

Test Report



**Measurements of radio frequency interference from
PT 5201 Compact VariTime Sync Generator**

Performed for DK Audio A/S

DANAK-

Project no.: K221686-1

Page 1 of 10

6 annexes

2001-11-30

DELTA

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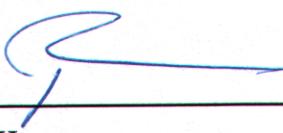
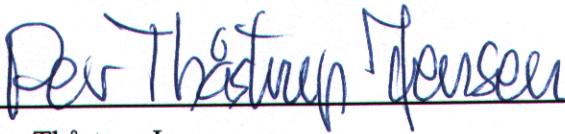
Title	Measurements of radio frequency interference from PT 5201 Compact VariTime Sync Generator
Test object	PT 5201 Compact VariTime Sync Generator
Report no.	DANAK-195876
Project no.	K221686-1
Test period	2001-11-02 to 2001-11-14
Client	DK Audio A/S Marielundvej 37 D DK-2730 Herlev Denmark Telephone: +45 44 85 02 55 Fax: +45 44 85 02 50
Contact person	Mr. Kim Steffensen
Manufacturer	DK Audio A/S
Specifications	EN 55103-1:1996 in part FCC Part 15, Subpart B, Class A
Results	The AC mains conducted emission and radiated electromagnetic fields emission from the test object were below the limits of EN 55103-1:1996 and FCC Part 15, Subpart B, Class A.
Test personnel	Jesper Nielsen Bjørn Larsen
Date	2001-11-30
Project manager	 Per Hansen Facility Manager - EMC DELTA
Responsible	 Per Thåstrup Jensen Project Manager - EMC DELTA

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Annex 5 Test record sheets and photos regarding radiated electromagnetic field (FCC Class A) (5 pages)

Annex 6 Test object (1 page)

1. **Summary of test results**

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

Emission tests	EN 55103-1	FCC Part 15, Subpart B, Class A
Conducted emission, AC mains	Passed	Passed
Radiated electromagnetic field	Passed	Passed

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

2.1 PT 5201 Compact VariTime Sync Generator

Category : Audio control equipment

Manufacturer : DK Audio A/S

Model/type : PT 5201

Part no. : -

Serial no. : -

Supply voltage : 115 VAC and 230 VAC (nominal voltage 100-240 VAC)

Operational mode : All output ports active (PAL format and Audio-L AES/EBU). 48 kHz.

Comments : The equipment should be used in electromagnetic environments E1 – E3 according to the definitions in EN 55103-1:1996. Therefore, the emission limits for these environments apply.

3. General test conditions

3.1 Test set-up

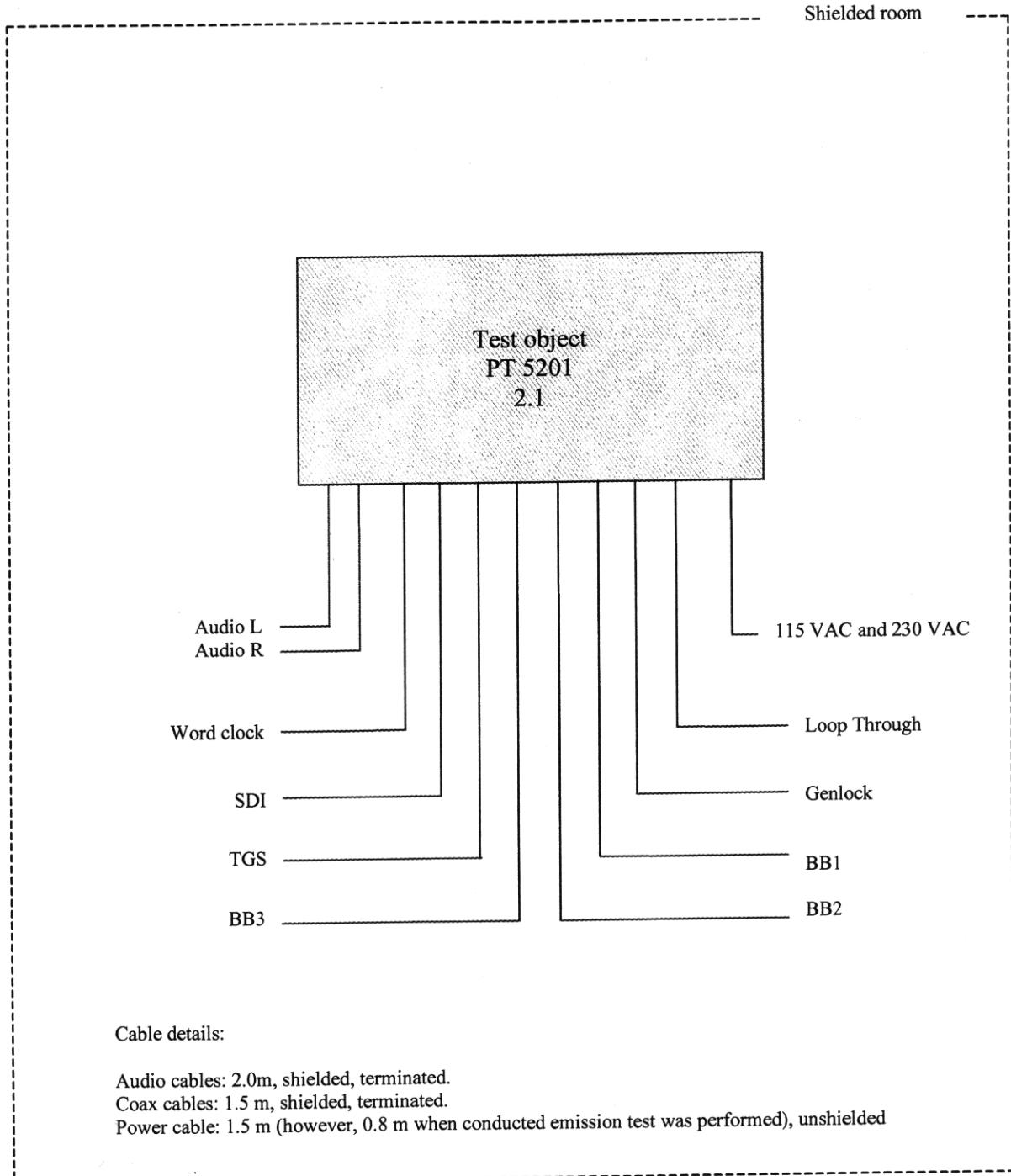


FIG. 1 Test set-up including test object and peripheral equipment.

4. Tests and results

4.1 Conducted emission, AC mains (EN 55103-1)

	Requirements
Specification	EN 55103-1:1996
Test method	EN 55022:1998 (CISPR 22:1997)
Frequency range	0.15-30 MHz
Limit: (quasi-peak)	0.15-0.50 MHz: (decreasing lin. with the logarithm of freq.) 66-56 dB μ V 0.50-5 MHz: 56 dB μ V 5-30 MHz: 60 dB μ V
Limit: (average)	0.15-0.50 MHz: (decreasing lin. with the logarithm of freq.) 56-46 dB μ V 0.50-5 MHz: 46 dB μ V 5-30 MHz: 50 dB μ V
Test record sheets	<i>Annex 2</i>

Results:

The emission was within the specified limits.

Climatic conditions:

24.0°C and 27.0% R.H.

Comments:

Supply power was 230 VAC.

When this test was performed no other cables than 0.8 m AC mains cable was connected to the test object.

4.2 Radiated electromagnetic field (EN 55103-1)

	Requirements	
Specification	EN 55103-1:1996	
Test method	EN 55022:1998 (CISPR 22:1997)	
Measuring distance	10 m	
Frequency range	30-1000 MHz	
Limit: (quasi-peak)	30-230 MHz: 230-1000 MHz:	30 dB μ V/m 37 dB μ V/m
Test record sheets and photos		Annex 3

Results:

The emission was within the specified limits.

Climatic conditions:

20.3°C and 25.2% R.H.

Comments:

Supply power was 115 VAC.

4.3 *Conducted emission, AC mains (FCC Part 15, Subpart B, Class A)*

	Requirements
Specification	FCC Rules and Regulations Part 15:1998, Subpart B, Class A
Test method	FCC Rules and Regulations Part 15:1998, Subpart B
Test set-up	ANSI C63.4:1992
Frequency range	0.45-30 MHz
Limit: (quasi-peak)	0.45-1.705 MHz: 60 dB μ V 1.705-30 MHz: 69.5 dB μ V
Test record sheets	<i>Annex 4</i>

Results

The emission was within the specified limits.

Climatic conditions:

24.0°C and 27.0% R.H

Comments:

Supply power was 115 VAC.

When this test was performed no other cables than 0.8 m AC mains cable was connected to the test object.

4.4 Radiated electromagnetic field (FCC Part 15, Subpart B, Class A)

	Requirements
Specification	FCC Rules and Regulations Part 15:1998, Subpart B, Class A
Test method	FCC Rules and Regulations Part 15:1998, Subpart B
Test set-up	ANSI C63.4:1992
Measuring distance	10 m
Frequency range	30-2000 MHz
Limit: (quasi-peak)	30-88 MHz: 39 dB μ V/m 88-216 MHz: 43.5 dB μ V/m 216-960 MHz: 46 dB μ V/m 960-1000 MHz: 49.5 dB μ V/m
Test record sheets	<i>Annex 5</i>

Results

The emission was within the specified limits.

Climatic conditions:

20.3°C and 25.2% R.H.

Comments

Supply power was 115 VAC.

