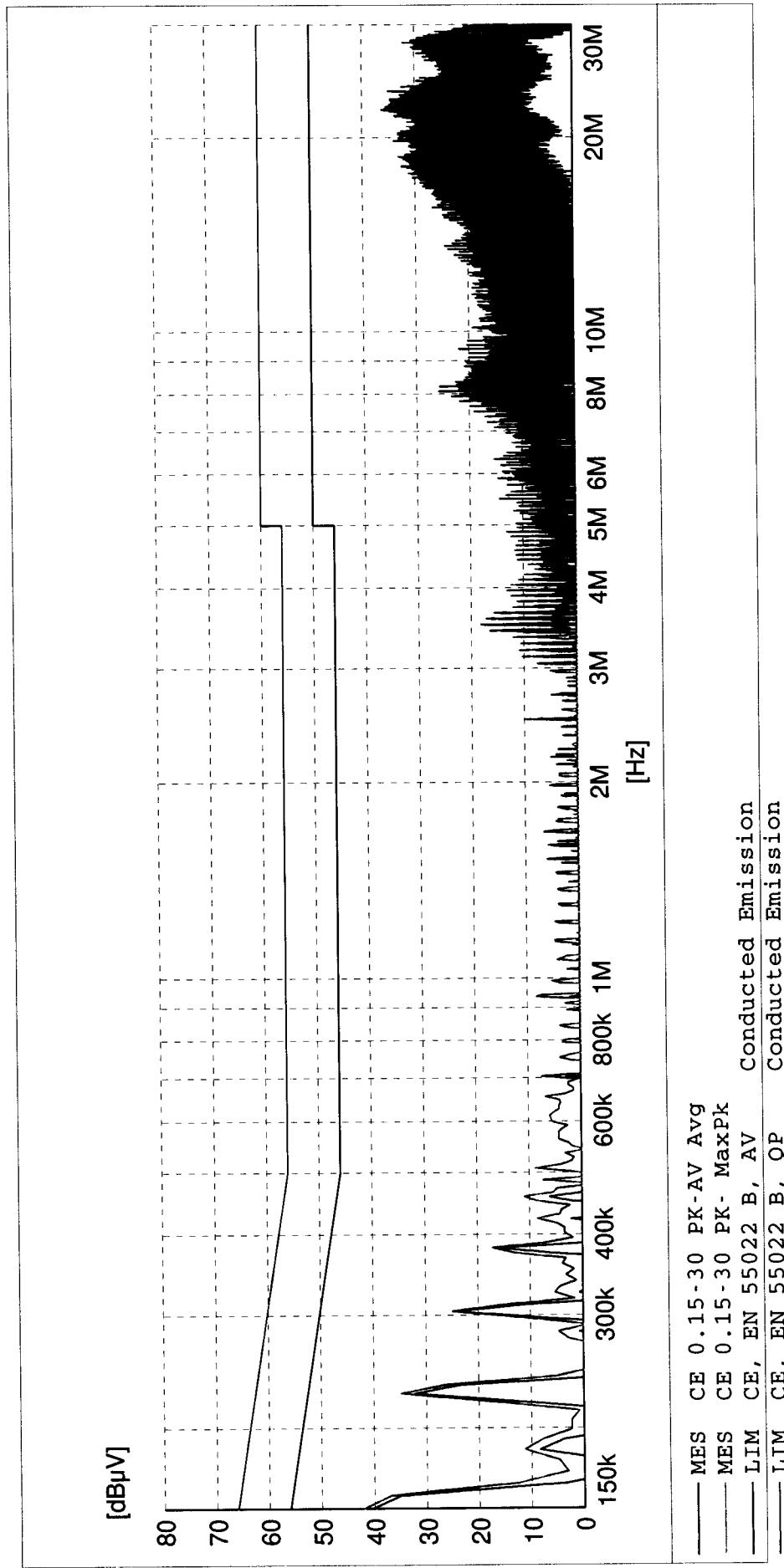
Annex 2

***Test record sheets and photos regarding
conducted emission, AC mains (EN 55022, class B)***

(3 pages)

DELTA Electronics Testing.

BUT: Masquarade II X82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: Neutral. 230 VAC.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 class B
Comment: Sheet 7
Start of Test: 2000-09-13



DELTA Electronics Testing.

EUT: Masquerade II X82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: Line 1. 230 VAC.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 Class B
Comment: Sheet 6
Start of Test: 2000-09-13

