

TEST REPORT

REPORT CERTIFICATE issued by a FCC listed Test Laboratory

CUSTOMER AND

Project no: 05264

MANUFACTURER: DigiTool AB

Box 6190
SE-10233 Stockholm
Sweden

EQUIPMENT

UNDER

TEST (EUT):

Flight instrument system for free balloons operating at the frequency 914.5 MHz, consisting of:

1. Temperature Transmitter, Type DBI TX1, code 10014, without s/n.
- 2) Temperature Transmitter, Type DBI TX2, code 00001, without s/n.
- 3) Receiver Instrument, Type DBI 002, without s/n.

TEST SPEC:

47 Cfr Ch. 1 (10-1-04 Edition):

Transmitters, Part 15, Subpart C:

§15.249, Operation within the band 902 - 928 MHz

Receiver, Part 15, Subpart B, Class B:

§15.107: Conducted Emission, AC power line

§15.109: Radiated Emission

DATE OF TEST: June 30 – July 1, 2005

TEST SITE:

Svenska EMC Lab AB, Karlskrona, Sweden.

FCC registration number: 90967.

CONFORMITY:

The EUT (Equipment Under Test), did pass the above mentioned tests.

The test result shows full compliance with the above technical specifications.

Approved, Karlskrona June 6, 2005



Hans Östergren
Manager Svenska EMC Lab AB

DATE OF RECEIPT:

June 30, 2005

CONDITION OF EUT:

No remarks. Operates as intended.

TEST PERSONNEL:

Svenska EMC Lab AB: Hans Östergren.

ASSISTANT PERSONNEL:

DigiTool AB: Stefan Hansson.

DESCRIPTION OF THE EUT:

The DBI TX1 is a wireless transmitter monitoring free hot air balloon envelope top temperature. The DBI TX2 is a wireless transmitter monitoring free hot air balloon envelope temperature by IR sensing. They transmit data to the DBI 002 flight instrument where temperature is displayed.

DBI TX1 unit consists of a sturdy aluminum enclosure fitted with a load tape slot attachment, exiting antenna and temperature probe wires.

DBI TX2 unit consists of a cylindrical aluminum enclosure with the radiating opening at one end. All units are power supplied with single replaceable long life lithium cell. DBI 002 could also be connected to the public mains by an AC/DC Adapter.

RF transmit is controlled automatic by the difference in temperature of transmitter and the hot air. No operator action is required.

All units are with built-in permanently attached antenna and without any external antenna contact. The embedded radio circuits are from Radiometrix, Type TX3A and RX3A.

ESTIMATED UNCERTAINTY:

Expanded uncertainty (k = 2):

Conducted Emission, 0.15 – 30 MHz:	± 1.1 dB
Field Strength, emission 30 – 300 MHz:	± 2.2 dB
Field Strength, emission 300 – 700 MHz:	± 2.3 dB
Field Strength, emission 700 – 1300 MHz:	± 2.4 dB
Field Strength, emission 1 to 10 GHz:	± 3.0 dB
Frequency, 0.15 – 1000 MHz:	± 10 Hz
Frequency, 1 – 10 GHz:	± 100 Hz

The uncertainties are for a confidence level of not less than 95 %.

TEST EQUIPMENT LIST:

Type/Manufacturer/Bandwidth	s/n	Calibration information	
		Date	Interval
EMI Test System, Monitor EZM, Rohde & Schwarz EP-6, 20 Hz - 1300 MHz	860157/014	2004-07	12 months
Test Receiver, Rohde & Schwarz ESH-3, 9 kHz - 30 MHz	894979/013	2004-07	12 months
Test Receiver, Rohde & Schwarz ESVP, 20 - 1300 MHz	893497/006	2004-07	12 months
Pulse Limiter, Rohde & Schwarz ESH3-Z2 DC - 30 MHz	357881052	2004-07	12 months
Plotter, Rohde & Schwarz DOP 2	893117/0108	NA	NA
LISN 50 OHM/50 µH, Electro Metrics EM-7820 10 kHz - 30 MHz, 16 A	2771	2004-07	12 months
LISN 50 OHM/50 µH, MEB NNB-4/200 0.15 - 30 MHz, 200 A	C96001/3	2004-07	12 months
Cable to Test Receiver, RG 223	006	2004-08	12 months
Cable to LISN, RG 223	015	2004-08	12 months
Loop Antenna, EMCO 6502, 9 kHz - 30 MHz	1057	2004-05	24 months
Biconical Antenna, Schwarzbeck BBA9106 30 - 300 MHz	93-92196.1	2004-07	24 months
Log-periodic Antenna, Schwarzbeck UHALP9107, 300 - 1000 MHz	91071205	2004-07	24 months
Antenna Cable, H-100	024	2004-08	12 months
Spectrum Analyzer Tektronix 2712, 10kHz - 1.8GHz	B023361	960131	12 months
Spectrum Analyzer, HP 8566B	2950A06284	2004-12	12 months
Signal Amplifier, HP 8449B, 1 - 26.5 GHz	3008A00514	2004-06	12 months
Double Ridged Guide Antenna, EMCO 3115, 1 - 18 GHz	2338	2003-09	36 months
Coaxial Cable, Sucoflex 104, l = 0.5 m	180067/4	2004-08	12 months
Coaxial Cable, Sucoflex 104, l = 5 m	171288/4	2004-08	12 months
Antenna Mast System, Jyske EMC, h = 1 - 4 m	02	NA	NA
Turn Table, Jyske EMC, h = 1 m	01	NA	NA
Anechoic Chamber, 8 x 4.5 x 3 m	1	2003-04	36 months
Open Area Test Site for 3 m antenna distance	1	2003-12	36 months

TEST SET-UP AND PROCEDURE:

See Appendix 1 to 3. As laid out in ANSI C.63.4:1992 Document.

TEST CONDITIONS:

ALL TRANSMITTERS:

Rating: Battery, 3 VDC. Tested with new batteries.

Fundamental frequency: 914.5 MHz.

Effective radiated power: < 1 mW.

Modulation: FM \pm 30 kHz.

Transmitting: Data length, 37 milliseconds. Repetition time, 2.3 seconds.

Operating Conditions: Active. The transmitter was continuously operating at 100% DC during the tests.

Measured frequency range: 30 – 10 000 MHz.

TRANSMITTER DBI TX1:

Peripherals: No peripherals.

Cables: To temp sensor: 254 mm.

Antenna: Fixed wire of 84 mm length

Clock Frequency: Only the fundamental 914.5 MHz.

Modifications: The Antenna length was shortened, See Appendix 4.

TRANSMITTER DBI TX2:

Peripherals: No peripherals.

Cables: No cables.

Antenna: Fixed PCB Antenna.

Clock Frequency: Only the fundamental 914.5 MHz.

Modifications: No modifications.