Annex 1

List of instruments

(1 page)

LIST OF INSTRUMENTS

NO.	DESCRIPTION	MANUFACTURER	TYPE NO.
29306	VARIOTRANSFORMER, 10 A	LUBCKE	R54-260B
29426	QUASI PEAK ADAPTOR	HEWLETT-PACKARD	85650 A
29433	SPECTRUM ANALYZER	HEWLETT-PACKARD	8566 B
29434	RF PRESELECTOR	HEWLETT-PACKARD	85685 A
29439	LISN, 50 OHM, 50 µH, 0.01-100 MHz	EMCO	3825/2
29460	MANUAL TEST RECEIVER 10 kHz-30 MHz	ROHDE & SCHWARZ	ESH2
29461	ARTIFICIAL MAINS NETWORK	ROHDE & SCHWARZ	ESH2/Z5
29716	DIGITAL MULTIMETER, ROOM 4	FLUKE	77, SERIES II
29797	BILOG ANTENNA, 30-1000 MHz	CHASE ELECTRICS LTD	CBL 6111A
29861	EMI-SOFTWARE Ver. 1.60	ROHDE & SCHWARZ	ES-K1, PART: 1026.6790.02
29916	AUTOMATIC TEST RECEIVER, 9 kHz-2.75 GHz	ROHDE & SCHWARZ	ESCS 30 1102.4500.30

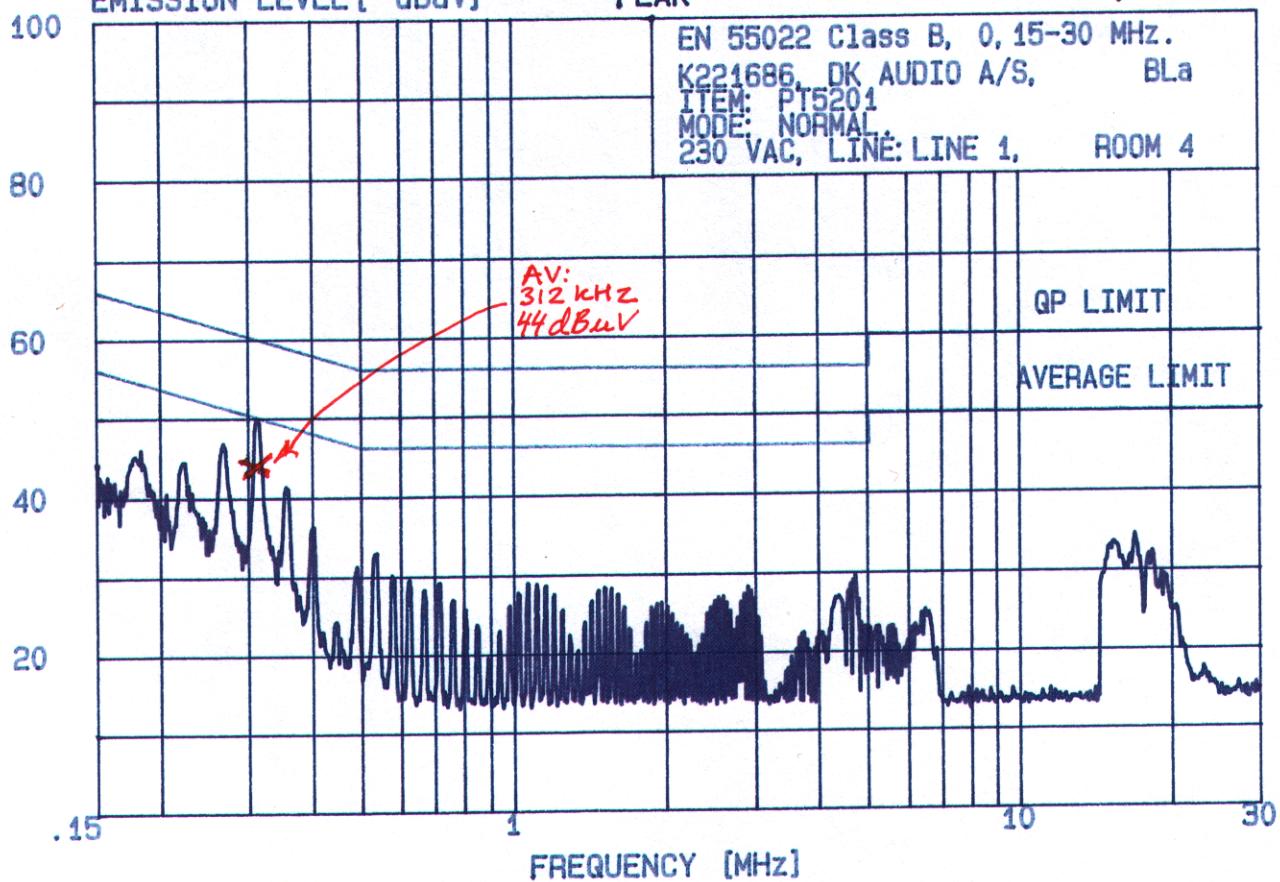
Annex 2

***Test record sheet and photos regarding
conducted emission, AC mains (EN 55103-1)***

(2 pages)

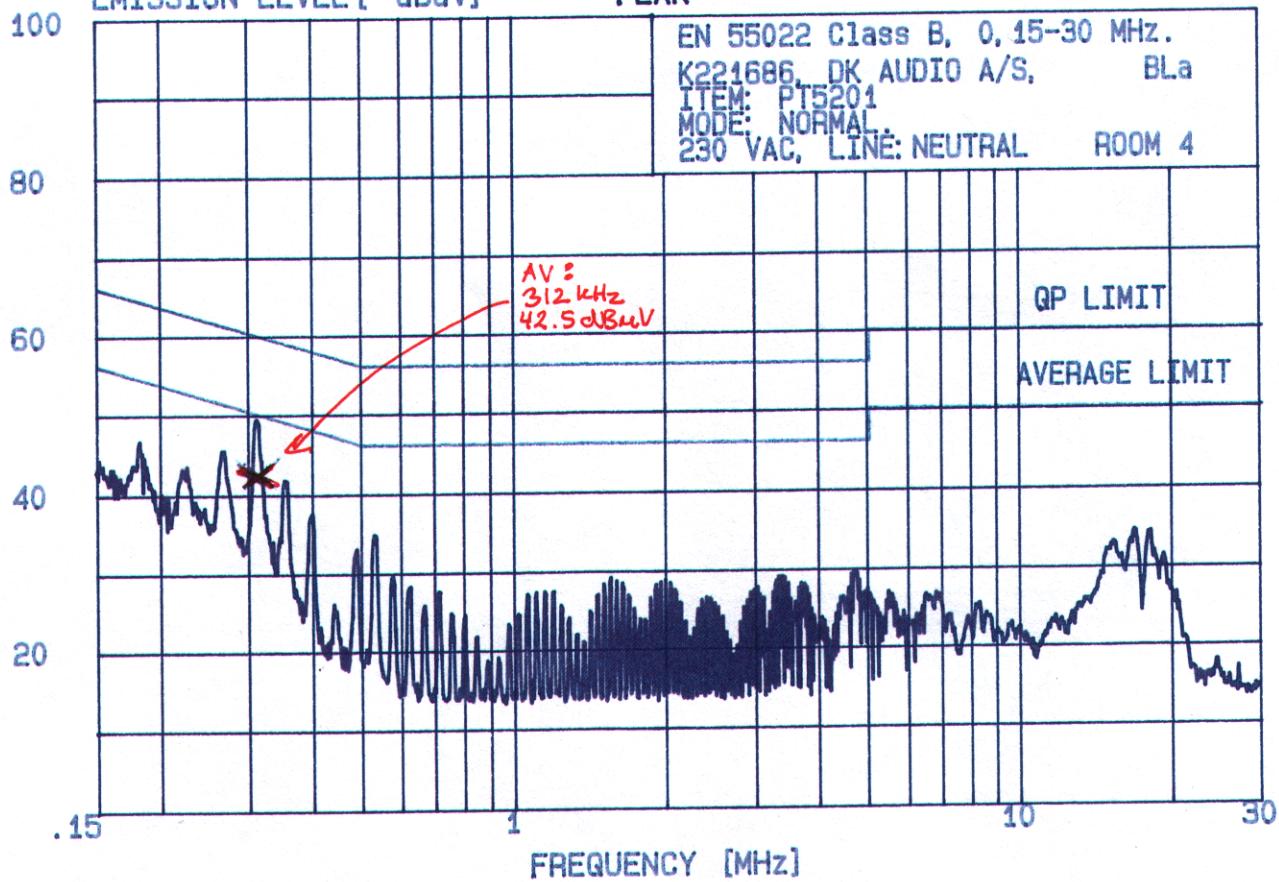
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EMISSION LEVEL [dBuV] PEAK

