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Report On

Limited Testing of the
McMurdo Fastfind PLB

Document 75901815 Report 02 Issue 1

October 2007



Product Service

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REPORT ON

Emergency Beacons Limited Testing of the
McMurdo Fastfind PLB

Document 75901815 Report 02 Issue 1

October 2007

PREPARED FOR

McMurdo
Silver Point
Airport Service Road
Hilsea
Portsmouth
PO3 5PB

PREPARED BY

A handwritten signature in black ink, appearing to read 'N Bennett'.

N Bennett
Administrator

APPROVED BY

A handwritten signature in black ink, appearing to read 'M Jenkins'.

M Jenkins
Authorised Signatory

DATED

16th October 2007



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SECTION 1

REPORT SUMMARY

Limited Testing of the
McMurdo Fastfind PLB



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the McMurdo Fastfind PLB to the requirements of T.007 Issue 4 – Rev 1 October 2006.

Objective	To determine the Equipment Under Test's (EUT's) compliance with the specification/Test Plan, for the series of tests carried out.	
Manufacturer	McMurdo	
Model Number(s)	Fastfind PLB	
Serial Number(s)	75901815_02	Fastfind PLB, S/N: 810-000001
Number of Samples Tested	One	
Test Specification/Issue/Date	Cospas-Sarsat T.007 Issue 4 – Rev 1 October 2006	
Incoming Release Date	Application Form 1 st August 2007	
Date of Receipt of Test Samples	20 th August 2007	
Order Number	PC0003097	
Date	16 th July 2007	
Start of Test	24 th August 2007	
Finish of Test	19 th September 2007	
Name of Engineer(s)	R Henley R Hampton	



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1.2 APPLICATION FORM

1.2.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	McMurdo
Beacon Model	Fastfind PLB/Fastfind PLB Plus

1.2.2 Beacon Type and Operational Configurations

Beacon Type	Beacon used while:	Tick where appropriate
EPIRB	Floating in water or on deck or in a safety raft	☐
PLB	On ground and above ground	☒
	On ground and above ground and floating in water	☐
ELT Survival	On ground and above ground	☐
	On ground and above ground and floating in water	☐
ELT Auto Fixed	Fixed ELT with aircraft external antenna	☐
ELT Auto Portable	In aircraft with an external antenna	☐
	On ground, above ground, or in a safety raft with an integrated antenna	☐
ELT Auto Deployable	Deployable ELT with attached antenna	☐
Other (specify)		☐

1.2.3 Beacon Characteristics

Characteristic	Specification
Operating temperature range	Tmin = -20°C Tmax = +55°C
Operating lifetime	24hrs/48 hours
Battery chemistry	Lithium ion di-sulphide
Battery cell size and number of cells	AA x 7cells
Battery manufacturer	Energizer
Battery pack manufacturer and part number	
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	CMAC
Oscillator part name and number	E4520
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes



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Characteristic	Specification
Antenna type (Integrated or External)	Integrated
Antenna manufacturer	Doig
Antenna part name and number	
Navigation device type (Internal, External or None)	Internal
Features in beacon that prevent degradation to 406 MHz signal or beacon lifetime resulting from a failure of navigation device or failure to acquire position data (Yes, No, or N/A)	Yes
Features in beacon that ensures erroneous position data is not encoded into the beacon message (Yes, No or N/A)	Yes
Navigation device capable of supporting global coverage (Yes, No or N/A)	Yes
For Internal Navigation Devices	
- Geodetic reference system (WGS 84 or GTRF)	WGS 84
- GNSS receiver cold start forced at every beacon activation (Yes or No)	Yes
- Navigation device manufacturer	uBlox
- Navigation device model name and part Number	TIM-4P
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	GPS
For External Navigation Devices	
- Data protocol for GNSS receiver to beacon interface	
- Physical interface for beacon to navigation device	
- Electrical interface for beacon to navigation device	
- Navigation device model and manufacturer (if beacon designed to use specific devices)	



