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47 CFR SECTION 2.1046 TO 2.1057

The required tests were either done in-house or at the BABT Product Service Test House. Measurements made at McMurdo were carried out by:

Neil Jordan, Design Engineer.
Experience: 9 years in a design and development environment.
Qualification: Higher National Diploma in Electrical and Electronic Engineering.

Richard Read, Senior Design Engineer.
Experience: 26 years in a design and development environment.
Qualification: Higher National Diploma in Electrical and Electronic Engineering.

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

1.	Spectrum analyser	Agilent Technologies E4405B
2.	Frequency counter	Philips PM6680
3.	Signal Generator	Adret 740A.
4.	Digital Storage Oscilloscope	LeCroy LT322
5.	Temperature chamber	Climatic Test Systems / West 4400
6.	Attenuator	N-type 50Ω in-line attenuator 20dB
7.	Thermometer	Comark 2001.
8.	Frequency mixer	SMC CLK703B.
9.	Rubidium Frequency Standard	Frequency Electronics Inc. FE-5680A

2.1046: RF POWER OUTPUT

406 Transmitter: See BABT Test Report.RM608213 sheet 8.

121 Transmitter: See RTCM BABT Test Report RM608213A sheet 6.

2.1047: MODULATION CHARACTERISTICS

406 Transmitter: See BABT Test Report RM608213 sheet 9.

121 Transmitter: See RTCM BABT Test Report RM608213A sheet 6.

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, (10log0.005).

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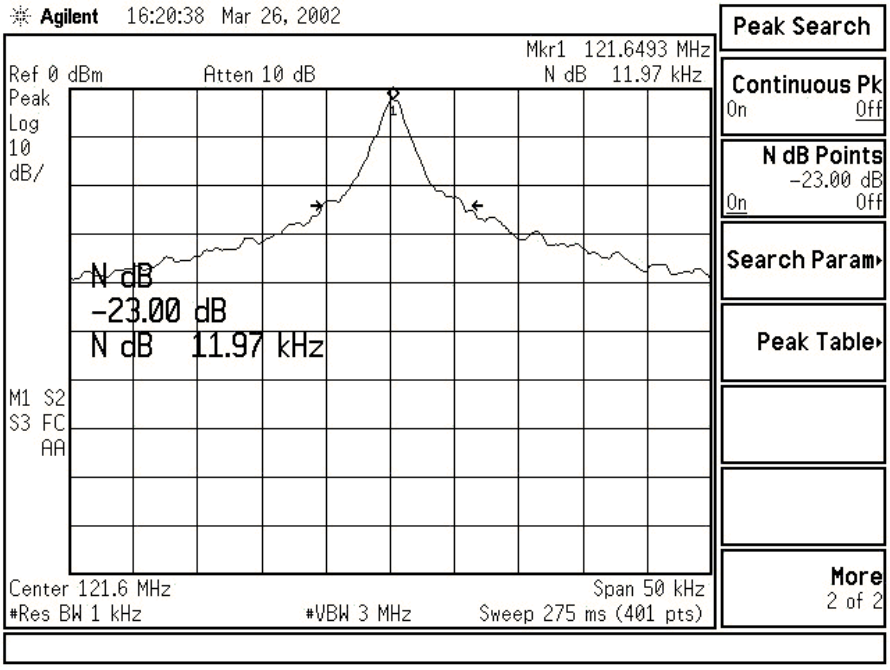
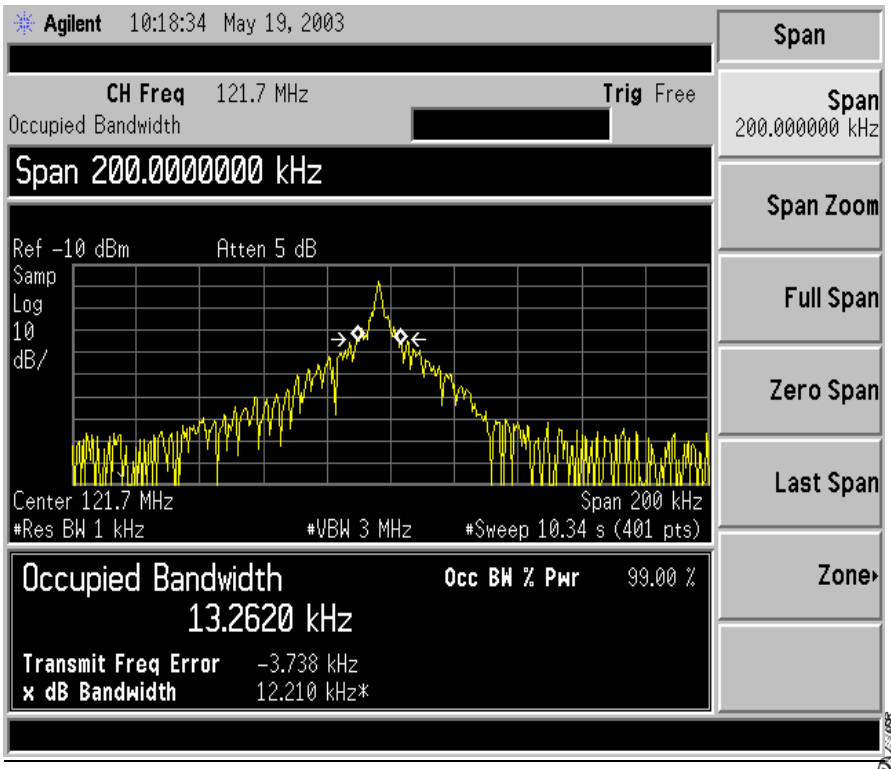


