

REPORT ON

Limited Type Approval Testing of the McMurdo 406 MHz Fastfind PLB with 121.5 MHz
Radio locating device using -40°C battery pack in accordance with C/S T.007 - Issue 3 -
Revision 7 October 2000

Report No. RM608213C

August 2001

Segensworth Road
Fareham
Hampshire
PO15 5RH
UK

REPORT ON

Limited Type Approval Testing of the McMurdo 406 MHz
Fastfind PLB with 121.5 MHz Radio locating device using -
40°C battery pack in accordance with C/S T.007 - Issue 3 -
Revision 7 October 2000

Report No. RM608213C

PREPARED FOR

McMurdo Ltd
Silverpoint
Airport Service Road
Hilsea
Portsmouth
Hampshire
PO3 5PB

DISTRIBUTION

McMurdo Ltd	Mr R Read	Copy No. 1
COSPAS-SARSAT Secretariat		Copy No. 2
BABT		Copy No. 3
		Copy No

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LIST OF MEASUREMENTS.

The list of measured parameters called for in C/S T.007 - Issue 3 - Revision 7 October 2000 is given below.

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For copyright details see page 9 of 9.

Manufacturer:	McMurdo Ltd
Type Designation:	Fastfind
Serial No.:	27
Number of Samples Tested:	One
Test Specification:	C/S T.007 Issue 3 – Revision 7 October 2000
Date of Receipt of Test Sample:	21 st August 2001
Start of Test:	21 st August 2001
Finish of Test:	23 rd August 2001
Test Engineer(s):	N Forsyth

TEST HOUSE DECLARATION

We, BABT of Segensworth Road, Titchfield, Fareham, Hampshire PO15 5RH, declare under our sole responsibility that the product :

Equipment : 406 MHz PLB with 121.5 MHz radio locating data
Type : -
Model : Fastfind
Serial Number : 27
Quantity : One

to which this declaration relates is in conformity with the following standard(s) or other normative document(s) :

C/S T.007 - Issue 3 - Revision 7 October 2000
Clause 6.3 i)

Detailed results are recorded in Test Report No. RM608213C

Place and date of issue : Titchfield, August 2001

Signature :



M JENKINS
Wireless Telecoms Group Manager

Date : 24th August 2001

This report should be read in conjunction with BABT Report No. RM608213 which contains results from the Full Type Approval Testing of the McMurdo Limited 406 MHz Fastfind Plus PLB with internal GPS position encoded data and 121.5 MHz Radio locating device in accordance with C/S T.007 - Issue 3 - Revision 7 October 2000

APPLICATION FOR A COSPAS-SARSAT 406 MHz
BEACON TYPE APPROVAL CERTIFICATE

Beacon Manufacturer : McMurdo Ltd

Beacon Model : Fastfind

Name and Location of Beacon Test Facility : BABT

Beacon Type : Aviation : [] Land : [✓] Maritime : [✓]

Specified Operating Temperature Range : -40°C to +55°C

Specified Operating Lifetime : 24 hr. [✓] 48 hr. [] Other []
Specify :

Beacon Battery Type(s) : Chemistry : Lithium

Manufacture & Model No. : Saft LO29 or Energiser L-91

Size & number of cells : 4 x 'C' or 7 x 'AA'

Extra Features in Beacon :	No	Yes	Details
a) Auxiliary Radio-Locating Device :	[]	[✓]	Frequency : 121.5 MHz Power : +25 mW Min Tx. Duty Cycle : 100%
b) Transmits Encoded Position Data :	[✓]	[]	Nav. Device:
c) Transmits Long Message (144 bits) :	[✓]	[]	
d) Automatic Activation :	[✓]	[]	
e) Built-in Strobe Light :	[✓]	[]	Intensity : Flash rate :
f) Self-test mode :	[]	[✓]	-
g) Other :	[✓]	[]	Specify :

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

Dated : 23-08-01

Signed :

(for test facility)

