

**EMISSION MEASUREMENTS IN ACCORDANCE
WITH FCC PART 15 AND ANSI C63.4-1992 OF A
TRANSPONDER, BRAND AMB, TYPE AMBrc
TRANSPONDER, INCLUDING A BATTERY CHARGER
RACK, BRAND AMB, TYPE CHARGE RACK.**

FCC ID: NXYAMBGP1

FCC report layout endorsed by the FCC by
Public Notice of March 11, 1992.

Accredited by	:STERLAB accreditation number L029 D.A.R., TTI-P-G.127/96-00
Competent body	:Article 10-2 EMC Directive
Notified body nr. 0122	:Article 10-5 EMC Directive Low Voltage Directive TTE Directive
Certification body	:Electrical Products Safety regulation, Hong Kong
Designated laboratory	:TTE Directive
Notified test service	:Automotive Directive
FCC listed	:31040/SIT
VCCI registered	:R-592 C-607

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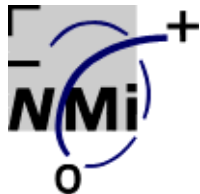
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Subsidiary companies:
NMI Certin B.V. (27233418)
NMI Van Swinden Laboratorium B.V. (27228703)
NMI International B.V. (27239176)



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

MEASUREMENT/TECHNICAL REPORT

AMB i.t. Holding B.V.

FCC ID: NXYAMBGP1

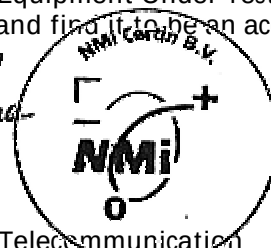
Date: June 14, 2000

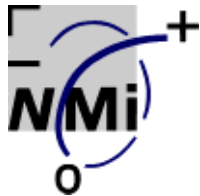
This report concerns: Verification / Notification / Certification																												
Equipment type: Intentional radiator																												
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) No																												
If yes defer until: not applicable																												
Transition Rules Request per 15.37: No																												
Report prepared by:	<table><tr><td>Name</td><td>:</td><td>D.S. Sariredjo, B.Sc.E.E.</td></tr><tr><td>Company name</td><td>:</td><td>NMi Certin B.V.</td></tr><tr><td>Address</td><td>:</td><td>Smidshornerweg 18</td></tr><tr><td>Telephone number</td><td>:</td><td>+ 31 594 505005</td></tr><tr><td>Telefax number</td><td>:</td><td>+ 31 594 504804</td></tr><tr><td>Mailing address</td><td>:</td><td>P.O. Box 15</td></tr><tr><td>City/Place/Postal cd.</td><td>:</td><td>9822 ZG NIEKERK</td></tr><tr><td>Country</td><td>:</td><td>The Netherlands</td></tr><tr><td>Email</td><td>:</td><td>et-desk@nmi.nl</td></tr></table>	Name	:	D.S. Sariredjo, B.Sc.E.E.	Company name	:	NMi Certin B.V.	Address	:	Smidshornerweg 18	Telephone number	:	+ 31 594 505005	Telefax number	:	+ 31 594 504804	Mailing address	:	P.O. Box 15	City/Place/Postal cd.	:	9822 ZG NIEKERK	Country	:	The Netherlands	Email	:	et-desk@nmi.nl
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Country	:	The Netherlands																										
Email	:	et-desk@nmi.nl																										

The data taken for this test and report herein was done in accordance with FCC Part 15 and ANSI C63.4-1992 measurements. NMi Certin B.V., location Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission-profile of the Equipment Under Test (EUT) on the date of the test noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: June 14, 2000

Signature:

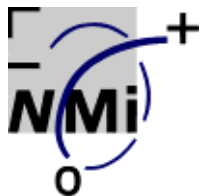


J.S. Sikkema, B.Sc.E.E.
Department EMC and Telecommunication



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

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Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

1 General Information.

1.1 Product description.

The product tested is part of an inductive laptiming system. The inductive laptiming system may include transponders, brand AMB, model number AMBrc Transponder, AMBrc_DP, AMBrc F102-RP5, a receiver model AMBrc Decoder and a battery charger, brand AMB, model number Charge Rack.

