

FCC submission (additional tests)

The G4 EPIRB is effectively a variant of the (approved) E3 EPIRB. The G4 121MHz and 406MHz circuitry is identical to that used in the E3 EPIRB. Hence the tests carried out on the E3 cover the G4 performance. However a different microprocessor is used in the G4 with different software. This results in slight changes to the 121 modulation characteristics. Hence the relevant tests have been performed to satisfy FCC rules.

This report details the results of measurements made at McMurdo Ltd, to satisfy the relevant items listed in CFR47 section 80.1061b and 2.985-2.997. (These items are not generally covered in the main RTCM test report.)

Test equipment

- | | | |
|----|---------------------|---|
| 1. | Spectrum analyser | Hewlett Packard 8568B |
| 2. | Frequency counter | Philips PM6680 |
| 3. | Temperature chamber | Montford BMC24 |
| 4. | Power meter | Hewlett Packard 437B + 8482B Power head |
| 5. | Attenuator | N-type 50Ω in-line attenuator 30dB |
| 6. | Thermometer | Comark 2001 |

Test Frequency

The unit under test was fitted with a 121.65MHz crystal to avoid generating interference.

Below are the results of the 121.5MHz homer in compliance with 80.1061B.

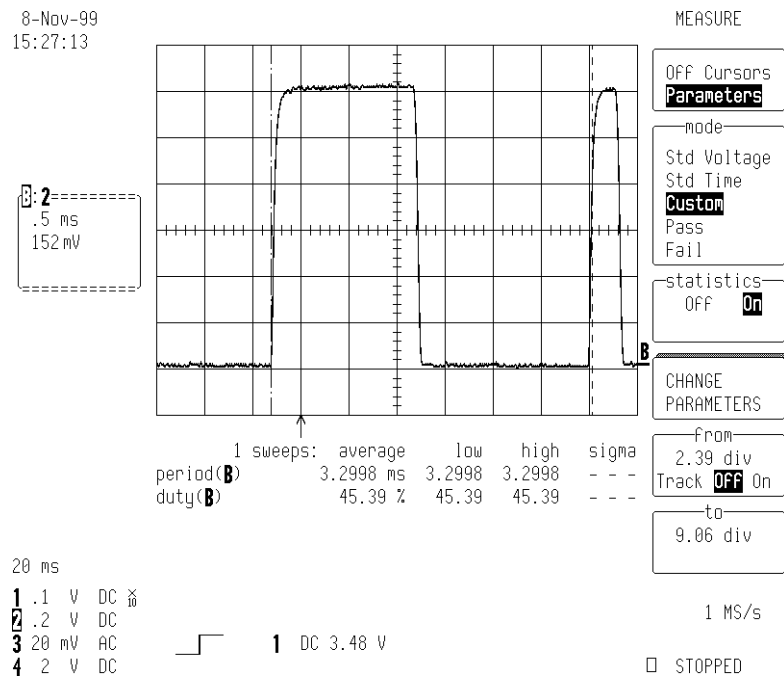
Modulation characteristics.

Testing was carried out in accordance with subpart N-FCC procedure for testing Class A,B and S EPIRBS.

Characteristics	121.65MHz	Limit
Sweep Start Frequency	1250Hz	1600Hz
Sweep stop frequency	348Hz	300Hz
Sweep frequency range	902	>700
Sweep repetition	3 Hz	2Hz-4Hz
Modulation factor	0.98	0.85-1.0
Modulation duty cycle	34.3%-45.4%	33%-55%

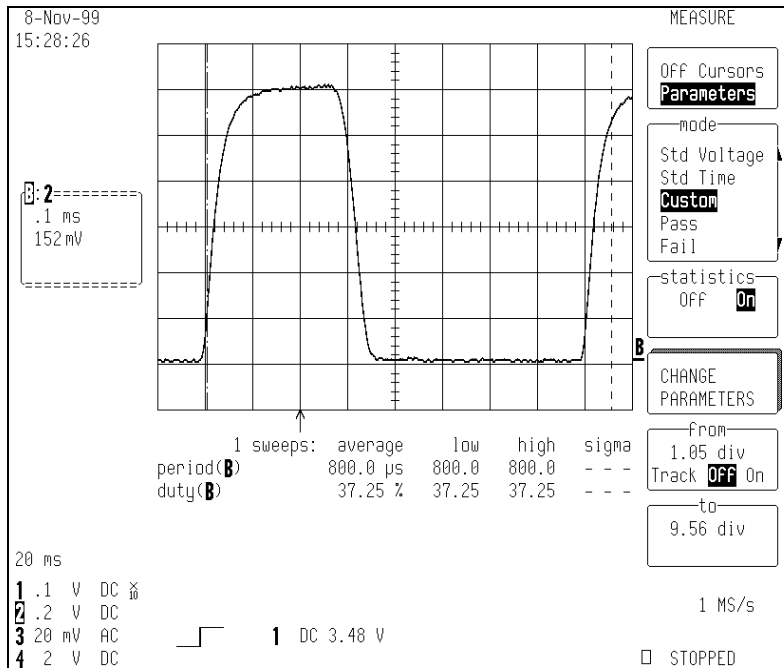
Plot 1 illustrates the duty cycle at 1.25KHz.