RECEIVER DBI 002:

Peripherals:

- PC, Dell, Type Inspiron 4000, s/n HYHN60J, FCC ID: Ref. number 99123. Tested to comply with FCC regulations.
- AC/DC Adapter, Ericsson, AA2195002 WW47, FCC ID: Tested to comply with FCC regulations.
- Printer, HP DeskJet, Type 820Cxi, FCC ID: Tested to comply with FCC regulations.
- Mouse, Logitech, Type M-BA47, s/n LZE12153206, FCC ID: Tested to comply with FCC regulations.

Cables:

- Unshielded DC cable of 2 m length without safety ground from AC/DC Adapter to EUT.
- Unshielded mains cable of 1.8 m length without safety ground to the Printer.
- Shielded cable of 2 m length from PC USB port to the Mouse.
- Shielded cable of 1.8 m length from PC parallel port to Printer.
- Shielded cable of 1.8 m length from PC serial port to EUT.

See also Appendix 5.

Antenna: Fixed PCB Antenna.

Clock Frequency: 4 MHz, 32 kHz.

Modifications: No modifications.

Configuration: See Appendix 5. A minimum system was configured with a PC and its peripherals. The EUT was connected to the PC serial port, other devices to the USB and parallel ports on the PC (15.31(i)).

TEST CONDITIONS (CONTINUED):

Operating Conditions: Operating in a normal application with continuous reading of the received temperature data, and with communication between the PC and the peripherals.

Measured frequency range: 0.15 – 1 000 MHz.

Ambient Humidity: 33 % RH

Ambient temperature: 28 °C.

Mains voltage at test: 117 VAC.

TEST PERFORMANCE AND RESULTS:

TRANSMITTERS.

Fundamental frequency.

The fundamental frequency was measured. Fully charged battery was used. With modulation.

Test instrument: Spectrum Analyzer Tektronix 2712, Antenna Schwarzbeck UHALP9107.

Measured with Analyzer in max hold and during 2 minutes.

Test result:

DBI TX1: The frequency was -45 to +95 kHz at dBc -3 dB with normal modulation.

DBI TX2: The frequency was -130 to +175 kHz at dBc -3 dB with normal modulation.

§2.1049: Occupied bandwidth.

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. Measured with the Spectrum Analyzer in max. hold and with Peak Detector (RBW = 120 kHz, VBW = 300 kHz). The bandwidth was measured at $\pm 0.5\%$ points ($= 99\%$ power as shown in diagram). Test instruments: Spectrum Analyzer Tektronix 2712, 10 kHz - 1.8 GHz. Antenna: Schwarzbeck UHALP9107, 300 - 1000 MHz.

Test result:

See Appendix 10 and 11.

DBI TX1: Maximum bandwidth is 321 kHz.

DBI TX2: Maximum bandwidth is 293 kHz.

§15.249(a): Field strength of emission, fundamental.

Measured at an antenna distance of 3 m, on the Open Area Test Site. The emission was maximized by rotating the turn table, put the EUT in X-Y-Z directions, varying the antenna height 1-4 m and with vertical and horizontal antenna polarizations. All directions were carefully investigated. Measured with CISPR quasi-peak detector with 10 seconds measuring time. The transmitter was modulated with normal modulation. The limit is 50 mV/m or 94 dB μ V/m at 3 m. The test receiver was compensated for the low repetition frequency the transmitters were using. Test Instruments: Rohde & Schwarz ESVP, 20 - 1300 MHz, Antenna UHALP9107, 300 – 1000 MHz. Worst cases were measured.

Test result:

DBI TX1: 92 dB μ V/m after modification. The margin to limit was - 2.0 dB.

DBI TX2: 73.3 dB μ V/m. The margin to limit was - 20.7 dB.

§15.249(d): Field strength of emission, except the fundamental.

Pre-test: A pre-test was performed in the Anechoic Chamber at 3 m antenna distance and in the frequency range 9 kHz to 10000 MHz to find any radiating frequencies except the fundamental or harmonics. No additional emission occurs in the range 9 kHz – 10000 MHz.

Final test: Measured in the frequency range 30 – 10 000 MHz at an antenna distance of 3 m, on the Open Area Test Site. The emission was maximized by rotating the table, put the EUT in X-Y-Z directions, varying the antenna height 1-4 m and with vertical and horizontal antenna polarizations. All directions were carefully investigated. Measured with CISPR quasi-peak detector up to 1 GHz. Measured with peak detector in max hold and with average detector in max hold from 1 – 10 GHz. The transmitter was modulated with normal modulation.

Test instruments: Rohde & Schwarz EP-6 System, 9 kHz - 1300 MHz, Spectrum Analyzer, HP 8566B, 9 kHz – 26.5 GHz, Preamplifier HP8449B, 1 – 26.5 GHz. Antennas: Schwarzbeck BBA9106, 30 - 300 MHz, Schwarzbeck UHALP9107, 300 - 1000 MHz, EMCO 3115, 1 - 18 GHz.

Worst case was measured.

Test result: Pass.

See Appendix 12 and 14.

DBI TX1: Pass.

DBI TX2: Pass.

Note: Both transmitters have a small margin to limit.

RECEIVER:

§15.107: Conducted Emission test, AC power line. The conducted emission was measured on the 115 VAC power input terminals through a 50 ohm 50 micro-Henry LISN (Line Impedance Stabilization Network) in the frequency range 0.15 to 30 MHz. The two lines were measured with a quasi-peak detector and an Average detector. Worst case was recorded.

Test result: Pass.

See Appendix 6 and 7.

The margin to limit was -2.3 dB(AV.) at 0.4846 MHz and 0,5816 MHz, and -8.6 dB(QP) at 0.5816 MHz.

§15.109: Radiated Emission:

Measured in the frequency range 30 MHz - 1000 MHz at an antenna distance of 3 m, on the Open Area Test Site. The emission was maximized by rotating the table, put the EUT in X-Y-Z directions, varying the antenna height 1-4 m and the antenna polarization. Measured with CISPR quasi-peak detector. Test instruments: Rohde & Schwarz EP-6 System, 9 kHz - 1300 MHz, Antennas Schwarzbeck BBA9106, 30 - 300 MHz and UHALP9107, 300 - 1000 MHz.

Worst case was recorded.

Test result: Pass.

See Appendix 8.

The margin to limit was -4.7 dB at 63.9 MHz.

§15.111: Conducted Antenna Power.

Not applicable. No antenna contact present.

SUMMARY OF RESULTS:

1) Temperature Transmitter, Type DBI TX1:

The fundamental radiated emission margin to limit was - 2 dB at 914.5 MHz as worst case.

The margin to limit for harmonics and spurious was – 2.1 dB(AV.) at 5487.0 MHz and

- 2.5 dB(peak) at 6401.5 MHz.

2) Temperature Transmitter, Type DBI TX2:

The fundamental radiated emission margin to limit was – 20.7 dB at 914.5 MHz as worst case.

The margin to limit for harmonics and spurious was – 2.7 dB(AV.) at 1829.0 MHz and minimum

- 14 dB(peak) at all frequencies.

