

# EMC Technologies (NZ) Ltd

Test Report No 30825.2

Report date: 8<sup>th</sup> September 2003

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## TEST REPORT

### **Tait TMBA12-H500 UHF Mobile Transceiver (FCC ID: CASTMAH5A)**

*tested to*

**47 Code of Federal Regulations**

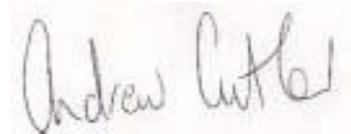
**Part 22 – Public Mobile Services**

**Part 90 – Private Land Mobile Service**

*for*

**Tait Electronics Ltd**

This Test Report is issued with the authority of:



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**Andrew Cutler - General Manager**

Prepared By:



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**Karen Miller - Office Administrator**



All tests reported  
herein have been  
performed in accordance  
with the laboratory's  
scope of accreditation

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**EMC Technologies (NZ) Ltd**

STREET ADDRESS - 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand  
POSTAL ADDRESS - PO Box 68 307, Newton, Auckland, New Zealand

Telephone: +64 9 360 0862 Fax: +64 9 360 0861

E-mail: [aucklab@ihug.co.nz](mailto:aucklab@ihug.co.nz)

Web Site: [www.emctech.com.au](http://www.emctech.com.au)

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## 1. STATEMENT OF COMPLIANCE

The Tait TMBA12-H500 UHF Mobile Station Transceiver complies with:

- FCC Part 22 Section 22.359 when tested in accordance with FCC Part 2 Section 2.1053
- FCC Part 90 Section 90.210 when tested in accordance with FCC Part 2 Section 2.1053

## 2. RESULTS SUMMARY

The results from testing are summarised in the following table:

Section	Result
22.359 and 90.210 when tested to 2.1053 – Radiated spurious emissions	Complies with a 23.7 dB margin at 1275.3000 MHz (Vertical) when transmitting on 425.1000 MHz in high power mode.

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## 3. CLIENT INFORMATION

<b>Company Name</b>	Tait Electronics Ltd
<b>Address</b>	PO Box 1645
<b>City</b>	Christchurch
<b>Country</b>	New Zealand
<b>Contact</b>	Mr Des Fox

## 4. DESCRIPTION OF TEST SAMPLE

<b>Brand Name</b>	Tait
<b>Model Number</b>	TMAB12-H500
<b>Product</b>	UHF Mobile Transceiver
<b>Manufacturer</b>	Tait Electronics Ltd
<b>Country of Origin</b>	New Zealand
<b>Serial Number</b>	19001188
<b>FCC ID</b>	CASTMAH6A

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## 5. TEST SAMPLE SPECIFICATIONS

### Transmit frequency

425.1000 MHz

### Band of operation

400 – 470 MHz

### FCC bands

Part 90: 421 – 512 MHz.

### Power Supply

13.8 Vdc from a sample external AC power supply

### Power Output

High power 25 watts

Low power approximately 1 watt.

### Attachments

- Hands free microphone kit
- Desktop microphone

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## 6. ATTESTATION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification with the following conditions:

**The client selected the test sample.**

**The report relates only to the sample tested.**

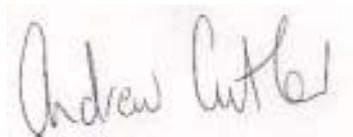
**This report does not contain corrections or erasures.**

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

In addition this equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations.

To the best of my knowledge, these tests were performed using measurement procedures that are consistent with industry or Commission standards and demonstrate that the equipment complies with the appropriate standards.

I further certify that the necessary measurements were made by EMC Technologies NZ Ltd, 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand.



Andrew Cutler  
General Manager  
EMC Technologies NZ Ltd

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## 7. TEST RESULTS

### Field strength of spurious emissions

Transmitter in stand by – Non specific emissions observed

Emission frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
86.0145	15.0	-82.4	-20.0	Vertical	62.4
108.9775	20.2	-77.2	-20.0	Vertical	57.2
110.5900	15.2	-82.2	-20.0	Vertical	62.2
122.8775	15.3	-82.1	-20.0	Vertical	62.1

Transmitter transmitting

Frequency: 425.1000 MHz

Power: 25 watts

Emission frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
850.2000	55.6	-44.1	-20.0	Vertical	24.1
850.2000	49.6	-47.8	-20.0	Horizontal	27.8
1275.3000	53.7	-43.7	-20.0	Vertical	23.7
1275.3000	47.3	-50.1	-20.0	Horizontal	30.1
1700.4000	45.1	-52.3	-20.0	Vertical	32.3
1700.4000	44.4	-53.0	-20.0	Horizontal	33.0
2125.5000	52.3	-45.1	-20.0	Vertical	25.1
2125.5000	48.5	-48.9	-20.0	Horizontal	28.9
2550.6000	44.5	-52.9	-20.0	Vertical	32.9
2550.6000	45.3	-52.1	-20.0	Horizontal	32.1
2975.7000	-	-	-20.0	Vertical	-
2975.7000	-	-	-20.0	Horizontal	-
3400.8000	-	-	-20.0	Vertical	-
3400.8000	-	-	-20.0	Horizontal	-
3825.9000	-	-	-20.0	Vertical	-
3825.9000	-	-	-20.0	Horizontal	-
4251.0000	-	-	-20.0	Vertical	-
4251.0000	-	-	-20.0	Horizontal	-

