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Report On

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 200 Non-GPS Variant

Document 75904389 Report 02 Issue 2

January 2009



Product Service

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REPORT ON

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 200 Non-GPS Variant

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PREPARED FOR

McMurdo A Division of Signature Industries Ltd
Silver Point,
Airport Service Road,
Portsmouth,
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PO3 5PB

PREPARED BY

A handwritten signature in black ink, appearing to read 'R Hampton'.

R Hampton
Test Engineer

APPROVED BY

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

M Jenkins
Authorised Signatory

DATED

08 January 2009



Product Service

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SECTION 1

REPORT SUMMARY

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 200 Non-GPS Variant



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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Testing of the McMurdo A Division of Signature Industries Ltd Fastfind PLB 200 Non-GPS Variant to the requirements of T.007 Issue 4 Rev 2 November 2007.

Objective	To perform Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.	
Manufacturer	McMurdo A Division of Signature Industries Ltd	
Model Number(s)	Fastfind PLB 200 Non-GPS Variant	
Serial Number(s)	75904389_04	Fastfind PLB 200 Non-GPS Variant, TUV 4
Number of Samples Tested	One	
Test Specification/Issue/Date	Cospas-Sarsat T.007 Issue 4 Rev 2 November 2007	
Incoming Release Date	Application Form 06 August 2008	
Date of Receipt of Test Samples	26 August 2008	
Order Number	PC0003427	
Date	24 July 2008	
Start of Test	03 September 2008	
Finish of Test	10 October 2008	
Name of Engineer(s)	M Hardy	



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1.2 APPLICATION FORM

1.2.1 Beacon Manufacturer and Beacon Model

Beacon Manufacturer	Signature Industries
Beacon Model	McMurdo Fastfind 200
Other Model Names	McMurdo Fastfind 201

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	24 hours
Battery chemistry	Lithium Manganese Dioxide
Battery cell size and number of cells	CR 2/3 AH x4 cells Alt Batt: CR123 x4 cells
Battery cell manufacturer	Varta Microbattery Alt Batt: Panasonic
Battery pack manufacturer and part number	Varta Microbattery /91-156D Alt Batt: Panasonic
Oscillator type (e.g. OCXO, MCXO, TCXO)	TCXO
Oscillator manufacturer	Rakon
Oscillator part name and number	E4892LF
Oscillator satisfies long-term frequency stability requirements (Yes or No)	Yes



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Characteristic	Specification
Antenna type: Integral or Other (e.g. External, Detachable – specify type)	Integrated
Antenna manufacturer	Doig
Antenna part name and number	91-206
Navigation device type (Internal, External or None)	None
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)	N/A
Features in beacon that ensures erroneous position data is not encoded into the beacon message (Yes, No or N/A)	N/A
Navigation device capable of supporting global coverage (Yes, No or N/A)	N/A
For Internal Navigation Devices	
- Geodetic reference system (WGS 84 or GTRF)	
- GNSS receiver cold start forced at every beacon activation (Yes or No)	
- Navigation device manufacturer	
- Navigation device model name and part Number	
- GNSS system supported (e.g. GPS, GLONASS, Galileo)	
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)	



Product Service

Characteristic	Specification	
Self-Test Mode Characteristics	Self-Test Mode	Optional GNSS Self-Test Mode
- Self-test has separate switch position (Yes or No)	Yes	No
- 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 White 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)	Yes 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	
- Self-test transmission burst duration (440 or 520 ms)	440 ms	
- Self-test format bit ("0" or "1")	1	
- Maximum duration of GNSS Self Test	N/A	
- Maximum number of GNSS Self Tests (beacons with internal navigation devices only)	N/A	
- Beacon includes a homer transmitter (if yes identify frequency of transmission)	121.5MHz	
-Homer Transmit Power	16.5dBm	
-Homer Duty Cycle	100%	
-Duty Cycle of Homer Swept Tone	35%	



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Characteristic	Specification
Beacon includes a strobe light (Yes or No)	No
- Strobe light intensity	
- Strobe light flash rate	
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.	None
Beacon includes automatic activation mechanism (Yes or No) Specify type of automatic beacon activation mechanism	No
Beacon includes software or hardware features and functions not listed above and non-related to 406 MHz (Yes or No)	No
List features and use a separate sheet if insufficient space	