The screen shot above shows that the occupied bandwidth for the 121MHz transmitter, (with A3X modulation), is 11.97kHz.
The screen shot below was produced in a special Engineering mode that produces a continuous Morse 'P' transmission. It shows that the occupied bandwidth for the 121MHz transmitter, (with A2A modulation), is 13.262kHz.



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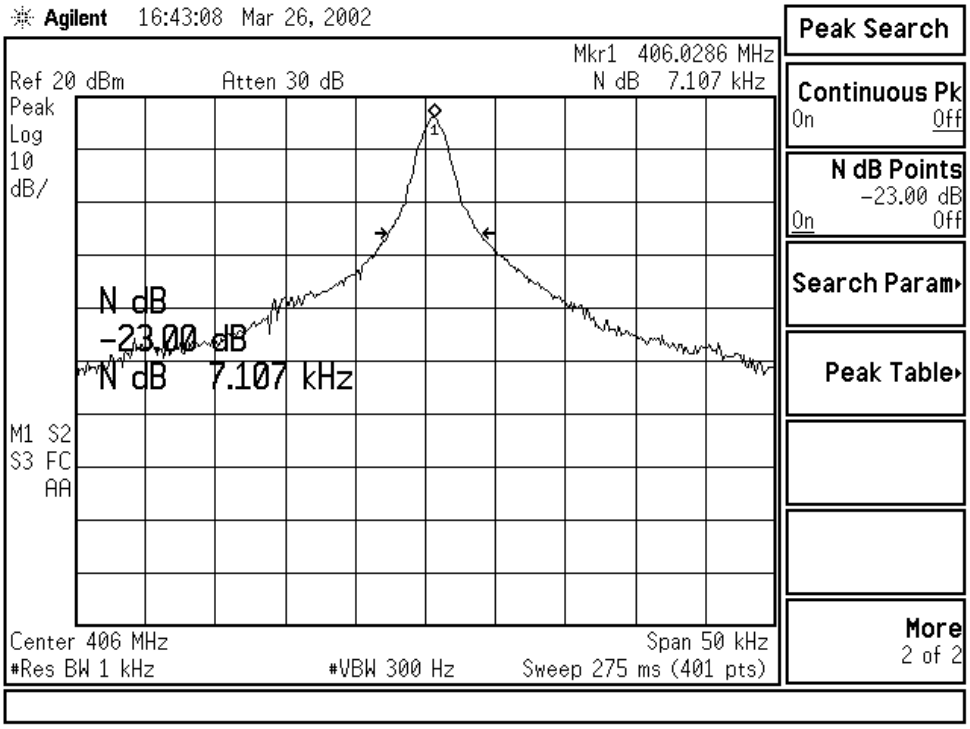

The screen shot above shows that the occupied bandwidth for the 406MHz transmitter is 7.107kHz.

2.1051: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

See also BABT Test Report RM608213 sheets 14,15 and 16.

The unit 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.