Ambient temperature.....22°C Relative humidity.....58%

Table 2: SUMMARY OF 406 MHz BEACON TEST RESULTS

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (-40°C)	T _{amb} (+22°C)	T _{max} (+55°C)	
1. POWER OUTPUT						
•transmitter power output	35-39	dBm	38.31	37.78	37.41	
•power output rise time	< 5	ms	0.37	0.39	0.41	
•power output 1 ms before burst	<-10 dBm	✓*	✓	✓	✓	
2. DIGITAL MESSAGE						
•bit sync	15 bits "1"	✓	✓	✓	✓	
•frame sync	9 bits (000101111)	✓	✓	✓	✓	
•format flag	1 bit	data bit	0	0	0	
•protocol flag	1 bit	data bit	1	1	1	
•identification code	59 bits	✓	✓	✓	✓	
•BCH code	21 bits	✓	✓	✓	✓	
•emerg.code/nat use/ suppl.data	6 bits	data bits	000000	000000	000000	
•activation type	1 bit	✓	✓	✓	✓	
•additional data/BCH (if applicable)	32 bits	✓	✓	✓	✓	
•position error (if applicable)	< 5	✓	✓	✓	✓	
3. DIGITAL MESSAGE GENERATOR						
•repetition rate**						
minimum T _{rep}	47.5	seconds	48.67	48.72	48.72	
maximum T _{rep}	52.5	seconds	51.41	51.41	51.41	
•bit rate:						
minimum f _b	396	bits/sec.	400.139	400.036	400.037	
maximum f _b	404	bits/sec.	400.142	400.039	400.037	
•total transmission time:						
short message	435.6-444.4	ms	439.352	439.416	439.439	
long message (optional)	514.8-525.2	ms	-	-	-	
•CW preamble:						
minimum T _{cw}	158.4	ms	158.93	158.99	158.98	
maximum T _{cw}	161.6	ms	158.93	158.99	158.98	
•First burst delay	>47.5	seconds	120	120	120	

TEST EQUIPMENT USED

1, 2, 3, 4, 5, 6, 7, 8, 9,10, 11, 12, 13, 14, 15, 16

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Ambient temperature.....22°C Relative humidity.....58%

Table 2: SUMMARY OF 406 MHz BEACON TEST RESULTS - Continued

PARAMETERS TO BE MEASURED DURING TESTS	RANGE OF SPECIFICATION	UNITS	TEST RESULTS			COMMENTS
			T _{min} (-40°C)	T _{amb} (+22°C)	T _{max} (+55°C)	
5. 406 MHz TRANSMITTED FREQUENCY						
•nominal value	406.023-406.027 or 406.027-406.029***)	MHz	406.028378	406.028388	406.028380	
•short term stability	$\leq 2 \times 10^{-9}$	/100 ms	2.11×10^{-10}	1.883×10^{-10}	1.603×10^{-10}	
•medium term stability: -slope	$(-1 \text{ to } +1) \times 10^{-9}$	/minute	2.974×10^{-11}	4.043×10^{-11}	-1.085×10^{-10}	
-residual frequency variation	$\leq 3 \times 10^{-9}$		1.896×10^{-10}	2.49×10^{-10}	1.793×10^{-10}	
8. SELF-TEST MODE (if applicable)						
•frame sync	9 bits (011010000)	✓	✓	✓	✓	
•format flag	1/0	bit	0	0	0	
•single radiated burst	440/520 ($\pm 1\%$)	ms	439.43	439.43	439.43	
•default position data (if applicable)	must be correct	✓	N/A	N/A	N/A	
•description provided		✓	✓	✓	✓	
•design data provided on protection against repetitive self-test mode transmissions	Protection provided	✓	✓	✓	✓	
•single burst verification	one burst	✓	✓	✓	✓	
•provides for beacon 15 Hex ID	must be correct	✓	✓	✓	✓	

TEST EQUIPMENT USED

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

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TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

No	Instrument/Ancillary	Type	Manufacturer	Serial No.
1	Hygrometer	A1	Rotronic	N/S
2	Freq & Time Interval Analyser	5372A	Hewlett Packard	3141A1073
3	Logic Analyser	1613D	Hewlett Packard	2713A62725
4	Signal Generator	SMX	Rohde & Schwarz	82737-002
5	10 dB Attenuator	47-10-34	Weinschel	AT 4937
6	10 dB Attenuator	HFP-50N	Texscan	N/S
7	3 dB Attenuator	HFP-50N	Texscan	N/S
8	Power Splitter	1506A	Weinschel	AC5343
9	Power Splitter	1506A	Weinschel	AC4934
10	Crystal Detector	8470B	Hewlett Packard	1822A15821
11	Mixer	M2TC	Watkins Johnson	050033
12	Low Pass Filter	WLJ 1.4C9EF	Wainwright	1
13	Spectrum Analyser	8566A	Hewlett Packard	2349A03049
14	Environmental Chamber	MINI-P-MEGH-P	Montford	3369-K5707
15	Power Meter	436A	Hewlett Packard	2330A15908
16	Power Sensor	8482A	Hewlett Packard	2349A08833



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