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Characteristic	Specification
Self-Test Mode Characteristics	
- Self-test has separate switch position (Yes or No)	Yes
- Self-test switch automatically returns to normal position when released (Yes or No)	Yes
- Self-test activation can cause an operational mode transmission (Yes or No)	No
- Self-test causes a single beacon self-test message burst only regardless of how long the self-test activation mechanism applied (Yes or No)	Yes
- Results of self-test indicated by (e.g. Pass / Fail Indicator Light, Strobe Light, etc.)	Pass/fail LED
- Self-test can be activated from beacon remote activation points (Yes or No)	No
- Self-test performs an internal check and indicates that RF power emitted at 406 MHz and 121.5 MHz if beacon includes a 121.5 MHz homer (Yes or No)	Yes
- Self-test transmits a signal(s) other than at 406 MHz (Yes & details or No)	121.5MHz
- Self-test can be activated directly at beacon (Yes or No)	Yes
- List of Items checked by self-test	406.037/121.5MHz power, PLL lock, GPS module
- Self-test transmission burst duration (440 or 520 ms)	520 ms
- Self-test format bit ("0" or "1")	0
Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5MHz
-Homer Transmit Power	20dBm
-Homer Duty Cycle	99.13%
-Duty Cycle of Homer Swept Tone	34%



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Characteristic	Specification
Beacon includes a strobe light (Yes or No)	No
- Strobe light intensity	N/A
- Strobe light flash rate	N/A
Beacon transmission repetition period satisfies C/S T.001 requirement that two beacon's repetition periods are not synchronised closer than a few seconds over 5 minute period, and the time intervals between transmissions are randomly distributed on the interval 47.5 to 52.5 seconds (Yes or No)	Yes
Other ancillary devices (e.g. voice transceiver). List details on a separate sheet if insufficient space to describe.	No
Beacon includes automatic activation mechanism (Yes or No)	No

1.2.4 Information Provided by the Cospas-Sarsat Accepted Test Facility

Name and Location of Beacon Test Facility: TUV Product Service Ltd, United Kingdom

Date of Submission for Testing: August 2007

Applicable C/S Standards:

Document	Issue	Revision	Date
C/S T.001	3	7	Nov-05
C/S T.007	4	1	Oct-06

I hereby confirm that the 406 MHz beacon described above has been successfully tested in accordance with the Cospas-Sarsat Type Approval Standard (C/S T.007) and complies with the Specification for Cospas-Sarsat 406 MHz Distress Beacons (C/S T.001) as demonstrated in the attached report.

Signed:

Name:

M Jenkins

Position Held:

Authorised Signatory

Date:

16th October 2007



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1.2.5 Applicant Details

Company Name	McMurdo		
Address	Silver Point Airport Service Road Hilsea Portsmouth, PO3 5PB		
Category of Applicant	☒ Manufacturer	☐ Importer	
	☐ Distributor	☐ Agent	
Contact Name	Mr Neil Jordan	Telephone	02392623934
Email	neiljordan@mcmurdo.co.uk	Facsimile	02392623997

1.2.6 Manufacturer Details

Company Name	Same as above		
Address			
Contact Name		Telephone	
Email		Facsimile	

1.2.7 Declaration of Build Status

Hardware Version	85-800N
- PCB Revision	Issue B
- Battery Model	
Software Version	
Firmware Version	
Other (Specify)	

1.2.8 Applicant's Declaration

I hereby declare that I am entitled to sign on the behalf of the applicant and that the information supplied is correct and complete

Signed: _____

Name: Neil Jordan

Position Held: Senior Electronics Engineer

Date: 20th August 2007

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a McMurdo Fastfind PLB as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test



Product Service

1.4 MODIFICATIONS

No modifications were made to the test sample during testing.

