

47 CFR SECTION 2.1046 TO 2.1057

Where measurements have been made in house, the following test equipment was used.

1.	Spectrum analyser	Hewlett Packard ESA-L1500A
2.	Frequency counter	Philips PM6680
3.	Temperature chamber	Montford BMC24
4.	Attenuator	N-type 50 Ω in-line attenuator 10dB
5.	Thermometer	Comark 2001
6.	Rubidium Frequency Standard	Ball-Efratom MRT
7.	Digital Storage Oscilloscope	LeCroy LT322

2.1046: RF POWER OUTPUT

406 Transmitter: See RTCM DERA Test Report sheet 28 figure 14.

121 Transmitter: See RTCM DERA Test Report sheet 15.

2.1047: MODULATION CHARACTERISTICS

406 Transmitter: See RTCM DERA Test Report sheets 22 to 24.

121 Transmitter: See RTCM DERA Test Report sheets 25 to 26. Additional tests carried out as below.

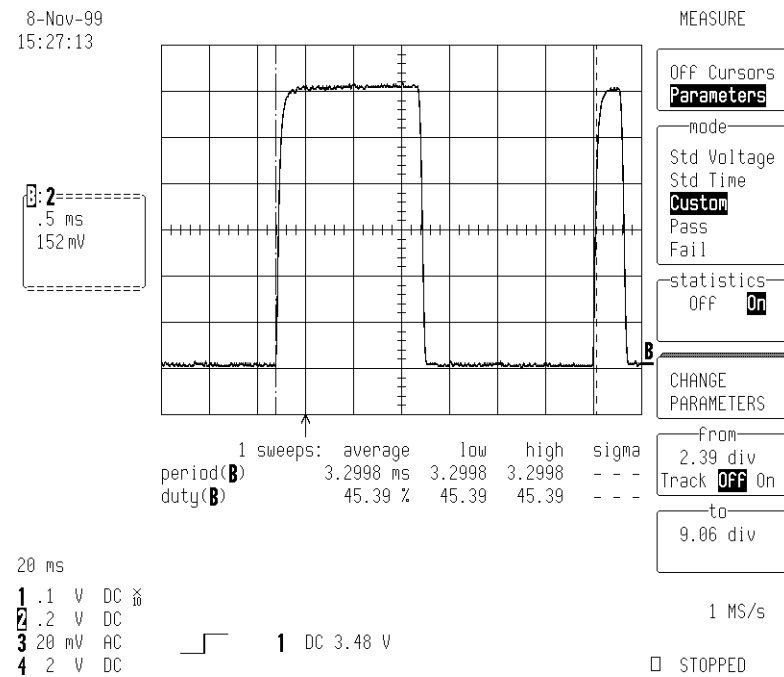
(Testing was carried out using the guidelines given in subpart N-FCC procedure for testing Class A,B and S EPIRBS).

The unit was fitted with a 121.65MHz Xtal to prevent the generation of interference.

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%

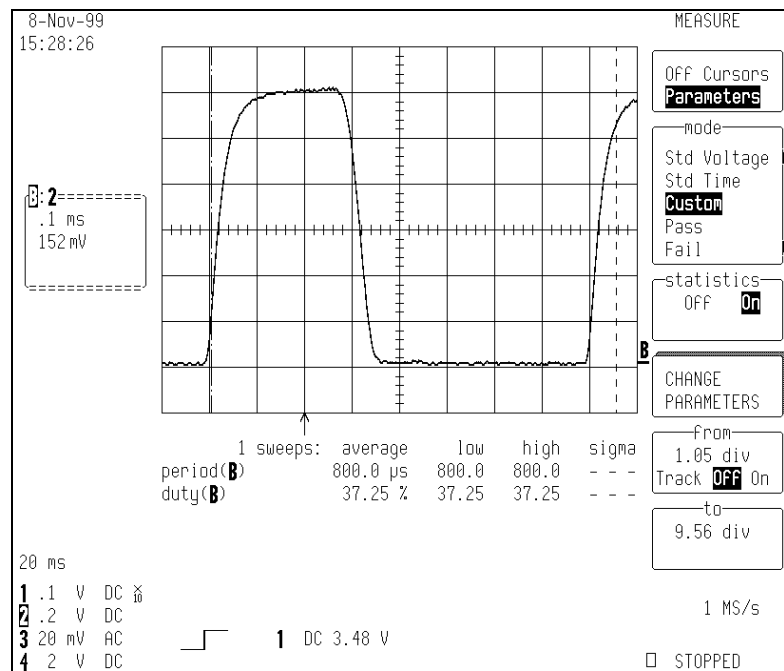
Plot 1 illustrates the duty cycle at 1.25KHz.