3) Receiver Instrument, Type DBI 002:

- The conducted emission on the mains terminals:

The margin to limit was - 8.6 dB (QP) at 0.5816 MHz, and – 2.3 dB(AV.) at 0.4846 MHz and at 0.5816 MHz.

- Final test of radiated emission:

The margin to limit was – 4.7 dB at 63.9 MHz.

CONCLUSION:

The Temperature Transmitter, Type DBI TX1, code 10014, Temperature Transmitter, Type DBI TX2, code 00001, and Receiver Instrument, Type DBI 002, did pass the above mentioned tests provided modification step outlined in this report is taken for DBI TX1.

Karlskrona July 11, 2005



Hans Östergren

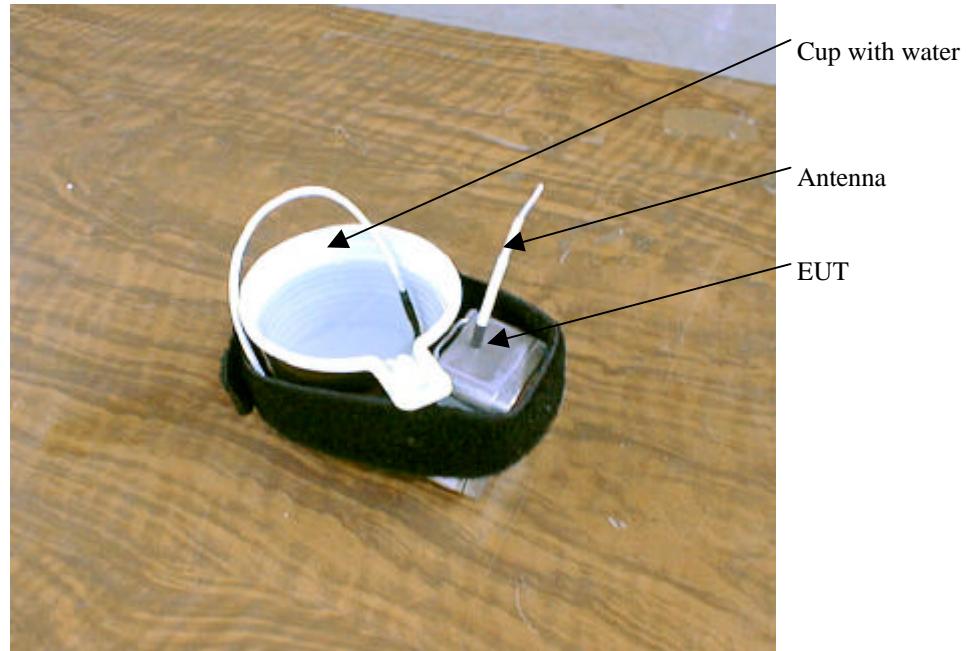
Manager Svenska EMC Lab AB

Sr. EMC Test Engineer

List over Appendixes.

<u>Appendix No</u>	<u>Note</u>
1	Test set-up photos, transmitter TX1 and TX2 on OATS
2	Test set-up photos, receiver 002 RE
3	Test set-up photos, receiver 002 CE
4	Modification of TX1 Antenna
5	Set-up configuration of receiver 002
6	Test Equipment set-up, 1 – 10 GHz
7	Diagram, CE, 0.15 - 30 MHz, L1, receiver 002
8	Diagram, CE, 0.15 - 30 MHz, L2, receiver 002
9	Diagram, RE, 30 - 1000 MHz, 3 m, receiver 002
10	Calculation of Final Emission Levels, 30 - 1000 MHz, receiver 002
11	Occupied Bandwidth, transmitter TX1
12	Calculation of Final Emission Levels, 1 – 10 GHz, transmitter TX1
13	Occupied Bandwidth, transmitter TX2
14	Calculation of Final Emission Levels, 1 – 10 GHz, transmitter TX2

Test set-up, Radiated Emission, transmitter DBI TX1



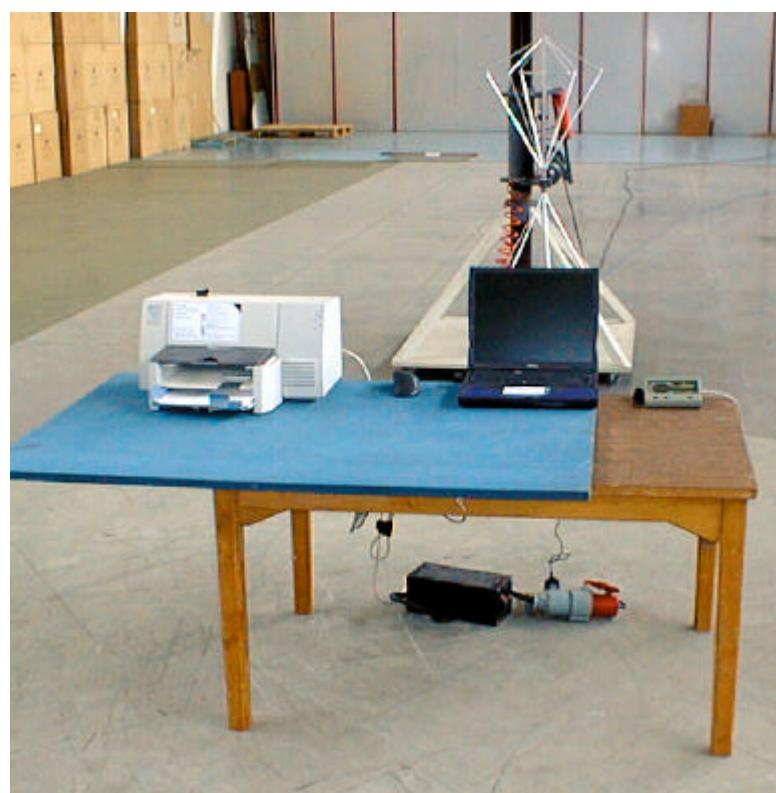
Test set-up, Radiated Emission, transmitter DBI TX2



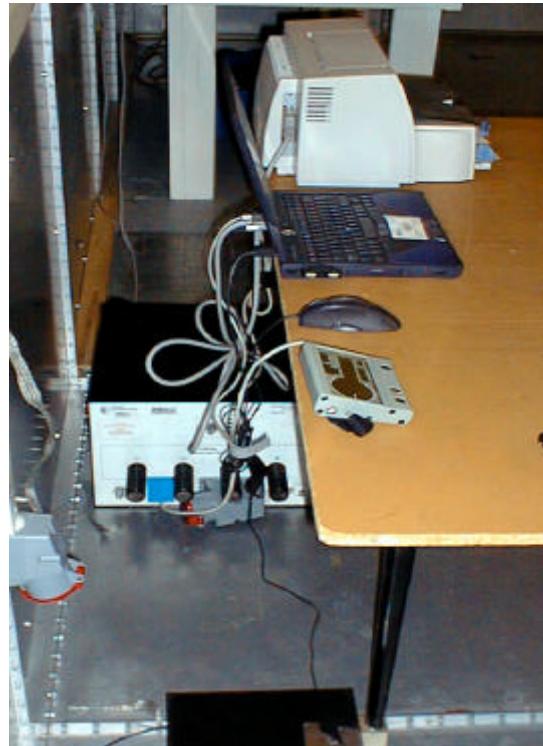
Test set-up, Radiated Emission, receiver DBI 002