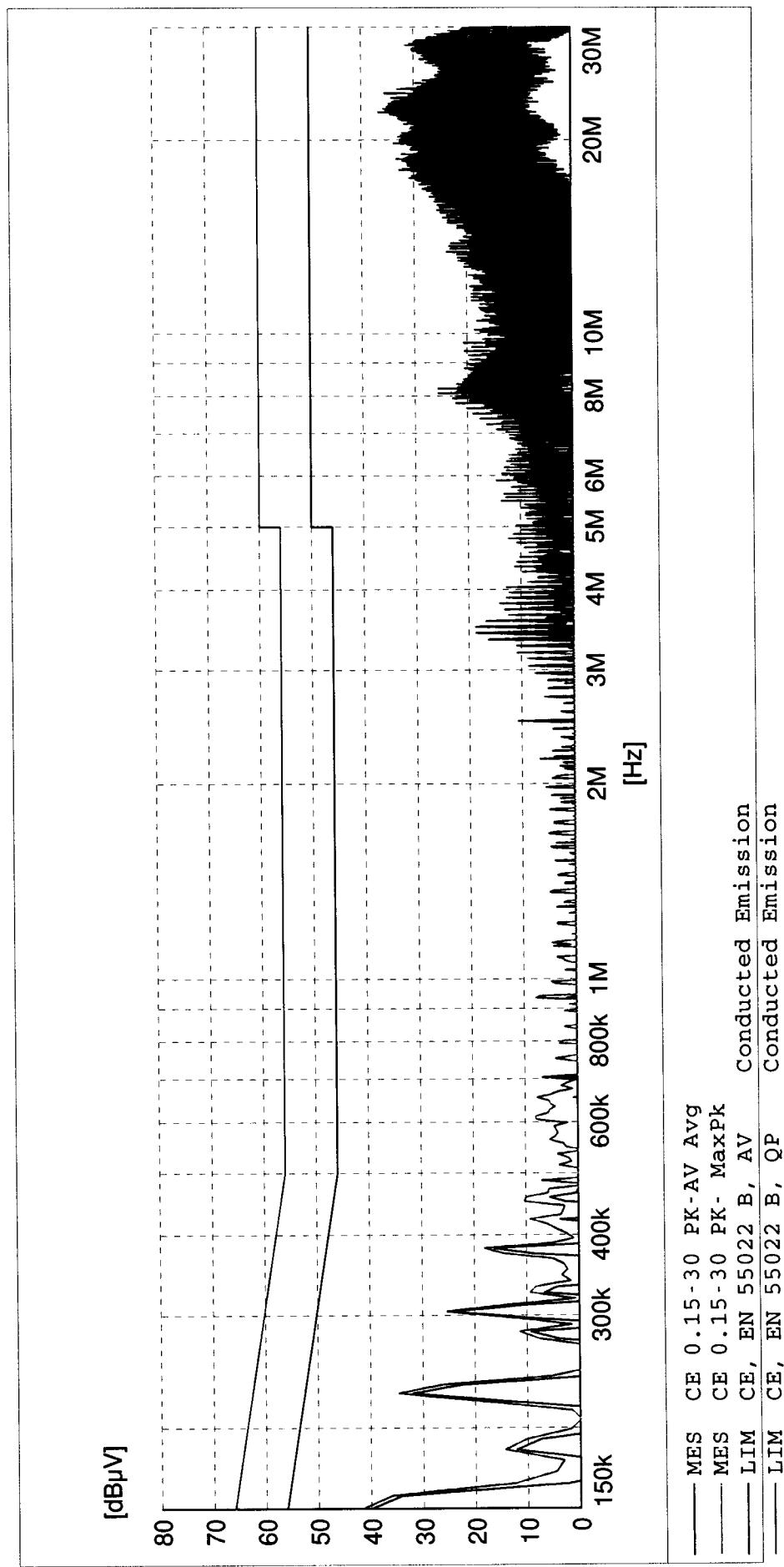




PHOTO A2.1

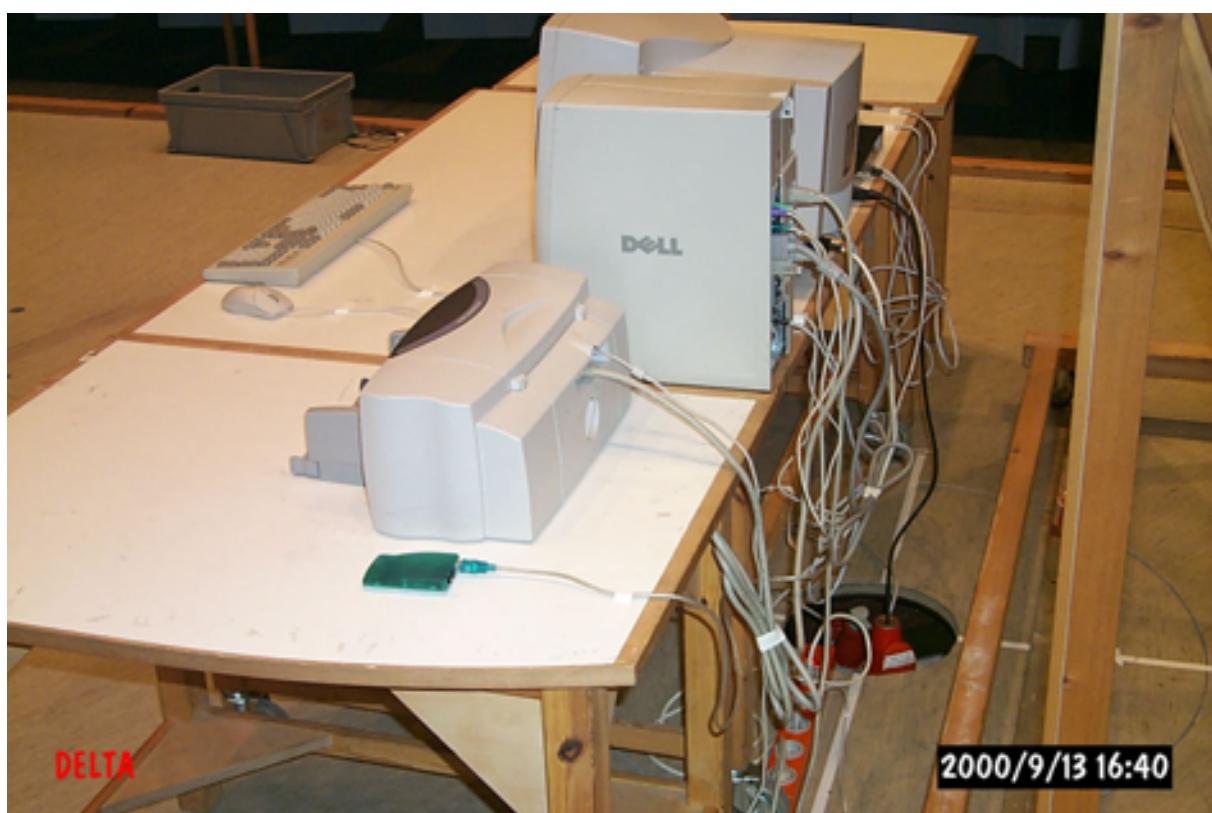


PHOTO A2.2

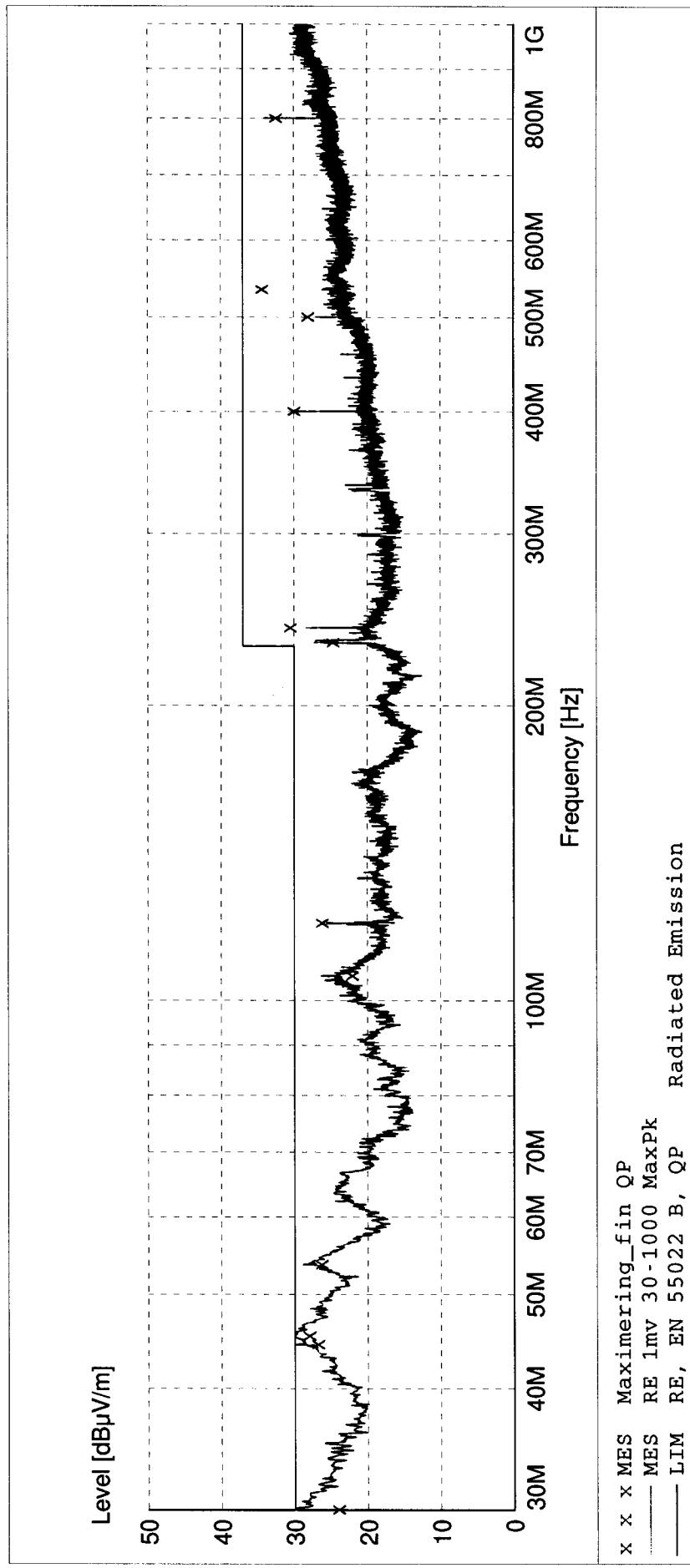
Annex 3

***Test record sheets and photos regarding
radiated electromagnetic field (EN 55022, class B)***

(3 pages)