14 Nov 2001 12:15:46 AVERAGE



DELTA ELECTRONICS TESTING, EMC
EMISSION LEVEL [dBuV] PEAK

14 Nov 2001 12:26:23



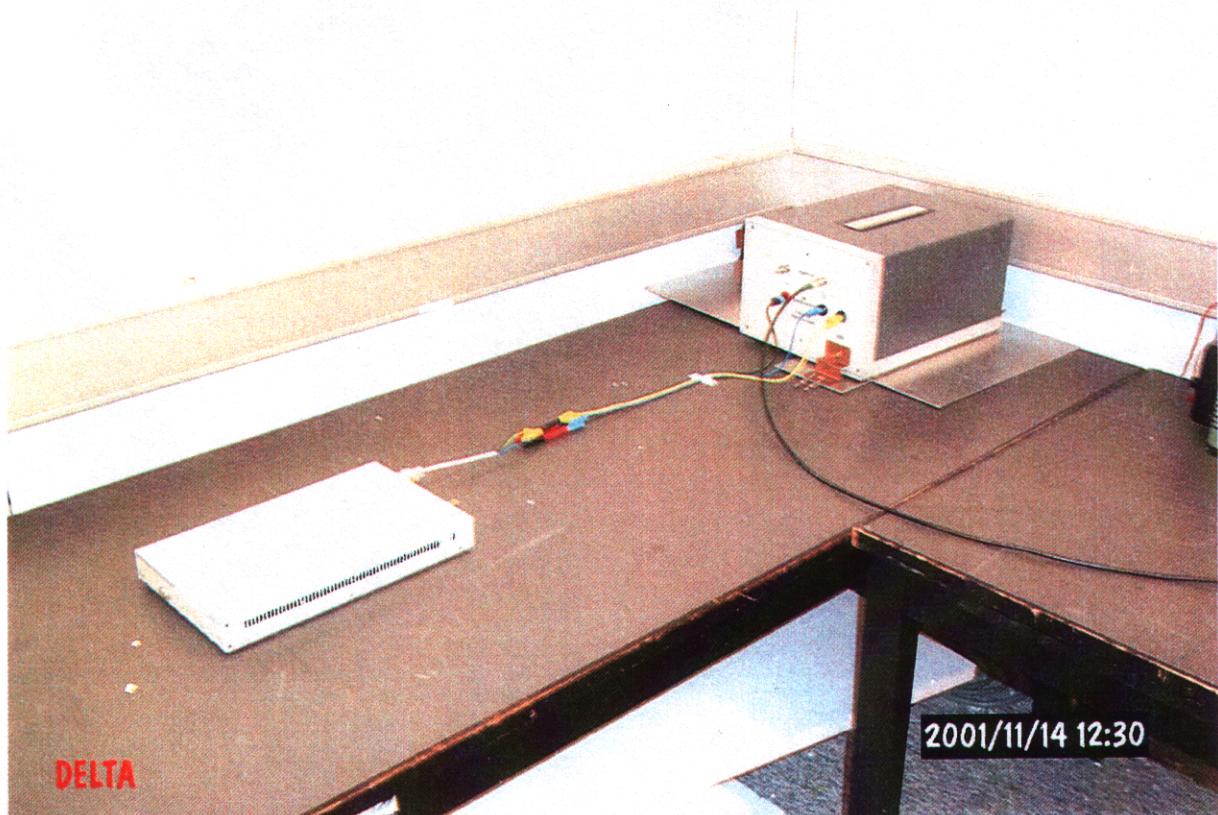


PHOTO A2.1 Conducted emission test



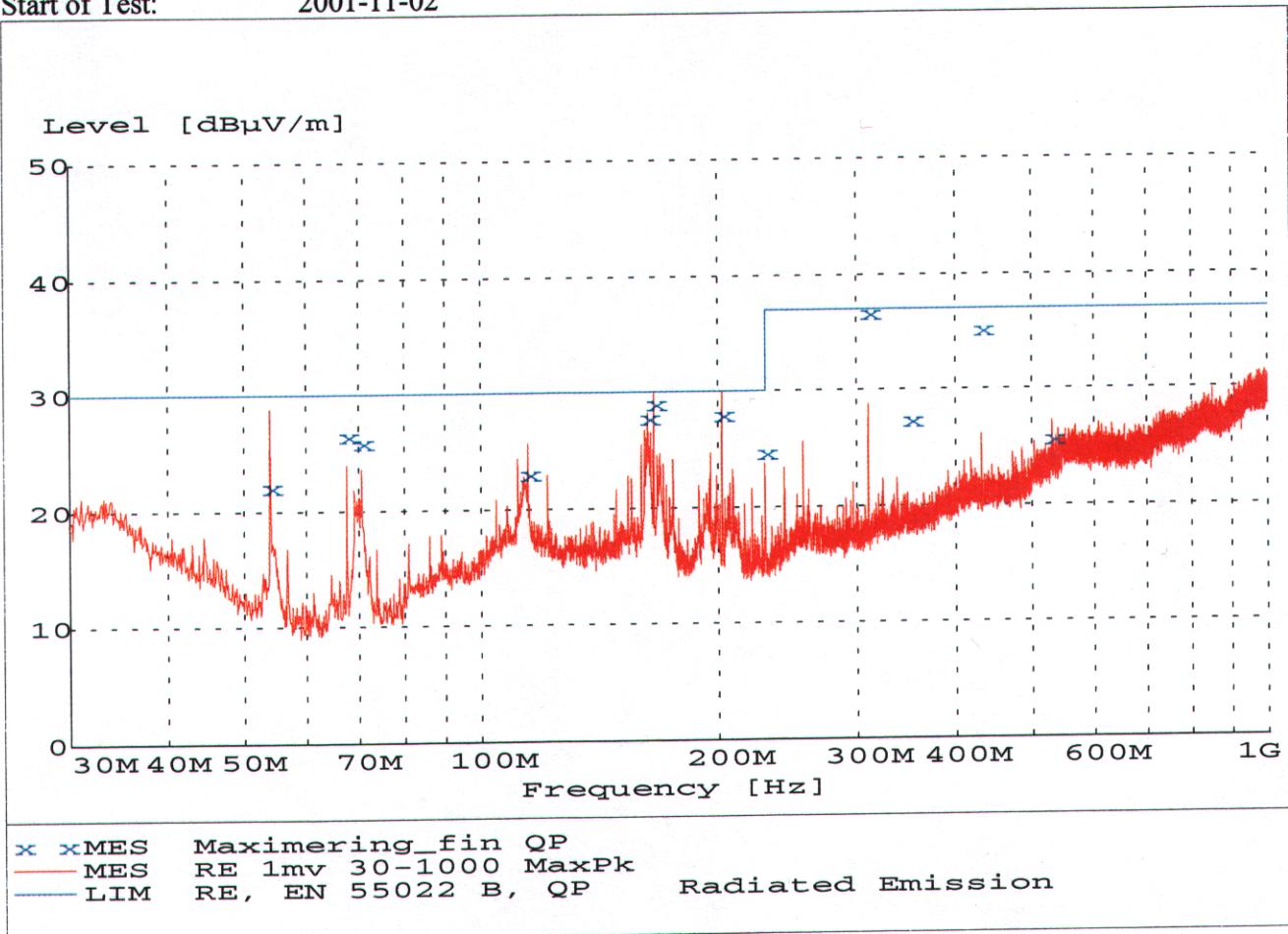
PHOTO A2.2 Conducted emission test

Annex 3

***Test record sheets and photos regarding
radiated electromagnetic field (EN 55103-1)***

(5 pages)

EUT: Sync.gen PT 5201
Manufacturer: DK-Audio A/S
Operating Condition: Ant. 1 meter vertical. 115 VAC
Test Site: EMC-5
Operator: JN - K221686
Test Specification: EN 55103-1 (EN 55022 Class B / CISPR22)
Comment: Sheet 9
Start of Test: 2001-11-02

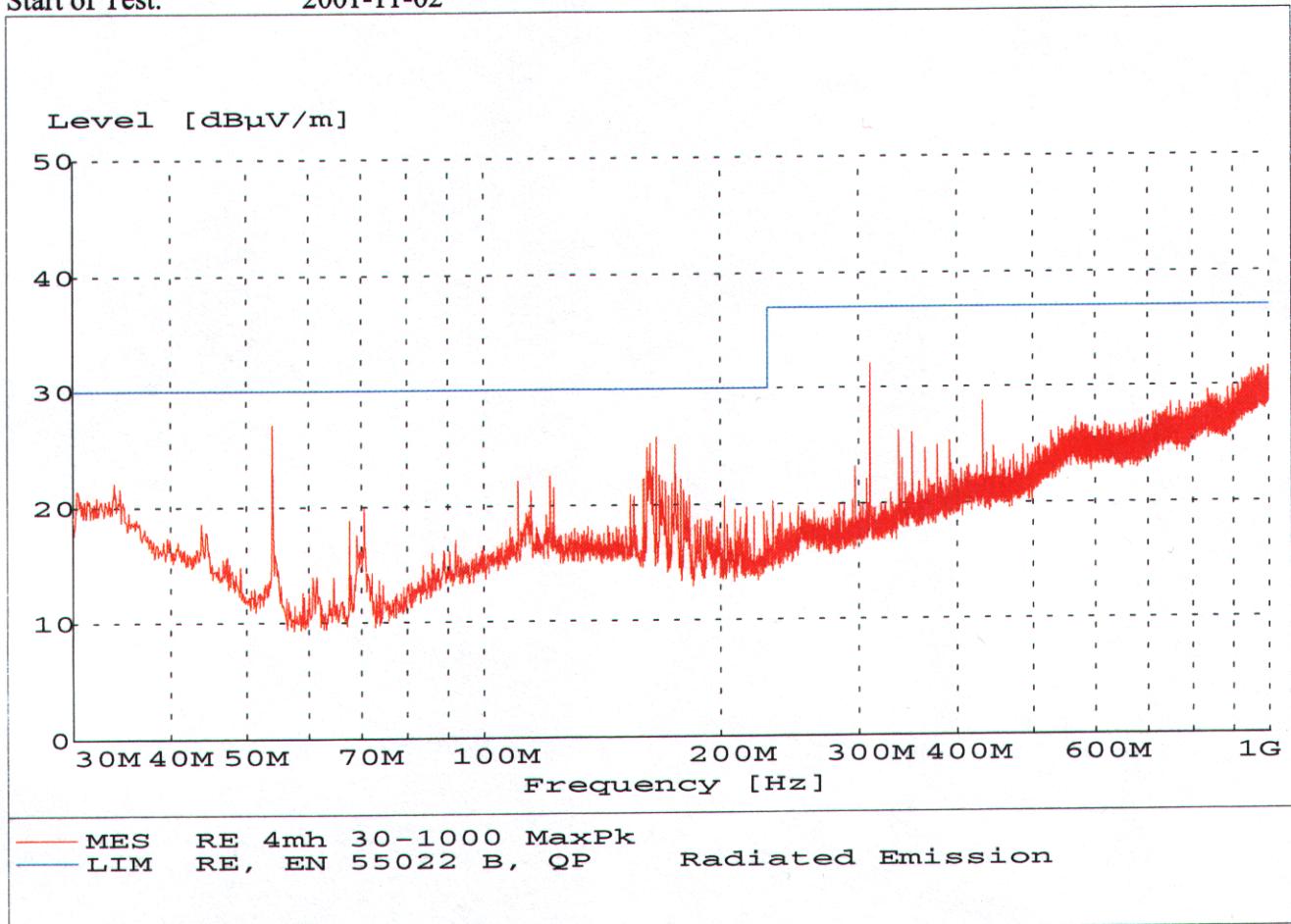


MEASUREMENT RESULT: "Maximering_fin QP"

