TEST REPORT

Purpose
This report details test method and results for the repeated 48 hour operational life test. In accordance with CFR47 part 2.1509 (e) except only fundamental ERP measured.

Qualifications
The tests and measurements required have been carried out by McMurdo Ltd at their factory in Portsmouth, United Kingdom. The test engineer involved was…

Mr John Norrish Bsc(Eng) Hons Age 38
Holds an honours degree in electronics gained at London University, UK.
17 years experience in the electronics industry as a design engineer.
6 years of which relate to EPIRB design and type approval thereof.

Test sample
Testing was carried out on a single unit, serial No 9601-MAVIS-1.
This being the unit used for the original acceptance testing.
Its build standard remains unchanged, as does the build standard of production units.

2.1503 Test Environment
ERP testing for the 48 hour operational test was carried out on the roof of the McMurdo building in Portsmouth, UK. The site has a large flat (non metallic) roof, approx. 10m above ground. This provides an un-obstructed RF horizon at least 50m in radius. The site has a central 3m diameter Aluminium ground plane and wooden receive mast with remote height adjustment of the receive dipole.

Further details of this test site can be found in the original test report. The test site is unchanged from that used for the original application.

2.1505 Test Equipment

(a)	Signal generator	Marconi Instruments 2030
(b)	RF amplifier	Lab 250mW amplifier
(c)	Attenuator	BNC 50 ohm pad 3dB
(d)	121.5MHz monopole	Custom antenna. VSWR optimised for 121.5MHz
(e)	243MHz monopole	Custom antenna. VSWR optimised for 243MHz.
(f)	Power meter	Hewlett Packard 437B + 8482B head
(g)	Receive dipole	Variable length (adjusted for each frequency)
(h)	Receiver	Advantest R3371
(i)	Temperature chamber	Montford BMC24

Note : All antennas involved are as per the original type acceptance testing.

2.1509 (e) 48 hour operation
On the roof test site, ERP references for 75mW into the base of a 121.65MHz and 243.3MHz monopole were established…

75mW into monopole	RX level on tuned dipole
121.65MHz	-11.8 dBm
243.3MHz	-20.9 dBm

The unit was soaked for 2 hours at –20C. It was then turned on. The carrier frequencies were measured as…

121.65MHz measured 121.648230 which equates to -14.5 ppm
243.3MHz measured 243.296610 which equates to –14.0 ppm

After a total of 46 hours operation at –20C the frequency was re-checked…

121.65MHz measured 121.648520 which equates to -12.2 ppm
243.3MHz measured 243.297203 which equates to –11.5 ppm

The unit was taken to test range for ERP measurements. To avoid warming problems, the unit was used for 10 minutes of testing then returned to the chamber for 20 minutes of soaking at –20C. A further ON time of 1.5 hours was accrued. ERP results were…

121.65MHz FUNDAMENTAL PERP

AZIMUTH	HIGH (m)	ELEV (°)	RX 75mW	RX dBm	REL dB	ERP mW
0	2.7	10.2	-11.8	-10.0	1.8	114
30	2.7	10.2	-11.8	-10.1	1.7	111
60	2.7	10.2	-11.8	-10.3	1.5	106
90	2.8	10.9	-11.8	-10.1	1.7	111
120	2.8	10.9	-11.8	-9.9	1.9	116
150	2.7	10.2	-11.8	-9.9	1.9	116
180	2.7	10.2	-11.8	-10.2	1.6	108
210	2.7	10.2	-11.8	-10.1	1.7	111
240	2.7	10.2	-11.8	-10.5	1.3	101
270	2.7	10.2	-11.8	-10.3	1.5	106
300	2.7	10.2	-11.8	-10.2	1.6	108
330	2.7	10.2	-11.8	-10.2	1.6	108

243.3MHz FUNDAMENTAL PERP

AZIMUTH	HIGH (m)	ELEV (°)	RX 75mW	RX dBm	REL dB	ERP mW
0	1.9	5.7	-20.9	-18.2	2.7	140
30	1.9	5.7	-20.9	-18.1	2.8	143
60	1.8	5.1	-20.9	-18.6	2.3	127
90	1.8	5.1	-20.9	-18.5	2.4	130
120	1.9	5.7	-20.9	-18.8	2.1	122
150	1.9	5.7	-20.9	-18.9	2.0	119
180	1.9	5.7	-20.9	-19.1	1.8	114
210	2.0	6.3	-20.9	-19.0	1.9	116
240	2.0	6.3	-20.9	-18.7	2.2	124
270	2.0	6.3	-20.9	-18.6	2.3	127

300	2.0	6.3	-20.9	-18.8	2.1	122
330	2.0	6.3	-20.9	-18.4	2.5	133

Conclusion

The tables above prove that after 48 hours of operation at –20C the unit still exceeds the 75mW ERP requirement.