DELTA Electronics Testing.

EUT: Masquerade II X82105, x83106
Manufacturer: I-Data
Operating Condition: Ant. 1 m vertical. 115 VAC.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 class B
Comment: Sheet 2
Start of Test: 2000-09-13



MEASUREMENT RESULT: "Maximering_f1n_QP"

9/13/00	14:26	Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
		MHz	dB μ V/m	dB	dB μ V/m	dB	cm	deg	
30.000000		24.30	18.8	30.0	5.7	113.0	158.00		VERTICAL
44.400000		27.10	11.5	30.0	2.9	101.0	193.00		VERTICAL
45.300000		28.30	11.1	30.0	1.7	101.0	140.00		VERTICAL
53.600000		26.60	7.3	30.0	3.4	260.0	133.00		VERTICAL
106.000000		22.40	11.0	30.0	7.6	177.0	334.00		VERTICAL
120.000000		26.50	11.7	30.0	3.5	111.0	96.00		VERTICAL
232.000000		25.00	10.7	37.0	12.0	111.0	294.00		VERTICAL
240.020000		30.80	11.7	37.0	6.2	101.0	290.00		VERTICAL
400.000000		30.30	17.0	37.0	6.7	110.0	329.00		VERTICAL
500.000000		28.40	19.1	37.0	8.6	209.0	165.00		HORIZONTAL
533.330000		34.70	19.9	37.0	2.3	192.0	229.00		HORIZONTAL
800.000000		32.80	23.5	37.0	4.2	147.0	0.00		VERTICAL