11/02/2001 17:37

Frequency MHz	Level dBμV/m	Transd. dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg.	Polarisation
54.00	22.10	8.20	30.00	7.90	170.00	97.00	Vertical
67.59	26.40	7.10	30.00	3.60	307.00	104.00	Vertical
70.65	25.80	7.40	30.00	4.20	214.00	64.00	Vertical
114.80	23.00	12.10	30.00	7.00	112.00	266.00	Vertical
162.81	27.70	11.40	30.00	2.30	101.00	330.00	Vertical
165.90	28.90	11.20	30.00	1.10	101.00	345.00	Vertical
202.48	27.90	11.40	30.00	2.10	101.00	336.00	Vertical
229.50	24.60	12.30	30.00	5.40	109.00	325.00	Vertical
310.48	36.60	15.00	37.00	0.40	284.00	54.00	Horizontal
351.00	27.30	16.40	37.00	9.70	249.00	175.00	Horizontal
432.00	35.10	18.80	37.00	1.90	222.00	179.00	Horizontal
531.00	25.60	20.80	37.00	11.40	198.00	303.00	Horizontal

EUT: Sync.gen PT 5201
Manufacturer: DK-Audio A/S
Operating Condition: Ant. 4 meter horizontal. 115 VAC
Test Site: EMC-5
Operator: JN - K221686
Test Specification: EN 55103-1 (EN 55022 Class B / CISPR22)
Comment: Sheet 10
Start of Test: 2001-11-02



MEASUREMENT RESULT: "Maximering_fin QP"

11/02/2001 17:37

Frequency MHz	Level dBμV/m	Transd. dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg.	Polarisation
54.00	22.10	8.20	30.00	7.90	170.00	97.00	Vertical
67.59	26.40	7.10	30.00	3.60	307.00	104.00	Vertical
70.65	25.80	7.40	30.00	4.20	214.00	64.00	Vertical
114.80	23.00	12.10	30.00	7.00	112.00	266.00	Vertical
162.81	27.70	11.40	30.00	2.30	101.00	330.00	Vertical
165.90	28.90	11.20	30.00	1.10	101.00	345.00	Vertical
202.48	27.90	11.40	30.00	2.10	101.00	336.00	Vertical
229.50	24.60	12.30	30.00	5.40	109.00	325.00	Vertical
310.48	36.60	15.00	37.00	0.40	284.00	54.00	Horizontal
351.00	27.30	16.40	37.00	9.70	249.00	175.00	Horizontal
432.00	35.10	18.80	37.00	1.90	222.00	179.00	Horizontal
531.00	25.60	20.80	37.00	11.40	198.00	303.00	Horizontal