1.2 Related Submittal(s)/grant(s).

The related similar submittals are: FCC ID: NXYAMBGP1 (transponder type AMBrc Transponder) and NXYAMBGP2 (transponder type AMBrc_DP), NXYAMBGP3 (Transponder type AMBrc F102RP-5) NXYAMBGP4 (receiver type AMBrc Decoder).

1.3 Test Methodology.

The Test methodology of ANSI C63.4-1992 has been applied to provide adequate measuring data.

Complete data of the tested model has been recorded.

According to FCC Part 15, § 101 the EUT shall be classified as an intentional radiator and is therefore subject to certification.

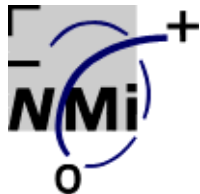
1.4 Test facility.

The FCC has per Public Notice declared that the measurement facilities located at the NMI Certin B.V. testsite Niekerk, Smidshornerweg 18, The Netherlands, have been reviewed and found to be in compliance with the requirements of section 2.948 (previously section 15.38) of the FCC rules per August 4, 1994.

The description of the measuring facilities have been filed with reference 31040/SIT, 1300B3 at the FCC's Offices.

1.5 List of measurement equipment.

NMI number	Description	Marketing name	Type
14277	Antennamast 4m	Heinrich Deisel	HD100
14278	Controller OATS	Heinrich Deisel	MA240
14340	Biconilog antenna 20MHz - 1100MHz	EMCO	3143
12473	Log-per antenna 200MHz - 1000MHz	Eaton	96005
12471	Biconical antenna 20MHz - 200MHz	Eaton	94455-1
12636	Plastic measurement room	Polyforce	-
13886	Open Area Test Site	Comtest	-
99108	Turntable OATS	Heinrich Deisel	HD050
15667	Measuring receiver 9kHz - 2750MHz	Rohde & Schwarz	ESCS30
12507	Artificial mains network 3-phase	Rohde & Schwarz	ESH2-Z5
13313	Impuls limiter	Rohde & Schwarz	ESH3Z2.357...
99115	Voltage probe	Schwarzbeck	TK9416



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Transponder
FCC ID:	NXYAMBG1

1.6 Bandwidth and antenna factors.

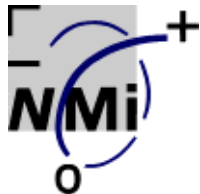
The utilized measuring equipment is stated in § 1.5. The bandwidth of the receiver switches automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. Also the antennafactors are included in the testreceiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate correction factor for the cable loss. The total correction is automatically added to the measured value.

2 Product labelling.

The following text shall be attached to the EUT, by means of a label, or -in case the enclosure is too small- on a prominent location in the users manual.

**This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions: (1)
This device may not cause harmful interference, and (2)
this device must accept any interference received,
including interference that may cause undesired
operation.**

The dimensions of the label, the location of the label and the type of font can be found in the FCC regulation book CFR 47, parts 0 to 19, revised as per October 1, 1997.



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Transponder
FCC ID:	NX-YAMBGP1

3 System test configuration.

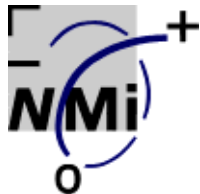
3.1 Justification.

During all measurements the transponders were transmitting continuously. The RF signal, generated by the transponder, is a CW signal. During radiated emission measurements the turntable was rotated in order to find the maximum radiated emission on each frequency.

In accordance with § 11.2.4. of ANSI C63.4-1992 the placing and manipulation of interface cables has been carried out.

3.2 Equipment modifications.

Not applicable.

