

DATE: 03 February 2005

I.T.L. (PRODUCT TESTING) LTD.

FCC EMC/Radio Test

for

AeroScout

Equipment under test:

AeroScout™ Tag Activator

TGA-1000, BWH1000-02-TA*

* See customer's declaration on page 6 and product description on page 8.

Written by: 
D. Shidlow, Documentation

Approved by: 
E. Pitt, Test Engineer

Approved by: 
I. Raz, EMC Laboratory Manager

This report must not be reproduced, except in full, without the written permission of I.T.L. (Product Testing) Ltd.

This report relates only to items tested.

Measurement/Technical Report for AeroScout

AeroScout™ Tag Activator (For Transmitter Section)

TGA-1000, BWH1000-02-TA*

FCC ID: Q3H BS2020-1

03 February 2005

* See customer's declaration on page 6 and product description on page 8.

This report concerns: Original Grant x Class II change

Class B verification ____ Class A verification _____ Class I change

Equipment type: Radio Telemetry Transmitter

Request Issue of Grant:

x Immediately upon completion of review

Limits used:

CISPR 22 _____

Part 15 x

Measurement procedure used is ANSI C63.4-2003.

Application for Certification

prepared by:

Ishaishou Raz

ITL (Product Testing) Ltd.

Kfar Bin Nun

D.N. Shimshon 99780

Israel

e-mail Sraz@itl.co.il

Applicant for this device:

(different from "prepared by")

Reuven Amsalem

AeroScout

10 Oppenheimer St. Park Tamar

Rechovot 76701

Israel

Tel: +972-8-9363136

Fax: +972-8-9365977

e-mail:

reuven.amsalem@aeroscout.com

TABLE OF CONTENTS

1.	GENERAL INFORMATION	5
1.1	Administrative Information	5
1.2	List of Accreditations	7
1.3	Product Description	8
1.4	Test Methodology	9
1.5	Test Facility	9
1.6	Measurement Uncertainty	9
2.	PRODUCT LABELING	10
3.	SYSTEM TEST CONFIGURATION	11
3.1	Justification	11
3.2	EUT Exercise Software	12
3.3	Special Accessories	12
3.4	Equipment Modifications	12
3.5	Configuration of Tested System	13
4.	BLOCK DIAGRAM	14
4.1	Schematic Block/Connection Diagram	14
4.2	Theory of Operation	14
5.	RADIATED EMISSION, FOR LOW FREQUENCY TRANSMITTER (125.0 KHZ)	15
5.1	Test Specification	15
5.2	Test Procedure	15
5.3	Test Data	15
5.4	Test Instrumentation Used, Radiated Measurements	17
6.	RADIATED EMISSION, RX MODE	18
6.1	Test Specification	18
6.2	Test Procedure	18
6.3	Measured Data	19
6.4	Test Instrumentation Used, Radiated Measurements Below 1 GHz	56
6.5	Test Instrumentation Used, Radiated Measurements Above 1 GHz	57
6.6	Field Strength Calculation	58
7.	SPURIOUS RADIATED EMISSION IN THE RESTRICTED BANDS TX MODE, BELOW 1 GHZ	59
7.1	Test Specification	59
7.2	Test Procedure	59
7.3	Measured Data	60
7.4	Test Instrumentation Used, Radiated Measurements	67
7.5	Field Strength Calculation	68
8.	SPURIOUS RADIATED EMISSION IN THE RESTRICTED BANDS TX MODE ABOVE 1 GHZ	69
8.1	Spurious Radiated Emission Above 1 GHz	69
8.2	Test Data	70
8.3	Test Instrumentation Used, Radiated Measurements Above 1 GHz	83
9.	ANTENNA GAIN	84
10.	R.F EXPOSURE/SAFETY	85

11.	APPENDIX A - CORRECTION FACTORS	86
11.1	Correction factors for CABLE	86
11.2	Correction factors for CABLE	87
11.3	Correction factors for CABLE	88
11.4	Correction factors for CABLE	89
11.5	Correction factors for LOG PERIODIC ANTENNA	90
11.6	Correction factors for BICONICAL ANTENNA	91
11.7	Correction factors for ACTIVE LOOP ANTENNA	92
11.8	Correction factors for LOG PERIODIC ANTENNA	93
13.9	Correction factors for Double-Ridged Waveguide Horn	94
13.10	Correction factors for Horn Antenna	95
13.11	Correction factors for BICONICAL ANTENNA	96
11.12	Correction factors for BICONICAL ANTENNA	97
12.	APPENDIX B – TEST RESULTS FOR MODEL LR-1000-R* BWH1000-2-R	98
13.	GENERAL INFORMATION	99
13.1	Administrative Information	99
14.	PRODUCT LABELING LR-1000-R	101
15.	RADIATED EMISSION, RX MODE	102
15.1	Test Specification	102
15.2	Test Procedure	102
15.3	Measured Data	103
15.4	Test Instrumentation Used, Radiated Measurements Below 1 GHz	110
15.5	Test Instrumentation Used, Radiated Measurements Above 1 GHz	111
15.6	Field Strength Calculation	112
16.	SPURIOUS RADIATED EMISSION IN THE RESTRICTED BANDS TX MODE, BELOW 1 GHZ	113
16.1	Test Specification	113
16.2	Test Procedure	113
16.3	Measured Data	114
16.4	Test Instrumentation Used, Radiated Measurements	116
16.5	Field Strength Calculation	117
17.	SPURIOUS RADIATED EMISSION IN THE RESTRICTED BANDS TX MODE, ABOVE 1 GHZ	118
17.1	Spurious Radiated Emission Above 1 GHz	118
17.2	Test Data	119
17.3	Test Instrumentation Used, Radiated Measurements Above 1 GHz	122
18.	APPENDIX C – CORRESPONDENCE WITH THE TCB	123

* See customer's declaration on page 100 and product description on page 8.

1. General Information

1.1 Administrative Information

Manufacturer:	AeroScout
Manufacturer's Address:	10 Oppenheimer St. Park Tamar Rehovot 76701 Israel Tel: +972-8-9363136 Fax: +972-8-9365977
Manufacturer's Representative:	Reuven Amsalem
Equipment Under Test (E.U.T):	AeroScout™ Tag Activator
Equipment Model No.:	TGA-1000, BWH1000-02-TA (See customer's declaration on following page and product description on page 8).
Equipment Serial No.:	130 1000 5137
Date of Receipt of E.U.T:	09.12.04
Start of Test:	09.12.04
End of Test:	18.01.05
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15, Sub-parts B,C, Correspondence with the TCB METLabs dated Nov. 24, 2004 and Dec. 1, 2004 in Appendix C

DECLARATION

I HEREBY DECLARE THAT THE FOLLOWING PRODUCTS:

- 1. BWH1000-02**
- 2. BWH1000-02-R**
- 3. BWH1000-02-TA**

**ARE IDENTICAL ELECTRONICALLY, PHYSICALLY, AND MECHANICALLY
TO:**

- 1. LR-1000**
- 2. LR-1000-R**
- 3. TGA-1000**

Respectively

Please relate to them all (from an EMC point of view) as the same product.

Sincerely,
Reuven Amsalem
Director, HW R&D
AeroScout, Ltd

Signature:



Date: 16/1/05

1.2 List of Accreditations

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.
7. Nemko (Norway), Authorization No. ELA 207.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

1.3 **Product Description**

The AeroScout™ Location Receiver is a component of the AeroScout wireless LAN location platform, which adds accurate location capabilities to a Wi-Fi™ wireless network

The Aeroscout Location Receiver / Tag Activator include an 802.11b 2.4GHz radio module, a LF (125 KHz) Transmitter and a powerful TOA processor, typically installed alongside standard access points and remotely configurable from the AeroScout Administration Console. Approximately the size of a small access point, Location Receivers includes two external antenna connectors with a range of antenna types. The Location Receivers can work over a wireless bridge to avoid the need for a wired Ethernet connection.

The Location Receiver is used to receive 802.11b clients and Aeroscout tags packets and calculate their location.

The EUT can act as a Tag Activator (**Model – BWH1000-02-TA and TGA-1000**) in this mode the Tag Activator transmits to the Aeroscout tags a short message via its LF transmitter, the tag wakeup, receive the message and replay using its 2.4GHz channel, the tag replay is received using the Tag activator 2.4GHz receiver. The Tag Activator is used to configure the AeroScout tag. This model uses the same plastic case as the original model BWH1000-02 FCC ID Q3H BS2020-0.

The Location Receiver has two other configurations/models where the 125kHz transmitter is not connected to an antenna:

- A. Housed in a plastic case (Model BWH1000-02 and LR-1000) (identical to model TGA-1000; BWH1000-02-TA)
- B. Housed in a metal case in the rugged version (Model BWH1000-02-R and LR-1000-R), Everything else is identical to model TGA-1000; BWH1000-02-TA.

Each model can be supplied with 6 new 2.4 GHz antennas (See page 87).

This product/application includes also the use of the "old" antennas authorized under FCC ID # Q3H BS2020-0. See additional information in ITL test report No. E57983.00.

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing December 12, 2003).

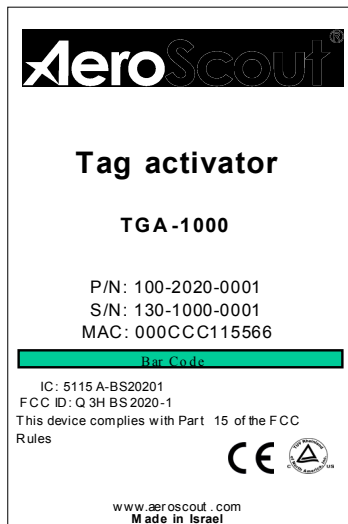
I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01. The other tests in this report were performed at the Nexus Data facility, Rosh Ha'ayin, Israel.

1.6 Measurement Uncertainty

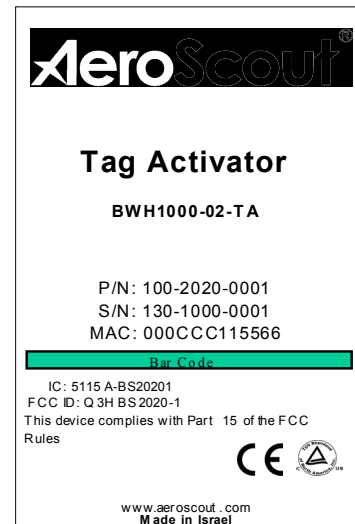
Radiated Emission

The Open Site complies with the ± 4 dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

2. Product Labeling



76.2 x 50.80



76.2 x 50.80

Figure 1. FCC Label

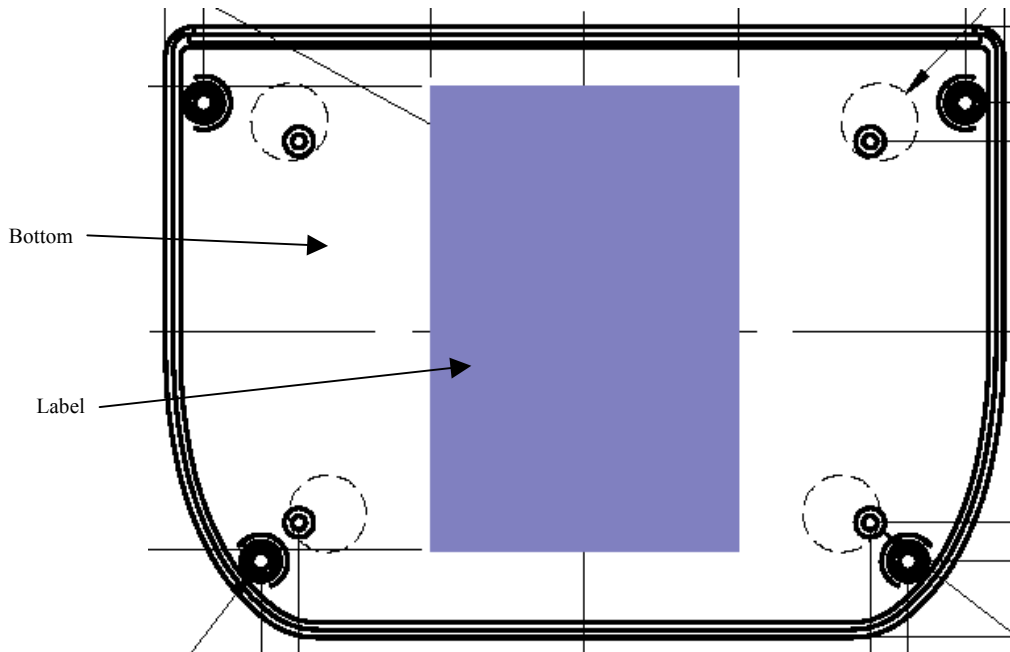


Figure 2. Location of Label on EUT

3. System Test Configuration

3.1 Justification

The product is a fixed installation type, either wall mounted or table mounted. Based on the original tested configuration, the table mounted configuration was used. The antennas' orientation was as used in normal operation.