Test set-up, Radiated Emission, receiver DBI 002



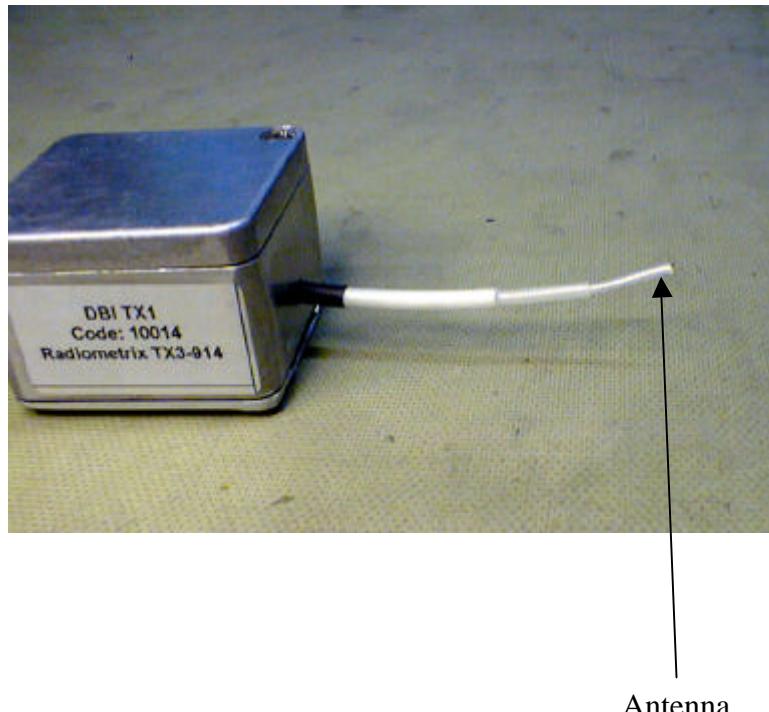
Test set-up, Conducted Emission, receiver DBI 002



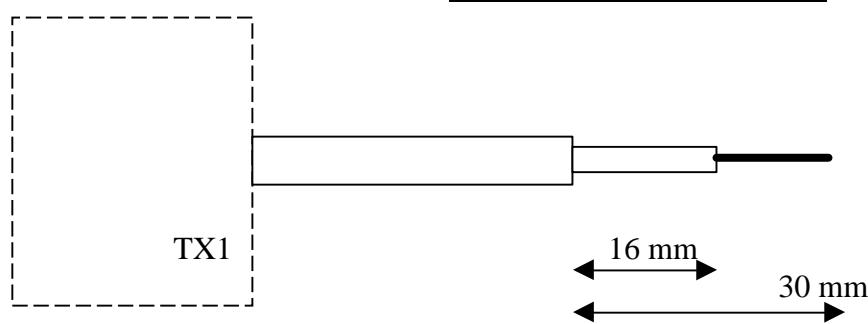
Test set-up, Conducted Emission, receiver DBI 002



Modification of Transmitter Antenna, DBI TX1

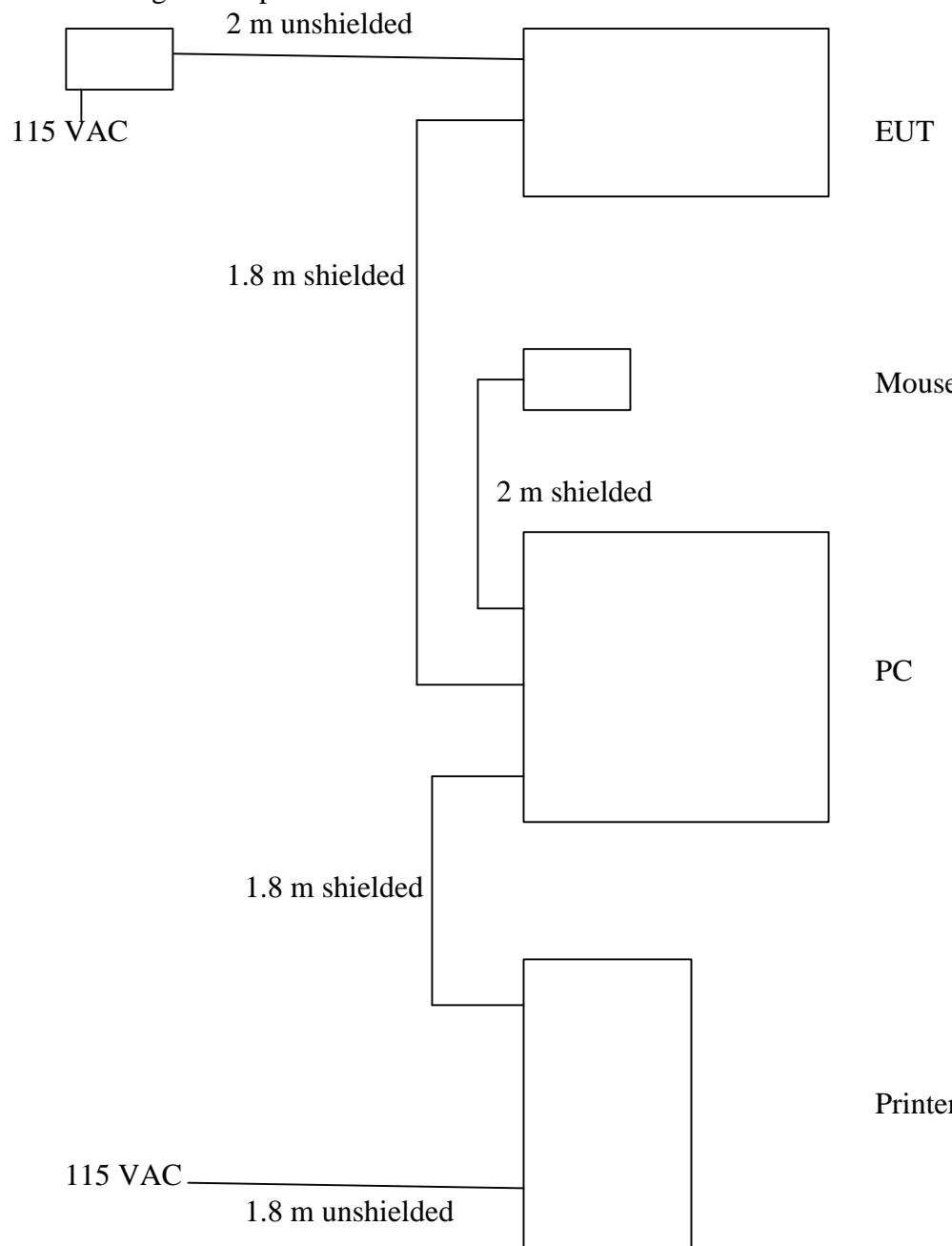


Antenna length changed to:



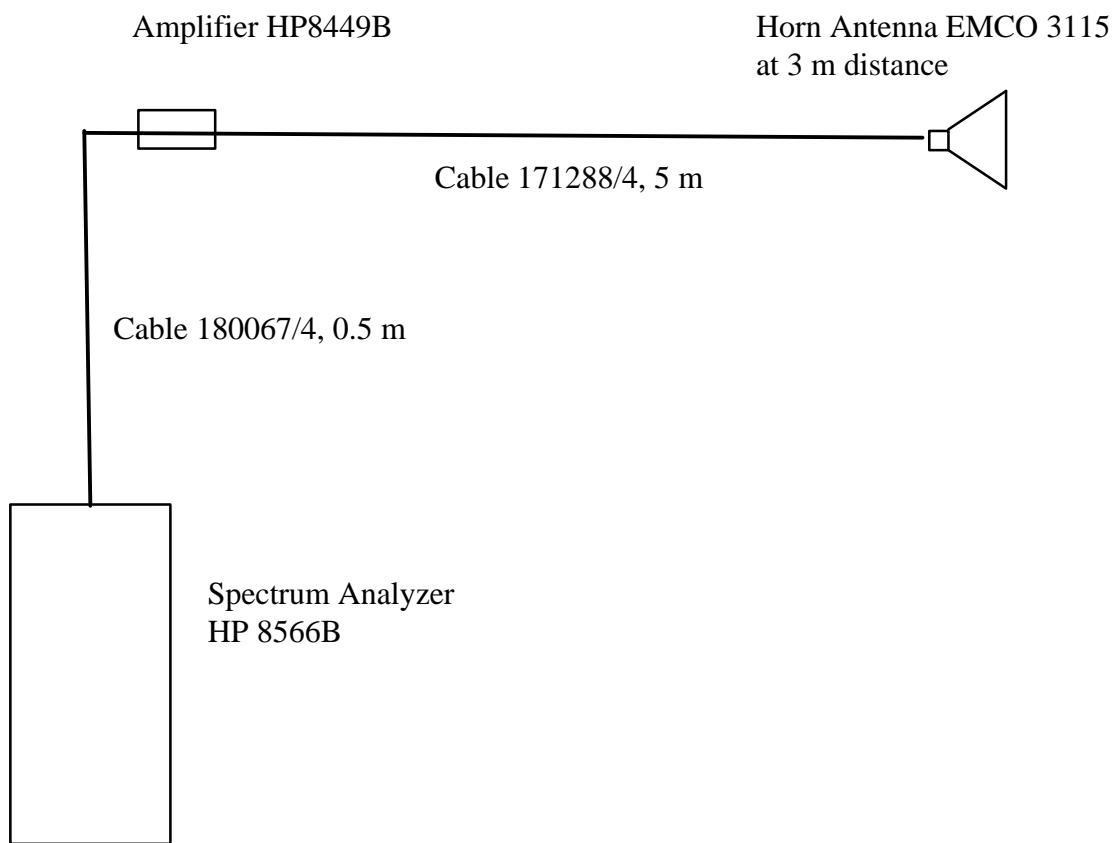
Test set-up, receiver DBI 002

AC/DC Plug-in Adapter



Test equipment set-up

1 - 10 GHz:

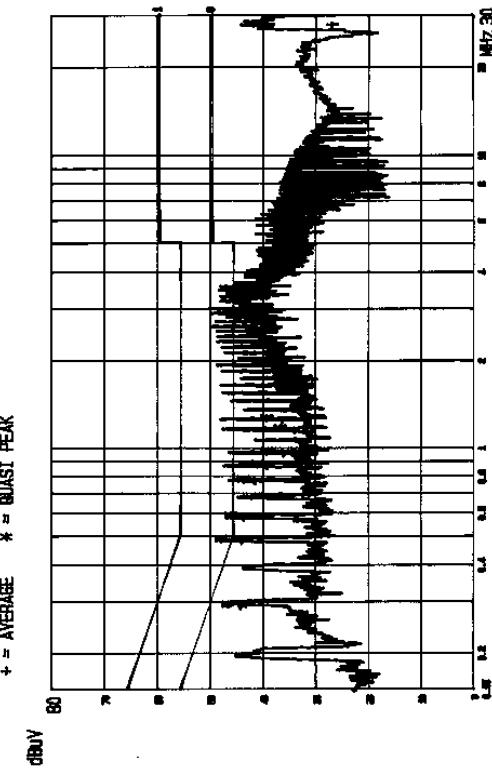


Conducted Emission, DBI 002 L1

DIGITOOL AB
 Conducted Emission Test
 Start of Test: 30.JUN'85 . 13:42
 E.U.T.: DBI 002
 Oper. Condition: ACTIVE
 Operator: HANS OSTERGREN
 Test Spec: FCC Part 15, Subpart B Conducted RFI, Class B. 04 Ed
 Start Fr. Stop Fr. IF-BW Display Att. Transducer
 MHz MHz kHz dB type
 0.1500 30.0000 10.00 Max Hold 0 EM7620L4

Frequency MHz	Average dBmV	AV-Margin dBmV	Quasi Peak dBmV	GP-Margin dBmV
0.2907	44.3	-6.3	46.4	-14.2
0.4846	44.1	-2.3	47.6	-8.6
0.5816	43.7	-2.3	45.8	-10.2
0.7754	41.5	-4.5	43.4	-12.6
0.8724	39.3	-6.7	40.9	-15.1
0.9693	36.1	-9.9	39.0	-17.0
1.1631	34.1	-11.9	36.4	-19.6
1.2601	35.2	-9.8	39.1	-16.9
1.9387	36.6	-9.2	38.7	-17.3
2.6174	37.4	-8.6	39.0	-17.0
3.0053	42.6	-3.4	39.1	-16.9
26.8	26.8	-23.2	41.7	-16.3
28.0182				