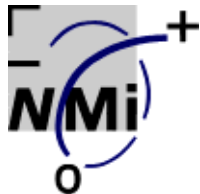


Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

3.3 Description of tested EUT.

3.3.1 Transponder AMBrc Transponder.

Unit title	:	Transponder
Model number	:	AMBrc Transponder
Part number	:	Not applicable
FCC ID number	:	NXYAMBGP1
Frequency range	:	5.0 MHz
Description/details	:	see section 3.1 of this report and exhibits to the application
Power supply	:	Internal NiMH 1.2V battery (to be charged by battery charger, brand AMB, model number Charge Rack).
Clock Oscillator(s)	:	5.0 MHz
Cabinet & Screening	:	Plastic
Interface Cable(s)	:	Not applicable
Method of screening	:	Not applicable
Method of grounding	:	Not applicable
Operating configuration	:	Transponder is continuously transmitting
Applicant's representative	:	F. Hin
Company	:	AMB i.t. Holding B.V.
Address	:	Herenweg 29A
Postal code and city	:	2105 MB HEEMSTEDE
Country	:	The Netherlands
Telephone number	:	+31 (0)23 5291893
Telefax number	:	+31 (0)23 5290156

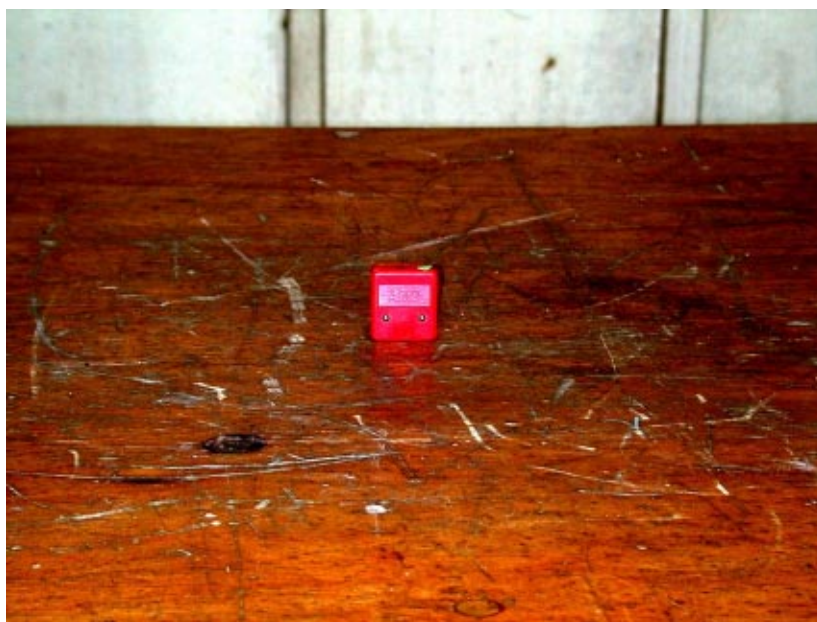


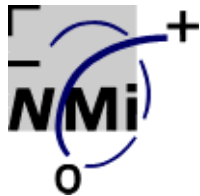
Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Transponder
FCC ID:	NXYAMBGP1

4 Conducted and radiated measurement photos.

On pages 08 to 10 the conducted and radiated emission measurements photos are given:

Page 08: AMBrC Transponder (radiated emission, x-orientation)

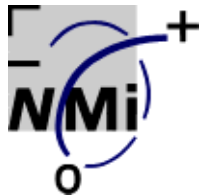




Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Transponder
FCC ID:	NXYAMBGP1

Page 09: AMBrC Transponder (radiated emission, y-orientation)





Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

Page 10: AMBrc Transponder (radiated emission, z-orientation)

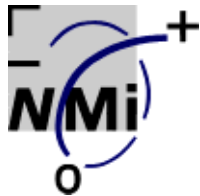


Page 11: AMBrc Charger Rack (conducted emission, test setup front view)