The typical operation of the EUT is as a Location Receiver (as a customer would normally use) is that the unit is working in continues receive mode, collects data packets from 802.11b clients and AeroScout tags information and performs calculation on the received data. In specific application one of the Location Receiver units in the system act as transmitter and transmits a short message to a 802.11b client which triggers it to reply and all the other Location Receivers in the system receive its signal and calculate the location.

The typical operation of the EUT as a Tag activator is that it transmits a short LF message and then switches to receive mode in its 802.11b 2.4GHz channel.

The way that the product was tested:

1. In 2.4GHz receive mode all the block was activated to test the continues received mode with all the available antennas.
2. Due to the short period of 2.4GHz transmit mode in a typical operation mode, the Location Receiver was configured in this test mode to be in continues transmit mode. The EUT was tested with all the external antennas.
3. Due to short LF (125 kHz) messages transmitted, the EUT was set to a continues data transmit mode with 125kHz ASK modulated signal.

For the plastic housing configuration (TGA-1000), spurious radiated emission tests were performed for each antenna model. A revised RF exposure calculation was performed for the antenna having the maximum gain (8 dBi).

For the metallic housing configuration (LR-1000-R), spurious radiated emission on one worst case antenna (based on an exploratory test in the semi-anechoic chamber) was performed. (See test results in Appendix B).

The above tests are based on agreed test plan with the TCB, METLabs, as detailed in our correspondences dated Nov. 24, 2004 and Dec. 1, 2004.

3.2 **EUT Exercise Software**

The EUT SW uses three working mode in typical operation a 2.4GHz receive mode, 2.4GHz transmit mode and a 125kHz transmit mode.

The EUT test mode SW allows configuring the EUT to one of three programmable modes

- 1) Continuous 2.4GHz receive mode (channel 1-11)
- 2) Continuous 2.4GHz transmits mode Data / CW (channel 1-11).
- 3) Continuous 125 kHz transmits mode Data / CW.

The testing SW also allows to configure the channel of operation on modes 1 and 2 and the tests where done on three different channels (1,6,11).

3.3 **Special Accessories**

No special accessories were needed to achieve compliance.

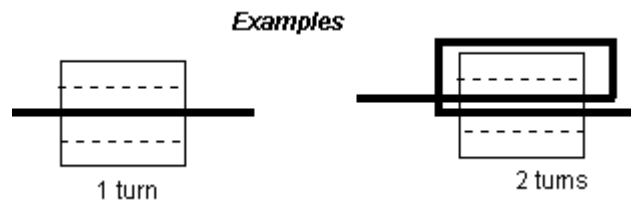
3.4 **Equipment Modifications**

A ferrite core, P/N 0443167251, manufactured by Fair-Rite, was added on the antenna cable near the E.U.T. connector. The core has two turns.

This correction applies only to the antennas which are connected to the E.U.T. via a cable.

General Note:

The number of turns when using ferrite cores is determined by the times the cable/wire crosses the internal aperture of the core.



3.5 Configuration of Tested System

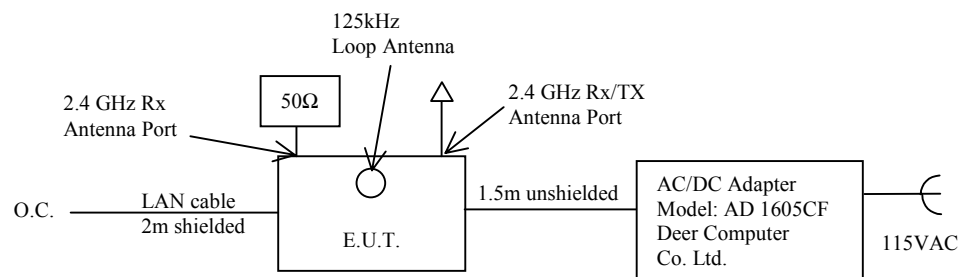


Figure 3. Configuration of Tested System

4. Block Diagram

4.1 Schematic Block/Connection Diagram

Intentionally Blank for Reasons of Confidentiality

4.2 Theory of Operation

Location Receiver

The AeroScout™ Location Receiver is a component of the AeroScout wireless LAN location platform, which adds accurate location capabilities to a Wi-Fi™ wireless network

The AeroScout Location Receiver includes a 802.11b 2.4GHz radio module, a LF (125 kHz) Transmitter and a powerful TOA processor, typically installed alongside standard access points and remotely configurable from the AeroScout Administration Console. Approximately the size of a small access point, Location Receivers includes two external antenna connectors with a range of antenna types. The Location Receivers can work over a wireless bridge to avoid the need for a wired Ethernet connection.

In a standard operation the Location Receiver is connected to the AeroScout Server (PC application) through the LAN, the server configures the Location Receiver (including the Receiving Channel), the location Receiver starts to listen on the configure channel and will process the location of each 802.11b client packet received. In specific application, the Location Receiver can be set to transmit (the through the transmit antenna – antenna left) a short 802.11b packet every preprogrammed interval (typically 100ms)

Tag Activator.

The Tag Activator includes two sections a 125 kHz transmitter and a 2.4GHz receiver. The Tag activator use to configure / activate the AeroScout tags.

The Activator is connected to the power (5VDC) and to the network through its LAN connector. The “Tag Manager” application running on a PC is used to control the tag activator.

The standard operation of the Tag Activator is that Tag Activator gets a command from the PC application to send a message, the Tag Activator transmits a short message (approximately 100ms) 125 kHz ASK modulated signal. This message wakes up the tag, the tag receives and interprets the message and acknowledges its receptions by its 2.4GHz 802.11b transmitter. The Tag Activator receives the tag acknowledgement and passes it to the PC application.

5. Radiated Emission, For Low Frequency Transmitter (125.0 kHz)

5.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Section 15.209

5.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and loop antenna. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in *Figure 3*.

The frequency range 9 kHz-30 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was operated at the frequency of 125.0 kHz

5.3 Test Data

JUDGEMENT: Passed by 27 dB

The EUT was tested and it met the requirements of the FCC Part 15, Subpart C, specification.

The margin between the carrier level (125.0 kHz) and the specification limit was 27 dB.

All other signals in the band 9 kHz – 30 MHz were below the spectrum analyzer noise level which is at least 6dB below the specification limit.

See details in Figure 4.

TEST PERSONNEL:

Tester Signature: 

Date: 03.02.05

Typed/Printed Name: E. Pitt

Radiated Emission, Below 1 GHz

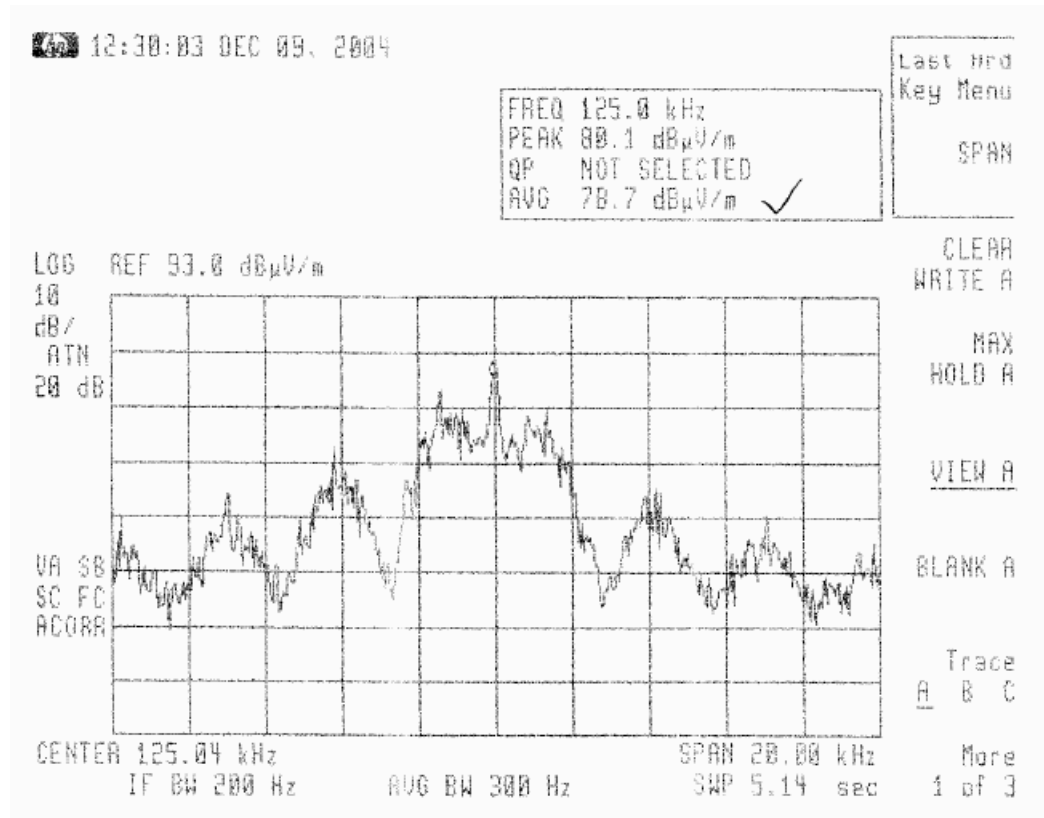


Figure 4 Radiated Emission at Carrier

$$\text{Limit}_{300\text{m}} = 20 \log \frac{2400}{125} = 25.7 \text{ dB}\mu\text{V}/\text{m}$$

$$\text{Limit}_{3\text{m}} = 25.7 + 40 \log \frac{300}{3} = 105.7 \text{ dB}\mu\text{V}/\text{m}$$

5.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 17, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

6. Radiated Emission, RX Mode

6.1 Test Specification

30-10500 MHz, FCC, Part 15, Subpart B

6.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission.

The frequency range 30-10500 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

In the frequency range 30MHz -2.9 GHz the emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

On the frequency range 2.9-10.5 GHz a spectrum analyzer including a low noise amplifier was used.

During average measurements above 1 GHz, IF bandwidth was 1MHz and video bandwidth was 100 Hz. During peak measurements both the IF and video bandwidths were 1 MHz.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

The E.U.T. was operated at the frequencies of 2412.0, 2442.0, and 2462.0 MHz.

6.3 **Measured Data**

JUDGEMENT: Passed by 0.9 dB

The EUT met the requirements of the FCC Part 15, Subpart B, specification.

The results, for all three operating frequencies in the frequency range up to 1 GHz, were the same.

The worst cases were:

for Antenna HG2409U, 0.9 dB margin at 132.00 MHz frequency, vertical polarization.

for Antenna HG2409P, 1.3 dB margin at 352.01 MHz frequency, vertical polarization

for Antenna SR2405135D12NF, 1.9 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna MM024005P, 0.9 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna S2402DS12, 2.5 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna S2406DSP12, 2.1 dB at 132.00 MHz frequency, vertical polarization

The details of the highest emissions are given in *Figure 5* to *Figure 40*.