1.5 REPORT MODIFICATION RECORD

Issue 1 – First Issue



Product Service

SECTION 2

TEST DETAILS

Limited Testing of the
McMurdo Fastfind PLB



Product Service

TEST RESULTS TABLE

Parameter	Limits	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(22°C)	(+55°C)	
2. Digital Message Coding		Bit Numbers				Test Sample: 75901815_02 Mod State: 0 Result: Pass
Bit Sync	1 - 15	15 bits "1"	P / F	P	P	Decoded Message: Page 17 to 19
Frame sync	16 - 24	"000101111"	P / F	P	P	
Format flag	25	1 bit	bit value	0	0	
Protocol flag	26	1 bit	bit value	1	1	
Identification / position data		59 bits	P / F	P	P	
BCH code	86 -106	21 bits	P / F	P	P	
Emerg. Code/nat. use/supplem. Data		6 bits	bit value	000000	000000	
Additional data / BCH (if applicable)		32 bits	P / F	N/A	N/A	
Position Error (if applicable)		< 5	km	N/A	N/A	
3. Digital Message Generator						Test Sample: 75901815_02 Mod State: 0 Result: Pass
Repetition rate TR:						
Average TR	48.5 ≤ TRavg ≤ 51.5	seconds	49.938	49.921	49.929	
Minimum TR	47.5 ≤ TRmin ≤ 48.0	seconds	47.688	47.86	47.812	
Maximum TR	52.0 ≤ TRmax ≤ 52.5	seconds	52.219	52.156	52.125	
Standard deviation	0.5 - 2.0	seconds	1.344	1.327	1.329	
Bit rate						
Minimum fb	≥ 396	bits/sec	400.318	400.422	400.503	
Maximum fb	≤ 404	bits/sec	400.348	400.445	400.526	
Total transmission time						
Short message	435.6 – 444.4	ms	441.458	441.358	441.297	
Long message	514.8 – 525.2	ms	N/A	N/A	N/A	
Unmodulated carrier						
Minimum T1	≥ 158.4	ms	161.268	161.231	161.207	
Maximum T1	≤ 161.6	ms	161.284	161.245	161.221	
First burst delay	≥ 47.5	seconds	121	121	121	



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Parameter	Limits	Units	Test Results			Comments
			T _{min}	T _{amb}	T _{max}	
			(-20°C)	(22°C)	(??°C)	
6. Spurious Emission on 50ohms						Test Sample: 75901815_02 Mod State: 0 Result: Pass
In band (406.0 – 406.1 MHz)	C/S T.001 mask	P / F	P	P	P	Spectrum plots: Page 20
8. Self-test Mode						Test Sample: 75901815_02 Mod State: 0 Result: Pass
Frame sync	011010000	P / F	P	P	P	Decoded Message: Page 21
Format flag	1 / 0	bit value	0	0	0	
Single radiated burst	≤440 / 520 (±1%)	ms	441.479	441.377	441.319	
Default position data (if applicable)	Correct	P / F	n/a	n/a	n/a	
Description provided		Y / N				
Design data on protection against repetitive self-test mode transmissions	Provided	Y / N				
Single burst verification	one burst	P / F	P	P	P	
Provides for 15 Hex ID	Correct	P / F		P	P	
121.5 MHz RF power (if applicable)	self-test checks that RF power emitted	P / F	P	P	P	
406 MHz power	self-test checks that RF power emitted	P / F	P	P	P	
14. Satellite Qualitative Tests						Test Sample: 75901815_02 Mod State: 0 Result: Pass
Test Configuration	C/S T.007	Figure	Resting on Dry Ground		B.5	Test Data: Page 21 to 22
15 Hex ID Decoded by LUT	correct	P / F	P		P	
Doppler Location results with error ≤5km	≥80	%	100		100	
16. Beacon Coding System						Test Sample: 75901815_02 Mod State: 0 Result: Pass
Sample message for each coding option of the applicable coding types	correct	P / F	P			
Sample self-test message for each coding option of the applicable coding types	correct	P / F	P			



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2.1 DIGITAL MESSAGE CODING

2.1.1 Equipment Under Test

Fastfind PLB, Serial Number: 810-000001

2.1.2 Date of Test

29th August 2007

2.1.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.4 Test Results

Digital Message at Ambient Temperature

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
 15 Hex (Bits 26- 85) = 992F40018C00F9D 992F40018C00F9D Default_Id
 36 Hex (Bits 25-144) = FFE2F4C97A000C6007CEBC6BCC000000000