* Limit exceeded



L1

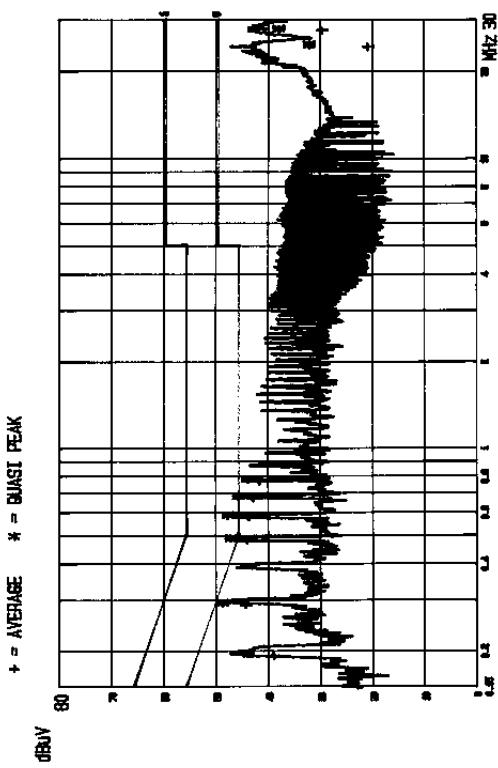
Conducted Emission, DBI 002 L2

Frequency MHz	Average dB _{UV}	AV-Margin dB _{UV}	Quasi Peak dB _{UV}	GP-Margin dB _{UV}
0.1937	38.8	-15.2	43.7	-20.3
0.2906	44.2	-8.4	48.5	-12.4
0.4846	44.0	-2.4	46.9	-9.5
0.5816	43.7	-2.3	47.4	-8.6
0.6785	42.9	-3.1	45.4	-10.6
0.7755	41.6	-4.4	43.7	-12.3
24.4312	20.8	-29.2	31.8	-26.2
27.9218	29.7	-20.3	37.7	-22.3

* Limit exceeded

DIGITOOL AB
 Conducted Emission Test
 Start of Test: 30.JUN.05 . 13:32
 E.U.T.: DBI 002
 Oper. Condition: ACTIVE
 Operator: HANS OSTERGREN
 Test Spec: FCC Part 15, Subpart B conducted RFI, Class B. 04 Ed

Start Fr. Stop Fr. IF-BW Display Att. Transducer
 MHz MHz kHz Mode dB type
 0.1500 30.0000 10.00 Max Hold 0 EM7820L2



L2

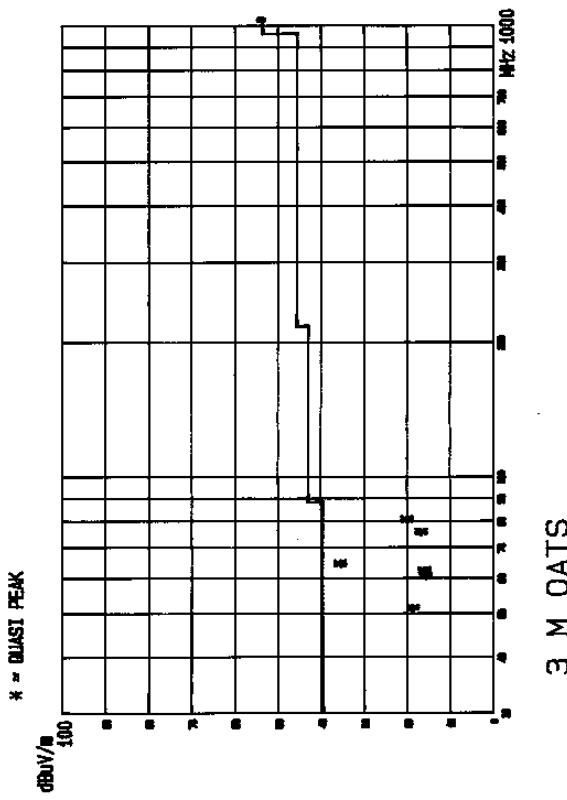
Radiated Emission, DBI 002

DIGIT001 AB
Radiated Emission test on OATS
 Start of Test: 30.JUN.05 . 14:27
 E.U.T.: DBI 002
 Oper. Condition: ACTIVE
 Operator: HANS OSTERGREN
 Test Spec: FCC Part 15, Subpart B, Class B, 3 m OATS

Start Fr. MHz Stop Fr. MHz IF-BW KHz Dete. Att. Meas. T. Transd. type.
 30.0000 299.9999 120 Peak LN 0.020 LONG105
 300.0000 1000.0000 120 Peak LN 0.020 LONG107

Frequency MHz	Measured Level dBmV/m	Margin dB	Point h/m	Height m	Angle deg.	Azimuth deg.
51.1030	18.6	-21.4	>	1.00	180	
60.3990	15.5	-24.5	>	1.00	180	
61.9020	15.8	-24.2	>	1.00	180	
63.9060	35.3	-4.7	>	1.00	215	
75.5210	15.6	-23.4	>	1.00	215	
79.5820	19.9	-20.1	>	1.00	215	

* Limit exceeded



Radiated Fieldstrength Test. Calculation of Final Emission Levels, DBI 002

EUT: Flight instrument system for free balloons operating at the frequency 914.5 MHz, consisting of:
3) Receiver Instrument, Type DBI 002, without s/n.

TEST SPEC: 47 Cfr Ch. 1 (10-1-04 Edition):
Part 15, Subpart B, Class B:
§15.109: Radiated Emission
3 m Antenna distance

DATE OF TEST: June 30 – July 1, 2005

OPERATION: Active.

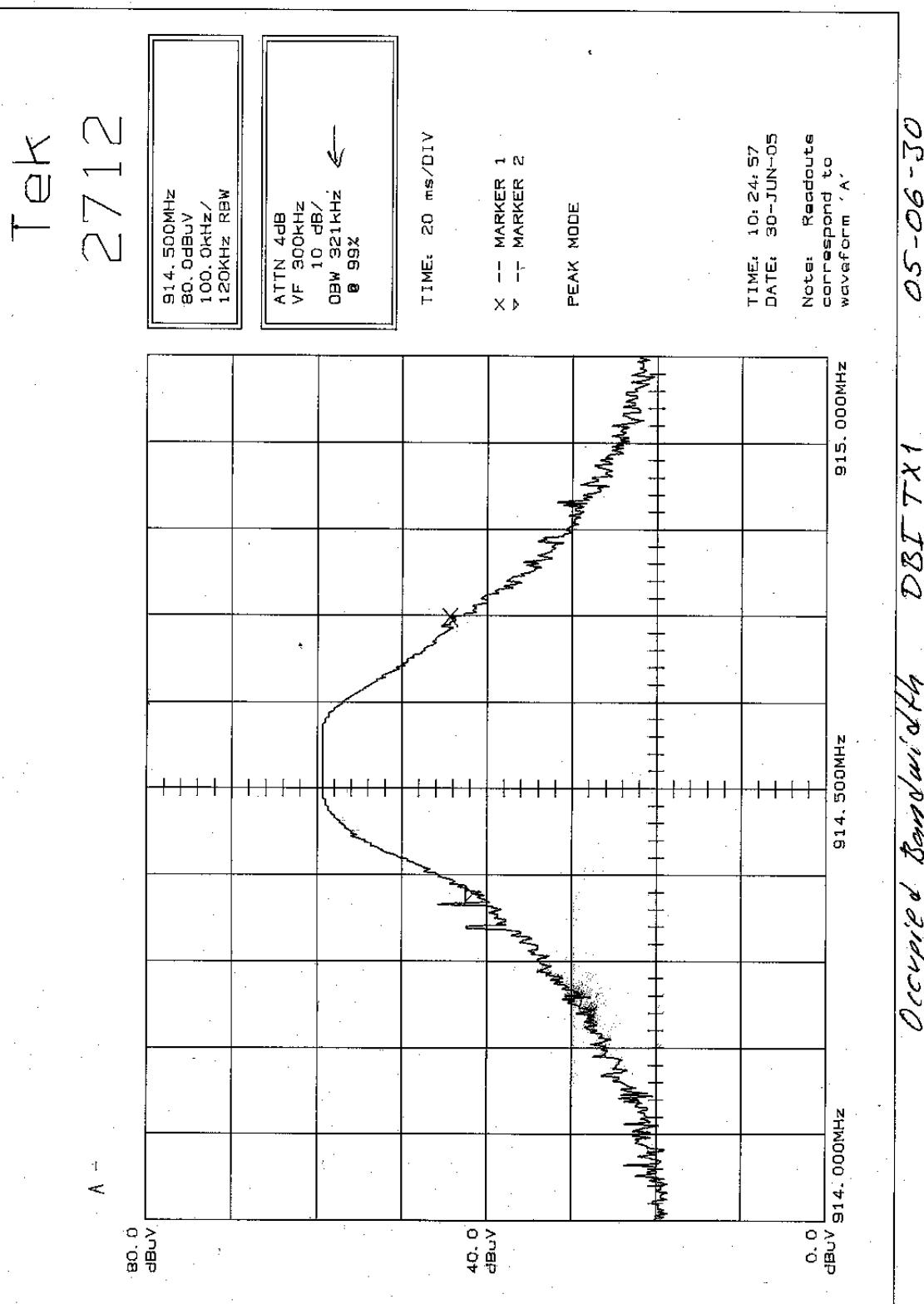
Field strength (dB μ V/m) = Amplitude (dB μ V) + Antenna factor (dB/m) + cable loss (dB)