1.



Plot 2 illustrates the duty-cycle at 348Hz.

2.



Signal Enhancement.

Wideband power was measured with a 10KHz bandwidth. Video bandwidth was set for the maximum of 3MHz.

The mean power correction for duty cycle made use of the highest duty cycle as this gave the worst results for carrier power content.

Characteristic	121.65MHz
Total wideband power	19.65dBm
Highest duty cycle	45.4%
10log (Duty) factor	-3.43dB
Total mean power	16.22dBm
Carrier power	13.4dBm
dBc-dBt	-3.32
Carrier content	52.24%

Carrier Bandwidth

Using the minimum resolution bandwidth available on the spectrum analyser of 10Hz, the 3dB bandwidth of the 121.65MHz carrier was measured as 10Hz.

Compliance with 2.985 : RF power output

The Hewlett Packard 437B power meter was used to measure the RF power .
Power at 121.65MHz = 19.55dBm

Compliance with 2.989 : Occupied bandwidth.

The limits are defined in 80.205. An accredited test house carried out these tests. Refer to the extracts from EMC report DERA/SS/PS/R/EMC/TT-03/2000/1.0.

Compliance with 2.993 : Field strength of spurious radiation.

Refer to the extracts from EMC report DERA/SS/PS/R/EMC/TT-03/2000/1.0.

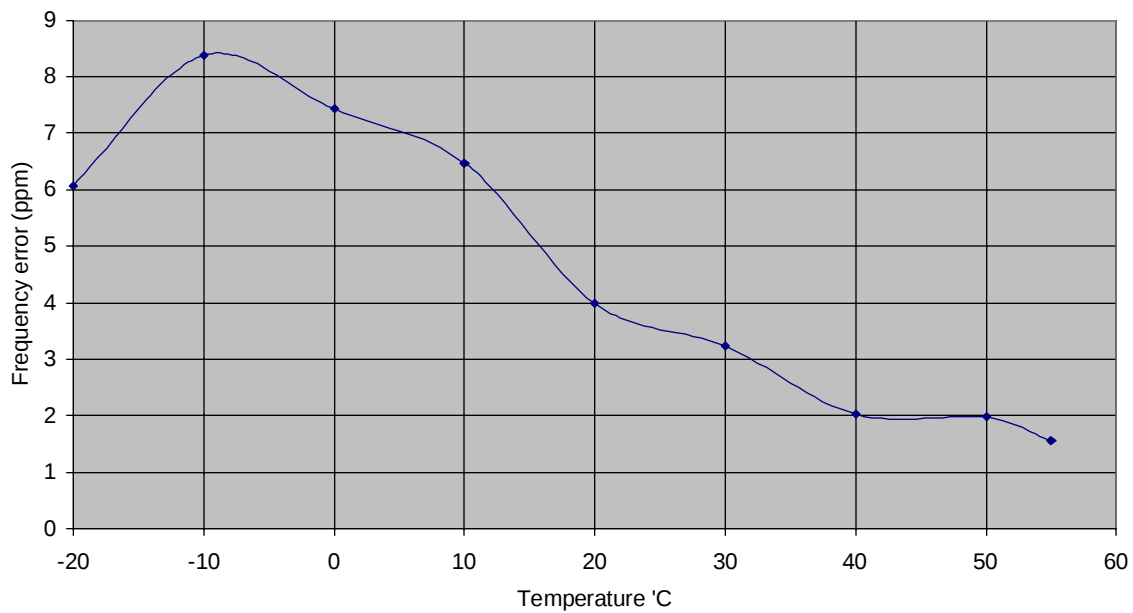
Compliance 2.995 : Frequency stability.

Frequency vs. temperature

Conducted as per FCC procedure. New battery fitted. Soak time 1 hour per step.

FREQUENCY	TEMPERATURE	ERROR (ppm)
121650738	-20	6.074074
121651018	-10	8.378601
121650902	0	7.423868
121650786	10	6.469136
121650484	20	3.983539
121650392	30	3.226337
121650246	40	2.024691
121650240	50	1.975309
121650189	55	1.555556

GPIRB 121MHz frequency error



Compliance with 2.997 : Frequency spectrum to be investigated.

Refer to the extracts from EMC report DERA/SS/PS/R/EMC/TT-03/2000/1.0.