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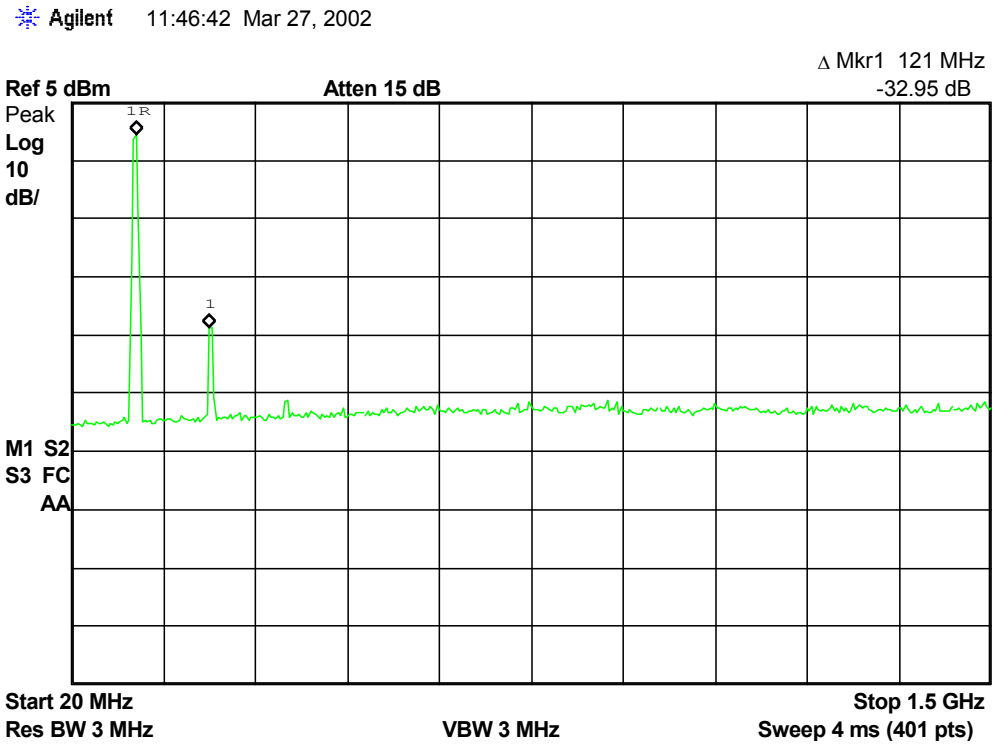
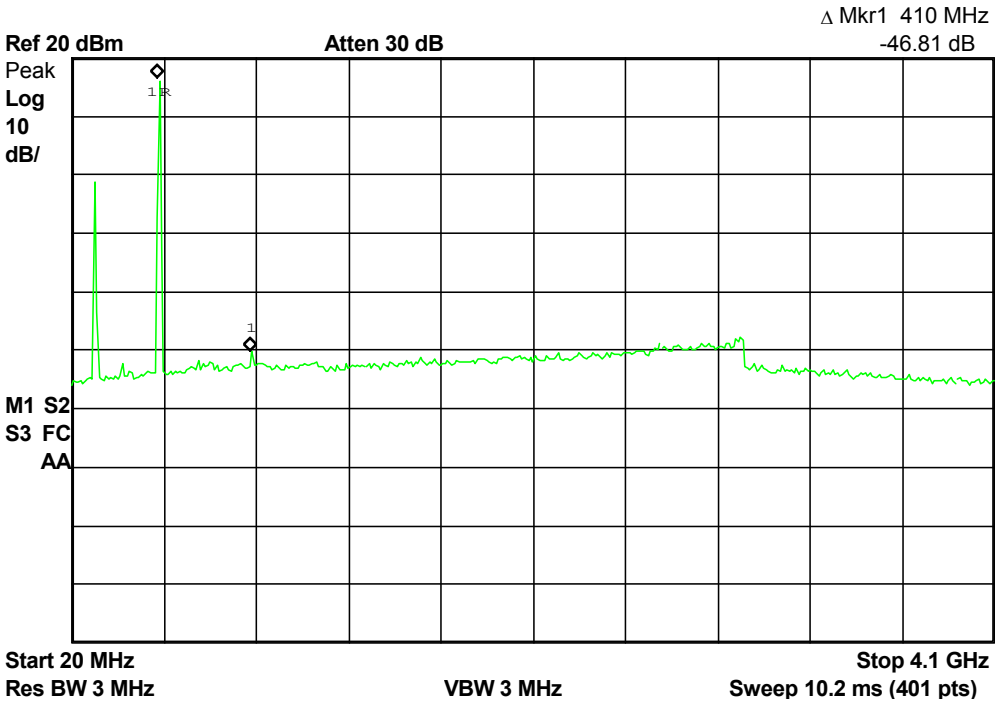


The figure above shows the 121MHz transmitter spectrum. The largest harmonic present is the 2nd harmonic at –32.95dBc.