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Characteristic	Specification
Message Coding Protocols:	(x) Tick the boxes below against the intended protocol options
User Protocol (tick where appropriate)	☒ Maritime with MMSI
	☒ Maritime with Radio Call Sign
	☐ EPIRB Float Free with Serial Number
	☒ EPIRB Non Float Free with Serial Number
	☒ Radio Call Sign
	☐ Aviation
	☐ ELT with Serial Number
	☐ ELT with Aircraft Operator and Serial Number
	☐ ELT with Aircraft 24-bit Address
	☒ PLB with Serial Number
	☐ National (Short Message Format)
	☐ National (Long Message Format)
Standard Location Protocol (tick where appropriate)	☐ EPIRB with MMSI
	☐ EPIRB with Serial Number
	☐ ELT with 24-bit Address
	☐ ELT with Aircraft Operator Designator
	☐ ELT with Serial Number
	☐ PLB with Serial Number
National Location Protocol (tick where appropriate)	☐ National Location: EPIRB
	☐ National Location: ELT
	☐ National Location: PLB
User Location Protocol (tick where appropriate)	☐ Maritime with MMSI
	☐ Maritime with Radio Call Sign
	☐ EPIRB Float Free with Serial Number
	☐ EPIRB Non Float Free with Serial Number
	☐ Radio Call Sign
	☐ Aviation
	☐ ELT with Serial Number
	☐ ELT with Aircraft Operator and Serial Number
	☐ ELT with Aircraft 24-bit Address
	☐ PLB with Serial Number



Product Service

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: 28 August 2008

Applicable C/S Standards:

Document	Issue	Revision	Date
C/S T.001	3	8	Nov-07
C/S T.007	4	2	Nov-07

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:

08 January 2009



Product Service

1.2.5 Applicant Details

Company Name	Signature Industries		
Address	Silver Point, Airport Service Road, Portsmouth, P03 5PB		
Category of Applicant	☒ Manufacturer	☐ Importer	
	☐ Distributor	☐ Agent	
Contact Name	Neil Jordan	Telephone	02392 623934
Email	neiljordan@mcmurdo.co.uk	Facsimile	02392 623997

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	
- PCB Revision	1
- Battery Model	Varta CR 2/3 AH / Panasonic CR123A
Software Version	N/A
Firmware Version	1.1.165
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: Engineering Manager

Date: 6-8-08

1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was a McMurdo A Division of Signature Industries Ltd Fastfind PLB 200 Non-GPS Variant as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.



Equipment Under Test



Product Service

1.3.2 Physical Test Configuration

The Equipment Under Test (EUT), S/N TUV 4 was operated using its own power source (internal VARTA batteries). The EUT was configurable so that it could be either connected to the 50 Ω test system using a coaxial cable or so that it radiated through its normal antenna as per normal operational configuration. In the 50 Ω -conducted mode, the 406MHz and 121MHz transmissions came from separate ports.

The test configuration for all tests was the 50 Ω -conducted configuration with the exception of Antenna Characteristics, Satellite Qualitative and Position Accuracy Time and Position Accuracy. The radiated configuration was used for these tests.

1.3.3 Modes of Operation

Modes of operation of the EUT during testing were as follows:

Standby Mode:

- No apparent EUT activity
- No ancillary devices were declared

Self-test:

- "TEST" button depressed until White LED light indicated Self-test operation
- List of features tested as per Application Form

(Long/GPS Self-test):

- "TEST" button depressed until White LED light indicated GNSS Self-test operation, note that the normal Self-test routine is completed in the interim
- List of features tested as per Application Form

Operating:

- 121 MHz homer active and offset to 121.65 MHz
- 243 MHz homer not declared
- Physical configuration as above



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1.4 MODIFICATIONS

No modifications were made to the test sample during testing.

1.5 REPORT MODIFICATION RECORD

Issue 1 – First Issue

Issue 2 – Modifications made in line with Cospas-Sarsat document “Worksheet-1_2008-27_McMurdo Fastfind PLB 200-210_18 DEC 08”. Changes include:

- Customer supplied information: Application Form (Section 1.2)
- Test Name “Digital Message Coding” changed to “Digital Message”
- Comment about max/min temperature added to Test Results Table, Section 8
- Modulus of all CTA values now replace original data for Satellite Qualitative Tests (Section 2.4)



Product Service

SECTION 2

TEST DETAILS

Cospas-Sarsat T.007 Limited Testing of the
McMurdo A Division of Signature Industries Ltd
Fastfind PLB 200 Non-GPS Variant