TEST PERSONNEL:

Tester Signature: 

Date: 03.02.05

Typed/Printed Name: E. Pitt

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409U

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	36.3	34.7	13.0	43.5	-8.8
176.00	33.7	30.1	15.9	43.5	-13.4
220.02	34.8	31.7	18.6	46.0	-14.3
352.00	37.9	36.2	17.7	46.0	-9.8
506.00	36.4	35.1	21.0	46.0	-10.9
506.00	36.7	35.2	21.0	46.0	-10.8
572.00	45.2	44.3	23.2	46.0	-1.7

**Figure 5. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
 Test Distance: 3 meters
 Antenna: HG2409U

Frequency range: 30 MHz to 1000 MHz
 Detector: Quasi-peak

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	42.4	38.1	13.0	43.5	-5.4
132.00	43.7	42.6	14.0	43.5	-0.9
176.00	33.8	30.9	15.9	43.5	-12.6
352.00	36.5	34.6	17.7	46.0	-11.4
506.00	33.5	31.7	21.0	46.0	-14.3
572.00	41.8	39.2	23.2	46.0	-6.8
660.00	37.4	35.3	24.5	46.0	-10.7

**Figure 7. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: HG2409U

Frequency	Peak Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	54.3**	H	74.0	-19.7
2068.00	53.5**	H	74.0	-20.5
2088.00	53.8**	H	74.0	-20.2
4076.00	48.2*	H	74.0	-25.8
4136.00	51.3*	H	74.0	-22.7
4176.00	52.7*	H	74.0	-21.3
6114.00	50.2*	V	74.0	-23.8
6204.00	50.0*	V	74.0	-24.0
6264.00	52.7*	V	74.0	-21.3
8152.00	55.6*	H	74.0	-18.4
8272.00	56.1*	H	74.0	-17.9
8352.00	55.8*	H	74.0	-18.2

**Figure 9. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: HG2409U

Frequency	Avg Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	46.9**	H	54.0	-7.1
2068.00	46.1**	H	54.0	-7.9
2088.00	46.3**	H	54.0	-7.7
4076.00	40.5*	H	54.0	-13.5
4136.00	43.8*	H	54.0	-10.2
4176.00	46.9*	H	54.0	-7.1
6114.00	41.2*	V	54.0	-12.8
6204.00	42.0*	V	54.0	-12.0
6264.00	42.3*	V	54.0	-11.7
8152.00	44.6*	H	54.0	-9.4
8272.00	45.7*	H	54.0	-8.3
8352.00	46.1*	H	54.0	-7.9

**Figure 10. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409P

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	36.9	33.6	13.0	43.5	-9.9
132.00	36.3	35.1	14.0	43.5	-8.4
176.00	37.9	34.8	15.9	43.5	-8.7
308.02	44.4	40.3	16.1	46.0	-5.7
352.00	37.0	35.5	17.7	46.0	-10.5
572.00	43.5	42.5	23.2	46.0	-3.5

**Figure 11. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

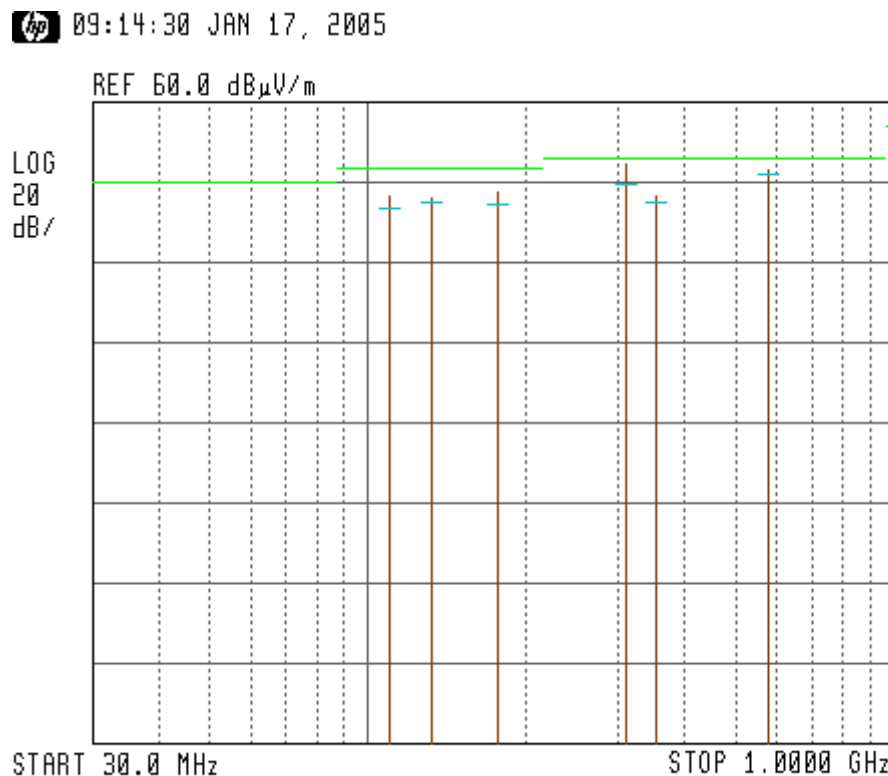
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
Test Distance: 3 meters
Antenna: HG2409P

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 12. Radiated Emission. Antenna Polarization: HORIZONTAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409P

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
66.00	35.8	32.4	10.3	40.0	-7.6
110.00	40.0	35.9	13.0	43.5	-7.6
132.00	43.3	42.0	14.0	43.5	-1.5
176.00	37.8	36.4	15.9	43.5	-7.1
330.00	39.2	38.1	16.9	46.0	-7.9
352.01	52.9	44.7	17.7	46.0	-1.3
572.02	48.5	43.1	23.2	46.0	-2.9

**Figure 13. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: HG2409P

Frequency	Peak Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	54.5**	H	74.0	-19.5
2068.00	54.3**	H	74.0	-19.7
2088.00	54.4**	H	74.0	-19.6
4076.00	48.0*	H	74.0	-26.0
4136.00	48.3*	H	74.0	-25.7
4176.00	48.9*	H	74.0	-25.1
6114.00	51.9*	V	74.0	-22.1
6204.00	52.0*	V	74.0	-22.0
6264.00	52.3*	V	74.0	-21.7
8152.00	56.0*	V	74.0	-18.0
8272.00	56.5*	V	74.0	-17.5
8352.00	56.9*	V	74.0	-17.1

**Figure 15. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: HG2409P

Frequency	Avg Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	47.4**	H	54.0	-6.6
2068.00	47.5**	H	54.0	-6.5
2088.00	47.7**	H	54.0	-6.3
4076.00	41.5*	H	54.0	-12.5
4136.00	42.3*	H	54.0	-11.7
4176.00	43.0*	H	54.0	-11.0
6114.00	43.7*	V	54.0	-10.3
6204.00	44.5*	V	54.0	-9.5
6264.00	45.0*	V	54.0	-9.0
8152.00	47.2*	V	54.0	-6.8
8272.00	48.1*	V	54.0	-5.9
8352.00	48.3*	V	54.0	-5.7

**Figure 16. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: SR2405135D12NF

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
132.02	33.9	32.6	14.0	43.5	-10.9
176.00	36.1	34.6	15.9	43.5	-8.9
220.02	35.2	32.8	18.6	46.0	-13.2
352.00	39.2	36.9	17.7	46.0	-9.1
506.00	34.5	31.9	21.0	46.0	-14.1
572.00	42.1	41.2	23.2	46.0	-4.8

**Figure 17. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: SR2405135D12NF

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	39.7	35.8	13.0	43.5	-7.7
132.00	43.4	41.6	14.0	43.5	-1.9
176.00	45.9	33.7	15.9	43.5	-9.8
220.00	43.0	37.6	18.6	46.0	-8.4
352.00	33.8	31.5	17.7	46.0	-14.5
506.00	33.3	31.2	21.0	46.0	-14.8

**Figure 19. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

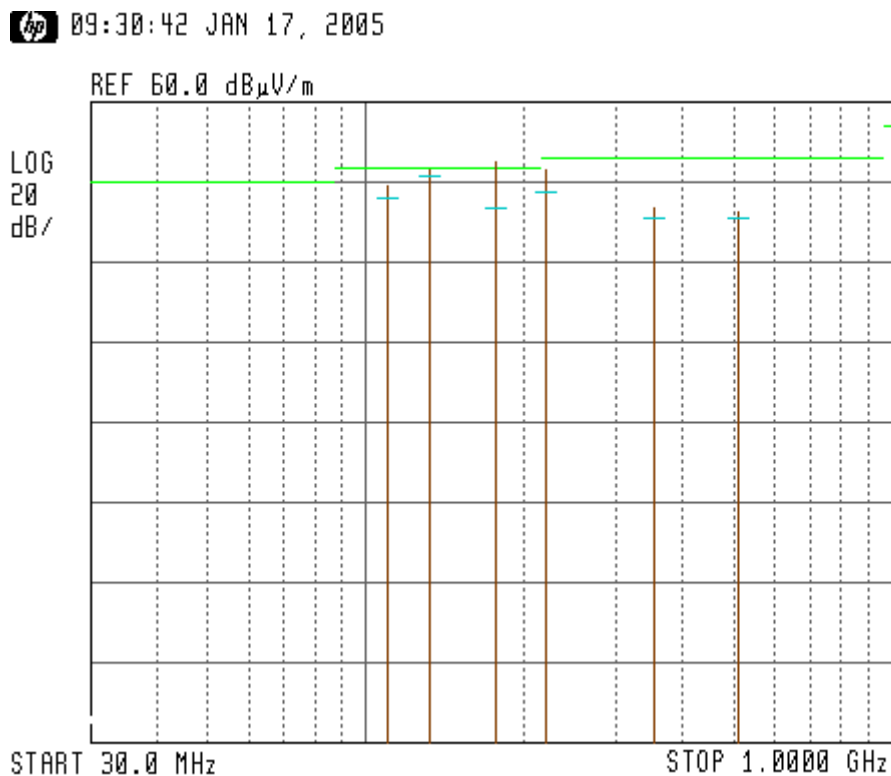
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
Test Distance: 3 meters
Antenna: SR2405135D12NF

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 20. Radiated Emission. Antenna Polarization: VERTICAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: SR2405135D12NF

Frequency	Peak Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	54.2**	H	74.0	-19.8
2068.00	54.2**	H	74.0	-19.8
2088.00	54.2**	H	74.0	-19.8
4076.00	52.9*	H	74.0	-21.1
4136.00	53.1*	H	74.0	-20.9
4176.00	53.4*	H	74.0	-20.6
6114.00	51.7*	H	74.0	-22.3
6204.00	51.7*	H	74.0	-22.3
6264.00	51.9*	H	74.0	-22.1
8152.00	55.7*	V	74.0	-18.3
8272.00	56.0*	V	74.0	-18.0
8352.00	56.3*	V	74.0	-17.7

**Figure 21. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: SR2405135D12NF

Frequency	Avg Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	47.4**	H	54.0	-6.6
2068.00	47.4**	H	54.0	-6.6
2088.00	47.6**	H	54.0	-6.4
4076.00	42.1*	H	54.0	-11.9
4136.00	42.3*	H	54.0	-11.7
4176.00	42.5*	H	54.0	-11.5
6114.00	41.8*	H	54.0	-12.2
6204.00	41.7*	H	54.0	-12.3
6264.00	42.0*	H	54.0	-12.0
8152.00	45.1*	V	54.0	-8.9
8272.00	46.2*	V	54.0	-7.8
8352.00	46.6*	V	54.0	-7.4

**Figure 22. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: MM024005P

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
132.00	38.3	34.8	14.0	43.5	-8.7
176.00	38.6	35.8	15.9	43.5	-7.7
220.00	41.7	35.6	18.6	46.0	-10.4
308.00	35.5	34.1	16.1	46.0	-11.9
330.00	34.4	32.2	16.9	46.0	-13.8
572.00	41.3	40.3	23.2	46.0	-5.7