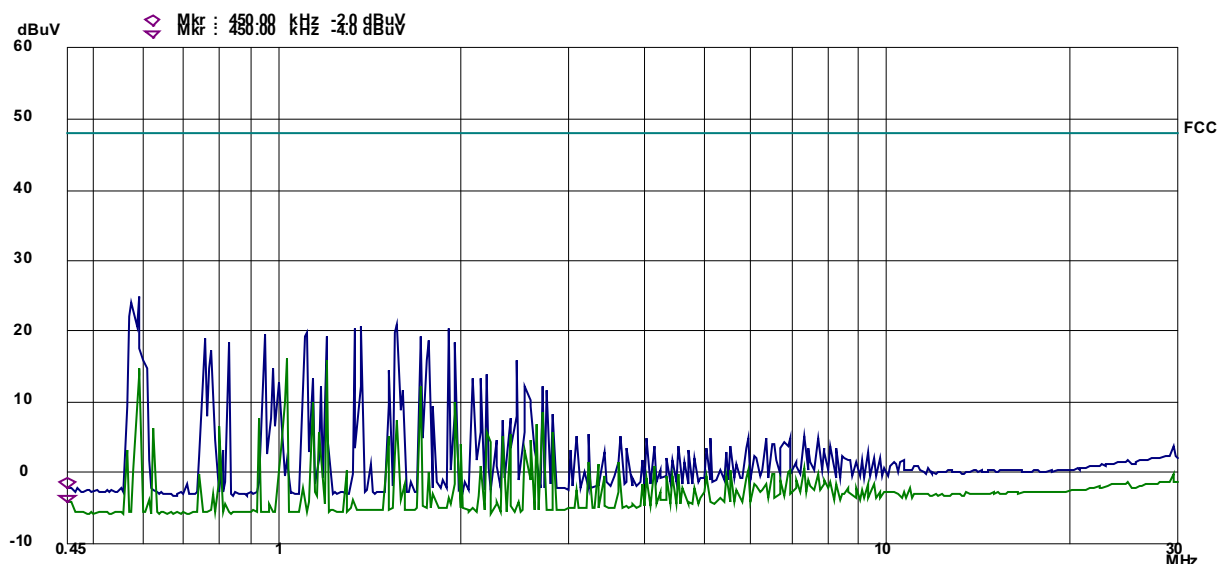
Page 12: AMBrC Charger Rack (conducted emission, test setup rear view)





Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Transponder
 FCC ID: NXYAMBP1

5 Conducted emission data.



L1: blue trace is QP, green trace is AVG

Frequency (MHz)	Measurement results dB(μ V) L1	Limits dB(μ V) section 207	Result
	QP	QP	
0.585	25.3	48.0	PASS
0.805	20.0	48.0	PASS
1.005	17.9	48.0	PASS
1.175	20.7	48.0	PASS
1.375	15.9	48.0	PASS
1.565	20.8	48.0	PASS
1.795	13.8	48.0	PASS
1.915	18.5	48.0	PASS

QP = Quasi-peak

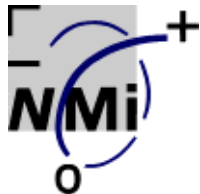
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 1