Tested frequency range: 30 - 1000 MHz

Measured quasi-peak values of the 6 highest levels.

Frequency	Level	Cable loss	Antenna factor	Field strength	Limit	Dist.	Margin	Antenna height	Antenna polaris.
MHz	dB μ V	dB	dB	dB μ V/m	dB μ V/m	m	dB	m	V/H
51.1	5.8	1.8	11.0	18.6	40.0	3	-21.4	1.0	V
60.4	5.7	2.0	7.8	15.5	40.0	3	-24.5	1.0	V
61.9	6.6	2.0	7.2	15.8	40.0	3	-24.2	1.0	V
63.9	26.6	2.0	6.7	35.3	40.0	3	- 4.7	1.0	V
75.2	8.4	2.2	6.0	16.6	40.0	3	-23.4	1.0	V
79.9	10.9	2.3	6.7	19.9	40.0	3	-20.1	1.0	V

Occupied bandwidth, DBI TX1



Radiated Fieldstrength Test. Calculation of Final Emission Levels, DBI TX1

EUT: Flight instrument system for free balloons operating at the frequency 914.5 MHz, consisting of:
 1. Temperature Transmitter, Type DBI TX1, code 10014, without s/n.

Test Spec: 47 Cfr Ch. 1 (10-1-04 Edition).
 Part 15, Subpart C. §15.249, Operation within the band 902 - 928 MHz.
 3 m Antenna distance.

Date of Test: June 30 – July 1, 2005

Operation: Normal operating conditions, 100 % DC. With normal modulation.

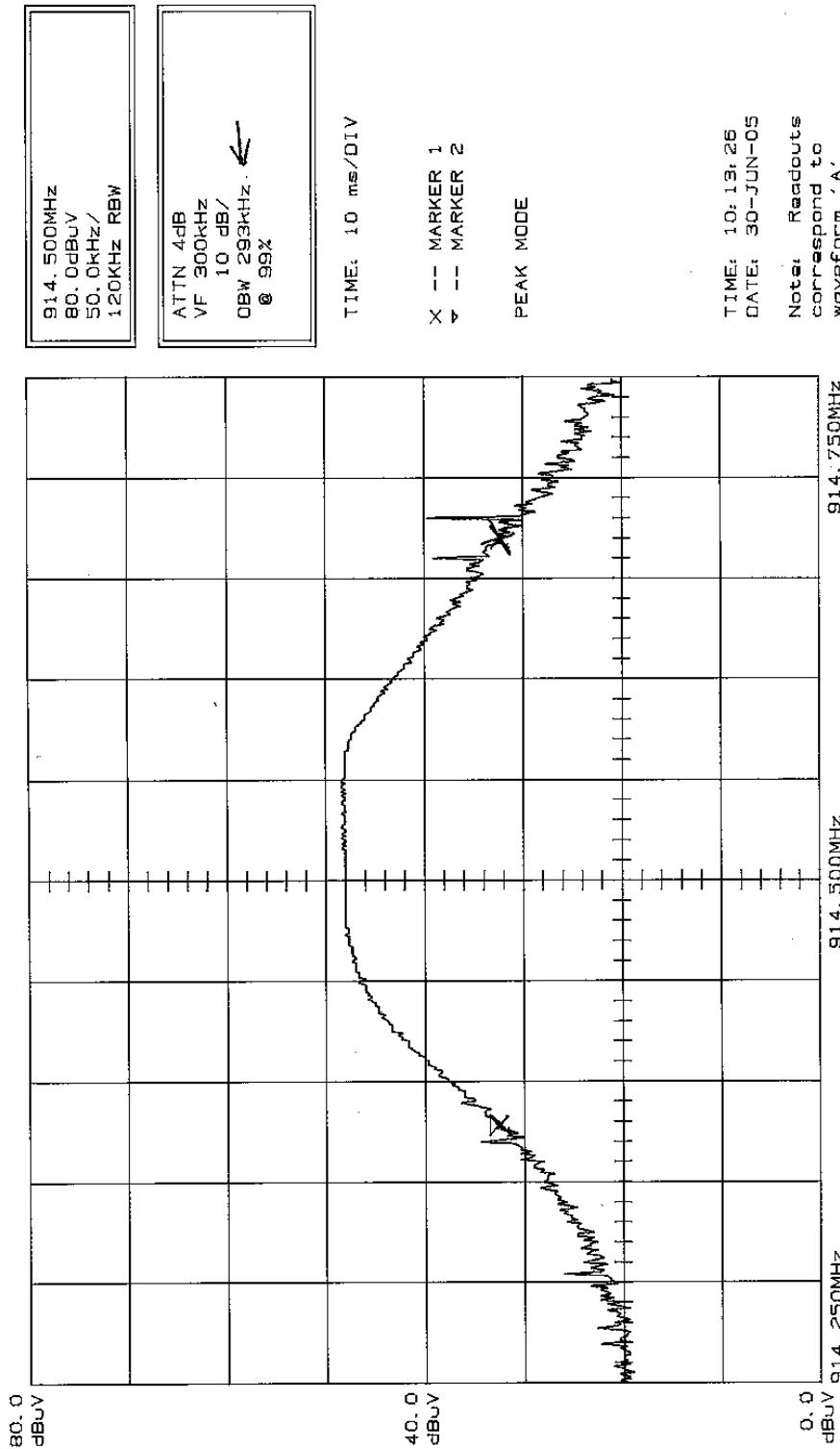
Field strength (dB μ V/m) = Amplitude (dB μ V) + Antenna factor (dB/m) + cable loss (dB) + Gain (dB)