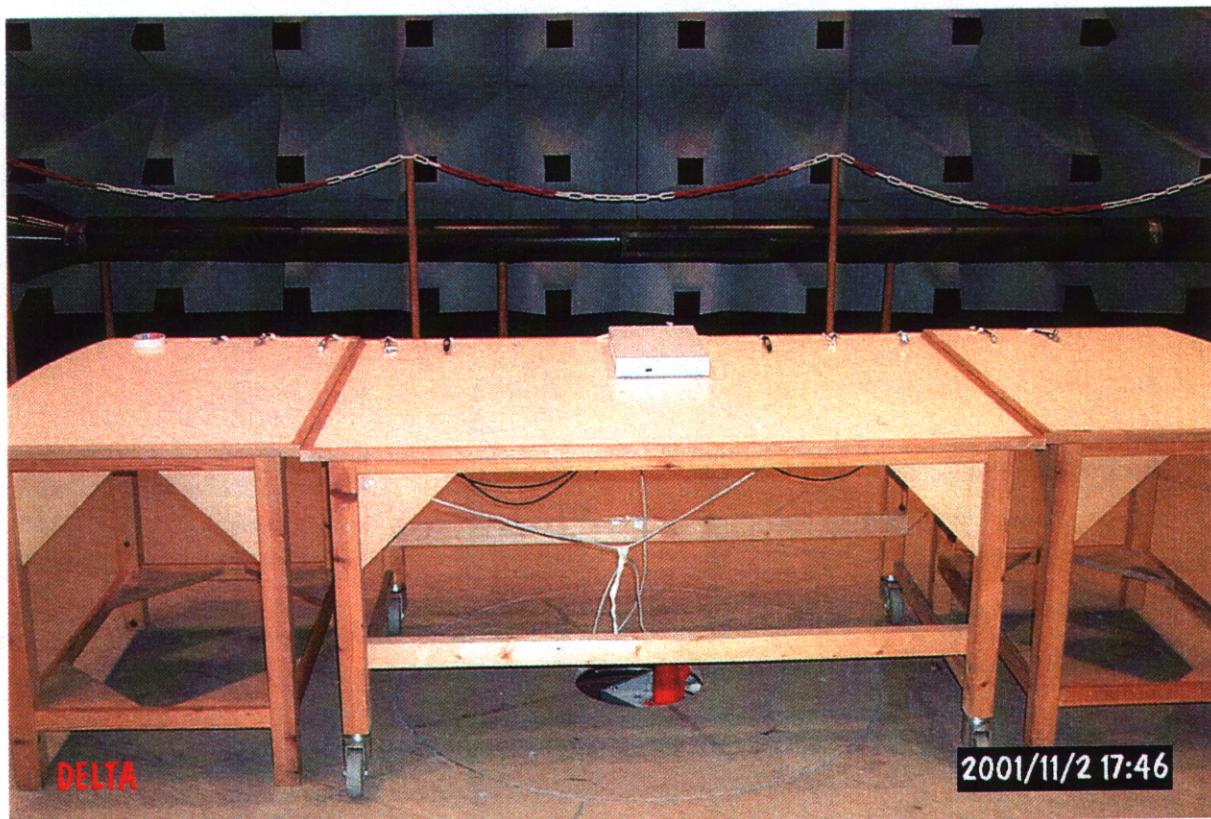


PHOTO A3.1 Radiated electromagnetic field test

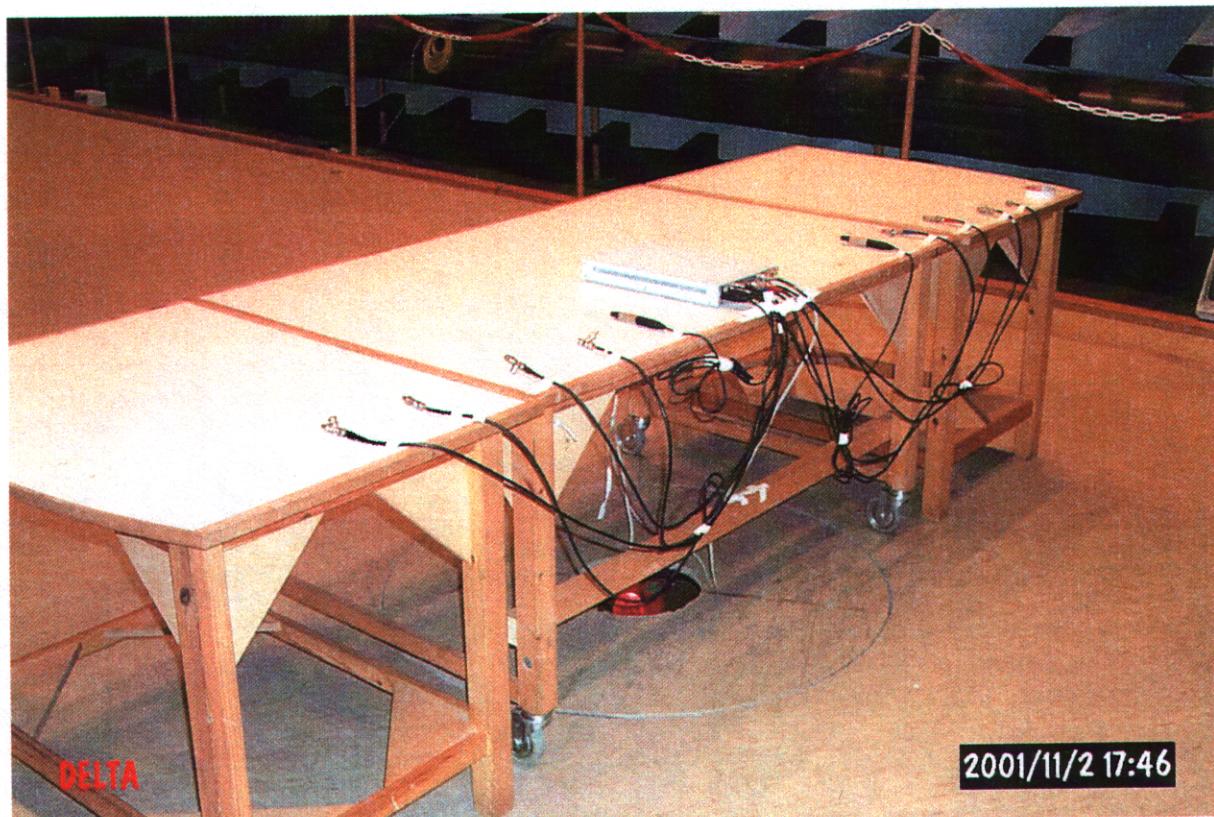


PHOTO A3.2 Radiated electromagnetic field test

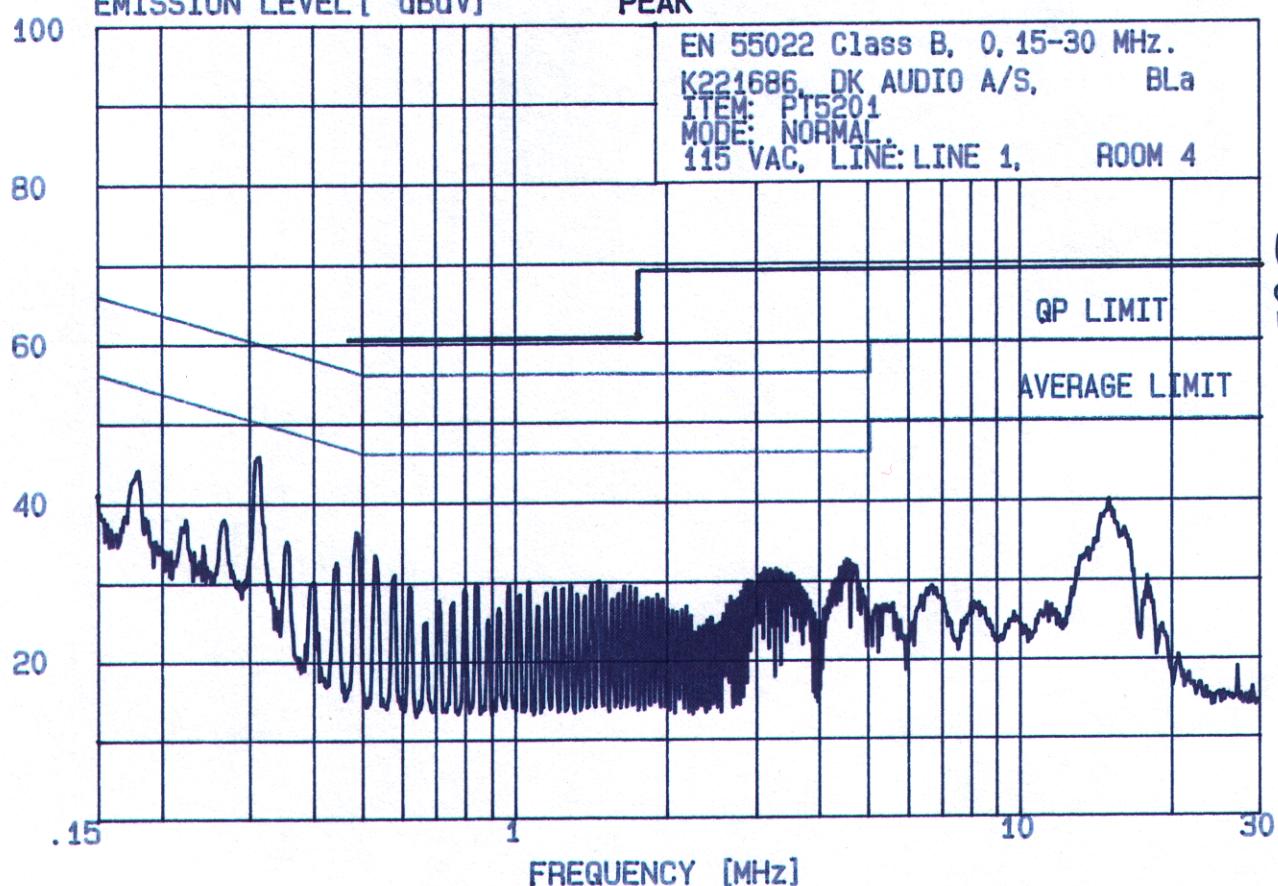
Annex 4

***Test record sheet and photos regarding
conducted emission, AC mains (FCC Class A)***

(2 pages)

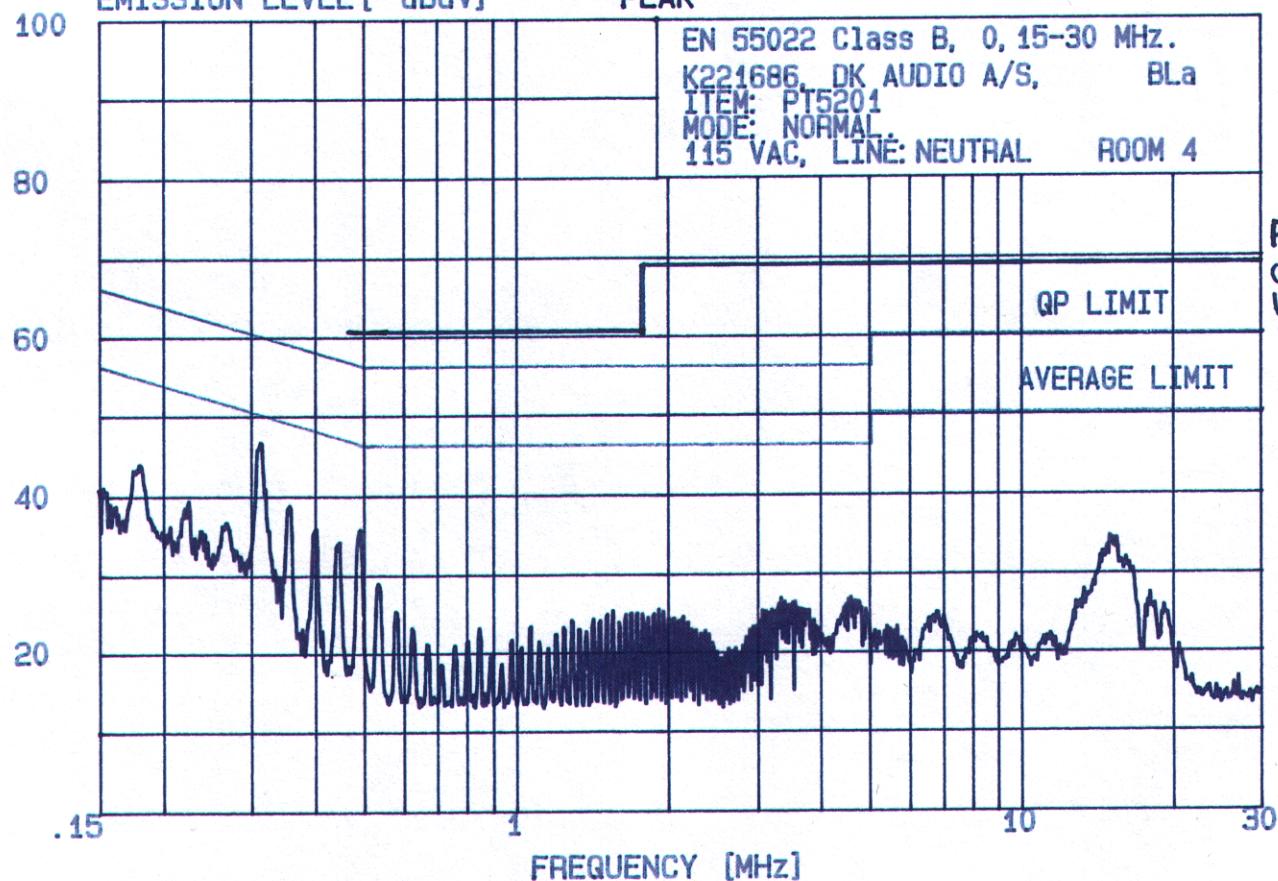
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EMISSION LEVEL [dBuV] PEAK

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DELTA ELECTRONICS TESTING, EMC
EMISSION LEVEL [dBuV] PEAK

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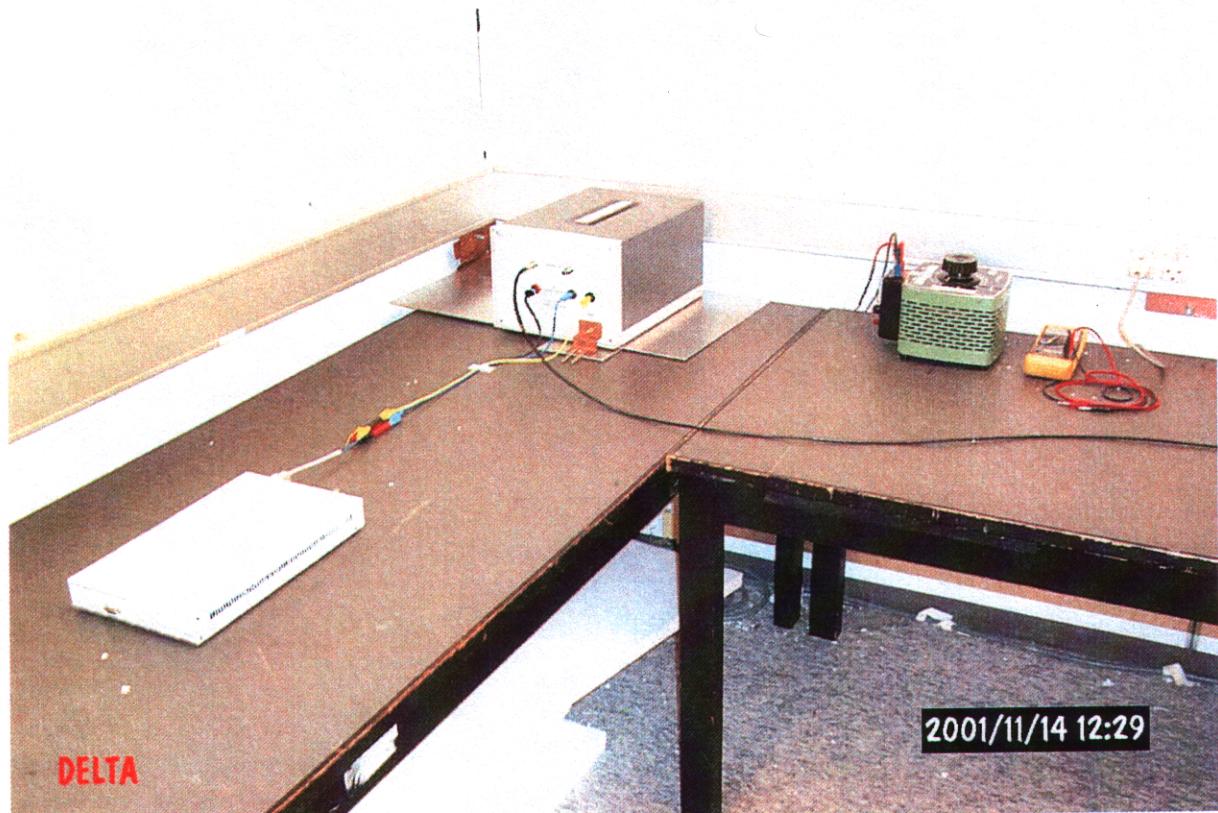