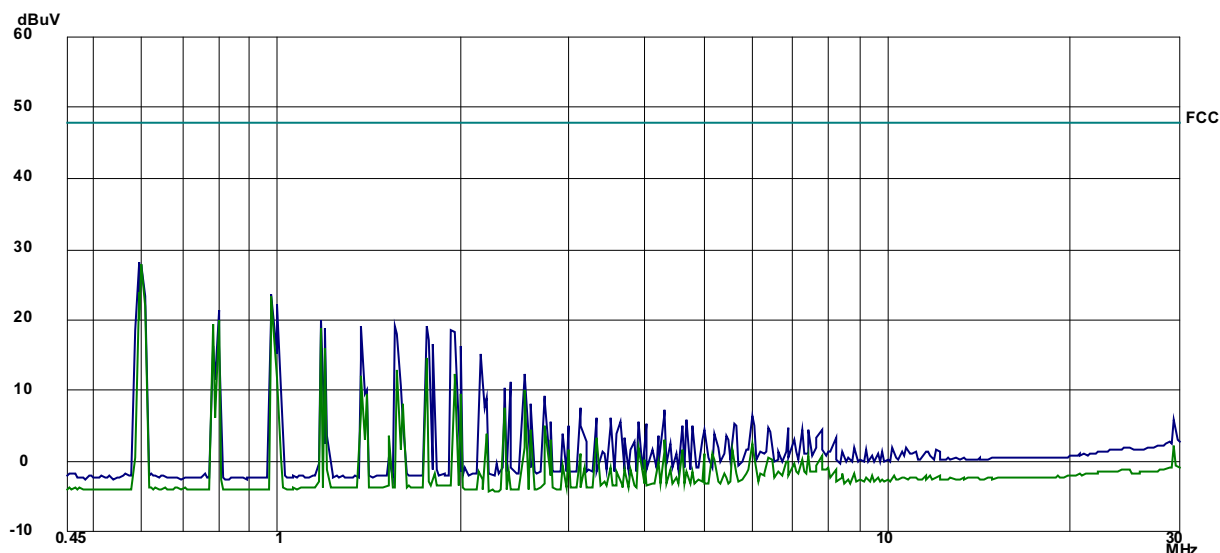
The results of the disturbance voltage level measurements at the AC mains connection terminal **L1** of the battery charger, brand AMB, type Charger Rack, when charging a transponder, brand AMB, type AMBrc Transponder, carried out in accordance with FCC Part 15, section 207 and ANSI C63.4-1992, are depicted in table 1. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Transponder
 FCC ID: NXYAMBGP1



L2: blue trace is QP, green trace is AVG

Frequency (MHz)	Measurement results dB(μV) L2	Limits dB(μV) section 207	Result
	QP	QP	
0.585	25.8	48.0	PASS
0.805	20.5	48.0	PASS
1.005	22.7	48.0	PASS
1.175	20.0	48.0	PASS
1.375	18.5	48.0	PASS
1.565	19.1	48.0	PASS
1.795	19.2	48.0	PASS
1.915	18.6	48.0	PASS

QP = Quasi-peak

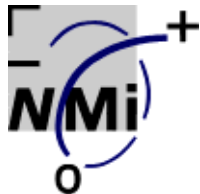
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 1a

The results of the disturbance voltage level measurements at the AC mains connection terminal **L2** of the battery charger, brand AMB, type Charger Rack, when charging a transponder, brand AMB, type AMBrc Transponder, carried out in accordance with FCC Part 15, section 207 and ANSI C63.4-1992, are depicted in table 1a. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

6 Radiated emission data.

6.1 Radiated field strength measurement (30 MHz - 1000 MHz, E-field).

6.1.1 AMBrc Transponder.

Frequency (MHz)	Measurement results dB(μV)/m 3 metres QP		Limits dB(μV)/m @ 3 metres QP section 209
	Vertical	Horizontal	
30.0 - 88.0	< 20.0	< 20.0	40.0
88.0 - 216.0	< 20.0	< 20.0	43.5
216.0 - 425.0	< 20.0	< 20.0	46.0
425.0 - 630.0	< 25.0	< 25.0	46.0
630.0 - 960.0	< 30.0	< 30.0	46.0
960.0 - 1000.0	< 31.0	< 31.0	54.0

QP = Quasi-peak

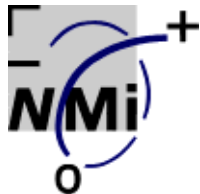
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 2

Results of the radiated field strength (E-field) measurements on the transponder, brand AMB products, type AMBrc Transponder, carried out in accordance with FCC Part 15, section 209 and ANSI C63.4-1992 in the configuration and operation mode(s) as stated in this testreport, are depicted in table 2. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