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Frequency: 425.1000 MHz

Power: low

Emission frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
850.2000	43.9	-53.5	-20.0	Vertical	33.5
850.2000	41.4	-56.0	-20.0	Horizontal	36.0
1275.3000	39.5	-57.9	-20.0	Vertical	37.9
1275.3000	35.9	-61.5	-20.0	Horizontal	41.5
1700.4000	36.7	-60.7	-20.0	Vertical	40.7
1700.4000	36.2	-61.2	-20.0	Horizontal	41.2
2125.5000	42.0	-55.4	-20.0	Vertical	35.4
2125.5000	43.7	-53.7	-20.0	Horizontal	33.7
2550.6000	43.0	-54.4	-20.0	Vertical	34.4
2550.6000	43.1	-54.3	-20.0	Horizontal	34.3
2975.7000	-	-	-20.0	Vertical	-
2975.7000	-	-	-20.0	Horizontal	-
3400.8000	-	-	-20.0	Vertical	-
3400.8000	-	-	-20.0	Horizontal	-
3825.9000	-	-	-20.0	Vertical	-
3825.9000	-	-	-20.0	Horizontal	-
4251.0000	-	-	-20.0	Vertical	-
4251.0000	-	-	-20.0	Horizontal	-

All other emissions observed are greater than 20 dB of the -20 dBm limit (ie all are less than -40 dBm) and have therefore not been recorded.

Device was tested on an open area test site at a distance of 3 metres.

Testing was carried out at EMC Technologies NZ Ltd Open Area Test Site, which is located at Driving Creek, Orere Point, Auckland. Details of this site have been filed with the Commission, Registration Number: 90838, which was last updated on May 12<sup>th</sup>, 2003.

The transmitter was tested with a resistive dummy load attached to the antenna terminal of the device.

Testing was carried out when the device was powered using a sample external 13.8 Vdc power supply.

Also attached to the transceiver were a hands free microphone kit and a desktop microphone.

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The power level of each emission was determined by replacing the transmitter with a dipole antenna that was connected to a signal generator.

The signal generator output level was increased until the same field strength level was observed at each emission frequency.

The level recorded is the signal generator output level in dBm less any gains / losses due to the coax cable and the dipole antenna.

*Limit:*

All spurious emissions are to be attenuated by at least  $50 + 10 \log (P)$ .

This gives a limit of  $-20$  dBm.

No measurements were made above the 10<sup>th</sup> harmonic.

**Result:** Complies

***Measurement Uncertainty:***  $\pm 4.1$  dB

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## 8. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial #	Asset
Aerial Controller	EMCO	1090	9112-1062	RFS 3710
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3612
Log Periodic Antenna	Schwarzbeck	UHALP 9107	-	RFS 3702
UHF Dipole Antenna	Schwarzbeck	UHA 9105	-	RFS 3679
Horn Antenna	EMCO	3115	9511-4629	E1526
Horn Antenna	Electrometrics	RGA-60	6234	E1494
Coax Cable	Sucoflex	104PA	2736/4PA	-
Signal Generator	Rohde & Schwarz	SMHU.58	838923/028	E1493
Measurement Receiver	Rohde & Schwarz	ESCS 30	839873/1	
Measurement Receiver	Rohde & Schwarz	ESHS 10	828404/005	RFS 3728
Spectrum Analyzer	Hewlett Packard	E7405A	US39150142	3776
Artificial Mains Network	Rhode & Schwarz	ESH 2-Z5	881362/034	RFS 3628
Variac	General Radio	1592	-	RFS 3690

## 9. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies NZ Ltd registration with the Federal Communications Commission as a listed facility, Registration Number: 90838, which was updated on May 12<sup>th</sup>, 2003.

The tests were carried out in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025: 1999.

All measurement equipment has been calibrated in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025: 1999.

International Accreditation New Zealand has Mutual Recognition Arrangements for testing and calibration with 46 accreditation bodies in 34 economies. This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden). Further details can be supplied on request.

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## 10. PHOTOGRAPH(S)



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STREET ADDRESS - 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand  
POSTAL ADDRESS - PO Box 68 307, Newton, Auckland, New Zealand

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Telephone: +64 9 360 0862 Fax: +64 9 360 0861

E-mail: [aucklab@ihug.co.nz](mailto:aucklab@ihug.co.nz)

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## Radiated emissions test set up



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