**Figure 23. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

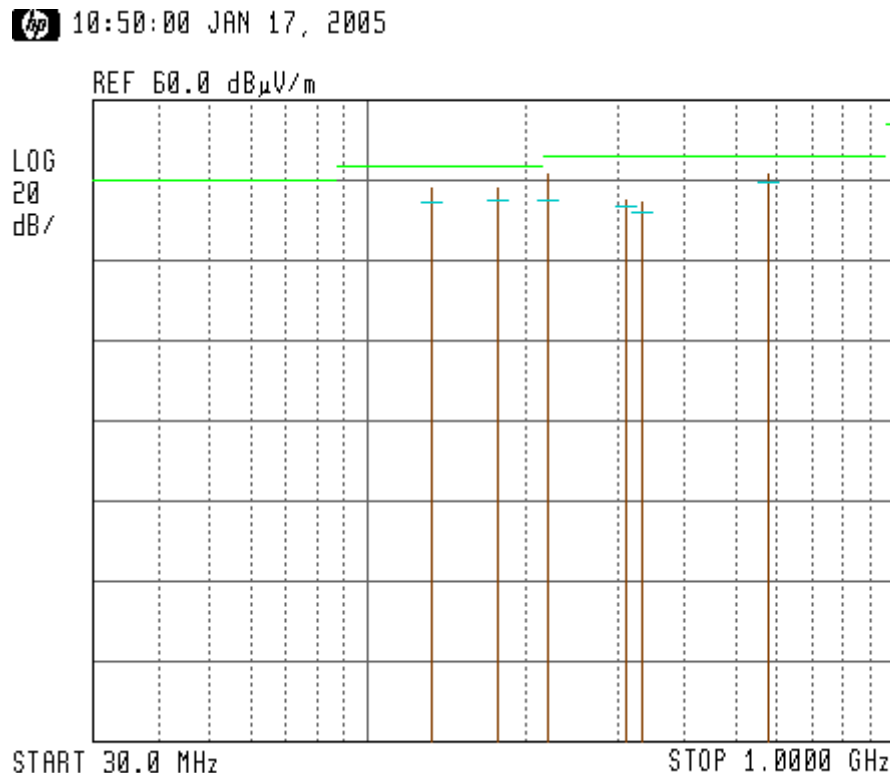
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
Test Distance: 3 meters
Antenna: MM024005P

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 24. Radiated Emission. Antenna Polarization: HORIZONTAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: MM024005P

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	42.1	38.0	13.0	43.5	-5.5
132.00	48.3	42.6	14.0	43.5	-0.9
176.00	40.1	38.6	15.9	43.5	-4.9
264.00	41.9	35.3	21.4	46.0	-10.7
352.00	35.4	32.9	17.7	46.0	-13.1
572.00	40.9	39.8	23.2	46.0	-6.2

**Figure 25. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: MM024005P

Frequency	Peak Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	54.4**	H	74.0	-19.6
2068.00	54.3**	H	74.0	-19.7
2088.00	54.5**	H	74.0	-19.5
4076.00	49.3*	V	74.0	-24.7
4136.00	49.6*	V	74.0	-24.4
4176.00	50.4*	V	74.0	-23.6
6114.00	50.3*	H	74.0	-23.7
6204.00	50.7*	H	74.0	-23.3
6264.00	51.8*	H	74.0	-22.2
8152.00	53.8*	V	74.0	-20.2
8272.00	54.3*	V	74.0	-19.7
8352.00	55.0*	V	74.0	-19.0

**Figure 27. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: MM024005P

Frequency	Avg Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	47.7**	H	54.0	-6.3
2068.00	46.4**	H	54.0	-7.6
2088.00	47.3**	H	54.0	-6.7
4076.00	43.9*	V	54.0	-10.1
4136.00	44.4*	V	54.0	-9.6
4176.00	45.1*	V	54.0	-8.9
6114.00	42.1*	H	54.0	-11.9
6204.00	42.3*	H	54.0	-11.7
6264.00	42.9*	H	54.0	-11.1
8152.00	45.3*	V	54.0	-8.7
8272.00	46.4*	V	54.0	-7.6
8352.00	46.9*	V	54.0	-7.1

**Figure 28. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: S2402DS12

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	38.9	36.9	12.3	43.5	-6.6
132.00	34.9	33.3	14.9	43.5	-10.2
220.00	37.0	34.1	17.3	46.0	-11.9
352.00	39.9	37.3	17.7	46.0	-8.7
572.00	44.1	43.2	23.2	46.0	-2.8
660.00	38.5	35.6	24.5	46.0	-10.4

**Figure 29. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

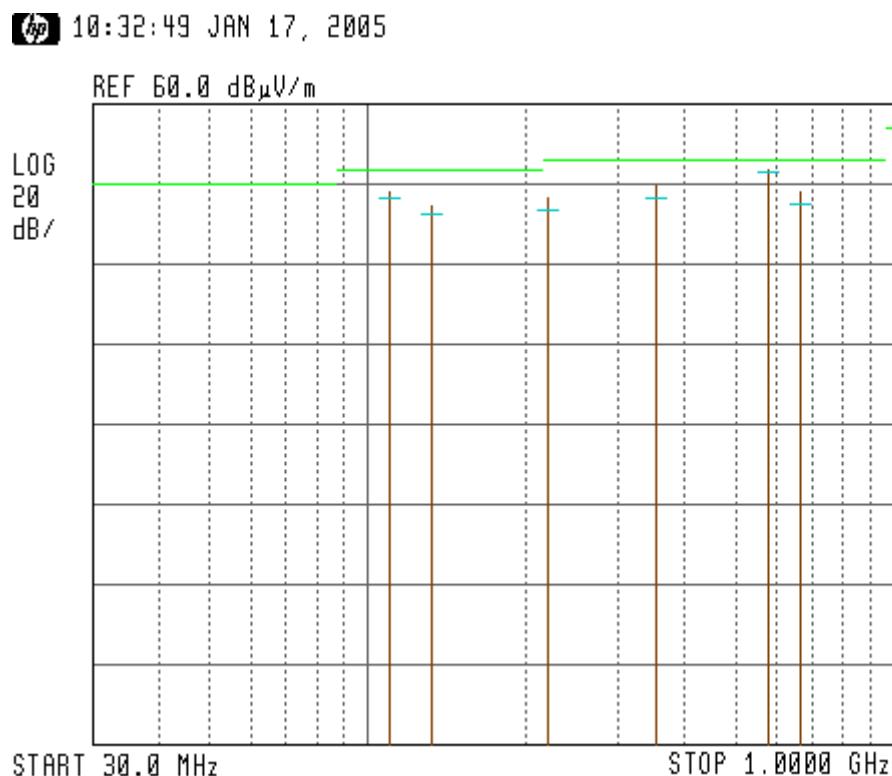
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
Test Distance: 3 meters
Antenna: S2402DS12

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 30. Radiated Emission. Antenna Polarization: HORIZONTAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: S2402DS12

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
66.00	35.7	32.2	10.2	40.0	-7.8
110.00	40.8	37.3	12.3	43.5	-6.2
132.00	43.0	41.0	14.9	43.5	-2.5
176.01	34.1	32.0	17.0	43.5	-11.5
352.00	34.3	32.4	17.7	46.0	-13.6
506.00	36.8	34.5	21.0	46.0	-11.5
572.00	42.7	40.9	23.2	46.0	-5.1

**Figure 31. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

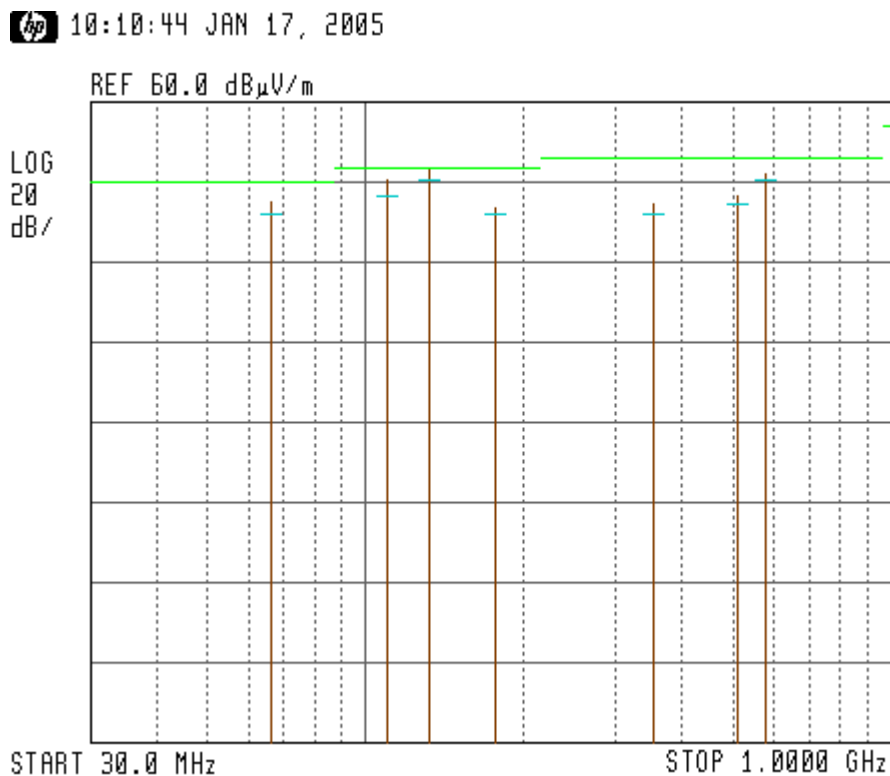
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
Test Distance: 3 meters
Antenna: S2402DS12

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 32. Radiated Emission. Antenna Polarization: VERTICAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: S2402DS12

Frequency	Peak Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	51.0**	H	74.0	-23.0
2068.00	51.2**	H	74.0	-22.8
2088.00	51.7**	H	74.0	-22.3
4076.00	50.9*	H	74.0	-23.1
4136.00	51.1*	H	74.0	-22.9
4176.00	51.3*	H	74.0	-22.7
6114.00	51.0*	V	74.0	-23.0
6204.00	51.2*	V	74.0	-22.8
6264.00	51.3*	V	74.0	-22.7
8152.00	55.7*	H	74.0	-18.3
8272.00	56.1*	H	74.0	-17.9
8352.00	56.5*	H	74.0	-17.5

**Figure 33. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: S2402DS12

Frequency	Avg Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	43.7**	H	54.0	-10.3
2068.00	44.0**	H	54.0	-10.0
2088.00	44.2**	H	54.0	-9.8
4076.00	45.9*	H	54.0	-8.1
4136.00	46.3*	H	54.0	-7.7
4176.00	46.7*	H	54.0	-7.3
6114.00	43.0*	V	54.0	-11.0
6204.00	43.2*	V	54.0	-10.8
6264.00	43.5*	V	54.0	-10.5
8152.00	45.9*	H	54.0	-8.1
8272.00	45.9*	H	54.0	-8.1
8352.00	46.2*	H	54.0	-7.8

**Figure 34. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: S2406DSP12

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	41.1	39.5	13.0	43.5	-4.0
132.00	37.9	36.8	14.0	43.5	-6.7
176.00	36.5	35.6	15.9	43.5	-7.9
308.00	38.8	37.0	16.1	46.0	-9.0
352.00	35.9	34.0	17.7	46.0	-12.0
572.00	44.5	43.1	23.2	46.0	-2.9
660.00	42.5	39.5	24.5	46.0	-6.5