PHOTO A3.1

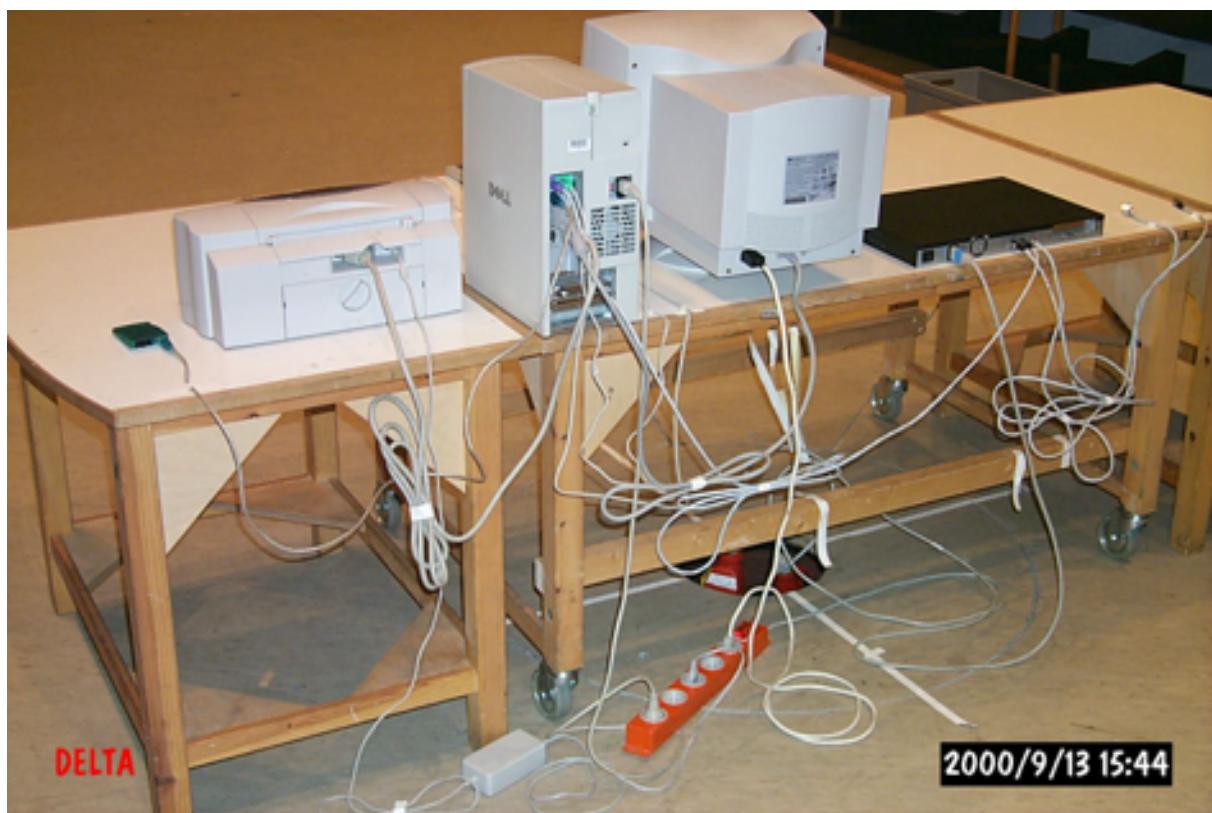


PHOTO A3.2

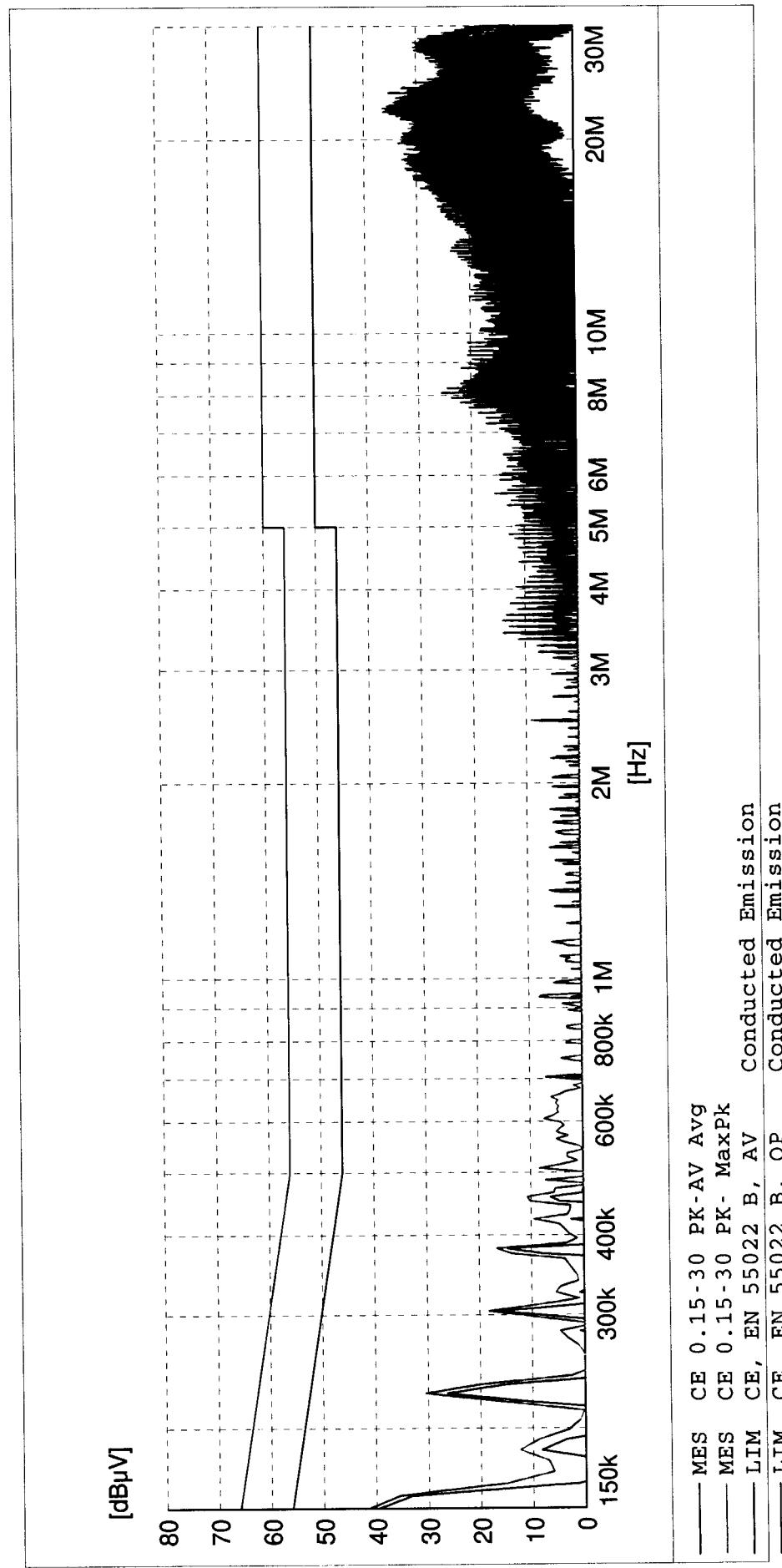
Annex 4

***Test record sheets and photos regarding
conducted emission, AC mains (FCC class B / EN 55022 class B)***

(3 pages)

DELTA Electronics Testing.

EUT: Masquarade II X82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: Neutral. 115 VAC.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 class B
Comment: Sheet 4
Start of Test: 2000-09-13



DELTA Electronics Testing.

EUT: Masquerade II X82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: Line 1. 115 VAC.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 class B
Comment: Sheet 5
Start of Test: 2000-09-13