PHOTO A4.1 Conducted emission test

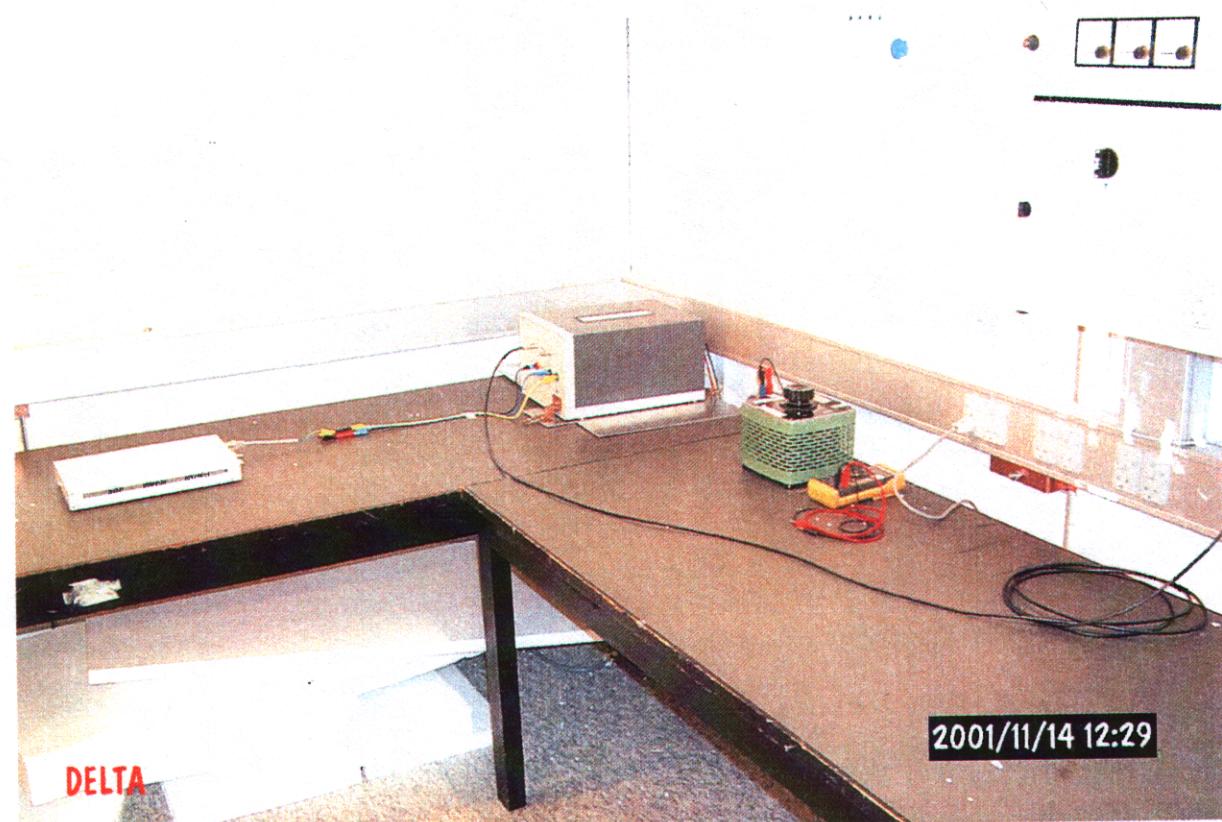


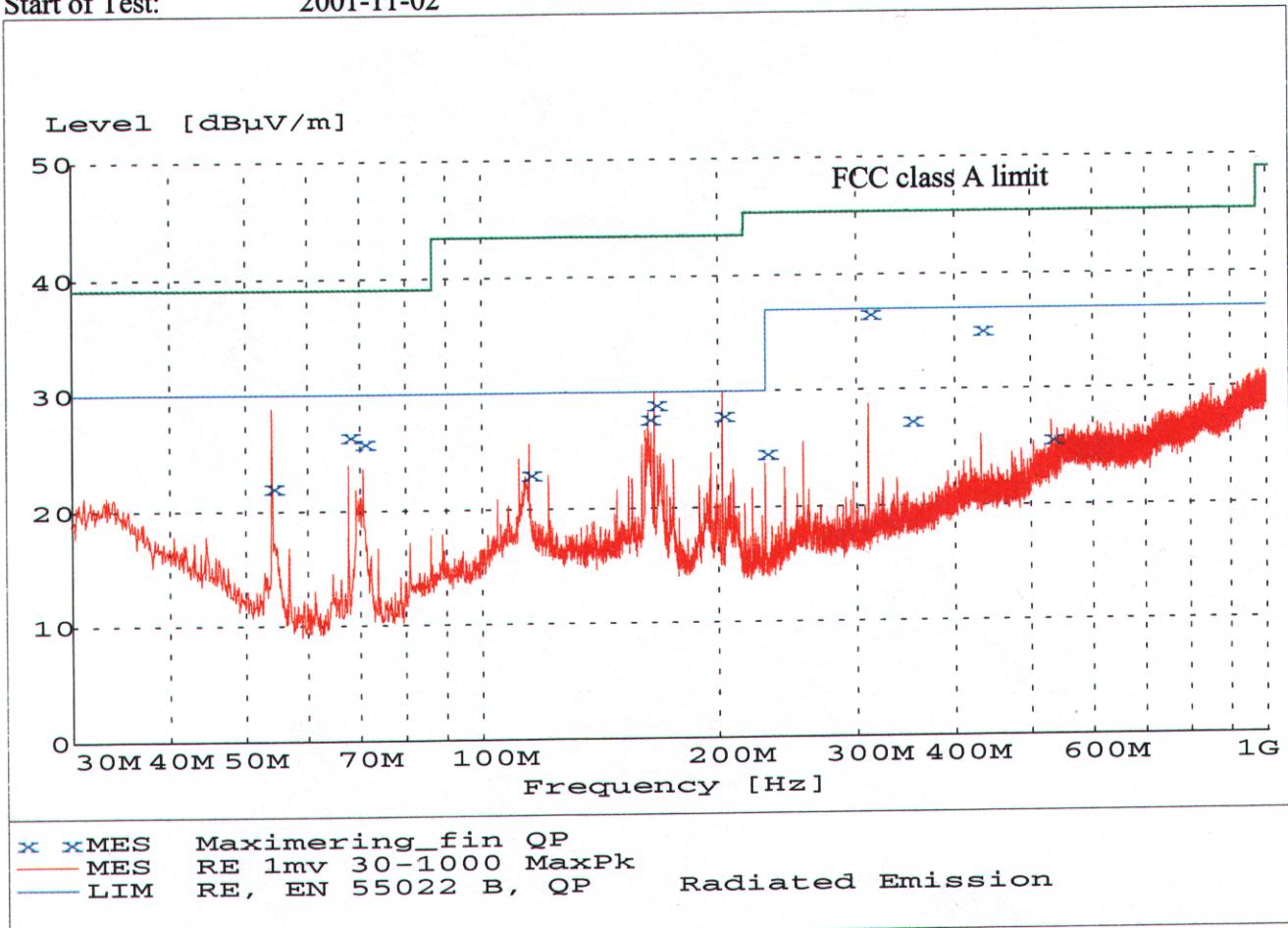
PHOTO A4.2 Conducted emission test

Annex 5

***Test record sheets and photos regarding
radiated electromagnetic field (FCC Class A)***

(5 pages)

EUT: Sync.gen PT 5201
Manufacturer: DK-Audio A/S
Operating Condition: Ant. 1 meter vertical. 115 VAC
Test Site: EMC-5
Operator: JN - K221686
Test Specification: FCC Class A (CISPR22)
Comment: Sheet 9
Start of Test: 2001-11-02