**Figure 35. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

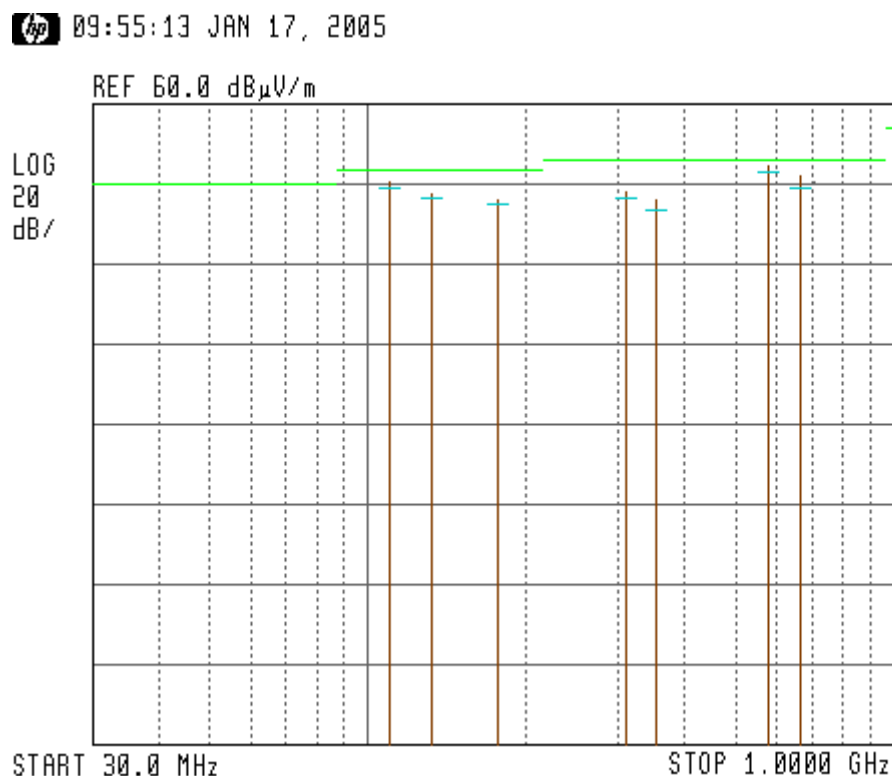
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal
Test Distance: 3 meters
Antenna: S2406DSP12

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 36. Radiated Emission. Antenna Polarization: HORIZONTAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: S2406DSP12

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
110.00	40.0	38.0	13.0	43.5	-5.5
132.00	43.7	41.4	14.0	43.5	-2.1
264.00	38.0	36.5	21.4	46.0	-9.5
352.00	34.9	33.2	17.7	46.0	-12.8
550.00	37.7	35.1	22.5	46.0	-10.9
572.00	44.7	42.8	23.2	46.0	-3.2
616.00	39.9	36.7	24.2	46.0	-9.3

**Figure 37. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

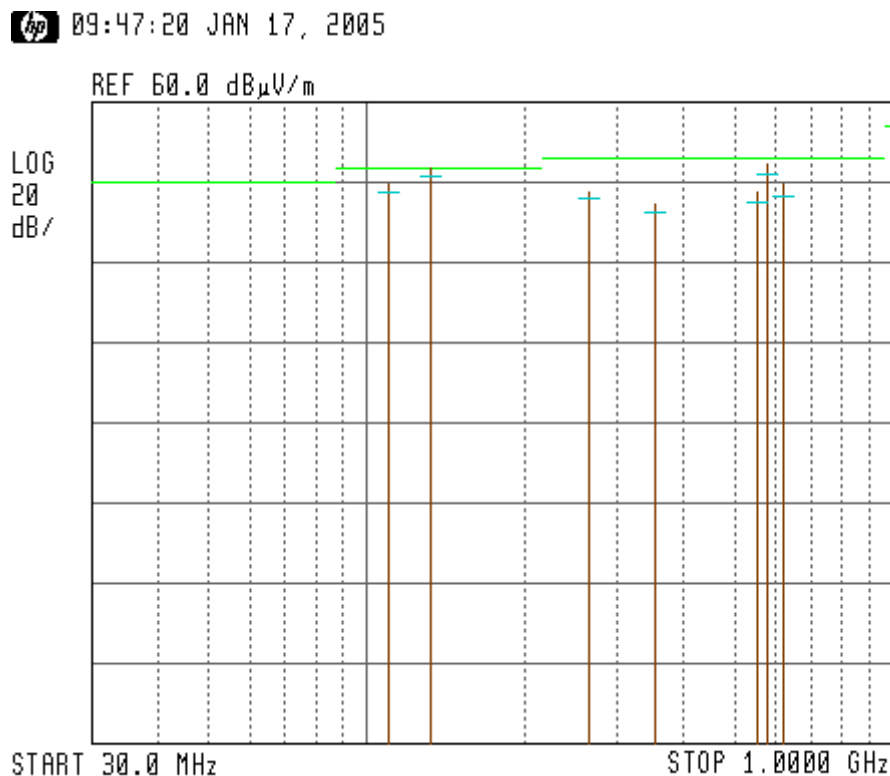
Radiated Emission

E.U.T Description	AeroScout™ Tag Activator
Type	TGA-1000
Serial Number:	130 1000 5137

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical
Test Distance: 3 meters
Antenna: S2406DSP12

Frequency range: 30 MHz to 1000 MHz
Detector: Quasi-peak



**Figure 38. Radiated Emission. Antenna Polarization: VERTICAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: S2406DSP12

Frequency	Peak Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	53.5**	H	74.0	-20.5
2068.00	54.0**	H	74.0	-20.0
2088.00	53.8**	H	74.0	-20.2
4076.00	49.6*	V	74.0	-24.4
4136.00	52.7*	V	74.0	-21.3
4176.00	54.0*	V	74.0	-20.0
6114.00	52.3*	V	74.0	-21.7
6204.00	52.8*	V	74.0	-21.2
6264.00	53.1*	V	74.0	-20.9
8152.00	55.2*	H	74.0	-18.8
8272.00	55.7*	H	74.0	-18.3
8352.00	56.1*	H	74.0	-17.9

**Figure 39. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: S2406DSP12

Frequency	Avg Amp	Polarization	Specification	Margin
(MHz)	(dBμV/m)	(H/V)	(dBμV/m)	(dB)
2038.00	47.0**	H	54.0	-7.0
2068.00	46.8**	H	54.0	-7.2
2088.00	46.2**	H	54.0	-7.8
4076.00	42.5*	V	54.0	-11.5
4136.00	44.1*	V	54.0	-9.9
4176.00	45.8*	V	54.0	-8.2
6114.00	43.9*	V	54.0	-10.1
6204.00	44.4*	V	54.0	-9.6
6264.00	44.8*	V	54.0	-9.2
8152.00	45.2*	H	54.0	-8.8
8272.00	45.7*	H	54.0	-8.3
8352.00	46.0*	H	54.0	-8.0

**Figure 40. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

6.4 Test Instrumentation Used, Radiated Measurements Below 1 GHz

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85420E/85422E	3427A00103/34	February 28, 2004	1 year
Antenna - Biconical HP	ARA	BCD-235/B	1041	April 11, 2004	1 year
Antenna - Log Periodic	ARA	LPD-2010/A	1038	March 21, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357.0	N/A	N/A

6.5 Test Instrumentation Used, Radiated Measurements Above 1 GHz

Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 31,2003	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 17, 2004	1 year
Horn Antenna	ARA	SWH-28	1007	October 28, 2003	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	October 17, 2004	1 year
Spectrum Analyzer	HP	8592L	3926A01204	February 28, 2004	1 year

6.6 **Field Strength Calculation**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v/m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF-GA}^*$$

FS: Field Strength [dB μ v/m]
RA: Receiver Amplitude [dB μ v]
AF: Receiving Antenna Correction Factor [dB/m]
CF: Cable Attenuation Factor [dB]
GA*: Gain Amplifier, if used

No external pre-amplifiers are used.

7. Spurious Radiated Emission in the Restricted Bands TX Mode, Below 1 GHz

7.1 Test Specification

9 kHz -1000 MHz, FCC Part 15, Subpart C

7.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in *Figure 3*.

The frequency range 9 kHz-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter.

In the frequency range 30-1000MHz, the readings were maximized by adjusting the antenna height between 1-4 meters. The turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The E.U.T. was operated in the frequencies of 2412.0, 2442.0, and 2462.0 MHz.

7.3 **Measured Data**

JUDGEMENT: Passed by 1.0 dB

The EUT met the requirements of the FCC Part 15, Subpart C, specification.

The signals in the band 9 kHz – 30 MHz were 20dB below the specification limit.

The test results were the same for all 3 operating frequencies.

The worst cases were:

for Antenna HG2409U, 1.0 dB margin at 132.00 MHz frequency, vertical polarization.

for Antenna HG2409P, 1.5 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna SR2405135D12NF, 1.9 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna MM024005P, 1.1 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna S2402DS12, 2.5 dB margin at 132.00 MHz frequency, vertical polarization

for Antenna S2406DSP12, 2.1 dB margin at 132.00 MHz frequency, vertical polarization

The details of the highest emissions are given in *Figure 41* to *Figure 46*.

TEST PERSONNEL:

Tester Signature: _____

Date:

Typed/Printed Name: E. Pitt

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409U

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	38.1	43.5	-5.4
132.00	42.5	43.5	-1.0

**Figure 41. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409P

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	35.9	43.5	-7.6
132.00	42.0	43.5	-1.5

**Figure 42. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: SR2405135012NF

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	35.8	43.5	-7.7
132.00	41.6	43.5	-1.9

**Figure 43. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: MM024005P

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	37.2	43.5	-6.3
132.00	42.4	43.5	-1.1

**Figure 44. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: S2402DS12

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	37.2	43.5	-6.3
132.00	41.0	43.5	-2.5

**Figure 45. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: S2406DSP12

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	38.0	43.5	-5.5
132.00	41.4	43.5	-2.1

**Figure 46. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

7.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	April 11, 2004	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 21, 2004	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 17, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

7.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v/m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

FS: Field Strength [dB μ v/m]
RA: Receiver Amplitude [dB μ v]
AF: Receiving Antenna Correction Factor [dB/m]
CF: Cable Attenuation Factor [dB]

No external pre-amplifiers are used.

8. Spurious Radiated Emission in the Restricted Bands Tx Mode Above 1 GHz

8.1 Spurious Radiated Emission Above 1 GHz

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in Figure 3.1.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used.

In the frequency range 2.9-25.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements, the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements, the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.

The test distance was 3 meters.

Above 12.0 GHz:

- a. The test distance was 1.5 meters. The reduced distance was used to increase the signal to noise ratio.
- b. For the average test, the IF bandwidth was reduced to 100kHz.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The E.U.T. was operated in the frequencies of 2412.0, 2442.0, and 2462.0 MHz.

8.2 Test Data

JUDGEMENT: Passed by 1.3 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

The worst cases were:

for Antenna HG2409U, 1.5 dB margin at 4824.00.00 MHz frequency, vertical polarization.

for Antenna HG2409P, 2.0 dB at 4824.00 margin MHz frequency, vertical polarization

for Antenna SR2405135D12NF, 2.9 dB margin at 4924.00 MHz frequency, vertical polarization

for Antenna MM024005P, 1.3 dB margin at 4884.00 MHz frequency, vertical polarization

for Antenna S2402DS12, 3.1 margin dB at 4824.00 MHz frequency, vertical polarization

for Antenna S2406DSP12, 6.1 dB margin at 4824.00 MHz frequency, vertical polarization

The details of the highest emissions are given in *Figure 47* to *Figure 58*.