1.



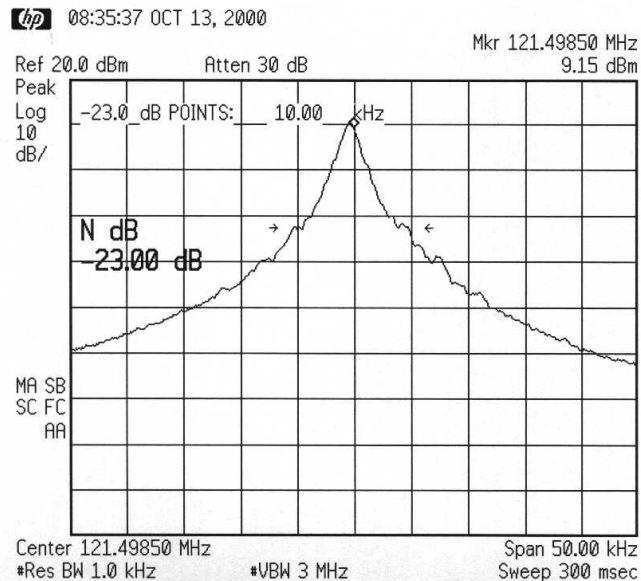
Plot 2 illustrates the duty-cycle at 348Hz.

2.

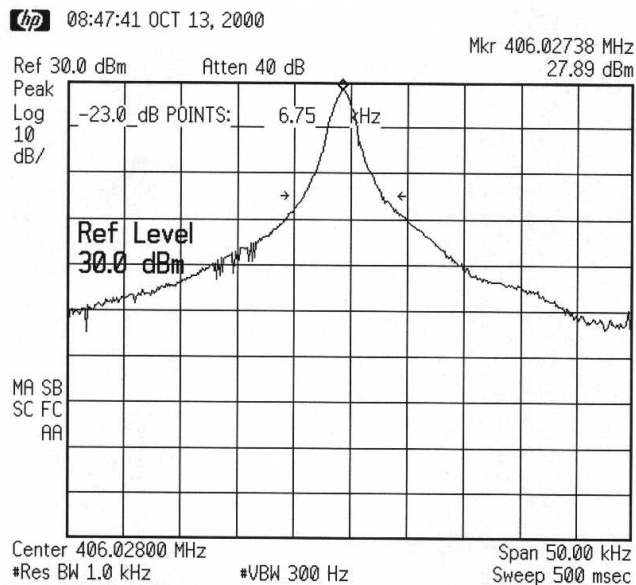


2.1049: OCCUPIED BANDWIDTH:

The FCC definition of occupied bandwidth is 'the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 per cent of the total mean power radiated'. This corresponds to the 23dB bandwidth, $(10\log 0.005)$.



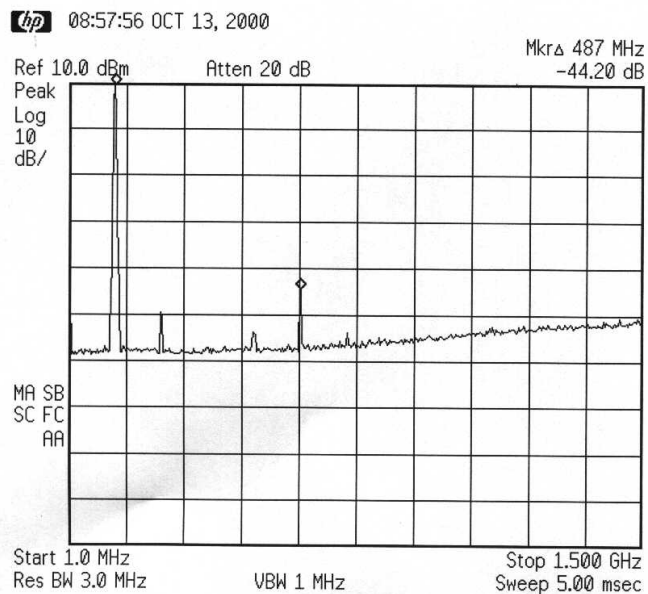
The figure above shows that the occupied bandwidth for the 121MHz transmitter is 10kHz.