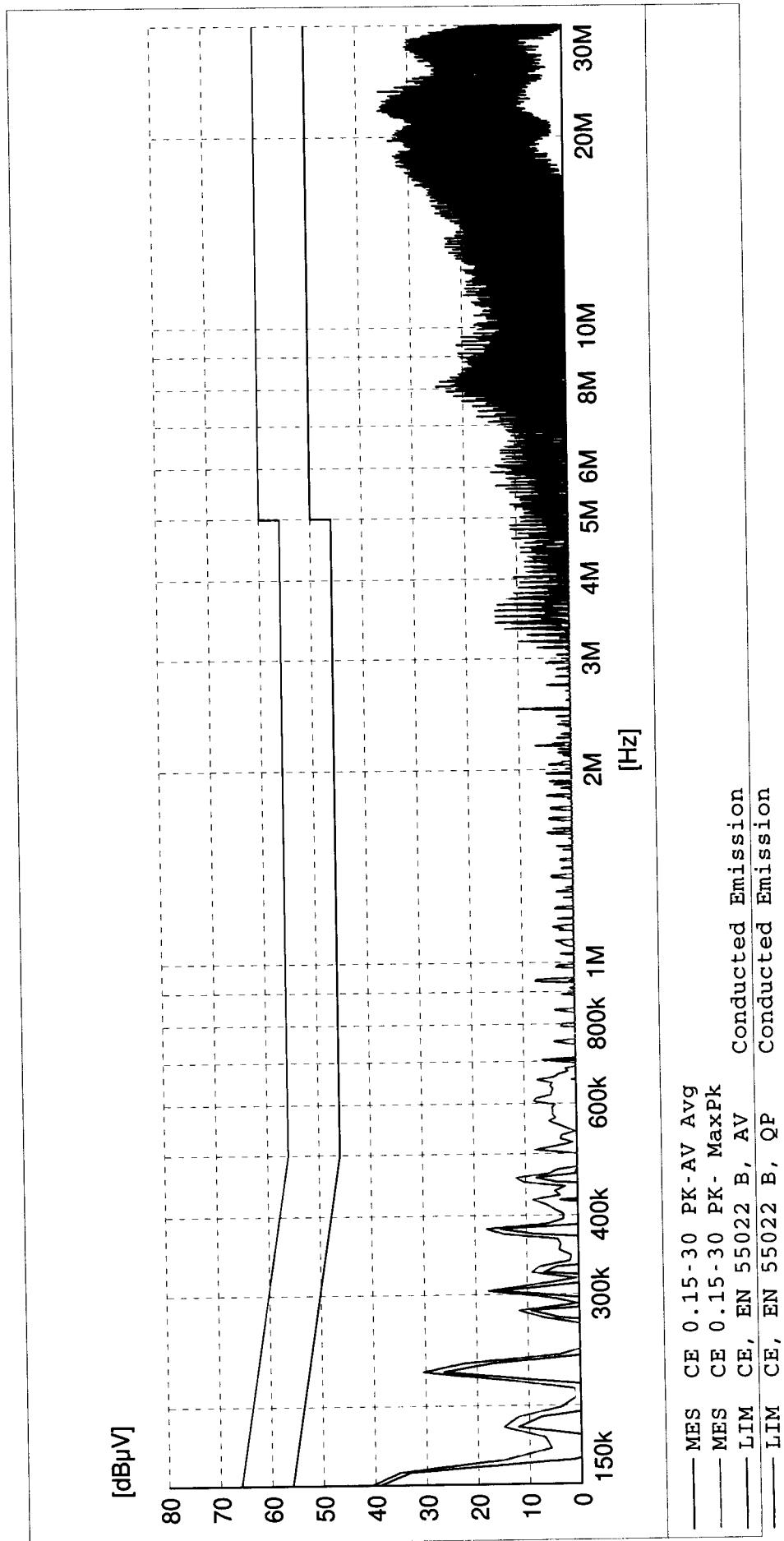




PHOTO A4.1

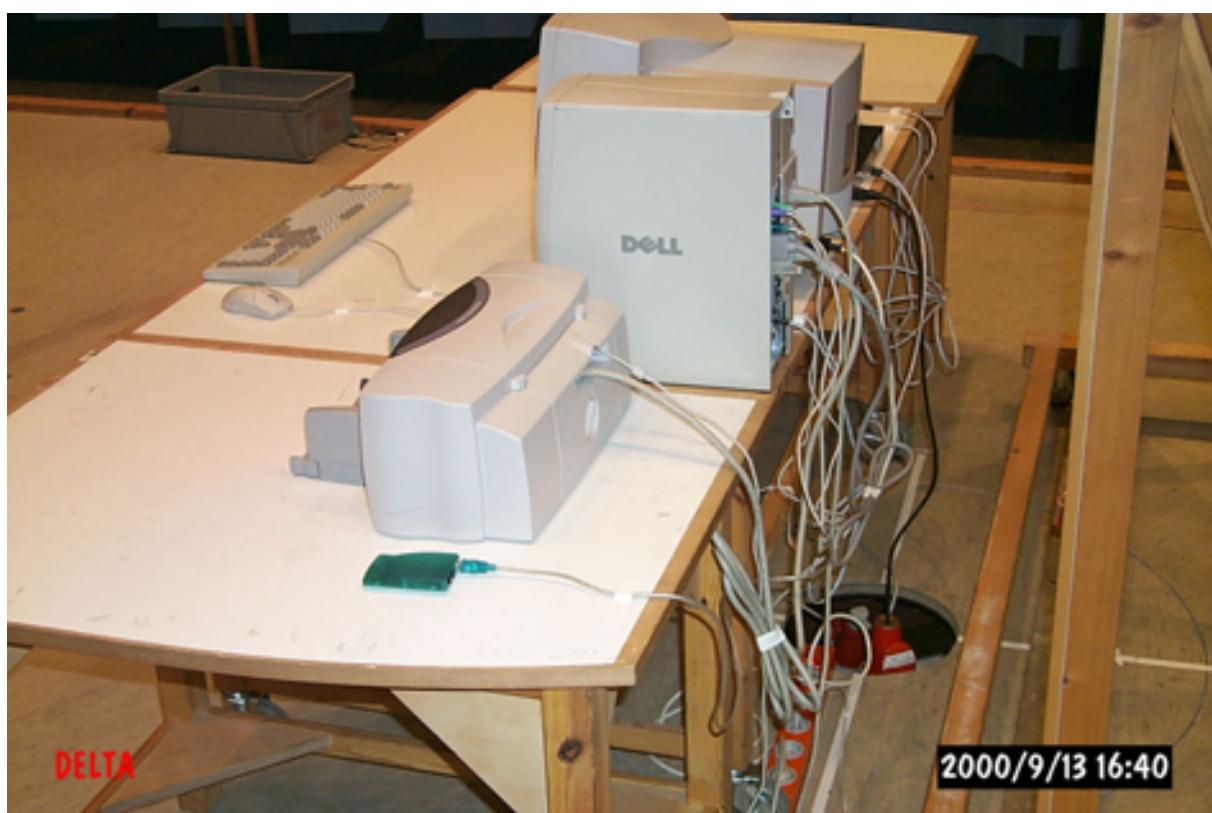


PHOTO A4.2

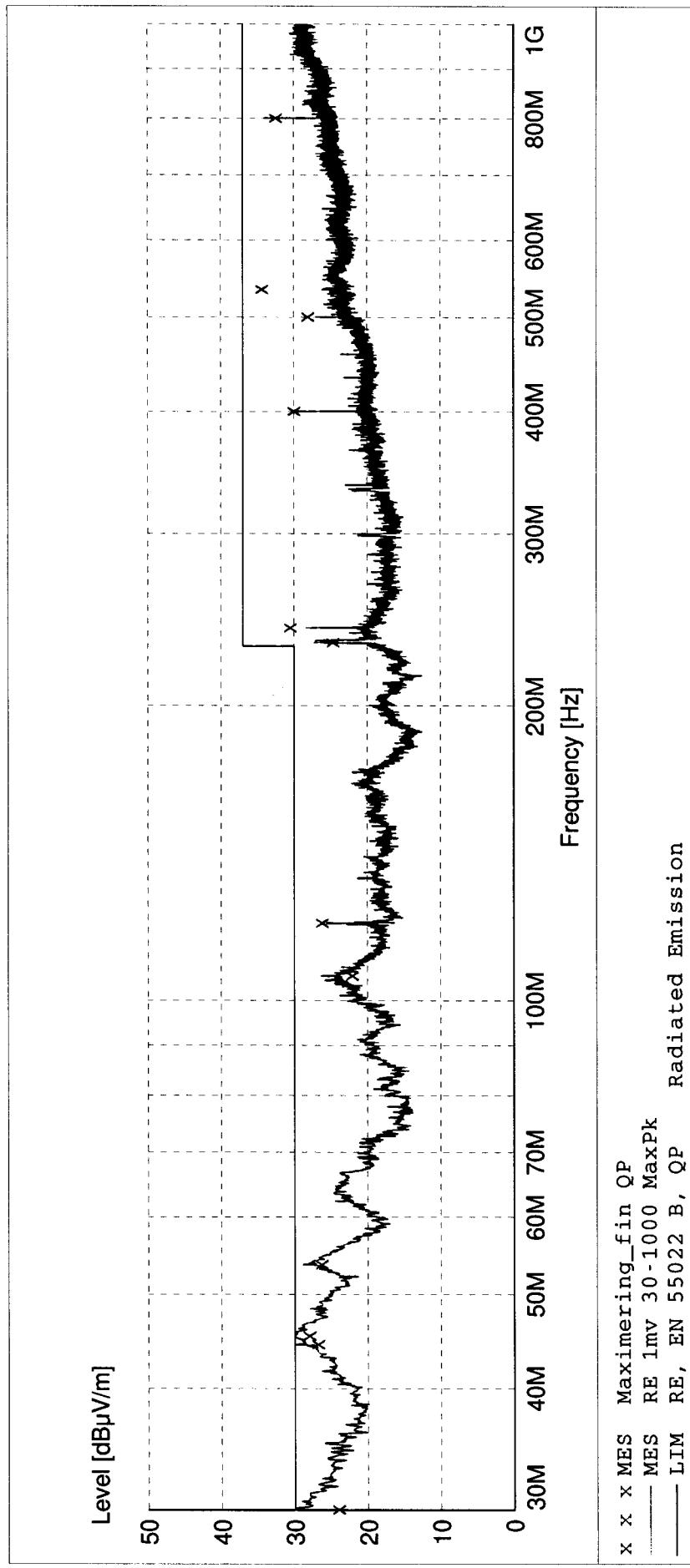
Annex 5

***Test record sheets and photos regarding
radiated electromagnetic field (FCC, class B / EN 55022, class B)***

(3 pages)

DELTA Electronics Testing.