TEST PERSONNEL:

Tester Signature: 

Date: 03.02.05

Typed/Printed Name: E. Pitt

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: HG2409U

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	48.2	H	74.0	-25.8
4136.00	51.3	H	74.0	-22.7
4176.00	52.7	H	74.0	-21.3
4824.00	56.2	V	74.0	-17.8
4884.00	54.9	V	74.0	-19.1
4924.00	53.4	V	74.0	-20.6
8152.00	55.6	H	74.0	-18.4
8272.00	56.1	H	74.0	-17.9
8352.00	55.8	H	74.0	-18.2

**Figure 47. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: HG2409U

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	40.5	H	54.0	-13.5
4136.00	43.8	H	54.0	-10.2
4176.00	46.9	H	54.0	-7.1
4824.00	52.5	V	54.0	-1.5
4884.00	51.6	V	54.0	-2.4
4924.00	49.9	V	54.0	-4.1
8152.00	44.6	H	54.0	-9.4
8272.00	45.7	H	54.0	-8.3
8352.00	46.1	H	54.0	-7.9

**Figure 48. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: HG2409P

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	48.0	H	74.0	-26.0
4136.00	48.3	H	74.0	-25.7
4176.00	48.9	H	74.0	-25.1
4824.00	53.4	V	74.0	-20.6
4884.00	54.2	V	74.0	-19.8
4924.00	52.8	V	74.0	-21.2
8152.00	56.0	V	74.0	-18.0
8272.00	56.5	V	74.0	-17.5
8352.00	56.9	V	74.0	-17.1

**Figure 49. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: HG2409P

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	41.5	H	54.0	-12.5
4136.00	42.3	H	54.0	-11.7
4176.00	43.0	H	54.0	-11.0
4824.00	52.0	V	54.0	-2.0
4884.00	49.2	V	54.0	-4.8
4924.00	48.3	V	54.0	-5.7
8152.00	47.2	V	54.0	-6.8
8272.00	48.1	V	54.0	-5.9
8352.00	48.3	V	54.0	-5.7

**Figure 50. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: SR2405135D12NF

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	52.9	H	74.0	-21.1
4136.00	53.1	H	74.0	-20.9
4176.00	53.4	H	74.0	-20.6
4824.00	53.8	V	74.0	-20.2
4884.00	54.0	V	74.0	-20.0
4924.00	54.8	V	74.0	-19.2
8152.00	55.7	V	74.0	-18.3
8272.00	56.0	V	74.0	-18.0
8352.00	56.3	V	74.0	-17.7

**Figure 51. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: SR2405135D12NF

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	42.1	H	54.0	-11.9
4136.00	42.3	H	54.0	-11.7
4176.00	42.5	H	54.0	-11.5
4824.00	50.5	V	54.0	-3.5
4884.00	50.4	V	54.0	-3.6
4924.00	51.1	V	54.0	-2.9
8152.00	45.1	V	54.0	-8.9
8272.00	46.2	V	54.0	-7.8
8352.00	46.6	V	54.0	-7.4

**Figure 52. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: MM024005P

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	49.3	V	74.0	-24.7
4136.00	49.6	V	74.0	-24.4
4176.00	50.4	V	74.0	-23.6
4824.00	54.3	V	74.0	-19.7
4884.00	55.9	V	74.0	-18.1
4924.00	53.6	V	74.0	-20.4
8152.00	53.8	V	74.0	-20.2
8272.00	54.3	V	74.0	-19.7
8352.00	55.0	V	74.0	-19.0

**Figure 53. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: MM024005P

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	43.9	V	54.0	-10.1
4136.00	44.4	V	54.0	-9.6
4176.00	45.1	V	54.0	-8.9
4824.00	50.2	V	54.0	-3.8
4884.00	52.7	V	54.0	-1.3
4924.00	49.4	V	54.0	-4.6
8152.00	45.3	V	54.0	-8.7
8272.00	46.4	V	54.0	-7.6
8352.00	46.9	V	54.0	-7.1

**Figure 54. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: S2402DS12

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	50.9	H	74.0	-23.1
4136.00	51.1	H	74.0	-22.9
4176.00	51.3	H	74.0	-22.7
4824.00	55.5	V	74.0	-18.5
4884.00	54.2	V	74.0	-19.8
4924.00	54.3	V	74.0	-19.7
8152.00	55.7	H	74.0	-18.3
8272.00	56.1	H	74.0	-17.9
8352.00	56.5	H	74.0	-17.5

**Figure 55. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: S2402DS12

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	45.9	H	54.0	-8.1
4136.00	46.3	H	54.0	-7.7
4176.00	46.7	H	54.0	-7.3
4824.00	50.9	V	54.0	-3.1
4884.00	48.8	V	54.0	-5.2
4924.00	49.1	V	54.0	-4.9
8152.00	45.9	H	54.0	-8.1
8272.00	45.9	H	54.0	-8.1
8352.00	46.2	H	54.0	-7.8

**Figure 56. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: S2406DSP12

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	49.6	V	74.0	-24.4
4136.00	52.7	V	74.0	-21.3
4176.00	54.0	V	74.0	-20.0
4824.00	53.4	V	74.0	-20.6
4884.00	52.3	V	74.0	-21.7
4924.00	51.8	V	74.0	-22.2
8152.00	55.2	H	74.0	-18.8
8272.00	55.7	H	74.0	-18.3
8352.00	56.1	H	74.0	-17.9

**Figure 57. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Tag Activator
 Type TGA-1000
 Serial Number: 130 1000 5137

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: S2406DSP12

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	42.5	V	54.0	-11.5
4136.00	44.1	V	54.0	-9.9
4176.00	45.8	V	54.0	-8.2
4824.00	47.9	V	54.0	-6.1
4884.00	47.1	V	54.0	-6.9
4924.00	46.3	V	54.0	-7.7
8152.00	45.2	H	54.0	-8.8
8272.00	45.7	H	54.0	-8.3
8352.00	46.0	H	54.0	-8.0

**Figure 58. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

8.3 Test Instrumentation Used, Radiated Measurements Above 1 GHz

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 31,2003	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 17, 2004	1 year
Horn Antenna	ARA	SWH-28	1007	October 28, 2003	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	October 17, 2004	1 year
Spectrum Analyzer	HP	8592L	3926A01204	February 28, 2004	1 year

9. Antenna Gain

The maximum antenna gain for Antenna HG2409U is 8dBi.

The maximum antenna gain for Antenna HG2409P is 8dBi.

The maximum antenna gain for Antenna SR2405135D12NF is 5dBi.

The maximum antenna gain for Antenna MM024005P is 5.5dBi.

The maximum antenna gain for Antenna S2402DS12 is 2dBi.

The maximum antenna gain for Antenna S2406DSP12 is 6.5dBi.

10. R.F Exposure/Safety

The E.U.T. is installed in fixed locations for application of collecting location data. Typical locations for the E.U.T. are offices and communication centers. The typical distance between the E.U.T. and the general population in normal use is at least 0.5 meters.

Calculation of Maximum Permissible Exposure (MPE) Based on Section 1.1307(b)(1) Requirements

- (a) FCC limits at 2442 MHz is: $1 \frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

- (b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t- Transmitted Power 30mw (Peak)

G_T- Maximum Antenna Gain, 8dBi = 6.3

R- Distance from Transmitter using 20cm worst case

- (c) The peak power density is :

$$S_p = \frac{30 \times 6.3}{4\pi(20)^2} = 3.8 \times 10^{-2} \frac{mW}{cm^2}$$

- (d) The duty cycle of transmission in actual worst case is 1 millisecond “on” and 50 microsecond “Off”.

The average power over 30 minutes is:

$$P_{AV} = \frac{30 \times 1}{1.05} = 28.6mW$$

- (e) The averaged power density of the E.U.T. is:

$$S_{AV} = \frac{28.6 \times 6.3}{4\pi(20)^2} = 3.6 \times 10^{-2} \frac{mW}{cm^2}$$

- (f) This is 2 orders of magnitude below the FCC limit.

11. APPENDIX A - CORRECTION FACTORS

11.1 Correction factors for

CABLE

from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.5	1200.0	7.5
20.0	0.7	1400.0	8.2
30.0	1.0	1600.0	9.0
40.0	1.2	1800.0	9.6
50.0	1.3	2000.0	10.7
60.0	1.5	2300.0	11.1
70.0	1.6	2600.0	11.8
80.0	1.7	2900.0	12.8
90.0	1.8		
100.0	1.9		
150.0	2.4		
200.0	2.7		
250.0	3.0		
300.0	3.3		
350.0	3.7		
400.0	4.0		
450.0	4.3		
500.0	4.7		
600.0	4.9		
700.0	5.4		
800.0	5.8		
900.0	6.3		
1000.0	6.7		

NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

11.2 Correction factors for

CABLE

from EMI receiver
to test antenna
at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.2
2.0	1.6
3.0	2.0
4.0	2.4
5.0	3.0
6.0	3.4
7.0	3.8
8.0	4.2
9.0	4.6
10.0	5.0
12.0	5.8

NOTES:

1. The cable type is RG-8.
2. The overall length of the cable is 10 meters.

11.3 Correction factors for

CABLE

from EMI receiver
to test antenna

FREQUENCY (MHz)	CORRECTION FACTOR (dB)	FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.1	1200.0	1.4
20.0	0.1	1400.0	1.5
30.0	0.2	1600.0	1.5
40.0	0.2	1800.0	1.7
50.0	0.2	2000.0	1.7
60.0	0.2	2300.0	2.0
70.0	0.3	2600.0	2.1
80.0	0.3	2900.0	2.2
90.0	0.3		
100.0	0.3		
150.0	0.4		
200.0	0.4		
250.0	0.4		
300.0	0.5		
350.0	0.6		
400.0	0.6		
450.0	0.6		
500.0	0.7		
600.0	0.8		
700.0	0.8		
800.0	1.0		
900.0	1.1		
1000.0	1.1		

NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 5.5 meters.

11.4 Correction factors for CABLE

from EMI receiver
to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

- 1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.*
- 2. The cable is used for measurements above 2.9 GHz.*
- 3. The overall length of the cable is 10 meters.*

11.5 Correction factors for

LOG PERIODIC ANTENNA

Type LPD 2010/A

at 3 and 10 meter ranges.

Distance of 3 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.1
250.0	10.2
300.0	11.4
400.0	14.5
500.0	15.2
600.0	17.3
700.0	19.0
850.0	20.1
1000.0	22.2

Distance of 10 meters

FREQUENCY (MHz)	AFE (dB/m)
200.0	9.0
250.0	10.1
300.0	11.2
400.0	14.4
500.0	15.2
600.0	17.2
700.0	19.0
850.0	20.1
1000.0	22.1

NOTES:

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M3O.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".

11.6 Correction factors for

BICONICAL ANTENNA

**Type BCD-235/B,
at 3 meter range**

FREQUENCY (MHz)	AFE (dB/m)
20.0	19.4
30.0	14.8
40.0	11.9
50.0	10.2
60.0	9.1
70.0	8.5
80.0	8.9
90.0	9.6
100.0	10.3
110.0	11.0
120.0	11.5
130.0	11.7
140.0	12.1
150.0	12.6
160.0	12.8
170.0	13.0
180.0	13.5
190.0	14.0
200.0	14.8
210.0	15.3
220.0	15.8
230.0	16.2
240.0	16.6
250.0	17.6
260.0	18.2
270.0	18.4
280.0	18.7
290.0	19.2
300.0	19.9
310	20.7
320	21.9
330	23.4
340	25.1
350	27.0

NOTES:

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

11.7 Correction factors for ACTIVE LOOP ANTENNA

Model 6502

S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna Factor
(MHz)	(dB)	(dB)
.009	-35.1	16.4
.010	-35.7	15.8
.020	-38.5	13.0
.050	-39.6	11.9
.075	-39.8	11.8
.100	-40.0	11.6
.150	-40.0	11.5
.250	-40.0	11.6
.500	-40.0	11.5
.750	-40.1	11.5
1.000	-39.9	11.7
2.000	-39.5	12.0
3.000	-39.4	12.1
4.000	-39.7	11.9
5.000	-39.7	11.8
10.000	40.2	11.3
15.000	-40.7	10.8
20.000	-40.5	11.0
25.000	-41.3	10.2
30.000	42.3	9.2

11.8 Correction factors for LOG PERIODIC ANTENNA

**Type SAS-200/511
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. Antenna serial number is 253.
2. The above lists are located in file number SAS3M0.ANT for a 3 meter range.
3. The files mentioned above are located on the disk marked "Antenna Factors".

13.9 Correction factors for Double-Ridged Waveguide Horn

**Model: 3115, S/N 29845
at 3 meter range.**

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENN A Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			

13.10 Correction factors for

Horn Antenna
Model: SWH-28
at 1 meter range.