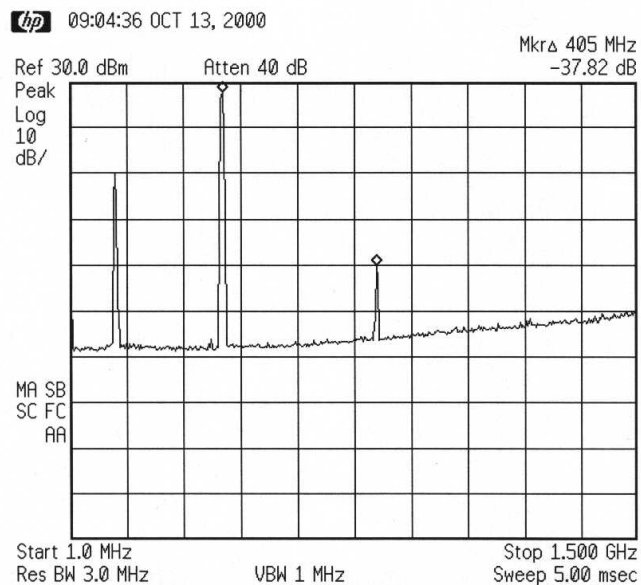
The figure above shows that the occupied bandwidth for the 406MHz transmitter is 6.75kHz

2.1051: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

The EPIRB is not designed to operate without an antenna, The antenna is an integral part of the unit. However, measurements of the spectrum at the transmitter output are shown below. The limit of 1.5GHz is the limitation of the available test equipment.



The figure above shows the 121MHz transmitter spectrum. The largest harmonic present is the 4th harmonic at -44.2dBc.



The figure above shows the 406MHz transmitter spectrum. The largest harmonic present is the 2nd harmonic at -37.82dBc.

2.1053: FIELD STRENGTH OF SPURIOUS RADIATION

The spurious radiation data for the 406 and 121 transmitters is contained in EMC TEST REPORT (DERA/SS/PS/R/EMC/TT-03/2000/1.0).

The table below summarises the results.

Sheet	Frequency	Level dBm	dBc	Comment
23	121.6496MHz	-28.9	0	Fundamental
26	406.02833MHz	+2.3	0	Fundamental
29	1.2196GHz	-58.47	-60.77	3rd harmonic of 406
30	1.4508GHz	-76.67	-47.77	12th harmonic of 121
31	1.6246GHz	-63.5	-65.8	4 th harmonic of 406
32	1.9133GHz	-75.83		No harmonic relationship
33	2.0296GHz	-71.2	-73.5	5 th harmonic of 406
34	2.3267GHz	-75.77		No harmonic relationship
35	2.705GHz	-75.37		No harmonic relationship
36	2.7825GHz	-72.3		No harmonic relationship
37	3.1767GHz	-73.37		No harmonic relationship
38	3.2692GHz	-73.57	-75.87	8 th harmonic of 406
39	3.5308GHz	-73.1	-44.2	29 th harmonic of 121
40	3.9207GHz	-72.8		No harmonic relationship