EUT: Masquerade II X82105, x83106
Manufacturer: I-Data
Operating Condition: Ant. 1 m vertical. 115 VAC.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 class B
Comment: Sheet 2
Start of Test: 2000-09-13



MEASUREMENT RESULT: "Maximering_f1n_QP"

9/13/00	14:26	Frequency	Level	Transd	Limit	Margin	Height	Azimuth	Polarisation
		MHz	dB μ V/m	dB	dB μ V/m	dB	cm	deg	
30.000000		24.30	18.8	30.0	5.7	113.0	158.00		VERTICAL
44.400000		27.10	11.5	30.0	2.9	101.0	193.00		VERTICAL
45.300000		28.30	11.1	30.0	1.7	101.0	140.00		VERTICAL
53.600000		26.60	7.3	30.0	3.4	260.0	133.00		VERTICAL
106.000000		22.40	11.0	30.0	7.6	177.0	334.00		VERTICAL
120.000000		26.50	11.7	30.0	3.5	111.0	96.00		VERTICAL
232.000000		25.00	10.7	37.0	12.0	111.0	294.00		VERTICAL
240.020000		30.80	11.7	37.0	6.2	101.0	290.00		VERTICAL
400.000000		30.30	17.0	37.0	6.7	110.0	329.00		VERTICAL
500.000000		28.40	19.1	37.0	8.6	209.0	165.00		HORIZONTAL
533.330000		34.70	19.9	37.0	2.3	192.0	229.00		HORIZONTAL
800.000000		32.80	23.5	37.0	4.2	147.0	0.00		VERTICAL



PHOTO A5.1



PHOTO A5.2

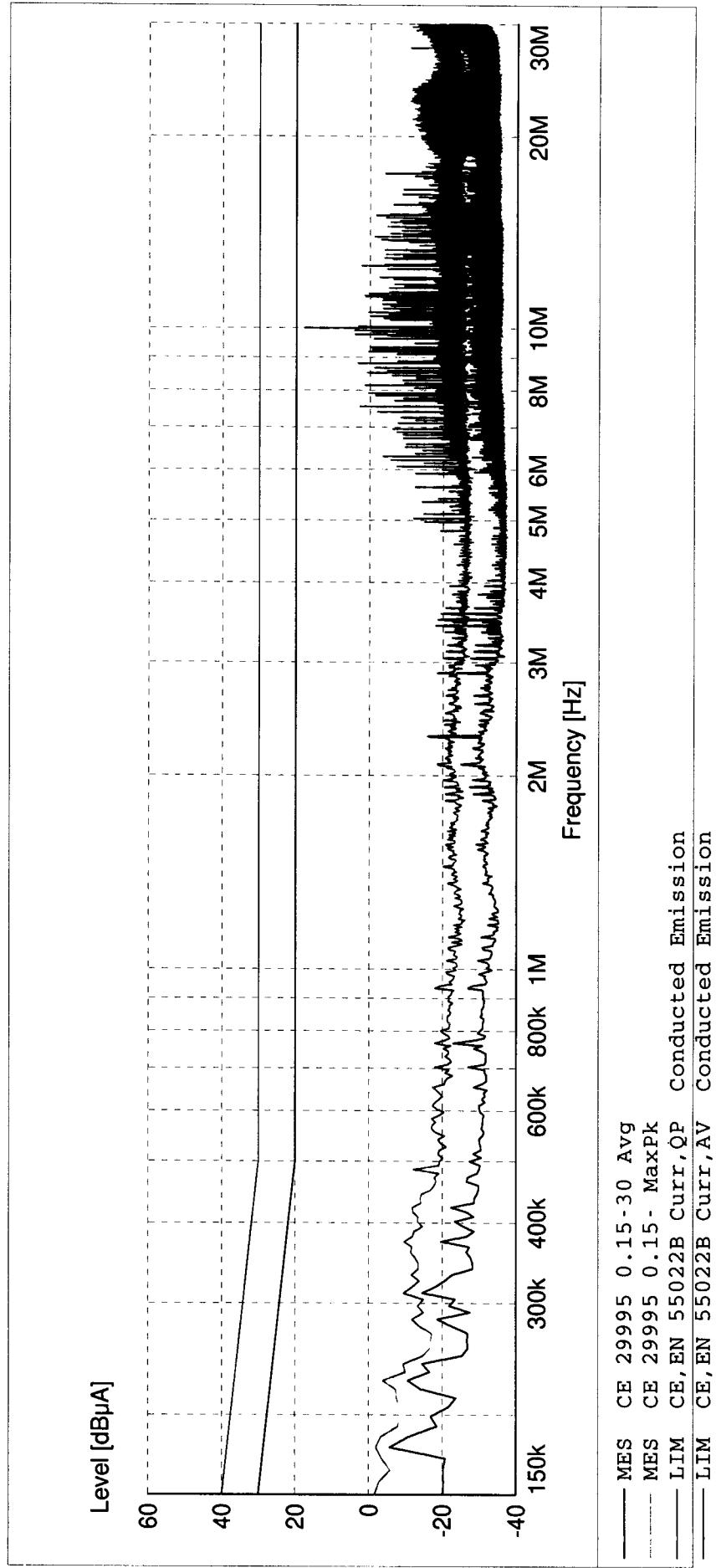
Annex 6

***Test record sheets and photos regarding
conducted emission at telecommunication ports
(EN 55022 class B)***

(6 pages)