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	
0	1001	1001	0010	1111	0100	0000	0000	0001	1000	1100	0000	0000	1111	1001	1101
	0111	1000	1101	0111	1001	1000	0000	0000	0000	0000	0000	0000	0000	0000	000
86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	

Field Name	Bit Pos	Value	Decode	Bits
-----	-----	-----	-----	----
Format Flag	25	0	Short Message	0
Protocol Flag	26	1	User	1
MID	27- 36	201	ALBANIA	0011 0010 01
User Protocol	37- 39	3	Serialized	011
Beacon type	40- 42	6	Personal/ PLB	110
Certification type	43	1	Cospas-Sarsat	1
Serial Number	44- 63	99		0000 0000 0000 0110 0011
Cosp-Sar Spare	64- 73	0		0000 0000 00
Cosp-Sar Cert #	74- 83	999		1111 1001 11
Homing	84- 85	1	121.5	01
BCH Encoded	86-106		Errors=0	0111 1000 1101 0111 1001 1
BCH Generated	86-106			0111 1000 1101 0111 1001 1
Emergency Cd Flag	107	0	National Use	0
Beacon Activation	108	0	Ma	



Product Service

Digital Message at Minimum Temperature

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112

15 Hex (Bits 26- 85) = 992E40018C00F9D 992E40018C00F9D Default_Id

36 Hex (Bits 25-144) = FFFE2F4C972000C6007CE887124000000000

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	
0	1001	1001	0010	1110	0100	0000	0000	0001	1000	1100	0000	0000	1111	1001	1101
	0001	0000	1110	0010	0100	1000	0000	0000	0000	0000	0000	0000	0000	0000	000
86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	

Field Name	Bit Pos	Value Decode	Bits
Format Flag	25	0 Short Message	0
Protocol Flag	26	1 User	1
MID	27- 36	201 ALBANIA	0011 0010 01
User Protocol	37- 39	3 Serialized	011
Beacon type	40- 42	4 Non FI/Free EPIRB	100
Certification type	43	1 Cospas-Sarsat	1
Serial Number	44- 63	99	0000 0000 0000 0110 0011
Cosp-Sar Spare	64- 73	0	0000 0000 00
Cosp-Sar Cert #	74- 83	999	1111 1001 11
Homing	84- 85	1 121.5	01
BCH Encoded	86-106	Errors=0	0001 0000 1110 0010 0100 1
BCH Generated	86-106		0001 0000 1110 0010 0100 1
Emergency Cd Flag	107	0 National Use	0
Beacon Activation	108	0 Ma	



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Digital Message at Maximum Temperature

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112

15 Hex (Bits 26- 85) = 992E40018C00F9D 992E40018C00F9D Default_Id

36 Hex (Bits 25-144) = FFFE2F4C972000C6007CE887124000000000

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	
0	1001	1001	0010	1110	0100	0000	0000	0001	1000	1100	0000	0000	1111	1001	1101
	0001	0000	1110	0010	0100	1000	0000	0000	0000	0000	0000	0000	0000	0000	000
86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	

Field Name	Bit Pos	Value Decode	Bits
Format Flag	25	0 Short Message	0
Protocol Flag	26	1 User	1
MID	27- 36	201 ALBANIA	0011 0010 01
User Protocol	37- 39	3 Serialized	011
Beacon type	40- 42	4 Non FI/Free EPIRB	100
Certification type	43	1 Cospas-Sarsat	1
Serial Number	44- 63	99	0000 0000 0000 0110 0011
Cosp-Sar Spare	64- 73	0	0000 0000 00
Cosp-Sar Cert #	74- 83	999	1111 1001 11
Homing	84- 85	1 121.5	01
BCH Encoded	86-106	Errors=0	0001 0000 1110 0010 0100 1
BCH Generated	86-106		0001 0000 1110 0010 0100 1
Emergency Cd Flag	107	0 National Use	0
Beacon Activation	108	0 Ma	