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The figure above shows the 406MHz transmitter spectrum. The largest harmonic present is the 2nd harmonic at –46.81dBc. (The signal to the left of the 406MHz carrier is the 121.5MHz transmission, not a harmonic).

2.1053 FIELD STRENGTH OF SPURIOUS RADIATION

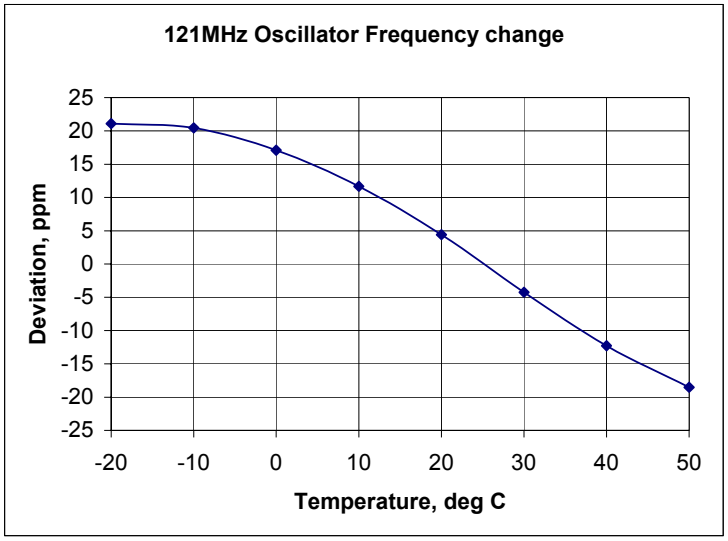
See BABT Test Report 00608213B.

2.1055: FREQUENCY STABILITY

Frequency vs. temperature. Offset 121.65MHz test crystal fitted.
Conducted as per the FCC procedure. New battery pack fitted. Soak time 1 hour per step.

FREQUENCY MHz	TEMPERATURE °C	ERROR * (ppm)
121.652567	-20	21.102
121.652487	-10	20.444
121.652078	0	17.082
121.651420	10	11.673
121.650536	20	4.4063
121.649483	30	-4.250
121.648505	40	-12.289
121.647745	50	-18.537

***** Error relative to the nominal centre frequency of 121.65MHz.



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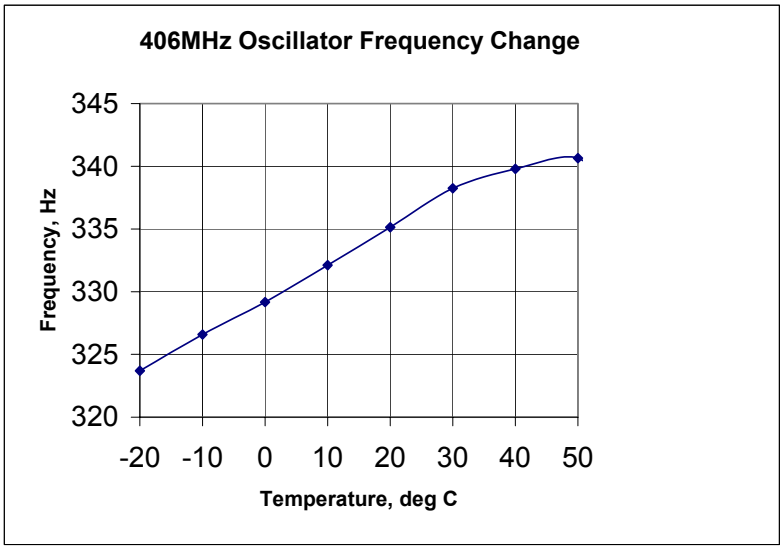
FREQUENCY MHz	TEMPERATURE °C	ERROR * (Hz))
406.0282370	-20	323.70
406.02832658	-10	326.58
406.02832917	0	329.17
406.02833212	10	332.12
406.02833514	20	335.14
406.02833825	30	338.25
406.02833980	40	339.8
406.02834065	50	340.65

* Error relative to the nominal centre frequency of 406.028MHz.



2.1057: Frequency spectrum to be investigated

See Frequency range statement in BABT Test Report 00608213B.

Richard Read
Senior Design Engineer
McMurdo Limited