Tested frequency range: 1 - 10 GHz. Measured maximum peak and average values. * = Noise level

Freq.	App.	Amplitude peak / av.	RBW / VBW	Antenna factor	Preamp Gain	Cable loss C1 C2	Field strength	Dist	Limit	Margin to limit	Note
MHz	No	dB μ V	kHz / kHz	dB/m	dB	dB dB	dB μ V/m	m	dB μ V/m	dB	
1829.0		63 / -	1000 / 1000	27.8	- 38.2	1.5 0.2	54.3	3	74	- 19.7	peak
1829.0		- / 56	1000 / 10	27.8	- 38.2	1.5 0.2	47.3	3	54	- 6.7	av.
2743.5		46* / -	1000 / 1000	29.9	- 38.0	1.8 0.3	40.0*	3	74	- 34*	Peak
2743.5		- / 39*	1000 / 10	29.9	- 38.0	1.8 0.3	33.0*	3	54	- 21*	av.
3658.0		44* / -	1000 / 1000	32.0	- 37.9	1.9 0.3	40.3*	3	74	- 34*	Peak
3658.0		- / 35*	1000 / 10	32.0	- 37.9	1.9 0.3	31.3*	3	54	- 23*	av.
4572.5		58 / -	1000 / 1000	33.2	- 37.8	2.1 0.4	55.9	3	74	- 18.1	Peak
4572.5		- / 48	1000 / 10	33.2	- 37.8	2.1 0.4	45.9	3	54	- 8.0	av.
5487.0		64 / -	1000 / 1000	34.7	- 37.8	2.5 0.5	63.9	3	74	- 9.9	Peak
5487.0		- / 52	1000 / 10	34.7	- 37.8	2.5 0.5	51.9	3	54	- 2.1	av.
6401.5		71 / -	1000 / 1000	35.2	- 38.0	2.7 0.6	71.5	3	74	- 2.5	Peak
6401.5		- / 44*	1000 / 10	35.2	- 38.0	2.7 0.6	44.5*	3	54	- 9.5*	av.
7316.0		54* / -	1000 / 1000	36.6	- 38.1	2.9 0.7	56.1*	3	74	- 18*	Peak
7316.0		- / 44*	1000 / 10	36.6	- 38.1	2.9 0.7	46.1*	3	54	- 7.9*	av.
8230.5		58 / -	1000 / 1000	38.3	- 38.2	3.0 0.7	61.8	3	74	- 12.2	Peak
8230.5		- / 47	1000 / 10	38.3	- 38.2	3.0 0.7	50.6	3	54	- 3.4	av.
9145.0		56* / -	1000 / 1000	38.5	- 38.4	3.2 0.8	60.1*	3	74	- 14*	Peak
9145.0		- / 46*	1000 / 10	38.5	- 38.4	3.2 0.8	50.1*	3	54	- 3.9*	av.

Occupied bandwidth, DBI TX12

Tek
 2712



DBI TX2 05-06-30

occupied Bandwidth

Radiated Fieldstrength Test. Calculation of Final Emission Levels, DBI TX2

EUT: Flight instrument system for free balloons operating at the frequency 914.5 MHz, consisting of:
 2) Temperature Transmitter, Type DBI TX2, code 00001, without s/n.

Test Spec: 47 Cfr Ch. 1 (10-1-04 Edition):
 Part 15, Subpart C. §15.249, Operation within the band 902 - 928 MHz
 3 m Antenna distance.

Date of Test: June 30 – July 1, 2005

Operation: Normal operating conditions, 100 % DC. With normal modulation.

Field strength (dB μ V/m) = Amplitude (dB μ V) + Antenna factor (dB/m) + cable loss (dB) + Gain (dB)

Tested frequency range: 1 - 10 GHz. Measured maximum peak and average values. * = Noise level

Freq.	App.	Amplitude peak / av.	RBW / VBW	Antenna factor	Preamp Gain	Cable loss C1 C2	Field strength	Dist	Limit	Margin to limit	Note
MHz	No	dB μ V	kHz / kHz	dB/m	dB	dB dB	dB μ V/m	m	dB μ V/m	dB	
1829.0		66 / -	1000 / 1000	27.8	- 38.2	1.5 0.2	57.3	3	74	- 16.7	peak
1829.0		- / 60	1000 / 10	27.8	- 38.2	1.5 0.2	51.3	3	54	- 2.7	av.
2743.5		43* / -	1000 / 1000	29.9	- 38.0	1.8 0.3	37.0*	3	74	- 37*	Peak
2743.5		- / 35*	1000 / 10	29.9	- 38.0	1.8 0.3	29.0*	3	54	- 25*	av.
3658.0		43* / -	1000 / 1000	32.0	- 37.9	1.9 0.3	39.3*	3	74	- 35*	Peak
3658.0		- / 35*	1000 / 10	32.0	- 37.9	1.9 0.3	31.3*	3	54	- 23*	av.
4572.5		39* / -	1000 / 1000	33.2	- 37.8	2.1 0.4	36.9*	3	74	- 37*	Peak
4572.5		- / 32*	1000 / 10	33.2	- 37.8	2.1 0.4	29.9*	3	54	- 24*	av.
5487.0		37* / -	1000 / 1000	34.7	- 37.8	2.5 0.5	36.9*	3	74	- 37*	Peak
5487.0		- / 30	1000 / 10	34.7	- 37.8	2.5 0.5	29.9*	3	54	- 24*	av.
6401.5		52* / -	1000 / 1000	35.2	- 38.0	2.7 0.6	52.5	3	74	- 21*	Peak
6401.5		- / 44*	1000 / 10	35.2	- 38.0	2.7 0.6	44.5*	3	54	- 9.5*	av.
7316.0		53* / -	1000 / 1000	36.6	- 38.1	2.9 0.7	55.1*	3	74	- 19*	Peak
7316.0		- / 45*	1000 / 10	36.6	- 38.1	2.9 0.7	47.1*	3	54	- 6.9*	av.
8230.5		54* / -	1000 / 1000	38.3	- 38.2	3.0 0.7	57.8*	3	74	- 16*	Peak
8230.5		- / 45*	1000 / 10	38.3	- 38.2	3.0 0.7	48.6*	3	54	- 5.4*	av.
9145.0		56* / -	1000 / 1000	38.5	- 38.4	3.2 0.8	60.1*	3	74	- 14*	Peak
9145.0		- / 46*	1000 / 10	38.5	- 38.4	3.2 0.8	50.1*	3	54	- 3.9*	av.