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2.2 SPURIOUS EMISSIONS

2.2.1 Equipment Under Test

Fastfind PLB, Serial Number: 810-000001

2.2.2 Date of Test

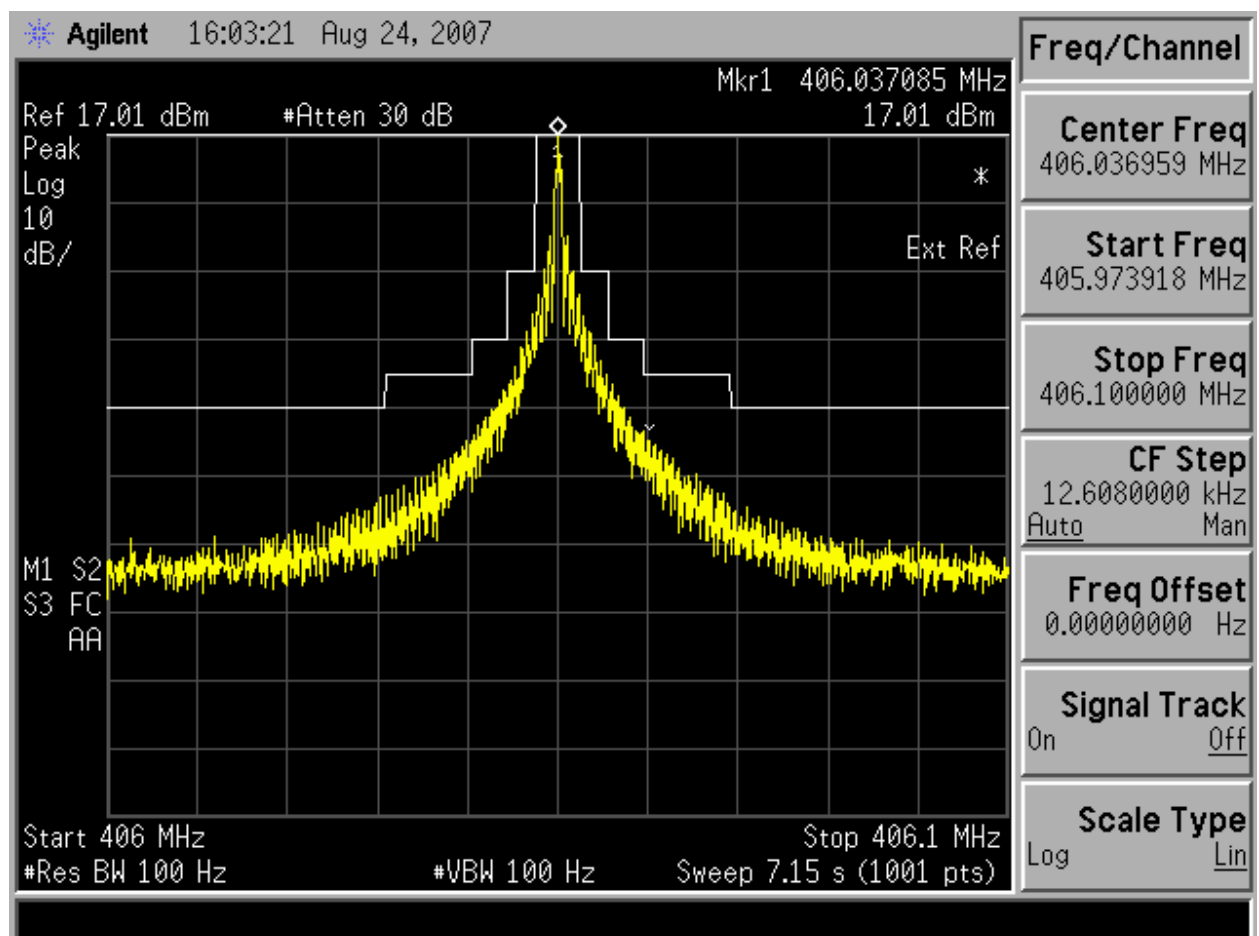
24th August 2007

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Test Results

Combined Spurious Emissions at -20°C, Ambient and +55°C





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2.3 SELF-TEST

2.3.1 Equipment Under Test

Fastfind PLB, Serial Number: 810-000001

2.3.2 Date of Test

30th August 2007

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Test Results

Digital Message

Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
 15 Hex (Bits 26- 85) = 992E40018C00F9D 992E40018C00F9D Default_Id
 36 Hex (Bits 25-144) = FFFED04C972000C6007CE887124000000000

26	30	34	38	42	46	50	54	58	62	66	70	74	78	82	
0	1001	1001	0010	1110	0100	0000	0000	0001	1000	1100	0000	0000	1111	1001	1101
	0001	0000	1110	0010	0100	1000	0000	0000	0000	0000	0000	0000	0000	0000	000
86	90	94	98	102	106	110	114	118	122	126	130	134	138	142	

Field Name	Bit Pos	Value	Decode	Bits
-----	-----	-----	-----	----
Format Flag	25	0	Short Message	0
Protocol Flag	26	1	User	1
MID	27- 36	201	ALBANIA	0011 0010 01
User Protocol	37- 39	3	Serialized	011
Beacon type	40- 42	4	Non Fl/Free EPIRB	100
Certification type	43	1	Cospas-Sarsat	1
Serial Number	44- 63	99		0000 0000 0000 0110 0011
Cosp-Sar Spare	64- 73	0		0000 0000 00
Cosp-Sar Cert #	74- 83	999		1111 1001 11
Homing	84- 85	1	121.5	01
BCH Encoded	86-106		Errors=0	0001 0000 1110 0010 0100 1
BCH Generated	86-106			0001 0000 1110 0010 0100 1
Emergency Cd Flag	107	0	National Use	0
Beacon Activation	108	0	Ma	



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2.4 SATELLITE QUALITATIVE TESTS

2.4.1 Equipment Under Test

Table 1 – Fastfind PLB Serial Number: 810-000001, Antenna Part/Model Number – 85-710B

Table 2 – Fastfind PLB Serial Number: 810-000001, Antenna Part/Model Number – 85-710B

