

EMC Technologies (NZ) Ltd

Test Report No **40534.2**

Report date: 4th June 2004

TEST REPORT

Tait TMAB22 – B100 VHF 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

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

Web Site: www.emctech.com.au

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1. STATEMENT OF COMPLIANCE

The **Tait TMAB22 – B100 VHF 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 14.6 dB margin at 310.200 MHz (Horizontal) when transmitting on 155.1000 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 – B100
Product	VHF Mobile Transceiver
Manufacturer	Tait Electronics Ltd
Country of Origin	New Zealand
FCC ID	CASTMAB1A
Serial Number	See below

The sample tested has a product code of TMAB22-B100 that covers the frequency band of 136 – 174 MHz

The sample tested comprised of the following modules:

- Model TMAB22 – B100 radio. Sn# 19007616
- Model TMAC40 – OT Control Head. Sn# 19009668.

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5. TEST SAMPLE SPECIFICATIONS

Transmit frequency

155.1000 MHz

Receive frequency

155.1000 MHz

Band of operation

136.000 – 174.000 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	21.0	-76.1	-20.0	Vertical	56.1
61.440	19.1	-78.0	-20.0	Vertical	58.0
73.735	12.0	-85.0	-20.0	Vertical	65.0
116.418	16.7	-81.0	-20.0	Vertical	61.0
159.758	19.6	-77.0	-20.0	Vertical	57.0
172.041	18.0	-79.0	-20.0	Vertical	59.0

Transmitting on: 155.1000 MHz

Power: Low

Frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
310.200	49.3	-48.0	-20.0	Horizontal	28.0
310.200	46.4	-50.9	-20.0	Vertical	30.9
465.300	31.9	-65.4	-20.0	Horizontal	45.4
465.300	25.7	-71.6	-20.0	Vertical	51.6
620.400	45.0	-52.3	-20.0	Horizontal	32.3
620.400	37.3	-60.0	-20.0	Vertical	40.0
775.500	-	-	-20.0	Horizontal	-
775.500	-	-	-20.0	Vertical	-
930.600	-	-	-20.0	Horizontal	-
930.600	-	-	-20.0	Vertical	-
1085.700	-	-	-20.0	Horizontal	-
1085.700	-	-	-20.0	Vertical	-
1240.800	-	-	-20.0	Horizontal	-
1240.800	-	-	-20.0	Vertical	-
1395.900	-	-	-20.0	Horizontal	-
1395.900	-	-	-20.0	Vertical	-
1551.000	-	-	-20.0	Horizontal	-
1551.000	-	-	-20.0	Vertical	-

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Transmitting on: 155.1000 MHz

Power: High

Frequency (MHz)	Level (dBuV/m)	Power (dBm)	Limit (dBm)	Polarity	Margin (dB)
310.200	58.4	-39.0	-20.0	Vertical	19.0
310.200	62.7	-34.6	-20.0	Horizontal	14.6
465.300	33.8	-63.5	-20.0	Vertical	43.5
465.300	38.7	-58.6	-20.0	Horizontal	38.6
620.400	40.8	-56.5	-20.0	Vertical	36.5
620.400	41.4	-55.9	-20.0	Horizontal	35.9
775.500	32.5	-64.8	-20.0	Vertical	44.8
775.500	38.5	-58.8	-20.0	Horizontal	38.8
930.600	-	-	-20.0	Vertical	-
930.600	-	-	-20.0	Horizontal	-
1085.700	37.1	-60.2	-20.0	Vertical	40.2
1085.700	39.9	-57.4	-20.0	Horizontal	37.4
1240.800	-	-	-20.0	Vertical	-
1240.800	-	-	-20.0	Horizontal	-
1395.900	-	-	-20.0	Vertical	-
1395.900	-	-	-20.0	Horizontal	-
1551.000	-	-	-20.0	Vertical	-
1551.000	-	-	-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.

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

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

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

E-mail: aucklab@ihug.co.nz

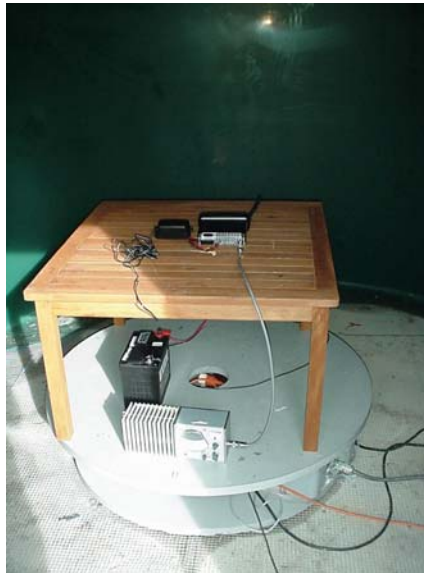
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Device under test photos



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