Product Service

TEST RESULTS TABLE

Parameter	Limits	Units	Test Results			Comments
			Tmin	Tamb	Tmax	
			(-20°C)	(22°C)	(+55°C)	
2. Digital Message						Test Sample: 75904389_04 Mod State: 0 Result: Pass
Bit Numbers						Decoded Message: Page 18
Bit Sync	1 - 15	15 bits "1"	P / F	P	P	
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	27 - 85	59 bits	P / F	P	P	
BCH code	86 -106	21 bits	P / F	P	P	
Emerg. Code/nat. use/supplem. Data	107 - 112	6 bits	bit value	000000	000000	
Additional data / BCH (if applicable)	112 - 144	32 bits	P / F	n/a	n/a	
Position Error (if applicable)	< 5	km		n/a	n/a	
3. Digital Message Generator						Test Sample: 75904389_04 Mod State: 0 Result: Pass
Repetition rate, T _R :						
Average T _R	48.5 ≤ T _{Ravg} ≤ 51.5	seconds	49.972	49.953	49.931	
Minimum T _R	47.5 ≤ T _{Rmin} ≤ 48.0	seconds	47.906	47.766	47.797	
Maximum T _R	52.0 ≤ T _{Rmax} ≤ 52.5	seconds	52.219	52.234	52.234	
Standard deviation	0.5 - 2.0	seconds	1.315	1.346	1.322	
Bit rate						
Minimum fb	≥ 396	bits/sec	400.061	400.260	400.403	
Maximum fb	≤ 404	bits/sec	400.101	400.295	400.435	
Total transmission time						
Short message	435.6 - 444.4	ms	439.578	440.277	439.863	
Long message	514.8 - 525.2	ms	n/a	n/a	n/a	
Unmodulated carrier						
Minimum T1	≥ 158.4	ms	158.869	159.589	159.124	
Maximum T1	≤ 161.6	ms	159.008	159.710	159.292	
First burst delay	≥ 47.5	Seconds	50	50	50	



Product Service

Parameter	Limits	Units	Test Results			Comments
			T _{min}	T _{amb}	T _{max}	
			(-20°C)	(22°C)	(+55°C)	
6. Spurious Emissions into 50ohms						Test Sample: 75904389_04 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 21
8. Self-test Mode						Test Sample: 75904389_04 Mod State: 0 Result: Pass
Frame sync	011010000	P / F	P	P	P	Decoded Message: Page 24
Format flag	1 / 0	bit value	0	0	0	Note: min and max temperature results are for information only
Single radiated burst	≤440 / 520 (±1%)	ms	442.537	442.514	442.589	Applicant's data: see Application Form (Section 1.2)
Default position data (if applicable)	correct	P / F	P	P	P	
Description	provided	Y / N		Y		
Design data on protection against repetitive self-test mode transmissions	provided	Y / N		Y		
Single burst verification	one burst	P / F	P	P	P	Applicant's data: See Annex A
Provides for 15 Hex ID	correct	P / F	P	P	P	
121.5 MHz RF power (if applicable)	self-test checks that RF power emitted	Y / N		Y		Applicant's data: See Annex A
406 MHz power	self-test checks that RF power emitted	Y / N		Y		

Parameter	Limits	Units	Test Results		Comments
14. Satellite Qualitative Tests					Test Sample: 75904389_04 Mod State: 0 Result: Pass
Test Configuration	As per C/S T.007		On dry ground	Figure B.5	Test Data: Page 25
15 Hex ID Decoded by LUT	correct	P / F	P	P	
Doppler Location results with error ≤5km	≥80	%	100	100	
16. Beacon Coding Software					Test Sample: 75904389_04 Mod State: 0 Result: Pass
Sample message for each coding option of the applicable coding types	correct	P / F	*	*	* Customer to supply information: Annex A
Sample self-test message for each coding option of the applicable coding types	correct	P / F	*	*	



Product Service

2.1 DIGITAL MESSAGE

2.1.1 Equipment Under Test

Fastfind PLB 200 Non-GPS Variant, Serial Number: TUV 4

2.1.2 Date of Test and Modification State

08 and 09 September 2008 - Modification State 0

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

Ambient Temperature

```
=====
Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
15 Hex (Bits 26- 85) = 993F40018C00F9D          993F40018C00F9D Default_Id
30 Hex (Bits 25-144) = 4C9FA000C6007CEA694640000000000

    26  30  34  38  42  46  50  54  58  62  66  70  74  78  82
    |   |   |   |   |   |   |   |   |   |   |   |   |
0 1001 1001 0011 1111 0100 0000 0000 0001 1000 1100 0000 0000 1111 1001 1101
   0100 1101 0010 1000 1100 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    7 Test                                          111
Spare           40- 63
Spare           64- 83          1101 0000 0000 0000 0110 0011
Homing          84- 85          0000 0000 0011 1110 0111
BCH Encoded     86-106      1 121.5                                          01
BCH Generated    86-106      Errors=0          0100 1101 0010 1000 1100 1
Emergency Cd Flag 107      0 National Use                                0
Beacon Activation 108      0 Manual only                                0
National Use    109-112
=====
```