2.4.2 Date of Test

Table 1 – 11th and 12th September 2007, 14:00 to 09:00

Table 2 – 18th and 19th September 2007, 15:00 to 09:00

2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.4 Test Results

Table 1

Beacon 15 Hex ID:

993F4 0018C 00F9D

Actual location of the test beacon :

Latitude: 050° 49.091'N

Longitude: 001° 11.870'W

Beacon test configuration

(e.g. on dry ground floating in water etc) :

Resting on Dry Ground

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S7	48509	993F4 0018C 00F9D	50.81754	-1.21728	-122.01	06:49:22	7.186	1.367
S8	35939	993F4 0018C 00F9D	50.81809	-1.19751	-123.04	06:34:52	13.490	0.025
S7	48508	993F4 0018C 00F9D	50.80904	-1.21013	-121.29	05:09:26	-8.170	1.333
S8	35938	993F4 0018C 00F9D	50.81768	-1.19552	-121.09	04:54:47	-1.032	0.172
S10	11911	993F4 0018C 00F9D	50.82154	-1.19347	-120.73	03:20:12	8.188	0.483
S8	35937	993F4 0018C 00F9D	50.81391	-1.19750	-125.45	03:13:16	-17.025	0.475
S10	11910	993F4 0018C 00F9D	50.81769	-1.19836	-122.65	01:39:27	-7.177	0.066
S8	35931	993F4 0018C 00F9D	50.82175	-1.19146	-118.21	16:38:18	-10.542	0.598
S10	11904	993F4 0018C 00F9D	50.81850	-1.19219	-123.04	15:04:10	-19.850	0.398
S9	27106	993F4 0018C 00F9D	50.82085	-1.19062	-123.51	23:02:31	-14.772	0.587
S11	4648	993F4 0018C 00F9D	50.82089	-1.19461	-120.57	22:13:24	-12.643	0.376
S9	27105	993F4 0018C 00F9D	50.82464	-1.19898	-123.00	21:21:57	1.040	0.722
S11	4647	993F4 0018C 00F9D	50.82441	-1.20390	-118.53	20:32:52	3.074	0.813
S11	4646	993F4 0018C 00F9D	50.82501	-1.20580	-113.27	18:53:43	16.908	0.943
S9	27104	993F4 0018C 00F9D	50.82259	-1.20487	-122.87	19:42:47	15.241	0.696
S7	48502	993F4 0018C 00F9D	50.80965	-1.22104	-126.11	18:40:11	-19.345	1.885
S7	48500	993F4 0018C 00F9D	50.82485	-1.19932	-117.10	15:19:42	11.422	0.748
S7	48501	993F4 0018C 00F9D	50.83282	-1.15866	-121.53	16:59:13	-3.451	3.195
S8	35930	993F4 0018C 00F9D	50.82438	-1.20506	-122.53	14:57:23	5.083	0.855