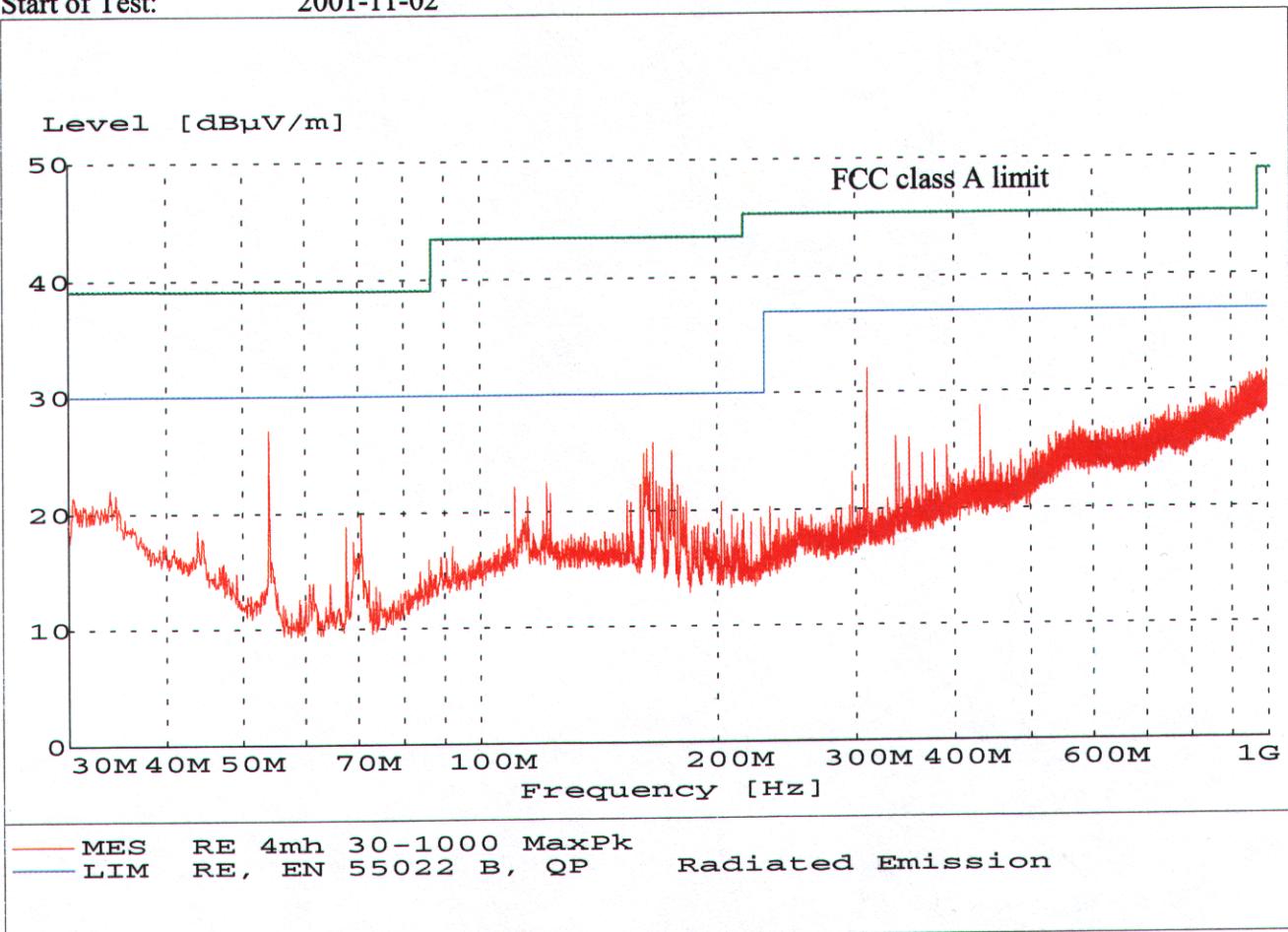


MEASUREMENT RESULT: "Maximering_fin QP"

11/02/2001 17:37

Frequency MHz	Level dBμV/m	Transd. dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg.	Polarisation
54.00	22.10	8.20	39.00	16.90	170.00	97.00	Vertical
67.59	26.40	7.10	39.00	12.60	307.00	104.00	Vertical
70.65	25.80	7.40	39.00	13.20	214.00	64.00	Vertical
114.80	23.00	12.10	43.50	20.50	112.00	266.00	Vertical
162.81	27.70	11.40	43.50	15.80	101.00	330.00	Vertical
165.90	28.90	11.20	43.50	14.60	101.00	345.00	Vertical
202.48	27.90	11.40	43.50	15.60	101.00	336.00	Vertical
229.50	24.60	12.30	46.00	21.40	109.00	325.00	Vertical
310.48	36.60	15.00	46.00	9.40	284.00	54.00	Horizontal
351.00	27.30	16.40	46.00	18.70	249.00	175.00	Horizontal
432.00	35.10	18.80	46.00	10.90	222.00	179.00	Horizontal
531.00	25.60	20.80	46.00	20.40	198.00	303.00	Horizontal

EUT: Sync.gen PT 5201
Manufacturer: DK-Audio A/S
Operating Condition: Ant. 4 meter horizontal. 115 VAC
Test Site: EMC-5
Operator: JN - K221686
Test Specification: FCC Class A (CISPR22)
Comment: Sheet 10
Start of Test: 2001-11-02



MEASUREMENT RESULT: "Maximering_fin QP"

11/02/2001 17:37

Frequency MHz	Level dBμV/m	Transd. dB	Limit dBμV/m	Margin dB	Height cm	Azimuth deg.	Polarisation
54.00	22.10	8.20	39.00	16.90	170.00	97.00	Vertical
67.59	26.40	7.10	39.00	12.60	307.00	104.00	Vertical
70.65	25.80	7.40	39.00	13.20	214.00	64.00	Vertical
114.80	23.00	12.10	43.50	20.50	112.00	266.00	Vertical
162.81	27.70	11.40	43.50	15.80	101.00	330.00	Vertical
165.90	28.90	11.20	43.50	14.60	101.00	345.00	Vertical
202.48	27.90	11.40	43.50	15.60	101.00	336.00	Vertical
229.50	24.60	12.30	46.00	21.40	109.00	325.00	Vertical
310.48	36.60	15.00	46.00	9.40	284.00	54.00	Horizontal
351.00	27.30	16.40	46.00	18.70	249.00	175.00	Horizontal
432.00	35.10	18.80	46.00	10.90	222.00	179.00	Horizontal
531.00	25.60	20.80	46.00	20.40	198.00	303.00	Horizontal