Product Service

Minimum Temperature

=====															
Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112															
15 Hex (Bits 26- 85) = 993F40018C00F9D 993F40018C00F9D Default_Id															
30 Hex (Bits 25-144) = 4C9FA000C6007CEA69464000000000															
	26	30	34	38	42	46	50	54	58	62	66	70	74	78	82
0	1001	1001	0011	1111	0100	0000	0000	0001	1000	1100	0000	0000	1111	1001	1101
	0100	1101	0010	1000	1100	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		7 Test										111	
Spare		40- 63												1101 0000 0000 0000 0110 0011	
Spare		64- 83												0000 0000 0011 1110 0111	
Homing		84- 85		1 121.5										01	
BCH Encoded		86-106		Errors=0										0100 1101 0010 1000 1100 1	
BCH Generated		86-106												0100 1101 0010 1000 1100 1	
Emergency Cd Flag		107		0 National Use										0	
Beacon Activation		108		0 Manual only										0	
National Use		109-112												0000	
=====															



Product Service

Maximum Temperature

```
=====
Beacon Id Format..... 22 Hex Id, Short Message, Bits 25-112
15 Hex (Bits 26- 85) = 993F40018C00F9D          993F40018C00F9D Default_Id
30 Hex (Bits 25-144) = 4C9FA000C6007CEA69464000000000

    26   30   34   38   42   46   50   54   58   62   66   70   74   78   82
    |   |   |   |   |   |   |   |   |   |   |   |   |   |
0 1001 1001 0011 1111 0100 0000 0000 0001 1000 1100 0000 0000 1111 1001 1101
   0100 1101 0010 1000 1100 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       7 Test                111
Spare          40- 63
Spare          64- 83
Homing         84- 85       1 121.5                01
BCH Encoded     86-106      Errors=0              0100 1101 0010 1000 1100 1
BCH Generated   86-106
Emergency Cd Flag 107       0 National Use        0
Beacon Activation 108      0 Manual only        0
National Use    109-112
=====
```



Product Service

2.2 SPURIOUS EMISSIONS

2.2.1 Equipment Under Test

Fastfind PLB 200 Non-GPS Variant, Serial Number: TUV 4

2.2.2 Date of Test and Modification State

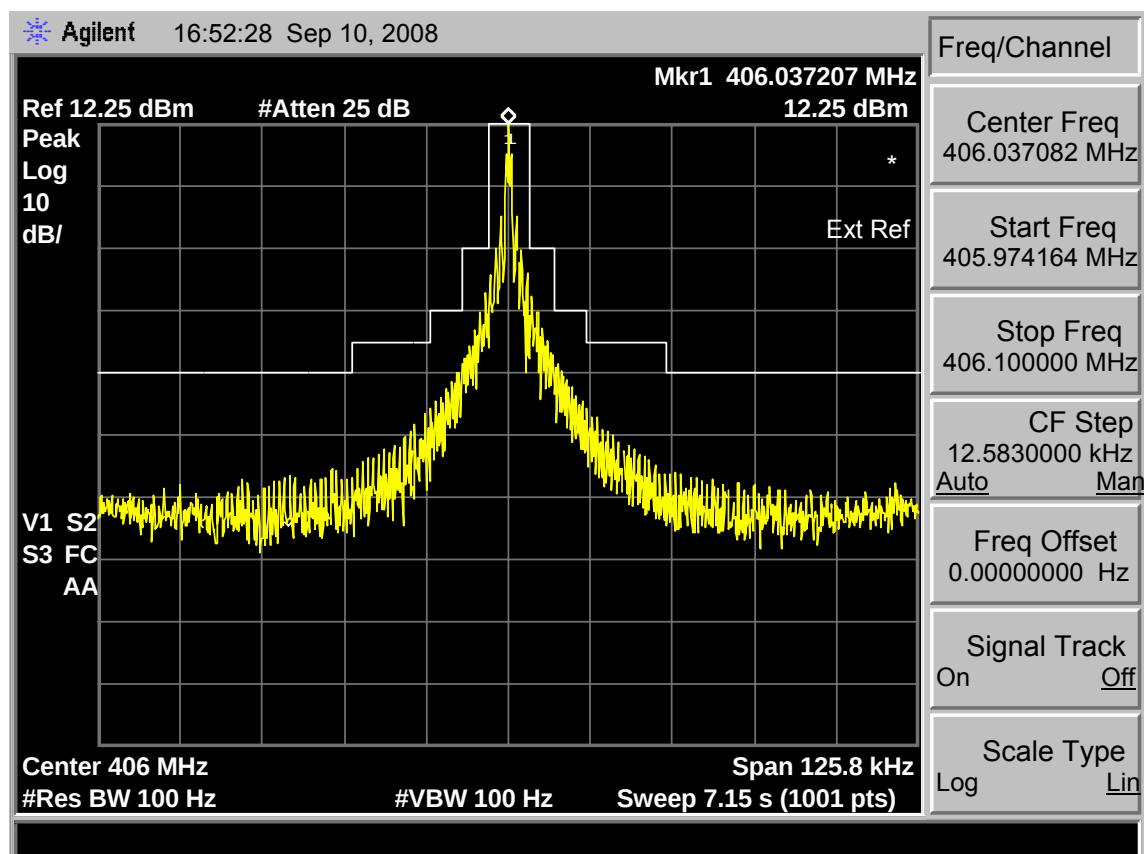
10 to 11 September 2008 - Modification State 0