6.1.2 Battery charger AMB modelnumber 2402.

Frequency (MHz)	Measurement results dB(μV)/m 3 metres QP		Limits dB(μV)/m @ 3 metres QP section 209
	Vertical	Horizontal	
30.0 - 88.0	< 20.0	< 20.0	40.0
88.0 - 216.0	< 20.0	< 20.0	43.5
216.0 - 425.0	< 20.0	< 20.0	46.0
425.0 - 630.0	< 25.0	< 25.0	46.0
630.0 - 960.0	< 30.0	< 30.0	46.0
960.0 - 1000.0	< 31.0	< 31.0	54.0

QP = Quasi-peak

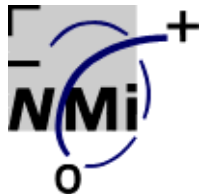
Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 3

Results of the radiated field strength (E-field) measurements on the battery charger, brand AMB modelnumber Charger Rack, when charging a transponder, brand AMB, model number AMBrc Transponder, carried out in accordance with FCC Part 15, section 209 and ANSI C63.4-1992 in the configuration and operation mode(s) as stated in this testreport, are depicted in table 3. Measurement results are quasi-peak results.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Transponder
 FCC ID: NXYAMBGP1

6.2 Radiated field strength measurement (9 kHz - 30 MHz, H-field).

6.2.1 AMBrc Transponder (x-orientation).

Frequency	Measurement results (QP) 1m	Measurement results (QP) 3m	Measurement results (QP) 10m	Antenna factor	Cable loss	Measurement results (QP, 30 m.)	Limits FCC Part 15 section 209
(MHz)	dB μ V	dB μ V		dB	dB	(dB μ V/m)	(dB μ V/m)
0.009 - 0.490	< <	< <	< <	17	1	< 18.0	48.5 - 13.8 (300 m.)
0.490 - 1.705	< <	< <	< <	17	1	< 18.0	33.8 - 22.9 (30 m.)
1.705 - 5.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)
5.000	59.3	39.5	n.m.	17	1	< 18.0	29.5 (30 m.)
5.000 - 30.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)

QP = Quasi-peak, n.m. = could not be measured

Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 4

Results of the radiated field strength (H-field) measurements, carried out in accordance with FCC Part 15, section 209 (Edition 10-1-97) and ANSI C63.4-1992, on a transponder, brand AMB, model number AMBrc Transponder, are depicted in table 4. Orientation of the transponder during measurement was x-orientation.

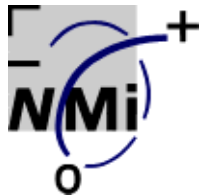
Notes: -Frequency range: 9-90 kHz Average detector used during measurements
 110-490 kHz Average detector used during measurements

-The radiated field strengths were measured at a distance of 1, 3 and 10 metres.

-A plot of the carrier bandwidth can be found in appendix A.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Transponder
 FCC ID: NXYAMBGP1

6.2.2 AMBrc Transponder (y-orientation).

Frequency	Measurement results (QP) 1m	Measurement results (QP) 3m	Measurement results (QP) 10m	Antenna factor	Cable loss	Measurement results (QP, 30 m.)	Limits FCC Part 15 section 209
(MHz)	dB μ V	dB μ V		dB	dB	(dB μ V/m)	(dB μ V/m)
0.009 - 0.490	< <	< <	< <	17	1	< 18.0	48.5 - 13.8 (300 m.)
0.490 - 1.705	< <	< <	< <	17	1	< 18.0	33.8 - 22.9 (30 m.)
1.705 - 5.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)
5.000	55.8	28.3	n.m.	17	1	< 18.0	29.5 (30 m.)
5.000 - 30.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)

QP = Quasi-peak, n.m. = could not be measured

Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 5

Results of the radiated field strength (H-field) measurements, carried out in accordance with FCC Part 15, section 209 (Edition 10-1-97) and ANSI C63.4-1992, on a transponder, brand AMB, model number AMBrc Transponder, are depicted in table 5. Orientation of the transponder during measurement was y-orientation.