$$\begin{aligned}
 \text{Ratio of successful solutions} &= \frac{\text{number of Doppler solution within 5km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\
 &= \frac{19}{19} = 100.0\%
 \end{aligned}$$



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Table 2

Beacon 15 Hex ID: 993F4 0018C 00F9D
 Actual location of the test beacon : Latitude: 052° 14.447'N
 Longitude: 001° 43.970'W

Beacon test configuration
 (e.g. on dry ground floating in water etc) : C/S T.007 Figure B.5

Satellite ID	Satellite Pass Number	15 Hex ID Provided by LUT	Doppler Latitude	Doppler Longitude	Mean Rx Power (dBm)	TCA	CTA (deg)	Location Error (km)
S9	27206	993F4 0018C 00F9D	52.23601	-1.72659	-134.93	23:41:53	-20.355	0.680
S9	27205	993F4 0018C 00F9D	52.24622	-1.72083	-124.65	22:00:43	-4.897	1.016
S9	27204	993F4 0018C 00F9D	52.24762	-1.73068	-124.46	20:20:59	9.651	0.774
S7	48601	993F4 0018C 00F9D	52.25459	-1.68970	-121.10	17:32:48	-8.544	3.311
S8	36030	993F4 0018C 00F9D	52.24539	-1.71824	-126.90	16:57:22	-13.046	1.117
S7	48609	993F4 0018C 00F9D	52.23757	-1.72607	-126.03	07:21:46	10.863	0.582
S8	36038	993F4 0018C 00F9D	52.24046	-1.72349	-128.56	06:52:49	14.575	0.637
S7	48607	993F4 0018C 00F9D	52.23498	-1.71978	-121.64	04:01:13	-18.953	1.098
S7	48608	993F4 0018C 00F9D	52.22949	-1.78804	-124.91	05:42:12	-3.545	3.961
S10	12010	993F4 0018C 00F9D	52.24121	-1.72310	-126.21	03:47:43	11.054	0.664
S8	36036	993F4 0018C 00F9D	52.23797	-1.72165	-126.76	03:31:33	-14.527	0.823
S10	12009	993F4 0018C 00F9D	52.24007	-1.72495	-125.24	02:07:17	-3.376	0.542
S10	12008	993F4 0018C 00F9D	52.23534	-1.72598	-121.81	00:25:22	-18.963	0.764

$$\begin{aligned}
 \text{Ratio of successful solutions} &= \frac{\text{number of Doppler solution within 5km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\
 &= \frac{13}{13} = 100.0\%
 \end{aligned}$$