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

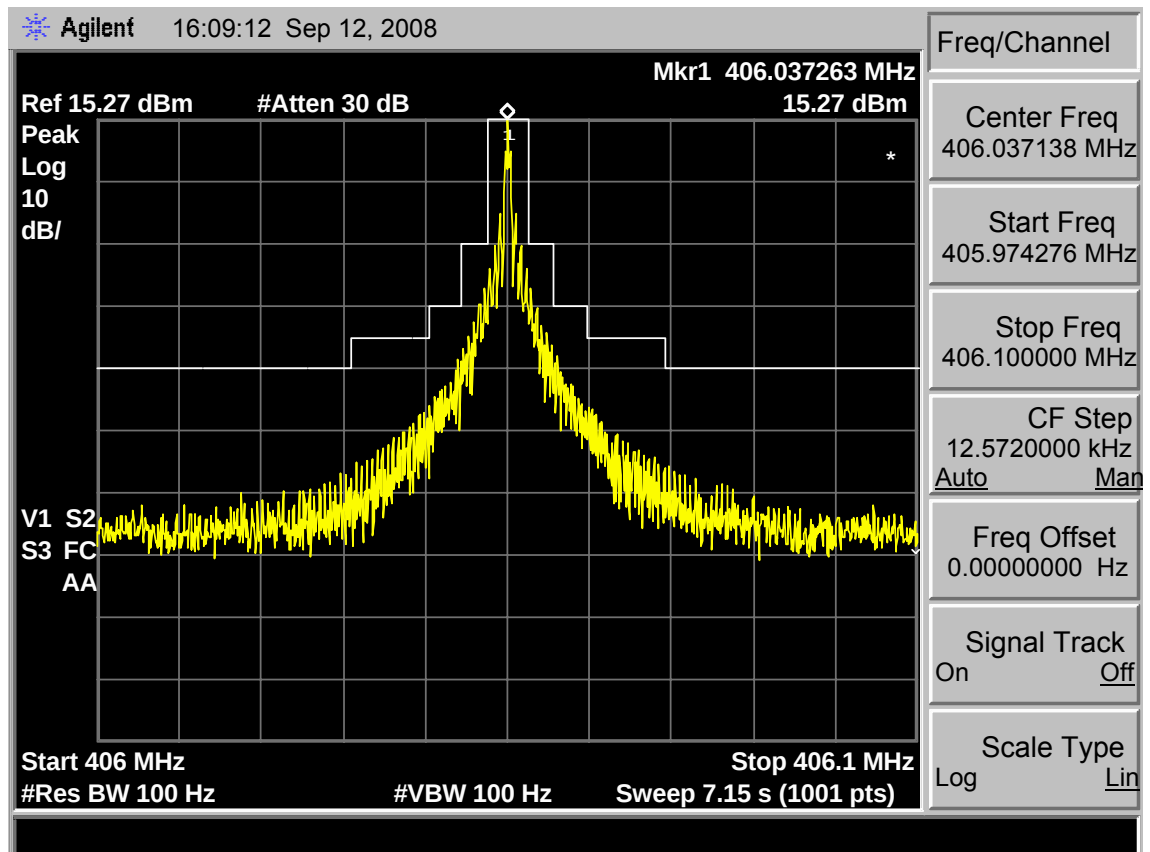
Ambient Temperature





Product Service

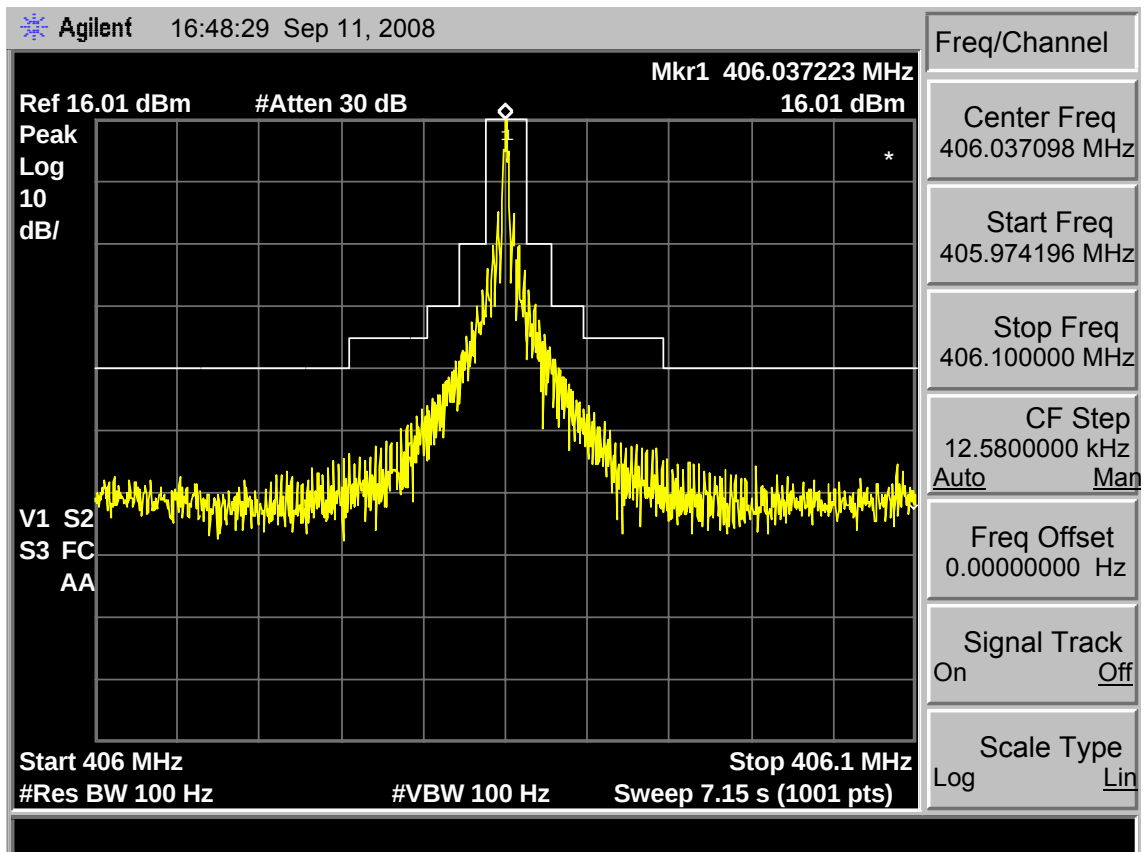
Minimum Temperature





Product Service

Maximum Temperature





Product Service

2.3 SELF-TEST MODE – DECODED MESSAGE

2.3.1 Equipment Under Test

Fastfind PLB 200 Non-GPS Variant, Serial Number: TUV 4

2.3.2 Date of Test and Modification State

09 September 2008 - Modification State 0

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) = 993F40018C00F9D          993F40018C00F9D Default_Id
30 Hex (Bits 25-144) = 4C9FA000C6007CEA69464000000000