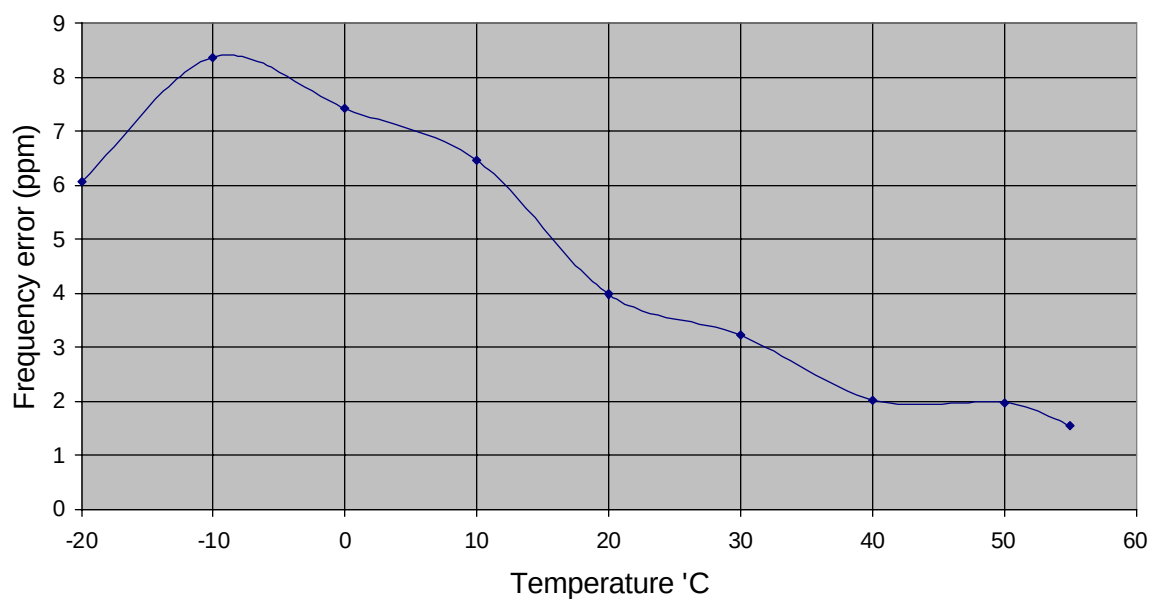
2.1055: FREQUENCY STABILITY

Frequency vs. temperature

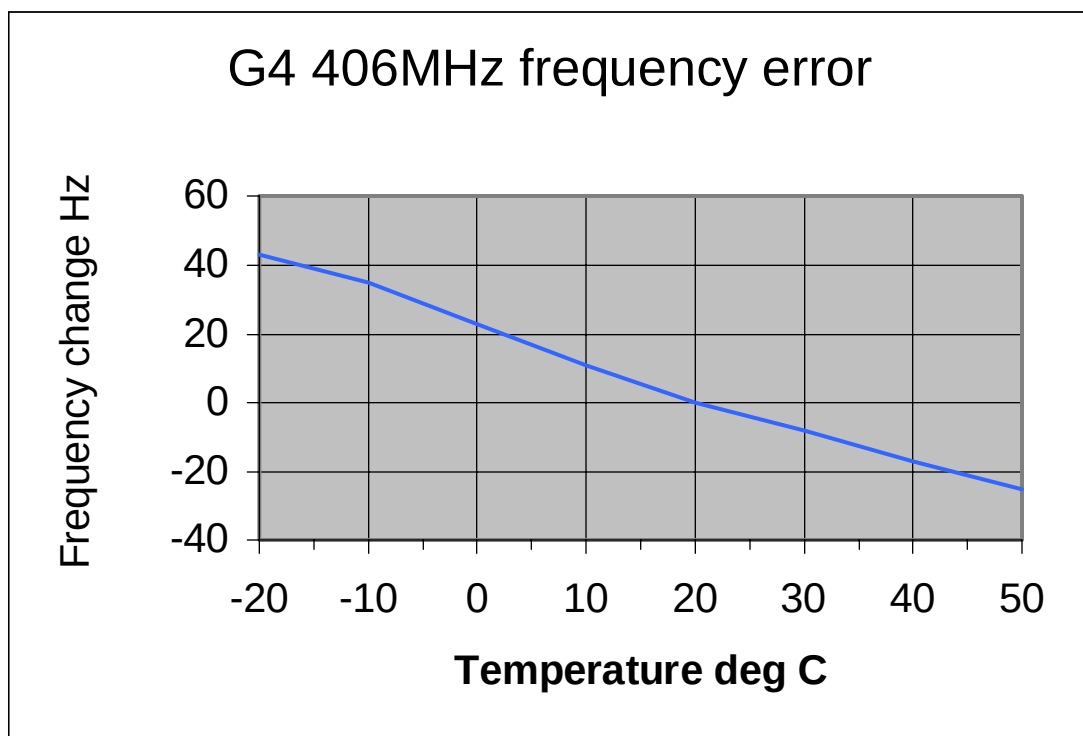
Conducted as per FCC procedure. New battery fitted. Soak time 1 hour per step.

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

G4 121MHz frequency error



FREQUENCY	TEMPERATURE	ERROR (Hz)
406.027768	-20	43
406.027760	-10	35
406.027748	0	23
406.027736	10	11
406.027725	20	0
406.027717	30	-8
406.027709	40	-17
406.027700	50	-25



2.1057: FREQUENCY SPECTRUM TO BE INVESTIGATED

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