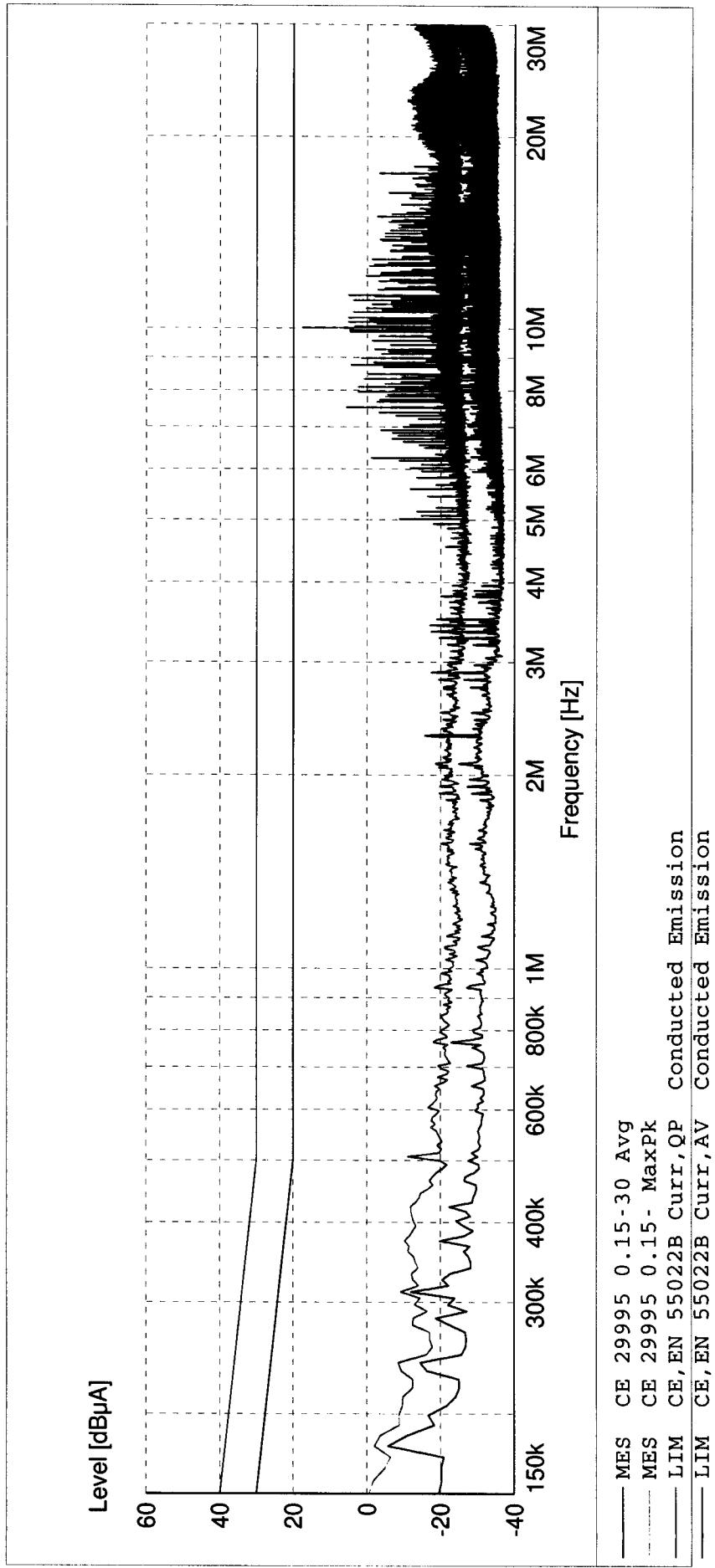
DELTA Electronics Testing.

EUT:
Manufacturer: Masquerade II x82105, x83106
Operating Condition: I-Data
Line no.: ISDN. (Lo)
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 Class B
Comment: Sheet 11
Start of Test: 2000-09-14



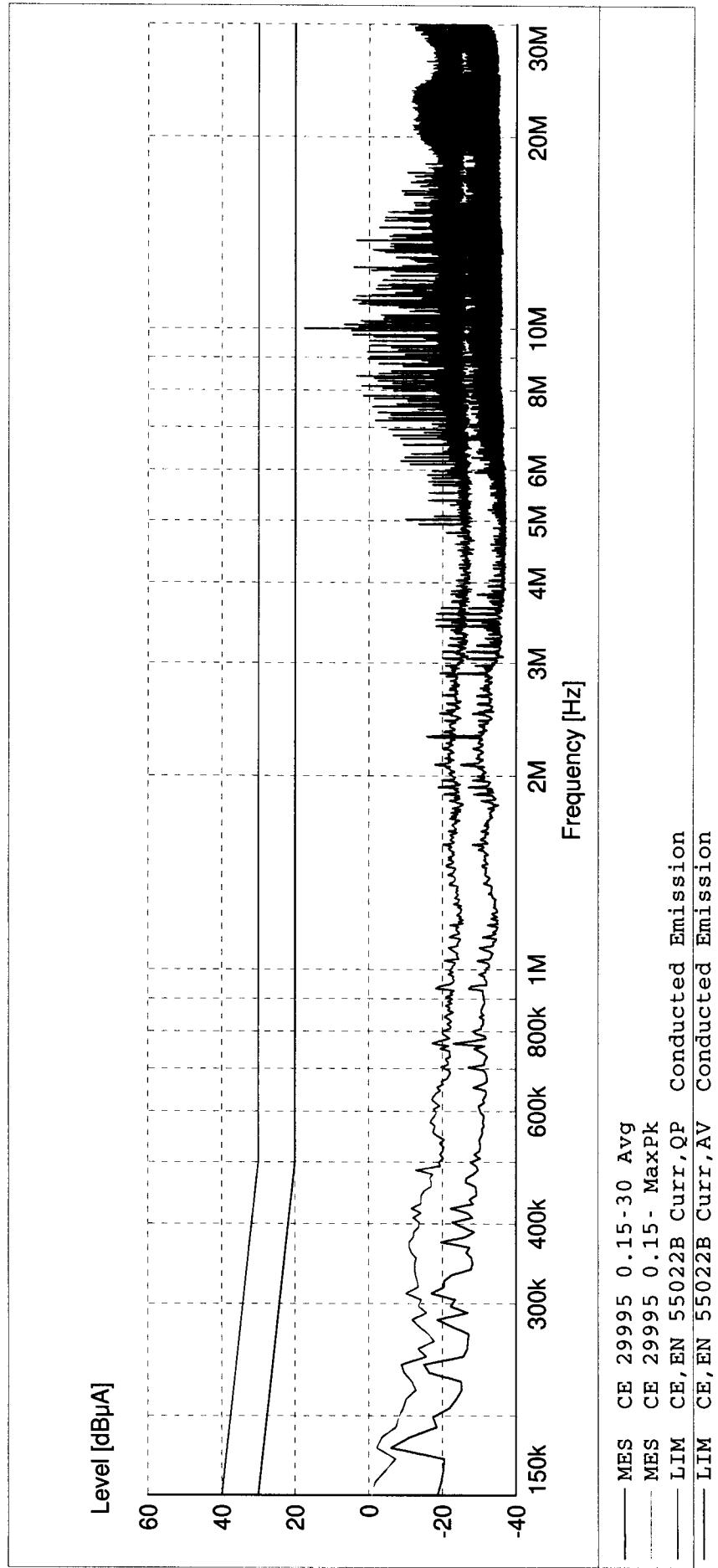
DELTA Electronics Testing.

EUT:
Manufacturer: Masquerade II x83105, x83106
Operating Condition: I-Data
Test Site: Line no.: ISDN. (up) **50 dB**
Operator: EMC-5
HEN - K221300
Test Specification: EN 55022 Class B
Comment: Sheet 10
Start of Test: 2000-09-14



DELTA Electronics Testing.

EUT: Masquerade II x82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: ISDN. (lo) **80 dB**
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 Class B
Comment: Sheet 13
Start of Test: 2000-09-14



DELTA Electronics Testing.