FREQUENCY (GHz)	AFE (dB /m)	Gain (dBi)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4

**13.11 Correction factors for BICONICAL ANTENNA
Type 3109,
1.0 meter range**

FREQUENCY (MHz)	AFE (dB/m)
20.0	11.1
30.0	12.0
40.0	12.0
50.0	11.4
60.0	10.3
70.0	10.7
80.0	8.3
90.0	9.0
100.0	10.0
110.0	11.6
120.0	13.6
130.0	14.2
140.0	13.5
150.0	12.7
160.0	12.7
170.0	13.6
180.0	15.3
190.0	14.6
200.0	14.7
210.0	15.3
220.0	15.8
230.0	17.0
240.0	18.0
250.0	18.1
260.0	18.0
270.0	17.5
280.0	18.2
290.0	19.7
300.0	21.8

NOTES:

1. Antenna serial number is 3244.
2. The above list is located in file 44BIC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver"

11.12 Correction factors for **BICONICAL ANTENNA**

Type 3109, 3 meter range

FREQUENCY (MHz)	AFE (dB/m)
20.0	18.4
30.0	14.0
40.0	12.3
50.0	10.6
60.0	8.3
70.0	8.7
80.0	7.2
90.0	8.6
100.0	10.1
110.0	11.2
120.0	11.8
130.0	12.3
140.0	12.7
150.0	12.5
160.0	12.4
170.0	12.1
180.0	12.2
190.0	12.8
200.0	13.7
210.0	14.5
220.0	15.4
230.0	15.9
240.0	16.3
250.0	16.7
260.0	17.1
270.0	17.2
280.0	17.5
290.0	18.1
300.0	18.9

NOTES:

- 1. Antenna serial number is 3244.*
- 2. The above list is located in file 44BIC3M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver"*

12. APPENDIX B – Test Results for Model LR-1000-R* BWH1000-2-R

* See customer's declaration on page 100 and product description on page 8.

13. General Information

13.1 Administrative Information

Manufacturer:	AeroScout
Manufacturer's Address:	10 Oppenheimer St. Park Tamar Rehovot 76701 Israel Tel: +972-8-9363136 Fax: +972-8-9365977
Manufacturer's Representative:	Reuven Amsalem
Equipment Under Test (E.U.T):	AeroScout™ Rugged Location Receiver
Equipment Model No.:	LR-1000-R, BWH1000-2-R (See customer's declaration on following page and product description on page 8).
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	18.01.05
Start of Test:	18.01.05
End of Test:	18.01.05
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15, Sub-parts B,C, Correspondence with the TCB METLabs dated Nov. 24, 2004 and Dec. 1, 2004 in Appendix C

DECLARATION

I HEREBY DECLARE THAT THE FOLLOWING PRODUCTS:

- 1. BWH1000-02**
- 2. BWH1000-02-R**
- 3. BWH1000-02-TA**

**ARE IDENTICAL ELECTRONICALLY, PHYSICALLY, AND MECHANICALLY
TO:**

- 1. LR-1000**
- 2. LR-1000-R**
- 3. TGA-1000**

Respectively

Please relate to them all (from an EMC point of view) as the same product.

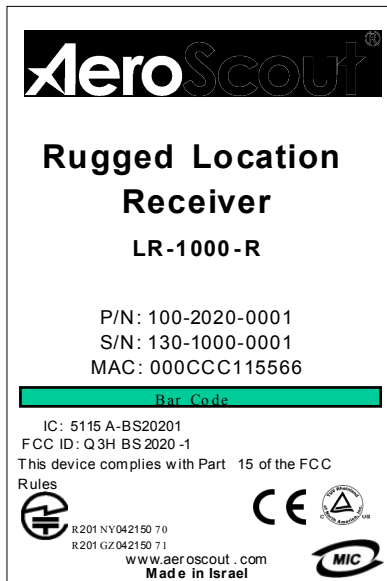
Sincerely,
Reuven Amsalem
Director, HW R&D
AeroScout, Ltd

Signature:

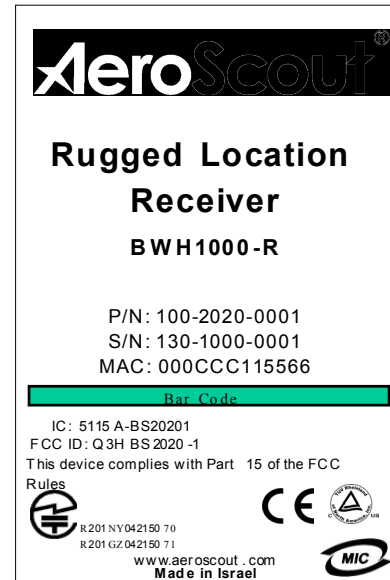


Date: 16/1/05

14. Product Labeling LR-1000-R



76.2 x 50.80



76.2 x 50.80

Figure 59. FCC Label

15. Radiated Emission, RX Mode

15.1 Test Specification

30-10500 MHz, FCC, Part 15, Subpart B

15.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission.

The frequency range 30-10500 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

In the frequency range 30MHz -2.9 GHz the emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

On the frequency range 2.9-10.5 GHz a spectrum analyzer including a low noise amplifier was used.

During average measurements above 1 GHz, IF bandwidth was 1MHz and video bandwidth was 100 Hz. During peak measurements both the IF and video bandwidths were 1 MHz.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

The emissions were measured at a distance of 3 meters.

The E.U.T. was operated at the frequencies of 2412.0, 2442.0, and 2462.0 MHz.

15.3 **Measured Data**

JUDGEMENT: Passed by 8.0 dB

The EUT met the requirements of the FCC Part 15, Subpart B, specification.

The results, for all three operating frequencies in the frequency range up to 1 GHz, were the same.

The margin between the emission level and the specification limit is 8.0 dB in the worst case at the frequency of 115.50 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 60* to *Figure 65*.

TEST PERSONNEL:

Tester Signature: 

Date: 03.02.05

Typed/Printed Name: E. Pitt

Radiated Emission

E.U.T Description AeroScout™ Rugged Location Receiver
 Type LR-1000-R
 Serial Number: Not Designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Horizontal Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409P

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
115.50	28.5	20.6	13.3	43.5	-22.9
154.00	21.9	17.1	15.1	43.5	-26.4
264.00	34.5	24.1	21.4	46.0	-21.9
308.00	30.0	23.0	16.1	46.0	-23.0
346.50	33.0	23.6	17.5	46.0	-22.4
396.00	33.6	24.4	19.3	46.0	-21.6

**Figure 60. Radiated Emission. Antenna Polarization: HORIZONTAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description	AeroScout™ Rugged Location Receiver
Type	LR-1000-R
Serial Number:	Not Designated

Specification: FCC Part 15, Subpart B, Class B

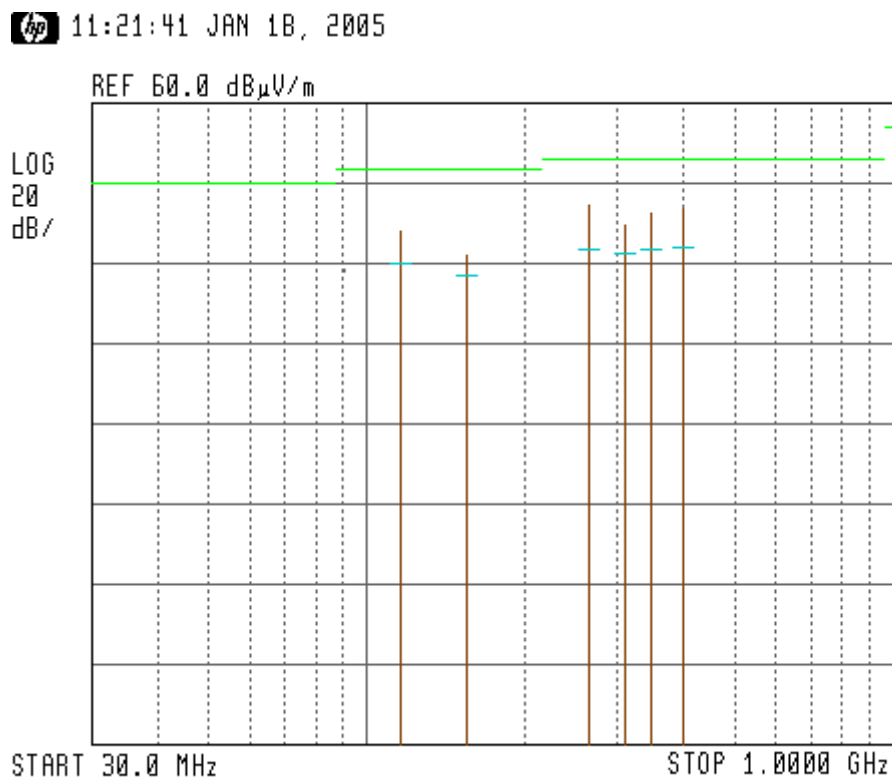
Antenna Polarization: Horizontal

Frequency range: 30 MHz to 1000 MHz

Test Distance: 3 meters

Detector: Quasi-peak

Antenna: HG2409P



**Figure 61. Radiated Emission. Antenna Polarization: HORIZONTAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission

E.U.T Description AeroScout™ Rugged Location Receiver
 Type LR-1000-R
 Serial Number: Not Designated

Specification: FCC Part 15, Subpart B, Class B

Antenna Polarization: Vertical Frequency range: 30 MHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG2409P

Frequency	Peak Amp	QP Amp	Correction	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)	(dBμV/m)	(dB)
66.00	30.4	26.7	10.3	40.0	-13.3
110.00	34.8	31.1	13.0	43.5	-12.4
115.50	38.1	35.5	13.3	43.5	-8.0
154.00	27.4	23.7	15.1	43.5	-19.8
346.50	25.4	20.6	17.5	46.0	-25.4
396.00	25.4	20.5	19.3	46.0	-25.5

**Figure 62. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

Radiated Emission

E.U.T Description	AeroScout™ Rugged Location Receiver
Type	LR-1000-R
Serial Number:	Not Designated

Specification: FCC Part 15, Subpart B, Class B

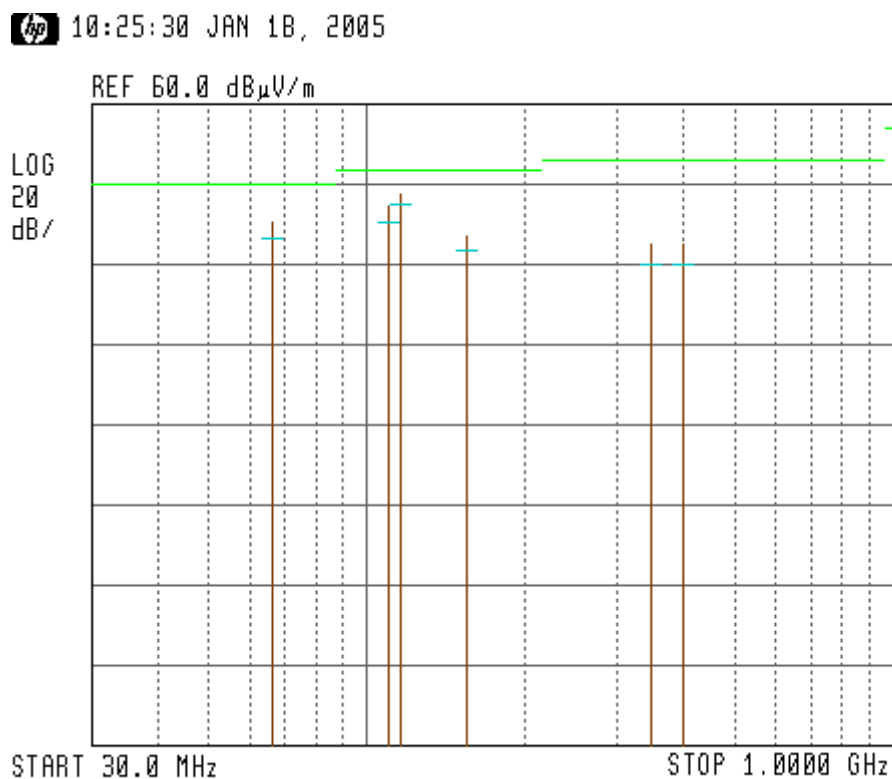
Antenna Polarization: Vertical

Frequency range: 30 MHz to 1000 MHz

Test Distance: 3 meters

Detector: Quasi-peak

Antenna: HG2409P



**Figure 63. Radiated Emission. Antenna Polarization: VERTICAL
Detectors: Peak, Quasi-peak**

Note:

1. Horizontal axis shows logarithmic frequency scale.
2. The vertical axis shows amplitude (in dB $\mu\text{V/m}$).
3. Peak detection is designated by the top of each vertical line.
4. Quasi-peak detection is designated by the first dash mark (from the top) of each vertical line.