    26  30  34  38  42  46  50  54  58  62  66  70  74  78  82
    |   |   |   |   |   |   |   |   |   |   |   |   |
0 1001 1001 0011 1111 0100 0000 0000 0001 1000 1100 0000 0000 1111 1001 1101
  0100 1101 0010 1000 1100 1000 0000 0000 0000 0000 0000 0000 0000 0000 0000
    |   |   |   |   |   |   |   |   |   |   |   |   |
   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    7 Test                                     111
Spare           40- 63
Spare           64- 83      1101 0000 0000 0000 0110 0011
Spare           84- 85      0000 0000 0011 1110 0111
Homing          86- 106    1 121.5                                     01
BCH Encoded     86-106      Errors=0                                0100 1101 0010 1000 1100 1
BCH Generated   86-106      0100 1101 0010 1000 1100 1
Emergency Cd Flag 107      0 National Use                             0
Beacon Activation 108      0 Manual only                             0
National Use    109-112
=====
```



Product Service

2.4 SATELLITE QUALITATIVE TESTS

2.4.1 Equipment Under Test

Configurations 7 and 8 – Fastfind PLB 200 Non-GPS Variant, Serial Number: TUV 4

2.4.2 Date of Test and Modification State

Configuration 7 – 4 and 5 September 2008, Time-10:00 to 10:00 - Modification State 0

Configuration 8 – 3 and 4 September 2008, Time-10:00 to 10:00 - Modification State 0

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

Configuration 7

Beacon 15 Hex ID:

993F4 0018C 00F9D

Actual location of the test beacon:

Latitude: 050° 49.091'N Daedalus*

Longitude: 001° 11.870'W Daedalus*

Beacon test configuration

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

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)
S9	32215	993F4 0018C 00F9D	50.82105	-1.18958	-125.36	22:53:02	16.237	0.661
S11	9740	993F4 0018C 00F9D	50.82082	-1.20070	-113.45	08:37:02	15.965	0.356
S7	53619	993F4 0018C 00F9D	50.81589	-1.19492	-120.66	03:55:15	17.227	0.327
S8	41006	993F4 0018C 00F9D	50.81699	-1.19748	-122.14	04:57:31	8.540	0.135
S10	16973	993F4 0018C 00F9D	50.81703	-1.19959	-124.14	01:20:40	10.355	0.178

$$\begin{aligned}
 \text{Ratio of successful solutions} &= \frac{\text{number of Doppler solution within 5km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\
 &= \frac{5}{5} = 100\%
 \end{aligned}$$



Product Service

Configuration 8

Beacon 15 Hex ID:

993F4 0018C 00F9D

Actual location of the test beacon:

Latitude: 050° 49.091'N Daedalus

Longitude: 001° 11.870'W Daedalus

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	32201	993F4 0018C 00F9D	50.81996	-1.19355	-126.38	23:16:37	19.921	0.360
S11	9728	993F4 0018C 00F9D	50.81902	-1.19547	-122.23	12:17:42	16.902	0.190
S8	40993	993F4 0018C 00F9D	50.81964	-1.19611	-121.13	06:49:58	8.608	0.202
S7	53605	993F4 0018C 00F9D	50.81914	-1.19347	-117.88	04:19:29	13.406	0.324
S10	16961	993F4 0018C 00F9D	50.81734	-1.19561	-126.77	04:51:36	19.914	0.182

$$\begin{aligned}\text{Ratio of successful solutions} &= \frac{\text{number of Doppler solution within 5km with } 1^\circ < \text{CTA} < 21^\circ}{\text{number of satellite passes over test duration with } 1^\circ < \text{CTA} < 21^\circ} \\ &= \frac{5}{5} = 100\%\end{aligned}$$



Product Service

2.5 BEACON CODING SOFTWARE

2.5.1 Test Results

Test completed by customer, results submitted to TÜV Product Service Ltd can be found at Annex 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 No.	Calibration Period (months)	Calibration Due
Section 2.1 and 2.3 Beacons - Constant Temperature Tests					
Climatic Chamber	Heraeus Votsch	VMT 04/30	40	-	O/P Mon
Power Meter	Hewlett Packard	436A	47	12	8-Jul-2009
Power Meter	Hewlett Packard	436A	83	12	13-Aug-2009
Climatic Chamber	Heraeus Votsch	VM 04/100	85	-	O/P Mon
Rubidium Frequency Standard	Quartzlock	A10-B	92	12	2-Jan-2009
Signal Generator	Hewlett Packard	8644A	96	12	17-Apr-2009
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Time Interval Analyser	Yokogawa	TA720	181	12	27-Feb-2009
High Resolution Oscilloscope	Gould	840	182	12	6-Mar-2009
Signal Generator	Hewlett Packard	8644A	199	12	29-Jul-2009
Attenuator 10dB/10W)	Trilithic	HFP-50N	454	12	22-Jul-2009
Attenuator: 6dB/10W	Trilithic	HFP-50N	476	12	22-Jul-2009
Attenuator: 10dB/20W	Narda	766-10	480	12	22-Jul-2009
Signal Generator (100kHz to 2.6GHz)	Hewlett Packard	8663A	1063	12	13-Feb-2009
Power Sensor	Hewlett Packard	8482A	1341	12	15-Oct-2008
Termination (50ohm, 15W)	Radio Spares	612-192	2416	12	1-Sep-2009
Distress Beacon RF Unit	TUV	-	2445	-	TU
Stop Clock	R.S Components	RS328 061	2674	-	TU
Beacon RF Unit	TUV	N/A	3066	-	TU
Hygrometer	Rotronic	I-1000	3068	12	26-Jun-2009
Termination (50ohm, 2W)	Omni-Spectra	3001-6100	3081	12	15-Mar-2009
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3096	12	15-Mar-2009