EUT: Masquerade II x82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: ISDN. (hi) **80 dB**

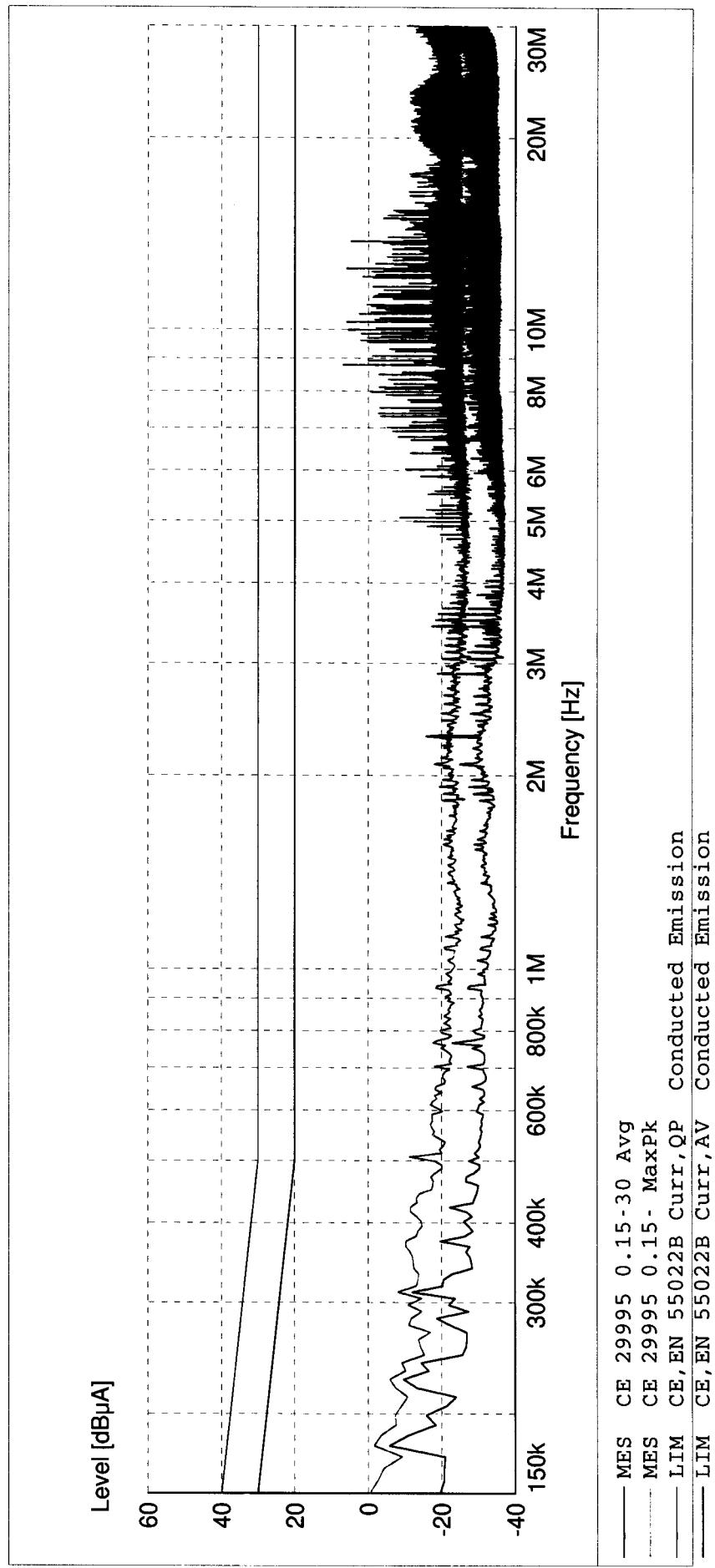
Test Site: EMC-5

Operator: HEN - K221300

Test Specification: EN 55022 Class B

Comment: Sheet 12

Start of Test: 2000-09-14



DELT A Electronics Testing.

EUT: Masquarade II x82105, x83106
Manufacturer: I-Data
Operating Condition: Line no.: Ethernet cable.
Test Site: EMC-5
Operator: HEN - K221300
Test Specification: EN 55022 class B
Comment: Sheet 14
Start of Test: 2000-09-14

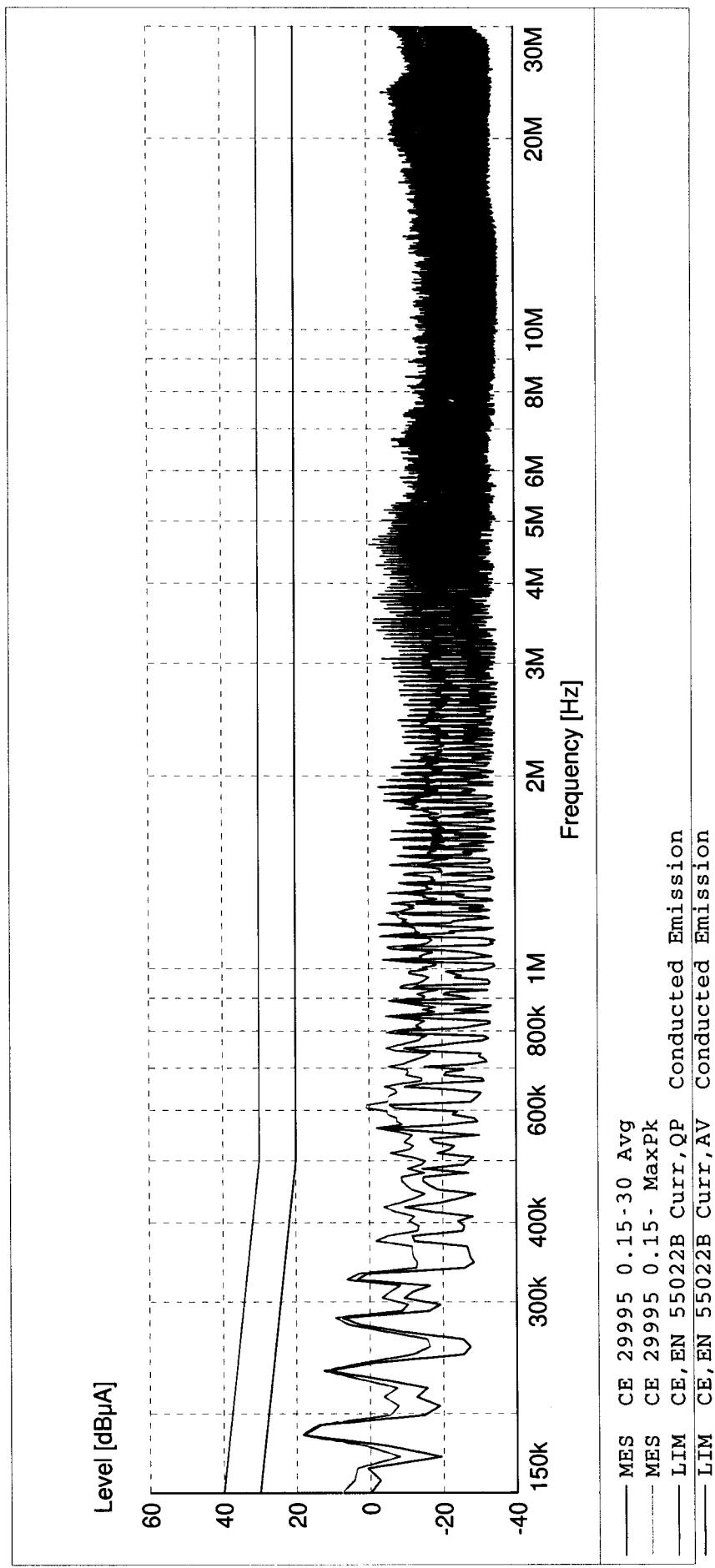




PHOTO A6.1



PHOTO A6.2

Annex 7

Photos of the EUT

(1 page)



PHOTO A7.1



PHOTO A7.2