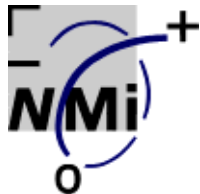
Notes: -Frequency range: 9-90 kHz Average detector used during measurements
 110-490 kHz Average detector used during measurements

-The radiated field strengths were measured at a distance of 1, 3 and 10 metres.

-A plot of the carrier bandwidth can be found in appendix A.

Test engineer : O. H. Hoekstra Date: June 8, 2000

Tester signature :



Description of EUT: RF Transponder
 Manufacturer: AMB i.t. Holding B.V.
 Brand mark: AMB
 Type: AMBrc Transponder
 FCC ID: NXYAMBGP1

6.2.3 AMBrc Transponder (z-orientation).

Frequency	Measurement results (QP) 1m	Measurement results (QP) 3m	Measurement results (QP) 10m	Antenna factor	Cable loss	Measurement results (QP, 30 m.)	Limits FCC Part 15 section 209
(MHz)	dB μ V	dB μ V		dB	dB	(dB μ V/m)	(dB μ V/m)
0.009 - 0.490	< <	< <	< <	17	1	< 18.0	48.5 - 13.8 (300 m.)
0.490 - 1.705	< <	< <	< <	17	1	< 18.0	33.8 - 22.9 (30 m.)
1.705 - 5.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)
5.000	58.9	33.6	n.m.	17	1	< 18.0	29.5 (30 m.)
5.000 - 30.000	< <	< <	< <	17	1	< 18.0	29.5 (30 m.)

QP = Quasi-peak, n.m. = could not be measured

Measured levels on frequencies not stated in this report have been measured more than 20 dB below the applicable limit.

Table 6

Results of the radiated field strength (H-field) measurements, carried out in accordance with FCC Part 15, section 209 (Edition 10-1-97) and ANSI C63.4-1992, on a transponder, brand AMB, model number AMBrc Transponder, are depicted in table 6. Orientation of the transponder during measurement was z-orientation.

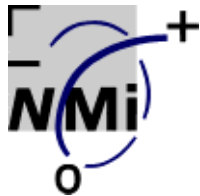
Notes: -Frequency range: 9-90 kHz Average detector used during measurements
 110-490 kHz Average detector used during measurements

-The radiated field strengths were measured at a distance of 1, 3 and 10 metres.

-A plot of the carrier bandwidth can be found in appendix A.

Test engineer : O. H. Hoekstra Date: June 8, 2000

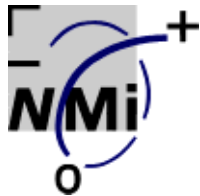
Tester signature :



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Transponder
FCC ID:	NXYAMBGP1

7 Photos of tested EUT.

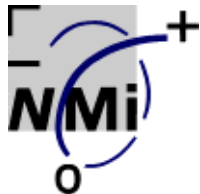
Photo's of exterior and interior are included in separate annex.



Description of EUT:	RF Transponder
Manufacturer:	AMB i.t. Holding B.V.
Brand mark:	AMB
Type:	AMBrC Transponder
FCC ID:	NXYAMBGP1

APPENDIX A

Plots of carrier bandwidth



Description of EUT: RF Transponder
Manufacturer: AMB i.t. Holding B.V.
Brand mark: AMB
Type: AMBrc Transponder
FCC ID: NXYAMBGP1

14: 54: 19 JUN 07, 2000

hp

REF .0 dBm

AT 10 dB

PEAK
LOG
10
dB/

VA SB
SC FC
CORR

CENTER 5.00 MHz

RES BW 100 kHz

VBW 30 kHz

SPAN 10.00 MHz

#SWP 20.0 msec

Plot 1 - Carrier bandwidth AMBrc Transponder