REPORT ON

EMC Testing of a Fastfind Plus Personal Locator Beacon

Report No OO608213B September 2001

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PREPARED FOR

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APPROVED BY

C H Gould
Chief Engineer

DATED **11th September 2001**

DISTRIBUTION

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STATUS

OBJECTIVE	To undertake measurements to determine the Equipment Under Test's (EUT's) compliance with the specification.
MANUFACTURING DESCRIPTION	406MHz Personal Locator Beacon with integral GPS
MANUFACTURER	McMurdo Limited
MANUFACTURERS MODEL NUMBER	Fastfind Plus
SERIAL NUMBER	E0002
TEST SPECIFICATION NUMBER	FCC CFR47 Part 2 Subpart J 2.1051, 2.1053: 1999 FCC CFR47 Part 80 Subpart E 80.211(e): 1999
REGISTRATION NUMBER	Y608213
QUANTITY OF ITEMS TESTED	One
SECURITY CLASSIFICATION OF EUT	Unclassified
INCOMING RELEASE SERIAL NUMBER DATE	Declaration of Build Status Y608213 23rd August 2001
DISPOSAL	Held pending disposal
ORDER NUMBER DATE	702907 16th May 2001
START OF TEST FINISH OF TEST	20th June 2001 30th July 2001
TEST ENGINEERS	A R Hubbard
RELATED DOCUMENTS	ANSI C63.4 1992. Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 10 kHz to 1 GHz.

SYSTEM CONFIGURATION DURING EMC TESTING

The Fastfind Plus PLB was set-up simulating a typical user installation on the Open Field Test Site, then tested in accordance with the specification.

The EUT was functioning correctly during all testing, and was transmitting a test message on 406.028MHz and a homing signal on 121.65MHz.

EMISSION TESTING

Instrumentation used for Emission Testing:

Instrument	Manufacturer	Type No	EMC No
Spectrum Analyser	Hewlett Packard	8568B	184
Quasi-Peak Adaptor	Hewlett Packard	85650A	1302
RF Preselector	Hewlett Packard	85685A	1370
Computer	Hewlett Packard	310	—
Biconical Antenna	Ailtech	94455-1	422
Log Periodic Antenna	Amplifier Research	AT1000	829
Automatic Turntable & Controller	EMCO	1060	1322
Automatic Antenna Mast & Controller	EMCO	1050	1321
Printer	Hewlett Packard	THINK JET	—
Spectrum Analyser	Hewlett Packard	8562A	2282
Horn	EMCO	3115	2397
Signal Generator	Marconi	2031	2199

RADIATED ELECTRIC FIELD EMISSIONS TEST PROCEDURE

A preliminary profile of the Radiated Electric Field Emissions was obtained by operating the Equipment Under Test (EUT) on a remotely controlled turntable within a Characterisation Chamber; measurements were taken at a 3m distance. Measurements of emissions from the EUT were obtained with the Measuring Antenna in both Horizontal and Vertical Polarisations. The profiling produced a list of the worst case emissions together with the EUT azimuth and polarisation.

The EUT was then transferred to the Open Field Site and placed on a remotely controlled turntable. Using the information from the preliminary profiling of the EUT, a search was made in the frequency range 30MHz to 4100MHz. The list of worst case emissions was then confirmed or updated under Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth. Emission levels were then formally measured using a Peak detector. The details of the worst case emissions were then recorded in the Job Log Book and are presented in Table 1.

The Radiated Electric Field Emission measurements were made using a Hewlett Packard Spectrum Analyser and Preselector in the frequency range 30MHz to 1000MHz and a Hewlett Packard Spectrum Analyser in the frequency range 1GHz to 4.1GHz.

The EUT was operating from an internal battery pack.

The test was performed in accordance with ANSI C63.4.

RADIATED ELECTRIC FIELD TEST RESULTS

The EUT met the requirements of FCC Part 80 Subpart E Clause 80.211(e) for Radiated Electric Field Emissions.

The emissions were measured at 3m.

Open Field Site Results : The levels of the two transmitters and the five highest spurious emissions measured in accordance with the specification are presented in Table 1 below :-

Frequency	Pol	Hgt	Azm	Level at 3m	Cable Loss	Antenna Factor	F.S at 3m	Spec Limit
MHz	H/V	cm	deg	dBµV	dB	dB	dBµV/m	dBµV/m
121.627	V	104	2	88.3	1.9	10.8	101.0	N/A
243.279	H	105	105	42.5	2.8	11.2	56.4	71.0
364.940	V	153	161	47.7	3.6	14.9	66.2	71.0
406.022	V	115	0	99.3	3.9	15.8	119.0	N/A
811.988	V	105	0	41.6	5.7	22.6	69.9	89.0
1216.500	V	100	87	24.0	2.0	25.9	51.9	71.0
1218.050	V	101	90	53.8	2.0	25.9	81.7	89.0

Table 1

The margin between the specification requirements and all other emissions was 14dB or more below the specification limit.

ABBREVIATIONS FOR ABOVE TABLE

H	Horizontal Polarisation	V	Vertical Polarisation
Pol	Polarisation	Hgt	Height
deg	degree	Azm	Azimuth
Spec	Specification	F S	Field Strength
N/A	Not Applicable		

Procedure Test Performed in accordance with ANSI C63.4.

Performed by A R Hubbard, EMC Engineer.

FCC SITE COMPLIANCE LETTER

FEDERAL COMMUNICATIONS COMMISSION
Laboratory Division
7435 Oakland Mills Road
Columbia, MD. 21046

April 10, 2001

Registration Number: 90987

BABT Product Service
Segensworth Road
Titchfield, Fareham
Hampshire PO15 5RH
United Kingdom
Attention: Jensen Adams

Re: Measurement facility located at Titchfield
3 & 10 meter site
Date of Listing: April 10, 2001

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that this filing must be updated for any changes made to the facility, and at least every three years from the date of listing the data on file must be certified as current.

If requested, the above mentioned facility has been added to our list of those who perform these measurement services for the public on a fee basis. An up-to-date list of such public test facilities is available on the Internet on the FCC Website at WWW.FCC.GOV, E-Filing, OET Equipment Authorization Electronic Filing.

Sincerely,

Thomas W Phillips
Electronics Engineer

SYSTEM MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems, in accordance with the recommendations of NIS 81 Edition 1, May 1994 are :-

For Radiated Emissions, Quasi-Peak Measurements taken in Zero Span using the Hewlett Packard Spectrum Analyser, Preselector and Quasi-Peak Adaptor:-

Frequency	$\pm 2 \times 10^{-7}$ x Centre Frequency
Amplitude	+4.45dB (30-200MHz; 3m Measurements) -4.42dB (30-200MHz; 3m Measurements) +4.80dB (200-1000MHz; 3m Measurements) -3.81dB (200-1000MHz; 3m Measurements)

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Group

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