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3097	12	15-Mar-2009
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3158	12	18-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3161	12	2-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3162	12	18-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3163	12	2-Jun-2009
Thermocouple Thermometer	Fluke	51	3172	12	3-Jul-2009
Thermocouple Thermometer	Fluke	51	3174	12	26-Jun-2009
Bandpass Filter	Trilithic	5BE406/35-1-AA	3205	12	1-Aug-2009
Bandpass filter	Trilithic	5BE406/35-1-AA	3206	12	1-Aug-2009
Time Interval Analyser	Yokogawa	TA720 704510	3253	12	6-Nov-2008
ScopeCorder	Yokogawa	DL750 701210	3254	12	6-Nov-2008
Short Circuit	TUV	Short Cicuit	3272	-	TU
Power Sensor	Agilent	8482A	3290	12	26-Nov-2008



Product Service

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 and 2.3 Beacons - Constant Temperature Tests					
Cable (1m, N type)	Rhophase	NPS-1601-1000-NPS	3350	12	22-Apr-2009
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3354	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3357	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3358	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3359	12	22-Apr-2009
Cable (3m, N-type)	Rhophase	NPS-1601-3000-NPS	3360	12	22-Apr-2009
Timer ('Electronic Clock Timer')	R.S Components	870A	3558	-	TU
Section 2.4 Beacons - Satellite Qualitative Test					
Copper GRP	TUV	27cm Diameter	3537	-	TU
Section 2.2 Beacons - Spurious Emissions					
Climatic Chamber	Votsch	VT4002	161	-	O/P Mon
Attenuator 10dB/10W)	Trilithic	HFP-50N	454	12	22-Jul-2009
Attenuator: 10dB/20W	Narda	766-10	480	12	22-Jul-2009
Spectrum Analyser	Hewlett Packard	E4407B	1154	12	9-Jun-2009
Hygrometer	Rotronic	I-1000	3068	12	26-Jun-2009
Attenuator (3dB, 20W)	Aeroflex / Weinschel	23-3-34	3163	12	2-Jun-2009
Thermocouple Thermometer	Fluke	51	3172	12	3-Jul-2009
Bandpass filter	Trilithic	5BE406/35-1-AA	3206	12	1-Aug-2009
Cable (1m, N Type)	Rhophase	NPS-1601-1000-NPS	3352	12	22-Apr-2009
Cable (2m, N Type)	Rhophase	NPS-1601-2000-NPS	3357	12	22-Apr-2009

TU – Traceability Unscheduled

OP MON – Output Monitored with Calibrated Equipment



Product Service

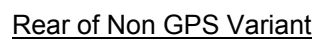
SECTION 4

PHOTOGRAPHS

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)



Front of Non GPS Variant





Configuration 7 (Satellite Qualitative Test)



Configuration 8 (Satellite Qualitative Test)



Product Service

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



Product Service

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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Product Service

ANNEX A

CUSTOMER SUPPLIED INFORMATION



Product Service

Self-test Mode Description and Protection Against Repetitive Self-test Mode Transmissions

COMMERCIAL IN CONFIDENCE

mcmurdo

Fastfind PLB 200/210

Statement on protection from repetitive self-test mode transmissions and self-test routine

Self-test routine

The Fastfind PLB is a 406.037MHz PLB operating with the Cospas-Sarsat satellite system.

The PLB has a press and release self-test facility, which operates as follows.

- a) Power up the micro-controller, the CMAC oscillator and the GPS module.
- b) Generate a burst at 121.5MHz, check the antenna RF level is above threshold.
- c) Activate the 406.037MHz PLL and check that it is locked.
- d) Generate an inverted frame 406.037MHz transmission. Check the antenna RF level is above threshold. (This also confirms the battery is capable of high current loads).
- e) Confirm the GPS receiver has output normal NMEA sentences. (do not wait for a fix).

The self-test completes within 5s. If all of the above checks prove true then the white LED will flash three times.

Protection from repetitive self-test mode transmissions

Once the self-test sequence is complete the hardware is powered off, preventing repetitive self-test transmissions.

Self-test may only be re-initiated by deliberate intervention on the part of the user.

Neil Jordan
Engineering Manager
8-8-08

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Product Service

Beacon Coding Software

Note that Table F-D.1 applies to the Non-GPS equipped variant.

Beacon Coding Software Results
91-115Z Firmware Version 1.1.165

CS T.007 ISSUE 4 REVISION 2 APPENDIX D TO ANNEX F BEACON CODING SOFTWARE RESULTS

Table F-D.1: User Protocol Beacon Messages

Protocol	Operational Message	Self-Test Message
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 : Non Float-Free EPIRB with Serial Number	FFFE2F4C972000C6007CE8871240	FFFED04C972000C6007CE8871240
Serial User : PLB with Serial Number	FFFE2F4C97A000C6007CE8C6BCC0	FFFED04C97A000C6007CE8C6BCC0

20/10/08