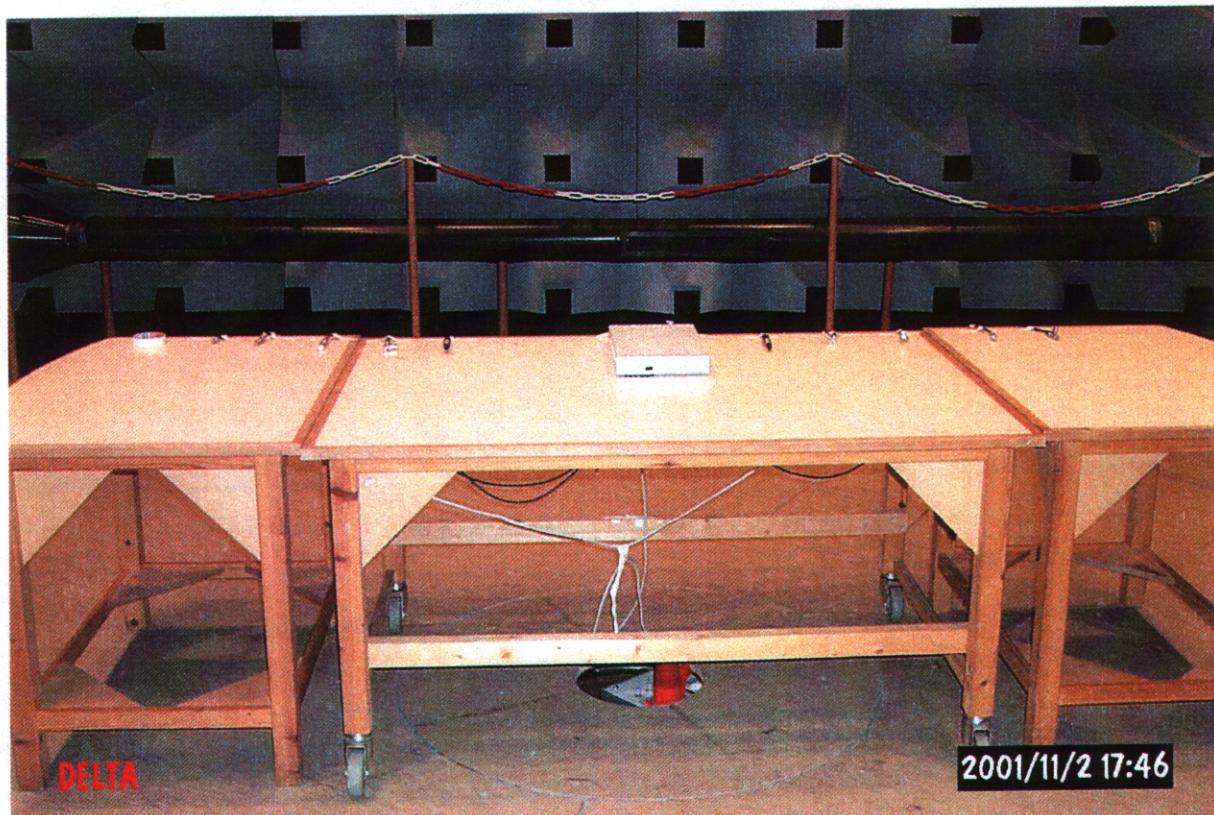


PHOTO A5.1 Radiated electromagnetic field test

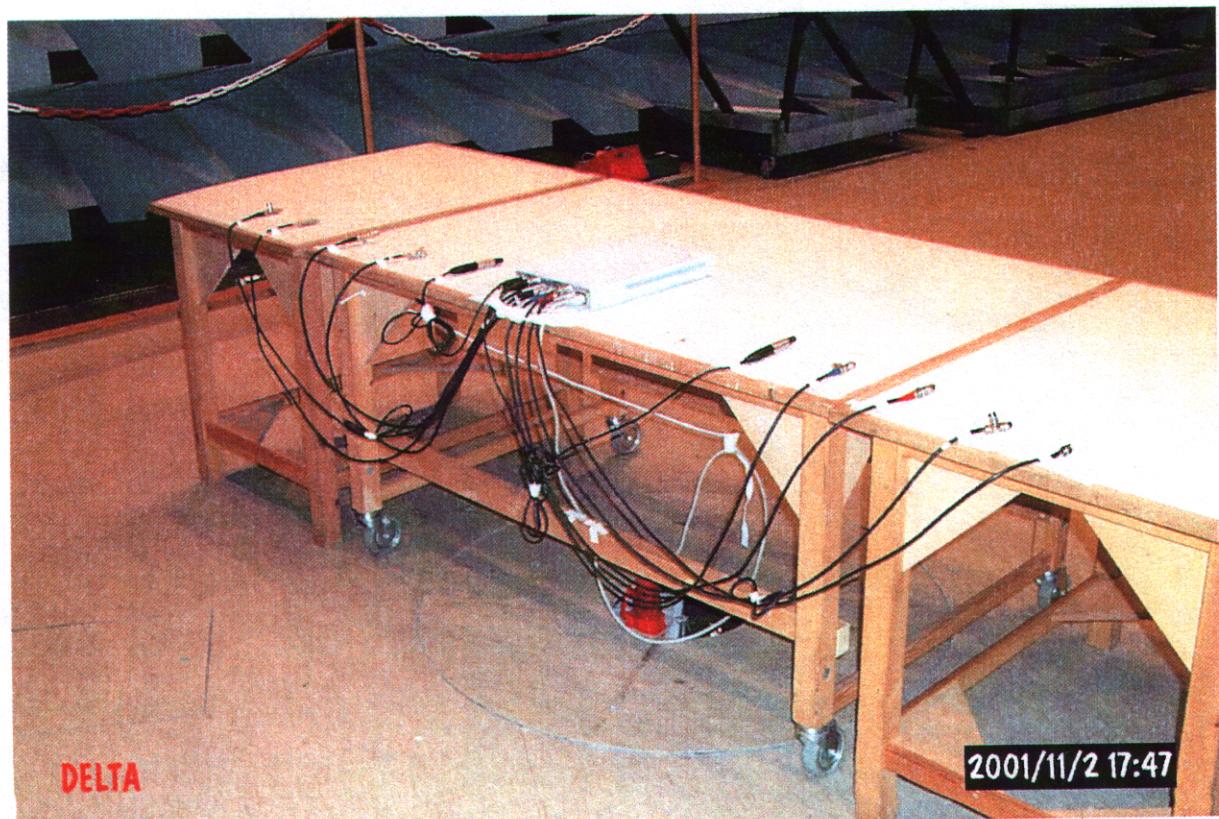


PHOTO A5.2 Radiated electromagnetic field test

Annex 6

Test object

(1 page)

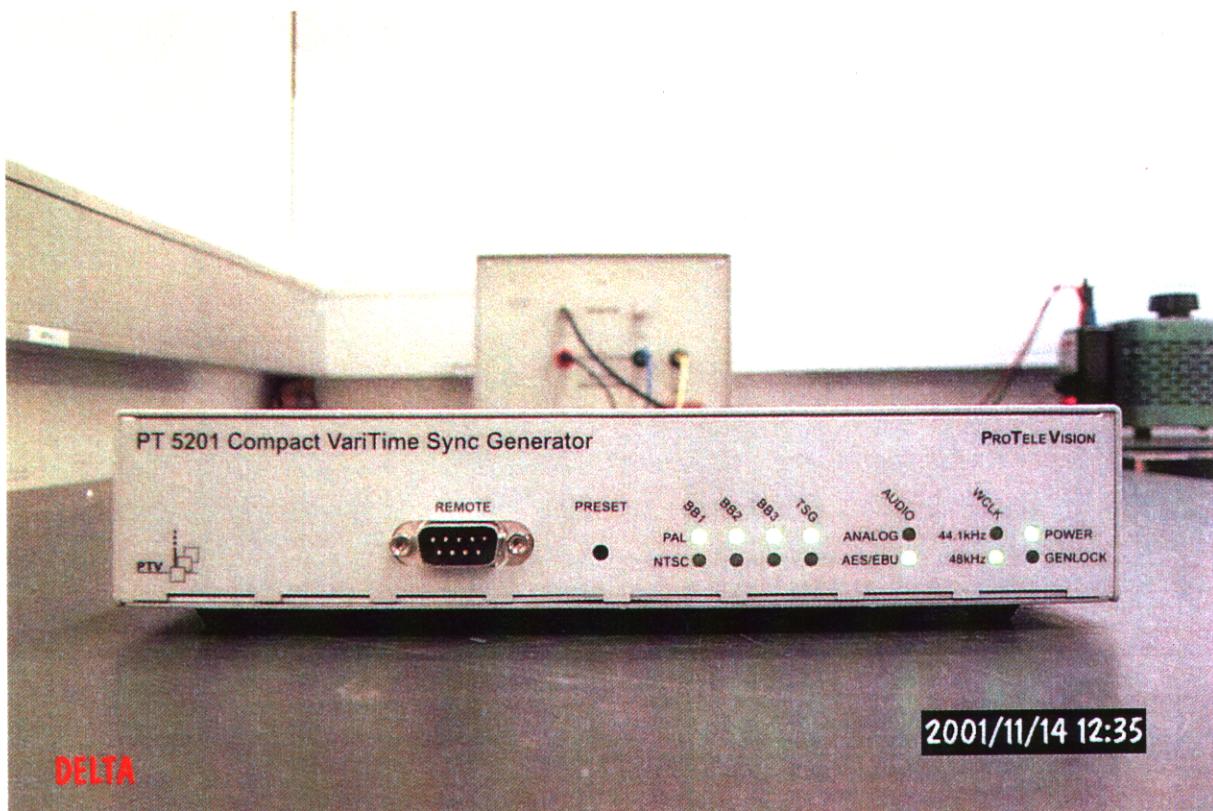


PHOTO A6.1 Test object front view

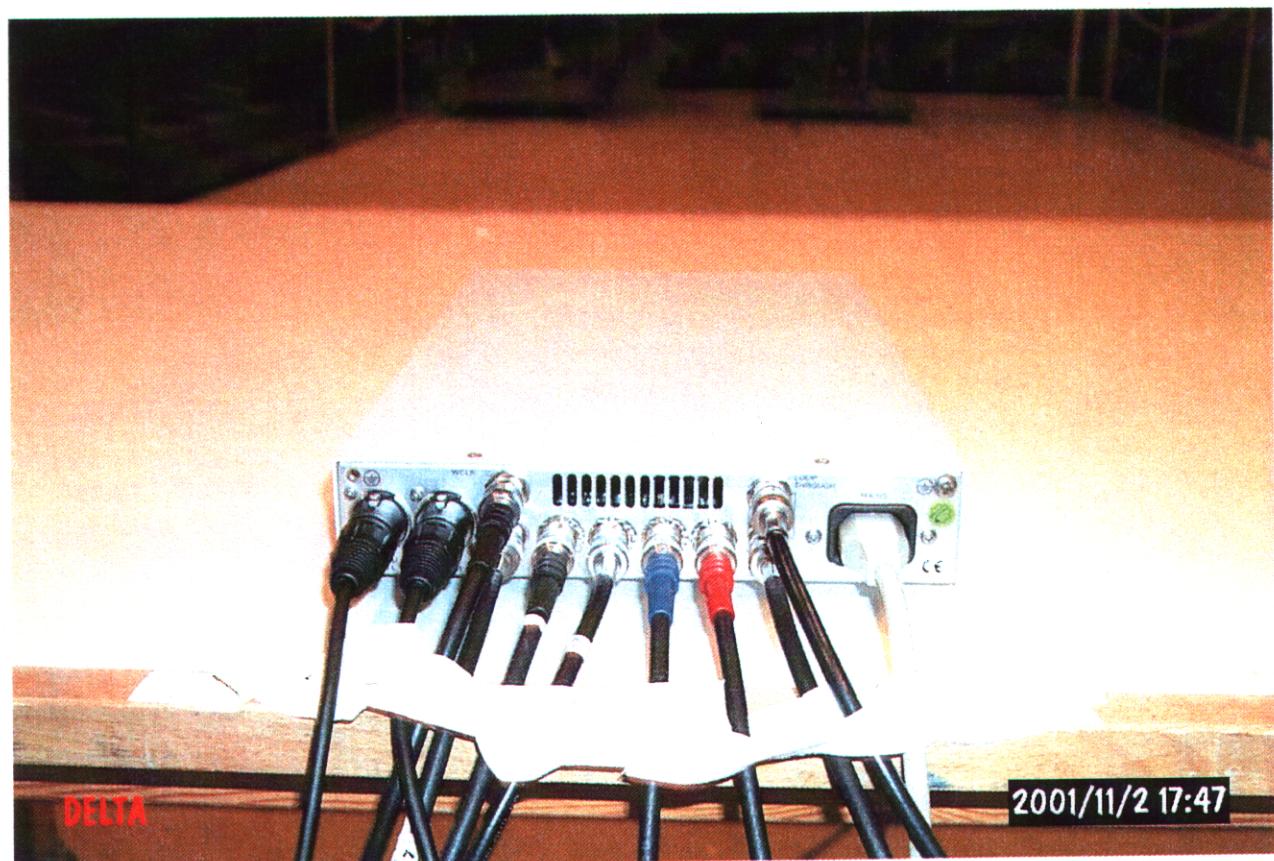


PHOTO A6.2 Test object rear view