Product Service

2.5 BEACON CODING SOFTWARE

2.5.1 Equipment Under Test

Fastfind PLB, Serial Number: 810-000001

2.5.2 Date of Test

30th August 2007

2.5.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.4 Test Results

Examples of User Protocol Beacon Messages

Protocol	Operational Message (in hexadecimal including bit and frame synchronisation bits)	Self-Test Message (in hexadecimal including bit and frame synchronisation bits)
Maritime User Protocol with MMSI	FFFE2F4C9418618618668A26F180	FFFED04C9418618618668A26F180
Maritime User Protocol with Radio Call Sign	FFFE2F4C9526F6F06B268C679100	FFFED04C9526F6F06B268C679100
Radio Call Sign User Protocol	FFFE2F4C9DBDBC1A55468D215500	FFFED04C9DBDBC1A55468D215500
Serial User: Float Free EPIRB with Serial Number	N/A	N/A
Serial User: No Float Free EPIRB with Serial Number	FFFE2F4C972000C6007CE8871240	FFFED04C972000C6007CE8871240
Aviation User Protocol	N/A	N/A
Serial User: ELT with Serial Number	N/A	N/A
Serial User: ELT with Aircraft Operator Designator & Serial Number	N/A	N/A
Serial User: ELT with Aircraft 24-bit address	N/A	N/A
Serial User: PLB with Serial Number	FFFE2F4C97A000C6007CEBC6BCC0	FFFED04C97A000C6007CEBC6BCC0
National User (Short)	N/A	N/A
National User (Long)	N/A	N/A



Product Service

SECTION 3

TEST EQUIPMENT USED



Product Service

3.1 TEST EQUIPMENT

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No	TE Number	Calibration Due
Section 2.1, 2.3 Beacons - Constant Temperature Tests				
Climatic Chamber	Heraeus Votsch	VMT 04/30	40	O/P Mon
Power Meter	Hewlett Packard	436A	83	11-Aug-2008
Signal Generator	Hewlett Packard	8644A	96	11-Jan-2008
Signal Generator	Hewlett Packard	3336C	1189	19-Jul-2008
Climatic Chamber	TAS	Micro 225	2892	15-Feb-2008
Beacon RF Unit	TUV	N/A	3066	TU
Hygrometer	Rotronic	I-1000	3068	25-Apr-2008
Termination (50ohm, 6W)	Micronde	R404613	3074	24-Feb-2008
Attenuator (20dB, 75W)	Bird	8308-200	3076	26-Feb-2008
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	30-May-2008
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3162	19-Jun-2008
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3163	30-May-2008
Thermocouple Thermometer	Fluke	51	3172	18-Jun-2008
Bandpass filter	Trilithic	5BE406/35-1-AA	3206	28-Jul-2008
Time Interval Analyser	Yokogawa	TA720 704510	3253	4-Oct-2007
Scope Corder	Yokogawa	DL750 701210	3254	9-Oct-2007
Power Sensor	Agilent	8482A	3290	14-Nov-2007
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3353	18-Apr-2008
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3355	18-Apr-2008
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3356	18-Apr-2008
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3357	18-Apr-2008
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3359	18-Apr-2008
Section 2.2 Beacons - Spurious Emissions				
Temperature Chamber	Montford	2F3	467	O/P Mon
Spectrum Analyser	Hewlett Packard	E4407B	1154	19-Jul-2008
GPS Frequency Standard	Rapco	GPS-804/3	1312	15-Sep-2007
Rubidium Oscillator	Rapco	GPS-805	1313	15-Sep-2007
Hygrometer	Rotronic	I-1000	2891	6-Jan-2008
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	30-May-2008
Thermocouple Thermometer	Fluke	51	3172	18-Jun-2008
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3356	18-Apr-2008
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3356	18-Apr-2008



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Instrument	Manufacturer	Type No	TE Number	Calibration Due
Section 2.4 Beacons - Satellite Qualitative Test				
Open Area Site 2	TUV	OATS2	1850	3-Oct-2008
Section 2.5 Beacons - Beacon Coding Software				
Hygrometer	Rotronic	I-1000	3068	25-Apr-2008
EPIRB Tester	Arg Electro Design	5412	3270	TU

TU – Traceability Unscheduled

OP MON – Output Monitored with Calibrated Equipment



Product Service

SECTION 4

PHOTOGRAPHS

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)



Side View



Rear View



Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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