

EMC Technologies (NZ) Ltd

Test Report No 40604.2

Report date: 10 June 2004

TEST REPORT

Tait TMAB22 – H500 UHF Mobile Transceiver

tested to

47 Code of Federal Regulations

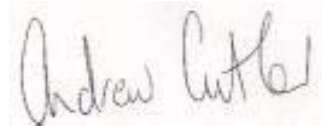
Part 22 – Public Mobile Services

Part 90 – Private Land Mobile Service

for

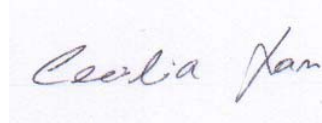
Tait Electronics Ltd

This Test Report is issued with the authority of:



Andrew Cutler - General Manager

Prepared By:



Cecilia Lam - Office Administrator



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

EMC Technologies (NZ) Ltd

STREET ADDRESS - 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand

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1. STATEMENT OF COMPLIANCE

The **Tait TMAB22 – H500 UHF Mobile 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 25.7 dB margin at 2550.600 MHz (Vertical) when transmitting on 425.1000 MHz in high power mode.

3. CLIENT INFORMATION

Company Name	Tait Electronics Ltd
Address	PO Box 1645
City	Christchurch
Country	New Zealand
Contact	Mr Bruce Jensen / Mr Des Fox

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4. DESCRIPTION OF TEST SAMPLE

Brand Name	Tait
Model Number	TMAB22 – H500
Product	UHF Mobile Transceiver
Manufacturer	Tait Electronics Ltd
Country of Origin	New Zealand
FCC ID	CASTMAH5C
Serial Number	See below

The sample tested has a product code of TMAB22-H500 that covers the frequency band of 400 – 470 MHz

The sample tested comprised of the following modules:

- Model TMAB22 – H500 Radio. Sn# 19008750
- Model TMAC40 – OT Control Head. Sn# 19009669.

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5. TEST SAMPLE SPECIFICATIONS

Transmit frequency

425.1000 MHz

Receive frequency

425.1000 MHz

Band of operation

400.000 – 470.000 MHz

Power Supply

12.0 Vdc from an external power supply (lead acid battery typically)

Power Output

High power 25 watts

Low power less than 1 watt

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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

Standby

Emission frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
49.158	13.9	-83.4	-20.0	Vertical	63.4
61.441	11.0	-86.3	-20.0	Vertical	66.3
159.758	14.5	-82.8	-20.0	Vertical	62.8

Transmitting on: 425.1000 MHz

Power: Low

Frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
850.200	40.9	-56.4	-20.0	Vertical	36.4
850.200	38.5	-58.8	-20.0	Horizontal	38.8
1275.300	37.7	-59.6	-20.0	Vertical	39.6
1275.300	37.1	-60.2	-20.0	Horizontal	40.2
1700.400	38.4	-58.9	-20.0	Vertical	38.9
1700.400	39.1	-58.2	-20.0	Horizontal	38.2
2125.500	43.4	-53.9	-20.0	Vertical	33.9
2125.500	42.9	-54.4	-20.0	Horizontal	34.4
2550.600	47.0	-50.3	-20.0	Vertical	30.3
2550.600	47.1	-50.2	-20.0	Horizontal	30.2
2975.700	-	-	-20.0	Vertical	-
2975.700	-	-	-20.0	Horizontal	-
3400.800	-	-	-20.0	Vertical	-
3400.800	-	-	-20.0	Horizontal	-
3825.900	-	-	-20.0	Vertical	-
3825.900	-	-	-20.0	Horizontal	-
4251.000	-	-	-20.0	Vertical	-
4251.000	-	-	-20.0	Horizontal	-

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Transmitting on: 425.1000 MHz

Power: High

Frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
850.200	45.2	-52.1	-20.0	Vertical	32.1
850.200	47.8	-49.5	-20.0	Horizontal	29.5
1275.300	50.1	-47.2	-20.0	Vertical	27.2
1275.300	46.8	-50.5	-20.0	Horizontal	30.5
1700.400	47.4	-49.9	-20.0	Vertical	29.9
1700.400	44.9	-52.4	-20.0	Horizontal	32.4
2125.500	50.6	-46.7	-20.0	Vertical	26.7
2125.500	50.7	-46.6	-20.0	Horizontal	26.6
2550.600	51.6	-45.7	-20.0	Vertical	25.7
2550.600	50.3	-47.0	-20.0	Horizontal	27.0
2975.700	-	-	-20.0	Vertical	-
2975.700	-	-	-20.0	Horizontal	-
3400.800	-	-	-20.0	Vertical	-
3400.800	-	-	-20.0	Horizontal	-
3825.900	-	-	-20.0	Vertical	-
3825.900	-	-	-20.0	Horizontal	-
4251.000	-	-	-20.0	Vertical	-
4251.000	-	-	-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 12th, 2003.

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

The remote head was placed at the front of the test table with the transmitter being placed in the centre with the interconnecting data cable being bundled loosely on top of the test table.

Testing was carried out when the device was powered using an external 12.0 Vdc lead acid battery.

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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 10th harmonic.

Result: Complies

Measurement Uncertainty: ± 4.1 dB

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7. 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	VUSLP 9111	9111-228	3785
UHF Dipole Antenna	Schwarzbeck	UHA 9105	-	RFS 3679
Horn Antenna	EMCO	3115	9511-4629	E1526
VHF Dipole Antenna	Schwarzbeck	VHA 9103	-	RFS 3603
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	847124/020	E1595
Spectrum Analyzer	Hewlett Packard	E7405A	US39150142	3776

8. 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 12th, 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.

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9. PHOTOGRAPH(S)



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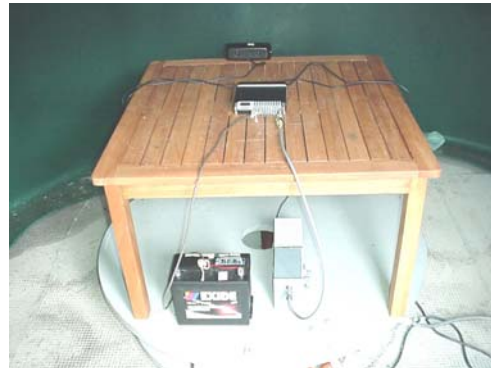
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Device under test photos



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