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Rugged Location Receiver
 Type LR-1000-R
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Peak
 Antenna: HG2409P

Frequency (MHz)	Peak Amp (dBμV/m)	Polarization (H/V)	Specification (dBμV/m)	Margin (dB)
2038.00	49.7**	H	74.0	-24.3
2068.00	49.7**	H	74.0	-24.3
2088.00	49.6**	H	74.0	-24.4
4076.00	45.3*	H	74.0	-28.7
4136.00	45.5*	H	74.0	-28.5
4176.00	46.8*	H	74.0	-27.2
6114.00	49.6*	V	74.0	-24.4
6204.00	50.3*	V	74.0	-23.7
6264.00	50.6*	V	74.0	-23.4

**Figure 64. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

* “Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

** “Correction Factor” = Antenna Factor + Cable Loss

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Rugged Location Receiver
 Type LR-1000-R
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart B

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 10.5 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: HG2409P

Frequency (MHz)	Avg Amp (dBμV/m)	Polarization (H/V)	Specification (dBμV/m)	Margin (dB)
2038.00	38.7**	H	54.0	-15.3
2068.00	38.9**	H	54.0	-15.1
2088.00	39.2**	H	54.0	-14.8
4076.00	37.1*	H	54.0	-16.9
4136.00	36.2*	H	54.0	-17.8
4176.00	39.5*	H	54.0	-14.5
6114.00	40.2*	V	54.0	-13.8
6204.00	42.8*	V	54.0	-11.2
6264.00	45.0*	V	54.0	-9.0

**Figure 65. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Preamplifier Gain

** Correction Factor = Antenna Factor + Cable Loss

15.4 Test Instrumentation Used, Radiated Measurements Below 1 GHz

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85420E/85422E	3427A00103/34	February 28, 2004	1 year
Antenna - Biconical HP	ARA	BCD-235/B	1041	April 11, 2004	1 year
Antenna - Log Periodic	ARA	LPD-2010/A	1038	March 21, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357.0	N/A	N/A

15.5 Test Instrumentation Used, Radiated Measurements Above 1 GHz

Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 31,2003	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 17, 2004	1 year
Horn Antenna	ARA	SWH-28	1007	October 28, 2003	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	October 17, 2004	1 year
Spectrum Analyzer	HP	8592L	3926A01204	February 28, 2004	1 year

15.6 **Field Strength Calculation**

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v/m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF} - \text{GA}^*$$

FS:	Field Strength [dB μ v/m]
RA:	Receiver Amplitude [dB μ v]
AF:	Receiving Antenna Correction Factor [dB/m]
CF:	Cable Attenuation Factor [dB]
GA*:	Gain Amplifier, if used

No external pre-amplifiers are used.

16. Spurious Radiated Emission in the Restricted Bands Tx Mode, Below 1 GHz

16.1 Test Specification

9kHz-1000 MHz, FCC Part 15, Subpart C

16.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in *Figure 3*.

The frequency range 9 kHz-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter.

In the frequency range 30-1000MHz, the readings were maximized by adjusting the antenna height between 1-4 meters. The turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

The E.U.T. was operated in the frequencies of 2412.0, 2442.0, and 2462.0 MHz.

16.3 **Measured Data**

JUDGEMENT: Passed by 5.4 dB

The EUT met the requirements of the FCC Part 15, Subpart C, specification.

The signals in the band 9 kHz – 30 MHz were 20dB below the specification limit.

The test results were the same for all 3 operating frequencies.

The margin between the emission level and the specification limit is 5.4 dB in the worst case at the frequency of 115.50 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 66*.

TEST PERSONNEL:

Tester Signature: 

Date: 03.02.05

Typed/Printed Name: E. Pitt

Radiated Emission

E.U.T Description AeroScout™ Rugged Location Receiver
 Type LR-1000-R
 Serial Number: Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Vertical Frequency range: 9 kHz to 1000 MHz
 Test Distance: 3 meters Detector: Quasi-peak
 Antenna: HG24099

Frequency	QP Amp	Specification	Margin
(MHz)	(dBμV/m)	(dBμV/m)	(dB)
110.00	34.8	43.5	-8.7
115.50	38.1	43.5	-5.4

**Figure 66. Radiated Emission. Antenna Polarization: VERTICAL.
 Detector: Quasi-peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“QP Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss

16.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Antenna Bioconical	ARA	BCD 235/B	1041	April 11, 2004	1 year
Antenna Log Periodic	ARA	LPD-2010/A	1038	March 21, 2004	1 year
Active Loop Antenna	EMCO	6502	9506-2950	October 17, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet 2225	2738508357.0	N/A	N/A

16.5 *Field Strength Calculation*

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{v}/\text{m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

FS:	Field Strength [dB μ v/m]
RA:	Receiver Amplitude [dB μ v]
AF:	Receiving Antenna Correction Factor [dB/m]
CF:	Cable Attenuation Factor [dB]

No external pre-amplifiers are used.

17. Spurious Radiated Emission in the Restricted Bands Tx Mode, Above 1 GHz

17.1 Spurious Radiated Emission Above 1 GHz

The E.U.T operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The effect of varying the position of the cables was investigated to find the configuration that produces maximum emission. The configuration tested is shown in Figure 3.1.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

In the frequency range 1-2.9 GHz, a computerized EMI receiver complying to CISPR 16 requirements was used.

In the frequency range 2.9-25.0 GHz, a spectrum analyzer including a low noise amplifier was used. During average measurements, the IF bandwidth was 1 MHz and the video bandwidth was 100Hz. During peak measurements, the IF bandwidth was 1 MHz and the video bandwidth was 3 MHz.

The test distance was 3 meters.

Above 12.0 GHz:

- c. The test distance was 1.5 meters. The reduced distance was used to increase the signal to noise ratio.
- d. For the average test, the IF bandwidth was reduced to 100kHz.

The readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods: turning the E.U.T on and off; using a frequency span less than 10 MHz; observation of the signal level during turntable rotation. (Background noise is not affected by the rotation of the E.U.T.)

The E.U.T. was operated in the frequencies of 2412.0, 2442.0, and 2462.0 MHz.

17.2 Test Data

JUDGEMENT: Passed by 5.0 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

The margin between the emission level and the specification limit is 5.4 dB in the worst case at the frequency of 4884.00 MHz, horizontal polarization.

The details of the highest emissions are given in *Figure 67* to *Figure 68*.

TEST PERSONNEL:

Tester Signature:  Date: 03.02.05

Typed/Printed Name: E. Pitt

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Rugged Location
Receiver
Type LR-1000-R
Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
Test Distance: 3 meters Detector: Peak
Antenna: HG2409P

Freq.	Peak Amp	Polarization	Peak. Specification	Peak. Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	45.3	H	74.0	-28.7
4136.00	45.5	H	74.0	-28.5
4176.00	46.8	H	74.0	-27.2
4824.00	52.1	H	74.0	-21.9
4884.00	52.8	H	74.0	-21.2
4924.00	52.2	H	74.0	-21.8

**Figure 67. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
Detector: Peak**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Peak Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

Radiated Emission Above 1 GHz

E.U.T Description AeroScout™ Rugged Location Receiver
 Type LR-1000-R
 Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical Frequency range: 1 GHz to 25 GHz
 Test Distance: 3 meters Detector: Average
 Antenna: HG2409P

Freq.	Average Amp	Polarization	Average Specification	Average Margin
(MHz)	(dBμV/m)	(H/L)	(dB μV/m)	(dB)
4076.00	37.1	H	54.0	-16.9
4136.00	38.2	H	54.0	-15.8
4176.00	39.5	H	54.0	-14.5
4824.00	48.2	H	54.0	-5.8
4884.00	49.0	H	54.0	-5.0
4924.00	48.6	H	54.0	-5.4

**Figure 68. Radiated Emission. Antenna Polarization: HORIZONTAL/VERTICAL.
 Detector: Average**

Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.

“Average Amp” includes correction factor.

“Correction Factor” = Antenna Factor + Cable Loss- Preamplifier Gain

17.3 Test Instrumentation Used, Radiated Measurements Above 1 GHz

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
Receiver	HP	85422E	3411A00102	February 28, 2004	1 year
RF Section	HP	85420E	3427A00103	February 28, 2004	1 year
Antenna Mast	ARA	AAM-4A	1001	N/A	N/A
Turntable	ARA	ART-1001/4	1001	N/A	N/A
Mast & Table Controller	ARA	ACU-2/5	1001	N/A	N/A
Printer	HP	ThinkJet2225	2738508357	N/A	N/A
Antenna-Log Periodic	A.H.System	SAS-200/511	253	January 31,2003	2 year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 17, 2004	1 year
Horn Antenna	ARA	SWH-28	1007	October 28, 2003	2 year
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	October 17, 2004	1 year
Spectrum Analyzer	HP	8592L	3926A01204	February 28, 2004	1 year

18. APPENDIX C – Correspondence With the TCB

Date: 24/11/04

To: Marianne Bosley

From: EMC

Subject: FCC Authorization for AeroScout Location Receiver Model BWH1000-2-AeroScout

Hello Marianne,

1. The subject product is a wireless spread spectrum receiver/transmitter, authorized for FCC via METLabs' TCB service (FCC ID # Q3HBS2020-0).

2. The customer plans now to add to the original product as follows:

a. A 125 kHz transmitter.

b. Use of 5 new antennas (1 at a time)

c. Produce another version of the original product + modifications 2.a, 2.b. + replacement of its plastic housing by metallic housing.

Note: The prior 2.4 GHz receiver/transmitter is without changes

3. We plan to:

a. Fully test to Part 15, Sub-part C the 125 kHz transmitter using the plastic housing.

b. Test spurious radiation for each new antenna with the plastic housing unit.

c. The metal housing version will be tested only for spurious radiation with only one new antenna (worst case), selected on maximum e-field at the operation frequency band.

4. Questions:

4.1. Could the authorization for the new product be under a single permissive change Class II?

Is a new FCC ID # required?

Please advise

4.2. Is the test plan acceptable?

Please advise/comment.

Regards

Shaike Raz

EMC Laboratory Manager

EMC Laboratory

ITL (Product Testing) Ltd.

Kfar Bin Nun

Israel

Tel: +972-8-979-7799

Fax: +972-8-979-7702

Email: sraz@itl.co.il/emc@itl.co.il

<http://www.itl.co.il>

<http://www.i-spec.com>

This e-mail message may contain privileged or confidential information. If you are not the intended recipient, you may not disclose, use, disseminate, distribute, copy or rely upon this message or attachment in any way. If you received this e-mail message in error, please return by forwarding the message and its attachments to the sender.



Date: 01/12/04

To: EMC

From: Chris Harvey

Subject: RE: FCC Authorization for AeroScout Location Receiver Model BWH1000-2-AeroScout-URGENT

Shaik, the FCC does not allow the addition of a Transmitter to a device under the existing FCC ID number, so this is not exactly doable as requested.

If you handle the 125kHz transmitter as a modular approval then this module can be added to this device under a permissive change.

The changes to the original unit then can be handled as Class II Permissive Changes (adding antennas, changing enclosures and co-locating with the 125kHz module as a single application for Class II). The label on the units that incorporated the 125kHz module would include the external Modular label required by the FCC. This module would have its own FCC ID number.

Since the final product is Mobile for RF Exposure classification you would need to address the multiple RF sources co-located within 20cm of each other in an MPE calculation.

The test plan approach seems appropriate for this approval.

I hope this is helpful.

Best regards,

Chris Harvey

Chris Harvey EMC Consultants, LLC

charvey@ieee.org

cell 443-622-3300

See additional correspondence with METLabs dated: 23.01.05, 07.12.05, and 02.12.05.